

Foreword

Dear users, Hi:

Thank you for your trust and love of our products! The series of agricultural small excavators produced by our company is a kind of small agricultural excavator mainly digging operation and supplemented by lifting and unloading operation. The design is compact, the power is matched properly, the stability of the product is good, the cost performance is high, , Hills, forests and other operating conditions of excavation and unloading requirements, but also for brick, kiln, river, construction, dredging, road construction, farm work and small works ideal construction machinery.

In order to enable users to properly understand the machine's use, adjustment, maintenance, maintenance and other aspects of knowledge, give full play to the effectiveness of excavators, users should carefully read this operation maintenance manual, and effectively implement the provisions of this operation maintenance manual. For the use and maintenance of ancillary engines, please refer to "Engine Operating Instructions" written by the supporting engine manufacturer.

The operating part is a technical reference for the driver using the machine. During the operation, the driver guides the driver to inspect, start, operate and stop the machine by using the graphic control method. The operation technique outlined in the manual is a basis for the driver to obtain the machine And its functional knowledge, can improve their own skills and skills.

Maintenance part of the user to carry out maintenance instructions. The presentation diagram by the maintenance cycle time from short to long hierarchical arrangement. The specific maintenance measures for the implement are described in detail in the "Lubrication and Maintenance Schedule". Users should follow the "lubrication and maintenance cycle table" in the request, according to the different working hours of mechanical maintenance of the project were maintained.

In extremely harsh, dusty or humid working conditions, according to the operation of the machine to increase the appropriate number of lubrication.

To demonstrate some of the structural features of the implement more intuitively, some of the demo pictures in this manual are set up as structural perspectives, so they differ from the actual appearance of the product. Due to technical changes caused by the actual vehicle mechanical structure, technical parameters, etc. are not shown in this manual, please consult the company for the latest product information of the product.

Before using or repairing the machine, you should approve the relevant information and contact with our technical service station if necessary. When purchasing parts, please indicate the excavator's date of manufacture and number.

In order to facilitate your use, the company set up a sound "three bags of technical service outlets." If the warranty period, your company's agricultural mini excavators purchased in the context of the use of quality problems, please promptly contact the excavator warranty repair station in the region.

As the company's product technology continues to innovate, we reserve the right to make any changes to this manual. The actual product and the picture of this manual are different, in kind prevail.

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Chapter I Safety Precautions

General precautions

It is your responsibility to follow departmental safety codes and laws and to operate, inspect and maintain the machine at the manufacturer's request.

In fact, all accidents are caused by failure to comply with basic safety regulations and precautions.

Most accidents can be avoided by identifying potentially dangerous situations in advance.

Read and understand all safety information describing how to prevent an accident. Do not operate the machine until you are certain that you understand how to operate, inspect and maintain the machine properly.

Observe all safety regulations

The machine must be operated, inspected and maintained by trained and qualified personnel.

All rules, regulations, precautions and safety precautions must be understood and followed when performing machine operations, inspections and maintenance.

In the case of alcohol, drugs, drugs, fatigue, or lack of sleep, do

not operate, inspect and maintain the machine.

When the machine is abnormal

In the operation or inspection and maintenance of the machine, if abnormal (noise, vibration, smell, oil leakage, false alarm, etc.) is found, immediately notify the sales or service agents and take appropriate measures. Do not operate the machine until it has been eliminated.

Operating temperature range

In order to maintain the machine's performance and to avoid premature wear, observe the following operating conditions.

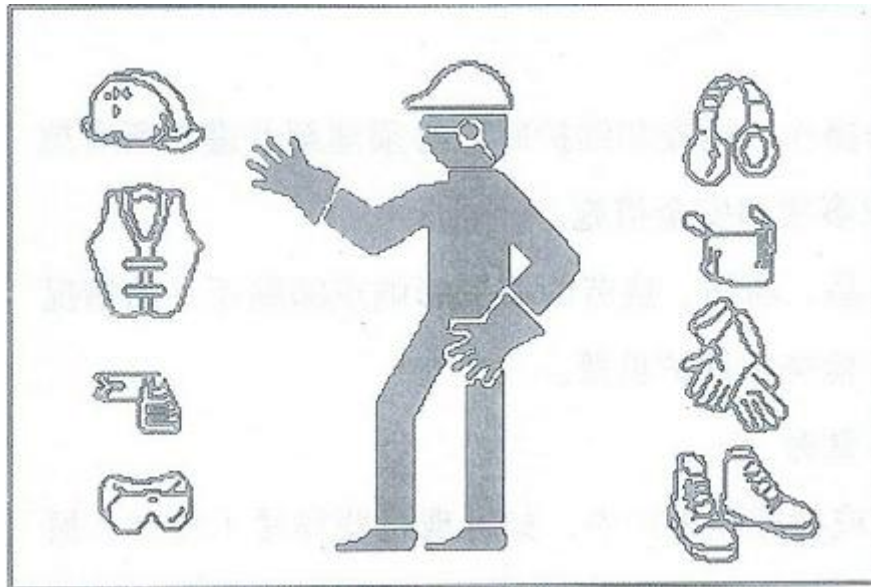
Do not operate the machine if the outdoor temperature is above + 45 ° C or below -15 ° C.

If the outdoor temperature is above + 45 ° C, the engine may overheat, causing the engine oil to deteriorate. Also, the hydraulic fluid may become very hot and cause damage to the hydraulic equipment.

If operated at outdoor temperatures below -15 ° C, rubber parts such as gaskets may become hardened, causing premature wear or damage to the machine.

If you need to operate the machine outside the above outdoor temperature range, consult your sales or service representative.

Wear suitable clothing and protective equipment



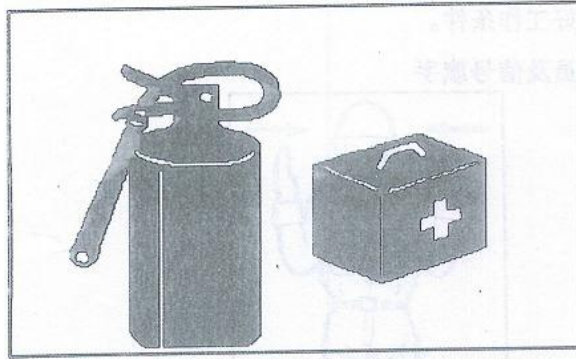
Do not wear loose clothing or accessories that may have attached control levers or moving parts

Do not wear easily greasy clothes with oil or grease.

Wear safety shoes, safety helmets, safety goggles, filter masks, thick gloves, ear protectors, and other protective equipment such as safety goggles and filter masks as work environment requires, as splashing metal shavings or other objects can cause serious injury.

When operating the machine, use a hearing protector. Prolonged exposure to high noise can cause hearing loss, or even total loss.

Install fire extinguisher and first aid kit



Do a good job of fire and accident preparation

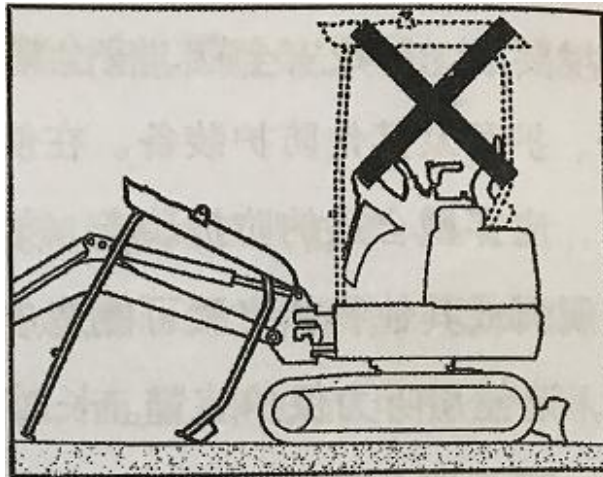
Safety fire extinguisher and first aid kit and learn if used.

Learn how to fight fire and deal with accidents.

Know how to contact emergency assistance and make a list of emergency contacts

Do not remove the safety device

Please ensure that all guardrails and so on are in place and firmly. Repair or replace damaged parts before operating the machine.



Do not remove any safety devices except for service. Use all safety features and always maintain good working conditions.

Equipped with signal staff and signal flag hand



Learn how to use the gestures required for a specific assignment and identify the person responsible for gesturing.

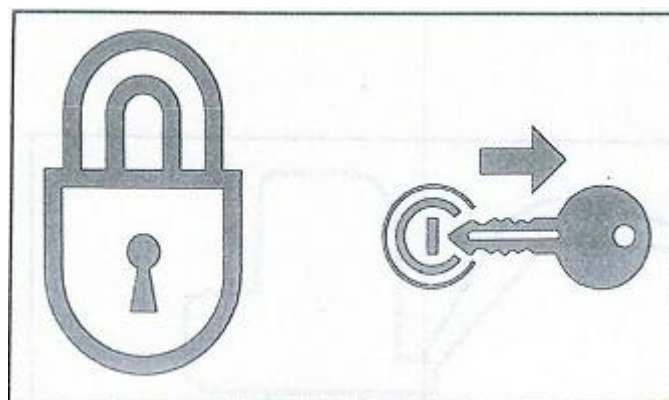
All people must fully understand all the gestures.

The operator must respond only to the gestures of the designated person, but must at any time follow the stop gesture issued by anyone.

The signalman must stand in a clearly visible place when signaling.

Precautions when standing up or leaving from the driver's seat

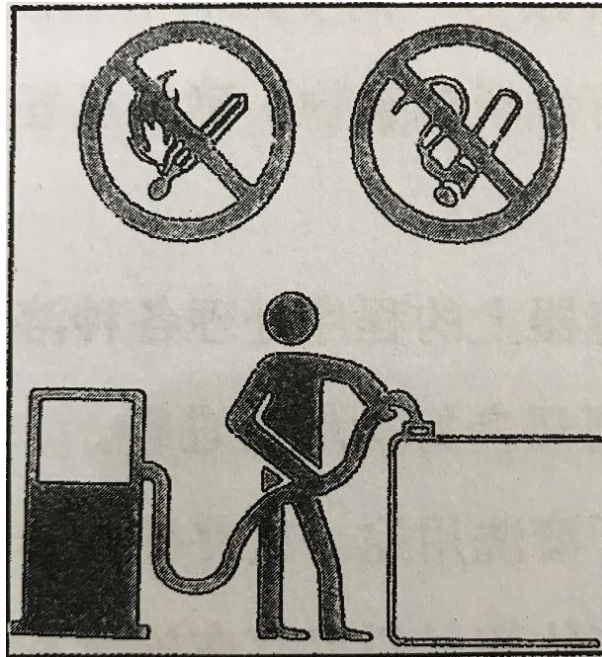
When standing up from the cab, lower the work unit to the ground and stop the engine. If you accidentally touch any control handle, it will cause the machine to move and cause serious injury or death.



Please note that dozer, boom and auxiliary hydraulic controls do not touch these controls.

Before leaving the cab seat, the work unit should be lowered to the ground and the engine should be turned off. At the same time turn off the headlights, key switch and the total power switch.

Avoid fire and explosion hazards



Maintain fuel, grease, grease and antifreeze principles to avoid flames.

Fuel is particularly flammable and dangerous.

While handling these combustibles, keep away from lit cigarettes, matches, lighters, and other flames or sources of ignition.

Do not smoke or there should be no open flame while handling fuel or carrying out fuel system operations.

Do not leave the job site while refueling or lubricating.

Do not remove tank cap or refuel while engine is running or not yet cooled. Also, do not spill fuel on the hot surfaces of the machine or on the electronics components.

Clean up spilled fuel or oil immediately.

Check fuel and lubricant leaks. Remove leaks and clean the machine before operation.

When polishing or welding, remove flammable materials to a safe place.

Do not cut or weld pipes or tubes that contain flammable liquids inside. Before cutting or welding, thoroughly clean with non-flammable solvent.

Remove all rubbish or debris from the machine. Make sure the machine does not retain greasy cloths or other combustibles.

Dispose of various solvents or dry chemicals (foam fire extinguishers) according to the procedures on the manufacturer's container. In a well-ventilated place.

Never use the fuel for cleaning purposes. Always use non-flammable solvents.

Store all flammable liquids and materials in a safe and airy place.

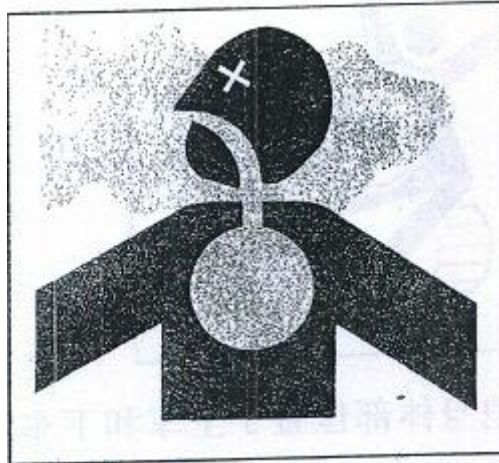
A short to the electronic system may cause a fire. Check wiring daily for looseness or damage. Retighten the loose connector and the cable tie. Repair or replace the damaged wire.

Pipe-induced fire:

Make sure that the hoses and tubes snaps, protector and cushion securely. In case of looseness, the hose or tube may be damaged during

operation due to vibration or contact with other components. This may cause high pressure oil to spill, causing fire or injury.

The exhaust gas from the engine is toxic:



Do not operate the engine in an enclosed, poorly ventilated location.

If natural ventilation is not available, ventilators, fans, extended exhaust pipes or other ventilation should be installed.

Asbestos dust treatment

Inhalation of asbestos dust may cause lung cancer. When handling materials that may contain asbestos, take the following safety precautions:

Do not use compressed air for cleaning.

Avoid polishing or sanding parts that contain asbestos.

When cleaning, use a vacuum setting with a high-efficiency particulate air filter.

If there is no other way to control dust, wear the specified respirator.

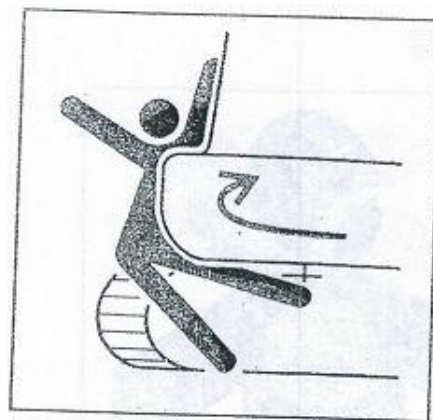
When working indoors, install a ventilation system equipped with a

polymer filter.

When working, do not allow unauthorized personnel to enter the work area.

Please strictly abide by the rules and environmental standards applicable to this work area.

Be careful not to squash



Do not place hands, feet or other body parts between the upper car and the lower car or between the crawler belts, between the body and work equipment or between the cylinder and the moving parts. As the machine moves, these void sizes can change and can cause serious injury or death.

Use option products

Before installing options, please consult the review. Depending on the type of accessory or a combination of these, the accessory may come into contact with the cab or other parts of the machine. Before use, make sure the installed options are not in contact with other parts.

Do not use unapproved accessories. Doing so may endanger the safety

or adversely affect the operation or service life of the machine.

The company is not responsible for any injuries, accidents or product damage caused by the use of unauthorized accessories.

Do not modify the machine

Unauthorized modifications to the machine can cause injury or death. Do not make unauthorized modifications to any part of the machine.

Safety signs (logo)

To ensure the safety of operators and staff around the work area, place the following safety signs (marks) on some parts of the machine. Walk around the machine with this manual and check the contents and location of these safety signs. Review these symbols and operating instructions in this manual with your machine operator.

Safety signs should be kept clean and easy to remove. If any safety label is missing or damaged and becomes illegible, replace it with a new one. When ordering a new logo from a company service agent, provide your product serial number.

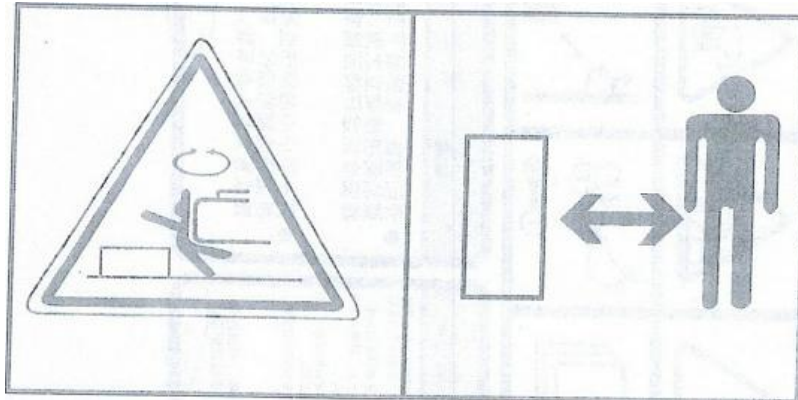
When the part / body posted on the safety sign has been replaced, a new one should be posted on the new part / body.

Chapter II Safety Signs

1, Keep away from the turning area logo

△ Must not stand in the machine rotation area within the station.

△ Do not damage or remove the logo from the machine



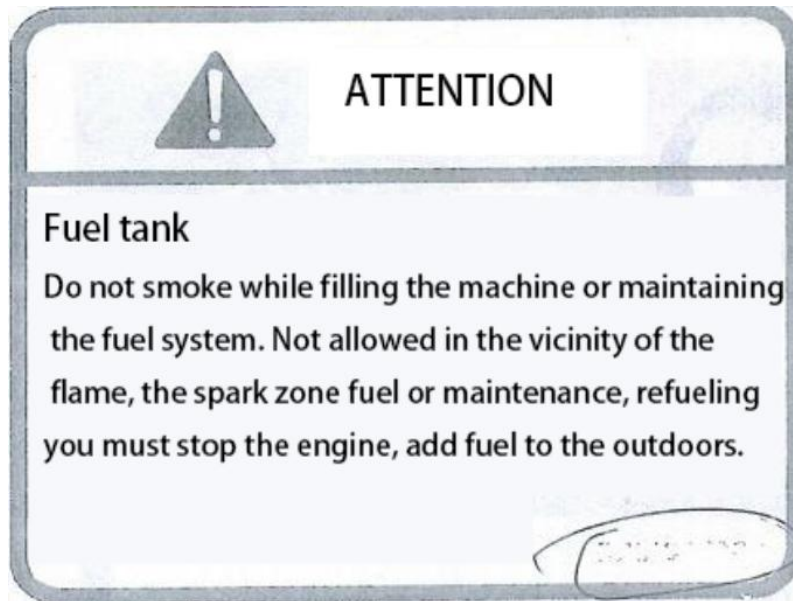
2, The fuel logo

This logo is located on the fuel tank

△ Turn off the engine when filling fuel, the fuel should be kept away from all open fire.



3, Fuel precautions



4, Must not stand within the scope of work

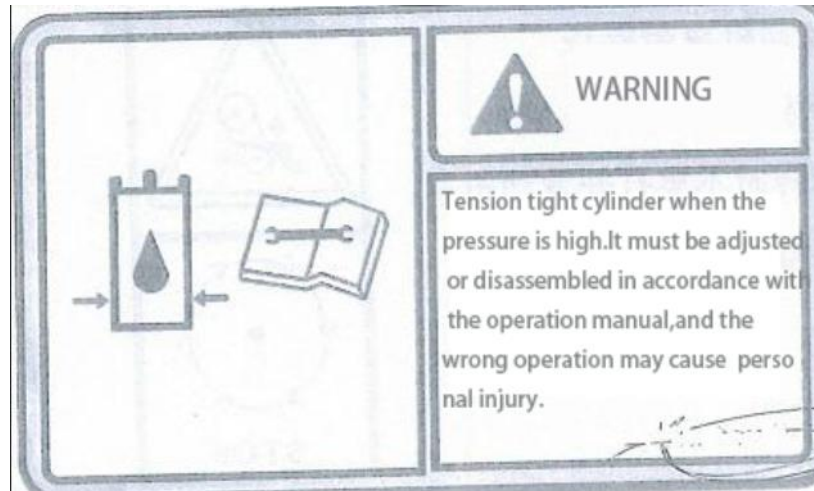


5, Keep away from the digging area

This logo is located on both sides of the stick

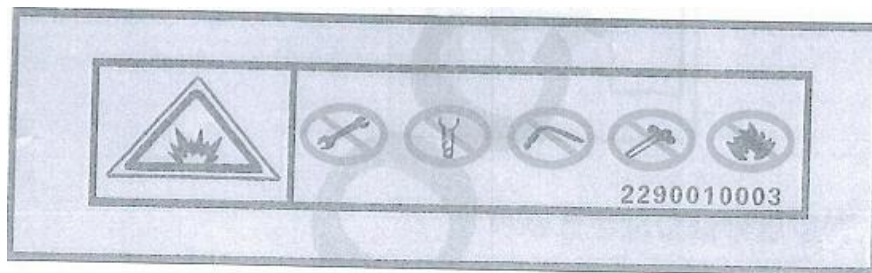


6, Precautions for adjustment of the track tightness



7, Pool, accumulator maintenance warning signs

This logo is located in the upper right corner of the rotary platform



8, Keep away from the engine belt logo

- △ Do not open the engine cover while the engine is running.
- △ Do not touch the exhaust pipe to prevent burns

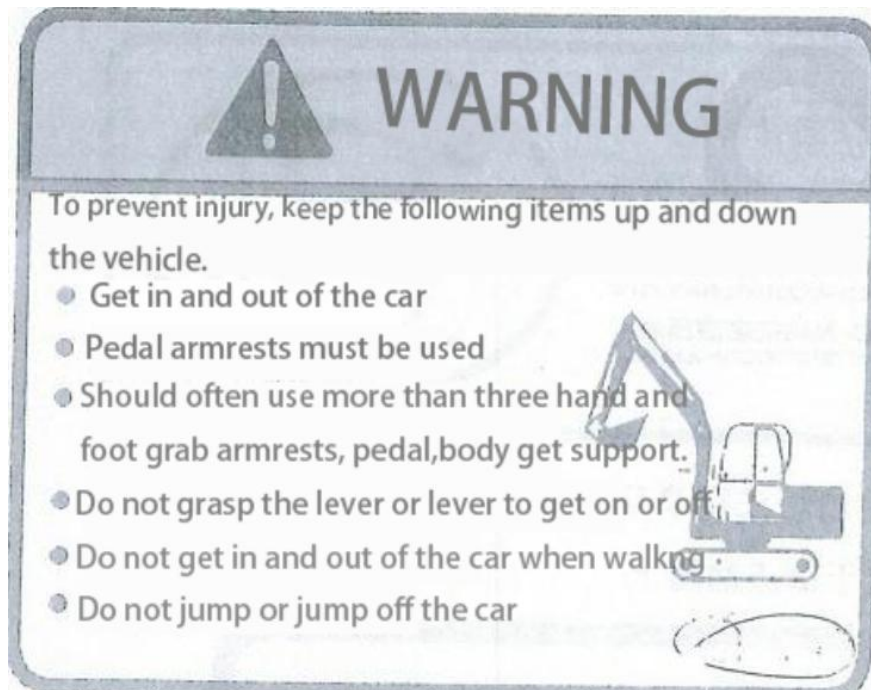


9, Hydraulic oil logo

This symbol is located on the hydraulic oil tank



10, Get on and off precautions



11,Slipping warning logo



Chapter III Pre-job inspection and

troubleshooting

Before operation, you should be fully aware of the conditions of the vehicle and operating area to ensure safety.

1, Car inspection

Before operation, check the fuel capacity of the vehicle. When the fuel is insufficient, the fuel should be replenished in time to avoid the machine from fire because the fuel runs out into the air. Once the fuel is exhausted and it can not ignite, first fill the fuel, and then discharge the air in the pipeline. 10-12 excavators used single-cylinder Changchai brand engine, such engine does not have manual fuel pump. You need to uninstall the engine pipe to discharge the oil, (as shown below). When the pipeline discharges oil and there is no bubble, you should re-install the pipeline on to the engine and tighten it, spark two or three times to start.



12-24 Excavators are equipped with manual fuel pump. When the fuel runs out, you only need to manually press the manual fuel pump for a

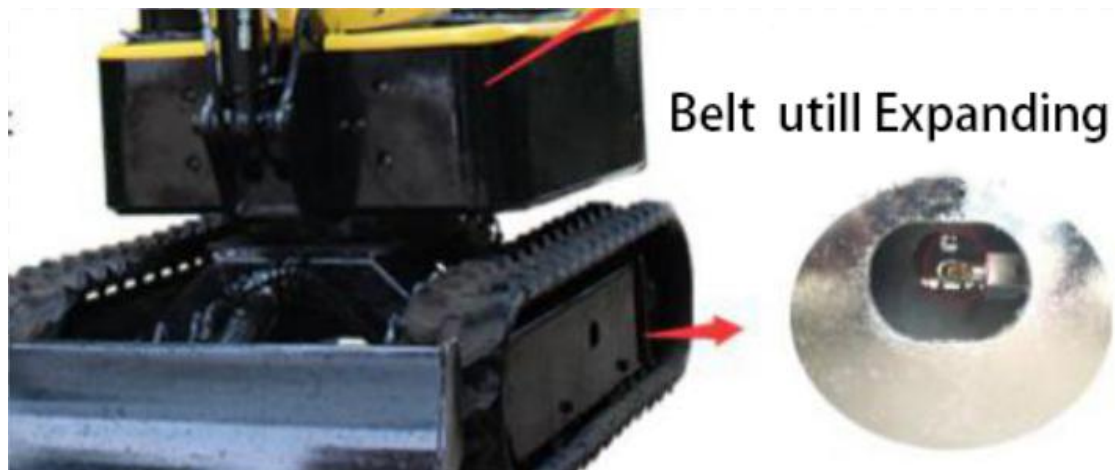
while, and the air in the pipeline will be drained.



Due to the large difference in climate between the regions where the machines are used, the regions with low temperature in winter must select the diesel suitable for the local temperature. For example, the minimum temperature is -20 degrees, -30 # diesel is required. Otherwise, diesel freezing may occur, and it is unable to start the machine.

Track tension check

Before work, check the tension of the track. If the track is too loose, it is necessary to fill the butter tensioner with the butter in time to tension the track (as shown in the figure below)

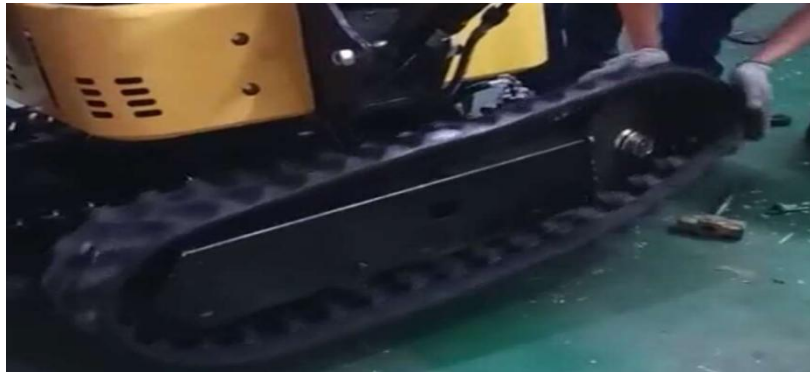


If the track is too loose, it will be easily off during turning or direct change or walking by one side. It will be difficult to be installed if it is off.

Off track installation

First start the machine, lift off the measured fuselage, unloaded rubber crawler out, remove the guide wheel and its butter pin, (remove the dozer cylinder if necessary) remove the check valve at the top of the butter pin, remove the butter pin. Re-insert the butter sleeve and press it all the way in. Remove the internal butter and replace with a one-way valve (note the direction of the mouth). Put the guide wheel back in the bracket, aligning the cross with the oil port facing outwards, Put the guide wheel (pay attention to the track direction do not make mistakes), pull the other end of the track, start the machine and operate the valve stem so that the drive wheel slowly inverted at the same time the track to the drive wheel buckle, the use of the machine-driven power and crowbar assisted, until crawler fully loaded, loaded into the butter tensioner into the butter, tensioning the track, in the operation of these

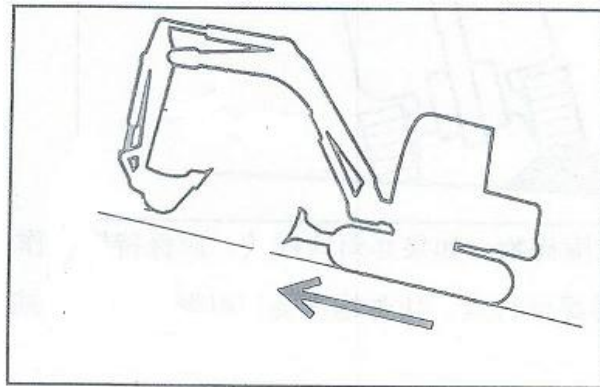
columns should pay special attention to safety, improper operation will lead to serious accidents, (track is rolled, pry stick swings or flies away, which make people injured). If your are uncertain about it, please contact the manufacturer for guidance.



Hydraulic oil check

Check hydraulic oil level before work, the hydraulic oil level is too low when the body tilting the fuel tank side of the fuel tank bias, will lead to the pump can not absorb the oil and the vehicle without any action, in

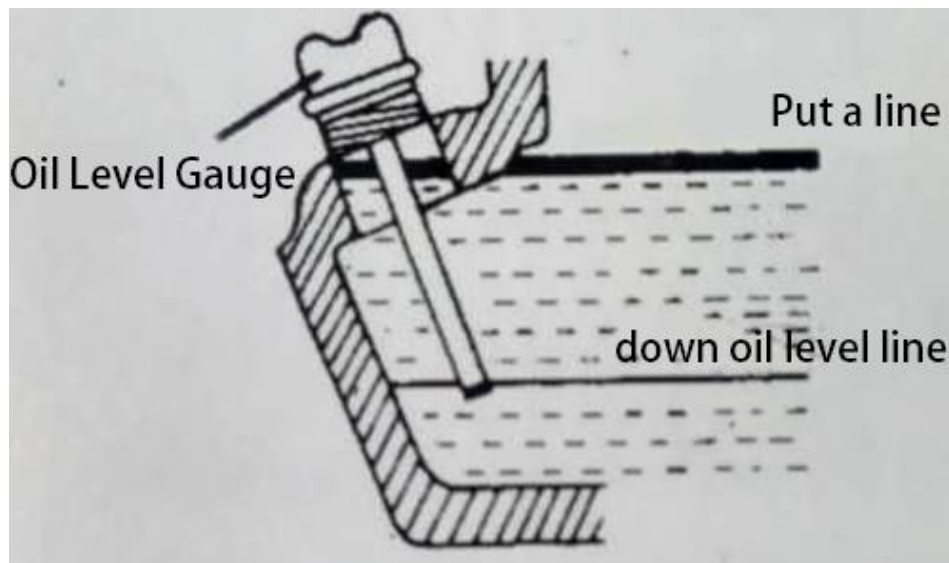
which case, need to add hydraulic oil or will balance the vehicle, if there is no hydraulic oil or can not cushion the body, you can try to break the rotary valve stem, push the boom, the boom turned to the side of the car body, and then start the machine, if there is action, adjust the car to the level first and then replenish the hydraulic oil.



Oil inspection: The hydraulic oil used in the excavator is 46 # anti-wear hydraulic oil. Due to the large difference in climatic area in use, the low or high temperature will affect the viscosity of the hydraulic oil, resulting in insufficient or abnormal system pressure and even accelerating the wear of the oil pump. Select the appropriate hydraulic oil according to local weather and temperature.

※ **Oil Inspection:** When using the machine, it is necessary to check the engine oil periodically to see if the oil is sufficient. If it is insufficient, it should be replenished promptly (oil will be slowly consumed as the engine works), so it is necessary to check the amount of oil regularly otherwise it will cause excessive engine wear or cylinder score. The engine manufacturer will not provide warranty for cylinder score or

other problems due to lack of oil.



2, Operating area inspection

Check the terrain and ground conditions of the work area, inspect the building structure during indoor work, and take safety measures when necessary.

Be sure to avoid dangers and obstacles such as ditches, underground pipelines, trees, cliffs, overhead lines, or lots of places where there is danger of landslide or solidification.



Check with administrator for the location of buried gas pipes, plumbing and power cables. If necessary, consult with the administrator and

determine the specific safety measures that must be followed to ensure safety.

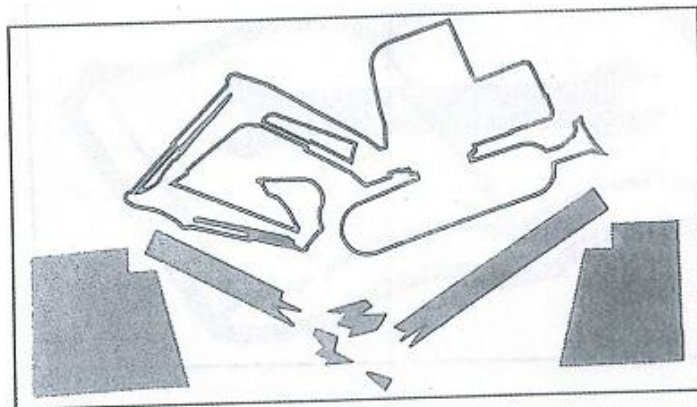
When working on the road, be sure to consider the safety of pedestrians and vehicles.

Use signal staff and / or signals. Isolate the working area, unauthorized personnel shall not enter.

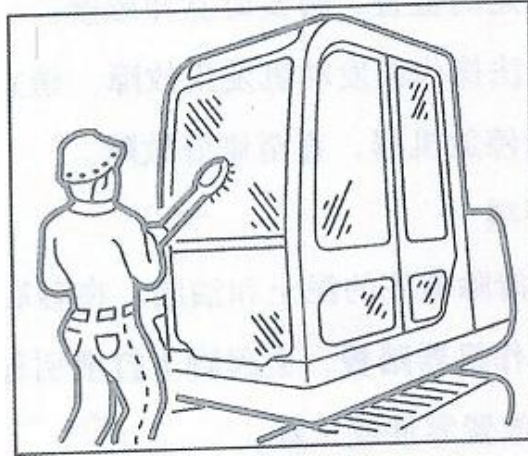
When working in the water or opening a shallow stream, water depth should be checked in advance and to see if the ground is solid and the flow rate.

Check the strength of the bridge

When walking on a bridge or structure, check the allowable load. If strength is insufficient, bridge or structure should be strengthened.



Always keep the machine clean



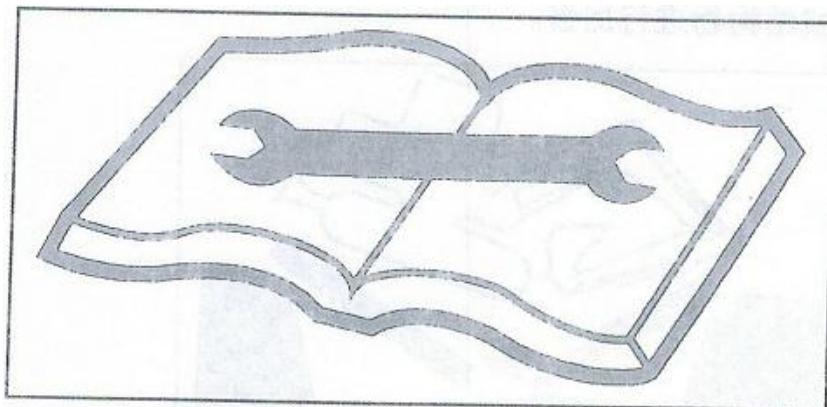
Wipe off grease, grease, dirt, snow or ice to prevent accidents due to slipping.

Remove all loose objects and unnecessary equipment in the machine.

Remove dust, grease or grease from engine parts to prevent fire.

Clean around the operator seat and remove any unnecessary objects in the machine.

Daily inspection and maintenance



Failure to identify or repair machine abnormalities or damage can cause an accident.

Before the operation, please perform the specified inspection and repair immediately if necessary.

In the event of an accident or it cannot be operated or engine failure, immediately shut down according to the shut-down procedure and park the machine firmly until troubleshooting.

Driver's room precautions

Before entering the driver's room, please remove the dirt and grease soles. If operating the machine pedal with dirt and grease adhering to the sole may cause an accident due to slipping.

Do not place parts or tools around the driver's seat.

Do not place any plastic bottle in the cab or install any suction cup. Plastic bottles or suction cups play a see-through role and may cause a fire.

Pre-start safety measures

The following three safe postures support you when you get on/off the vehicle.

Do not jump on or off the machine. Do not try to get on/off the machine when it is moving.

When get on/off the machine when it is moving, first fully open the door to the locked position and check to make sure that the door can not be moved (for cab-equipped machines).



Face the machine up / down the pedal and hold the armrest to support you in three-point safe posture (hands and feet).

Do not use the lever as a handle.

Before starting the machine, remove any unauthorized personnel from the area

Be sure to start the machine safely by checking the following items.

Go around the machine to issue warnings to maintenance personnel and those walking around them. Be sure that no one is around the machine before starting the machine.

Check the driver's cab, control or start switch for "do not operate" warning signs or similar signs. If yes, do not start the engine or touch any joystick.

Sitting in the driver's seat, start the engine

Adjust seat to firm lock



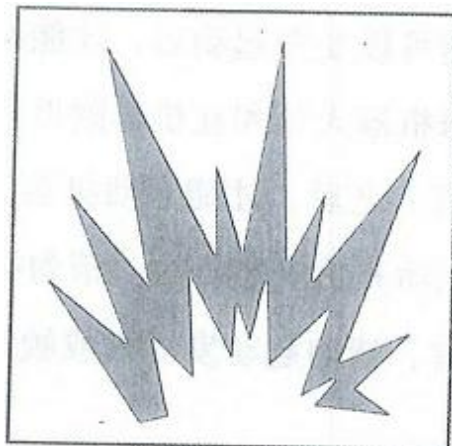
Fasten your seatbelt.

Check if parking device is on and all levers and pedals are in neutral position.

Make sure no one is near the machine. Only start and operate the machine from the driver's seat.

Never attempt to start the engine by connecting neutral wire and live wire of the terminals.

Start with jumper cables



Starting with jumper cables can only be done as recommended. Improper use of jumper cables can cause battery explosions or unexpected machine movements.

Chapter IV Engine start

Start the engine after turning on the power switch, the amount of fuel, (pull the decompression switch is limited to 10-12 excavators, pull the decompression start can effectively reduce the power consumption) press the decompression start until the engine speed reaches. After starting the engine, immediately release the ignition key, at the same time to confirm whether the key bounces back.

※ **It is forbidden to twist the key again after starting the engine. This operation will damage the starting motor and the engine flywheel gear, even destroy the starter casing and burn the starter coil. In addition, excessive ignition of the ignition key will cause the key not to rebound. After starting the engine, the starter gear can not be separated from the engine. Under the condition of high engine speed, the current in the starter increases rapidly, causing the coil to be destroyed.**

Start key is equipped with dust cap, which can effectively prevent the dust and other substances from entering into the key, once the water and other impurities enter into the key, it will make lock core not return or internal short circuit, damage starter, so in rainy days or humid, dusty environment, it must not park for a long time with the key unplugged. If it needs to park, protection measures should be taken for the key.

Special Note: The diesel engine can not start after starting the motor for 10 seconds. Please wait for 15 seconds to start again. (Continuous operation of the motor for a long time will cause a lot of battery power consumption and possibly burn the starter)

The manufacturer will not provide warranty for motor if it is damaged due to the reasons above.

After starting the machine, the power switch and the key gear 1 should be in the open state, otherwise the battery can not be charged.

After starting the engine, perform the following operations and inspections where there is no person or malfunction. If any trouble is found, shut down according to the procedure and report the trouble.

Preheat engine and hydraulic oil.

Check whether the instruments and alarm devices are working properly.

Check for noise.

Test engine speed control.

Operate the controls to make sure they are working properly.

For cold weather



Be careful, the frozen ground, pedal and the handle are very slippery.

In cold weather, do not touch any metal part of the machine with bare hands.

The skin will freeze to the metal, causing serious injury.

Do not use ether or primer on the engine. Priming fluid can cause an explosion and serious injury or death.

Preheat engine and hydraulic oil. If the lever is operated without warm-up, the machine does not react or move quickly or appropriately, causing an accident

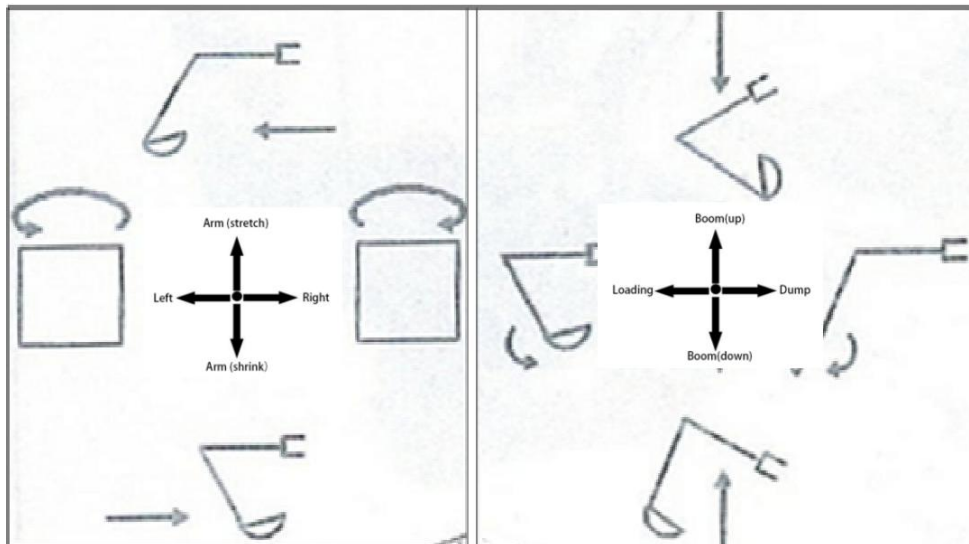
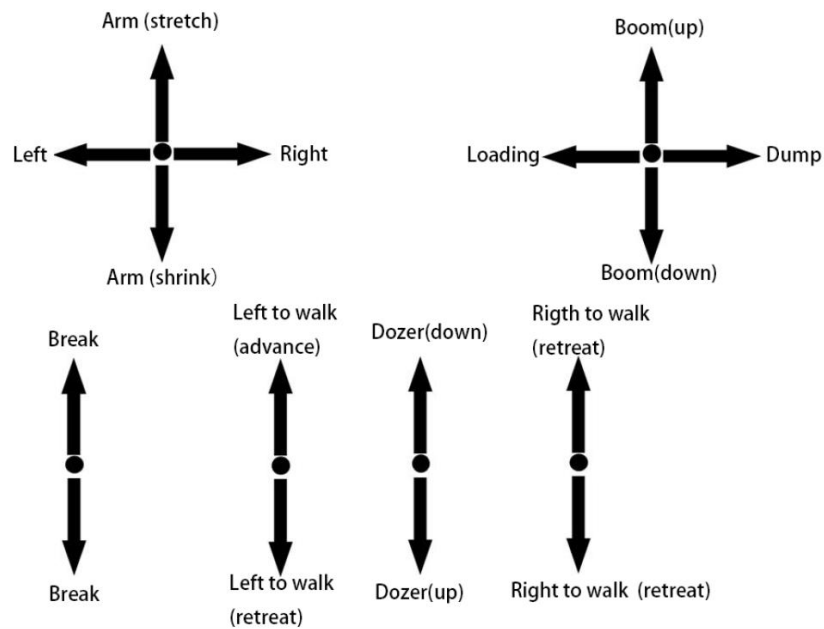
Chapter V Operation instructions and precautions

1. Work equipment operation diagram

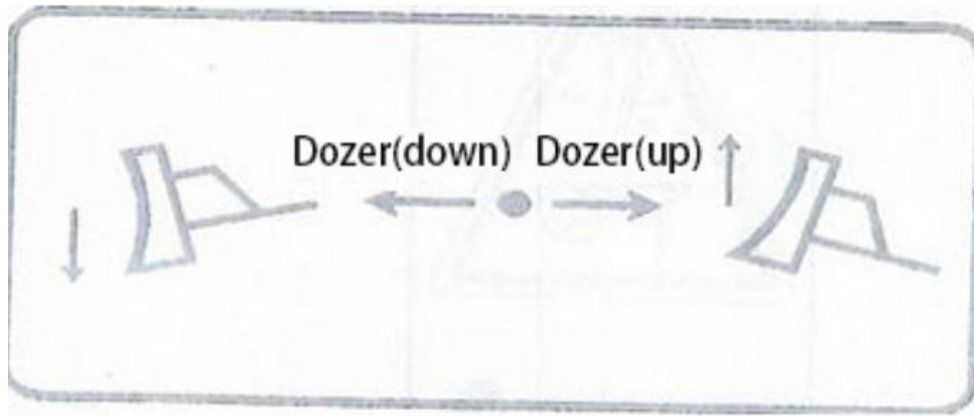
This logo is located inside the front of the cab, check if the machine control mode and label are matched. If different, replace the sticker before operating the

machine to match the machine control mode.

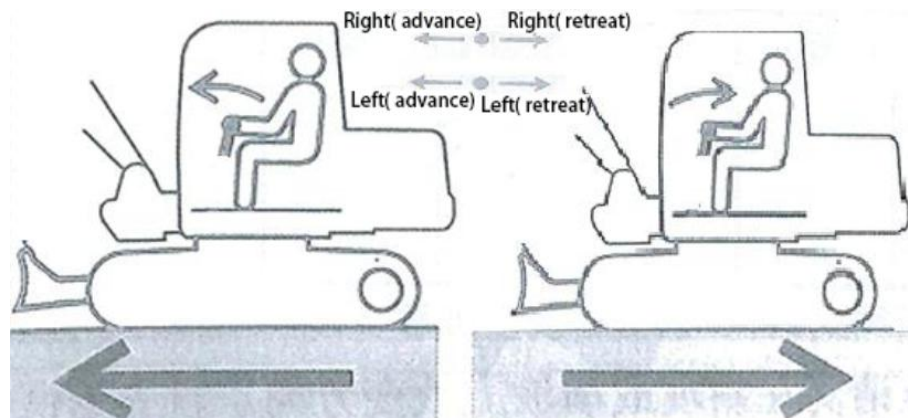
△ Failure to do so may result in personal injury or death.



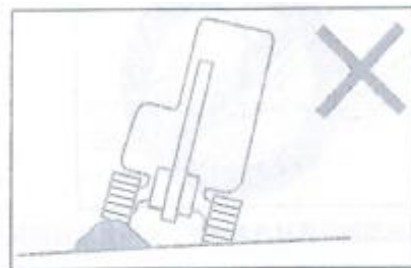
2. Bulldozer operation diagram



3. Walking operation diagram

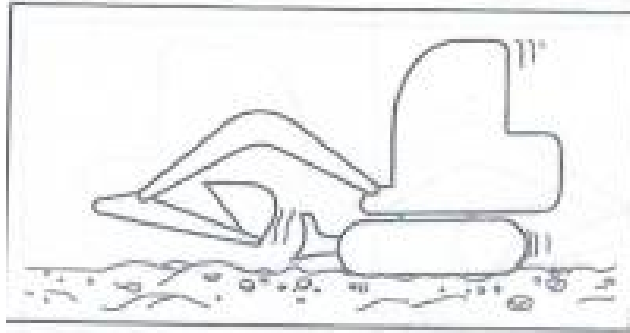


Walking job considerations



Walking on obstacles (rocks, tree stumps, etc.) can put a heavy load on the body and can cause damage to it and try to avoid crossing obstacles. If this is necessary, the bucket should be mounted close to the ground and walking at low speeds to get the center of the track over obstacles.

Precautions when walking at high speed



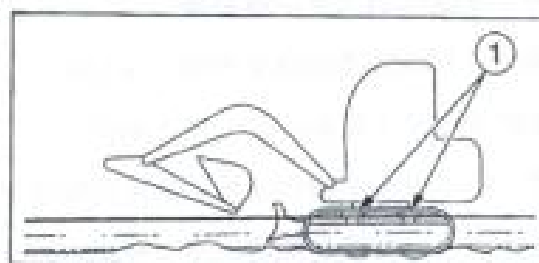
On uneven roads, keep walking at low speed, avoid sudden start, stop or change direction.

Bulldozers should be in the front when walking at high speed

Precautions when using this machine in water



If the rear of the machine is immersed in water as shown above, it will cause the radiator fan to rotate in the water, causing the fan to be damaged. The rear of the machine must not be submerged in water.



Allowable water depth

Use this machine in water only when the water does not exceed

the middle of the shoe slipping.

For those parts that have been used for a long time in the water, add enough grease until the old grease is squeezed out.

Do not submerge swivel support or body in water or sand. If it is submerged, contact your company service representative to check it.

Out from the mud

If the machine gets stuck in the mud, follow the steps below.

If a track is stuck into the mud



1, the bucket swings towards the stuck track.

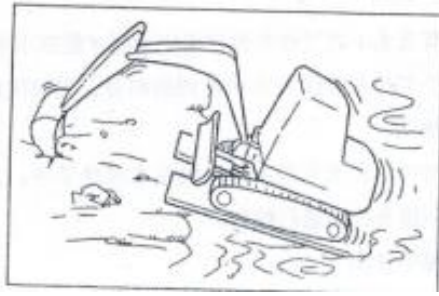
2, the stick and boom angle is set to 90° to 110°

3, put the bottom of the bucket (rather than bucket teeth) on the ground.

4, put a piece of wood or similar objects under the lifted track.

5, lift the bucket slowly and drive the machine out from the mud.

If both tracks are stuck in the mud

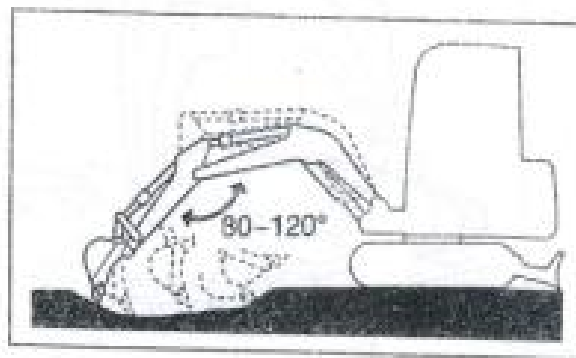


1, Perform the above steps 1 to 4 on both tracks.

2, in front of the machine, dig the bucket into the ground.

Pull the stick while walking forward and slowly remove the machine.

Digging



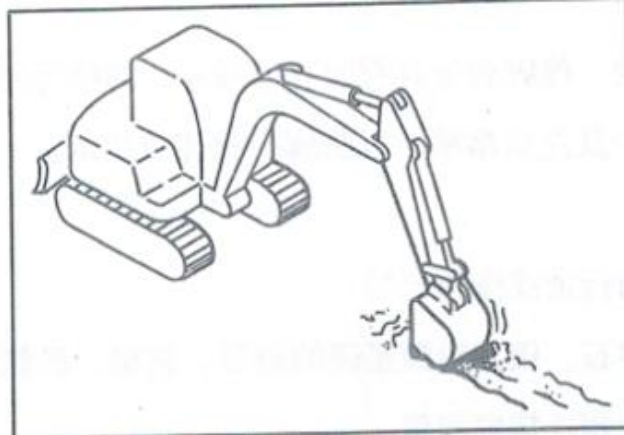
1. Push the blade to the opposite side of the digging area.

2. Use sticks and bucket to dig, and when digging, you should dig shallowly with the long digging journey. Boom and stick angle is 80° to 120° , which will be the maximum digging force. Should adopt this angle for effective digging.

✘ **When digging the medium with stones, place the dozer at the rear of the excavator to prevent the rock raised by the bucket from smashing onto the push cylinder and causing the tubing to break. The manufacturer will not provide warranty**

for broken pipeline due to such reasons.

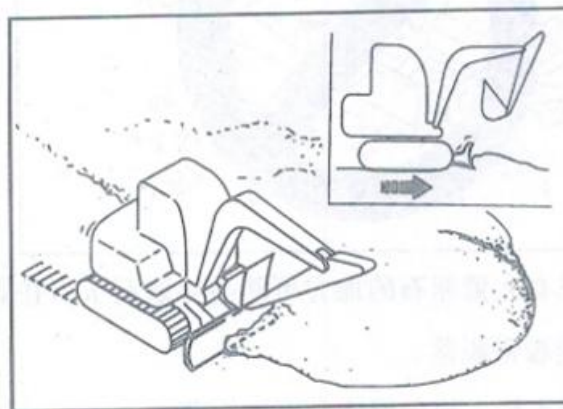
Dig ditch



Install buckets suitable for digging ditches and adjust the crawlers to be parallel to the ditches to be dug to improve efficiency.

When digging the wide ditch, first dig side, and then dig in the middle.

Leveling



1, place the bucket close to the machine.

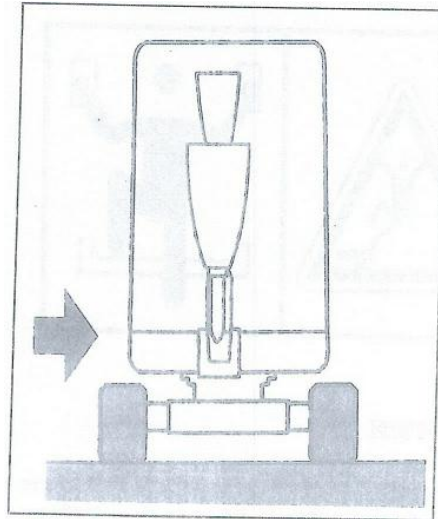
2, push the soil slowly from the side of the mound.

When the mound is low, push the soil from the top. If the load

on the body is too heavy, raise or lower the blade to adjust.

Chapter VI Precautions when working

Ensure good sight



When working in dark places, turn on the machine's work light and headlamps, and install additional lighting if necessary.

Due to bad weather (fog, snow, rain or haze) resulting in poor visibility, should stop operating the machine until you can see it clearly.

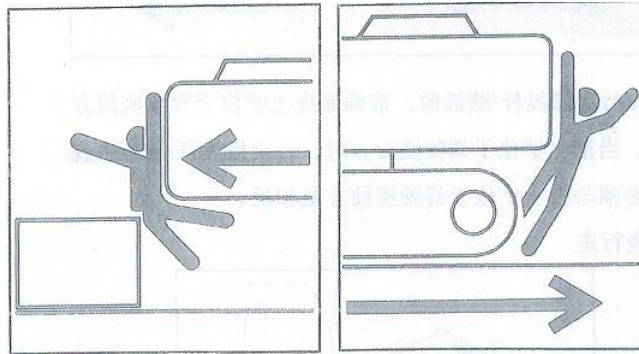
Do not upload people on the machine

Do not allow anyone to ride on any part of the machine at all times while the machine is walking or operating.



Before operating, check whether the work

area is safe and reliable



Confirm the performance limits of the machine.

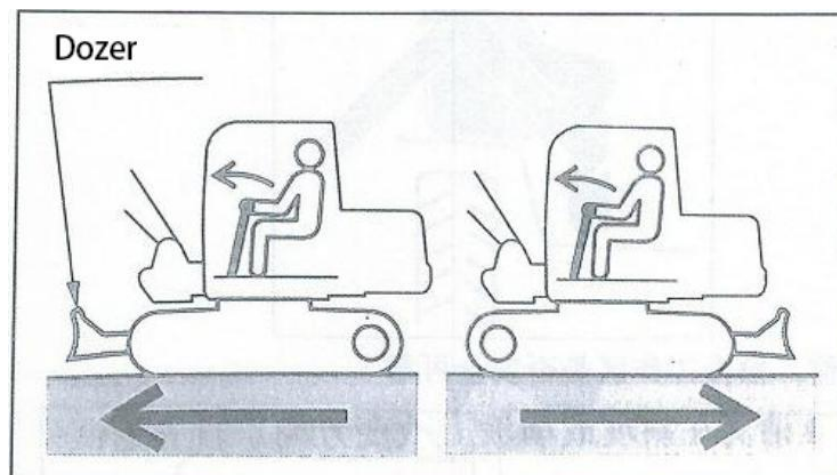
On the road shoulders, at the narrow places or obstruction of sight, using signal staff.

Do not allow anyone to enter the turning radius and path of the machine.

Honk your intent to move.

There is a blind spot at the back of the machine. Before walking backwards, check the safety behind and make sure no one is behind.

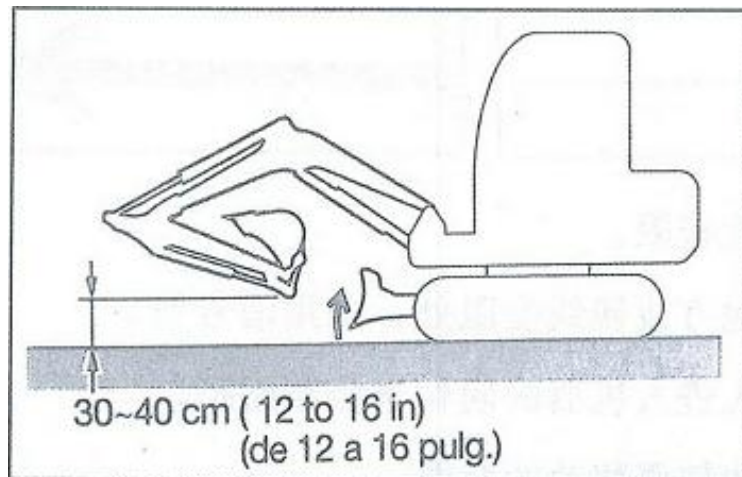
Before walking, check the position of the lower frame (track)



Before operating the walking joystick / pedals, make sure the dozer is in front of the driver's seat, keeping in mind that when

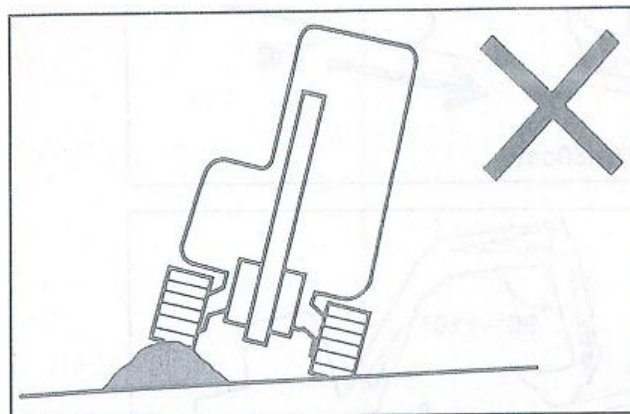
the dozer is behind the driver's seat, the operation direction of steering stick / pedals must be When digging the wide ditch, first dig side, and then in front of the driver's seat.

Safe walking



When walking the dozer is raised, fold the bucket as shown in above figure and lift the bucket to 30 cm to 40 cm above ground level.

Do not turn when walking. If you have to operate the bucket while walking, the speed should be slow enough to allow you to fully control it at all times.



Try to avoid crossing obstacles. If this must be done, keep the

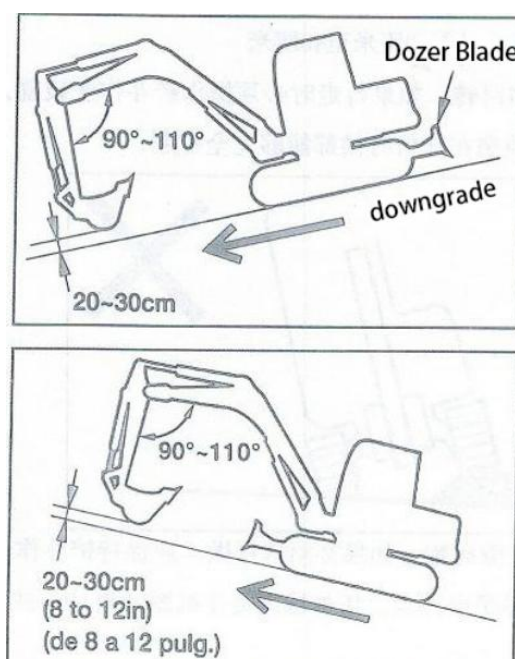
bucket closer to the ground and walk slowly. Do not jump over obstacles that will tilt the machine 10° or more.

On uneven roads, keep walking at low speed, avoid sudden start, stop or change direction. Otherwise, work equipment may come into contact with the ground, causing the machine to lose balance and damage or break the structure in the surrounding area.

Precautions for walking on the slopes

When walking on slopes or ramps, be careful not to tip or slide the machine.

Do not walk past steep slopes where the machine can not maintain stability (up to 30° , dip: 10°) Note that in practice, depending on the operating conditions, the stability of the machine will be lower than above.



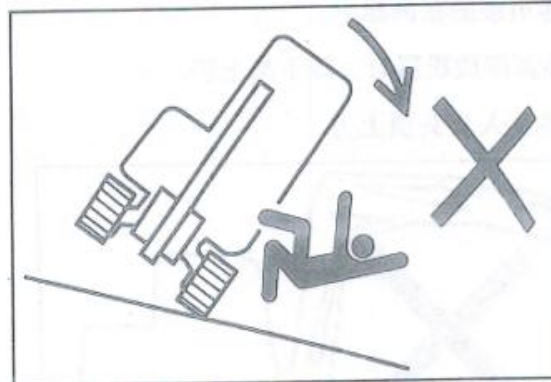
When climbing, keep the driver's seat facing the hillside. When downhill, keep the driver's seat facing downhill. In both cases, care must be taken when walking to the ground in front of the machine.

When walking on slopes, lower the bucket to 20 cm to 30 cm above the ground. When climbing a steep slope, extend the bucket to the front. In an emergency, lower the bucket to the ground and extinguish the machine.

Slow down at low speed while walking on a ramp or ramp.

Downhill, lower engine speed.

Do not reverse downhill.



Do not change direction on slopes or slopes. Return to flat ground first, then pick another path.

The machine may slip on a gentle slope covered with grass or dead leaves, or on a wet sheet metal or frozen floor. Make sure the machine is not parked on the slope sideways.

If the machine stalls on the slope, return each lever to neutral

position and restart the engine.

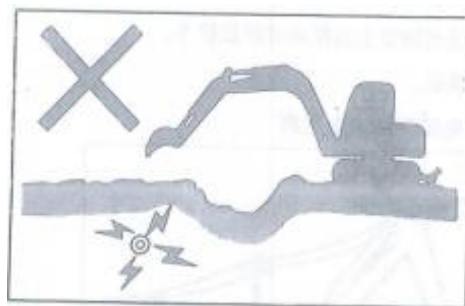
Take extra care when operating the machine on snow or ice.

When driving on snow or icy ground, drive at low speed to avoid sudden start, stop or direction change.

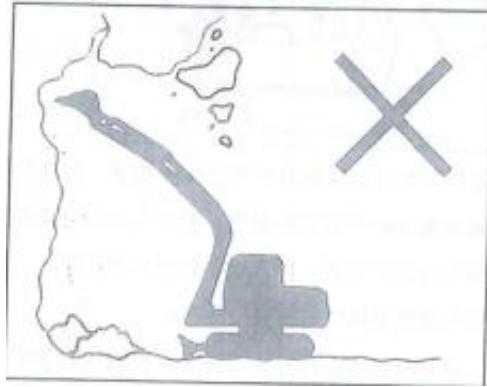
In snowy areas, objects placed on the shoulders and on the curb are buried in snow and can not be seen. There is also the danger of the machine overturning or bumping into the covering, so always handle it carefully.

If the machine enters thick snow, there is danger of capsizing or being buried in the snow. Drive carefully, not over the shoulder or trapped in snow.

Please also pay special attention to the high-voltage cables buried underground.

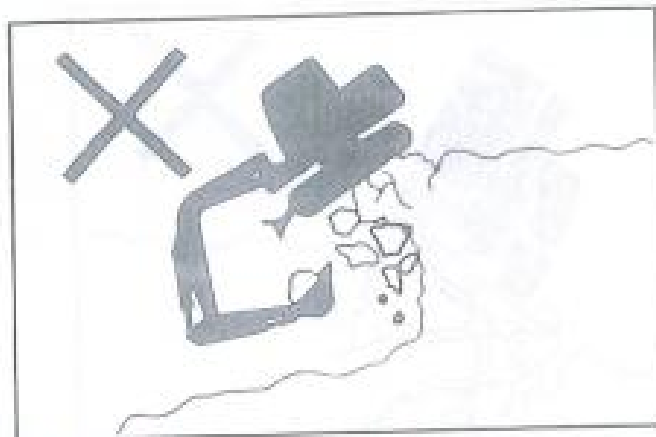


Pay close attention to dangerous working conditions



Never dig a machine at the bottom of a high embankment. It may be dangerous to collapse the ground in so doing.

Do not operate in a place where there is danger of falling rocks. Keep the machine safe from the edge of the excavation site. Do not excavate the ground in front of the machine.



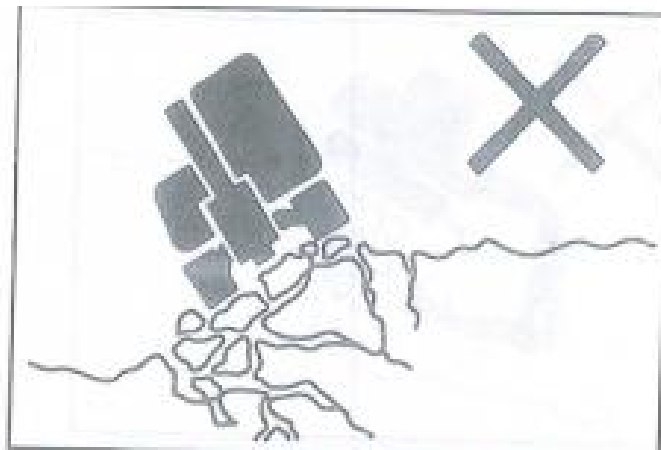
When working close to cliffs or shoulders, to make it easier to escape if something goes wrong, keep the crawler at right angles to the cliff or road shoulder with the dozer in front.



Do not enter the soft ground area. Doing so may cause the machine to tilt due to its own weight, causing it to overturn or fall into the ground.

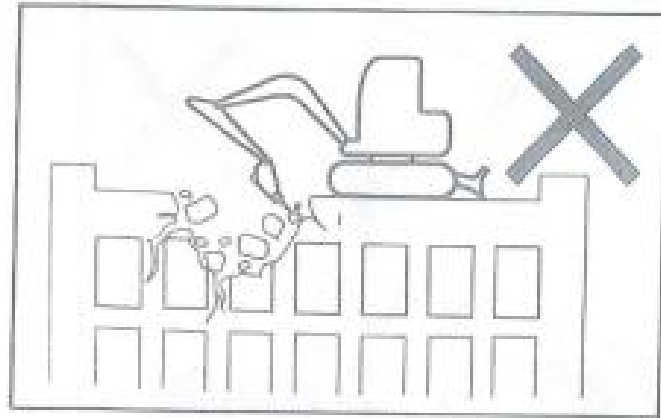
Do not approach unstable ground (cliff, shoulder, deep groove).

If the ground collapses due to machine weight or vibration, there is a danger of the machine falling or overturning.



Remember that the soil is not strong after heavy rains or explosions.

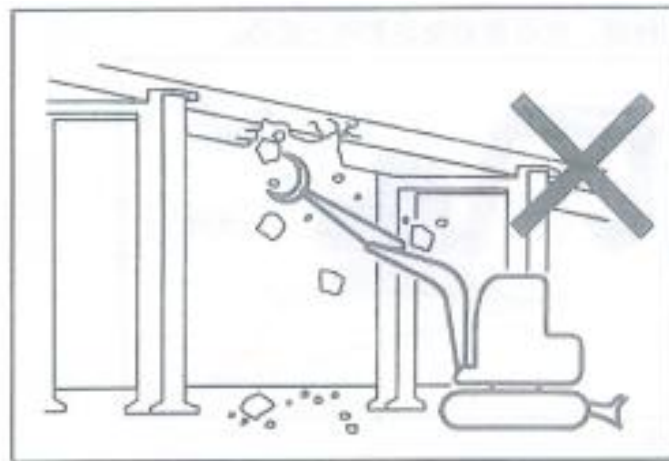
The top of the bank and ground around ditches are not solid.



Do not dismantle under the machine. As the ground becomes unstable, there is a danger of the machine falling.

When working on or from the top of a building or other structure, check the strength and structure before proceeding.

If a building or structure collapses, it can cause serious injury or damage.



When disassembling, do not disassemble overhead. There is a risk of damage caused by a fall or collapse of a building, causing serious injury or damage.



Do not use the impact of the bucket for the demolition work.
Danger of serious injury due to splattering material fragments and damaged bucket.

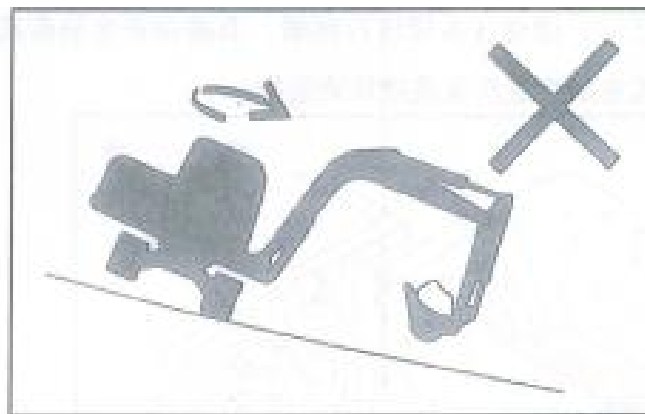
※ **Excavation operations need to ensure that there is enough space between the digging machine and obstacles, digging machine body and obstacles may occur during the operation of a small space, resulting in deformation of the body, cylinder fracture, tubing fracture. The manufacturer will not provide warranty for articles damaged listed below.**

Dangerous operation on slopes

When operating on slopes or ramps, turning or operating the work unit may cause the machine to buckle and tip over. Try to avoid operating on slopes.



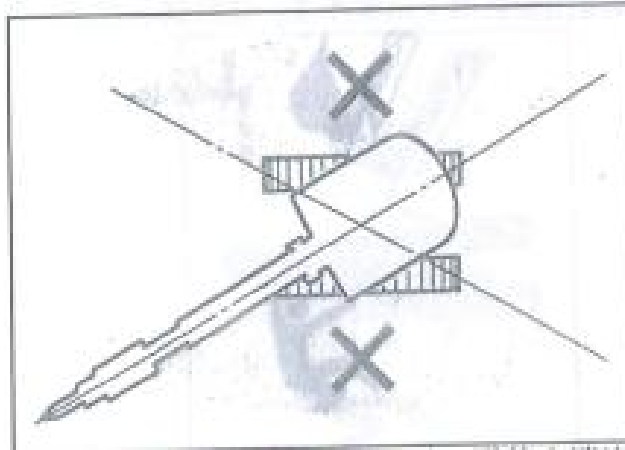
Leveling area.



When the bucket is full of material, avoid turning downhill. This will reduce the stability of the machine and may cause overturning.

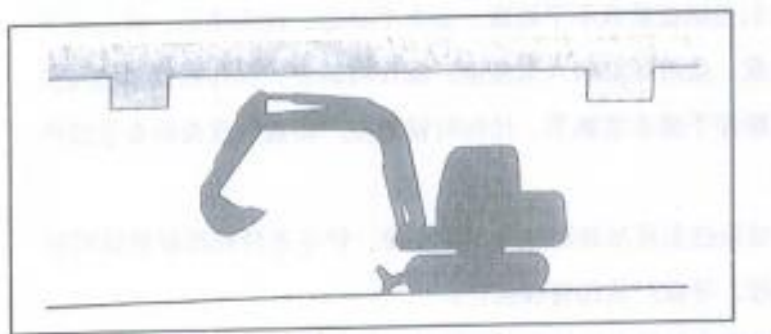
Do not turn sideways (swing) when the bucket is heavily loaded
The machine is easier to capsize in the landscape than in the portrait.

Do not swing laterally (swing) when the end of the bucket is heavy. In particular, do not turn (swing) sideways on slopes.



When the machine is equipped with a breaker, shredder or long stick, the end of the accessory is heavier than that being equipped with a standard bucket. For such heavier end machines, do not dig in the downhill direction or move it sideways.

Please pay attention to overhead objects



When operating the machine under the bridge, in the tunnel, near the cable or indoor, you should be careful and do not make the boom or stick hit the overhead objects.

Excavators are not designed for lifting

This machine is specially designed for digging work. Therefore, it has no lifting safety device. Use excavators for hoisting

operations with special care.



Do not overload. Overloading can cause the machine to overturn, causing serious injury or death.

All rated lifting capabilities are based on using the machine on a stable and level floor. For safety hoisting operations, and for specific working conditions, we hope that users leave appropriate margin. They include loose or uneven ground, non-horizontal conditions, lateral loads, dynamic or sudden loads, hazardous environments and personnel experience.

Before operating the machine, the operator and other personnel should be familiar with the operating manual and should always observe the safe working practices of the equipment at all times.

If the chain or lifting device is not properly connected, the bucket linkage or lifting device may fail, causing serious injury or death.

When using this machine as a crane, do not attempt to remove the stump from the ground. It is unknown for the load imposed on the machine for such purpose. Do not allow anyone to stand on or under the suspended object or approach the work area.

Be careful of the flying object.

Chapter VII Prohibited Practices

Do not operate on bedrock (hard or soft).

Do not turn when walking. If you have to operate the bucket while walking, the speed should be slow enough to allow you to fully control it at all times.

- Do not use the rotating force to disassemble, pry or level.



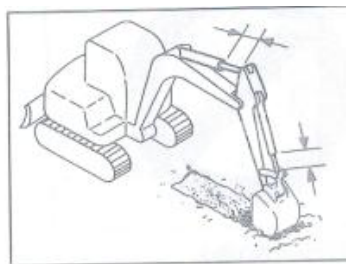
Do not disassemble the wall or level the floor with the force of rotation. Also, do not dig the bucket teeth into the ground while turning. Doing so can damage the bucket and seriously damage the swing motor and swiveling gear.

- Do not dig when walking



Do not dig the bucket into the ground and use the walking ability to excavate

Use a hydraulic cylinder gently



- Do not fully extend the hydraulic cylinder. When operating, leave some margin.



Do not use bucket to support the body when the body is lowered and the arm cylinder is fully extended. Doing so will concentrate the load on the arm cylinder and may damage the

arm cylinder.

- Do not use the bucket to push or tap the bucket to dig. Doing so will shorten the life of the bucket. Use hydraulic pressure to dig.



- Do not hold the machine up and turn it to change the direction of travel. This will impact the turning motor and gear, causing the gear to be damaged. In severe cases, it will cause overturning.

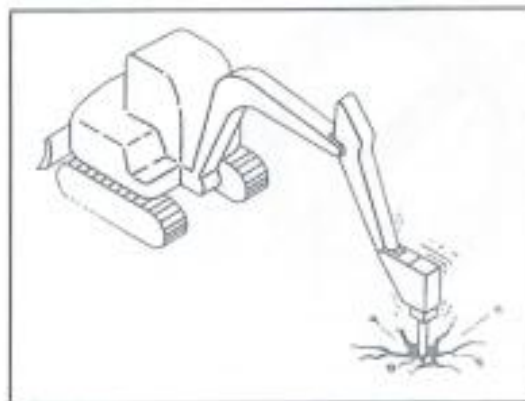


- Do not use the machine's sinking force to perform the operation.



Applying extra tension to the machine can shorten its service life. When digging, it uses hydraulic pressure of cylinder, dig it shallowly with large stroke.

- Dig bedrock



For hard bedrock. Before digging, it is advisable to use a hammer to break the rock into smaller pieces. In this way, it is more economical to prevent damage to the machine.

Pay attention to the impact of the dozer blade



Bumping a rock with a dozer blade will damage the dozer blade and its cylinder.

Carefully retract the bucket

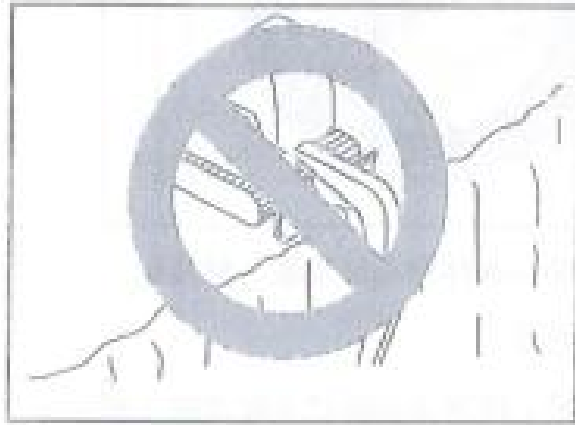
When the bucket is stowed, be careful not to hit the dozer blade with the bucket.



- Do not use the dozer blade as a stand



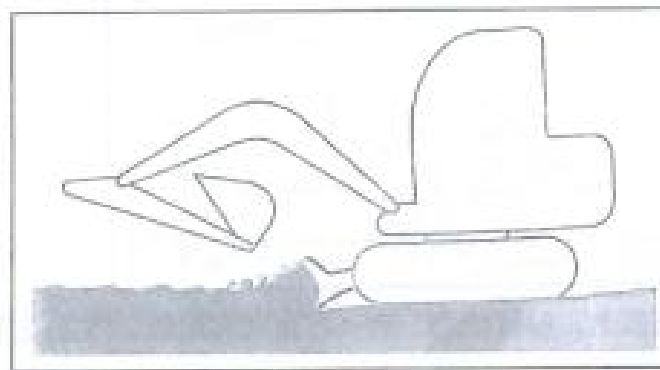
Pay attention to the dozer blade when digging



When digging deeply, if the dozer is in front, be careful not to hit the dozer blade with boom and bucket.

During operation, try to make dozer blade located in the rear

Carefully use the dozer blade to dig down



This dozer blade is designed for simple dozing operations. Do not use dozer blade to dig down deeply. Doing so may damage the dozer blade and the undercarriage.

Handling rubber tracks

Due to the use of rubber, rubber has the inherent weakness, that is lack of strength. Please be sure to observe the following prohibitions and precautions to prevent the track from being damaged or separated.

Ban

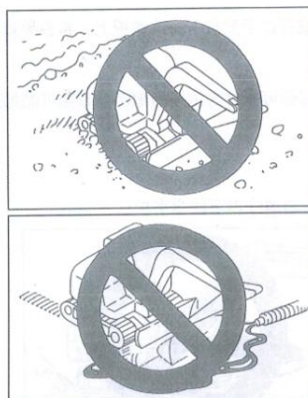
Do not walk or operate the machine in the following locations:

Walking and turning on gravel, extremely rough hard rock, steel beams, scrap metal, or near the edges of steel will damage the rubber track.



Walking on a riverbed or where there are lots of pebbles may cause gravel stuck in the track, and damage the tracks or make the tracks fall off.

Do not use this machine by the sea. Salt may corrode the steel core.



Do not allow fuel, grease, salt or chemical solvents to adhere

to the track. These substances can corrode the steel core weld on the track and cause rust or flaking. If any of these substances stained track, it should be immediately washed with water.



If the machine is walking on an irregular surface, such as the newly laid asphalt pavement,

Do not allow the bucket to hit the rubber track, causing the track to be damaged.

Be careful when walking on snow-covered or frozen surfaces in winter because the tracks tend to slip under such conditions.

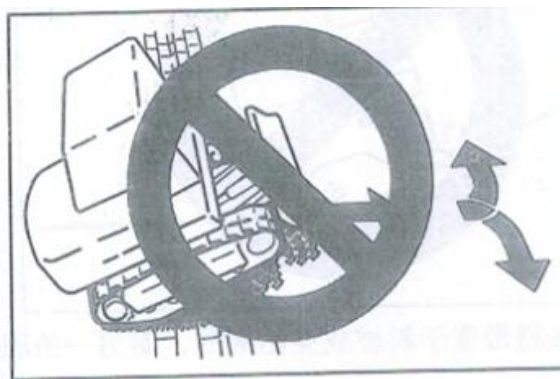
Use a rubber track between -25°C and $+55^{\circ}\text{C}$.

When long-term storage of rubber track (three months or longer), please store it indoor at the place where there is no direct sunlight or rain.



Because the entire arm is made of rubber, rubber tracks are not as stable as steel tracks. Take special care when turning and swinging in the horizontal direction.

Prevent the rubber track from falling off



Observe the following precautions to prevent the track from falling off.

Always maintain track and proper tension.

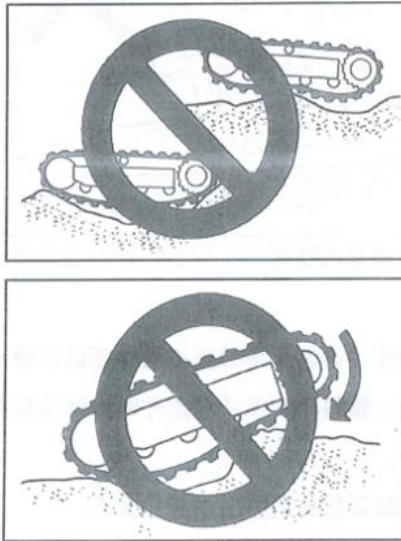
When the vehicle crosses large steps such as pebbles or rocks (20 cm or deeper), climb the steps at right angles, and do not change the route above the steps.



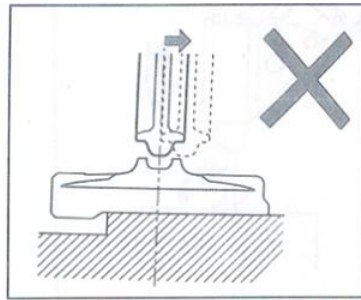
When uphill reversely, do not change direction at the beginning of the slope.



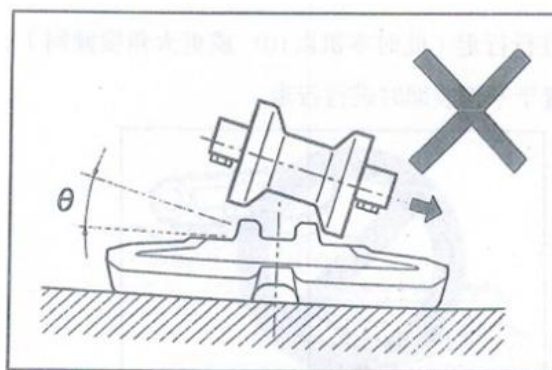
During walking, avoid placing a track on a slope or overhang while the other track is placed on a flat surface (in this case, the machine is inclined at an angle of 10° or more). Walking when both tracks are placed on a flat surface..



When the track slacks as shown, do not change direction



In this case, the rubber track will fall off if the machine is walking backwards.



In this case, the rubber track will fall off if the machine is spinning.

Chapter VIII Hydraulic hammer

For the operation of the breaker, refer to the following

hydraulic breaker manual.

Note: when the machine loaded hammer to ask the hammer plus nitrogen how much the appropriate size and type of hammer hammer may be added inside the different amount of nitrogen is different, generally 10/12 excavator head plus 8-10Mpa Nitrogen, too high or too low pressure, may lead to hammer, or hammer to stop working after the oil temperature increases, the nitrogen added to the new nozzle when using 9Mpa nitrogen is better, of course, this is due to the gun head.

Nitrogen cylinders, tools

Nitrogen bottle, nitrogen meter, wrench. This is the tool you need, and it is best to take a picture of your cellphone before putting it out in the box, because the position is always not properly positioned and not properly fitted when installed.



Breakers nitrogen gas mouth

The figure is circled the place is to add nitrogen, the first clean around the mud, the dust blown away to prevent the

screw to open the dirty things into it



Remove the air inlet

Use a wrench to open the upper part of the screw, the screw below that is not moving, turn the top of the table, the demolition of the screw direction do not make a mistake, indecisively tentative demolition, the friendship prompt, "the above small Screw inside an o-ring do not lose it. " Renderings as follows



Hammer

The screw is removed above is like this, and then there is nitrogen on the table how much nitrogen.

Gauge to measure the remaining nitrogen

Nitrogen gas meter installed after the start of nitrogen, but before measuring the nitrogen in the ring 2 is to install the screw that ring 3 screw locking ring 4 screw locking, if there is no lock a nitrogen leak will leak Clean, measure the nitrogen when the circle 1 press down you can see how much gas inside the gun head, measured after the circle where the needle is raised to prepare for the next step.



Ready to add nitrogen

Open the cap 2 ring 2, note that there is a o-ring, do not lose, lost, then add nitrogen will leak, the nitrogen inside the nitrogen table returned to 0



The following gas pipe connected to the mouth and nitrogen bottle, the effect is as follows ↓



Add nitrogen

At this point the line is connected, check the joints are tightened, all the steps are ready, pay attention to the picture that circle, the needle must be brought before inflating, slowly open the blue cylinder that blue plum switch, Special attention, [nitrogen tank pressure is very high, can not be quickly opened,

or pressure will instantly reach tens of Mpa, and even lead to pipeline explosion, life-threatening crisis] a little open and then turn off, in order to cycle, in the process of addition Need to watch the needles at any time, to meet the pressure requirements, once more than the need to deflate the pressure.

More nitrogen after deflation

Nitrogen to join too much, should first turn off the nitrogen tank switch, open the ring 3 screws, deflated tight ring 3 screws, and then the circle 1 thimble press until the thimble bounce after observing the pressure gauge pointer, if the pressure is still higher than the setting Value, repeat the above operation, until the nitrogen pressure reached the standard, demolition of the header, the gas is completed

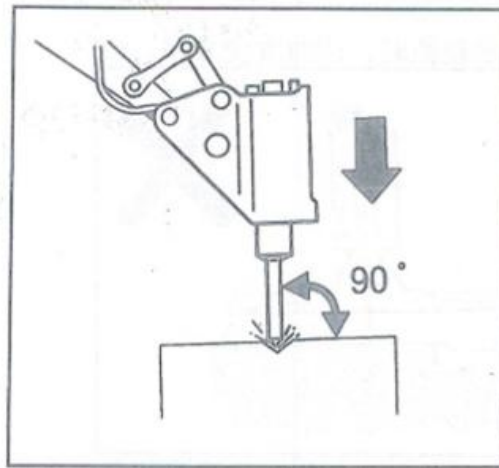


When using a hammer, to extend the life of the hammer

must be in the designated butter port filling butter, otherwise it may cause the hammer rod stuck or excessive wear.

When installing options such as a hammer, tilt bucket, or grab, make sure that it is appropriate for the type of machine being used.

When choosing nearby, contact your sales or service agency.



Hammer head perpendicular to the operating surface crushing operation.

Broken, the hammer should be properly aligned broken objects, to avoid impacting the air.



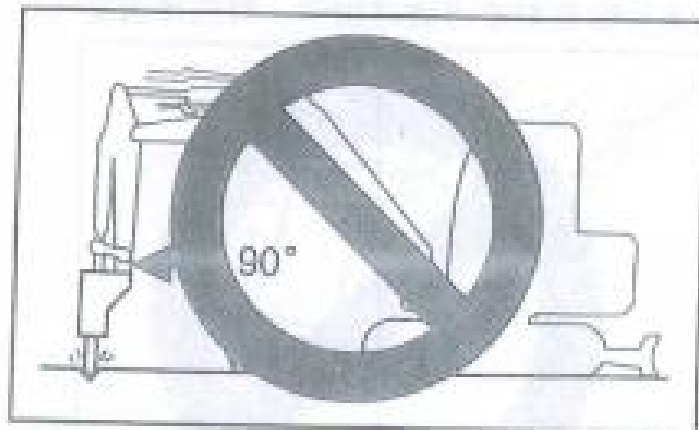
Do not pry with a hammer, do not pry when it is broken.

Do not move the hammer when broken.

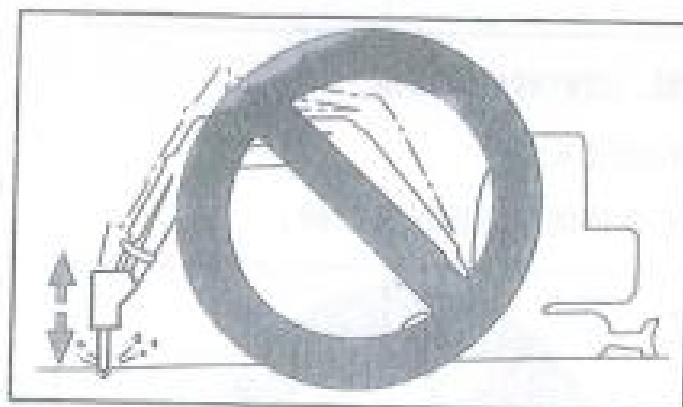
The same surface, do not continue to impact more than 30 seconds.



When the cylinder is fully extended or fully retracted (end of travel), do not crush. Keep at least 50mm Void.



Do not crush the stick perpendicular to the ground



Do not crush the object to be crushed by its falling impact.

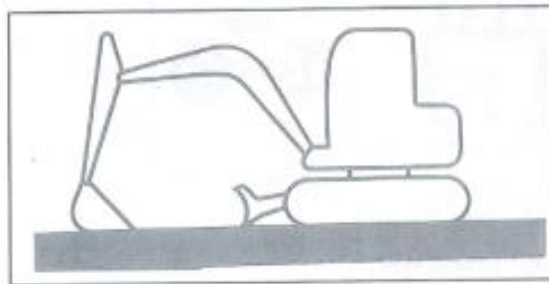
Do not use a hammer to move objects or rocks to be broken.

Rotate the machine from time to time to cool the engine.

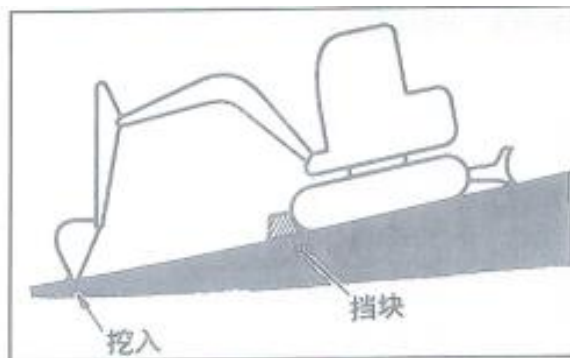
If the hydraulic tube abnormal vibration, it may be nitrogen leak in the accumulator. Please check as soon as possible.

Chapter IX Precautions when shutdown

Safe parking

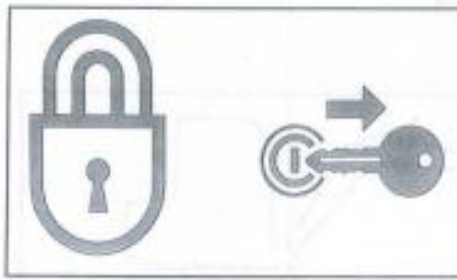


Park the machine on a level, solid and safe floor. Set the parking device.



If you must park or tilt the body on a slope, park the machine securely and prevent the machine from moving.

When parked in the street, use grilles, warning signs, lights, etc. to make the machine easily to be seen even at night and avoid colliding with other vehicles.



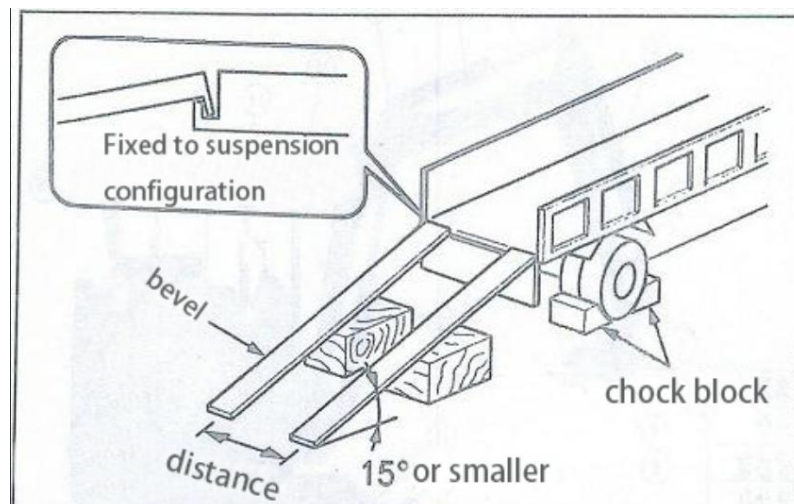
Before leaving the machine, do the following:

Lower the bucket and dozer blade to the ground.

Turn off the engine, turn off the headlight switch and the main power switch (Otherwise, it may cause the power loss and the power fail, and unable to restart the machine)

Chapter X Transportation considerations

Safety loading/ unloading of machines



The machine may tip over or fall off during handling. Please take the following safety measures:

Choose a solid, level floor and keep it away from the

shoulders.

Secure the bevel with sufficient strength and dimensions to the truck compartment. Inclined slope of not more than 15° . If the ramp is bent too far down, use pillars or pads for support.

Do not use working equipment to handle the machine. Doing so may cause the machine to overturn or fall.

Maintain the truck compartment with loads of clean, oil-free, sand, ice, snow and other foreign objects to prevent the machine from sliding. Sweep the track.

Plug wagon wagon wheel to prevent movement.

When loading and unloading the machine, follow the signal of the signalman and walk slowly at low speed.

Do not change the course on the slope.

Do not swivel / swing on the bevel. The machine may turn over.

When swiveling / swinging on a truck body, the footing may not be stable enough and should be done slowly.

If possible, lock the doors and covers after loading. Otherwise, it may open during transport.

Stabilize the track with the wedge and fasten the machine to the truck compartment with cables or chains.

Safe hoisting machine

Grasp and use the correct lifting cramp gestures.

Check the lifting equipment daily to see if any parts are damaged or missing and replaced if necessary.

When hoisting, use a cable that pulls up the weight of the machine.

Hoist the machine as described below. Do not operate in any other way as this may cause the machine to become unbalanced.

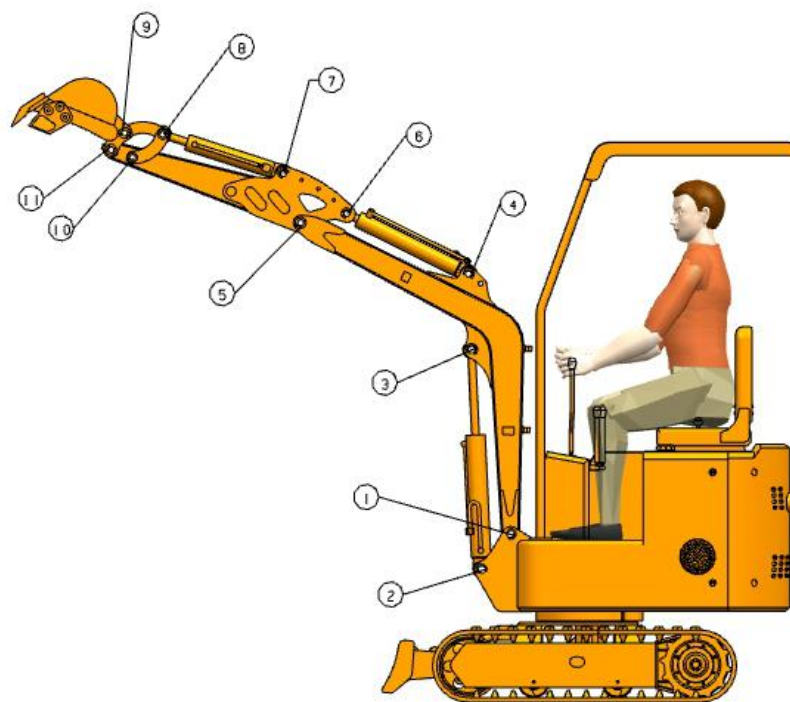
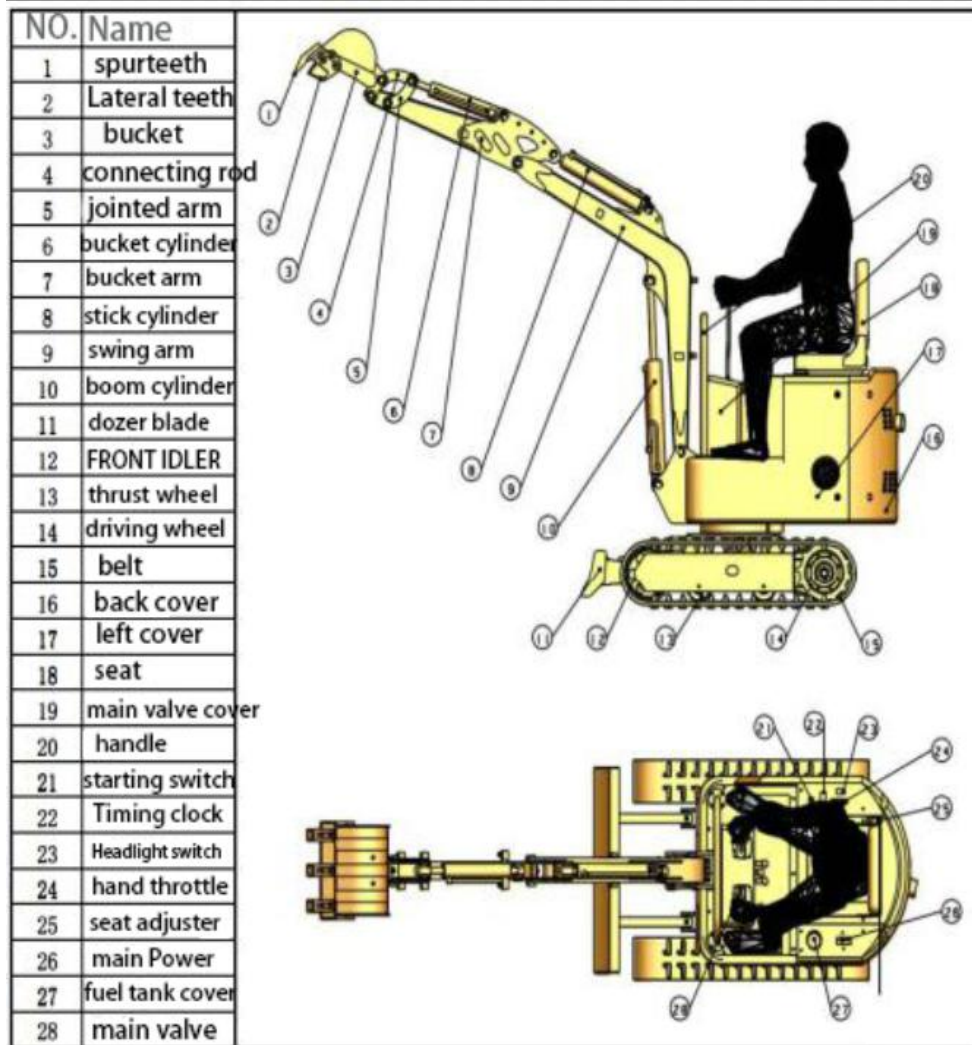
Do not lift the machine when there is an operator.

When hoisting, please slowly, to avoid overturning the machine.

When lifting all personnel away from the work area. Do not move the machine above the head of people.

Chapter XI Excavator basic parameters

The main structural components of the machine



No	Connecting pin or butter eyes
1	Boom, the upper frame connecting pin
2	Boom cylinder, the upper frame connecting pin
3	Boom cylinder, boom connection pin
4	Stick cylinder, boom connection pin
5	Boom, stick connecting pin
6	Arm cylinder, arm connecting pin
7	Bucket cylinder, bucket connecting pin
8	Arm cylinder, rocker, connecting rod connecting rod
9	Connecting rod, bucket connecting pin
10	Stick, rocker connecting pin
11	Rocker, bucket connecting pin
12	Bulldozer cylinder fixed pin and the lower frame connecting pin

lubrication chart:



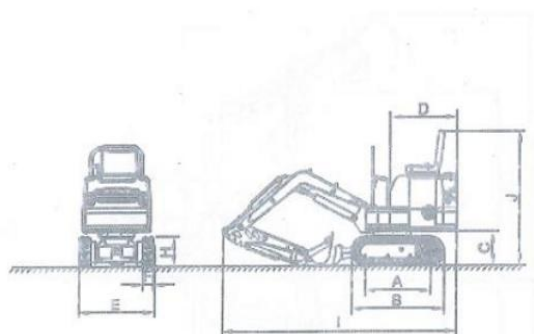
Standard technical parameters:

NO.	Items	Data
1	Operating Weight:	980 (1000 KG)
2	Bucket Capacity	0.025 - 0.03
3	Bucket Width	380
4	Boom Length	1350
5	Arm Length	700
6	Swing speed	15
7	Swing	800
8	Travel Speed	0-3.5
9	Grade Ability	45
10	Ground Pressure	25
11	Bucket digging force	800
12	Arm digging force	600
13	maximum drawbar pull	500
14	Model	192F
15	Engine brand	Changchai
16	Rated Power	12/8.6/2200
17	Max.Torque	43
18	Displacement	0.499
19	Cylinders	1
20	bore and stroke	92*72
21	Cooling type	air cooling
22	Main pump	310
23	Rated Pressure	18
24	Main pump Max.Flow	10
25	Walking hydraulic motor type	OMS-2450
26	Swing hydraulic motor	BMP200

27	Working hydraulic circuit	20
28	Travel Hydraulic Circuit	20
29	Swing hydraulic circuit	20
30	Maximum working pressure	25
31	Auxiliary Piping for Hammer	No
32	Fuel Tank	12
33	Hydraulic Oil tank	18
34	Hydraulic system	imported
35	Engine Oil	2.5
36	Coolant	--
37	fuel consumption	0.8-1.2 1.5
38	Overall Length	2550
39	Overall Width	930
40	Overall Height	1350
41	Superstructure width	800
42	Counterweight ground clearance	400
43	Track grounding length	1100
44	Total track length	1200
45	Track shoe width	180
46	Total track width	930
47	Track gauge	76
48	Number of tracks	37
49	Min.ground clearance	150
50	Min.Front Swing radius	1800
51	Tail Swing radius	470
52	Dozer blade width	930
53	Max.Digging radius	2550
54	Max.Digging Depth	1600
55	Max.Digging Height	2500
56	Max.Dumping Height	1750
57	Dozer blade width	930*210

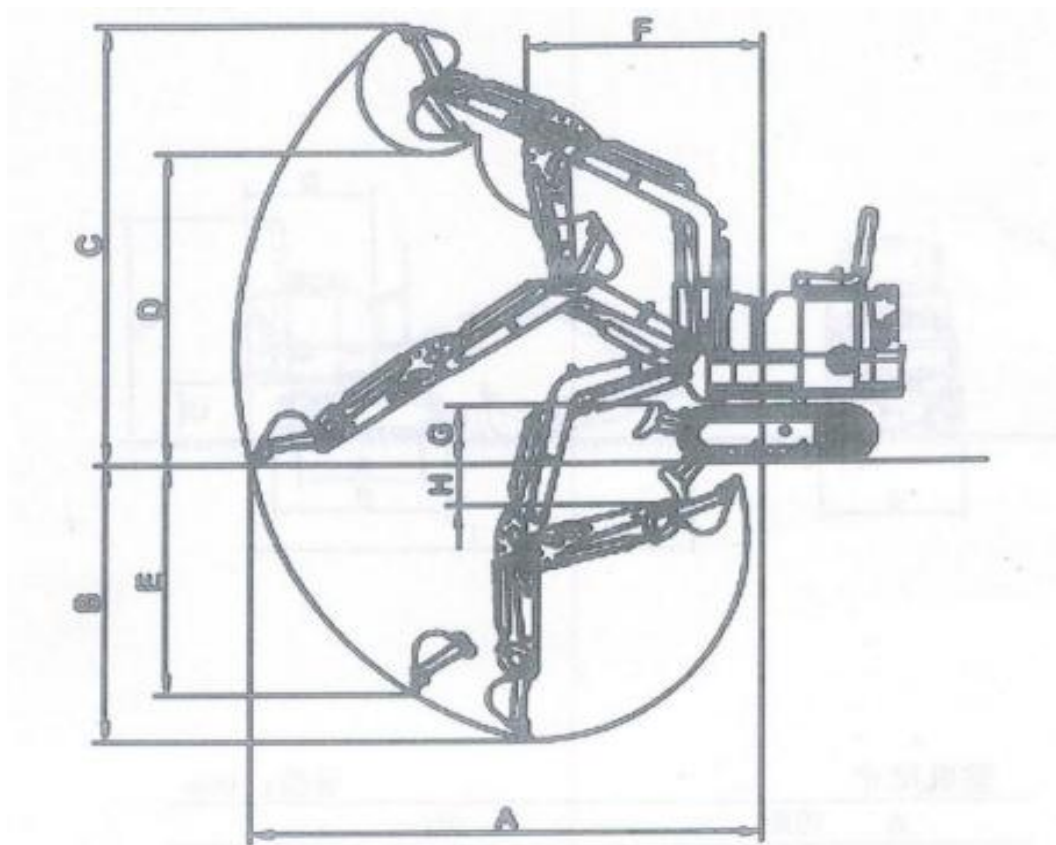
58	Dozer blade lift/digging	155/172
59	Wheel-Base	770
60	Terrace Ground Clearance	380
61	Chassis Width	896
62	Track Width	180
63	Track Height	320
64	Max. perpendicular Digging Depth	1320
65	Least Radius Of Gyration	1100

The main size specifications:



No	Item	Data	unit
A	Distance of track	770	mm
B	Track length	1230	mm
C	Terrace Ground Clearance	380	mm
D	Least Radius Of Gyration	1100	mm
E	Bottom width	950	mm
F	Track Width	180	mm
H	Track Height	320	mm
I	Overall Length	2550	mm
J	Overall Height	1490	mm

Scope of work:



No	Item	Data	unit
A	Max.digging radius	2550	mm
B	Max.digging depth	1600	mm
C	Max.digging height	2500	mm
D	Max.dumping height	1750	mm
E	Max. vertical digging depth	1375	mm
F	Least radius of gyration	1100	mm
G	Dozer blade width	930*210	mm
H	Dozer blade lift/digging	155/172	mm

Hydraulic system schematic

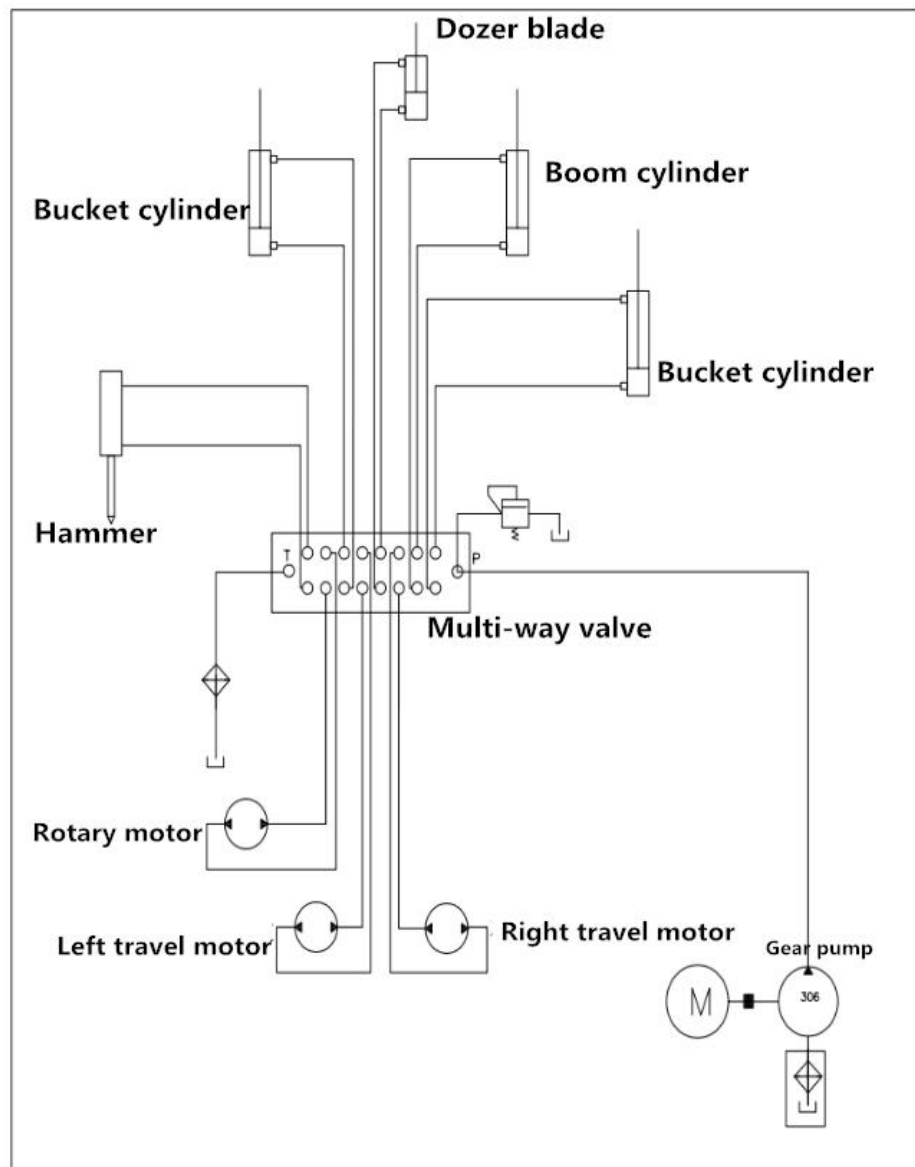
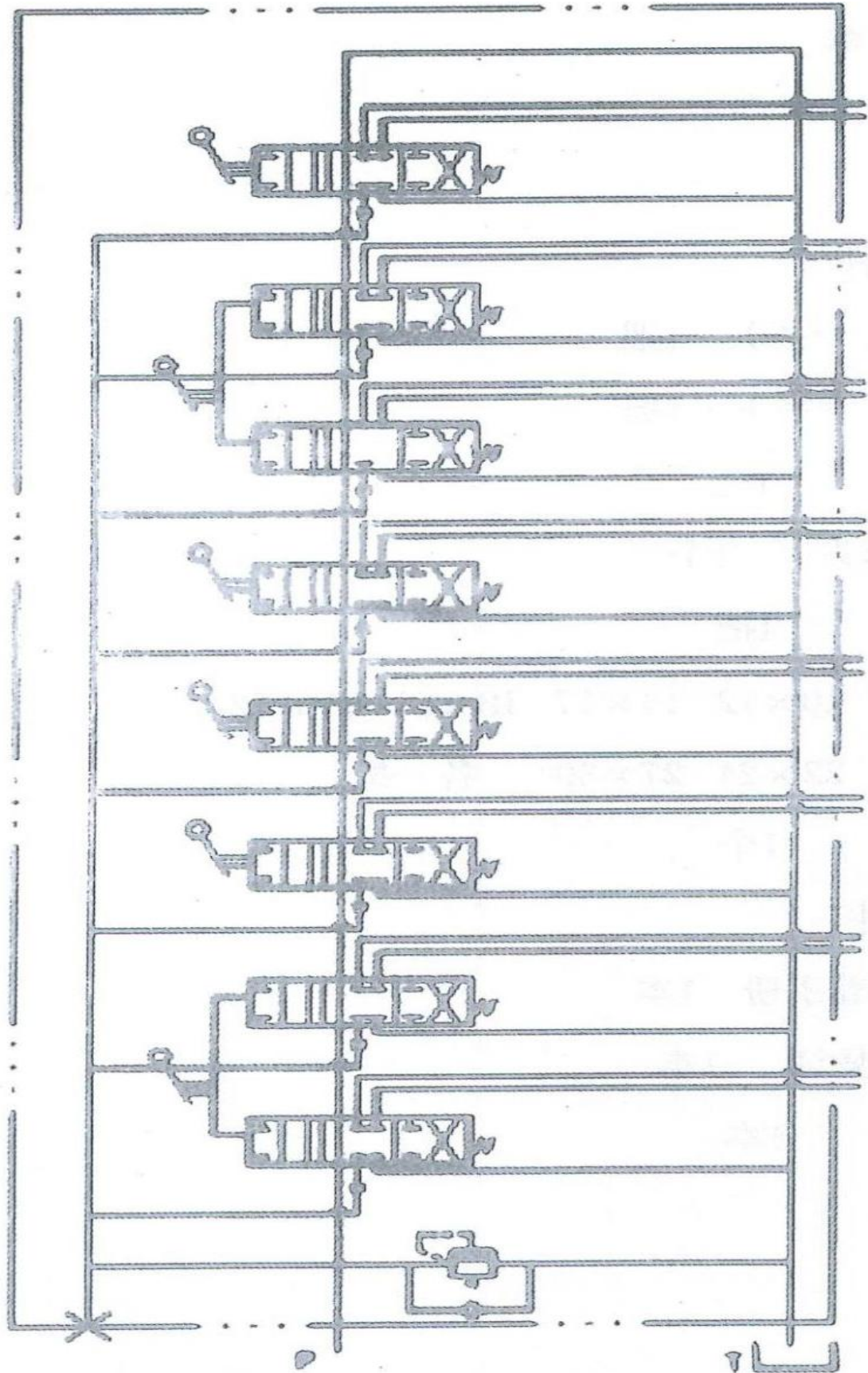


diagram:

Multi-way valve schematic:



Chapter XII Common faults and solutions

10/12 Excavator common faults and solutions		
Common faults	Causes of faults	Solutions
Machine weakness, slow motion	Relief valve is clogged or too loose	Remove or clean, fasten relief valve
	Damaged pump	Replace hydraulic pump
	Oil pump inlet pipe blockage	Clean or replace the inlet pipe
	Engine failure	Contact factory to repair engine
The machine without any action	Damaged pump	Replace hydraulic pump
	Coupling spline damage	Replace coupling spline
	The tilt of the fuselage causes the hydraulic oil to bias aside	Add hydraulic oil or adjust the level of the machine
The machine can not rotate	The slewing motor gear falls off	Put the slewing gear in place
	Rotary motor damaged	Replace swing motor
Engine emits blue smoke and works powerless	Oil filling is excessive	According to the upper and lower limits of the oil rod to adjust the amount of oil
	Engine failure	Contact factory to repair engine
Engine emits blue smoke and works powerless	Air filter is clogged	Clean or replace the air filter
	Engine failure	Contact factory to repair engine
Engine emits white smoke	Diesel engine mixed with water	Diesel released and full in the new oil

Engine is halted or its speed is fall sharply	Relief valve is stuck	Disassemble relief valve re-installed after cleaning with gasoline
	Relief valve adjusted tightly	Loose relief valve
The engine does not fire	Battery shortage voltage shortage	Charging or charging with external battery
	Fill diesel after it is ran out, which leads to air in the pipeline	Unplug the diesel pipe on the engine and dry the air
	Diesel is frozen	Choose the right diesel brand based on the local temperature
	Engine failure	Contact factory to repair engine
Engine throttle is suddenly big or suddenly small	Diesel pipe is folded, which makes oil supply not be smooth	Check the diesel pipe, adjust the direction to ensure smooth oil supply
Step on the gas continuously	Engine throttle fixator is locked	Release engine throttle fixator
Unable to step on the gas	Throttle cable sleeve looses	Tighten the throttle cable sleeve
Headlight is off, stopwatch does not work	Wiring plug is off	Check whether the wiring plug is loose or off
	Parts damaged	Replace the parts
Battery is not charged	Generator line broken	Check the engine line, and connect it well
	Fuse damaged	Replace the fuse
	Line fault	Check if the wiring is broken
	The battery is damaged	Replace the battery

Track is off	Butter does not regularly be filled into the butter tensioner	The machine is propped up, remove the tensioner check valve, drain the oil and re-install, the track set into the tensioner, and then start the machine. By use of the rotation power of driving wheel to install the track in place, fill the butter into the tensioner until the track is tensioned
----------------------------	--	--

Relief valve (safety valve) cleaning and system pressure regulation:

As one of the core components of the hydraulic system, the relief valve plays a decisive role in the pressure of the system. When the relief valve is adjusted too loose or stuck, the machine will be running powerless, moved slowly, and be powerless when it walks, changes direction and climbs, and the hammer does not hit. If it is adjusted too tight, it will cause the machine be halted when it works at the limit of the vehicle, and the oil temperature will rise too fast.

Pressure relief valve cleaning method:

Remove the screw, stem and handle of the selected area under the frame. Lift the main valve guard up.

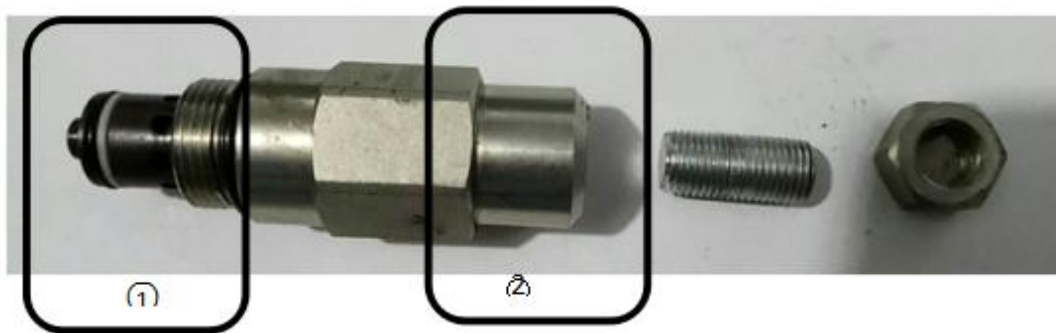


**Open the main valve guard and remove the relief valve
(shown below):**



Adjust the screw
screw nut just the screw
Relief valve

Remove the entire relief valve, record the relative position of the adjusting screw and the lock nut, and then loosen the lock nut, remove the adjusting screw with a 6mm hex wrench.



1. Immersed ① in gasoline and be back and forth for several times.
2. Place ② down and tap gently.
3. Repeat 1. 2 action, until the internal parts popping sound can be heard when shaking the relief valve horizontally. The relief valve cleaning is completed.
4. Restore the adjustment screw and lock nut back to their original state.
5. Install the pressure relief valve into the valve body and tighten.
6. Start the machine and adjust the system pressure: the engine throttle will be increased to 80% -90% . Operate the valve rod to extend the boom cylinder to the longest position. Hold the valve stem for about 5 seconds to observe if the engine decelerates or turns off. If no Obvious changes, continue to adjust the nut clockwise half a turn, repeat the above operation until the engine load significantly increased, but will not stall. (If the engine is decelerated and accompanied by smoke and extinguishes within 5 seconds, the pressure is adjusted too high and the adjustment screw needs to be tightened counterclockwise to reduce the system pressure.) After the completion of the tightening, tighten the lock nut to install the valve stem of the shroud Reset, relief valve cleaning and system pressure adjustment completed.

Chapter XIII Maintenance precautions

Engine maintenance

As the main power system of excavator, the engine needs to be maintained according to the "Engine Operation Manual" carried with the vehicle, and the maintenance and maintenance can be carried out strictly according to the provisions in the engine operation manual to effectively improve the service life and reduce the occurrence of the fault.

The main maintenance includes the following main parts:

1. engine conditioner care.
- 2 oil replacement cycle, and added. (The oil will be consumed slowly with the machine, so you need to check the amount of oil regularly, rather than adding the oil until the next replacement of oil, when it is lack of oil, you need to add the oil timely, otherwise it will cause serious effects such as cylinder score, the manufacturer will not provide warranty for motor if it is damaged due to lack of oil)
3. Oil filter, diesel filter replacement cycle
4. Air filter replacement cycle

Mark "do not operate" warning message

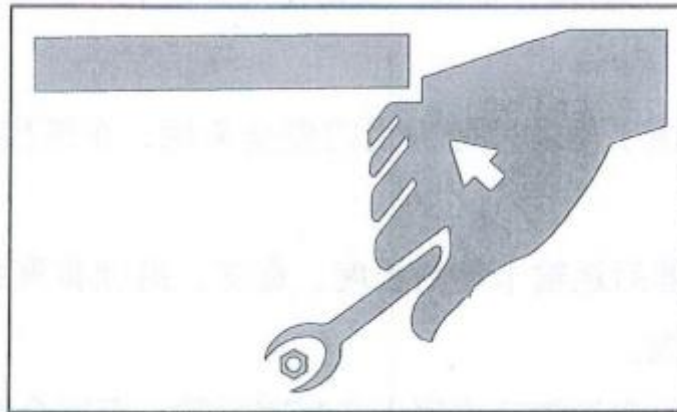
When inspecting or maintaining the machine, serious injury may result if an unauthorized person starts the engine or encounters controls.

Before performing maintenance, turn off the engine, remove the key and carry it with you.



Mark the "Do Not Simulate" warning message in a conspicuous place where starting switch or lever.

Use the correct tool



Do not use damaged or deteriorated tools or tools designed for other uses. Use the appropriate job related tools.

Regular replacement of safety critical components:

To ensure that the machine can be safely used for a longer period of time, it should be refueled regularly and inspected and maintained. To improve safety, Regularly replace safety-critical parts such as hoses and safety belts.

"Safety-critical parts replaced on a regular basis" refer to parts that have been aged, worn and functionally degraded after repeated use, and the performance of such parts may change over time. These features of these components make it possible to cause serious mechanical damage or personal injury, but by visual inspection or operating feel, it is difficult to judge the remaining life.

Visual inspection of the appearance of any damage found, replace the "regularly replaced safety critical components," even if the specified replacement interval has not yet reached. Change the fuel hose regularly. Fuel hoses wear out over time, even though no signs of wear have been shown.

Whenever a symptom of wear is found, it is replaced, no matter how the schedule is changed.

To use the machine safely, perform regular inspections and maintenance. The following safety critical components must be replaced on a regular basis to enhance safety.

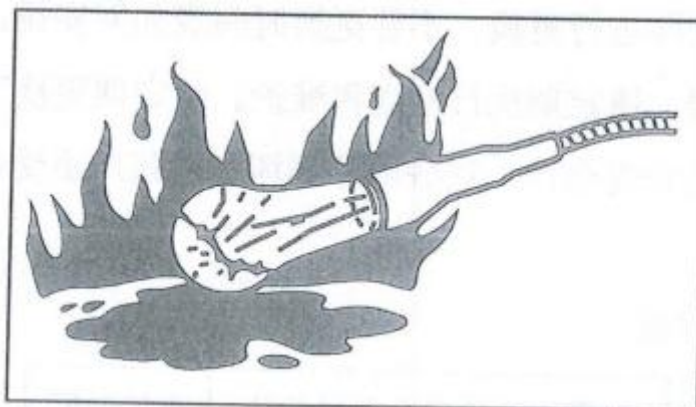
Damage to these parts can cause serious injury or fire.

Safety Critical Parts List:

Excavator	Regular replacement of the safety critical components		Replacement time
Fuel system	Fuel pipe		Every 2years
	Fuel filler cap on the lid		
Hydraulic system	Machine body	Hydraulic pipe (pump outlet)	Every 2 years
		Hydraulic pipe (pump suction port)	
		Hydraulic pipe (swing motor)	
		Hydraulic pipe (travel motor)	

	Working equipment	Hydraulic pipe (boom cylinder line)	
		Hydraulic pipe (stick cylinder line)	
		Hydraulic pipe (bucket cylinder line)	
		Hydraulic pipe (swing cylinder)	
		Hydraulic pipe (dozer cylinder)	
		Hydraulic pipe (pilot valve)	
		Hydraulic pipe (auxiliary pipe)	

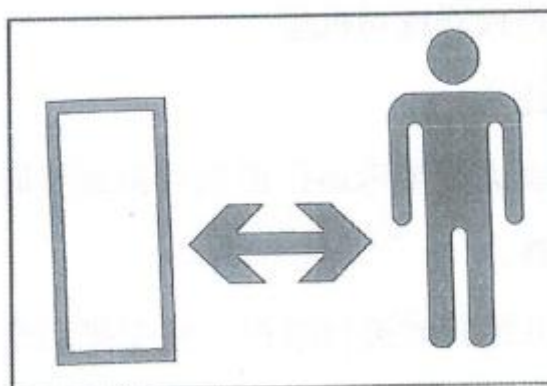
Explosion-proof lighting:



When inspecting fuel, lubricating oil, coolant or battery electrolyte, use an explosion-proof light to prevent a fire or explosion.

Otherwise, an explosion may occur, causing serious casualties.

It is strictly forbidden to let unauthorized personnel enter:



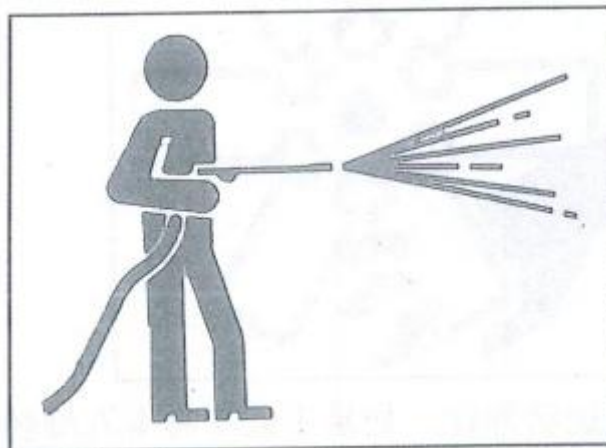
During work, do not allow unauthorized personnel to enter the work area. Be careful when grinding, welding or using a hammer. You may be injured by flying debris from the machine.

Preparation of work area:

Choose a stable work area. Ensure that there are suitable lighting conditions, such as indoor work, ventilation should be guaranteed.

Remove obstacles and dangerous goods. Eliminate easy-to-slip areas.

Always keep the machine clean:



Before maintenance, the machine should be cleaned.

Turn off the engine before cleaning the machine. Cover electrical components to prevent water ingress. Electrical parts may cause short circuits or malfunctions when they enter water. Do not clean the battery, electronics, sensors, connectors, or cab with water or steam.

Turn off the engine before maintenance.

When the machine is running, or the machine is not running but the engine is running, avoid the machine

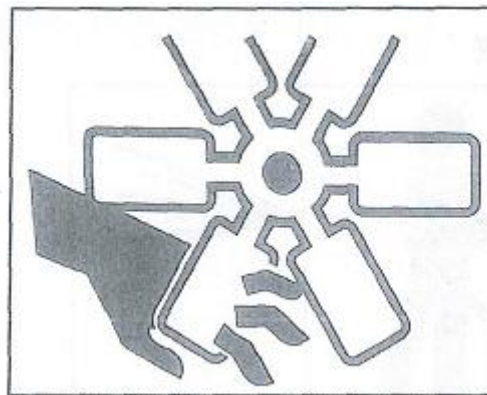
Lubricate or mechanically adjust.

If maintenance must be done while the engine is running, two people should be scheduled to work in teams and stay in touch.

A person must sit on the driver's seat so that the engine can be turned off immediately if necessary. This person must take special care not to touch the levers and pedals unless required.

Another person performing maintenance should ensure that their body or clothing is kept away from moving parts of the machine.

Keep away from moving parts



Keep away from all rotating and moving parts. If a hand or a tool gets stuck in a rotating or moving part, it can cause serious injury or even death.

If you throw tools or other objects in or insert the fan or fan straps, these objects can be crushed or shredded. Do not throw or insert anything into the fan or fan straps.

Firmly secure the machine or any parts that may fall.



Before performing any maintenance or repair under the machine, lower all movable work units to the floor or to the lowest level.

Fixed track

If you have to work on a raised machine or equipment, always use a wooden pad, jack, or other sturdy support. Do not get under the machine or working device until it is firmly supported. This procedure is especially important when working on hydraulic rams.

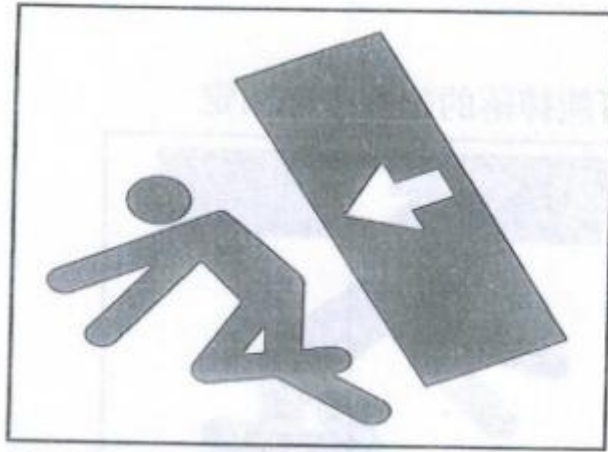
Stable work device

When carrying out repair or replacement of teeth or side teeth, the work equipment should be fixed firmly to prevent accidental movement of the machine.

Stabilize the hood or lid when opening it

Be sure to secure the engine cover or cover before working inside the machine. Windy weather or when the machine is parked on a slope, keep the bonnet or lid closed.

Place heavy objects in a stable position



During the process of dismantling or installing, if you need to temporarily put heavy objects or accessories on the ground, be sure to put them in a stable place. Do not allow unauthorized persons to approach such places.

Refueling precautions



Do not smoke or there should be no open flames near or near refueling points.

Do not remove the lid or refuel the engine while it is running or not yet cooled. Do not scatter the fuel on the hot surfaces of the machine.

Fuel the fuel tank in a well-ventilated area.

Do not fill the fuel tank. Should be left space for oil expansion.

Spilled fuel should be immediately wiped clean.

Tighten the fuel tank firmly. If the fuel cap is missing, replace it with the original one. Using an unpermitted and poorly ventilated fuel tank cap creates internal pressure in the tank.

Prevent dust from entering

When installing and removing parts, they should be carried out in a dust-free place, clean the work area and clean the parts to prevent dust from entering.

Clean the mounting surface

When installing and removing parts, make sure that the contact surfaces of the parts are clean. If the sealing surface of the contact surface is damaged, contact your sales or service representative for repair or release.

Sealing ring and cotter pins

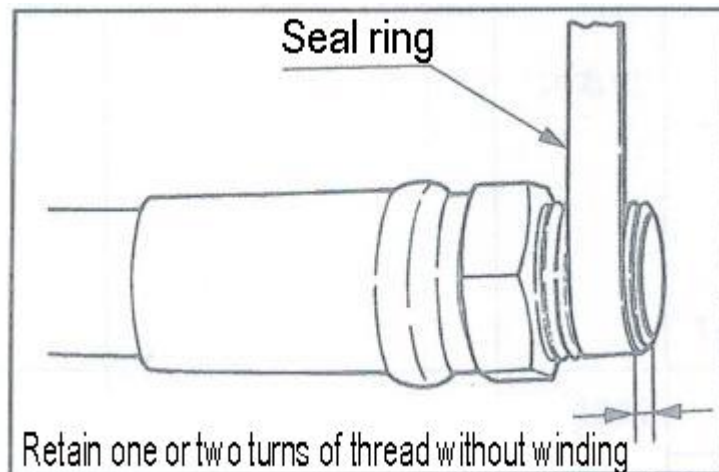
Be sure to replace all the removed seals and cotters with new ones.

When installing, be careful not to damage or distort the seal.

Sealing ring

When winding the plug with the tape, clean the thread of the old gasket and clean the thread.

Tighten the thread with a seal, taking care to leave 1 or 2 at the end of the plug.



Do not use fuel for cleaning!

Fuel and lubricants require the correct fuel grade for the season.

Please refer to the following table, according to the temperature to choose the right fuel, lubricating oil and grease. Whether or not it has reached the designated time, replace the oil if it becomes too dirty or has deteriorated.

When refueling, do not mix different brands of oil. If you want to change the brand of oil, please replace all the fuel / lubricating oil.

Fuel oil

Diesel should meet the following conditions, the table lists the world's current several diesel specifications.

Fuel oil specification	Area	Fuel oil specification	Area
GB252	China	BS2869-A1 or A2	UK
ASTM D975 Number: 1-D,S15	USA/ Canada	ISO 8217DMX	International
Biodiesel Biodiesel mixture is B5 ASTM D6751,D7467			
EN590:96	EU	JIS K2204 Grade II	Japan
Biodiesel Biodiesel mixture is B5 ENI4214, EN590			

Fuel oil tank

In order to maintain engine performance and service life, always use clean, high-quality fuel.

To prevent icing in cold weather, select diesel that is could still usable when the expected minimum outdoor temperature is at least 12 °C below the actual temperature.

Please use a diesel that burns 45# or more. When used in high altitude or high altitudes, higher fuel burn is required.

Sulfur content of less than 0.05 ~ 0.0015% by volume of fuel. (In the United States or Canada, ULSD should be used.) Using sulfur-rich fuels may cause sulfuric acid corrosion of the engine cylinders.

Do not use of kerosene. Do not mix kerosene, used lubricant or residual fuel with diesel.

Poor quality fuel can degrade engine performance or cause engine damage. Not recommended for fuel additives. Certain fuel additives cause engine performance to drop.

Metal contents, such as zinc, sodium, fuels, silicon and aluminum, shall be limited to (1 mass ppm) or less.

The safety precautions when using bio diesel, the engine manufacturer's warranty, are not valid for machines that do not meet standard or deteriorated bio diesel.

Lubricating oil

API standards: American Petroleum Institute

ACEA Standard: European Automobile Manufacturers Association

SAE standard: American Society of Automotive Engineers

Part	Type	According to temperature choose different type														Change time
		-4 14 32 50 68 86 104°F														
		-20-10 0 10 20 30 40℃														
Oil Sump	Engine diesel oil														First: 50 hours Other: 250 hours	
	API: CD Grade															
	ACEA: E-3、E-4															
	E-5															
Hydraulic oil tank	ANTI - WEAR														Each 2000 hours ***	
	HYDRAULIC OIL															
Cooling system	Cooling water														Each 1000 hours	
	(water and cooling liquid)															
	**															
	SAE: J814C or J1034															
Walking reduction gear	Gear oil														First: 50 hours	
	API: GL-4														Other: 1000 hours	
Swing motor gear	Lithium grease														Each 50 hours	
Swing bearing															Each 50 hours	
Working device															Every day/ each 8 hour	
Joint															If need	

*: If the travel time is high in the total operation, replace the gear oil at the specified time.

**: Please use tap water (soft water) when using water. Do not use well water or river water. When outdoor temperature drops below 0 °C, add coolant (antifreeze). Follow the coolant manufacturer's instructions to determine the mixing ratio.

*****: Hydraulic fluid change intervals depend on the type of hydraulic fluid being used. When using ordinary anti-wear hydraulic oil, the hydraulic oil should be changed every 2000 hours.**

Hose handling

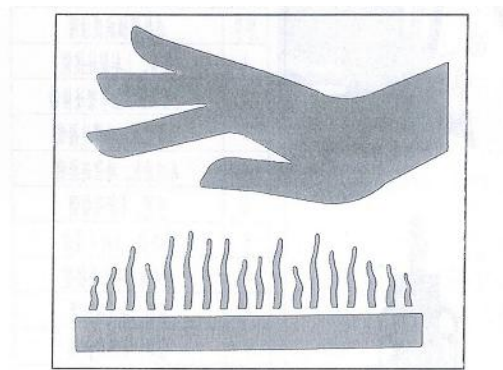
Lube oil or fuel leak can cause fire.

Do not twist, bend or hitch hoses.

Do not use pipes, tubes, or hoses that are twisted, bent, or cracked, or they may burst.

Re-tighten the loose connector.

Be careful when handling high temperature and pressure components.



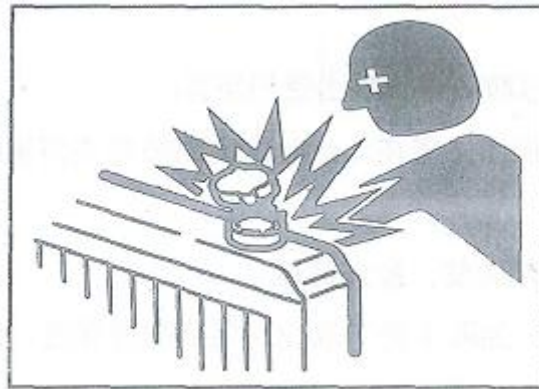
Turn off the engine and wait for the machine to cool down before performing maintenance.

The engine, exhaust pipes, radiators, hydraulic pipes, sliding parts and many other parts of the machine are hot when the engine is just off. Touching these parts can cause burns.

Engine coolant, hydraulic oil and other oils are also under high temperature and pressure.

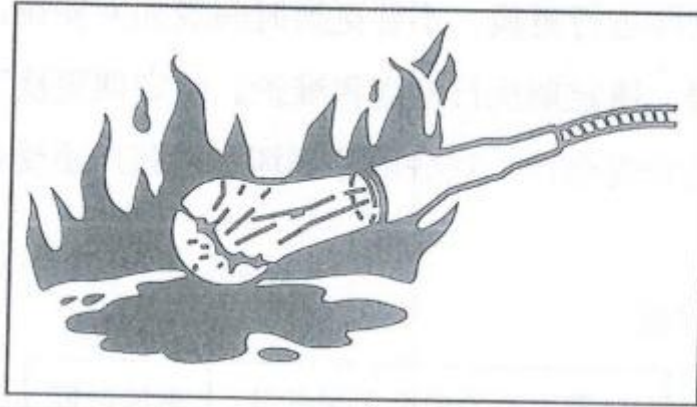
Be careful not to touch the hydraulic oil when releasing the cover or plug. Operating the machine in this condition can cause burns or injury due to the hot oil sprayed out.

Be careful when operating the high-temperature cooling system



When cooling water is hot, do not remove the radiator cap or drain plug. Turn off the engine and wait until the engine and cooling water cool down. Then slowly release the radiator cap, vent the internal pressure, and remove it.

Be careful with the oil pressure



After the engine is switched off, the pressure in the hydraulic tubing will remain for a long time. Internal pressure should be completely relieved before maintenance work.

High pressure hydraulic fluid can pierce the skin or eyes, causing serious injury, leading to blindness to death. Remember that the sight of hydraulic oil leaking from the hole is almost invisible. When inspecting for leaks, wear protective goggles and thick gloves and use cardboard or glue

Plywood protects the skin against the hydraulic oil spray from being harmed.

If the hydraulic fluid invades the skin, it should be removed within a few hours by a surgical doctor familiar with such injuries.

Before working on the hydraulic system, you should first release the pressure

Hydraulic system may discharge if hydraulic system is depressurized, such as removing cover or filter or disconnecting pipe.

Slowly loosen the vent to relieve tank pressure.

When removing the plug or screw or disconnecting the hose, stand on one side and slowly release it to gradually relieve internal pressure before removing.

The oil or oil plug may be discharged due to the pressure in the traveling motor oil tank. Please slowly release the plug to release the internal pressure.

Be careful with splashes of debris when using a hammer

When using a hammer, pins or metal debris may fly around. This can cause serious injury.

When hammering hard metal parts such as dowels, teeth, side teeth or bearings with a hammer, wear protective goggles and gloves.

When knocking pins or teeth, make sure there are no people around.

Be careful high pressure grease

In track tensioning devices, grease is under high pressure such as. When adjusting the tension, the grease relief valve may fly out and cause injury if not performed in accordance with the procedures specified below.



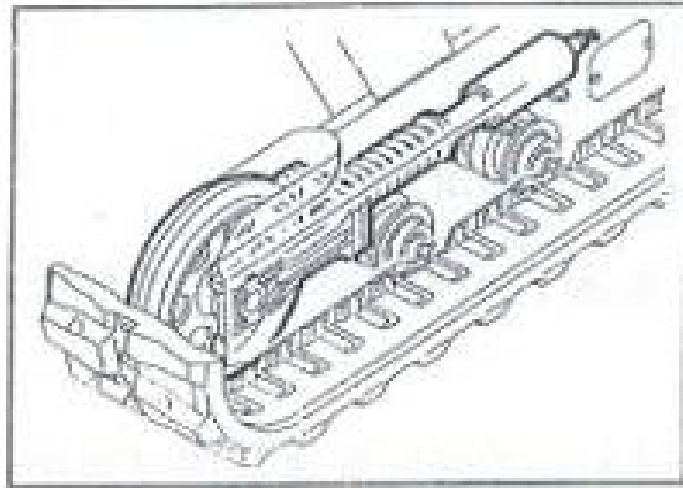
Do not loosen the butter tube.

Slowly loosen butter pressure relief valve. Do not rotate it more than once.

Do not place face, wall, legs or body in front of the butter pressure relief valve.

When releasing the butter pressure relief valve, the valve malfunctions if no oil flows out.

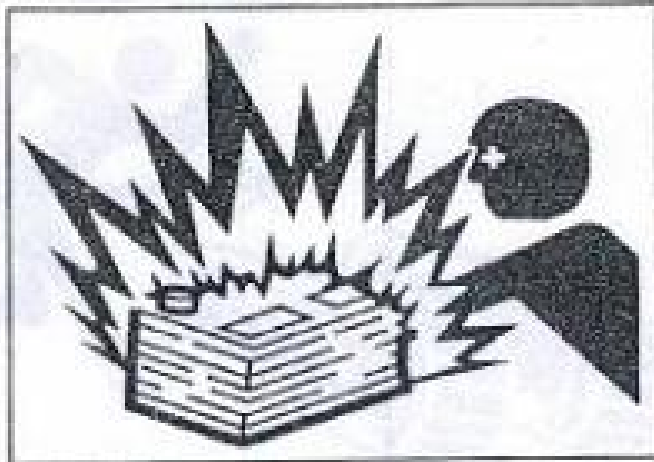
Please contact the manufacturer for repair.



Track tensioner fitted with a strong spring. Inadvertently disassembling the track tensioner, the spring pops up, causing serious injury. Do not disassemble the track tensioner.

Disconnect the battery cable

Disconnect the battery cable before performing electrical system operations or welding. First disconnect the negative (a) battery cable. When reconnecting, lastly connect the negative (a) battery cable.



Be careful when handling the battery

Battery contains sulfuric acid, can cause eye damage or skin contact.

If inadvertently into the eyes, rinse immediately with water and promptly seek medical treatment.

If swallowed accidentally, should drink plenty of water or milk and seek medical care immediately.

If sulfuric acid hits the skin or clothes, wash it off immediately with plenty of water.

Wear goggles and gloves when operating the battery.

Battery can generate flammable hydrogen gas, which may cause explosion. Stay away from open flames, sparks or lit cigarettes.

Use a flashlight to check the electrolyte level.

Before checking or handling the battery, make sure that the starter switch is turned off to shut off the engine.

Please be careful not to let metal tools or any metal objects contact the electrode and cause a short circuit.

Sparks when the electrode is loose. Be sure to tighten it.

Make sure the battery cover is firmly closed.

When the battery is frozen, do not charge or start the engine over, otherwise it may explode.

Freeze the battery to 15 ° C before use.

Do not use the battery when the liquid level is below the lower limit. Otherwise it will speed up the battery internal aging and shorten the life. At the same time can lead to rupture (explosion).

Do not add distilled water above the upper limit. Electrolyte may leak out otherwise. Contact with this liquid can damage the skin or cause corrosion of the machine parts.

Clean the area around the electrolyte level line with a damp cloth and check the level. Do not use a dry cloth to clean, otherwise it may cause the accumulation of static electricity, burning or exploding.

Use the battery charging cable across the start

When using the battery charging cable to start the engine, be sure to connect the cables by following the correct procedure below. Wrong cable connection will cause discharge and battery explosion.

Do not let "problem machine" and "rescue machine" touch each other.

Do not touch or touch the positive (+) and negative (-) clamps on the battery charging cable.

When connecting, connect the positive end of the battery charging cable to the positive (+) terminal first. When disconnected, first disconnect the negative cable from the negative (-) terminal (ground).

Please be sure to connect the clamp firmly.

Connect the last clip on the battery charging cable as far as possible from the battery.

Always wear goggles and gloves when starting the engine with the battery charging cable.

Use a battery charging cable and cable clip sized for the battery capacity. Do not use damaged or corrosive battery charging cables and clamps.

Make sure the Rescue Machine has the same battery capacity as the Problem Machine.

Please entrust our service agents to carry out welding repair

When welding work must be carried out, it must be done by a qualified person in a well-equipped workplace. To prevent damage to any part of the machine due to excessive currents or sparks, observe the following.

Before welding should disconnect the battery wiring.

Do not continuously apply 200V or more.

Grounding point to be connected within 1 meter from the welding area. Do not connect the ground to the electrical control unit / meter or connector.

Make sure there is no seal or bearing between the welding area and the ground.

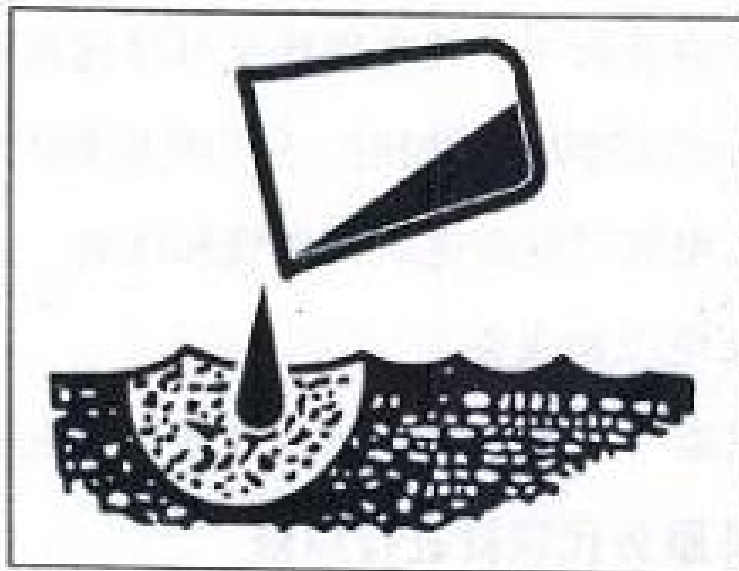
Do not connect the ground terminal to the pin or hydraulic cylinder of the work unit.

To carry out welding work on the machine, disconnect the electrical control unit before working.

Vibrations borne by the operator

Tests conducted on vibrations conducted by the machine to the operator indicate that the operator's upper body is under $2.5\text{m} / \text{s}^2$ and that the body is subject to less than $0.5\text{m} / \text{s}^2$ vibration at the seat.

Waste treatment



Make sure that the machine discharges the waste oil collected in the container. Improper disposal of used oil can harm the environment.

Observe the applicable laws and regulations when handling hazardous substances such as lubricants, fuel, coolant, solvents, filters and batteries.

Hazardous chemicals handling:

Direct exposure to hazardous chemicals can cause serious injury.

Hazardous chemicals used in this machine include grease, battery electrolytes, coolants, coatings, and adhesives.

Please be careful and properly handle harmful chemicals.

List of attachments and spare parts

一、 Attachment tools

1、 Foot pad

2、 Interior parts

二、 Excavator spare tools

1、 SLOTTED SCREWDRIVER	1 pcs
2、 PHILLIPS SCREWDRIVER	1 pcs
3、 14 ANGLED SOCKET WRENCH	1 pcs
4、 SLEEVE CORNER	1 pcs
5、 HAND POWERED GREASE GUN	1 pcs
6、 SINGLE OPEN ENDED SPANNER	1 pcs
7、 TOOL KIT	1 pcs

三、 Attachment documents

1、 Operation and maintenance manual 1 pcs

2、 Three Guarantees service voucher 1 pcs

3、 Qualified certificate

4、 10-12excavator (with changchai 192F diesel engine)

4.1 Engine operate instruction	1 pcs
4.2 Three Guarantees engine voucher	1 pcs
4.3 Market service network list	1 pcs