



## SHANDONG LIPAI MACHINERY GROUP CO., LTD

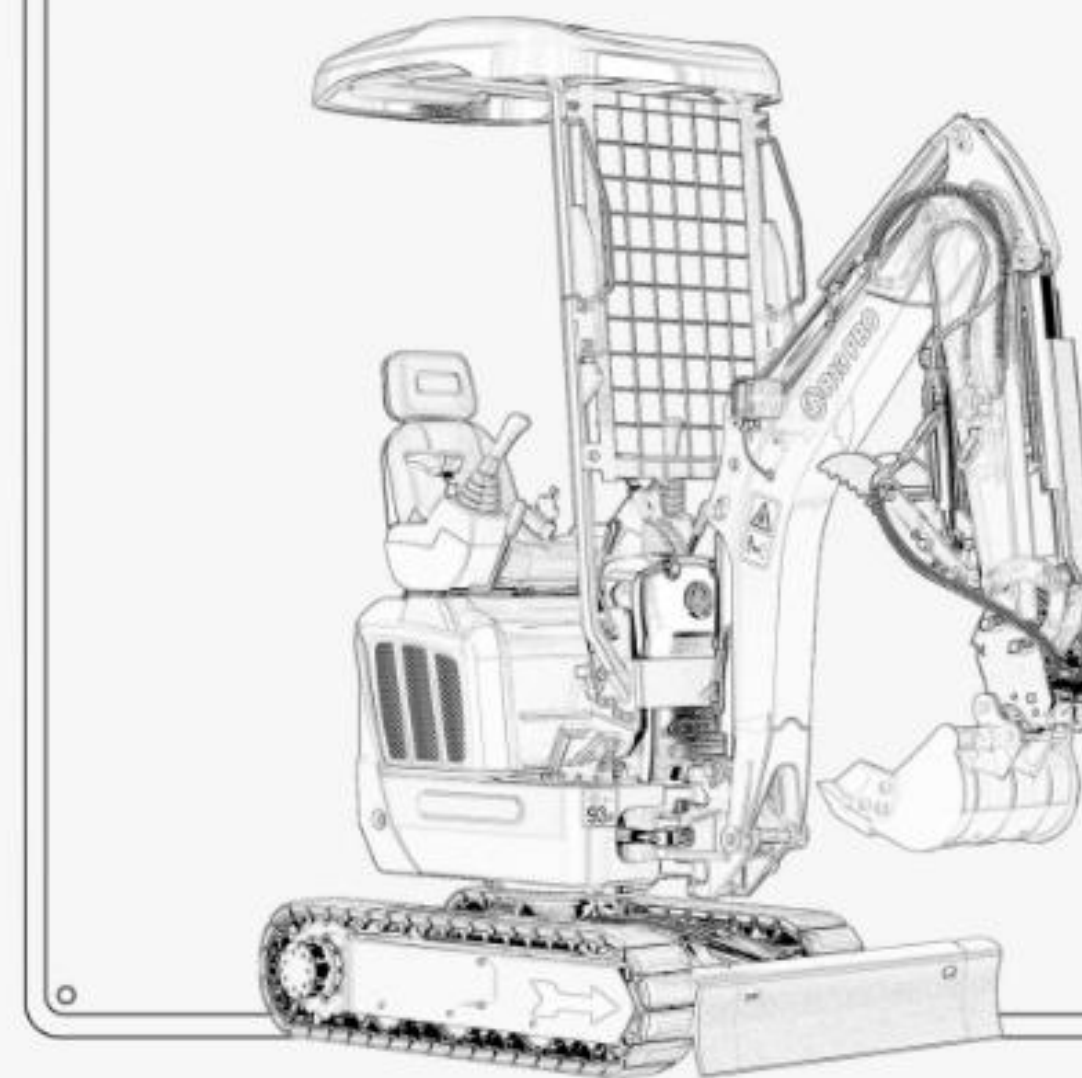
Address: 36m north of Guang 'an Jiayuan, Guang 'an Road, High-tech Zone, Jining, Shandong.

☎ : (86) 0537-2339712

📞 : (86) 18753778717

✉ : rippamachine@gmail.com

WWW.RIPPA.COM



# OPERATION INSTRUCTION
























## R13 PRO Hydraulic excavator

This manual only shows parts, please refer to the manual of the corresponding model for detailed operation steps.



# Symbols for operating devices

The operating device is marked with symbols to facilitate operation and maintenance management The meanings of the symbols are as follows Show , Please fully understand and pay attention to avoid erroneous operations.

|                                                                                     |                              |                                                                                     |                                 |
|-------------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------|---------------------------------|
|    | Bucket dumping               |    | Bucket pull up                  |
|    | Boom down                    |    | Boom lifting                    |
|    | go ahead                     |    | Back                            |
|    | Rotate Left Swing left       |    | Rotate Right Swing to the right |
|    | Pull up the arm              |    | Stick extended                  |
|   | Bulldozer lowered            |   | Bulldozer Lift                  |
|  | Machine travels at low speed |  | High speed machine travel       |
|  | locking                      |  | unlock                          |
|  | fuel ( Light oil )           |  | Working oil                     |
|  | Battery charging warning     |  | Engine oil pressure             |
|  | trumpet                      |  | Engine warm-up                  |
|  | Automatic idling             |  | Work Light                      |
|  | Arm limit                    |  | Water temperature gauge         |




## forward Word


Thank you for purchasing RIPPA products.

This instruction manual explains the correct use of the product and simple inspection and repair . Please read and fully understand this content to maximize the excellent performance of the product you purchased and perform safe and comfortable work. The manufacturer cannot directly supervise and guide the use, operation, inspection and maintenance of the machine. Therefore , the user should Please be fully aware that matters not described in this instruction manual may Depending on the content of the work, relevant laws, regulations, rules and insurance conditions apply. After reading this instruction manual, Please keep this manual in your favorites folder so that you can refer to it at any time when you have any questions . If the instruction manual collection folder is damaged, please be sure to replace it with a new one . Please understand that the product may not be consistent with the contents of this manual.



## Safety first

The precautions described in this book and the symbolized  labels on the machine are important items that may cause accidents. Please read them carefully and observe them.

In addition, if the label with the symbol  is soiled or detached, be sure to order it from your local dealer and place it in the designated location.

### Labeling of precautions

This instruction manual contains the matters that require special attention when using the machine. Mark below.



### ***danger***

Indicates a risk of death or serious injury if precautions are not followed.



### ***warn***

Indicates a risk of death or serious injury if precautions are not observed.



### ***note***

Indicates a risk of injury if precautions are not followed.



### ***significant***

Indicates that failure to observe the precautions may result in damage to the machine or cause 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.



# catalogue

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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.

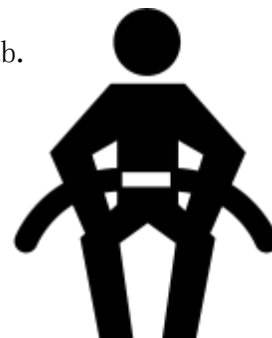
### Basic safety matters

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1. Before using this machine, please read this instruction manual carefully. Book, operate safely based on full understanding.
2. When lending this machine to others, please explain in detail how to use it. Before use, instruct the person in charge to read the " Instructions for Use .



- 
3. When using the ROPS cab specification, please always wear the seat belt.  
Not equipped ROPS Do not use seat belts when in the cab.
  4. Do not modify the ROPS cab. In addition, if the Do not repair if the strength is damaged or bent. Directly replace with new ROPS Cab.
  5. Do not remove ROPS Cab driving.







## Please read this for safe operation

6. When operating or maintaining the vehicle, please wear a helmet and Safety shoes and safety clothing.

Please wear protective glasses, dust masks, and isolation masks according to the work content. Please wear protective equipment such as sound equipment, protective gloves and safety belts. Make sure all protective gear is functioning properly before use.

Please keep the area around the driver's seat clean.

If there is oil, grease, ice, snow or Mud can easily cause slipping. In addition, please check whether the shoes are Is there any dirt attached to it?



7. Prepare safety supplies

Please prepare safety equipment in advance in case of injury or fire.

- Please prepare a first aid kit and fire-fighting equipment.
- Please make a note of the emergency doctor, ambulance, fire department, etc. The address of the emergency department.

8. People who drink alcohol, lack of sleep, pregnant women, overly tired people and the sick Please do not use this machine.



9. Please perform daily inspections.

- Please confirm whether there was any abnormality (leakage) during the last use. Oil, water leakage, loose bolts and nuts, broken electrical wiring Loose wires and terminals, etc. ), if there is any abnormality, please Take corresponding measures.

- Please use designated brands of fuel and grease.

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



11. When refueling, adding lubricating oil, checking and adjusting, please close engine.

Fireworks are strictly prohibited when refueling. Also, be careful not to spill the fuel.



## Please read this for safe operation

12. When the bucket is pulled up, no one is allowed to enter under the bucket.

13. When pulling the bucket upward, please avoid touching the overhead wires. Or obstacles.

Especially when touching electric wires, there is a risk of death from electric shock , so be careful.

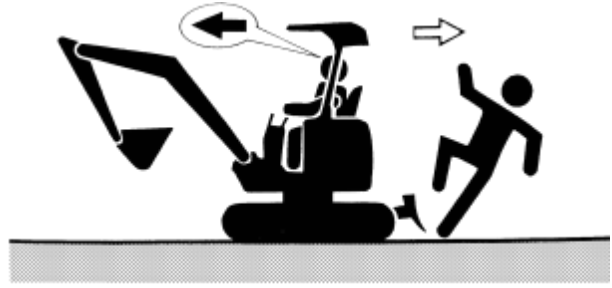
14. Do not drive if you are drinking, taking medicine or in poor health. Otherwise, it will cause an accident.



# Please read this for safe operation

## Precautions before operation

1. Please make sure there is no one around the machine.



2. Be sure to check the following before starting the engine.

- Always sit in the driver's seat when starting.
- Be sure to confirm the "action" and "release" of the automatic idle switch. remove" .
- Please make sure that each operating handle is in "Neutral" position.
- With the left operating handle lock lever lifted , **Start** the engine.
- Since the muffler outlet pipe faces rearward, please confirm There is no one behind the machine. Also, near a fence or tree When working, sometimes the fence is Blackening of trees due to exhaust heat Withering, so please protect the fence or trees After taking measures, continue working.
- Please make sure there are no flammable objects around the engine.
- Make sure the bucket is in contact with the ground.
- Exhaust gas may cause poisoning, so When working inside, please provide adequate ventilation. In addition, please carry out inspection work outdoors.



3. Please hold the handrail when getting on or off the vehicle to avoid slipping. Jumping on or off is extremely dangerous.  
Be careful not to get caught on the operating handle when getting on or off the vehicle.



4. For machines with adjustable driver's seat, please adjust the driver's seat to Proper location.
5. Please check the direction of the machine before shifting gears. If you run the lever, it may go in the opposite





direction against your will. Walking is dangerous.

6. After starting the engine, check the bucket, stick, boom, Check the working conditions of the bulldozer, travel and rotation. Perform the operation in a spacious area with no people or obstacles around. OK.  
If you find any abnormality, repair it immediately.



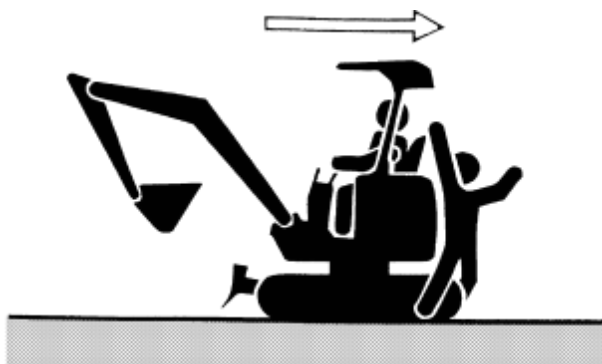
## Please read this for safe operation

### Precautions during operation

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 )



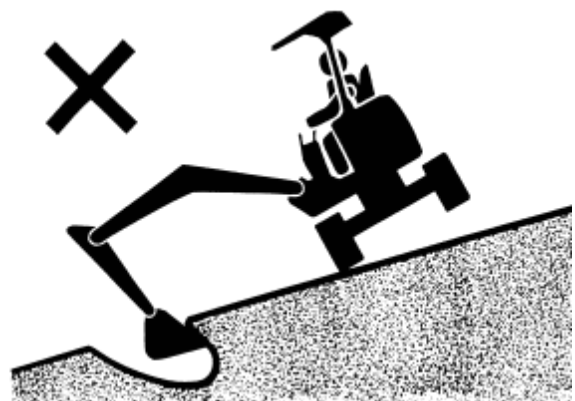


## Please read this for safe operation

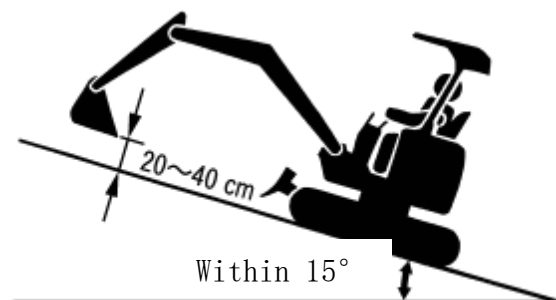
7. Never turn (make a U-turn) or cross on a slope, as this can cause the vehicle to roll over or slide sideways, which is extremely dangerous. Please turn on flat ground. When going up or down a slope, drive along the maximum slope line.



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

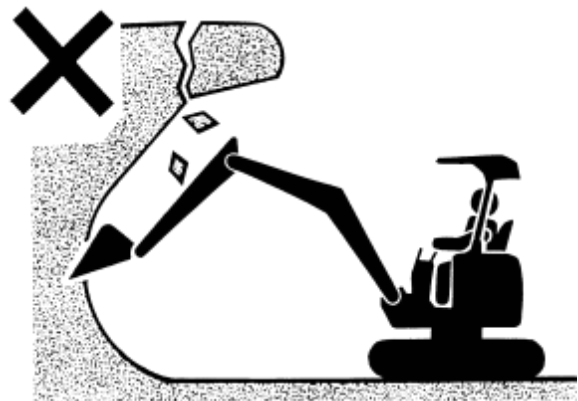
11. When moving near cliffs or embankments, leave enough space for maneuvers or take appropriate measures such as reinforcement to prevent ground collapse. Also, stay away from areas where there is a risk of falling rocks. Driving after rain is even more dangerous. Never approach an overhanging road without preparation. Cliff or embankment.



12. When digging under the machine body, please pay full attention, otherwise The vehicle overturned due to ground collapse.

13. Please do not dig a pit under the cliff, it is dangerous. Collapse of cliffs and ground can cause rockfall.

14. If the working site or road conditions are poor, the stability of the machine The quality will be reduced, and operating errors may cause accidents or even Therefore, while leveling the work site, you must also level Smooth the road or avoid obstacles. When driving on buildings, the allowable load should be investigated. If it is insufficient, reinforcement should be carried out.



15. Generally speaking, it is easier to roll over in the lateral direction than in the longitudinal direction. Therefore, when the working device is under heavy load, please do not Perform a lateral rotation.

16. In case of rain or water, use wooden boards, iron plates , etc. It is easy to slip when working in such a slippery place. Please pay full attention when working.

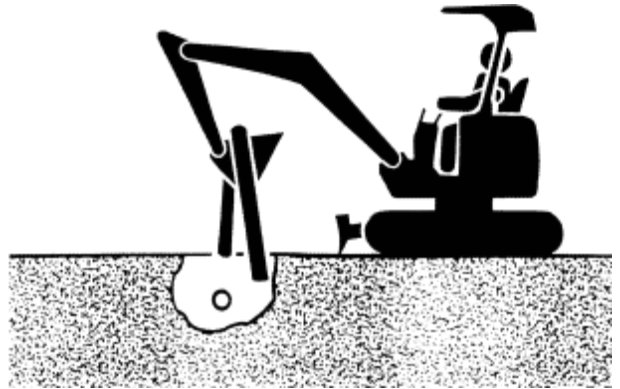




## Please read this for safe operation

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17. When working in places with electrical wiring, gas pipes, water and sewage lines, etc., an expert should be present to provide guidance.
18. When the bucket teeth are hung on stones, etc., when the bucket teeth are lifted off the stones, etc. When the surface falls off, the vehicle may roll over due to the reaction force. Therefore, please pay full attention when working. Also, never dig the bucket into the ground. Driving or digging with the machine body floating is very dangerous.
- 



19. When working in a building, pay full attention to the Strength of surfaces, exits, passages and floors.



20. About cargo lifting operations

The lifting of cargo may cause the cargo to fall or The car may overturn, so it is very dangerous.

● Please never use this machine instead of a crane for operation.





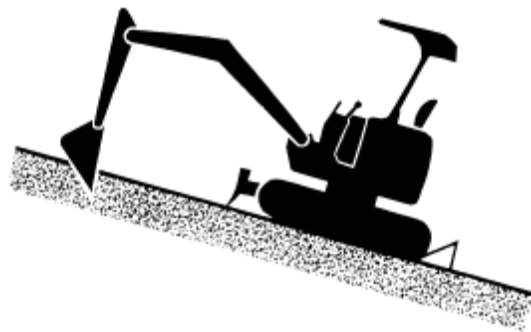
## Please read this for safe operation

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### Things to note after work

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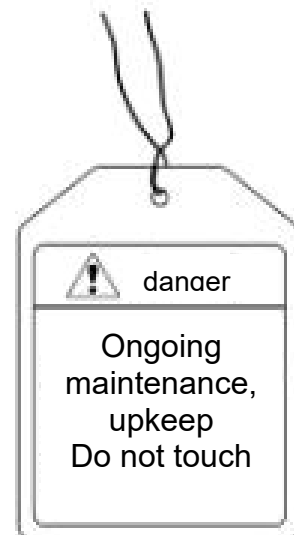
1. Always park your vehicle on level ground.  
If you have to park the vehicle on a slope, please Insert into the ground and brake the tracks.
2. When leaving the driver's seat,
  - Please lower the bucket to the ground
  - Locking handle lock lever
  - Stop the engine and remove the key.
3. When storing 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

---

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 )





## Please read this for safe operation

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6. When performing maintenance indoors or in places with poor ventilation, please Provide adequate ventilation. Especially when the engine is exhausting or When handling fuel, flushing oil, paint, etc. Must be charged Provide adequate ventilation.
7. When performing maintenance, please use proper tools that are suitable for the intended purpose. If you do not use regular tools during maintenance, not only will the work efficiency be low, and may result in injury.
8. Maintenance and inspection around the engine should be done after the exterior is firmly fixed. The cover-type bracket will be installed later.
9. If you have to interrupt work to remove parts of the hydraulic system, Lower the bucket and bulldozer to the ground, and then shut off the engine.

After starting the machine, all equipment, working oil and lubricating oil are in High temperature and high pressure state. When the working oil is at high temperature, There is a risk of burns.

The hydraulic oil sprayed out during pressurization has the force to penetrate the skin and In addition, The plug or screw may fly out. Please be careful when disassembling hydraulic system components as this may result in injury. Be sure to wait until the temperature of each part drops and the residual pressure is released. When loosening a plug or screw, Please avoid the whole body Loosen slowly while keeping the surface intact.

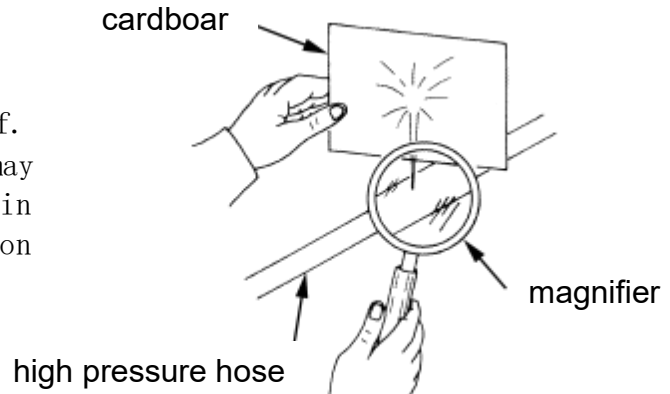
In addition, when fuel and oil leak under high pressure, be sure to Be careful not to put your hands or face near the leaking part. Facing the leaking part is extremely dangerous.





## Please read this for safe operation

10. When looking for oil leaks from invisible holes, please wear Protect your glasses and use something like cardboard to help you position yourself. Once the oil penetrates the skin, it may cause serious allergic reaction, in this case, seek medical attention immediately.



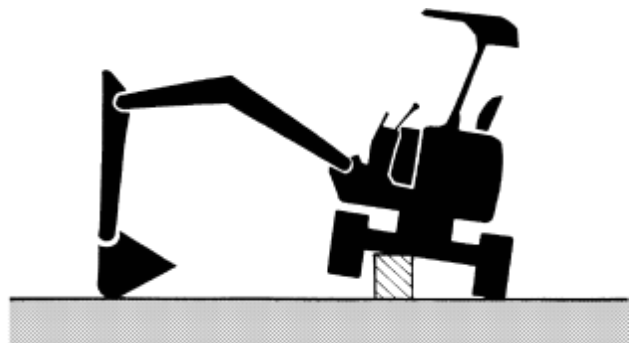
11. Please wait until the engine is fully cooled before cooling the radiator. Inspection, replenishment and replacement.  
If the radiator cap is loose and steam is Or hot water will spray out, sometimes causing burns. Loose drain cocks or plugs can sometimes cause burns from hot water. In addition, the muffler is still in high Please be careful not to touch it in order to avoid burns.



12. When welding directly on the machine body, please turn off the starter switch. Go to "STOP" close) In addition, In process of welding When welding, do not heat up or generate sparks. Placement between the part and the grounded part may cause the cylinder or Components such as sealed bearings that may malfunction if electricity is applied.

13. For maintenance and repair, the machine must be lifted with a working device.

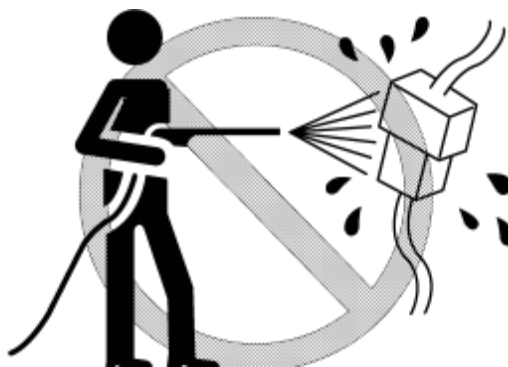
Do not enter the body at this time. If you must enter the body, answer Place safety pads and safety pillars underneath to prevent sudden falls. In addition, please put the operating handle lock lever in the locked state.





Please read this for safe operation

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.

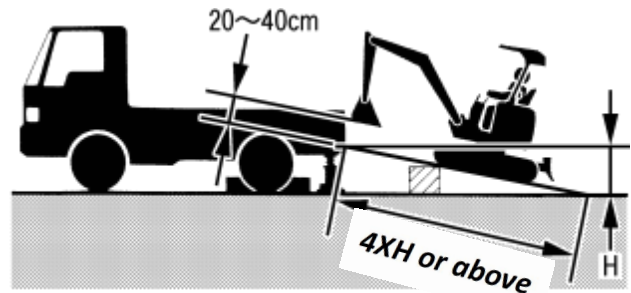
If the loading platform is bent significantly, use the **"bracket"** (Support table) To prevent the loading and unloading plate from bending.

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

---

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 inspections should be carried out

---

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.

★The above lists the main points to note. The purpose is to prevent errors that may 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.

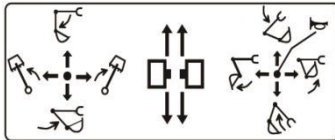


# Read this carefully for safe operation

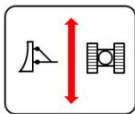
## Labeling and posting locations

- ◆ Safety labels are posted on this machine. Please drive with full understanding. The following information is recorded here. Please read it carefully.

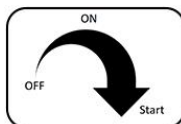
### 1. Operation





### 2. Trowel handle

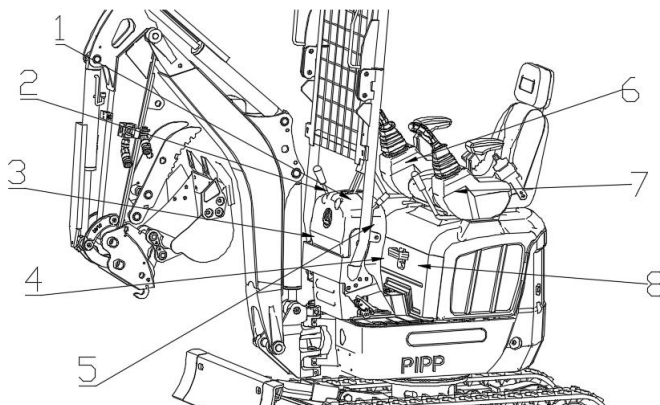


### 3. Key door

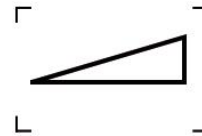


### 4.R13 Calculate the natch

| Lift capacity ratings                                                               |                                                                                     |     |     |     |     |     |     |     |      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|------|
|  |  |     |     |     |     |     |     |     |      |
| A: Load radius                                                                      | Conditions of operation                                                             |     |     |     |     |     |     |     |      |
| B: Load point height                                                                | 1347mm Big arm                                                                      |     |     |     |     |     |     |     |      |
| C: Lift capacity ratings                                                            | 1000mm 90m                                                                          |     |     |     |     |     |     |     |      |
| D: Rated loads over front                                                           | weight: 1105kg                                                                      |     |     |     |     |     |     |     |      |
| E: Rated loads                                                                      | Track width: 100mm                                                                  |     |     |     |     |     |     |     |      |
|                                                                                     | Track spacing: 640mm                                                                |     |     |     |     |     |     |     |      |
| (Unit: kg)                                                                          |                                                                                     |     |     |     |     |     |     |     |      |
| Load radius A (Static-bulldozer support)                                            |                                                                                     |     |     |     |     |     |     |     |      |
| Load point height (Unit: m)                                                         | 1.5                                                                                 |     | 2   |     | 2.5 |     |     |     | Max  |
|                                                                                     | CF                                                                                  | Ca  | CF  | Ca  | CF  | Ca  | CF  | Ca  |      |
| 1                                                                                   | 317                                                                                 | 250 | 241 | 150 | 208 | 115 | 193 | 103 | 2651 |
| 0.5                                                                                 | 391.5                                                                               | 245 | 309 | 169 | 207 | 124 | 206 | 104 | 2718 |
| 0 (Grade)                                                                           | 454                                                                                 | 264 | 332 | 188 | 234 | 129 | 206 | 99  | 2645 |
| -1                                                                                  | 461                                                                                 | 273 | 283 | 194 | /   | /   | /   | /   | 2074 |
| -1.1                                                                                | 468                                                                                 | 302 | /   | /   | /   | /   | /   | /   | 1965 |



### 5. The accelerator



### 6. Wear ear protection when operating the excavator



### 7. Release the operation lock after operating the



### 8. Maintain car stickers

#### MAINTENANCE PRECAUTIONS

##### VORSICHTSMAßNAHMEN FÜR DIE WARTUNG



- Pin, buttering is recommended every 10 hours  
Soft, Buttering wird alle 10 Stunden empfohlen
- Track tensioning device, check before use, if the track becomes loose, please add butter immediately  
Kettenspannvorrichtung, vor Gebrauch prüfen, wenn sich die Kette lockert, bitte sofort Butter zugeben

| Filter name<br>Filtername                 | The first time<br>Time Zeit | das erste Mal<br>maintenance mode<br>Wartungsmodus | Normal<br>Time Zeit | normalerweise<br>maintenance mode<br>Wartungsmodus |
|-------------------------------------------|-----------------------------|----------------------------------------------------|---------------------|----------------------------------------------------|
|                                           |                             |                                                    |                     |                                                    |
| Air filter<br>Luftfilter                  | 50H                         | cleaning<br>Reinigung                              | 100H                | replacement<br>Ersatz                              |
| Diesel filter<br>Dieselfilter             | 50H                         | replacement<br>Ersatz                              | 200H                | replacement<br>Ersatz                              |
| Hydraulic oil filter<br>Hydraulikölfilter | 100H                        | replacement<br>Ersatz                              | 300H                | replacement<br>Ersatz                              |

RIIPA service website: [www.riipaservice.com](http://www.riipaservice.com)



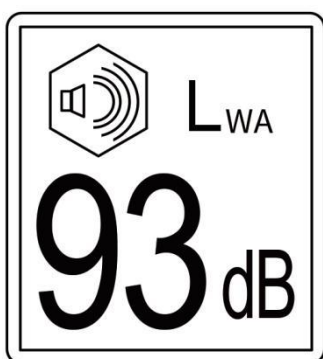
### 1. Lifting



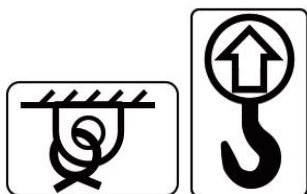
### 2. Brand models (1)



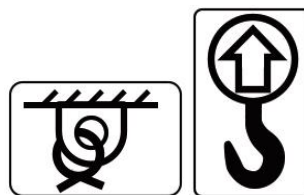
### 3. noise



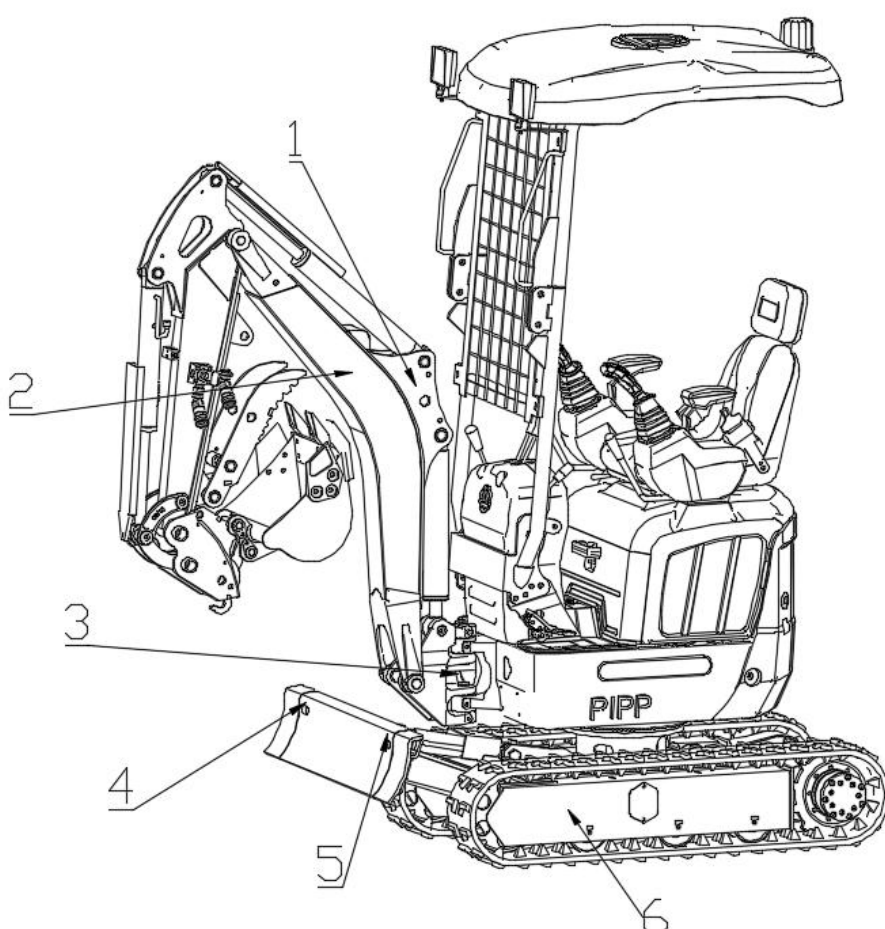
### 4. Bundled transportation points and lifting



### 5. Bundled transportation points and lifting



### 6. Direction

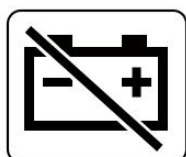




## 1. Hydraulic oil tank



## 2. Power failure



## 3. Diesel tank



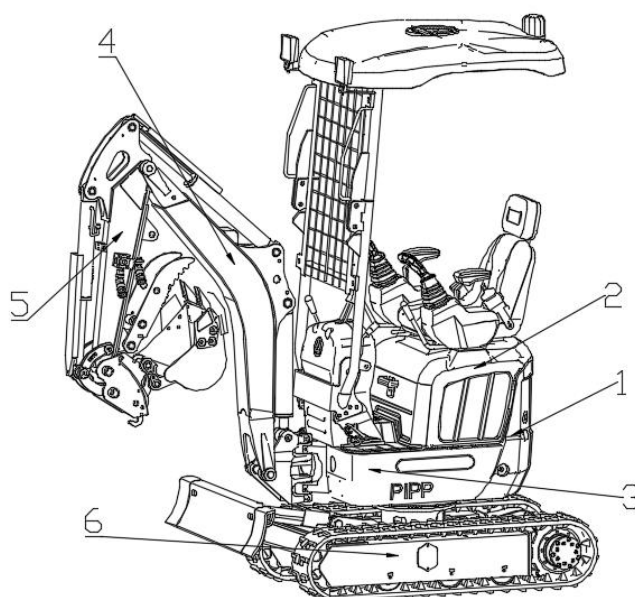
## 4. Brand models (2)



## 5. The lower end of the working device is strictly standing



## 6. Direction



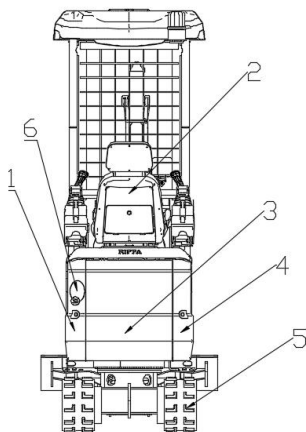
1. Do not stand within the operation range



2. Operation, inspection and maintenance precautions



3. Brand models (after)



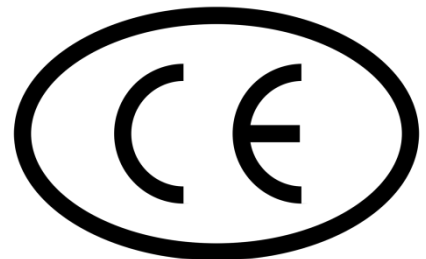
4. Stand firm within the scope of work



5. Lifting



6.CE  
Europe Five  
EPA Level 4 emission  
standards





## Read this carefully for safe operation

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### Maintenance of labeling

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1. The label should always be kept clean and avoid scratches.  
If the label is dirty, rinse it with soapy water and wipe it clean with a soft cloth.
2. If you wash the car with a high-pressure washer, the label may peel off. Therefore, do not use high-pressure water to directly rinse the label.
3. If the label is broken or lost, please order it from the product purchase office and re-paste the new label.
4. When pasting a new label, wipe off the dirt thoroughly and re-paste it in the original position after drying.
5. When replacing the labeled parts with new ones, please replace the labels at the same time.



# About repairs and warranties

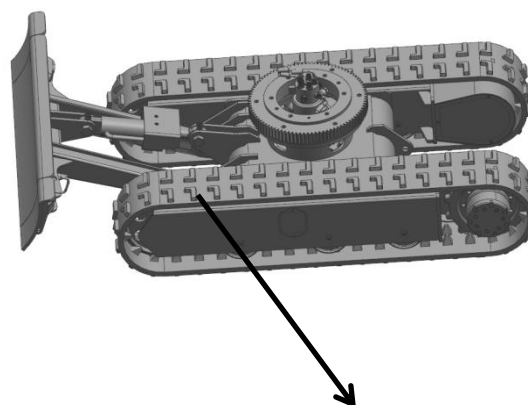
If there is a fault or something you don't understand during the use and need to be repaired, please contact your sales store or the maintenance factory designated by our company.

Please inform the following information when con

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

In addition, the sales store has an authentic parts list. Please negotiate with the sales store when ordering parts.

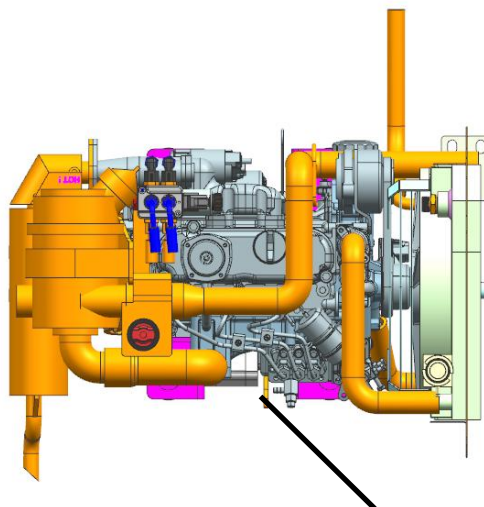
This product is equipped with an electronic key for anti-theft (hereinafter referred to as the anti-theft device). However, this device is only a device to suppress theft and does not guarantee that no theft will occur.



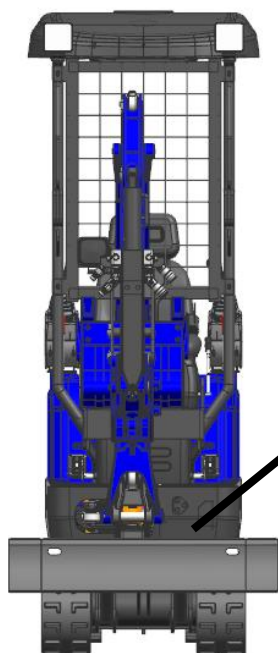
Chassis number



\* It is dangerous to modify the machine. Do not modify the machine. If the purpose of modification or use is different from the correct purpose described in the instruction manual, it is not within the scope of the manufacturer's guarantee. Please pay attention.



Engine model



data

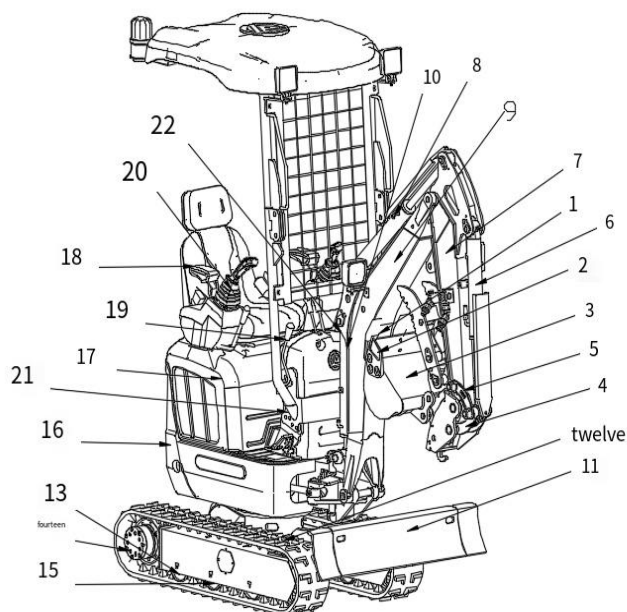


### Maintenance of label

---

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

# Instructions for each device



| Serial number | 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            | Tracks             |
| 13            | Support wheels     |
| 14            | Walking motor      |
| 15            | Drive sprocket     |
| 16            | Counterweight      |
| 17            | Seat guard         |
| 18            | Seat               |
| 19            | Bulldozer handle   |
| 20            | Pilot handle       |
| 21            | Turn on the switch |
| 22            | Throttle pull cord |
| 23            | Skip work switch   |

# About the use of the devices

## Use of safety devices

### ■ Operating handle lock lever



#### ***note***

- \* When parking or leaving the machine, be sure to lower the bucket to the ground and lock the handle lock rod. The working device is very dangerous to fall. Therefore, please make sure that the lock is in the starting position before getting off the vehicle. Also, please pull out the key to avoid others to operate the machine by mistake.

#### ***supplement***

- \* The engine cannot be started when the handle lock rod is not in the "locked" position.
- \* Even if the operating handle is not fixed to the handle lock, the working device is in a non-operational state. (except the driving handle)



#### ***supplement***

- \* Pull up the lock rods of the operating handles on both sides, and the working device cannot be operated.  
When getting on and off the bus, pull the lock rod of the left and right operating handle to the maximum position.



## About the use of the devices

---

### ■ Starter switch

#### ● "SIARTERSWITCH CONTACT"

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

#### ● "START" (operation)

If you turn one gear to the right from the "SIARTER SWITCH CONTACT" position into the "START" position, all circuits will be energized and preheat and glow display will occur.

At this time, in order to perform the lamp off check, the indicator lamp is lit for about 1second.

#### ● "START"


If the operating handle lock lever is in the **lock** position and the "SIARTER SWITCH CONTACT" position is rotated to the right by one gear to enter the "START" position, the starter motor rotates and the engine starts. When you release the key, it will automatically return to the "START SWITCH CONTACT" position. Therefore, after the engine has started, please release the keymotor will rotate and the engine will start. When you release the key, the key will automatically return to the "SIARTER SWITCH CONTACT" position. Therefore, after the engine starts, please release the key.





## About the use of each device

### Toolbox

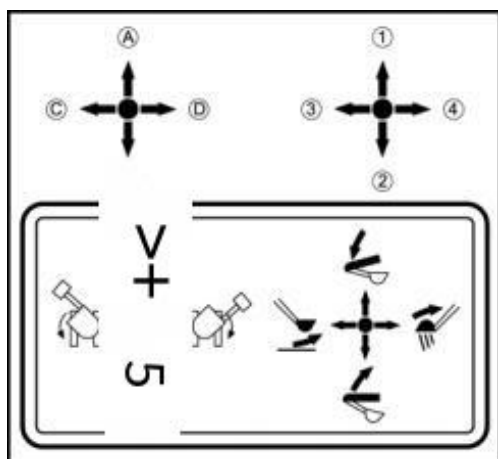
|                                                                                                                                                                                                                                                                       |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                                                                                                                                                                      | <b>warn</b> |
| <p>* Pushing the seat forward with the engine started may touch the driving handle and cause the vehicle to move. Therefore, before pushing or pulling the seat forward, be sure to turn off the engine and place the handle lock lever in the “locked” position.</p> |             |

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.



## ■ Use of operating handles

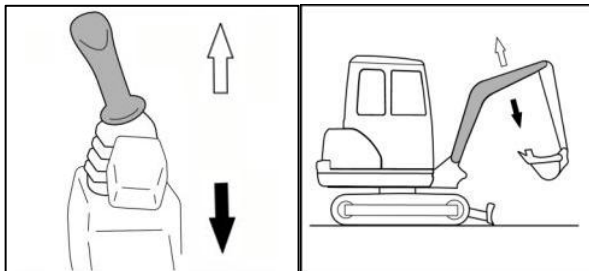
| joystick       |                  | movement                                                                                      |
|----------------|------------------|-----------------------------------------------------------------------------------------------|
| right joystick | 1<br>2<br>3<br>4 | Lower boom<br>raise the boom<br>stow bucket<br>Open bucket                                    |
| left joystick  | A<br>B<br>C<br>D | Lower the stick.<br>Raise the arm<br>Turn the cab to the left.<br>Rotate the cab to the right |





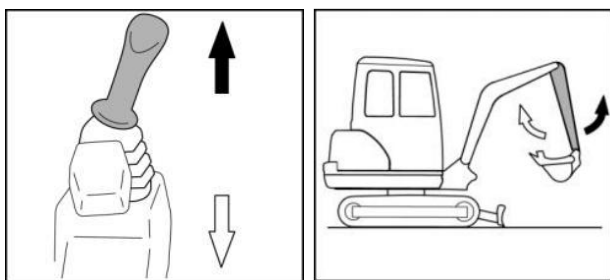
## ■ Boom Operation

When the excavator encounters an overload condition, always lower the boom until the load reaches the ground. To raise the boom, pull back using the right joystick. To lower the main boom, push forward using the right joystick.

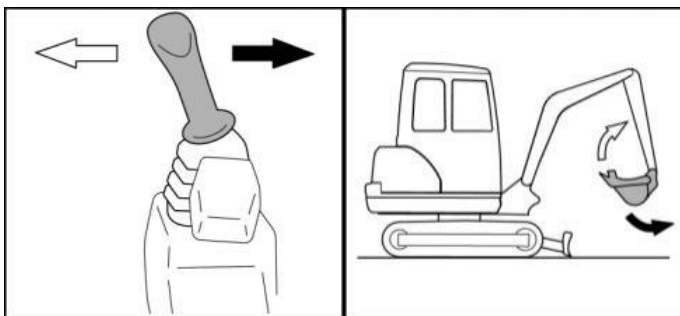


## ■ Stick Operation

To raise the stick, push the left joystick forward; to retract the stick, pull the left joystick backward. The joystick moves as shown.



To raise the bucket, use the right joystick to pull to the left. To empty the bucket, use the right joystick to push to the right. When loading into the bucket, make sure the bucket teeth do not hit the front plate of the dozer. The bucket moves as shown.



## ■ Throttle

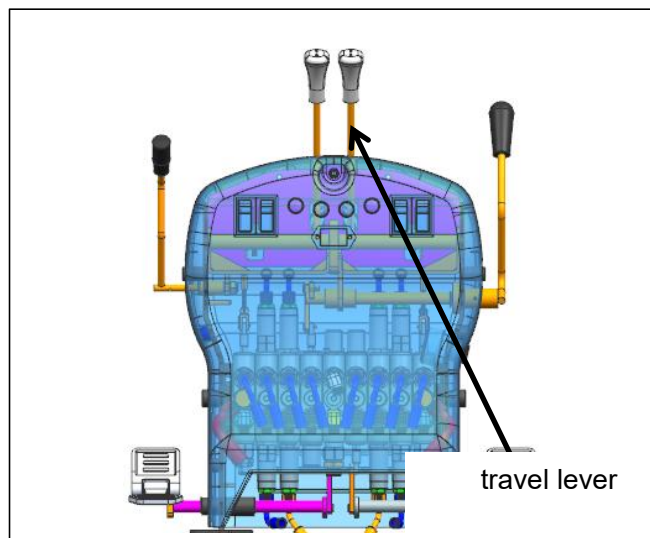
knob

Sitting in the driver's seat

1. If the throttle is pushed to the lowest position (high speed side), the engine speed will be increased.
2. To shut down the engine, push the throttle all the way down, then set the starter switch to the "SIARTER SWITCH CONTACT" (starter switch contact) position

## Travel handle (right, left)

If you sit in the driver's seat, push the two handles forward and push the handles backward.



**supplement** \* Due to the hydraulic pilot system, the working device can be operated only when the engine is running. To bring the bucket into contact with the ground, do so after turning the engine at low speed.

- \* When getting on or off the vehicle, pull up the operating handle lock lever and be sure to place it in the "locked" position.
  - \* Since the responsiveness of the operating device to the operating handle becomes slow when the operating oil temperature is low, be sure to perform warm-up operation.
  - \* During periods of low operating oil temperatures, the operating handle feels slightly heavy, but this is not a fault.
  - \* To remove hydraulic equipment, follow the steps below.
    - Lower the engine speed so that the bucket touches the ground.
    - Stop the engine and move the handle in all directions.
    - Please wait more than 10 minutes to remove the residual pressure of the hydraulic circuit.
- These steps are essential to prevent danger.

# Inspection before operation

## ■ Check and replenish the cooling water



### **note**

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

Please check whether the water tank is filled with the specified amount of cooling water. If cooling water is insufficient, replenish cooling water to the tank.

\* When filling cooling water, please do not make the water level exceed half of the height of the auxiliary kettle.

\* Never add muddy water or seawater.

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

### **supplement**

- \* Check the cooling water through the water tank while the engine is cooling.
- \* Long-lasting coolant (mixture ratio: antifreeze 50% water 50%) is added as cooling water at the factory.

## ■ Fuel inspection and replenishment



### **note**

- \* Be sure to stop the engine when refueling.
- \* Never approach a source of ignition.  
Negligence .....  
may cause a fire.

1. Check with oil gauge.
  2. When fuel is low, open the fuel tank lid to replenish it.
  3. The fuel tank lid cannot be opened without inserting the key into the fuel tank lid.
- \* After completion of the operation, refuel until the fuel tank is full, and then tighten the fuel tank cap securely.
  - \* When refueling, make sure that the fuel passes through the filter screen of the fuel tank.
  - \* Please take care not to mix dust or water into the fuel tank.
  - \* The fuel system generally does not admit air unless the fuel tank is emptied. If air is mixed, deflate.

## ■ Oil inspection and replenishment

1. Check that the specified amount of oil is filled.
  2. If the oil measured by the oil gauge is within the range shown in the figure, it is normal.
  3. If the oil is insufficient, replenish it through the filler.
- \* Use oil with the appropriate viscosity according to the temperature conditions.
  - \* After the engine has just stopped, the correct oil quantity cannot be measured because there is still oil left in each part. Please keep the body level and wait at least 5 minutes before performing the test.
  - \* Please insert the oil label after inspection.

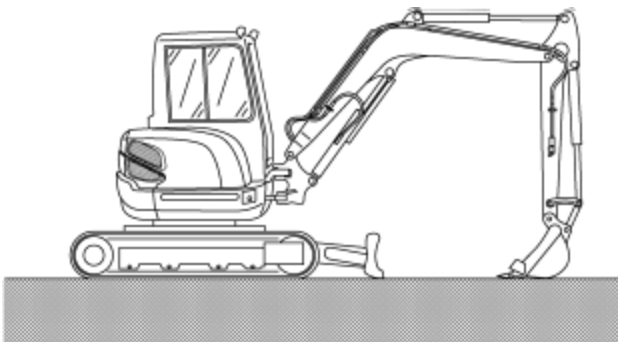
## ■ Inspection and supplement of working oil



### **note**

- \* Remove the filler neck of the working tank only after the oil temperature has completely decreased. Otherwise, the oil will spray out, resulting in burns.

1. Park the machine in a horizontal position, extend the piston rod of each cylinder to approximately the middle position, and make the bucket and bulldozer touch the ground.



2. Check whether the working oil is in the center of the oil level gauge at normal temperature.
3. If it is in the middle of the oil level gauge, it is normal.
4. When the oil is insufficient, please replenish it through the filler.
5. When the working oil is mixed with impurities such as water and must be replaced, please replace it in time.
6. When replenishing, please clean up the sand or garbage nearby, and be sure to use the same brand of working oil.




# Inspection before operation

---

## Radiator, oil cooler inspection and cleaning

1. Check for blocked fins. If blocked, purge with compressed air (or steam). At this point, be sure to wear safety glasses.
2. Also check the radiator hose.  
If the hose is cracked or brittle, replace it and check that the clamp is loose.

## Inspection and cleaning of battery, wiring and engine surroundings

|                                                                                                                                                                                                                                                                     |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                                                                                                                                                                                    | <b><i>note</i></b> |
| <p>* Damage to the wiring harness and battery ( + ) cables can cause a short circuit, so be sure to inspect them.</p> <p>* If garbage or fuel is attached to the battery, wiring, muffler or engine, it may cause a fire, so check before each day's operation.</p> |                    |

The harness and the battery(+)wire wrap will contact the corners of the component and cause natural aging due to damage, so check the following items.

1. Harnesses shall not be damaged and clamps shall not be loose.
2. Terminal, wiring board (socket) connection part must not have loose.
3. Each switch must operate properly.



# Starting and stopping the engine

## Starting the engine



**warn**

\* Be sure to sit in the driver's seat and make sure that the operating handles are in the "neutral" position before starting.

It is dangerous to inadvertently ..... start the machine while the engine is running, preventing from operating normally.

\* Engine exhaust contains harmful carbon monoxide, which can cause poisoning. Do not operate the machine in a room where exhaust fumes tend to accumulate or in a poorly ventilated area .

1. are in the stop position before operating the switch .
2. Place the operating handle lock lever in "Locked" position.



3. Insert key into switch.

4. Turn the throttle knob to the maximum position on the high-speed side.
5. Turn the key to the right until it stops.



**significant**

When the engine starts, release the key. The key will automatically return to Return to " STARTER SWITCH CONTACT " ( starter switch contacts) position.

- \* Since the starting motor consumes a large current, please avoid continuous use. use 10 More than seconds. If it fails to start within 10 seconds, stop 20 More than a second, then Repeat later Operations 5 and 6.
- \* If equipped with a battery, connect it to other When using batteries, be sure to use 12V Please do not use batteries. Do not use 24V Used batteries.

# Starting and stopping the engine

## ■ Starting in cold seasons

the stop position before operating the starter switch .

2. Insert the key into the switch.
3. Turn the throttle knob to the maximum position on the high-speed side.
4. Put the starter key in the **ON** position and keep Hold until the display on the LCD disappears .
5. If the engine starts, release the key. Return to ( **Operation** ) Location.
6. If the engine does not start, repeat 4, 5 operation.

### supplement

- \* When the working oil temperature is low, the working device will affect the operating handle Responsiveness becomes slow. Therefore, please be sure to perform warm-up operation.
- \* When the working oil temperature is low, the operating handle will feel slightly heavy. This is not a malfunction.
- \* When the operating oil temperature is low, The automatic idle function may not work It is not a malfunction.
- \* Before the cooling water temperature rises to the specified temperature, increase the idle speed. The function takes action.
- \* In the case of "air conditioning specifications" , turn the air conditioning switch to ( **open** ) .

## ■ Inspection of each part

After the engine is warm, check the following.

- Check if there is any abnormality on the LCD display.
- Is the exhaust gas color normal?
- Are there any abnormal sounds or vibrations?
- Check for leaks of oil, fuel, water, etc.

◆ In the following situations, please turn off the engine immediately.

1. The speed drops or increases sharply.
2. An unusual sound is made suddenly.
3. The color of exhaust gas deteriorates.

## ■ Precautions for 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 approaches boiling point ( The water temperature gauge shows "H" )( Right now So-called overheating ), please take the following actions.

1. Please stop working in a safe place. (Remove engine load )
2. Do not stop the engine suddenly. 5 About a minute without Turn off the engine after it is idling under load.
3. Please wait 10 minutes, or stay away from the machine while it is emitting steam. machine.
4. After confirming that there is no danger of burns, follow Backhoe Eliminate the cause of overheating according to the instructions in the "Problems and Solutions" item. Then restart the engine.

## Stopping the engine



### 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 allow the engine to run for about 5 Let it idle for minutes to cool down slowly.

1. Slowly move the left and right working device operating handles to Place on the ground.
- 2 Stop the engine and remove the key.



# Starting and stopping the engine

---

3. Pull up the operating handle lock lever and place it "Locked" position.



\* Make sure the bucket is in contact with the ground before stopping the engine. The device's own weight contacts the ground.

\* When the throttle knob is in the high speed position, the engine At this time, please make sure to turn the throttle knob to low. position, and then put the key in the (Stop) position.

\* A time interval of 2 seconds is set for restarting the engine after it stops.





# Backhoe excavator operation

## Run-in



**significant**

\*Initially 100 The usage of the machine will determine its service life. Therefore, it should be used with caution.

Especially in the case of new vehicles, do not apply excessive load load.

- 50 Hours ago, the load was maintained at 50% the following.

- 100 Hours ago, the load was maintained at 70% the following.

## Start and drive



**warn**

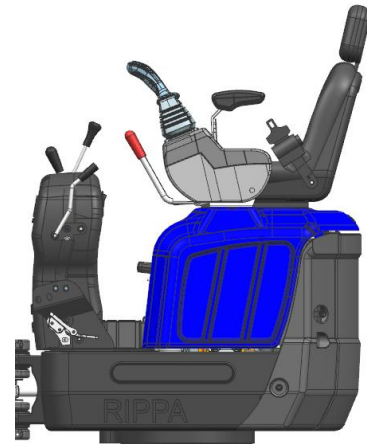
\* Please check the safety conditions in front, behind, left and right before starting.

\* If the dozer blade is placed at the rear and the handle is operated , the machine body will move in the opposite direction of the handle. Therefore, please confirm whether the bulldozer is facing forward or backward. Towards the rear. The bulldozer is facing forward. )  
▶If you don't confirm carefully... will move in the opposite direction, sometimes causing harm. Therefore.

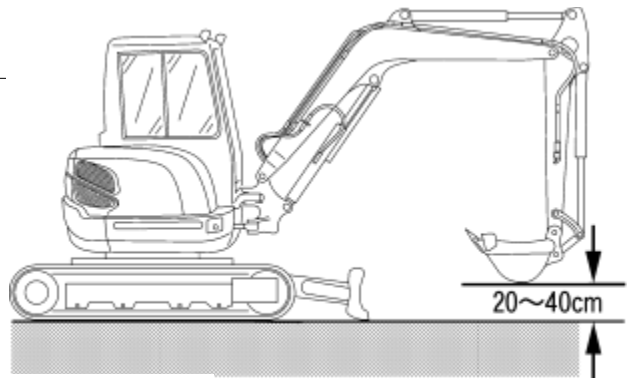
Please don't do it 15 Driving on a steep slope of more than degrees.

▶If you are careless... it may cause the vehicle to roll over and cause an injury accident.

1. Press the operating handle lock lever to "Release" position, operation work



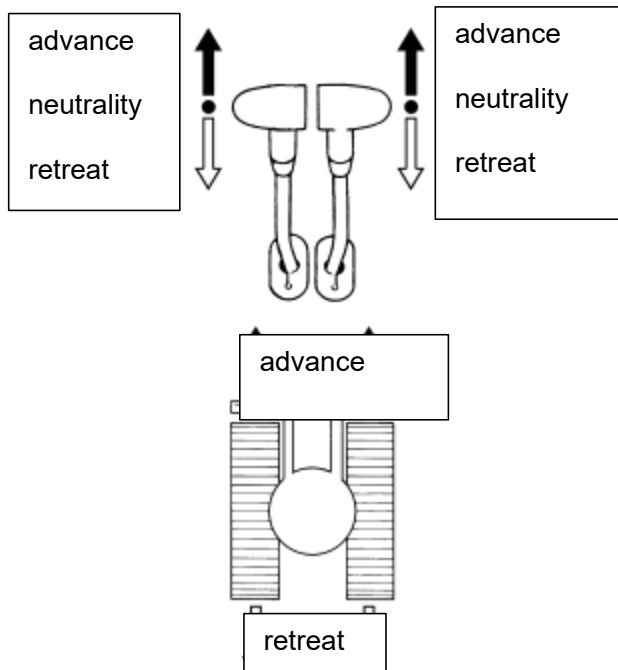
Device to keep the bottom of the bucket off the ground 20 ~ 40 cm .



2. Pull the bulldozer operating handle backwards and lift the bulldozer.

# Backhoe excavator operation

3. Slowly push the travel handle forward (FORWARD) or backward (REVERSE) to move



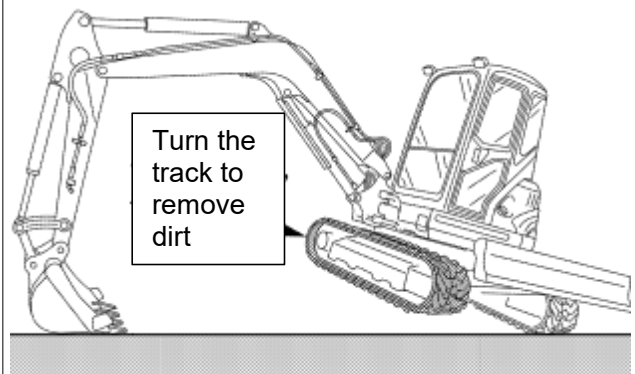
## 4. burn the road

If you press the rabbit button while operating the travel handle, increase the vehicle speed. Pressing the turtle button releases acceleration and returns to normal speed.



### **note**

- \* When driving uphill or on uneven ground, If the resistance is high, do not use the accelerator pedal.
- \* When driving on soft ground, the tracks are filled with mud, When the track is abnormally tightened and unable to travel due to gravel, Use the boom, arm and bucket to float one side of the crawler and It rotates to remove dirt, sand and gravel until the track is smooth. Until it rotates.



# Backhoe excavator operation

## Steering



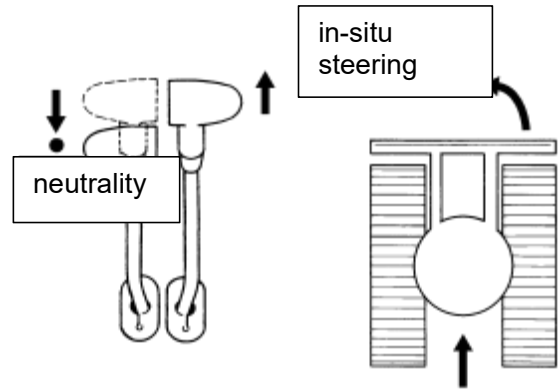
**warn**

- \* 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.

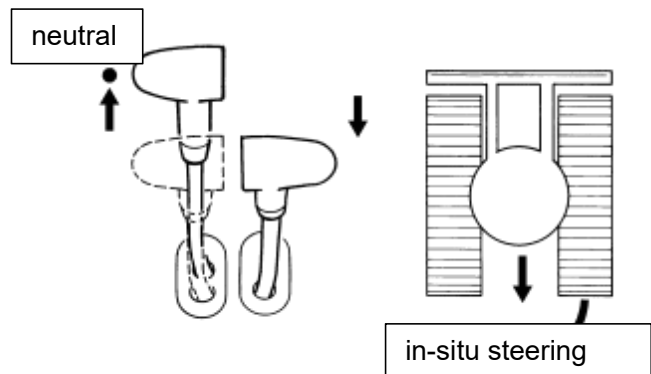
The following describes the operation method when the bulldozer is located in the front .

### ■ Steering while driving (Turn on the spot )

1. When moving forward, (right) When the travel handle is in the neutral position, turn left (right) Turn.



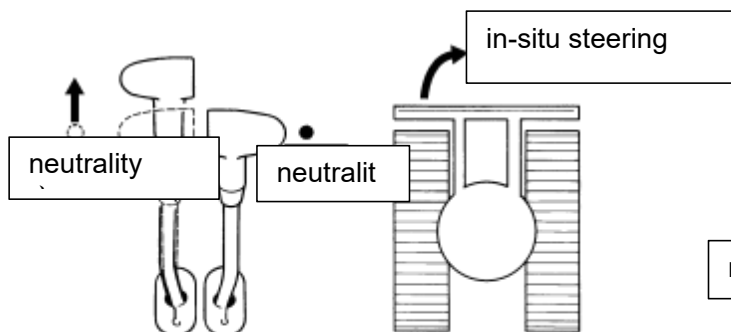
2. When moving backward, (right) When the travel handle is in the neutral position, turn left (right) Turn.



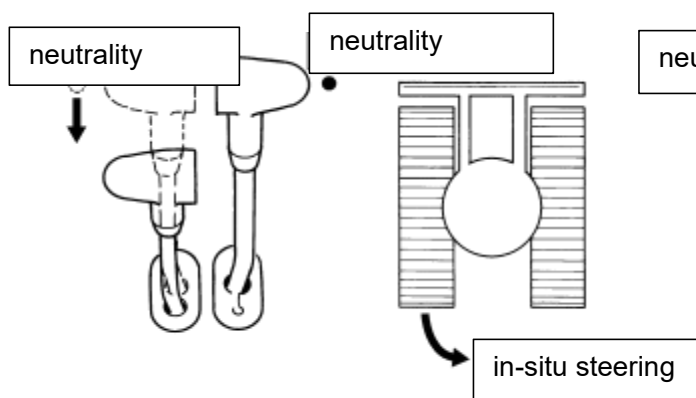
# Backhoe excavator operation

## ■ Steering when stopped ( Turn on the spot )

1. If you operate the left ( right ) Driving handle, then right ( Left ) Turn.

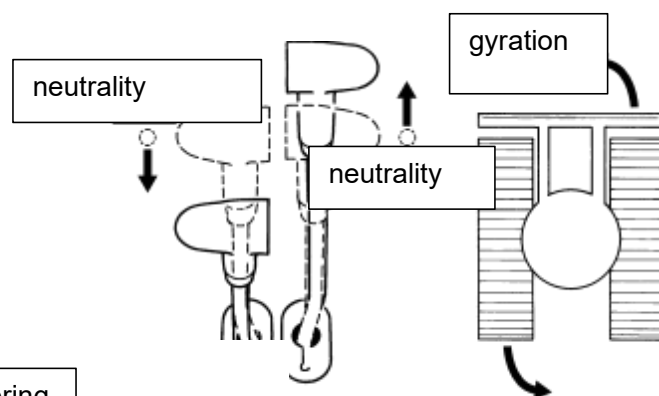
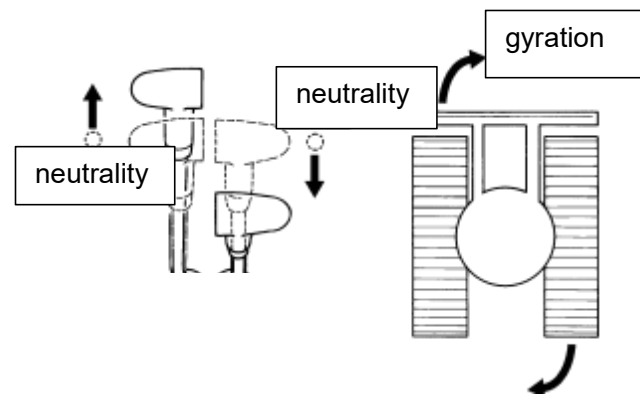


2. If you operate the left ( right ) Driving handle, then right ( Left ) Turn.



## ■ Rotation direction

1. If you operate the left ( right ) Travel handle and backward operation right ( Left ) Driving handle, Then right on the spot ( Left ) change.



# Backhoe excavator operation

## Up and down ramps



**warn**

\* Be sure to keep the swivel frame and body frame parallel to each other when traveling on an inclined lot.

If you are not careful, the ..... may rotate in the opposite direction, resulting in a rollover and an accident.

\* When traveling uphill, lift the bucket so that the lower part of the bucket is 20 to 40 cm above the ground.

\* When going down a steep slope where the tracks tend to slip, lower the bucket to the ground and walk down the slope while letting it slide. When descending a slope that is not steep, place the bucket at a level where it can immediately touch the ground.

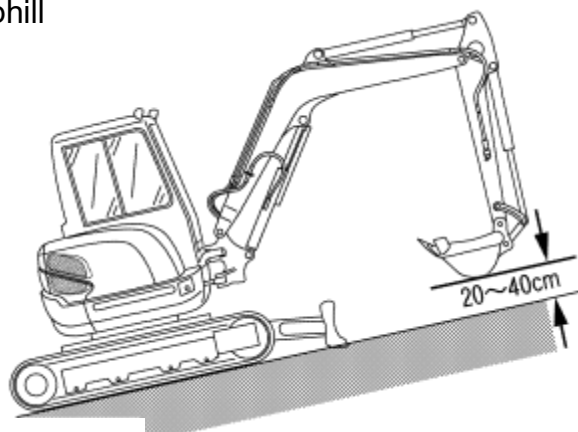
\* Adjust the throttle knob to travel slowly up and down a slope.

\* When traveling up or down a slope, place the automatic idle switch in the "OFF" (light off) position.

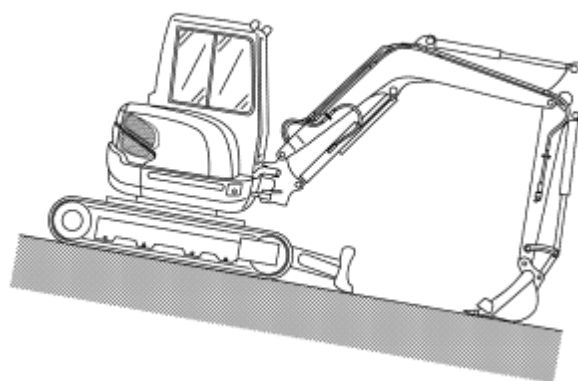
If you are careless .....

the engine speed will change, which may cause an injury accident.

uphill



downhill



# Backhoe excavator operation

## Parking on a Sloped Lot

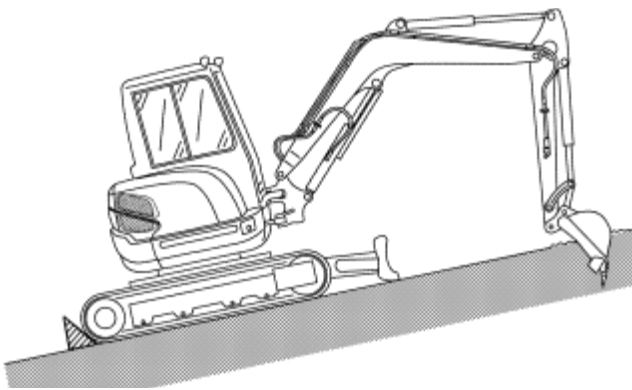


**warn**

\* Parking on an inclined area is dangerous. Therefore, do not park your vehicle on an incline. If you have no choice but to park on an incline, insert the bucket into the ground and put each handle in the neutral position before braking.

Inadvertently .....

the machine may slip and cause injury



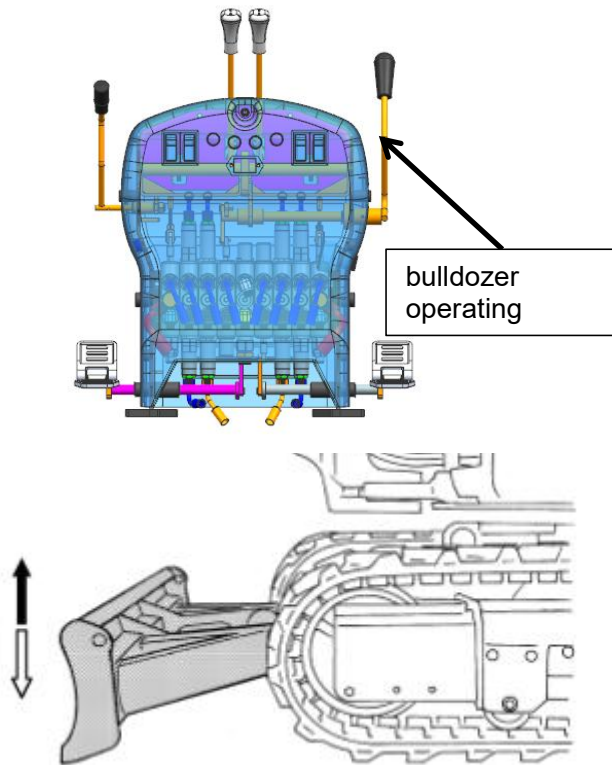
## parking

1. Park the machine on a flat, solid surface. Stand upright and lower the bucket to the ground.
2. Please turn the throttle knob back to the maximum position on the low speed side to make the engine idling 5 minutes to slowly cool the engine.
3. Put the starter key in " STOP " position, Turn off the engine and remove the key.
4. Pull up the lock lever of the operating handle and place it "Locked" position.
5. When leaving the machine, close all covers and lock the doors.

# Backhoe excavator operation

## Bulldozer operation

When the bulldozer operating handle is pulled back, the bulldozer rises and pushes forward. When the bulldozer operating handle is moved, the bulldozer moves down.

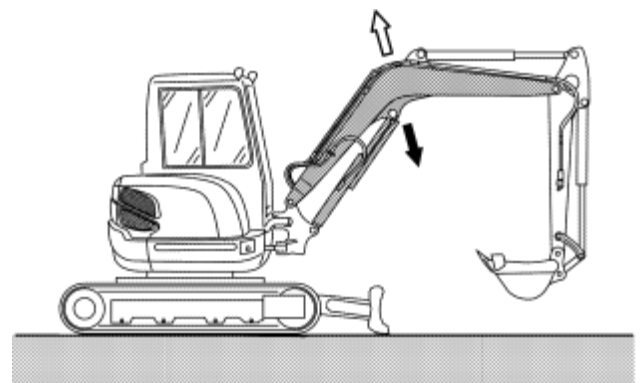
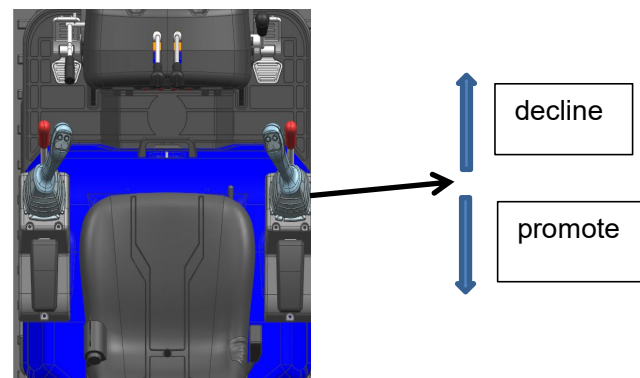


When performing the bulldozer operation, operate the two travel handles with your left hand and lift the bulldozer with your right hand.

## Boom operation

Boom lift... Pull back the right working device operating handle. Boom down... Push the right working device operating handle forward.

In order to reduce the soil loss in the bucket, a buffer joint is used at the lifting end of the boom. Structure. When the working oil temperature is low (such as when the engine has just been started), the buffer time may be longer than during normal operation. This is due to the viscosity of the working oil. This is not an abnormal phenomenon.



### 补充

- \* When the boom is lowered, be careful not to let the dozer blade collide with the boom. Do not allow the bucket teeth to catch on the dozer blade.



# Backhoe excavator operation

## Stick Operation

Pull up the stick...

If you pull back the left working device operating handle To make the handle, pull the stick forward. The bucket reduces soil loss, and the extended end of the bucket arm adopts The buffer structure.

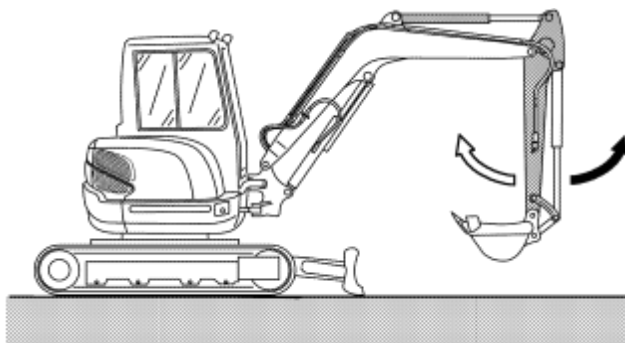
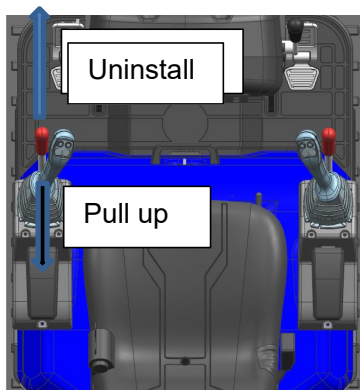
The stick extends...

Push the left working device operating handle forward. The stick extends.



**significant**

- \* When the boom is pulled up, if the boom is facing downward, sometimes the action It stops momentarily. This is not a malfunction.



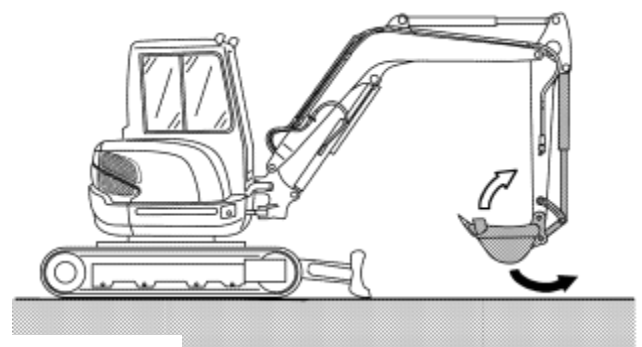
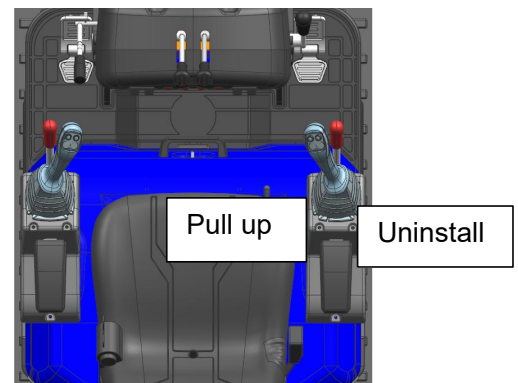
## Bucket Operation

The bucket is pulled up...

Move the right working device operating handle to the left. side.

Bucket dumping...

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





# Backhoe excavator operation

## Rotation operation



**warn**

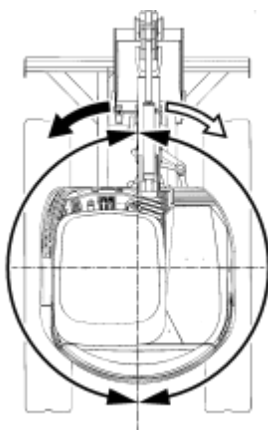
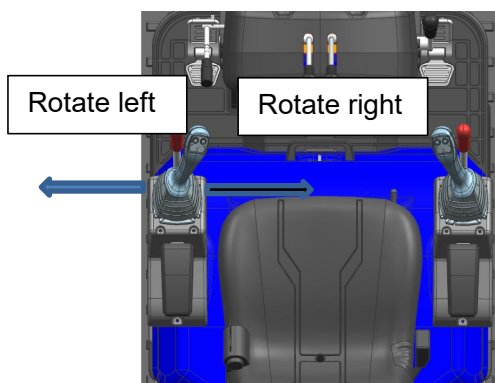
\* Do not perform rotational operations on sloped terrain, as this may result in overturning. If rotational operations or excavation work must be performed on sloped terrain, level the ground before proceeding.

► Negligence may result in overturning and cause injury.

The left working device operating handle can be used for rotation operation.

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

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



## Swing operation



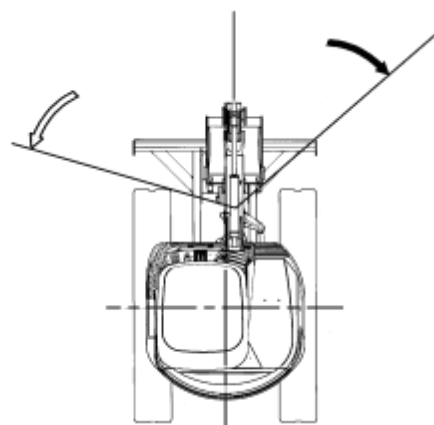
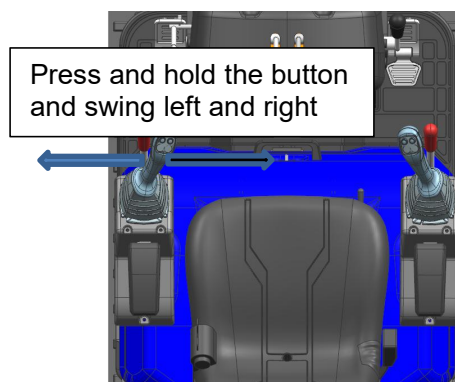
**warn**

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.

The boom can be swung left and right using the swing operating handle. Left swing... Press the left button on the left handle and swing the handle to the left .

Swing right... Swing the operating handle to the right while pressing the left button on the left handle .





# Backhoe excavator operation

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**significant**

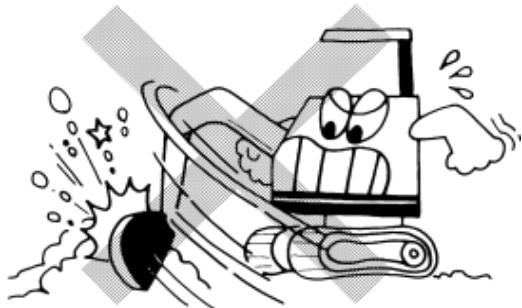
- \* Rapid rotation and rapid reversal will shorten the service life of the machine. Do not do this.



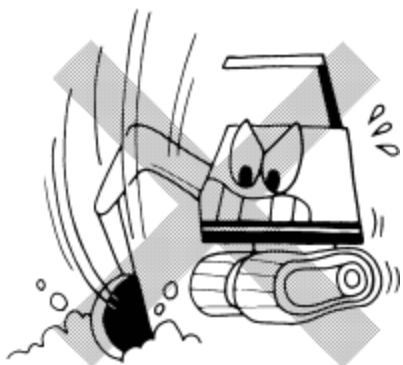
# Backhoe excavator operation

## Prohibited on operations

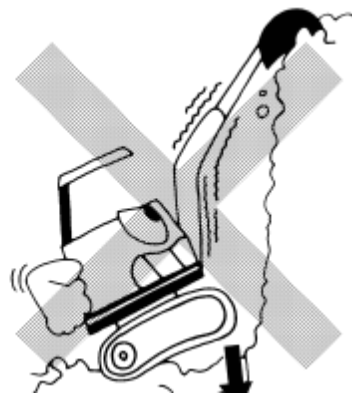
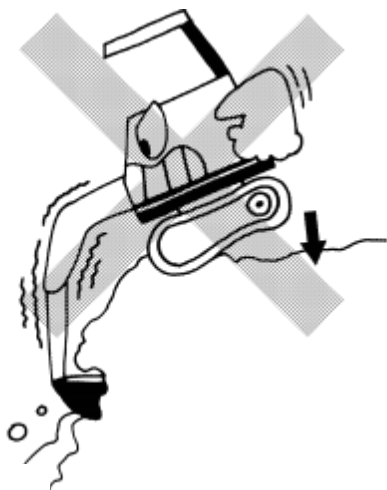
1. It is prohibited to use rotational force to perform operations. ( Use bucket to carry out horizontal Push homework, etc. )



2. It is prohibited to use the falling gravity of the bucket to perform operations. Using a shovel Piling operations, etc. )



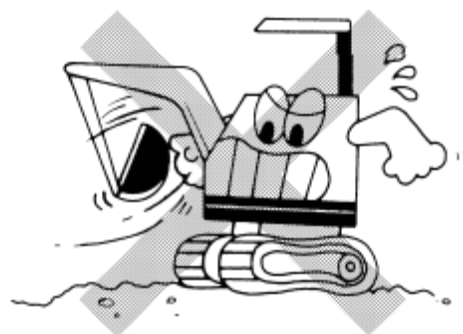
3. It is prohibited to use the falling gravity of the main body to perform operations. ( Use machine Excavation work



4. It is prohibited to use walking force to perform work. Insert the bucket into the ground Driving, etc. )



5. Use the bucket to remove soil. ( Do not remove soil by impact with the bucket end )



# Backhoe excavator operation

## Operation precautions

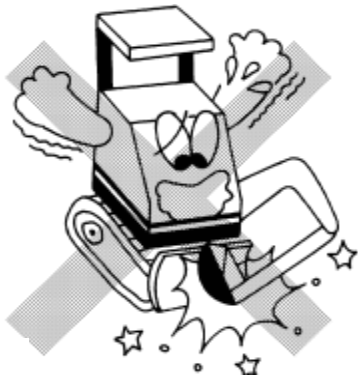
### 1. Watch out for the bulldozer.

When digging deep in front of the bulldozer, be careful not to move. The arm and boom cylinder collide with the bulldozer.



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

When folding the working device during driving or transportation, be careful not to make the bucket hit the dozer blade.



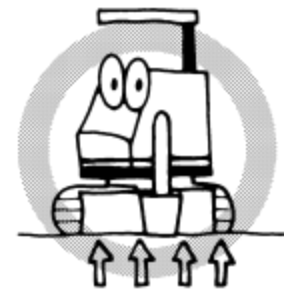
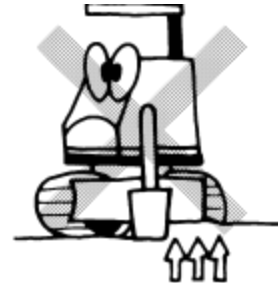
### 3. Watch out for collisions with the bulldozer!

Do not allow the bulldozer to hit the rocks. Otherwise, the bulldozer and premature cylinder failure.



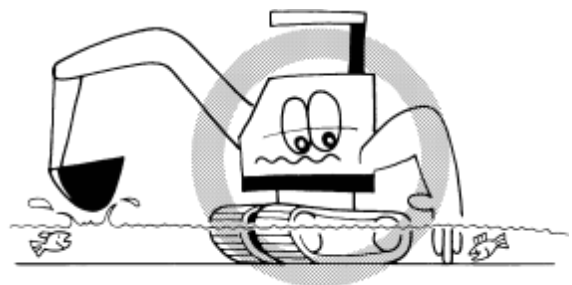
### 4. When using a bulldozer for support, both sides must be supported at the same time!

When using the bulldozer as a support foot, it is prohibited to use only the bulldozer support on one side.



### 5. Pay attention to the allowed water depth!

When working in water, check that all latches and cocks are After tightening, the depth range of the crawler upper part to the idle part For use within.



### ! significant

- \* After the work is completed, please be sure to remove the dirt and rinse it clean. Then add grease to the fulcrum parts, etc.
- \* After working at the beach, please wash the car carefully and clean the Thoroughly maintain electrical parts to prevent Corrosion of mechanical parts.

# Truck Transport

## Loading and transporting



### 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 relevant laws and regulations such as the Road Traffic Safety Law, the Road Transport Vehicle Law, and vehicle restrictions during transportation.



### 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.

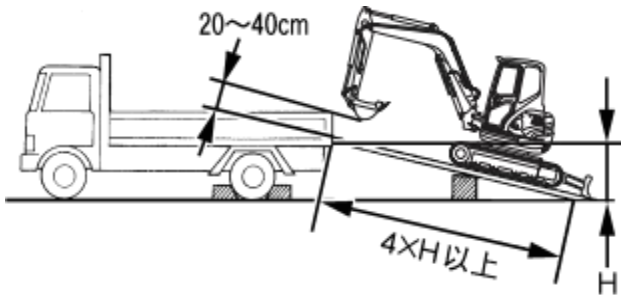
1. Engage the truck's brakes and apply pressure to the front and rear tires to ensure The tires will not rotate.



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.



- 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



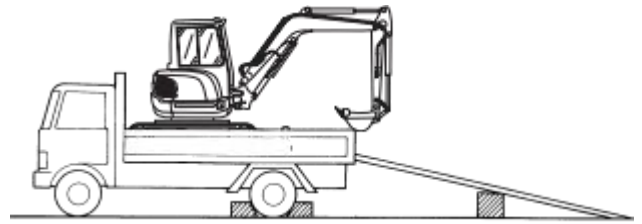
- Before moving the machine to the front of the truck bed, follow the instructions as shown below. Stop temporarily and let the bucket lightly touch the truck bed. Then, make sure the vehicle is level. state.
- Adjusting the direction on the loading and unloading board is extremely dangerous. To adjust the direction, be sure to get off the loading and unloading plate first and adjust it After the direction, then put on the loading and unloading plate.
- After moving forward to the designated position on the truck bed, While pulling up, slowly rotate the upper rotating body 180 degrees. At the same time, pay attention to the balance of the car.
- Lower the bucket onto the truck bed, stop the engine, and place the operating handle lock lever in the " Locked " position.
- Use wire ropes to securely fix the machine to the truck bed. superior.

## 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.

## Unloading from the truck

- Make sure the working device faces the direction of travel and that the arm and the truck bed are aligned. With the board kept vertical or slightly raised, move forward to In front of the loading and unloading board.



- Stop the machine before moving to the loading platform and gently Contact the ground or loading platform, then move forward slowly to avoid The machine's center of gravity moves too quickly.
- 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.
- Move the bucket forward after it has lightly touched the ground. At this time, Please be careful not to damage the road surface.



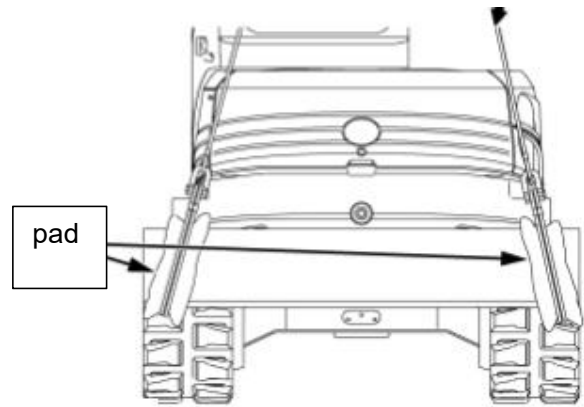
# Truck Transport

## Fuselage lifting



### **note**

- \* Do not perform lifting operations when there are people in the vehicle, as this is dangerous.
- \* The wire rope used for lifting should be strong enough for the machine .
- \* Do not use round bars when lifting. This is dangerous, so Please do not tie the wire rope to the round bar for lifting operations.



Please follow the instructions below when lifting.

1. Rotate the upper rotating body so that the dozer blade is aligned with the working device. 180 Spend Reverse direction.
2. Raise the dozer blade to its highest position.
3. Raise the boom to pull the bucket and stick up as far as possible. Then Place the operating handle lock lever in " **Locked** " position.
4. Without swinging the boom, place the swing pedal in the middle. Stand still, close the pedal cover, and stop the engine.
5. Add pads around the boom angle and hang wire ropes. As shown, pads are also added to the bulldozer and a wire rope is hung on it.
6. Keep the lifting angle of the wire rope 55 Degrees, lift.

### **supplement**

- \* When lifting, please pay attention to the center of gravity to ensure full balance.
- \* Do not swing the boom or rotate the upper part when lifting.



# Truck Transport

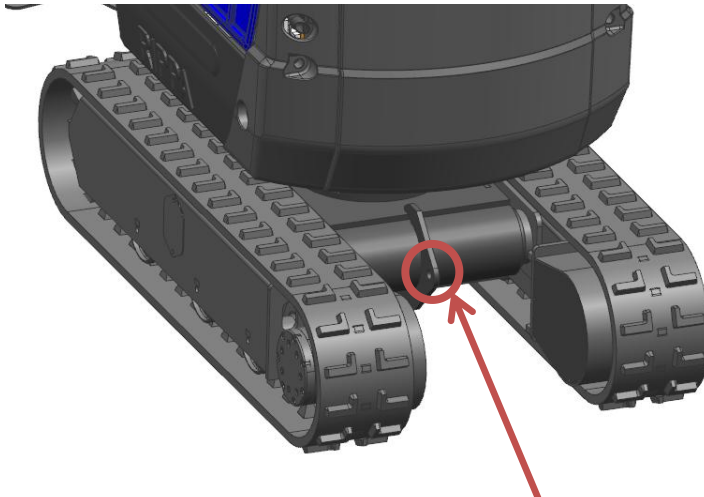
## Main towing method



### ***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 aircraft is stuck in mud and cannot get out. Please use wire rope, sling and hook to lift the machine as shown in the figure. Pull out of the mud.



Use a sling or steel wire rope to pass through here





## **note**

\* When refueling and performing maintenance,

1. Place the machine on a flat, spacious surface.
2. Lower the bucket and dozer blade to the ground.
3. Turn off the engine.
4. Check that there is no residual pressure in the work device lever and dozer blade lever.
5. Remove the key and confirm that it is safe before proceeding with the work.

## Regarding the



## **warn**

Please do not discard or burn waste at will, otherwise it will not only cause environmental damage Environmental pollution, And they will also be subject to legal sanctions.

When handling waste

- \* Collect the waste liquid discharged from the machine into a container.
- \* Do not pour waste liquid into drains, rivers, lakes or oceans middle.
- \* Waste oil, fuel, cooling water (not frozen ) should be discarded or burned. liquid), refrigerants, solvents, filters, batteries, rubber If you are using glue or other harmful substances, please contact the sales store or Consult with industrial waste treatment units to ensure that Processing according to established rules.



# maintain

## Periodic Checklist

| No. | period  |       | number<br>quantity | Hour meter shows time |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             | Afterwards |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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|---|---|---|---|---|
|     | project |       |                    | 5<br>0                | 1<br>0<br>0 | 1<br>5<br>0 | 2<br>0<br>0 | 2<br>5<br>0 | 3<br>0<br>0 | 3<br>5<br>0 | 4<br>0<br>0 | 4<br>5<br>0 | 5<br>0<br>0 | 5<br>5<br>0 | 6<br>0<br>0 | 6<br>5<br>0 | 7<br>0<br>0 | 7<br>5<br>0 | 8<br>0<br>0 |            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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|   |   |   |   |   |
| 1   | fuel    | drain | 1                  | ○                     | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○           | ○          | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |





# maintain

| No. | period                         |         | number quantity | Hour meter shows time |     |     |     |     |     |     |     |     |     |     |     |     |     |     |              | Afterwards |
|-----|--------------------------------|---------|-----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------|------------|
|     | project                        |         |                 | 50                    | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800          |            |
| 19  | Electrical wiring, Use of fuse | examine | —               |                       |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Every 1 Year |            |
| 20  | Cooling water                  | replace | 1               |                       |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Every 2 Year |            |

(1) The symbol © indicates that it is only implemented for the first time.

(2) The ☆ symbol indicates that when using a hydraulic front-end working device such as a breaker, Replacement time will be shortened.

[ Air Conditioning Specifications ]

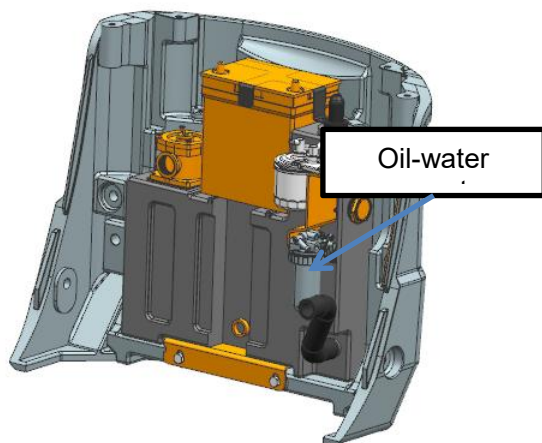


## Each use 50 Hours of maintenance

### ◆ Water separator

If water accumulates, the red float will rise. At this time, the oil cup should be removed and the oil Drop the stagnant water.

1. Place the water separator handle in " CLOSE " ( close ) Location.
2. Loosen the fixing ring on the top of the oil cup, remove the oil cup, and pour out the oil inside. of stagnant water.



**significant**

- \* Be careful not to get dirt or dust on it when assembling
- \* After draining the water from the oil cup, please vent the air. See "Fuel Material system venting" project )

### ■ Battery fluid level check



**danger**

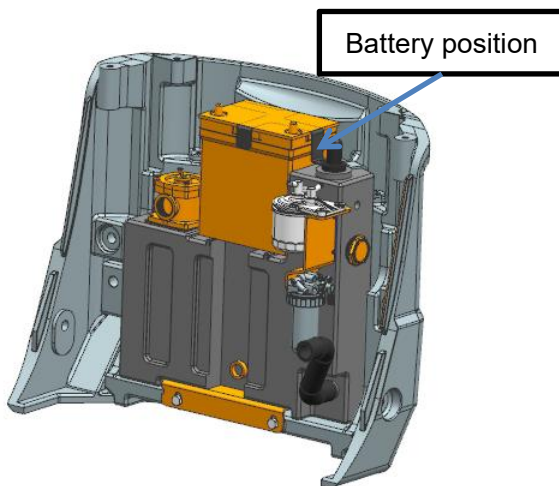
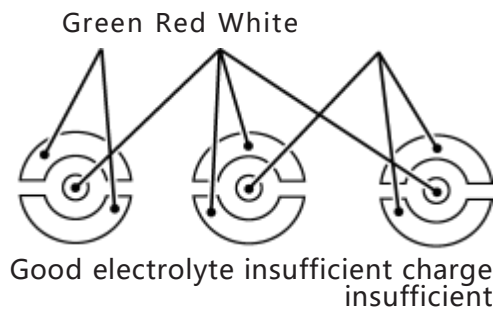
There are two types of batteries: one that does not require water refilling and one that does. For batteries that require water refilling, please observe the following precautions.

- \* If the battery fluid level is below the LOWER (minimum fluid level line), do not use or charge the battery.
- \* Continuing to use the battery below the LOWER (minimum level line) will accelerate the aging of internal components, not only shortening the battery's lifespan but also potentially causing an explosion.
- \* Immediately add water to bring the level between the UPPER LEVEL (upper limit) and LOWER LEVEL (lower limit).

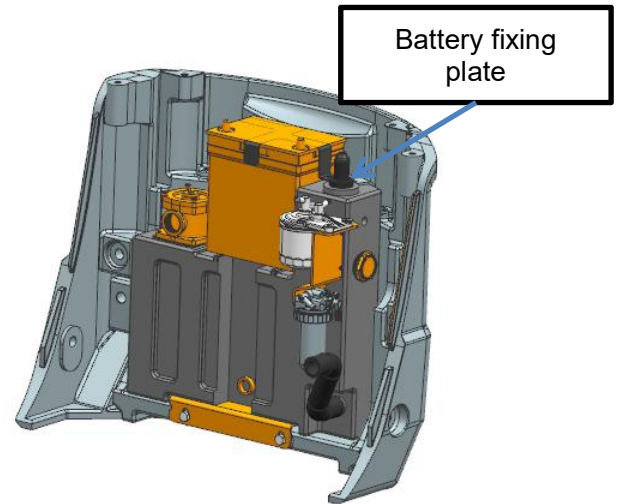
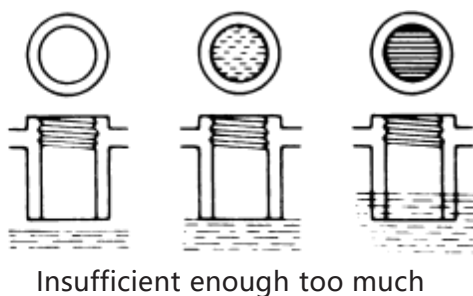
# maintain

1. Open the right hood and check the battery indicator light.
2. When the solution is insufficient, please add distilled water.
3. If the electrolyte is reduced due to overflow, please go to a battery specialty store Add dilute sulfuric acid of the same concentration.

## View method of indicator light



## Battery level



## ◆ The method of removing the battery

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 remove the battery bolts.
5. Remove the battery by offsetting the battery's clamps.



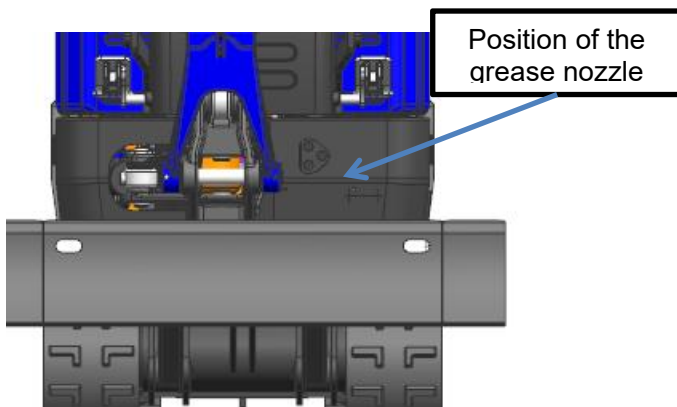
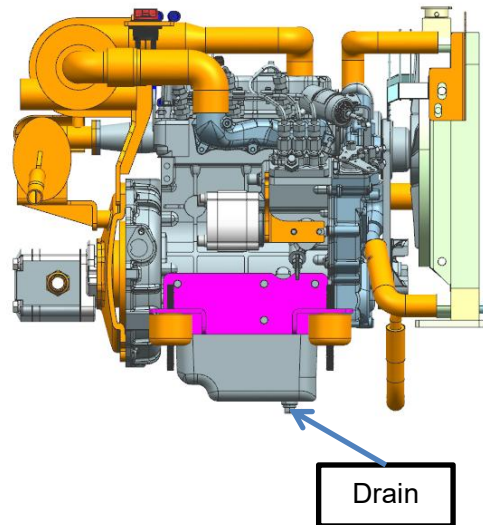
## note

- \* When charging the battery, be sure to remove it from the main unit and charge it in a well-ventilated area.
- \* When disconnecting the wires from the battery, disconnect the (-) side first, and connect the (+) side first when installing. If you reverse the order, it will cause a short circuit when it comes into contact with the tool.
- \* When charging, connect the battery's (+) terminal to the charger's (+) terminal and the battery's (-) terminal to the charger's (-) terminal, and charge using the standard charging method. Please note that the wires must not be connected incorrectly.
- \* Never charge the battery while both the (-) and (+) terminals are connected to the battery.
- \* Loose terminals can cause sparks or electrical component failures. Therefore, ensure they are securely tightened.
- \* The battery indicator display is only an approximate standard. Therefore, in addition to checking the indicator display, please also perform a thorough inspection of the fluid level, etc.



## ! significant

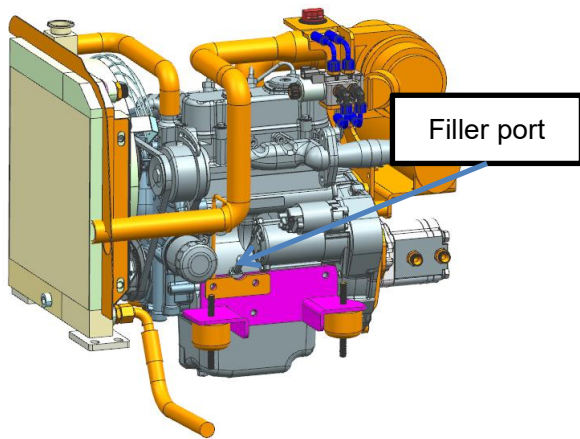
- \* If the battery solution is insufficient, it will damage the battery. If it is too much, the solution will overflow and corrode the metal parts of the body.
  - \* In addition to damage to electrical installation components, Also, please avoid rapid charging as much as possible. It will shorten the 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 replacement ( First time 50 Hour, 2 After For each 250 Hour )

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

3. Add the specified amount of engine oil from the filler neck.



4. Allow the engine to idle, then stop the engine. 5 minute. Later, use the oil dipstick to confirm whether the specified amount of engine oil has been added.

## supplement

|              |     |                                   |
|--------------|-----|-----------------------------------|
| Oil quantity | R13 | About 2.5L (including the filter) |
|--------------|-----|-----------------------------------|

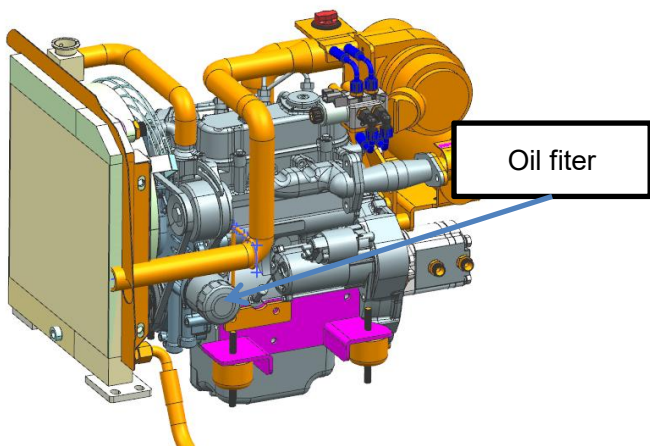
The area in parentheses indicates when to replace the filter and oil.


\* Please use CF Grade above engine oil.

\* Even if dissatisfied 250 hours, please 6 Monthly replacement 1 Second-rate.

■ Replacement of oil filter element (50 hours for the first time, No. 2 After each 500 Hour )

1. Please change the engine oil at the same time.
2. Use the included filter wrench to remove the filter element.





## Each use 100 Hours of maintenance

---

Each use 50 Please also carry out hourly maintenance at the same time.

### ■Replacement of driving motor oil (First time 100 Hour, 2 After each 500 Hour )

1. Rotate the track so that the travel motor drain plug is lowered.
2. Remove the oil drain plug and drain the oil.
3. After tightening, remove the oil filling port and oil inspection port plug, and Fill the gear oil.
4. Specified oil quantities are as follows.

Fill the gear oil until oil flows out of the oil filling port, and then Tighten the plug.

5. Please use gear oil as engine oil SAE #90.  
( See also "List of recommended lubricants" )
3. Place the new filter in the O Apply a thin layer of oil to the ring, then By hand ( No t using a filter wrench ) Secure in place.
4. Add the specified amount of engine oil to the engine.
5. Perform about 5 Minutes of operation, and confirm that no The engine is shut down after the "Engine Hydraulics Abnormal" warning.
6. Please confirm the oil level again with the oil mark and refill if it is insufficient.

## Each use 200 Hours of maintenance

Each use 50 Hours, 100 Please also carry out hourly maintenance at the same time.

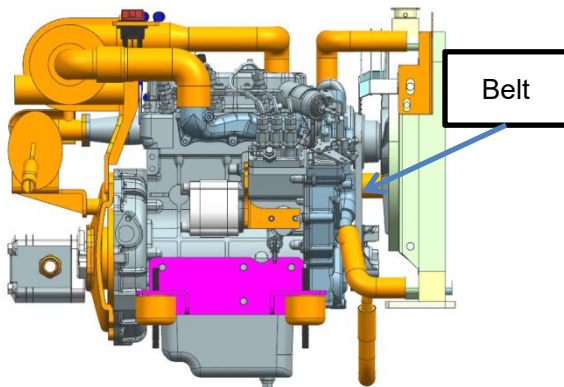
### ■ Check the tension of the air conditioning belt



#### **note**

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

If [68.8N(7 kgf )] When the force is pressed, the belt sags 12 ~ 15 mm That is normal.

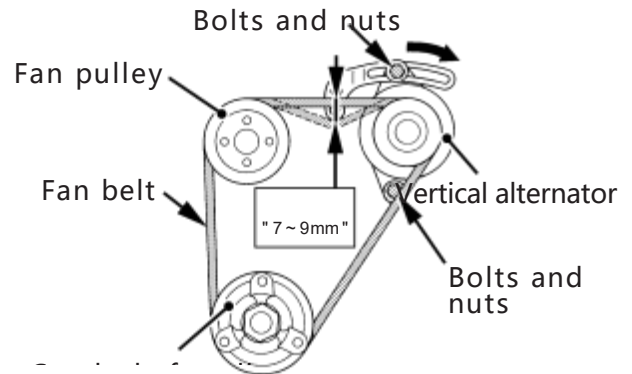


#### **supplement**

- \* If the air conditioning belt is too loose, discuss it with the store of sale or the repair factory designated by our company.

### ■ Inspection and adjustment of fan belt tension

- 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 engine continues to operate when the belt tension is low, the belt will slip. This not only reduces the engine's performance but also shortens its service life. Therefore, please check and adjust it.

# maintain

## ■ Cleaning and inspection of air filter elements



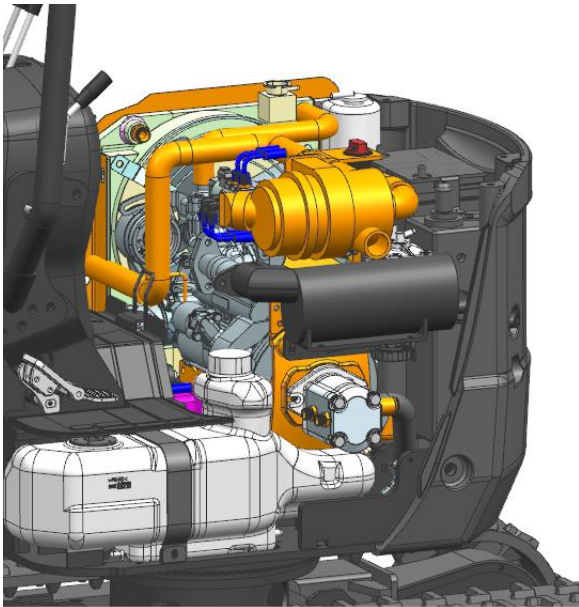
### **note**

\* Because using compressed air to forcibly sweep away dust will cause the dust to spread Scattered everywhere, So be sure to wear protective glasses.

Especially when working in dusty places, please Clean and inspect early.

Remove the clip, take out the external filter element, and clean the external filter element and housing. After the inside, attach it.

Do not remove the internal filter.



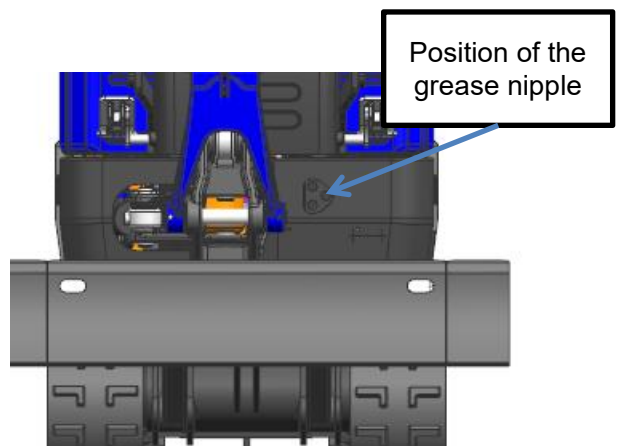
## ◆ Cleaning Method

Use dry compressed air [205 kPa (2.1 kgf / cm<sup>2</sup>) or less] Sweep the outside of the filter element to forcefully remove the attached dust, then sweep from the inside to External purge, Remove all the dust.



## ■ Grease injection of rotating bearing ball

1. Fill in grease from the grease nipple marked with an arrow. (Central grease nozzle)
2. Please follow the appointment 90 Degree rotation, 4 Refill grease.

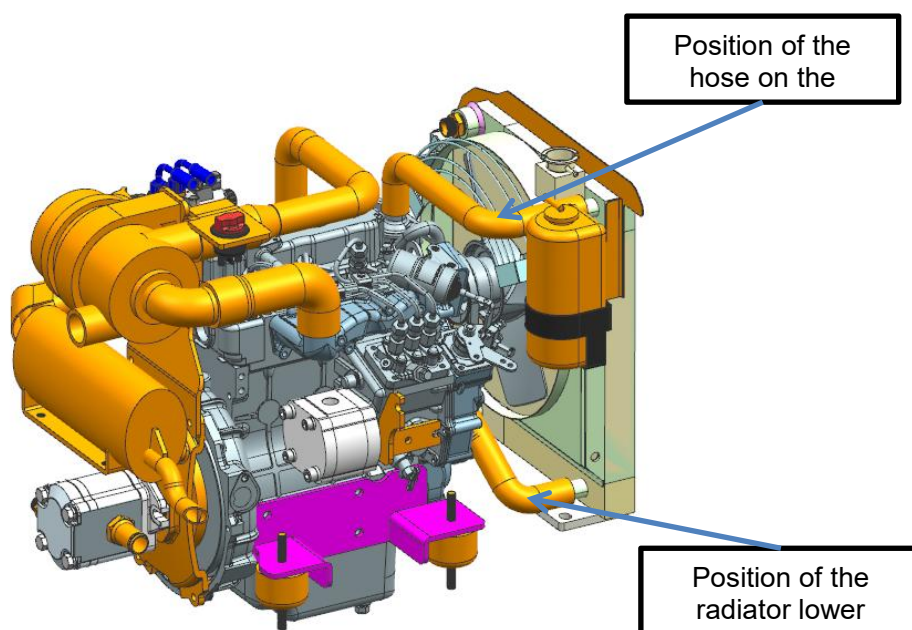


## ■ Inspection of radiator hoses and clamps

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.

- When severely dirty  
Immerse in warm water with household neutral detergent, move up and down and left and right while cleaning, then rinse thoroughly with clean water to remove the solvent and let it dry naturally.





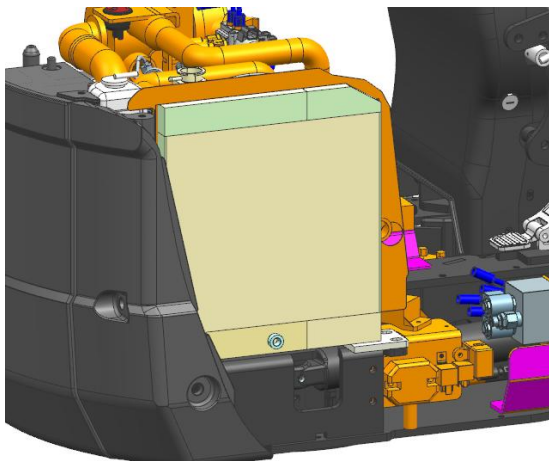
## ■ Cleaning of the radiator



### **note**

\* During inspection, Be sure to stop the engine before doing this.

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



## Each use 250 Hours of maintenance

Each use 50 Please also carry out hourly maintenance at the same time.

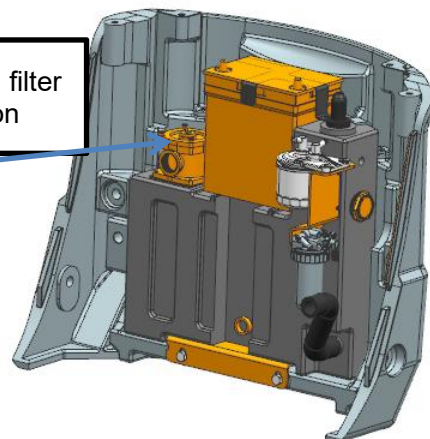
### ■ Oil replacement ( First time 50 Hour, 2 After For each 250 Hour )

For information on how to change the engine oil, refer to “Every use 50 Hours Maintenance” project.

### ■ Replacement of the return oil filter ( 2 50 hours for the first time At that time, 2 After each 500 Hour 1 Second-rate )

Please remove the filter after the oil temperature in the working oil tank drops.

Return oil filter position



1. Hold the upper part of the filter bracket and remove it from the oil tank. Remove it.
2. Loosen the positioning bolts and remove the filter from the filter bracket. Oil filter and replace it with a new one.
3. Remove the bolts from the cover, take out the protective filter, and replace it with a new one. filter.



- \* 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            | Every 100 hours                         |
| More than 80%                                          | Every 200 hours            |                                         |

## supplement

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

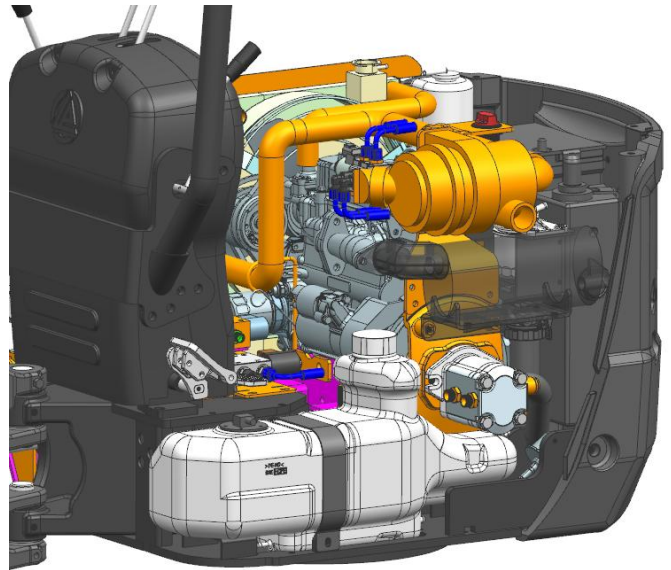
## Maintenance every 500 hours

### of use

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.

■ **Replacement of driving motor oil (First time 100 Hour, 2 After each 500 Hour )**

For information on how to change the engine oil, refer to “ Every 100 hours of use Maintenance” project.

■ **Replacement of the return oil filter (2 50 hours for the first time At that time, 2 After each 500 Hour )**

For replacement of the return filter, refer to “Every use 250 Hours of maintenance” project.

■ **Replacement of oil filter element (50 hours for the first time, No. 2 After each 500 Hour )**

For information on how to replace the filter element, refer to “Every 50 Hours of maintenance” project.

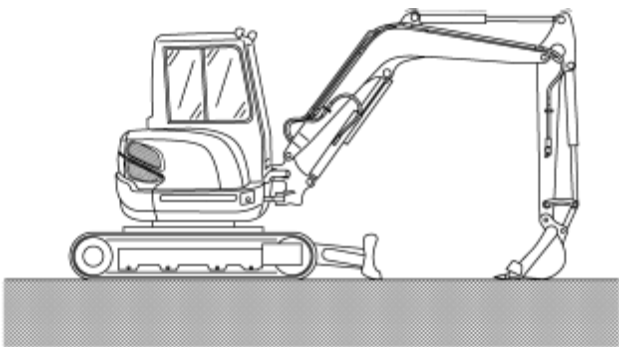


Each use 1000 Hours of maintenance

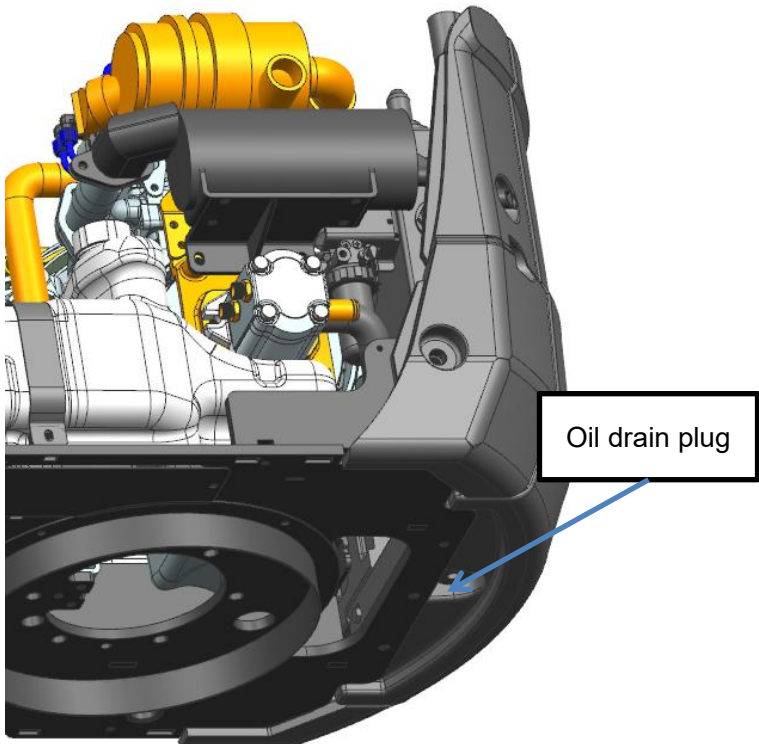
Each use 50, 100, 200, 250, 500 Hours of maintenance please At the same time.

■Replacement of hydraulic oil (Please also check the suction filter in the working oil tank. Replace)

- 1. Park the machine on a level surface and extend the piston rods of each cylinder. Extend to approximately the middle position and make the bucket and dozer blade contact ground.



- 2. Remove the drain plug at the bottom of the oil 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, please tighten the Oil drain plug firmly.
  - 5 Add the specified amount of working oil through the oil filler.
- Let the engine idle for about 5 minutes.
- After stopping the engine, please confirm whether the specified amount of working oil has been added.

● Working oil replacement capacity

|                                  |     |                       |
|----------------------------------|-----|-----------------------|
| Working oil Replacement capacity | R13 | Total oil volume 37 L |
|----------------------------------|-----|-----------------------|

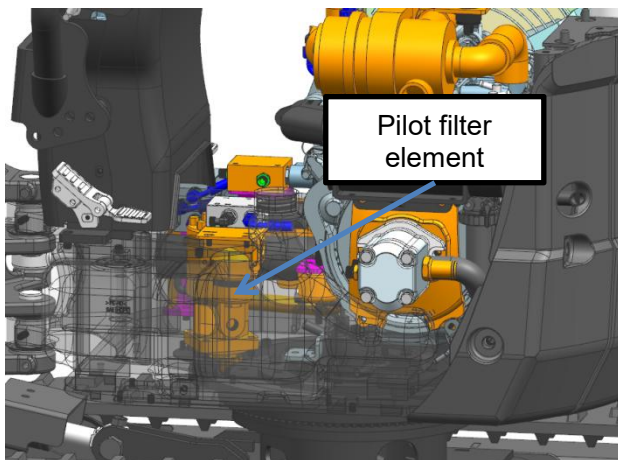
supplement

- \* When sediment accumulates in the fuel tank, flush the inner surface.
- \* Be careful not to allow foreign matter to enter the fuel tank.
- \* When replacing the suction filter, please contact the sales store or the company's designated Consult with the repair factory.

## ■ Hydraulic pilot filter replacement

Replace the filter element after the oil temperature has dropped.

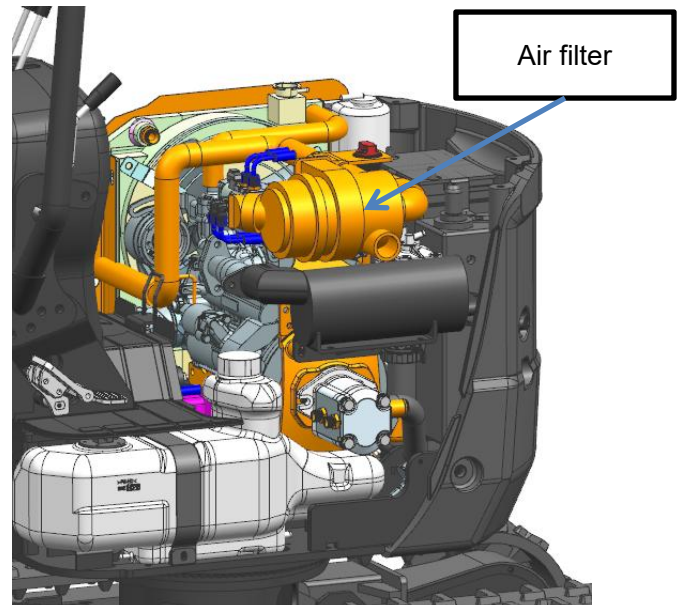
1. Please open the seat guard.
2. Please remove the footrest.
- 3 Remove the quick-change valve mounting plate.
- 4 Remove the housing of the pilot filter.
5. While rotating the filter element, pull it out from the bottom.
- 6 Please replace the O-ring with a new one.
7. Apply a thin layer of clean working oil to the O-ring of the new filter element, and then firmly embed it without damaging the O-ring.
- 8 Please fasten the housing to the end cap.
9. After replacement, let the engine idle for about 3 minutes to expel air from the circuit.
- 10 Be sure to check the level of the working fuel tank.



Maintenance every 1000 hours or every 1 year

## ■ Replacement of the air filter element

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





# maintain

## Each use 2000 Hours of maintenance

Each use 50, 200, 250, 500, 1000 Hours of maintenance please At the same time.

### ■ Grease replacement of supporting wheels, idlers and support wheels

Please consult with the sales store or the repair shop designated by our company.

### ■ Inspection of AC generator and starter motor

Please consult with the sales store or the repair shop designated by our company.

authorization. Have it inspected and repaired by a repair shop or a repair shop designated by our company. reason.

### ■ Check the air conditioning pipes and hoses



**note**

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

## Each use 1 Years of maintenance

### ■ 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 lead to poor contact. If the wiring is damaged , it will not only impair the performance of the electrical components, but may also It may cause short circuit, leakage or burning. Replace or repair damaged wiring as soon as possible.



**significant**

- \* If you replace a fuse and it blows immediately, do not use a metal wire. Instead, it should be inspected and repaired at a repair shop designated by our company .
- \* Since the wiring harness of this machine has been fully considered waterproof when wiring Therefore, do not repair or use it without it without authorization. It should be





1. Confirm that all lines and hose clamps are securely connected and undamaged.
2. If you find that the hose or clamp is worn or damaged, repair or replace it immediately.

### Each use 2 Years of maintenance

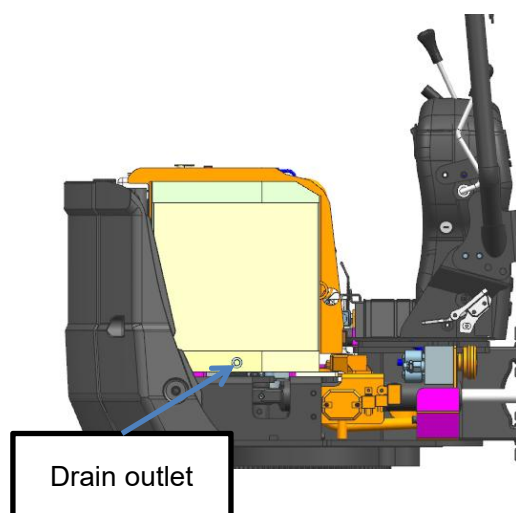
#### ■ Replacement of cooling water (When using extended-life coolant)



#### **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 All cooling water is drained.  
To drain the water tank, remove the water tank and unscrew the water tank cap. Drain the water.
2. Please drain the water while filling the radiator with water. Continue until clean water flows out of the drain.
3. Then, securely tighten the drain plug and pour the extended-life coolant into the drain. After filling the radiator and water tank, tighten the cap. Start the engine and run it at idle speed for about 5 minutes. Turn on the engine, then turn off the engine and check whether the specified amount of of cooling water.





# maintain

- ◆ 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, be sure to mix the permanent type (PT type) antifreeze into clear water and then refill the radiator and water tank.



## **significant**

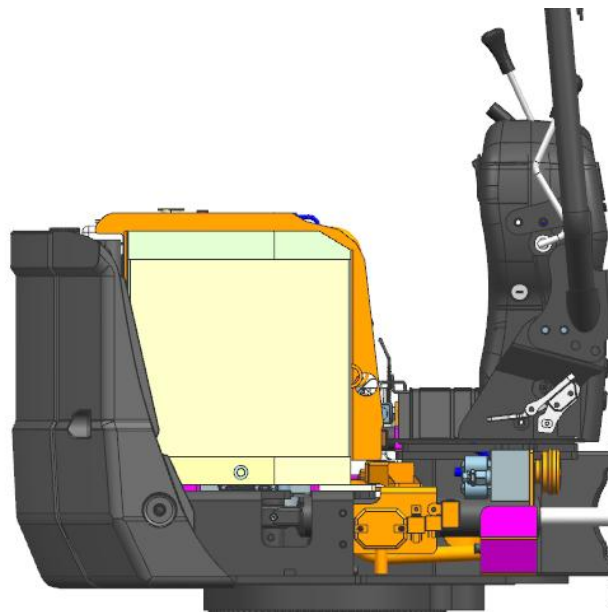
\* The mix ratio of antifreeze varies by manufacturer and temperature.

Please follow the mixing ratio specified in the "Cryogenic Preparedness" section.

\* Do not mix antifreeze from different manufacturers.



- \* Antifreeze - long-lasting coolant has an effective service life of 2 years.
- \* In case of other than long-life coolant, please Replace separately 1 Second-rate.





## warn

\* Since removing the battery cables may cause a short circuit, be sure to disconnect the negative cable first. When reassembling, connect the positive cable first.

\* Batteries generate flammable hydrogen gas, which may cause a fire or explosion if exposed to a heat source. Therefore, never expose the battery to a heat source.

\* Never place tools, metal objects, or flammable materials on or around the battery. If a short circuit occurs, it may cause a fire or explosion.

\* Battery solution (diluted sulfuric acid) can cause blindness or burns. If battery solution comes into contact with your skin or clothing, immediately rinse with a large amount of water. Additionally, if battery solution splashes into your eyes, rinse thoroughly with plenty of water and seek medical attention immediately.

\* When charging, remove all liquid plugs from each battery.

\* When working near the battery, always wear goggles to protect your eyes.

## Inspection and use of cistern

When checking and using the battery, please stop the engine and start the The key is " STOP " ( stop ) State is carried out.

### ■Battery maintenance and repair

The latest batteries have extremely high performance, but if used incorrectly, This will shorten the battery life and lead to unnecessary expenses. Therefore, please use the correct method to fully utilize the storage capacity. Pool functionality.

1. The battery is a must as the power source for the engine starter and indicator light. Spare parts.
2. If the battery reserve power is reduced, the engine cannot be started. This is related to the malfunction of electrical components. Sometimes it's too late, so please ground for charging.
3. As the water in the electrolyte evaporates, the battery The amount of solution will decrease. Insufficient solution may damage the battery. Over time, the liquid will overflow and corrode the body.
4. Please check whether the plate separator is exposed. If it is insufficient, be sure to add Battery solution or distilled water.
5. When storing the machine for a long time, please remove the battery from the machine. Charge the battery and store in a dry place away from light after adjusting the liquid level to the correct level .
6. Since the battery will automatically discharge during storage, Please do this every month 1 Recharge the battery.

## ■ Precautions when charging the battery

Please be sure to To the key to "STOP" before removing 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, do it from the (-) side; when installing, 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 a cistern, in addition to measuring its specific gravity, the cables connected to the battery should also be removed before checking the amount of solution in the cistern.
9. Please remove all the liquid port plugs of each battery.

## ■ Liquid level inspection of the cistern

For the method of checking the liquid level of the cistern, please refer to the "Maintenance Every 50 Hours of Use" item.

## ■ Precautions for charging with the cistern in full load (only when necessary)

The correct approach is to do so after removing the cistern from the body.

1. As applying abnormal voltage to the alternator can cause it to be damaged, insert the key and To to "STOP" (stop), then remove the (-) terminal wiring of the battery and charge it.
- 2 During the charging process, remove all the liquid port plugs to release the generated gas.
3. When the cistern overheats (the liquid temperature exceeds 45 °C), suspend charging.
- 4 Stop charging immediately after it is fully charged. If charging continues beyond the necessary level, the following adverse conditions will occur.
  - cistern overheatingThe amount of cistern solution has decreased  
The cistern is in poor condition
5. When connecting the cistern, please be careful not to reverse the connection (linking (+) and (-), (-) and (+) together).  
Otherwise it will cause damage to the alternator, etc.
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, the service life of the cistern will be seriously shortened. Therefore, please pay close attention.

## ■ 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.

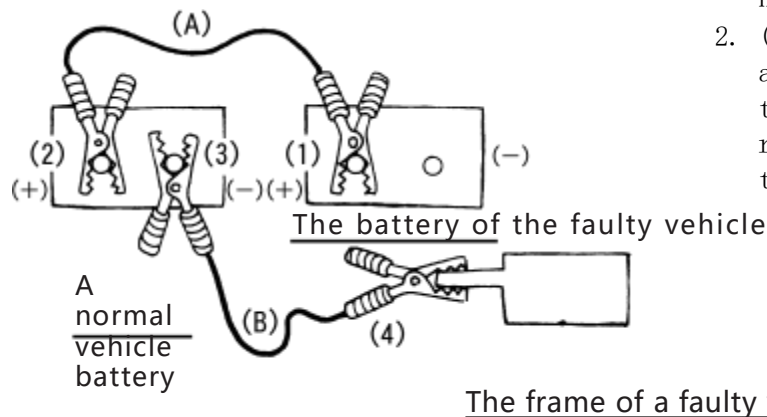
- 2 To prevent failure, batteries that are approaching the end of their lifespan should be replaced with new ones as soon as possible.

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.

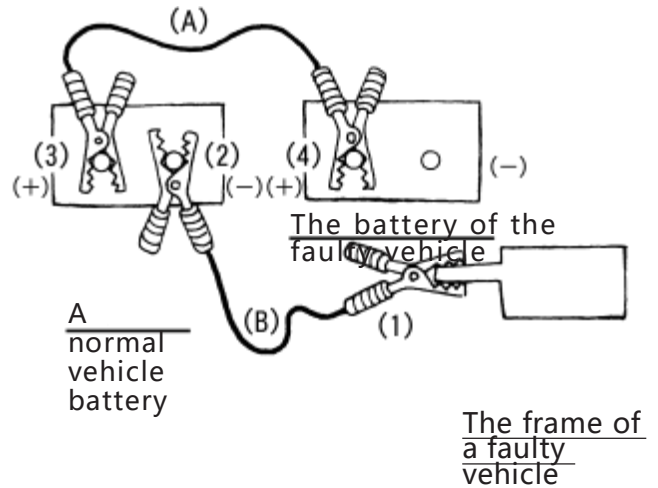
### ◆ Connection of auxiliary cables



### ◆ The engine of the faulty vehicle starts

1. After confirming the connection, start the engine.
2. If the start fails, wait for a moment (2 to 3 minutes) before restarting the engine.

### ◆ Removal of auxiliary cables



1. (1) Remove the clamps of the auxiliary cable (B) from the frame of the faulty vehicle, and (2) next remove the connection with the (-) terminal of the normal vehicle.
2. (3) After removing the clamp of the auxiliary cable (A) from the (+) terminal of the normal vehicle, (4) remove the (+) terminal connection of the faulty vehicle.



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.





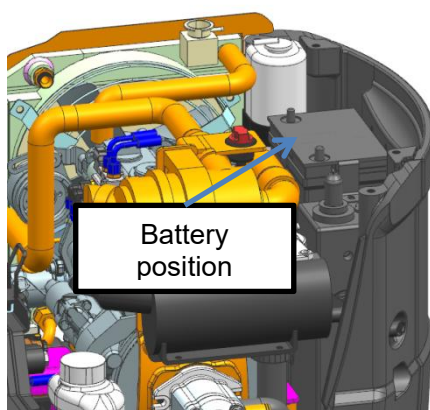
# maintain

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

For the method of starting the engine when the battery is depleted and the use of the battery, please proceed as described below.



- \* Prohibitions on charging and starting when the battery is exhausted Industry (In the following cases, if the electrical installation components (including control Control device, instrument ) Applying too much voltage may cause damage. Therefore, please pay full attention when performing maintenance.)
  - Please do not use large construction machinery or Trucks, etc. are started after being bridged. (Please use 12V start.)
  - Do not remove the battery terminals. to charge. (Be sure to remove the terminals when charging. )
  - Do not use a battery charger for starting.
  - Please do not use 24V Battery starting. (Please use 12V Battery starting.)
  - Do not disconnect the battery terminals while the engine is running.





### **note**

\* Be sure to turn the starter key to " STOP " ( stop )

Position to stop the engine before  
fuse, slow fuse

Replacement of fuse.

▶ If you neglect...

Sparks will be generated, causing  
danger.

### ■ Replacement of fuse

1. Put the starter key in " STOP " ( stop )  
Location.
2. Remove the cover under the seat and open  
the cover of the fuse box.
3. Please replace the fuse with one with the  
same capacity as the blown fuse. Simply  
remove the fuse through the fuse box cover.

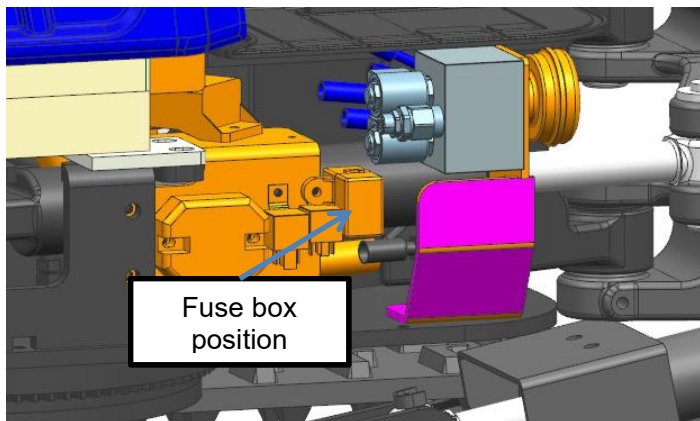


### **significant**

- \* 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.



## ■ Location of the fuse box



## ■ Fuse capacity and compatible circuits



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.

## ■ Backup power (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.

For details, please contact the sales store or the designated repair factory of our company.

### supplement

If the battery is left idle for a long time while the additional electrical assembly components are being started, it may be exhausted. Please be careful not to let it idle for a long time.

## Release gas from the fuel system

1. Please refill the fuel tank.
2. Please insert the key into the starter switch and turn it to the "START" (run) position



- 3 Perform about 1 minute of automatic air release.

### supplement

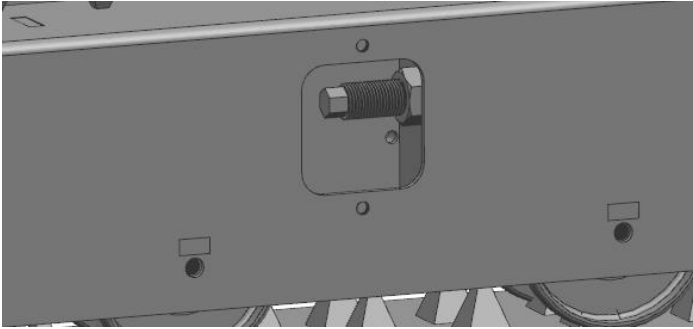
- \* If the air is not completely vented in the first attempt, repeat operations 2 and 3 when you want to stop the engine after starting

## Track adjustment

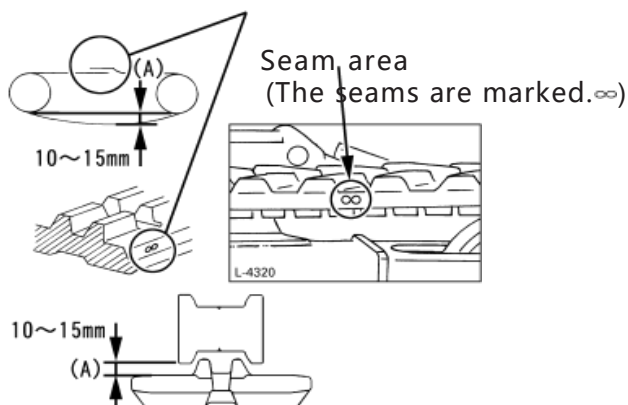
### ■ When tensioning steel tracks

Tighten the nut. Use a wrench to turn the hexagonal corner at the top of the tensioner until the track is tensioned to an appropriate state, then tighten the nut to fix it.

After adjustment, please rotate the track 1 to 2 times to confirm the tension allowance.



2. The tension of the track should be adjusted in the manner shown in the figure, that is, in the lifted part of the track (A), the size (the gap between the outer end of the central idler wheel and the tread of the track) should reach 10 to 15mm. (The seam of the track is located at the center of the upper part)



## ■ When loosening the steel tracks

Loosen the nut and use a wrench to turn the hexagonal corner at the top of the tensioner until the track is tensioned to an appropriate state.



**significant**

If the relaxation allowance reaches 25mm, please readjust it.

- \* 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 steel tracks.
- \* If too loose, it will
  - Cause poor meshing in the final drive.
  - Accelerate the wear of steel tracks.
  - Cause the steel tracks to fall off.
- \* After the work is done, thoroughly clean the steel track section. Do not leave it unattended as it is covered with dirt, etc.

If the steel track part becomes too tight due to being clogged with soil or the like during operation, use the boom, bucket arm and bucket to float the steel track part and rotate it side by side without load to remove the soil.

- \* Pay attention to the seams of the tracks  
Rubber-steel tracks have seams. When adjusting the tracks, please be sure to move the joint part to the center of the upper part. Additionally, in the upper moving wheel mechanism, make sure the upper moving wheel reaches between the Connecting rod 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.

# maintain

## ■ For ease of using steel tracks

When turning, try to avoid turning in place as much as possible. Instead, perform a low-speed To.  
It can reduce the wear of the wheel claws and the jamming of stones.

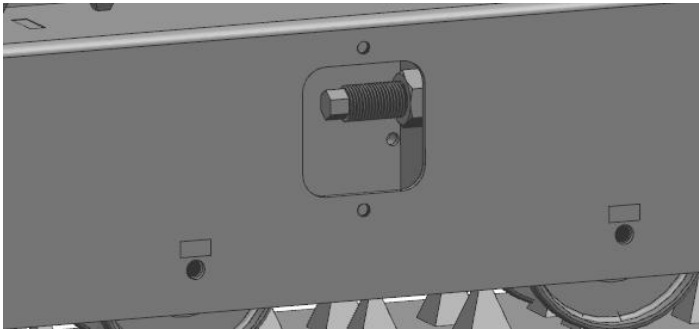
When the safety valve trips due to sand or soil getting stuck while turning, do not force the turn. Instead, immediately reverse, remove the sand or soil, and then turn again.

3. Do not use the track in such environments as it can damage the rubber blocks and shorten the service life when used on riversides, gravel ground, steel bars, and iron filings.

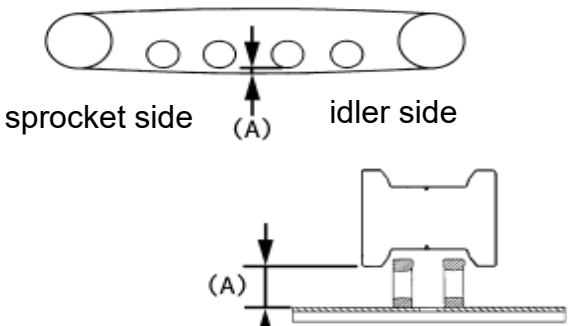
As shown in the figure, when the gap "(A) size" between the outer end of the central idler wheel and the upper part of the track plate reaches the value shown in the figure below in the state of the floating track part, the track tension condition reaches the optimal state.



## ■ When tensioning the tracks of the iron tracks



- 1 Use a wrench to tighten the tensioner bar.



|               |     |            |
|---------------|-----|------------|
| Clearance (A) | R13 | 25 to 30mm |
|---------------|-----|------------|

When you want to loosen the track plates, follow the guidelines for steel tracks.

## Bucket replacement



### **note**

\* Please wear a helmet, protective glasses, etc. when performing replacement work.

Protective gear.

\* When working together, you should fully understand the agreed signals and To achieve mutual communication, 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.

### ■ 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.

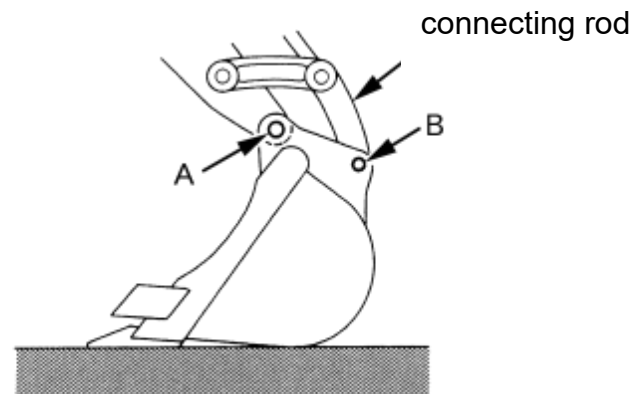


### **significant**

\* When replacing the bucket, make sure that the pulled-out pins are not contaminated with sand or soil, which can enter the bushing and cause it to wear out quickly.

### ■ Installation of the bucket

- 1 Align the bucket rod with hole A and join it with a pin. Then align the connecting rod with hole B and use a pin to join.
- 2 Install the locating bolts of the pins securely.
- 3 Grease the pins.





# maintain

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## Replacement of bucket teeth and side teeth

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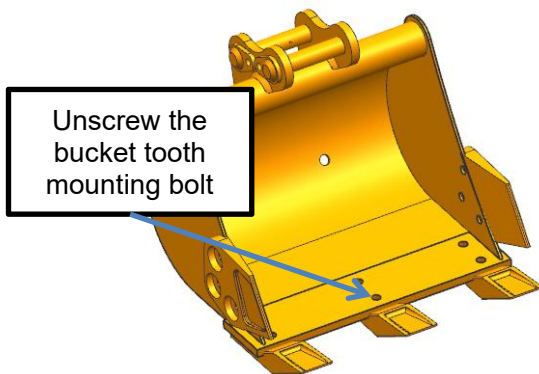
### ■ Replacement of bucket teeth



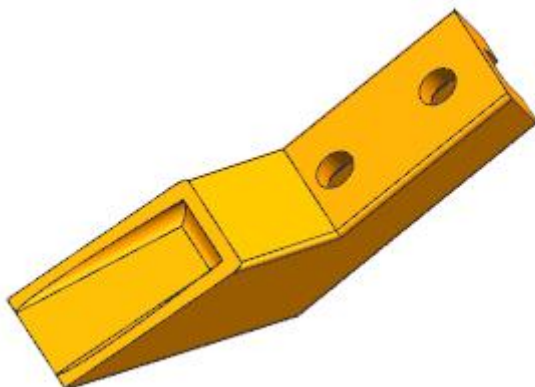
**warn**

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

- 1 Use socket wrenches, wrenches, etc. to unscrew the bucket tooth mounting bolts.
- 2 Remove the dirt attached to the bucket.
- 3 Install the new side teeth. And temporarily tighten the bolts.



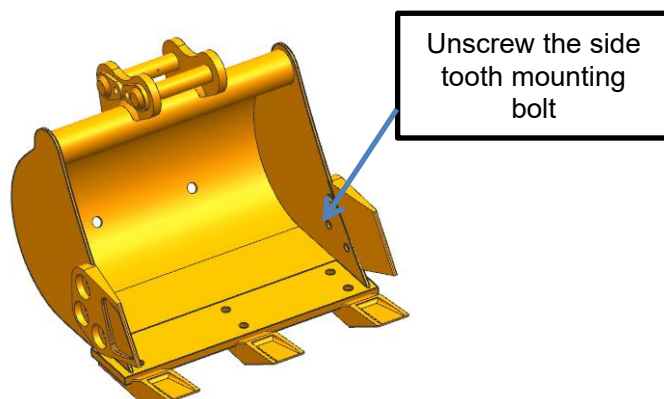
4. Tighten the bolts after confirming that the side tooth contact surface is securely in contact with the bucket metal joint.





## ■ Replacement of side teeth

1. Use socket wrenches, wrenches, etc. to unscrew the side tooth installation bolts.
- 2 Install the new side teeth. And temporarily tighten the bolts.
3. Please tighten the bolts after confirming that the contact surface of the side teeth is in solid contact with the metal adapter=adaptor of the bucket.



- Fasten the bolts with a fastening torque of 260 to 304N ·m(26.5 to 31kgf·m).

When the contact surface of the side teeth does not come into contact with the metal adapter=adaptor of the bucket or the clamping force is weak, the bolts may loosen.

## Maintenance for 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. Please apply sufficient grease to the exposed parts of the piston rod of the hydraulic cylinder.
4. Please remove the grounding wire of the cistern or take the cistern off the vehicle and then 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

Please wipe off the grease applied to 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 use a permanent brand or long-lasting 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

■ **Notes after the work is completed**

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.



# maintain

## Regarding regular replacement of important parts

To ensure the safety of operation and work at all times, the machine users must carry out regular maintenance and upkeep. 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 components 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                   | Fuel, hydraulic hose connections, riveting leaks fuel, hydraulic hose damage (cracking, wear, fuzzing)                                                     |
| Specific self-inspection (annual inspection) | Fuel, hydraulic hose connections, riveting leaks<br>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<br>Change every<br>4,000 hours,<br>whichever<br>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 the small backhoe excavator encounters any adverse conditions, please diagnose it according to the table below and take appropriate measures. If you have any questions, please contact the store where you purchased the product or the repair shop designated by our company.

|               | Status Quo                                                      | Reasons                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Disposal                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engine aspect | Unable to start                                                 | (1) Starting the engine with the wrong key.<br>(2) The key has a metal part (key ring, etc.)                                                                                                                                                                                                                                                                                                                                                                            | (1) If the instrument panel shows <b>"Key Error"</b> , please use the correct key to start the engine.<br>(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.<br>(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.<br>(2) Release the air. (See the <b>"Fuel System Venting"</b> item)                                                                                                                                                                                                                      |
|               |                                                                 | (3) When it is cold, the viscosity of the oil increases, and the engine itself rotates heavily.                                                                                                                                                                                                                                                                                                                                                                         | (1) Inject hot water into the radiator.<br>(2) Use different types of engine oil depending on the temperature. (Use SAE10W30 in winter)                                                                                                                                                                                                                                                       |
|               |                                                                 | (4) The battery power seems to have run out, the rotational force has weakened, and there is no tendency to exceed the 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.<br>(2) Excessive engine oil.                                                                                                                                                                                                                                                                                                                                                                                                                             | (1) Switch to high-quality fuel.<br>(2) Adjust to normal fuel levels.                                                                                                                                                                                                                                                                                                                         |
|               | When the water temperature gauge shows "H" (engine overheating) | (1) Poor sealing of the water pump.<br>(2) The fan belt is extended or broken.<br>(3) The thermostat is faulty.<br>(4) Insufficient cooling water.<br>(5) The radiator mesh and fins are clogged with dust.<br>(6) Rust on the cylinder head and crankcase contaminates the coolant.<br>(7) Poor radiator cap (evaporation).<br>(8) Corrosion of the cooling water passage.<br>(9) Continuous overload operation.<br>(10) Damaged cover gasket (reduced cooling water). | (1) Replace.<br>(2) Make adjustments or replacements.<br>(3) Make a replacement.<br>(4) Replenish to the specified amount.<br>(5) Do the cleaning.<br>(6) Replace the cooling water and add rust inhibitor.<br>(7) Replace.<br>(8) rinse.<br>(9) Reduce the load.<br>(10) Replace.<br>(11) Adjust to normal oil levels.<br>(12) Make adjustments.<br>(13) Please switch to high-quality fuel. |



|            |                                                                                                                                                             |                                                                                              |                                                          |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------|
|            |                                                                                                                                                             | (11) Insufficient engine oil.<br>(12) Poor fuel injection timing.<br>(13) Poor fuel quality. |                                                          |
| Hydraulics | Working devices<br>(boom, bucket,<br>bucket)<br>Insufficient<br>force, slow speed<br>or no movement of<br>the rotating,<br>traveling or<br>bulldozer shovel | (1) Insufficient working oil.<br>(2) Oil leakage at hose and piping<br>joints.               | (1) Refill the working oil.<br>(2) Reinforce or replace. |
| Driving    | Not driving<br>smoothly                                                                                                                                     | (1) Track gets stuck in stones.<br>(2) The tracks are too tight or too<br>loose.             | (1) Remove the stones.<br>(2) Make adjustments.          |





# Precautions for the use of hydraulic breakers

## Precautions when installing a hydraulic breaker

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

#### prohibit 1 Working posture

If you lift the 5 cm Attack in the above state. Then, as the rock was broken, the machine fell forward sharply. The main body of the breaker or the top of the bracket hits the rock violently. Sometimes it will cause damage. In addition, due to the Vibration will be transmitted to the track section, so to protect the track, Don't use this method of attack.

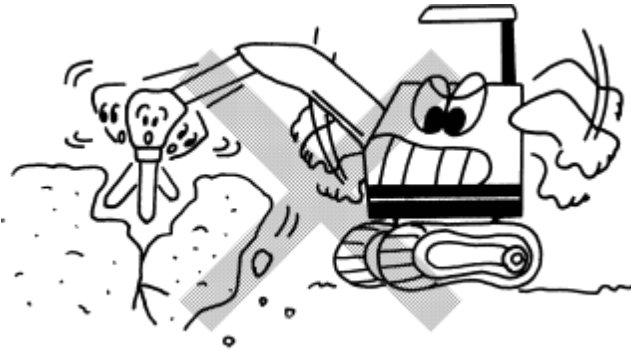


#### prohibit 2 Movement of rocks, etc. is prohibited

As shown in the figure, please never use the boom, arm, etc. Hydraulically rotate or knock down the hammer rod or bracket side. Otherwise, it may cause damage to the hammer mounting bolts. The bracket is damaged, the hammer rod is bruised and stuck, and the arm and boom are damaged.

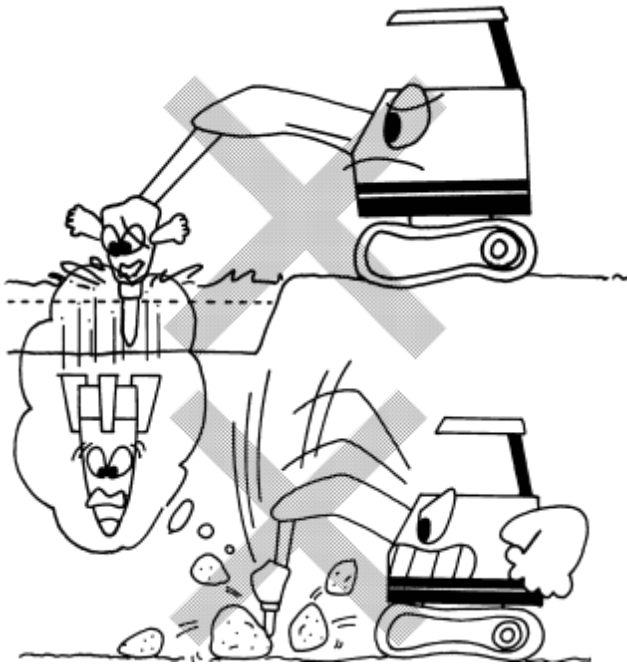
**prohibit 3** Prying crushing operations are prohibited

If the rock is broken by prying with a hammer, it will cause Bolts, hammer rods, etc. cause bruises.



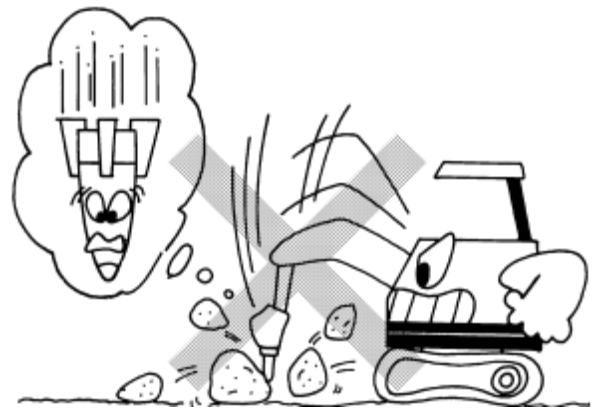
**prohibit 4** Do not perform crushing operations in water or mud

Please do not put any part other than the hammer into water or mud. Otherwise, the breaker will be damaged due to rust of pistons. Early failure.



**prohibit 5** It is prohibited to drop the breaker to break rocks, etc.

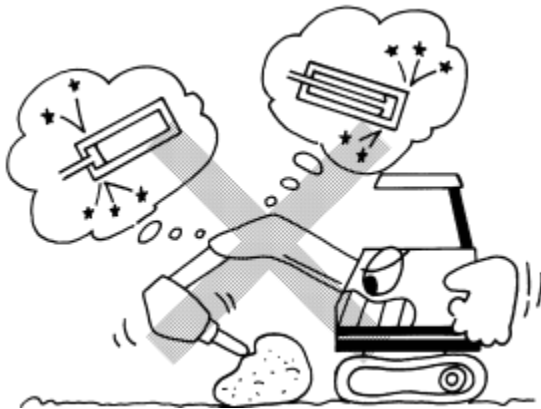
If excessive force is applied to the hammer or the machine, it may Cause damage to the breaker or various parts of the machine.



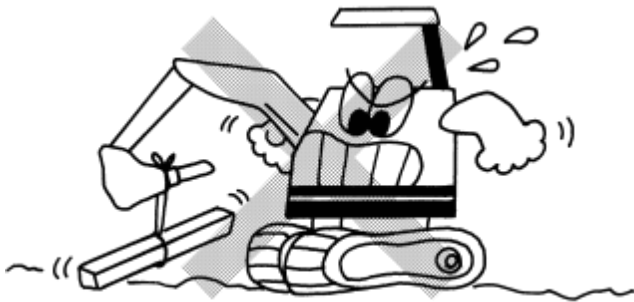
# Precautions for using hydraulic breaker

**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.



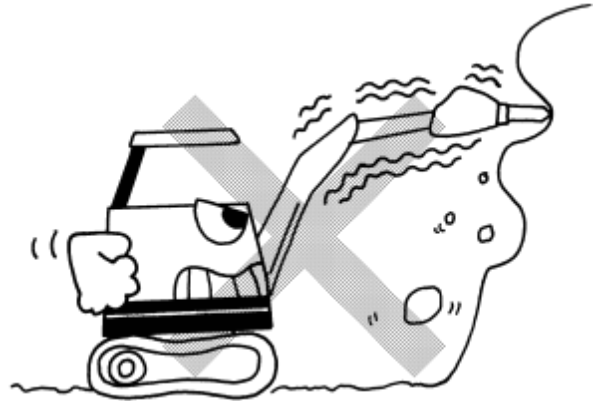
**Prohibition 7** Do not lift cargo operations  
Do not use hydraulic breakers for lifting goods.



**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.

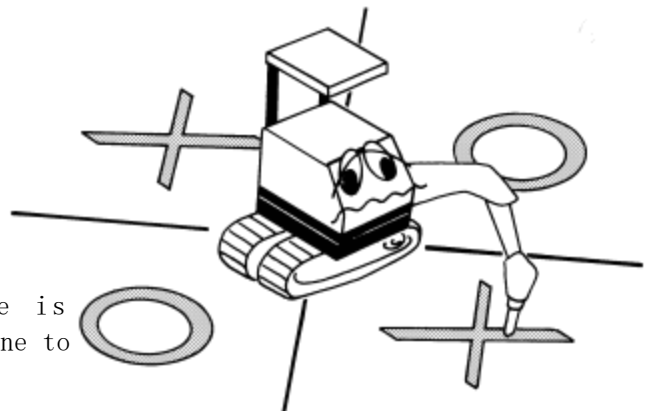
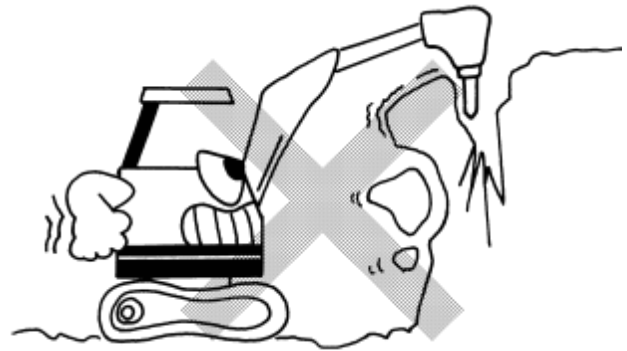
**Prohibited 9**

Horizontal, upward-facing strike operations are prohibited.



**Prohibition 10**

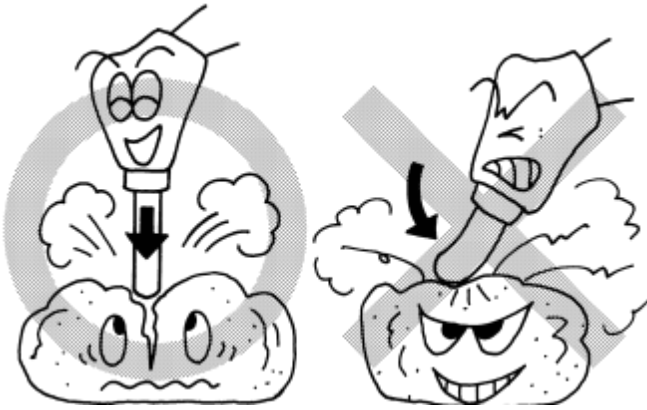
No high-altitude crushing. Otherwise it will cause rockfalls and overturns.



# Precautions for using hydraulic breaker

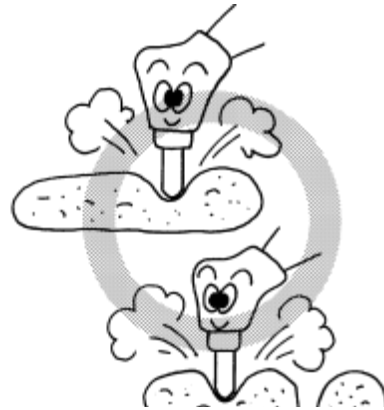
## Notes 1

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.



## 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.



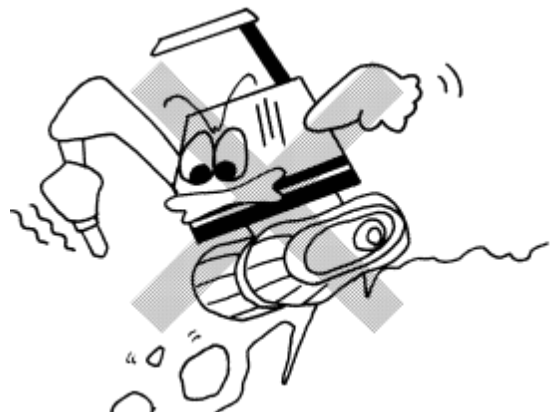
## Notes 3

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



## Precautions 4

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



# Recommended lubricating grease

■ Please be sure to use the genuine RIPPA oil and grease as 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

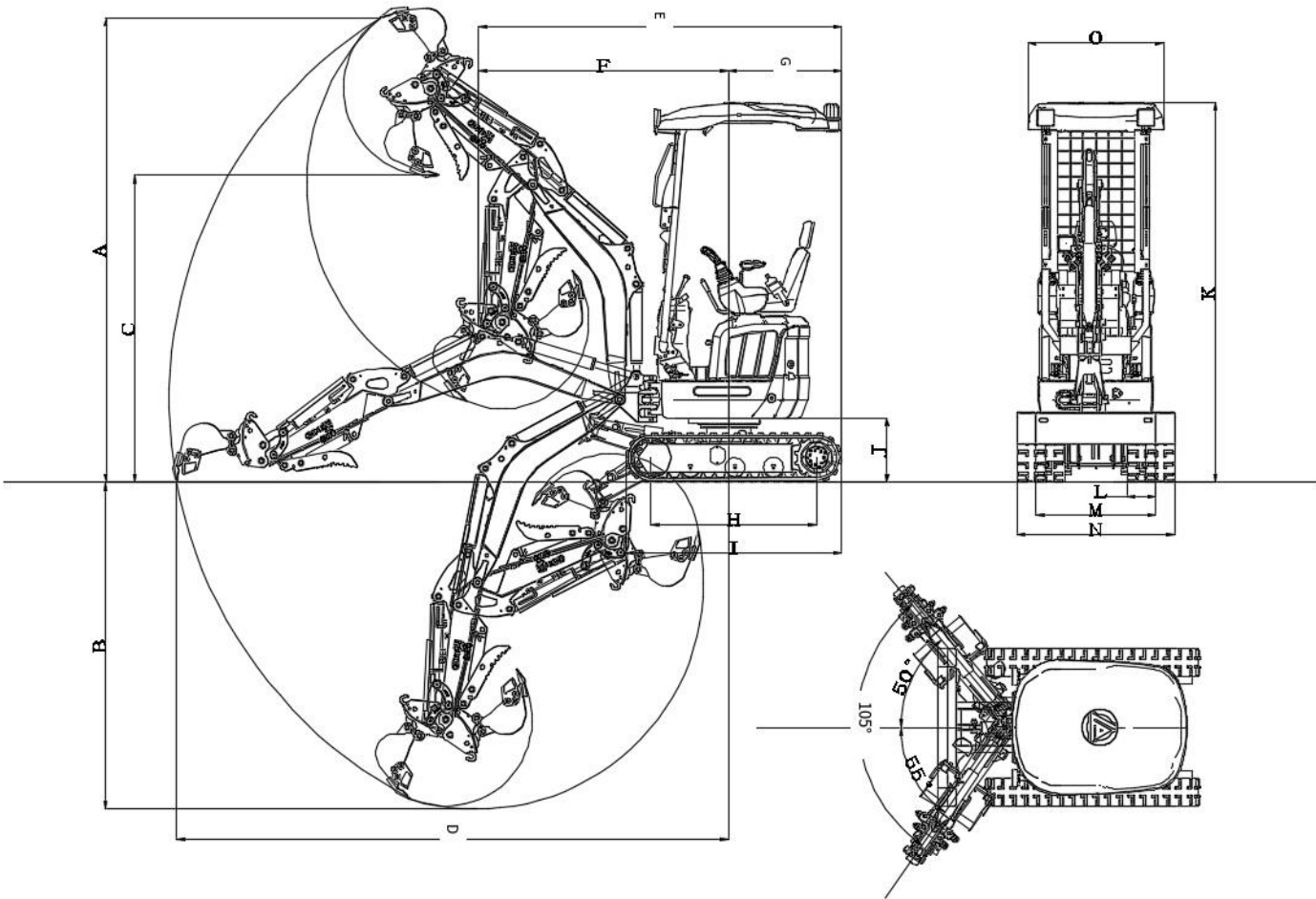
| Producers      | Engine oil                                                                                                    | Hydraulic oil                         | Gear oil                                |
|----------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------|
| Mobil          | The Black Tyrant Delvac MX(15W-40)<br>Super Tyrant Delvac Surper<br>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;<br>Strongman (RX Super Plus) SAE10W-30                                  | HYDRAULIC Series hydraulic oil (VG46) |                                         |
| Gades TEXACO   | Havoline <sup>a</sup> Motor Oil 10W-30                                                                        |                                       | Havoline <sup>■</sup> Gear Oil 80W-90   |
| Koei JOMO      | Premium DIESEL engine oil JOMO Diesel CF-4(SAE15W-40)/<br>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

Dimension diagram



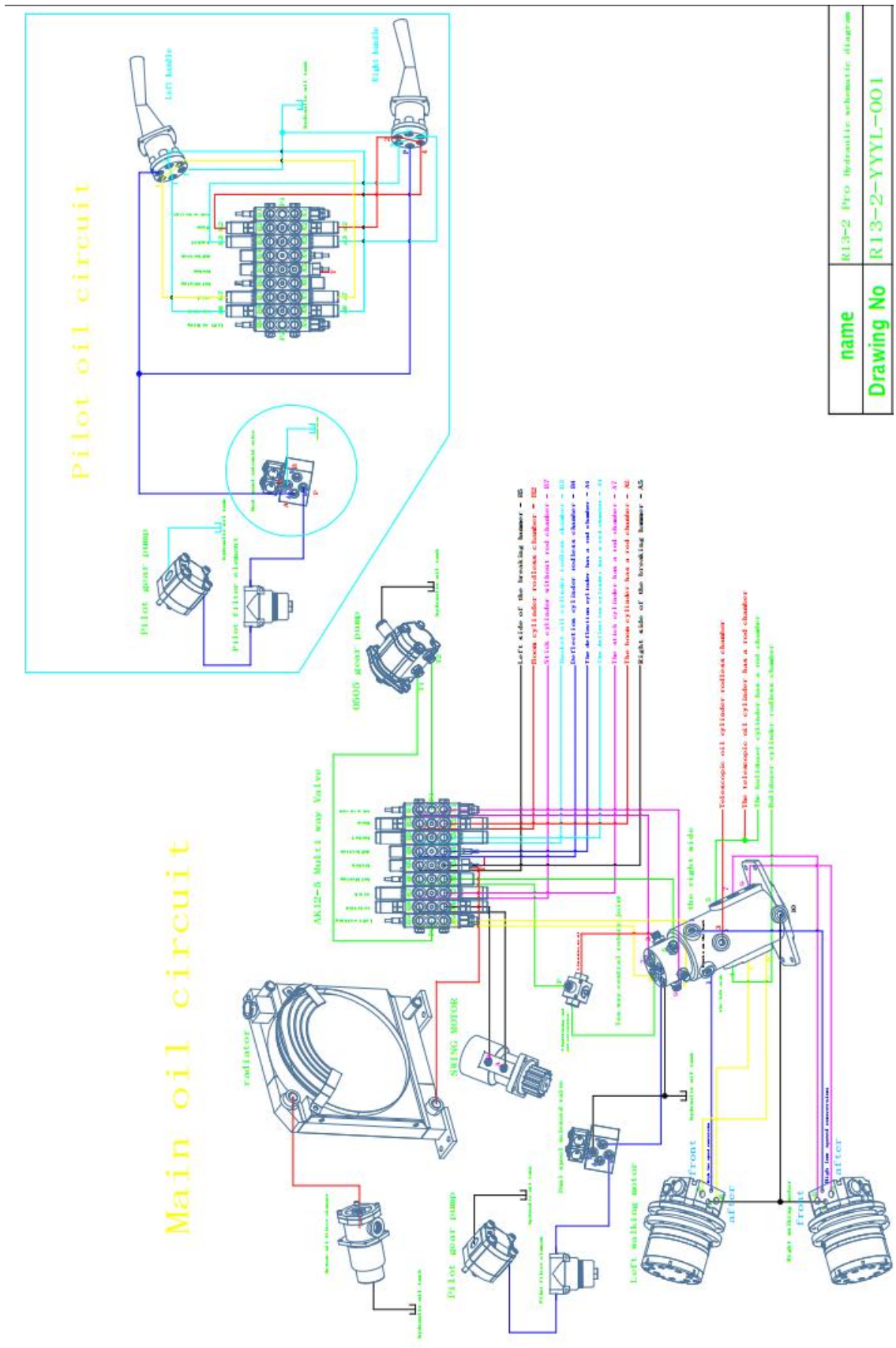
Unit: mm

|     | (A)  | (B)  | (C)  | (D)  | (E)  | (F)  | (G) | (H)  | (I)  | (J) | (K)  | (L) | (M) |
|-----|------|------|------|------|------|------|-----|------|------|-----|------|-----|-----|
| R13 | 2905 | 2044 | 1922 | 3456 | 2273 | 1566 | 708 | 1040 | 1350 | 401 | 2377 | 180 | 750 |
|     | (N)  | (O)  |      |      |      |      |     |      |      |     |      |     |     |
| R13 | 990  | 849  |      |      |      |      |     |      |      |     |      |     |     |



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.

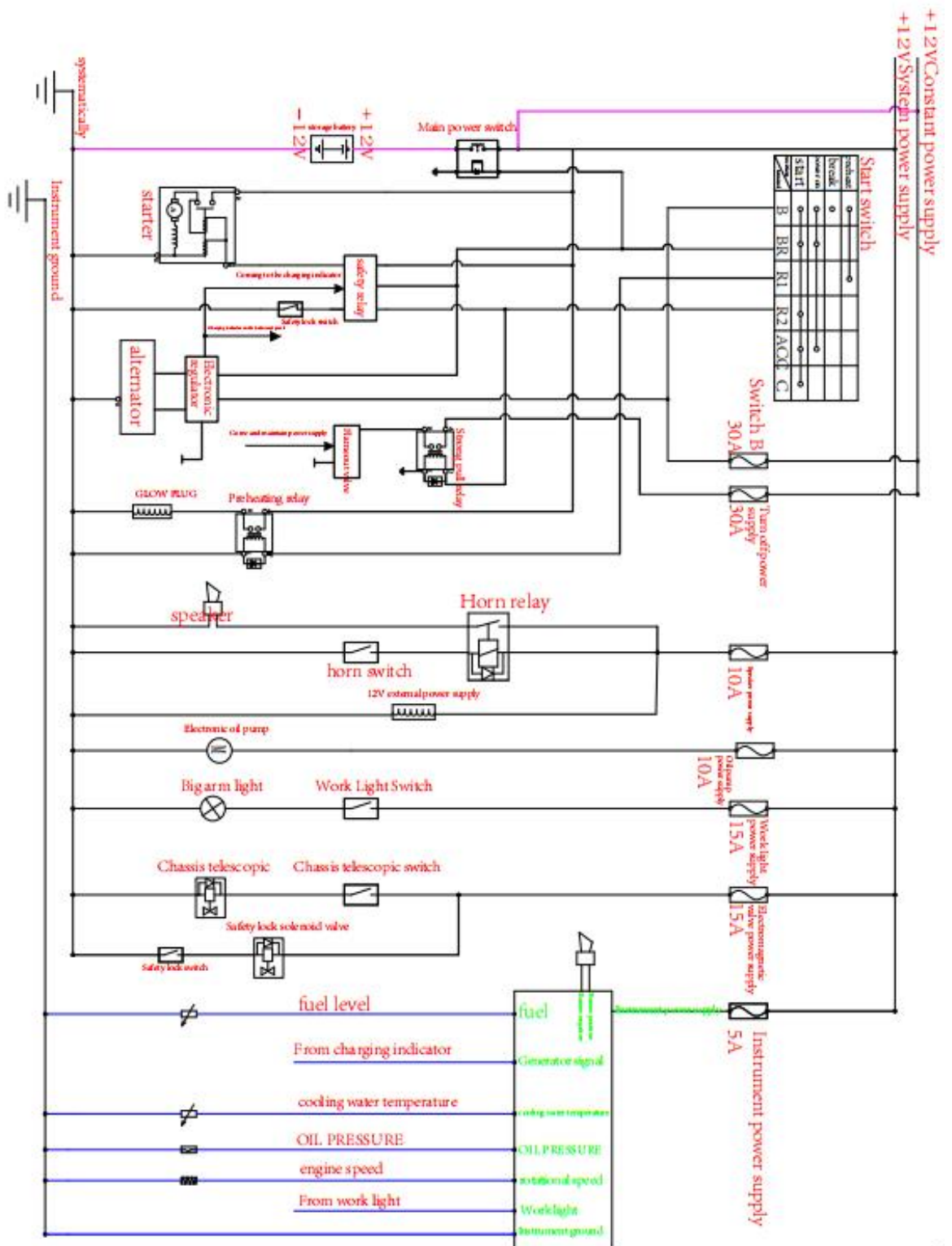


|            |                                       |
|------------|---------------------------------------|
| name       | R13-2 Pro Hydraulic schematic diagram |
| Drawing No | R13-2-YYVL-001                        |



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.

Wire diameter details:  
 The blue line represents a wire diameter of  $1.5\text{mm}^2$ ,  
 The black line represents a wire diameter of  $2.5\text{mm}^2$ ,  
 The purple line represents a wire diameter of  $3.5\text{mm}^2$ .



# Excavator Parameter table

| Model information configuration status<br>● Standard ○ Optional |                                            |                        | R13-4     |                                                    |               |
|-----------------------------------------------------------------|--------------------------------------------|------------------------|-----------|----------------------------------------------------|---------------|
| Basic<br>Performance<br>Parameters                              | Overall working weight (kg)                | 1320                   | Engine    | Engine model                                       | Kubota D722   |
|                                                                 | Container volume (m³)                      | 0.014                  |           | Maximum horsepower (ps)                            | 13.97         |
|                                                                 | Walking speed low/high (Km/h)              | 0-2.8-1.8/0            |           | Maximum power (Kw)                                 | 10.2          |
|                                                                 | Climbing ability (%)                       | 30%                    |           | Maximum speed (rpm)                                | 2500          |
|                                                                 | Ground specific pressure (Kpa)             | 26.79                  |           | Displacement (L)                                   | 0.719         |
|                                                                 | Maximum digging force (kN)                 | 9.8                    |           | Number of cylinders                                | 3             |
|                                                                 | Maximum digging radius (mm)                | 3456                   |           | Cooling method                                     | Water cooling |
|                                                                 | Maximum digging depth (mm)                 | 2044                   |           | Engine oil change volume (L)                       | 2.5           |
|                                                                 | Maximum digging height (mm)                | 2905                   |           | Fuel form                                          | Diesel        |
|                                                                 | Maximum unloading height (mm)              | 1923                   |           | Fuel grade                                         | 0/-10         |
|                                                                 | Maximum deflection Angle (°)               | 105                    |           | Theoretical fuel consumption (L/h)                 | 1.1-1.5       |
|                                                                 | Track extension range (mm)                 | 750-990                | Body      | Transport length (mm)                              | 2273          |
|                                                                 |                                            |                        |           | Transport width (mm)                               | 849           |
|                                                                 |                                            |                        |           | Transport height (mm)                              | 2377          |
| Configurati<br>on                                               | Cab                                        | -                      |           | Counterweight ground clearance (mm)                | 401           |
|                                                                 | Handrails                                  | ●                      |           | Bucket width (mm)                                  | 400           |
|                                                                 | Quick change                               | -                      |           | Boom length (mm)                                   | 1450          |
|                                                                 | Hydraulic quick change                     | ●                      |           | Barrel length (mm)                                 | 880           |
|                                                                 | Rake                                       | ○                      |           | Width of the bulldozer board (mm)                  | 750-990       |
|                                                                 | Grabber                                    | ○                      | Fuel tank | Fuel tank (L)                                      | 10            |
|                                                                 | Loosener                                   | ○                      |           | Hydraulic tank (L)                                 | 12            |
|                                                                 | Breaker hammer                             | ○                      | Tracks    | ○- Rubber (bandwidth * pitch * number of sections) | 180 * 72 * 41 |
|                                                                 | Counterweight                              | ●                      |           | ○- steel (bandwidth * pitch * number of segments)  | 180 * 72 * 41 |
|                                                                 | Tensioned form                             | Mechanical tensioning  |           | Rubber blocks (pieces)                             | 82            |
| Hydraulic<br>system                                             | air conditioner                            | -                      |           |                                                    |               |
|                                                                 | Main pump type/model                       | Gear pump /305+305+303 |           |                                                    |               |
|                                                                 | Main pump brand                            | Tianjin Walk           |           |                                                    |               |
|                                                                 | Maximum flow rate of the main pump (L/min) | 25                     |           |                                                    |               |
|                                                                 | Multi-way valve                            | THD12 multi-way valve  |           |                                                    |               |
|                                                                 | Multi-way valve brand                      | Soar                   |           |                                                    |               |
| Rated set pressure                                              |                                            | 17                     |           |                                                    |               |



|  |                                 |                                  |
|--|---------------------------------|----------------------------------|
|  | (Mpa)                           |                                  |
|  | Maximum set pressure (Mpa)      | 18                               |
|  | Type of walking hydraulic motor | WDM-390 dual-speed walking motor |
|  | Walking motor brand             | Pai Yi                           |
|  | Motor displacement              | 390                              |
|  | Rotary hydraulic motor type     | BM2-315                          |
|  | Displacement                    | 315                              |





## EC DECLARATION OF CONFORMITY

Original Declaration

**MANUFACTURER:**

Name: SHANDONG RIPPA MACHINERY GROUP CO., LTD.

Address: No. 6 Industrial Park, No. 2166 Chongwen 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, Bulgarian

**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

| Parts Name                       | quantity | type  |
|----------------------------------|----------|-------|
|                                  |          | R13-4 |
| 14 inch tool box                 | 1        | ○     |
| Grease gun                       | 1        | ○     |
| Tool Butter                      | 1        | ○     |
| Belt wrench                      | 1        | ○     |
| Tool wrench set                  | 1        | ○     |
| Hexagon wrench                   | 1 group  | ○     |
| New Funnel                       | 1        | ○     |
| Open-end wrench                  | 1        | ○     |
| Air filter                       | 1        | ○     |
| Oil return filter                | 1        | ○     |
| R22 complete set of car stickers | 1        | ○     |
| R22 Parts Manual                 | 1        | ○     |
| R22 Instructions                 | 1        | ○     |
| Orthodontic                      | 2        | ○     |
| Side teeth                       | 2        | ○     |
| Bucket pin                       | 2        | ○     |

## 3. Random Files

- ① . Operation and maintenance manual 1 copy
- ② . Three Guarantees for Service Certificates 1 serving
- ③ . Qualification Certificate 1 serving
- ④.Engine manual 1 share

