



## **Caution**

**If it operates the machine with wrong way,it will make some dangers.Before use the machine,it should do as follow:**

- **Remember the operation manual and the use criterion**
- **Read & understand the content of the user manual about the safety operation**
- **Understand & know the safety sign of the machine**
- **Let the person leave the workplace who not the operator**
- **It should have a safety operation training before operates the machine**

**You have the duty to observance the ordinance & laws, follow the relevant direction about machine operation & maintain from YUCHAI.**

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**Material safety list and lifting capacity**

**1**

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**Prolegomenon**

# TO USER

Dear users,

You are welcome to use YUCHAI excavator, thank you for your support to our business.

This manual is for the operator and the service man of YUCHAI excavator. Hope you can read this manual carefully before operating and maintaining, and work strictly as the regulations of safety measures, operating guides, lubrication and periodic maintenance.

Correctly handle the operating method and maintain frequently are the necessary measures for the machine work reliably and efficiently, and also can lengthen machine use life.

Please send the machine to our company's service office or agent for important servicing and adjustment, and use the original parts supplied by our company. It will cause many problems if you install other parts on our machines even it is not clear effect for beginning.

We will not supply the warranty service if the machine broken as Used the unoriginal parts or repaired by the service department which is not authorized by Yuchai even it is during the warranty period.

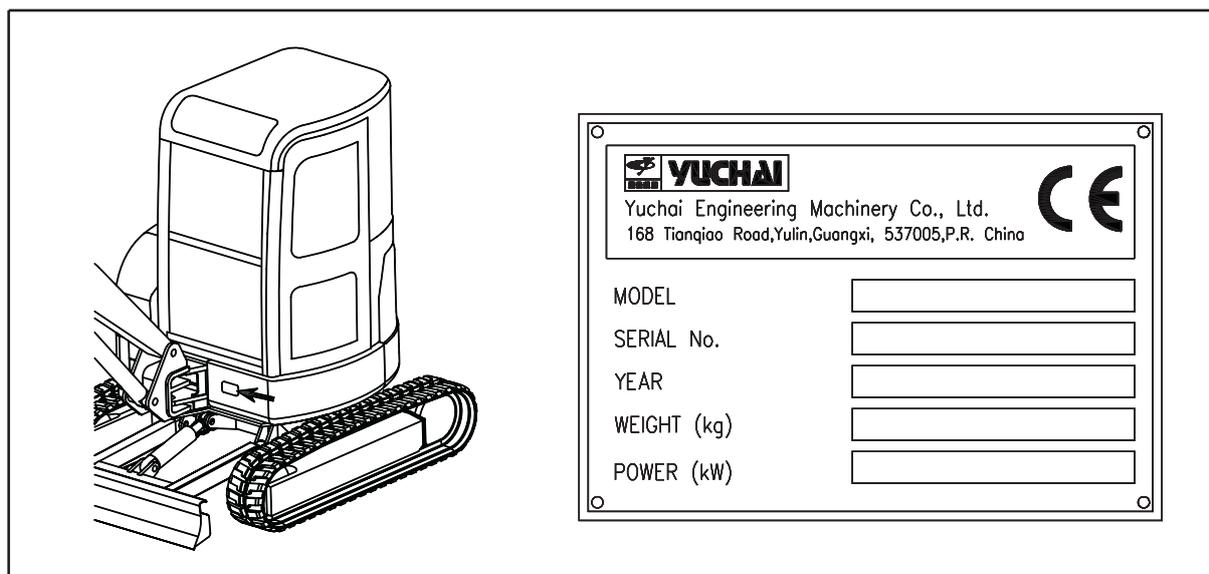
According to the principle of "The customer is god", we will keep improving the machine for supplying the product to the user as best as we can. The improvement will be take in any minute, we will not responsible for sending the new manuals for the selling products and giving the notice in advance. Hope this machine can supply the comfortable operating condition.

Guangxi Yulin Yuchai Engineering Machinery co.,LTD

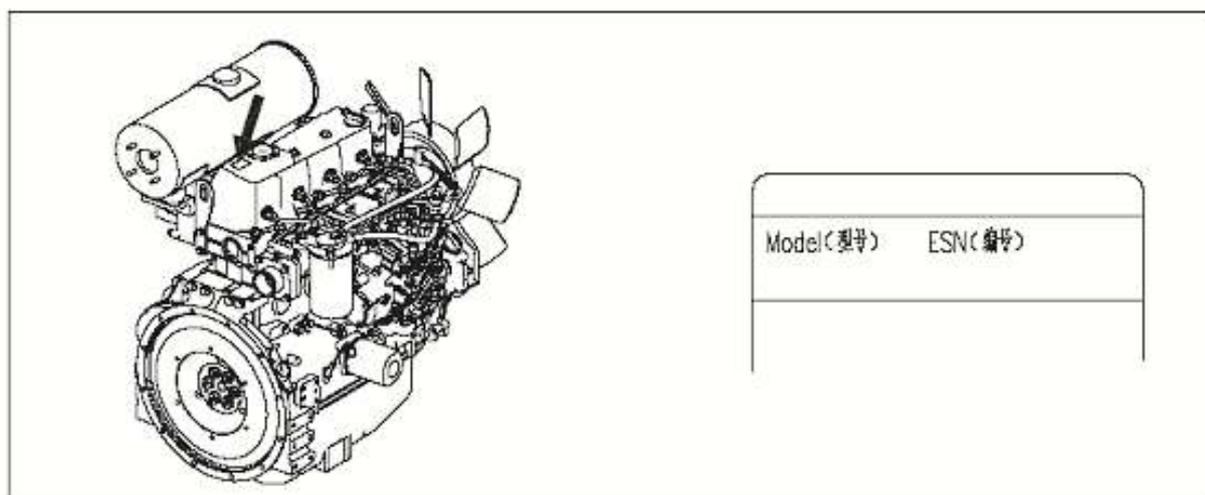
## Product Information

If you want to know the basic information of the machine, please check the following picture:

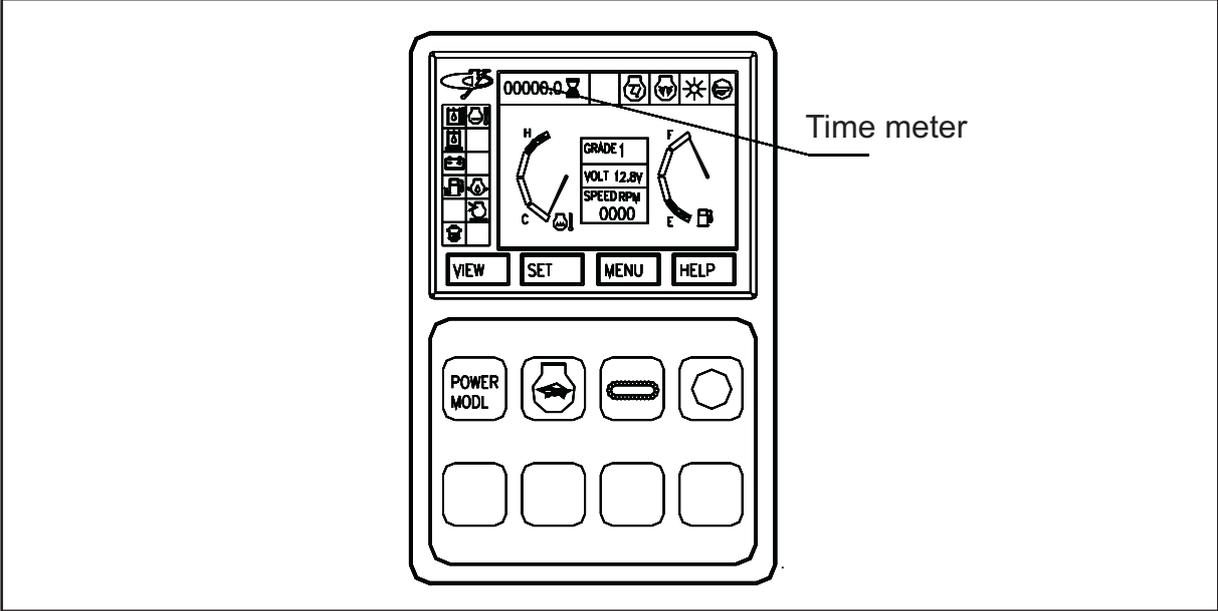
● **Machine Information**(The nameplate is on the left-front side of the platform)



● **Engine Information**(The nameplate is in the middle of the engine)



● Machine running Information(The time meter of the engine is on the digital instrument which is inside the cab)



### Machine File

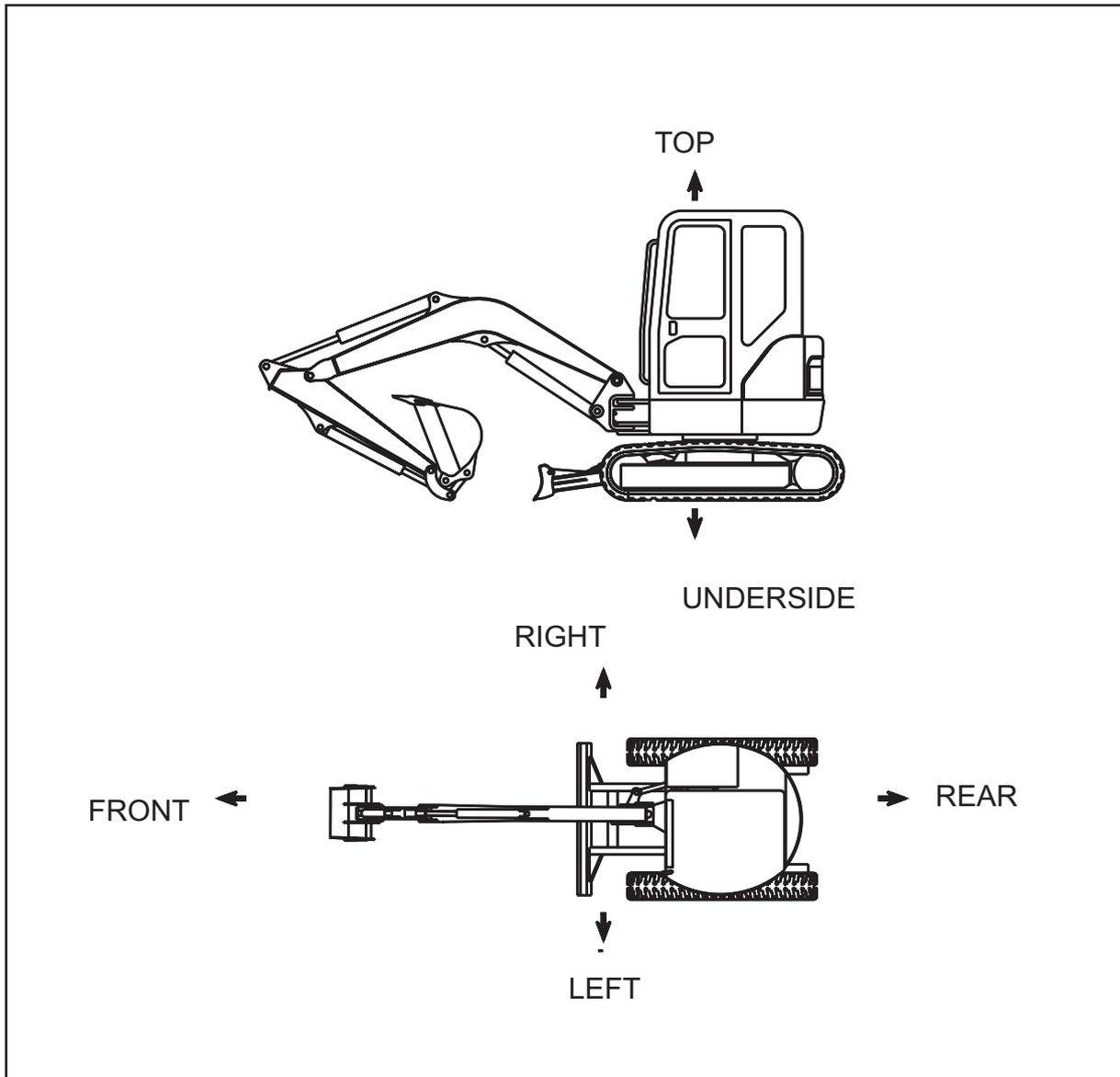
Please fill the machine series No. and engine series No. in the following table. If you need to buy the spare parts or related information, please advice YUCHAI these series numbers.

Please keep this paper together with the production certificate in a safe place, you can supply this information for your local police station if the machine is stolen.

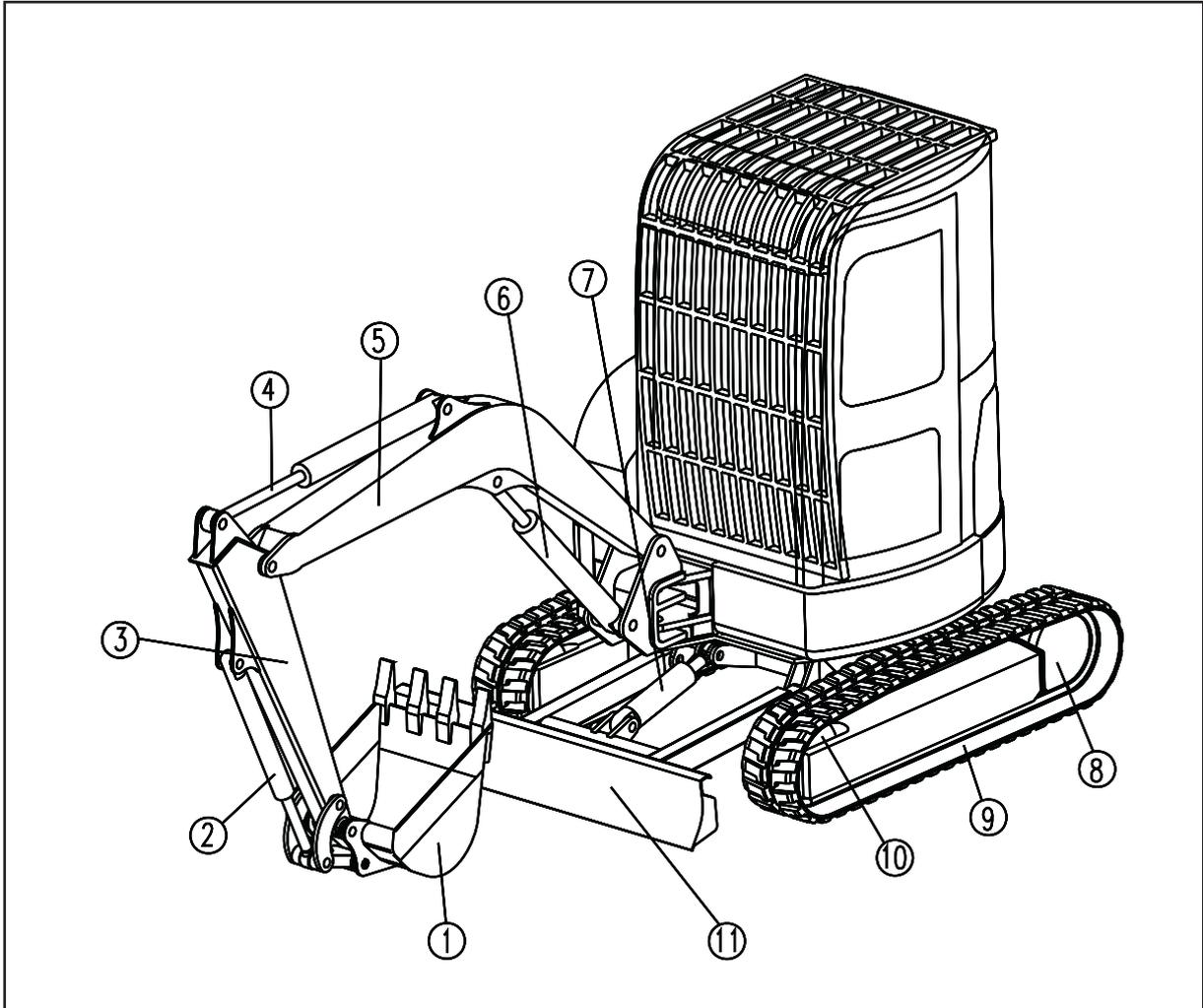
	<ul style="list-style-type: none"> <li>● Model: _____</li> <li>● Machine No: _____</li> <li>● Engine No: _____</li> <li>● Dealer Information: _____</li> <li>_____</li> <li>_____</li> <li>_____</li> </ul>
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## Machine Direction

Front, back, left, right, top, underside in the manual same as the direction as follow:



## Machine Configuration



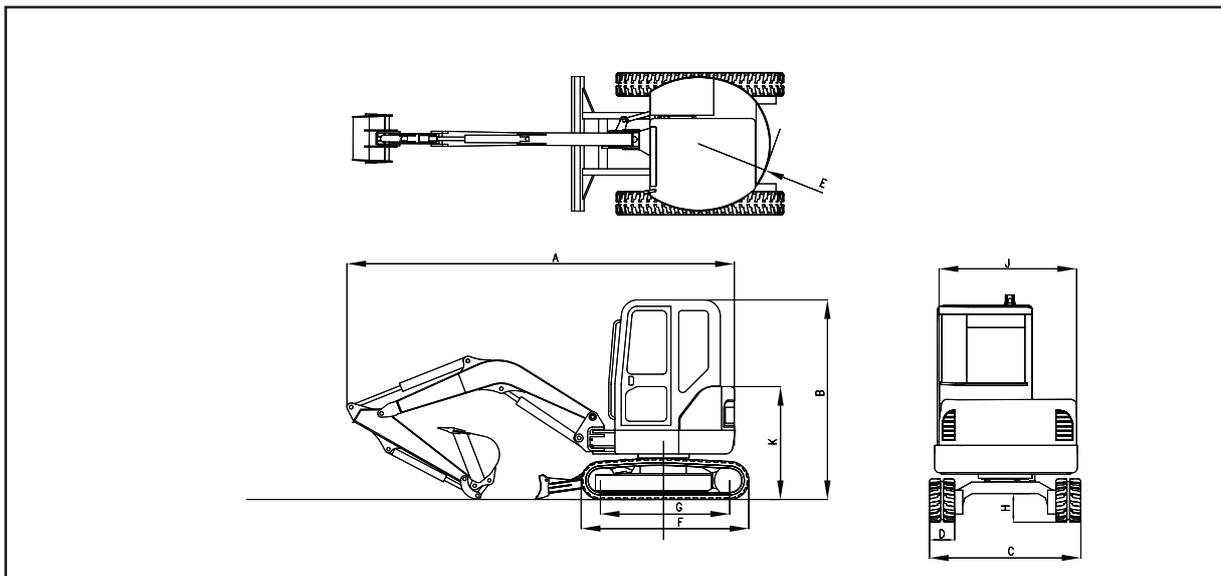
1. Bucket    2. Bucket cylinder    3. Arm    4. Arm cylinder  
5. Boom    6. Boom cylinder    7. Dozer cylinder  
8. Driving wheel    9. Crawler    10. Front Idler  
11. Bull dozer plate

# Technical Data

## 1.Dimension parameter

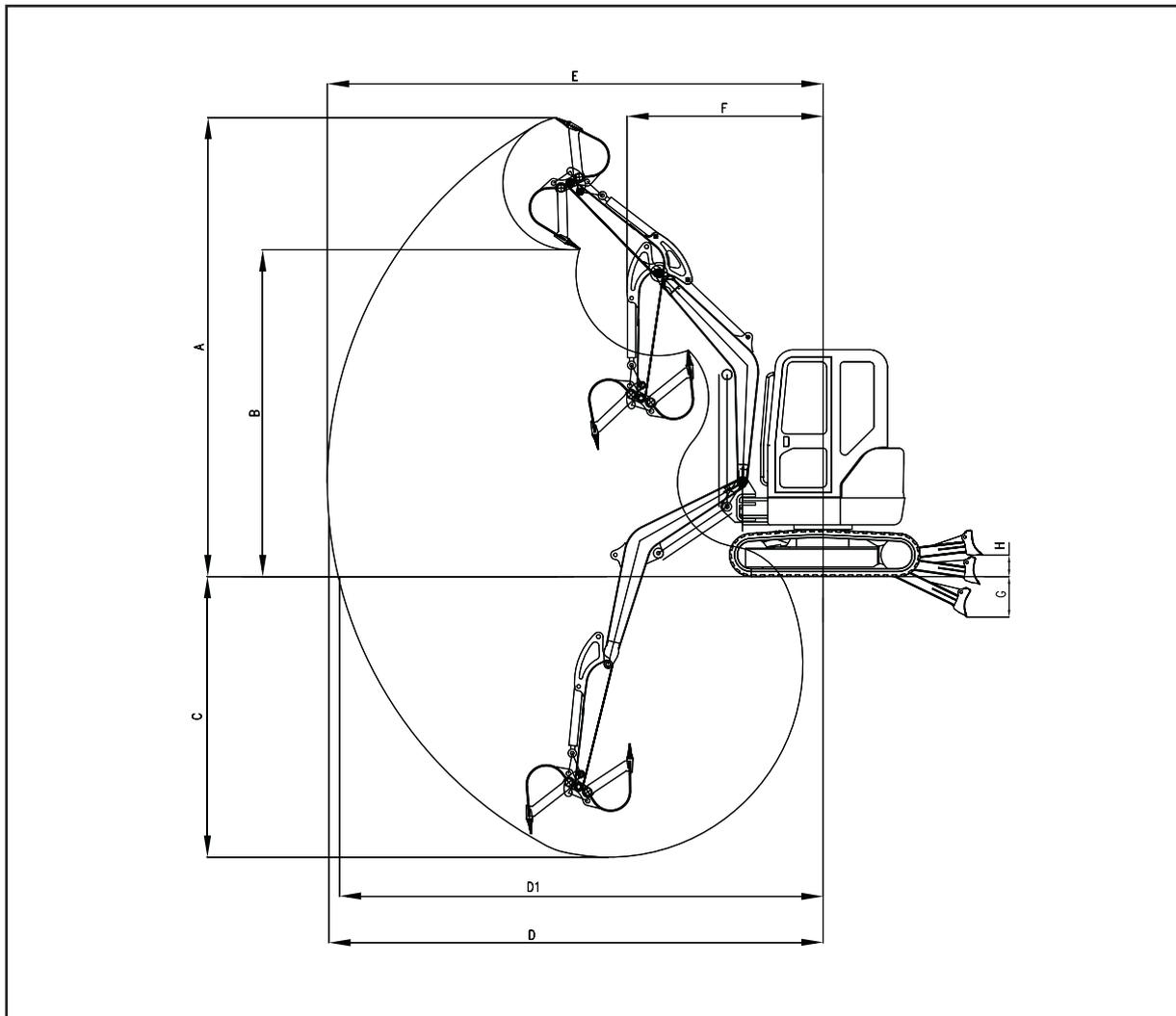
Code	Item	Unit	55SR
	Operating Weight	Kg	5710
	Standard bucket capacity	m <sup>3</sup>	0.20
	Name of engine		Yanmer 4TNV94L-S
<b>A</b>	Power of engine	KW/rpm	30.5/2200
<b>B</b>	Machine length	mm	5715
<b>C</b>	Machine height	mm	2715
<b>D</b>	Overall width	mm	2000
<b>E</b>	Crawler width	mm	400
<b>F</b>	Platform slewing radius	mm	1000
<b>G</b>	Crawler length	mm	2600
<b>H</b>	Wheel-base	mm	2060
<b>I</b>	Min ground clearance	mm	345
<b>J</b>	Width of platform	mm	1936
<b>K</b>	Height of engine hood	mm	1600
<b>L</b>	Height from floor to platform	mm	700
	Width of bucket	mm	547
	Walking speed(low/high)	Km/h	2.8/4.7
	Platform slewing speed	rpm	10.4
	Cab		●
	Canopy		
	With swing boom		●
	Boom swing angle (left/right)	°	80°/50°

Note: Technical data are subject to replace without prior notice!



## 2. Operating parameters

Code	Item	Unit	55SR
<b>A</b>	Max. digging height	mm	5940
<b>B</b>	Max. Dumping height	mm	4050
<b>C</b>	Max. digging depth	mm	3790
<b>D</b>	Max. digging radius	mm	6360
<b>D1</b>	Max. horizontal digging length	mm	6227
<b>E</b>	Max. digging height radius	mm	6370
<b>F</b>	Min. slewing radius	mm	2465
<b>G</b>	Max. depth of Bulldozer	mm	460
<b>H</b>	Max. height of Bulldozer	mm	350
	Max. digging force	kN	25.7



### 3. Bucket

Capacity(m <sup>3</sup> )	Bucket Width(mm)	Bucket Weight(kg)	Bucket teeth .
0.2	547	150	4

### 4. Traveling system

Traveling system is combined by Hydraulic traveling motor and multiple- planetary reducer, reducer is inside the crawler.

	Walking speed(km/h)	Max. pull force (kN)	Gradeability
High speed	4.7		35 °
Low speed	2.8	44	

### 5. Hydraulic system

Advance throttle hydraulic system

Main valve: Imported multiple valve

Pressure (mpa): 24.5mpa

Oil return filter: 10 um

Oil intake filter: 150 u

### 6. Electric system

Voltage: 12V

Battery: 80AH

### 7: Environment Condition

Temperature: -15° ~40°

Humidity:<85%

Altitude: The output is natural when the Altitude under level of 1200 Meter, and do please fix up the data follow the Manual when the Altitude is up to 1200 Meter.

Temperature for Transport and Stock: -15~40 °C

# 2

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## Safety Rules

## General Rules

Almost accidents about machines operation and maintenance will be avoided as per the related safety rules of this manual. It is required to read this book and all the safety information before the machines operation and maintenance.

The related safety contents of the manual indicate the possible things made during the machines normal run, and give the methods to solve it.

The related safety contents can see from the integrative guidelines of each chapter, including the contents of this chapter.

This manual shall not include all the potential risks and related solving methods. It is your responsibility to adopt the methods and keep safety if you use the methods and actions that not allowed in this book.

The Forbidden purposes and operations of this manual shall never be done in any circumstance.

This excavator shall be operated and maintained by trained and qualified persons.

It is required to check each function of the machines before work, and look for the reasons if finding the malfunction. It only can work after being repaired.

The machines shall be checked and maintained according to the manual. And the operators are required to follow the operation ways and safety regulations in the work scope.

Under the condition of alcohol and medicines, it is not allowed to operate and maintain the machines.

It is required to learn the expressive contents of related signals and gestures

It is required to know and obey the related laws and regulations of the countries or the regions when being on the road.

The machine can be operated only if make sure nobody around the work area.

## Safety Tips

### 1.Warning sign



**The sign in this manual indicates the important information about safety. You should carefully read the information and advice followed when you find this sign, to avoid the casualty accidents.**

### 2. Safety Tips

The manual provides the security notices, signs and potential dangers conditions, the operators are required to carefully read this manual and the attached signs on the machines, and should work as per the related process.

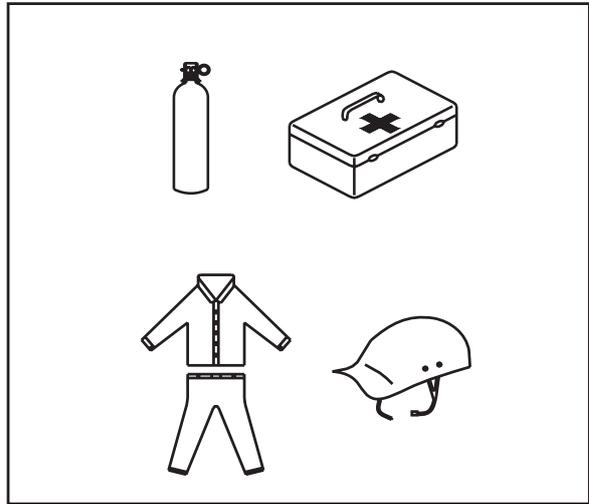
The safety tips of this machine shall be expressed as: Danger, Caution and Notice, the explanations of these words are as follows:

- **Danger:** It indicates that it can lead to casualty and serious hurts if the danger happens. It only appears in the most dangerous occasions.
- **Caution:** It indicates that it can lead to casualty and serious hurts if the potential danger happens.
- **Notice:** It indicates that it may lead to lower and medium hurts if he potential danger happens. And it can also give the advice of risky operation.

# Safety Equipment

## 1. The safeguard for the operator

1) Operators should wear the skintight and suitable work clothes, safety helmets, work shoes and other related protective equipment before operation and maintenance work. (For example: Protective earplugs, grooves, protective glasses, safety belts and so on)



2) Long hair should be fastened and covered with safety helmets to prevent entanglement with any rotating.

3) Users should arrange the first aid medicines in the machine, check them periodically, and arrange more medicines if necessary.

4) It is required to check if the protective equipment are in normal before operation and maintenance work.

## 2. Escape Hammer and Fire Extinguisher

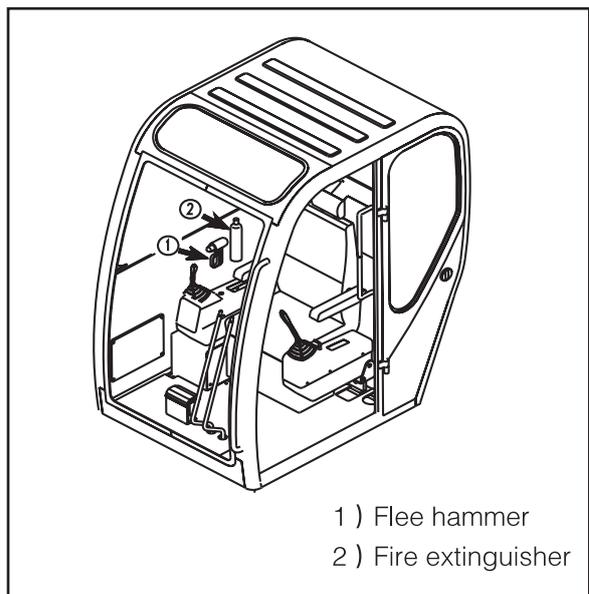
Escape hammer and fire extinguisher shall be installed in the driver's Cabs.

It is required to hit the glass with hammerhead if the driver is trapped in cabs, under this condition, the driver shall notice to protect the eyes and face.

It is required to put out the fire with the fire extinguisher if there is fire in cabs.

It is required to read the users' manual of fire extinguisher carefully, and follow the requirements strictly.

It is required to check and maintain fire extinguishers periodically.



# Safety Signs



**Warning: Ignorant of safety signs or safety signs lost may lead to the casualty. Please replace the lost and damaged signs in time, and keep them clean.**

Read the manual and caution signs attached on the machine before operation and maintenance work, and make sure to know and follow the contents.

Check the signs before operation every day, and clean them if dirty.

It can only use the calico, water and soap during the cleaning work. It is forbidden to use organic dissolvent or gas, because they can make the signs shed.

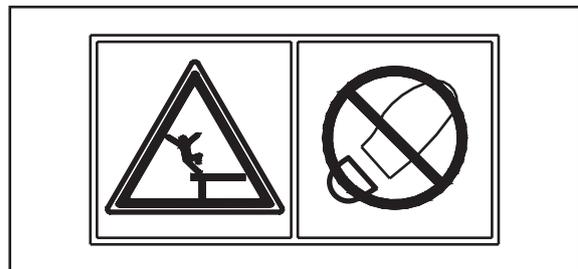
The signs shall be replaced if they are damaged, lost or unclear. New signs shall be attached on the new parts replaced. It can ask Yuchai agents for new safety signs.

## 1. Classifications of Safety Signs

Safety signs in this manual and on the machines shall be divided into: safety signs with picture and safety signs with picture & character

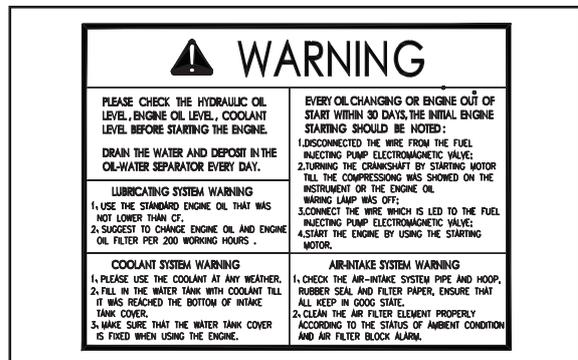
### A. Safety Signs with Picture

This kind of safety sign can easily and clearly express the caution information with pictures.



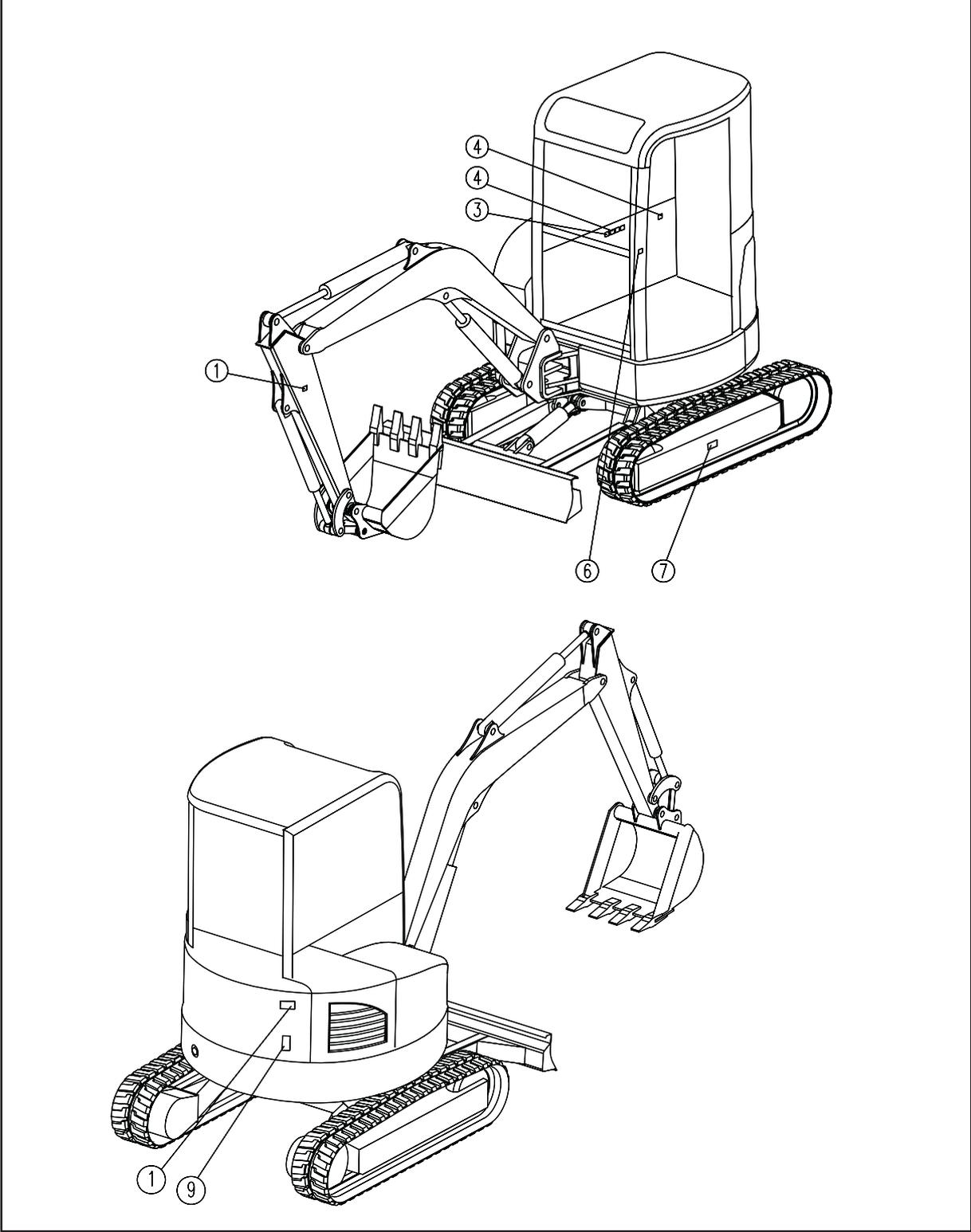
### B. Safety Signs with Picture & Character

This kind of safety sign is configured with pictures and explanative words. It can be used in the place where cannot explain the safety information enough only with the pictures.



## 2.The way of the safety sign

The sign is the picture only show the “Safety sign” part of the sign,other will show in next section.



### 3.Safe signs illustration and explanation

1) Notice or Keep away from working equipment



Make sure do not run over people standing in the working zone, during reverse movement play the horn before moving

2)Please pay attention to locking it after opening the driver's cabin and turning the window.



windows with no lock will close back suddenly because of the vibration of a certain outside dint or the machine, will bring Human body injury probably

3) Make sure keep safe when up and down the machine.



Please keep the slow movement when up and down the machine.

4). The Usage and Precaution items when using the crash hammer escape in Emergency



Read and remember the Precaution items carefully in case of the Emergency.

5). There might be eject the High-pressure hydraulic oil out from the tension assemble when adjust the tension pressure.



### 6). Warning Signs

 <b>WARNING</b>	
<p>PLEASE CHECK THE HYDRAULIC OIL LEVEL , ENGINE OIL LEVEL , COOLANT LEVEL BEFORE STARTING THE ENGINE.</p> <p>DRAIN THE WATER AND DEPOSIT IN THE OIL-WATER SEPARATOR EVERY DAY.</p> <p>LUBRICATING SYSTEM WARNING</p> <p>1. USE THE STANDARD ENGINE OIL THAT WAS NOT LOWER THAN CF.</p> <p>2. SUGGEST TO CHANGE ENGINE OIL AND ENGINE OIL FILTER PER 200 WORKING HOURS .</p>	<p>EVERY OIL CHANGING OR ENGINE OIL START WITHIN 30 DAYS, THE INITIAL ENGINE STARTING SHOULD BE NOTED :</p> <p>1.DISCONNECTED THE WIRE FROM THE FUEL INJECTING PUMP ELECTROMAGNETIC VALVE;</p> <p>2.TURNING THE CRANKSHAFT BY STARTING MOTOR TILL THE COMPRESSION WAS SHOWN ON THE INSTRUMENT OR THE ENGINE OIL WARNING LAMP WAS OFF;</p> <p>3.CONNECT THE WIRE WHICH IS LED TO THE FUEL INJECTING PUMP ELECTROMAGNETIC VALVE;</p> <p>4.START THE ENGINE BY USING THE STARTING MOTOR.</p>
<p>COOLANT SYSTEM WARNING</p> <p>1. PLEASE USE THE COOLANT AT ANY WEATHER.</p> <p>2. FILL IN THE WATER TANK WITH COOLANT TILL IT WAS REACHED THE BOTTOM OF INTAKE TANK COVER.</p> <p>3. MAKE SURE THAT THE WATER TANK COVER IS FIXED WHEN USING THE ENGINE.</p>	<p>AIR-INTAKE SYSTEM WARNING</p> <p>1- CHECK THE AIR-INTAKE SYSTEM PIPE AND HOOP, RUBBER SEAL AND FILTER PAPER, ENSURE THAT ALL KEEP IN GOOD STATE.</p> <p>2. CLEAN THE AIR FILTER ELEMENT PROPERLY ACCORDING TO THE STATUS OF AMBIENT CONDITION AND AIR FILTER BLOCK ALARM.</p>

clutch at the armrests of both sides and face the machine, use the pedal and tread shoe.

7). It's forbidden to open the container's cover when Hydraulic oil or coolant are in high temperature.



The hot hydraulic oil and coolant may hurt the human body when open the cover during the oil getting high temperature. Because of the hot hydraulic oil and coolant with high pressure.

8). Safe Sign



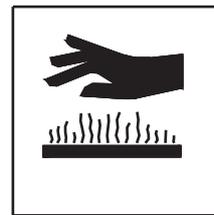
9) please stop the engine when adjust the inner assembly of the machine.



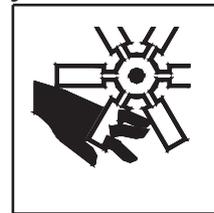
10). Can't depend the short circuit connect a start motor to start engine



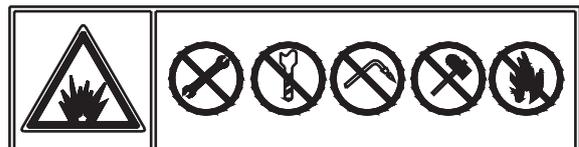
11). precaution the engine, radiators, muffler and some other hot or pressurized components. Hand, arm, skin and clothes may be damaged by blade fan or fan belt so never touch them if then are moving.



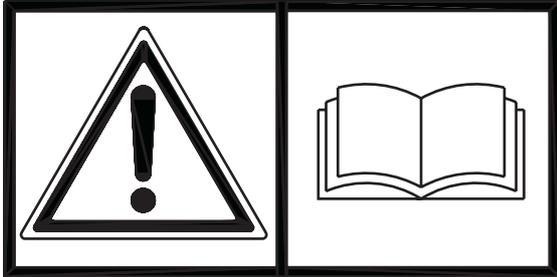
12). Be careful of the engine fan hurt Human body



13) It's forbidden to disassemble, drill and cut off the accumulator and air-spring. Those equipment is including the High-pressure air. The wrong operation will cause human hurt. Please ask the skillful people deal with such problem.

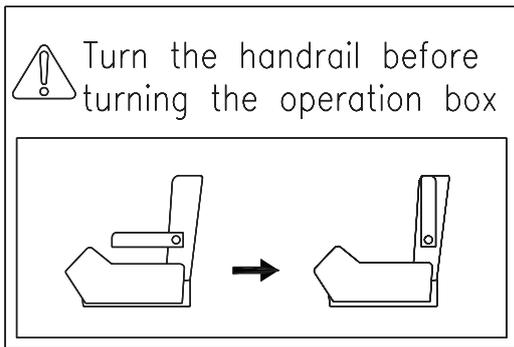


14). Please check the specification and other correlative file when you maintain the electric equipment.

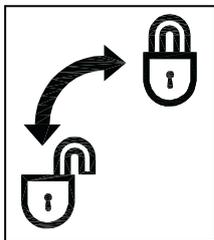


It is easy to happen the electric shock in electric system. Must follow manual's etc. relevant instruction while maintaining.

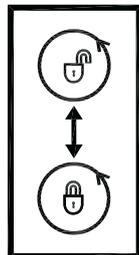
15). Warning sign of left operation box.



16). Lock signs

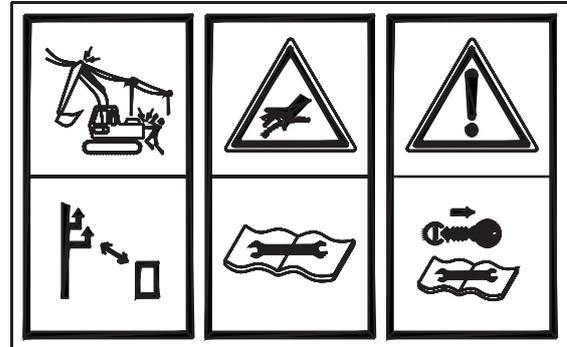


Left operating box locked



platform slewing locked

17). Electric shock signs of excavator



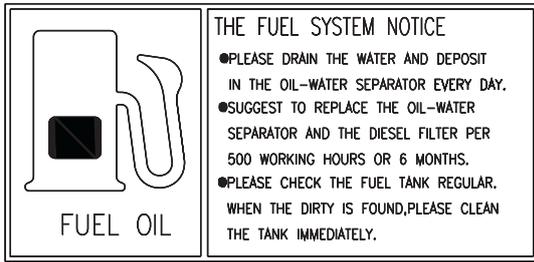
18). System Warning sign

<span style="font-size: 2em; font-weight: bold;">WARNING</span>	
<p>PLEASE CHECK THE HYDRAULIC OIL LEVEL, ENGINE OIL LEVEL, COOLANT LEVEL BEFORE STARTING THE ENGINE.</p> <p>DRAIN THE WATER AND DEPOSIT IN THE OIL-WATER SEPARATOR EVERY DAY.</p>	<p>EVERY OIL CHANGING OR ENGINE OUT OF START WITHIN 30 DAYS THE INITIAL ENGINE STARTING SHOULD BE NOTED:</p> <ol style="list-style-type: none"> <li>1. DISCONNECTED THE WIRE FROM THE FUEL INJECTING PUMP ELECTROMAGNETIC VALVE;</li> <li>2. TURNING THE CRANKSHAFT BY STARTING MOTOR TILL THE COMPRESSING WAS SHOWED ON THE INSTRUMENT OR THE ENGINE OIL WARNING LAMP WAS OFF;</li> <li>3. CONNECT THE WIRE WHICH IS LED TO THE FUEL INJECTING PUMP ELECTROMAGNETIC VALVE;</li> <li>4. START THE ENGINE BY USING THE STARTING MOTOR.</li> </ol>
<p><b>LUBRICATING SYSTEM WARNING</b></p> <ol style="list-style-type: none"> <li>1. USE THE STANDARD ENGINE OIL THAT WAS NOT LOWER THAN CF.</li> <li>2. SUGGEST TO CHANGE ENGINE OIL AND ENGINE OIL FILTER PER 200 WORKING HOURS .</li> </ol>	<p><b>AIR-INTAKE SYSTEM WARNING</b></p> <ol style="list-style-type: none"> <li>1. CHECK THE AIR-INTAKE SYSTEM PIPE AND HOOP, RUBBER SEAL AND FILTER PAPER, ENSURE THAT ALL KEEP IN GOOD STATE.</li> <li>2. CLEAN THE AIR FILTER ELEMENT PROPERLY ACCORDING TO THE STATUS OF AMBIENT CONDITION AND AIR FILTER BLOCK ALARM.</li> </ol>
<p><b>COOLANT SYSTEM WARNING</b></p> <ol style="list-style-type: none"> <li>1. PLEASE USE THE COOLANT AT ANY WEATHER.</li> <li>2. FILL IN THE WATER TANK WITH COOLANT TILL IT WAS REACHED THE BOTTOM OF INTAKE TANK COVER.</li> <li>3. MAKE SURE THAT THE WATER TANK COVER IS FIXED WHEN USING THE ENGINE.</li> </ol>	

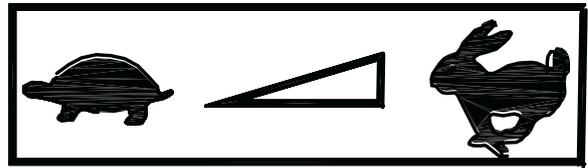
19). Hydraulic oil signs of Refill

<p><b>HYDRAULIC OIL</b></p>	<p><b>NOTICE</b></p> <ol style="list-style-type: none"> <li>1. PLEASE REPLACE THE HYDRAULIC OIL AND CLEAN THE FILTER EVERY 800 HOURS.</li> <li>2. PLEASE REPLACE THE FILTER ELEMENT FOR OIL RETURN EVERY 400 HOURS.</li> <li>3. PLEASE SELECT L-HM68 TYPE HYDRAULIC OIL.</li> </ol>
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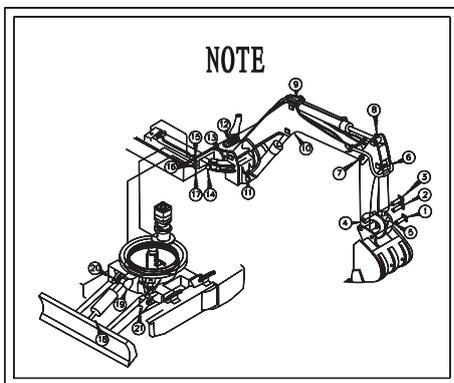
20 ).fuel sign of refi



23). Accelerator sign



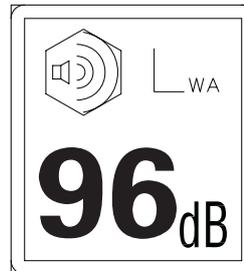
21). Refill sign



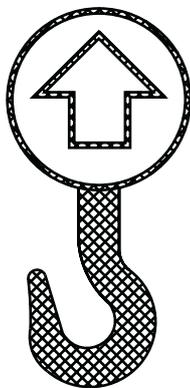
24). Read the signs of operator' manual



25). Noise sign



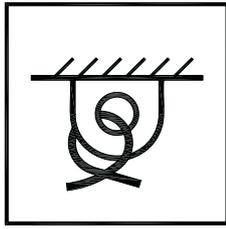
22). Sling sign



26). CE Sign



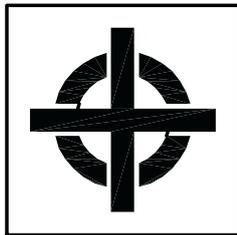
27) Sign of lifting hook



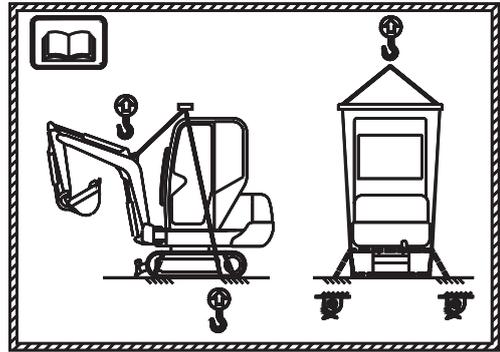
30) Sign of back



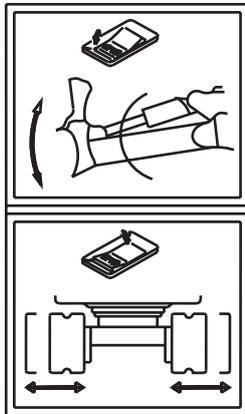
28) Sign of slewing center



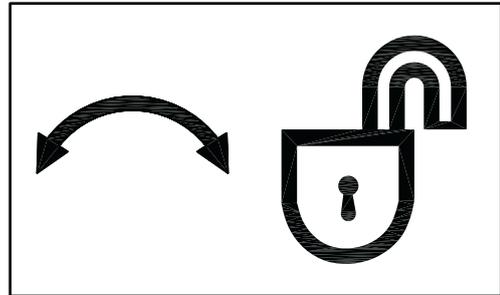
31) Sign of binding



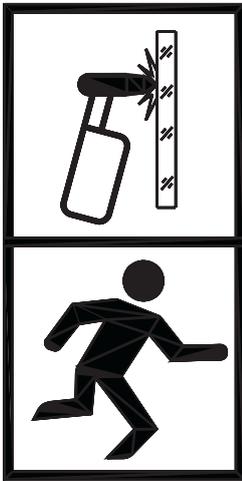
29) Sign of dozer and chassis adjusting



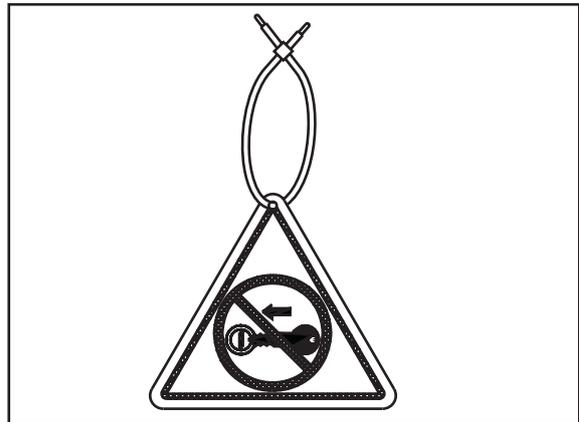
32) Sign of door open



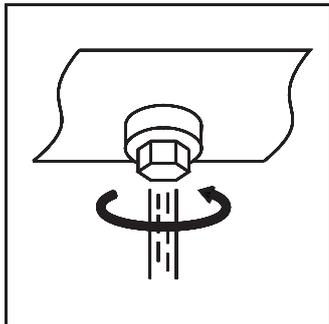
33 Sign of escaping



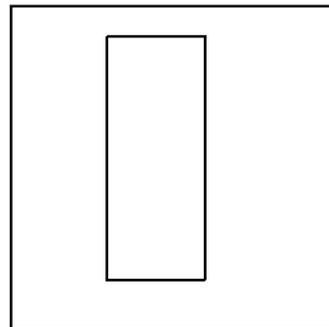
36) Sign of maintaining



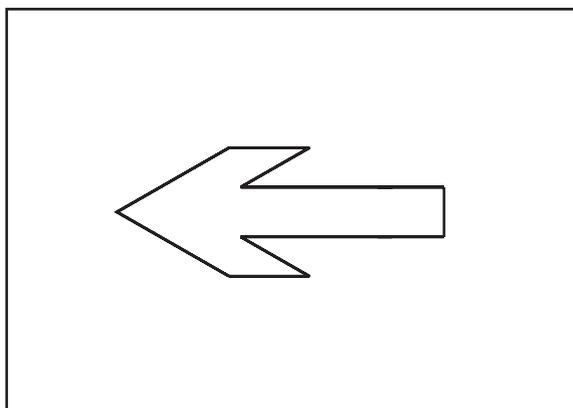
34) Sign of fuel outlet



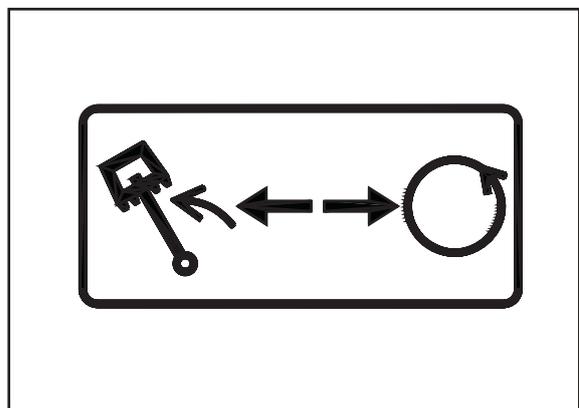
37) Sign of glistening



35) Sign of forward



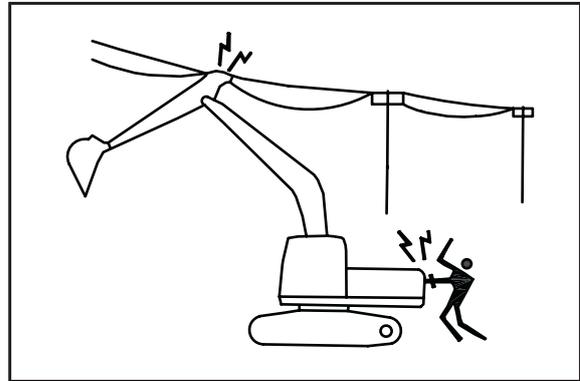
38) Sign of shifting



## Safety of The Workplace

As far as possible to know the workplace, please check as follow:

- 1.The place of slope
- 2.The hole
- 3.The hanging
- 4.The agrotupe(soft or hard)
- 5.The plash or the fenland
- 6.The rock or stub
- 7.The groundsill which buried,the limit of the stub or wall.
- 8.The garbage which buried or the limit of the filling
- 9.The hole、 the roadblock、 the mud、 the water
- 10.The traffic
- 11.The dust、 the smother、 the fog
- 12.The place of the electric、 gas、 phone、 water、 sewage which hang or buried



**Warning:Before digging,please contact the public establishment service system or sector**

- 13.When operating the machine in the building,you need to know the space of the door, aisle,the bearing capability of the floor.
- 14.Know the distance of the wire、 the line &the machine、 the machine & the floor.If possible,it's better to cut off the power.



**Warning:Touch or close the power or close the machine which connect the power will shock.No let any part of the machine close the power line except have the preventive.**

- 15.Keep the min.legal distance of the gas-main、 the cable、 the line、 water pipe



**Warning:If you see the end of the broken cable,the cutting cable will hurt your eye.**

## Operation Safety

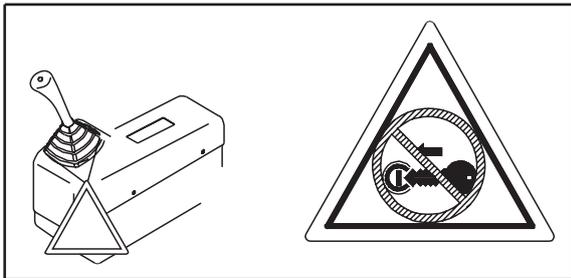


**Warning:** Before running the machine, please tie the safety belt, ring the trumpet, and confirm nobody in the workplace.

### 1. Start the machine

#### A. Safety detailed rules of start engine

- 1) Before to start the engine, it need to ring the trumpet.
- 2) Except the operator, it doesn't allow somebody to hitching
- 3) It only allow the operator sit on the seat to operate the machine
- 4) It's not allow to start the engine by short start motor.
- 5) In the cold day, the machine need to warm-up



**Warning:** If the operation handle hangs the sign: no start the engine, it doesn't allow to start the engine

#### B. After start the engine

After start the engine, it needs to check the things as follow:

- 1) Whether tie the safety belt
- 2) Whether the part running well, like the operation device, the bulldozer, the driving device, the rotating device, the operation device deflecting
- 3) Whether the sound, the libration, the smell, the instrument are well
- 4) Whether the machine oil or the fuel leak

## 2.Travelling and rotating

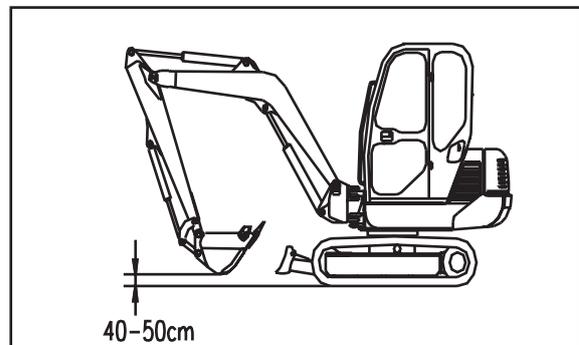
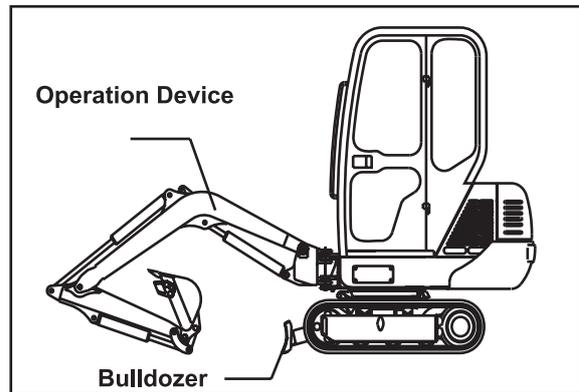
1)Before the machine driving, please turn the top of the platform to the right way, make the operating device and the bulldozer to the same direction. If they don't the same direction, the operation will opposite

2)Before the machine driving &rotating, please ring the trumpet to warn the people

3)The digger operated on the hand ground which the width must more than 1.5 times.

4)Before driving, please lock the cab's door. The cab's window allows to open, but it needs to lock.

5)Before back off or rotating, if it not see the back, it need arrange the signal compere



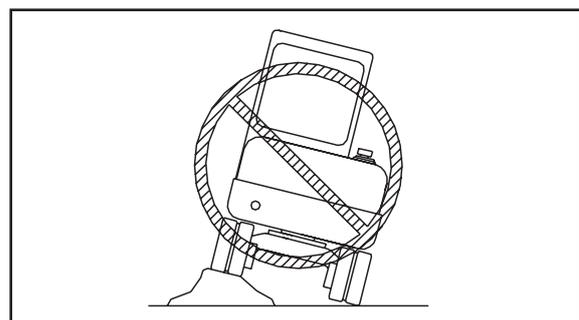
### ● Safety rules of driving

1)when the machine drives on the flat road,it need to reduce the moving-arm, retract the lever,keep the best way for the barycenter, keep 40-50mm distance for the bucket with the ground.

2)When the machine drives on the uneven road,it adopts the low speed driving,and not allow to turn the machine.If do it,may be lead the machine overturn.

3)The machine doesn't drive on the roadblock which lopsided,it will lead the machine overturn.

4)When the machine drives or operates, it must keep a distance with the people、the building and other machines



- 5)When the machine drives on the area which have the underpass、 the bridge、 the cable,it need have the sign command,keep a distance
- 6)Upgrade or downgrade,it need lock the platform
- 7)When the machine overpass the bridge、 the building、 the bearing,it should confirm whether they can bear the weight of the digger.
- 8)If the machine needs to drive on the calzada,it need to ask the local traffic section.

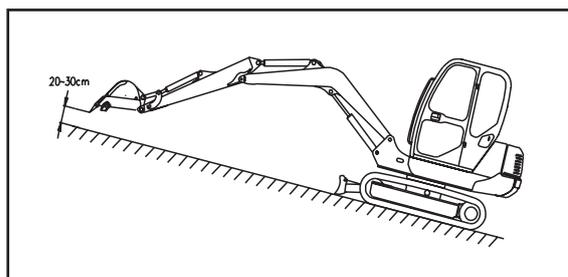
### 3.Driving or operating on the slope

It is dangerous to driving、 operating on the slope.Be care!

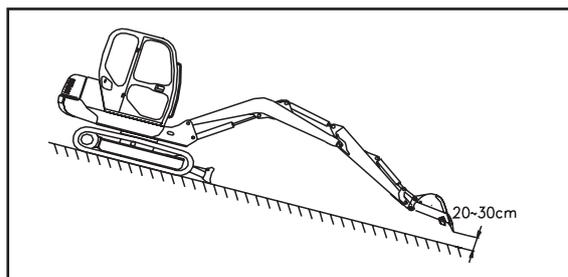
1)It suggests not upgrade or downgrade on the slope which the gradient more than 20°

2)When the machine works,it need to tie the safety belt especially on the uograde or downgrade and the danger area

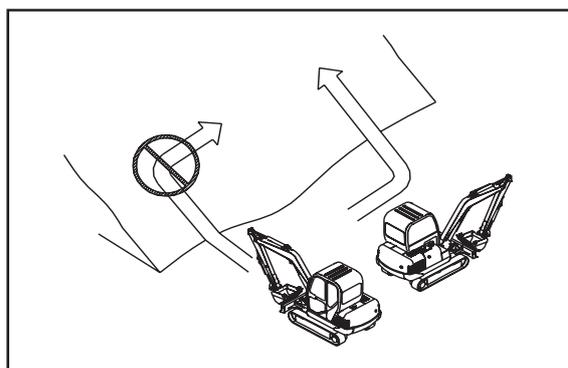
3)When the digger upgrades, the drive wheel need towards the direction which under the slope. It should let the moving–arm、 lever with the slope parallel, the gear of the bucket have 20–30cm distance from the ground. And lock the platform then upgrade low speed.



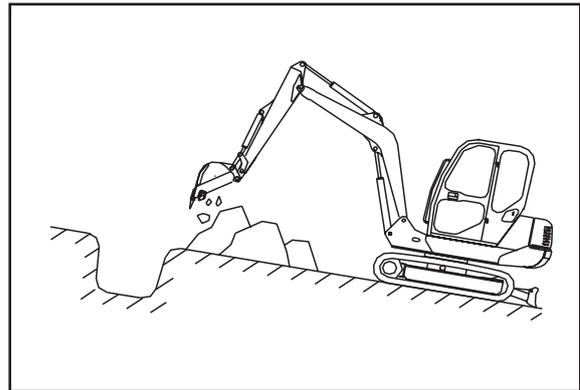
4)When the digger downgrade, it locks the platform. The drive wheel need towards the direction which up the slope. Elongate the moving–arm、 lever , and the gear of bucket have 20–30cm distance from the ground, then downgrade low speed.



5)No allow to swerve on the slope or pass the slope, it must replace the machine's place on the next flat place, Then upgrand.



6)When the machine operates on the slope,it must start the high first ,then towards the direction of the downgrade. The Bulldozer back it,and press the ground,the place for remove the soil on the direction of the upgrade.



7)It need drives low speed on the lea、 the shatter 、 the wet armor plate

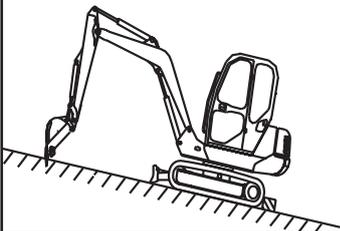
8)No allow to swerve when the machine upgrade or downgrade. Otherwise, the machine maybe overturn.

9)When the machine stops on the slope,it must make the bulldozer into the ground, and make the bucket into the groud,too. After it stop placidly,then stop the engine, and the operator out.

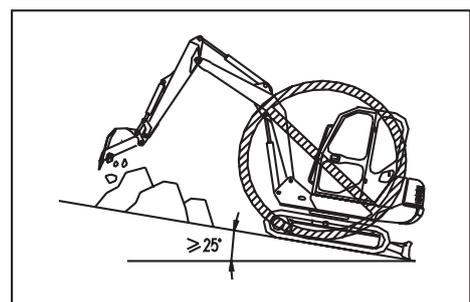


**Dangerous**

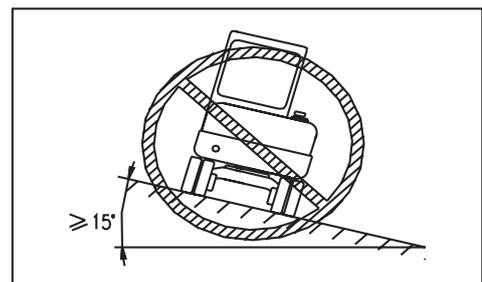
**It's very dangerous to stop the machine on the slopes. If the machine have to stop on the slopes please do as following ways: If the engine stop suddenly, remember put the bucket and dozer on the surface of the ground. And make sure all the handle are in middle position. After restart the engine. Even stop the machine on the slopes in a short time. Also make sure put the bucket and dozer on the ground, and put the handle on the middle way. Besides, please use enough block to the track..**



10)No driving or operating on the slope which the portrait gradient more than 25°



11)No driving or operating on the slope which the landscape orientation gradient more than 15°

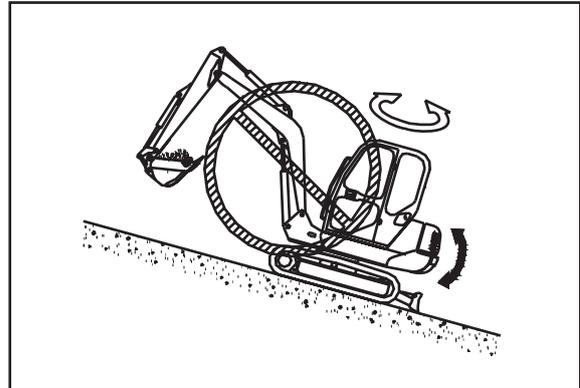


12)As far as possible to keep the machine balanceable,no driving on the rock or over the roadblock.

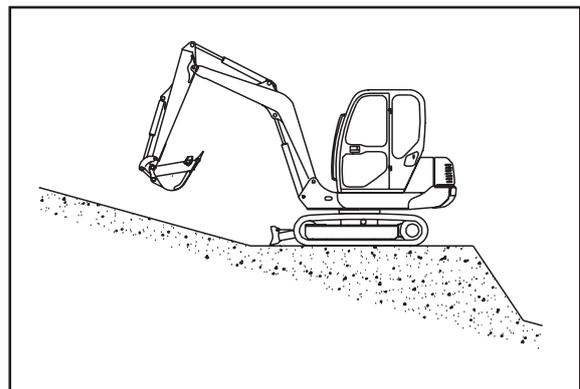
13)No swerve on the slope.

14)On the slope,the engine and the hydraulic oil must warn-up.

15)When the pedrail and the slope is  $90^\circ$  ,the machine is very dangerous if it rotating.If the machine must rotating,it should make the bucket close the ground, near the machine body,the padrial towards the top of the slope,and rotating low speed.



16)When the machine operates on the slope,operating the rotating or operation device, the machine maybe overturn.



#### 4.Safe to operation



**Warning:the operation must remember the operation handles to avoid the wrong operation.**



**Warning:the wrong operation will make the machine overture. Remember the information can make a right guide to protect the body.**

1) Before operating, it should remove all the things and the people.

2) To confirm the workplace can bear the machine, then let the machine enter.

3) As far as possible the two pedrails in the same plane, then it can operate.

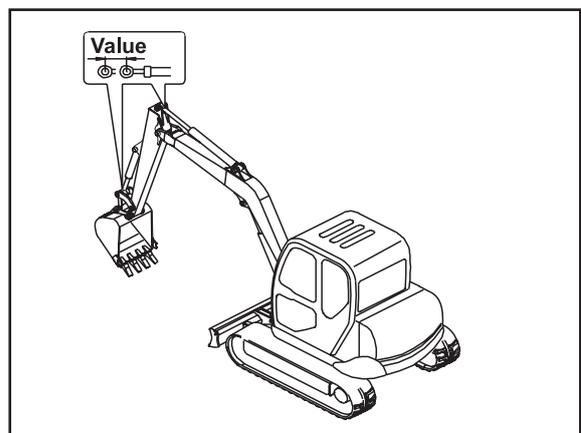
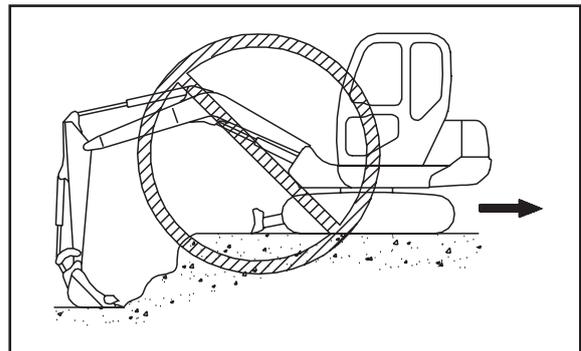
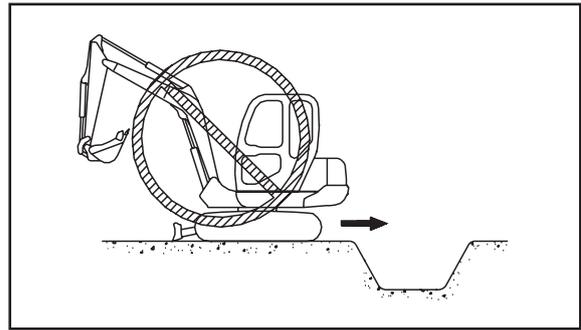
4) To confirm the workplace no cable, no windpipe, no water pipe, the machine starts

5) When the machine back off, it should observe whether the moving line regular, whether it has the roadblock

6) When the bucket has the special resistance, it doesn't allow to driving or rotating. Otherwise, the machine broken.

7) When the machine operated, if the hydraulic oil tank reach the end-point of the driving, the power will act on the limit ring of the oil tank. It will reduce the use life of the machine. To avoid the case, when the hydraulic oil tank operated, it should have a little value.

8) When the machine digs deep, it need to avoid the bottom of the moving-arm or the oil tank's soft pipe of the bucket touch the ground.



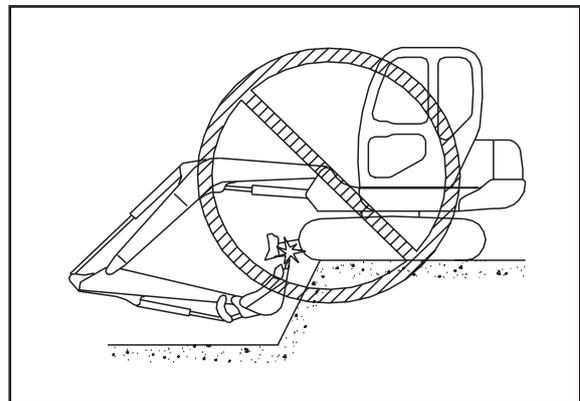
9) When the machine is operated, do avoid collision between the boom\*the arm\*the bucket\*the cabin (canopy) and the nonego.

10) When the machine rotates, do avoid to colliding the engine hood and the counter weight.

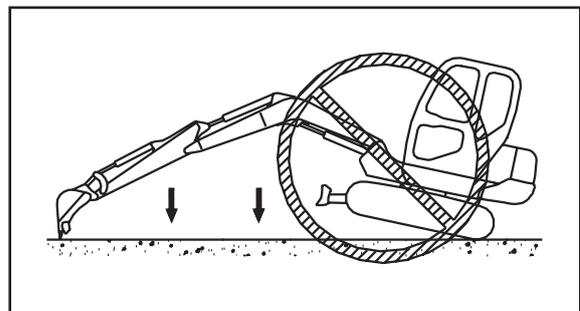
11) When the moving-arm reduced, it can't stop unexpected.

12) Do not dig to the machine body.

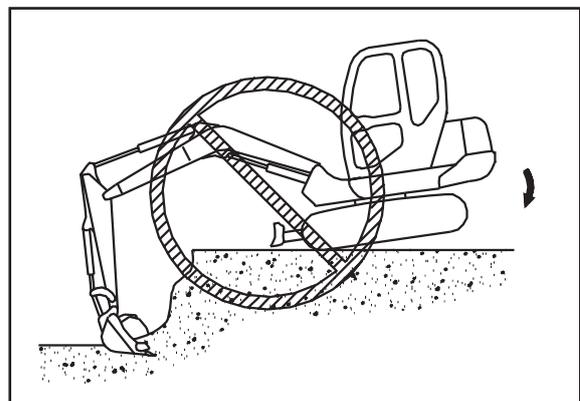
13) When the crawlers leave the ground, do not dig. Otherwise the machine and the frame will be broken.



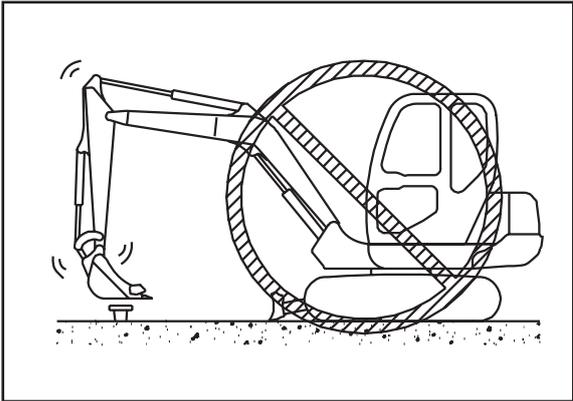
14) Do not dig when the crawlers off the ground otherwise the machine and the frame are destroyed.



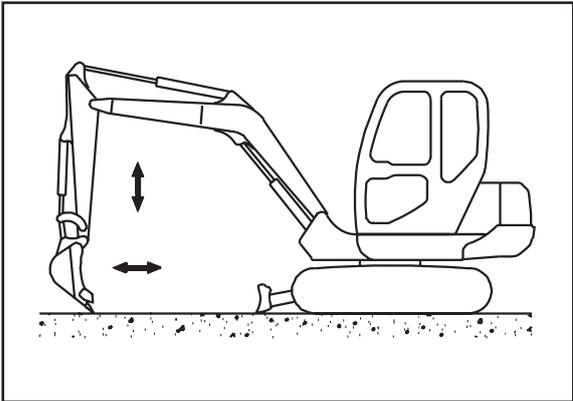
15) Do not use the deadweight of the machine to increase the digging power.



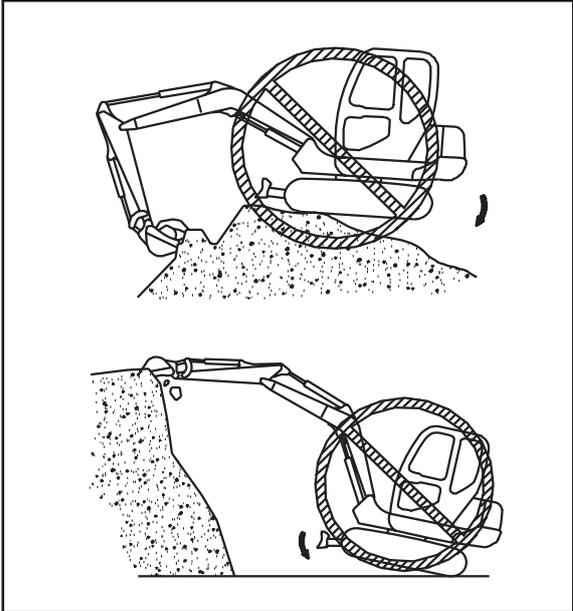
16) Do not use the falling power of the bucket as the handle\*the knapper or the pile driver. It will make the back of the machine bear over-weight.



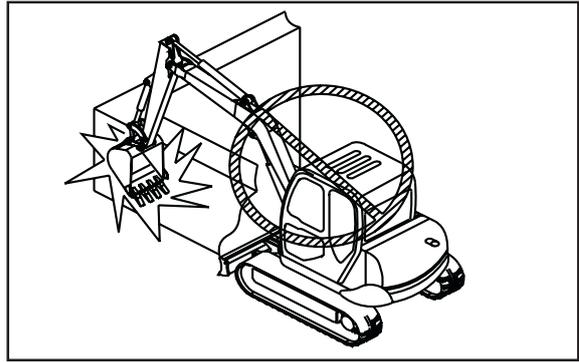
17) Do not use the bucket to dig the road surface more. Otherwise the parts will be overload and broken.



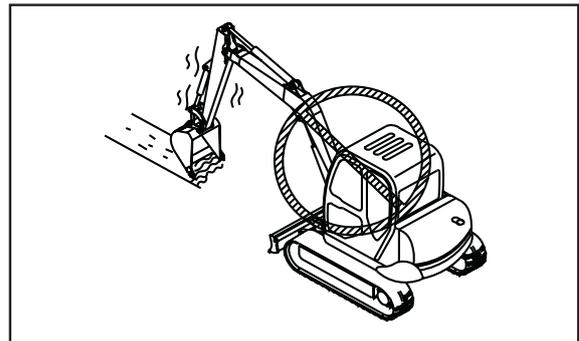
18) Do not use the falling power of the machine. Otherwise the machine will be broken.



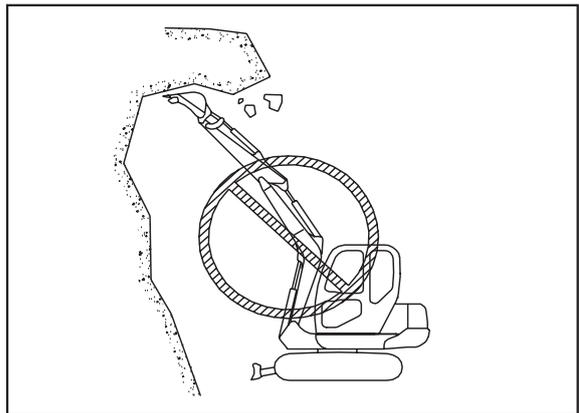
19) Do not use the power of rotating to press the soil or destroy the ridge and the wall. When the machine rotates, do not insert the teeth of the bucket into the soil.



20) Do not make the bucket into the soil to use the driving power to dig. It makes the back of the machine bear overweight.



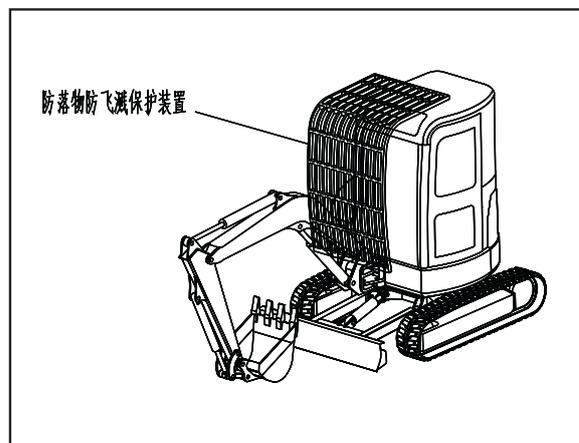
21) Do not dig the plane which is under the hanging part. It may cause the danger of the rock-fall or the collapse.



22) Proof equipment of preventing falling and splashing should be installed when the machine working in place with falling and splashing.

23) Do not operate or run the machine in the soft and waterlogged ground.

24) Do not use the machine to haul or pull other equipments or objects.



## 5. Prevent dumpage、ntiskid and the resolvent



**Warning:1)If it need to swerve on the slope,it only use the big radian swerve.When the machine turn right,turn the lever of the moving-arm to left.The distance to the ground about 30cm,lock the platform.**

**2)When the machine slip,it need press the bulldozer and the bucket to the ground.**

**3)When the machine dumpage,the operator mustn' jump off .It must to fist the handrail or the pillar of the lookum.**

Following,the machine is easy to overturn:

1)The machine moves on the uneven road,the two pedrail one side high one side low or half of the pedrail hangs.

2)One of the pedrail touch the soft soil, another touch the hard soil.

3)One side of the machine is Limestone cave or the slime

4)The machine operates on the slope which the portrait gradient more than  $25^{\circ}$  ,the thing towards the downgrade.

5)The machine operates on the slope which the landscape orientation gradient more than  $15^{\circ}$  the thing towards the downgrade.

6)On the slope,it is  $90^{\circ}$  for the two pedrail and the gradient,the rotating platform more than  $90^{\circ}$

7)The machine operates on the slope,it swerves,the platform rotates fast or no power.

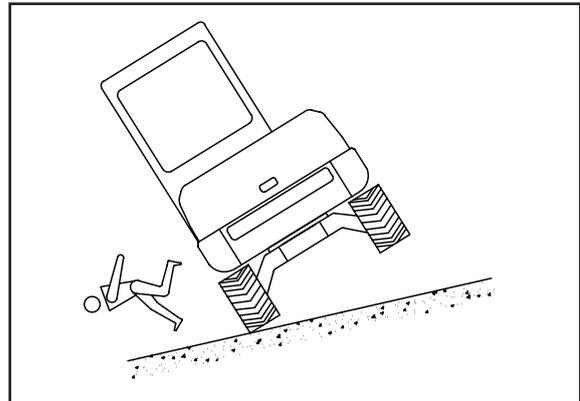
8)When the machine turn adown about  $180^{\circ}$  .

9)It is the uneven road for the back operation.

10)The machine dig the underside of the body when it depth digging.

11)The machine moves on the frost road.

12)The two pedrail have the machine oil or the lube



## 6.Stop the machine

See it at the chapter of parking machine.

## Maintain



**Warning: When the machine is maintained, there should be warning sign "No operation" hanging on the operation handle.**

- Machines should stop on the smooth and hard road.
- After the excavator stops, it must put down the bucket, and run the engine 3 minutes with low speed, then stop it and pull out the key.
- Release all the power of the hydraulic system.
- If the machine should stop on the slope, there should be enough road-block under the crawlers.
- There should be enough distance between other machines when the machine stops.
- When the electric system or electric welding is maintained, it should take-down the cathode cable of the accumulator. Do avoid the current movement.
- After the machine starts, do not lubricate or maintain. Do not let the motion touch the running part.
- If the machine needs to maintain when the engine runs, there should be someone to see it.
- Do not put some small parts into the placket.
- The high-pressure liquid can hurt the eyes and the skin. Do avoid it when the machine maintains.
- Do clean all the sundries in the interior of the machine, it may hurt the operator or destroy the machine.
- Do deal with the waste liquid with correct way. Do not throw the oil into ground、 drain、 creek、 pond or lake. Letting oil、 fuel、 antifreeze、 plastic、 accumulator oil and other poisonous waste should obey environmental protection rules.

**Notice: When the machine can not work or can not operate, please hoist it to the truck and leave away the scene before maintenance. Hoisting steps please refer to the "hoisting machine."**

## Fire-proof、 Explosion-proof& Antigas

●When the excavator transported、 driving、 digging, it shouldn't touch the wire. Otherwise, it causes the casualty.

●The wiring and the line needs to check frequently. If it finds the broken、 aging part, it must be replaced to avoid the fire.

●Keep the line linker clean and fix it firmly. Check the line everyday.

Tightening the loose connector or hoop.  
Repairing the damaged wire.

●Do not put the thing which is flammability or explosive into the excavator.

●Do stop the engine when it oiled, and keep away from the fire and do not leave the machine.

●When it is being oiled, the fuel can't overflow to the surface which is super heated or the parts of the electric system.

●After oiling, do clean the fuel or machine oil which overflow, and screw down the cover of the fuel or the machine oil.

●Clean out the slip、 spill、 lamina and other flammability thing which is in the engine\*the vent-pipe、 the muffler、 the engine room.

●Do not put the dishcloth which is with the oil into the cab.

●There should be fire extinguisher in the cab, and put it on the place where can be easily to take from.

●When the machine is welded, do segregate the pipeline of the hydraulic oil and the fuel.

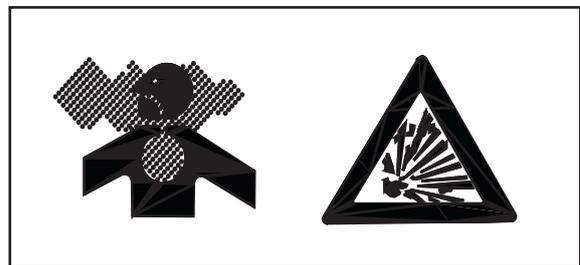
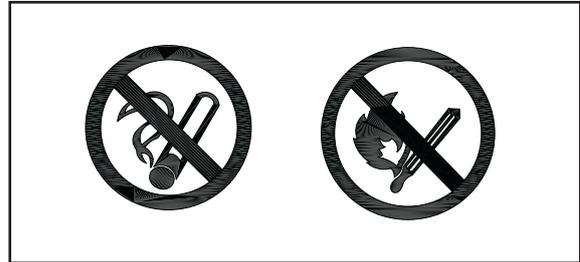
●Do avoid the fire caused by the hydraulic pipeline. Check all the soft pipe and the fastener\*the cover\*the block whether they fixed firmly.

●Accumulator should be far away from the fire. Do avoid the high temperature. Otherwise it will explode.

●The excavator with cabin should be checked with the sealed center clapboard. Do avoid the exhaust gas into the cab to cause the operator poison.

●Do not operate the machine on the area where the airiness system is not good.

●When the fire happens, do not use the water to put out the fire. Should use the powder extinguisher or the sand, or use the slipcover



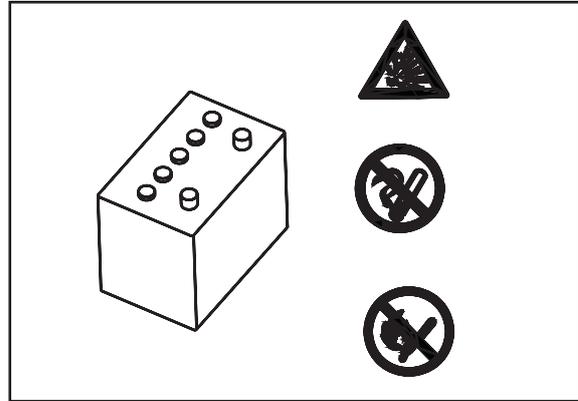
# ACCUMULATOR

## Safety rules of the accumulator

The electrolyte of the accumulator includes the vitriol and the hydrogen which is flammability and explosive.

The wrong operation leads hurt or fire. Do as follow:

Indicator showing battery chamber is equipped in the cover of battery. When it shows green, the battery can be used normally. When the it shows black, the battery should be recharged in time. When it shows white, the battery should be replaced immediately.



- Do wear the safety glass and the rubber gloves when operate the accumulator.
- Do not smoke or fire near the accumulator.
- If the eyes、 cloth、 skin are bespattered by the vitriol, do use lots of water to wash and go to the hospital.
- Before operating the accumulator, it should turn the key to "OFF".
- Do stop the starting system when use the electric torch to check the electrolyte of the accumulator.
- The end of the sealed accumulator dilates, it show the accumulator freezing. When the accumulator freezing, do not electricize or connect the starting engine. The temperature should be less than 15°C when heat up the freezing accumulator. Otherwise it explodes.



### Explosion-proof of the accumulator

**Warning: the electric spark or the flame can make the hydrogen of the accumulator explodes. Avoid explode please do as follow:**

- 1) Before cutting off the cable of the accumulator, do cut the cathode cable first.
- 2) Before connecting the cable, do connect the cathode cable first.
- 3) Don't use the metal element to connect the port of the accumulator.
- 4) Don't weld\*grind\*smoke near the accumulator.

Because it has danger of spark, do as follow:

- Please fix the accumulator to the right place.
- The tool or other metal can't touch the port of the accumulator. Do not fall the tool or other metal near it
- Connect or cut off the sign of the accumulator follow the right order. The port of the accumulator should fix fast.
- When the accumulator electricized, it produces flammability hydrogen. So before electricized, it should unload the accumulator from the machine, and put it to the draughty place and remove the cover.
- Screw down the cover of the accumulator.

**Caution: When maintaining the electric system or weld, it should remove the cathode port to avoid the current flowing.**

# Hydraulic System

## 1. Safety rule of high-pressure oil

The inside of the hydraulic system always have the pressure. When check or replace the pipeline or the soft pipe, do check whether the pressure has release or not. If there is pressure, it will make a serious hurt or destroy. Do as follow:

- 1)When the hydraulic system has pressure, do not check or replace.
- 2)If the pipeline of the soft pipe leaks and in wet area, please check the pipeline or the soft pipe whether it is broken or dilates. The operator should wear the safety glass and the glove to check.
- 3)If the high-pressure touch the eyes, it will be dangerous of ablepsia. Use the clean water to wash the eyeS or the skin which touch the high-pressure, and go to the hospital.



## 2. Safety operation of the high-pressure soft pipe

If the high-pressure leaks, it will make the fire or the operation trouble and lead the serious hurt or destroy. If the bolt is loose, stop the machine, and screw it down. Do not weld the machine when the hydraulic oil pipeline (soft pipe) is not separate. If the soft pipe is broken, do stop operate, and contact us.

If any problems as follow happen, do replace the soft pipe:

- 1)The tie-in of hydraulic pipe leaks or is destroyed.
- 2)The envelope is broken or apart, or the steel wire of the reinforcement is out.
- 3)Some parts of the envelope dilate.
- 4)The mobile parts contort.
- 5)The envelope has impurities.

## 3. Safety rules of the high-temperature oil

The hydraulic oil which is cooling on working or after working is high-temperature and high-pressure. Do avoid the oil squirting or touching the hot parts. Before operating, the oil should be cooling. Do loosen the cover or staff before unload them even if the oil has been cooling.

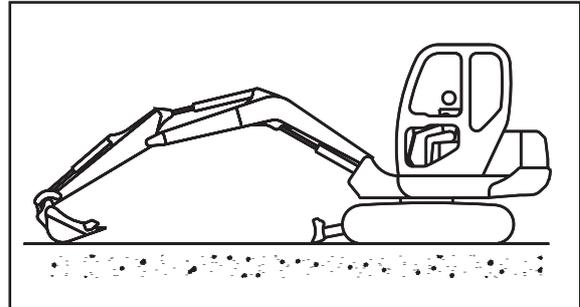
#### 4. Release the pressure of the hydraulic system

The process of releasing the pressure:

1) If the working equipment doesn't locate the state as the picture, it needs to start the engine and runs slowly, hold out the bucket cylinder, draw back the arm cylinder.

Then put down the bucket and the bulldozer on the ground, stop the engine.

2) Within 15 seconds after stop the engine, turn the switch to "ON" and operates the joy stick to all directions (working equipment, driving) to release the pressure.



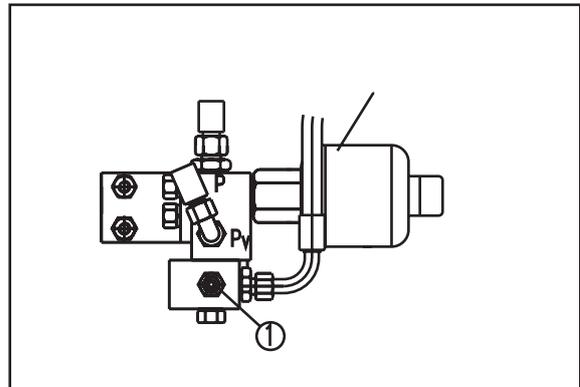
#### 5. Safety operation of the accumulator



**Warning: The accumulator is the part which is full of the high-pressure nitrogen gas. Using wrongly will lead to explode. Do not take-down the accumulator, no drilling and welding. Do not close to the fire. Avoid collision and impact. It should be managed by professional person.**

The machine is installed accumulator in the control pipeline. It is a device which stores the pressure. It can operate the control pipeline for a short time after the engine stops.

Operating the joy stick can put down the working equipment by the deadweight.



The way of controlling pipeline to release the pressure with accumulator:

1) Put down the working equipment to the ground, and stop the rock breaker or other attachments.

2) Stop the engine.

3) Turn the start key to "ON" to make the current of the circuit moves.

4) Turn the safety lock joy stick to the free place, driving the joy stick of the working equipment to front, back, left, right and the pedal of attachments controlling to release the pressure of the control pipeline.

5) Turn the safety lock joy stick to the lock place to lock the job stick and the pedal of attachments controlling.

## **Material safety list and lifting capacity**

**Material safety please refer to Attachment 2**

**Lifting power please refer to Attachment 3**



**Incorrect operation to the machine will be casualties. Suggestion below should be followed before operate machine:**

**Do remember the safety rules and correct regulations.**

**Do read and understand the reference of safety rules of machine in the manual.**

**Do understand all safety tips in the machine.**

**Do keep people away from the workplace.**

**Safety operation training should be necessary before operating the machines in workplace.**

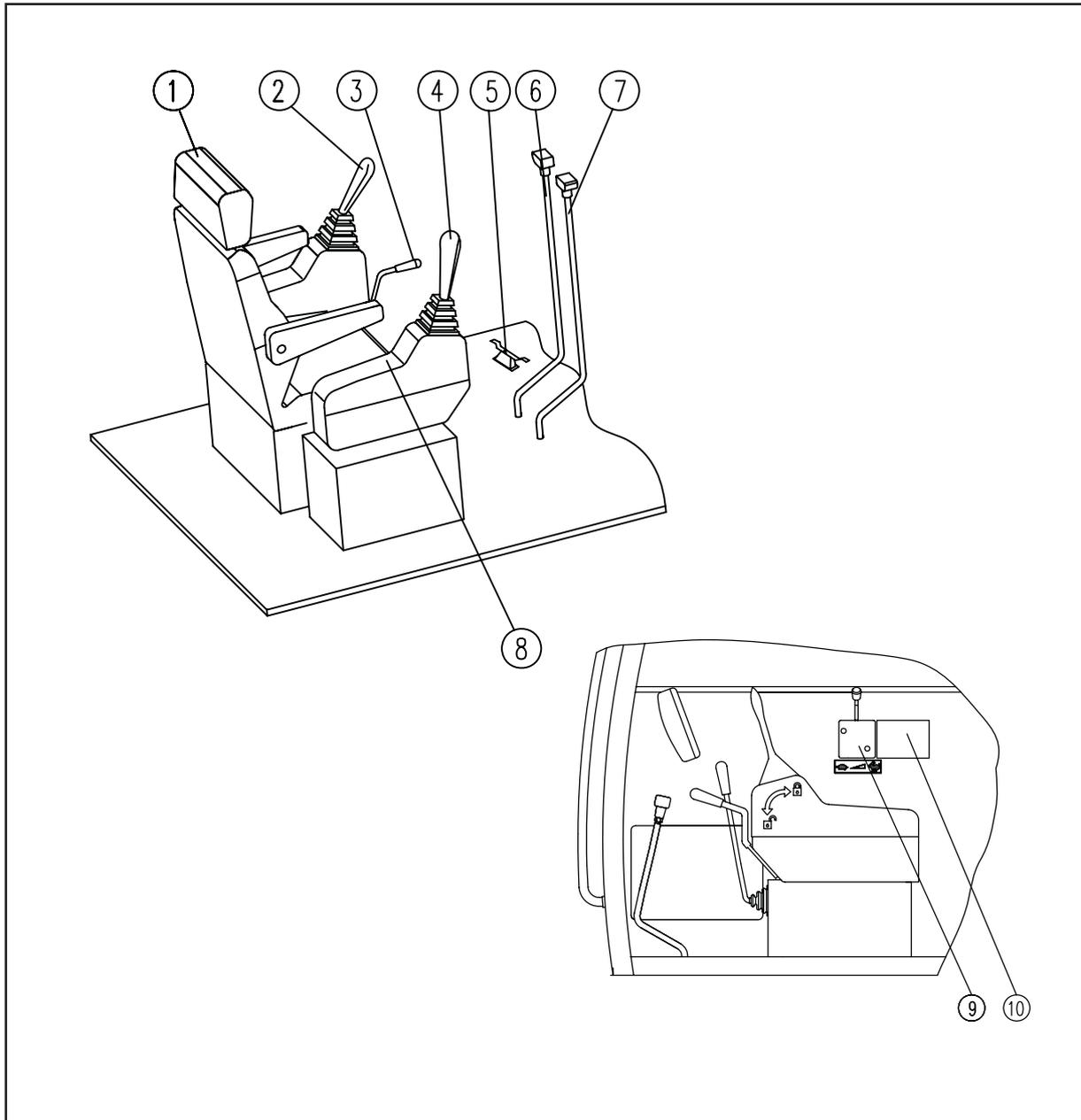
**You are responsible for compliance with the relevant rules and regulations and comply with the relevant operators and maintenance guide of Yuchai.**

# 3

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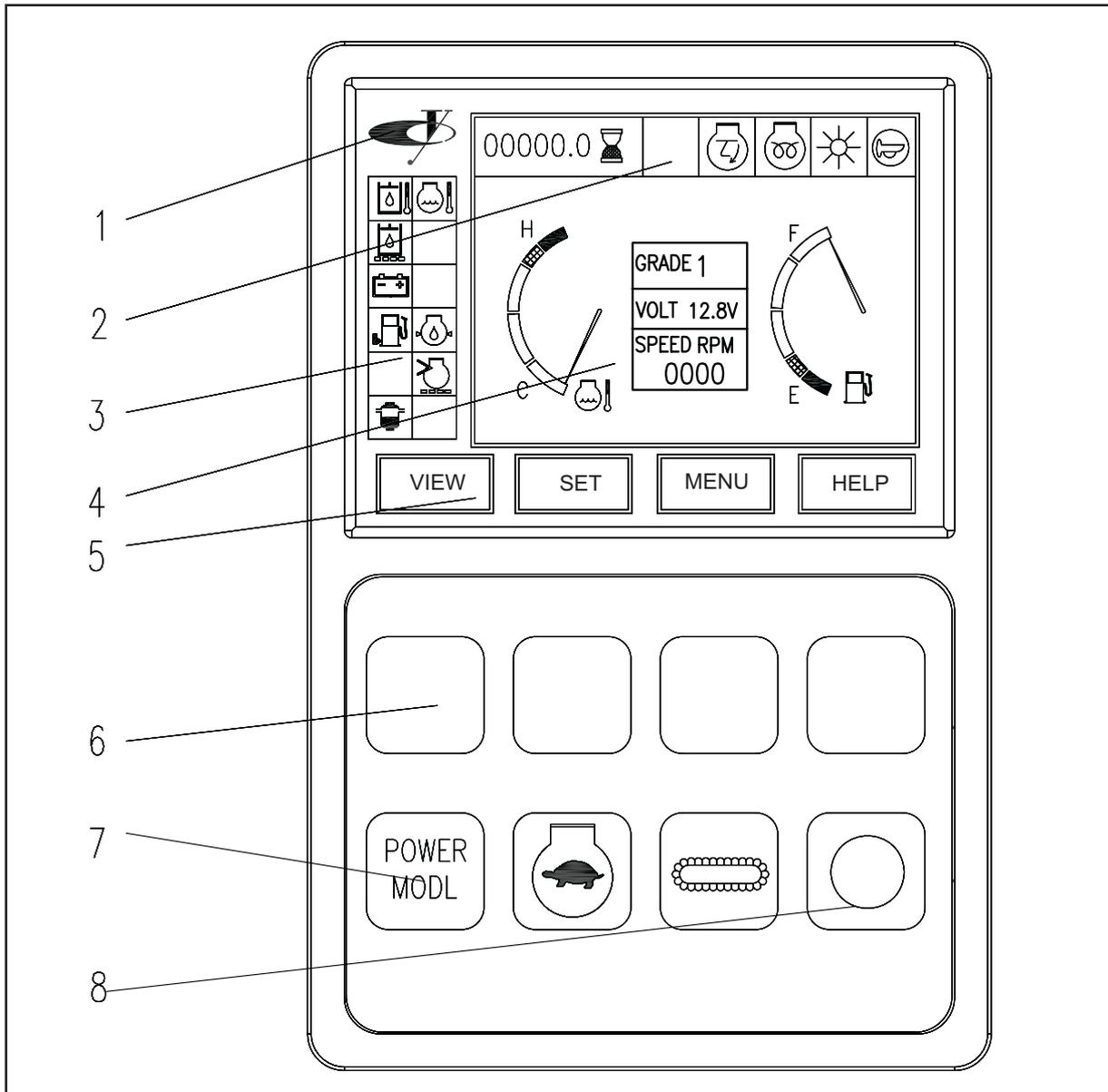
## Parts Description

## Controlling Equipment



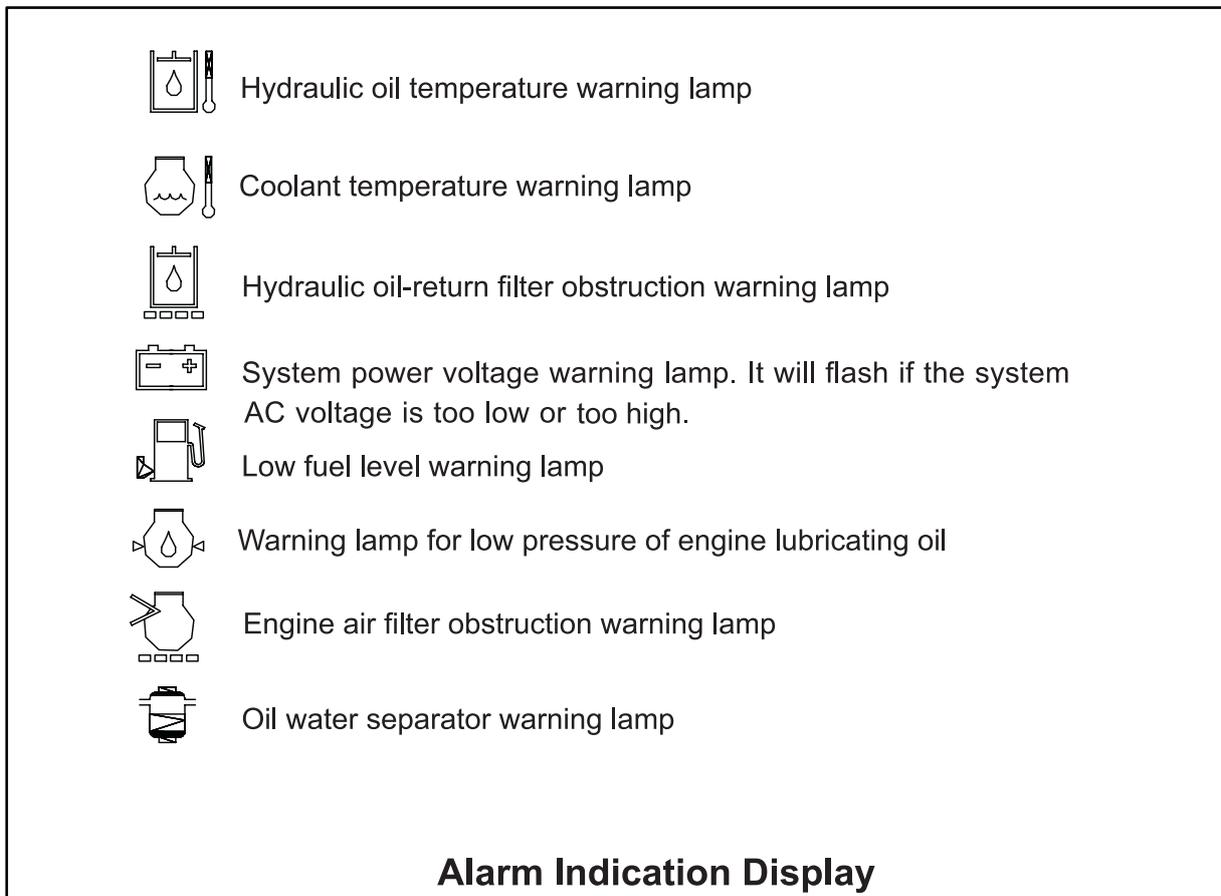
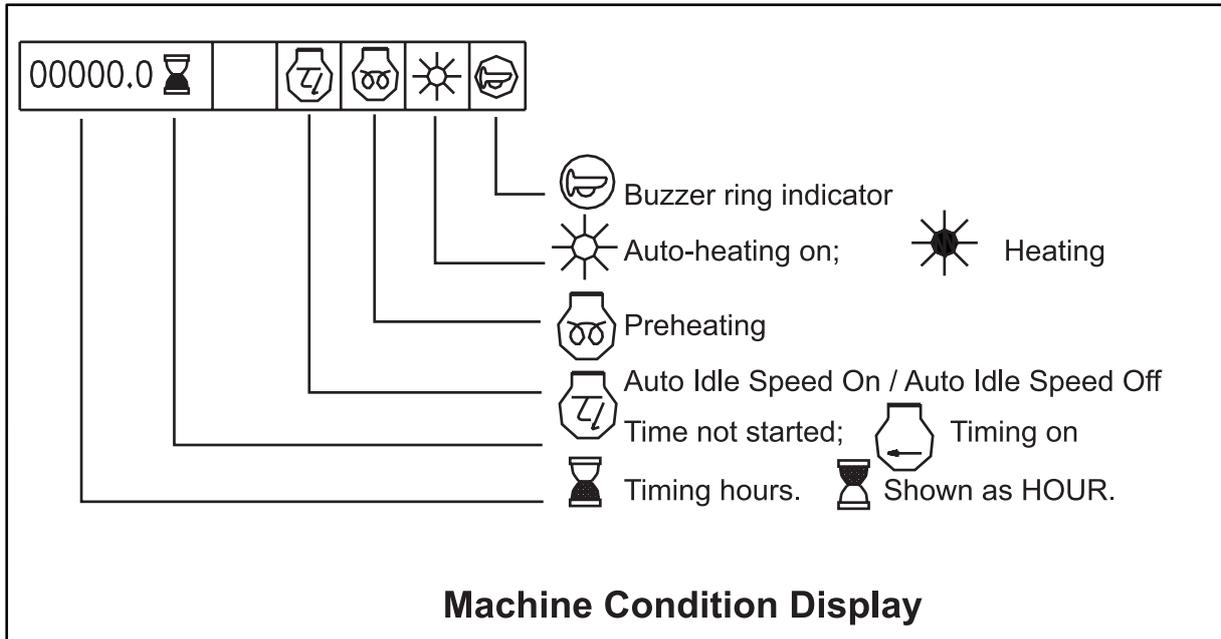
- |                              |                                       |
|------------------------------|---------------------------------------|
| 1. Operator Seat             | 6. Left travel speed lever            |
| 2. Left operating lever      | 7. Right travel speed lever           |
| 3. Blade lever               | 8. The Panel of right controlling box |
| 4. Right operating lever     | 9. Throttle lever                     |
| 5. Accessories pedal control | 10. Radio                             |

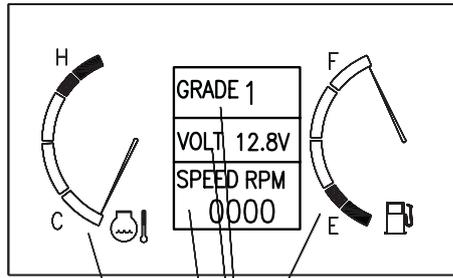
## Combined Digital Instrument



- |                          |                              |                             |
|--------------------------|------------------------------|-----------------------------|
| 1. Machine Scutchen      | 2. Machine Condition Display | 3. Alarm Indication Display |
| 4. Main Display          | 5. Soft Keys                 | 6. Selection Key            |
| 7. Alarm Indicator Light | 8. Keys                      |                             |

## A. Instrument Display





Fuel Gauge. Warning lamp flashes when fuel level reaches low position.

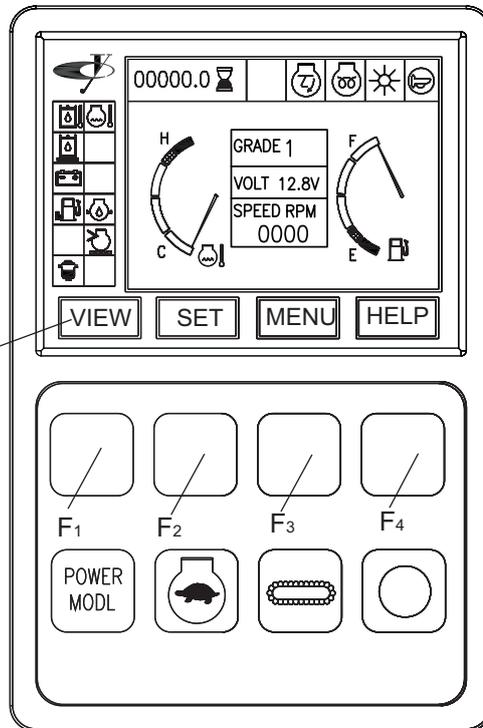
Throttle threshold. It has 1-10 gears, gear 10 has the highest revolution. (only for YC85-8 model)

Current system voltage indicator. Shown as Volt.

Revolution meter, shown as vr/min.

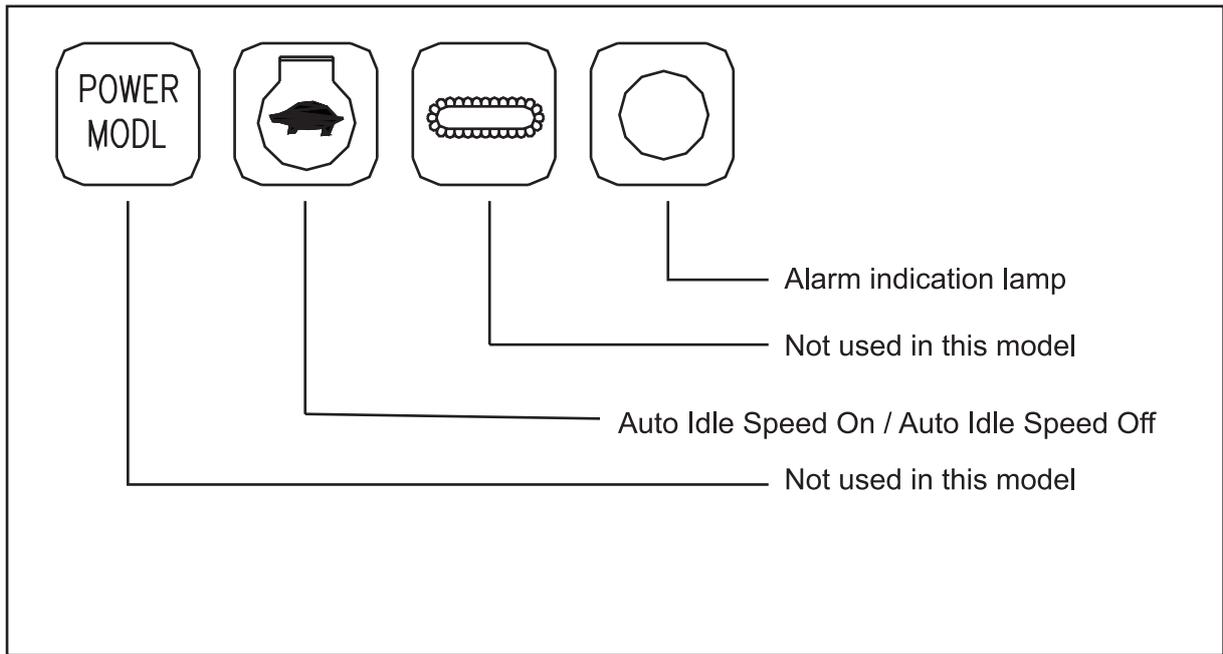
Engine coolant temperature meter. Warning lamp flashes when coolant temperature reaches high level.

### Instrument Main Display



Soft keys

Soft key (menu) on screen matches the key F1 - F4. Soft keys (menu)'s functions are defined by specific menu definition.

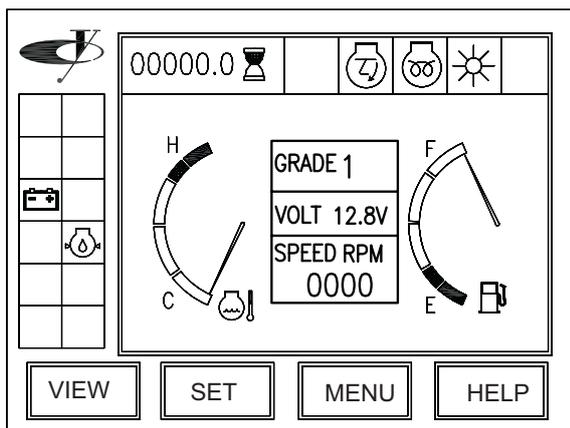


### Function selection keys and alarm indication lamp

When operating function selection keys, user could check the Machine Condition Display to confirm the selection.

Alarm indication lamp: red indication lamp flashes if alarm is on monitor.

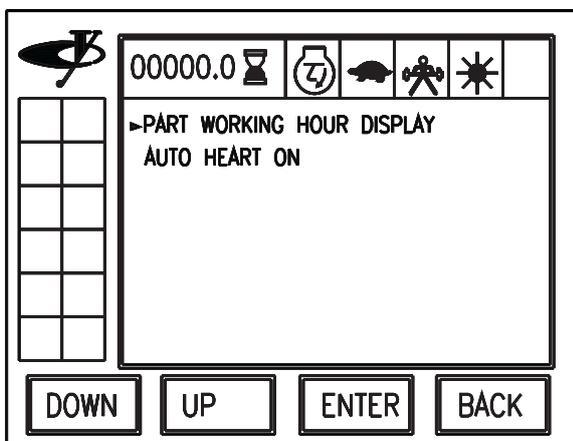
### B. Instrument Operation Display



Switch on the power, under the normal condition, main picture of the monitor is shown as figure on the left. When engine starts, power voltage alarm and engine lubricating oil low pressure alarm disappear. Timing starts.

ENGINE OIL	0000	KPa
FULL LEVEL	100	%
ENGINE SPEED	0000	RPM
COOLANT T	040	°C
HYD OIL T	025	°C
ENGINE H	00000.0	h
PART WORKING H	0000.0	h

Select "parameter" through keys, machine operating data is displayed on monitor.

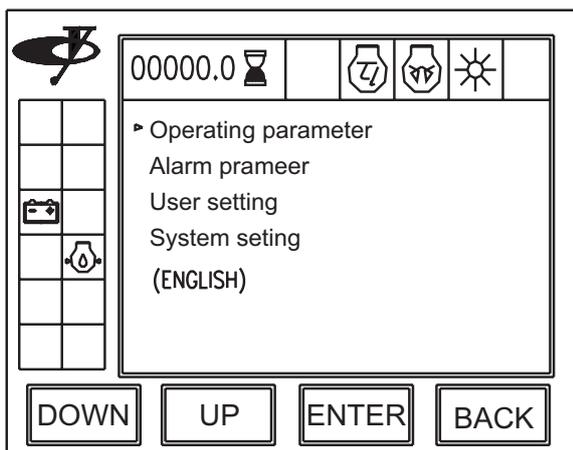


Select "Settings" through keys, settings menu is displayed on Monitor.

Use "up" and "down" to select menu. Use "OK" to change options, which include:-

- 1.working time display / period working time
- 2.Auto warm-up on / Auto warm-up off; if select auto warming-up off, warm-up condition icon will not be displayed.

(Press "Back" to main menu of monitor)



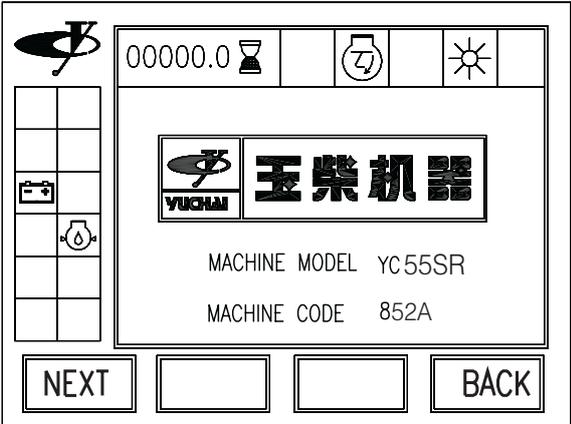
Select "menu", system settings menu is displayed on monitor screen.

Select menu options through "up" and "down", change options by "OK", which include:-

- 1.select "operating parameter" to show machine operating data.
- 2.select "alarm parameter" to show default setting of alarm parameter. Monitor will send out alarm message when machine operation exceeds default value of alarm parameter.
- 3.Select "user settings" to enter into user setting menu, which includes: user password setting, stage timing reset.
- 4.Select "System setting" to enter into system setting menu, which is only for factory debugging use.
- 5.Select "English", using "OK" to change option - English/Chinese to set the Chinese or English display mode.

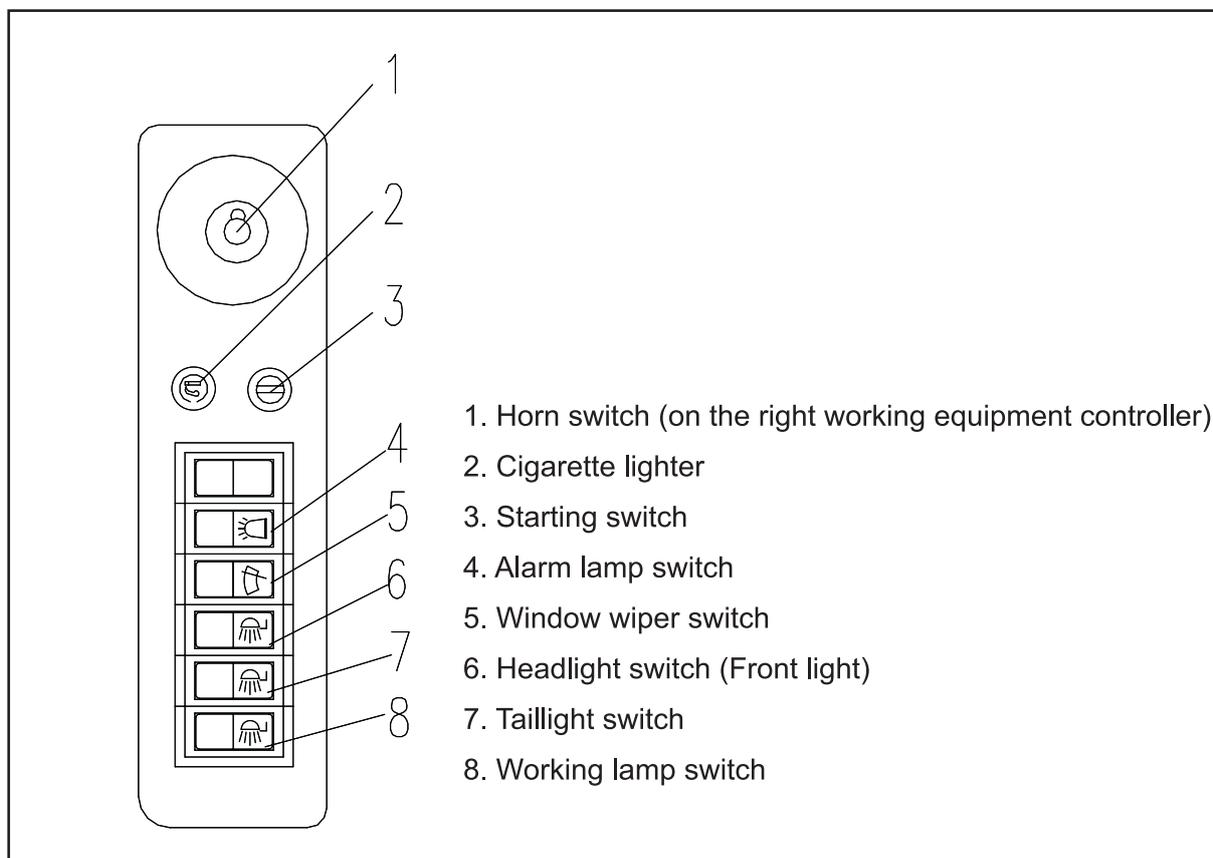
ENGINE OIL	0000	KPa
FULL LEVEL	100	%
ENGINE SPEED	0000	RPM
COOLANT T	040	°C
HYD OIL T	025	°C
ENGINE H	00000.0	h
PART WORKING H	0000.0	h

Select "Alarm parameter" to show default setting of alarm parameter.



Select "Help" to display system help information. The information includes machine model and machine code. "Next Page" displays version No. of monitor's hardware and software.

## Instrument panel on right control box



### 1. Horn switch

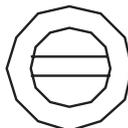
Press horn switch on the top of right working equipment controller to sound the horn.



### 2. Cigarette lighter

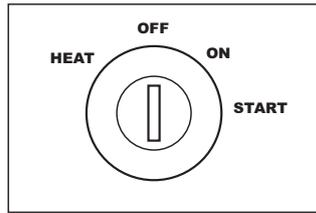
It can be directly connected with cigarette lighter components, or using cigarette lighter cable to supply electronic power to other electrical devices.

**Please note: supplied electronic current capacity doex not exceed 10A.**



### 3. Starting switch

Switch on or switch off the engine. It has four positions:-



**"OFF" position**

When starter key is on "OFF" position, user could insert or remove the key. All the switches of electrical system are off. Engine is stopped.

**"ON" position**

When engine is running, please keep starter key on "ON" position.

**"START" position**

It is the starting position for Engine. Please keep the key on "START" position while starting the engine. Once engine started, loose the key immediately and let it back to "ON" position.

**"HEAT" position**

Please turn the key to "HEAT" position while starting the engine in the winter. When the key is truned to "HEAT" position, pre-heating indicator light is on. When warming-up is finished, lose the key and let it back to "OFF" position. Then turn the key to "START" position to start the engine.



**4. Alarm lamp switch (optional)**

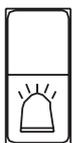
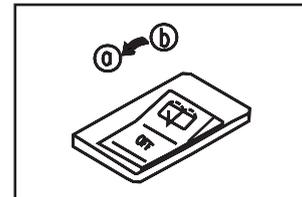
Alarm lamp switch on cab roof. Press the switch identifier side to turn on the alarm lamp. Press the other side to turn off lamp.



**5. Window wiper switch**

To control the front window wiper. There are two positions of the switch:-

- a)OFF: wiper stops
- b)ON: wiper moves continuously.



**6. Headlight switch (Front light)**

It is the switch for boom lamp and cabin top lamp. Press the switch identifier side to turn on the lamp. Press the other side to turn off the lamp.

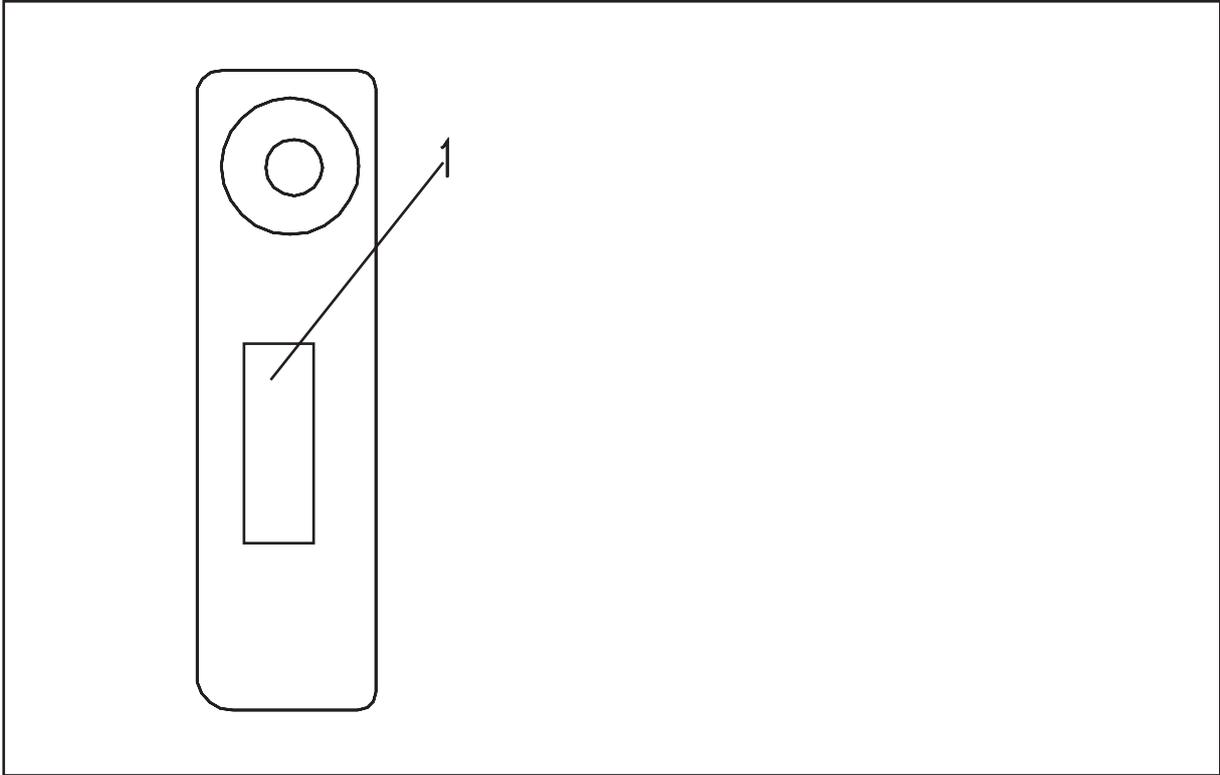


**7. Taillight switch (Optional)**

It is the switch for cabin top rear lamp. Press the switch identifier side to turn on the lamp. Press the other side to turn off the lamp.

**Note: Do NOT turn on all the lamps at one time.**

## Instrument panel on left control box



### **1. Air conditioning controlling panel**

### **2. Boom slewing indicator light**

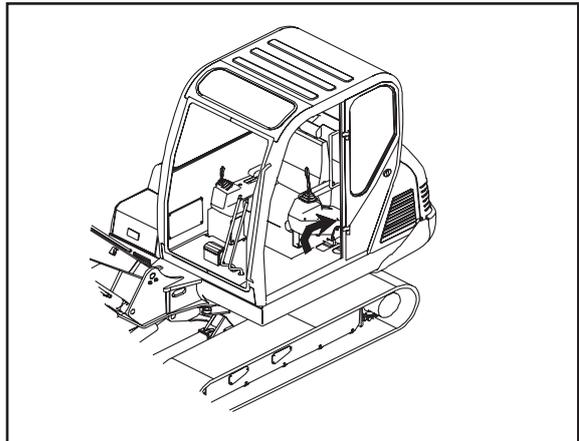
Please refer to the relevant chapters for the use of air conditioning.

# Safety Lock Lever Equipment

## 1.Safety lock lever



**Warning:** Working equipment safety lock framework is important component of machine safety system. User must lock the machine when leaving cabin. If left controlling box is not set to LOCK position, handle may be moved, therefore working equipment or platform will be operated, which could cause accident.



Please level the left controlling box up to lock position, and press lock sheath to lock gas spring. Therefore Pilot system does not supply hydraulic oil, working equipment and platform slewing do not work (except left/right travelling and dozer blade), which can protect the machine.

Unlock the gas spring of controlling box, press controlling box down to the bottom and reach the free position, therefore pilot system is connected with oil pressure origin, then machine can work properly.

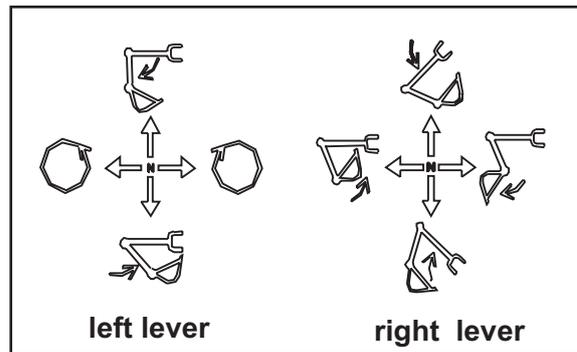
# Work Equipment and Swinging Control

## 1. Operating working equipment and platform equipment (without boom slewing)

The direction of using working equipment's left and right servo handles as the picture right:

### A.left servo handle of working equipment:

Operating arm: Pushing the left handle forwards, the arm spreads forwards. Drawing back the handle, the arm draws backwards. Operating platform slewing: Putting the left handle to the left side, the platform swings to the left. Pushing it to the right side, the platform swings to the right.



### B.right servo handles of working equipment:

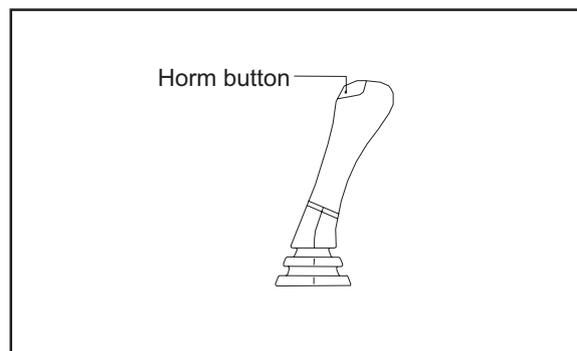
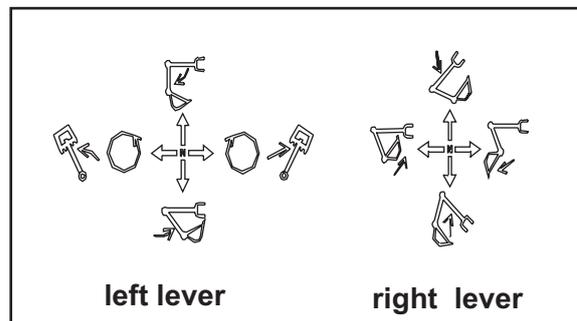
Operating boom: Pushing right handle forwards, the boom drops down. Drawing back the handle, the boom lifts up. Operating bucket: Pushing right handle to the right side, bucket spreads up, pushing the handle to the left side, bucket draws down.

## 2. Operating working equipment and platform equipment (with boom slewing)

### A.left servo handle of working equipment:

Operating arm: Pushing the left handle forwards, the arm spreads forwards. Drawing back the handle, the arm draws backwards. Operating platform slewing: Putting the left handle to the left side, the platform swings to the left. Pushing to the right, the platform swings to the right.

Operating boom slewing: Pushing right handle to the left, boom swings to the left. Pushing the handle to the right, the boom swings to the right.



### B.right servo handle of working equipment:

Operating boom: Pushing right handle forwards, the boom drops down. Drawing back the handle, the boom lifts up.

Operating bucket: Pushing right handle to the right, bucket spreads up, pushing the handle to the left, bucket draws down.

### ●Platform Slewing and Boom Slewing Selector

About the excavator with steering head , push the switch button on the left pilot valve handle to switch the functions of platform slewing and boom slewing.

It is set to platform slewing mode under the normal condition. Directly control the left lever to swing the Cab/Canopy.

Press the switch button on the left pilot lever, you can operate the steering head slewing. Press the switch button again, it switches to the platform slewing mode.

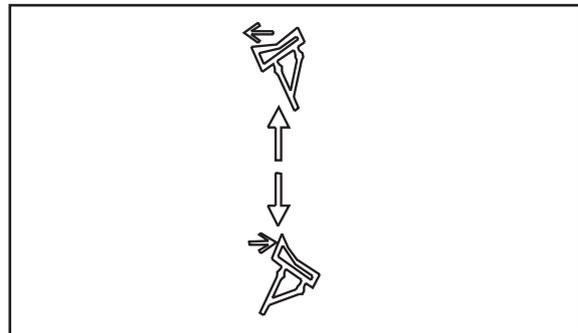


### 3.Operating dozer blade

Push down the dozer control lever, dozer cuts down. Drawing up the control lever, dozer lifts up.

### 4.Operating accessories

When the machine has equipped with accessories, open the cover on the control pilot valve pedal and step the pedal in order to connect the assistant oil supply.

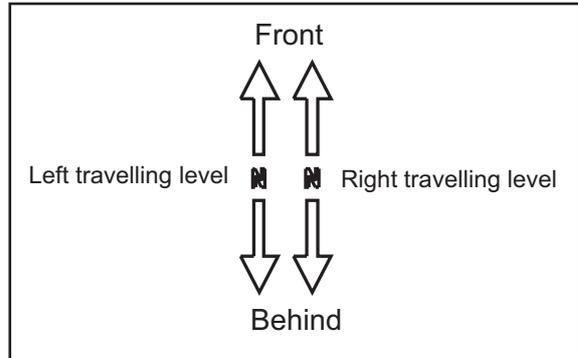


# Travelling Operation

## 1. Directional Control

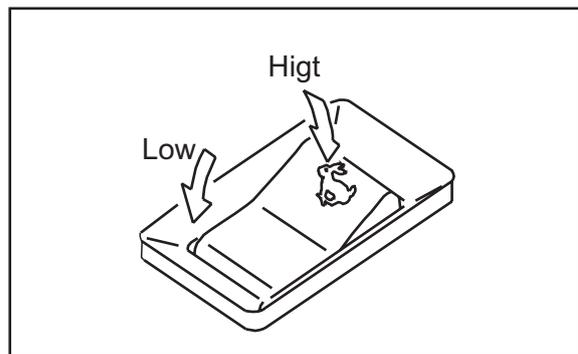
The left/right lever controls the left/right rubber crawler.

The single lever controls the machine to turn to one side.



## 2. Speed Control

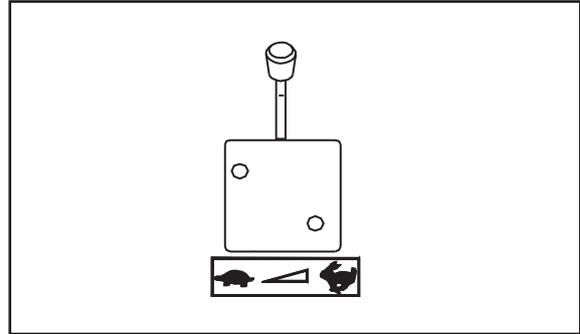
For standard machine, speed is controlled by accessorial operating pilot valve. Open the pilot valve footplate, and then step on the footplate, the machine travels at high speed. The speed electric is controlled by the high or low speed buttons on the panel of left controlling box (Accessories)



# Throttle Lever

## 1. Throttle Lever

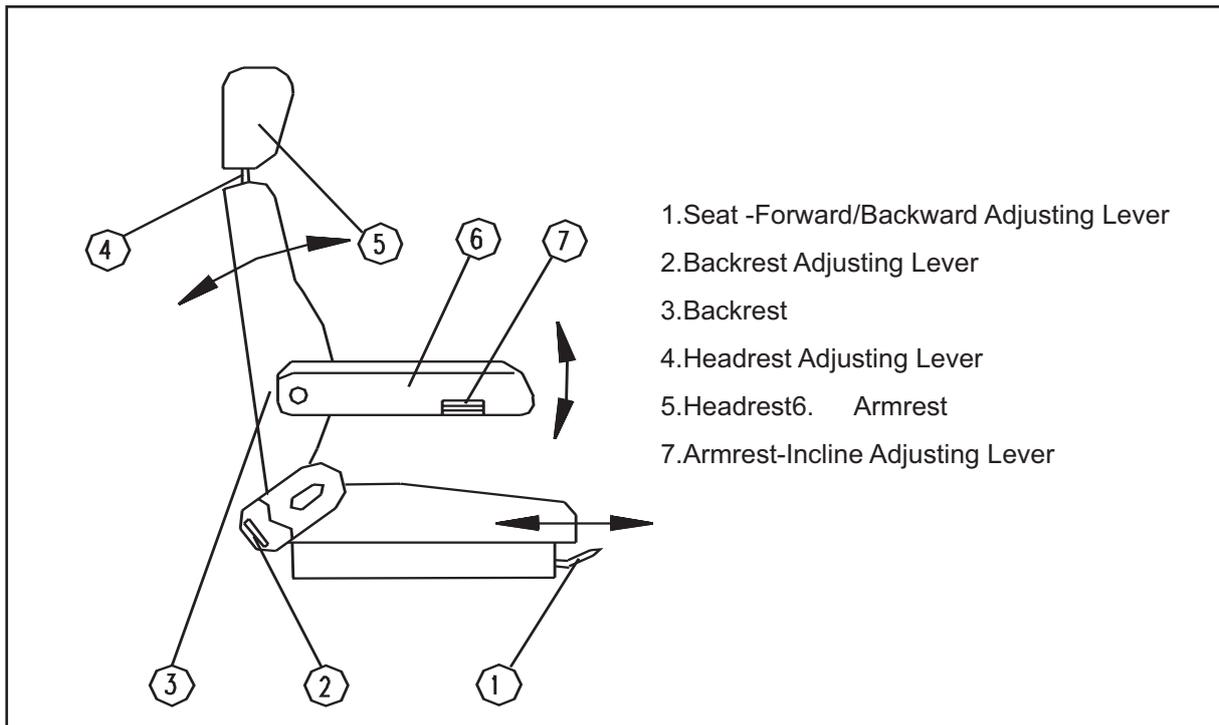
Push backward the throttle lever and accelerate,.Push forward the lever end before the engine stop,then the lever recovered after the engine stop.



## Operator Seat



**Warning:**The machine may cause serious injuries or death if it is overturning accidentally or moving suddenly. For the sake of safety, please make sure to fastening the seat belt and the seat is in suitable position before start job.



### ●Seat-Forward/Backward Adjust:

Control the Seat-Foarward/Backward Adjusting Lever and the rang of activity are 0~\*75mm, five shift. The seat in lock position when uncontrol the lever.

### ●Backrest Adjust:

Pull the Backrest Adjusting Lever up and the rang of activity have 5 position.. The backrest in lock position when uncontrol the lever.

### ●Headrest Adjust:

Pull backward the headrest Adjusting Lever, push and pull the headrest in a proper place

### ●Armrest-Incline Adjust:

Control the Armrest-Incline Adjusting Lever and adjusting the incline of the armrest.

**Notice:** Must stopping machine when adjust the operation seat. To ensure the operation seat in lock position, please shake it after adjusted.

## Seat Bel



Warning: Seat Belt is an important part of the machine safety system. Before operation the machine , make sure to belt up. If the belt down, the cab or the machine will hurt you when the machine overturned



Warning: Pay attention that the seat belt without any problem. If it damaged please change in time.

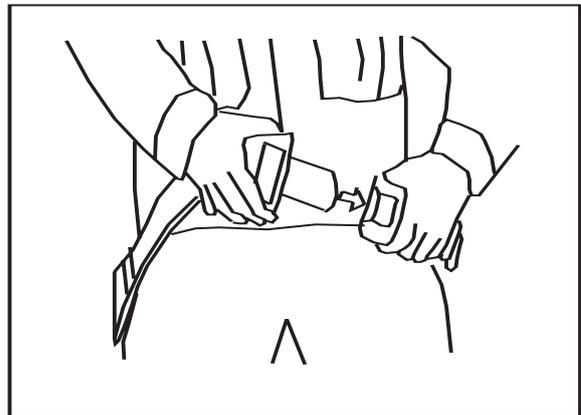
- Must change the Seat Belt every three years without any problem. The date of production is mark on the label of the Seat Belt.
- While working , make sure to belt up.
- Don't let the belt twisted.

### 1.Fasten Seat Belt.

Pay attention that the seat belt is not twisted. Pull slowly the belt to be sure that the buckle is well fixed. Set the belt to avoid clearance between it and body.

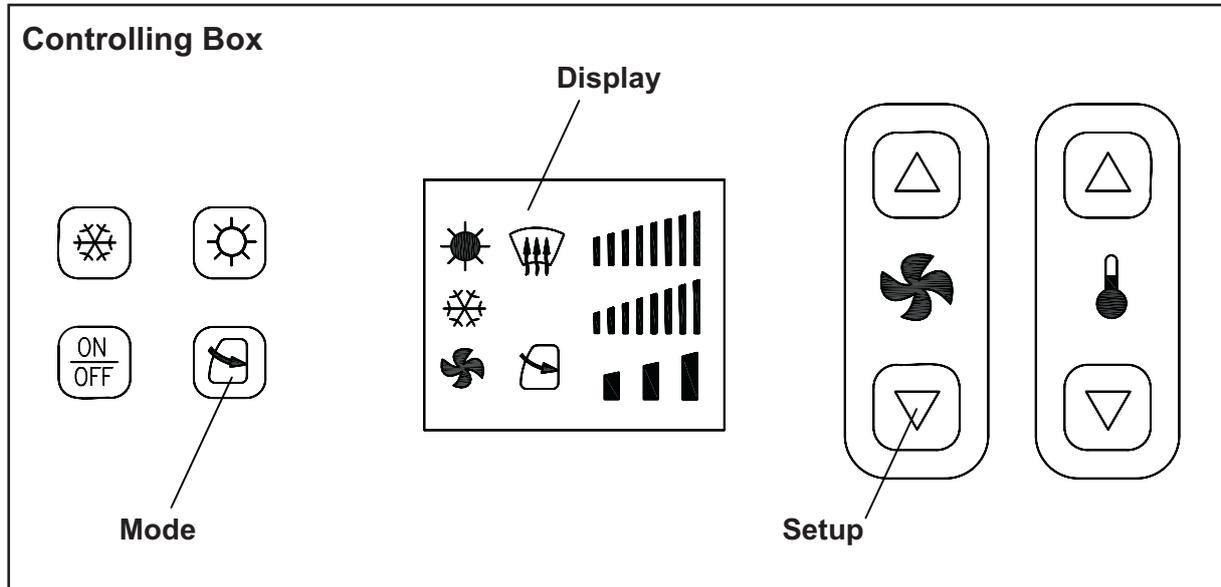
### 2.Unfasten Seat Belt

Push the red button on the buckle to unfasten the belt.



# Air-Conditioning Control

## The Air-Conditioning Controlling panel on the Panel of Left



### 1.Function and Operation

#### Power Switch

 Push it to turn on the air-conditioning and screen backlight. Fan is operating in low gear for 3sec. (not to operate within these time), then to return the state of last operation. Turn on the air-conditioning and press again that keys, memory the current working status (cooling/heating /defrosting , wind-speed, cooling and heating capacity setting), turn off the air-conditioning.

#### Cooling button

 The system will turn into cooling mode after pressed this button under ventilation mode, memory current state (wind speed ). The system will turn into last ventilation state(cooling capacity, wind speed) after the mark  (middle) on display screen will disappeared.

Press cooling button for canceling cool mode, and memory current state (cooling capacity, wind speed). The system will turn into last ventilation state(wind speed) after the mark  (middle) on display screen will disappeared.

The system will turn into defrosting mode after press this button under heating mode, and memory current state (heating capacity, wind speed). The screen display  (up),  (middle), and recover last defrosting state (heating capacity, wind speed).

## Warming button



The system will turn into heating mode after pressed this button under ventilation mode, memory current state (wind speed ). The system will turn into last ventilation state after the mark   (up) on display screen will disappeared.

The system will turn into defrosting mode after press this button under cool mode, and memory current state (cooling capacity, wind speed). The system will turn into last ventilation state after the mark   (up) on display screen will disappeared.

The system will turn into defrost mode after press this button under cooling mode, and memory current state (cooling capacity, wind speed). The screen display    (up),  (middle), and recover last defrost state (heating capacity, wind speed).

The system will turn into cool mode after press defrosting button for canceling defrosting mode, memory current state (heating capacity, wind speed). The system will turn into last cooling mode (cooling capacity, wind speed) after the mark   (up) on the screen disappeared.

## CircleVentilation button

The system will turn into outside circle ventilation mode after press ventilation button. The screen display   in the condition of outside circle ventilation mode, and press the button again, and the function will be cancel, and the sysetem enter inside circle mode, and disappeared.

## Aggrandizement Setting Button



It means increasing the cooling capacity under cool mode, the lattices of the mark   (middle) on the screen will be increased. It means increasing the heating capacity under warm mode or defrost mode (refrigeration and heating running at the same time), it means the heating capacity is increasing if the lattices of the mark   (up) on the screen is becoming more. It will increase one lattice for each pressing on this button.

## Minish Setting Button



It means reducing the cooling capacity under cool mode, the lattices of the mark   (middle) on the screen will be reduced. It means reduce the heating capacity under heat mode or defrost mode (refrigeration and heating running at the same time), it means the heating capacity is reducing if the lattices of the mark   (up) on the screen is becoming lest. It will reduce one lattice for each pressing on this button.

  Press this button if need to increase the wind speed, the lattices of the mark   (middle) on the screen will increase too. It will increase one lattice for each pressing on this button.



Press this button if need to reduce the wind speed, the lattices of the mark   (middle) on the screen will reduce too. It will less one lattice for each pressing on this button.

## 2. Special operation

### 1) Strong refrigerating

Use this function when in the sweltering weather or turn on the air condition for a short time.

Steps: Select the refrigeration mode and press the "wind speed" button to the max position.

### 2) Weak refrigerating

Use this function when the climate is not very hot and the temperature indoor is comfortable or cooler after turn on the air condition.

Steps: Select the refrigeration mode and press the "wind speed" button to minimum position.

### 3) Strong heating and defrosting

Normally use this function when the weather is very cold and there is frost in the glass.

Steps: Select the heating mode and press the "wind speed" button to the max position.

### 4) Weak heating

Normally use this function when the weather is not very cold and the temperature indoor is warm.

Steps: Select the heating mode and press the "wind speed" button to the minimum position.

### 5) Moisture removal and defogging.

Select this function when the weather is wet and the fog on the glass has influenced the vision.

Steps:

A: Select weak refrigeration mode under a warm weather

B: Select the defrosting mode  under a cold weather. The refrigerating capacity can not be changed under this mode, but heating capacity can be adjusted by the user.

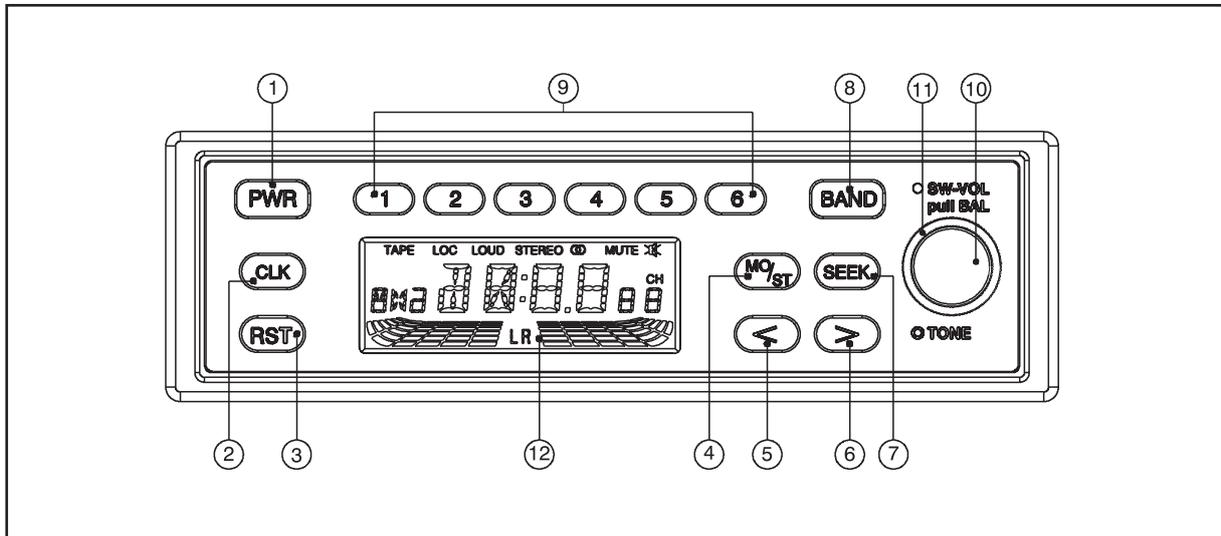
## 3. Other instructions

(1) Use inside Circle long time, it will make the cloudy air in the room fresh, but use outside circle long time, it will make some part of cooling and heating disappeared. So the operator should take the circumstances into consideration.

The machine set: The system will close the outside circle ventilation point (and enter inside circle mode). If the operator wants to change the operating mode or open the machine, and press button making the function of outside circle effective.

(2) Except the mode of circle, this machine can memorize every change of the mode and setting. When you select the mode again and the machine will select the former setting automatically. It will be convenient and user-friendly.

# Radio



- |  |                                     |
|--|-------------------------------------|
| 1. Power Button                        | 7. Seek Button                      |
| 2. Clock/Frequency Changing Button.    | 8. Band Button                      |
| 3. Reset Button                        | 9. Channel Preset Button            |
| 4. Stereo/Single Track Changing Button | 10. Volume/Balance adjusting Button |
| 5. Channel/Minute Changing Button      | 11. Tone Adjusting Button           |
| 6. Channel/Hour Changing Button        | 12. Monitor                         |

## Operation Manual of The Radio

### 1. Power ON/OFF:

Push the 1.PWR button to turn on the Radio, and re-push the button, and turn off the Radio (If the type of radio with automatic, push any key to turn on the Radio, and push 1.PWR button to turn off the Radio)

### 2. Band Changing:

Push the 8.BAND button to switch the reception of band.  
The Sequence is FM1→FM2→FM3→AM1→AM2

### 3. Seek automatic

Push the 7.SEEK button one time to seek the channel automatic, and the radio will seek the channel automatic from high to lower, and receive the channel then lock and begin to play. If you want to receive the next channel, and repeat the above control, until find the satisfaction channel.

### 4. Seek by hand

Change Channel by hand when the channel have poor reception. Push 5.<button or 6.> step by step can seek channel up and down by hand. Push for a long time 5.<button or 6.> step by step can seek channel up and down by hand fleetly.

### **5.Memory Radio by hand**

When seeking the Radio for automatic or hand and press(over 3 sec.) the Radio Preset Button (1-6) to set the channel. You will find the radio direct on that button next time.

### **6. Stereo/Single Track Changing**

Press 4.MO/ST button to change the mode of Stereo and Single Track. The radio should be stereophonic broadcast if the Monitor showed "STEREO". The radio should be stereo channel if the Monitor showed "∞" , Changing to the mode of Single track if the stereophonic broadcast have poor reception.

### **7. Clock/Frequency Changeing**

Press 2.CLK button to change the mode of clock or frequency when the Radio working. Press any button (except "PWR" button) return to the frequency display when the display in clock. Then automatic return to clock display 5 sec. later.

### **8.Clock Adjusting**

Under the clock display ,press 2. CLK button (over 3sec.) and the clock flash. Press 5.< to adjust minute, press 6.> to adjust hour. Automatic return to nomal display 5 sec. later after adjusted.

### **9.Volume Adjusting:**

Turn the 10. to adjust volume.

### **10.Tone Adjusting:**

Turn the 11. to adjust tone.

### **11.BAL Balance Adjusting:**

Pull out and turn the 10. (about 2mm) to adjust the BAL balance. Push the 10. after adjusted.

### **12.Reset:**

If the Radio will not operate properly, press 3.RST button reset to default. If the problem still have, please contact with your local dealer.

**Notice1: Excavator have not in used the clock function of radio.**

**Notice2: The panel of controlling have a different owing to difference type of radio.**

# Door and Window

## 1. The cab door

The cab door is the only way to entry or exit.

Lock the door after the driver left the cab.

When the door opened, fix the door with the lock on the right of the door to avoid hurting peoples.

Pull Door Unlock Lever to close the door.

## 2. Rear window

Rear window will be one of Emergency Exit.

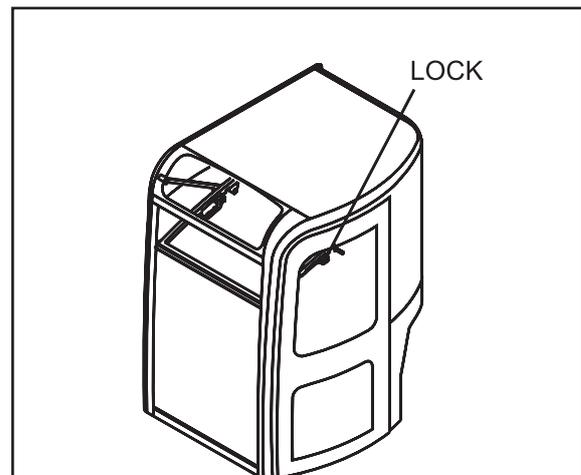
In EMERGENCY , if you can not run out the cab through the door, you can go out through the side window. If necessary break out the window using a hammer or similar.

## 3. Front Window (Rotary Window)

Open the front window have a good condition to drive and airy.

If want to open the turning window(front window), if should undraw two side of draw handle of turning window, and it can slip the turning window through operate the handle of the knob. And when the turning window draw to the suitable position, and push up the window reach the lock position, loose the knob and lock the window.

Whereas, and put down the turning window.



# 4

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## Operation Manual

## Precaution before operating the machine

- 1) Only trained, qualified, and authorized operator can drive the machine and make maintenance.
- 2) Operator has to read operation manual carefully before operate the machine.
- 3) When drive or make service on the machine, wear a tight work clothes, eyeglass, safety shoes, and heavy gloves.
- 4) Before turning on the engine check the machine follow the manual indication.
- 5) Check if the machine's equipments, hydraulic cylinders, and pipes are damaged.
- 6) Clear dust around machine's engine, cooler and battery.
- 7) Check if it is oil leak from tank, pipe, connection (check if there is obvious oil leak on the ground)
- 8) Check if parts of the machine (crawler, idler wheel) are damaged or loose.
- 9) Check all instruments, and make sure they are in good working condition.
- 10) Clean mirrors, and adjust them to the correct position for the best view.
- 11) Check if the safely belt is damaged or not.
- 12) Check if you have followed the manual to maintain the machine correctly.



**Caution: Before operating the machine, make sure that you have read the safety concept and understand it well.**

## Engine Operation



**Caution: Before starting the machine, read carefully the safety detail, and read every safety sign on the machine. Do not allow other people stay around the working place. Learn how to operate the machine, and follow the manual indication.**

### Checking before engine start

- 1) Before start working, check if the safety belt, horn is in good condition. Check the working area, if any person on the machine or down the machine.
- 2) Check glasses and mirrors for a best view.
- 3) Check the engine, cooler, battery. If the parts have dusted, clean it.
- 4) Check all equipments, hydraulic cylinder, rubber pipe, if any part has damaged or abrasion, repair or change it.
- 5) Check the hydraulic equipment, hydraulic oil tank, rubber pipe, connection, if they have oil leak.
- 6) Check the undercarriage (crawlers and wheels) whether they are damage, loose or oil leak.
- 7) Check if the instrument, working lamps are working well, and check if electronic circuitries system is working well.
- 8) Check coolant, fuel, hydraulic oil, engine oil level if they are in appropriate level, are they out of maximum or minimum limit.
- 9) When in the cold weather condition, check the coolant, fuel, hydraulic oil, battery electrolyte, and lube. If any of them is frozen, do not start the engine.
- 10) Check if the left operation handle is on LOCK condition.
- 11) Check the working condition, machine's direction and position before start the engine.

### 2.Start the engine



**Caution: Do not start the engine if there is an alarm sign hang on the handle with NO START.**



**Caution: Make sure that the safety lever is on the LOCK position, avoiding unexpected touch the operating handle and cause accident.**



**Caution: If electrolyte is frozen, do not charge the battery or start the engine, it may cause the battery on fire. Check the electrolyte before starting the engine to prevent electrolyte frozen or leak.**

When starting the engine, put the key into lock, turn to ON position, and check the instrument. If any alarm light up on the instrument, check the problem before start the machine.

### **A.Engine Starting in Normal Temperature**

Turn the key clockwise to ON position. When Alarm light black out, start the machine. Turn the key to start position within 10 seconds, after the engine start, let the key turn back to ON position. If the engine does not start, try again after 30 seconds

**Notice: Do not run the starter more then 10 seconds, if the engine does not start, wait for one minute then try to start the machine again. If the engine does not start for three times, check if the engine is in normal condition.**



**Caution:**

- 1) Do not rotate the key to ON position when the engine is running, the starter could be damaged.**
- 2) Do not start the engine when the machine is dragging by other vehicle.**
- 3) Do not start engine by starter short circuit.**

## B. Assistant power for starting machine



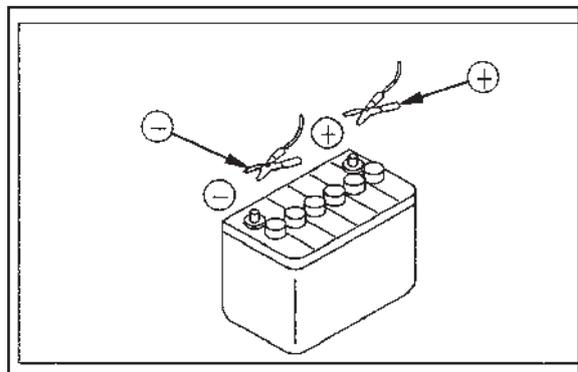
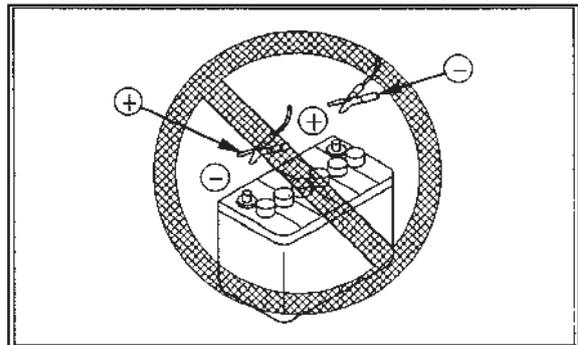
**Caution: when electrolyte is frozen, DO NOT start the engine, DO NOT charge the battery, it may cause the battery explode. In order to avoid electrolyte freezing, always keep the battery on full charge.**



**Caution: Battery can generate flammable gas. Keep the battery away from spark or fire. Keep ventilate when charging the battery. Wear eyeglasses when working near to the battery.**

**Connecting wires wrongly may cause battery explosion. Please follow the manual.**

- 1) Starting machine by assistant power request two worker to operate (one in the cabin of the machine, another operate the battery)
- 2) When the other machine starts, do not connect electricity to the fault machine.
- 3) Rotate the key to OFF position then connect the two machines, otherwise machine could move.
- 4) When connecting assistant power wire, connect cathode lastly, when disconnect, remove cathode firstly.
- 5) When disconnect assistant power wire, do not let both anode and cathode touch each other or touch the machine.
- 6) When using assistant power, do wear an eyeglass and rubber glove.
- 7) When using assistant power, using the same model of normal machine to start the failure machine.



### **3. Engine starting**

#### **A. Engine preheating**

Hydraulic oil's normal working temperature is 50°C~80°C, machine working with hydraulic oil temperature under 20°C may cause the hydraulic parts damaged. If the hydraulic oil temperature is under 20°C, preheat the oil by following method.

- 1) Start engine and run it with rotate speed more than 200rpm for 5 min.
- 2) Running machine with turning accelerator to medium stage for 5~10min.
- 3) With this working speed, operate every motion, and slightly operate the slewing motor and traveling motor, operate the machine for work after the oil temperature get to 20°C.

#### **B. Check the starting machine**

- 1) Check every light on the instrument, any of the light out.
- 2) Check if there is oil leak (lube, fuel) or water leak.
- 3) Check the noise, shake, smell of the gas, and instrument to find any abnormality, if any of them is abnormality, find out the problem immediately.

### **4. Turing of the engine**

Caution: turn off the engine before the engine cool down will reduce the engine's working life. So if it is not in emergency condition, do not turn off the engine suddenly.

Do not turn off the engine when it is over heat, operate the engine to a medium working speed and let the engine cool down gradually, then stop the engine.

- 1) Let the engine cool down by operating it at a medium working speed.
- 2) Push the accelerator to the end (most slowly); draw the stop handle back to the end.
- 3) Rotate key to OFF position, engine stop and all instruct light black out.
- 4) Take out the key.

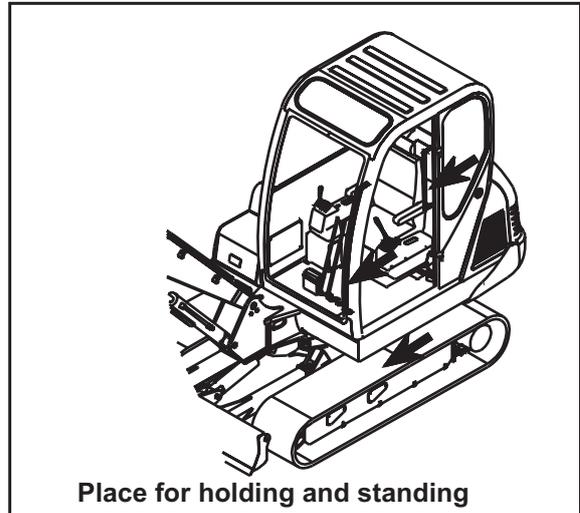
### **5. Check the machine after it is stop**

- 1) Check around the machine, if there is oil or water leak, find the problem and repair it.
- 2) Fill fuel into the fuel tank.
- 3) Check the cabin, if there is wastepaper or rubbish, cleaning it to avoid fire.
- 4) Clean the clay on the platform.

## Enter the cabin

- 1) Hold the door rail according to the right picture.
- 2) Make sure step on the flat crawler.
- 3) Do not hold the operate hand to enter or exit the cabin.
- 4) Check the door rail and crawler if there is oil or slurry, clean it.

5) Do not jump up and down of the machine, do not enter or exit the machine when it is moving.

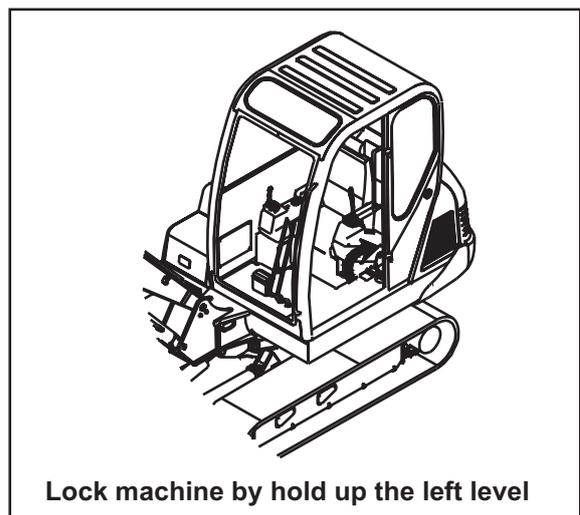


6) Before getting out of the machine, lower down the boom, bucket and dozer blade on the ground, draw up the LOCK handle, now the machine is on LOCK condition, turn off the engine. Keep this situation to the next machine start.

**Notice: Lock all doors and windows when leaving the machine.**

It is not allow climbing up onto the fuel tank, engine cover and cabin.

People are not allowed staying on the bucket, boom, arm, and attachment.



# Machine travel

## 1. Safety concept for moving the machine

- 1) Before starting engine, check around the working place to make sure no other people and object is around, check the ground support capability.
- 2) Horn the speaker to alarm near by people.
- 3) It is forbidden that worker operate machine by standing on the ground not in the cabin
- 4) Excavator should travel on a hard ground where 1.5 times wider than the machine.
- 5) When moving trough underpass, bridge, electrical wire, it is necessary to have people commanding the driver.
- 6) When moving the machine, Lower down the boom and arm to keep the best machine weight balance.
- 7) Only operator can be in the cabin, no other person in the cabin when machine traveling.
- 8) Before turning traveling lever, check the crawlers' direction.
- 9) If the dozer blade in on rear, traveling action is opposite.
- 10) Do not let any other people around the machine's working area.
- 11) Clean all obstacles on the way.
- 12) There is a blind area on the rear of the machine, So be more careful when backward the machine.

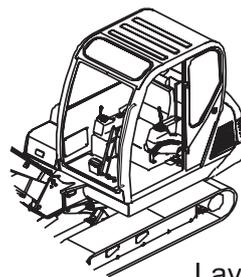


**Caution: When machine moving at a high speed, do not suddenly change the movement.**

- 1) Do not suddenly operate the travel lever, if may cause a suddenly movement.**
- 2) Do not suddenly change the travel action from forwards to backwards.**
- 3) Do not suddenly change the moving speed from high to stop.**

## 2. Prepare for moving machine

- 1) Press down the slewing button of the NO SIGN side to lock the platform (see the picture).
- 2) Turn the fuel handle to a accelerate position to increase the engine speed.

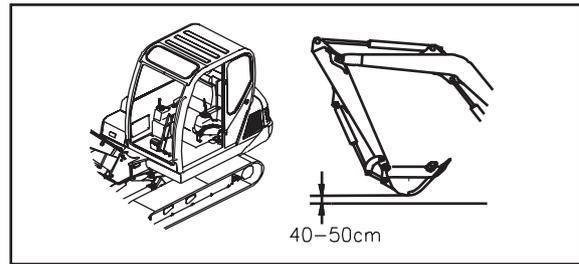


Lay down the left level

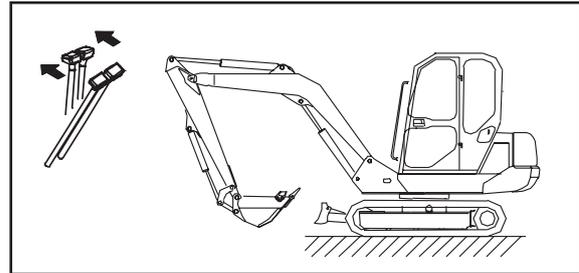
### 3. Machine moving forwards

- 1) Lay down the safety handle, rise working equipment distance ground 40~50cm.
- 2) Following steps for operating travel lever.

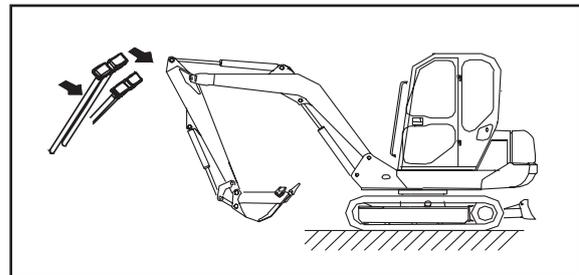
When dozer blade is in front, slowly push travel levers to have the machine move forwards.



When dozer blade is at rear, slowly draw travel levers to make the machine move forwards.



**Notice: When in the cold weather, if the machine does not move normally, check the preheating operation. In addition if the crawler is block by stone or earth, machine moving speed could be abnormal, clean the stone and earth on the undercarriage.**



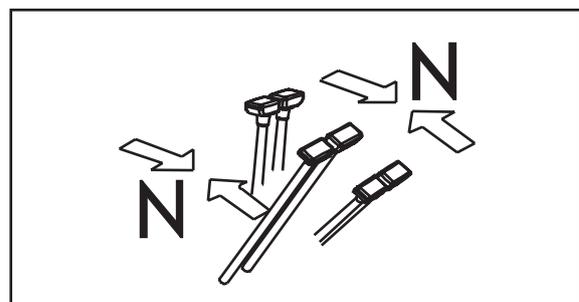
### 4. Machine move backwards

- 1) Lay down the safety lever, life up all working equipment from the earth 40~50mm
- 2) Operating opposite directions of forwards

### 5. Stop machine

Let both traveling lever to the middle position the machine could be stop.

**Notice: Avoiding suddenly stop the machine, it should have enough space for shopping the machine.**



## Rotate the machine

**Notice: Check position of the dozer blade before operates the travel levers. If the dozer break is at the back of the machine, travel operation should be opposite.**

Using left and right travel to change the machine's moving direction.

Avoiding suddenly change the direction, especially rotate the machine, stop the moving forwards action before rotate it.

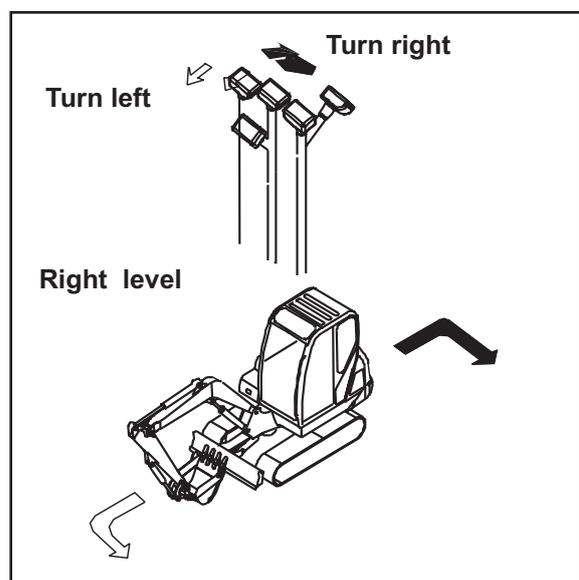
### 1. Turning machine when machine is stop

Turning to the left:

When machine moving forwards, push the right travel lever, machine turns to the left.

When machine moving backwards, draw right travel lever, machine turns to the left.

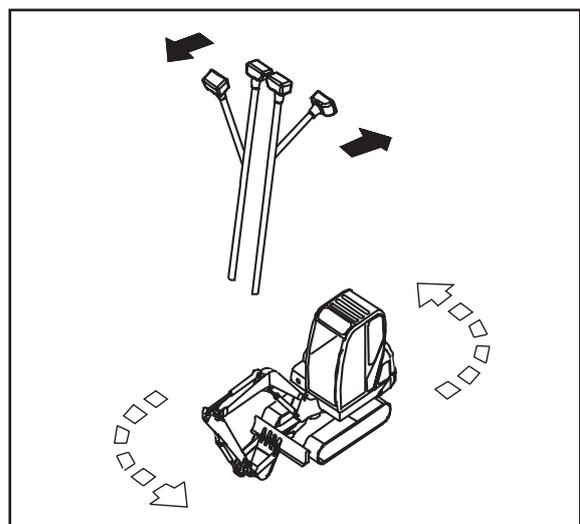
When turning machine to the right, operate it as the same method of turning to the left.



### Rotate the machine

When rotate to machine to the left, draw back the left travel lever meanwhile push the right travel lever.

When rotate the machine to the right, draw back the right travel lever, meanwhile push the left travel lever.



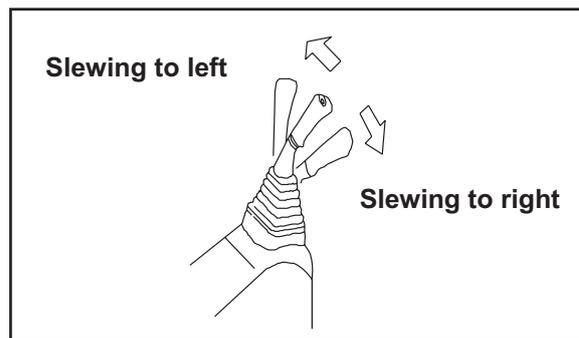
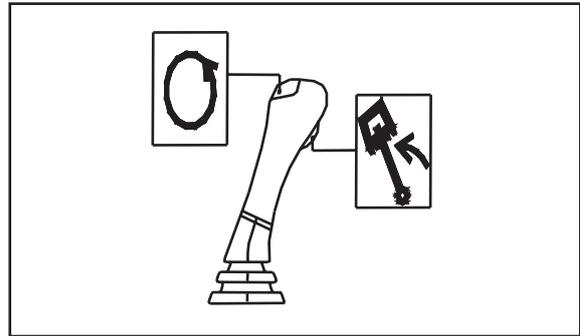
## Swing the Platform

Before swing the platform, check around whether it is safety.

If operate the operation handle fast, the platform could also swing fast. If slowly operate the handle, platform swing slowly. Beware of the speed of operate the handle.

1) If the machine installs a boom swing function, push the button on the left operation handle, setting the machine is on platform slewing condition.

2) Operate left handle to swing the platform as the pictures show.



# Operating working equipment

If operate the handle fast, equipments could also move fast, if operate the handle slowly, equipments will move slowly.

Equipment was controlled by the left and right servo handle. The left handle controlling arm and swing (Boom slewing and platform slewing), right handle controlling the action of boom and bucket.

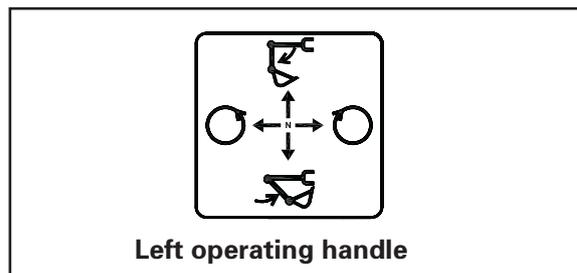
Let the handle return to the middle position, equipment will stop action and keep position.

When turning off the engine, within 15 seconds, operating he valve can still let the equipment drop down to the ground.

In additional, operating valve to reduce hydraulic oil pressure could also drop the boom on the ground.

## 1. Operating arm

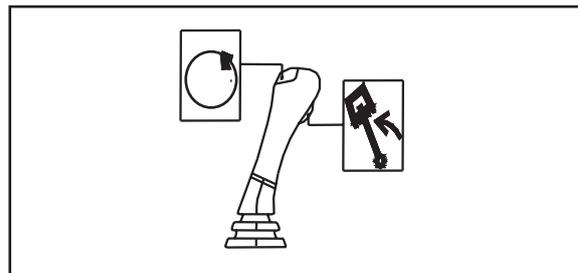
Push the left handle forwards, the arm spread forwards. Draw back the handle, the arm draw backwards.



## 2. Operating swing.

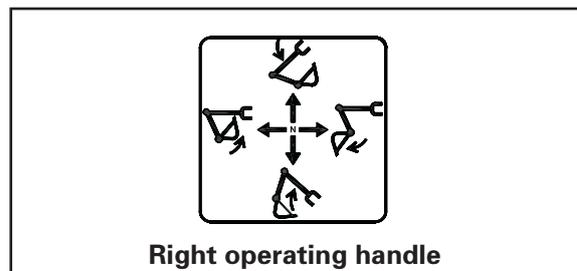
Put the left handle to the left side, the platform swing to the left. Push to the right, the platform swing to the right.

If the machine has boom slewing function, make sure that the machine is in platform slewing condition.



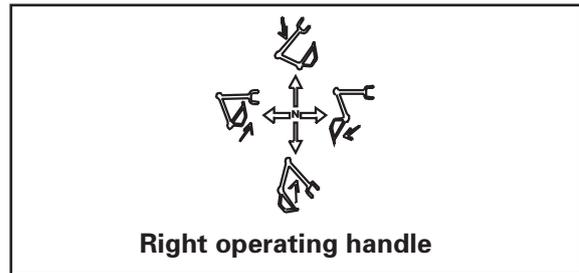
## 3. Operating boom

Push right handle forwards, the boom will drop down. Draw back the handle, the boom will lift up.



#### 4. Operating bucket

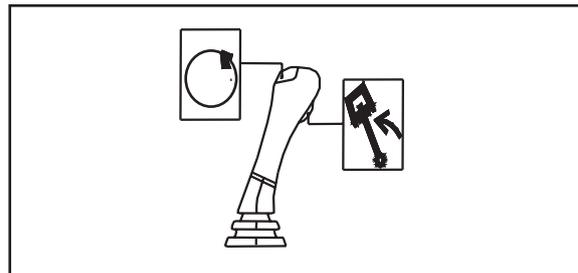
Push right handle to the right, bucket spread up, push the handle to the left, bucket draw down.



#### 5. Operating boom slewing

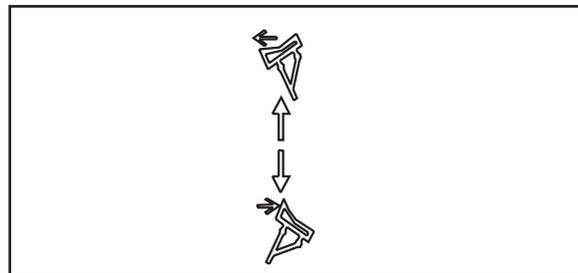
Push right handle to the left, boom will swing to the left. Push the handle to the right, the boom swing to the right.

If the machine has boom slewing function, make sure that the machine is in platform slewing condition.



#### 6. Operating dozer blade

Push down the dozer control lever, dozer cutting down. Draw up the control lever, dozer lift up.



**Notice: operating arm could come across action pause. This is not a false state, but a normal situation. Because when the arm moving; self weight accelerates the movement causing lack of oil supply.**

## Machine working on slope or in water



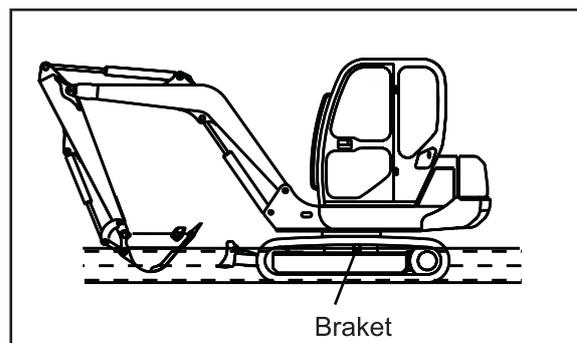
**Caution: working on following condition is dangerous. On the slope, muddy ground, snow ground, frozen ground, sandy and loose ground. When working in such condition, operator has to judge the condition, whether it is available to work.**

- Lift up the dozer blade away the ground 20~30mm, then move the machine.
- Do not move the machine backwards down a slope.
- When traveling through object or mound, keep the equipment down near to the ground, drive the machine slowly.
- Do not turn around on a slope, do not cross the slope. Turn to the correct direction on the flat ground then drive the machine to the slope.
- When working on a slope, turning around the machine may lose its balance and causing accident. Avoid turning around the machine on the slope. If the bucket is full loading, slewing platform to downgrade direction is very dangerous. Produce a flat ground on the slope to keep the machine balance.
- Do not drive the machine to a steep slope, machine may turn over.
- When driving the machine up to a slope, if the crawlers skid, do not use the arm to drag for climb up the slope. It may cause the machine turn over.
- When driving machine upgrade the slope, make sure the engine and hydraulic oil have been preheated. Otherwise may cause accident.

### Allowed water deep

Do not immerse the machine in water by more than the permissible depth (under centre of crawler)

For parts that have been immersed in water for long time, pump in grease until the old grease comes out form the bearing.



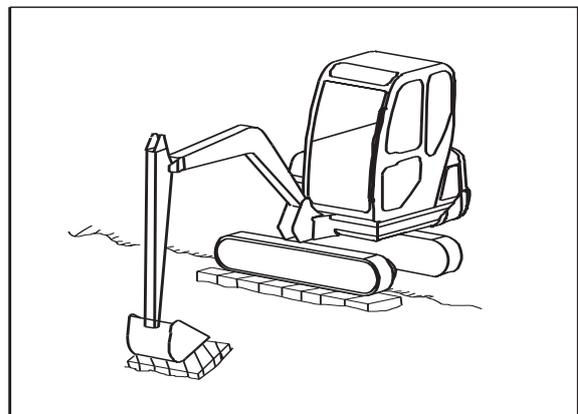
## Escape from the slushy condition

Always operate the machine carefully to avoid getting into the mire. If the machine gets into the mire, follow the below steps to get out the machine.

### A. One side of the crawler sinks into the mud

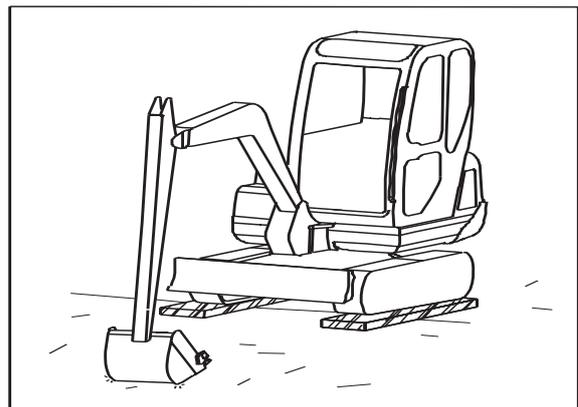
**Notice:** when lift up the machine with the arm, using the bottom of the bucket to touch the ground (do not use the teeth). Arm and boom keep an angle of 90~110 degrees.

When only one side of the crawler sinks into the mud, use the bucket to lift the crawler, fill with boards under the crawler, then drive the machine out of the mire. If it is necessary, put boards under the bucket.



### B. both sides of crawlers sink into the mud

If both of the crawlers sink, fill board with above method. Dig the bucket into the earth as the picture shows. Use the bucket to drag the machine, meanwhile push forward the travel lever to drive the machine out.

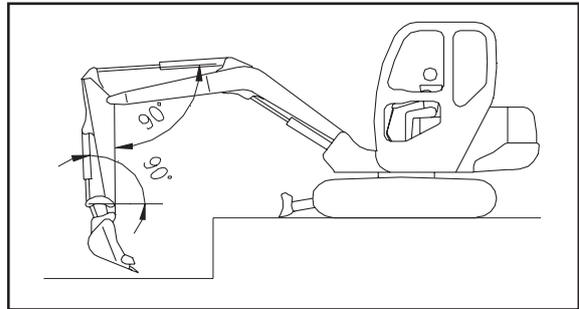


## Working Operate guide

### 1. Backhoe work

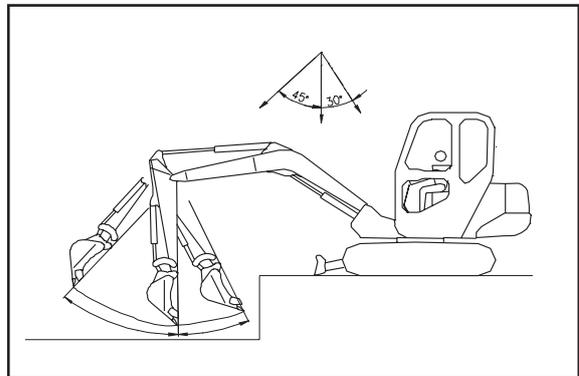
Backhoe is suitable on the position lower than the machine.

When condition of the machine is as shown in the diagram at right, each cylinders maximum pushing excavation force is obtained when the bucket cylinder and link, arm cylinder and arm at  $90^{\circ}$ . When excavating use this angle effectively to optimize work efficiency.



The range for excavating with the arm is from a  $45^{\circ}$  angle away from the machine to a  $30^{\circ}$  toward the machine.

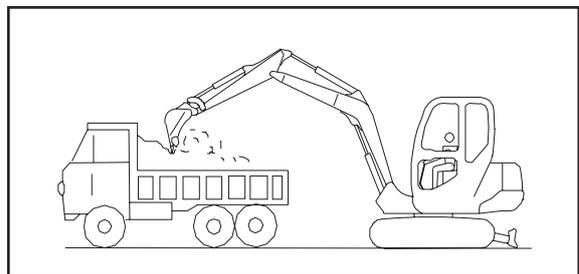
There may be some differences depending on the excavation depth, but try to use within the above range rather than going all the way to the extreme end of the cylinder stroke.



**Notice: Excavating hard rock ground, better breaker the hard ground before excavating it. Doing by this way can reduce the damage of the machine, also more efficiency.**

### 2. Loading work

In place where the swing angle is small, locating the dump truck in a place where easily visible to the operator, doing like this can increase the working efficiency.



### **3. Ditching work**

Cut the dozer blade into the earth.

Spread out the arm and boom; dig teeth of the bucket in to earth.

Operate arm to excavate. Adjust the cutting angle of the bucket. Do not dig the bucket too deep into the soil, avoid hydraulic over loading, otherwise the arm can not excavate. If it can not excavate, lift up the arm a little. When bucket is fully loaded, lift the arm and boom up from the ground, swing platform to the right position for bucket unload.

#### **Notice:**

**1) Do not touch the electricity wire.**

**2) Make clear the condition of conduit, cable underground. Avoid damage the cable or conduit, damaging cable may cause electric shock**

**3) If come across to this accident, do not leave the seat. Warnings near by people do not get close, drive the machine to a safety place, cut the electricity.**

### **4. Backfill and smoothing work.**

When refilling after excavation, use the dozer blade, drive the machine for pushing the earth into the ditch.

### **5. Shake down the soil and sand from the bucket**

Operate the arm to a level position, bucket to unload position, if the soil still does not drop down, operate bucket up and down to shake the soil down. Avoid using the cylinder end strike to shock the soil down.

### **6. Notice for relevant parts**

#### **A. Notice for crawler**

1) Too many objects enter into the crawler will cause damage.

2) Avoid suddenly turning around the machine on a hard friction ground.

3) Try to avoid touch brine, it will erode the crawler.

4) If the crawler does no use for long, keep it in a dry and cool place.

5) When one of the crawlers is lifted, do not move the other crawler, this will cause the crawler fray.

6) When machine moving, do not loose the crawler, otherwise crawler may drop out.

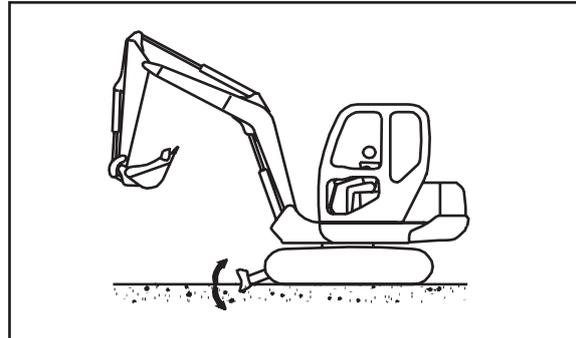
## **B. Notice for using dozer blade.**

1) Dozer blade could only be used to push the earth. Do not use it for other purpose, otherwise dozer blade and crawler may be damaged.

2) Dozer blade could not endure huge heavy object.

3) When machine traveling, do not hang any object on the blade.

4) When using blade to lift up the machine, make sure it is on a flat and reliable ground.



# BUCKET ASSEMBLING AND REMOVING

## Safety regulation

- When you hit the pins with hammer to extract them, splinters may be produced and hit you, it may cause severe injury and permanent damage in your eyes. So use protective eyeglasses and heavy gloves.
- When remove the bucket from the working equipment put it in a stable position.
- Be sure that people standing around working zone, keep clearance from the bucket range when you hit the pins, because if you hit hard, the pins may fly off to result in the damage.
- Don't put any part of the body or stand underneath the bucket when removing the bucket.
- Be careful not to bump your hands
- Don't put your hands in the pin which is aimed at the o-rings directly.

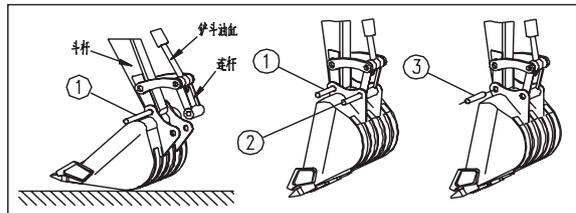
## Bucket assembling

Stop the machine on a firm and solid ground.

Start the machine then operate the arm till the hole of the arm and bucket in a line, then put a 300mm steel bar into ①.

Raise the arm and bucket, dozer the blade

Extend the bucket cylinder to align the hole of the arm and bucket. Insert the pin ② inside the bucket hub, then take out the ① steel bar, insert the pin ③



## Bucket removing

Stop the machine on a firm and solid ground. Lower the arm until the bucket touches the loader face softly, or else more is ground contact pressure more difficult is remove the pins from bucket. Remove the split-pin from pins, the spacer and then the o-ring anti clearance. Remove ② bucket pins and ③, in this order.

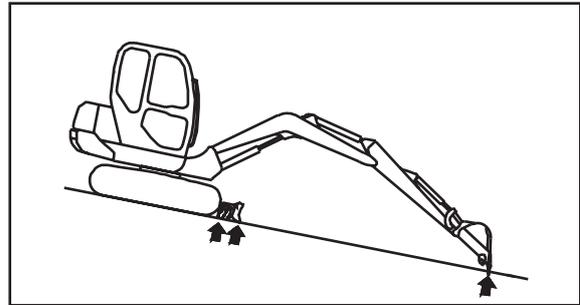
# MACHINE STOP AND PARK

## Safety regulation

1) Avoid abruptly stop. Keep enough space when you want to stop the machine

2) Stop the machine on a firm and solid ground, avoid dangerous place. If you must park the machine on slope, put some pieces of wood under the crawlers, then trust the bucket under ground.

3) If touch levers with unconsciously, the equipment could move suddenly, that could be make a accident or hurt the people. Put the safety lock lever in the lock position, otherwise accidental action on a lever may cause sudden machine movement and it may cause injury or death.



## Machine stop

1) Put all levers in neutral position.

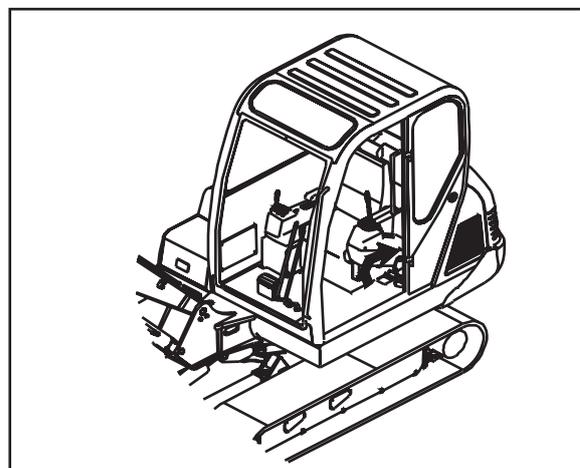
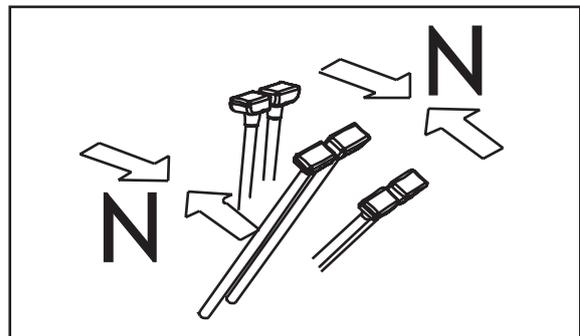
2) Don't stop the engine abruptly before it is cool enough. If the engine is over heated let it run at low speed for 5mins then stop it.

3) Lower bucket and dozer blade on the ground.

4) Put the throttle lever in low idle, and pull the stop lever rearwards in the end (If there is the stop lever).

5) Rotate the start key in "OFF" until the warning lamps go out.

6) Move the engine stop lever in clockwise until the engine stop completely.



## CHECK AFTER COMPLETION WORK

### 1.Check

Check the water temperature\*engine oil pressure\*fuel pressure\*the level of the fuel on the instrument panel.

### 2.Lock

After completion work , make sure the follow compartment is locked.

1)Cab's door. ( And don't forget the door windows or front window). In any condition, if you want to open the front windows, using the handle , can pull the front window up and down to slide the roller inside the guide, then lock it to upthrust till the lock position, whereas, put the front windows down.

2)Refuel port.

3)Hydraulic oil filing port.

4)Battery-box cover

5)Engine hood

**Warning: Make sure that there is nobody stand by engine hood when opening the engine hood to avoid hurt.**

# TRANSPORTATION

## 1. Safety regulation for loading machine

- 1) When loading or unloading the machine, run the engine at the idling speed.
- 2) Don't loading or unloading the machine when turn on the heater.
- 3) If you turn off the heater when operating the machine, the speed of machine's movement will suddenly change.
- 4) When loading or unloading the machine, park the trailer on a flat, firm road. Keep a fairly long distance between the road shoulder and the machine.
- 5) Make sure the ramp has sufficient width, length and thickness to enable the machine to be safely loaded and unloaded. And set the distance between ramps 1.2-1.5 times as much as the track width. In order to avoiding accident, advise to make the angle of the gangplank a maximum of 15\* or the length of ramp is greater than the height 2.5 times.
- 6) Keep the crawler off mud and dirty to prevent from slipping on the slopes. Make sure the slope is cleanness, no water, snow, ice, lubricating grease or oil.
- 7) Never change the direction of travel when on the ramps. If it is necessary drive off the ramps and correct the direction, then drive on to the ramps again.
- 8) Don't use the work equipment to load or unload the machine.
- 9) Don't operate any lever besides walking lever when the machine is on the ramp.
- 10) The machine's focus may be suddenly changed at the joint of the ramp and trailer which may cause the machine lose balance. Therefore, carry out the operation slowly when pass through the joint.
- 11) When turning the machine on trailer, the machine's footing is unstable, so the work equipment should be retracted when slewing.
- 12) No matter loading or unloading the machine, there must be some blocks beneath the tires to ensure the trailer doesn't move.
- 13) Place rectangular timber underneath the front and rear track shoes to prevent the machine from moving about. Also, hold it down with chains or ropes.
- 14) After completing work or operating, before the operator leave the seat, make sure the pilot operating oil circuit is cut off by lifting the safety lock lever, in case that somebody impact the operating lever accidentally what cause the machine move.
- 15) When on the ramps, make sure put down the orientation handle, prevent flat slew.

## 2 . Loading precaution

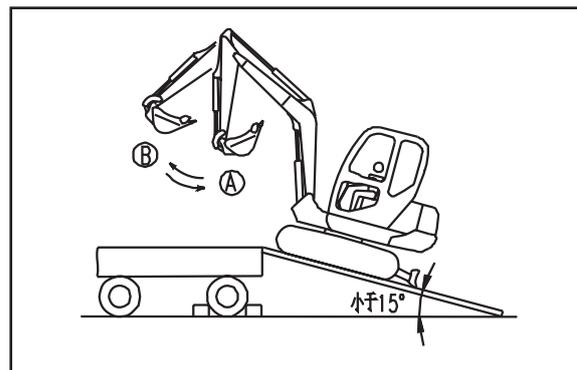
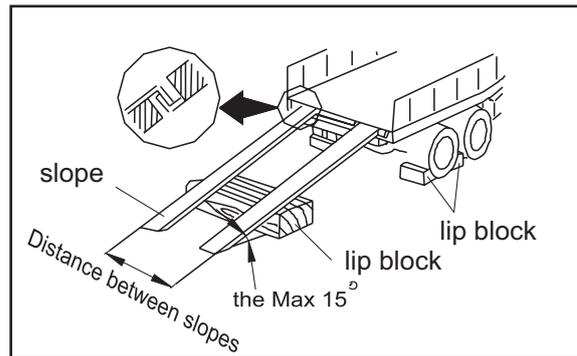
1)When loading or unloading the machine, park the trailer on a flat, firm road. Keep a fairly long distance between the road shoulder and the machine.

2)Properly apply the brakes on the trailer and insert blocks beneath the tires to ensure that it does not move.

3)Make the angle of the gangplank a maximum of  $15^{\circ}$  . Set the distance between the ramps to match the centre of the tracks.

4)Make sure lock the flat slew.

5)Let the excavator and the ramp in the line, the bulldozer stay in the backside, for safety reason, the excavator should drive slowly when climbing the ramp until reach to the end of the ramp.



**NOTICE:** when you are on the ramps don't operate any lever besides the travel lever.

6)Set in direction of the ramps, then stop walking to extend the arm (B), enable the front of crawler load the trailer's floor. Lower the work equipment for fear it hitting the trailer, then travel slowly to load or unload the machine correctly in the specified position on the trailer.

7)Lower down the arm slowly and make the bucket contact with floor, then lower down the blade, load the machine correctly in the specified position on the trailer.

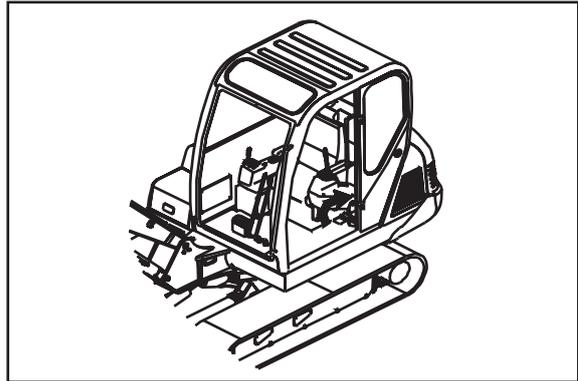


**WARNING:** After completing work or operating, before leave the seat, the operator should lift the safety lock lever at first to make the pilot operating oil circuit is cut off. For in case that somebody impact the operating lever accidentally what cause the machine move.

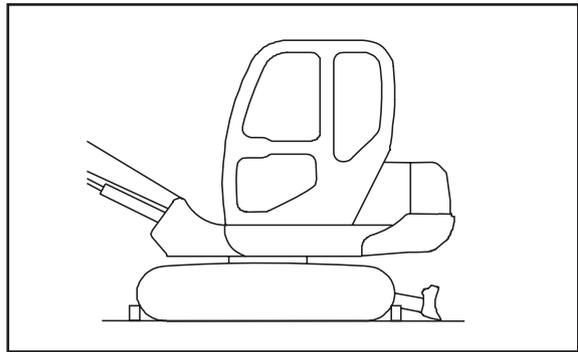
**NOTICE:** Choose the trailer to match the machine in weight and size offered in this manual

### 3. Fix the machine on the trailer

- 1) Lower the work equipment correctly
- 2) Stop the engine and remove the start key.
- 3) Lift the safety lock lever up
- 4) Lock the door and engine hood



- 5) Place rectangular timber underneath the front and rear crawler to prevent the machine from moving about. Also, hold it down with chains or ropes. Be particularly careful to ensure that the machine does not slip sideways.



### 4. Unload the machine from the trailer

- 1) When loading or unloading the machine, park the trailer on a flat, firm road. Keep a fairly long distance between the road shoulder and the machine.
- 2) Properly apply the brakes on the trailer and insert blocks beneath the tires to ensure that it does not move.
- 3) Fix ramps in line with the centre of the trailer and the machine. Be sure that two sides are at the same level as one another. Make the angle of the gangplank a maximum of  $15^\circ$ . Set the distance between the ramps to match the centre of the tracks.
- 4) Remove the chains or ropes on the machine.
- 5) Start the engine. If it is winter, turn on the heater to warm the machine completely.
- 6) Put the safety lock lever down.
- 7) Lift the arm and bucket, and raises blade.
- 8) Make sure no unauthorized obstacles in the working area.
- 9) Moving the platform lock pin and slewing the machine  $180^\circ$ , operate the work equipment to face to the ramps.
- 10) Run the engine at the idling speed then travel slowly till the top of the ramps, then extend the arm when the machine loads on the road,

## 5. Suspend the machine

### A. safety regulation

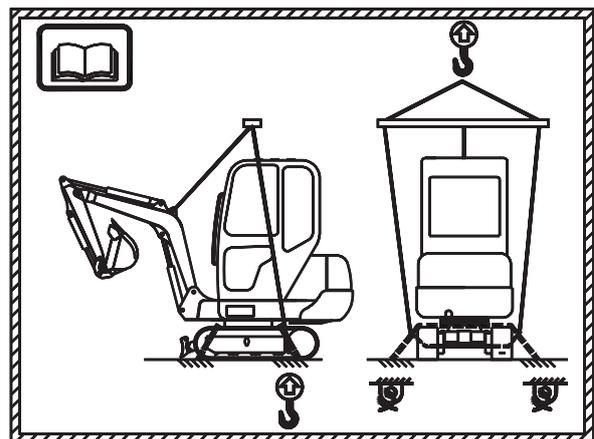
- 1) Don't suspend the machine when there is somebody on it.
- 2) It must be sure the chain that use to suspend the machine have the enough intensity to carry the weight of the machine.
- 3) In order to avoid the machine's unbalance, it must do just like following provided steps.
- 4) Don't suspend the machine when the above body doesn't parallel with the track. And only when they parallel, it can use the chain to suspend the machine.
- 5) When in the process of lifting, it must keep the machine in horizontal.
- 6) When in the process of lifting, there must be nobody under the machine or around the machine.

### B. Suspending procedure

**NOTICE: the suspending procedure is used for the standard machine. The suspender must be used the professional tool that can carry the weight of the machine enough.**

When suspending the machine, it must be at the smooth floor before doing the following procedures.

- 1) Slew the a above part of the machine to in line with the wheel of the chain.
- 2) Let the cylinders of the arm and boom unwind, until the working equipment on the floor.
- 3) Stop the engine, make sure there is nothing else in the cabin, then leave the machine. Close the door of the cabin and the window.
- 4) Tightwire have to get through the front idler and idler of wheel in the front of the machine, meanwhile it also have to get through the driving wheel and crawler supporting wheel in the back of the machine. Or putting the tightwire to get through the machine under its crawler.
- 5) Firstly, we have to adjust the rising angle of the tightwire to 30 or 40 degree, then we can slowly rise the machine .
- 6) When the machine lifted above the floor, double check if whether the machine is balance, then lift it up slowly.



# COLD / HOT WEATHER OPERATION

## 1. Cold weather operation

The cold weather may cause some trouble, so the protection is very important at this time. Avoiding the machine to be badly damaged, if maintain machinery adequately, it will extend machinery life.

1)Electrical system: keep the battery clean and charge fully. Check the cable and joint, clean the joint then apply a layer of grease at it to prevent it from rusting

2)Lubricants: apply the lubricant moderate in viscosity at every joint. Please use the recommended lubricant fit for this machine.

3)Fuel system: check if the fuel supply is suitable for the cold climate at that time, and change into fuel in low viscosity.

Check if there is water in the fuel system. In cold weather, moisture content will gather in the fuel box, so check whether there is moisture content in the fuel filter once working every 50 hours each time. If there's no water inside, extend the inspection cycle, or else, check the oil tank.

4)Cooling system: before operating the machine in cold weather, it is necessary to check the coolant if it is mixed at a suitable proportion, and the coolant must be the right one which is fit for the environment temperature.

5)Work equipment: before starting the engine, put the throttle lever in low idle, start the machine slowly, then stop traveling to operate the work equipment for about 10mins or till every hydraulic cylinder working normally.

## 2. Hot weather operation

To avoid the machine is damaged, follows these rules:

1)Make sure the quantity of liquid coolant in radiator is normal

2)Before the hot weather coming, check the radiator and change the coolant if necessary.

3)Removing the dirty and fouling on the surface of radiator and engine.

4)Check the fan belt.

5)Use the lubricant in moderate viscosity.

6)In the cooling system, use the appropriate mix of coolant.

7)In the condition of the large dusty environment, air filter should be often checked.

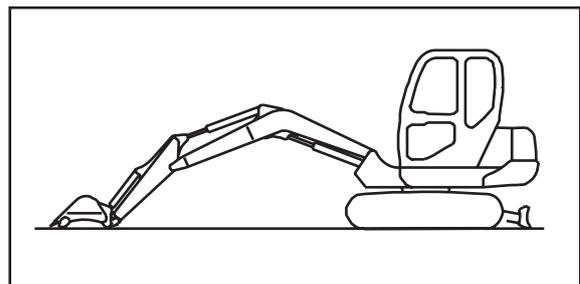
# LONG TERM STORAGE

## 1.Before storage

When putting the machine in storage for a long time, do as follow:

- 1)After every part is washed and dried, the machine shall be housed in a dry building. Never leave it outdoor. In case it is indispensable to leave it outdoors, park the machine on a flat road and cover it with canvas etc.
- 2)Apply a thin coat of grease to metal surface of the hydraulic piston rods.
- 3)Removing the battery, which will be fulfilled with the electrolyte and electricity and then put it at a not dry ice-free areas.
- 4)Drain the engine oil at the warm state, and change with anticorrosion oil. For the piston-type engine the anticorrosion oil MIL-L-21260 is selected. For a winter storage use 1.grade or 2.grade SAE 10W, but for a summer storage use SAE 30.
- 5)Fill also the same type of the anticorrosion oil for about 4%~6% in the fuel oil, and mix them completely. In order to prevent from bringing about condensed water, refill the fuel tank with this kind of mixed oil.
- 6)Check the antifreeze function of the coolant. By filling with antifreeze, its antifreeze ability is at least 20\*. There is non corrosion inhibitor in coolant because of the climate, you should fill with corrosion inhibitor.(it contains 5% corrosion inhibitor according to MIL-G4339C.)
- 7)Start the engine, run it above 15mins at different rotational speed and without load.
- 8)Shut off the inlet of the air filter and the outlet of the exhaust pipe. Plastic thick papers and tape are recommended in this case.
- 9)Lock the platform, and set the safety lock lever in lock position\*the left operating box\*, set all levers in lock position.
- 10)Lock the cut-off valve which for install the attachment, and installing a bolt in the elbow.
- 11)Keep the machine clean, and place it in a dry space.

**NOTICE: When the machine is not being used, set the work equipment as showed in beside figure. This will prevent the cylinder rod from rusting.**



## 2. During storage

- 1) Start the engine and travel the machine for a short stretch every month, so a thin coat of grease will cover the moving parts. At the same time, charge the battery.
- 2) Also run the air condition if it is assembled.
- 3) Turning the crawler.



**WARNING: When the machine housed in the building, if the antirust operation should be done, open windows and doors to improve the ventilation and prevent gas poisoning**

## 3. After storage

When you start the machine after a long term storage, do as follow:

- 1) Remove the excess grease with a duster from cylinder rods.
- 2) Add oil and grease to all place.
- 3) After the machine have stored for a long time, moisture content in the atmosphere may mixed in the oil. Before or after starting the engine, you should check the oil at all places. If the oil mixed with some water, the oil at all places should be changed.

**NOTICE: 1) According the normal climate, the machine can be stored for a year by means of above method. However, after storing for six months, you should operate every part for 15mins without load. At the same time add the lubricant to every part.**

**2) Before operating the machine again, which have stored for a long time, you should do some necessary inspection. After stored over a year, the machine must be drained out and change the oil from its reducers and hydraulic system, too.**

## Reason for the Technical Trouble & Resolve

Trouble	Reason	Resolve
1. The engine couldn't start or start difficult	● Problem for start the engine	● Replace or check the engine
	● Lack electrification of the battery	● Electrification or replace the battery
	● Error use for the line or the piston of the warm-up	● Mend or replace the warm-up piston
	● Error of the oil injection positive	● Check the oil injection positive
	● The pipe laying obstructed	● Clean the pipe laying
	● The filter of the fuel obstructed	● Clean or replace the filter of the fuel
	● The fuel system has the water, the dust or the air	● Ejectment the air, clean the pipe laying
	● The nozzle dirty or the pressure of oil injection lower	● Maintain the nozzle
	● The trouble of the fuel injection pump	● Contact assistant service
	● The fuel lacks	● Immit the oil
	● The intake/vent system obstructed	● Ejectment the trouble
2. The engine knocking, running irregularly or stop	● It have many air	● Contact assistant service
	● The filter of the fuel obstructed	● Clean the filter
	● The fuel system has the dust or the air.	● Vent and clean the oil line
	● The filter obstructed, the nozzle dirty or trouble	● Check them
	● The high-pressure oil pipe destroyed	● Replace the high-pressure oil pipe
	● The fuel lacks	● Immit the oil
	● The velometer couldn't adjust	● Contact assistant service
	● The trouble of the fuel injection pump	● Contact assistant service
● Error of spurt oil positive or the nozzle clip	● Check them	

<b>Trouble</b>	<b>Reason</b>	<b>Resolve</b>
3. The power of the engine descend	●The fuel has the air	●Ejectment the air
	●The pipe laying obstructed which supply the oil	●Check and clean it
	●The oil injection positive replaces	●Adjust it with the ordain value
	●The oil injection work not good	●Check the working pressure and the pulverization of the nozzle
	●The air filter obstructed	●Clean the core of the filter
	●Error of the intake vent or not seal	●Adjust the gap of the intake/vent
	●The cylinder cushion bad or leak	●Replace the cylinder cushion
	●The oil injection pump work not good	●Contact assistant service
	●The engine overheat	●Check whether use the coolant right. whether the water pump and the belt loose .If they have, it need to mend or replace them, and clear the choker of the flume
4. The engine overheat	●The level of the coolant low	●Immit the coolant
	●The temperature sensor has the trouble	●Replace the sensor
	●The air filter obstructed	●Clean the filter
	●The belt of the fan looses or trouble	●Screw down it again or replace
	●The pipe of the cooling system has the dust	●Clean the pipe
	●Bad machine oil or much the machine oil	●Replace the machine oil
5. The pressure of the engine low	●The level of the machine oil low	●Immit the oil
	●The filter of the machine oil Obstructed	●Clean the filter of the machine oil
	●The pipe leaks oil	●Screw down or replace
	●The coolant of the engine Exorbitant	●Mix the coolant with the right rate or contact assistant service

<b>Trouble</b>	<b>Reason</b>	<b>Resolve</b>
6.The engine emit the black smoke	●Bad fuel	●Use the better fuel
	●The air filter obstructed	●Replace the core of the filter
	●Error of the oil injection positive	●Adjust it with the ordain value
	●The pulverization of the nozzle not good	●Check and replace the parts
7.The engine emit the withe smoke	●Bad fuel	●Use the better fuel
	●The machine oil of the engine more	●Renew the level of the oil
	●Error of the oil injection positive	●Adjust it with the ordain value
	●The oil tank &the fuel have the water	●Check and replace the fuel
8.The electricize battery not	●The tie-in looses or rusts	●Clean or screw down
	●The belt of the engine loose or trouble	●Screw down or replace
	●The engine not electricize	●contact assistant service
9.The engine not run or run slow	●The tie-in looses or rusts	●Clean or screw down
	●The battery undercharge	●Replace
	●The line destroy	●Contact assistant service
10.The engine runs,but the alarming light lights	●The engine has trouble	●Contact assistant service
	●The electron adjuster has the trouble	●Replace
	●The line has the trouble	●Check and repair
11.The part of the hydraulic system runs slow	●The hydraulic oil cool	●Warm-up
	●The pressure of the guide system low	●Contact assistant service
	●Error use of the hydraulic oil	●Use the hydraulic oil which right
	●The speed of the engine too Slow	●contact assistant service

<b>Trouble</b>	<b>Reason</b>	<b>Resolve</b>
12.The temperature of the hydraulic oil too high	●Error use of the hydraulic oil	●Use the hydraulic oil which right
	●The pipe laying obstructed	●contact assistant service
	●The oil filter of the hydraulic oil obstructed	●Clean or replace
	●The oil pump attrite	●contact assistant service
	●The oil cooler obstructed	●Clean the oil cooler
	●The oil cooler has trouble	●contact assistant service
	●The pressure of the main safety valve or the spill valve too high	●Contact assistant service
	●The oil too dirty	●Replace the oil
	●The senor has trouble	●Replace
13.The hydraulic emulsification or has the foam	●The pipe which from the oil tank to the oil pump leak	●Check and repair,and screw down
	●Error use of the hydraulic oil	●Use the hydraulic oil which righ
	●The hydraulic oil includes the water	●Replace the oil
	●The level of the oil too low	●Check the level of the oil
14.The pressure of the oil too low or not	●The hydraulic pump destroy	●contact assistant service
	●The oil lacks	●Immit the oil
	●The safety valve has trouble.	●contact assistant service
15.All parts no work	●The hydraulic pump destroy	●Contact assistant service
A.The oil pump has the noise	●The hydraulic oil lacks	●Immit the oil
	●The oil suction pipe leaks	●Repair or replace
B.The noise of the oil pump not replace	●The donkey pump destroy	●Replace
	●The operation device of the hydraulic safety not working	●Check and repair

<b>Trouble</b>	<b>Reason</b>	<b>Resolve</b>
16.The oil tanks or the motor no working or no power to working	●The hydraulic pump destroy	●contact assistant service
	●The pressure of the main safety valve become low	●Adjust the pressure
	●The level of the oil low	●Immit the oil
	●The oil suction filter obstructed	●Clean the filter
	●The oil sealer destroy	●Repair or replace
	●The piston lever destroy and leak oil	●Repair or replace
	●The guide valve trouble	●Replace
	●The guide pipe rupture and leak oil	●Repair or replace
17.Double driving device not working	●The joint of the central rotating series oil	●Contact assistant service
18.One driving device not working	●The driving device destroy	●Contact assistant service
	●The control machine destroy	●Check and repair
19.Driving deviant	●The pedrail too tight or too loose	●Adjust it again
	●The performance of the oil pump reduce	●contact assistant service
	●The pedrail frame metamorphosed	●Repair or replace
	●The chain of the pedrail has the scree	●Repair
	●The control valve leaks oil	●contact assistant service
	●The performance of the motor reduce	●contact assistant service
20.The rotating deviant	●The performance of the oil pump reduce	●contact assistant service
	●The rotating motor destroy	●contact assistant service
	●The guide valve not working	●contact assistant service
21.The rotating discrete	●The rotating gear attrite	●contact assistant service
	●The rotating bearing or ball bearing attrite	●contact assistant service
	●The axunge lacks	●contact assistant service
	●The control valve leaks oil	●contact assistant service

<b>Trouble</b>	<b>Reason</b>	<b>Resolve</b>
22.The air-condition system has the noise	●The joint of the electron looses, to lead the clutch not good	●Inter the joint tight or repaire
	●The belt looses	●Adjust it ,replace it if it broken
	●The fan of the blower looses	●Screw down agin
	●The blower works deviant	●Repair or replace
	●The electric fan works deviant	●Repair or replace
	●The bearing of the decrement machine destroy	●Replace
	●The tension bearing destroy	●Replace
23.The air-condition couldn't refrigeration	●The line trouble	●Repair or replace
	●The switch of the air-condition trouble	●Repair or replace
	●Not have the cryogen	●Check、 repair、 immit the cryogen
	●The system obstructed	●Clean or replace
	●The belt looses or rupture	●Adjust or replace
	●The expansion valve trouble	●Clean or replace
	●The decrement machine runs deviant	●Repair or replace
	●The switch of the pressure trouble	●Replace
24.The air-conditioning is intermittent	●The line touch not good	●Check and repair
	●The belt loose	●Adjust the belt
	●The temperature of the air-condition switch adjust unsuitable	●Adjust
	●The system includes much water,the inside has the ice	●Replace the dryer
	●The electron fan or other relays destroy	●Repair or replace

# 5

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## Maintenance

## Maintenance Information

### Break-in of the new machine

The break-in period is the first 100 working hours of the new machine. Cautious use must be taken during this period in order to prevent the machine from heavy load and working intensity. In the first 50 hours in break-in period, only 80% of working intensity is permitted, because the proper use during the break-in period has a deep influence in the service life of machine.

After 50 working hours, the user must check the machine according to the maintenance list for the first time, and change the relative oil and filter. Meantime, to check the pollution degree of hydraulic oil, the degree must lower than grade NAS9 or the hydraulic oil should be changed.

When the hydraulic systems stop working, high speed running of the engine is prohibited. Working equipments can be used only if the temperature of hydraulic oil has exceeded 20°C.

### Working in the dusty worksites

When the machine is working on a dusty worksite, please follow the below instructions:

- To check whether the air filter is clogged or not with the sensor and frequent cleaning of filter core is required.

- Clean the radiator core frequently to prevent the clogging.

- Frequent cleaning and change of fuel filter are required.

- Clean the electrical equipment, especially the starting motor and alternator in order to avoid the blocking of the dust.

- Move the machine to a clean ground for preventing dust from oil when checking and changing the oil.

### Oil and the filter core

Clean engine oil and greases are required to avoid any impurity in the engine oil container.

After changed the oil and filter core, to exam whether there are cuttings or impurities in the old oil and filter core. Adopt proper measures if large numbers of cuttings and impurities are found.

Never mix different kinds of oil.

### **The hour meter**

Check the hour meter in the instrument to see if it is the time to do maintenance for the machine.

Use the original spare parts

It is important to use the original spare parts of YUCHAI EXCAVATOR.

### **Environment protection**

When dealing with the engine oil, fuel, coolant, anti-freeze, plastic, impregnant, filter core and battery which will be harmful to the environment, do abide by the environmental laws.

### **Do not drop anything into the machine**

When checking the machine, pay attention to avoid dropping the bolts, nuts, spacers and tools into the machine, that will cause the damage to the machine and may bring accidents. If something has dropped into the machine, take it out immediately.

### **Periodical maintenance**

Periodical maintenance should be undertaken according to the items in the Maintenance Schedule.

### **Counter checking**

Counter checking is important after doing the maintenance every time. Please pay attention to the following instructions:

- Whether some parts of the machine which need to be maintained are missed.
- Assure that all items of maintenance have been carried out.
- To check if there is impurity has dropped into the machine.
- To check if there is oil, water and fuel leakage in the machine and make sure that the bolts are tightened.

## Maintenance Outlines

### Lubricants

- Use the right type of oil which is indicated in the “Oil List” and change the oil on a specified time.
- Prevent the lubricant from impurities (water, metal cuttings and dust etc.). Most problems with the machine are caused by these impurities.
- Do not mix the different lubricant.
- Add the lubricant to the right quantity.
- When change the lubricant, change the relative filter at the same time.

### Fuel

- Be sure that no impurity will contaminate fuel when storage or refueling.
- Always use fuel specified in the “Oil Chosen list”. Fuel may freeze below  $-15^{\circ}\text{C}$ , so it is necessary to change the fuel according to the environment.
- To avoid air condensation inside the fuel tank, refueling the tank after work.
- Before starting the machine or after refueling for 10 minutes, do let the deposits and water out of the tank.
- Exhaust the air in the oil circuit if the fuel of engine has run out or the filter has been changed.

### Grease

- Grease is used to avoid the scratch wear and noise emission form jointed parts.
- To add grease after the parts are used for a long time.
- When adding the grease do remember to get rid of the old one.

### Coolant

- Anti-freeze should be used under in different climate.
- Check the quantity of coolant in the tank and add it when the coolant is insufficient.
- Use the proportional mixture of coolant and anti-freeze according to the temperature.
- Never add the coolant when the engine is hot or not completely cool.

### Filter

- Change the filter core periodically.
- Do not use the filter core which has been cleaned.
- When changing the filter, contact YUCHAI if you have found that there are metal grains on the filter.
- Do not open the package of the spare filter before usage.

### **Hydraulic system**

- Check and do the maintenance on the hydraulic system after the temperature is down and release the pressure of the pipeline in the cylinder.
- When loosening the bolts, nuts and tie-in of pipes, do not stand at the front of the spare parts.
- Release the air in the pipeline when doing the checking and maintenance.
- The maintenance of hydraulic system consists of checking the quantity of hydraulic oil, changing the filter and refilling the hydraulic oil.
- When disassembling the tubes, the o rings must be changed if they are found broken.
- Do not use the contorted or bended tubes.

### **Electrical system**

- If cables become damp or will damage, the electrical wiring may reduce machine safety and acting.
- If you wash the machine, be careful to prevent electrical wiring wets.
- To avoid radio interference between control device and walkie-talkie or radio system please check from YUCHAI before install anything.
- If you work near the seashore, keep the electrical wiring clean to avoid corrosion.
- If you install a fan or other electrical device connect it to an independent connector.

## **Compel lent replacement of parts**

Those parts which play an important role in safety, such as some soft pipes, will be aging, wear-out and deteriorated as working time accumulated and will cause some safety hazard. It must replace those parts after they have reached the expiry date.

If those parts have abnormality, maintenance and replacement must be taken. Change the related seals when replace the soft pipes.

## Oil choosing list

As the temperature of the condition 、 the using fact to choose the oil plants. But the oil plants must pass muster:

	Lube or Fuel	Use temperature	Viscosity	Fill-in
Lube of the engine	Chilliness area:CD10W/30 General area:CD15W/40	-20°Cupwards -15°C upwards	9.3-12.5 centipoise 12.-16.5 centipoise (when it is 100°C)	
Hydraulic oil	Low temperature:L-HS46 General area:L-HM68	-25°C upwards -4°C upwards	61.2-74.8 centipoise (When it is 40°C)	
Lube of the driving reducer	Overload use the gear oil (GL-5)	Winter/summer		SAE80W/90
Lube of the rotating reducer	Overload use the gear oil (GL-5)	Winter/summer		
Lube of the guide wheel/carrier wheel	Vehicle oil Hz-23	All the temperatures	20-25 centipoise (When it is 50°C)	
Lubricating oil	Lubricating grease	-20°C-160°C		
Fuel	Summer:0# light dies fuel Winter:-10# light dies fuel -20# light dies fuel	>0°C 0-5°C -5°C-15°C		
Coolant	Antifreeze (50%water and50%---Ethylene glycol)	>-32°C		
Refrigerant	R134a			

### ● The capacity of the Oil

Sort	Unit	Value
Fuel tank	L	74
Hydraulic oil tank	L	60

## The Tighten Moment

Refer to the value to install the bolts、the nuts.

### The tighten moment of the general parts

Intensity Grade of The Bolt	Bend Intensity N/mm <sup>2</sup>	Diameter of The Bolt mm							
		6	8	10	12	14	16	18	20
		The Tighten Moment Nm							
8.8	640	9~12	22~30	45~59	78~104	124~165	193~257	264~354	376~502
10.9	900	13~16	30~36	65~78	110~130	180~210	280~330	380~450	540~650
12.9	1080	16~21	38~51	75~100	131~175	209~278	326~434	448~697	635~847

Intensity Grade of The Bolt	Bend Intensity N/mm <sup>2</sup>	Diameter of The Bolt mm						
		22	24	27	30	33	36	39
		The Tighten Moment Nm						
8.8	640	512~683	651~868	952~1269	1293~1723	1759~2345	2259~3012	2923~3898
10.9	900	740~880	940~1120	1400~1650	1700~2000	2473~3298	2800~3350	4111~5481
12.9	1080	864~1152	1098~1461	1606~2142	2181~2908	2968~3958	3812~5082	4933~6577

## The tighten moment of hydraulic soft pipe

Rotating Nut with The Metric System Thread			
Metric System Thread	Outside diameter of steel tube	Nm	
		Moment	min./max
M12x1.5	6	20	15~25
M14x1.5	8	38	30~45
M16x1.5	8/10	45	38~52
M18x1.5	10/12	51	43~85
M20x1.5	12	58	50~65
M22x1.5	14/15	74	60~88
M24x1.5	16	74	60~88
M26x1.5	18	105	85~25
M30x2	20/22	135	115~155
M36x2	25/28	166	140~192
M42x2	30	240	210~270
M45x2	35	290	255~325
M52x2	38/42	330	280~380

## The tighten moment of hydraulic soft pipe

<b>BSP Thread and Rotating Nut</b>		
	<b>Nm</b>	
<b>BSP Thread</b>	<b>Metric System Moment</b>	<b>Min./max</b>
G1/4	20	15~25
G3/8	34	27~41
G1/2	60	42~76
G5/8	69	44~94
G3/4	115	95~135
G1	140	115~165
G1.1/4	210	140~280
G1.1/2	290	215~365
G2	400	300~500

<b>ORFS Rotating Nut</b>			
		<b>Nm</b>	
<b>UNF Thread</b>	<b>Specs of the lineation</b>	<b>Min</b>	<b>Max</b>
9/16~18	- 4	14	16
11/16~16	- 6	24	27
13/16~16	- 8	43	47
1~14	- 10	60	68
1.3/16~12	- 12	90	95
1.3/16~12	- 14	90	95
1.7/16~12	- 16	125	135
1.11/16~12	- 20	170	190
2~12	- 24	200	225

## Maintenance List of Time-Check

Refer to the list and the calculagraph,time-Check and maintenance to the machine.If the condition of the machine bad or the working intensity strong,or it hast the hydraulic crash hammer and so on,the period of some parts maybe reduce.

No.	Item	Period of Maintenance (Total of the Working Hour)					
		10	50	100	250	500	1000
1	<b>General Check</b>						
	●Whether the machine oil、 water、 fuel leak	▲					
	●Parts of the machine and the appearance of the soft pipe	▲					
	●Fix circs of bolt and hydraulic joint	▲					
	●Circs of the operation device、 light 、 indicator light	▲					
	●Working circs of the diesel engine	▲					
2	<b>Fuel System of The Engine</b>						
	●Check the level of the oil and supply	▲					
	●Vent the water and the impurity			▲			
	●Clean the oil tank				▲		
	●Check the pressure of oil injection					▲	
	●Replace the filter core					▲	
3	<b>Cooling System of The Engine</b>						
	●Check soft pipe and cutting sleeve	▲					
	●Check the level of the coolant	▲					
	●Clean the vane of the radiator					▲	
	●Replace the coolant		☆				■
	●Check the consistence of the coolant	▲					
4	<b>Lubricate System of The Engine&amp;Other</b>						
	●Check the level of the machine oil	▲					
	●Replace the machine oil		☆		▲		
	●Replace the filter core of the machine oil		☆		▲		
	●Check belt of the fan		☆	▲			
	●Check the gap of the valve					☆	▲
	●Check fastening circs of the cylinder					☆	▲
	●Check fastening circs of the engine bearing		☆			▲	

No.	Item	Period of Maintenance (Total of the Working Hour)						
		10	50	100	250	500	1000	2000
5	<b>Air Intake System of The Engine</b>							
	● Break out the deposit tank	▲						
	● Clean the core of the air filter			▲				
	● Replace the core of the air filter					▲		
6	<b>Hydraulic System</b>							
	● Check the level of the machine oil	▲						
	● Vent the water and dust of the oil tank				▲			
	● Replace the hydraulic oil, clean the filter							▲
	● Replace the return oil of the hydraulic oil and the core of the guide loop filter		☆			▲		
● Check the pressure of the system					▲			
7	<b>Accumulator</b>							
	● Check the level of the electrolyte		▲					
	● Check the acidity and the state of the electrification					▲		
8	<b>Pedrail</b>							
	● Check and adjust the tension state of the pedrial				▲			
	● Check the level of the oil and immit						▲	
	● Replace the machine oil		☆			▲		
9	<b>Reducer</b>							
	● Check the tighten moment of the reducer which connect the bolt	▲						
10	<b>Bear wheel ,carrier wheel ,guide wheel</b>							
	● Check the tighten moment		☆			▲		
	● Check the level oil of the guide wheel/carrier wheel						▲	
11	<b>Lubricate</b>							
	● Immit lube to the point which need		▲					



Routine period to do



Maintenance of the first time to do



Every spring and Autumn

## Routine Check

It need do the routine Check to the machine everyday or every 10hours.

- 1)Check whether the machine leak oil、 water or the fuel leaks
- 2)Check whether the parts and the attachment have the rupture、 the nick or the distortion
- 3)Check the hydraulic device's fix and connect
- 4)Check the appearance of the parts
- 5)Check the working circs of the operation device、 light 、 indicator light
- 6)Check the working circs of the engine.
- 7) The adjustment system of driver's seat.

# Fuel System of Engine

## Maintenance manual

Capacity of the oil tank-----	100L
Check the level of the oil-----	10h
Vent the water and the impurity from the oil tank-----	100h
Clean the oil tank-----	250h
Replace the filter core of the fuel-----	500h

### 1. Check the level of the oil and immit

It can see the instruction sheet of the combination instruction sheet to check the level of the oil. Do it everyday or every 10 hours.

It should immit the oil tank after working to avoid have the hydrometeor.

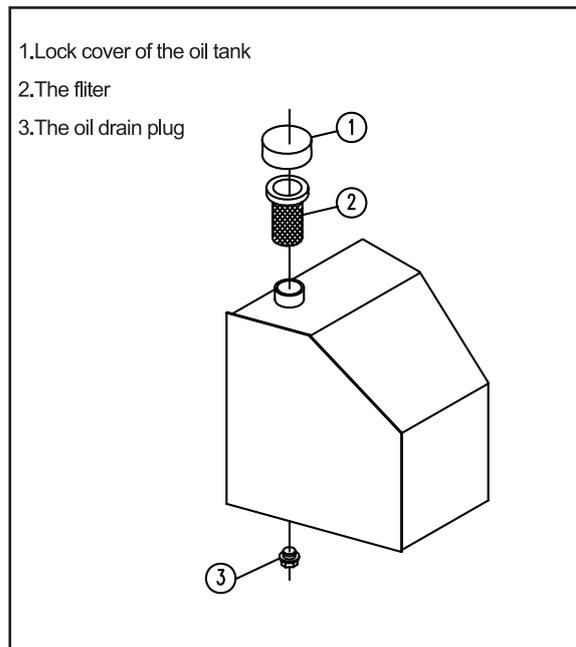
The gun stay front of the fuel-hydraulic oil tank

### 2. Vent the water and the impurity from the tank

### 3. Clean the oil tank

Clean it every 250hours

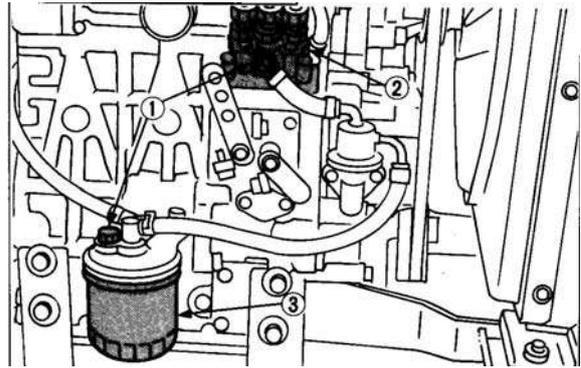
- 1) Vent the fuel to the container
- 2) Take-down the oil drain plug, take out the fliter.  
Top up half of the oil tank, and vent it again.
- 3) Clean the filter and replace.
- 4) Install the oil drain plug again. Through the fliter  
top up the fuel
- 5) Vent the air of the pipe laying



**Caution: Don't use the trichlene to washing the inside of the oil tank, it only use the diesel oil**

#### 4. Exhaust of the fuel-return circuit

It need to exhaust the air before start the engine when it replaces filter core of the fuel、 cut off the pipe of the fuel、 clean the filter of the fuel and make the air into the fuel-return circuit.



#### 5. Air-draining of fuel-return circuit

- 1) Fulfill the fuel tank and turn on the control lever if fuel filter
- 2) Loose the drain plug screw of fuel filter
- 3) Tighten the plug screw when there is no air bubble in the fuel draining from draining bolt.
- 4) Open the draining bolt on the fuel plunger pump.
- 5) Tighten the plug screw when there is no air bubble in the fuel draining from draining bolt.

- 1) Draining plug screw
- 2) Plunger pump
- 3) Fuel filter

#### 6. Pre-filter of engine oil

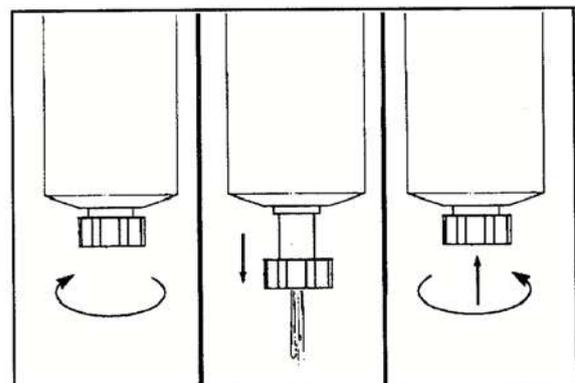
Change the filter core every 500 hours (can see the following chapter of changing the filter cores)

Drain the water and sediment from the separator.

- 1) Stop the engine, open the outlet valve, and turn the valve about half and three circle counterclockwise till the valve drop down about 25.4mm(1 inch) and start to vent

- 2) Vent the water of the separator till see the cleanly fuel.
- 3) Screw down the valve clockwise when close the valve.

**Caution: Don't screw the valve too tight. It will destroy the thread.**



Turn the valve counter clockwise

Down the valve

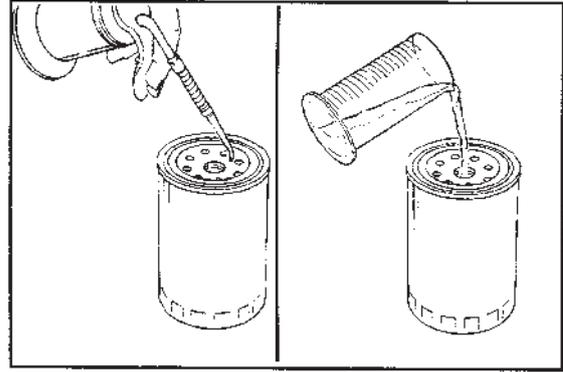
Turn the valve clockwise

## 7. Replace the filter core of the fuel

Replace it every 200 hours or every 3 months.

It must use the sterling filter core

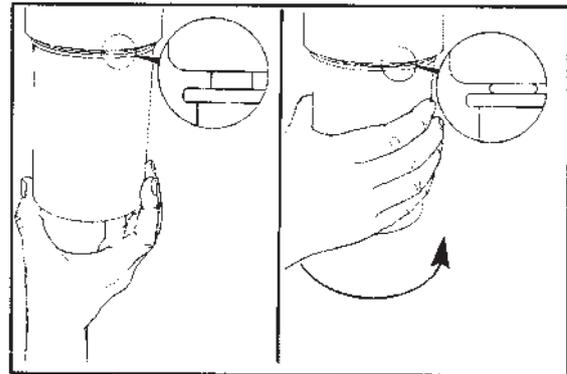
- 1) Take-down the filter of the fuel
- 2) Use the cloth which not cottony to clean the surface of the sealing gasket.
- 3) Disuse the "O" ring
- 4) Install the new "O" ring



**Caution: Check whether the base of the filter core has the old sealing gasket. If it has the old sealing water, it will leak oil.**

- 5) Use the new fuel top up the new filter, and use the cleanly machine oil to lubricate the "O" seal ring.

- 6) Install the filter as the manufacturer's order



**Caution: For reduce the feasibility of the fuel leaks, it make sure to install the filter fix but on too tight. Too tight will destroy the filter of the fuel.**

- 7) After replace the filter core, start the engine and Check whether the surface of the seal ring leaks the oil

# Cooling System of Engine

## Maintenance manual

Capacity of the radiator-----	5.7L
Check the level of the coolant-----	Everyday or 10h
Check the rubber soft pipe and the clip-----	Everyday or 10h
Clean the vane of the radiator-----	500h
Replace the coolant-----	Spring and Autumn
Check the consistency of the coolant -----	Everyday or 10h

### 1. Check the level of the coolant

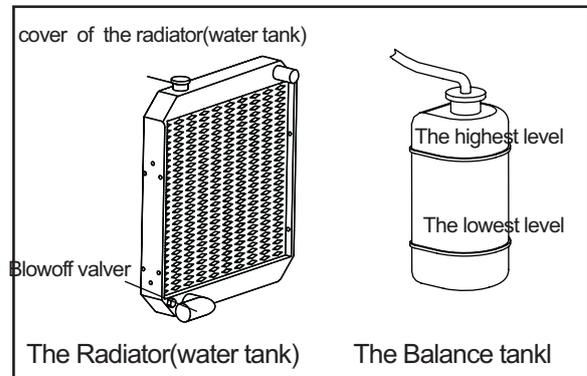
When a new machine has been started, you must check the level of the coolant first.

And check the level of the coolant everyday or every 10hours.

Take out the cover of the radiator (water tank), check the level of the coolant.

The level of the coolant should under the sprue about 20mm Observe the position of the level in the balance tank.

The level of the coolant should lie in between the highest and the lowest level when the engine cooling.



**Warning: The hot coolant will spurt when open the cover of the radiator.**

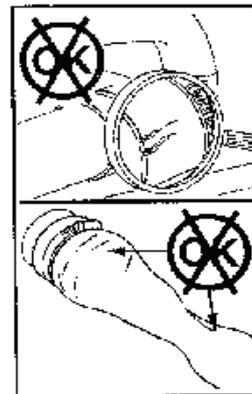
**The way to open the cover: Open the cover little after the system cooled .Then wait it release the pressure.**

### 2. Check the rubber soft pipe and the clip

Check it everyday or every 10hours.

It needs replace the soft pipe if it has the flaw or become hard because of the aging.

Check whether the clip locked,if it becomes less crowded or destroy ,it need replace it in time.



## 2. Check the rubber soft pipe and the clip

Check it everyday or every 10 hours.

It needs replace the soft pipe if it has the flaw or become hard because of the aging.

Check whether the clip locked, if it becomes less crowded or destroy ,it need replace it in time.

## 3. Clean and Check the vane of the radiator

Clean it every 500 hours.

It need clean it in time. Because the dust of the radiator (water tank) will affect the effect of the cooling.

Open the cover, and use the high-pressure water or the compress air to blow the dust or the leaves and so on. Meantime, it need clean the cleading which front of the cooler .If the machine has the air-condition, it need clean the condenser.



**Warning:**It is dangerous when the compress air、 the high-pressure water、 the steam hit the body.It must use the glasses、 the veil and so on

**Caution:**Avoid shatter the vane of the radiator,the distance should exceed 500mm between the nozzle of the high-pressure water or the compress air and the surface of the radiator(water tank).The vane of the radiator which destroyed lead leak water or overheat.It need Check the radiator everyday when the pace has much dust.

## 4. Replace the coolant

After work 50 hours, the coolant will replace first time. Then it need replace it two times in one year, Spring and Autumn.

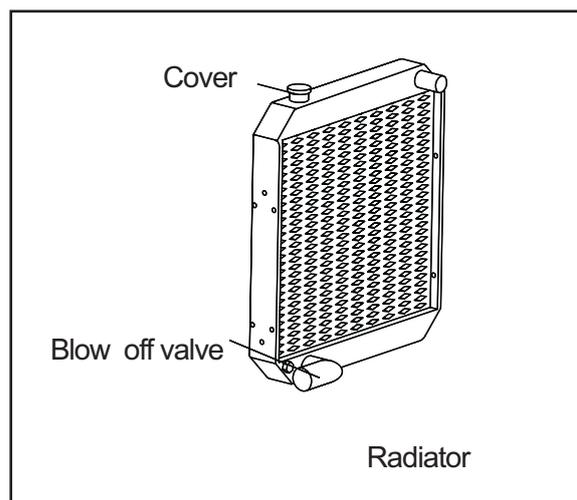
1)Take down the cover of the radiator (water tank), open the vent valve to make the coolant out.

2)Clean the cooling loop, close the draining valve valve. Immit the coolant, then start the engine to make the engine run about 10 minutes with the low-speed. Then stop the machine and blow off the coolant.

3)Close the vent valve again

4)Immit the coolant, let the engine run several minutes with the low-speed to make the coolant permeated the loop.

5)Check the level of the coolant and supply the coolant.





**Warning: Don't open the cover of the radiator (water tank) with the hot engine except the temperature of the coolant under 50°C.**

### **5. Check the consistency of the coolant**

It need to Check the consistency of the coolant before the beginning of the cold weather. The coolant can use under 20°C. If the temperature of the condition lower, it should increase the proportion of the coolant.



**Warning: The coolant is the toxicant. Avoid the children and the pet touch the coolant. If the coolant doesn't used, it need deal it as the rule.**



**Warning: It must use the coolant in any weather.**

**No use the water instead of the coolant.**

**The water from the river includes much autunite and other impurity. If it use this water, it will become the scale and adhesive to the radiator or the pipe of the cooling water. No use the drinking-water, too.**

**The coolant is easy to burn. No close the fire.**

**If the coolant into the eye, it should use the water to clean and to the hospital in time.**

# Lubricating System of the Engine

## Maintenance manual

Capacity of the radiator-----7L

Check the level of the oil-----Everyday or 10h

Replace the oil or replace the filter core-----Everyday 250 hour

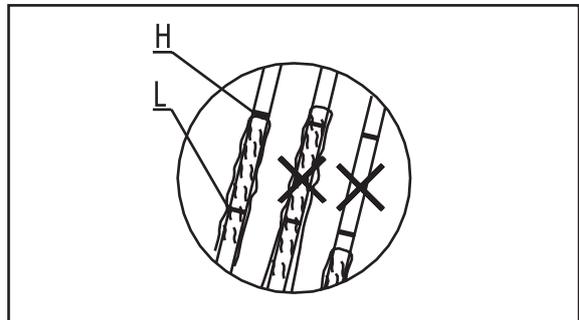
### 1.Check the oil level

Check the level of the oil before start the new machine.Then Check it every 10 hours.

1)Place the digger to the level road,and stop the engine.

2)Open the cover of the engine,take out the staff guage of the machine oil.Observe the value which has the oil.The level of the oil should lie in the value between the lowest(L) and the highest(H).

3)It can immit the oil through the sprue to make the level of the oil arrive the ordain value.

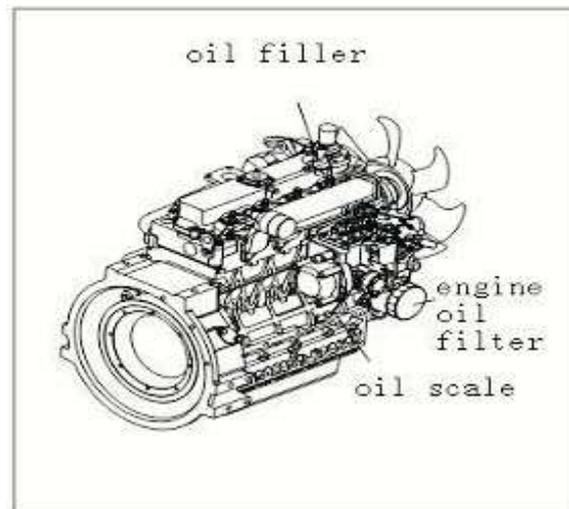


**Warning:After stop the engine,the parts and the oil are the high-temperature.They will hurt the body.It need wait the temperature reduce when it start to maintenance.**

### 2.Replace the engine oil

Replace the engine oil of the engine after start the new machine 50hours.Then replace it every 250 hours

- 1) Place the Excavator to the level road, and stop the engine, and remove the machine oil.
- 2) Take-down the vent bolt to make all the machine oil removed.





**Warning: Avoid inhale the oil steam、 eat or touch the engine oil long time**

- 3) Clean the vent bolts and install, if the seal ring has broken, it need replace it.
- 4) Open the filler.
- 5) Fill the new machine oil till the oil arrive the "Max" of the oil leveler
- 6) Close the cover of the filler, and run the engine about 5 minutes.
- 7) After stop the engine about 10-20 minutes, check the level of the machine oil. Refill the machine oil if it necessary.

### **3. Replace the filter core which for the engine oil**

The first cleaning after the new machine runs 50 hours. Then clean or replace it every 250 hours.

- 1) Clean the area which around the base of the filter, take-down the filter of the machine oil, clean the surface of the base.
- 2) Lubricate two seal gaskets which lie in the right of the filter
- 3) Before install the filter, it need wipe the machine oil on the surface of the seal gasket.
- 4) Install the filter as the manufacturer's request
- 5) Run the engine with the low-speed, check whether the filter leaks the oil
- 6) Stop the engine and wait 15 minutes to make the machine oil return
- 7) Check the level of the oil. Immit the machine oil to the "H" sign if it necessary.

# Air Intake System of The Engine

## Maintenance manual

Replace period of the filter core-----Every 500h

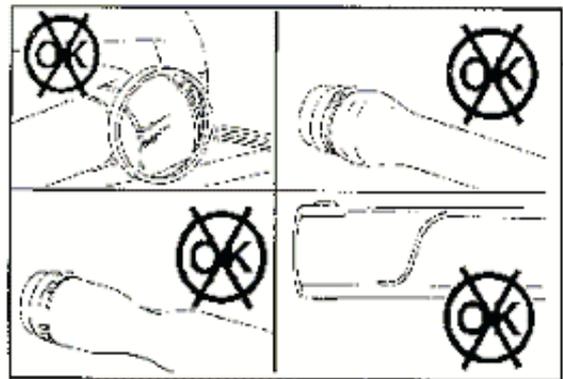
### 1. Replace the air filter core

When the indicating lamp shines or every 500 hours, must replace the air filter cores.

### 2. Check the air intake pipe

Check whether it has the things which the intake pipe has the fray、the pipe destroy、the clip loose or the pipe break and so on

Replace the pipe and the clip if it necessary, to make sure the intake system not leak.



## Other Maintenances of Engine



**Warning:**No maintenance when the engine runs.If it must do the maintenance before the engine runs,it need have more than two persons to operate and operate as follow:

**Must have one person sit on the operator's seat and prepare to stop the engine at any moment.And all the persons must keep in touch.**

**It maybe has the danger-winded when it near the fan、 the belt of the fan and so on to operate.**

**No insert the tools or other things into the fan or the belt of the fan.Otherwise,the part rupture or fly out**



**Warning:**It has the audition problem with temporary oreverduring if the machine has the noise too big.It need wear the earplug when do the maintenance and in the noise long time.

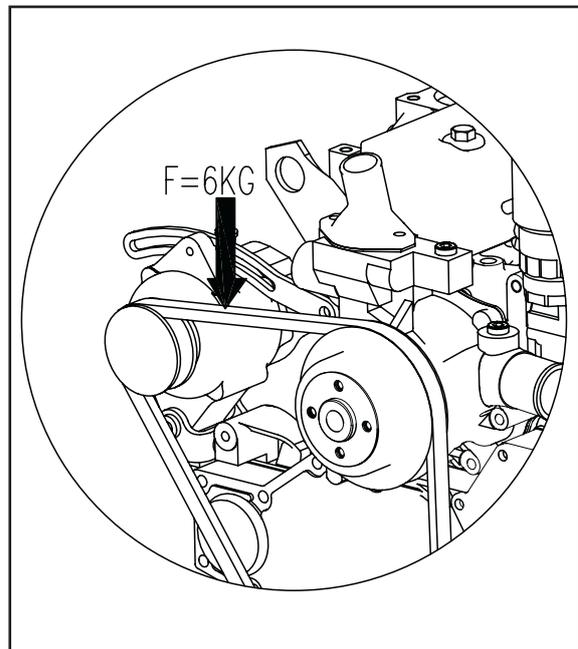
### ●Check the belt of the fan' tension

After 50 hours do the first checking.

Then check it every 100hours.

It must use the right tension of the belt to assure the engine working and the belt's use life

For the right tension belts, between the belt wheel of fan and belt wheel of generator, add 6kg on the belt vertically and the subquality product on the belt is about 5-10mm.



- Please see the attachment— 《User Manual for The Diesel Engine》 for the maintenance period of the other element and the ways

# Hydraulic System

## Maintenance manual

Capacity of the hydraulic oil tank-----	60L
Check the level of the oil-----	10h
Replace the filter-----	500h
Replace the hydraulic oil-----	1000h
Check the pressure system-----	500h



**warning: It brings the serious injury and death if the hydraulic oil or the axunge rip into the skin. Avoid your hand or body close the leaking area. It should use the paper to check it.**

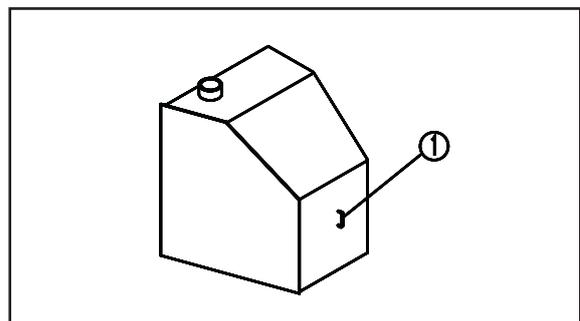
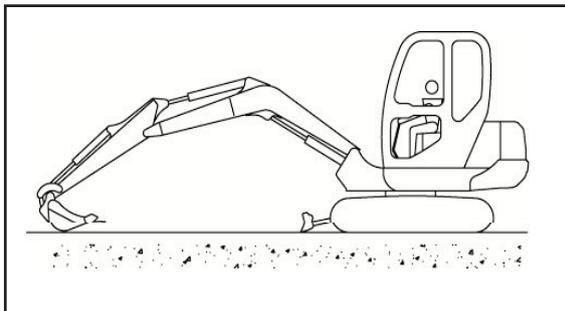


**Warning: For avoid hurt, it does the maintenance only after the hydraulic oil cool or before working everyday. When Take-down the flange cover of the sprue, it need turn the cover slow and release the pressure to avoid the oil spurt out.**

## 1.Check the level of the oil of hydraulic pressure tank

Check it every 10 hours.

- 1)Stop the machine on the road.
- 2)Start the engine and make the oil tanks reciprocation moving
- 3)Draw back the oil tank of the level, and throw out the oil tank of the bucket, then down the bucket. Lie the bulldozer to the ground, then stop. See the picture.
- 4)Observe the level of the oil thought the oil leveler of the hydraulic oil tank(see \*)

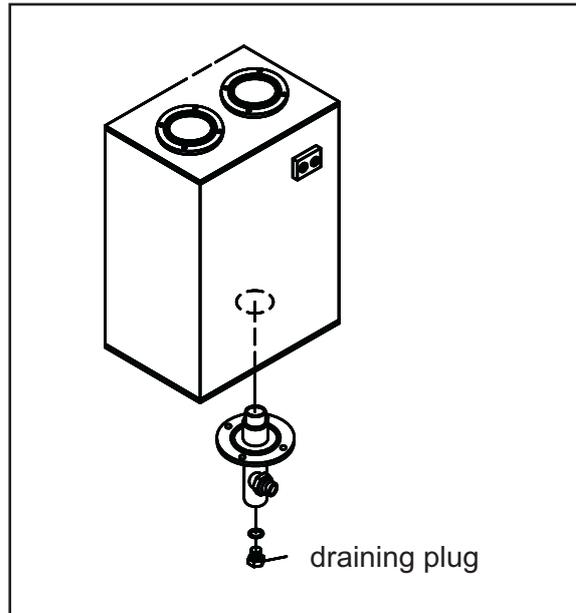


**Caution: The level of the hydraulic oil will change when the temperature up. Before operate, the level lie the middle of the oil leveler, and when the temperature up, the level will arrive the top of the oil leveler.**

## 2. Vent the water and the dust of the oil tank

Vent the water and the dust of the oil tank every 250 hours.

- 1) Vent the air of the oil tank after stop the machine and the temperature down or before start the machine everyday.
- 2) Loose the oil drain valve which lie in the bottom of the oil tank or the oil drain cock(see the picture)
- 3) Vent the water or the dust till the hydraulic oil is clean. Close the oil drain valve or screw down the bolt.
- 4) If the oil lacks, please refill it.



## 3. Replace the hydraulic oil and clean the filter

Replace and clean it every 1000 hours.



**Warning:** 1) Avoid the scald, it vents the oil only after the hydraulic oil cool or before start the machine everyday.  
2) When Take-down the flange cover of the sprue, it needs turn the cover slow and release the pressure to avoid the oil spurt out.  
3) No allow the water\*the dust\*the soil into the oil tank when it replaces the oil.

### Steps for replace the oil:

- 1) Park the Excavator to the level road
- 2) Loose the air filter of oil filter flange assembly on the oil tank, to lower the pressure in the tank.
- 3) Disassemble the cover under the air filter.

4) To extract hydraulic oil with oil pump and put it into an empty oil drum.

5) Loosen the draining valve or draining plug on the bottom of the oil tank, drain the remainder out completely.

6) Put down the oil intake filter.

7) Clean the inside of the oil tank.

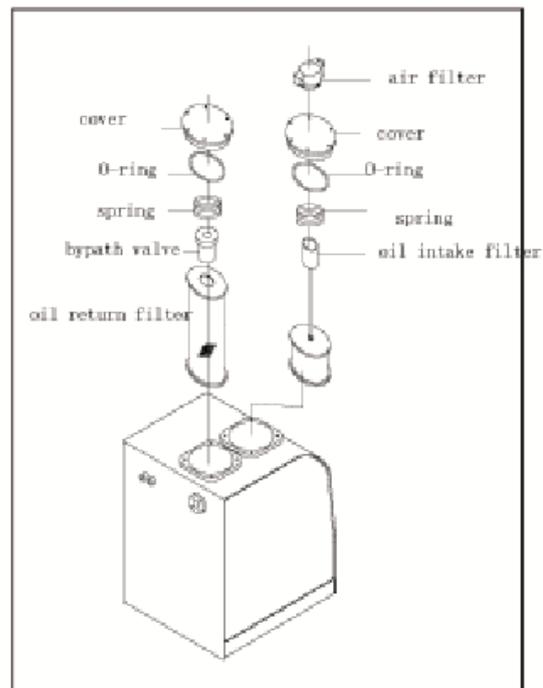
8) Clean the drain plug and reassemble.

9) Clean the oil intake filter.

10) Fill the regulated hydraulic oil (see oil choosing oil list)

Until the oil level has reached to the middle of the oil scale.

11) Assemble the oil intake filter and cover the air filter.



#### 4. Drain the air which in the hydraulic system

##### A. Drain the air which in the pump

1) Loosen the drain bolt of the vent, and check whether it has the oil out. Over the exhaust.

2) Over the exhaust\* screw down the bolt.

**Caution: If it run the pump without the oil, the pump will have the high temperature and make the pump break prematurely.**

##### B. Vent the air which between the pump and the hydraulic oil tank

1) Start the engine, and keep it run with the mid-speed

2) Operate the operation device slow about 5 minutes to vent the air

**Caution: If the engine runs with the high speed if it didn't vent the air which between the pump and the hydraulic oil, the pump also has the high-temperature**

##### C. Vent the air which in the oil tank

1) Under the engine runs with the low-speed, draw/throw out the oil tank to the part 4-5 times which the end of the driving about 100mm (It mustn't draw/throw out to the end)

2) Then operate the oil tank to the end of the driving 3-4 times

3) Last, operate the oil tank to the end of the driving 4-5 times, and vent the air

**Caution: If starts the machine and runs the engine with high-speed at once or the operate the oil tank to the end of the driving, the air which in the oil tank can destroy the piston airproof, and destroy the oil tank.**

##### D. Drain the air which in the rotating motor (when it vent the oil from the shell of the rotating motor)

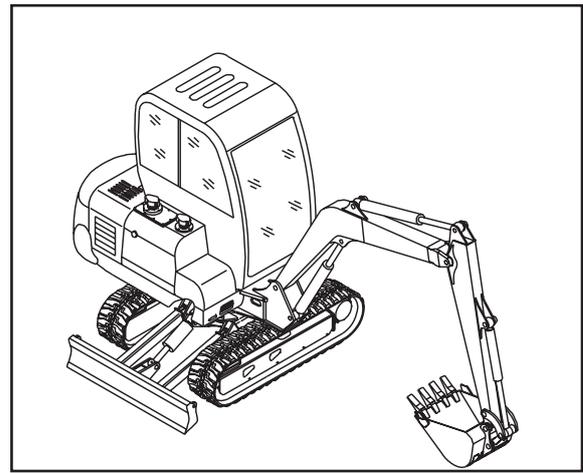
**Caution : Don't rotating the machine at any time during vent the air**

- 1) Run the engine with low-speed, loose the blowoff cock, examine whether the oil outflow from the drain bolt
- 2) If it doesn't have the oil outflow, take-down the drain bolt, then fill the hydraulic oil into the crust of the motor
- 3) After vent the air, screw down the drain bolt
- 4) Last runs the engine with the low-speed, and turn the frame of the machine to left/right about two times.

**Caution: If it doesn't vent the air which in the motor, it maybe destroy the bearing of the rotating motor.**

#### **E. Vent the air which in the driving motor (when it vent the oil from the shell of the driving motor)**

- 1) Run the engine with low-speed, loose the blow off cock. If the right oil outflow, screw the bolt.
- 2) Run the engine with low-speed, make the operation device rotating 90°, and let it lie in one side of the crawler. (See the picture)
- 3) Use the operation device uplift the machine, make one side of the crawler away the ground litter, and run the crawler 2 minute. Repeat do for the left/right crawler, and turn the crawler forwards and backwards.



#### **F. Vent the air which in the attachment**

If the machine has the attachment, it need run the engine with low-speed, and operate the footplate of the attachment (about 10 times), till the air vented from the pipe laying of the attachment.

#### **Caution:**

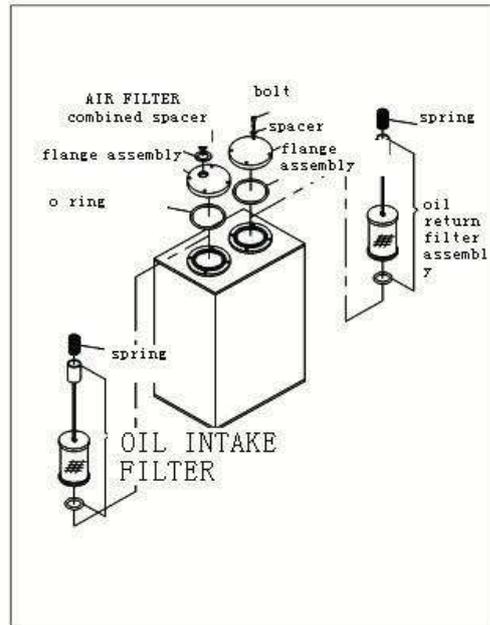
**If the manufacturer has the way for vent the air, it should do it as the way**

- 1. Abide the regulation of exhausting which formulated by manufacturer.**
- 2. After finish the operation, stop the engine. It need lay up the machine 5 minutes before start the operation to clear the air bubble of the oil tank**
- 3. It shouldn't leak when checking. Wipe the oil which spill over.**
- 4. After the operation, check the level of the oil. If the level of the oil low, it need supply it.**

## 5. Replace the filter core of the oil return

Replace it every 500 hours. The filter of the oil return in the hydraulic oil tank, so:

- 1) Unscrewing the cover on the top of tank.
- 2) Disassemble the spring, by-pass valve and oil return filter.
- 3) Clean the filter core with diesel oil and assemble the new filter core. Clean the spring and by-pass valve and reassemble them.
- 4) Screwing the cover of tank.

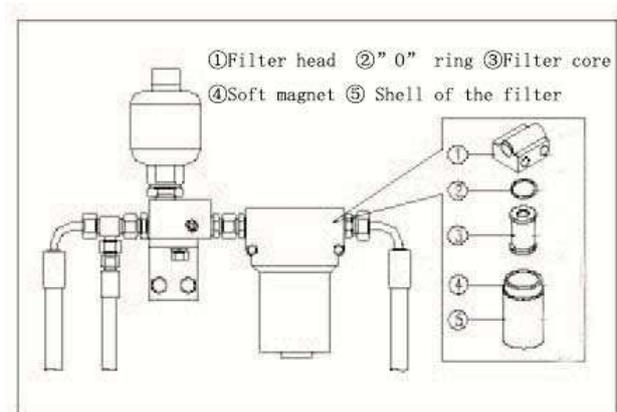


## 6. Replace the filter core of the guide pipe laying

Replace it every 500 hours.

**Caution: It must vent the pressure of the hydraulic oil tank before take-down the filter core**

- 1). Screw down the filter shell ⑤
- 2) Take-down the filter core ③
- 3) Install the new "O" ring ② into the groove of the filter head
- 4) Before install the new core, it needs to wipe the hydraulic oil on the surface of the sealer, and put the core into the filter head



- 5) Clean the filter shell ⑤ and soft magnet. No allow the dust and the water into the filter shell.
- 6) Screw down the filter shell and the filter head with the moment 25–35Nm
- 7) Connect the pipeline, and start the engine slow. And run 3–5 minutes vent the air
- 8) Place the machine on the level road, stop and check the level of the oil. It can supply the oil if it necessary. No let the oil over the highest limit

**■The replace period of the hydraulic oil and the filter core when it the attachment (Crush hammer, etc.)**

It increase the pollution of the hydraulic system when use the hydraulic hammer. The replace period of the hydraulic oil and the filter core reduces, too. Avoid destroy the hydraulic pump and other hydraulic elements, it suggest the periods as follow:

(Unit: Hour)

Working rate of the hydraulic hammer	Replace period of the hydraulic oil	Replace period of the filter core
50%	1000	300
100%	500	300

**Caution: It adjust the pressure of the system as the hydraulic hammer' request when use the hydraulic hammer**

# The Reducer

## Instructions of maintenance

Lubricant capacity of slewing reducer	1.6L
Lubricant capacity of reducer	2.5L (each side)
Check the lubricant oil level and refill	every 250 hours
Replace the lubricant	every 1000 hours
Check the tightening torque of reducer connecting bolt	every 500 hours

### 1. Check the level of the lube for the driving reducer and put on steam

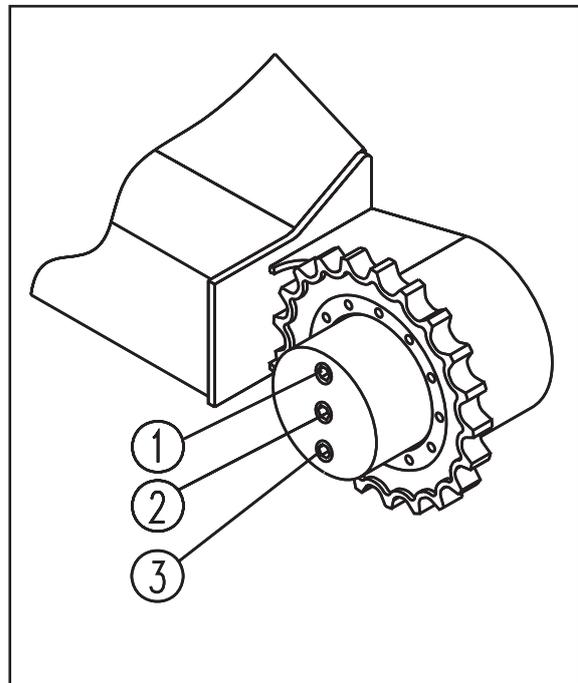


**Warning:** The oil of the reducer will heat when the machine drives. The driving reducer and the oil in the high-temperature after stop the engine. It will make scald.

**It must wait the oil cool before start. Loose the vent bolt two or three, it can take-down the bolt after release the air pressure. It is dangerous to take-down the bolt fast.**

#### Check it every 250 hours

- 1) Prepare an inside hexagon spanner.
- 2) Stop the Excavator on the level road.
- 3) Turn the driving reducer make the two bolt of the outboard in "a" position (see the picture), then stop the machine
- 4) After the oil cooling, open the bolt ①
- 5) After release the air pressure, use 12–15Nm the moment to screw down the bolt ①
- 6) Open the bolt ②, check the position of the level. The height of the level should arrive the bottom of the bolt hole.
- 7) It can supply the machine oil if it necessary (as the way to append the oil)
- 8) Clean the bolt ②, install to the reducer again. The tighten moment is 12–15Nm.



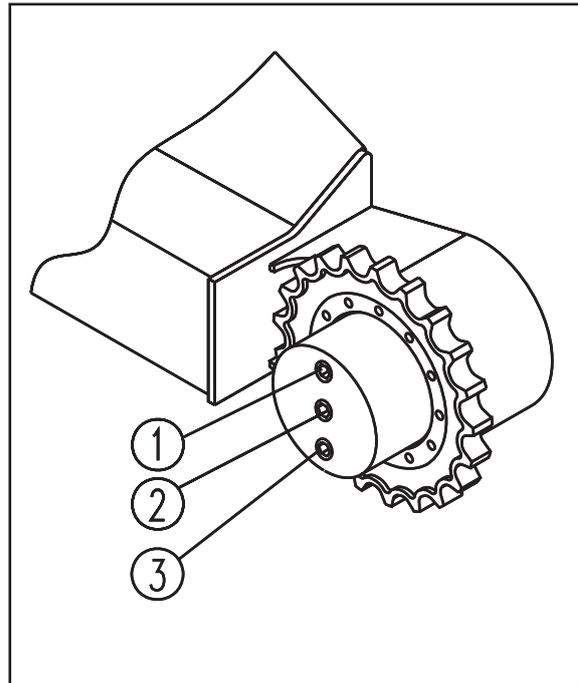
## 2. Replace the lube (For each reducer)

### Replace it every 1000 hours

- 1) Stop the Excavator on the level road.
- 2) Turn the driving reducer make the bolt ① in "b" position (see the picture)
- 3) Vent the oil when the oil of the reducer is in the hot state.

### Caution: Don't let the hot oil scald

- 4) Loosen the bolt ① and vent the oil, and loosen the bolt ② to make vent the oil complete
- 5) Turn the driving reducer make the bolt in "a" position
- 6) Append the operation lube through the sprue till there is oil out of check hole ②.



## 3. Check the tighten moment for the driving reducer with the connect bolt of the rotating reducer

### A. Fixing check for the connect bolt of the driving reducer

After runs 50 hours check it the first time.

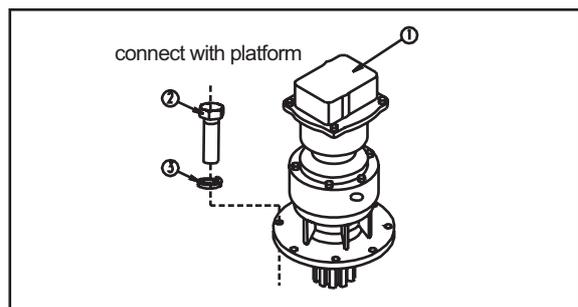
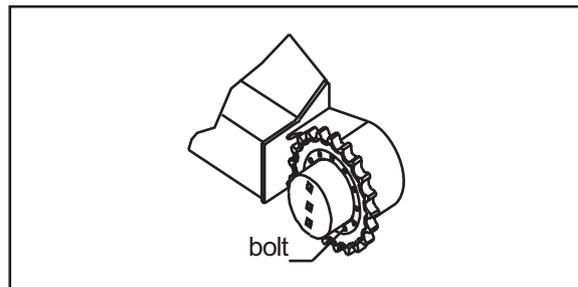
Then check it every 500 hours.

The tighten moment is  $150 \pm 10\text{Nm}$  for the bolt which connect the reducer, the base and the driving wheel.

### B. Fixing check for the connect bolt of the rotating reducer

After runs 50 hours check it the first time. Then check it every 500 hours.

The tighten moment is  $195\text{--}250\text{Nm}$  for the reducer and the bolt of the platform.



## Support Roller, Carrier Roller & Leading Roller

### 1. Check the tighten moment of the support roll

After 50 hours check it the first time. Then check it every 500 hours.

The tighter moment of the bolt ② is  $195 \pm 15 \text{ Nm}$

If it finds the bolt looses, it need screw it down and clean the thread additive which for lock and fix of the bolt. And wipe the additive again, then screw down it with the tighten moment which requested.

If it need to replace the bolt, it must use the same bolt.

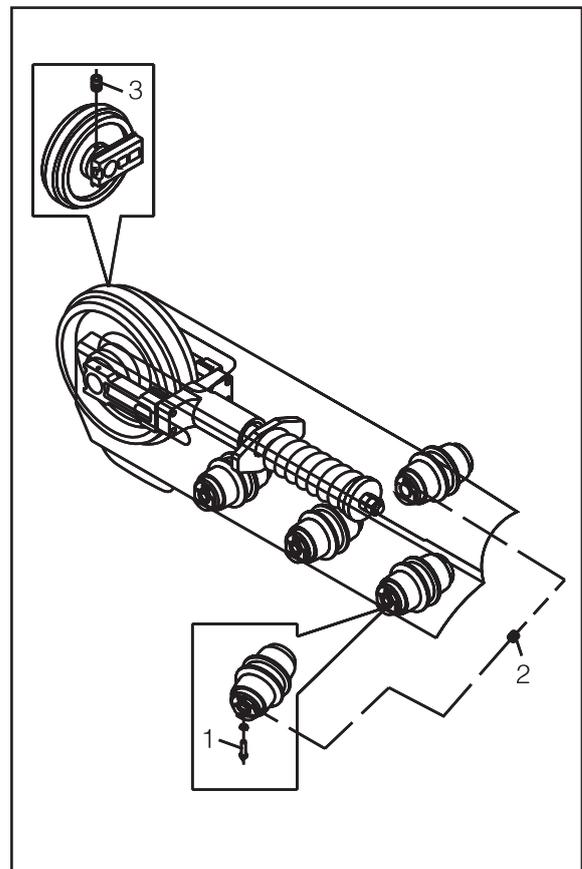
### 2. Check the level of the machine oil for the carrier roller and leading roller

Check it every 1000 hours.

1) Take out the nut ②、③ of the carrier roller and leading roller

2) Immit the oil

3) When the sprue has the oil out, screw down the nut ②、③ again.



1. Bolt of the support roller

2. Carried roller cock

3. Guide roller cock

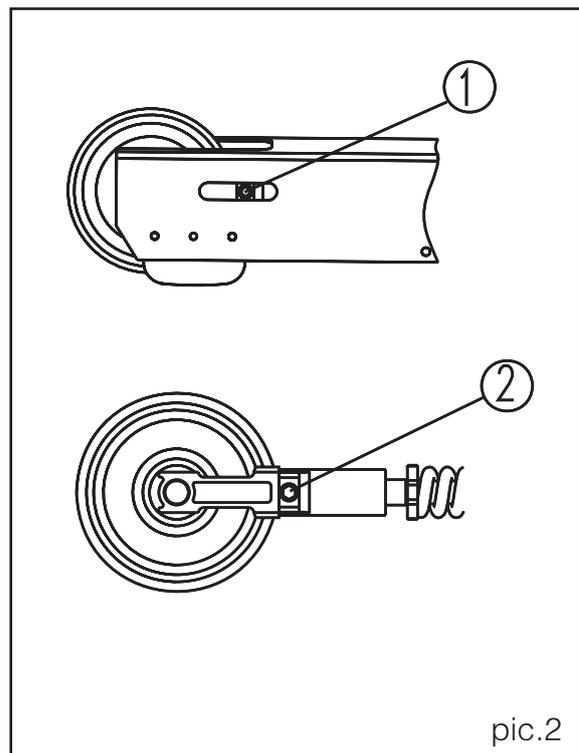
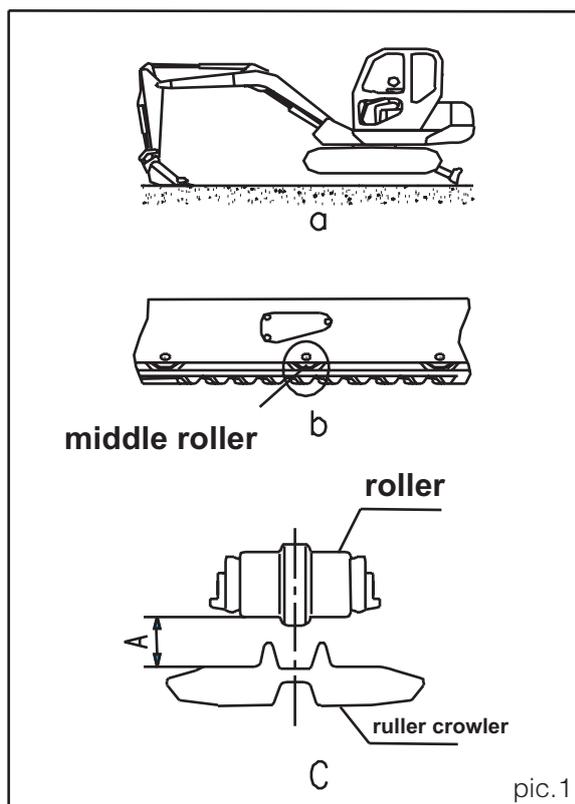
# Crawler

## Check and adjust the tension state of the crawler

Check it every 10 hours.

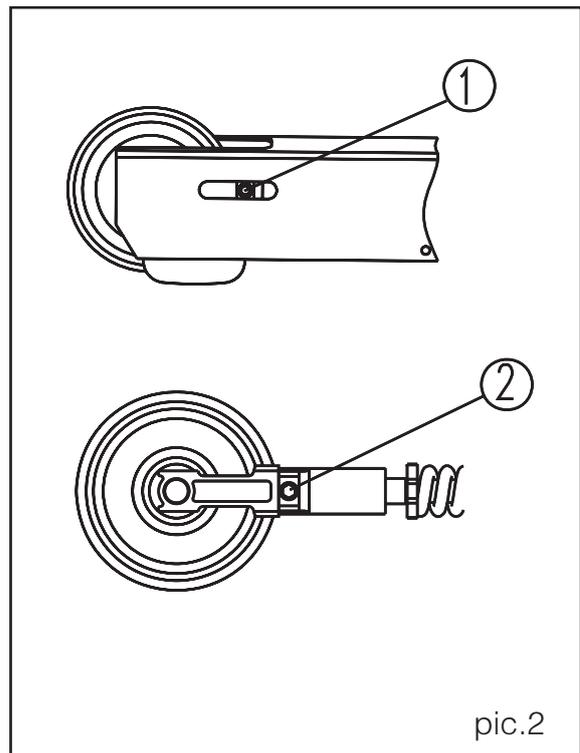
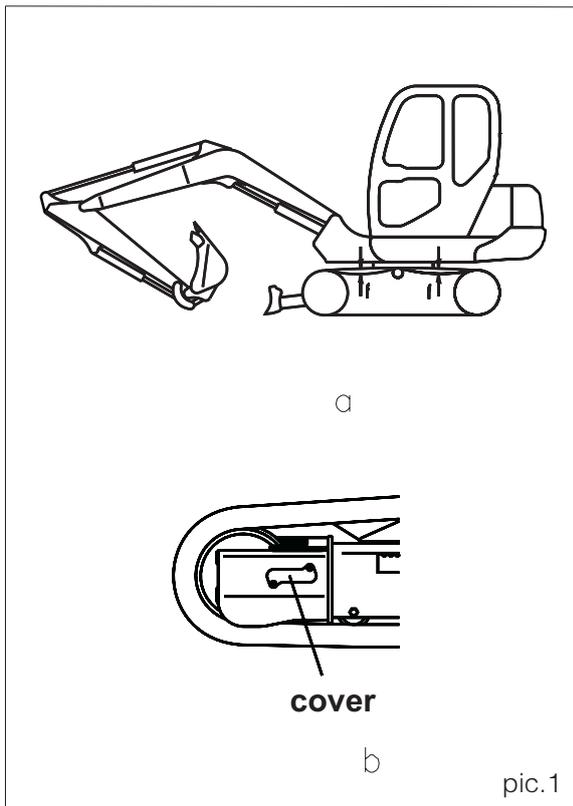
### A. Rubber crawler

- 1) Place the Excavator on the smooth and hared road.
- 2) Put the bulldozer back, and draw out the piston level of the oil tank till the crawler uplift.
- 3) Put the bucket on the ground, operate the moving-arm oil tank to uplift the foreside of the Excavator(a of the picture 1).
- 4) Adjust the tension of the crawler to make the A which between the middle part of the support roller, and the flexibility is 10-15mm
- 5) Take down each cover① of the crawler frame(b of the picture 1), show up the sprue of the tension device(③ of the picture 2)
- 6) For loose the crawler, first loose the tie-in\*(picture 2), to make the lube out till the tension screw down again.
- 7) For adjust the crawler, connet the tie-in of the grease gun and the tie-in③(picture 2). Then use the grease gun to fill the grease till the right tension.



## B. Steel crawler

- 1) Place the Excavator on the smooth and hared road.
- 2) Adjust the tension of the crawler to make the A which between the middle part of the support roller, and the flexibility is 10–15mm
- 3) Take down each cover① of the crawler frame(b of the picture 1), show up the sprue of the tension device(③ of the picture 2)
- 4) For loose the crawler, first loose the tie-in②(picture 2), to



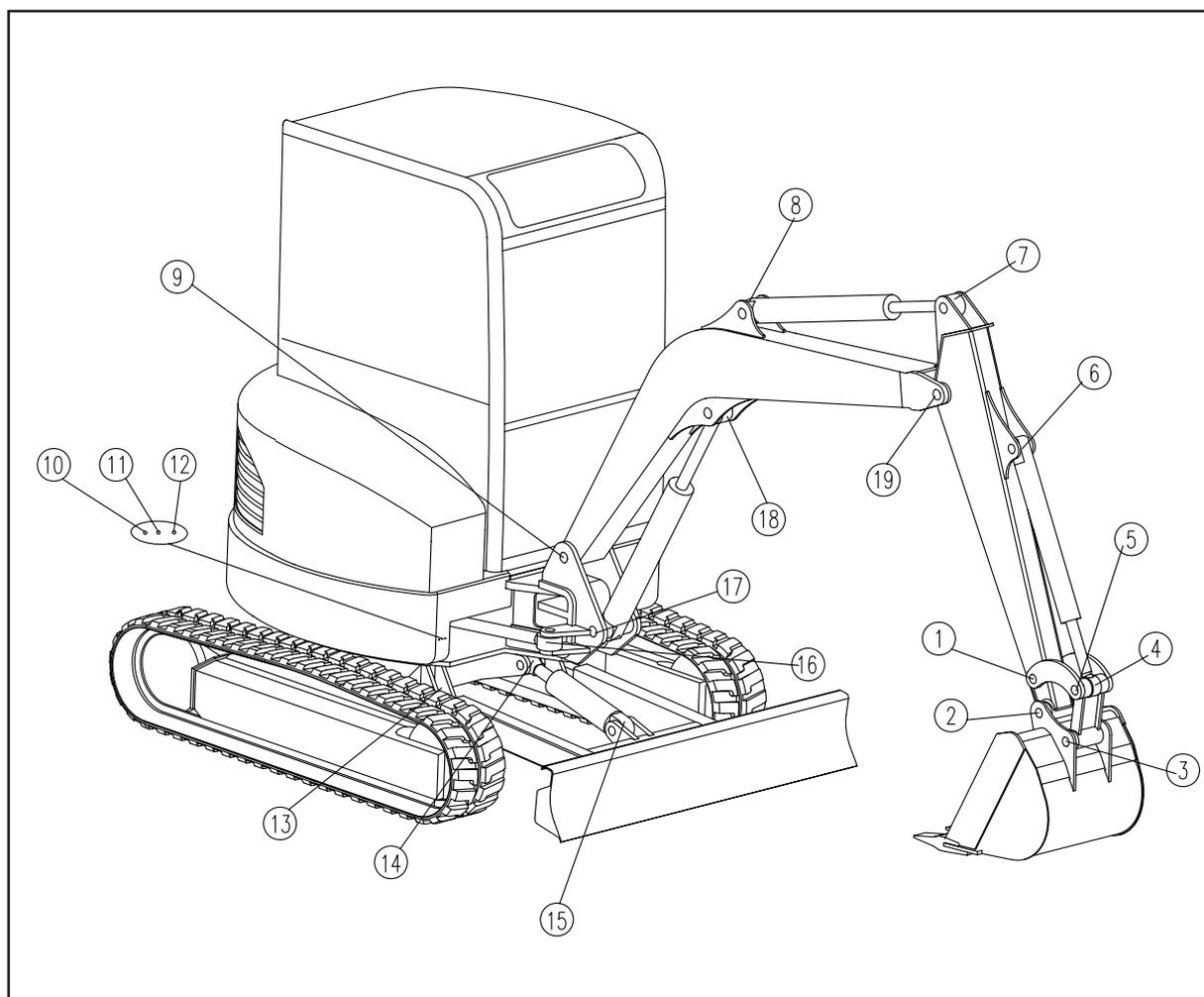
**Warning: Don't knock the tension spring of the crawler. The spring will rupture when it bear the large pressure. And hurt the person. Don't take-down the spring when it in pull state.**

## Lubricating

### Lubricating the parts which need every 50 hours

The step:

- 1) Start the operation device, and put the bucket to the ground
- 2) Put the bulldozer to the ground
- 3) Stop the engine
- 4) Clean the sprue of the oil cup
- 5) Lubricating the parts and wipe the superabundance



1. Joint between arm and bucket.
2. Joint between arm and bucket.
3. Joint between connecting rod and bucket
4. Lubricating point of bucket cylinder head
5. Joint between rocker and connecting rod.
6. Lubricating point of bucket cylinder end.
7. Lubricating point of arm cylinder head
8. Lubricating point of arm cylinder end.
9. Joint between boom and platform
10. Lubrication point of steering cylinder
11. Lubricating point of slewing support roller
12. Lubricating point of slewing support bearing
13. Joint between dozer blade and chasis
14. Lubricating point of dozer cylinder head.
15. Lubricating point of dozer cylinder end
16. Lubricating point of steering cylinder
17. Lubricating point of boom cylinder end
18. Lubricating point of boom cylinder end
19. Joint between boom and arm

## Air-condition(optional)

The main makeup of the air-condition as the following picture. The operation switch in the plane of the control box.

About the operation and the maintenance of the air-condition, please see the user manual and the air-condition user manual

.

### **1.Caution items of the air-condition maintenance**

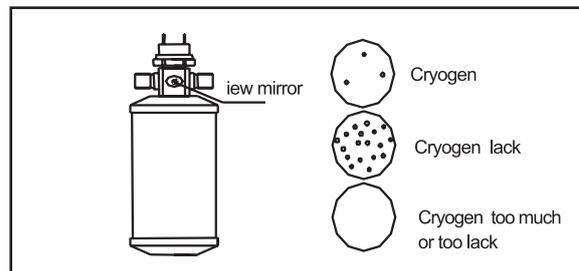
- 1)If the air-condition assembly has the dust screen. The dust screen must clean often. Otherwise, the dust will stop the dust screen and make the air not thought the heat exchanger
- 2)It should close the water warming valve, when it uses the refrigeration system in summer and use the draft system in spring and autumn. When it use the warming-up system, it should open the water warming and turn the air-condition's switch to "OFF"
- 3)The core of the caliduct connect to the water tank of the engine, if the core leaks, it will lead the water of the water tank lack, and make the engine overheat. In winter, it same to protect core not freeze as the water tank. Avoid the coolant freeze to make the core or the water tank freeze, please use the coolant which the manufacture requests, which produce the main machine. Please let out the coolant if the machine stops long time in winter when it maybe freezes.
- 4)Please run the thermantidote every 15 days if it doesn't use it long time. And run about 5-10 minutes every time.

## 2. Check the value of the refrigeration



The refrigerating agent is easy to frostbite the skin. And it emit the poisonous gas and light when the refrigerating agent near the fire. It need make sure the refrigerating agent no spray to the skin and the eyes when it need to take-down the refrigeration system. It should let it out then take-down it. No fire.

If the machine short of the refrigeration agent, the cooling performance will worse. Check the value every month or every 250 hours. According the view mirror of the desiccator whether has the air bubble to judge the value when the engine runs high-speed and the air-condition stay the refrigeration state.



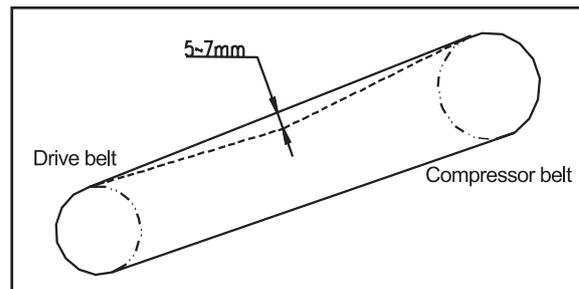
## 3. Check、 adjust the belt tension of the compressor

Check it every 250hours

### A. Check

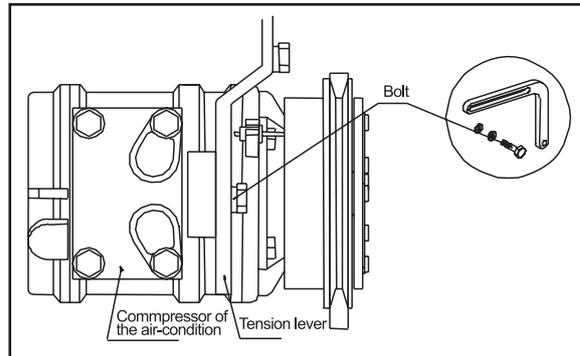
Use the finger about 12N power to press the middle part which between the drive belt wheel and the compressor belt wheel and check the deflexion about 5–7 mm

Check whether the belt destroy .It need to replace when the belt pulled ,no adjust value or the belt has the rift.



## B.Adjust

Loose the bolt(see the picture),use the tommy bar to open the compressor, adjust the belt to the suitable tension. And screw down the bolt.(If it necessary,it can loose the two bolts which for fix the compressor)



## 4、 Items of the time-ckeck

No.	Check Item	Check Content	Check Periods	
			Every Month	Every Quarter
1	Fastener	If loose、 fall off	★	
2	Belt of air-condition	The tension and fray	★	
3	Pipeline	If fray or rupture	★	
4	Tie-in	If fray or leak		★
5	Electric fan	Whether run normal	★	
6	Line	If fray、 burn	★	
7	Condensator	If has the dust stop		★
8	Electromagnetism clutch	If slip	★	
9	Compressor	If has the noise		★
10	Value of refrigeration agent	If the view mirror has the air bubble	★	
11	dust screen	If stop	★	

## Replacement of bucket teeth

It replaces the gear of the bucket before the base of the gear fray.



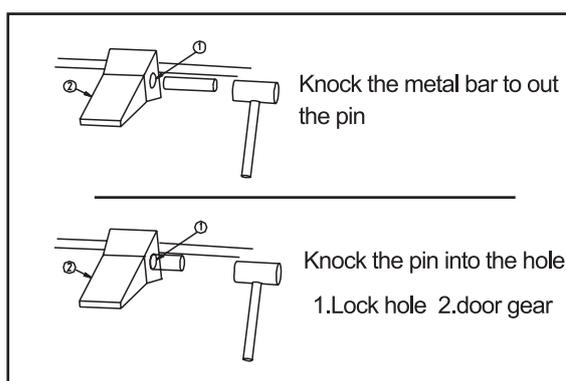
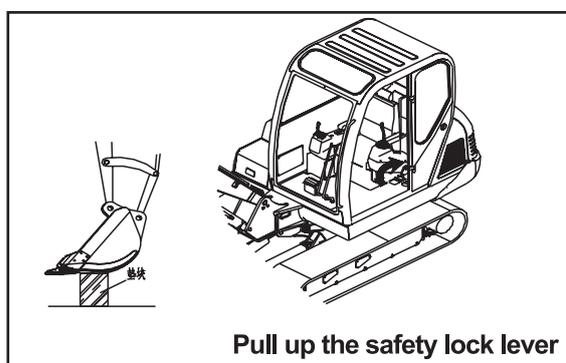
**Warning:** If the operation device because of the wrong operation and lead it moving, it very dangerous when replace the gear. Before replace the gear, it should make the operation device locked, then stop the engine and let all the joy stick locked. It need use the guard to avoid the axes out.

### Replace the teeth of bucket

1) Make the base device of the bucket on the stow-wood for take-down the axes. Check whether the operation device stay the tranquilization state and the bucket place level. Then push up the safety lever on the left control box, then stop the engine.

2) Put the metal stick which the diameter smaller than the axes on the axe's head, use the hammer knock the stick to knock out the axes, and take-down the teeth.

3) Clean the installing surface. Install the new teeth into the base of the teeth, use the hand push the axes into it, then use the hammer knock the axes into the lock to make the gear into the base of the teeth.



## Wash the plastic cushion

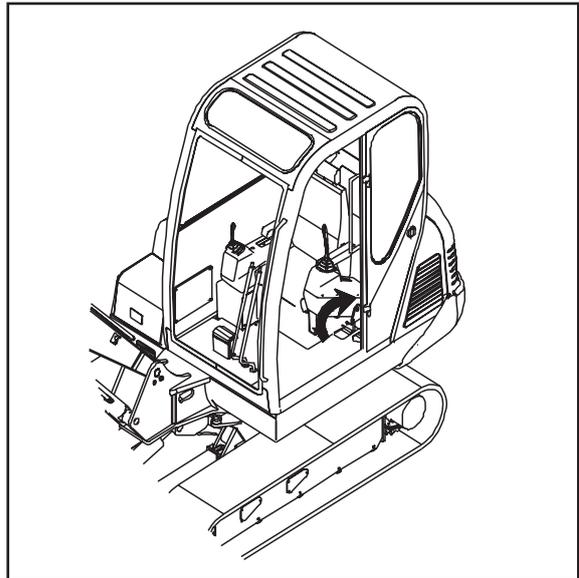
Avoid the floor slip\*tumble to make the accident, please wash it at any moment if it dirty.



**Warning:** If it touches the joy stick unguarded, the operation device or the machine will move, and lead the accident. So it must place the machine on the hard and smooth road before take down the plastic cushion. It must uplift the guide safety handle and the top control box to lock the guide system before the operator leaves the seat.

### The step for washing the plastic cushion:

- 1) Take the plastic cushion out the cab
- 2) Use the brush to washing the dunghill or use the water washing it.
- 3) Use the clean mop to clean the floor
- 4) After the plastic cushion is dry then take it into the cabin.



### Appendix: Account for black the circle of The Certificate of Quality

Backside of the certification has six circles in the bottom (see the picture). They use to indicate the equipment of the produce

## MATERIAL SAFETY PLEASE REFER

<b>1. Chemicals name</b>
<b>【dangerous articles name】 : Diesel Oil</b>
<b>【Chinese name】 : 柴油</b>
<b>【English name】 : Diesel Oil</b>
<b>【Molecular formula】 :</b>
<b>【Relative molecular weight】 :</b>
<b>【CAS number】 :</b>
<b>【Fatalness classification】 :</b>
<b>2. Composition and characteristic</b>
<b>【Basic ingredient】 :</b>
<b>【Appearance and characteristic】 : Viscous Brown Liquid</b>
<b>【Function】 : Fuel of Engine</b>
<b>3. Health Hazard</b>
<b>【Intrusion Approach】 :</b>
<b>【Health Hazard】 :</b> The absorb approach is breathing and it may bring emergency jury to the entrails. Diesel can cause contact dermatitis and oily acne. Breathing the fogdrop and chopping the liquid of diesel may cause aspiration pneumonitis. And the diesel can get into the brood of infant trough placenta. The exhaust gas of diesel irritates the eyes and chest, also cause the head dizzy and headache.
<b>4. Emergency Treatment</b>
<b>【Contacting skin】 : Take off the polluted clothes immediately and wash the skin with soap and clean water. Go to the hospital.</b>
<b>【Contacting eyes】: Wash eyes with flowing water and normal saline. Go to the hospital.</b>
<b>【Breathing】 : Away from the scene and go to the spot with fresh air. Keep better breath and provide the oxygen therapy if the person is lack of oxygen. If absence of breath happens, the artificial respiration must be taken. Go to the hospital.</b>

<b>【Eating】 : Adopting gastric lavage and go to the hospital.</b>
<b>5. Burning characteristic and fire fighting</b>
<b>【Flash point】 :38</b>
<b>【Lower limit of burning】 : No information</b>
<b>【Ignition temperature】 :257</b>
<b>【Upper limit of explosion】 : No information</b>
<b>【Hazard characteristic】 : Contacting with the fire, hyperpyrexia and oxidant may cause burning and explosion. Meeting the high temperature may cause cracks and burning.</b>
<b>【Approaches of fire fighting】 :Fireman must wear gas mask and protecting clothing, fire fighting should be carried out on the upper drift. Move the container to a open area from the fire scene and keep the container cool through sparing water on it. Withdrawing the area when the color of container changes or the safe equipment makes a sound.</b>
<b>Fire extinguishing agent: spray water, foam, dry agent, carbon dioxide and sand soil.</b>
<b>6. Emergency Treatment of Leaking</b>
<b>Withdraw from the polluted area to a safety yard and isolated the polluted area. Cut off the ignition source. Working person must wear respirator and the working uniform. Do the best to cut off the leaking source. Prevent the leaking into the sewers and ditches or any enclosing spaces.</b>
<b>7. Notice for stock</b>
<b>【Notice for stock】 : Stocked in the warehouse in shade and keep venting. Keep away from ignition source and fire. Do not stock with oxidant and halogen. Use explosion proof light and keep venting.</b>
<b>8. Protecting approaches</b>
<b>【MAC in China】 : Not listed</b>
<b>【MAC in Former Soviet Union】 : Not listed</b>
<b>【Examine approaches】 :</b>

<b>【Project control】</b> : Operating in a seal space and pay attention to the venting.
<b>【Protection of breathing systems】</b> : When the air consistency is exceeded, it is suggested to wear protection mask. Wearing respirator when emergent rescue happened or withdrawing.
<b>【Protection of eyes】</b> : Must wear protection glasses.
<b>【protection of body】</b> : Must wear protection clothing
<b>【protection of hands】</b> : Must wear rubber groves
<b>【other protection】</b> : No smoking in working area. Avoiding contacting over long period and repeatedly.
<b>9. Physical and Chemical Characteristics</b>
<b>【Melting point】</b> :-18
<b>【Boiling point】</b> :282-338
<b>【Relative consistency (water=1)】</b> :0.87-0.9
<b>【Relative consistency (air=1)】</b> : No information
<b>【Saturated vapor pressure】</b> : No information
<b>【logarithm of caprylicum/water Partition coefficient】</b> : No information
<b>【Heat of combustion】</b> : No information
<b>【Critical temperature】</b> : No information
<b>【Critical pressure】</b> : No information
<b>【Deliquescence】</b> :
<b>10. Stability and reacting activation</b>
<b>【Stability】</b> :
<b>【Polymerization Hazard】</b> :
<b>【Forbidden】</b> : strong oxidizer, halogen
<b>【production of burning decomposition】</b> :
<b>11. Toxicology</b>
<b>【Acute toxicity】</b> : LD50: No information LC50: No information
<b>【Thrill】</b> :
<b>【subacute and chronic toxicity】</b> :
<b>【Reproductive toxicity】</b> :

<b>【Carcinogenicity】 :</b>
<b>【Mutagenicity】 :</b>
<b>12. Environment</b>
<b>【Environmental information】 : No information</b>
<b>13. Discarding</b>
<b>【Discarding】 : Refer to the country and local laws. It is suggested to use method of burning.</b>
<b>14. Transportation</b>
<b>【Number of danger stipulation】 : No information</b>
<b>【Number of UN】 :No information</b>
<b>【Packing classification】 : No information</b>
<b>【Packing labels】 :</b>
<b>【Packing approaches】 : No information</b>
<b>15. Rules and laws</b>
<b>【Rules and laws】 : Refer to the related rules and laws which issued by state department and department of labor.</b>

#### Part I. Name of Chemicals

<b>Chinese Name of Chemicals:</b>	润滑油
<b>English Name of Chemicals:</b>	Lubricating oil
<b>Chinese Name 2:</b>	机油
<b>English Name 2:</b>	Lube oil
<b>Number of technical instruction:</b>	1279
<b>CAS NO.:</b>	
<b>Molecular formula:</b>	
<b>Molecular weight:</b>	230-500

#### Part II. Information of consisting

Hazard Ingredient	Content	CAS No.
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### Part III. Hazard Information

<b>Hazard classification:</b>	
<b>Approach of invasion:</b>	
<b>Health Hazard:</b>	Suddenly breathing can cause power lacking, head dizzy, headache, nausea and Greasy pneumonia if seriously. The slow contact can cause oily acne and contact dermatitis. And also it can cause neurasthenic, respiratory tract and eyes irritation. It is reported that those workers who contact lubricating oil have chances to get cancers.
<b>Environmental Hazard:</b>	
<b>Explosion and burning:</b>	Inflammable and irritant

### Part IV Emergency Treatment

<b>Contacting skin</b>	Take off the polluted clothes immediately and wash the skin with soap and clean water. Go to the hospital.
<b>Contacting eyes</b>	Wash eyes with flowing water and normal saline. Go to the hospital.
<b>Breathing</b>	Away from the scene and go to the spot with fresh air. Keep better breath and provide the oxygen therapy if the person is lack of oxygen. If absence of breath happens, the artificial respiration must be taken. Go to the hospital.

### Part V. Fire fighting

<b>Hazard characteristic</b>	<b>Contacting the fire, hyperpyrexia and oxidant may cause burning and explosion.</b>
<b>Noxious burning material</b>	<b>carbon monoxide, carbon dioxide</b>
<b>Approaches of fire fighting</b>	<b>Fireman must wear gas mask and protecting clothing, fire fighting should be carried out on the upper drift. Move the container to a open area from the fire scene and keep the container cool through sparing water on it. Withdrawing the area when the color of container changes or the safe equipment makes a sound.  Fire extinguishing agent: spray water, foam, dry agent, carbon dioxide and sand soil.</b>

#### **Part VI. Emergency treatment of leaking**

<b>Emergency treatment</b>	<b>Withdraw from the polluted area to a safety yard and isolated the polluted area. Cut off the ignition source. Working person must wear respirator and the working uniform. Do the best to cut off the leaking source. Prevent the leaking into the sewers and ditches or any enclosing spaces.</b>
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#### **Part VII. Operation and stock**

<b>Notice for operation</b>	<b>Operating in a seal space and pay attention to the venting. Operator must</b>
-----------------------------	--

	<p>wear protection glasses, protecting clothing and rubber gloves. Away from kindling and heat source, do not smoke in working place. Adopting explosion proof venting system and equipments. Preventing stem getting into the air in working place. Do not contact the oxidant. Handle the package and container with care to prevent rack and ruin. Equipment for emergency must be prepared. There may be some remained injurant in the empty container.</p>
Notice for stock	<p>Stocked in the warehouse in shade and keep venting. Keep away from ignition source and fire. Do not stock with oxidant and halogen. Equipment for emergency leaking and suitable container must be prepared.</p>

#### Part VIII. Contacting control/ Individual protection

Professional contacting limits	
MAC in China	No standard
MAC in former soviet union	No standard
TLVTN	No standard
TLVWN	No standard
Examine approaches	
Project control	Operating in a seal space and pay attention to the venting.
Protection of breathing systems	When the air consistency is exceeded, it

	is suggested to wear protection mask. Wearing respirator when emergent rescue happened or withdrawing.
Protection of eyes	Must wear protection glasses.
Protection of body	Must wear protection clothing
Protection of hands	Must wear rubber groves
Other protections	No smoking in working area. Avoiding contacting over long period and repeatedly.

#### Part IX. Physical and Chemical characteristics

Main ingredient	
Appearance and characteristic	Greasy liquid, light yellow to brown color. No odor or a little strange odor.
PH	
Melting point (°C)	No information
Boiling point (°C)	No information
Relative density (water = 1)	<1
Relative vapor density (water = 1)	No information
Saturated vapor pressure (kpa)	No information
Heat of combustion (kJ/mol)	No information
Critical temperature (°C)	No information
Critical pressure (Mpa)	No information
logarithm of caprylicum/water	No information
Partition coefficient	
Flash point (°C)	76
Ignition temperature (°C)	248
Upper limit of explosion	No information
Lower limit of explosion	No information

<b>Solubility</b>	
<b>Main function</b>	<b>Used for the friction of machine, lubricating, cooling and seal.</b>
<b>Other Physical and Chemical characteristics</b>	

#### **Part X. Stability and reacting activation**

<b>Stability</b>	
<b>Forbidden</b>	<b>strong oxidizer</b>
<b>Conditions for avoiding contact</b>	
<b>Polymerization Hazard</b>	
<b>Dissociation product</b>	

#### **Part XI. Toxicology**

<b>Acute toxicity</b>	<b>LD50: No information LC50: No information</b>
<b>subacute and chronic toxicity</b>	
<b>Thrill</b>	
<b>Sensitization</b>	
<b>Mutagenicity</b>	
<b>Teratogenesis</b>	
<b>Carcinogenecity</b>	

#### **Part XII. Ecology**

<b>Ecological toxicology</b>	
<b>Biological degradation property</b>	
<b>Non biological degradation property</b>	
<b>Biological enrichment or biological accumulation</b>	

<b>Other hazard information</b>	
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### Part XIII Discarding

<b>Discarding characteristics</b>	
<b>Discarding approaches</b>	<b>Refer to some related laws and rules. It is suggested to use burning as the discarding approach.</b>
<b>Notice of discarding</b>	

### Part XIV. Transportation

<b>Name of dangerous cargos</b>	<b>No information</b>
<b>UN NO.</b>	<b>No information</b>
<b>Packing label</b>	
<b>Packing classification</b>	<b>Z01</b>
<b>Packing approaches</b>	<b>No information</b>
<b>Notice of packing</b>	<b>Check the integrity and leak proof of container before transporting. Ensure there is no leaking, clasp, damage of container during transportation. Do not mix the oxidant and edible chemicals. The vehicles or ships must be cleaned and disinfected. The container must be away from bedroom and kitchen, also isolate from engine room, electricity and fire.</b>

### Part XV. Rules and laws

<b>Rules and laws</b>	<b>Refer to the related rules and laws about the usage safety, production, stock, transportation and loading, which issued by state department and department of labor.</b>
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### Attachment 3

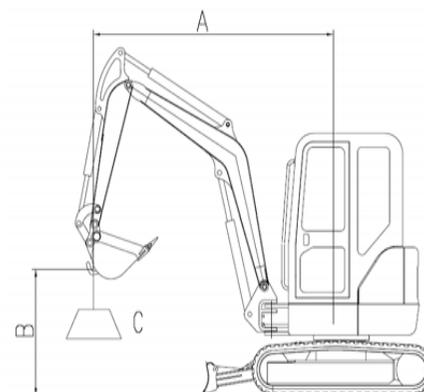
## YC55SR Lifting Capacity(Including bucket)

Rated Lifting Capacity in accordance with ISO10567;

Lifting capacity dose not exceed 75% of tipping load or 87% of hydraulic lifting capacity on the flat and solid ground,if the ground is loose then other dangerous factors must be considered.

Liftign capacity us 87%,the loding point is in the middle of jointed hole between bucket and arm.

Mark “\*” indicates that is limited by the hydraulic condition.



A: lifting radius  
 B: height of lifting point  
 C: lifting load

Liftign load of YC55SR excavator,standard configuration are boom and arm,bulldozer supporting.

Height of lifting piont B	Lifting radius A									
	2.5m		3m		3.5m		4m		4.5m	
	vertical	horizontal	vertical	horizontal	vertical	horizontal	vertical	horizontal	vertical	horizontal
3m					0.905*	0.767	0.786*	0.765	0.798*	0.653
2m	1.630*	1.487	1.240*	1.133	1.039*	0.983	0.913*	0.795	0.841*	0.559
1m	2.323*	1.133	1.640*	0.80	1.161*	0.569	0.933*	0.408	0.781*	0.281
0m	2.448*	1.304	1.650*	0.818	1.263*	0.554	1.016*	0.429	0.762*	0.274