

SHANDONG RIPPA MACHINERY GROUP CO., LTD.

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

☎ : (86) 18863720821

🕒 : (86) 18863720821

✉ : service@rippa.com

WWW.RIPPA.COM



OPERATION AND MAINTENANCE MANUAL

R22 PRO Hydraulic excavator

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

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. 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
	Windshield wipers and window washers		Water temperature gauge
	Arm limit		




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 user manual also describes products with different models and specifications. Please confirm the model of the product you purchased, and specifications before proceeding to avoid mistakes.



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Precautions for using hydraulic breaker

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Please read this for safe operation

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.

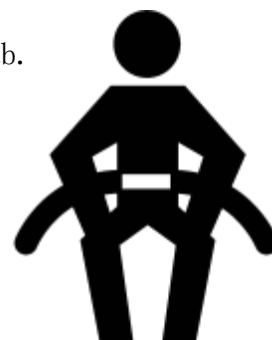
For safe operation, be sure to observe
the following.

Basic safety matters

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 .



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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.





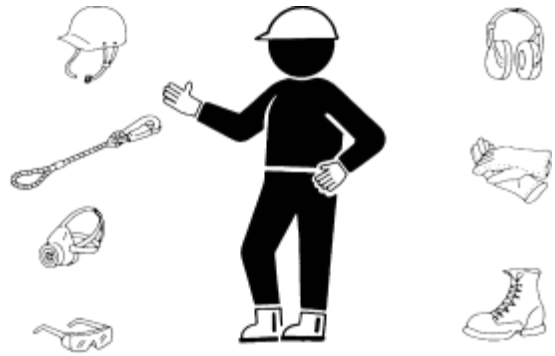
Please read this for safe operation

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.

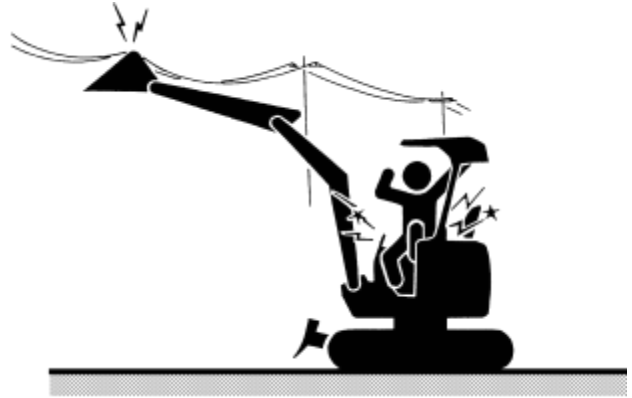
Fireworks are strictly prohibited when refueling. Also, be careful not to spill the fuel.





Please read this for safe operation

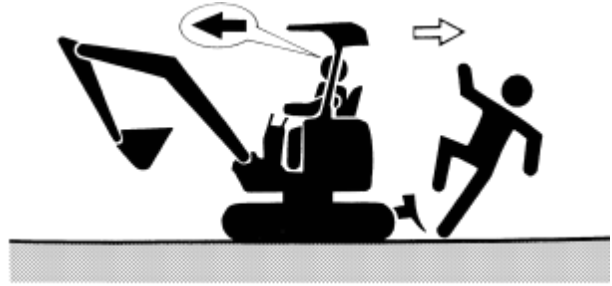
12. When the bucket is pulled up, no one is allowed to enter under the bucket.
13. When pulling the bucket upward, please avoid touching the overhead wires. Or obstacles.
Especially when touching electric wires, there is a risk of death from electric shock , so be careful.
14. Do not drive if you are 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.



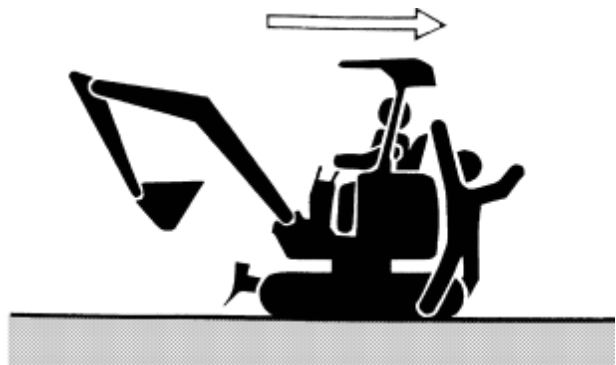
Please read this for safe operation

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)



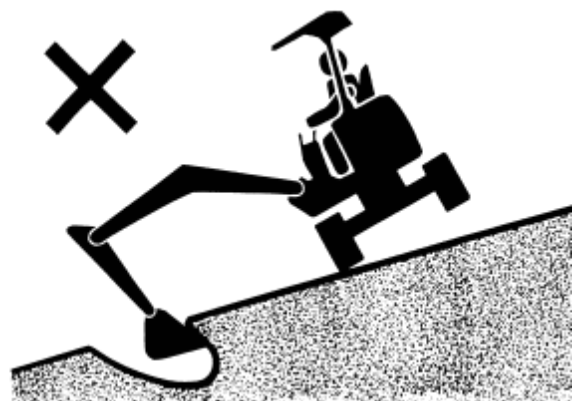


Please read this for safe operation

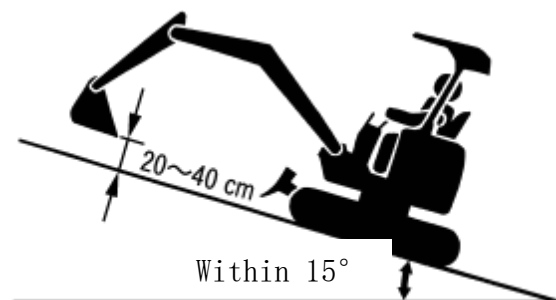
7. Never turn (make a U-turn) or cross on a slope, as this can cause the vehicle to roll over or slide sideways, which is extremely dangerous. Please turn on flat ground. When going up or down a slope, drive along the maximum slope line.



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.

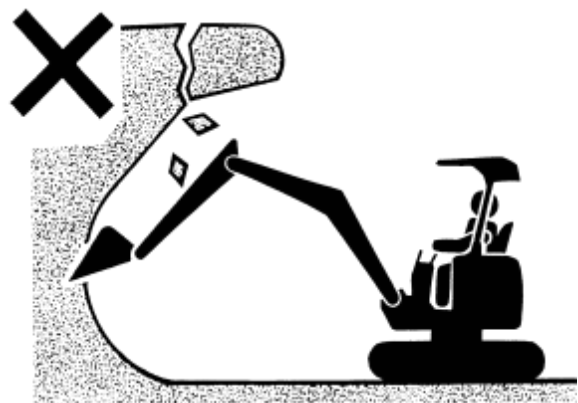


12. When digging under the machine body, please pay full attention, otherwise The vehicle overturned due to ground collapse.

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.



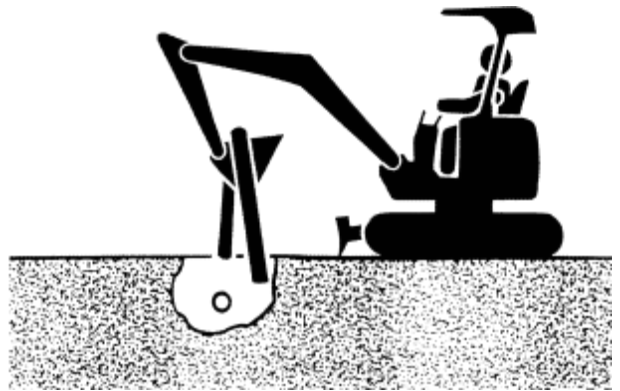
16. In case of rain or water, use wooden boards, iron plates , etc. It is easy to slip when working in such a slippery place. Please pay full attention when working.



Please read this for safe operation

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.

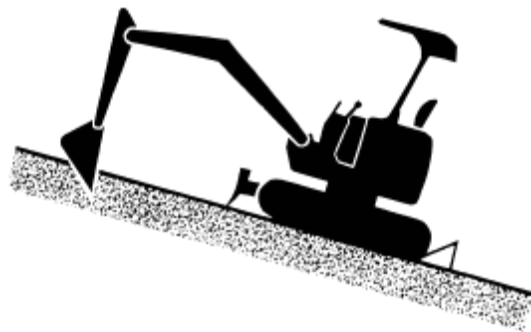




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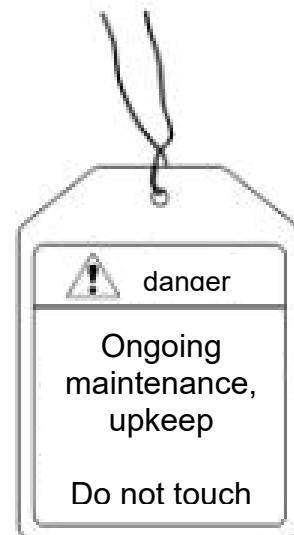
Things to note after work

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

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.

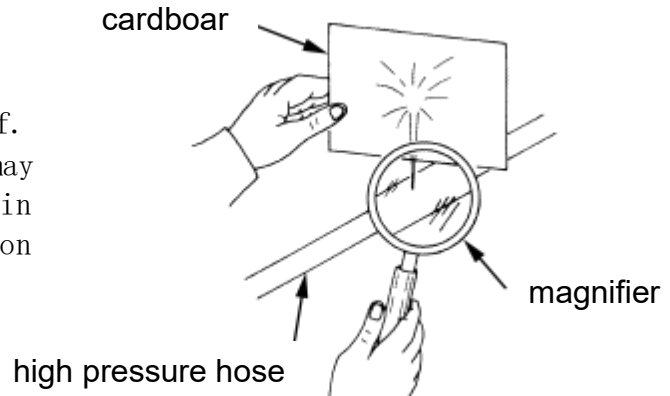
In addition, when fuel and oil leak under high pressure, be sure to Be careful not to put your hands or face near the leaking part. Facing the leaking part is extremely dangerous.





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.



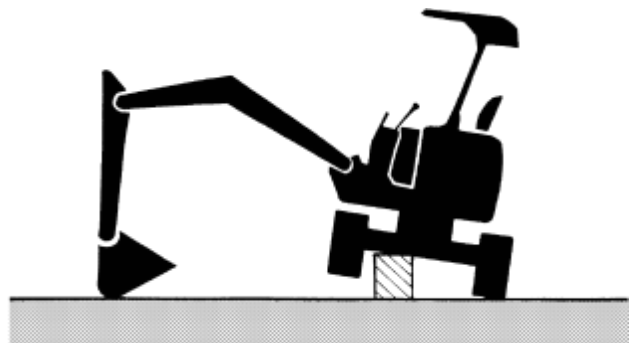
11. Please wait until the engine is fully cooled before cooling the radiator. Inspection, replenishment and replacement.
If the radiator cap is loose and steam is Or hot water will spray out, sometimes causing burns. Loose drain cocks or plugs can sometimes cause burns from hot water. In addition, the 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.

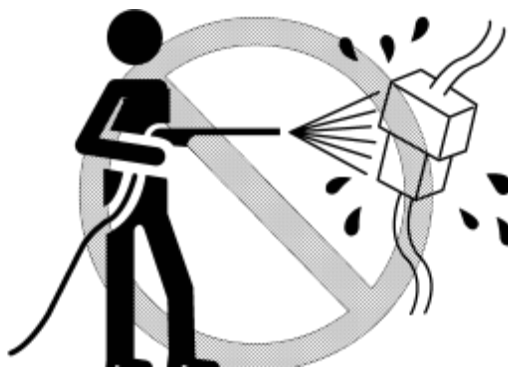
Do not enter the body at this time. If you must enter the body, answer Place safety pads and safety pillars underneath to prevent sudden falls. In addition, please put the operating handle lock lever in the locked state.





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.

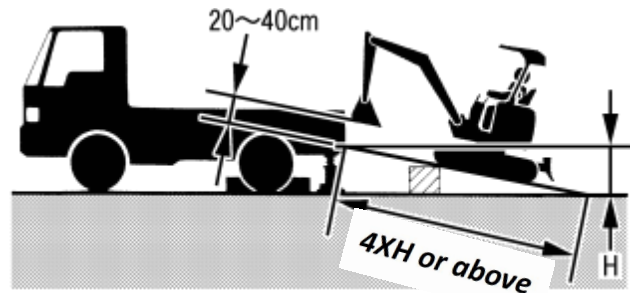
If the loading platform is bent significantly, use the **"bracket"** (Support table) To prevent the loading and unloading plate from bending.

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

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.

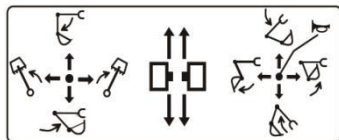


Please read this for safe operation

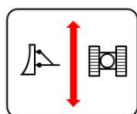
Labeling and posting locations

- ◆ This machine has safety labels attached. Please drive it after fully understanding the safety labels. Read carefully.

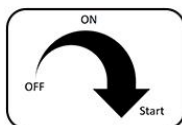
1. operation





2. bulldozer lever

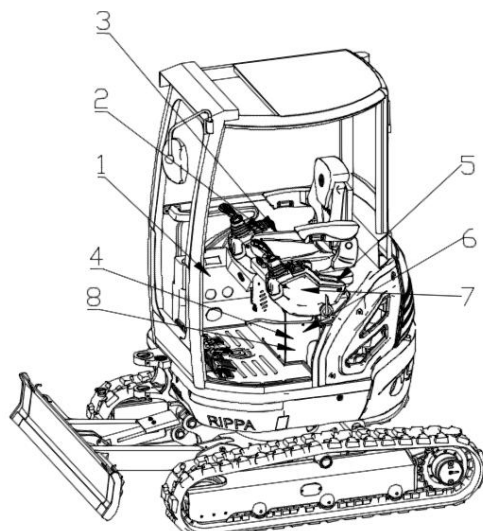


3. Key gate

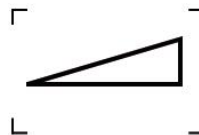


4. R22 Calculation

Lift capacity ratings									
									
A: Load radius					Conditions of operation				
B: Load point height					940mm Big arm				
C: Lift capacity ratings					1780mm Arm				
Cf: Rated loads over front					Weight: 2023kg				
Cs: Rated loads over side					Track width: 2023kg				
(Unit: kg)					Track spacing: 840mm				
Load radius A (Static-bulldozer support)									
Load point height (Unit: m)	1.5		2		2.5		Max3.5		A/mm
	Cf	Cs	Cf	Cs	Cf	Cs	Cf	Cs	
1	668	330	531	198	458	152	272	112	3515
0.5	729	320	576	221	411	160	260	114	3500
0 (Grade)	847	345	610	246	436	169	384	129	3492
-1	860	351	528	254	460	181	/	/	2780
-1.1	872	395	488	260	476	190	/	/	2760



5. accelerator



6. Wear ear protection when operating digging machines



7. Put down the operating lock after operating the machine



8. Maintenance stickers

MAINTENANCE PRECAUTIONS

VORSICHTSMAßNAHMEN FÜR DIE WARTUNG



- Pin, buttering is recommended every 10 hours
Stift, 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 ausgeben

Filter name Filtername	The first time		das erste Mal		Normal		normalerweise	
	Time	Zeit	Time	Zeit	Time	Zeit	Time	Zeit
Air filter Luftfilter	50H		cleaning Reinigung		100H		replacement Ersetzen	
Diesel filter Dieselfilter	50H		replacement Ersetzen		200H		replacement Ersetzen	
Hydraulic oil filter Hydraulikölfilter	100H		replacement Ersetzen		300H		replacement Ersetzen	

RIPPA service website: www.rippaservice.com



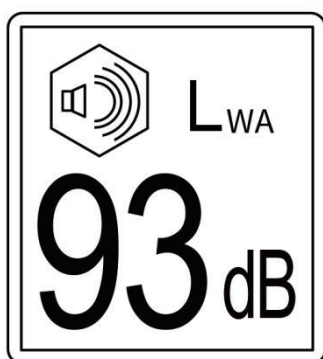
1. hoisting



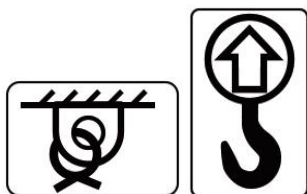
2. Brand model (1)



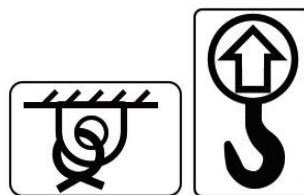
3. noise



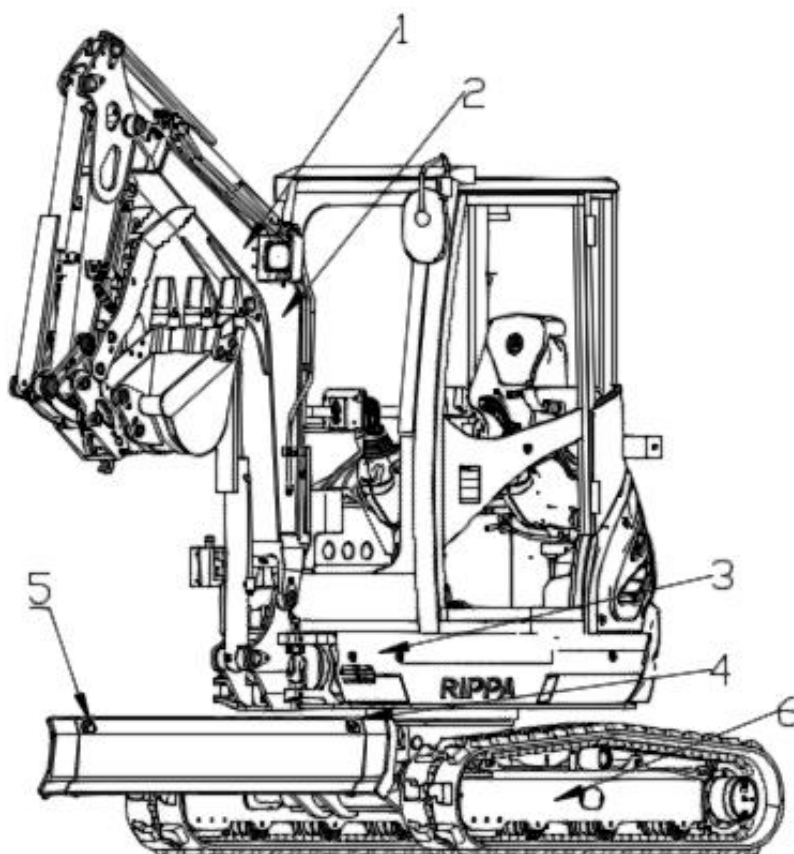
4. Bundling transport points, lifting



5. Bundling transport points, lifting



6. direction

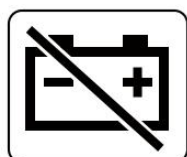




1. hydraulic fluid chamber



2. outage



3. diesel tank



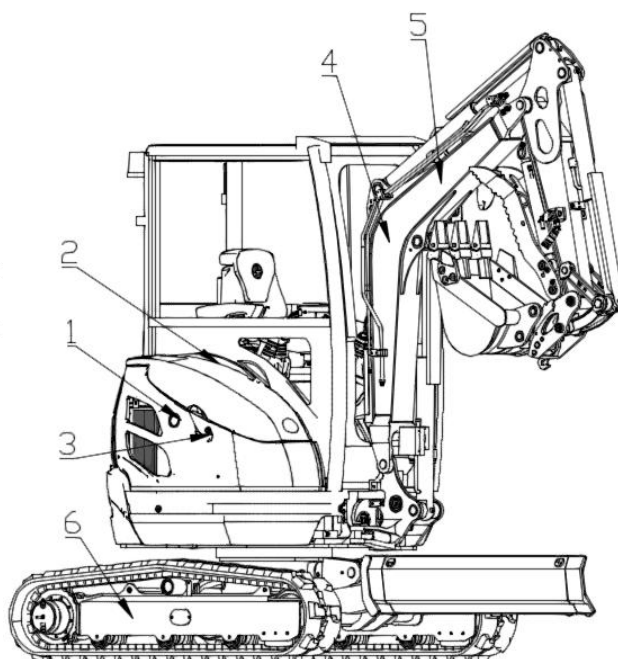
4. brand model(2)



5. The lower end of the working device stands strictly



6. direction



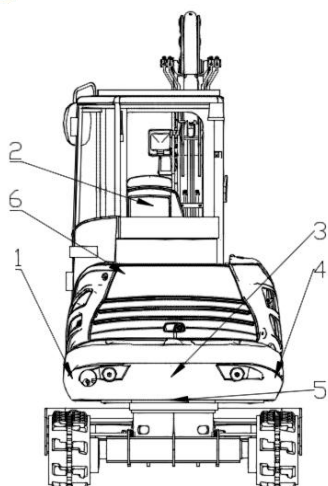
1.No one is allowed to stand in the operation area



2.Precautions for operation, inspection and maintenance



3.brand model (back)



4.Strictly stand within the scope of operation



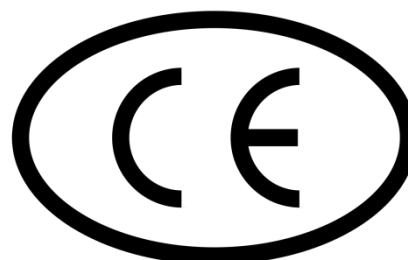
5.hoisting



6.CE

Euro 5

EPA Tier 4 emission standard





Please read this for safe operation

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.

About repair and warranty

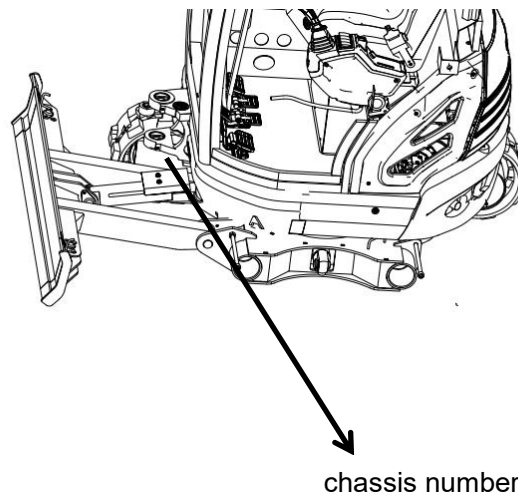
If there is any malfunction or something is unclear during use. If you need repairs, please contact the store where you purchased the product or Please contact the repair shop designated by our company.

When contacting us, please include the following

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

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

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

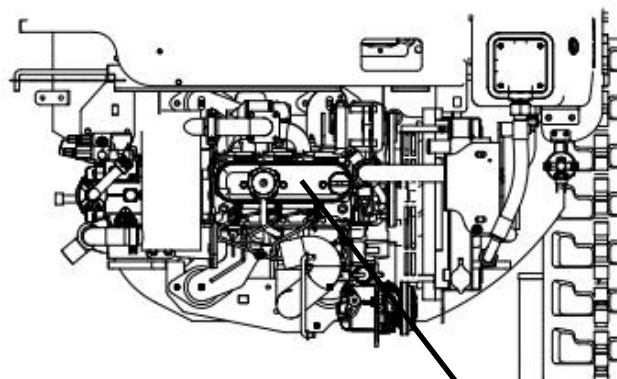


chassis number

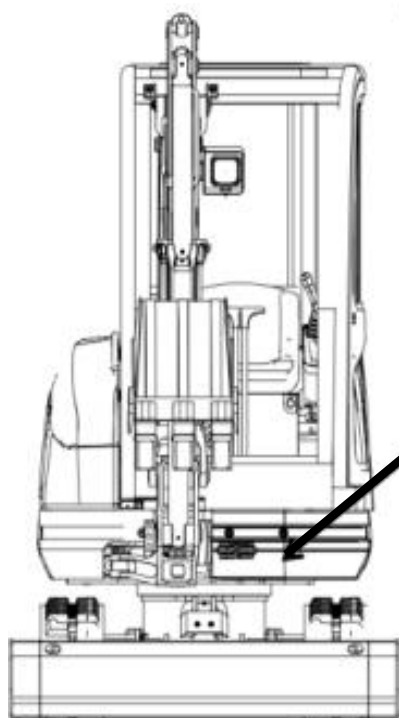


warn

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



Engine type



SHANDONG RIPPA MACHINERY GROUP CO.,LTD.

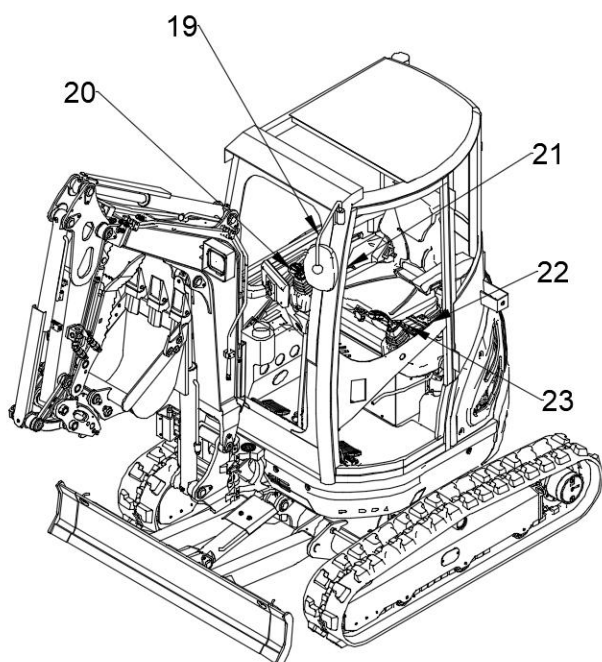
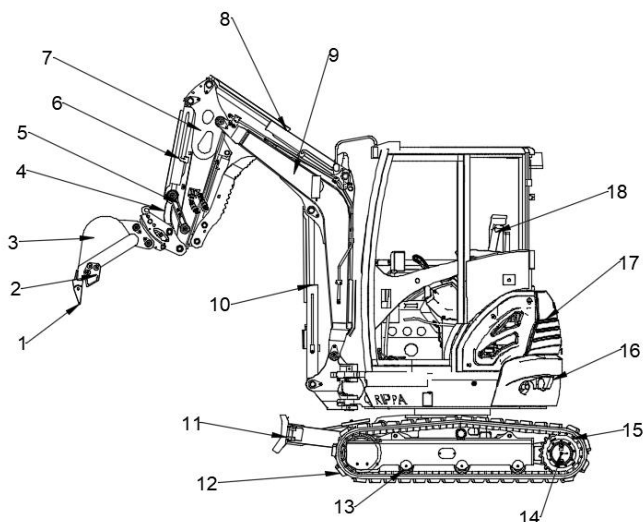
Product Name	Hydraulic Excavator	Model	R22
Engine power(kw)	18.2	Operating Mass(kg)	2439
Serial Number	SLP20250528012	Year	2025/4

The north of Guang'an Road and east of Gaoxin Avenue (Liaohe Road),
High tech Zone, Jining City, Shandong, P.R. China.

TEL:+86-0537 2339712
Web:www.rippa.com



Description of each device



serial number	title
1	bucket teeth
2	side teeth
3	bucket
4	connecting rod
5	rocker
6	bucket cylinder
7	bucket rod
8	the stick cylinder
9	swing arm
10	boom cylinder
11	dozer blade
12	track
13	thrust wheel
14	travel motor
15	drive sprocket
16	bob-weight
17	back shroud
18	seat
19	dozer handle
20	digging handle
21	start button
22	accelerator cable
23	off-duty switch

About the use of each device

Use of safety devices

■ Operating handle lock lever

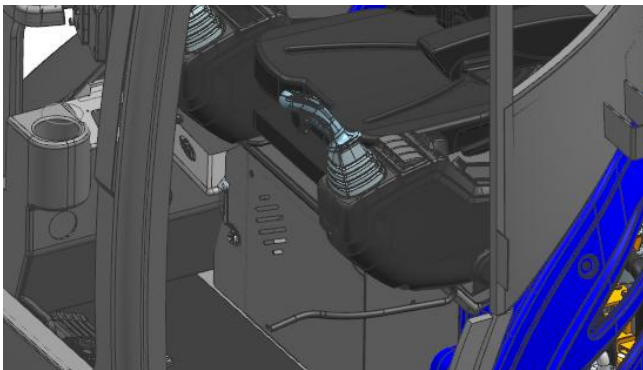


note

- * When parking or leaving the machine, always lower the bucket. The working device falls to the ground and locks the operating handle lock rod. Therefore, please make sure that the lock is in place. Also, please remove the key to avoid others Human error in operating the machine.

supplement

- * The vehicle will not operate normally if the control lever lock rod is not lowered correctly.
- * Even if the operating handle lock rod does not fix the operating handle, the working device is in a non-operating state. Except for the travel handle)



supplement

- * Pull up the left operating handle lock rod, the working device cannot be operated. do.
When getting on or off the vehicle, please pull the left operating handle lock lever to the maximum position. Great location.
- * When the operating handle lock rod In the maximum position, the travel handle is mechanically locked and cannot be operate.

■ 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.

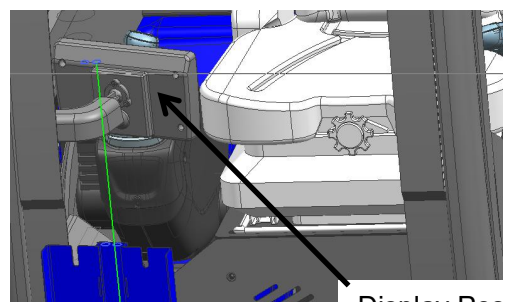
● "START"

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 key.



■ Electronic display

At the LCD display of the electronic instrument, turn the key gently to the "START" position and release the key to activate the display.



Display Position

About the use of each device

■ Electronic instrument display part (Normally)

◆ Water temperature gauge



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.



number of revolutions
per minute

temp

On the LCD display of the electronic instrument, gently turn the key to " START " (Operation) position, and release the key to activate the display, LCD The display will show the cooling water temperature. "H" , then

1. Stop the operation.
2. Put the engine at idle speed (About 5 minute) back,
3. Stop the engine and do the following (1) ~ (3) Item inspection.
 - (1) The presence or leakage of cooling water.
 - (2) The fan belt is loose.
 - (3) Check whether there is any dirt or dust attached to the radiator.

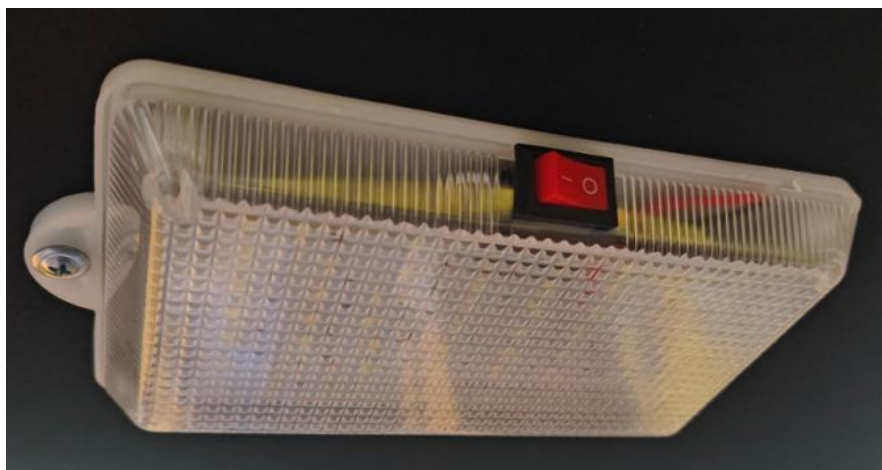
◆Engine tachometer

* It is not unusual that the display content of the liquid crystal display unit is sometimes difficult to see clearly due to different viewing angles.

■ Indoor lights

Turn the key gently to the START position and release the key.

If the switch of the ceiling indoor lamp is turned on, the indoor lamp lights up.



■ Wiper and window washer switches

When the starter key is on, if the wiper switch is pressed down, the wiper motor will operate, and if pressed down again, the window washer will operate. (Even when pressed to the off position, the window washer still works.)

- Do not use the washer switch when the washing tank is empty. Otherwise the pump will be damaged.
- Dry cleaning may damage the glass. Therefore, be sure to spraycleaningsolution before using the wiper.

■ Preheater switch

When the starter key is at "SIARTER SWITCH CONTACT" (starter switch contact) position, turn the preheater switch to the right to start preheating.



windshield



start button

■ Cooler usage (cab/cooler specifications)

◆ Air volume

adjustment ●

Air outlet

The wind direction can be adjusted freely via the outlet orientation.

■ air conditioning

Air-conditioning in the cab, with 3 adjustable air outlets for comfort.

air-conditioning switch

Turn on the switch when using the air conditioner.

Press the switch again to turn it OFF.

Be sure to close the door when you turn on the air conditioner

Seat adjustment



warn

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

The seat is a seat that slides back and forth.

1. The seat adjustment lever, which adjusts the front of the seat by moving it forward, moves the seat forward and backward. Adjust the seat to a position that is easy to operate. Make sure that the seat is secured after adjustment.

supplement

- * When restoring the seat, make sure that the seat is securely fastened using the seat lock lever.



air conditioner



seat adjustment

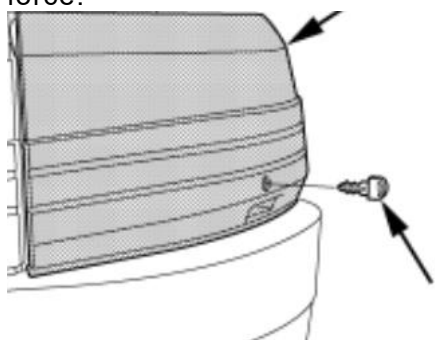
■ Rear hood opening and closing



note

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

1. Insert the starting key into the keyhole and turn left to unlock the rear hood. When the keyhole is pressed down and the rear hood is lifted up to the maximum height, the hood is automatically fixed by the spring force.



2. When closing, lower the rear cover until you hear a “click” to ensure that the rear cover is securely closed.
3. Turn the starting key to the right and lock it.



significant

- * Do not operate with the hood open. Failure to do so could result in hood damage.
- * The rear hood is lifted by the pressure of the cylinder.

■ toolboxes

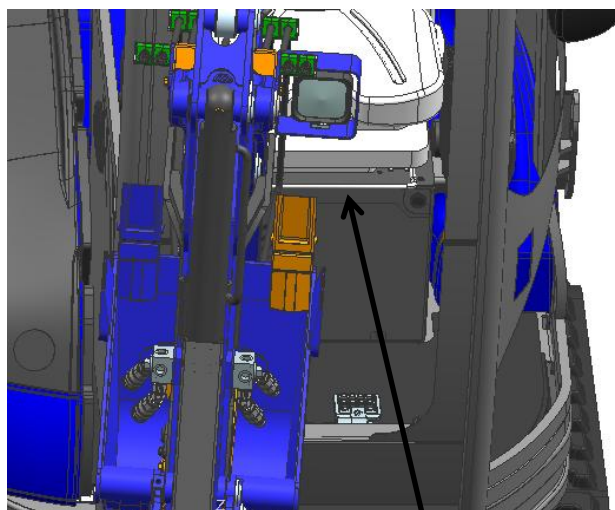


warn

- * 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.

There is a tool storage space in the back of the seat. To use, pull the lever on the lower part of the seat and push the seat forward.

Push the button on the back of the seat to open the cover on the back of the seat.



seat fore and aft adjustment lever

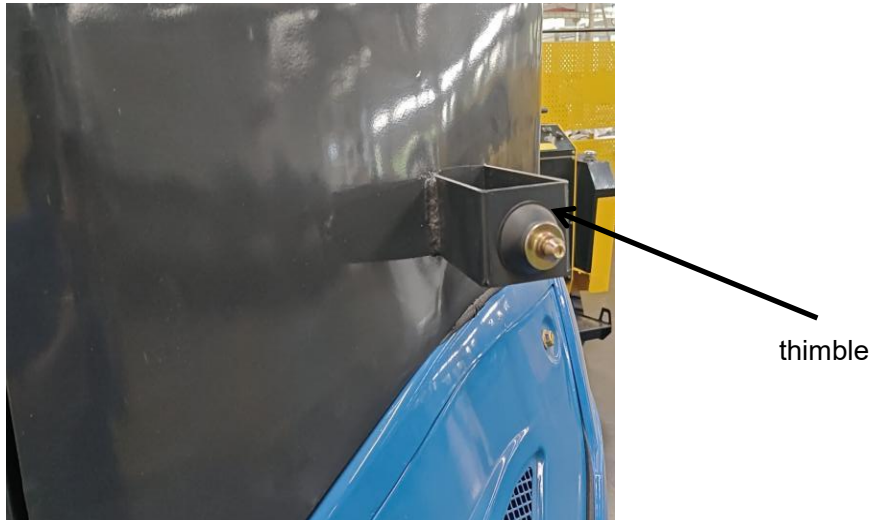


Seat Toolbox



■ Opening and closing of the cab door

1. When opening the door, use the key to open the door lock, pull the handle, open the door, there will be a thimble to fix the door, open the door to the maximum.



2. To close, press and hold the button inside the door, and then close the door.

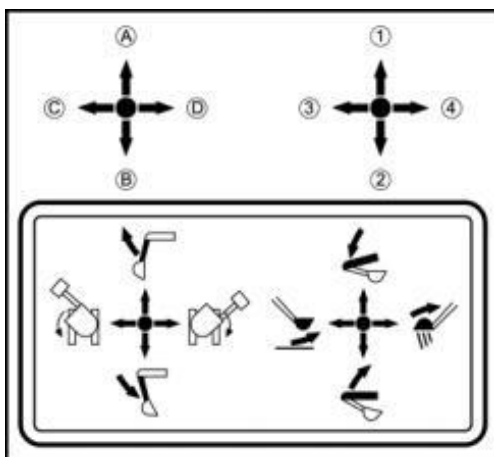


3. Please lock the door when leaving the machine for a long time.



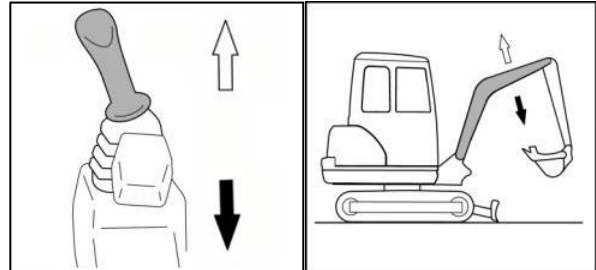
■Use of operating handles

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



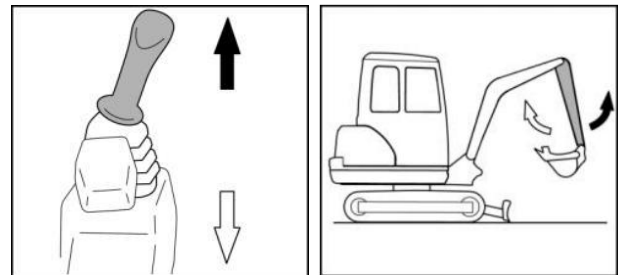
■Boom Operation

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.

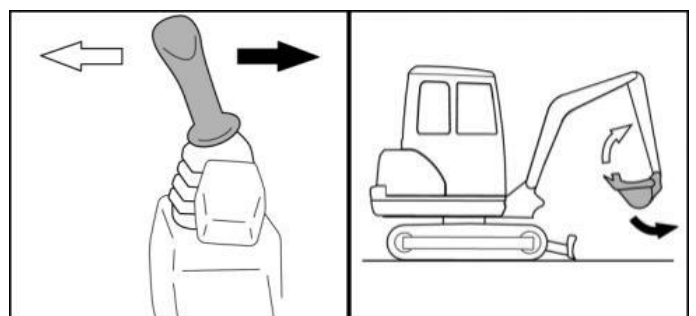


■Stick Operation

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.



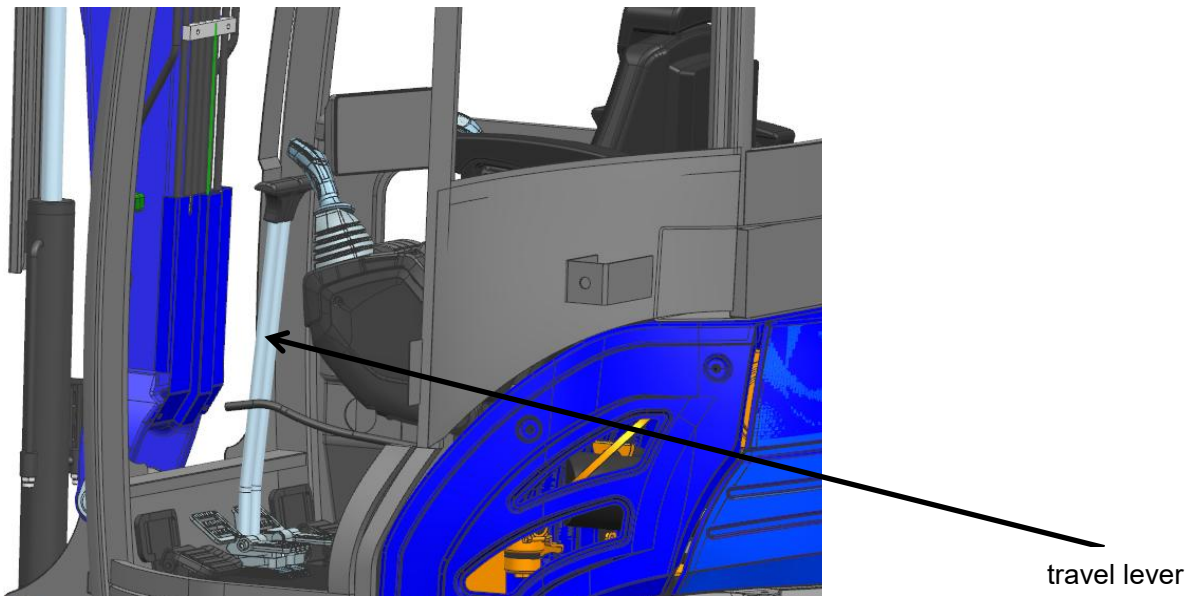
■ Throttle knob

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 supplement 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.

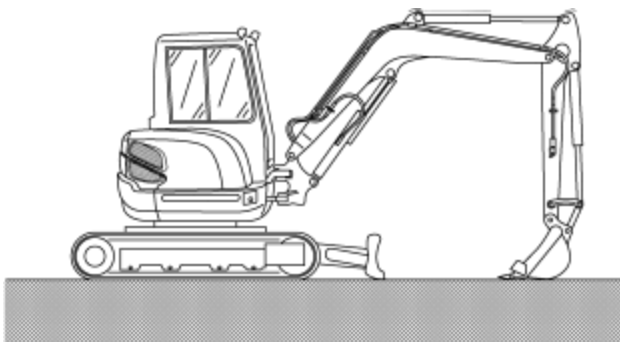
■ Inspection and supplement of working oil



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



note

- * Damage to the wiring harness and battery (+) cables can cause a short circuit, so be sure to inspect them.
- * 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.

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

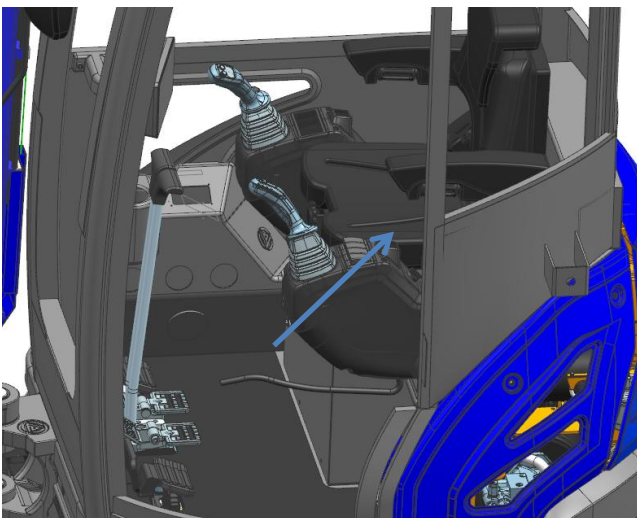
start the machine while the engine is running, preventing

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.



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



significant

- * 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.



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



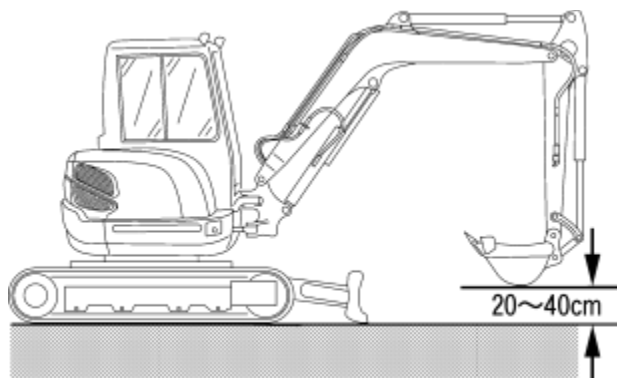
warn

- * 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.

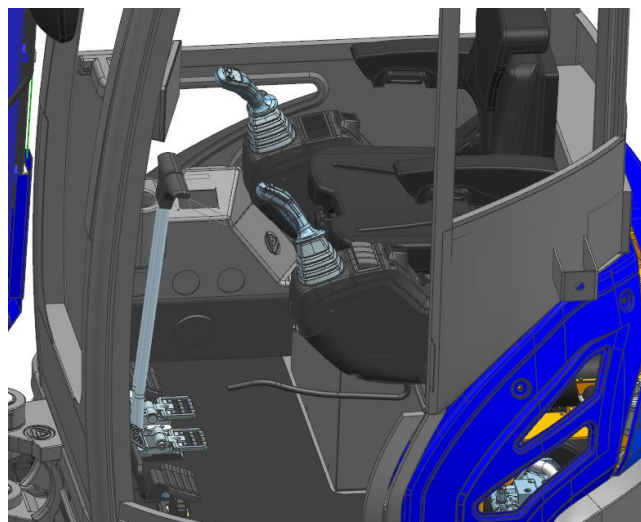
Please don't do it 15 Driving on a steep slope of more than degrees.

- ▶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 .

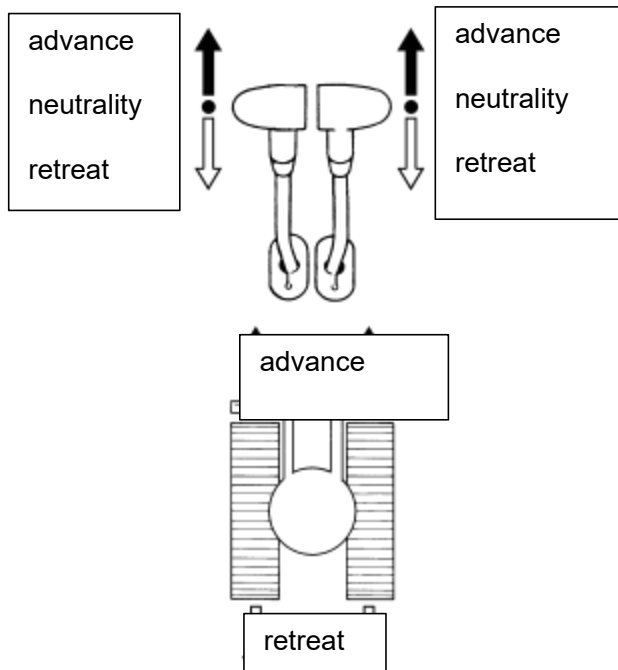


2. Pull the bulldozer operating handle backwards and lift the bulldozer.



Backhoe excavator operation

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



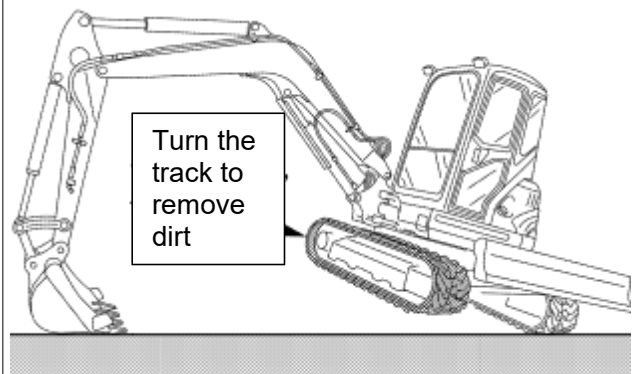
4. burn the road

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



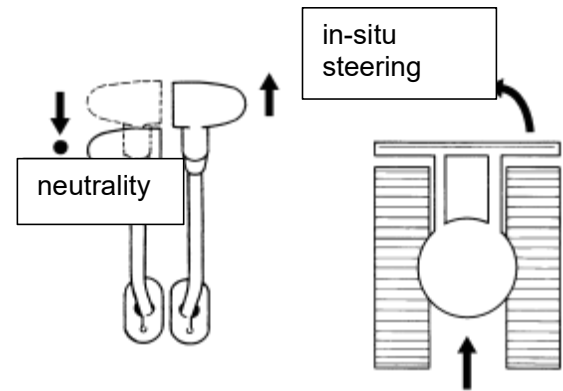
warn

- * 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.

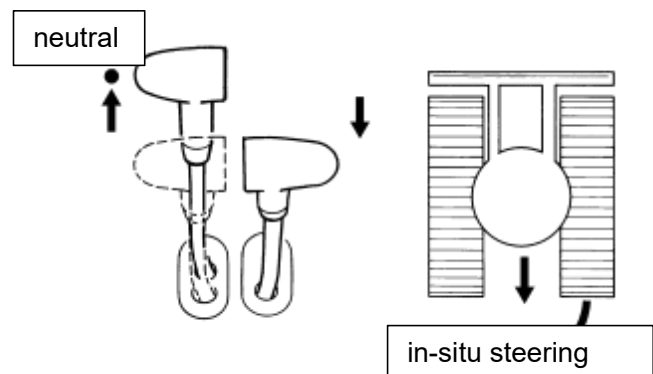
The following describes the operation method when the bulldozer is located in the front .

■ 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.



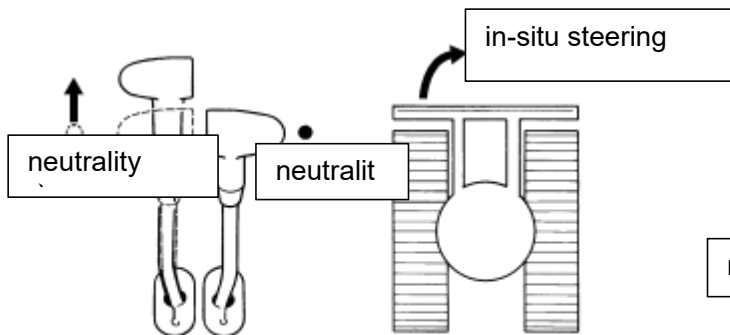
2. When moving backward, (right) When the travel handle is in the neutral position, turn left (right) Turn.



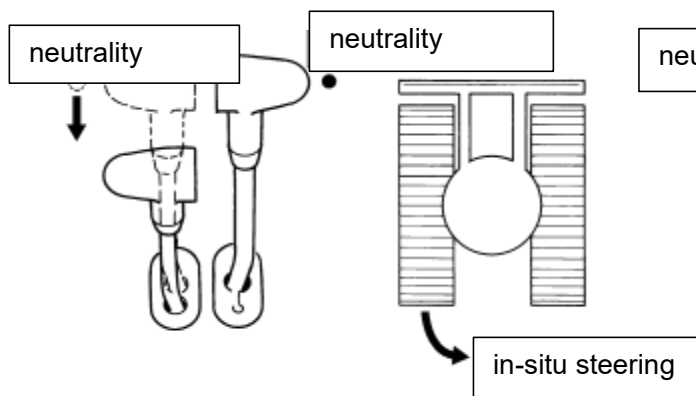
Backhoe excavator operation

■ Steering when stopped (Turn on the spot)

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

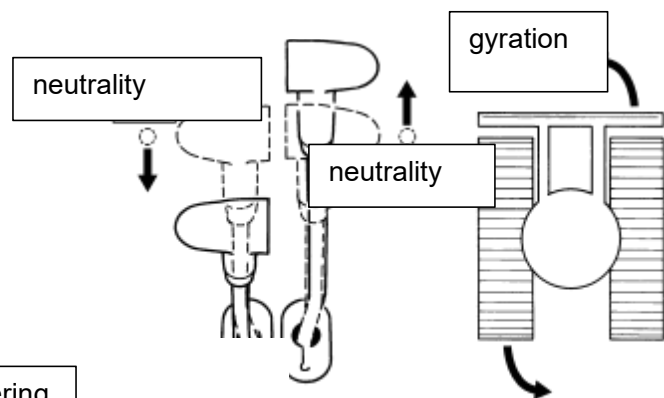
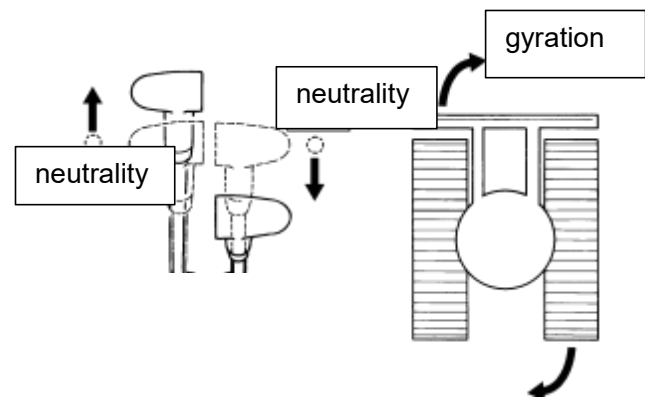


2. If you operate the left (right) Driving handle, then right (Left) Turn.



■ 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.

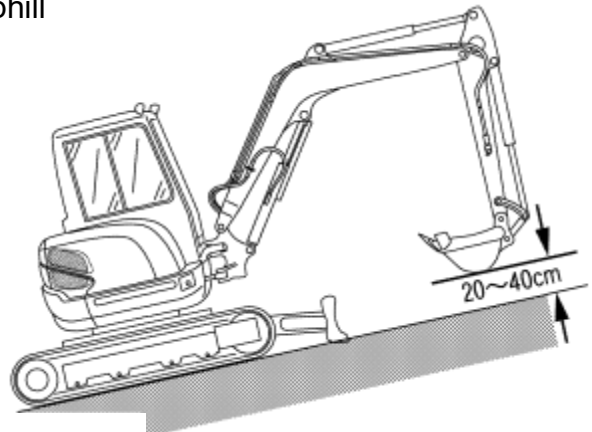
* Adjust the throttle knob to travel slowly up and down a slope.

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

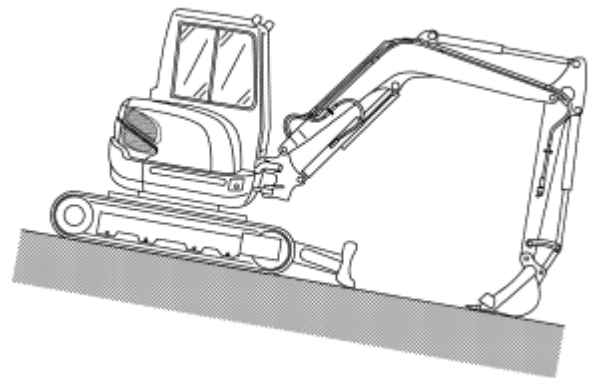
If you are careless

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

uphill



downhill



Backhoe excavator operation

Parking on a Sloped Lot

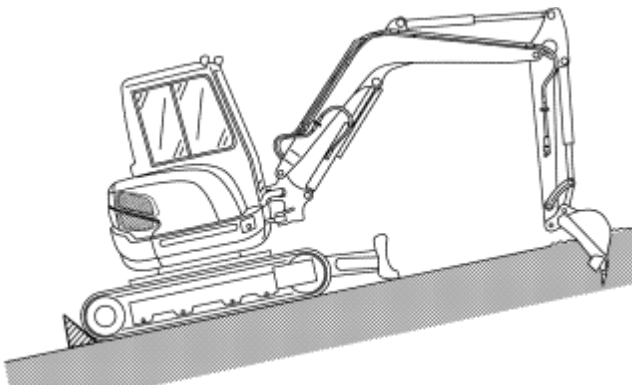


warn

* 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.



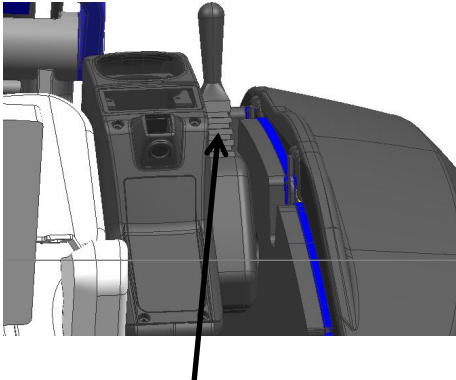
parking

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.

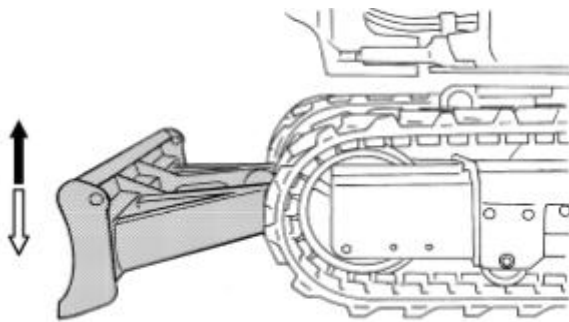
Backhoe excavator operation

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.



bulldozer operating

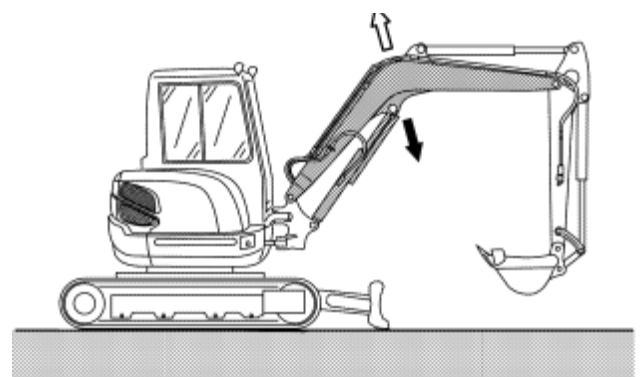
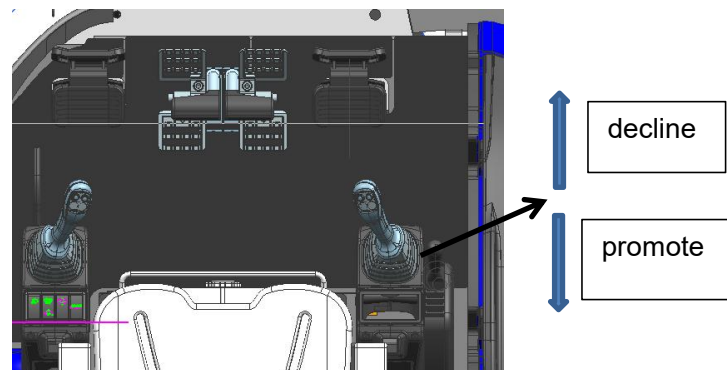


When doing bulldozer work, please use your left hand 2A driving handle, The right hand is used to raise and lower the bulldozer.

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.



supplement

- * 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.

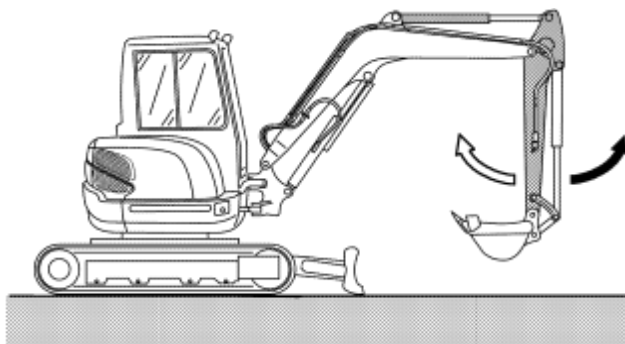
The stick extends...

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.



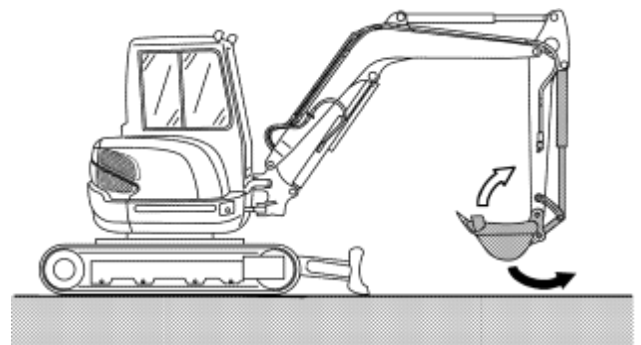
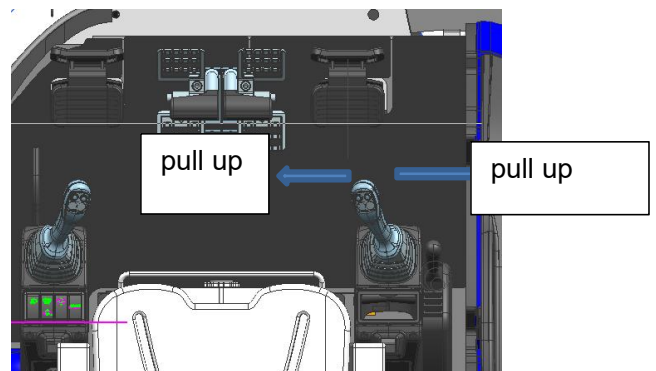
Bucket Operation

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

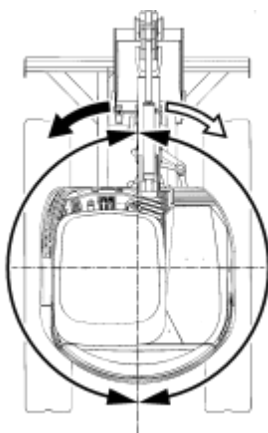
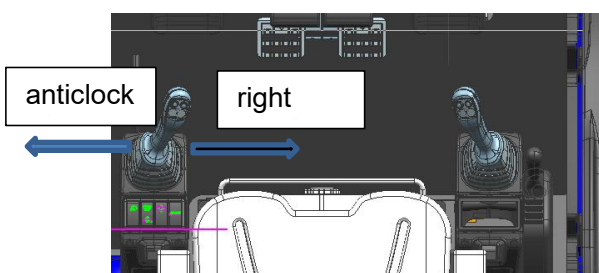
* Do not perform rotational operations on sloped terrain, as this may result in overturning. If rotational operations or excavation work must be performed on sloped terrain, level the ground before proceeding.

► 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.



significant

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

Swing operation



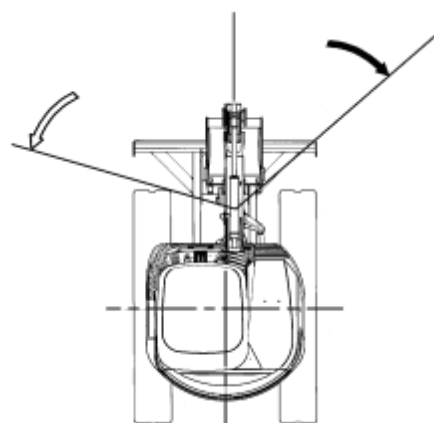
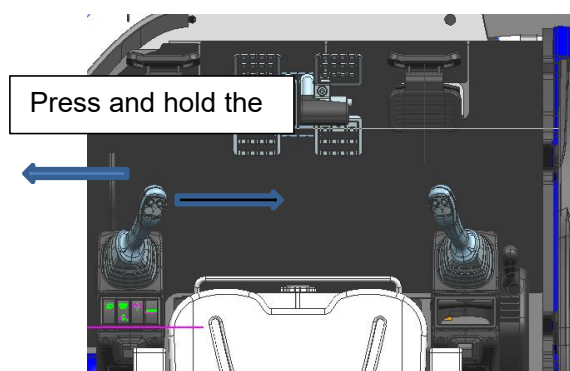
warn

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 .

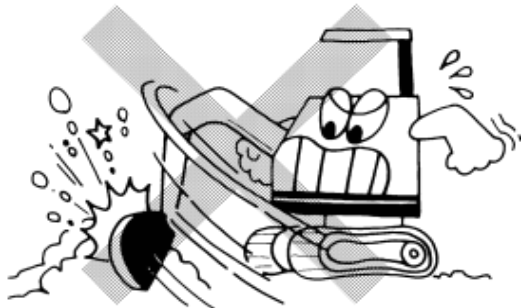
Swing right... Swing the operating handle to the right while pressing the left button on the left handle .



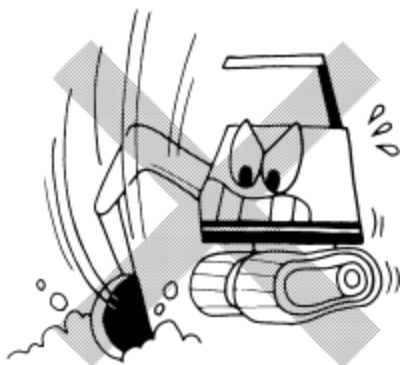
Backhoe excavator operation

Prohibited on operations

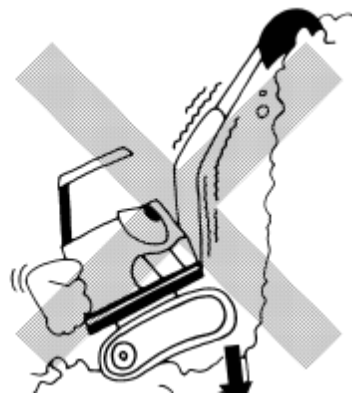
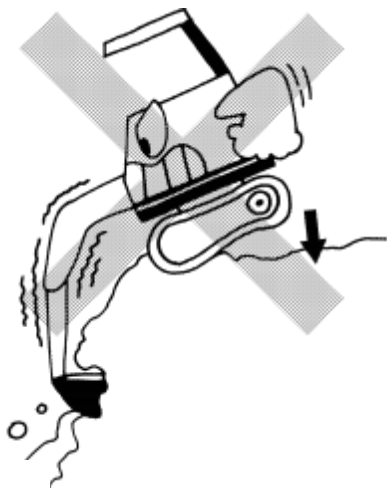
1. It is prohibited to use rotational force to perform operations. (Use bucket to carry out horizontal Push homework, etc.)



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



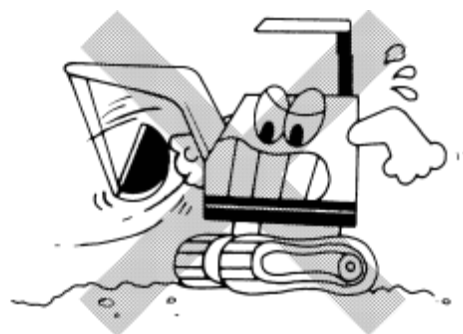
3. It is prohibited to use the falling gravity of the main body to perform operations. (Use machine Excavation work



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

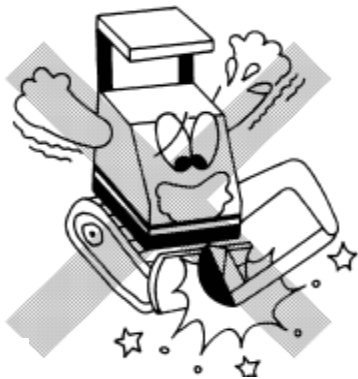
1. Watch out for the bulldozer.

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.



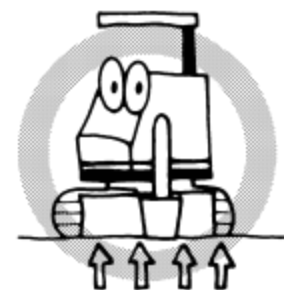
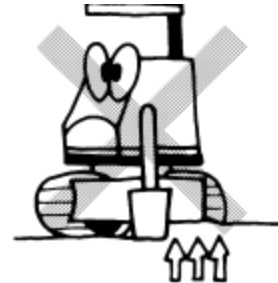
3. Watch out for collisions with the bulldozer!

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



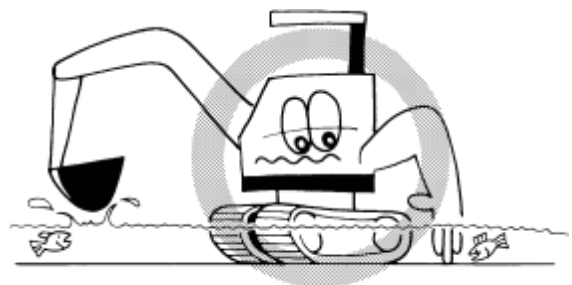
4. When using a bulldozer for support, both sides must be supported at the same time!

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



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.

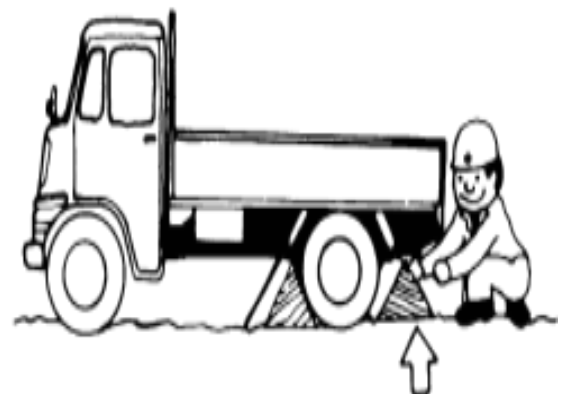
Loading and transportation



note

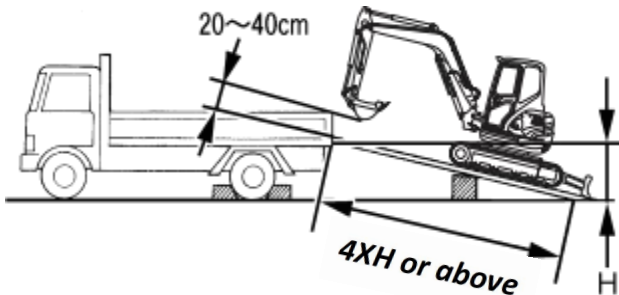
* If loading is performed while the boom is extended, the reaction force generated by the shift in the center of gravity of the machine may damage the truck.

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



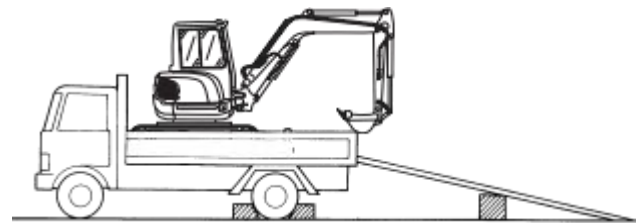
- Before moving the machine to the front of the truck bed, follow the instructions as shown below. Stop temporarily and let the bucket lightly touch the truck bed. Then, make sure the vehicle is level. state.
- Adjusting the direction on the loading and unloading board is extremely dangerous. To adjust 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.



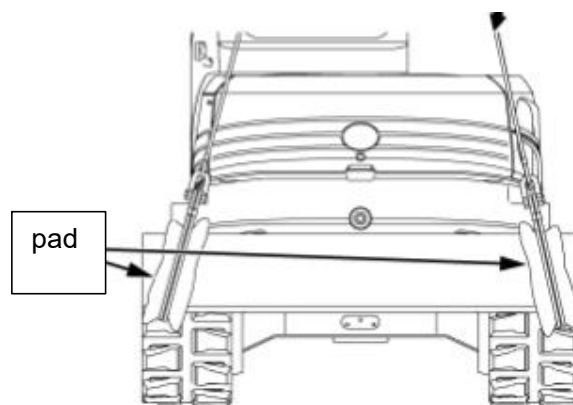
Truck Transport

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 during lifting.



Truck Transport

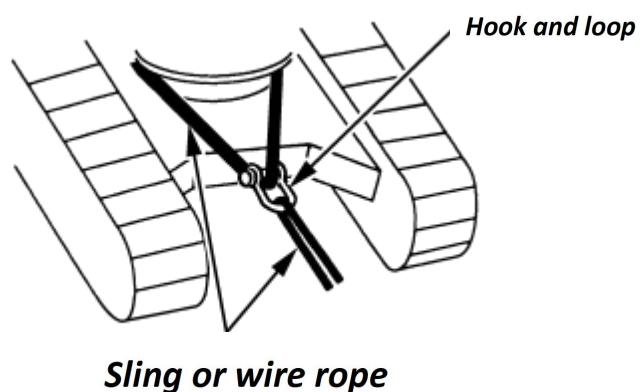
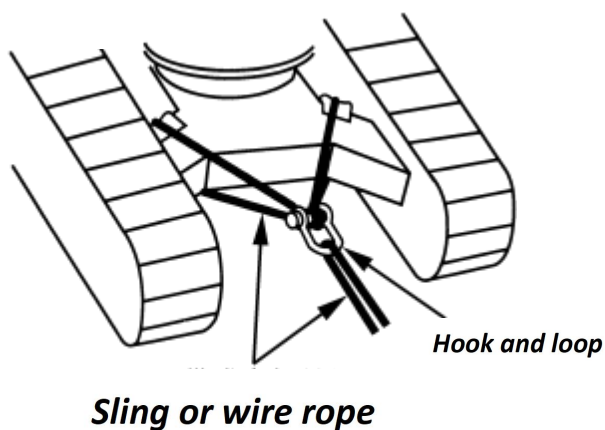
Main traction method



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.





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.

About Waste Disposal



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 quantity	Hour meter shows time																Afterwards																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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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]

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	
1	Air conditioning belt	examine	1				○			○				○				○	Every 200 Hour	
2	Internal air filter☆	Cleaning	1				○			○				○				○	Every 200 Hour	
		replace	1																Every 1000 Hour	
3	External air filter☆	Cleaning	1				○			○				○				○	Every 200 Hour	
		replace	1																Every 1000 Hour	
4	Air conditioning condenser	Cleaning	1				○			○				○				○	Every 200 Hour	
5	Air conditioning pipes and hoses	examine	4																Every 1 Year	
		replace	4																Every 2 Year	
6	Refrigerant gas	examine	—																Repair on demand	

[Cooler Specifications]

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	
1	Cooler belt	examine	1				○				○				○				○	Every 200 Hour

2	Cooler filter☆	examine	1																○	Every 200 Hour
		Cleaning	1																○	Every 200 Hour
3	Cooler condenser	Cleaning	1																○	Every 200 Hour
4	Cooler pipes and hoses	examine	4																	Every 1 Year
		replace	4																	Every 2 Year
5	Refrigerant gas	examine	—																	Repair on demand

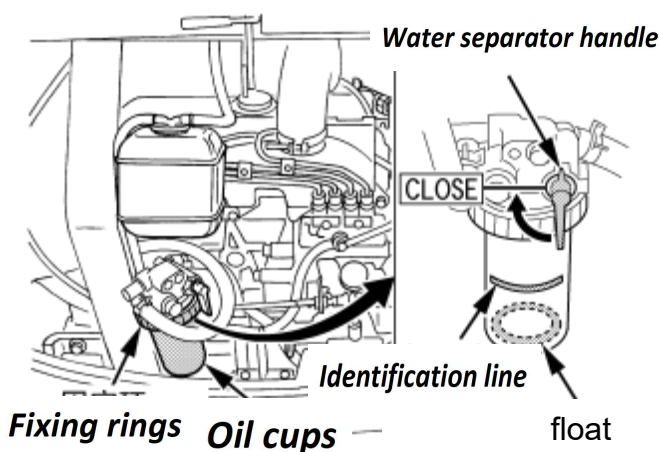
☆ If used in a dusty environment, the filter needs to be flushed and replaced more frequently. Replace the filter when it is heavily soiled.

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).

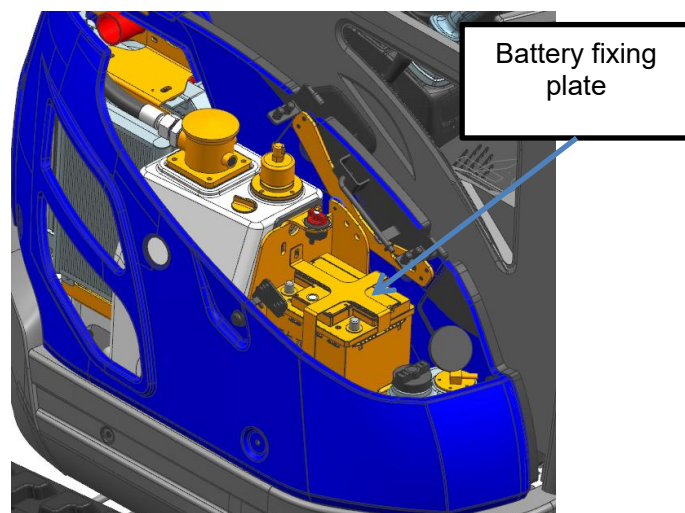
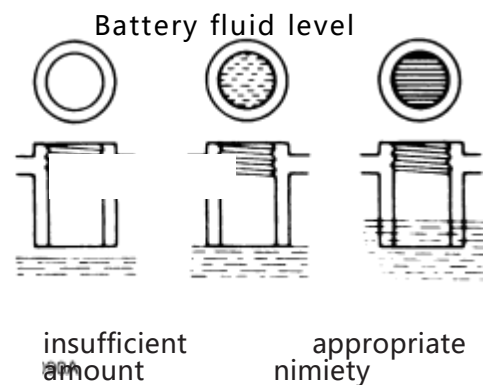
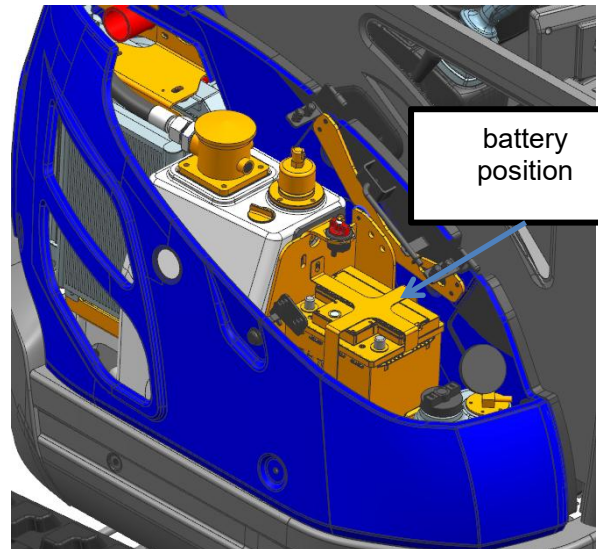
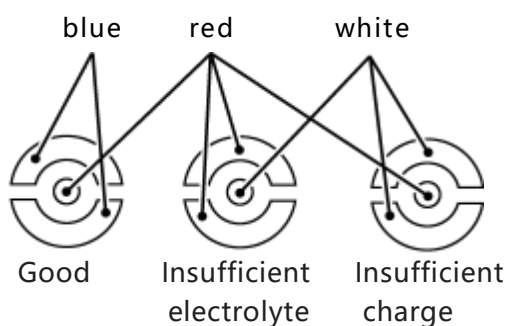


warn

- * Do not allow battery solution to come into contact with your body or clothing.
If it does come into contact, immediately rinse with plenty of water.
If you are careless...
Dilute sulfuric acid may cause burns.
- * When inspecting or disassembling the battery, stop the engine and place the starter key in the "STOP" position.
- * Due to the production of gas during charging, there is a risk of fire or explosion.
Do not approach any heat sources and avoid creating sparks.
- When charging the battery, remove all liquid plugs from each cell.
- * When working near the battery, always wear safety goggles to protect your eyes.
- * When working near the battery, always wear safety goggles to protect your eyes.
- * When working near the battery, always wear safety goggles to protect your eyes.

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



maintain

◆ Battery disassembly method

1. Stop the engine and turn the starter key to " STOP " (stop) Location.
2. Disconnect the (-) cable from the battery.
3. Disconnect the (+) battery wire.
4. Remove the nuts of the battery bolts and then remove the battery screws. bolt.
5. Undo the battery fixing clamps and remove the battery.



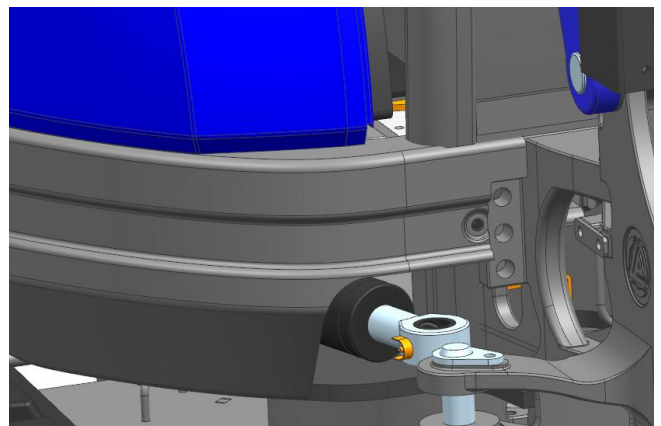
note

- * 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

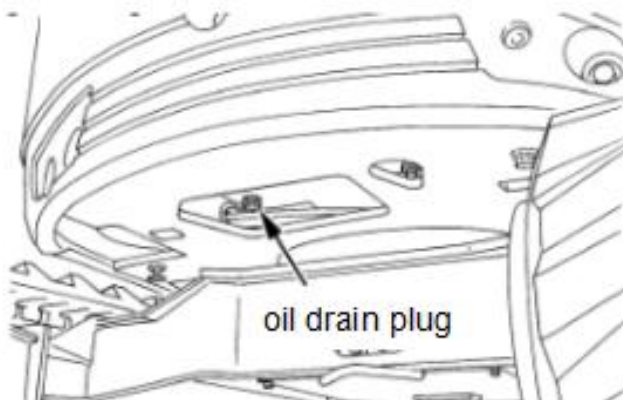
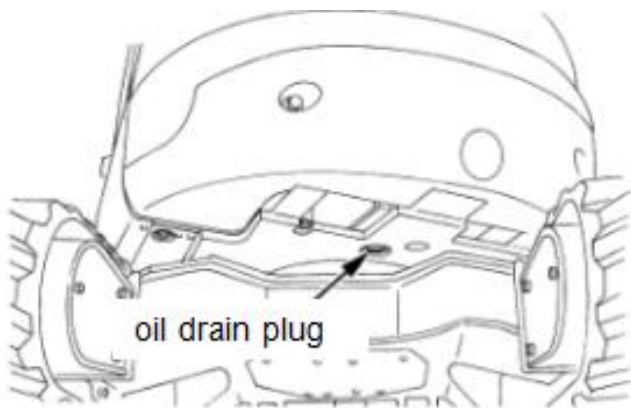
- * If the battery solution is insufficient, it will damage the battery. If it is too much, the solution will overflow and corrode the metal parts of the body.
- * In addition to damage to electrical installation components, Also, please avoid rapid charging as much as possible. It will shorten the battery 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.



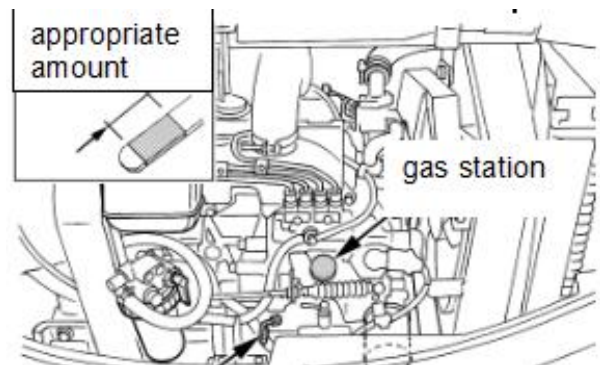
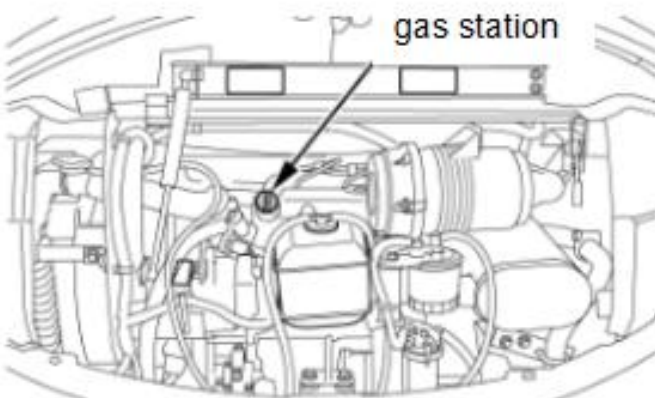
maintain

■ 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

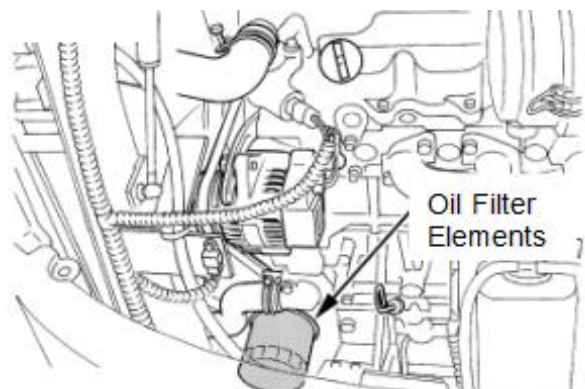
Oil quantity	R22	About 4.2 L (With filter)
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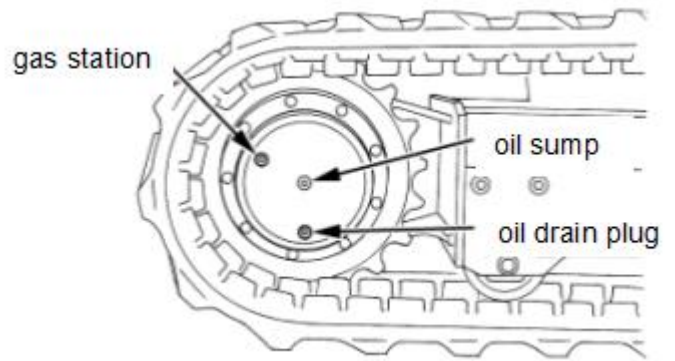
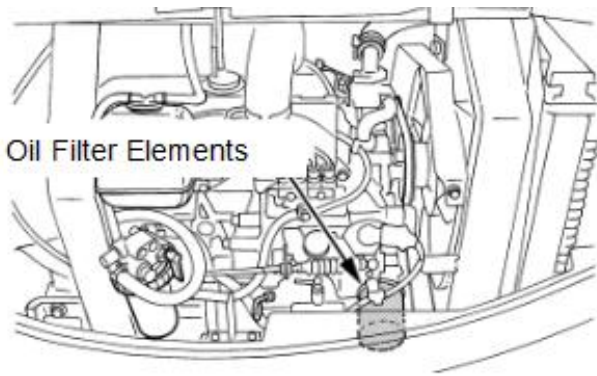
The area in parentheses indicates when to replace the filter and oil.

- * 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.





3. Place the new filter in the 0 Apply a thin layer of oil to the ring, then By hand (Not 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 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")

maintain

Each use 200 Hours of maintenance

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

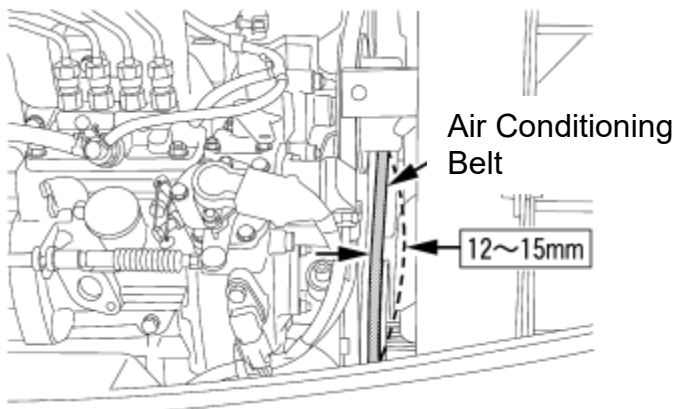
■ Check the tension of the air conditioning belt



note

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

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

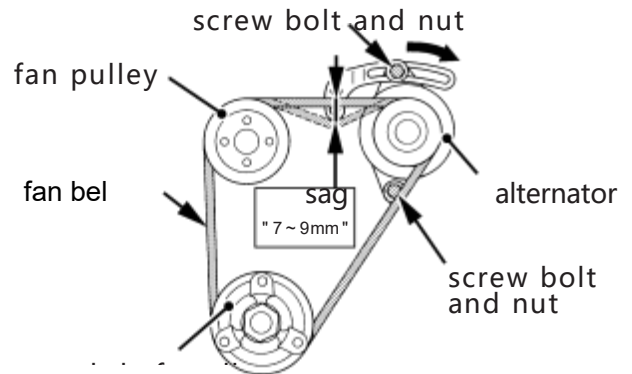


supplement

- * If the air conditioner belt is too loose, please contact the sales store or our company. Please consult with a designated repair shop.

■ Inspection and adjustment of fan belt tension

1. Press with your fingertips [58.8 ~ 68.6N(6 ~ 7 kgf)] Belt Central, curvature 7 ~ 9 mm If it is not appropriate, loosen the bolts and move the generator in the direction of the arrow. Move to tighten the belt.



2. Check the damage of each pulley, V The wear condition of the groove The wear condition of the V-belt should be checked especially V-belts are No touch V The bottom of the groove.
3. If the belt is stretched, has no adjustment margin, is scratched or has a torsion If it is cracked, replace it.



significant

- * If the belt continues to run with low belt tension, will slip, which will not only reduce the engine's capacity but also It will also shorten its service life, so please check and adjust all.

■ Cleaning and inspection of air filter element

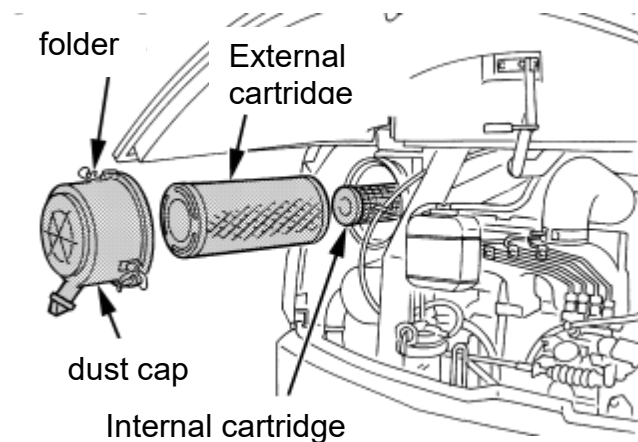
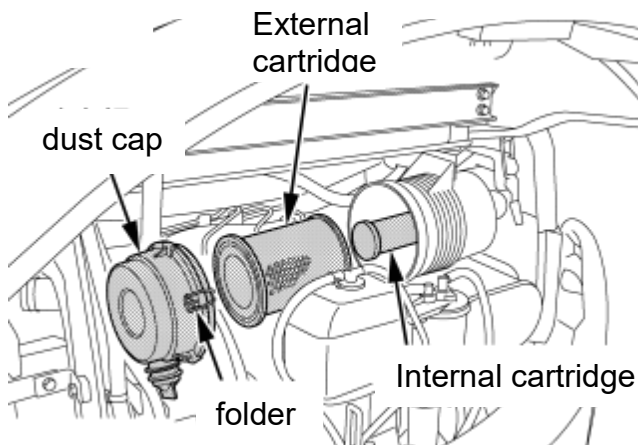


note

* 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.



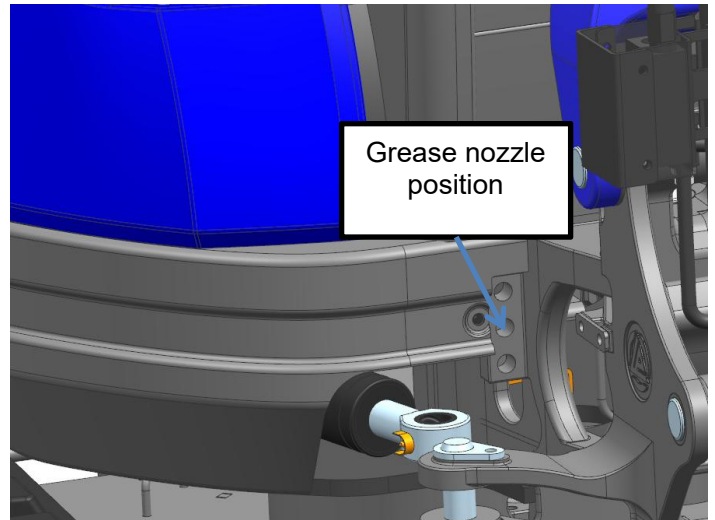
◆ Cleaning method

Use dry compressed air [205 kPa (2.1 kgf / cm²) 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.

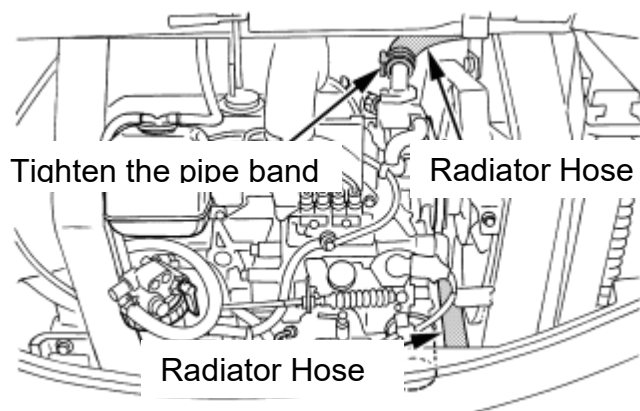
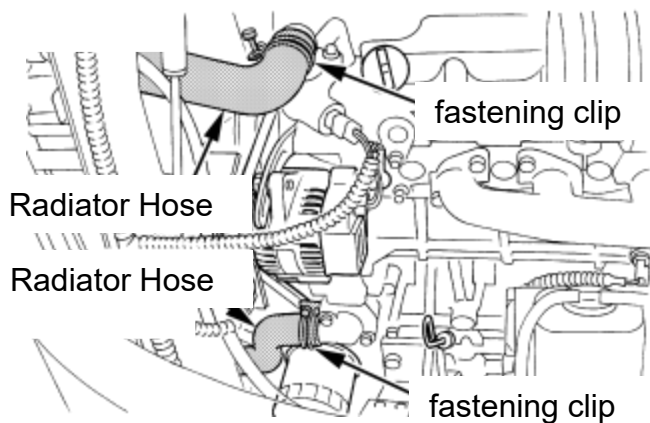


■ Inspection of radiator hose and hose clamp

Every 200 Hourly operation or 6 Months 1 Secondary radiator hose Check the tightness of the

1. If the clamp is loose or leaking, tighten the pipe securely. hoop.
2. When the radiator hose swells, hardens or cracks, replace it. hose and tighten the hose clamp securely.

maintain



● When severely soiled

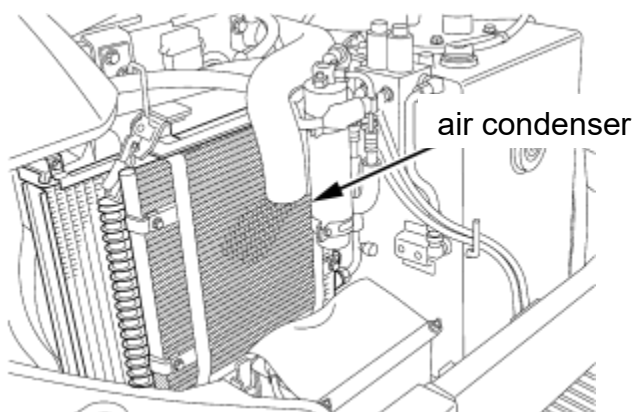
Soak in warm water with household neutral detergent, moving it up and down Move left and right to clean, then rinse thoroughly with clean water Solvent and allow to dry completely naturally.

■ Cleaning of air conditioner condenser



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

If dust accumulates on the condenser fins, use compressed air or Incoming water, etc. are removed.



Each use 250 Hours of maintenance

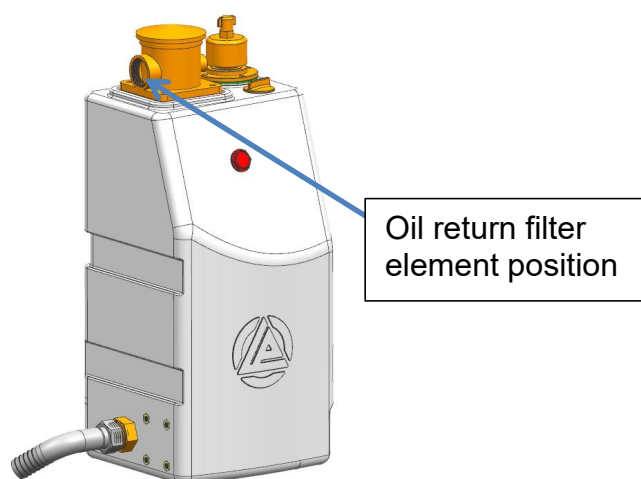
Each use 50 Please also carry out hourly maintenance at the same time.

■ 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.



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.

! significant

- * When using hydraulic front working devices such as breaker hammers, etc. In this case, please adjust the hydraulic front working device according to The usage frequency should be replaced according to the instructions below.

Hydraulic auxiliary device Use time ratio	Working oil Replacement time	Replacement of return oil filter time
Standard Work Backhoe operation)	Every 1000 Hour	Every 500 Hour (First time every 250 Hour)
Hammer utilization rate 20%	Every 800 Hour	Every 200 Hour
40%	Every 400 Hour	
60%	Every 300 Hour	
80% above	Every 200 Hour	Every 100 Hour

supplement

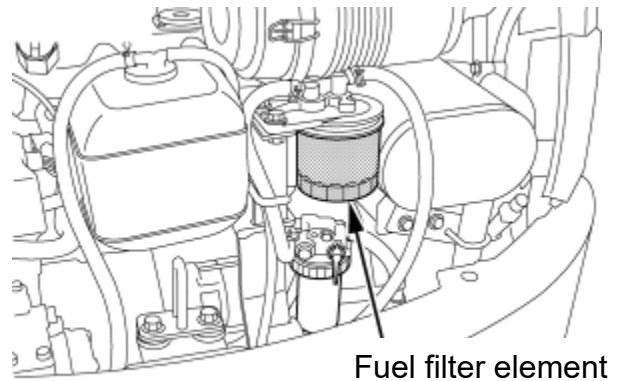
- * After replacing the filter, always check the oil level.

Each use 500 Hours of maintenance

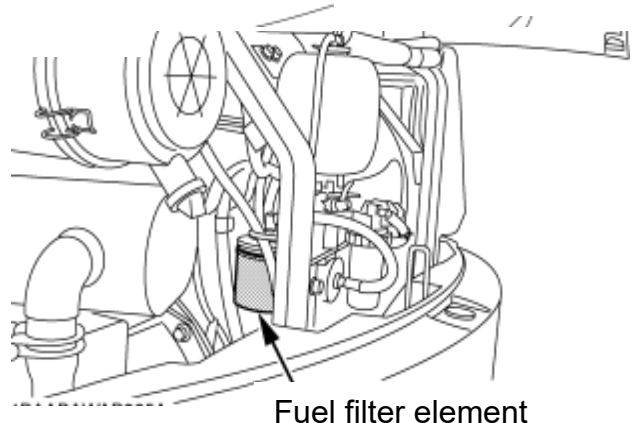
Each use 50, 100, 250 Please also carry out hourly maintenance at the same time.

■Replacement of fuel filter element

1. Use a filter wrench to remove the filter.
2. When assembling, lightly apply a layer of fuel on the sealing layer. Filter wrench, tighten the filter directly by hand.
3. Please deflate.
(Please refer to Project "Bleeding of the fuel system")



Fuel filter element



Fuel filter element

! significant

- * When assembling, be careful not to get dirt or dust 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)

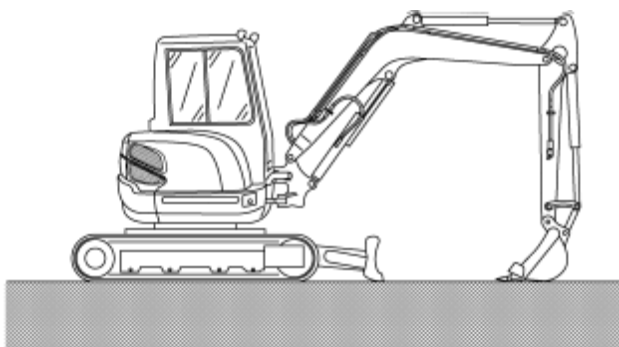
For information on how to replace the filter element, refer to "Every 50 Hours of maintenance" project.

Each use 1000 Hours of maintenance

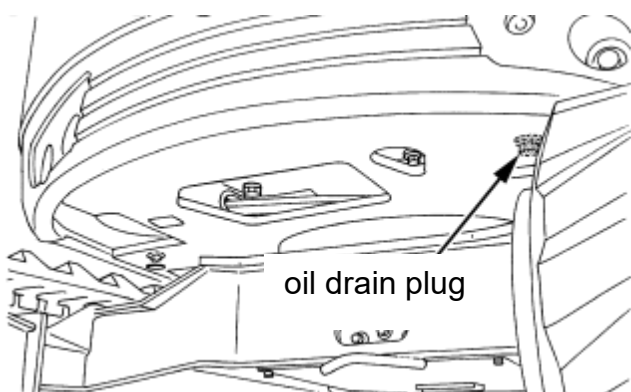
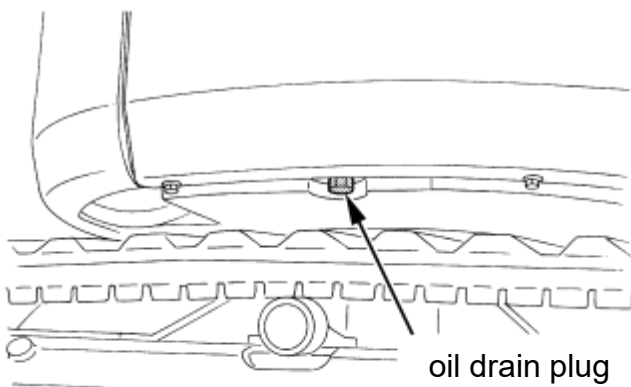
Each use 50, 100, 200, 250, 500 Hours of maintenance please At the same time.

■ 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. Remove the suction filter using a wrench, etc., and replace it with a new one.
4. Next, tighten the drain plug securely.
5. Please add the specified amount of operating oil from the oil filling port.
6. Allow the engine to run for approximately 5 Minutes of idling, stop After the motivation, please confirm whether the required amount of work has been added Oil.

● Working oil replacement capacity

Working oil Replacement capacity	R22	Total oil volume 37 L
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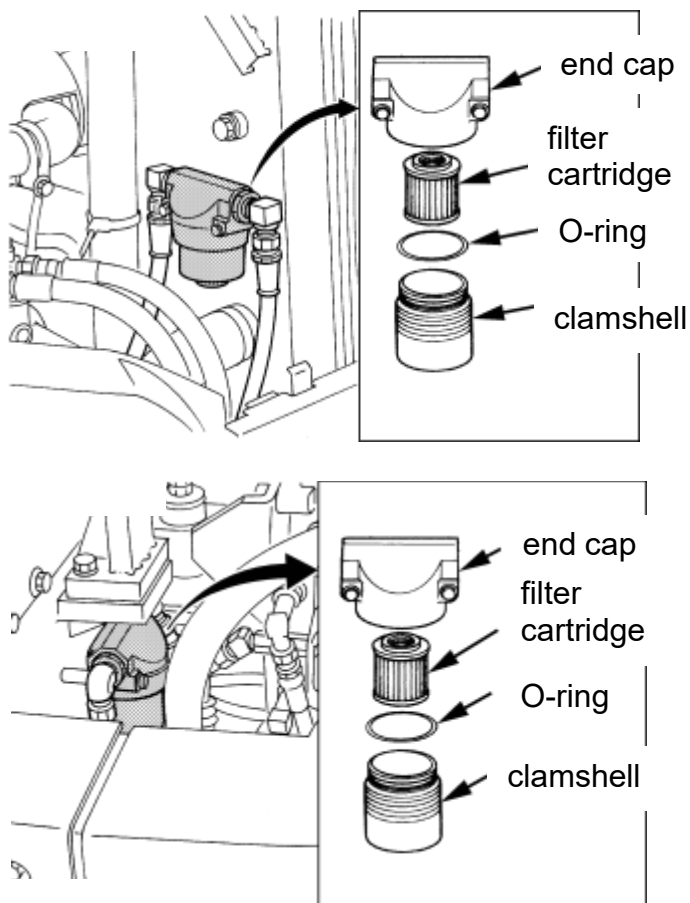
supplement

- * 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.

■Replacement of hydraulic pilot filter

Please replace the filter element after the oil temperature drops.

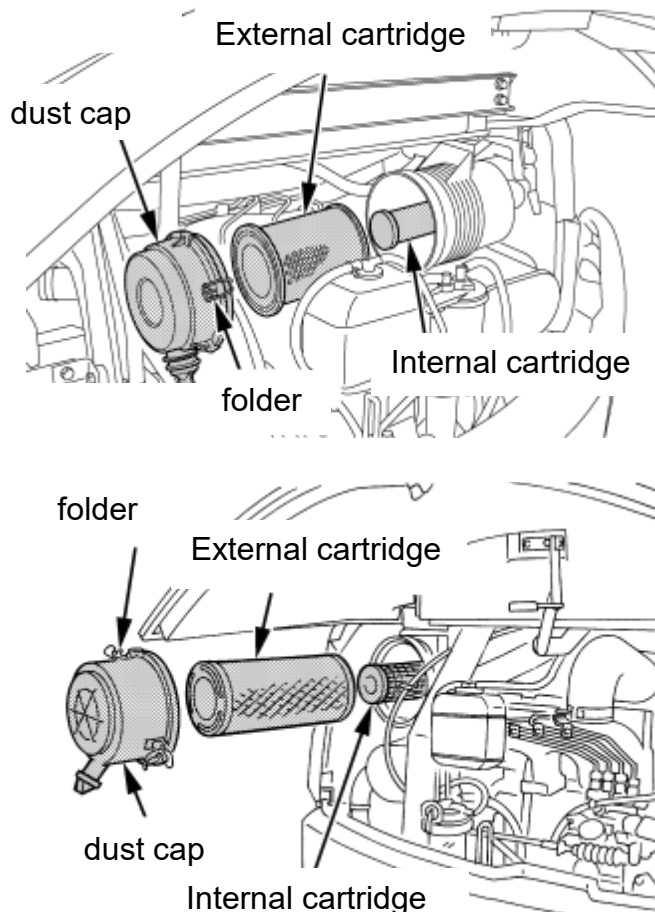
1. Open the rear hood, then the right hood.
2. Remove the pilot filter housing from the end cover.
3. Pull out the filter element from the bottom while rotating it.
4. Please send 0 Replace the ring with a new one.
5. Apply a thin layer of clean operating oil to the O-ring of the new filter element. Then insert firmly, but without damaging O Shaped ring.
6. Fasten the housing onto the end cap.
7. After replacement, let the engine idle for about 3 minutes. And bleed the air in the circuit.
8. Be sure to check the fluid level of the working oil tank.



Maintenance every 1000 hours or one year of use

■Replacement of air filter element

Remove the clip, take out the outer filter element and inner filter element, and replace them with new ones Afterwards, reinstall it.





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.

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

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.

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**

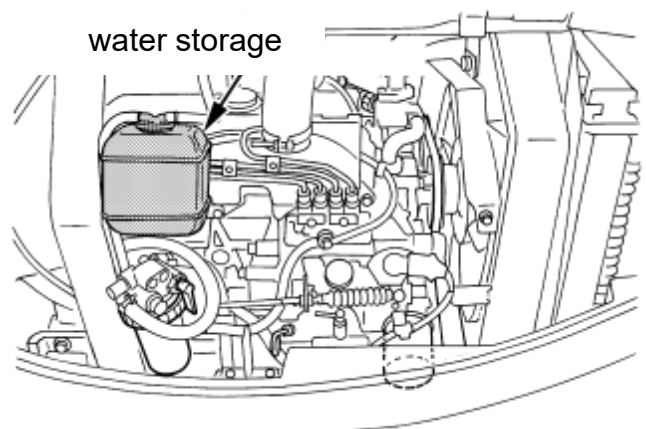
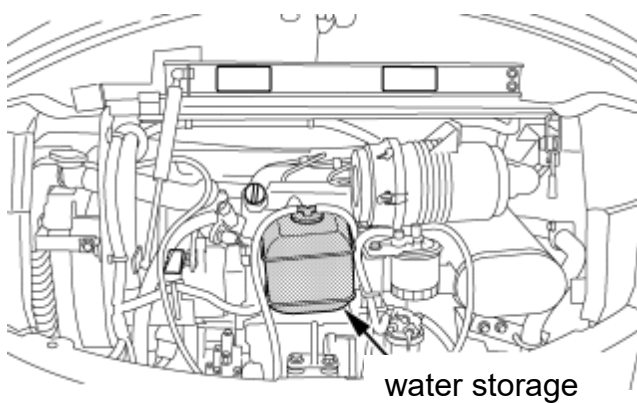
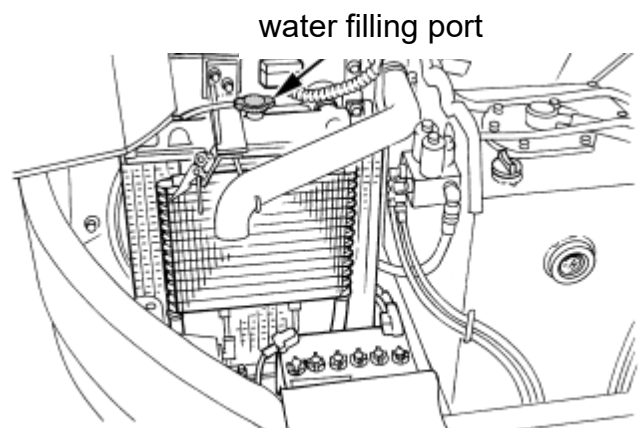
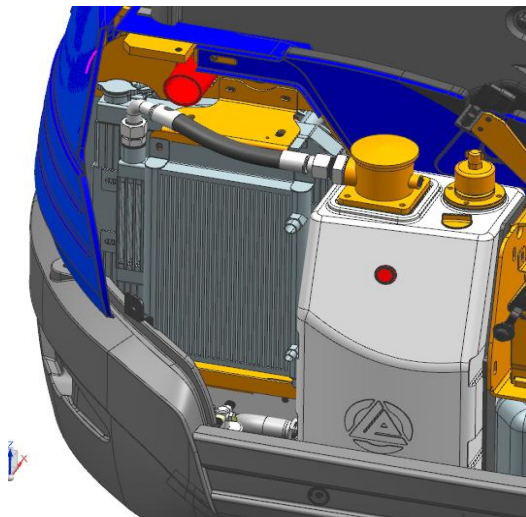
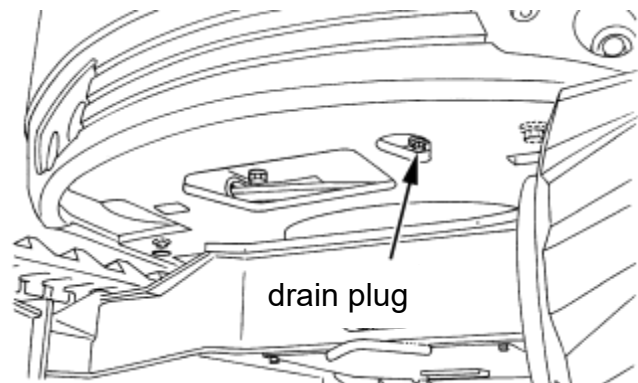
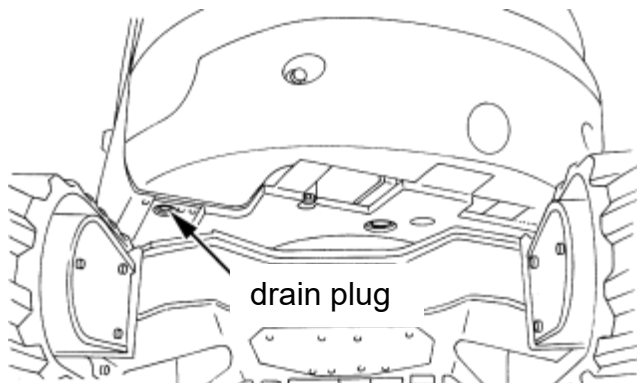
- * If you open the Radiator cap, steam or hot water may spray out and cause burns Therefore, wait until the radiator cools down before opening it. build.

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



maintain

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 case of other than extended life coolant)



note

* Please do not mix antifreeze from different manufacturers.

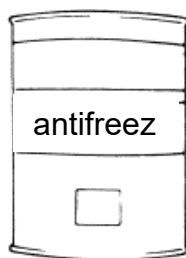
Antifreeze has the effect of lowering the freezing point of water, which can prevent Damage to the oil cylinder and radiator caused by cooling water freezing.

In winter the temperature reaches 0 °C or below, please be sure to replace the permanent type (PT type) Mix the antifreeze into clean water and then add it to the radiator and water. In the box.



significant

- * The mixing ratio of antifreeze varies by manufacturer and temperature. Please follow Mixing ratios listed in the "Cryogenics precautions" section.
- * Please do not mix antifreeze from different manufacturers.



- * Antifreeze - The effective period of long-term coolant is 2 years.
- * In case of other than long-life coolant, please Replace separately 1 Second-rate.

supplement

- * Long-life coolant has been added as cooling antifreeze 50% water 50%).

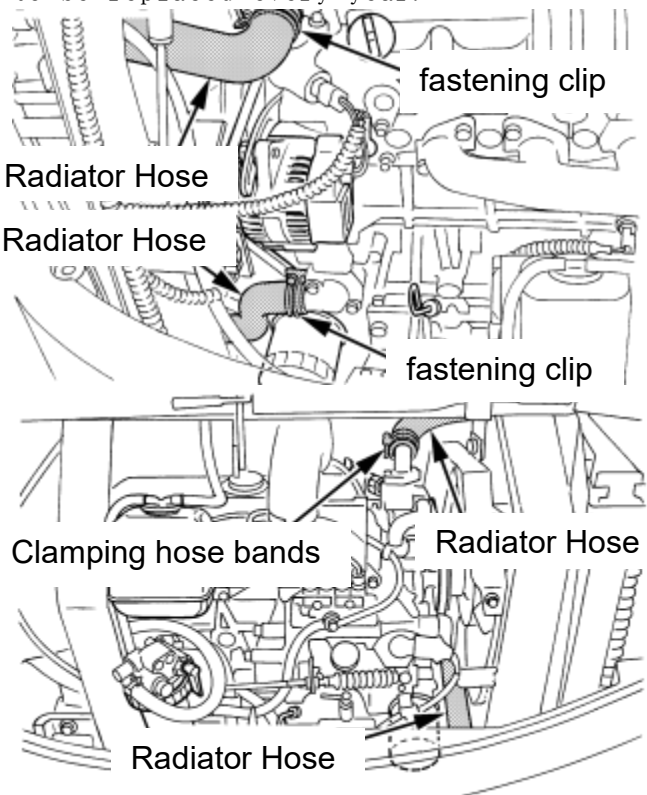
■ Replacement of radiator hose and hose clamp



note

- * Radiator hoses and hose clamps will produce rupture, causing hot water to spurt out, which can sometimes cause unexpected Therefore, please replace it as soon as possible.

Please 2 Annual replacement 1 Secondary radiator hose and clamp. If you check Radiator hose swelling, hardening or cracking is found when 2 It also needs to be replaced every year.



■ Replacement of air conditioning pipes and hoses



note

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

Replace the air conditioning pipes and hoses every two years. If the pipe expands, hardens or cracks, it must be

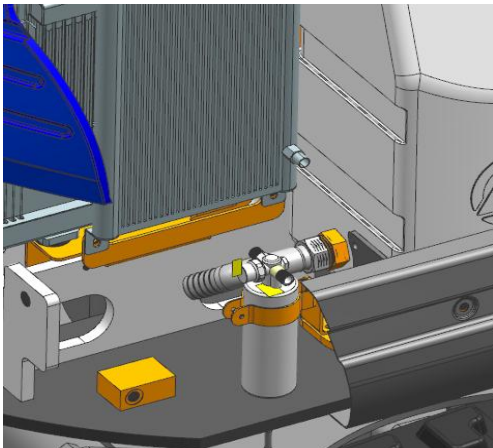
Repair on demand

■ Check the refrigerant (gas) quantity

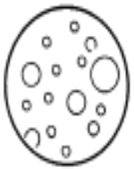
Lack of refrigerant will impair the performance of the air conditioner. Please check the following items. If there are signs that the refrigerant is low, have it checked at the dealership. Check and fill.

◆ Inspection steps

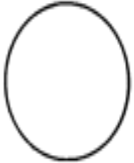
1. Operate the air conditioner under the following conditions.
 - * Engine speed: Approx. 1500 rpm
 - * Temperature adjustment handle: Maximum cooling position (Far right)
 - * Fan switch: Maximum air volume (3)
 - * Air conditioning switch: ON
2. Check through the sight glass whether the refrigerant is flowing through its circuit.



Appropriate ····· Bubbles in refrigerant fluid
Very few or no bubbles.



Low ····· Continuous bubbles in the refrigerant fluid (continuous flow of bubbles)



No refrigerant ····· Colorless and transparent.

Battery inspection and use



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.

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.



maintain

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

1. Please be sure to turn the key to " STOP " (stop) Afterwards, from Remove the battery from the vehicle body.
2. Insufficient battery fluid will damage the battery. The body will overflow and corrode the metal parts of the car body.
3. Please avoid rapid charging as much as possible. Otherwise, the battery life will be shortened. service life.
4. Rapid charging is a high current charging method used in short Partially discharge the battery in a discharged state within a certain time Therefore, it can only be carried out in emergency situations.
5. When connecting the wires to the battery, make sure you do not mistake the (+) and (-). If you make a mistake, it may cause battery and electrical system failure. barrier.
6. When removing the wires from the battery, start with the (-) Side by side, When installing, please start from (+) If you do it the other way around, It will cause a short circuit when it reaches the battery.
7. When charging, connect the (+) Connected to the charger (+) On the battery (-) Connect to the charger (-) superior, Charge the battery in the normal way.
8. When using batteries, in addition to measuring the specific gravity, Remove the cables connected to the battery before applying the battery solution. Quantity inspection.
9. Please remove all the liquid port plugs of each battery.

■Battery fluid level check

For battery fluid level inspection, refer to " Every 50 Hours of maintenance " project.

■When charging with the battery still loaded Notes(Only when necessary)

The correct way to do this is to remove the battery from the machine body.

1. Since applying abnormal voltage to the alternator may cause damage Bad, insert the key and turn to " STOP " (stop) , remove the battery Battery (-) After wiring the terminals, charge the battery.
2. During charging, remove all fluid port plugs to release the generated of gas.
3. Battery overheating (Liquid temperature exceeds 45 °C) Pause charging when
4. After charging is complete, stop charging immediately. If you charge the battery more than necessary, the following adverse conditions may occur: condition.
 - Battery overheating
 - Battery fluid volume reduction
 - The battery is in poor condition
5. When connecting the battery, be careful not to connect it in reverse (connect (+) and (-), (-) and (+) Tie it together). Otherwise it may cause damage to the alternator, etc.
6. In addition, starting the engine in this way will After that, please follow the instructions in the charger manual as soon as possible. If this supplementary charging is not performed, This will seriously shorten the battery life, so please Notice.



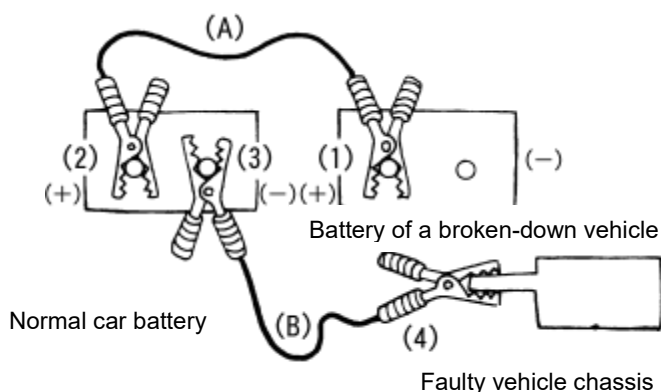
■ Starting the engine using an auxiliary cable

1. Since batteries produce flammable gases, Sparks or fire near a pool are extremely dangerous. It may cause ignition and explosion.
Therefore, avoid using a boost cable to start the engine if possible. machine.
2. To prevent malfunctions, batteries that are near the end of their life should be Replace with new ones as soon as possible.
If you have to use the auxiliary cable to start the engine, Use the battery as follows to avoid accidents.

◆ Before connecting

1. Use auxiliary cables and clamps with capacity suitable for the battery.
2. Cables, wire clamps, and battery (+), (-) ~~Check~~ if the terminals are broken or corroded.
3. Is the starter key in the " STOP " position? stop) In terms of location.
4. The battery of the normal vehicle should have the same capacity.

◆ Connection of auxiliary cable



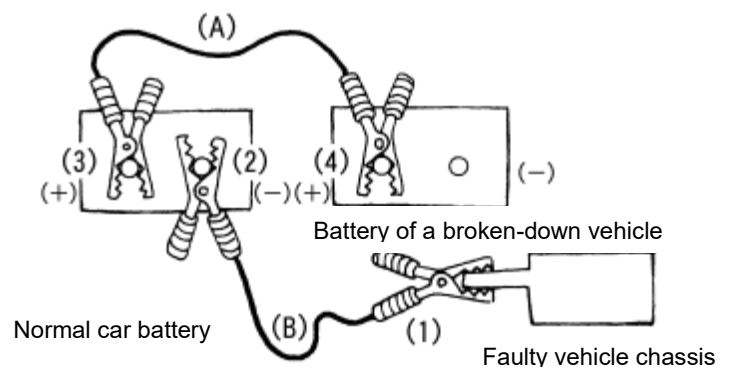
1. (1) Connect the auxiliary cable (A) The wire clip is connected to the faulty vehicle (+) terminal, (2) Connect one of the wire clips to the normal vehicle. (+) On the terminal.

2. (3) Connect the auxiliary cable (B) Connect the wire clip of the normal car to the (-) On the terminal, (4) Connect one of the wire clips securely to the On the body of the broken-down vehicle.
* The connection to the vehicle body should be farther away from the battery.
3. After connecting each terminal, confirm that they are securely connected before starting the engine.

◆ Starting the engine of a faulty vehicle

1. After completing the connection confirmation, start the engine.
2. If the startup fails, wait for a while (2 ~ 3 minute) Then restart the engine.

◆ Removal of auxiliary cables



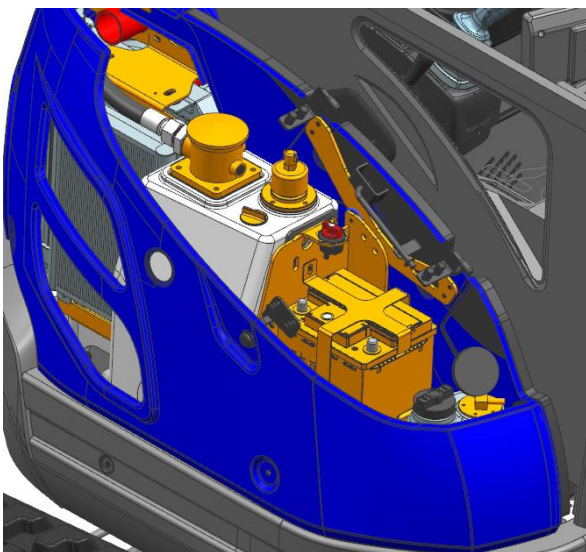
1. (1) Remove the auxiliary cable from the frame of the faulty vehicle. (B) Line (2) Next, remove the (-) terminal of the normal car. connection.
2. (3) From the normal car Remove the auxiliary cable from the (+) terminal (A) of After the wire clamp, (4) Remove the (+) of the faulty vehicle Terminal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

■ Notes on starting the engine and charging the battery Note

Regarding how to start the engine when the battery is exhausted and how to use the battery, please follow the steps below.

! **significant**

- * 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.



About fuse



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

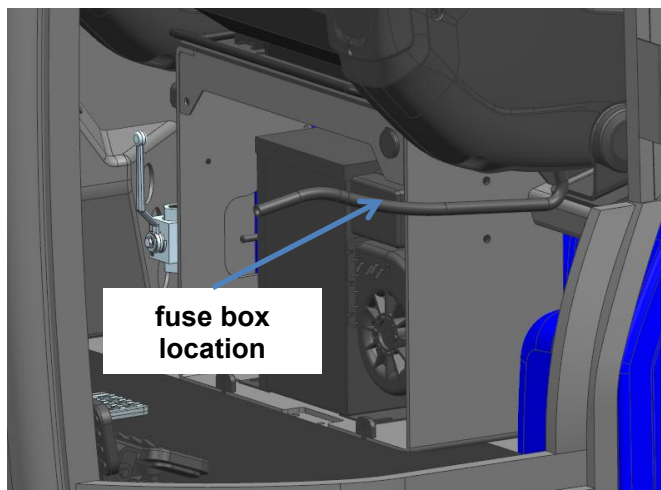
1. Put the starter key in " STOP " (stop) Location.
2. Remove the cover under the seat and open the cover of the fuse box.
3. Please replace the fuse with one with the same capacity as the blown fuse. Simply remove the fuse through the fuse box cover.



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



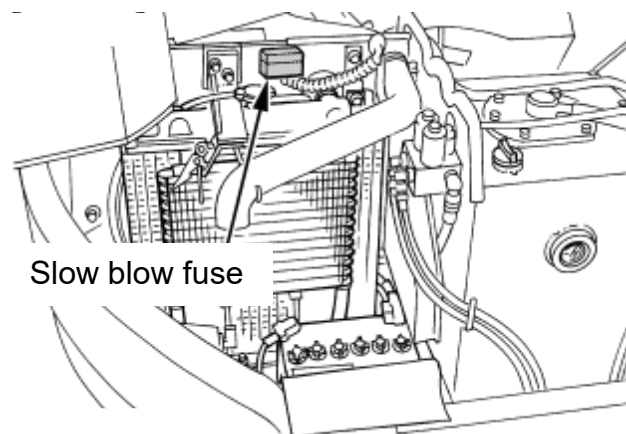
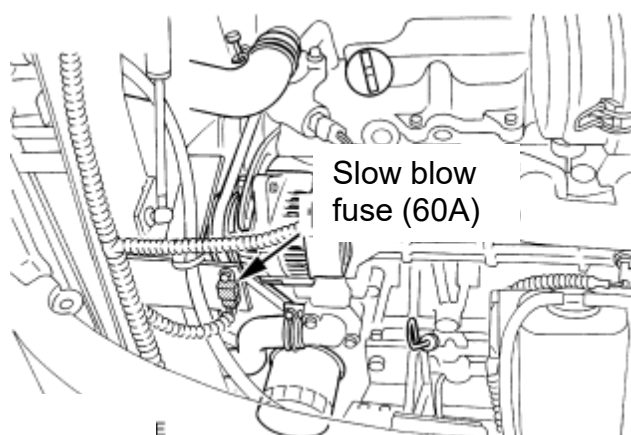
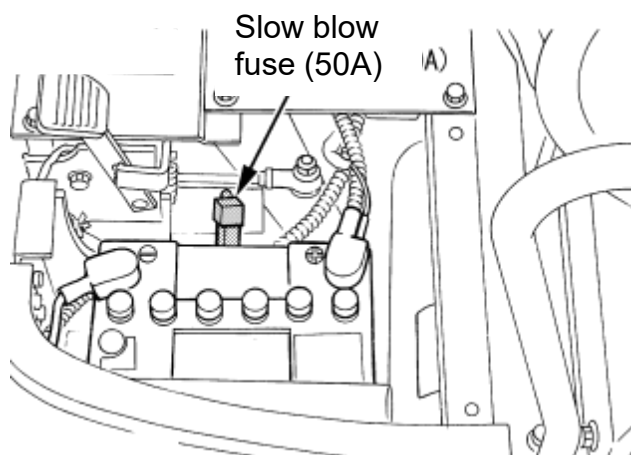
■ Fuse capacity and applicable circuit

12V80A Preheating relay	12V30A start relay		30A Air conditioning
			20A Reverse valve
12V80A Start relay	30A Start switch	30A Preheating relay	20A Excitation
			20A Left Rocker panel electric
			20A Left Rocker panel electric
			10A Instrument

Do not use fuses other than those of the specified capacity.

■ Replacement of slow blow fuse

Slow blow fuses are used to protect wiring. If a slow blow fuse blows, please be sure to investigate the cause and never use substitutes. Instead, use authentic parts.

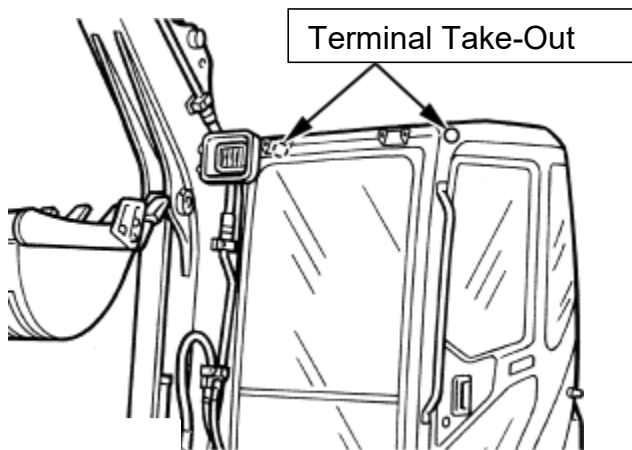


■ Backup power supply(Working lights, etc.

Additional installation of the machine with the work light (55W) When other than working lights. When using the canopy specification, branch harness (Work Light) Conduct. The maximum installation capacity includes the machine's work light 110W.

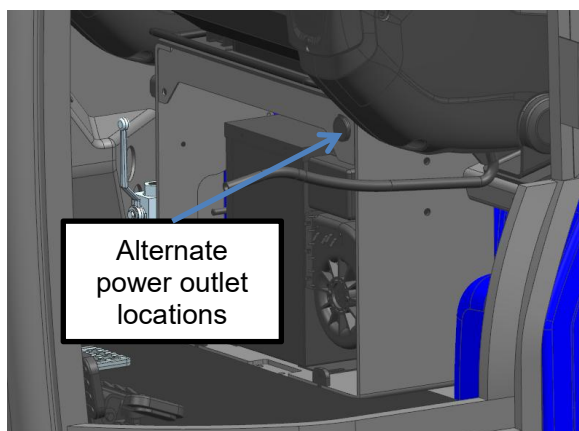
In the case of cab specifications, there are terminals on the upper front of the cab. The installed capacity is 27W × 2 lamp.

For more details, please contact the sales store or our designated maintenance factory.



■ Backup power supply

The backup power outlet must be within 120W.



supplement

- * The battery may be depleted if it is left idle for a long period of time with additional electrical components started. Be careful not to leave it idle for a long time.

Fuel system bleeding

1. Please refill the fuel tank.
2. Insert the key into the starter switch and turn it to " START " (transport change) Location.



3. Conduct approximately 1 Automatic deflation every minute.

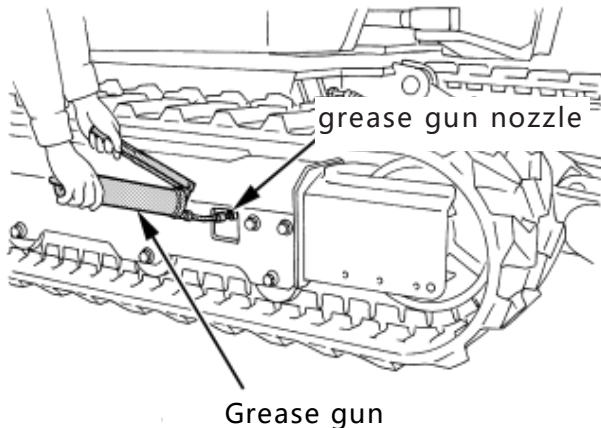
supplement

- * 1 If the air is not exhausted for the first time, stop the engine after starting. When motivated, repeat 2 and 3 operation.

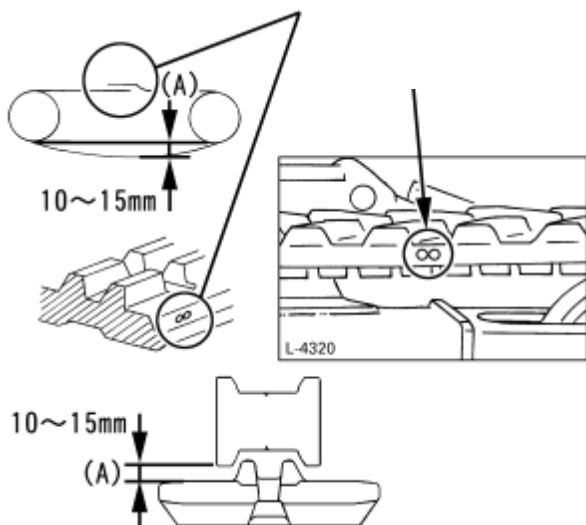
Track adjustment

■ Tightening the rubber track

1. Insert the grease gun into the grease gun nozzle and fill with grease.



2. Please adjust the tension of the crawler belt as shown in the figure. In the state of floating crawler part (A) so that the size (The distance between the outer peripheral end of the center roller and the track shoe tread gap) achieve 10 ~ 15 mm . (The seams of the rubber tracks are located on the Central)



- * After adjustment, please turn 1 ~ 2 Check the track tension to confirm the remaining quantity.

■ When loosening the rubber track



note

- * Because of the high pressure inside the grease tank, if the grease tank nozzle is relaxed too much or too quickly, the nozzle will fly out and the high-pressure grease inside the tank will spurt out, posing a danger. Therefore, do not put your face or other objects near the nozzle, keep your body away from the front side of the nozzle, and slowly relax the nozzle.
- * If a stone, etc. gets stuck in the final drive, remove it before working.

1. Insert the socket wrench into the base of the grease cylinder nozzle and turn it slowly. move 3 ~ 4 Next, relax.
2. If grease flows out of the threaded part, the track will float. Run the track idle for adequate relaxation.

After the adjustment

3. Tighten the hexagonal portion of the nozzle using a socket wrench or the like.
※Tightening torque is approx. 98 ~ 108 N • m (10 ~ 11 kgf • m).



significant

- * If the slack allowance reaches 25 mm , please readjust .
- * Check the tension margin for the first time 30 hours after use and readjust After that, every 50 Hour 1 Check the tension margin and readjust all.
- * If it is too tight, it will
 - Accelerate the wear of rubber tracks.
- * If it is too loose,
 - Causes poor engagement of the final drive.
 - Accelerate the wear of rubber tracks.
 - Cause the rubber track to fall off.
- * After the operation is completed, please clean the rubber track thoroughly. Do not leave dirt or other substances attached to the surface.
- * If the rubber track is filled with mud during operation, If it is too tight, use the boom, stick and bucket to make the rubber The crawler tracks are

partially floated and rotate side by side without load to remove mud earth.

- * Pay attention to the seams of the tracks

Rubber tracks have seams. When adjusting the tracks, be sure to The joint is moved to the upper center. In the moving wheel machine, the upper moving wheel reaches between the connecting rods, and then Then make adjustments.

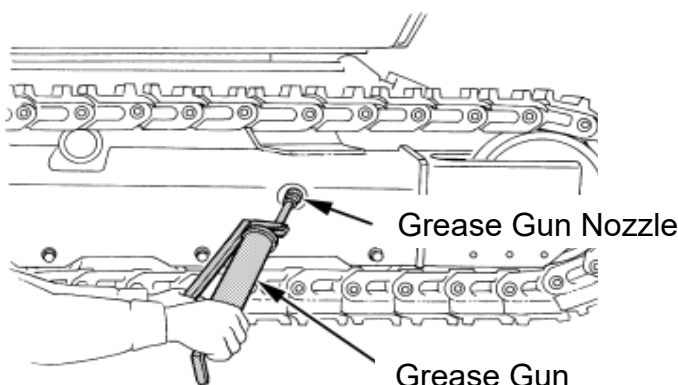
If the seam position is wrong, it will produce more than the proper tension. Greater relaxation will require readjustment.

■To use rubber tracks with ease

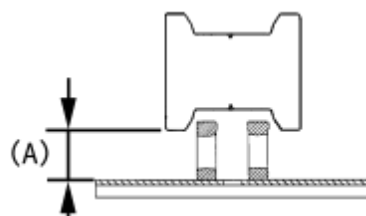
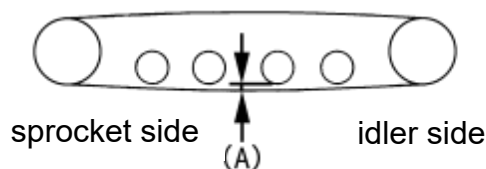
1. Avoid steering in place when turning if possible and make low speed rotations. (This will minimize wear and tear on the wheel claws and stone entrapment.)
2. If the safety valve is activated due to sand or dirt stuck in the wheel, do not force the wheel to turn, but back up immediately and remove the sand or dirt before turning again.
3. Do not use the track near rivers, on gravel floors, on steel bars, or on iron filings, as this may damage the rubber and shorten the life of the track.

■When tightening the track shoes of the iron track

1. Insert the grease gun into the grease gun nozzle and fill with grease.



2. As shown in the figure, with the crawler part floating, make the center The outer end of the track wheel and the track On the film between gap “(A)) When the size reaches the value shown in the As shown in the figure, the track tension is optimized when the clearance “(A) dimension” between the peripheral end of the center support wheel and the top of the track plate is as shown in the figure below, with the track section floating.



Gap (A)	R22	25 ~ 30mm
---------	-----	-----------

When you want to loosen the track shoes, please follow the instructions for rubber 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.

Please replace the bucket according to the following instructions.

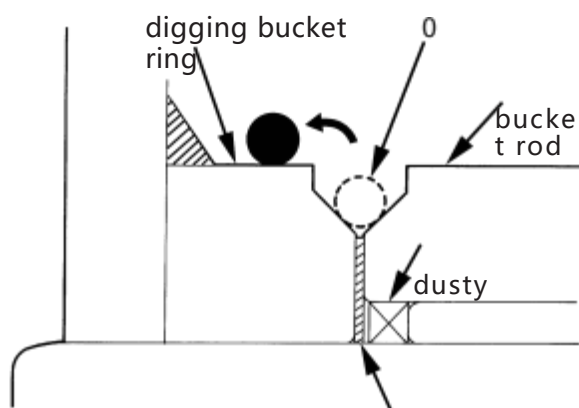


significant

- * Be careful not to get sand or dirt on the pulled pin.
- * Since dust seals are placed at both ends of the bushing, please pay attention to Be careful not to damage the dust.

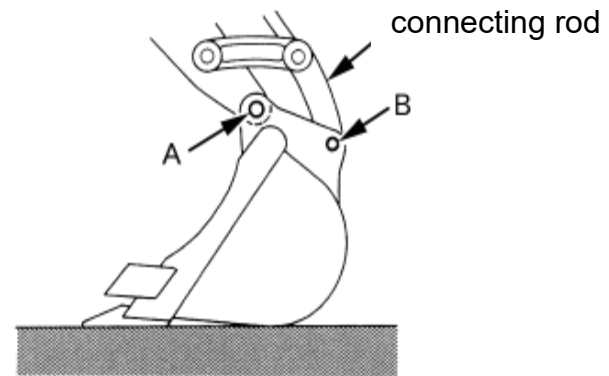
■ Bucket removal

1. On a flat, level surface, place the bucket in contact with the ground.
2. Stop the engine, Depressurize the hydraulic system.
3. Remove from the slot O Ring, pull out A and B pin.



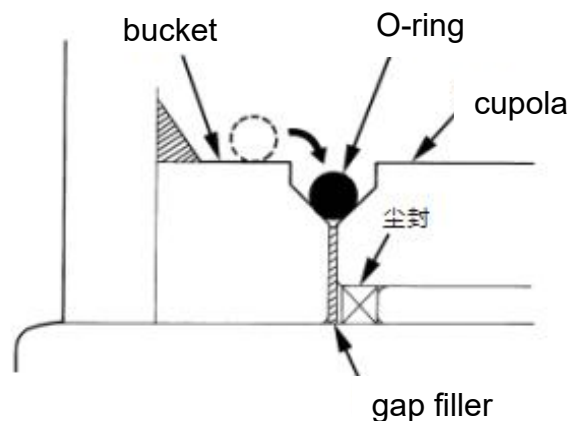
significant

- * When replacing the bucket, please make sure that the front end of the bucket rod and the bucket ring are free of dust. If a damaged dust seal is used, sand, etc. Entering the bushing, causing the bushing to wear out quickly.



■ Bucket Installation

1. Please send O The shaped ring is placed into the hub of the bucket.
2. Align the arm A Hole, when the gap between the two ends of the bucket is large Insert the shim and secure with the pin. Then, align the connecting rod with B. When the gap between the two ends of the connecting rod is large, insert a shim and Combine with pins.
3. Install the set bolt of the pin securely.
4. Please send O Install the shaped ring into the groove.



5. Grease the pin.

Replacement of bucket teeth and side teeth

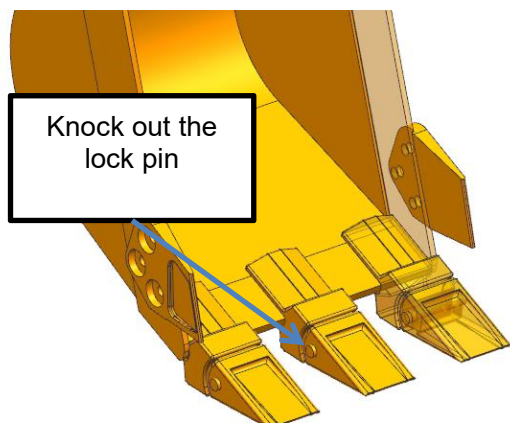
■ Bucket teeth replacement



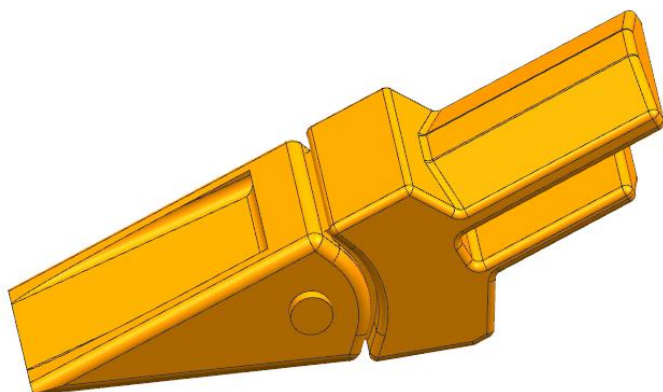
warn

* When working, Please be sure to use protective equipment such as protective glasses.

1. Use a punch to hold the locking pin and use a hammer to knock out the locking pin first.
2. Use a hammer to hit the worn bucket teeth and remove the bucket from the joint. tooth.
3. Remove any dirt adhering to the joints.

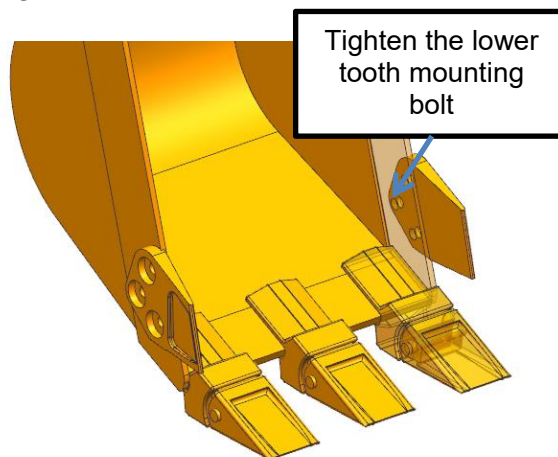


4. Align the new tooth with the adapter and insert it into the adapter.



■ Replacement of side teeth

1. Use a socket wrench, spanner, etc. to loosen the side gear mounting bolts.
2. Install new side teeth and temporarily tighten the bolts.
3. Make sure that the side teeth contact surface is firmly in contact with the bucket metal joint. After touching, tighten the bolts.



- Please use 260 ~ 304N m (26.5 ~ 31kgf • m) Fastening Torque tightening bolts. When the side tooth contact surface is not in contact with the bucket metal joint or when the fixing force is weak, the bolt may loosen.

Long-term storage maintenance

■ When parking for a long time, please store as follows

1. After washing and cleaning all parts, put the machine away. Keep it indoors, not outdoors.
If you have to place it outdoors, please choose a flat surface and Place on the wood and cover with the drop cloth.
2. Please don't forget to add oil, grease and change oil.
3. Apply sufficient oil to the exposed part of the hydraulic cylinder piston rod. fat.
4. Please remove the battery ground wire or remove the battery from the vehicle. Then save it.
5. When the temperature drops to When the temperature is below 0°C, add Antifreeze, or drain the water completely.

■ When using after long-term parking, please do the following

1. Wipe off the grease on the piston rod of the hydraulic cylinder.
2. Start the engine and operate the working device under no-load condition. The movement related to driving allows the oil to flow everywhere fully.
(Parking time exceeds 1 If it lasts more than one month, please implement it every month. 1 Second-rate 1 and 2 operation.)

Use in cold seasons

■ Precautions against low temperatures

1. Engine oil, hydraulic oil
Please replace with oil of specified viscosity.
2. fuel
Choose the appropriate diesel according to the temperature.
3. Battery
Under low temperature conditions, Battery capacity will decrease and charge capacity will decrease Therefore, when you want to stop the engine, Make sure the charging rate is 75% or more, and keep warm Start the next morning. When adding distilled water due to low liquid level, Instead of supplementing after the homework is finished, start the next morning Refill before operation to prevent freezing.
4. Cooling water
Please add antifreeze.
If the temperature drops to Below 0 °C, To Add antifreeze to the cooling water and add it to the radiator and water box to prevent freezing.

● Mixing ratio table of water and antifreeze

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

supplement

- * Antifreeze should be permanent brand or long-life coolant.
- * The mixture of water and antifreeze should be removed after the cooling water is completely drained and the Inject after the scale is removed.
- * Antifreeze is used because rust inhibitors are added to the antifreeze. No need to add detergent.

maintain

* Cooling water

See also " Cooling water replacement " project.

■ Things to note after work is completed

Wipe off the dirt and water attached to the vehicle body and place the track on the mixed On concrete floors or in dry places. Especially on the wheels If the attached soil is not completely removed, then after freezing, Therefore, If there is no suitable parking space, Then, you can park your car after laying wooden boards on the ground, or park your car On the straw mat. If you park directly on the land, then the next morning When the track is frozen, it may be impossible to drive or cause the vehicle to stall. Damage such as damage.

In particular, water drops on the surface of the hydraulic cylinder piston rod must be thoroughly wiped off. Fruit mud and frozen water droplets enter the seal together, then The seal may be damaged.



maintain

Regular replacement of important parts

To ensure the safety of operation and operation at all times, please ensure that the machine users carry out regular maintenance. Safety, especially the following important parts related to safety and fire, should be regularly replaced by the sales store or the repair factory designated by our company. Change.

These parts will change in material over time and are prone to wear and tear or aging. It is difficult to determine its usage status, so after reaching a certain period of use, Even if no abnormality is found, replace it with a new one to ensure Maintain normal function.

However, if any abnormality is found in these parts before they reach their service life, they should be repaired or replaced with new ones according to the usual practice. For the hose part, When the hose clamp is found to be deformed, cracked or other aging signs, it should be replaced with a new one together with the hose clamp .

In addition, hydraulic hoses other than regularly replaced parts must be inspected as follows, and if any abnormality is found , they must be reinforced or replaced.

When replacing the hydraulic hose, please also replace O Rings and sealing parts.

Please entrust the sales store or the repair factory designated by our company to replace important parts.

● When performing the following periodic inspections, also inspect the fuel hoses and hydraulic hoses .

Inspection categories	Inspection items
Daily inspection	Oil leakage from the connections and riveted joints of fuel and hydraulic hoses
Monthly routine inspection	Oil leakage from the connections and riveted joints of fuel and hydraulic hoses Damage to fuel and hydraulic hoses (Cracks, wear, and fuzzing)
Specific self-inspection (Annual inspection)	Oil leakage from the joints and rivets of fuel and hydraulic hoses Interference, cracking, aging, extrusion, damage to fuel and hydraulic hoses (Cracks, wear, and fuzzing)

● List of important parts

No.	Regular replacement of parts	quantity	Replacement time
1	Fuel hose(Fuel tank ~ fuel filter)	1	Every 2 Year or Every 4000 Hourly update Exchange, whichever comes first allow.
2	Fuel hose(Fuel filter ~ fuel pump)	1	
3	Fuel hose(Fuel pump~Fuel nozzle)	1	
4	Fuel hose(Fuel nozzle~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(Stick Cylinder)	4	
9	Hydraulic hose(Bucket cylinder)	4	
10	Hydraulic hose(Swing Cylinder)	2	
11	Hydraulic hose(Bulldozer Cylinder)	6	





12	Hydraulic hose(Auxiliary devices)	6	
13	Hydraulic hose(Rotary motor)	2	



Backhoe Excavator Problems and Solutions

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

	status quo	reason	Disposal
Engine	Cannot start	(1) Misuse of an incorrect key to start the engine. (2) Keys with metal parts (Key rings, etc.)	(1) Display on the instrument panel " Key error ", please use The correct key starts the engine. (2) Remove the metal piece from the key and start the engine.
	When starting is difficult	(1) Fuel is not flowing.	(1) Check the fuel tank, Remove precipitated impurities or moisture. (2) Check the fuel filter and replace it if dirty. Change.
		(2) Air or water mixed into the fuel delivery system	(1) Check the pipes and clamps. If damaged, Replace with new one or repair it. (2) Deflate. See also "Bleeding the fuel system" project)
		(3) When the engine oil viscosity increases in cold weather, the engine rotates by itself heavy.	(1) Fill the radiator with hot water. (2) Use different engine oils according to the temperature. (Winter use SAE 10W30)
		(4) The battery seems to be exhausted, the rotational force is weakened, and there is no There is momentum beyond compression.	(1) Battery charging.
	When the output power is insufficient	(1) Low on fuel.	(1) Refuel.
		(2) The air filter is clogged.	(1) Clean the filter element.
	When you stop suddenly	(1) Low on fuel.	(1) Refuel.
	When the exhaust gas is abnormally black	(1) Bad fuel. (2) Excessive engine oil.	(1) Switch to high-quality fuel. (2) Adjust to normal oil volume.
	Water temperature gauge display " H " (Engine overheating)	(1) The water pump seal is defective. (2) The fan belt is extended or disconnected. (3) Defective thermostat. (4) Insufficient cooling water. (5) The radiator mesh and radiator fins are filled with dust. (6) The rust on the cylinder head and crankcase contaminates the cooling water. (7) Defective radiator cap (evaporation). (8) Cooling water passage corrosion. (9) Continuous overload operation. (10) Cover gasket damaged (Cooling water reduction). (11) The engine oil is low. (12) Fuel injection timing is faulty. (13) Bad fuel.	(1) Make a replacement. (2) Adjust or replace. (3) Make a replacement. (4) Refill to the prescribed amount. (5) Clean up. (6) Replace cooling water and add rust inhibitor. (7) Make a replacement. (8) Rinse. (9) Reduce the load. (10) Make a replacement. (11) Adjust to normal oil volume. (12) Make adjustments. (13) Please switch to high quality fuel.



Hydraulic	Working device (Boom, bucket Rod, bucket) Rotate, drive, dozer Lack of strength, slowness or No action	(1) Insufficient operating oil. (2) Oil leakage from hose and piping joints.	(1) Refill the operating oil. (2) Reinforce or replace.
Driving	Unable to drive smoothly	(1) Tracks are stuck in stones. (2) Track is too tight or too loose.	(1) Remove the stones. (2) Make adjustments.





Precautions for using hydraulic breaker

Precautions when installing hydraulic breaker

Please install a breaker hammer suitable for the machine. If you install a breaker hammer other than the recommended one, it will not only affect the service life of the machine, but also cause safety problems.

In addition, when installing another manufacturer's crushing hammers and front-end working devices, please discuss in advance with the sales store or our designated repair factory.

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.



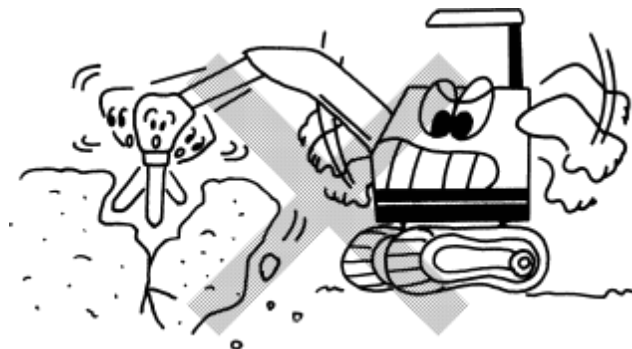
prohibit 2 Movement of rocks, etc. is prohibited

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.



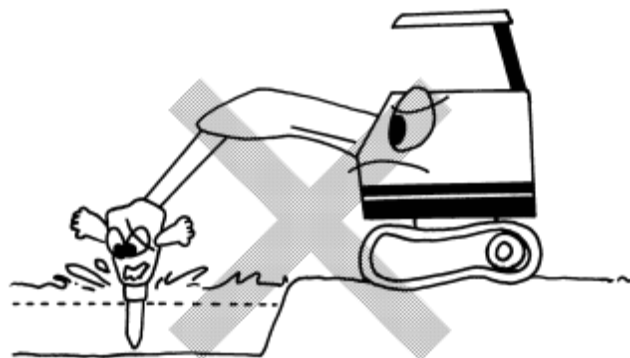
prohibit 3 Prying crushing operations are prohibited

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



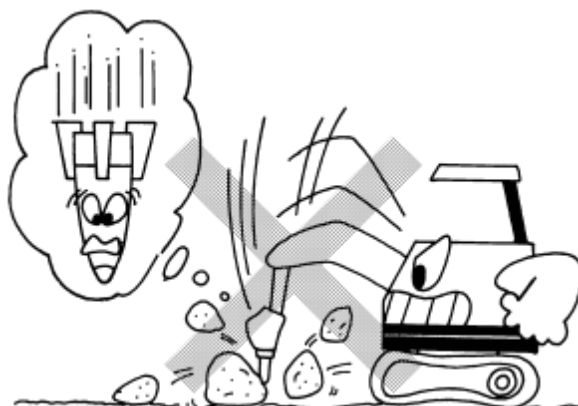
prohibit 4 Do not perform crushing operations in water or mud

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.

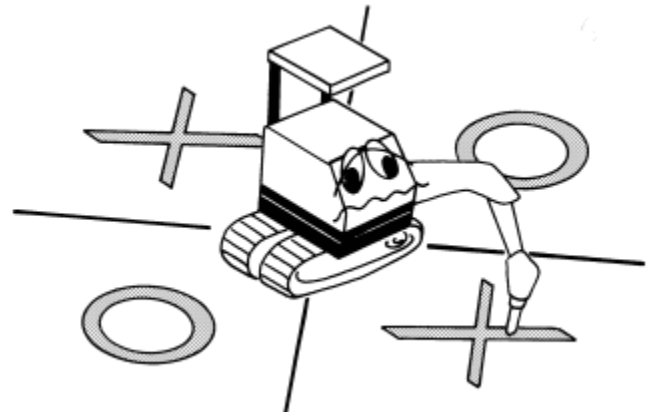
If excessive force is applied to the hammer or the machine, it may Cause damage to the breaker or various parts of the machine.



Precautions for using hydraulic breaker

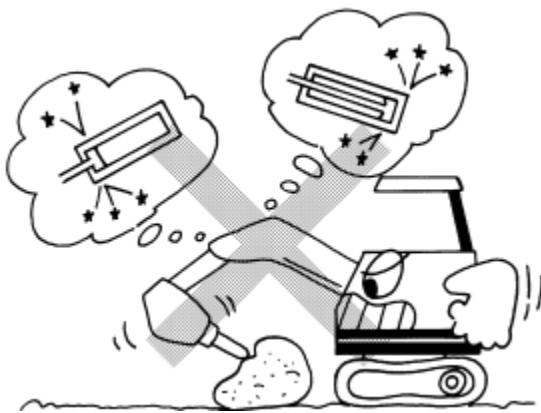
prohibit 6. It is forbidden to operate the machine when the hydraulic cylinder is at the end of the stroke. Crushing operation

Do not break the machine while the hydraulic cylinders are at the end of their stroke. Damage to the hydraulic cylinders or other parts of the machine may be caused if striking is performed when the hydraulic cylinders of the machine are at the end of their stroke (when the cylinders are extended or retracted to their maximum position).



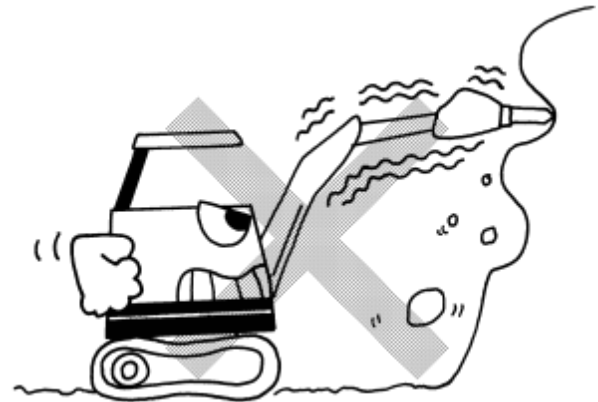
prohibit 9

Horizontal, upward striking operations are prohibited.



prohibit 7 Lifting of cargo is prohibited

It is prohibited to use hydraulic breakers for lifting cargo operations.



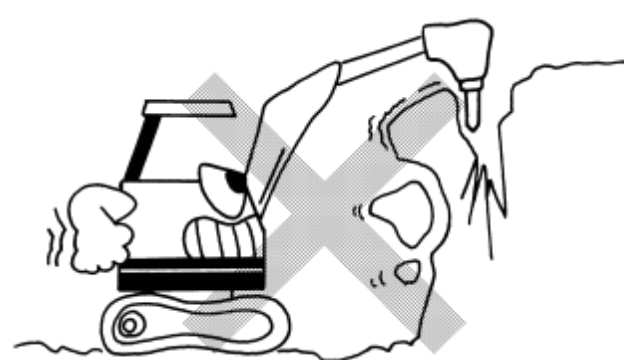
prohibit 10

It is forbidden to carry out high-altitude crushing, otherwise it will cause falling rocks and overturning.



prohibit 8 Do not operate the machine when it is facing sideways.

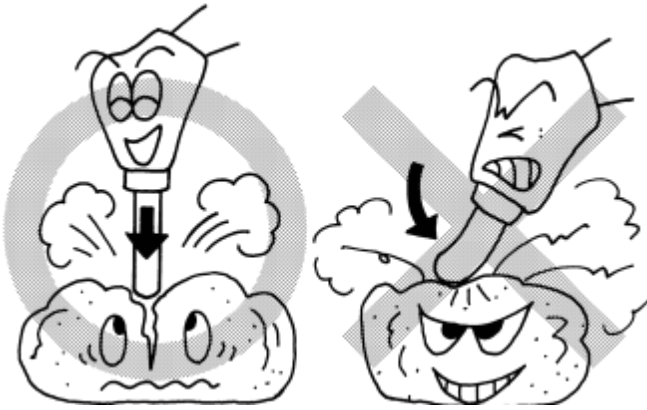
Do not operate the breaker with the machine facing sideways. Otherwise, This may cause the machine to tip over, lowering the wheel section. Service life.



Precautions for using hydraulic breaker

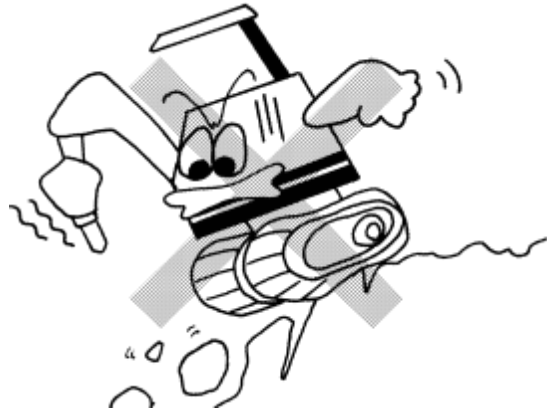
Precautions 1

Please press the chisel vertically on the striking surface to strike. During the striking process, be sure to always apply thrust and never hit in the air.



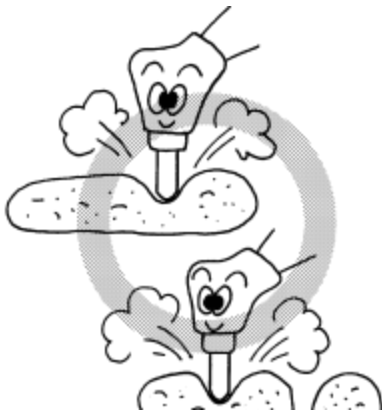
Precautions 3

When pulling up the hydraulic breaker, be careful not to let the steel rod hit the boom or boom cylinder.



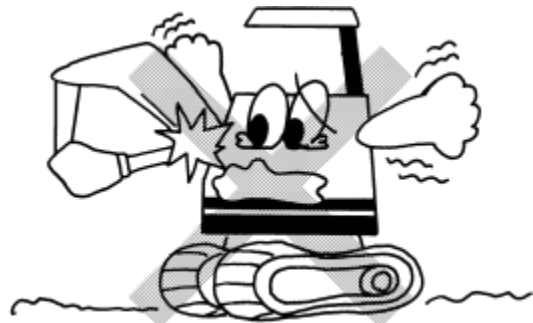
Precautions 2

Continuously strike the same striking surface but fail to 1 Broken within minutes, When penetrating, change the striking surface and chisel from the top to break it. broken.



Precautions 4

Please make sure that the ground under your feet is firm before working.



Recommended grease

RIPPA genuine oil and grease as shown in the table below .

factory	RIPPA working oil	RIPPA Motor Oil	Universal Grease
Shell SHELL	Hydraulic oil 46 (Hydraulic 46)	D30 CD or D10W-30 CD	—
Cartel Oil	—	—	Engineering King General 3 Lithium)

● Recommended lubricants

Manufacturer	Engine oil	Hydraulic oil	Gear Oil
Mobil Mobil	Black Overlord Delvac MX (15W-40) Super Black Overlord Delvac Surper Multigrades (10W-30/15W-40)	DTE 25(VG 46)	Automotive gear oil Mobilube HD 80W-90
Esso ESSO	Chao Li Fu Superflo (10W-40)	NUTO H 46	Gear oil GX 80W-90
Shell SHELL	KingBoss / RIMULA (SAE 10W-30)	Tellus / Tellus ST 46	SPIRAX EP 90
Castrol CALTEX	Super Hercules (RX Super) SAE 15W-40; Hercules (RX Super Plus) SAE 10W-30	HYDRAULIC Series Hydraulic Oil (VG46)	
Gadex TEXACO	Havoline ^a Motor Oil 10W-30		Havoline [®] Gear Oil 80W-90
Horse JOMO	Premium diesel engine oil JOMO DIESEL CF -4 (SAE 15W-40)/ Premium diesel engine oil JOMO DIESEL CD (SAE 10W-30)	JOMO Hydflux (VG46)	Advanced automotive gear oil JOMO GEAR 5

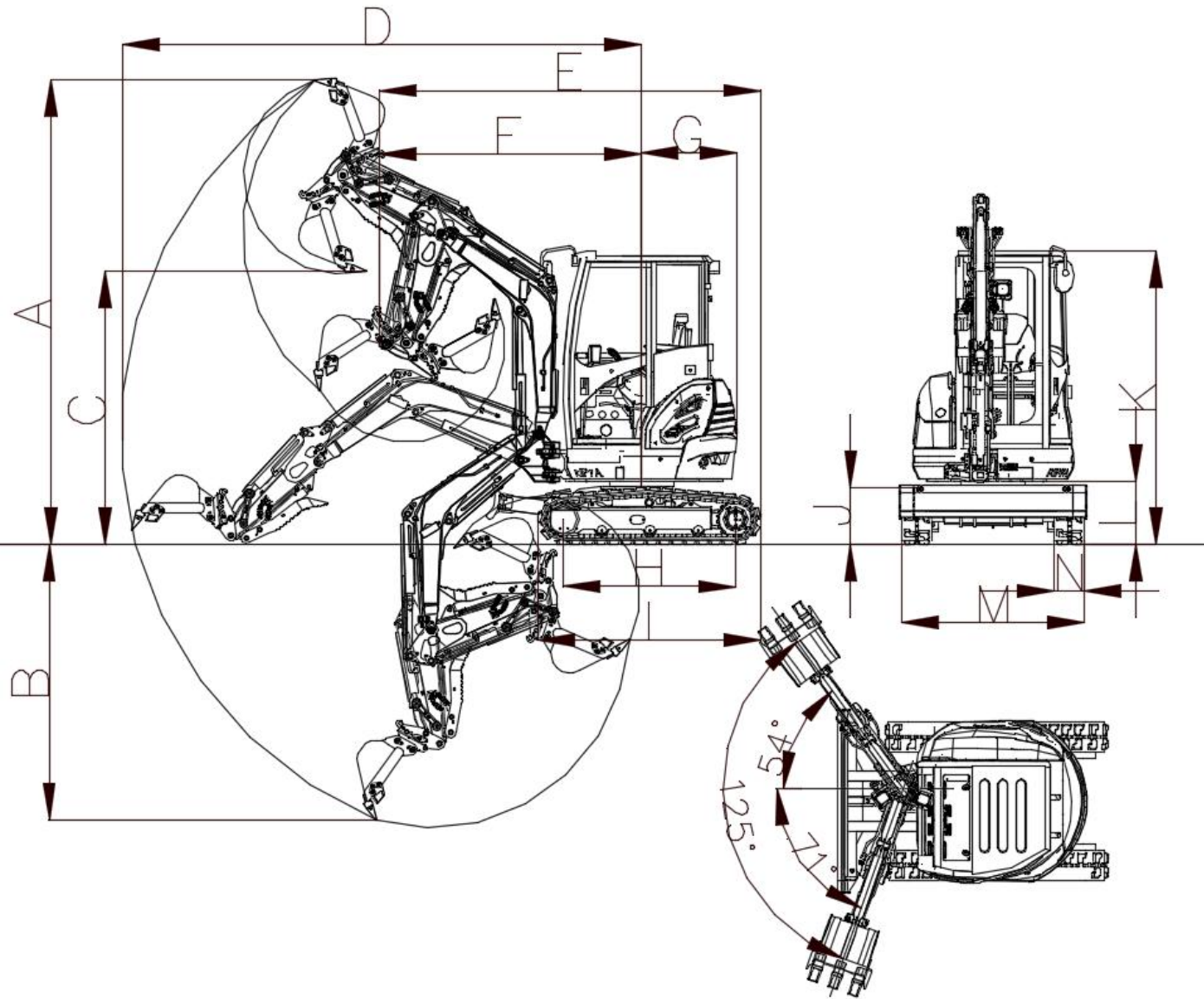
※ When changing the oil, please drain all the oil and then inject new oil. ※ Please use the following fuels.

- 0 # Diesel: Summer use
- -10 # , -20 # , -35 # : Winter, select according to local temperature



Schedule

Dimensions



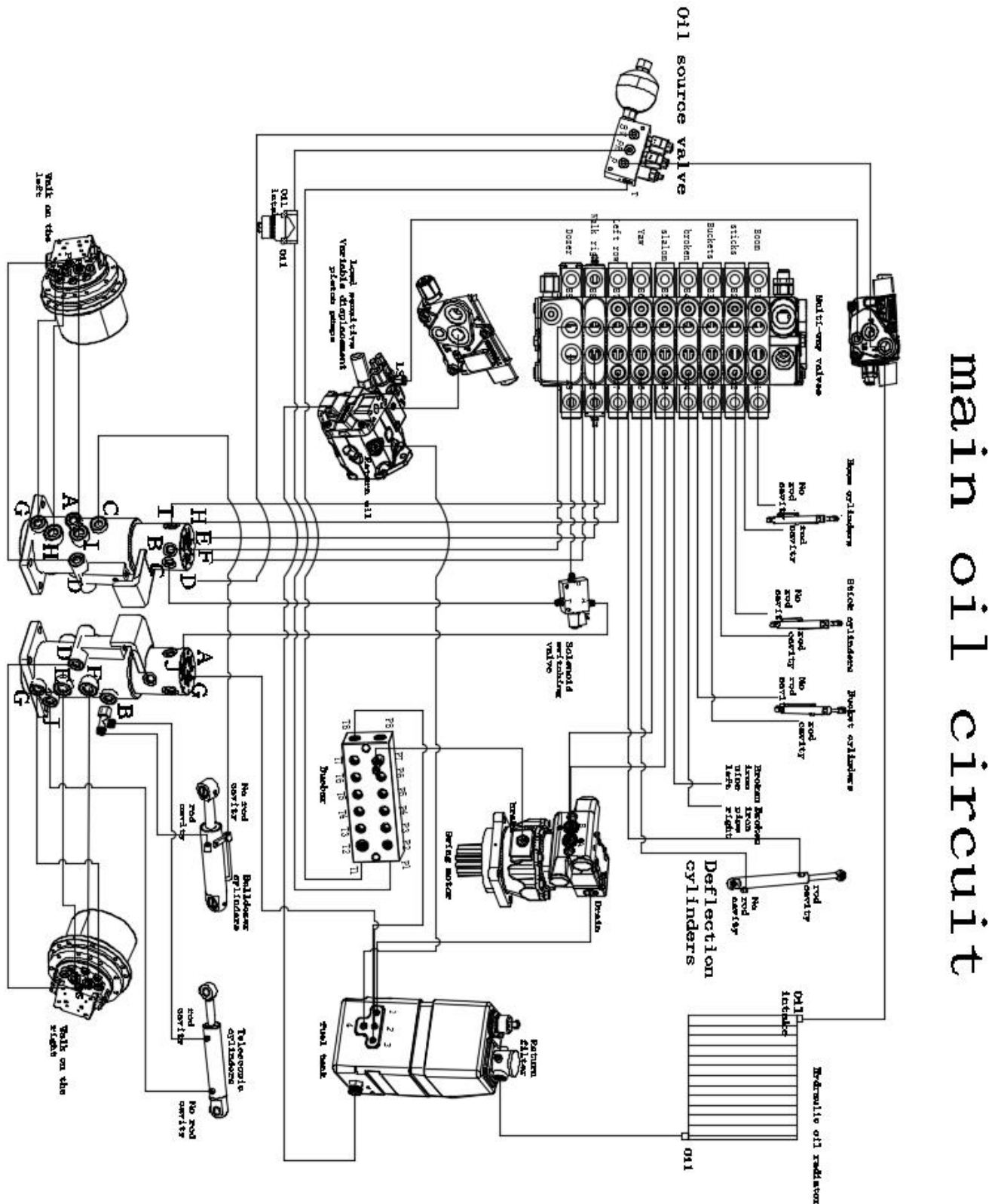
Unit: mm

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
R22	3800	2261	2231	4255	3125	2151	778	1414	1827	465	2400	517	1500
	(N)												
R22	250												

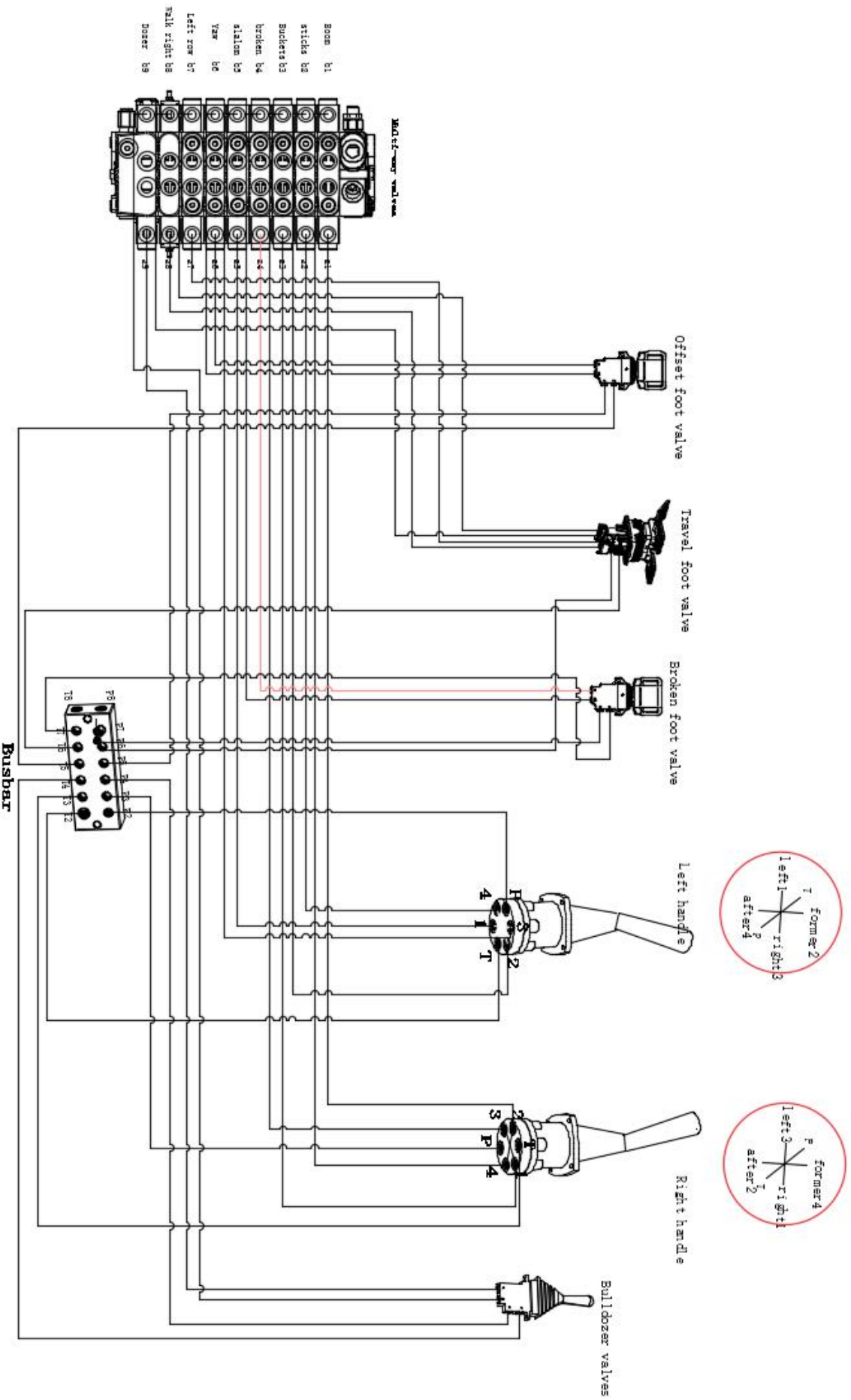


Hydraulic schematics and detailed information

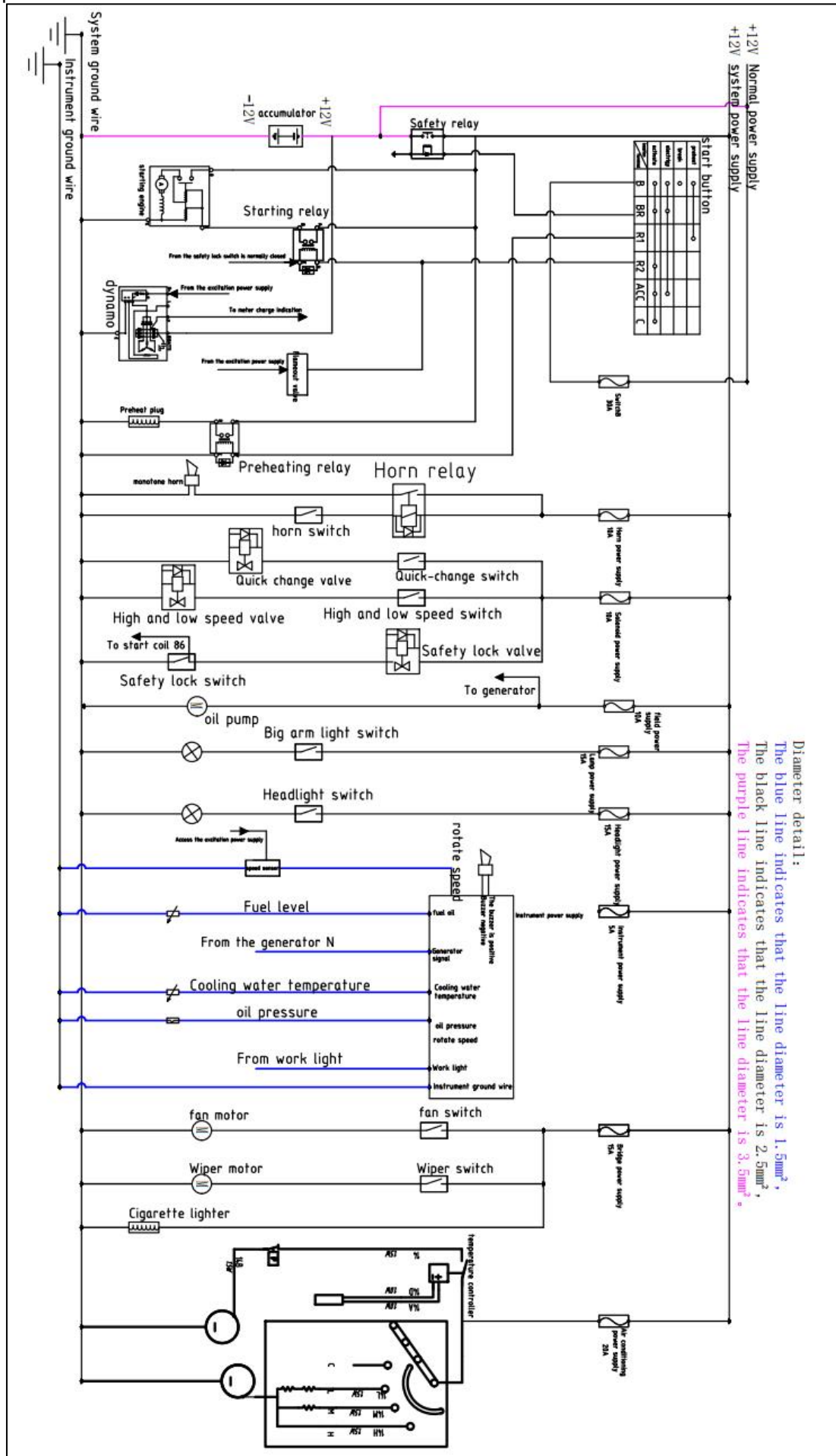
As an important part of hydraulic system design, the hydraulic schematic diagram clearly shows the working principle, structure and control method of the hydraulic system. According to the hydraulic circuit of the machine based on the hydraulic schematic diagram, the problem of hydraulic pipeline can be better solved.



pilot circuit



As an important part of circuit design, electrical schematics are used to clearly show the working principle, structure and control method of the circuit. Based on the electrical schematics, we can have a comprehensive understanding of the electrical layout of the machine and can also be used to troubleshoot electrical problems .



Model information configuration status ● Standard ○ Optional			R22-2		
Basic performance parameters	Machine working weight (kg)	2371.5	engine	Engine Model	Kubota D1105
	Bucket capacity (m³)	0.054		Maximum horsepower (ps)	24.75
	Walking speed low/high (km/h)	0 -1.5/0-2.8		Maximum power (Kw)	18.2
	Climbing ability (%)	30 %		Maximum speed (rpm)	3000
	Ground pressure (Kpa)	33.4		Displacement (L)	1.123
	Maximum digging force (kN)	18.4		Number of cylinders	3
	Maximum digging radius (mm)	4143		Cooling method	Water Cooling
	Maximum digging depth (mm)	2293		Engine oil change amount (L)	4.2
	Maximum digging height (mm)	3761		Fuel form	diesel fuel
	Maximum unloading height (mm)	2496		Fuel grade	0/-10
	Maximum deflection angle (°)	125		Theoretical fuel consumption (L/h)	1.3 -1.5
	Track extension range (mm)	1300-1500	Body	Transport length (mm)	2824
				Transport width (mm)	1300
Configuration	Cab	○		Transport height (mm)	2361
	armrest	-		Counterweight ground clearance (mm)	510
	Quick Change	○		Bucket width (mm)	450
	Hydraulic quick change	○		Boom length (mm)	1830
	Rake	○		Arm length (mm)	1250
	Wood Grabber	○		Bulldozer blade width (mm)	1300
	Scarifier	○	tank	Fuel tank (L)	28
	Breaker	○		Hydraulic oil tank (L)	37
	Counterweight	-	track	0 -Rubber (bandwidth*pitch*number of sections)	250 * 47 * 84
	Tension form	Butter tensioning		0 -Steel (bandwidth*pitch*number of sections)	300 * 101.6 * 43
	air conditioner			Rubber block (piece)	74
Hydraulic system	Main pump type/model	Load Sensing Piston Pump/28			
	Main pump brand	Taifeng			
	Main pump maximum flow (L/min)	67.2L/min			
	Multi-way valve	Load sensitive 9-way hydraulic control valve			
	Multi-way valve brand	Taifeng			
	Rated setting pressure (Mpa)	18			



Hydraulic system	Maximum set pressure (Mpa)	20
	Travel hydraulic motor type	LTM03CDK
	Travel motor brand	Li Kechuan
	Motor displacement	11-20
	Swing hydraulic motor type	BM2-315
	Displacement	15.1





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

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1. Foot pads

2. Accessories

Parts Name	quantity	type
		R 22-2
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

