



SHANDONG RIPPA MACHINERY GROUP CO., LTD.

Address: No. 39, Guang'an Road, Liuhang Sub-district Office,  
High-tech Zone, Jining City, Shandong Province.

☎ : (86) 18863720821

🕒 : (86) 18863720821

✉ : service@rippa.com

WWW.RIPPA.COM



# OPERATION AND MAINTENANCE MANUAL

## R32 PRO Hydraulic excavator

Warning: Unsafe use of this machine may cause serious injury or death. Operation and maintenance personnel must read this manual before operating and maintaining this machine. This manual shall be placed near the machine for timely access and all machine-related personnel.

www.rippa.com

First edition



# The symbol of the operating device

Operating devices are marked with symbols to facilitate operation and maintenance management. The meanings of the symbols are as follows. Please pay more attention on the basis of full understanding to avoid misoperation.

	Bucket dumping		The bucket is pulled up
	Boom descends		Boom lift
	Forward		Back off
	Spin left Swing left		Spin right swing right
	Pull up the lever		Boom extended
	The bulldozer shovel descends		The bulldozer lift
	The machine moves at a low speed		The machine moves at high speed
	Lock		Unlocking
	Fuel (light oil)		Working oil
	Battery charging warnings		Engine oil pressure
	Horn		Engine preheating
	Auto Idle		Operation lights
	Wiper and window washer		Water temperature gauge
	Lever limit position		


## Previous remarks


Thank you for purchasing RIPPA products.

This user manual explains the correct usage method of the product and simple inspection and repair. Please read and fully understand this content before use to bring out the best performance of the product you have purchased and to work safely and comfortably. The manufacturer does not directly supervise and guide the use, operation, inspection and maintenance of the machine. Therefore, users should operate correctly and safely. Also, please be fully aware that matters not recorded in this user manual may sometimes be subject to relevant laws, regulations, rules and insurance conditions depending on the content of the operation. After reading this manual, please be sure to keep it properly in your User manual favorites so that you can access it at any time if you have any questions. When the User Manual collection is damaged, be sure to replace it with a new one. Also, due to changes in product specifications, the product you purchase may sometimes not be consistent with the contents of this manual. We apologize for any inconvenience.



## Safety first

The precautions recorded in this book and the symbolic labels attached to machines are important items that could lead to personal accidents.  Be sure to read carefully and follow strictly.

Also, if the label with the symbol is dirty, damaged or fallen off, be sure to order it from your local store and post it in the designated place. 

### Marking about precautions

This manual marks the particular matters that need attention when using the machine as follows.



### ***danger***

It indicates that failure to follow the instructions may result in death or serious injury.



### ***warn***

Indicates that there is a risk of death or serious injury if the precautions are not followed.



### ***note***

Indicates that there is a risk of injury if the precautions are not followed.



### ***significant***

It indicates that failure to follow the precautions will cause damage to the machine or trigger a malfunction.

### ***supplement***

Indicates other supplementary instructions that are helpful for use.



## About Specifications

This manual also provides instructions for different models and specifications of the product. Please confirm the model and specification of the product you are purchasing before proceeding to avoid mistakes.





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## Please read this for safe operation

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Before using this machine, please read and understand this In order to ensure safe operation, The following are the precautions that must be followed. In addition, this In this case, the text is attached  **danger** ,  **warn** ,  **note** ,  **significant** ,  **supplement** signs for attention.

### Pay attention to comply with local regulations

Some areas may require compliance with government regulations for minimum insurance levels, work permits or certifications, guardrails around work areas, operating hours, etc. When performing certain work, there may be reference standards or restrictions on equipment. Check and comply with local regulations regarding underground utilities and cables. Safety requirements.

For safe operation, be sure to observe the following.

### Basic safety matters

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1. Before using this machine, be sure to read this instruction manual carefully and operate safely on the basis of full understanding.
- 2 When lending this machine to others, please provide detailed instructions on how to use it and instruct the person taking over to read the "Instruction Manual" carefully before use.



- 3 When it is ROPS cab specification, fasten your seat belt at all times while driving.  
Do not use seat belts when the ROPS cab is not equipped.
- 4 Do not modify the ROPS cab. Also, in the event of damage that affects strength, bending, etc., do not repair it directly and replace it with a new ROPS cab.
- 5 Do not drive with the ROPS cab removed.







## Please read this for safe operation

6 Wear a helmet, safety shoes and safety clothing when operating and maintaining. Please wear protective glasses, dust masks, soundproof devices, protective gloves and safety belts as required for your work. Please ensure that all protective gear is functioning properly before use.



Keep the area around the driver's seat clean. If there is oil, grease, ice, snow and mud attached to the pedals and handrails, it can cause skidding. Also, check for dirt attached to the shoes, etc.

### 7 Prepare safety supplies

Prepare safety supplies in advance for use in case of injury or fire.

- Prepare first aid kits and fire-fighting equipment.
- Note down in advance the addresses of emergency doctors, ambulances and fire stations.

8 Do not use this device if you are drinking alcohol, sleep deprived, pregnant, overly fatigued or sick.



### 9. Please have a routine check-up.

- Please check if there were any anomalies (leaking oil, leaking water, loose bolts and nuts, broken electrical wiring, loose terminals, etc.) during the last use. If there were any anomalies, please handle them accordingly.
- Use the specified brand of fuel and grease.



10. Please make sure to install the safety cover and protective cover before use.

11 Turn off the engine when refueling, lubricating, checking and adjusting.

No fire or smoke when refueling.

Also, be fully careful not to let the fuel spill.





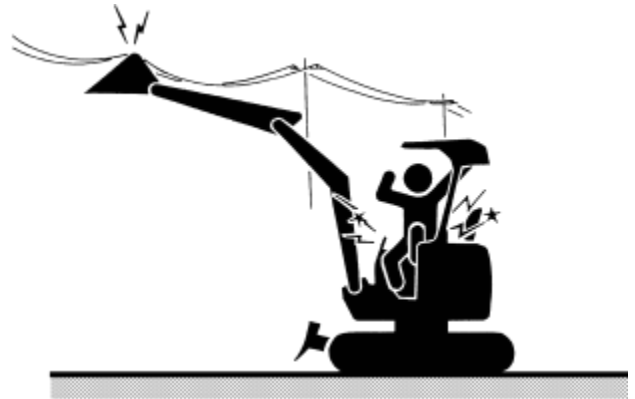
## Please read this for safe operation

12. No one is allowed to enter under the bucket when it is lifted.

13. When pulling up the bucket, do not touch wires or obstacles above your head.

Especially when touching wires, you may die from electric shock, so be sure to be careful.

14 Do not drive when you have drunk alcohol, taken medicine or are in poor health. Otherwise, it will cause an accident.



# Please read this for safe operation

## Notes before work

1 Make sure there is no one around the machine.



2 Make sure to confirm the following before starting the engine.

- Be sure to sit in the driver's seat when starting.
  - Please make sure the automatic idle switch is "in action" and "off".
  - Make sure all levers are in the "neutral" position. Please "start" the engine while lifting the lock lever of the left operation handle.
  - Since the muffler exhaust pipe faces backward, make sure there is no one behind the machine. Also, when working near a wall or tree, sometimes the wall can be blackened by the exhaust gas and the tree can wither due to the heat of the exhaust gas. Therefore, take protective measures for the wall or tree before working.
  - Make sure there are no flammable materials around the engine.
  - Make sure the bucket is in contact with the ground. The exhaust gas emitted poses a risk of poisoning. Therefore, when conducting operations indoors or elsewhere, please ensure adequate ventilation. In addition, inspection work should be carried out outdoors.



3 Be careful to hold the handrails when getting on or off the vehicle to avoid slipping. Jumping on or off is extremely dangerous.



Never get caught in the control handle when getting on or off the vehicle.

4. In a machine with adjustable driver's seat, adjust the driver's seat to the proper position.

5 Check the direction of the machine before shifting gears. If you don't pay attention to operating the lever, you may move in the opposite direction against your will, which is very dangerous.



6 After starting the engine, check the working conditions of the bucket, boom, boom, bulldozer, travel and rotation, etc. The inspection should be carried out in an open area where there are no people around and no obstacles. If any abnormality is found, repair it immediately.

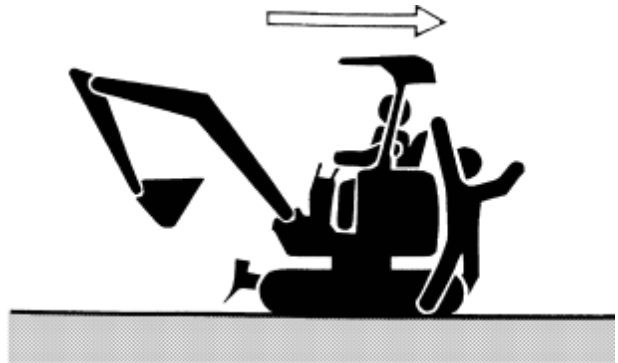
## Please read this for safe operation

### Notes during the work process

1. For those who are driving the machine for the first time, please operate it at a low speed before getting used to the operation. OK.
2. Sit in the driver's seat and operate correctly (Strictly prohibit : Looking around, jumping on or off, etc. ), please do not allow anyone other than the driver to ride on the vehicle.  
Never sit on the bucket.
3. It shall not be used for any other purpose. Otherwise, not only will it lead to The body may malfunction and cause unexpected accidents.



4. When moving the machine, make sure there are no people or obstacles around. During the operation, Absolutely not No one is allowed to enter the working area.
5. In places with poor visibility ahead and bad terrain Operation, please set up a commander and follow the commander's signal Do your homework.



6. Before operating the travel handle, please confirm the direction of the machine. Partially facing rearward ( Idle wheels and dozer blade are located at the rear. ) When the travel handle is pressed forward, it will move backward, and when the travel handle is pulled backward, it will move backward. The handle moves forward. Before starting, Please make sure that the front, back, left and right sides are Then proceed after it is in a safe state.

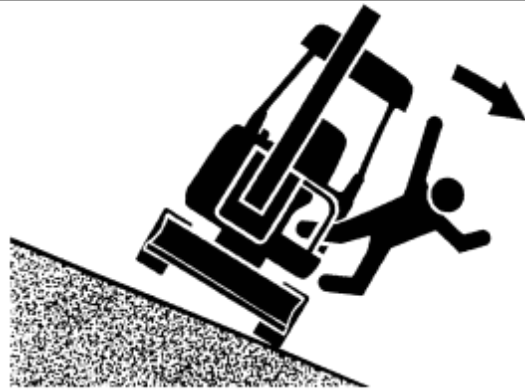
(If you are careless during operation, it will move in the opposite direction. This is very dangerous )



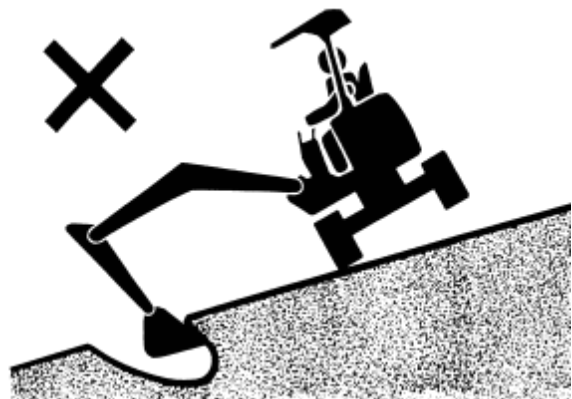


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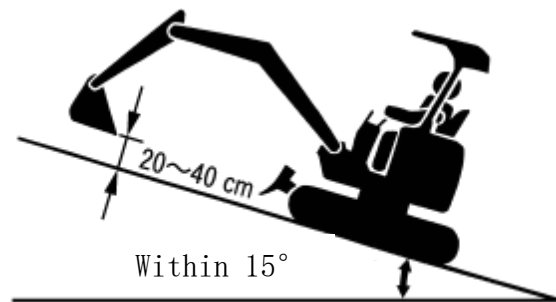
7. Never make a turn (turn around) or cross on a slope, which can cause a rollover or skidding, which is very dangerous. Turn on flat ground. Drive along the maximum slope line when going up or down slopes.



8. Do not swing or rotate the machine on a slope. and excavation operations, otherwise there is a risk of overturning. When working on a slope, the machine should Place it level before proceeding. Do not drive over rocks or soft dirt. Do the homework. When climbing up a slope, if you drive your car onto a rock or bump If the vehicle is driven on an uneven road, it may overturn. It is dangerous, so please do not climb in such places.



9. When driving or climbing, please keep the rotating frame and working device facing forward. square(Place the idler wheel and dozer blade at the front ), so that the bucket Get off the ground below 20 ~ 40cm, so that in case of danger In such cases, it can be lowered directly to the ground to ensure stable driving. Go up and down the ramp while swinging. Also, please do not drive on a slope of more than 15 degrees. Otherwise, there is a risk of overturning.



10. When driving up or down soft slopes, if the machine is likely to slip, immediately lower the bucket to act as a brake.



## Please read this for safe operation

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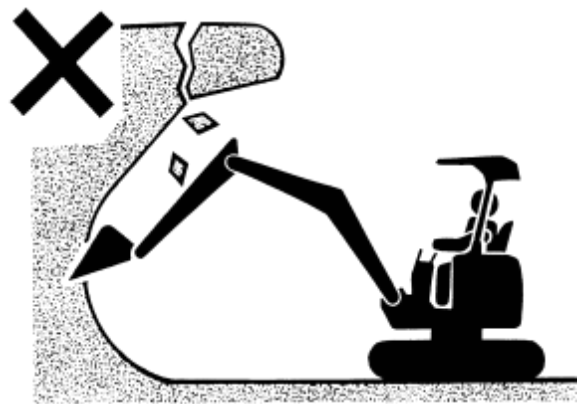
11. When moving near cliffs or embankments, leave sufficient leeway or take appropriate measures such as reinforcement to prevent the ground from collapsing. Also, do not approach sites where there is a risk of falling rocks.

Driving after rain is even more dangerous. Never approach a cliff or embankment unprepared.



12. When digging beneath the machine body, be sure to pay full attention, otherwise it may overturn due to ground collapse.

13. Do not dig a pit under a cliff. It is dangerous. Cliffs and ground collapses can cause rockfalls.
14. If the work site or road conditions are poor, the stability of the machine will decline, and operational errors may cause accidents or even rollover. Therefore, while leveling the work site, also level the road surface or drive away from obstacles. Also, when driving on Bridges or buildings, investigate the allowable load and reinforce it if the strength is insufficient.



15. Generally speaking, it is more likely to roll over in the lateral direction than in the forward and backward direction. For this reason, do not rotate laterally when the working device is under heavy load.
16. When it rains or there is water, using wooden boards, iron plates, etc. is prone to slipping. Be sure to be fully careful when working in such slippery areas.

17. When working in places with electrical wiring, gas pipes, water supply and drainage systems, etc., experts should be present to guide.

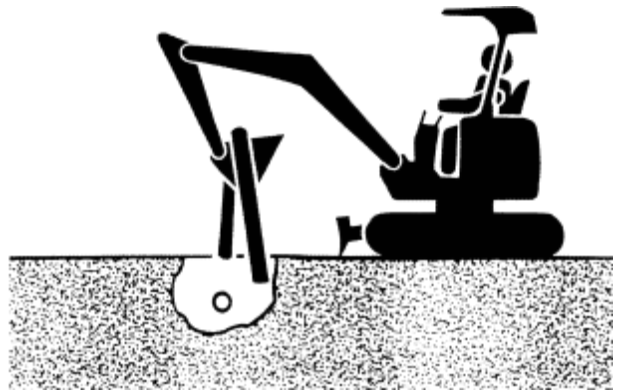




## Please read this for safe operation

18. When the bucket teeth are hung on stones, etc., they may overturn due to the reaction force when they fall off from the surface of stones, etc. Therefore, be sure to pay full attention when working.

Also, never drive while the bucket is in the ground or dig while the body is floating, which is very dangerous.



19. When working in a building, pay full attention to the strength of overhead surfaces, exits, passages and floor surfaces.



20. Regarding cargo lifting operations

The lifting operation of goods is dangerous because it may cause the goods to fall or the vehicle to overturn.

- Never use this machine instead of the crane for work.





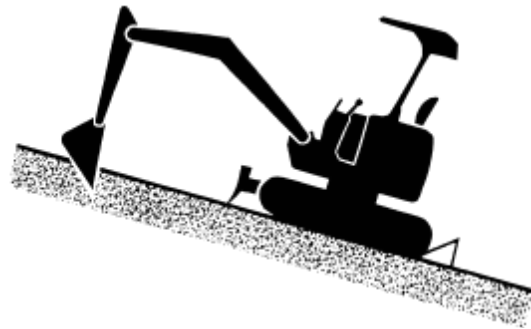
## Please read this for safe operation

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### Notes after work

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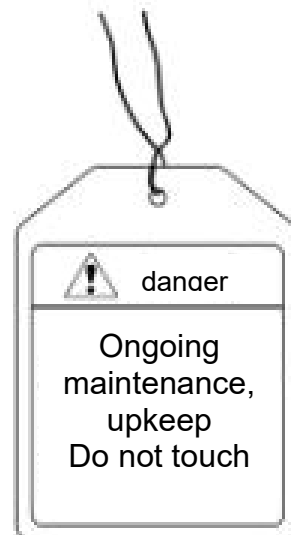
1. Always park your vehicle on level ground.  
If you have to park the vehicle on a slope, please Insert into the ground and brake the tracks.
2. When leaving the driver's seat,
  - Please lower the bucket to the ground
  - Locking handle lock lever
  - Stop the engine and remove the key.
3. When storing the machine, the protective cover should be placed on the high temperature parts such as the muffler.  
Allow to cool slightly before covering.  
(Otherwise there is a risk of fire.)



### Precautions during maintenance

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1. Inspection and cleaning of the machine body and working device, and inspection of each part When making adjustments or leaving the driver's seat, be sure to turn off the With the engine still running, It is very dangerous to conduct the inspection.  
Please choose a place with no danger and a solid, flat ground. Then check again.
2. When maintaining the machine, Please place it in a conspicuous place on the machine. Put up a "Maintenance in Progress" warning sign. Prevent unintentional contact with the machine. In the machine week Please also put up a warning sign.





## Please read this for safe operation

3. When performing maintenance or refueling, remove any items that may cause the fuel or battery to ignite.

Fire prevention measures:

- Please use non-flammable oil to flush parts, etc.
- Eliminate any ignition sources that pose a hazard.
- Please prepare fire extinguishers and other firefighting equipment.
- When checking fuel, oil, battery fluid, etc., please Use explosion-proof lighting fixtures.
- Especially when performing grinding or welding operations, keep away from Kindling.

4. Battery gas may cause fire and explosion.

- Do not create sparks near batteries or approach fire. source.
- Do not use metal sheets to short-circuit the two poles of the battery. Check. This is dangerous. Always check with a voltmeter or hydrometer.
- Do not charge a frozen battery. Otherwise there is a risk of explosion. When the battery is frozen, keep the battery temperature at 15 °C above.
- Battery solution (dilute sulfuric acid) Can cause blindness or burns If the battery fluid sticks to your skin or clothes, but Please rinse immediately with plenty of water. If battery solution splashes into eyes, rinse with plenty of water. After rinsing thoroughly with plenty of water, seek medical attention immediately



5. If the battery liquid level is at LOWER (minimum liquid level line) Please do not use or charge below. If in LOWER (Minimum liquid level) Continue to use the following, It will accelerate the aging of the internal parts of the battery, not only shortening The battery life may be shortened and may cause an explosion. Please add water immediately to bring the liquid level to UPPER LEVEL ( superior limit ) and LOWER LEVEL ( Lower limit ) between. ( Refillable water Battery )



6. When performing maintenance indoors or in a poorly ventilated area, ensure adequate ventilation. Adequate ventilation is essential



## Please read this for safe operation

especially when the engine is emitting exhaust or when handling fuel, flushing oil, paint, etc.

- 7 When maintaining, use proper tools that are suitable for the purpose. If proper tools are not used during maintenance, not only will the work efficiency be low, but injuries may also occur.
8. Maintenance and inspection around the engine should be carried out only after the outer cover brackets are securely fastened.
9. When it is necessary to interrupt the operation to disassemble the hydraulic system part, lower the bucket and the bulldozer shovel to the ground and then shut down the engine.

After starting the machine, all equipment, as well as working oil and lubricating oil, are at high temperature and high pressure. There is a risk of scalding when the working oil is at a high temperature.

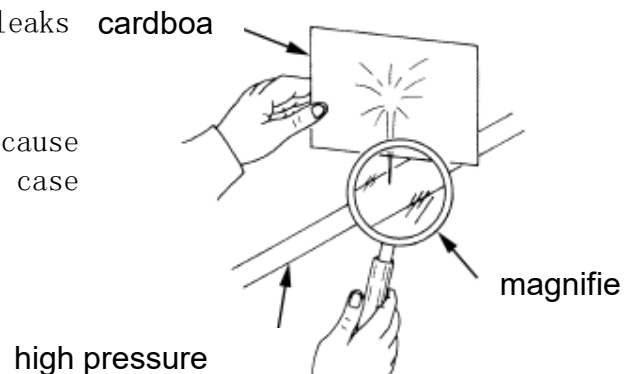
The working oil sprayed out under pressure has the force to penetrate the skin and can cause injury. Also, since plugs or screws flying out can cause injury, disassemble components of the hydraulic system only after the temperature of each part has dropped and the residual pressure has been released. When loosening plugs or screws, do it slowly with your entire body away from the front.

In addition, when fuel and oil leak under high pressure, please be extremely cautious and never bring your hands or face close to the leaking area. It is extremely dangerous to face the leak.



10. Wear protective glasses when looking for leaks from invisible small holes and use straw cardboard to help locate them.

Once the oil penetrates the skin, it may cause a more severe allergic reaction, in which case you should see a doctor immediately.





## Please read this for safe operation

11. Check, replenish and replace the radiator coolant only after the engine has cooled down sufficiently.

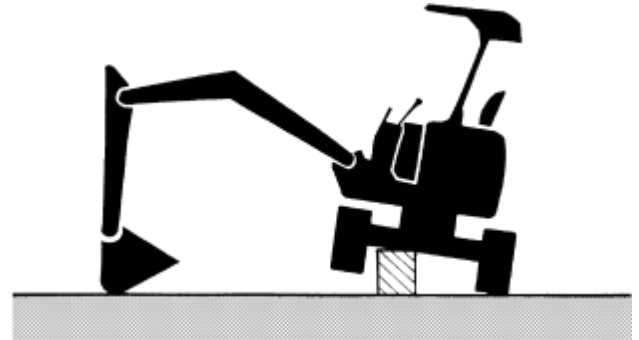
Immediately after the operation, if the radiator cap is loose, steam or hot water will spray out, sometimes causing scalding. Also, loosening the vent plug or plug can sometimes cause scalding by hot water. Also, after the engine has just stopped, the muffler is still at high temperature, so be careful not to touch it to avoid scalding.



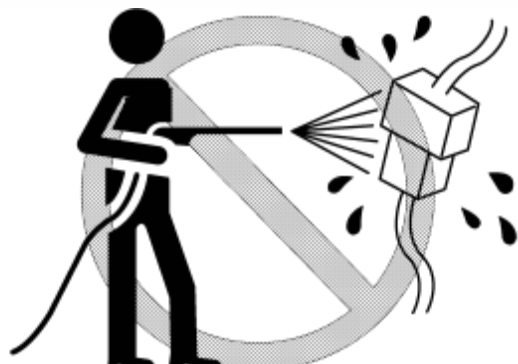
- 12 When welding directly on the engine block, turn the starter switch to the "STOP" position. Also, during the welding process, do not place components between the welding area and the ground that may cause the cylinder or sealed bearing to be electrified and result in poor conditions, as they generate heat and sparks.

- 13 Lift the machine with a working device for maintenance and repair

Do not enter the body at this time. If it is necessary to go down, place a safety pad and a safety pillar underneath to prevent a sudden drop. Also, please place the handle lock rod in the locked position.



14. If the electrical system is flooded, it may sometimes cause a short circuit or Otherwise, the instrument and starter switch may malfunction. Electrical installation parts such as switches, batteries, sensors and connectors Piece.





## Please read this for safe operation

### Transportation Notes

● Please note: When moving this machine, always use a truck.

1. Please be sure to comply with transportation regulations and ensure safe transportation. Drive.
2. When loading and unloading, The truck should be parked on a level surface and Apply the brakes and apply pressure to the front and rear wheels to ensure that the wheels are in a stable position. will not move, then set up a device with sufficient strength and width Unloading platform for loading and unloading.

If you have to use a loading plate, be sure to use a sturdy one and remove any oil or other materials that may cause slipping. of material and then slowly load and unload.

Place the working device facing the travel direction, and align the boom with the loading and unloading plate. Vertical or slightly raised position, the bucket and loading platform Leave space 20 ~ 40cm Please use the length of the car box Height(H)4 More than times the loading and unloading board.

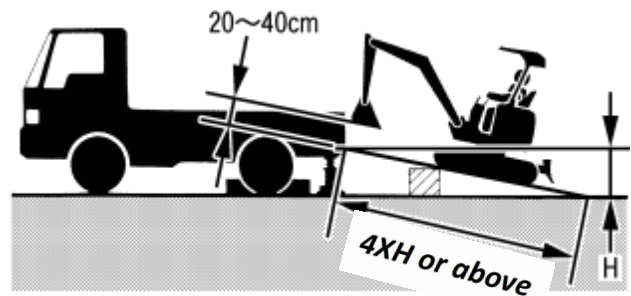
If the loading platform is bent significantly, use the **"bracket"** (Support table) To prevent the loading and unloading plate from bending.

Do not use loading and unloading pallets for loading and unloading on rainy days.

because The loading and unloading plate is easy to slip and very dangerous.

Never use a loading platform or dock leveler when not in use. Do not lift the machine body by the boom or arm. Loading and unloading operations may cause falls or rollovers. It is very dangerous. In addition, it is strictly forbidden to adjust the direction on the loading and unloading board.

3. On the truck, place the bucket and dozer blade in contact with and secure them to the truck. The crawler is then braked and the wire rope is used to Secure the machine body to the truck bed surface.







## Please read this for safe operation

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In addition, due to different truck models, some trucks need to The bucket is stored in the truck's fender and secured with wire ropes. to prevent the bucket from moving.

4. Please do not start or stop the vehicle suddenly during transportation. Cars, sharp turns, Otherwise the machine will move or lose balance. Balance is extremely dangerous. (Please read carefully for details **"Truck Transport"** , Then, perform the above operation.)







## Please read this for safe operation

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### Regular checks should be conducted

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In order to use the machine safely and prevent accidents, please be sure to perform regular inspections. The time recorded in this article is the time indicated by the hour meter. The actual inspection should be based on this time and the date should be determined on a daily, weekly or monthly basis for maintenance.

occur during the use of the machine . In this case, the article is attached  **danger** ,  **warn** ,  **note** ,  **significant** , **supplement** signs for attention.

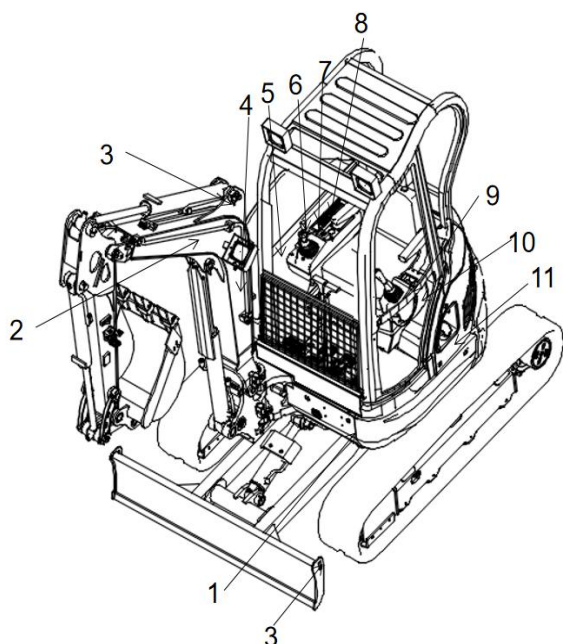
Please read carefully and follow strictly.



Please read this for safe operation

Mark the labels and where they are posted

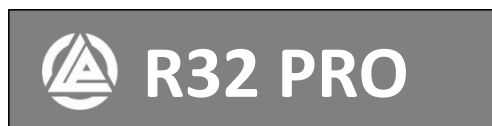
- ◆ Safety labels are attached to this machine. Drive with full understanding. This is recorded below. Please read carefully.



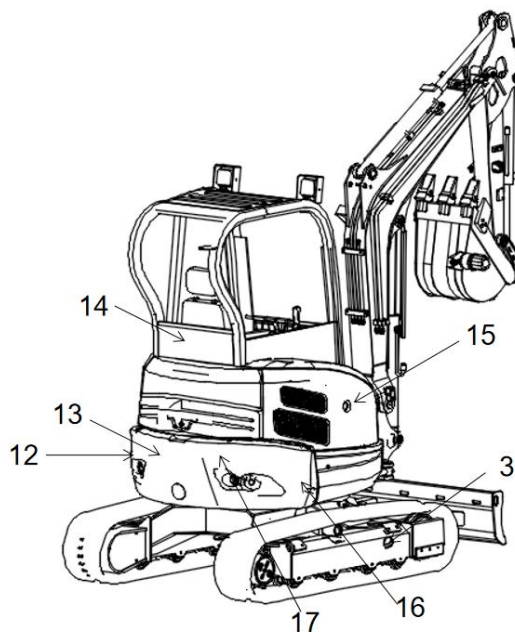
1 Pay attention to the machine operating noise of 93dB



2 Brand model



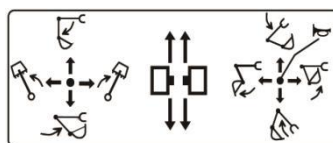
3 Hoisting



4 No one is allowed to stand at the lower end of the working device



5. Diagram of how to operate the excavator



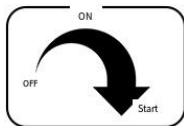


Please read this for safe operation

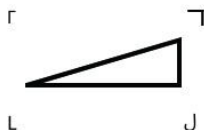
## 6. Bulldozer operating lever



## 7. Start switch identification



## 8. Throttle marking



## 9. Wear ear protectors when operating the excavator

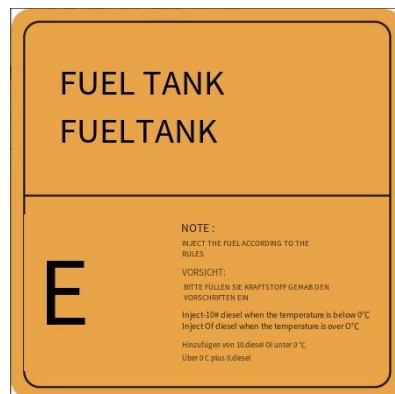


## 10 Pull the safety lock after operating the machine



## 12. Diesel filling port

△ Refuel at the designated position.  
When refueling, the engine should be turned off and kept away from all open flames.



## 11. No one is allowed to stand within the operating area

△ No one is allowed to stand within the operating range of the machine.



## 13.CE

Euro 5  
EPA Level 4 emission standards



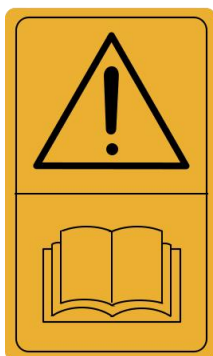
 Please read this for safe operation



# Tier4



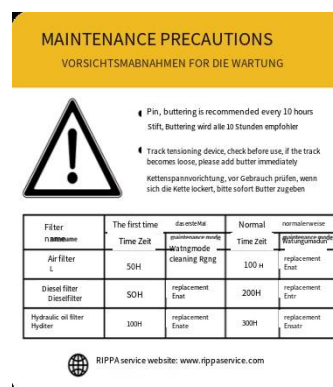
14. Precautions for operation, inspection and maintenance  
 △ Read the instructions before operating, maintaining, disassembling, assembling and transporting.



15. Hydraulic oil filling port



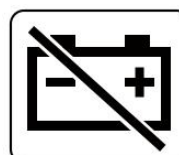
16. Maintenance label



17. Brand model logo label



18. Power switch



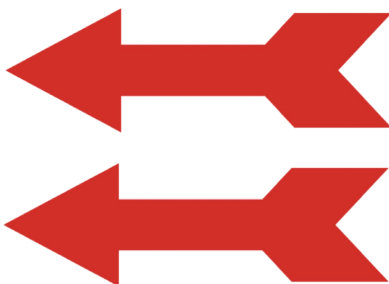


Please read this for safe operation

## 19. Calculation stickers

Lift capacity ratings									
Aload radius					Conditions of operation				
B. Load point height					2203mm Big arm				
C. Lift capacity ratings Cf					1229mm Rbm				
Rated loads over front					Weight: 3375kg				
Cs. Rated loads over side					Track width: 300mm				
(Unit: kg)					Track spacing: 350mm				
Load radius A (Static-buildozer support)									
Load point height (Unit: m)									Max(S/I) (kN/m)
	1.5	2		2.5					
1.5	1147	602	995	427	806	367	539	262	4211
1	1400	475	1	/	956	326	552	236	4251
0.5	1376	413	1	/	1087	285	565	210	4216
0 (Grade)	1599	445	1169	317	823	218	725	167	4103
-1	1622	460	997	328	870	234	750	186	3600
1.1	1647	509	921	335	898	246	776	198	3523

## 20. Direction







## Please read this for safe operation

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### Label maintenance

---

1. The label should always be kept clean and be careful not to scratch it.  
If the label is dirty, rinse it with soapy water and wipe it with a soft cloth.
2. If you wash your car with a high-pressure washer, the label may peel off.  
Therefore, please do not use high-pressure water to wash the label directly.
3. If the label is damaged or lost, please order a new label from the place where you purchased the product.
4. When posting a new label, please wipe off the dirt on the surface thoroughly and re-post it in the original position after it is dry.
5. When replacing a part with a label with a new one, please also replace the label at the same time.

# About repair and warranty

If there is any malfunction or something is unclear during use. If you need repairs, please contact the store where you purchased the product or Please contact the repair shop designated by our company.

When contacting us, please include the following

- (1) Model name and chassis number
- (2) Engine name and engine number

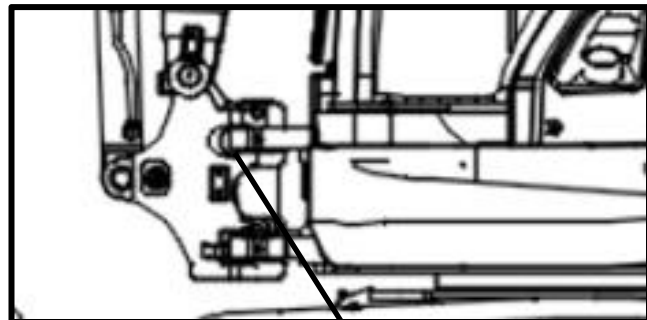
In addition, the sales store has a genuine parts list. When ordering parts, please contact Please consult with the store.

This product is equipped with an electronic key for anti-theft (hereinafter referred to as anti-theft device). Place ), however, this device is only a device to inhibit theft and does not It can ensure that no theft occurs.

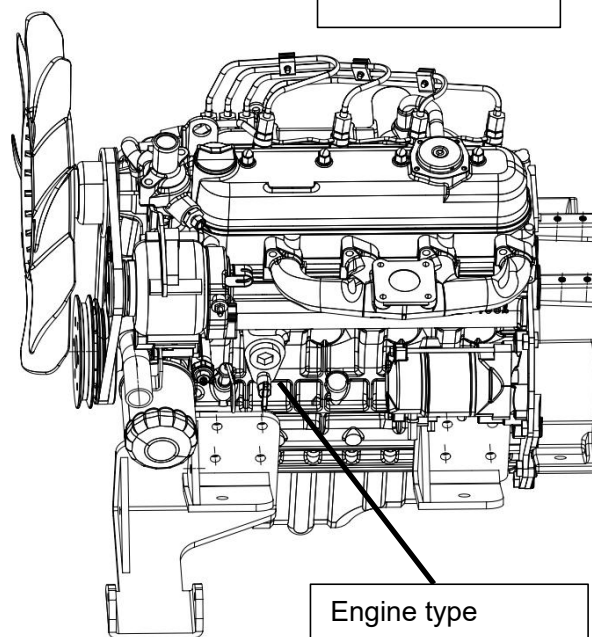


**warn**

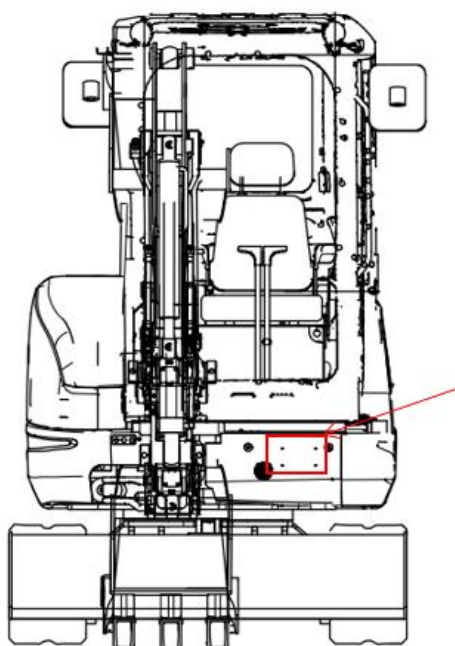
\* Do not modify the machine as it is dangerous. The purpose of modification or use is different from the correct use described in the instruction manual. If the purpose of use is different, it is not within the scope of the manufacturer's guarantee, so please be careful.



chassis number



Engine type



SHANDONG RIPPA MACHINERY GROUP CO., LTD.

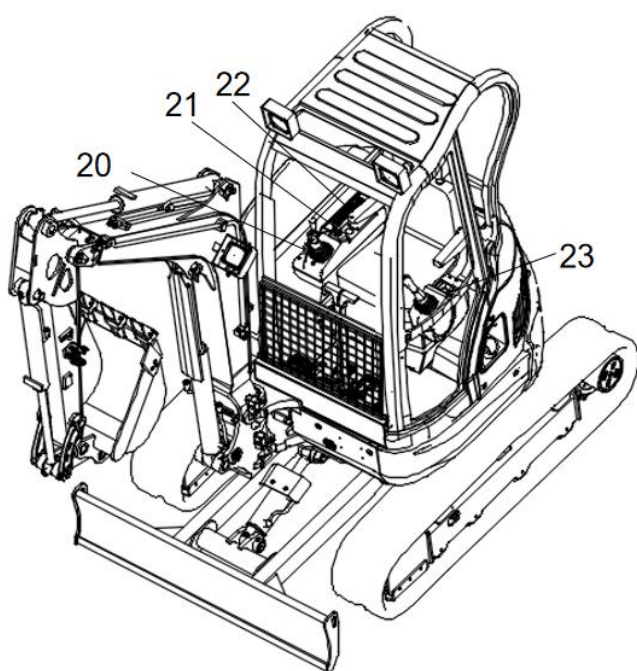
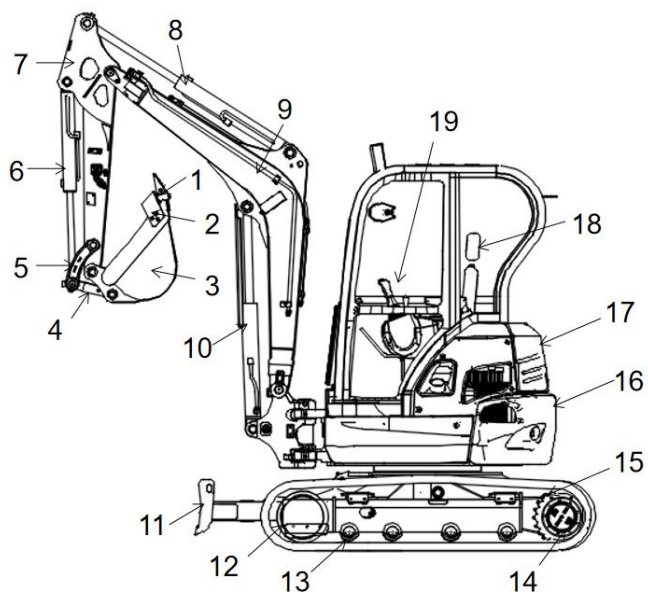
Gerätename	Hydraulic Excavator	Modell	R32
Leistung(kW)	18.5	Qualität der Arbeit(kg)	3171
Seriennummer	SLP240112512	Herstellungsdatum	2025/08

Adresse: Nr. 2166, Industriepark Nr. 6, Chongwen Avenue,  
High-Tech-Zone, Stadt Jining, Provinz Shandong

Tel:+86-05372339712



## Description of each device



No.	Name
1	Bucket teeth
2	Side teeth
3	Bucket
4	Connecting rod
5	Rocker
6	Bucket cylinder
7	Bucket rod
8	Barrel cylinder
9	Boom
10	Boom cylinder
11	Spatula
12	Track
13	Support wheels
14	Walking motor
15	Drive sprocket
16	Counterweight
17	Rear guard
18	Seat
19	Bulldozer handle
20	Digging handle
21	Start switch
22	Throttle pull cord
23	Shift switch



# About the use of each device

## The use of safety devices

### ■ Operate the handle lock rod

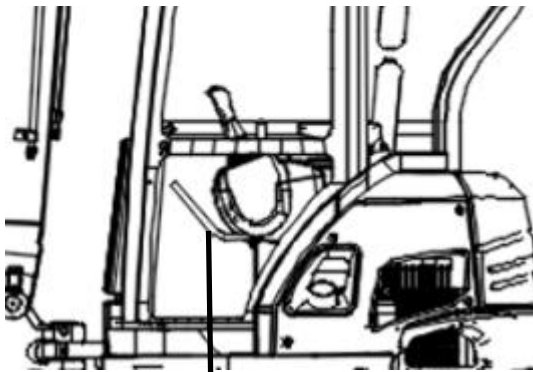


#### **note**

- \* When parking or leaving the machine, be sure to lower the bucket to the ground and lock the operating handle lock rod. It is dangerous for the working device to fall. Therefore, make sure the lock is in the starting position before getting off. Also, remove the key to prevent others from operating the machine by mistake.

#### **supplement**

- \* The engine does not start when the handle lock rod is not in the "locked" position.
- \* Even if the operating handle lock rod is not fixed to the operating handle, the working device remains inactive.



Pilot lock

#### **supplement**

- \* Pull up the lock lever of the operating handle on the left and the working device cannot be operated. When getting on or off the vehicle, pull the lock lever on the left handle to the maximum position.
- \* When the handle lock lever is in the "locked" position, the driving handle is locked and in an unworkable state.

### ■ Starter switch

- "SIARTER SWITCH CONTACT" (starter switch contact)

The key can be inserted at the position of "SIARTER SWITCH CONTACT".

- "START" (running)

If you turn one stop to the right from the "SIARTER SWITCH CONTACT" position to the "START" position, all circuits will be powered on and preheated with glow display.

At this point, the indicator light will be on for about 1 second to perform the light off check.

- "START" (start)

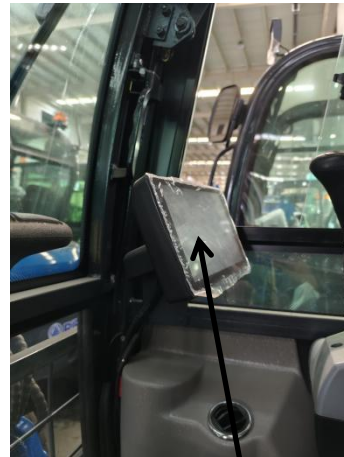
Operate the handle lock lever in the "Lock" position. If the "SIARTER SWITCH CONTACT" position is turned one more step to the right to enter the "START" position, the starter motor will rotate and the engine will start. When you release the key, the key will automatically return to the "SIARTER SWITCH CONTACT"



# About the use of each device

## ■ Electronic display

In the liquid crystal display area of the electronic instrument, gently twist the key to the "START" position and release the key to activate the display



Display position

## ■ Electronic instrument display area (usually)

### ◆ Water temperature gauge



### *note*

\* If opened during operation or just after the operation has stopped

The radiator cap can sometimes be scalded by hot water spurting out.

Therefore, do not open the radiator cap until the radiator has cooled down.



Rotation  
al speed

Temperature

At the LCD display area of the electronic in "START" position and release the key to activate the cooling water temperature. If the water temperature is high, stop the operation.

- 1 Stop the operation,
- 2 After leaving the engine idling (about 5 minutes)
- 3 Stop the engine and perform the following checks
  - (1) Check for the presence or leakage of coolant
  - (2) The fan belt is loose.
  - (3) Whether there is dirt or dust attached to the radiator

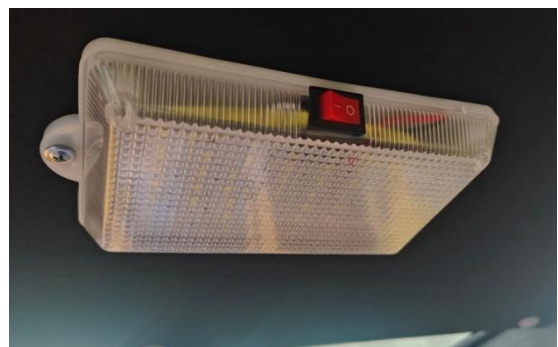
### ◆ Engine tachometer

\* It is not abnormal that the contents of the LCD display are sometimes hard to see clearly due to different viewing angles.

## ■ Indoor lights

Gently twist the key to the "START" position and release the key,

If the switch of the ceiling indoor light is in the on position, the indoor light will light up.



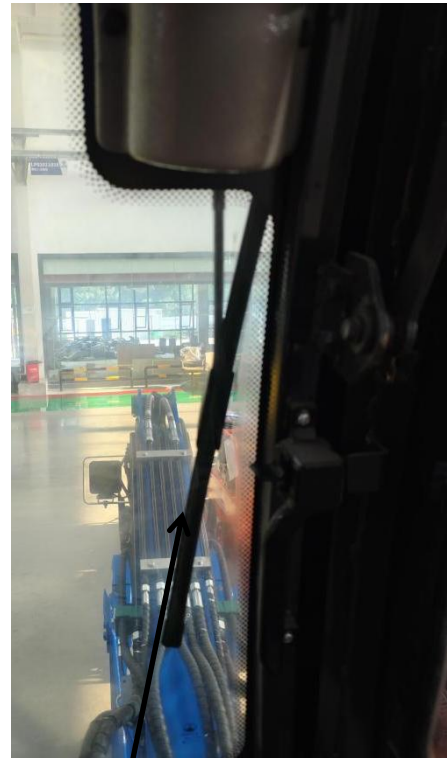


## About the use of each device

### ■ Wiper and window washer switches

When the starter key is turned on, if you press the wiper switch, then the wiper motor will work, and if you press it further down, the window washer will work. (Even when pressed to the **off** position, the window washer still works.)

- Do not use the washer switch when the washer box is empty. Otherwise, the pump will be damaged.
- Dry wiping may damage the glass. So be sure to use the wiper only after spraying the cleaning fluid.



Wiper

### ■ Preheater switch

When the starter key is at the initial insertion key

When in the position, turn left, the preheater switch is powered on, and preheating begins.



Start the switch



## ■ Use of Cooler (Cab · Cooler Specifications)

- ◆ Air volume regulation •
- Air outlet

The direction of the air can be freely

## ■ Air conditioning

The air conditioning in the cab has three adjustable air outlets for comfort.

### Air conditioning switch

Turn on the switch when using the air conditioner.

Press the switch **again** to turn it off.

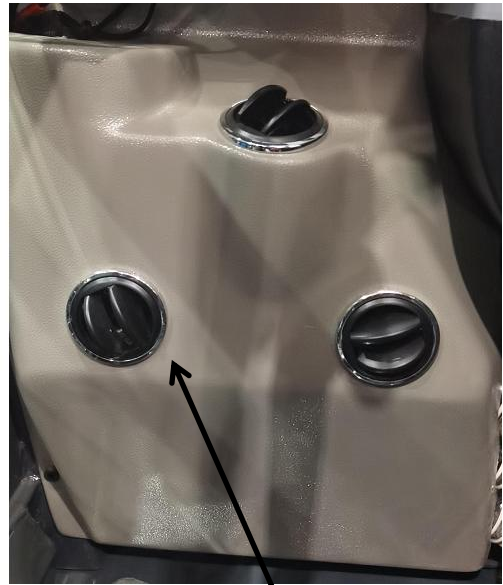
Be sure to close the door when you turn on the

### Seat adjustment



**warn**

- \* If the seat is tilted forward with the engine started, the driving handle may be triggered, causing the vehicle to move. Before tipping the seat forward, be sure to turn off the engine and place the handle lock lever in the “LOCKED” position.



air conditioner

The seat is a seat that can slide back and forth.

1. Before moving forward, you can adjust the seat adjustment lever at the front of the seat to move the seat forward and backward. Adjust the seat to a position that is easy to operate. Make sure the seat is securely fastened after adjustment.

### supplement

- \* When restoring the seat, make sure the seat is securely fastened through the seat lock bar.



Seat adjustment lever

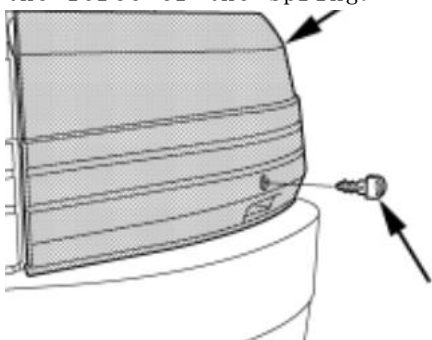
## ■ Rear hood opening and closing



### **note**

- \* Be careful not to pinch your hands when closing the rear hood.
- \* After the rear hood is closed, lock it securely.

1 Insert the rear hood key into the keyhole and turn it to the left to unlock the rear hood. When you press the keyhole section and lift the hood up to its maximum height, the hood will be automatically fixed by the force of the spring.



- 2 When closing, lower the rear hood until you hear a "click" to ensure it closes properly.
- 3 Turn the key to the right and lock it.

### **! significant**

- \* Do not operate with the hood open. Otherwise it may cause damage to the hood.
- \* The rear hood will be lifted by the pressure of the cylinder.

## ■ toolboxes



### **warn**

- \* Push the seat forward while the engine is running

There is a possibility that the driving handle will be triggered, causing the vehicle to move.

So be sure to turn off the engine before pushing or pulling the seat forward

Move the engine and put the handle lock lever in the "locked" position.

There is tool storage space at the back of the seat. When in use, pull the lever at the bottom of the seat and push the seat forward.

Press the button at the back of the seat to open the back cover of the seat.



Seat front and rear adjustment rods



Seat toolbox



## ■ Opening and closing of the cab

1 When opening the door, use the key to unlock the door lock, hold the handle, and after opening the door, there will be a thimble to fix the door. Open the



Thimble

2 When closing, hold down the button inside the door and then close it.



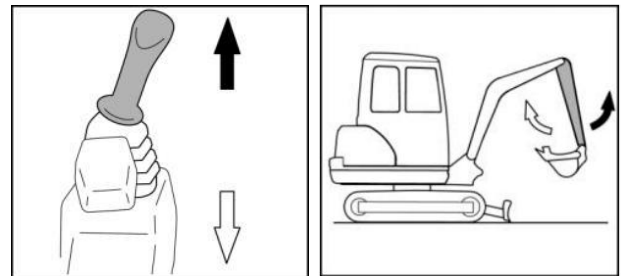
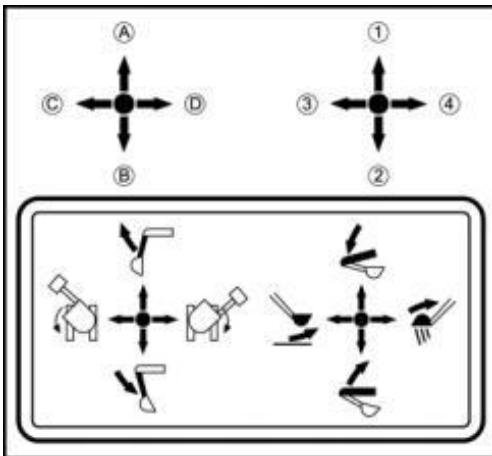
Button

3 Lock the door when you are away from the machine for a long time.



## ■ Use of operating handles

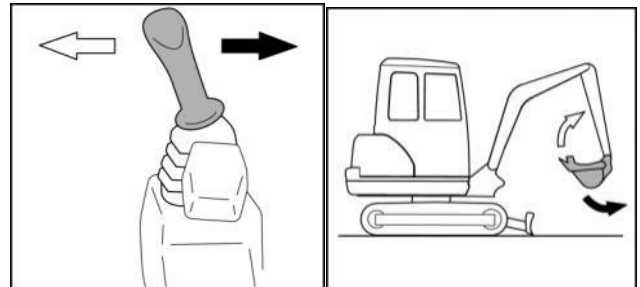
Joystick		Action
Right joystick	1	Lower the arm
	2	Raise the boom
	3	Retract the bucket
	4	Open the bucket
Left joystick	A	Lower the bucket lever
	B	Raise the bucket stick
	C	Rotate the cab to the left
	D	Rotate the cab to the right



Lift the bucket and pull it to the left using the right joystick. To empty the bucket, use the right joystick to push to the right.

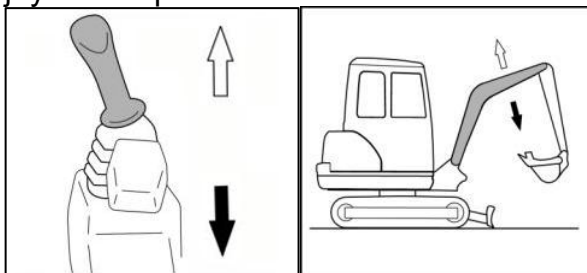
When installing the bucket, make sure the bucket teeth don't hit the front panel of the bulldozer.

Move the bucket, as shown in the picture.



## Boom operation

When the excavator is overloaded, always lower the boom until the load reaches the ground. To raise the boom, use the right lever to pull backward. To lower the active arm, use the right joystick to push forward.



## Arm operation

To lift the lever, push the left lever forward; To retract the lever, pull the left lever backward. Move the joystick as shown in the picture.



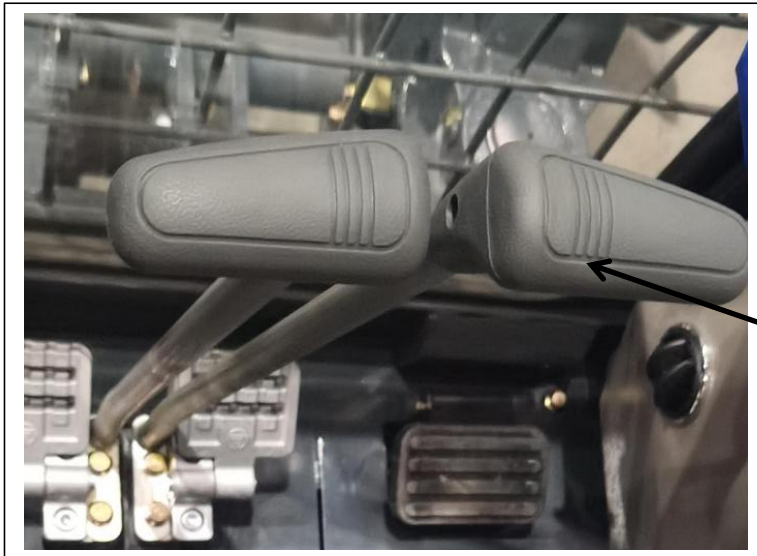
### ■ Throttle knob

Sitting in the driver's seat

1. If you push the accelerator to the bottom (the high-speed side), you will increase the engine speed.
- 2 To turn off the engine, push **the throttle** all the way down and then place the starter SWITCH in the "SIARTER SWITCH CONTACT" position.

### Travel handle (right, left)

If sitting in the driver's seat, move forward when both handles are pushed forward and backward when they are pushed backward.



Walking control lever

### supplement

- \* Because of the hydraulic pilot system, the working device can only be operated when the engine is running. To bring the bucket into contact with the ground, do so after the engine has been placed in low-speed rotation.
  - \* When getting on or off the vehicle, pull up the operating handle lock bar and make sure it is in the "locked" position.
- When the temperature of the working oil is low, the response of the working device to the operating handle becomes sluggish. Therefore, it is essential to carry out warm-up operation.
- \* During the period when the working oil temperature is low, the operating handle feels slightly heavy, but this is not a fault.
  - \* When disassembling the hydraulic equipment, follow the steps below.
    - Reduce the engine speed so that the bucket touches the ground.
    - Stop the engine and move the handle in all directions.
    - Please wait for more than 10 minutes to release the residual pressure in the hydraulic circuit.
- These steps are extremely necessary to prevent danger.



# Inspection before operation

## ■ Check and replenish the cooling water



### ***note***

\* If it is done during operation or just after the operation has stopped  
Open the radiator cap and sometimes steam or hot water will spray out and conduct  
Cause scalding. Therefore, turn on the radiator only after it has cooled down  
Heat cap.

Please check if the tank is filled with the specified amount of cooling water.  
If the cooling water is insufficient, add it to the tank.

\* When adding cooling water, do not let the water level exceed half the height of the secondary kettle.

\* Never add mud water or seawater.

\* Under normal circumstances, do not open the radiator cap.

### ***supplement***

Please check the coolant through the radiator when the engine is cooling down.

\* Long-lasting coolant (mix ratio: antifreeze 50% water 50%) has been added as coolant at the factory.

## ■ Inspection and replenishment of fuel



### ***note***

Please be sure to stop the engine when refueling.

\* Never approach a fire source.

If you are careless...

It may cause a fire.

1. Check with an oil gauge.

2. When the fuel is low, open the fuel tank cap to refill it.

3. The fuel tank cap cannot be opened if the key is not inserted into it.

\* Refuel after the job is done until the fuel tank is full, and then securely fasten the fuel tank cap.

\* When refueling, make sure the fuel passes through the filter screen of the fuel tank.

\* Be fully careful not to let dust or water get into the fuel tank.

\* The fuel system generally does not get air in unless the fuel tank is emptied. If air is mixed in, please deflate it.



### ■ Inspection and replenishment of engine oil

1. Please check if the specified amount of engine oil has been filled in.
  2. If the oil level measured by the oil gauge is within the range shown in the figure, it is normal.
  3. If the fuel level is insufficient, please replenish it through the fuel filler port.
- \* Use engine oil with the appropriate viscosity depending on the temperature conditions.
  - \* The correct amount of oil cannot be measured right after the engine has just stopped because there is still oil remaining in various parts. Please place the engine in a level state and wait for at least 5 minutes before checking.
  - \* Insert the oil gauge securely after the check.

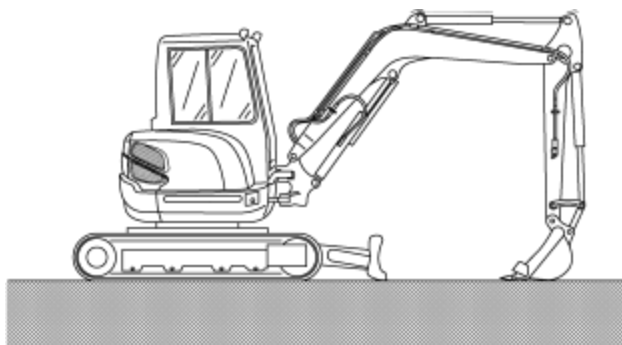
### Inspection and replenishment of working oil



#### **note**

- \* Do not remove the filling port of the working oil tank until the oil temperature has completely dropped. Otherwise, the working oil will spray out, causing burns.

- 1 Place the machine in a level position with the piston rods of each cylinder extended to approximately the middle position and the bucket and bulldozer touching the ground.



- 2 Check at room temperature whether the working oil is in the center of the oil level gauge.
  3. If it is in the center of the oil level gauge, it is normal.
- When the fuel level is insufficient, please replenish it through the fuel filler port.
5. When the working oil is mixed with impurities such as water and a complete replacement is necessary, replace it promptly.
  - 6 When replenishing, clean up nearby sand or garbage and be sure to use the same brand of working oil.





# Inspection before operation

## Inspection and cleaning of radiators and oil coolers

1. Check if the heat sink is clogged. If it is clogged, blow it with compressed air (or steam). Be sure to wear protective glasses at this point.
- 2 Also check the radiator hose.  
Replace the hose if it has cracks or becomes brittle, and also check if the clamps are loose.

## Inspection and cleaning of the battery, wiring and around the engine



### ***note***

\* If the wiring harness and battery (+) wires are damaged, it will conduct  
It can cause a short circuit, so be sure to check.

\* If the battery, wiring, muffler or engine  
If garbage or fuel is attached around, it may cause a fire  
Disaster, therefore, check before each day of work.

The wrapping of the wiring harness and battery (+) wires comes into contact with the corners of the components and will naturally age due to damage, so please check the following related items.

1. The wiring harness must not be damaged and the clamps must not be loose.
2. The connection parts of terminals and power strips (sockets) shall not be loose.
3. All switches must be functioning properly.



# Starting and stopping the engine

## Engine starting



**warn**

\* Please be sure to sit in the driver's seat and make sure all levers are in place.

Start in the "neutral" position.

**D** If you're careless...

While the engine starts, the machine will act, causing

It's dangerous not to be able to operate normally.

\* The engine exhaust contains harmful carbon monoxide, causing poisoning.

Dangerous.

Do not stay indoors where exhaust gases tend to accumulate or in poorly ventilated areas

Run the machine in a place.

1. Make sure all handles and pedals are in the stop position before operating the switch.
2. Please place the handle lock lever in the "locked" position.



- 3 Insert the key into the switch.

- 4 Turn the throttle knob to the maximum position on the high-speed side.

- 5 Turn the key to the right to the end.



- 6 Release the key after the engine starts. The key will automatically return to the "SIARTER SWITCH CONTACT" position.



**significant**

- \* As the starter motor consumes a large amount of current, avoid using it continuously for more than 10 seconds. If it fails to start within 10 seconds, stop for more than 20 seconds and then repeat operations 6 and 7.
- \* If you have a battery, be sure to use a 12V battery when connecting to other batteries with an auxiliary cable, etc. Never use a 24V battery.

# Starting and stopping the engine

---

## ■ Starting in cold season

1. Make sure all handles and pedals are in the **stop** position before operating the starter switch.
- 2 Insert the key into the switch.
3. Please turn the throttle knob to the maximum position on the high-speed side.
- 4 Place the starter key in the **running** position and hold it in the **running** position until the display on the LCD disappears.
- 5 Release the key if the engine starts. The key will automatically return to the **(running)** position.
6. If the engine does not start, repeat operations 4 and 5.

### **supplement**

- \* Since the response of the working device to the operating handle becomes sluggish when the working oil temperature is low, be sure to perform a warm-up run.
- \* During periods of low working oil temperature, the handle may feel slightly heavy. This is not a fault.
- \* When the working oil temperature is low, the automatic idle function may not work, which is not a fault.
- \* The function of increasing idle rotation operates before the coolant water temperature rises to the specified temperature.
- \* In the case of "Air Conditioning Specifications", set the air conditioning switch to (on).

## ■ Inspection of all parts

After the engine warms up, please confirm the following items.

- Check if there are any abnormal displays on the LCD display.
  - Whether the exhaust color is normal.
  - Are there any unusual sounds or vibrations?
  - Check for leaks in oil, fuel, water, etc.
- ◆ Shut down the engine immediately in the following circumstances.
1. The rotational speed drops sharply or rises sharply.
  2. Suddenly make an unusual sound.
  3. The color of the exhaust gas gets worse.

# Starting and stopping the engine

## ■ Precautions in case of overheating



### **note**

\* If the radiator cap is opened during operation or just after operation has stopped, hot water may spurt out and cause burns. Therefore, open the radiator cap after the radiator has cooled down.



### **significant**

Once the cooling water temperature is close to the boiling point (the water temperature gauge shows "H") (what is called overheating), please take the following actions.

- 1 Stop the operation at a safe location. (Remove engine load)
- 2 Do not make an emergency stop to the engine. Instead, let it idle without load for about 5 minutes before turning it off.
- 3 Please wait for 10 minutes, or move away from the machine while it is emitting steam.
4. After confirming that there is no danger such as scalding, rule out the cause of overheating as described in the "**Backhoe Excavator Problems and Solutions**" section. Then restart the engine.

## Engine stop



### **warn**

\* When the engine is stopped, do not  
Do not care about the position and the raised state of the bulldozer.  
It slowly fell down due to its own weight, causing an accident.

Turn the throttle knob to the maximum position on the low-speed side and let the engine idle for about 5 minutes to cool down gradually.

- 1 Slowly move the left and right working device operating handles to place the working device on the ground.
- 2 Stop the engine and then remove the key.
- 3 Pull up the handle lock lever and place it in the "locked" position.



### **significant**

- \* The bucket should be in contact with the ground before stopping the engine. Do not touch the ground by the weight of the working device.
- \* The engine cannot stop at times when the throttle knob is in the high-speed position. At this point, be sure to set the throttle knob to the low speed position and then place the key in the (stop) position.
- \* Set a time interval of 2 seconds after the engine stops before restarting.

# Backhoe excavator operation

## Running-in



**significant**

- \* The first 100 hours of use will determine the lifespan of the machine. Therefore use it with caution. Do not apply excessive load, especially in the case of a new car.
  - Keep the load below 50% for more than 50 hours.
  - Keep the load below 70% before 100 hours.

## Start, drive



**warn**

- \* Make sure you are safe in all directions before starting.

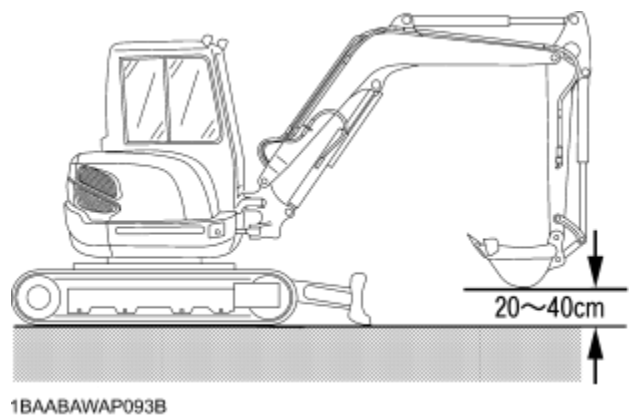
If the bulldozer is placed at the rear and the handle is operated, the machine body will move in the opposite direction of the handle. So make sure the bulldozer is facing forward or backward. (The direction of the bulldozer blade is facing forward)

If not carefully confirmed... It will move in the opposite direction and sometimes cause injury incidents.

Never drive on steep slopes above 15 degrees.

- If you're careless... It could cause a rollover, resulting in an injury accident.

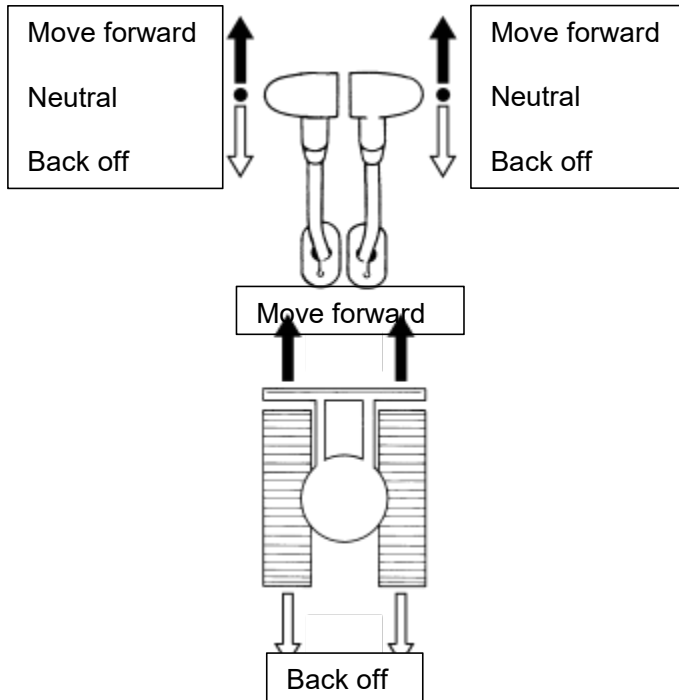
1. Press the lock lever of the operating handle to the "release" position and operate the working device so that the bottom of the bucket is 20 to 40cm off the ground.



- 2 Pull the bulldozer operating handle backward to lift the bulldozer.

# Backhoe excavator operation

- 3 Slowly push the travel handle forward  
(forward) or backward (backward) to make

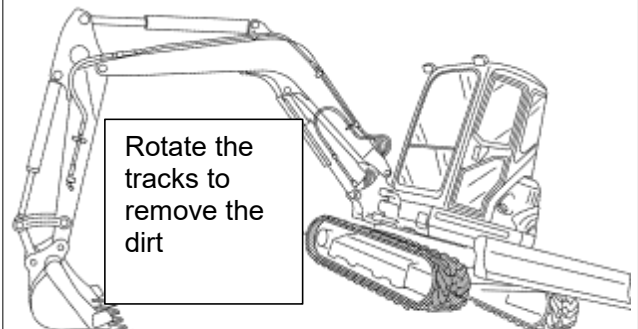


- 4 Drive at  
Increase speed if you press the  
rabbit button while operating the  
drive handle.  
Pressing the turtle button



## **note**

- \* Do not use the driving accelerator pedal when going uphill or driving on uneven ground if there is a lot of drag.
- \* When driving on soft ground and the tracks are clogged with dirt and sand, causing the tracks to be abnormally tight and unable to move, use the boom, boom, bucket to lift and turn one side of the tracks to remove the dirt and sand until the tracks turn smoothly.



# Backhoe excavator operation

## Turn

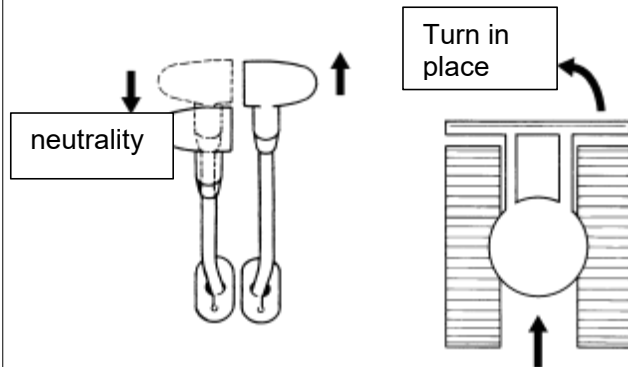


**warn**

- \* Do not steer (turn around, etc.) while driving on steep slopes, otherwise there is a danger of overturning. Steer on a flat surface.
  - \* Make sure that no one is around before steering.
  - \* Never steer in place or in a circle, but steer by increasing the number of zigzag turns.
- Carelessness .....  
may result in injury.

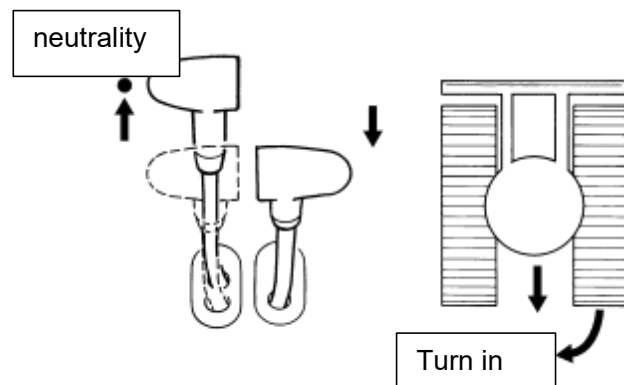
### ■ Turn while driving (Turn in place)

- 1 Turn left (right) while moving forward if the left (right) drive handle is in neutral position.



The following is an explanation of how to operate when the bulldozer is in front.

- 2 Turn left (right) when reversing if the left (right) drive handle is in neutral position.

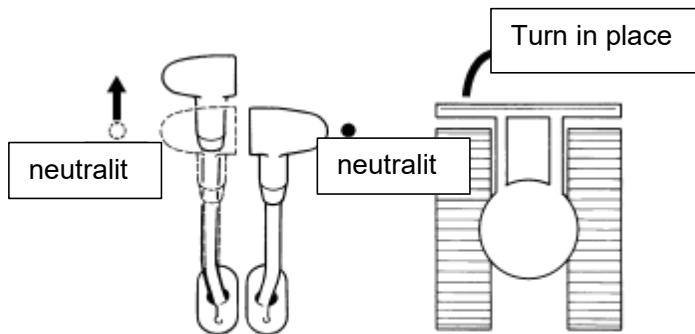




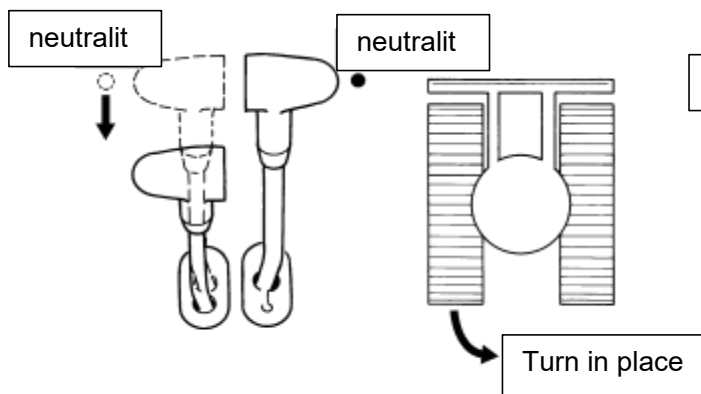
# Backhoe excavator operation

## ■ Turning at stop (in-place turning)

- 1 Turn right (left) if you operate the left (right) drive handle forward.

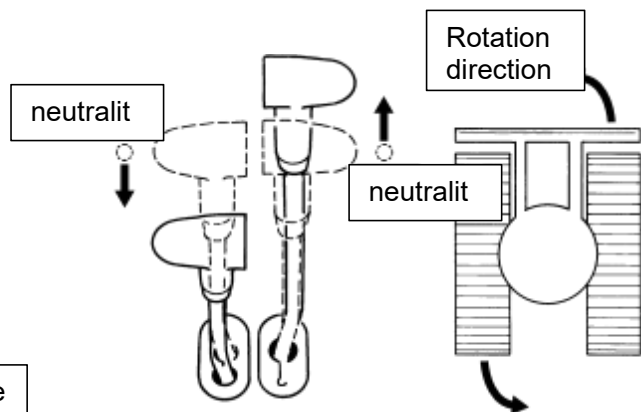
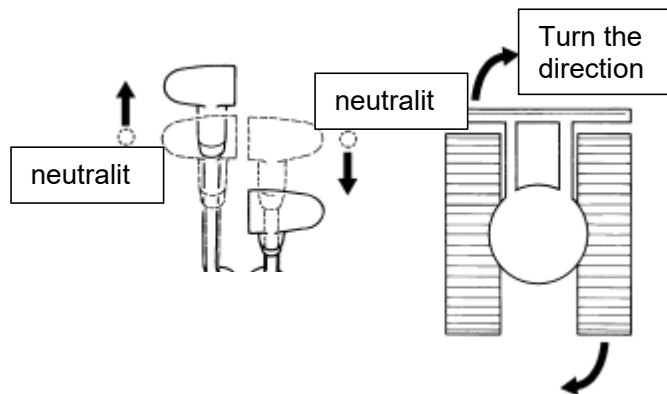


- 2 Turn right (left) if you operate the left (right) drive handle backward.



## ■ Spin Turn

1. If you operate the left (right) drive handle forward and the right (left) drive handle backward, turn right (left) on the spot.



# Backhoe excavator operation

## Up and down ramps



**warn**

\* When driving on a slope, make sure the rotating frame is in contact with the vehicle

The frame is parallel to each other.

**D** If you're careless...

It is possible to spin in the opposite direction, resulting in a rollover

An injury accident.

\* When going uphill, lift the bucket so that the lower part of the bucket is off the ground

Wait 20 to 40cm ahead before driving.

\* When going downhill from a steep downhill ramp where tracks are prone to slipping, please

Lower the bucket to the ground, allowing it to slide down while going down

Go. When going downhill from a not-steep slope, please hold the bucket

Place it at a height that can immediately touch the ground.

\* When going up or down slopes, adjust the throttle knob to drive slowly.

\* When going up or down slopes, set the automatic idle switch to "OFF".

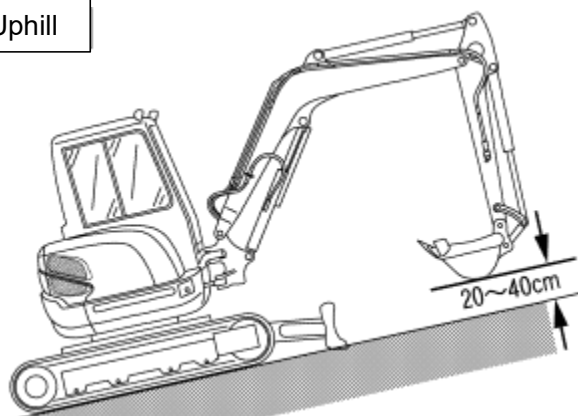
(Lights off) position.

**D** If you're careless...

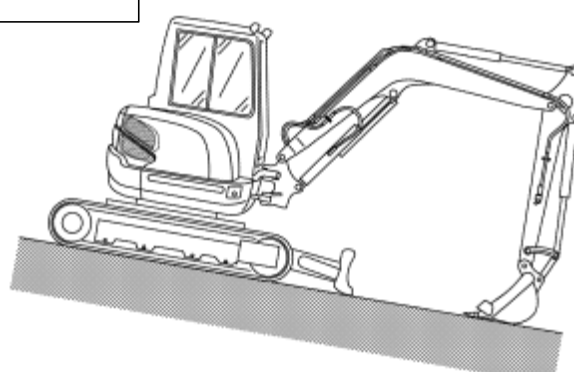
The engine speed will change and may cause damage

Accident.

Uphill



Downhill



# Backhoe excavator operation

## Parking on a Sloped Lot



**warn**

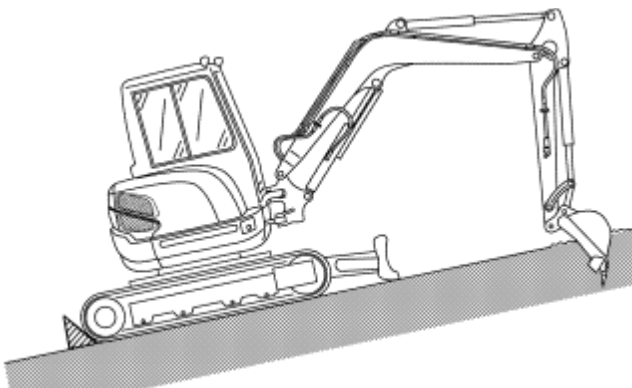
\* Parking on a slope is dangerous. So please don't

Park your vehicle on a slope.

If you have no choice but to park your vehicle on a slope, please park. Insert the bucket into the ground and place all handles in neutral. Then apply the brake.

If you're careless...

Machines may slip and cause injury accidents.



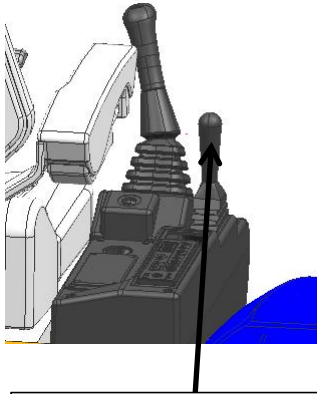
## Parking

1. Please park the machine on a flat, solid ground. Keep the bucket pole upright and lower the bucket to the ground.
- 2 Turn the throttle knob back to the maximum position on the low-speed side and let the engine idle for about 5 minutes to gradually cool the engine.
- 3 Place the starter key in the "STOP" position, turn off the engine, and then remove the key.
- 4 Pull up the handle lock bar and place it in the "Lock" position.
5. When leaving the machine, please close all the covers and lock the door.

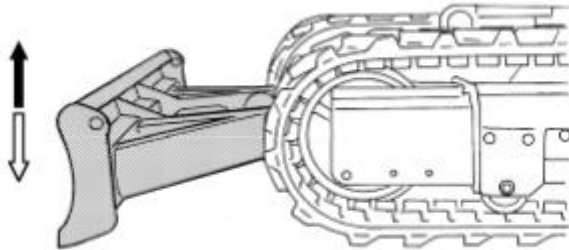
# Backhoe excavator operation

## Bulldozer operation

When you pull the handle of the bulldozer shovel backward, the bulldozer shovel rises; when you push it forward, the bulldozer shovel drops.



Bulldozer operating handle



When performing the bulldozer operation, operate the two travel handles with your left hand and lift the bulldozer with your right hand.

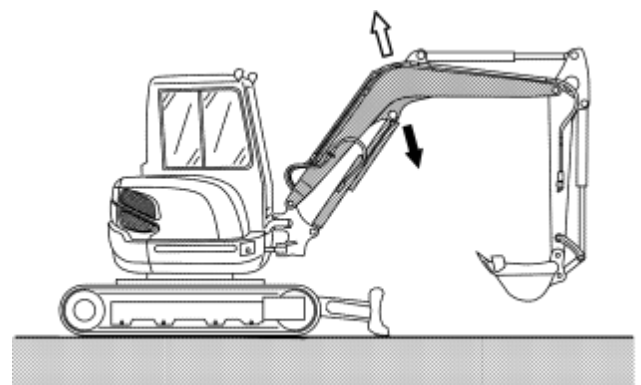
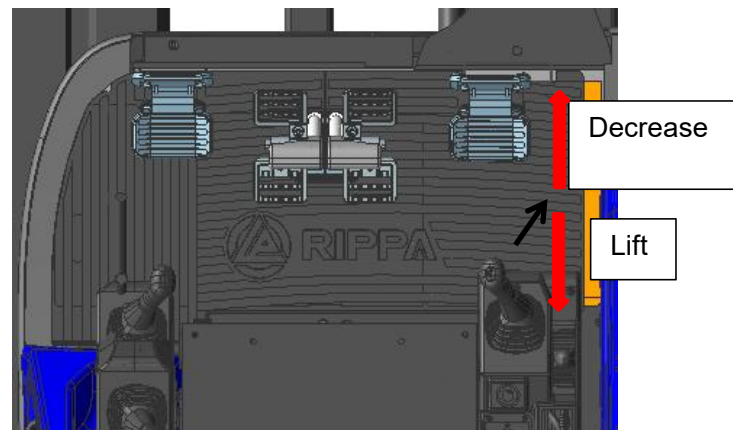
## Boom operation

Arm lift Pull the right working device operating handle backward. The boom descends... Push forward the right working device operating handle.

To reduce soil drop in the bucket, a buffer structure is used at the lifting end of the boom.

When the working oil temperature is low (such as shortly after the engine starts, etc.), the buffering time is sometimes longer than usual.

This is caused by the viscosity of the working oil and is not an abnormal phenomenon.



### supplement

- \* When "lowering the boom", be careful not to let the bulldozer blade collide with the boom cylinder, nor let the teeth of the bucket catch the bulldozer blade.

# Backhoe excavator operation

## Stick Operation

The bucket lever is pulled up...

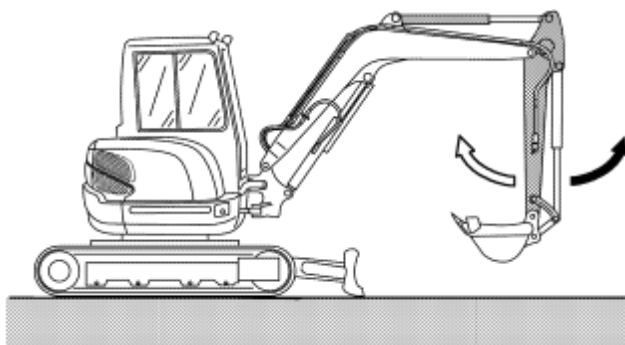
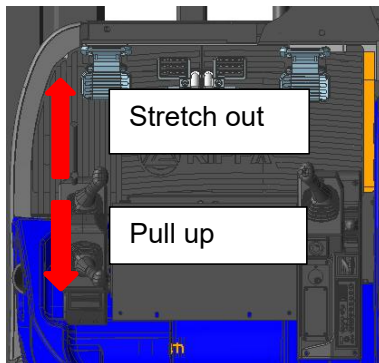
If you pull the left working device operating handle backward, then pull the bucket rod forward. To reduce the amount of soil falling from the bucket, a buffer structure is used at the extended end of the bucket rod.

The boom extends out...

Push the left working device operating handle forward and the bucket stick will extend out.



When the bucket lever is pulled up, if it is facing directly downward, sometimes the movement will stop instantly. This is not a fault.



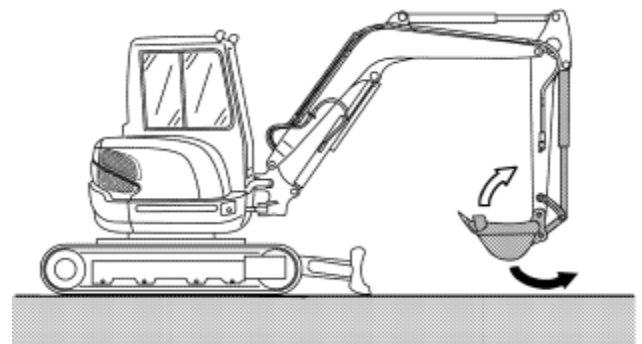
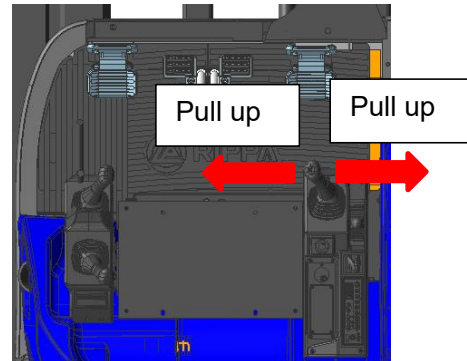
## Bucket Operation

The bucket pulls up...

Pull the right working device operating handle to the left.

Bucket dump...

Turn the operating handle of the right working device to the right.



# Backhoe excavator operation

## Rotation operation



**warn**

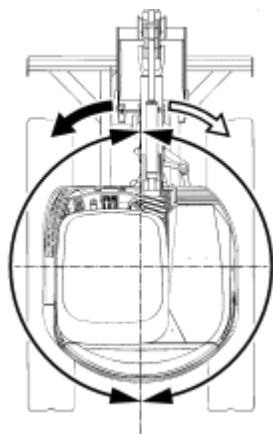
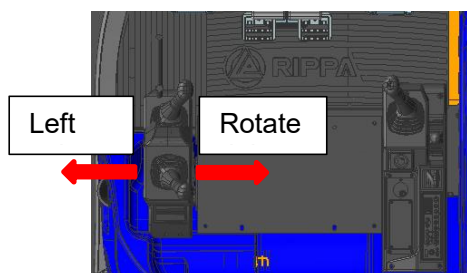
\* Do not perform rotational operations on sloped terrain, as this may result in overturning. If rotational operations or excavation work must be performed on sloped terrain, level the ground before proceeding.

► Negligence may result in overturning and cause injury.

It can be rotated using the working device handle on the left side.

Rotate left... Turn the left working device operating handle to the left.

Rotate right... Turn the left working device operating handle to the right.



**significant**

\* Quick rotation and quick reverse will shorten the lifespan of the machine. Do not perform such operations.

## Swing operation



**warn**

When not performing a swing operation, do not press the swing button. Lock the swing.

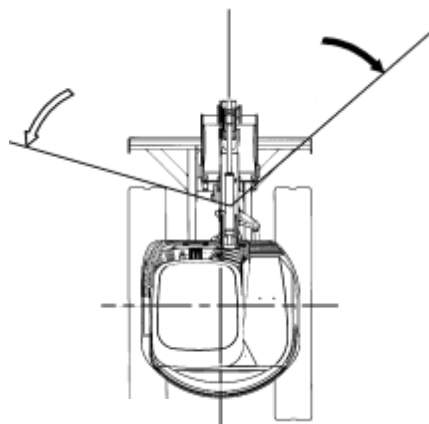
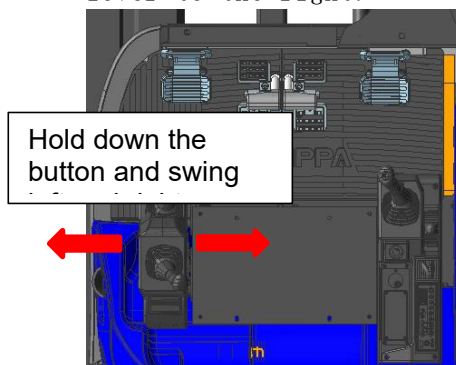
► If you are careless...

it is possible that the machine will swing in the opposite direction due to an operating error, causing an accident.

Use the swing manipulator lever to swing the arm left and right.

Swing left... Press the left button on the left lever while swinging the lever to the left.

Swing to the right... While pressing the left button on the left lever, swing the manipulator lever to the right.

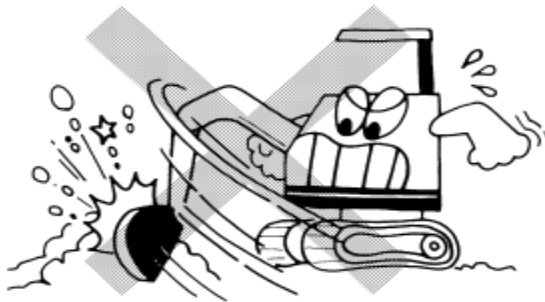




# Backhoe excavator operation

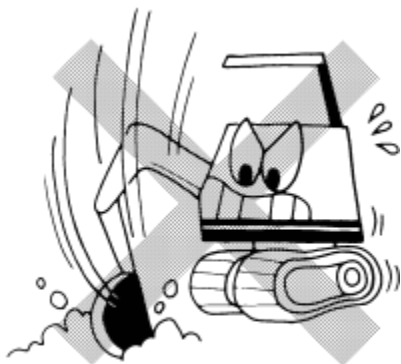
## No operation allowed

- 1 Do not work using rotational force.  
(Using a bucket for lateral push operations, etc.)

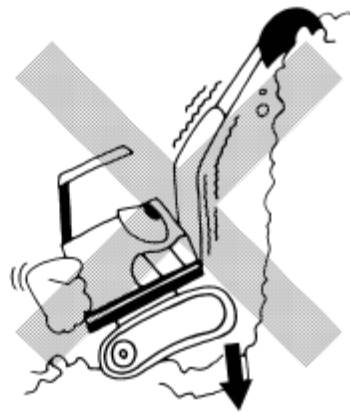
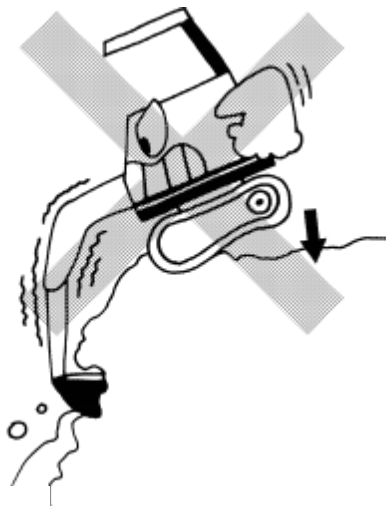


1BAABAUAP070A

2. It is prohibited to carry out operations by taking advantage of the falling gravity of the bucket. (Using the bucket for pile driving, etc.)



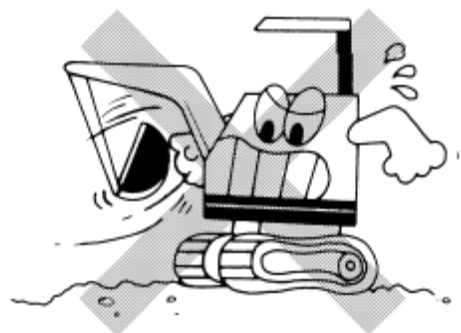
- 3 Do not use the falling gravity of the main body for operations. (Using the falling force of the machine body for digging operations, etc.)



- 4 Do not use walking force for work.  
(Insert the bucket into the ground for driving, etc.)



- 5 Remove soil from the bucket. (Do not remove soil by hitting the end of the bucket)



# Backhoe excavator operation

## Precautions for operation

### 1 Pay attention to the bulldozer shovel.

When digging deep in front of the bulldozer be careful not to let the boom and boom cylinder collide with the bulldozer.



### 2 Pay attention to the folding of the working device!

When folding the working device while in motion or transport, be careful not to let the bucket collide with the bulldozer.



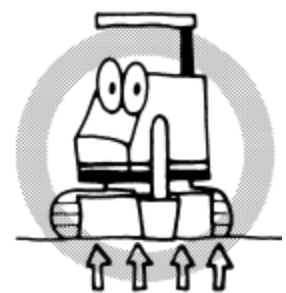
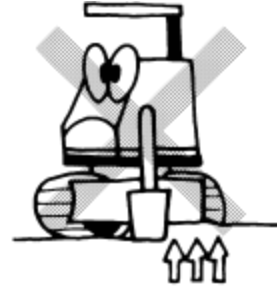
### 3 Be careful of collisions with the bulldozer shovel!

Do not let the bulldozer shovel hit the rocks. Otherwise, it will cause premature damage to the bulldozer shovel and cylinder.



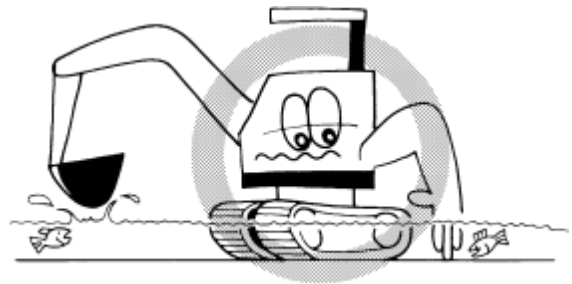
### 4 When using a bulldozer to support, do it on both sides simultaneously!

When using a bulldozer as a support foot, do not use only one side of the bulldozer for support.



### 5 Pay attention to the allowable water depth!

When working in water, after confirming that all pins, plugs, etc. are fastened, use within the depth range to the upper part of the track in the idling section.



After the work is completed, please be sure to remove the soil and rinse it thoroughly, and then apply grease to the support points and other areas.

\* After finishing work at the seaside, wash your car especially carefully to remove salt from it. Maintain the electrical components thoroughly to prevent corrosion of the mechanical parts.

# Truck Transport



## warn

\*Please select a truck that is suitable for the weight and size of the machine, and do not overload it.

►If you neglect...

When loading the truck, the driver's seat rises upward, creating a safety hazard during transportation.

\* Securely attach the loading platform to the truck bed using hooks. In addition, wet loading platforms may become slippery. Take particular care to prevent slipping when using wooden loading platforms.

►If you neglect...

Otherwise, it may cause injury due to falling or tipping.

\* When not using a loading platform or loading board, never load or unload cargo by lifting the machine body with the boom or stick.

►If you neglect...

Otherwise, it may cause injury due to falling or tipping.

Please be sure to comply with the Road Traffic Safety Law, the Road Transport Vehicle Law, the Vehicle Restriction Order and other relevant regulations during transportation.

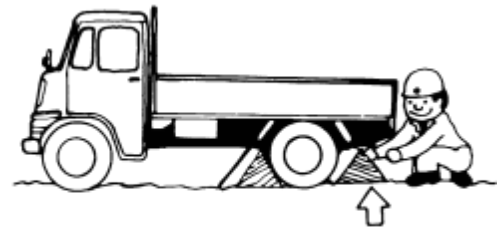
## Loading and transporting



## note

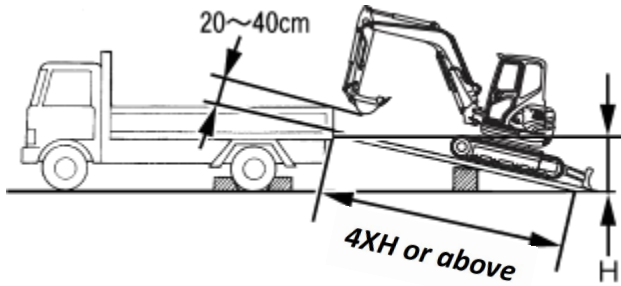
\* If loading is performed while the boom is extended, the reaction force generated by the shift in the center of gravity of the machine may damage the truck.

1. Engage the truck's brakes and apply pressure to the front and rear tires to ensure The tires will not rotate.

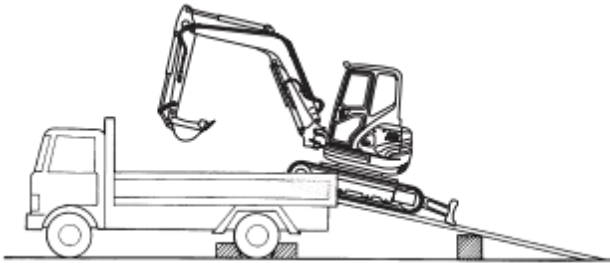


2. Set up a loading platform with sufficient strength and width, and Carry out loading.
3. If you have to use a loading platform, please do so on a flat, solid surface. The loading and unloading plates used should be of sufficient strength for the operations to be carried out. length, width and length, the loading and unloading plates should be parallel left and right, and The track should be aligned. In addition, the loading platform should be the same length as the truck bed. Surface height (H) 4 times more. In addition to using a hook In addition to preventing the loading board from detaching from the truck, Before use, check all parts for cracks, etc. A support platform is placed under the unloading plate to prevent the loading and unloading plate from bending.
4. When loading the machine onto a truck, make sure the working device faces the direction of travel. Towards (upward ), the boom is perpendicular to the loading and unloading plate or slightly pulled up , Keep the bucket and loading platform 20 ~ 40 cm height

# Truck Transport



5. Before moving this machine into the truck compartment, please temporarily stop in the state shown below, allow the bucket to gently touch the truck compartment surface, and then move forward slowly. Then, keep the vehicle body in a horizontal position.



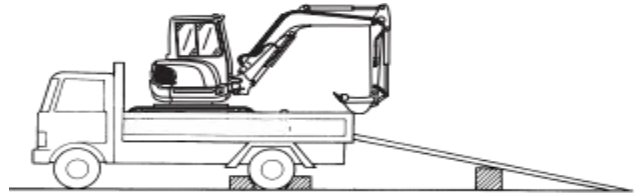
6. It is extremely dangerous to adjust the direction on the loading and unloading board. If you must adjust the direction, be sure to get off the loading and unloading board first, adjust the direction, and then get on the loading and unloading board.
7. After moving forward to the designated position on the truck's cargo box surface, slowly rotate the upper rotating body 180 degrees while the boom is lifted, and pay attention to the balance of the vehicle.
8. Lower the bucket onto the truck compartment, stop the engine, and place the operating handle lock lever in the "locked" position.
9. Secure the machine firmly to the truck bed with wire rope, etc.

## supplement

- \* When loading onto a truck, the total height must not exceed a certain height. If it exceeds a certain height, permission must be obtained from the local transportation department.

## Unload from the truck

1. With the working device facing the direction of travel, move forward to the loading and unloading board while the boom is perpendicular to or slightly pulled up to the surface of the truck compartment.



2. Stop the machine before moving to the loading plate, allowing the bucket to gently touch the ground or the loading plate, and then move forward slowly to prevent the center of gravity of the machine from moving too fast.
3. When about half of the track is out of the truck bed. When the machine is stopped, slowly lift the boom and load the machine onto Loading and unloading board.
4. Move the bucket forward after it has lightly touched the ground. At this time, Please be careful not to damage the road surface.

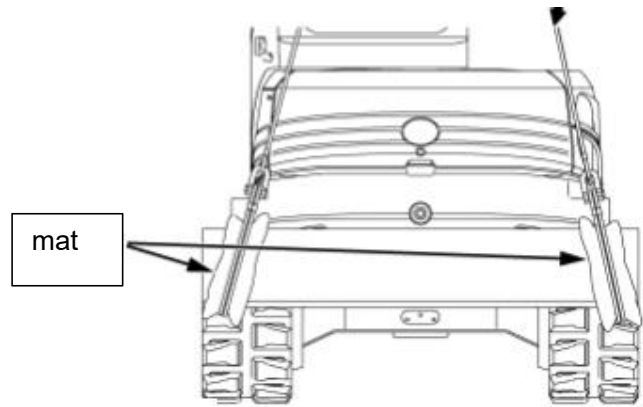
# Truck Transport

## Machine hoisting



### **note**

- \* Do not lift when there are people in the vehicle. It is dangerous.
- \* The wire rope used for lifting should have sufficient strength relative to the machine.
- \* Do not use round bars when lifting. This is dangerous, so do not lift with a wire rope tied to a round bar.



Follow the instructions below when lifting the m

- 1 Rotate the upper rotating body so that the bulldozer blade is 180 degrees opposite to the working device.
2. Raise the bulldozer shovel to the highest posi
3. Raise the boom to maximize the pulling of the bucket and boom. Then place the operating handle lock lever in the "locked" position.
4. Without swinging the boom, place the swing pedal in the center position, close the pedal cover, and stop the engine.
- 5 Place pads around the boom corners and attach wire ropes. Also, as shown in the picture, add pads and hang wire ropes at the bulldozer shovel.
- 6 Keep the lifting Angle of the wire rope at 55 degrees for lifting.

### **supplement**

- \* Pay attention to the center of gravity position when lifting to maintain full balance.
- \* Do not swing the boom or rotate the upper part when lifting.



# Truck Transport

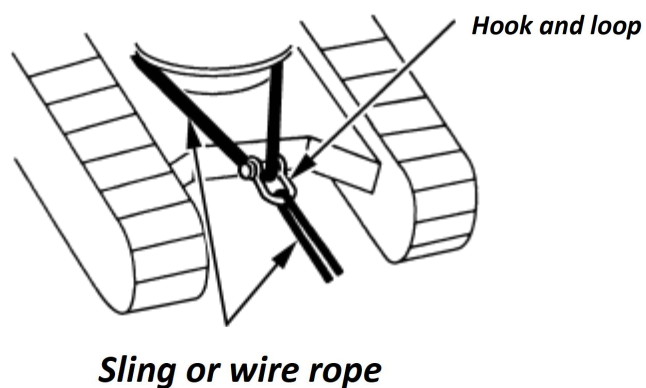
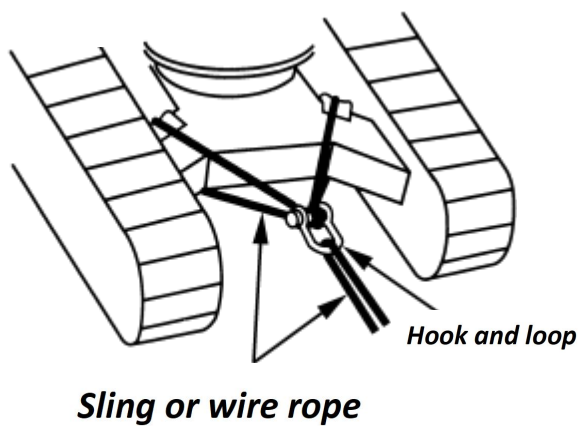
## Main towing method



### ***note***

\* The steel wire rope, slings, and hook rings used should be of sufficient strength. In addition, please check for any breaks or cracks before use.

In an emergency where the machine is stuck in the mud and cannot be pulled out, use wire ropes, slings, hooks and loops as shown in the diagram to pull the machine out of the mud.







## **note**

When refueling and maintaining,

- 1 Place the machine on a flat and spacious surface
- 2 Lower the bucket and the bulldozer shovel to the ground
- 3 Turn off the engine
- 4 Confirm whether the working device lever and the bulldozer lever have released residual pressure
- 5 Remove the key and confirm safety before proceeding with the work

## About Waste Disposal



## **warn**

Do not casually discard or burn waste, or you will not only cause environmental pollution but also be punished by law.

When disposing of waste

- \* Collect the waste liquid discharged by machinery into containers.
- \* Do not pour waste liquid into drains, rivers, lakes or oceans.
- \* When disposing of or burning waste oil, fuel, cooling water (non-freezing), refrigerants, solvents, filters, batteries, rubber, and other hazardous substances, consult with the sales store or industrial waste disposal unit so that they can be disposed of in accordance with the specified rules.

# Maintenance

## Periodic Checklist

No.	Period		Quantity	The hour watch shows the time																After that		
	Project			5 0	1 0 0	1 5 0	2 0 0	2 5 0	3 0 0	3 5 0	4 0 0	4 5 0	5 0 0	5 5 0	6 0 0	6 5 0	7 0 0	7 5 0	8 0 0			
1	Fuel	Drainage	1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Every 50 hours
2	Battery electrolyte	Check	1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Every 50 hours
3	Rotate the root surface of the bearing tooth	Add grease	1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Every 50 hours
4	Engine oil	Change	1	◎					○						○						○	Every 250 hours
5	Oil filter element	Replace	1	◎					○						○						○	Every 500 hours
6	Running motor oil	Replace	2		◎											○						Every 500 hours
7	Fan belt	Check and adjust	1				○				○					○					○	Every 200 hours
8	Air filter element	Cleaning check	1				○				○					○					○	Every 200 hours
		Replace	1																			Every 1000 hours or every year
9	Rotate the ball part of the bearing	Add grease	1				○				○					○					○	Every 200 hours
10	Radiator hoses and clamps	Check	2 4				○				○					○					○	Every 200 hours
		Replace	2 4																			Every 2 years
11	Working oil return oil filter ☆ Protective filter ☆	Replace	1					◎												○		Every 500 hours
12	Fuel filter element	Replace	1											○								Every 500 hours
13	Working oil ☆	Replace	1																			Every 1000 hours
14	Working oil suction filter	Replace	1																			Every 1,000 hours
15	Hydraulic pilot filter	Cleaning	2																			Every 1000 hours or every year
16	Hydraulic pilot filter	Replace	1																			Every 1000 hours
17	Grease for idler wheels and support wheels	Replace	8																			Every 2000 hours
18	Alternator, starter motor	Check	—																			Every 2000 hours

# Maintenance

No.	Period		Quantity	The hour chart shows the time																After that
	Project			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	
19	Electrical wiring, Use of fuses	Check	—																	Every year
20	Cooling water	Replace	1																	Every 2 years

(1) © symbols indicate only initial implementation.

(2) The ☆ symbol indicates that the replacement time will be shortened when using hydraulic front-end working devices such as breakers.

[Air Conditioning specifications]

No.	Period		Quantity	The hour chart shows the time																After that
	Project			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	
1	Air conditioning belt	Check	1				○				○				○				○	Every 200 hours
2	Internal air filter ☆	Cleaning	1				○				○				○				○	Every 200 hours
		Replace	1																	Every 1000 hours
3	External air filter ☆	Cleaning	1				○				○				○				○	Every 200 hours
		Replace	1																	Every 1,000 hours
4	Air conditioning condenser	Cleaning	1				○				○				○				○	Every 200 hours
5	Air conditioning piping and hoses	Check	4																	Every year
		Replace	4																	Every 2 years
6	Refrigeration gas	Check	—																	Repair on demand

[Cooler specifications]

No.	Period		Quantity	The hour watch shows the time																After that
	Project			50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	
1	Cooler belt	Check	1				○				○				○				○	Every 200 hours
2	Cooler filter ☆	Check	1				○				○				○				○	Every 200 hours
		Sweep	1				○				○				○				○	Every 200 hours
3	Cooler condenser	Cleaning	1				○				○				○				○	Every 200 hours
4	Cooler piping and hoses	Check	4																	Every year
		Replace	4																	Every 2 years
5	Refrigeration gas	Check	—																	Repair on demand

☆ If used in a dusty environment, the filter will need to be flushed and replaced more frequently. Replace the filter when it is severely dirty.

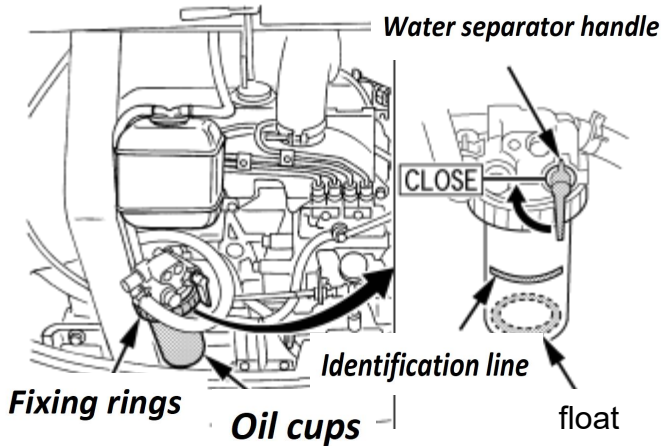
# Maintenance

## Maintenance every 50 hours of use

### ◆ Water separator

If water accumulates, the red float floats up. At this point, the oil cup should be removed and the water drained.

- 1 Place the water separator handle in the "CLOSE" position.
- 2 Loosen the fixing ring at the top of the oil cup, remove the oil cup and drain the water inside.



### ! significant

- \* Be careful not to get dust or dirt on the assembly.
- \* After draining the water from the oil cup, exhaust it. (See the "Fuel System Venting" item)

### ■ Battery level check

### ! danger

There are two types of storage batteries. One does not require water replenishment, while the other does. For batteries that require water replenishment, follow the following instructions.

- \* Do not use or charge the battery if its level is below the LOWER (lowest level line).
- \* Continuing to use the battery below the LOWER (minimum level line) will accelerate the aging of the internal parts of the battery, not only shortening the battery's lifespan but also potentially causing an explosion.
- \* Add water immediately to bring the LEVEL between UPPER LEVEL and LOWER LEVEL.

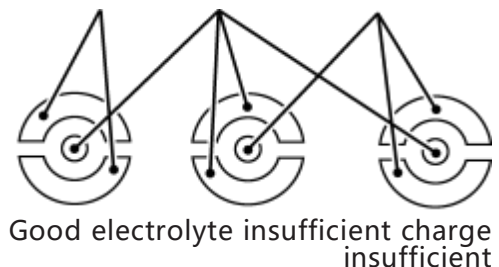
### ! warn

- \* Do not get the battery solution on your body or clothes.  
If it gets on you, rinse immediately with plenty of water.  
D If you're careless...  
Dilute sulfuric acid can cause burns.
- \* Stop the engine when inspecting and removing the battery, and  
Place the starter key in the "STOP" position.
- \* There is a risk of fire and explosion as gas is produced during charging.  
Dangerous. Please never approach a fire source and do not fire Flowers.  
When charging the battery, plug all the liquid ports of each battery.  
Remove it.
- \* Be sure to wear glasses for safety when working near the battery.  
Protect your eyes.

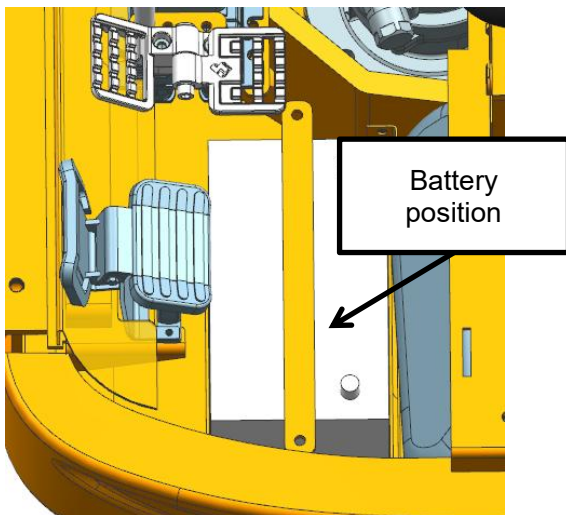
1. Open the footrest and confirm the battery indicator light.
- 2 Add distilled water if the solution is insufficient.
3. When the electrolyte is reduced due to overflow, go to a battery specialty store to replenish dilute sulfuric acid of the same concentration.

### View method of indicator light

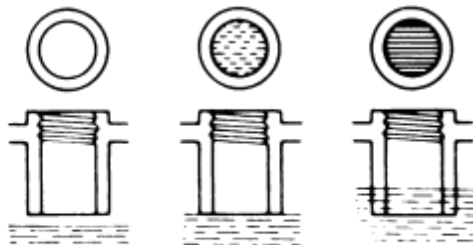
Blue Red White



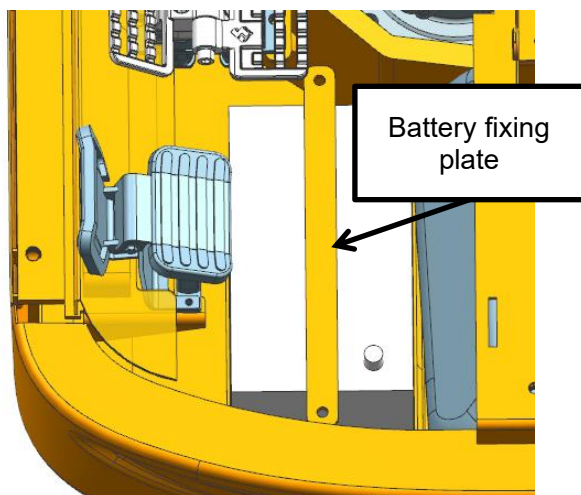
# Maintenance



Battery level



Insufficient enough too much



## ◆ Battery disassembly method

1. Please STOP the engine and place the starter key in the "Stop" position.
- 2 Remove the (-) wire from the battery.
3. Please remove the (+) wire of the battery.
4. Please remove the nuts of the battery bolts and then take off the battery bolts.
5. Remove the battery by offsetting the battery's clamps.



## note

\* When charging the battery, be sure to keep the battery off the main body  
Remove it and do it in a well-ventilated area.

\* When removing wires from the battery, do it from the (-) side, an

When installing, do it from the (+) side.  
If you do it in reverse, when it hits  
It will cause a short circuit when the tool is used.

\* When charging, separately connect the (+) of the battery to the charger

(+) on the battery (-) to the charger (-),  
Charge it in the usual way. Note, no  
Do not get the wire connections wrong.

\* Please never connect both (-) and (+) to the battery of this machine

Charge while connected to the battery.

\* Loose terminals can cause sparks or electrical installation components  
Fault. So fasten it tightly.

\* The display of the battery indicator light is only a rough standard.  
Therefore,

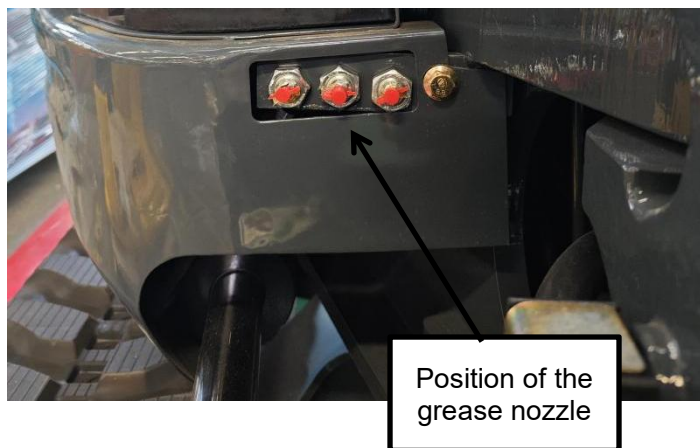
Not only should the indicator light display be confirmed, but also it  
should be carried out in practice  
Check the liquid level, etc.



# Maintenance

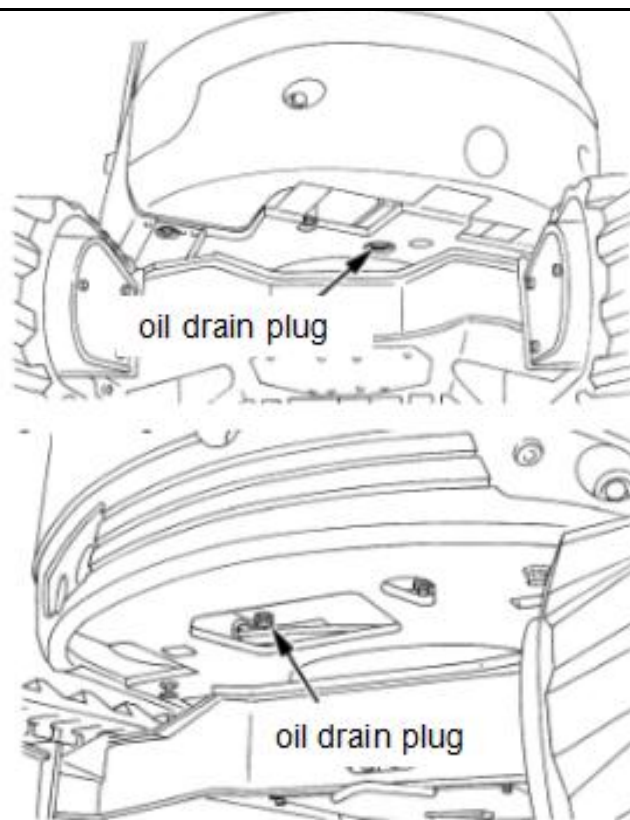
## ! significant

- \* If the battery solution is insufficient, it will damage the battery. If it is too much, the solution will overflow and corrode the metal parts of the body.
  - \* In addition to damage to electrical installation components, Also, please avoid rapid charging as much as possible. It will shorten the battery life.
  - \* When connecting the wires to the battery, make sure not to make any mistakes. (+) and (-). If you get it wrong, it can lead to battery and electrical system failure.
- Grease injection on the root surface of rotating bearing
1. Fill the grease gun with grease from the nozzle marked with an arrow.
  2. Every approximately 90 Degree rotation 1 Times, minutes 4 Refill grease.
  3. When adding grease to the tooth root surface, use the grease gun nozzle 1 Injection About 50g( Grease gun approx. 20 Most ), for the entire tooth root surface Add grease.

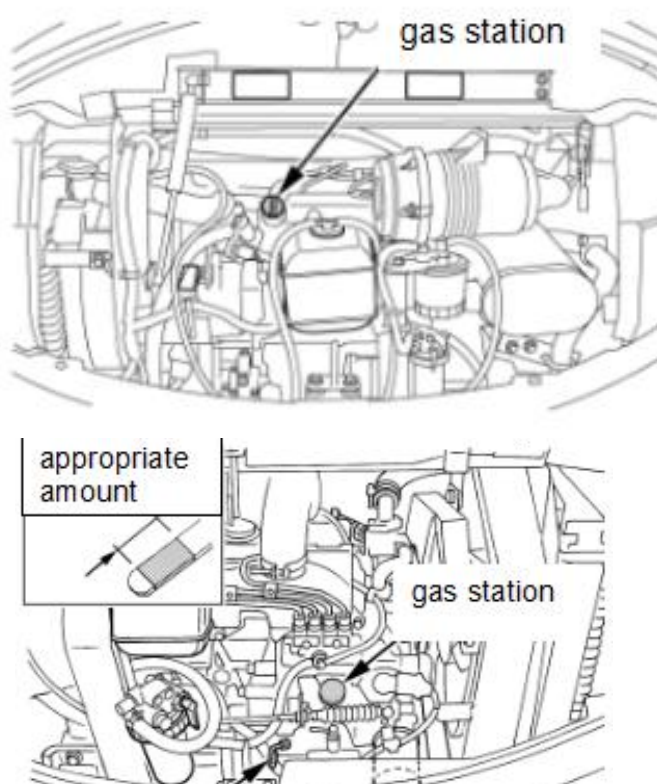


■ Oil change (50 hours for the first time, and every 250 hours thereafter)

- 1 Remove the oil drain plug at the bottom of the engine and drain the oil.
- 2 After draining the oil, tighten the oil drain plug firmly.



- 3 Add the specified amount of engine oil through the filler port.



- 4 Let the engine idle, then stop the engine for 5 minutes Check the oil gauge later to see if the specified amount of engine oil has been added.



# Maintenance

## supplement

Oil level	R32	About 5L(including the filter)
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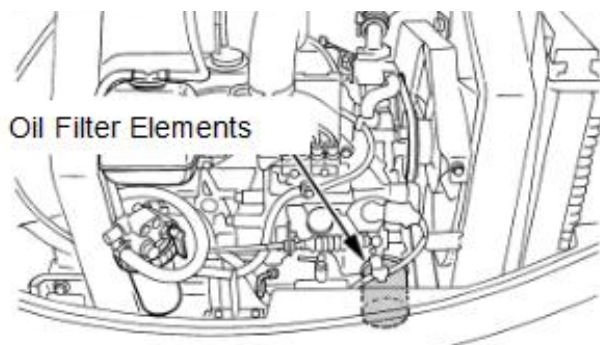
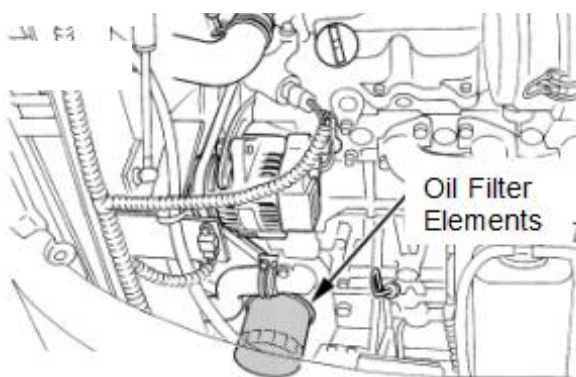
indicates when the filter and oil are replaced.

\* Use engine oil of grade CF or above.

\* Change every 6 months, even if it's less than 250 hours.

### ■ Oil filter element replacement (50 hours for the first time, and every 500 hours thereafter)

1. Do it at the same time as the oil change.
- 2 Use the included filter wrench to remove the filter element.



- 3 Apply a thin layer of engine oil to the O-ring of the new filter element and secure it in place by hand (without using a filter wrench).
- 4 Add the specified amount of engine oil to the engine.
- 5 Run the engine for about 5 minutes and turn it off after confirming that there is no "engine hydraulic anomaly" warning.
- 6 Check the oil level again with the oil gauge and replenish it if it is insufficient.

## Every 100 hours of maintenance

Do the maintenance every 50 hours as well.

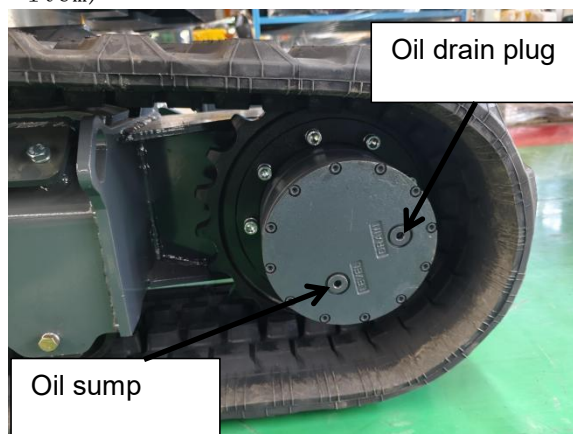
### ■ Change of driving motor oil (100 hours for the first time, and every 500 hours thereafter)

- 1 Rotate the tracks to lower the oil drain plug of the running motor to the bottom.
- 2 Remove the oil drain plug and drain the oil.
- 3 After fastening, remove the oil filler and check plug, and add gear oil through the oil filler.
4. Specify the amount of oil as shown below.

The specified oil level for the running motor	R32	About 0.5L
---	-----	------------

Pour in the gear oil until oil flows out of the filler port, then tighten the plug firmly.

5. Engine oil use gear oil SAE#90. (See the "List of Recommended Greases" item)



# Maintenance

## Maintenance every 200 hours of use

Please also perform maintenance every 50 and 100 hours.

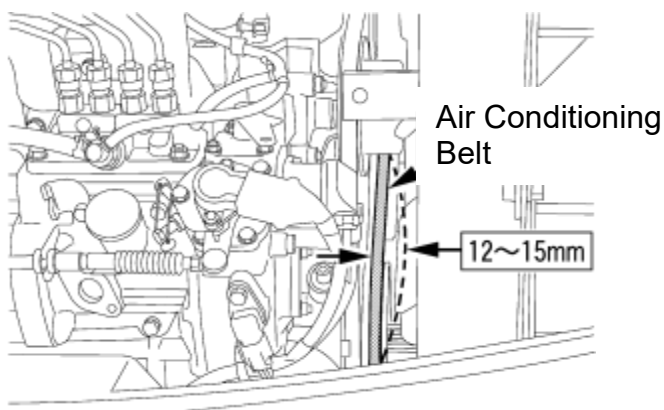
### ■ Check the tension of the air conditioning belt



#### **note**

- \* First, stop the engine and remove the key.
- \* After checking, be sure to put the belt cover back in its original position.

It is normal for the belt to sag by 12 to 15mm when pressed with [68.8N(7 kgf)].

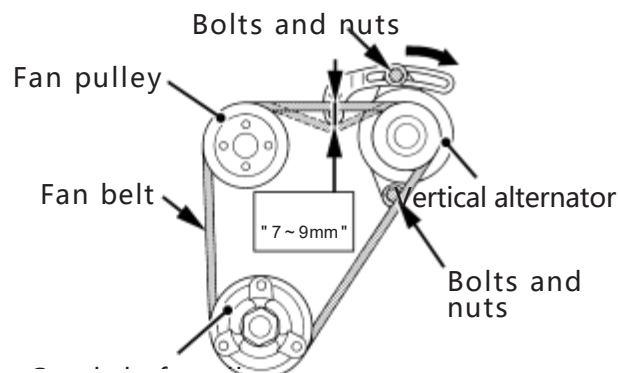


#### **supplement**

- \* If the air conditioning belt is too loose, please consult the sales store or the repair factory designated by our company.

### ■ Check and adjust the tension of fan belts

- 1 Press the center of the [58.8 to 68.6N(6 to 7kgf)] belt with your fingertip. A bend of 7 to 9mm is appropriate. If it is not appropriate, loosen the bolts and move the generator in the direction of the arrow to tighten the belt.



- 2 Check for damage to the pulleys, wear to the V-grooves, wear to the V-belts, especially to check if the V-belts touch the bottom of the V-grooves.
- 3 Replace the belt if it is elongated, has no adjustment allowance, is scratched or cracked.



#### **significant**

- \* If the belt continues to run at a low tension, it will slip, which not only reduces the engine's capacity but also shortens its lifespan, so check and adjust it.

# Maintenance

## ■ Cleaning and inspection of air filter elements

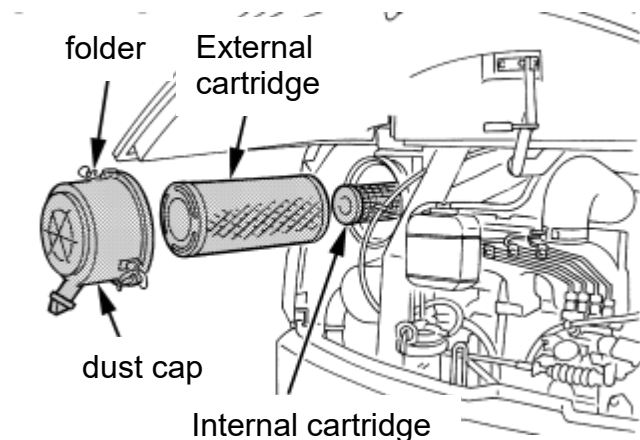
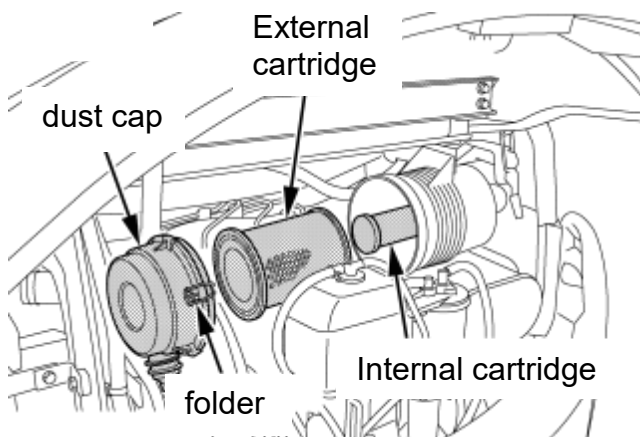


### **note**

\* As forced dust removal with compressed air can cause dust to fly in four places, please be sure to wear protective glasses. Clean and check as early as possible, especially when working in places with a lot of sand and dust.

Remove the clips, take out the external filter element, clean the external filter element and the inner side of the housing, and then reinstall it.

Do not remove the inner filter element.



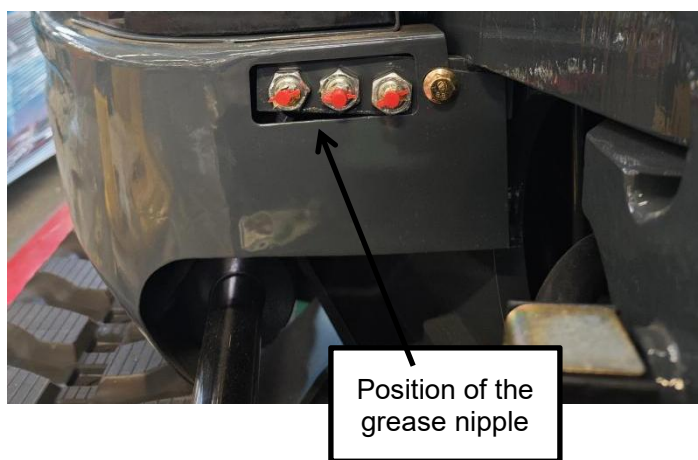
## ◆ Cleaning Method

Blow the outside of the filter element with dry compressed air [below 205kPa(2.1kgf/cm<sup>2</sup>)] to forcefully sweep away the attached dust, then blow from the inside to the outside to remove all the dust.



## ■ Grease at the rotating bearing ball area

1. Apply grease from the grease nozzle marked with an arrow. (Central grease nozzle)
- 2 Rotate about 90 degrees and add grease in 4 portions.

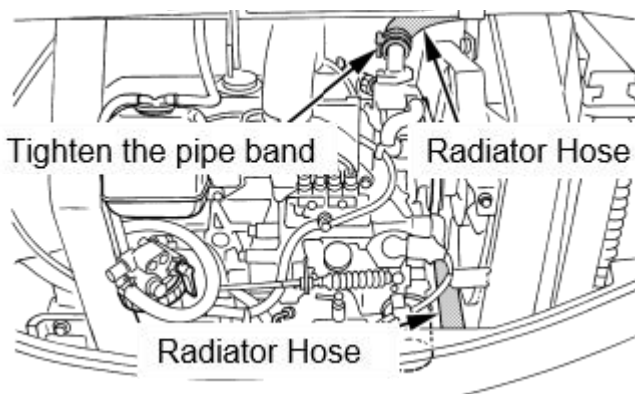
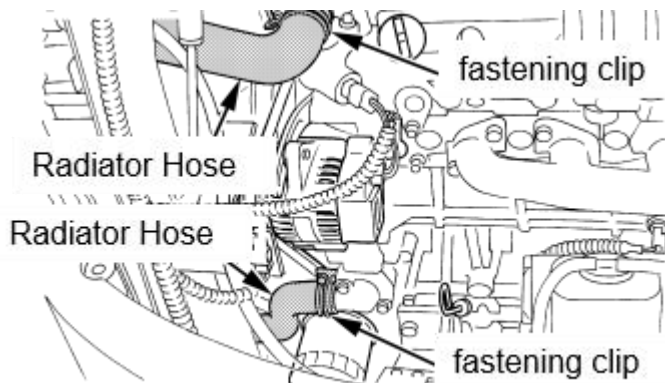


## ■ Inspection of radiator hoses and clamps

Check the radiator hose fastening every 200 hours of operation or every 6 months.

1. Tighten the clamps securely when they are loose or leaking.
- 2 When the radiator hose expands, hardens, or cracks, replace the hose and tighten the hose clamp firmly.

# Maintenance



## ● When severely soiled

Soak in warm water with household neutral detergent, moving it up and down. Move left and right to clean, then rinse thoroughly with clean water. Solvent and allow to dry completely naturally.

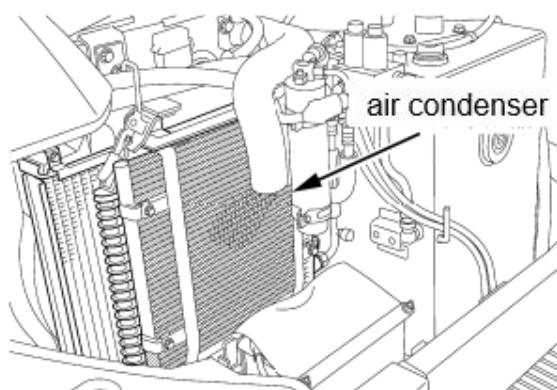
## ■ Cleaning of the air conditioning condenser



**note**

\* Make sure to do the inspection after the engine has stopped.

When dust accumulates on the heat sink of the condenser, please remove it with compressed air or tap water, etc.



## Maintenance every 250 hours of use

Also do the maintenance every 50 hours.

### ■ Oil change (50 hours for the first time, and every 250 hours thereafter)

For the method of changing the oil, see the "Maintenance every 50 hours of Use" item

### ■ Replacement of the working oil return filter (for the first 250 hours, once every 500 hours thereafter)

Remove the filter after the oil temperature in the working tank has dropped.



Return oil filter  
element  
position

- 1 Hold the upper part of the filter holder and remove it from the working oil tank.
- 2 Loosen the locating bolts, then remove the return oil filter from the filter holder and replace it with a new one.
- 3 Remove the cap bolts, take out the protective filter and replace it with a new one.



# Maintenance

## ! significant

\* When using hydraulic front-end working devices such as breakers, it is different from the above. In this case, please replace them according to the instructions below based on the frequency of use of the hydraulic front-end working devices.

The usage time ratio of the hydraulic auxiliary device	Change time of working oil	Return oil filter replacement time
Standard operation (backhoe operation)	Every 1000 hours	Every 500 hours (First every 250 hours)
Breaker hammer usage rate 20%	Every 800 hours	Every 200 hours
40%	Every 400 hours	
60%	Every 300 hours	
More than 80%	Every 200 hours	Every 100 hours

## supplement

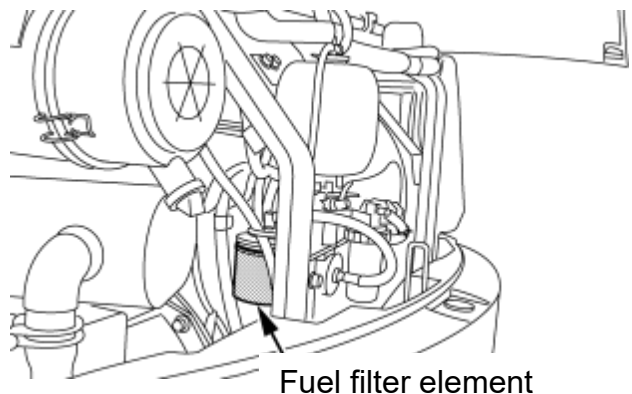
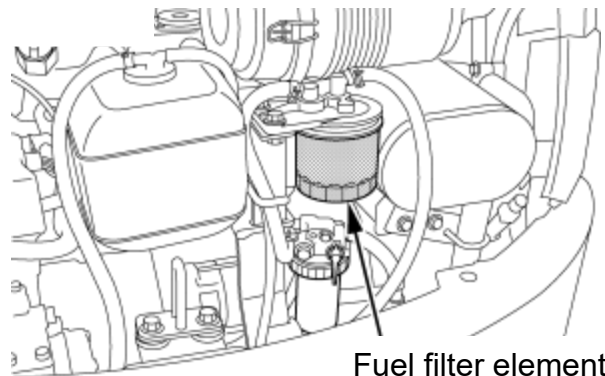
\* Be sure to check the oil level after replacing the filter.

## Each use 500 Hours of maintenance

Please also perform maintenance every 50, 100, and 250 hours.

### ■ Replace the fuel filter element

- 1 Remove the filter using a filter wrench.
2. When assembling, after gently applying a layer of fuel on the seal layer, tighten the filter directly by hand without using the filter wrench.
- 3 Release the air.  
(Please refer to the "Fuel System Exhaust" item)



## ! significant

\* When assembling, be careful not to get dust or dirt on it.

- Change of running motor oil (100 hours for the first time, and every 500 hours thereafter)

For the method of changing the engine oil, see the "Maintenance Every 100 hours of Use" item.

- Replacement of the working oil return filter (250 hours for the first time, and every 500 hours thereafter)

For the method of replacing the return oil filter, please refer to the "Maintenance every 250 hours of Use" item

- Oil filter element replacement (50 hours for the first time, and every 500 hours thereafter)

For the method of replacing the filter element, see the "Maintenance every 50 hours of Use" item

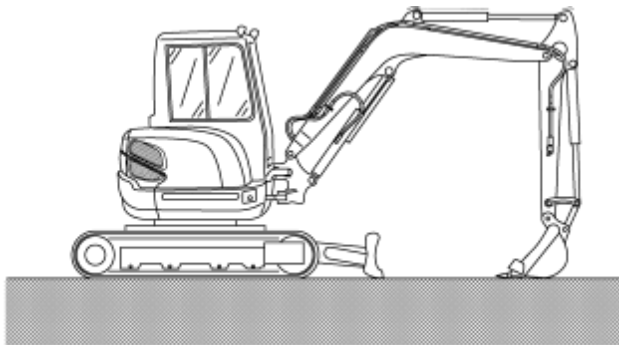
# Maintenance

## Maintenance every 1,000 hours of use

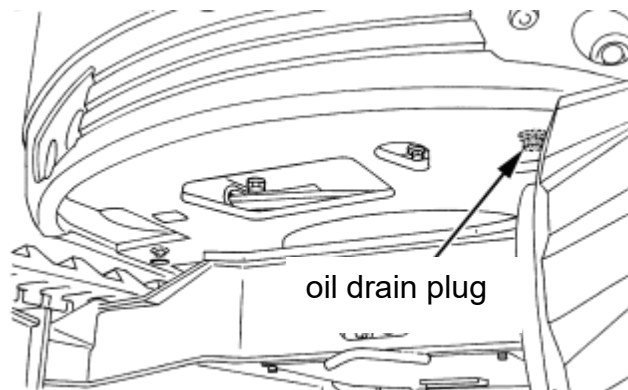
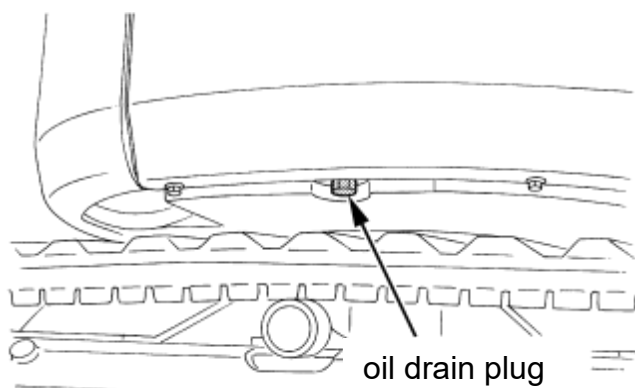
Please also perform maintenance every 50, 100, 200, 250, and 500 hours.

### ■ Change of working oil (Replace the suction filter in the working oil tank at the same time)

- 1 Place the machine in a level position with the piston rods of each cylinder extended to approximately the middle position and the bucket and bulldozer touching the ground.



- 2 Remove the drain plug at the bottom of the tank and drain the oil.



3. Please use a wrench, etc. to remove the suction filter and then replace it with a new part.
- 4 Next, fasten the oil drain plug securely.
- 5 Add the specified amount of working oil through the oil filler.
- 6 Let the engine idle for about 5 minutes.  
After stopping the engine, make sure you have added the specified amount of working oil.

### ● Working oil replacement capacity

Working oil replacement capacity	R32	Total oil volume 40L
----------------------------------	-----	----------------------

### supplement

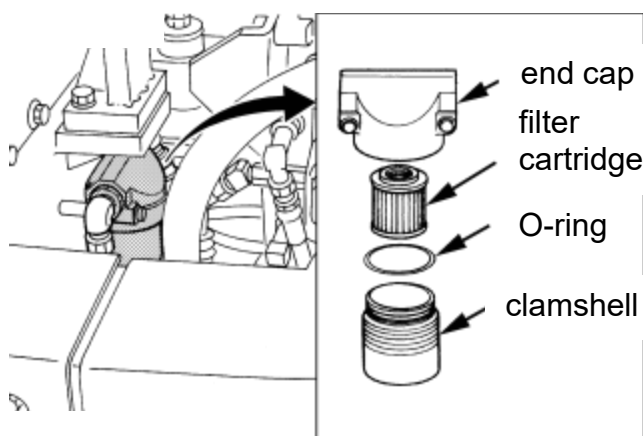
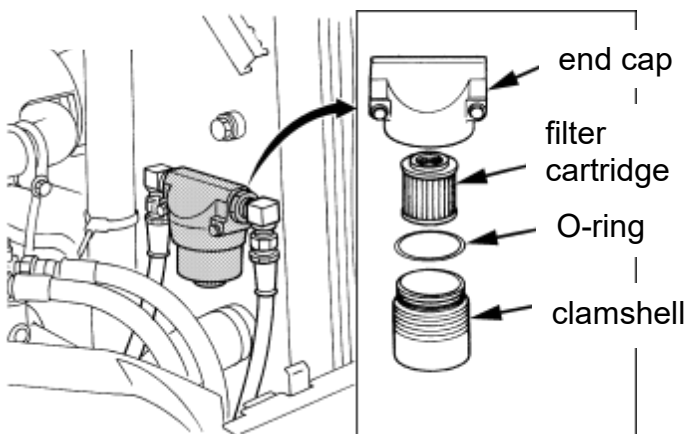
- \* Flush the inner surface when sediment accumulates in the tank.
- \* Be careful not to mix foreign objects into the tank.
- \* When replacing the suction filter, please negotiate with the sales store or the repair factory designated by our company.



## ■ Replacement of hydraulic pilot filter

Replace the filter element after the oil temperature has dropped.

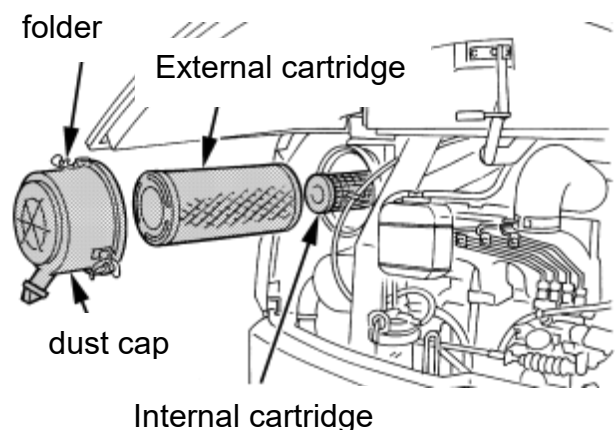
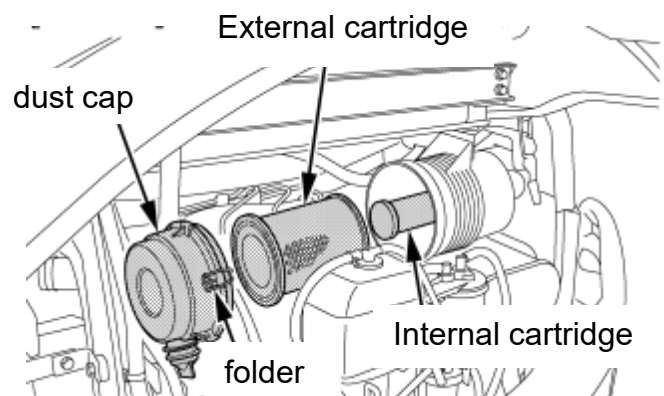
- 1 Open the rear hood and then the right hood.
- 2 Remove the housing of the pilot filter from the end cover.
- 3 Pull out from the bottom while the filter element is rotating.
4. Please replace the O-ring with a new one.
- 5 Apply a thin layer of clean working oil to the O-ring of the new filter element, then insert it firmly without damaging the O-ring.
- 6 Please fasten the housing to the end cap.
7. After replacement, let the engine idle for about 3 minutes to expel air from the circuit.
- 8 Be sure to check the level of the working fuel tank.



Every 1000 hours of use or every 1 year of use for maintenance

## ■ Replacement of the air filter element

Remove the clips, take out the external and internal filters, replace them with new ones and reinstall them.



# Maintenance

## Maintenance every 2000 hours of use

Please also carry out maintenance every 50, 200, 250, 500, and 1000 hours.

### ■ Grease replacement of idler wheels, idler wheels and supporting wheels

Please negotiate with the sales store or the maintenance factory designated by our company.

### ■ Inspection of alternators and starter motors

Please consult with the sales store or the maintenance factory designated by our company.

## Maintenance for each year of use

### ■ Inspection of electrical wiring and use of fuses



#### **note**

- \* Be sure to check for damage to the wiring harness and battery cables, as damage can cause a short circuit.
- \* Check for debris and fuel adhering to the battery, wiring, muffler, and generator, as this may cause a fire.

Loose wiring terminals can cause poor contact, and if the wiring is damaged, it can not only damage the performance of the electrical components, but also sometimes cause accidents such as short circuits, leaks or burns. Therefore, replace or repair damaged wiring as early as possible.



#### **significant**

- \* When replacing a fuse and it immediately blows, do not replace it with wire. Instead, have it inspected and repaired at a repair shop designated by our company.
- \* Since the wiring harness of this machine has been fully considered for factors such as water resistance during wiring, do not repair and use it without authorization. It should be inspected and repaired at the sales store or the maintenance factory designated by our company.

### ■ Inspect the air conditioning piping and hoses



#### **note**

- \* Do not touch the water pipes or the heating plugs. This may cause burns. hurt.

- 1 Make sure that all lines are securely connected to the hose clamps and there is no damage.
2. If wear or damage to the hose and fixture is found, please repair or replace them immediately.

## Maintenance every 2 years of use

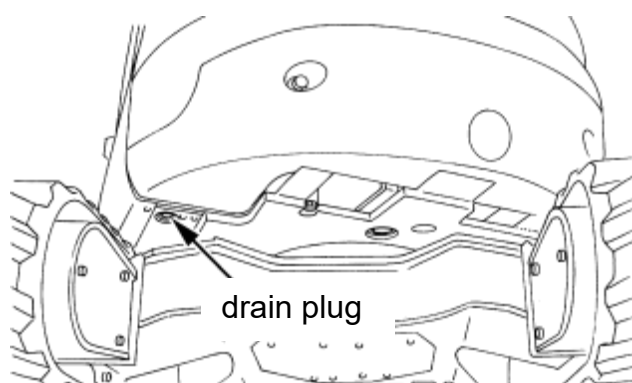
### ■ Replacement of coolant (when using long-lasting coolant)



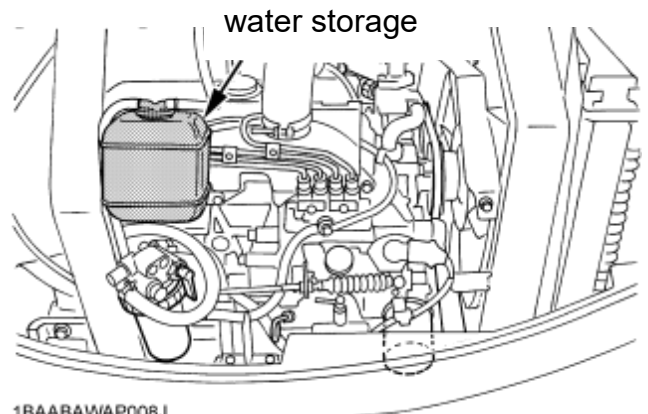
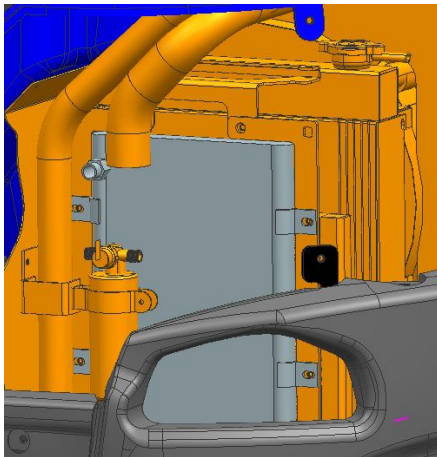
#### **note**

- \* If you open the Radiator cap, steam or hot water may spray out and cause burns. Therefore, wait until the radiator cools down before opening it. build.

- 1 Remove the radiator cap, remove the drain plug at the bottom of the radiator, and drain all the cooling water.  
To drain the radiator, remove the radiator, unscrew the radiator cap and drain the water.
- 2 Drain while filling the radiator with water and continue until clean water flows out of the drain.
- 3 Then, securely fasten the drain plug and inject long-lasting coolant into the radiator as well as the tank.  
After filling the water, tighten the cap, start the engine and let it idle for about 5 minutes, then turn off the engine and make sure the specified amount of coolant has been added.



# Maintenance



## ◆ How to use antifreeze

(In cases other than long-lasting coolant)



### **note**

\* Please do not mix antifreeze from different manufacturers.

Antifreeze has the effect of lowering the freezing temperature of water, which can prevent damage to cylinders and radiators caused by the freezing of cold water.

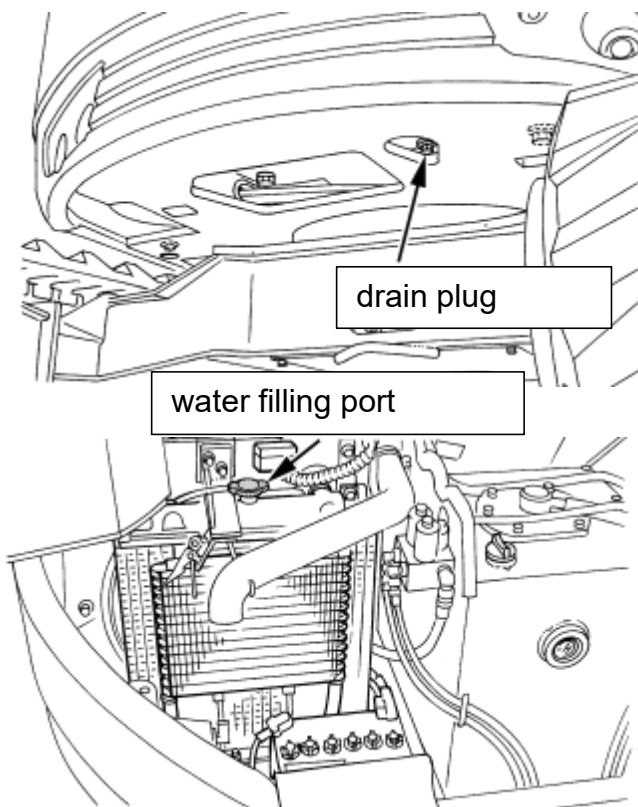
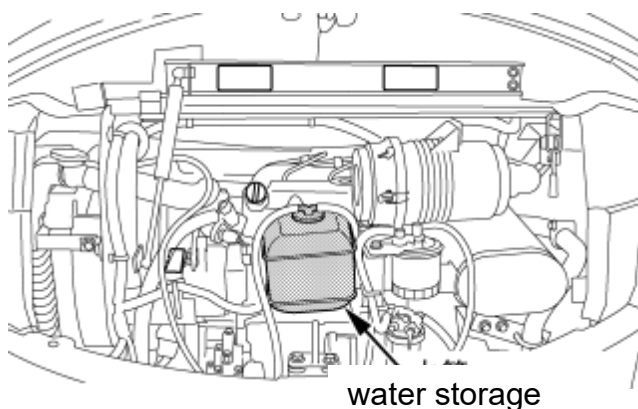
When the temperature drops below 0 °C in winter, please be sure to mix the permanent type (PT type) antifreeze into clear water and then add it to the radiator and water tank.



### **significant**

\* The mix ratio of antifreeze varies by manufacturer and temperature. Please follow the mixing ratio specified in the "Cryogenic Preparedness" section.

\* Do not mix antifreeze from different manufacturers.



# Maintenance

- \* Antifreeze - long-lasting coolant has an effective service life of 2 years.
- \* Except for long-lasting coolant, change it once in spring and once in autumn each year.

## supplement

- \* Long-lasting coolant (mix ratio: antifreeze 50% water 50%) has been added as coolant at the factory.

## ■ Replacement of radiator hoses and clamps



### note

- \* When radiator hoses and hoops have been in use for too long  
Rupture can cause hot water to spray out, sometimes unexpectedly  
It can cause a burn. So change as soon as possible.

Replace radiator hoses and clamps every two years. Replace the radiator hose if it is found to be swollen, hardened or cracked during the inspection, even if it is less than 2 years old.

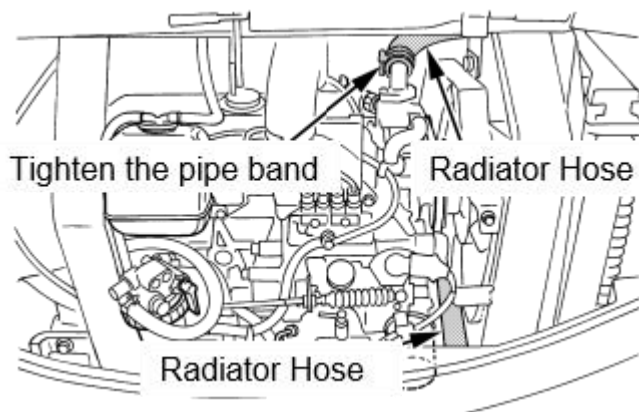
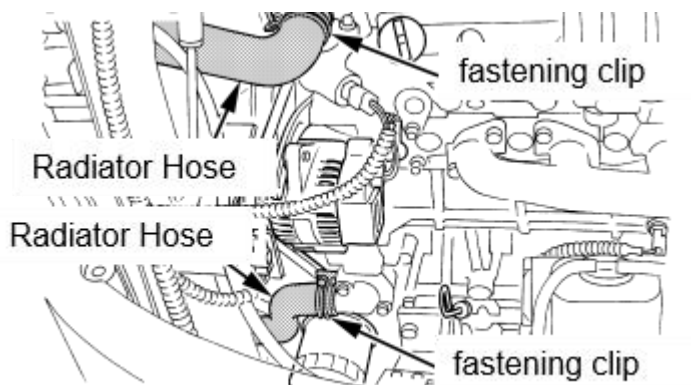
## ■ Replace the air conditioning piping and hoses



### note

- \* Do not touch the water pipes or the heating plugs. This may result in burns. hurt.

Replace air conditioning piping and hoses every two years. If the hose or piping expands, hardens, or cracks, it must be replaced as soon as possible.





# Maintenance

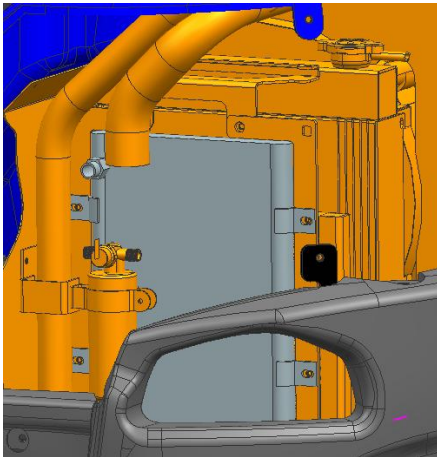
## Repair as needed

### ■ Check the amount of refrigerant (gas)

A lack of refrigerant will weaken the performance of the air conditioner. Check the following items. If there are indications that the refrigerant dose is too low, check and refill at the store of sale.

#### ◆ Inspection Steps

1. Run the air conditioner under the following conditions.
  - \* Engine speed: approximately 2300rpm
  - \* Temperature control handle: Maximum cooling position (far right)
  - \* Fan switch: Maximum air volume (3)
  - \* Air conditioning switch: ON
- 2 Check through the observation window whether the refrigerant is flowing through its circuit.

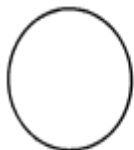


Appropriate There are few or no bubbles in the refrigerant fluid.



Low . . . . .

Continuous production in the refrigerant fluid Gas bubbles(Bubbles or foam flow continuously).



No refrigerant... colorless and transparent.

## Battery inspection, use



**warn**

\* As short circuits may occur when the battery wires are removed, as

Be sure to remove the negative wire first. Also, when assembling, please

First, connect the positive wire.

\* The battery can produce flammable hydrogen, which is likely to be near a fire source

There will be a fire and explosion, so please never get close to fire Source.

\* Never place tools, etc. on or around the battery

Metal items or flammable materials. Otherwise, a short circuit may occur

It can cause a fire and explosion, resulting in a fire.

\* Battery solution (dilute sulfuric acid) can cause blindness or burns,

If battery solution sticks to your skin or clothing, please do it immediately

Rinse with plenty of water. Also, if the battery solution

If it splashes into your eyes, go after rinsing with plenty of clean water See a doctor.

\* When charging, remove all the drain plugs from each battery Come down.

\* Be sure to wear glasses for safety when working near the battery Protect your eyes.

The inspection and use of the battery should be carried out when the engine is off and the starter key is in the "STOP" position.

### ■ Maintenance and inspection of the battery

The latest batteries have extremely high performance, but if they are used incorrectly, their lifespan will be shortened, resulting in unnecessary expenses. Therefore, use it correctly to make the most of the battery.

1. The battery, which serves as the power source for engine start and indicator lights, is an essential component.

2. If the battery's power reserve is reduced, the engine cannot be started, which is related to misoperation of the electrical components. By the time it becomes this state, it can sometimes be too late, so charge it as soon as possible.

3. Due to the evaporation of water in the electrolyte, the amount of solution in the battery decreases during charging. Insufficient solution can damage the battery. When there is too much, the liquid will spill and corrode the body.

4 Check if the plate separator is exposed and be sure to add battery solution or distilled water if it is insufficient.

5. When storing the machine for a long time, remove the battery from the machine, charge it, and store it in a dry place away from light after adjusting to the correct level.

6. Since the battery will also automatically discharge during storage, please perform a supplementary charge once a month.

# Maintenance

## ■ Precautions when charging the battery

- 1 Be sure to turn the key to "STOP" and then remove the battery from the vehicle body.
- 2 The battery will be damaged when the battery solution is insufficient. When there is too much, the fluid will overflow and corrode the metal parts of the vehicle body.
- 3 Avoid rapid charging as much as possible. Otherwise it will shorten the battery's lifespan.
4. The rapid charging method is a high-current charging method used to partially compensate for the discharge of a battery in a state of discharge for a short period of time, so it can only be done in an emergency.
- 5 Do not get (+) and (-) mixed up when connecting the wires to the battery. If you do, it will cause problems with the battery and the electrical system.
6. When removing wires from the battery, please do it from the (-) side. When installing, please do it from the (+) side. If you do it in reverse, a short circuit will occur when the tool touches the battery.
- 7 When charging, connect the (+) of the battery to the (+) of the charger and the (-) of the battery to the (-) of the charger respectively, and charge as usual.
- 8 When using the battery, in addition to measuring the specific gravity, remove the cable connected to the battery before checking the battery solution volume.
9. Please remove all the liquid plugs from each battery.

## ■ Check the battery level

For the method of checking the battery level, see the "Maintenance every 50 hours of Use" item.

## ■ Precautions when charging the battery while it is still loaded (only if necessary)

The correct practice is to do so after the battery is removed from the body.

1. Since applying an abnormal voltage to the alternator can cause damage to it, insert the key to turn to "STOP", remove the (-) terminal wiring of the battery before charging.
- 2 During the charging process, remove all the liquid port plugs to release the generated gas.
- 3 Pause charging when the battery overheats (the liquid temperature exceeds 45 ° C).
- 4 Stop charging immediately after it is fully charged. If charging continues beyond the necessary level, the following adverse conditions will occur.
  - Overheating of the battery
  - Reduced battery solution volume
  - Poor battery condition
5. When connecting the battery, be careful not to reverse (connect (+) and (-), (-) and (+) together). Otherwise, it will cause damage to the alternator and other components.
6. Also, start the engine in this way and, as soon as possible after the operation is completed, perform the correct supplementary charging according to the instructions in the charger's user manual. If this supplementary charging is not carried out, it will significantly shorten the battery life, so be sure to pay attention.



# Maintenance

## ■ Start the engine using an auxiliary cable

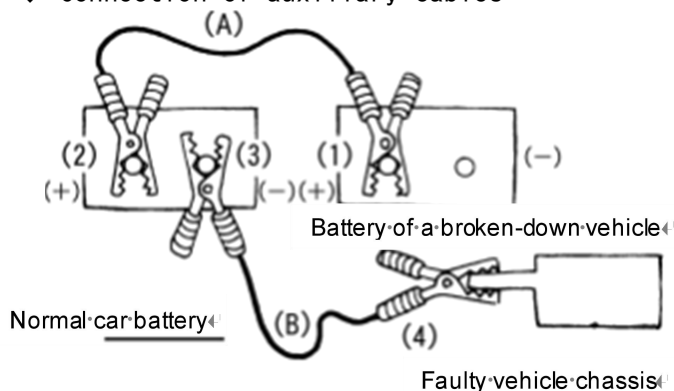
1. Since the battery can produce flammable gas, it is extremely dangerous to spark near the battery or approach a fire source as it may cause an ignition explosion. Therefore, avoid using a boost cable to start the engine as much as possible.
- 2 To prevent failure, batteries that are approaching the end of their lifespan should be replaced with new ones as soon as possible.

When it is unavoidable to start the engine with an auxiliary cable, please use the battery as follows to avoid accidents.

### ◆ Before connection

1. Use auxiliary cables and clamps with a capacity suitable for the battery.
- 2 Check if the cables, clamps, and the (+) and (-) terminals of the battery are broken or corroded.
3. Whether the starter key is in the "STOP" position.
4. The battery of a regular vehicle should have the same capacity as that of the faulty vehicle.

### ◆ Connection of auxiliary cables



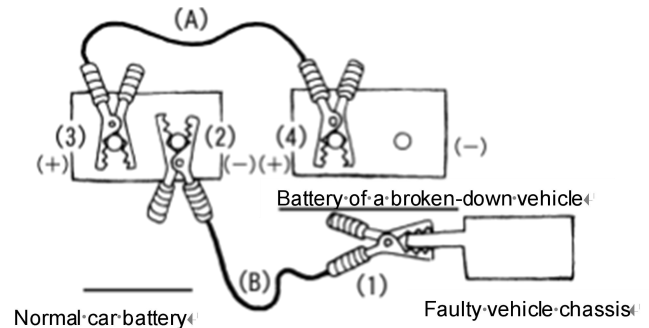
1. (1) Connect the clamps of the auxiliary cable (A) to the (+) terminal of the faulty vehicle, and (2) connect one of the clamps to the (+) terminal of the normal vehicle.
  2. (3) Connect the clamps of the auxiliary cable (B) to the (-) terminal of the normal vehicle, and (4) securely connect one of the clamps to the body of the faulty vehicle.
- \* Keep the connection to the vehicle body a little farther from the battery.
- 3 After all terminals are connected, make sure they are securely connected before starting the engine.

## ◆ The engine of the faulty vehicle starts

1. After confirming the connection, start the engine.

When starting fails, wait for a moment (2 to 3 minutes) and then restart the engine.

### ◆ Removal of auxiliary cables



1. (1) Remove the auxiliary cable from the frame of the faulty vehicle. (B) Line (2) Next, remove the (-) terminal of the normal car connection.
2. (3) From the normal car Remove the auxiliary cable from the (+) terminal (A) of After the wire clamp, (4) Remove the (+) of the faulty vehicle Terminal connections.

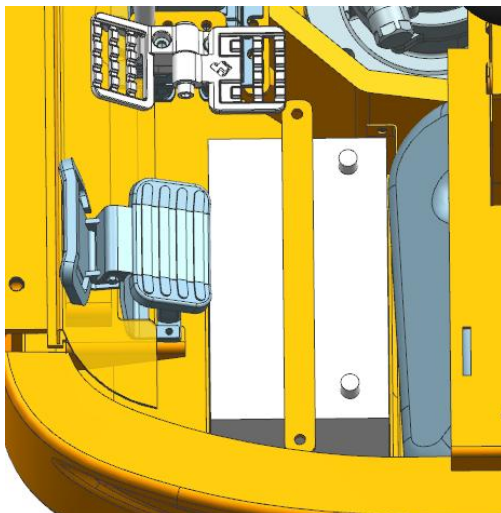
# Maintenance

## ■ Notes on starting the engine and charging the battery

For the engine starting method when the battery power is exhausted and the use of the battery, please follow the procedures below.

### ! **significant**

- \* Prohibited operations regarding charging and starting when the battery power is depleted  
(In the following circumstances, applying excessive voltage to electrical installation components (including controllers, instruments) may cause damage, so be careful when performing maintenance.)
  - Do not operate from large construction machinery with a 24V working voltage or Start after bridging a truck, etc. (Make sure to start with 12V.)
  - Do not charge when the battery terminals are not removed.  
(Please make sure to remove the terminals when charging.)
  - Do not start with a battery charger.
  - Do not start with a 24V battery.  
(Be sure to start with a 12V battery.)
  - Do not remove the battery terminals while the engine is rotating.



## About Fuses



### **note**

- \* Be sure to set the starter key to "STOP".

Do the fuse, slow fuse after the engine has stopped

Fuse replacement.

**D** If you're careless...

It will produce sparks and pose a danger.

### ■ Replacement of the fuse

- 1 Place the starter key in the "STOP" position.
- 2 Remove the cover under the seat and open the cover of the fuse box.
3. Please replace with a fuse of the same capacity as the blown fuse. The fuse can be easily removed through the fuse box cover plate.

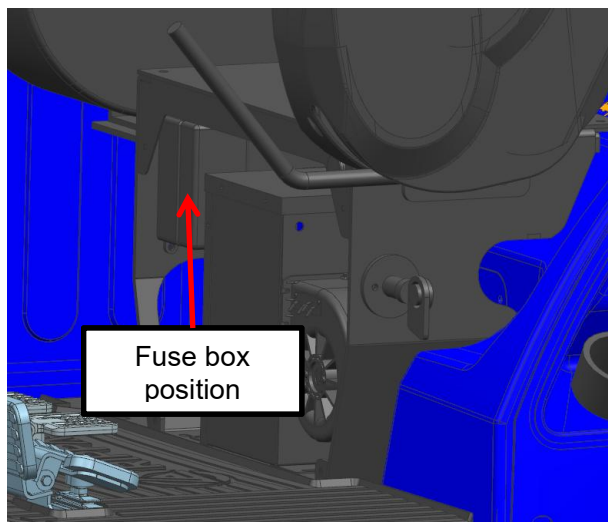


### **significant**

- \* If you replace a fuse and it blows immediately, do not use metal. Instead of silk or silver foil core wire, you should buy it at the sales store or The maintenance factory designated by our company will carry out inspection and repair.

# Maintenance

## ■ Position of the fuse box



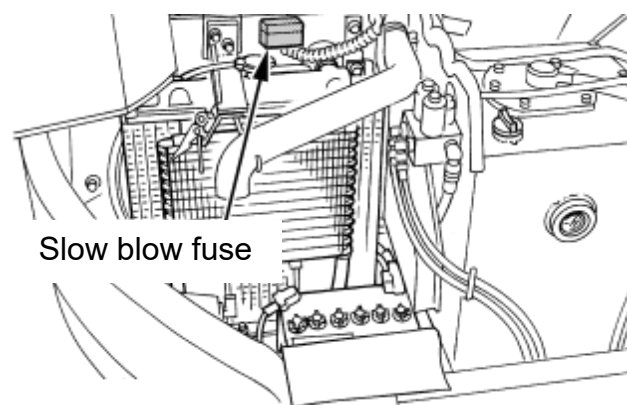
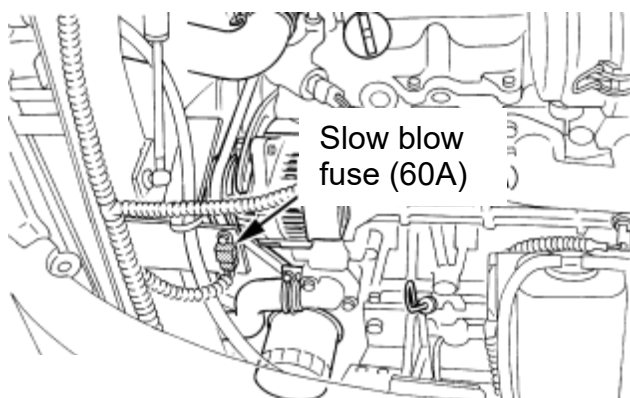
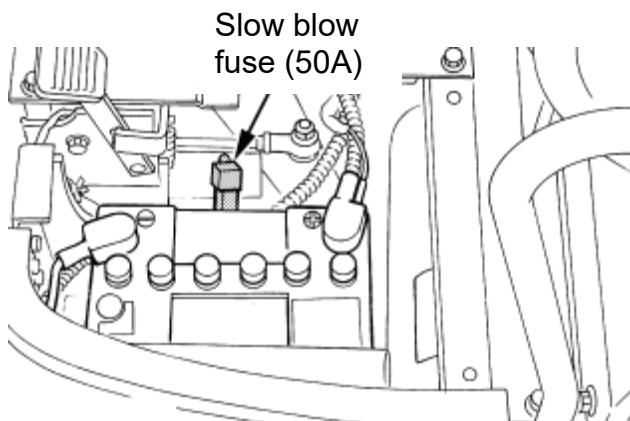
## ■ Fuse capacity and compatible circuits

12V80A Preheating relay	12V80A start relay		30A Air conditioning
			20A Reverse valve
12V80A Start relay	30A Start switch	30A Preheating	20A Excitation
			20A Left Rocker panel electric
			20A Left Rocker panel electric
			10A Instrument

Do not use fuses other than the specified capacity.

## ■ Replacement of slow-blow fuses

Slow-blow fuses are used to protect wiring. If a slow-melt fuse blows, be sure to investigate the cause of the blow and never use a substitute but use an authentic part.

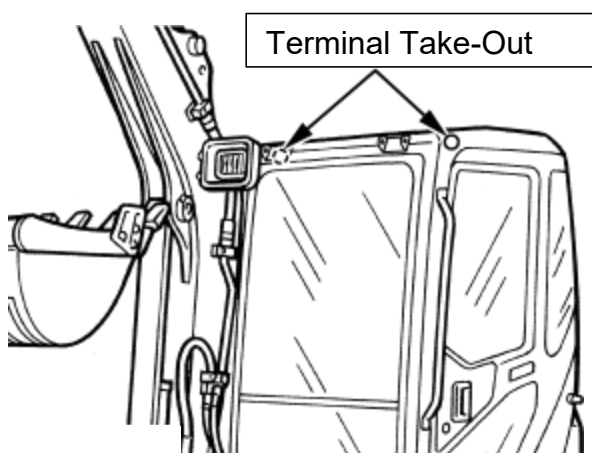


# Maintenance

## ■ Backup Power supply (work lights, etc.)

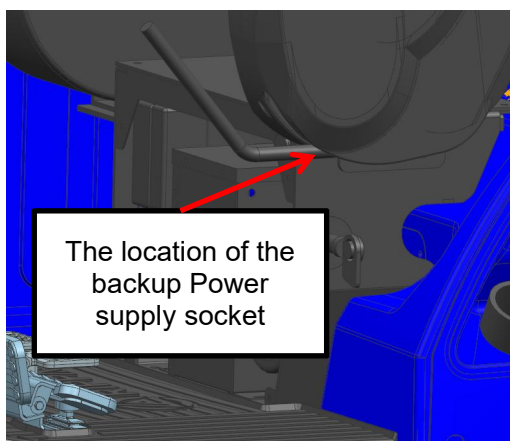
When installing additional operation lights other than those included with the machine (55W). When using the canopy specification, do it through the branch harness (work light). The maximum installation capacity is 110W including the local work light.

When the cab specification is adopted, there are terminals on the upper front part of the cab. The maximum installation capacity is 27W × 2 lights. For details, please re-consult the sales store or our designated repair factory.



## ■ Backup Power supply

The backup Power supply socket must be within 120W.



### supplement

- \* The battery may run out if left idle for a long time while starting up additional electrical assemblies. Be careful not to let it idle for a long time.

## Fuel system deflate

1. Please refill the fuel tank.
- 2 Insert the key into the starter switch and turn it to the "START" position



- 3 Perform about 1 minute of automatic air release.

### supplement

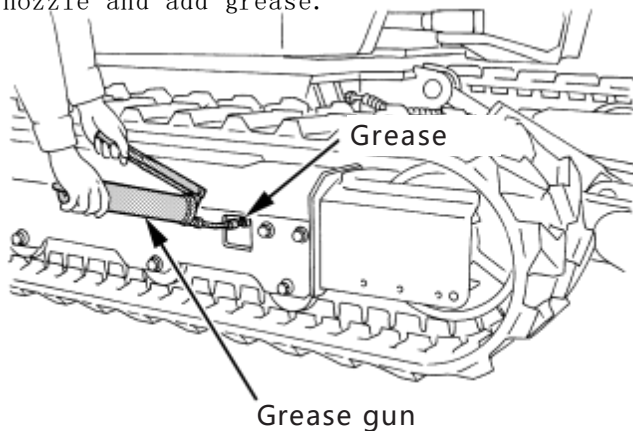
- \* If the air is not completely vented in the first attempt, repeat operations 2 and 3 when you want to stop the engine after starting.

# Maintenance

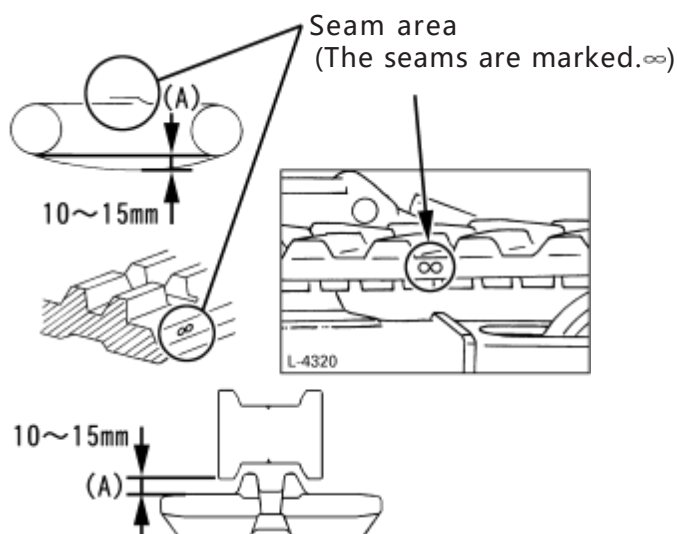
## Track adjustment

### ■ Tightening the rubber track

1 Insert the grease gun into the grease gun nozzle and add grease.



2. Track tensioning should be adjusted in the manner shown in the figure, that is, in the state of the floating track section (A), the size (the gap between the outer end of the central idler wheel and the tread of the track plate) should be 10 to 15mm. (The joint of the rubber track is located at the center of the upper part)



\* After adjustment, turn the track 1 to 2 times to confirm the tension allowance.

### ■ When loosening the rubber tracks



#### **note**

\* Since there is high pressure in the grease cylinder, therefore, if the grease cylinder If the nozzle relaxes too much or too quickly, the nozzle will fly out

Then, the high-pressure grease in the grease tank will also spray out, causing danger

Danger, so keep your face, etc. close to the nozzle and stay

Keep your body away from the front of the nozzle and release it slowly.

\* Remove stones, etc. that get stuck in the final drive

Proceed with the operation.

1 Insert the socket wrench into the base of the grease tank nozzle and slowly turn it 3 to 4 times to relax.

2. If grease flows out of the threaded section, spin the track idle while it is floating to allow for full relaxation.

After adjustment is completed

3. Use a socket wrench or similar tool to tighten the hexagonal part of the nozzle.

※ The tightening torque is approximately 98 to 108 nm (10 to 11kgfm).



#### **significant**

\* Readjust if the relaxation allowance reaches 25mm.

\* First check and readjust the tensioning allowance 30 hours after use, and then check and readjust it every 50 hours thereafter.

\* If too tight, it will

● Accelerate the wear of rubber tracks.

\* If too loose, it will

● Cause poor meshing in the final drive.

● Accelerate the wear of rubber tracks.

● Cause rubber tracks to come off.

\* After the work is done, thoroughly clean the rubber track section. Do not leave it unattended as it is covered with dirt, etc.

\* If the rubber track section becomes too tight due to being stuffed with dirt, etc., use the boom, boom and bucket to float the rubber track section and rotate it side by side without load to remove the dirt.

\* Pay attention to the seams of the tracks

Rubber tracks have seams. When adjusting the track, be sure to move the seam to the



# Maintenance

center of the upper part. Additionally, in the upper moving wheel mechanism, bring the upper moving wheel between the connecting rods and then make the adjustment.

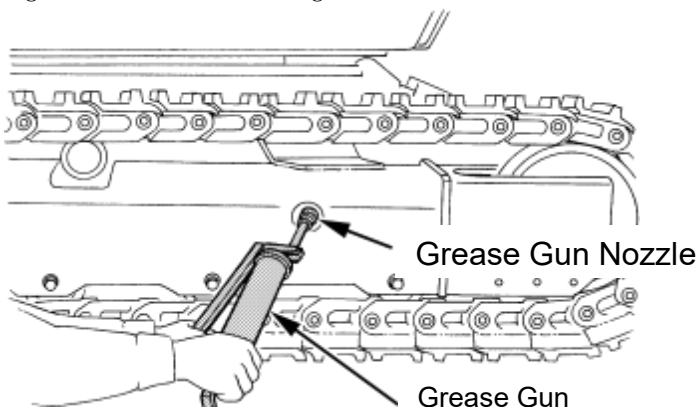
If the seam position is incorrect, it will result in a greater relaxation than the proper tension and will require readjustment instead.

## ■ In order to use the rubber tracks with ease

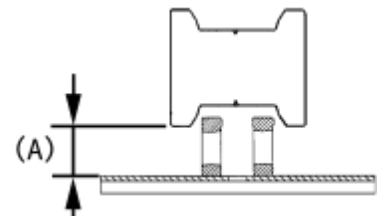
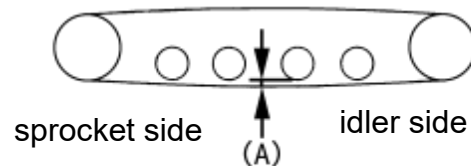
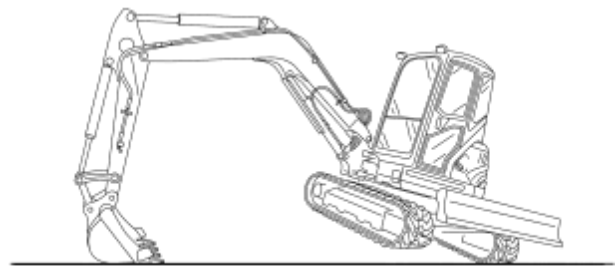
1. When turning, avoid turning in place as much as possible; instead, perform low-speed spins.  
(Reduces wheel claw wear and stones getting stuck)
2. When the safety valve operates due to sand getting stuck while turning, do not force the turn. Instead, go back immediately, remove the sand and then turn again.
3. Do not use it in such environments as it can damage the rubber and shorten the service life of the tracks when used on riversides, gravel ground, steel bars, and iron filings.

## ■ When tightening the track shoes of the iron track

- 1 Insert the grease gun into the grease gun nozzle and add grease.



2. As shown in the figure, when the gap "(A) size" between the outer end of the central idler wheel and the upper part of the track plate reaches the value shown in the figure below, the track tension is optimal.



Clearance (A)	25 to 30mm
---------------	------------



## Bucket replacement



### **note**

\* Wear a helmet, protective glasses, etc. when performing the replacement operation

Protective equipment.

\* When working together, you should thoroughly understand the agreed signals, precisely

Communicate with each other and pay full attention to safety.

The bucket replacement should be carried out following these guidelines.



### **significant**

\* Be careful not to let the pull-out pins come into contact with sand or dirt.

\* Since dust seals are placed at both ends of the bushing, be careful not to damage the dust seals when loading and unloading the pins.

### ■ Removal of the bucket

1 Place the bucket in a flat, level position to touch the ground.

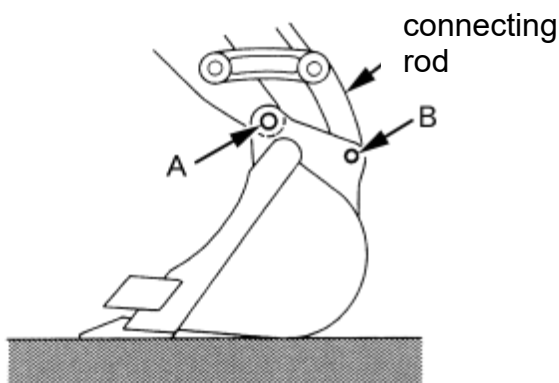
2 Stop the engine and release the pressure from the hydraulic system.

3 Pull out pins A and B.



### **significant**

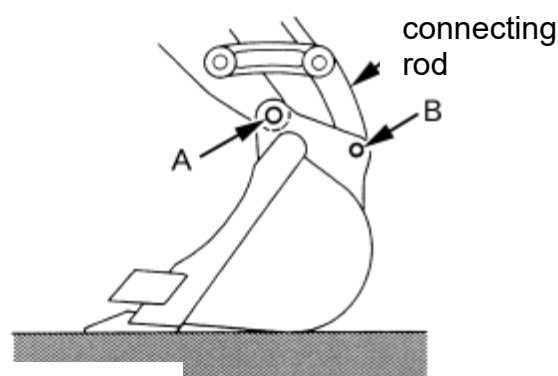
\* When replacing the bucket, make sure the AB pin shafts are clean and free of sand, etc. Sand entering the bushing may cause the bushing to wear out quickly.



### ■ Installation of the bucket

1 Align the bucket rod with hole A, insert spacers when the gap at both ends of the bucket rod is large, and combine with pins. Then align the connecting rod with the B hole, insert the spacer when the gap at both ends of the connecting rod is large, and combine with pins.

2 Install the locating bolts of the pins securely.



3 Grease the pins.

# Maintenance

## Replacement of bucket teeth and side teeth

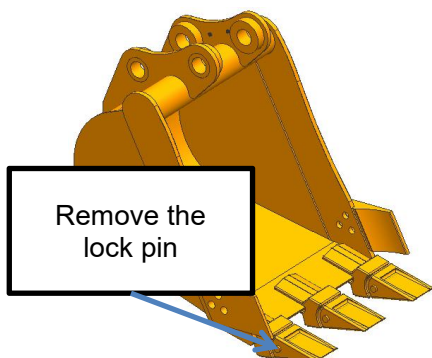
### ■ Replacement of bucket teeth



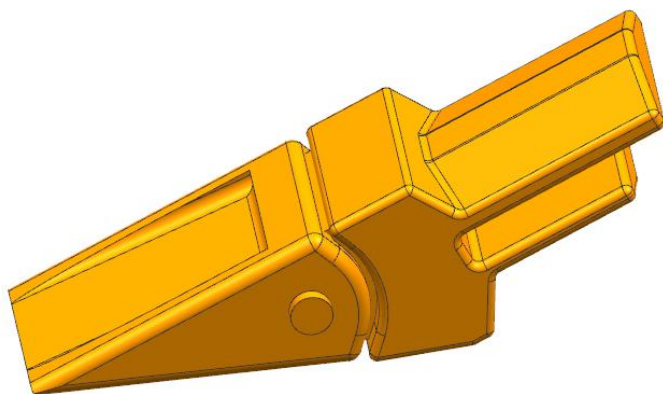
**warn**

\* When working, be sure to use protective gear such as protective glasses.

- 1 Press the lock pin with a punch and then hammer off the lock pin first.
- 2 Strike the worn bucket teeth with a hammer or the like to pull them out of the joint.
- 3 Remove the dirt attached to the joint.

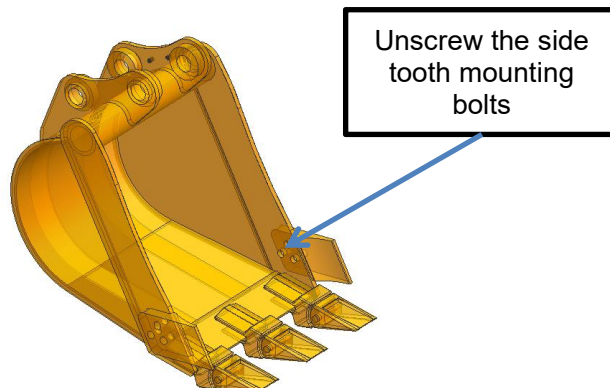


- 4 Align the new bucket teeth with the joint and insert them into the joint.



### ■ Replacement of side teeth

- 1 Unscrew the side tooth mounting bolts with socket wrenches, wrenches, etc.
- 2 Install the new side teeth. And temporarily tighten the bolts.
3. Tighten the bolts after confirming that the side tooth contact surface is securely in contact with the bucket metal joint.



- Fasten the bolts with a fastening torque of 260 to 304N·m(26.5 to 31kgf·m). Bolts may loosen when the side tooth contact surface is not in contact with the bucket metal joint or when the clamping force is weak.

# Maintenance

## Maintenance during long-term storage

### ■ When parking for a long time, please save as follows

1. After rinsing and cleaning all parts, store the machine indoors, not outdoors.  
If it has to be placed outdoors, choose a flat ground and put it on a piece of wood, then cover it with a cover cloth.
- 2 Do not forget to add oil, grease and change the oil.
- 3 Apply grease thoroughly to the exposed parts of the hydraulic cylinder piston rod.
- 4 Remove the battery ground wire, or remove the battery from the vehicle and store it.
5. When the temperature drops below 0 ° C, add antifreeze to the coolant or drain the water completely.

### ■ When using after a long period of parking, follow these steps

1. Wipe off the grease on the piston rod of the hydraulic cylinder.
- 2 Start the engine and perform the working device and driving actions without load to ensure the oil flows to all directions.  
(If the vehicle is parked for more than one month, perform operations 1 and 2 once a month.)

## Use during the cold season

### ■ Cryogenic precautions

1. Engine oil, hydraulic working oil  
Change to oil of the specified viscosity.
2. Fuel  
Choose the appropriate diesel according to the temperature.
3. Battery  
Battery capacity drops at low temperatures and the solution freezes when the charge is reduced. Therefore, when stopping the engine, make sure the charging rate is above 75% and pay attention to keeping warm in case of starting the next morning.

When replenishing distilled water due to a low level, do not do it after the operation is completed, but do it before starting the operation the next morning to prevent freezing.

#### 4. Cooling water

Add antifreeze, please.

If the temperature drops below 0 ° C during parking, add antifreeze to the coolant and replenish the radiator and water tank to prevent freezing.

- Table of mixing ratios of water and antifreeze

Minimum temperature(°C)	-5	-10	-15	-20	-25	-30	-35	-40
Antifreeze volume(%)	30	30	30	35	40	45	50	55
Water volume(%)	70	70	70	65	60	55	50	45

### supplement

\* Antifreeze should be permanent brand or long-life coolant.

\* The mixture of water and antifreeze should be injected after the coolant has been completely drained and scale has been removed.

\* Since rust inhibitors have been added to the antifreeze, no detergent is needed when using the antifreeze.

\* Cooling water

See the "Coolant Replacement" item

### ■ Precautions after the completion of the assignment

Wipe off dirt and water attached to the vehicle body and place the tracks on concrete surface or in a dry area.

Especially the dirt attached to the wheels, if not completely removed, can sometimes make it impossible to drive after freezing. So, if there is no proper place to park, you can park after laying a wooden board on the ground or on a straw mat. If you park directly on the ground, you may not be able to drive or cause damage such as a motor when the tracks freeze the next morning.

Especially wipe the surface of the hydraulic cylinder piston rod thoroughly to remove water droplets. If dirt and frozen water droplets get into the seal together, then the seal may be damaged.

# Maintenance

## Regarding regular replacement of important parts

In order to always ensure safety in operation and work, machine operators must carry out regular maintenance. In order to further enhance safety, especially the following important components related to safety and fire should be entrusted to the sales store or the maintenance factory designated by the company for regular replacement.

These components can change in material over time and are prone to wear and tear or aging. Since it is difficult to determine their condition during regular maintenance operations, it is necessary to replace them with new ones after a certain period of use, even if no abnormalities are found, to ensure that they remain functioning properly throughout.

However, if certain abnormalities are found in these components before they reach the end of their service life, they should also be repaired or replaced with new ones as usual. For the hose section, when signs of aging such as deformation or cracking of the hose clamp are found, the hose clamp should be replaced with new ones at the same time.

In addition, the following checks should be carried out on hydraulic hoses other than regular replacement parts, and reinforcement, replacement, etc. should be carried out when abnormalities are found. When replacing the hydraulic hose, also replace the O-rings and sealing components.

The replacement of important parts should be entrusted to the sales store or the maintenance factory designated by our company.

- Check fuel hoses and hydraulic hoses as well during the following regular inspections.

Check categories	Check items
Daily checks	Fuel, hydraulic hose connections, riveting leaks
Monthly routine inspection	Oil leakage at the connection and riveting parts of fuel and hydraulic hoses, damage (cracking, wear, fuzzing) to fuel and hydraulic hoses
Specific self-inspection (annual inspection)	Fuel, hydraulic hose connections, riveting leaks Interference, cracking, aging, squeezing, damage (cracking, wear, fuzzing) of fuel and hydraulic hoses

- List of important components

No.	Replace parts regularly	Quantity	Change time
1	Fuel hose (fuel tank - fuel filter)	1	Every 2 years or Change every 4,000 hours, whichever comes first.
2	Fuel hose (fuel filter - fuel pump)	1	
3	Fuel hose (fuel pump - fuel nozzle)	1	
4	Fuel hose (fuel nozzle to fuel tank)	2	
5	Hydraulic hose (main pump suction)	2	
6	Hydraulic hose (main pump output)	5	
7	Hydraulic hose (boom cylinder)	4	
8	Hydraulic hose (boom cylinder)	4	
9	Hydraulic hose (bucket cylinder)	4	
10	Hydraulic hose (swing cylinder)	2	
11	Hydraulic hose (bulldozer cylinder)	6	
12	Hydraulic hose (auxiliary device)	6	
13	Hydraulic hose (rotary motor)	2	



# Backhoe Excavator Problems and Solutions

If an undesirable condition occurs with the mini backhoe, please diagnose it according to the table below and take appropriate action. If you have any questions, please contact the store where you purchased the product or the repair factory designated by our company.

	Status Quo	Reasons	Disposal
Engine aspect	Unable to start	(1) Starting the engine with the wrong key. (2) The key has metal parts (such as key rings, etc.)	(1) If the instrument panel shows "Key Error", please use the correct key to start the engine. (2) Remove the metal parts from the key and start the engine.
	When it's difficult to start	(1) The fuel is not flowing.	(1) Check the fuel tank to remove settled impurities or moisture. (2) Check the fuel filter and replace it if it is dirty.
		(2) Air or water mixed into the fuel delivery system	(1) Check the piping and clamp the clamps, and replace them with new ones or repair them if damaged. (2) Deflate. (See the "Fuel System Venting" item)
		(3) In cold weather, the viscosity of the oil increases and the engine itself rotates heavily.	(1) Inject hot water into the radiator. (2) Use different types of engine oil depending on the temperature. (Use SAE10W30 in winter)
		(4) The battery power appears to be depleted, the rotational force weakens, and there is no momentum to exceed compression.	(1) Charge the battery.
	When the output power is insufficient	(1) Insufficient fuel.	(1) Refuel.
		(2) Clogged air filter.	(1) Clean the filter element.
	When suddenly stopping	(1) Insufficient fuel.	(1) Refuel.
	When the exhaust gas color is abnormally black	(1) Poor fuel. (2) Excessive engine oil.	(1) Switch to high-quality fuel. (2) Adjust to normal fuel levels.
	When the water temperature gauge shows "H" (engine overheating)	(1) The Water pump has poor sealing. (2) The fan belt is extended or broken. (3) The thermostat is faulty. (4) Insufficient cooling water. (5) The radiator mesh and fins are clogged with dust. (6) Rust on the cylinder head and crankcase contaminates the coolant. (7) Poor radiator cap (evaporation). (8) Corrosion of the cooling water passage. (9) Continuous overload operation. (10) Damaged cover gasket (reduced cooling water). (11) Insufficient engine oil. (12) Poor fuel injection timing. (13) Poor fuel.	(1) Replace. (2) Make adjustments or replacements. (3) Make a replacement. (4) Replenish to the specified amount. (5) Do the cleaning. (6) Replace the cooling water and add rust inhibitor. (7) Replace. (8) rinse. (9) Reduce the load. (10) Replace. (11) Adjust to normal oil levels. (12) Make adjustments. (13) Please switch to high-quality fuel.
Hydraul	Working devices (boom, bucket, bucket) Rotating, traveling,	(1) Insufficient working oil. (2) Oil leakage at hose and piping joints.	(1) Refill the working oil. (2) Reinforce or replace.





	insufficient force, slow speed or no action of the bulldozer shovel		
Drivin	Not driving smoothly	(1) Stones got stuck in the track. (2) The tracks are too tight or too loose.	(1) Remove the stones. (2) Make adjustments.







# Precautions for the use of hydraulic breaker

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## Precautions when installing a hydraulic breaker

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Please install a breaker that fits the machine. If a breaker other than recommended is installed, it will not only affect the lifespan of the machine, but also pose safety concerns.

Also, when installing a breaker from a manufacturer other than the one below and the front end working device, please talk to the store of sale or the maintenance worker designated by our company in advance.



# Precautions for using hydraulic breaker

## Precautions when using a breaker hammer

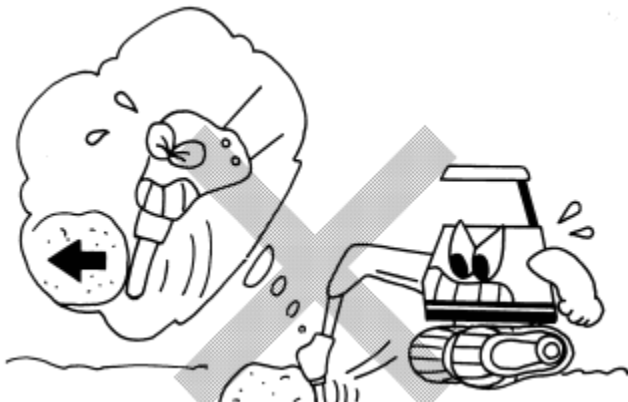
### Prohibited 1 Working posture

If the strike is carried out with a lift of more than 5cm in front of the machine, then at the same time the rock is broken, the machine will also sharply lean forward, causing the main body of the breaker or the top part of the bracket to collide with the rock, sometimes resulting in damage. Also, since the vibration generated during the strike spreads to the track section, do not use this strike method for the protection of the track.



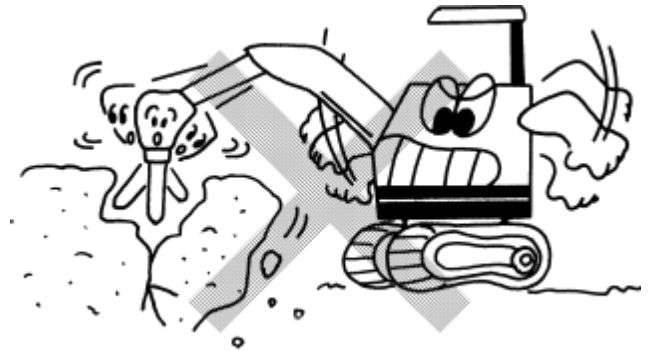
### 2 Do not move rocks, etc

As shown in the figure, do not use the hydraulic power of the boom, bucket rod, etc. of this machine to turn or knock over rocks through the top of the hammer rod or the side of the bracket, otherwise it may cause damage to the mounting bolts of the breaker, damage to the bracket, damage to the hammer rod and jamming, damage to the bucket rod and boom.



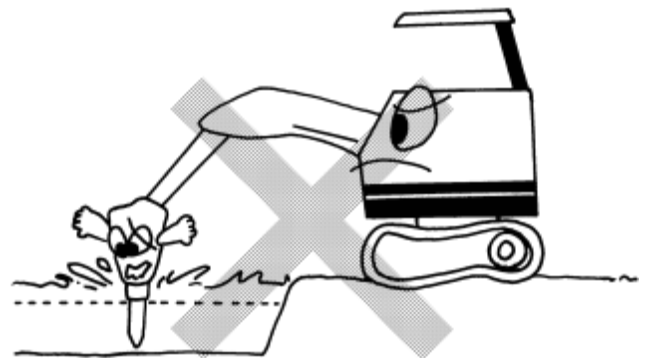
### Prohibition 3 Do not perform prying crushing operations

If rocks, etc. are broken by prying with a hammer rod, it will cause damage to bolts, hammer rods, etc.



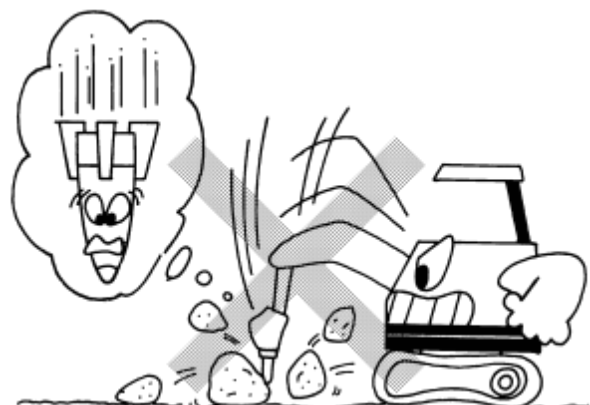
### Prohibition 4: Crushing operations are prohibited in water or mud

Do not perform crushing operations by placing parts other than the hammer rod in water or mud. Otherwise, the hammer will fail too early due to rusting of the piston and other parts.



### Prohibition 5 Do not let the breaker fall to break rocks, etc

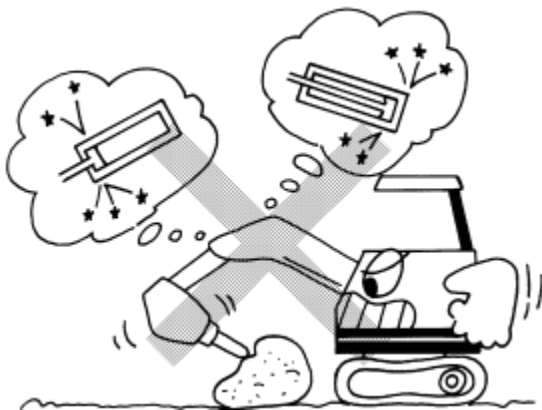
If excessive force is applied to the breaker or the machine, it may cause damage to various parts of the breaker or the machine.



# Precautions for using hydraulic breaker

**Prohibition 6** Do not perform crushing operations when the hydraulic cylinder of this machine is at the end of its stroke

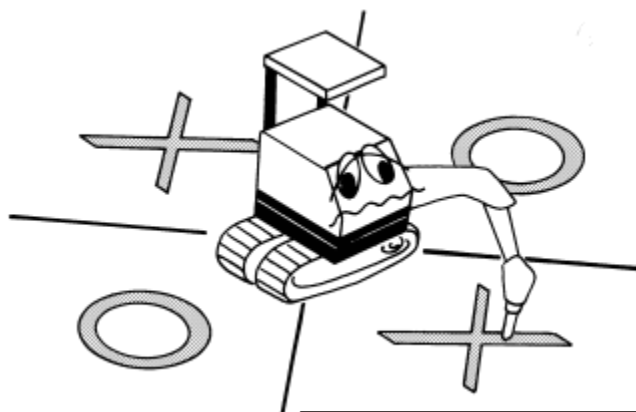
If strike operations are carried out when each of the hydraulic cylinders of the machine is at the end of its stroke (when the hydraulic cylinders are extended to the maximum position or contracted to the maximum position), it may cause damage to the hydraulic cylinders of the machine or damage to various parts of the machine.



**Prohibition 7** Do not lift cargo operations  
Do not use hydraulic breakers for lifting goods.

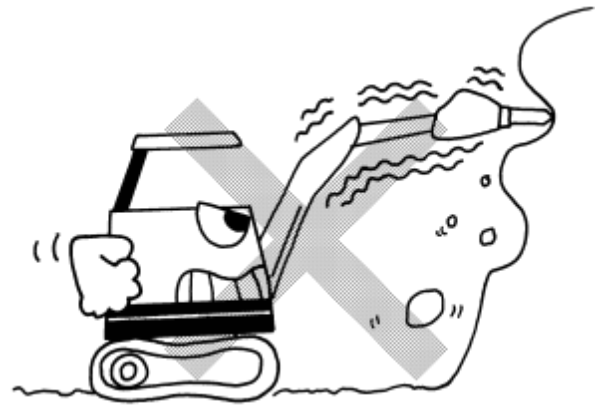


**Do not work when the machine is facing sideways**  
Do not operate the breaker when the machine is facing sideways. Otherwise, it may cause the machine to tip over and reduce the lifespan of the wheel section.



**Prohibition 9**

Horizontal, upward-facing strike operations are prohibited.



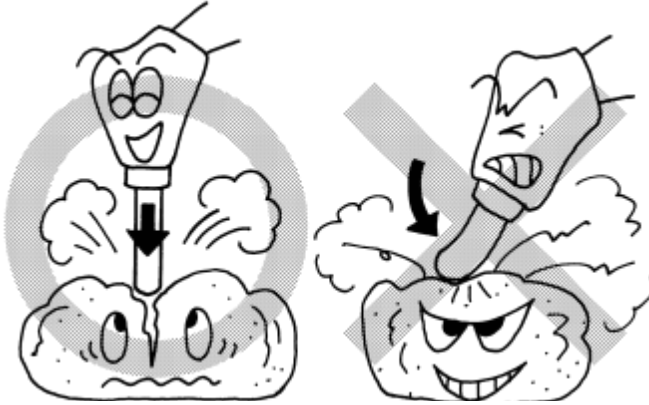
**Prohibition 10**

No high-altitude crushing. Otherwise it will cause rockfalls and overturns.

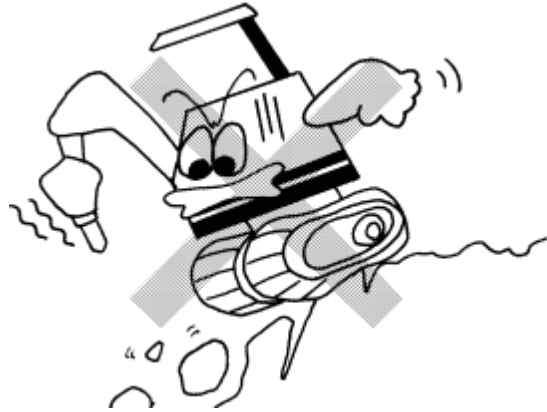
# Precautions for using hydraulic breaker

## Note 1

Strike by pressing the chisel vertically against the strike face. Also, be sure to apply thrust throughout the strike and never make an empty strike.

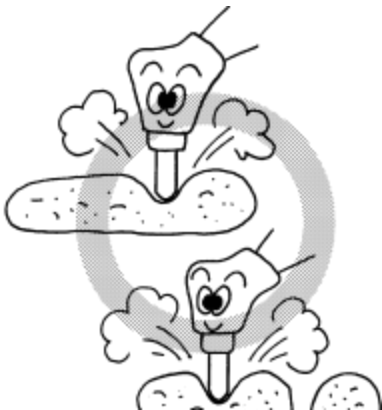


Make sure the ground under your feet is solid before proceeding.



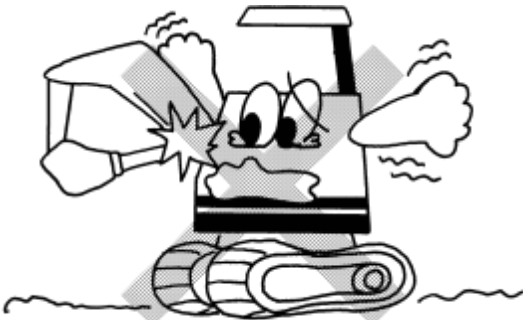
## Notes 2

If you strike the same strike surface consecutively but fail to break and penetrate within 1 minute, change the strike surface and chisel from the top to break it.



## Notes 3

When lifting the hydraulic breaker, be careful not to let the steel rod strike the boom or the boom cylinder.



## Notes 3

# Recommended grease

■ Be sure to use the genuine RIPPA oils and greases shown in the table below.

Manufacturer	RIPPA working oil	RIPPA engine oil	Universal grease
SHELL Shell	Hydraulic 46	D30CD or D10W-30CD	—
Cartel Oil	—	—	Engineering King (General Electric No. 3 lithium)

## ● Recommended lubricating grease

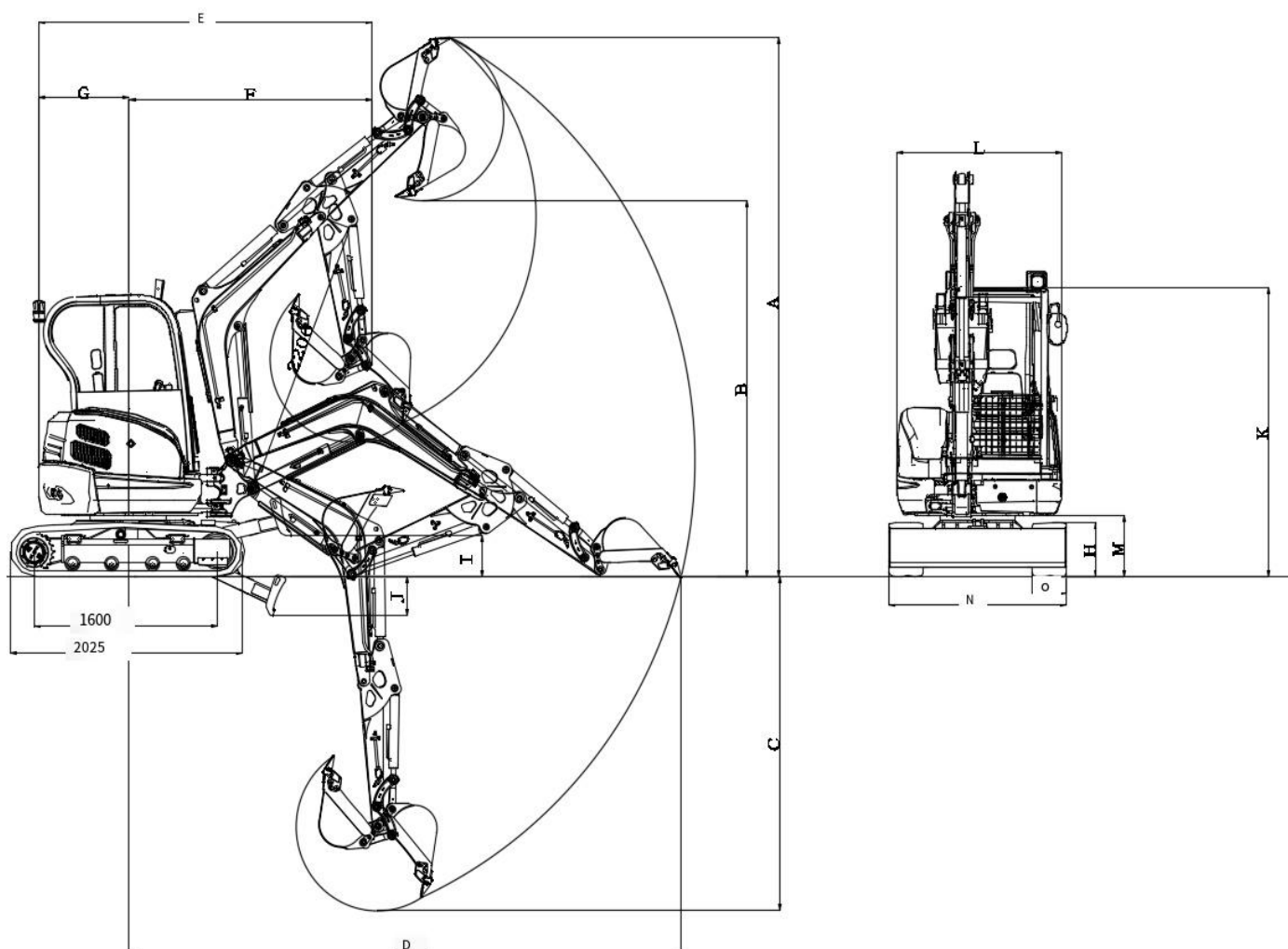
Producers	Engine oil	Hydraulic oil	Gear oil
Mobil	The Black Tyrant Delvac MX(15W-40) Super Tyrant Delvac Surper Multigrades(10W-30/15W-40)	DTE 25(VG46)	Vehicle gear oil Mobilube HD 80W-90
ESSO	Superflo(10W-40)	NUTO H46	Gear oil GX 80W-90
SHELL	RIMULA(SAE10W-30)	Tellus /Tellus ST46	SPIRAX EP90
Castrol CALTEX	Super Strongman (RX Super) SAE15W-40; Strongman (RX Super Plus) SAE10W-30	HYDRAULIC series (VG46)	
Gades TEXACO	Havoline <sup>a</sup> Motor Oil 10W-30		Havoline <sup>■</sup> Gear Oil 80W-90
Koei JOMO	High-grade DIESEL engine oil JOMO Diesel CF-4(SAE15W-40)/ Premium DIESEL Engine oil JOMO Diesel CD(SAE10W-30)	JOMO Hydlux (VG46)	Premium automotive GEAR oil JOMO GEAR 5

※ When changing the oil, drain all the oil before adding new oil. ※  
Please use the following fuels.

- 0# diesel: For summer use
- -10#, -20#, -35# : Winter, choose according to local temperature

# Schedule

## Dimension diagram

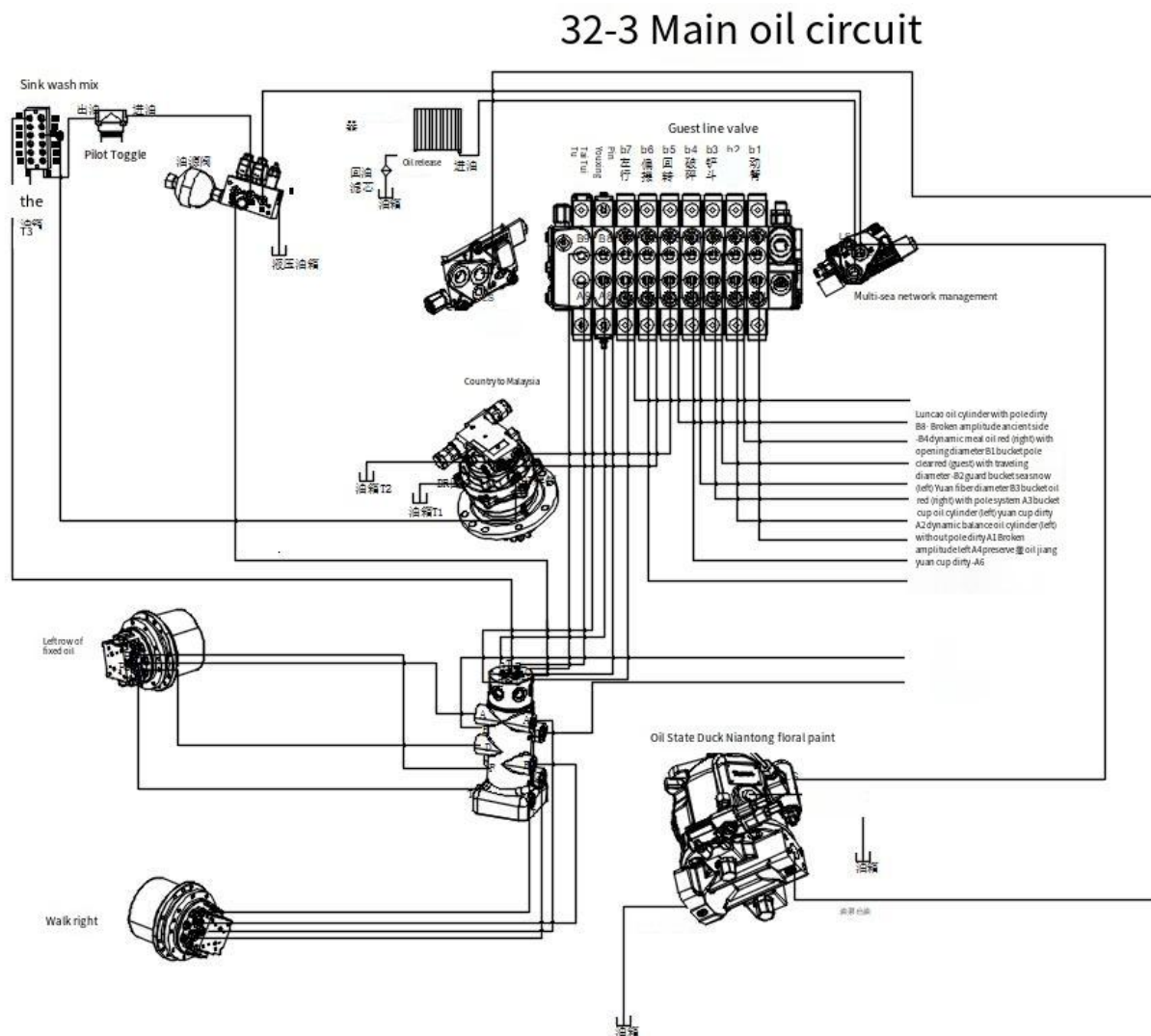


Range of work		Unit: mm
		R32-4
A	Maximum ground excavation height	4563
B	Maximum unloading height	3181
C	Maximum mining depth	2827
D	The maximum range of ground activity	4831
E	Transport length	2921
F	Turning radius	2126
G	Minimum tail rotation radius	796
H	Orbital height	460
I	Maximum lift height	351
J	The maximum sinking height of the bucket teeth	331
K	Overall vehicle height	2369
L	Overall vehicle width	1435
M	Height of the vehicle body	552
N	Push the width of the shovel	1550
O	Track width	300

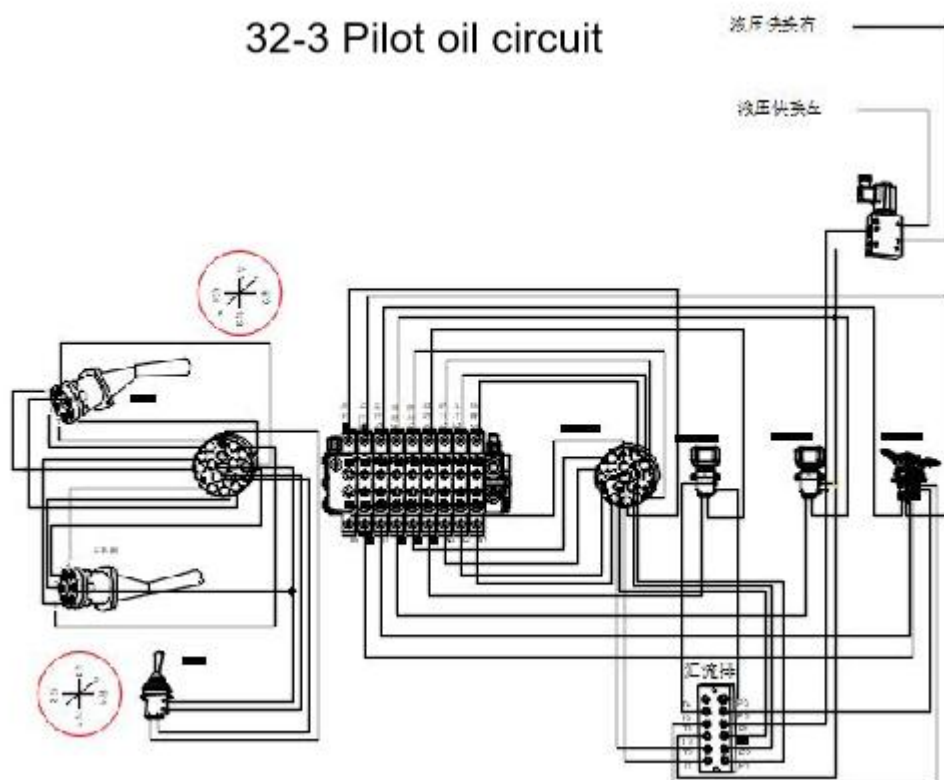


## Hydraulic schematic diagram and detailed information

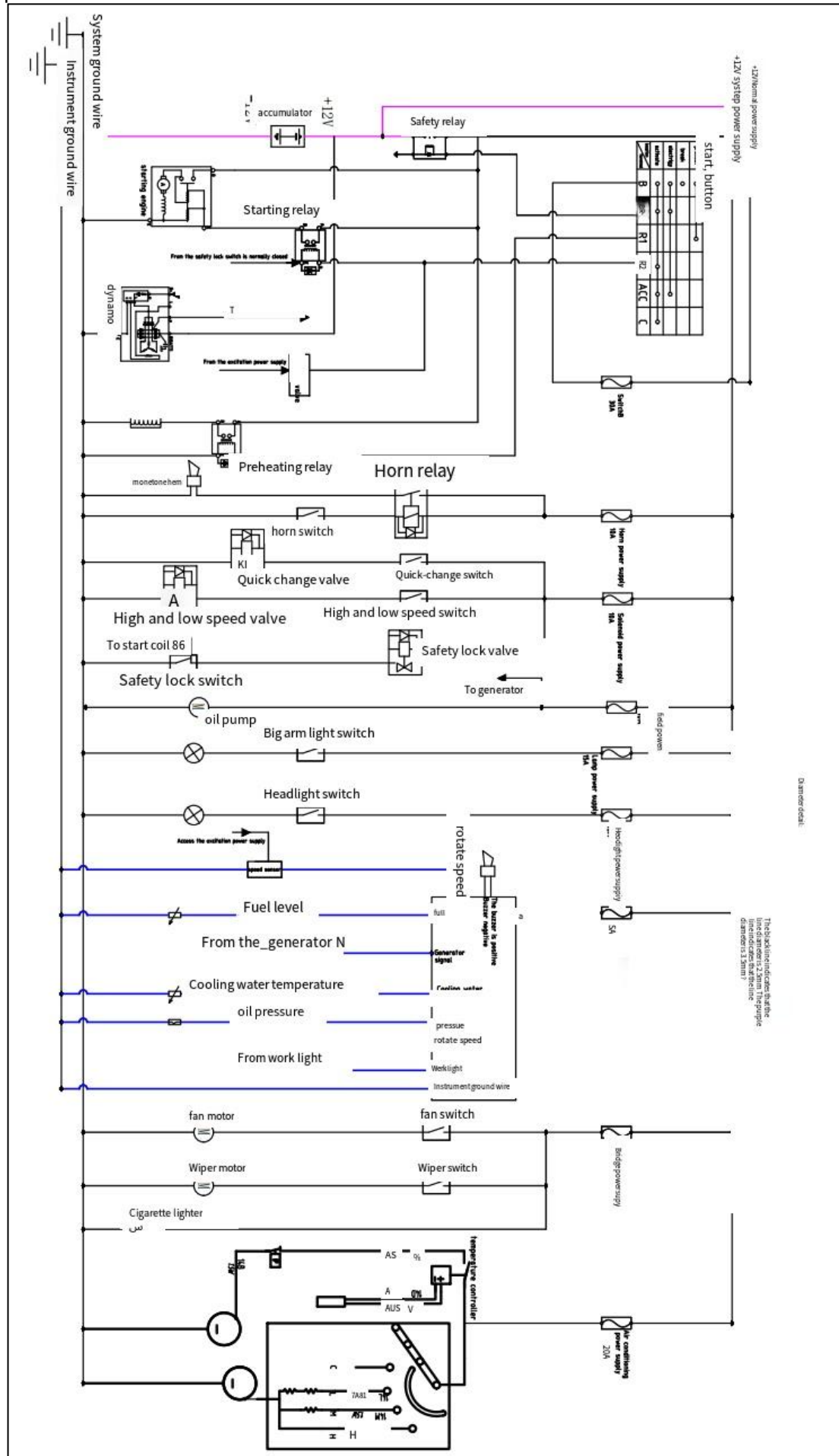
The hydraulic schematic diagram, as an essential part of the design of a hydraulic system, clearly shows how the hydraulic system works, its structure, and its control mode. The machine hydraulic circuit based on the hydraulic schematic diagram can better solve the problems of the hydraulic pipeline.



### 32-3 Pilot oil circuit



Electrical schematic diagrams, as an important part of circuit design, are used to clearly show how the circuit works, how it is structured, and how it is controlled. An electrical schematic diagram can provide a comprehensive understanding of the electrical layout of a machine and can also be used to troubleshoot electrical problems.



# Excavator Parameter table

Model information configuration status ● Standard ○ Optional			R32-4		
Basic Performance Parameters	Overall working weight (kg)	3219	Engine	Engine model	Kubota V1505
	Container volume (m³)	0.08		Maximum horsepower (ps)	25
	Walking speed low/high (Km/h)	0-2.8-1.8/0		Maximum power (Kw)	18.5
	Climbing ability (%)	30%		Maximum speed (rpm)	2300
	Ground specific pressure (Kpa)	36		Displacement (L)	1.5
	Maximum digging force (kN)	27		Number of cylinders	4
	Maximum digging radius (mm)	4831		Cooling method	Water cooling
	Maximum digging depth (mm)	2827		Engine oil change volume (L)	5
	Maximum digging height (mm)	4563		Fuel form	Diesel
	Maximum unloading height (mm)	3181		Fuel grade	No. 0/-10
	Maximum deflection Angle (°)	110 °		Theoretical fuel consumption (L/h)	1.3-1.5
			Vehicle body	Transport length (mm)	2921
				Transport width (mm)	1550
Configuration	Cab	●		Transport height (mm)	2369
	Handrails	-		Counterweight ground clearance (mm)	522
	Quick change	○		Bucket width (mm)	400
	Hydraulic quick change	●		Boom length (mm)	2220
	Rake	○		Barrel length (mm)	1620
	Grabber	○		Width of the bulldozer board (mm)	1550
	Loosener	○	Fuel tank	Fuel tank (L)	45
	Breaker hammer	○		Hydraulic tank (L)	40
	Counterweight	●	Tracks	○- Rubber (bandwidth * pitch * number of sections)	300 * 52.5 * 84
	Tensioned form	Butter tension		○- steel (bandwidth * pitch * number of segments)	300 * 101.6 * 43
	air conditioner	●		Rubber blocks (pieces)	86
Hydraulic system	Main pump type/Model	Load sensitive plunger pump /45			
	Main pump brand	Taifeng			
	Maximum flow rate of the main pump (L/min)	99L/min			
	Multi-way valve	Load-sensitive 9-way hydraulic multi-way valve			
	Multi-way valve brand	Taifeng			
	Rated set pressure (Mpa)	20			
	Maximum set pressure (Mpa)	20			
	Walking hydraulic motor type	LTM03AX			
	Walking motor brand	Likechuan			
	Motor displacement	15.4/23.2			
	Rotary hydraulic motor type	LS24B--24BD			
	Displacement	18.1			



## EC DECLARATION OF CONFORMITY

Original Declaration

MANUFACTURER:

Name:

SHANDONG RIPPA MACHINERY GROUP CO., LTD. No. 6 Industrial Park, No. 2166 Chongwen

Address:

Avenue, High tech Zone, Jining City, Shandong Province, P.R.China

AUTHORIZED REPRESENTATIVE: RIPPA EUROPE LLC EOOD

1 Racho Dimchev str., entr. A, 1st floor, office 1 1000 Sofia, Bulgarien AUTHORIZED TO HOLD TECHNICAL FILE  
ON BEHALF OF MANUFACTURER ABOVE

HEREBY DECLARES THAT THE BELOW MENTIONED MACHINE:

DESCRIPTION OF MACHINERY

PRODUCT NAME:

HYDRAULIC EXCAVATOR

MODEL TYPE:

SERIAL NO.:

PRODUCTION YEAR:

IN ACCORDANCE WITH:

MACHINERY DIRECTIVE

2006/42/EC EN 474-1:2022: EN  
474-5:2022

EMC DIRECTIVE

2014/30/EU EN ISO 13766-1:2018 EN ISO  
13766-2:2018

AS WELL AS TO THE FOLLOWING OTHER DIRECTIVES AND THE CORRESPONDING NATIONAL REGULATIONS:

NOISE DIRECTIVE

2000/14/EC & 2005/88/EC, DLGS 262/02

EQUIPMENT ACCORDING TO THE DEFINITION GIVEN BY ANNEX I, ITEM 20 OF NOISE DIRECTIVE. CONFORMITY ASSESSMENT  
PROCEDURE FOLLOWED: ANNEX VII OF 2000/14/EC NOTIFIED BODY: EUROPEAN CERTIFYING ORGANIZATION S.P.A. NB 0714, VIA  
MENGOLINA 33, FAENZA (RA), ITALY HOLDER OF THE TECHNICAL DOCUMENTATION: MANUFACTURER MEASURED SOUND  
POWER LEVEL: 92 dB(A) GUARANTEED SOUND POWER LEVEL: 93 dB(A)

SIGNED ON BEHALF OF SHANDONG RIPPA MACHINERY GROUP CO., LTD

STAMP & SIGNATURE:

Jacky Yan

NAME:

Jacky Yan

POSITION:

GENERAL MANAGER

PLACE:

JINING, CHINA

DATE:





# Accessories and spare parts list

Attachment list

Attachment List

## 1. Foot pads

## 2. Accessories

Accessory name	Quantity	Type
		R32
14-inch toolbox	1	○
Butter gun	1	○
Tool butter	1	○
Belt wrench	1	○
Tool wrench set	1	○
Hex socket wrench	1 set	○
New funnel	1	○
Open wrench	1	○
Air filter element	1	○
Return oil filter element	1	○
R32 complete car stickers	1	○
R32 Parts Manual	1	○
R32 Instruction Manual	1	○
Orthodontic teeth	2	○
Side teeth	2	○
Bucket pin shaft	2	○

## 3. Random file

- ① One copy of the operation and maintenance manual
- ②. One service voucher for the three guarantees
- ③ One copy of qualification certificate
- ④ One copy of the engine manual

