TP26 MINI CRAWLER EXCAVATOR

OPERATION & MAINTENANCE MANUAL

Samtraks

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INTRODUCTION

- Read this manual carefully to learn how to operate and service your machine correctly.
- Failure to do so could result in personal injury or equipment damage.
- This manual should be considered a permanent part of your machine and should remain with the ma- chine when you sell it.
- This machine is of metric design, and consequently the measurements in this manual are also metric
- Use only metric hardware and tools as specified.
- Right and left-hand sides are determined by facing in the direction of forward travel.
- The images in this book are provided as a rough guide and may vary according to the models.

⚠ CAUTION

- **Never attempt to operate or service this machine until you have first read and understood all of the applicable Safety instructions that are set forth in this Manual.**
- **The failure to comply with all relevant Safety instructions could result in bodily injury.**
- **To assure that this Manual will be conveniently available to future users, always return it to storage compartment, when it is not being used.**
- **The instructions are stored in the vehicle kit.**

Scope of application of this manual:

1. This manual is applicable to the maintenance service personnel of SAMTRACKS and agents and the users with SAMTRACKS ' machines, and can be used for basic operation.

2. This manual is applicable to TP26 models.

SAMTRACKS is not responsible for the following situations:

1. Damage and related losses caused by misoperation, including insufficient coolant, lubricating oil, fuel, over speed, etc;

2. Failure to carry out maintenance on time;

3. Unauthorized maintenance of the machine;

4. Damage caused by using non specified fuel oil, lubricating oil or fuel oil mixed with water, mud and other dirt.

Accessories installing

(a) When installing options or accessories, there are safety or legal issues. Therefore, please contact the dealer of SAMTRACKS in advance.

(b) SAMTRACKS shall not be liable for any injury, accident or product failure caused by the use of unapproved accessories or parts.

(c) When installing and using the optional accessories, read the instructions for the accessories and the general instructions for the accessories in this manual.

Combination of attachments

Different types or combinations of working devices may cause the risk of collision with the cab or other parts of the machine.

Before using unfamiliar working devices, check whether there is any risk of mutual interference and operate carefully.

Two Unapproved modifications

Before modification, contact the dealer of SAMTRACKS . Any modification not approved by SAMTRACKS may cause danger.

Without the approval of SAMTRACKS , SAMTRACKS will not be liable for any injury, accident or product failure caused by modification.

CONTENTS

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1 Introduction

This Operation and Maintenance Manual for theNEX machine is designed to provide you with IMPORTANTANT information and suggestions necessary for using the machine with safety and efficiency.

Please be sure to read through the manual before using the machine, to make yourself familiar with the procedures and instructions for operating, inspecting and servicing. Keep in mind that failure to observe the precautions given in the manual or using any procedures not prescribed in the manual may cause a serious accident.

⚠ WARNING

Improper use of the machine may lead to hazards which can result in death or serious injury. Personnel engaged in operating and maintaining the machine are required to familiarize themselves with the contents of the manual before setting about their job.

- Do not attempt to operate the machine before making yourself familiar with the contents of the manual.
- Personnel responsible for using the machine must keep the manual at hand and review it periodically.
- If the manual should be lost or damaged, promptly order a new copy from the dealer.
- When you transfer the machine to another user, always transfer the manual as well.
- Some machine specifications may differ from those which are described in this manual because of improvements in its design and performance. If you have any questions about the contents of the manual, don't hesitate to contact your dealer.
- IMPORTANTANT safety instructions have been presented throughout this manual, and have been summarized in PART : SAFETY. Be sure to review these pages and pay heed to those safety instructions before proceeding to operate the machine.

2 Safety Information

The following Signal Words have been used in this Manual and on the Safety Signs to indicate the seriousness of the hazards that could be encountered by failing to comply with the applicable Product Warnings, as follows:

DANGER

Could result in death or catastrophic bodily injury.

WARNING

Could result in bodily injury.

CAUTION

Could result in property damage.

IMPORTANT

The signal Word "IMPORTANTANTANT" has been utilized in this Manual to denote those User Directions that must be followed to assure the safe operation and maintenance of the machine.

• **WARNING :** The operator of this machine must be competent and trained for its use.

• **WARNING** : Never attempt to operate or service this ma- chine until you have first read and understood all of the applicable Product Warnings and User Directions that are set forth in this Manual and on the Safety Signs that are affixed to this machine.

The failure to comply with all relevant Safety Instructions could result in bodily injury.

• **WARNING** : Never modify the design of this machine or its engine; never remove or disable any of the installed safety guards or devices; and never use any unauthorized attachments in the operation of this equipment.

The implementation of any unauthorized design modifications or the use of unauthorized attachments could result in bodily injury.

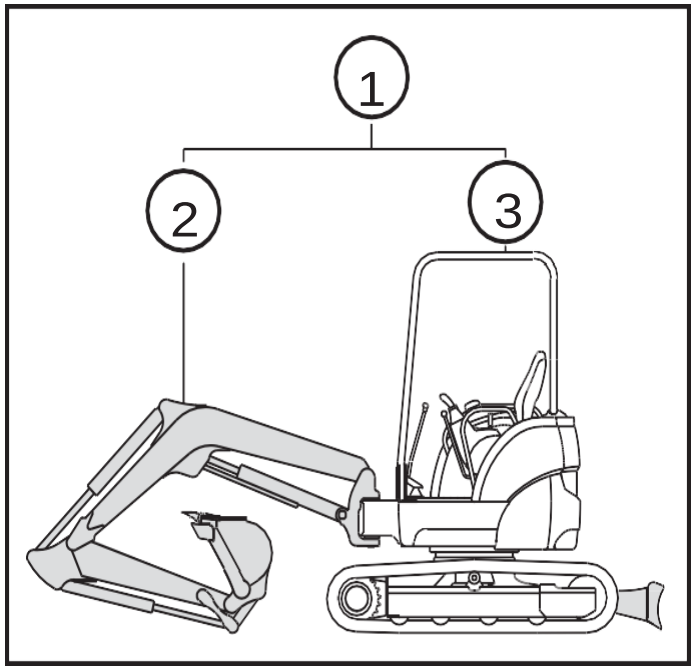
Furthermore, since those actions would expressly violate the terms of NEX Product Warranty, the applicable Warranty would also be voided.

In this Manual, the major sections of the product are designated as follows:

Machine (1).....refers to the entire product.

Implement (2).... refers to the section consisting of the arm,boom and bucket or other attachment.

Machine base (3).... refers to the section consisting of the up perstructure and the undercarriage.



3 Product Overview and regulation

3.1 Intended uses

The machine is intended to perform the following tasks:

- Digging
- Shoveling
- Ditching

3.2 Operation License

Before you operate this machine, confirm the licensing requirements that are applicable to the operation of this machine. Comply with all applicable laws.

Ask your dealer about licensing requirements.

3.3 Lifting

The use of the machine as lifting equipment is subject to the machine Directive 98/37/CE and to the specific legislation of each country.

In case of use not complying with the instructions in this standard, the NEX company declines any responsibility.

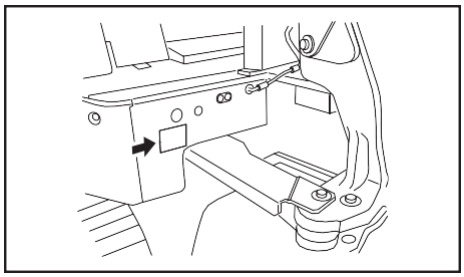
⚠ WARNING

It is prohibited to transport or hoist persons with this machine.

⚠ WARNING

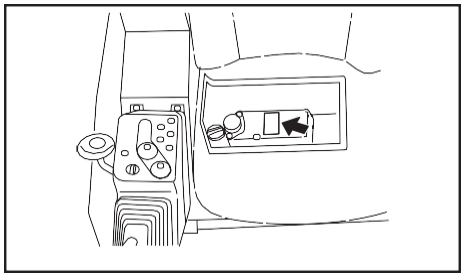
Refer to your NEX dealer for more information

4 Ordering Replacement Parts and Service Call



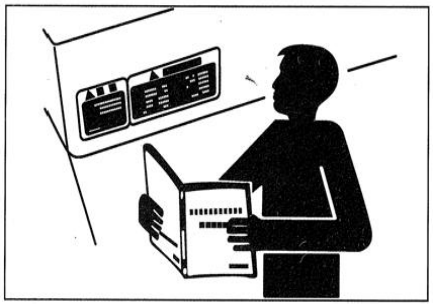
4.1 Location of machine serial number plate

Never remove the plate for any reason.



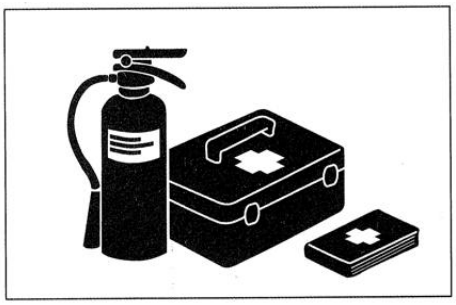
4.2 Location of engine serial number plate

The engine serial number plate is located on the top of the cylinder head cover and on the label on the inside of the engine's bonnet. Never remove the plate for any reason.



4.3 Location of the UK/EC identification plate

The UK / EU identification plate is fixed at the left front position of the platform. The signboard shall not be moved again for any reason.



4.4 Ordering replacement parts and service calls

When ordering replacement parts or calling for service, let your dealer know the model designation, the machine serial number, and the engine serial number on the machine serial number plate as well as the reading of the hourmete Machine serial number plate .

SAFETY

⚠ WARNING

Never attempt to operate or service this machine until you have first read and understood all of the applicable Safety Instructions that are set forth in this Manual.

The failure to comply with all relevant Safety Instructions could result in bodily injury.

5 Basic Precautions

⚠ WARNING

It is the user's responsibility to determine if an application presents any dangerous phenomena, for example: toxic gases, ground conditions requiring special precautions and measures to be taken to eliminate or reduce risks.

Follow safety rules at your workplace

- The operation and servicing of this machine is restricted to qualified persons.
- When operating or servicing the machine, follow all the safety rules, precautions and procedures.
- Any work performed by a team or with a signal person should be conducted in accordance with signals agreed on beforehand.

⚠ DANGER

The machines are not equipped to operate in explosive environments.

Install safety devices

- Make sure that all guards and covers are installed in their correct position. If any of them are damaged, repair them immediately.
- The proper use of all safety devices, such as lock lever, should be well understood by the machine operator.
- Never remove the safety devices. Always make sure that they operate properly. Incorrect operation of the safety devices could cause serious bodily injury.

Fasten the seat belt

- For your safety, the machine is equipped with a Roll-Over Protective Structure (ROPS), a Falling Object Protective Structure (FOPS), a Tip-Over Protective Structure (TOPS) and a safety belt on the seat.
- Always fasten the seat belt and adjust snugly before you operate the machine.
- The seat belt must be replaced after an accident.
- In addition the seat and seat mounting must be checked by your dealer after an accident has occurred.
- If the seat and seat mounting are damaged, they must be replaced

Wear proper clothing and safety items

- Do not wear loose clothing or jewelry that can be caught on the control levers and other machine parts. Also avoid wearing working clothes stained with oil as they can ignite.
- Be sure to wear a helmet, safety goggles, safety shoes, a mask, gloves and other protective items, as appropriate. Take particular precautions when generating metal debris, when striking metal objects with a hammer or when cleaning components with compressed air.
- Also make sure there are no persons near the machine.

Alcohol

- Never operate the machine while you are under the influence of alcohol or when you are ill or feel unwell as this results in accidents.

Provide adequate ventilation when working in an enclosed area

- Engine exhaust fumes are harmful to the human body and their inhalation is extremely hazardous. When starting the engine in an enclosed area, open the windows and doors for ventilation.
- Also do not idle the engine unnecessarily or leave the engine running while the machine is not in use.

Caution for the protection of plants from hot air

- Hot air is exhausted from the muffler and the radiator. If this hot air hits plants directly, they will die.
- Give a cover board to protect plants from the hot air when working near the arranging fence or plant.

Keep fuel and oil away from sources of ignition

- Open flames can ignite fuel, oil, hydraulic oil or antifreeze solutions, which are flammable and dangerous..
- Special attention must be paid to the following matters:
- Keep flammable materials away from lighted cigarettes or matches, or any other sources of ignition.
- Never refuel while the engine is running. Smoking during refueling must be strictly prohibited.
- Firmly tighten the caps on the fuel and oil tanks.
- Store fuel and oil in a cool and well-ventilated place where they are not subjected to direct sunlight.
- Fuel and oil must be stored in a place which meets all applicable safety regulations. Unauthorized persons should not be allowed entry.

Avoid removing filler caps while temperatures are high

- The engine coolant, engine oil and hydraulic oil are hot and under pressure immediately after the machine stops ope- ration.
- Removing caps, draining coolant or oil, or replacing a filter at such a time may cause burns. Allow temperatures to cool down and follow the procedures in this manual.
- When removing the radiator cap, stop the engine and allow the coolant to cool down, then turn the cap slowly to relieve all pressures.
- Before removing the cap from the hydraulic oil tank, stop the engine and turn the cap slowly to relieve all pressure to prevent oil from spouting out.

Avoid harmful asbestos dust

- Air containing asbestos dust is carcinogenic and is hazardous to humans. Inhalation of the air may cause lung cancer. When handling materials that may contain asbestos, keep in mind that:
- Compressed air must not be used for cleaning.
- Water must be used to clean the machine to prevent asbestos from scattering in the air.
- You must work on the windward side when operating the machine in a place where there may be asbestos dust.
- You should wear breathing apparatus as necessary.

Prevent crush injuries by the implements

- Keep hands, arms and all other parts of your body away from all the moving parts, particularly between the implements and the machine and between the hydraulic cylinder and the implements, as pinch points are created in those areas.

Keep a fire extinguisher and first aid kit handy

- The workplace must be provided with a fire extinguisher. Read instructions on the label to familiarize yourself with how to use it.
- Keep a first aid kit in a prescribed place.
- Advise what to do in the event of fire or accidents.
- Indicate who to contact in an emergency and keep their telephone number in a prominent place.

Avoid unauthorized modifications

Precautions for installing optional parts and attachments

- Modifications not recommended by NEX may cause safety hazards.
- When you wish to modify your machine, contact your dealer. The implementation of unauthorized modifications or the use of unauthorized attachments could result in bodily injury, since those actions would also violate, the terms of NEX 's Warranty, it would be voided.
- When installing or using optional attachments, read the operating instructions for the attachments and the Manual Sections relating to the installation of attachments.
- Use only attachments authorized by NEX . The use of unauthorized attachments may affect not only the safety of the machine but also the proper operation and life of the machine.
- The use of unauthorized attachments would also violate the terms of NEX 's Warranty, so that it would be voided.

Caution for cabin glass

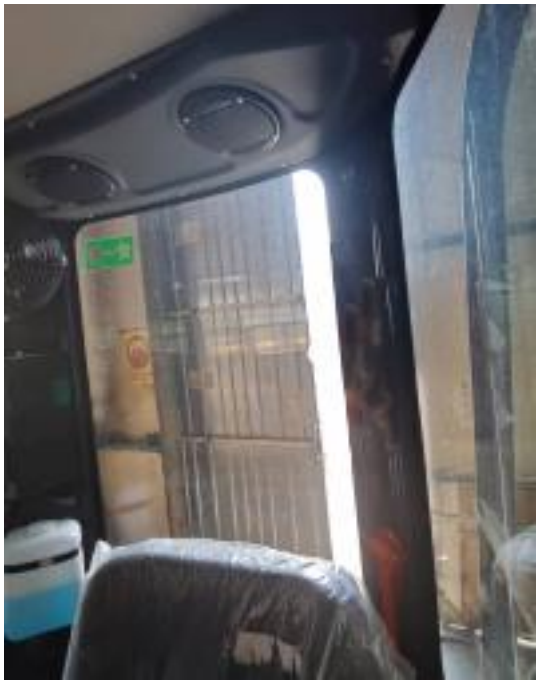
- If the glass of the cabin should be broken by accident, it is very dangerous since the operator’s body might contact the implement directly.
- Immediately stop working to replace the broken glass with a new one.

Fire extinguishers and emergency exits

Fire Extinguisher

Located in the cab at the rear right post.

Users can purchase fire extinguishers produced by regular manufacturers locally by themselves；



Emergency Exit

If it is impossible to escape from the cab door in an emergency,

The escape hammer can be used to break the door and window glass to escape from the vehicle body. Then escape from the rear window.

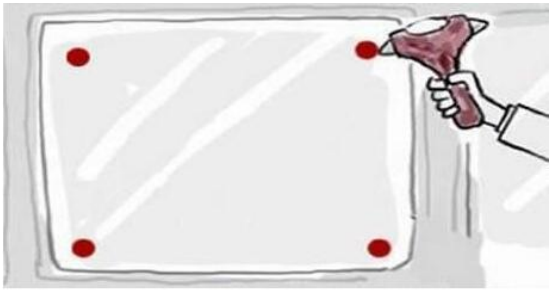
Emergency escape from operator’s cab (for cabin)

- If the door of the cabin should not open, break the window glass with a hammer which is provided inside the cabin to escape from the operator’s cab in an emergency.
- Remove the broken pieces of the window glass from the window frame to prevent any injury by those broken pieces. Besides, watch your step not to slip on the broken pieces of the window glass which dropped around your feet.

How to use safety hammer correctly to escape

1. pick up the safety hammer and hammer the four corners of the tempered glass. Do not knock the middle part. The middle part is the strongest

2. because some glasses are coated, the broken glass will not fall off immediately. We can kick it open



3. after the glass falls off, jump out of the car body in a timely and orderly manner and transfer to a safe place.

6 Operating Precautions

6.1 Precautions before starting the engine

Ensure the safety of your workplace

- Before starting the machine, check to see if there are any hazards in your working area.
- Examine the terrain and soil, and decide the best way to do the work.
- When working on the street, provide a signal person or fence for the safety of vehicles and pedestrians.
- If there are underground utilities at the work site, such as water pipes, gas pipes, high-voltage conduits or others, contact the responsible companies to locate them exactly, so as not to damage them.

Inspect around the operator's seat

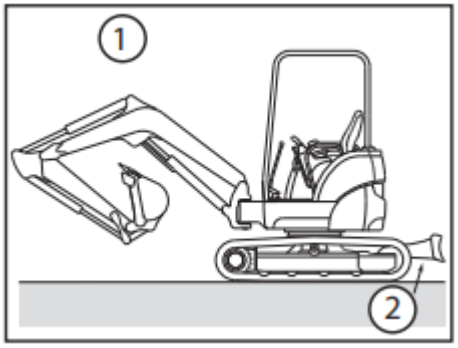
- Dirt, oil and snow on the floor, levers, handrails or steps are slippery and hazardous. Remove them all completely.
- Keep parts and tools away from the operator's seat as they may damage the control levers or switches or create any other hazards.

Signal before starting the engine

- Check the machine carefully before initial start up for the day.
- Make sure there are no persons near the machine before getting on it.
- Never start the engine when the "SERVICING IN PRO- GRESS" tag is attached to the control system.
- Sound the horn to alert people nearby before starting the engine.
- Be sure to start the engine and operate the machine from the operator's seat only.
- Do not allow any other persons to get on the machine.
- Keep the headlights clean
- Keep the surface of the headlights clean for clear view.
- Make sure that your machine is equipped with headlights and all required working lamps, and that they work properly.

⚠ CAUTION

The headlight gets hot when it is turned on. Do not touch it carelessly with your bare hand to prevent burns.



Check the position of the blade before operating the machine

- Check the position of the blade before operating the travel levers. When the blade is located in the back, the operation of the travel levers is reversed.

(1) Traveling in reverse

(2) Blade

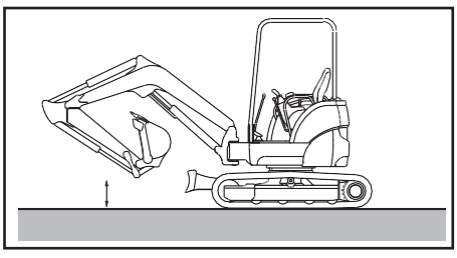
ROPS / FOPS / TOPS

- Never modify the structural member of ROPS / FOPS / TOPS.
- If ROPS / FOPS / TOPS is damaged, replace it immediately to prevent bodily injury. Never repair or modify it.

6.2 Precautions when traveling

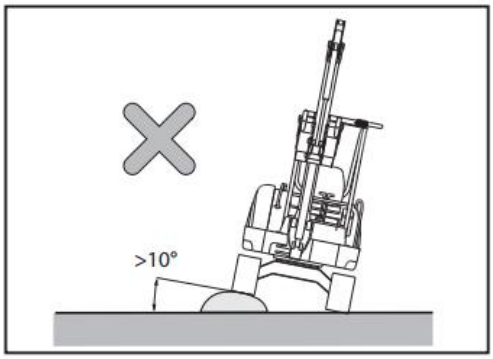
Make sure there are no persons nearby when turning or reversing the machine

- A signal person should be provided for safety when the work site is hazardous or when visibility is poor.
- Keep all other persons away from the work site or the traveling path of the machine.
- Alert persons nearby with a horn or other signal before starting the machine.
- The machine permits a limited range of vision toward the rear. Make sure there are no persons behind the machine before reversing.



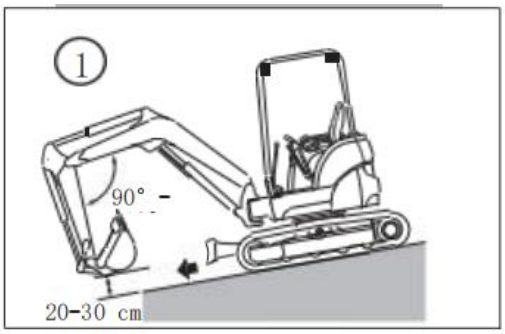
Precautions for traveling

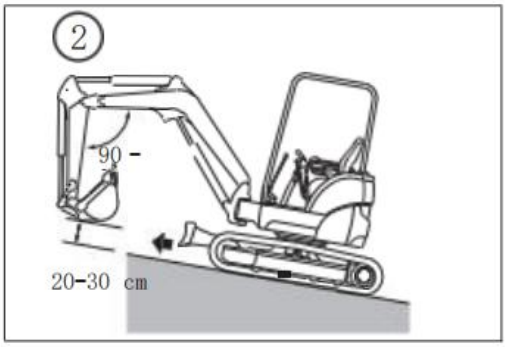
- When traveling with the machine, keep the bucket 40 to 50 cm above the ground with boom and arm folded as illustrated below.
- If you need to operate the control levers while traveling, never move them abruptly.



- Travel the machine at a low speed and slow down when turning on rough terrain.
- Avoid running over obstacles if possible. If unavoidable, run the machine at a low speed while keeping the implement close to the ground. Never run over obstacles that may cause the machine to tilt more than 10 degrees.

Running the machine on a slope





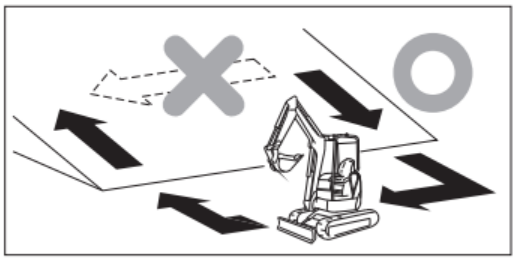
- Run the machine carefully on a slope to avoid overturning or skidding side wards
- When running the machine on a slope, keep the bucket 20 to 30 cm above the ground so that you can immediately lower it to the ground and stop the machine in an emergency.
- Never turn the machine on a slope or run it across the slope.
- Move down to flat ground and then make a turn.
- On grasses, dead leaves or a wet metal plate, even with a slight gradient, the machine will easily slip. Under those circumstances, run the machine carefully at low speed to prevent it from skidding.

(1) Going down a slope

(2) Going up a slope

Note: For the maximum accepted gradient, refer to the specification table.

Braking when going down a slope



- When going down a slope, you can automatically brake the machine by setting the travel levers to the neutral position.

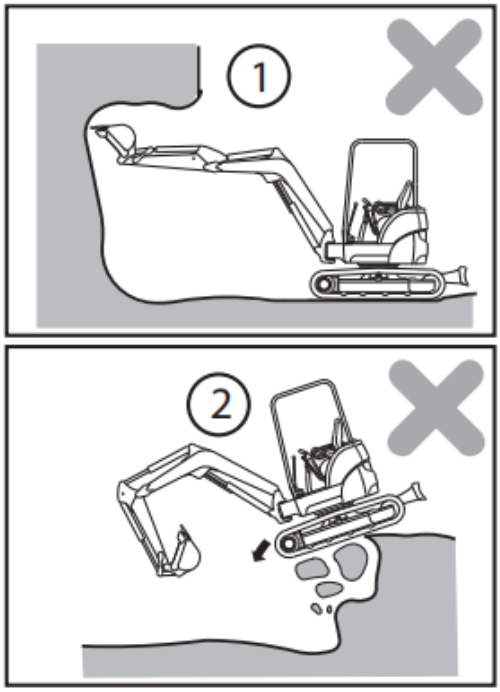
When the crawler is slipping

- If you cannot climb a slope by operating the travel levers because the crawler is slipping, retract the arm and make use of the pull-back power of the implement to climb the slope.

When the engine stops

- If the engine stops while climbing a slope, set the travel levers to the neutral position, stop the machine, and restart the engine.

6.3 Precautions when working



Avoid hazardous work

- Undermining a cliff is dangerous as it may cause a rock slide or landslide.
- Undercutting the machine is dangerous as it may cause a cave-in, resulting in the machine overturning and falling into the excavation.

(1) Undermining

(2) Under cutting

⚠ DANGER

Keep away from electric power lines

- Working in the vicinity of overhead electric power lines presents a very serious hazard and special precautions must be taken. For purposes of this manual you are considered to be working in the vicinity of overhead power lines when the attachment or load of your machine, in any position, can reach to within the minimum distances shown in the table.
- The following procedures are effective in preventing accidents or injuries.

1) Wear shoes with rubber soles.

2) Use a signal person to warn the operator when the ma- chine is getting too close to a power line.

- If the machine should contact a wire, the operator must not leave the seat.
- When working near power lines, caution all ground personnel to stand clear of the machine.
- To determine the transmission voltage at the working site, contact the electric utility concerned.

	Transmission voltage (V)	Minimum safe distance (m)
Power distribution	100/200 or less	2 or more
	6600 or less	2 or more
Transmission line	22000 or less	3 or more
	66000 or less	4 or more
	154000 or less	5 or more
	275000 or less	7 or more

Prevent bumping the implements

- When traveling through tunnels or under bridges, or working at a site near other overhead obstacles, operate the machine carefully so as not to bump the boom, arm, or the implement against those overhead obstacles.

Work only where visibility as good

- When working in a dark place, light up the area with the work lights and head lights, and prepare extra lighting equipment as necessary.
- Stop working when fog, snow or rain impedes your view.

Work carefully in a snow-covered areas

- A snow-covered ground and icy roads are dangerous as they may cause the machine to skid even on a slight slope. Run the machine at low speed, and never start, stop or turn abruptly on such ground or under such road conditions.
- Be careful removing snow as road shoulders or other hazards may be buried under snow.

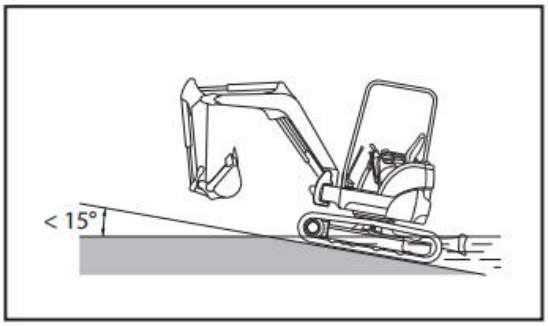
Unstable ground creates a high possibility of overturn

- Keep away from cliffs, road shoulders or trenches if possible as the ground near them is unstable. The ground may

crumble due to the weight or vibrations of the machine, resulting in an overturn or fall of the machine. Be particularly careful when working immediately after rainstorm or after blasting as the ground may be unstable.

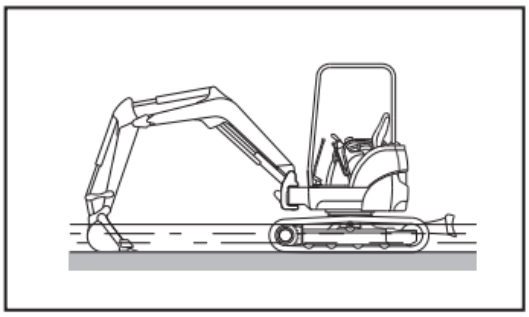
- Ground-fills or ground near a ditch may be unstable and may crumble due to the weight or vibrations of the ma- chine, causing the machine to tilt. Much caution must be taken in working in these areas.
- When working in an area where there is a high possibility of falling rocks, wear a hard-hat and stay under the canopy.

Allowable water depth

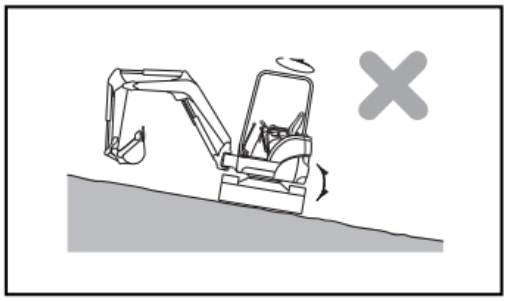


⚠ IMPORTANTANT

When driving out of water, if the machine climbs a slope at an angle of more than 15 degrees, the rear of the upper structure may submerge too deeply in the water, which may damage the radiator fan since the radiator fan paddles the water. Avoid this if possible when driving out of water.



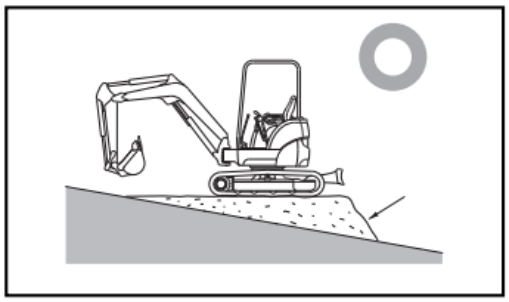
- The limit of the water depth in which the machine can be used in is up to the center of the shoe slide plate.
- Apply a generous amount of grease to the moving parts (especially bucket pin) that have been submerged in the water for a long time until the used grease is extruded out of the bearings.
- Wipe the extruded used grease off with a waste cloth.



Working on a slope

- Be aware that the machine may tip over when swinging the upper structure or swinging the implement on a slope.
- Never swing the upper structure toward the downward side of the slope with earth loaded in the bucket.

(See the illustration)

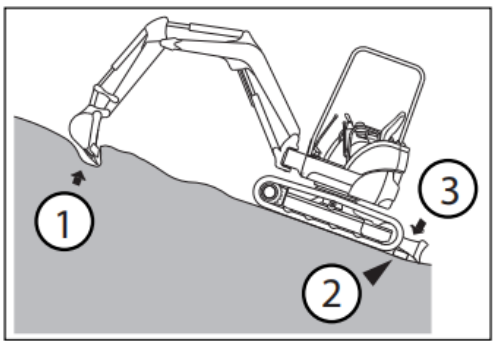


- If swinging is unavoidable, level off a work area to maintain the machine as horizontal as possible, then swing.

  See the illustration)

Note: For the maximum accepted gradient, refer to the specification table.

6.4 Precautions for parking



Parking the machine

- Park on level ground. If park on a slope is unavoidable, block the tracks with solid pieces of wood and dig the bucket into the ground. (See the illustration)
- If necessary to park the machine on the side of a road, set up a warning flag, fence, or lamp that can be easily recognized by passing cars and pedestrians but does not impede them.

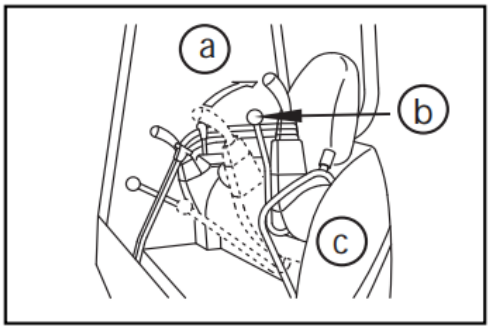
(1) Dig the bucket into the ground

(2) Block

(3) Place the blade on the ground

⚠ CAUTION

- **Do not touch the control levers accidentally. Other- wise, the implement or the machine may move unexpectedly, causing a serious accident.**
- **When leaving the operator's seat, be sure to place the lock levers securely in the lock position and remove the starter switch key.**



1) Set the left and right travel levers to the neutral position to stop the machine.
2) Idle the engine with the accelerator lever.
3) Place the bucket on the ground with its bottom surface in contact with the ground.
4) Place the blade on the ground.
5) Set the lock levers to the "LOCK" position.

   (a) Lock

   (b) Lock lever

   (c) Left side

Use handrails and steps when getting on and off

- Do not jump on or off the machine. Never get on or off a machine in motion as it may result in bodily injury.
- When getting on and off the machine, face the machine and use the handrails and steps.
- Do not use control levers as handrails.
- Make sure that you maintain three point contact with the handrails or the steps.
- If the handrails and the steps are soiled with oil or dirt, clean them off immediately. Repair any damaged parts and retighten any loose bolts.

6.5 Attachment precautions

⚠ WARNING

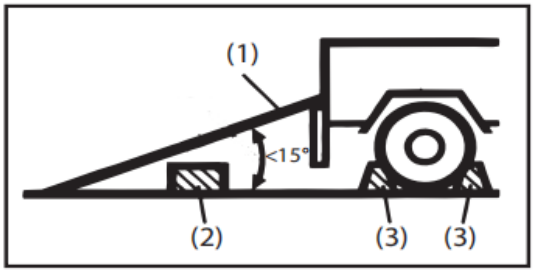
Be careful when setting up and dismantling the attachments. An attachment not adapted to the machine can destabilise it.

When you install or remove the attachments, comply with the following precautions:

- Place the machine on hard, flat ground.
- Shutdown the engine.
- Keep the parts clean and well lubricated.
- Never install attachments that exceed the maximum accepted overall dimensions.
- Never stand under a suspended load.

It is recommended that the user acquaint himself with and retain the instructions relating to the installation and use of the attachment.

6.6 Precautions for transportation



Precautions for loading and unloading the machine

(1) Ramp plate

(2) Block

(3) Stoppers

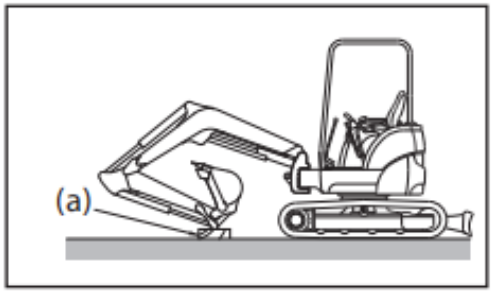
- Be careful in loading and unloading the machine, because it is a job of high hazard potential.
- Load or unload the machine at a low engine speed, and low travel speed.
- Load or unload the machine on the level, solid ground away from the shoulder of the road.
- Use ramp plates of adequate strength with hooks on their ends.
- Check to see that the ramp plates are wide, long, and thick enough to sustain the load so that you can load or unload the machine safely. Support the ramp plates with blocks, to provide additional strength.
- Securely hook the ramp plates to the deck of the truck so that they will not come off.
- Remove grease, oil, and other slippery deposits from the ramp plates, and remove mud from the tracks to prevent the machine from skidding on the ramp plates.
- Do not load or unload the machine if the ramp plates are slippery because of rain, snow or ice.
- Never change travel direction while on the ramp plates. If you need to change travel direction, go down the ramp plates, and change direction on the ground.
- After loading the machine, block it with lumber and secure the machine with a chain or a wire rope so that the ma- chine will not move during transit. (Refer to Chap. 12.2 'Machine tie-down' in this manual.)

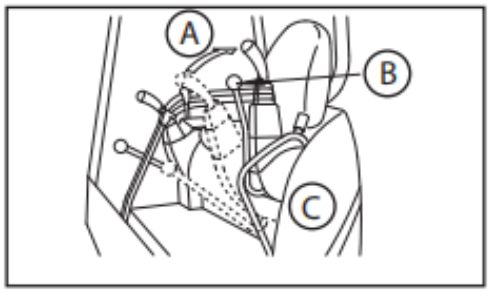
Precautions for transporting

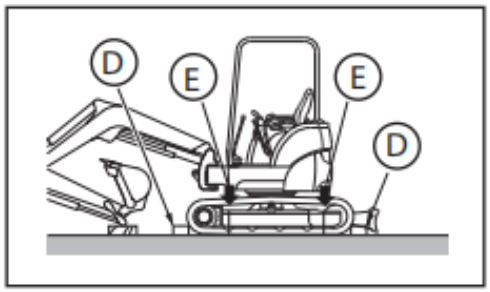
- Transport the machine safely in accordance with the laws associated with applicable law.
- Select a travel route consistent with the width, height and weight of the machine loaded on the truck.

⚠ CAUTION

Load or unload the machine on level, solid ground far away from the shoulder of the road.







After loading the machine in a safe position on the truck, secure the machine as follows:

1) Place the blade down on the ground.
2) Extend the bucket and arm cylinders to the maximum limit, and slowly lower the boom down on a block of wood (a).
3) Stop the engine and take the key out of the starter switch. (The brake works to lock the swing motor.)
4) Be sure to lock the control levers with the lock levers.
5) Provide wood blocks in the front and back of the crawler and secure the machine with a chain or a wire rope so that the machine will not move during shipping. In particular, be sure to secure it to prevent skidding.

A = Locked

B = Lock lever

C = Left side

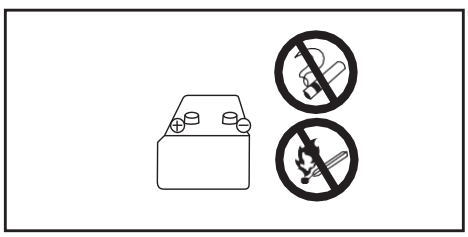
D = Blocks

E = Belts

IMPORTANT

To protect the bucket cylinder from being damaged during shipping, place a wooden block under one end of the bucket to prevent it from directly touching the deck of the truck.

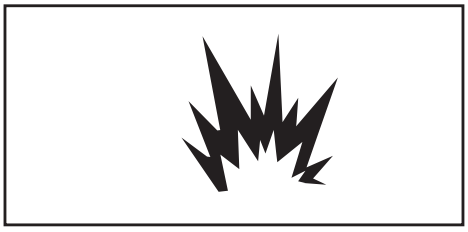
6.7 Precautions for the battery



⚠ DANGER

Be careful in handling the battery

- The battery electrolyte contains dilute sulfuric acid, which can severely burn the eyes or skin. Always wear safety goggles and protective clothing when servicing the battery. If contact with the eyes or skin should occur, flush with a large amount of water and obtain prompt medical treatment.



- Because flammable hydrogen gas is produced by the battery, ignition and explosion may occur. Keep flames and sparks away from the battery.
- If you swallow battery electrolyte by mistake, drink a large amount of water, milk, or fresh eggs, and obtain medical treatment immediately.

- Before checking or handling the battery, be sure to stop the engine and turn the starter switch to the "OFF" position.
- Be careful not to cause a short circuit by placing a tool across the terminals of the battery.
- If a terminal connection is loose, sparks may be generated due to contact failure, causing possible ignition and explosion. Be sure to connect the terminals securely.

⚠ ATTENTION

Observe the procedures for starting the engine using booster cables

- When you start the engine using booster cables, wear safety goggles.
- If you start the engine by taking electric power from another machine, do not allow your machine to contact the other machine.
- To connect the booster cables, begin with the positive terminal, and to disconnect them, begin with the negative terminal (ground side).
- If a tool simultaneously touches the positive terminal and the machine, potentially hazardous sparks may be genera- ted.
- Do not connect the booster cables to the terminals in re- verse polarity. In other words, never connect the negative terminal on one machine to the positive terminal on the other machine.
- As the last step, connect the negative booster cable terminal to the upper structure frame. At that time, sparks will be generated. Consequently, connect the terminal to a point as far away from the battery as possible.

7 Precautions for Servicing

7.1 Precautions before servicing

- Attach the "SERVICING IN PROGRESS" tag to an implement control lever.
- If another person should start the engine or operate the control levers while service is in progress, the service personnel can sustain serious bodily injury.
- Attach the "SERVICING IN PROGRESS" tag indicating "Servicing in Progress" to one of the implement control levers.

Use appropriate tools

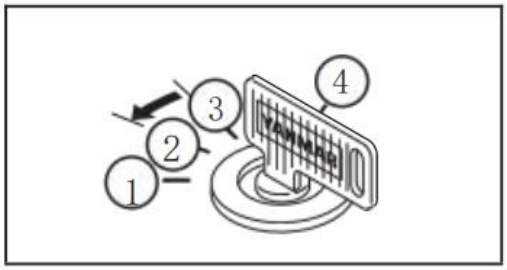
- Using damaged or worn tools or using tools inappropriate for the required application is very dangerous, and may also cause damage to the machine. Make sure to use the tools that are appropriate for the specific job.

7.2 Replacing Essential Parts Periodically

- For safe operation, the machine must be serviced periodically. To increase safety, be sure to periodically replace the parts listed in the table of safety parts on the next page. A fire could result if they deteriorate or are damaged.
- These parts are vulnerable to age and wear or deterioration and it is difficult to determine the degree to which they have deteriorated on the occasion of periodic service. To maintain their proper function at all times, therefore, re- place them with new ones after using them for a specific period of time even if no abnormality is found with the parts.
- If you find abnormalities in these parts before their scheduled replacement time is reached, repair or replace them immediately.
- If a hose clamp is deformed or cracked, replace it immediately.
- Check the hydraulic hoses (which are not periodic replacement parts). If any abnormality is found in them, retighten them or replace them immediately.
- When replacing the hydraulic hoses, replace the O-rings and seals at the same time.
- For further information about replacing the safety parts, ask your dealer.

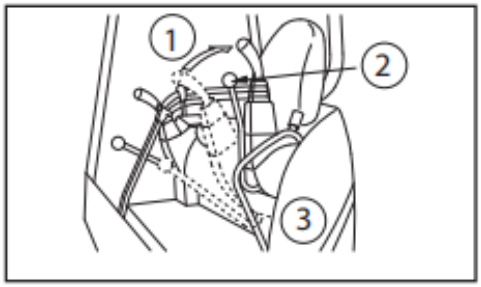
- Check the fuel and hydraulic hoses according to the periodic schedule described below.

Check categories	Check points
Start-up check	Oil leak from the connections or bodies of the fuel and hydraulic hoses
Voluntary monthly check	Oil leak from the connections or bodies of the fuel and hydraulic hoses Damage (crack, wear, or peeling) of the fuel and hydraulic hoses
Prescribed annual check	Oil leak from the connections or bodies of the fuel and hydraulic hoses Interference, crushing, aging, torsion, or damage (crack, wear, or pee- ling) of the fuel and hydraulic hoses



Stop the engine before beginning the inspection and servicing

- Be sure to stop the engine before performing inspection and servicing.
  1) Preheat
  2) Off
  3) On
  4) Start
- If necessary to perform service while running the engine, as when cleaning the inside of the radiator, be sure to set the lock lever to the lock position and do the job together with a partner.



a = Lock

b = Lock lever

c = Left side

- (One should take the operator's seat so that he or she can stop the engine at any time.)
- That person must be careful not to touch any levers in the cabin.
- Be extremely careful not to contact the moving fan or fan or fan belt, or any hot surfaces.

7.3 Precautions during servicing

Keep unauthorized persons away

- Never admit any persons into the work area who are not taking part in the work. Be conscious of the safety of other persons.
- Be especially careful when grinding, welding, or using a large hammer.

Removed attachments

- When an attachment is placed on the ground or against a wall after removing it or prior to reinstalling it, be sure that it is stable to prevent it from falling down.

Working under the machine

- Before performing service or repairs underneath the ma- chine, place the implement on the ground in its lowest position.
- Be sure to apply blocks to the tracks to lock the tracks securely.
- Never perform service underneath the machine if it is not completely stable.

Pressure equipment (accumulator)

- The machines are equipped with an accumulator. This pressure equipment complies with the prescriptions of Article 3 Paragraph 3 of the European directive (97/23/CE) on pressure equipment. In view of Article 3 Paragraph 3, the acronym EU cannot be affixed on this device.
- The pressure equipment (accumulator) is pressurized. Re- pair, maintenance and commissioning must be done only by qualified personnel.
- Do not open and carry out modifications to the pressure equipment.

Keep the machine clean

- Spilled oil or grease, or scattered parts are dangerous and can cause falls. Keep the machine clean.
- Getting water into the electrical system may cause it to malfunction, resulting in faulty operation of the machine. Also it may permit electrical leaks that could cause a fire or electric shocks.
- Never clean the sensors, connectors or the operator's seat with water or steam.

Radiator cooling water level

- Before checking the radiator cooling water level, stop the engine and wait until the engine and the radiator have coo- led down.
- Slowly loosen the cap to release the inner pressure before removing the cap.

Use an explosion-proof lighting source

- Use an explosion-proof lighting source when checking the fuel, the oil, the cooling water, or the battery electrolyte. Failure to use an explosion-proof lighting source may cause ignition to occur, inducing an explosion.

Precautions for handling battery

- When welding or repairing the electrical system, disconnect the negative terminal of the battery to interrupt the electric circuit.

Handling high-pressure hoses

- Leaks of fuel and oil could cause a fire.
- Do not bend a high-pressure hose forcibly, or strike it with a hard object. Because abnormally bent or damaged pi- ping, tubes, and hoses easily burst under high pressure, never use them.

Be careful of hot oil under high-pressure

- The hydraulic system for the implement operates under high pressure. When replenishing or draining hydraulic oil, be sure to first relieve the high pressure.
- The emission of hot oil under high-pressure from a small leak could result in serious bodily injury. Wear safety goggles and thick gloves when checking for leaks. Use a piece of cardboard or a plywood block to detect emissions of hot oil.
- If the hot oil should contact your body, obtain prompt medical treatment.

Hazards from the high-pressure grease when adjusting the track crawler tension

High-pressure grease is enclosed in the track crawler adjuster. Failure to use the specified procedures for adjusting the track crawler tension, could cause grease plugs or nipples to eject, which could result in bodily injury.

- Do not loosen the grease draining plug more than one turn.
- Never position your face, hands, legs, or body in line with the grease draining plug and valve.

Rotating radiator fan and fan belt

- Never contact the rotating radiator fan or fan belt with any object.
- Contacting the rotating radiator fan or fan belt with any object can result in serious bodily injury.

Processing wastes

- Do not dispose of waste oil in the sanitary sewer system.
- Always drain the oil from the machine into a secure container, and never directly to the ground.
- When disposing of toxic wastes such as fuel, oil, cooling water, solvent, filters, and spent batteries, comply with all applicable disposal regulations.

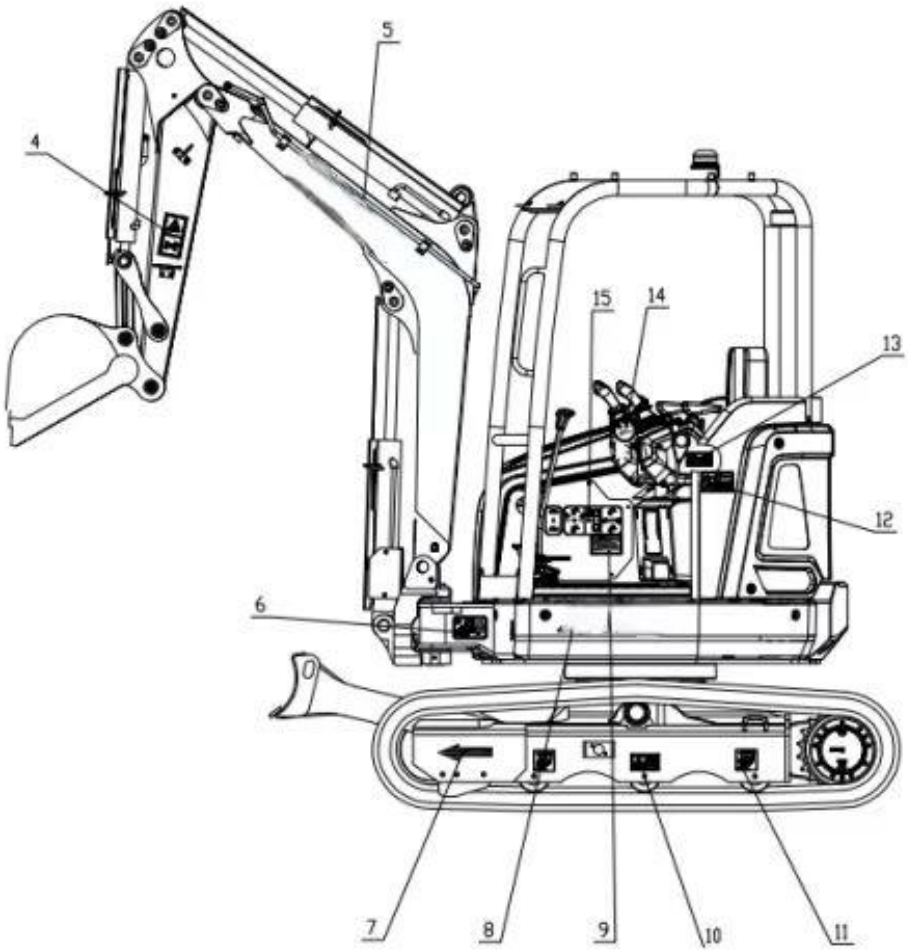
8 Safety Messages (Warning Labels)

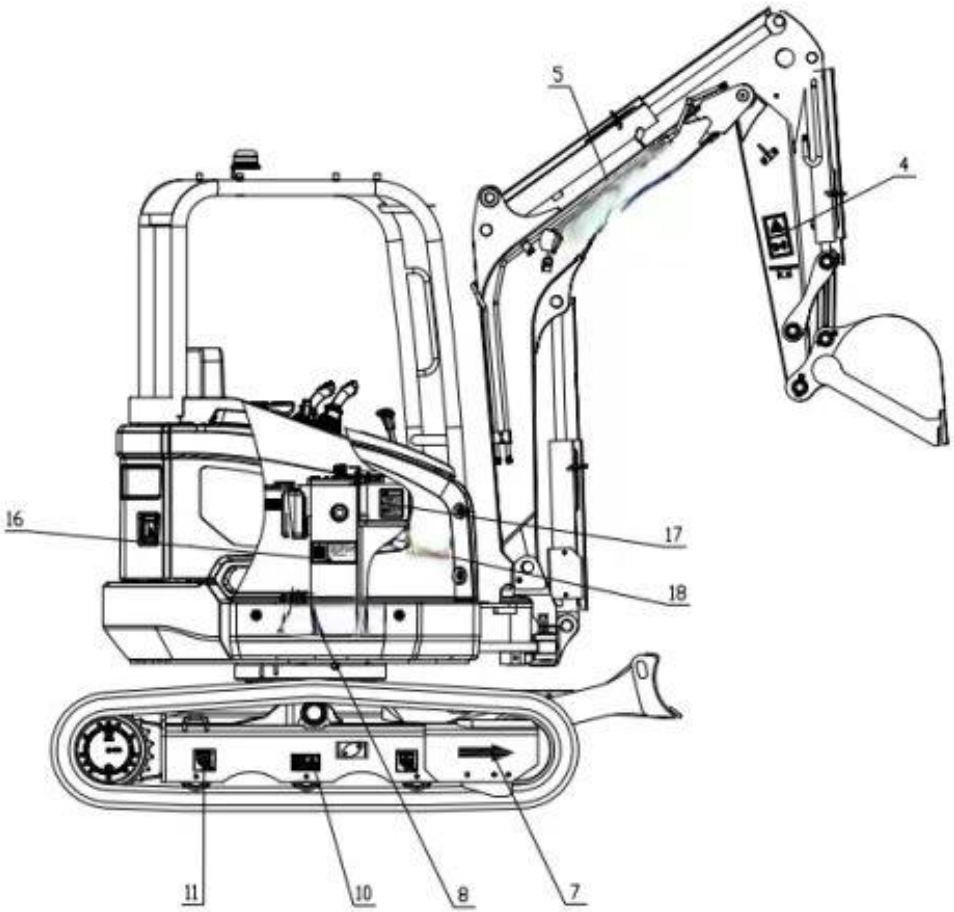
There are a number of Warning Labels on the machine. Full descriptions of all Warning Labels and their locations are re- viewed in this section. Periodically confirm whether all Warning Labels are still mounted in their correct locations and can be easily read.

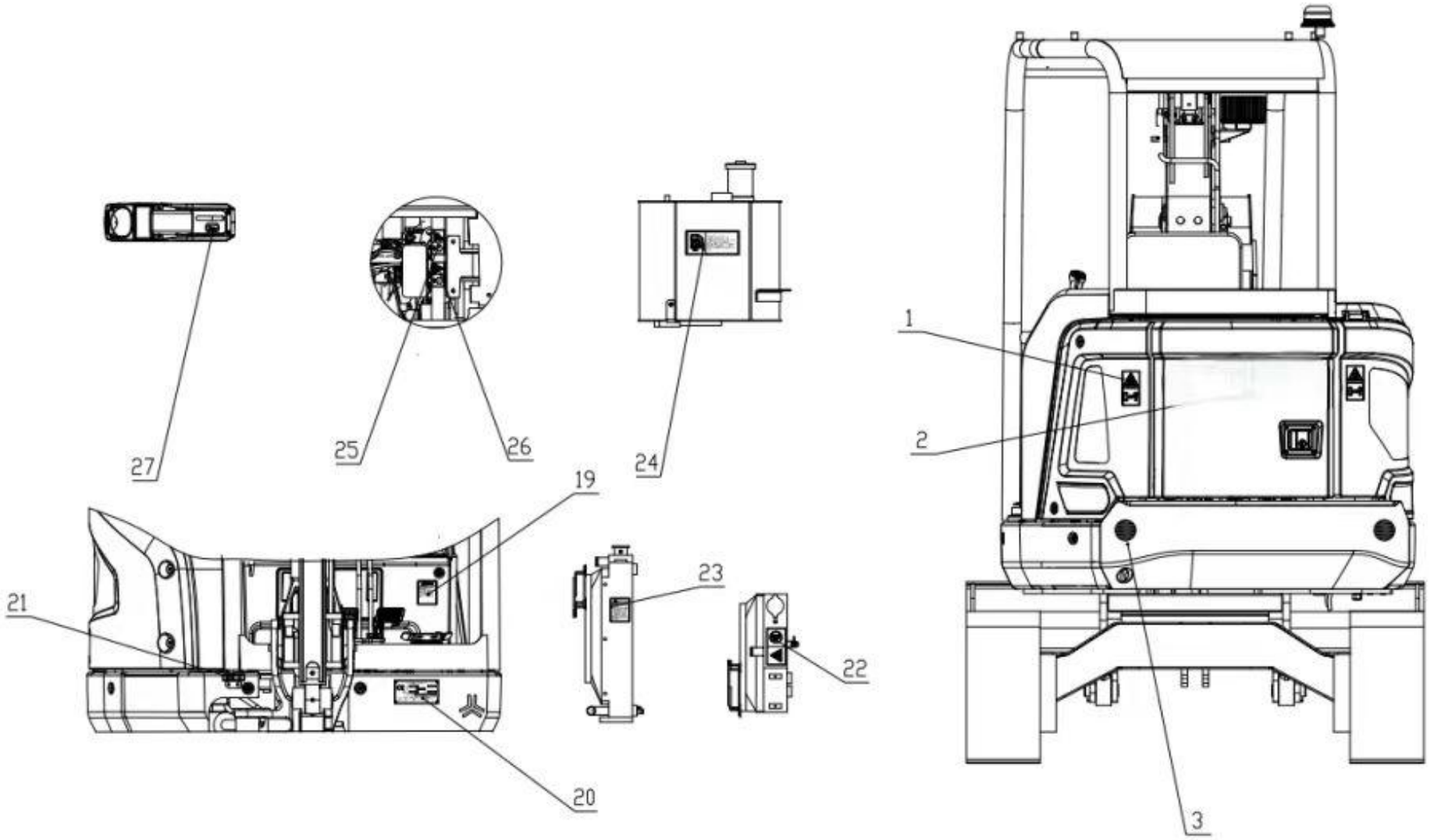
If a warning label is missing, damaged or cannot be read, it must be promptly replaced. Also, if a warning label was mounted on a part which is replaced, a new warning label must be installed on the replaced part.

Contact your dealer to obtain new labels. The part code number is shown on each warning label.

8 Safety Messages



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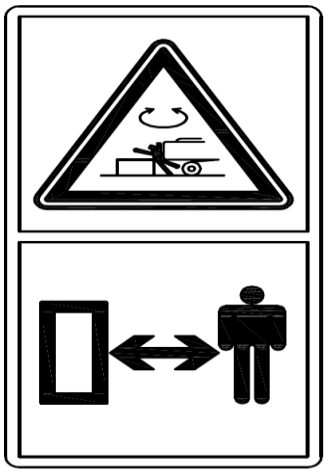
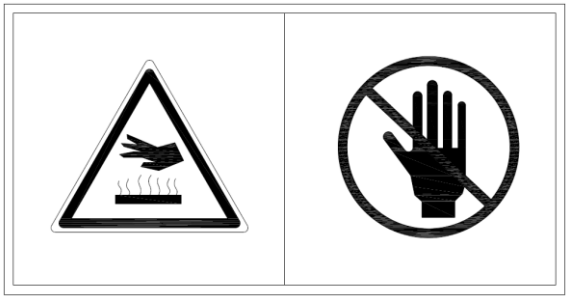


1. Warning!

Do not stay in the working range of the excavator, otherwise there is a risk of being rolled.



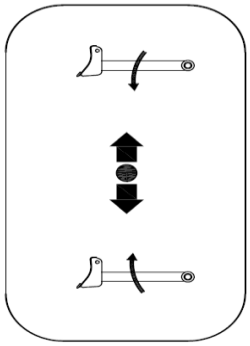
2. surface high temperature warning sign

Do not touch with your hands!

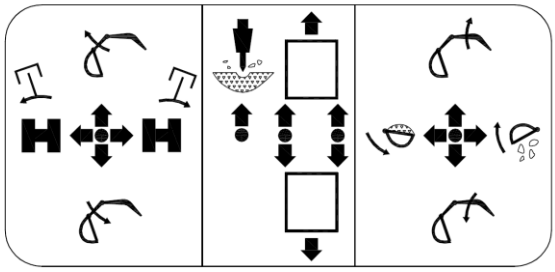
3. warning! Working range of excavator

Keep a distance from the excavator operation area! Otherwise there is a risk of being bruised

4. bulldozer operation signs

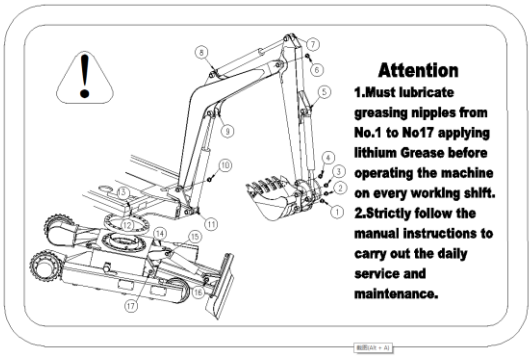


5. machine operation options

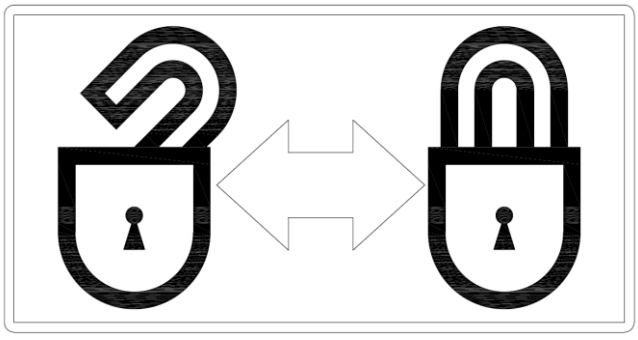


6. no operation sign during maintenance

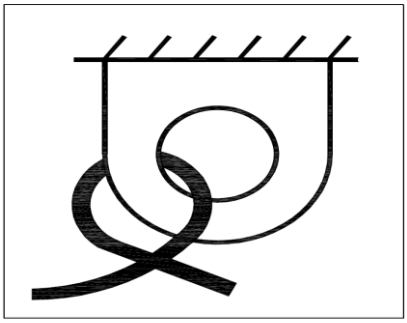
7. machine lubrication and maintenance signs

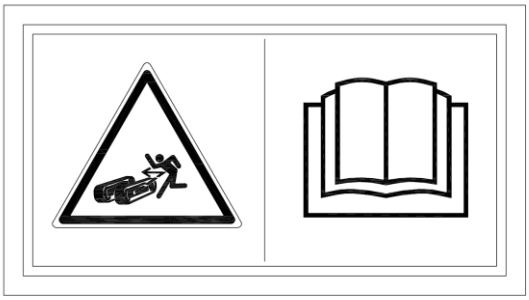


8. Safety lever "lock, open" sign



9. marks of lifting points for lifting the machine



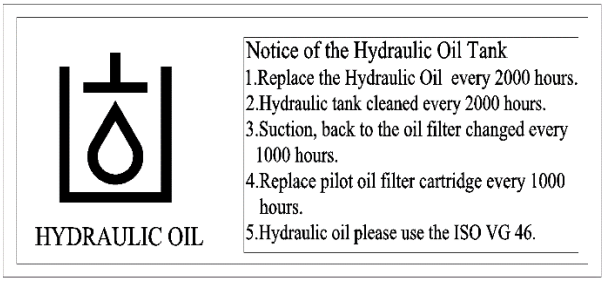


10. prevent parts from flying out (high pressure warning)

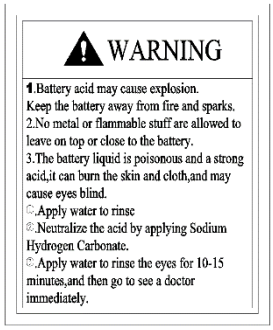
Please read the manual carefully before operation.

11. hydraulic oil tank sign

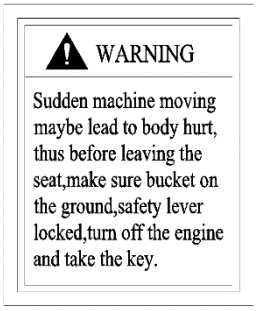
Warn the user of the grade and maintenance cycle of hydraulic oil



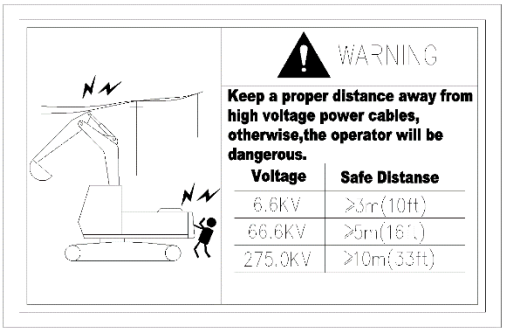
12.battery maintenance signs



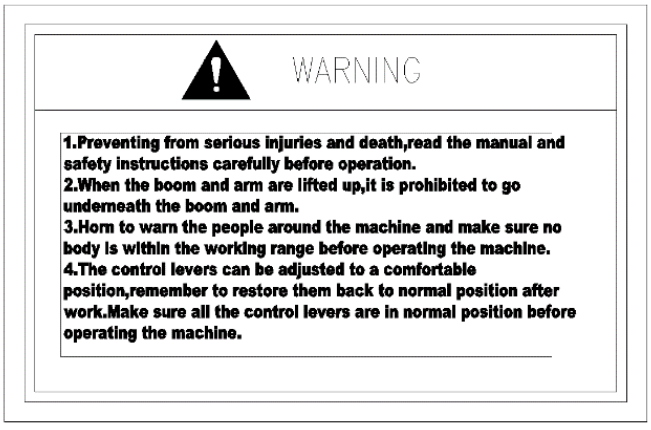
13. leave seat warning sign



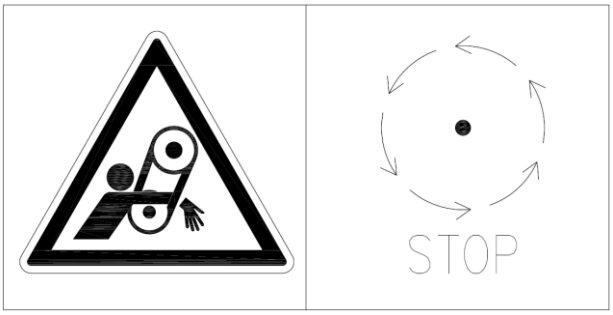
14. high voltage line warning sign



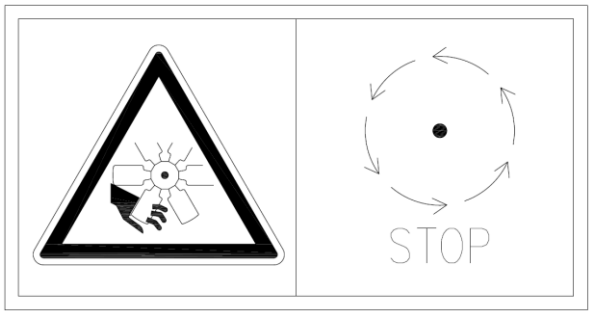
15. Operation warning signs

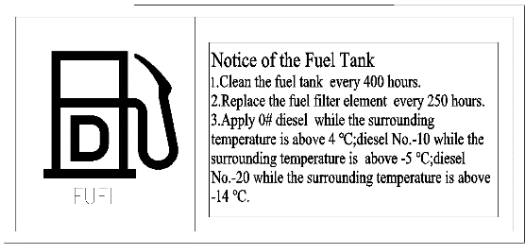


16.Warning! Danger of injury caused by belt



17. Warning! Danger of injury caused by rotating objects

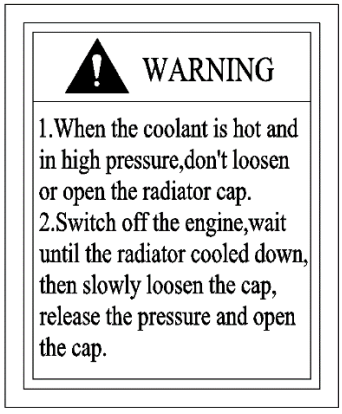


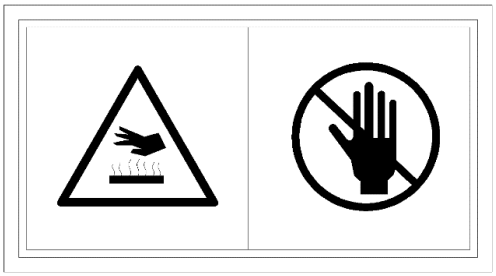


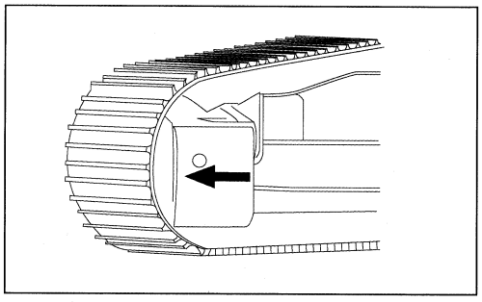
18.Diesel tank marking

Warn users of the time to fill different brands of high-quality diesel at different ambient temperatures, and to replace the filter element and clean the oil tank!

19. warning to prevent high temperature scald.



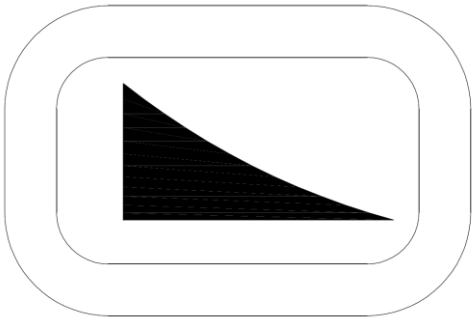




20. excavator forward direction

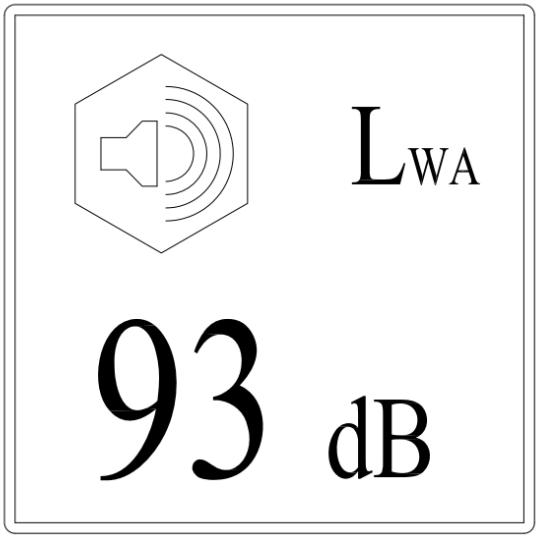
Warning: when the excavator travel control lever (pedal) is operated forward

It is the actual forward direction of the excavator.



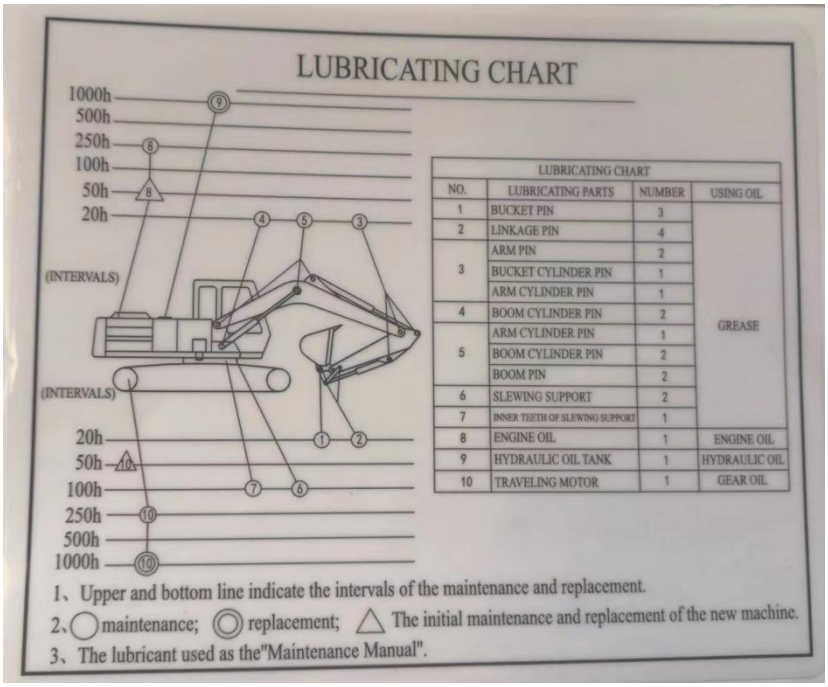
21. Throttle identification

22.Safety exit sign



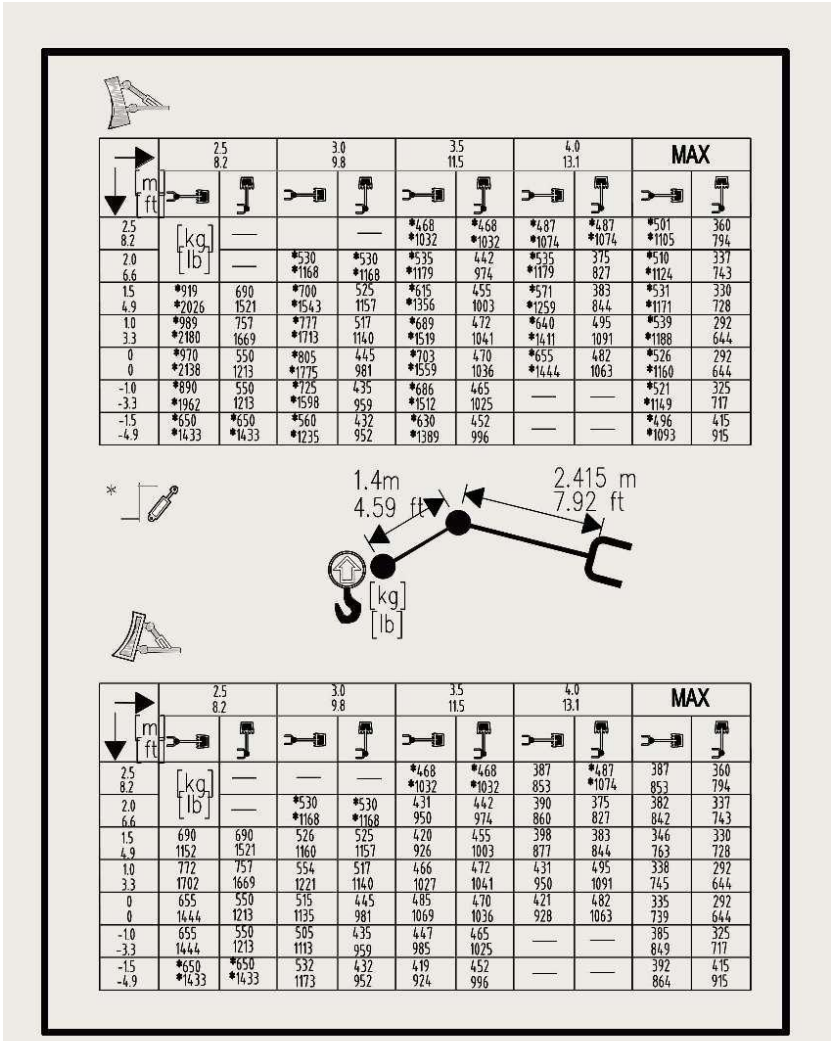
23.Noise identification

24、Lubrication periodic table



LUBRICATING CHART			
NO.	LUBRICATING PARTS	NUMBER	USING OIL
1	BUCKET PIN	3	GREASE
2	LINKAGE PIN	4	
3	ARM PIN	2	
	BUCKET CYLINDER PIN	1	
	ARM CYLINDER PIN	1	
4	BOOM CYLINDER PIN	2	
5	ARM CYLINDER PIN	1	
	BOOM CYLINDER PIN	2	
	BOOM PIN	2	
6	SLEWING SUPPORT	2	
7	INNER TEETH OF SLEWING SUPPORT	1	
8	ENGINE OIL	1	ENGINE OIL
9	HYDRAULIC OIL TANK	1	HYDRAULIC OIL
10	TRAVELING MOTOR	1	GEAR OIL

25、Lifting load identification



m / ft	2.5 / 8.2		3.0 / 9.8		3.5 / 11.5		4.0 / 13.1		MAX	
2.5 / 8.2	[kg] / [lb]	—		—	*468 / *1032	*468 / *1032	*487 / *1074	*487 / *1074	*501 / *1105	360 / 794
2.0 / 6.6		—	*530 / *1168	*530 / *1168	*535 / *1179	442 / 974	*535 / *1179	375 / 827	*510 / *1124	337 / 743
1.5 / 4.9	*919 / *2026	690 / 1521	*700 / *1543	525 / 1157	*615 / *1356	455 / 1003	*571 / *1259	383 / 844	*531 / *1171	330 / 728
1.0 / 3.3	*989 / *2180	757 / 1669	*777 / *1713	517 / 1140	*689 / *1519	472 / 1041	*640 / *1411	495 / 1091	*539 / *1188	292 / 644
0 / 0	*970 / *2138	550 / 1213	*805 / *1775	445 / 981	*703 / *1559	470 / 1036	*655 / *1444	482 / 1063	*526 / *1160	292 / 644
-1.0 / -3.3	*890 / *1962	550 / 1213	*725 / *1598	435 / 959	*686 / *1512	465 / 1025	—	—	*521 / *1149	325 / 717
-1.5 / -4.9	*650 / *1433	*650 / *1433	*560 / *1235	432 / 952	*630 / *1389	452 / 996	—	—	*496 / *1093	415 / 915

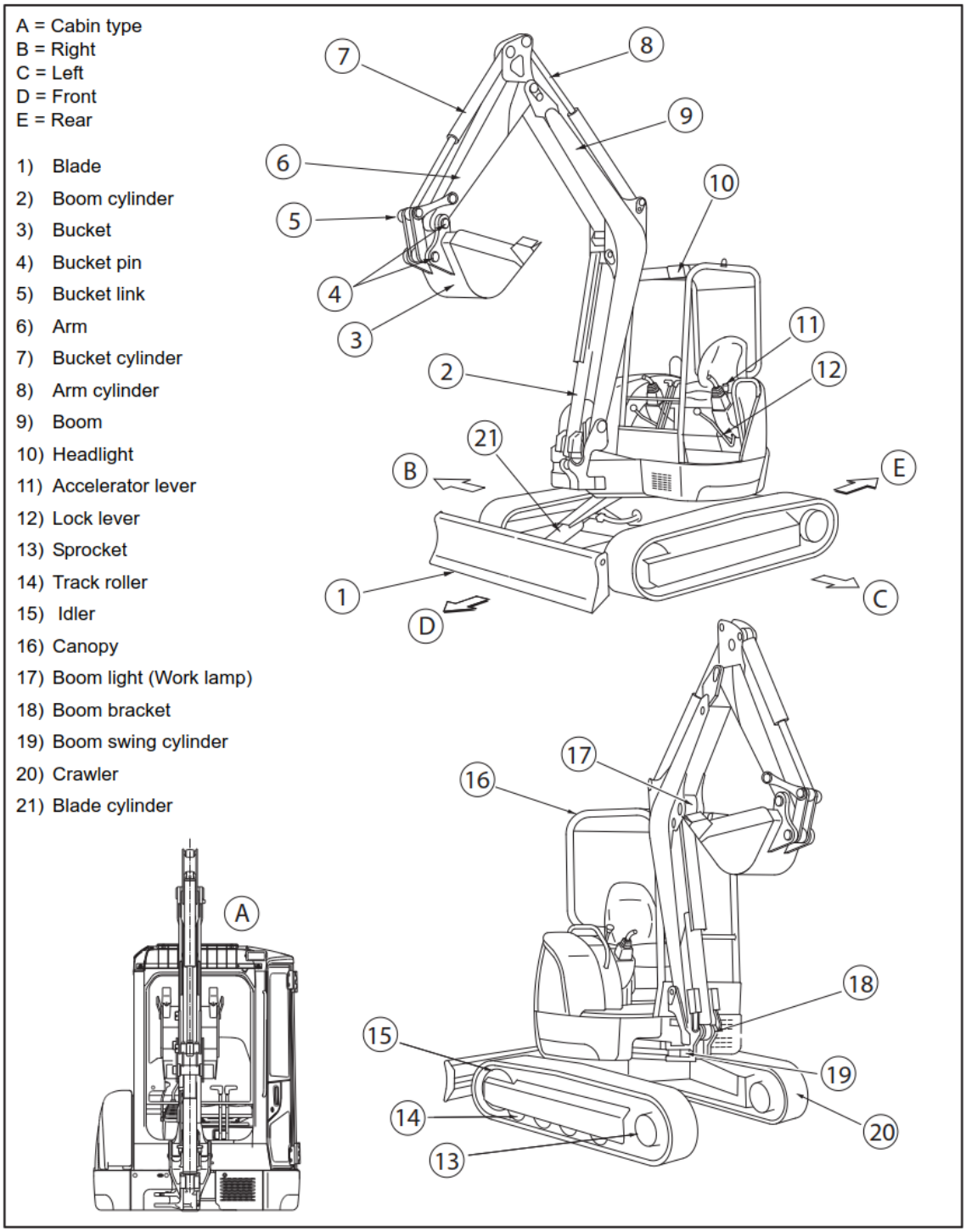
m / ft	2.5 / 8.2		3.0 / 9.8		3.5 / 11.5		4.0 / 13.1		MAX	
2.5 / 8.2	[kg] / [lb]	—	—	—	*468 / *1032	*468 / *1032	387 / 853	*487 / *1074	387 / 853	360 / 794
2.0 / 6.6		—	*530 / *1168	*530 / *1168	431 / 950	442 / 974	390 / 860	375 / 827	382 / 842	337 / 743
1.5 / 4.9	690 / 1152	690 / 1521	526 / 1160	525 / 1157	420 / 926	455 / 1003	398 / 877	383 / 844	346 / 763	330 / 728
1.0 / 3.3	772 / 1702	757 / 1669	554 / 1221	517 / 1140	466 / 1027	472 / 1041	431 / 950	495 / 1091	338 / 745	292 / 644
0 / 0	655 / 1444	550 / 1213	515 / 1135	445 / 981	485 / 1069	470 / 1036	421 / 928	482 / 1063	335 / 739	292 / 644
-1.0 / -3.3	655 / 1444	550 / 1213	505 / 1113	435 / 959	447 / 985	465 / 1025	—	—	385 / 849	325 / 717
-1.5 / -4.9	*650 / *1433	*650 / *1433	532 / 1173	432 / 952	419 / 924	452 / 996	—	—	392 / 864	415 / 915

9 Introduction to complete machine parts

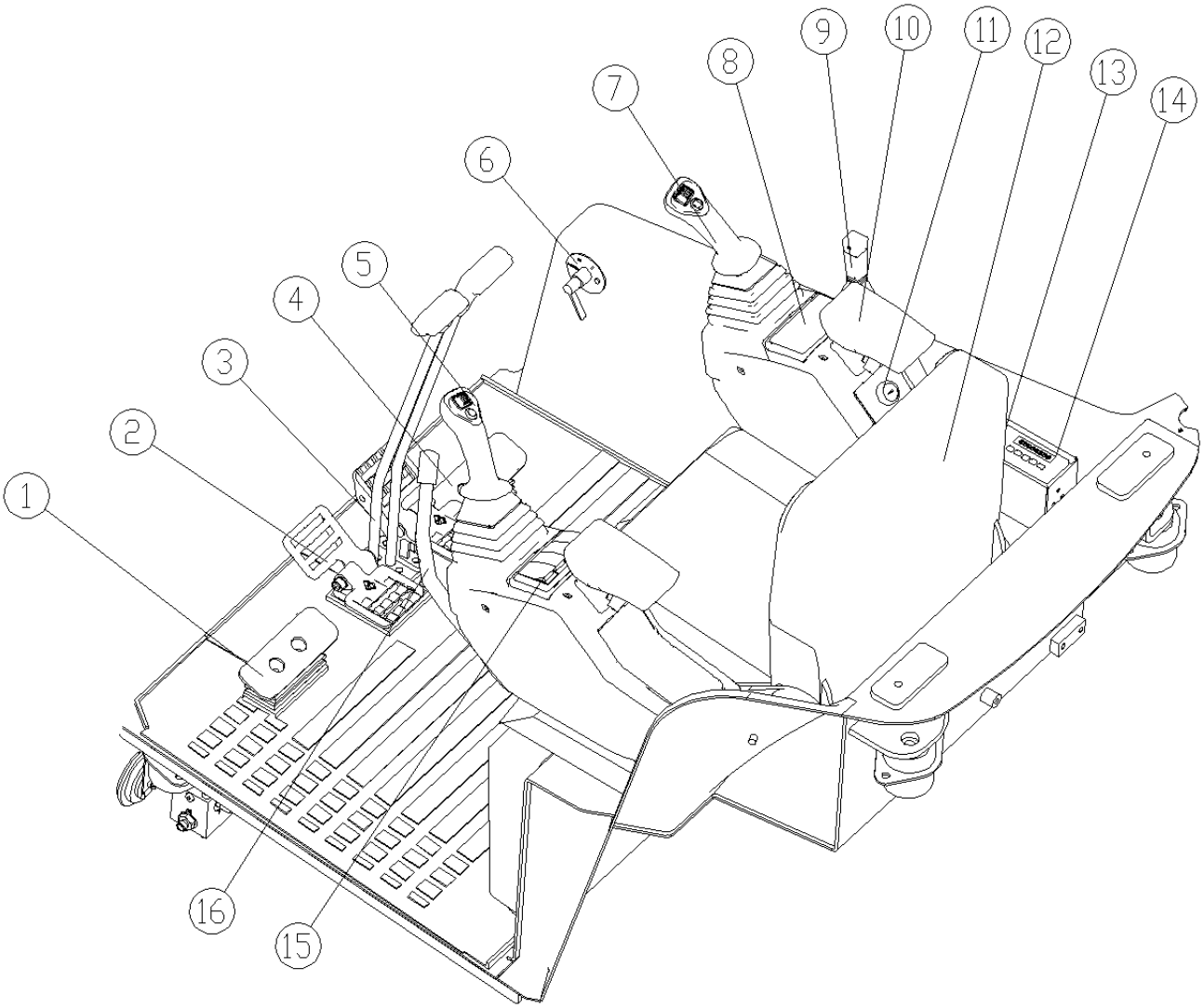
9.1 Overview of the machine

A = Cabin type
B = Right
C = Left
D = Front
E = Rear

1) Blade
2) Boom cylinder
3) Bucket
4) Bucket pin
5) Bucket link
6) Arm
7) Bucket cylinder
8) Arm cylinder
9) Boom
10) Headlight
11) Accelerator lever
12) Lock lever
13) Sprocket
14) Track roller
15) Idler
16) Canopy
17) Boom light (Work lamp)
18) Boom bracket
19) Boom swing cylinder
20) Crawler
21) Blade cylinder



9.2 Cab / cab and internal components



1) Auxiliary pedal 2) travel pedal 3) travel control lever 4) deflection pedal

5) Left joystick 6) main power switch 7) right joystick 8) instrument assembly

9) Bulldozer joystick 10) armrest 11) start switch 12) seat

13) throttle control handle 14) Radio

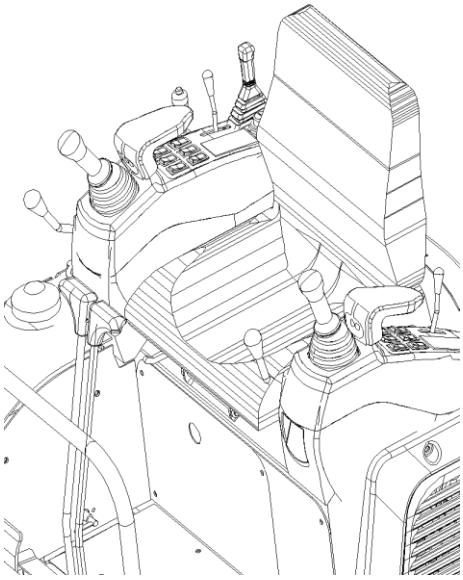
15) switch assembly: including high and low speed, warning light, lighting, USB interface, water spray and wiper (CAB)

16) Safety level

9.3 Description of operator’s area

This section describes several of the control devices necessary to operate the machine. In order to ensure safety and comfort in working with the machine, it is imperative for you to fully understand how to operate and interact with these devices.

9.3.1 Cab (applicable to models with CAB)



1. The interior of the cab is designed according to the principle of ergonomics, which is convenient for adjustment,

The control force of the joystick and foot pedal is small, and each control button is

Within the driver's reach.

2. The front window of the cab can be turned up to the top, and the track can be seen from the lower window

And nearby ground. The rear window provides a good view of the rear and left side of the cab

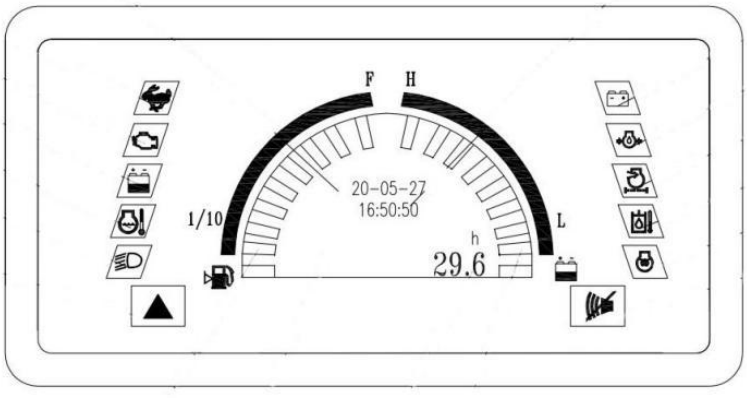
There is a wide view from the inside to the outside.

3. warm air and sound are installed inside the cab to improve the working environment.

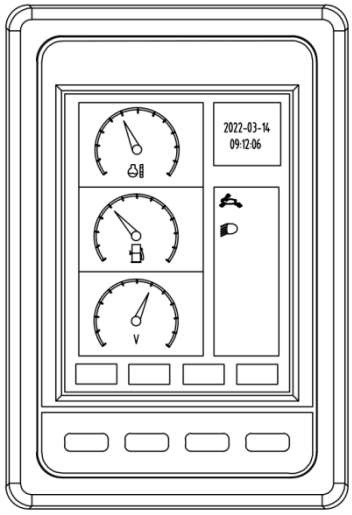
4. it is equipped with adjustable seats whose front and rear positions can be adjusted.

9.3.2Monitor

The monitor is located on the right side of the seat. It includes high water temperature alarm indicator, fuel volume indicator, machine operating hours, high hydraulic oil temperature alarm indicator, engine oil pressure alarm indicator, air filter indicator and other functions.



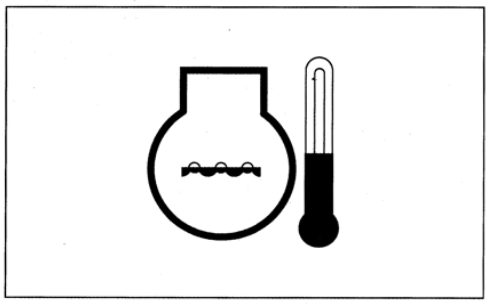
Driving shed

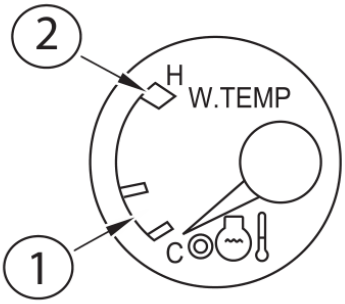


Cab

1. Cooling water thermometer

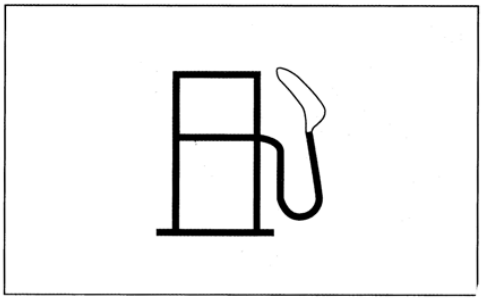
Monitor the engine cooling water temperature, and zone 1 indicates the normal water temperature. When the temperature reaches zone 2 and 102 ℃, the lamp is on and accompanied by a buzzer.

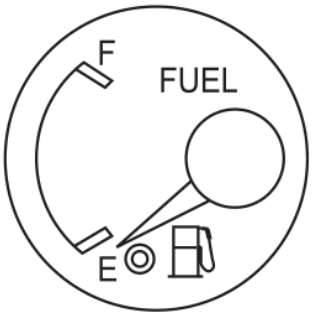


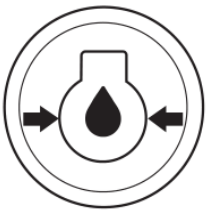


2. Fuel gauge

Add fuel before the fuel indicator enters the red zone

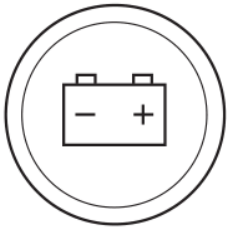






3. Engine oil pressure alarm indication

Monitor the engine oil temperature. If the engine oil pressure is lower than the normal level, the alarm light will be on and the buzzer will sound. At this point, stop the engine and check.



4. Charging alarm indicator

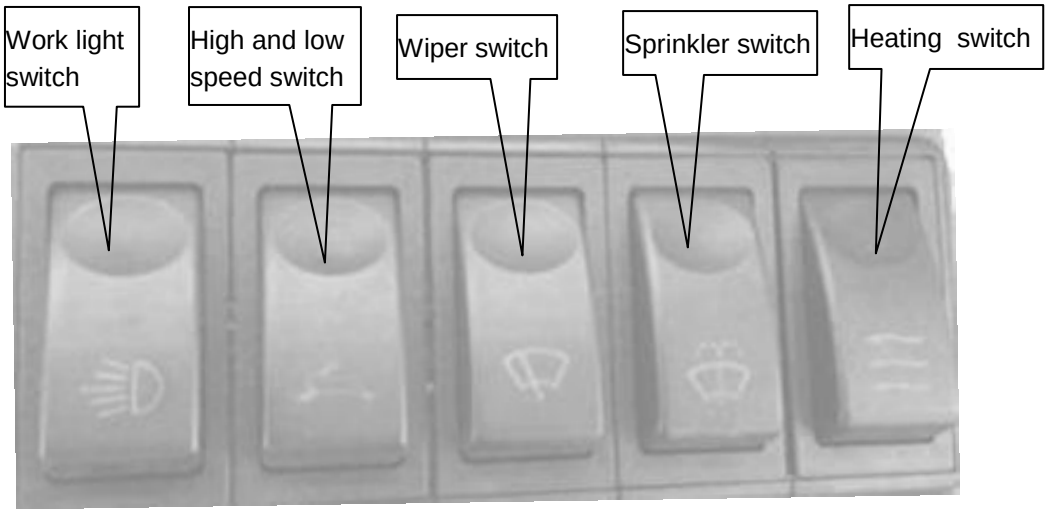
If the battery is not properly charged, the warning lamp will flash. Please check the battery charging circuit.

9.3.3 Travel high and low speed switch

The high and low speed switching is controlled by the travel high and low speed rocker switch (see the figure below).

9.3.4 Work light switch

The work light switch is located on the left operation box and is switched by the rocker switch to control the work light switch



9.3.5 Wiper and switch - (specially provided for the cab)

When it rains or the front window glass is dirty and the wiper needs to be turned on, press the switch. See the above figure for the wiper switch.

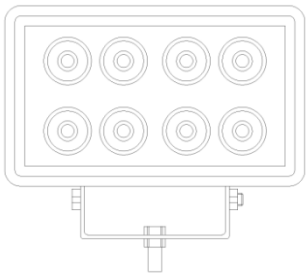
9.3.6 Washer switch -- (specially provided in the cab)

Press the washer switch to spray detergent. The switch is shown in the figure above.

⚠ CAUTION

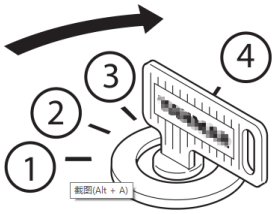
When using the wiper, first press the washer switch to spray a certain amount of detergent to prevent the wiper from being damaged by friction.

Properly replenish the windshield washer fluid, and add the glass washer fluid with appropriate ambient temperature to the reservoir.



9.3.7 Cab lamp

There is a cab lamp at the body position in the cab. Turn on or off the cab lamp.



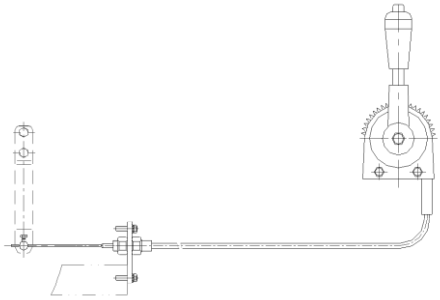
9.3.8 Start key switch

1) Heat----- machine preheating

2) Off----- power off

3) On----- power on

4) Start----- engine start

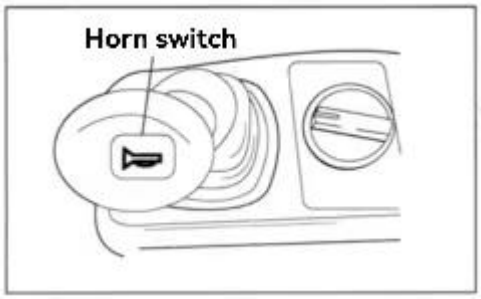


9.3.9 Throttle lever

The engine speed can be adjusted by the throttle lever through the throttle cable,

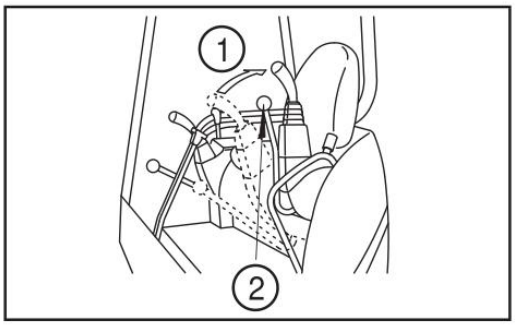
Turning forward can increase the engine speed, pushing back can

Reduce the engine speed.



9.3.10 Horn switch

The horn switch is mounted on the top of the right control lever. The horn will sound continuously as long as the switch is pressed.



9.3.11 Pilot control switch / safety lever

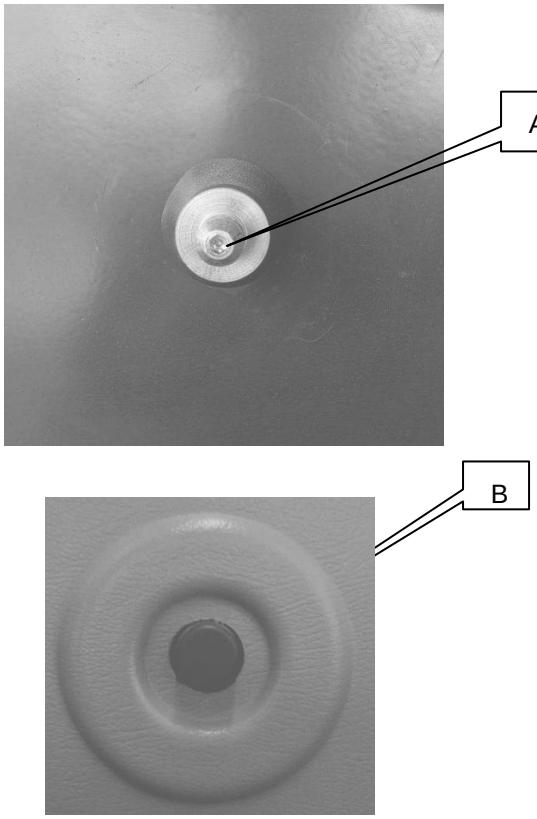
The function of the pilot control switch is to prevent the machine from being misoperated when the operator gets on and off the machine.

⚠ WARNING

- **If the pilot control switch is not fully pulled to the locked position, the pilot control will not be cut off.**
- **When leaving the operating seat, first pull the**

pilot control switch lever to the locked position, and then shut down the engine. When transporting the machine or after a day's work, pull the pilot control switch lever to the locked position.

- **Before starting the engine, confirm that the pilot control switch lever is in the locked position, otherwise the engine cannot be started.**



9.3.12 Cab door lock button

1. Push the cab door to the outside;

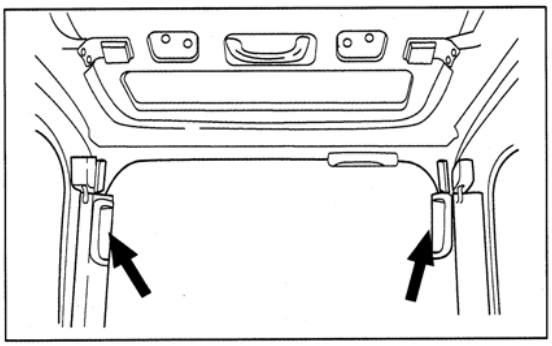
2. Ensure that the groove (A) on the cab door is firmly clamped into the cab buckle (B);

⚠ CAUTION

When the cab door is open, the cab door shall be fully opened until it is locked by the latch on the side wall.

First press down the black button inside the cab door on the left side of the cab to open the latch,

Close the cab door again. This system is used to keep the cab door open.



9.3.13 Cab front upper window

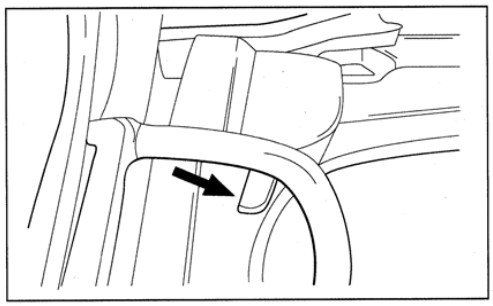
(applicable to models with CAB)

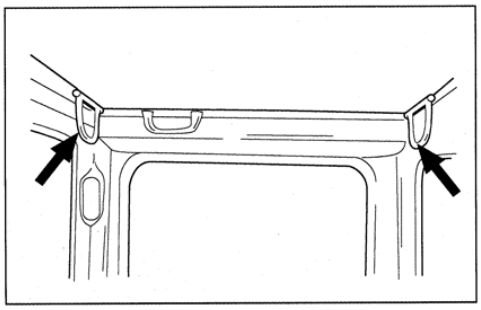
Open the front upper window

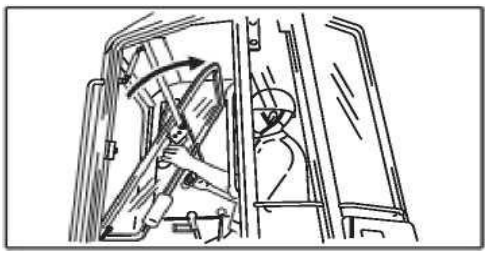
1. Hold the handle with both hands and move the latch toward the cab with your index finger,

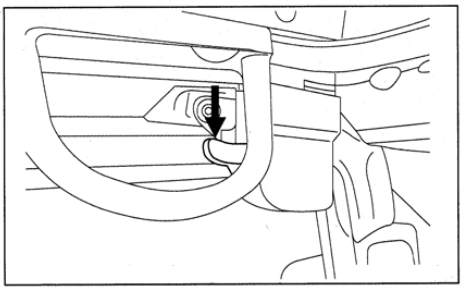
2. Unlock the lock.

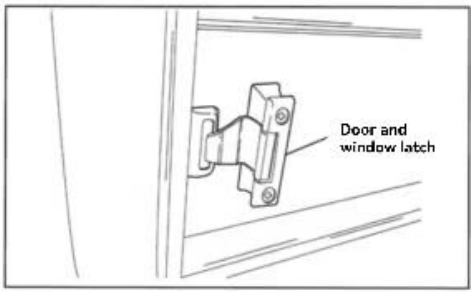
3. Hold the upper and lower handles on the window frame with both hands, and pull the window upward and backward,











4. Lock the window into the lock pin.

⚠ CAUTION

- **If the front window slides down, it may cause injury. Be sure to lock the front window pushed onto the top of the cab completely.**
- **Do not operate the wiper when and after the front upper window is opened.**

Close the front upper window

1. Hold the handle with both hands and pull the lock buckle with your index finger.

2. Hold the front and rear handles with both hands and slowly pull down the window without jamming the wiper.

3. When the window slides in place, release the handle, hold it and push the window outward to make the lock pin hang into the lock catch and turn to the locked position.

⚠ CAUTION

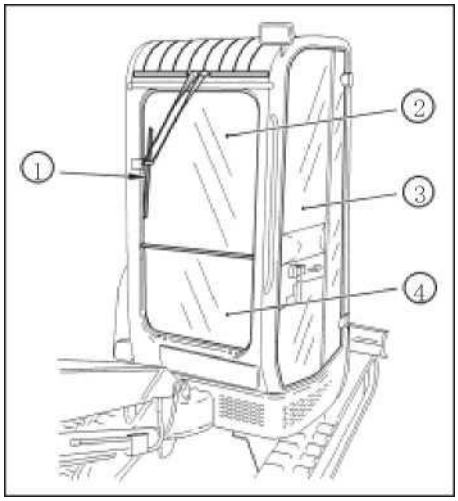
If the front window slides down, it may cause injury. Be sure to lock the front window push

9.3.14 Cab doors and windows

1. Open the cab door and window

(a) Press the latch first when opening the window of the cab door.

(b) Slide the front window backwards and / or the rear window forwards.



2. Close the cab doors and windows

(a) Slide the front window forward and / or the rear window rearward.

(b) Make sure the latch is fully locked after closing the door and window.

⚠ CAUTION

To avoid personal injury when operating the machine, make sure that the door and windshield are locked in the open or closed position

When the side door or windshield is opened and the lock is not firm, it may be closed suddenly during operation. They may cause physical injury. For example, your hand is placed between the door or windshield and the cabin frame, or your head is hit on them.

Do not extend your hand or head out of the open side door or windshield. When opening the side door or windshield, it shall be securely locked.

1) Wiper

2) Upper windshield

3) Side door

4) Lower windshield

9.3.15 Fire extinguishers and emergency exits

Fire extinguisher

Located in the cab at the rear right post.

Emergency exit

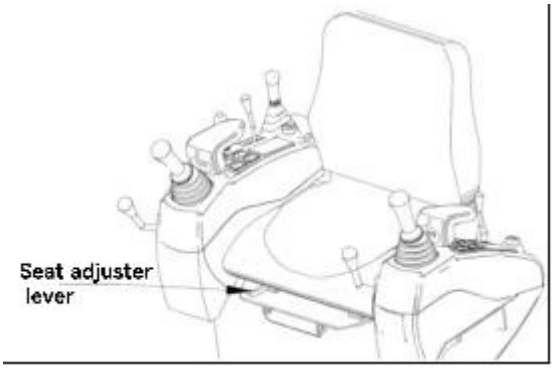
If it is impossible to escape from the cab door in an emergency, the escape hammer can be used to break the door and window glass to escape from the vehicle body. Then escape from the rear window.

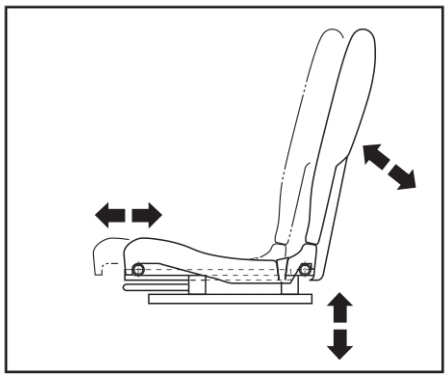
⚠ CAUTION

The rear window glass can be broken only when the rear window is used as an escape exit in an emergency. Do not break it at any other time.

9.3.16 Seats

Seat fore-and-aft adjustment seat fore-and-aft position adjustment adopts double-layer slide rail control, which can adjust the seat fore-and-aft position according to the operator's body shape, so as to make it suitable for the operator to operate the machine comfortably for various actions. Sit on the seat, pull up the adjusting rod in front of the seat, push and pull back and forth to adjust to the appropriate position, and loosen the seat fixing of the adjusting rod.



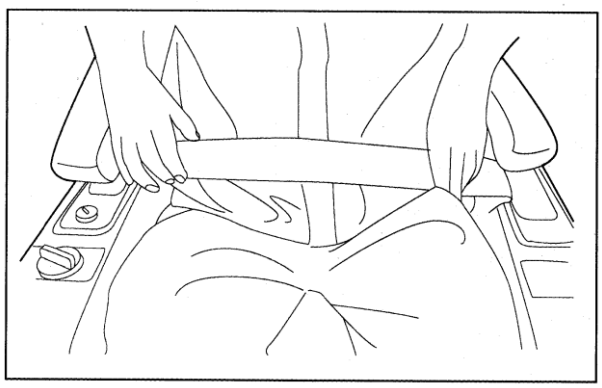


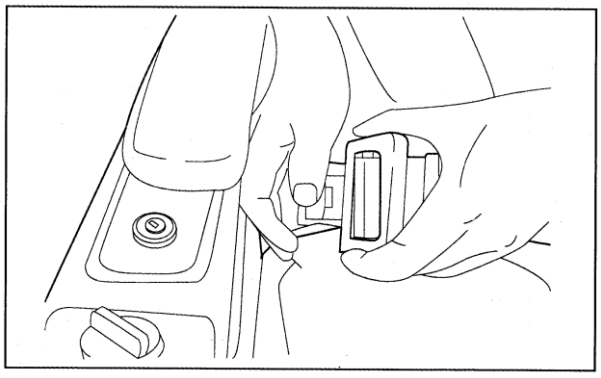
9.3.17 Safety belt

1.Confirm that the safety belt is not twisted, and ensure that the end of the safety belt is inserted into the buckle. Gently pull the safety belt to confirm whether the buckle is fastened, as shown in the above figure.

2. Adjust the safety belt to make it just and comfortably tied on the waist of the operator.

3. Press the button on the buckle to release the safety belt.





⚠ CAUTION

If the safety belt is worn, damaged or deformed due to an accident, the safety belt shall be replaced immediately.

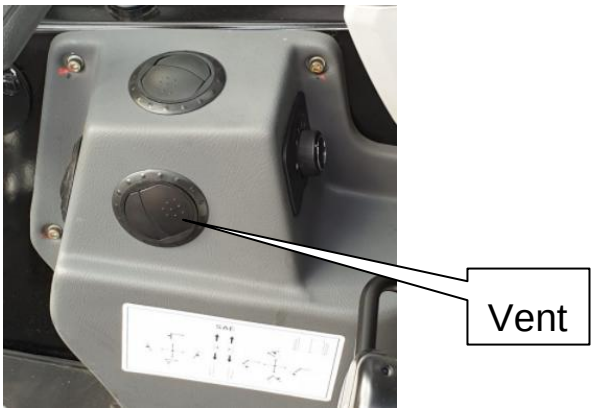
If the seat belt needs cleaning

- Use neutral soap solution.
- Before rolling up the safety belt, make it dry under the condition of fully stretching.
- Ensure that the safety belt is installed in the correct way.
- It is not allowed to modify the safety belt and its support.
- The safety belt can only be used by one adult.
- Whether the safety belt is used or not, it must be replaced every 2 years.

9.3.18 Air heater

Standard air heater in the cab,

For the use of warm air, the cab heating device in winter is to introduce the hot engine cooling water into the cab and dissipate the heat to the cab through the fan to achieve the purpose of heating (the figure below shows the warm air outlet). See the schematic diagram for the heating control switch.

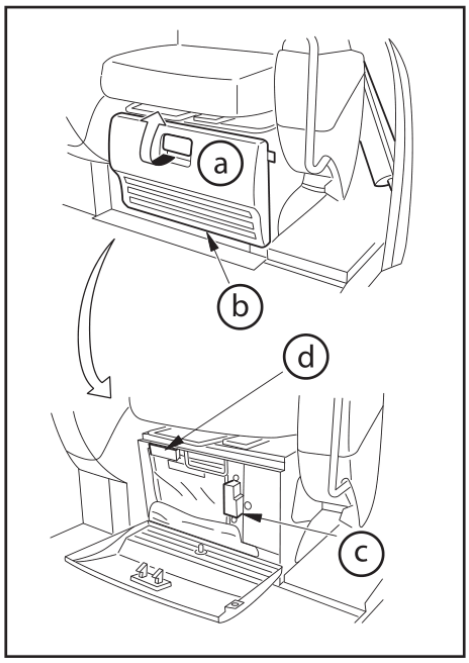


⚠ CAUTION

Note: to use the cab heating device, first make sure that the heating switch on the engine has been turned on.

9.3.19 Fuse box

Fuses can protect electrical equipment and wires from overheating. If the fuse is corroded by deposits, or if the fuse in the fuse frame is loose, it must be replaced with a new fuse.



Location of fuse box

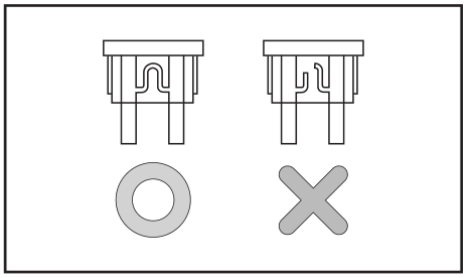
The fuse box is in the drawer box

a: Open

b: Drawer box cover

c: Fuse box

d: For other models



CAUTION

- **When replacing the fuse, please ensure that the engine is turned off and the start switch is in the stop position.**
- **Using a wire, aluminum foil or similar to replace the fuse may cause the instrument, electrical equipment and wire to Overheat and burn out.**
- **If the fuse burns out immediately after replacement, there may be a problem with the electrical system. Ask the nearest dealer for service.**

9.4 Engine

The engine is the power source of the whole machine, which converts the heat energy generated by fuel combustion into mechanical energy through the crankshaft connecting rod mechanism; Features: powerful power, low noise, low emission, turbocharging; Original IMPORTANT engine.

9.5 Hydraulic pump

The hydraulic pump is an energy conversion device, which converts the mechanical energy transmitted from the engine into hydraulic energy, provides a certain flow of pressure oil for the hydraulic system, drives the hydraulic cylinder and hydraulic motor, and is the power source of the whole hydraulic system.

9.6 Distribution valve

The distribution valve divides the high-pressure oil output by the main pump according to the action needs of the working device, so as to realize different operations of the working device; Crawler excavators usually have several basic operations, such as boom operation, stick operation, bucket operation, slewing operation, left and right walking operation, bulldozer and so on. The above basic operations have corresponding control valves, and the distribution valve is the component that centralizes these control valves. In addition, the distribution valve has a backup valve.

9.7 Swing motor

The slewing motor is a component that drives the upper vehicle body to rotate relative to the lower vehicle frame, and is composed of a slewing motor, a reducer and a braking device; It is engaged with the slewing ring to complete the slewing action of the machine at any angle.

9.8 Center swivel

When the machine rotates in any direction, the hydraulic oil flow of the upper body is continuously supplied to the travel motor at the lower part of the body through its internal rotating oil passage. Each oil passage inside the swivel joint is separated by seals with good anti-wear performance and high pressure resistance.

9.9 Slewing Support

The slewing support is a kind of bearing. Its outer wheel is fixed on the upper vehicle body, and its inner wheel is fixed on the chassis, so that the upper vehicle body can rotate freely on the chassis. The inner wheel is processed with an inner ring gear, so it is also called the slewing inner ring gear.

9.10 Counterweight

Adjust the components of the excavator's center of gravity, and make the center of gravity of the machine as close as possible to the rotation center of the vehicle body through appropriate center of gravity adjustment, so as to ensure the dynamic stability of the vehicle body, reduce the rotation resistance of the slewing bearing, and realize fast and stable rotation. The inner side near the engine is also pasted with noise absorbing materials, which can reduce the noise emitted by the engine.

9.11 Cooler

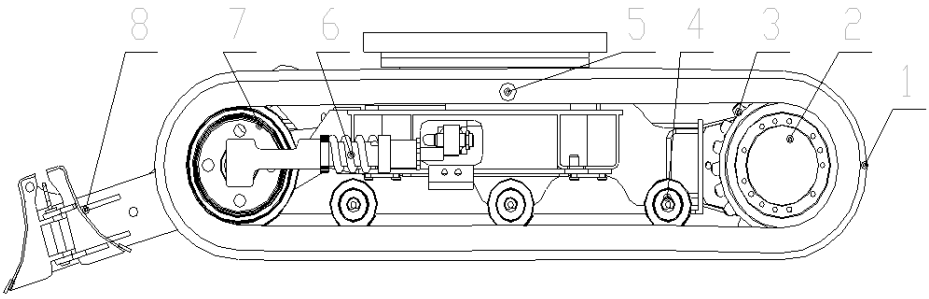
The cooler is divided into water cooler of engine and oil cooler of hydraulic system; The structure and working principle are the same.

Due to the resistance and load of the working oil during circulation, the temperature will gradually rise, the viscosity will gradually decrease, and the internal leakage will also increase. Therefore, in order to maintain a certain viscosity, the cooler can be used to reduce the rising oil temperature.

9.12 Chassis

1. Track 2 Travel motor (final drive) 3 Drive wheel 4 Roller

5. Chain tug 6 Track tensioner 7 Idler 8 Bulldozer

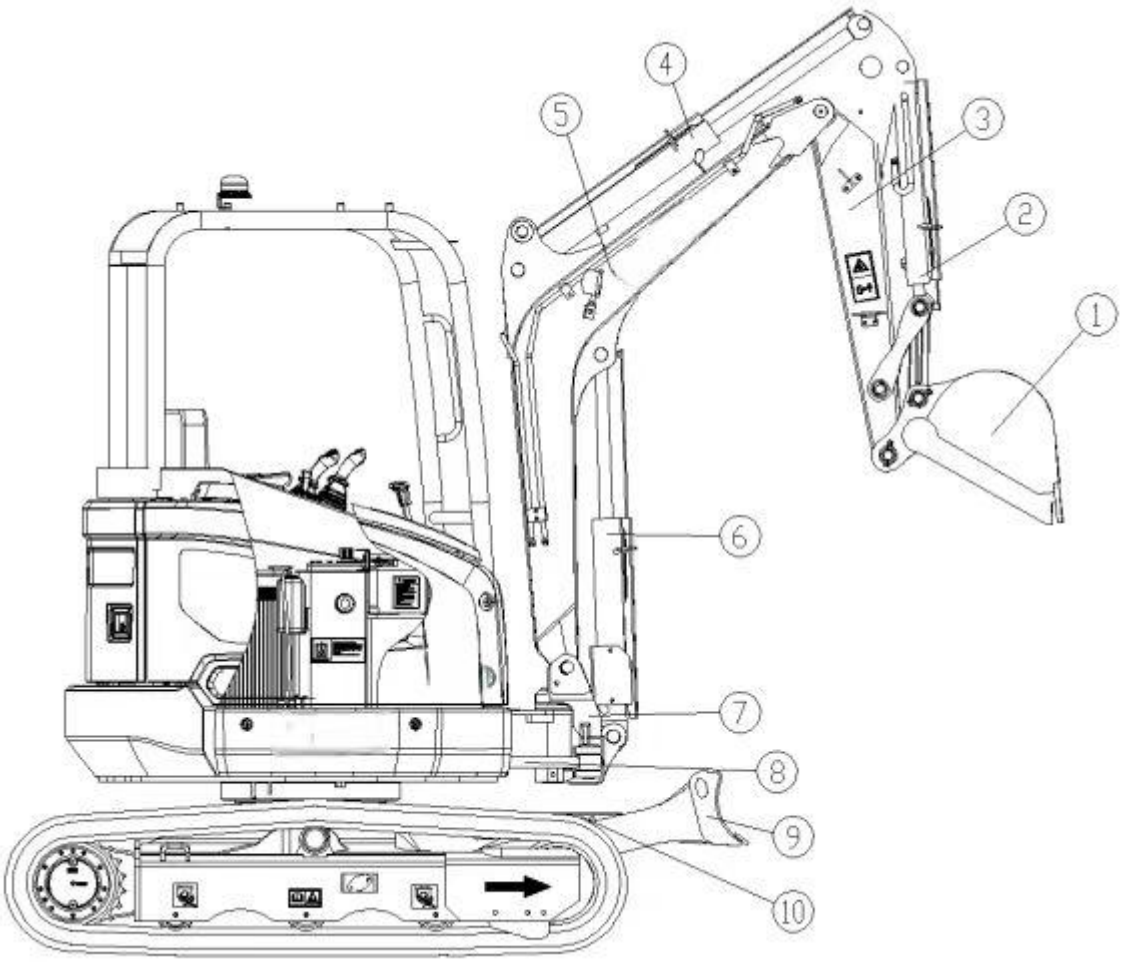


9.13 Working device

1. Bucket 2. Bucket cylinder 3. Stick 4. Stick cylinder

5. Boom 6. Boom cylinder 7. Deflection head

8. Deflection cylinder 9. Bulldozer 10. Bulldozer cylinder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10 Machine operation and use

This chapter contains provisions on operation and safety, which must be observed to ensure the correct and safe operation and operation of the machine. However, compliance with these regulations does not mean that the operator may not comply with the responsibilities and obligations stipulated in national and regional laws and regulations on transportation safety, traffic safety, industrial safety and welfare.

Introduction to safety responsibilities of personnel related to machine operation

Responsibilities of excavator driver

Excavator drivers have the responsibility to understand the potential hazards in their work site and the specific requirements for mechanical operation and personnel safety. This is an essential condition to avoid serious personnel and property losses and fatal accidents.

At the same time, when the operation endangers the safety of the machine, the driver has the responsibility to report in time to avoid other hazards.

Responsibilities of other personnel

When operating the machine, avoid any injury and accident. Drivers have the obligation and responsibility to prevent such accidents.

When the machine is working, no one is allowed to enter the working area of the machine without informing the driver. If someone has to enter the working area of the machine to do some work, the driver must take extra care and only operate the machine when determining the position of this person.

⚠ WARNING

- **Only trained personnel can operate the machine.**
- **Do not stay on the working machine, which will prevent the operator from operating the machine correctly and safely.**

Running in of new machines

1. After the engine is started, idle for 3-5 minutes.

2. Avoid heavy load operation or high-speed operation.

3. Avoid sudden start, sudden acceleration, sudden steering and sudden stop except in case of emergency.

⚠ CAUTION

- **Before delivery, the machine of SAMTRACKS has been adjusted and tested. However, operating the machine in harsh conditions at the beginning will adversely affect the performance of the machine and shorten the service life of the machine.**
- **The machine must be run in in the first 100 hours (as shown in the hour table). During the running in operation, observe the precautions required in this manual.**

10.1 Preparations before startup

IMPORTANT

Before starting, make sure that there is no one near the machine.

1. Put the machine in the maintenance position.
2. For routine maintenance, refer to "maintenance".
3. Adjust the seat to operate the controller and pedal comfortably and safely.
4. Check the instrument and control.
5. Check whether the headlights, windshield wipers / washers, reflectors, etc. are in serviceable state.
6. Check and confirm that there is no leakage.
7. Check and confirm that there are no defective or loose parts, which may cause damage.
8. Check and make sure there is enough hydraulic oil and fuel in the hydraulic and fuel tanks.
9. Check that the engine hood is closed.
10. If the fuel is used up or the air enters the system for some reason, the air must be discharged before the engine is started. Refer to "air emission of fuel system".

If the fuel is used up or the air enters the system for some reason, the air must be discharged before the engine is started. Refer to "air emission of fuel system"

Preparations for startup

1. Window cleaning / defrosting.

2. Always sit on the operator's seat when starting the engine, refer to "starting the engine".

3. Fasten the seat belt before all operations.

4. Check and confirm that all meters, controllers and instruments can operate normally.

5. Before starting the machine, check and confirm that there is no one near the machine.

6. Sound the horn.

7.Finally, put down the safety locking handle and start.

10.2 Starting the engine

Start key switch

The start key switch has four positions: warm-up heat, off, on and start.

Preheating position: heat machine preheating

Stop position: 0ff engine stop

On position: on power on the electronic equipment

Start position: start the engine when the start motor is engaged.

1. Turn the key to the start position.

2. After the engine is started, release the key.

⚠ WARNING

- **After checking the personnel and obstacles around the machine, start the engine and sound the horn at the same time.**
- **Do not operate any operating handle and switch during startup.**
- **If the engine fails to start successfully once, try to start the engine after 15 seconds.**
- **In case of abnormal sound, excessive vibration or abnormal conditions, immediately turn the key to the stop (stop) position and shut down the engine.**
- **After the engine is started, idle for 3-5 minutes until the oil in the engine and hydraulic system becomes hot and easier to flow. It is also easier to lubricate.**

⚠ IMPORTANT

When it is very cold, it is lower than -15 ℃. After the engine is started, it is not allowed to put into high-intensity work immediately. Allow the engine to run at low speed for 10-15 minutes.

10.3 Monitor

⚠ WARNING

Do not operate the machine until the position, function and use method of the monitor instrument and control controller are clear. Read and be familiar with this part carefully. Check the information displayed by the instrument at any time and take appropriate measures to avoid damage to the machine.

Display lamp function:

- Alarm lamp for high engine water temperature: when the engine water temperature exceeds the specified temperature, the lamp will be on and the buzzer will sound.
- Charging indicator alarm lamp: when the system voltage is high or low, this lamp is on; When the charging voltage is too high or too low, the lamp is on and the buzzer rings.
- Fuel level alarm lamp: when the fuel level is too low, the lamp is on and the buzzer rings.
- Low engine oil pressure alarm lamp: when the engine is not working, the alarm lamp will be on constantly; When the engine oil pressure is lower than the specified value when the engine is working, the light is on and the buzzer sounds.
- Preheating indicator light: the indicator light is always on when the machine is preheated.
- Air filter blockage alarm lamp: when the engine air filter resistance is too large, that is, when the filter

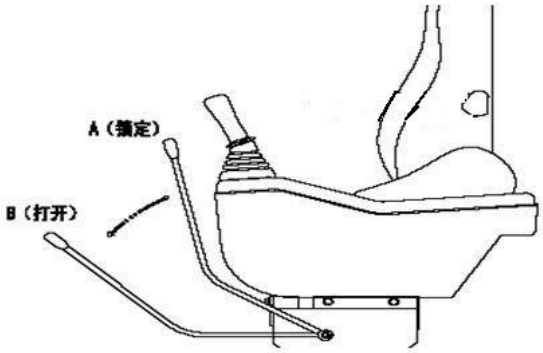
element needs to be replaced, this lamp is on and the buzzer rings.

- Full water alarm lamp of engine oil-water separator: when there is too much water in the oil-water separator, the water will be

10.4 Safety locking system

⚠ WARNING

Remember to lift the safety locking lever before starting the operation. If the safety locking lever is not in the "locked" a position, the machine will act if it accidentally touches the joystick, which may cause serious injury.



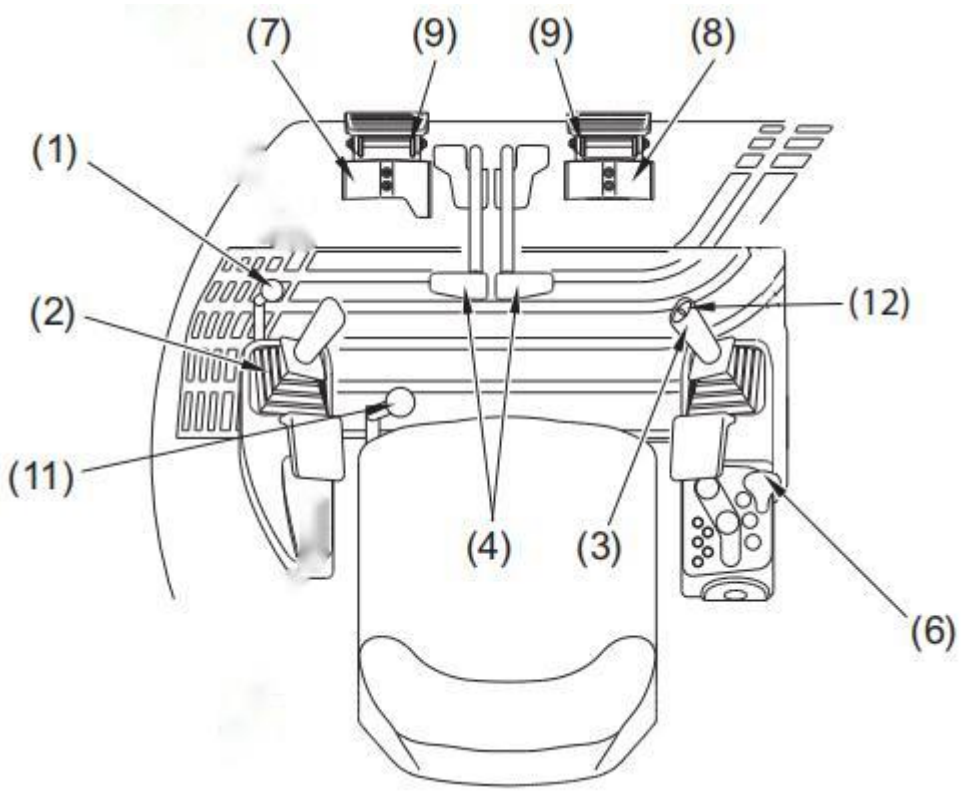
Safety locking handle

A-locked position (the engine can be started when the safety locking lever is placed in this position)

B-open position (the engine cannot be started when the safety locking lever is in this position)

This system is used to lock the working device, rotation, travel, deflection device and other actions.

10.5 Operating the machine



1) Lock lever

2) Control lever (L)

3) Control lever (R)

4) Travel levers and pedals

6）Bulldozer control lever

7）3rd circuit pedal / switch (P.T.O.) (depending on model)

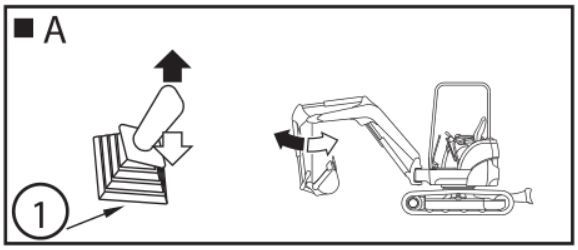
8）Boom swing pedal

9）Pedal guard (foot rest)

11）Track spacing levers (for ViO17)

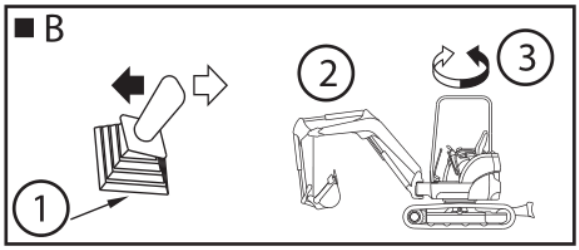
12）Proportional P.T.O. (depending on model)

10.5.1 Partial operation of working device



Acontrol stick action

1) Left joystick

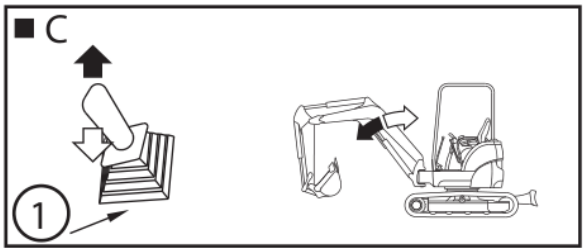


B Control slewing action

1) Left joystick

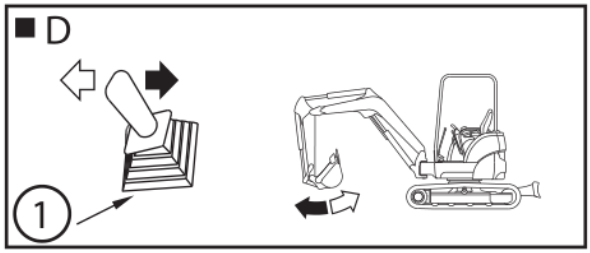
2) Right swing action

3) Left swing action



C Control boom action

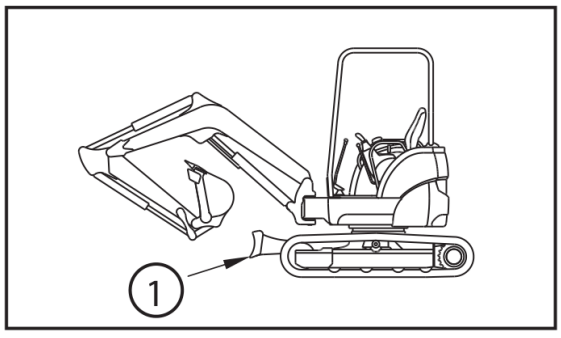
1) Right joystick



D Operation of bucket

1) Right joystick

10.5.2 Travel part control



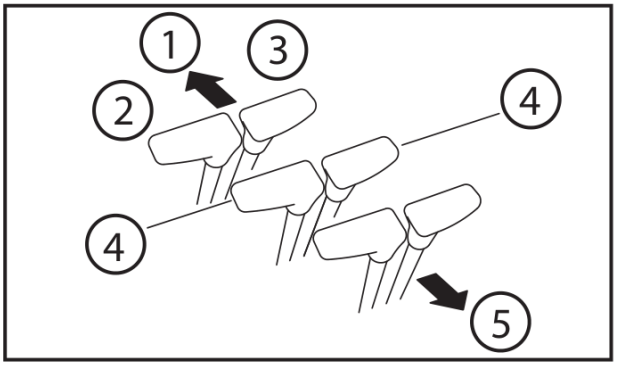
Travel direction control

⚠ WARNING

Before operating the travel handle or foot pedal, check the direction of the track. If the drive wheel is at the front of the machine, the travel handle (pedal) must be operated in the opposite direction. Do not change the direction of travel quickly. In particular, change the direction at rest.

1) Bulldozer

When the bulldozer blade is in the normal position



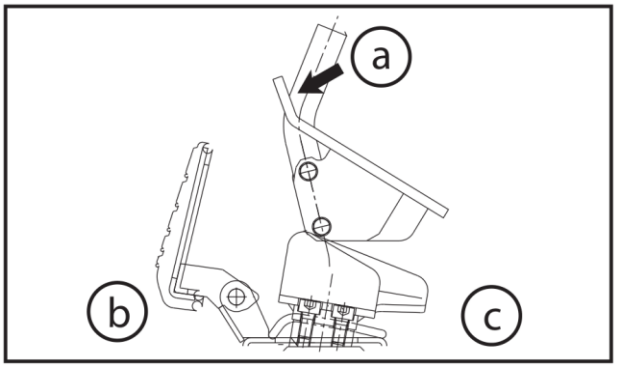
Forward: 1) propel the travel lever forward

2) Left turn

3) Right turn

Stop: 4) return to the middle position and stop the movement

Backward: 5) pull the travel control lever backward



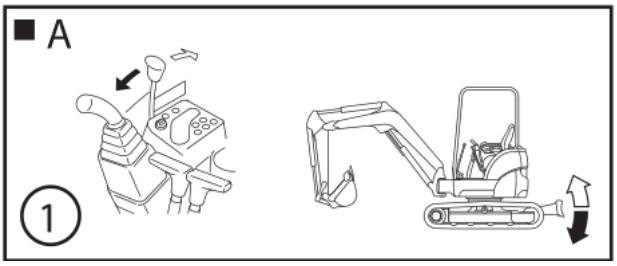
Foot pedal control

a: Forward

b: Frontage

c: Back

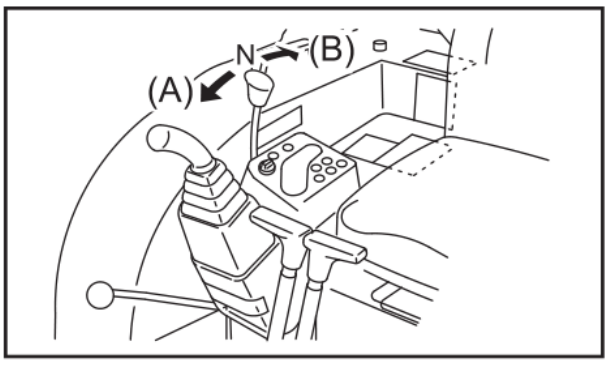
10.5.3 Bulldozer operation



Operate the bulldozer handle to control the bulldozer action

A: Operating the bulldozer blade

1) Bulldozer

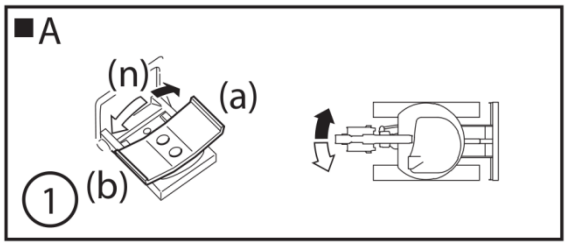


A: The control lever is pushed forward, and the bulldozer plate is pushed downward

B: Pull the lever backward and the bulldozer plate is upward

N: After release, the control lever returns to the middle position without action

10.5.4 Boom deflection operation



Use this pedal to swing the boom to the left and right.

A: Control boom deflection

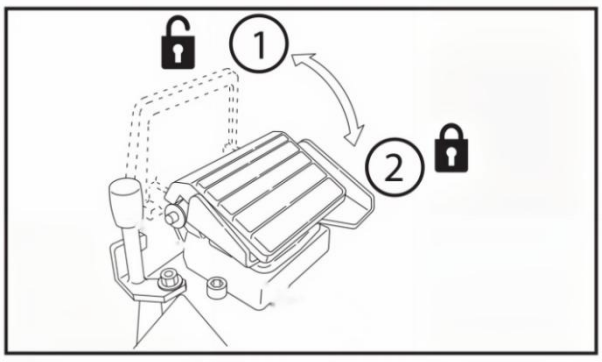
1) Boom deflection pedal

a: Swing boom right

b: Swing the boom to the left

n: After the neutral position is released, the pedal returns to the neutral position and the boom stops swinging

10.5.5 Crushing hammer operation



PTO auxiliary pedal / electric switch ------ (depending on model)

Use this pedal to control auxiliary actions

1) Unlock

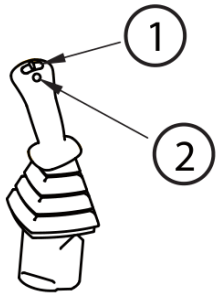
2) Lock

Operation and boom deflection are similar

CAUTION

- The boom yaw pedal and PTO pedal are equipped with protective devices.
- To avoid physical injury, when the boom swings or pt O when the pedal is not operated, ensure that the guard is in the locked position.

10.5.6 Proportional operation (optional)

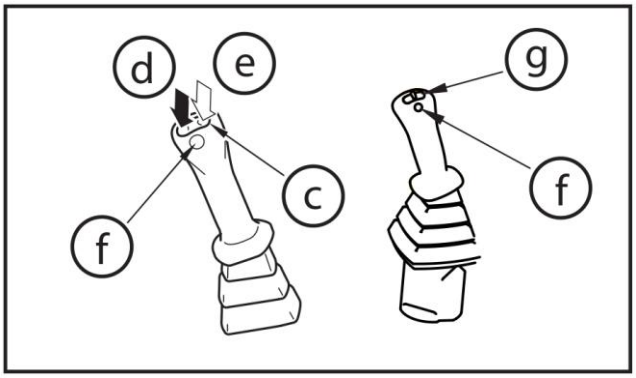


Using the proportional button to control the PTO operation has a dual effect

Electronic control proportional valve

Horn switch

This function has multiple operation modes, which shall be determined with your agent



c: PTO proportional switch

d: Single effect

e: Double effect

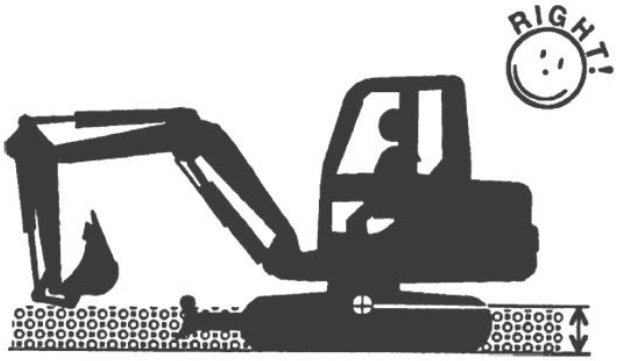
f: Horn switch

g: Proportional roller

10.6 Precautions for operation after startup

When entering or leaving the machine, always face the machine, and use steps and handrails to avoid slipping. When climbing or descending from a machine, always use the three-point pose, that is, two hands and one foot or one hand and two feet. Do not jump!

10.6.1 Operation in water or muddy water



1. Only when the foundation of the working area has sufficient strength to prevent the machine from sinking beyond the upper edge of the carrier sprocket can the machine be operated in water lower than the upper edge of the carrier sprocket.

2. When operating in this environment, always check the position of the machine. If necessary, update and adjust the position of the machine.

3.The allowable water depth is the center line of the carrier sprocket, Do not completely submerge the carrier sprocket to avoid submerging the slewing ring and slewing gear.

4. When leaving the water area, it is necessary to remove and refill the grease of the water immersed parts in time whether it is within the maintenance cycle or not.

⚠ CAUTION

When driving in the water, the rear of the upper fuselage is in the water, and the engine fan may be damaged. Special care should be taken in such cases.

10.6.2 Do not operate near high-voltage lines

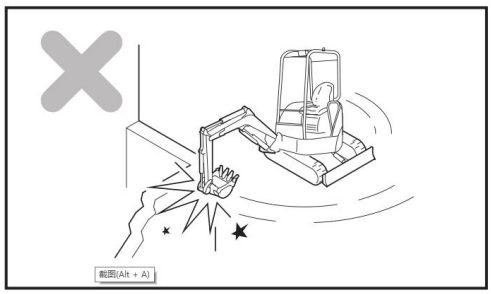
If the machine is close to the high-voltage line, people may be shocked. Although not necessarily in direct contact, hazards may still occur.

If working near high voltage lines, do not allow anyone to approach the machine. Contact the power company before working near the high-voltage line. For the sake of safety, the following minimum distances must be maintained between the machine and the high voltage line.

If the working device accidentally touches the wire, the operator must stay in the cab. If the machine can still work, try to carefully move the working device away from the high-voltage wire, so as to avoid the risk of electric shock.

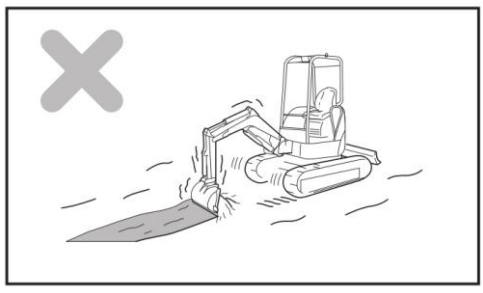
Voltage	Minimum distance from wire
0~1 KV	2m (7 feet)
1~55 KV	4m (13 feet))
55~500 KV	6m (20 feet))

10.6.3 Prohibited operation



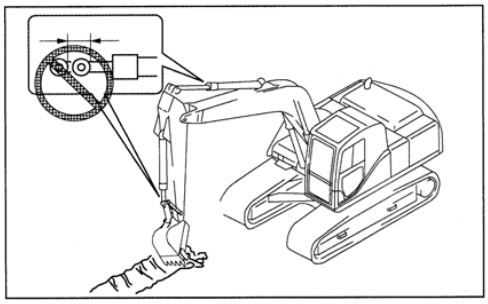
1.Operation using rotary force

Do not use the rotary force to compact the ground or break objects.



2. Operation using walking force

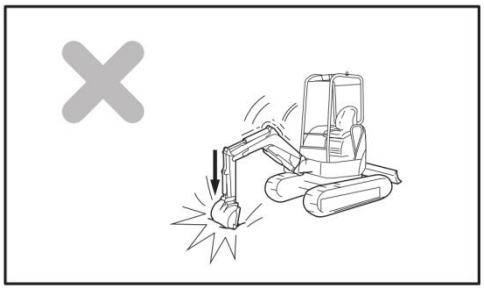
Do not dig the bucket into the ground. Use the walking force to dig.



3. Use the end of stroke operation of hydraulic cylinder

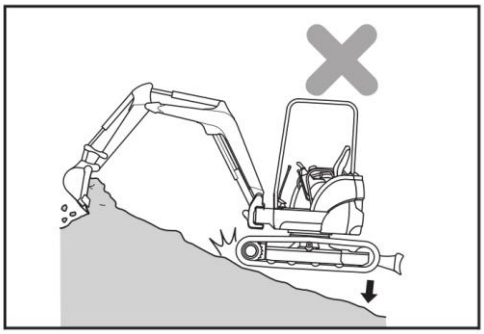
Do not operate with the hydraulic cylinder fully retracted or fully extended,

Carry out work operations.



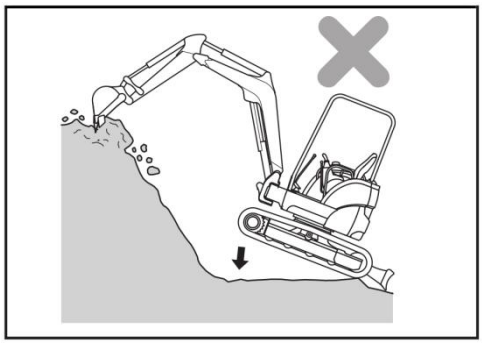
4. Operation using bucket lowering force

Do not use the lowering force of the machine for excavation or the lowering force of the bucket as a pick, crusher or pile driver.



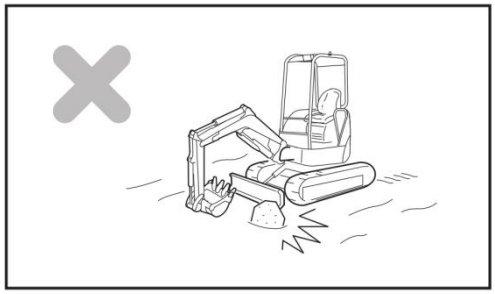
5. Operation using the lowering force of the machine

Do not use the lowering force of the machine for digging.



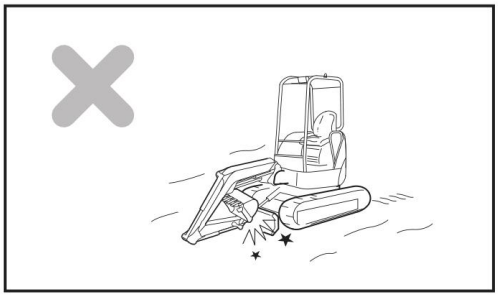
6. Excavation of hard rock

Do not use machines to dig hard rocks.



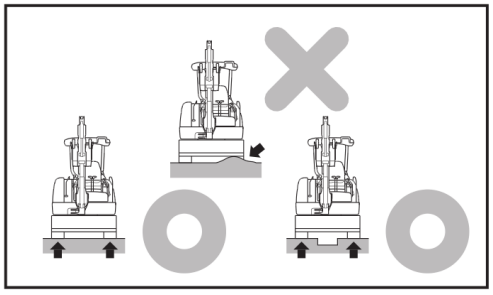
7. Bulldozer shovels large rocks

Do not use the blade of the bulldozer to strike large rocks.

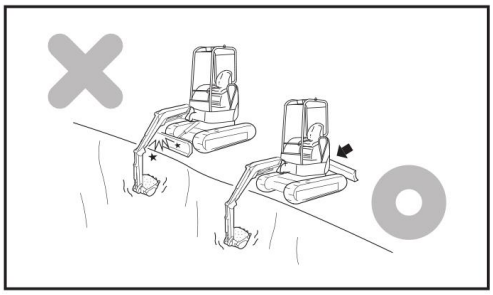


8. Pay attention to collision when recycling machines and tools

Be careful when retrieving the implement



9. Support the bulldozer on both sides

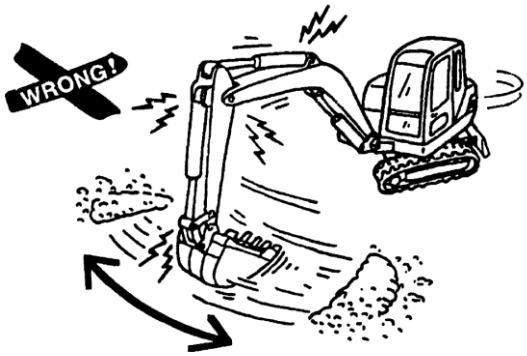


10. The bulldozer is encountered during excavation

Be careful not to push when digging deeply

10.6.4 Note for operation of extended arm and large dredger

The operating performance of the long arm of the excavator and the large dredger is very high, but there are also a lot of precautions in use: because the long arm of the excavator is longer than the standard arm, the capacity of the large dredger exceeds the standard bucket, the forebody of the excavator is heavier and has greater inertia. Therefore, it is lighter than the standard arm when operating, and each operating process should be smooth, and the action should not be too fast or too violent, the bulldozer in front can obviously feel the center of gravity of the excavator moved back, the whole machine operation is more stable



WARNING

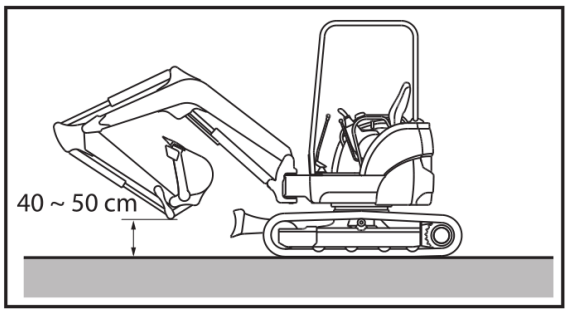
Extended Arm and extended bucket rod and large volume bucket, there will be the risk of overturning, be careful

10.7 Travel function

	Rubber track	Steel track
Low vibration	◇	□
Smooth driving without creaking	◇	○
Silent driving	◇	□
Reduce damage to pavement	◇	□
Simple handling	◇	□
Vulnerability	□	◇
Tractive force	◇	◇

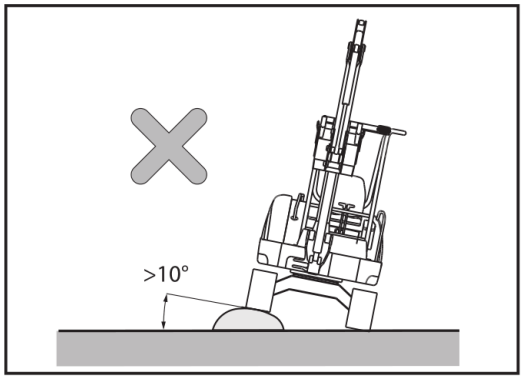
◇: very good □: OK ○: Normal

10.7.1 Walking on horizontal ground

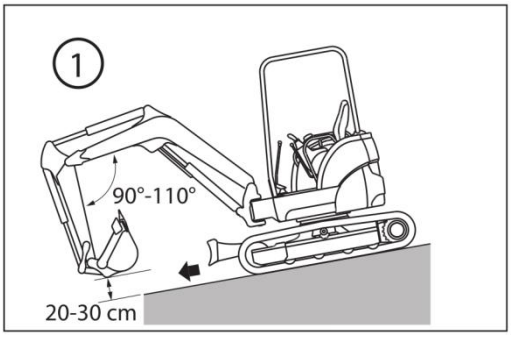


If you walk on a flat ground, you must retract the working device and lift it to 40-50 cm above the ground.

10.7.2 Walking on slope

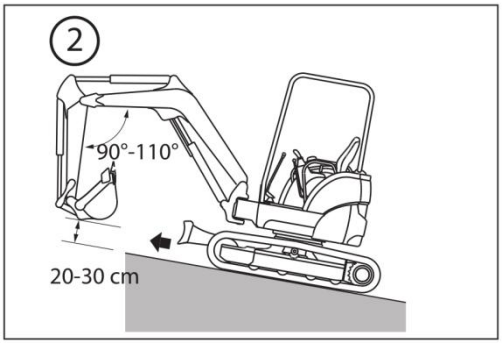


1. if walking or operating on rough ground, the right tilt angle shall not be greater than 10 ° .



2. when walking down a slope of 15 degrees or more,

Make the machine as shown in the figure and walk at low speed.



3. when walking upward on a slope of 15 degrees or greater, make the machine as shown in the figure.

If the track slips, the bucket can be pushed into the soil to help the travel mechanism push the machine upward.

WARNING

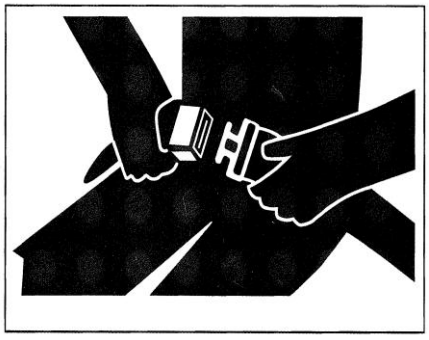
Risk of serious injury!
The wrong operation may result in serious injury.

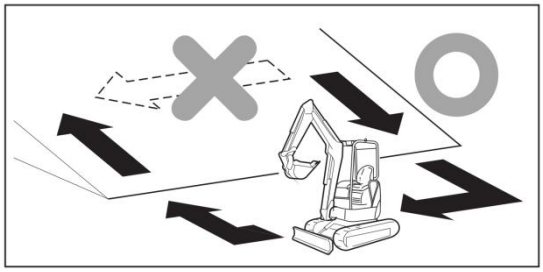
- Never attempt to go up or down a slope with a gradient greater than 30 ° , and never attempt to cross a slope with a gradient greater than 15 ° .
- Be sure to fasten your seat belt.
- Don't try to turn on the slope. The machine may slip or tip over. You can turn only on very gentle, solid slopes.
- Try to avoid crossing slopes where the machine may slip or tip over.
- Avoid turning onto the ramp. Never try to turn onto the ramp. The machine may tip over. If you must turn downhill, carefully operate the loading and arm at low speed.

- If the engine stalls on a ramp, immediately lower the bucket to the ground, return the levers to neutral position, and restart the engine.
- Be sure to warm up the machine fully before going up the steep slope. If the hydraulic oil is not sufficiently preheated, it may not give full play to the performance of the machine.

The machine has the potential to tip over on rough terrain or slopes. To prevent rollover accidents, when operating on uneven ground or slopes:

- Slow down the engine.
- Choose low-speed walking mode.
- Operate the machine slowly and pay attention to the movement of the machine.
- Never attempt to walk on a slope with a bucket loaded with material or with a suspended object.
- When the slope angle exceeds 25 degrees, will cause the engine lubrication insufficient.

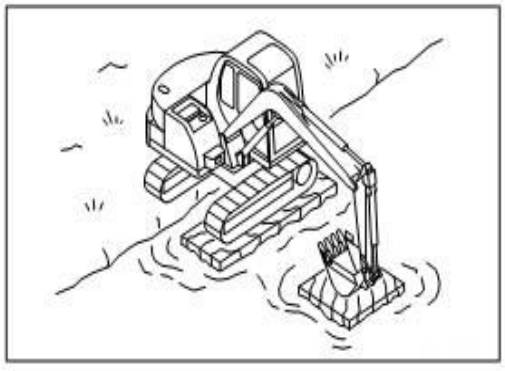




⚠WARNING

It is forbidden to work or walk in parallel with the inclined Cape

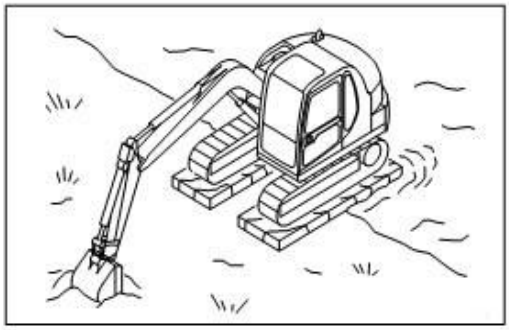
10.7.3 Exit from muddy ground



Be very careful when working on soft and muddy ground.

- When one crawler is trapped, the bucket can be used to support the crawler on the trapped side, and a wooden block is padded under the crawler.
- When both tracks are trapped, a wooden board shall be placed under the track. The bucket teeth are pushed into the ground, and the stick is recovered as if it were digging

- Push the walking handle to the forward position, so that the machine can get out of the swamp.



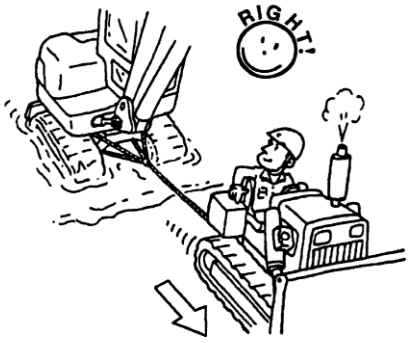
⚠ IMPORTANT

- When using the boom or stick to support the machinery, use the bottom of the bucket (not the bucket teeth).
- Set the angle between boom and stick at 90 ° - 100 ° .
- After working in water or exiting from muddy ground, add lubricating grease to the pin shaft of the working device. Check the lubricating oil in the idler, roller and travel motor. If the lubricating oil has been contaminated, replace the lubricating oil.

10.7.4 Short distance traction

⚠ WARNING

Use steel wire rope with sufficient strength for traction.



When sliding into the mud or towing heavy objects, use steel wire rope to tow the machinery, as shown in the figure.

1. To prevent the steel cable from being worn off, place some protective materials between the traveling frame and the steel cable. To protect the machinery and steel wire rope from damage.

2.Connect the towing wire rope as shown in the figure, and use other machines to pull your machine to the solid ground.

3. Keep the dragging wire rope horizontal and consistent with the track direction, and drag it slowly.

⚠ CAUTION

Do not use the shackle hole a to tow the machine. This hole is only used for fixing when transporting the excavator.

10.8 Parking the machine

10.8.1 Shutdown

⚠ CAUTION

- **S**elect horizontal ground parking machinery.
- Put the left and right control handles to the neutral position.
- Turn the engine speed control switch to the low idle position.
- Lower the bucket to the ground to keep the bottom of the bucket parallel.
- Lift the safety locking handle and securely lock the hydraulic system. Refer to "security locking system".
- Stop the engine
- Make the engine run at idle speed for several minutes before stopping.
- Turn the start switch to the stop position.
- Note: if the machine will stay for a period of time (no matter how long), disconnect the battery switch.

10.8.2 Short term parking

(a) Park the machine on level ground.

(b) Lower the bucket to the ground.

(c) Turn the engine control knob counterclockwise to the limit position. (low speed no-load position). Run the engine for approximately 5 minutes in order to allow the engine to cool.

(d) Pull the pilot control switch lever to the locked position.

(e) Turn the key switch to off and remove the key from the key switch.

(f) Close the windows, the sunroof, and the cab door.

(g) Lock all service door locks.

If you have to stop on a slope, you need to do the following:

(a) Insert the bucket teeth into the ground.

(b) Return all operating levers to the middle position and pull the pilot control switch to the locked position.

(c) Block the tracks on both sides.

(d) Turn off the battery disconnect switch.

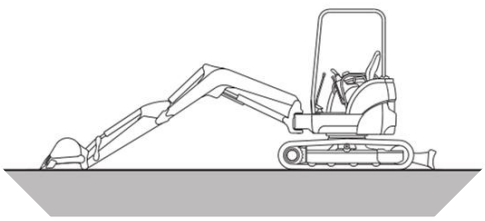
⚠ CAUTION

- **Try to avoid parking the machine on the slope. The machine may tip over and cause personal injury!**
- **Pay attention to the weather conditions and take appropriate measures to prevent the machinery from freezing, sinking on the ground or other adverse consequences.**

10.8.3 Long term parking machinery

In addition to the above short-term storage and parking regulations, the following points must be met:

- **R**emove the soil and debris attached to the track and roller.
- The exposed components such as oil cylinder rod shall be treated with rust prevention, and the machinery shall be thoroughly lubricated.
- Inject fuel oil and hydraulic oil to the mark of maximum capacity.
- Park the machine according to the above figure



⚠ CAUTION

The shutdown mode for short-term and long-term storage of the machine is different

11 Transportation

11.1 Precautions for transporting the machine

Shipping weight: Refer to the specifications table.

⚠ CAUTION

Select a route for transporting the machine based on the road width and clearance, and the height and weight of the machine.

For safer transportation, comply with all local regulations and laws.

⚠ CAUTION

- Before loading, check whether the details and quantity of tools in the toolbox are correct (attach a detailed list);
- The tool box shall be locked with a lock to avoid being lost in the middle; The tool box and related list details are placed on the seats in the cab;
- The cab door is locked and sealed.

11.2 Machine tie-down

⚠ CAUTION

- **Do not tie the machine down with a person on or on an attachment.**
- **Use a chain sufficiently resistant for the machine weight.**
- **Do not tie the machine down to other points than those indicated below:**
- Machine attachments and equipment items that are not secured with limiting devices and may move beyond the vehicle envelope should be prevented from moving. Instructions should be provided on the equipment item limiting the tie-down device movement.
- It is advised to correctly secure on the trailer floor loose parts such as hydraulic cylinders that can move due to vibrations during transport and/or limit their displacement using a tie-down device.

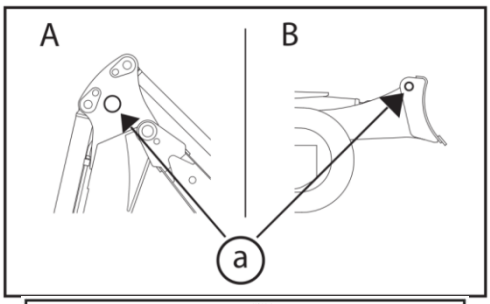
Precautions concerning side movements:

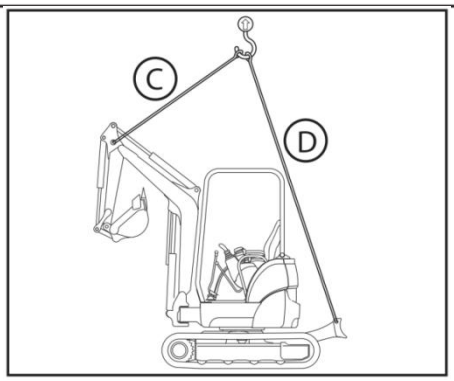
- The machine should be tied down using the securing devices provided for the vehicle, using appropriate tie-down attachments or using devices appropriate for the machine, by tying down the machine chassis using metallic cables or chains.

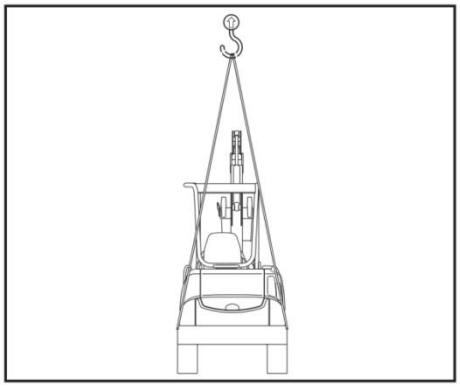
11.3 Machine slinging

⚠ CAUTION

- **Never suspend the machine if any person is on the machine or the implement.**
- **Use wire ropes strong enough for the weight of the machine.**
- **Do not suspend the machine in any way other than that explained on the following page.**
- **Failure to suspend the machine as prescribed will throw the machine off balance.**
- **Do not swing the machine being suspended.**
- **When lifting the machine, keep the machine in balance taking care on the center of gravity of the machine.**
- **Never stand near or under the suspended machine.**







For safety in suspending the machine, comply with all applicable regulations.

Suspend the machine on the level ground as follows:

A： Front side

B：Rear side

a： Hook bores are on both ends.

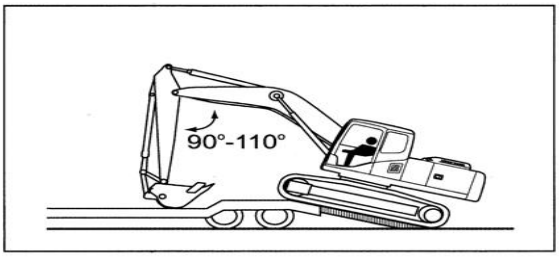
1) Swing the upper structure so that the blade is behind the operator’s seat.
2) Raise the blade to the highest limit.
3) Extend the hydraulic cylinders of the front implement (except for the swing cylinder) to the maximum.
4) Top the engine, and make sure that nothing is left around the operator's seat before leaving the machine.
5) Fit the shackles to the suspending hooks on the front side (one point) and the rear side (two points), and securely fasten a sling belt (or a wire rope) to the shackles.

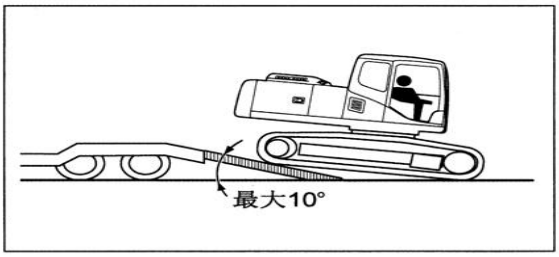
11.4 Loading machinery

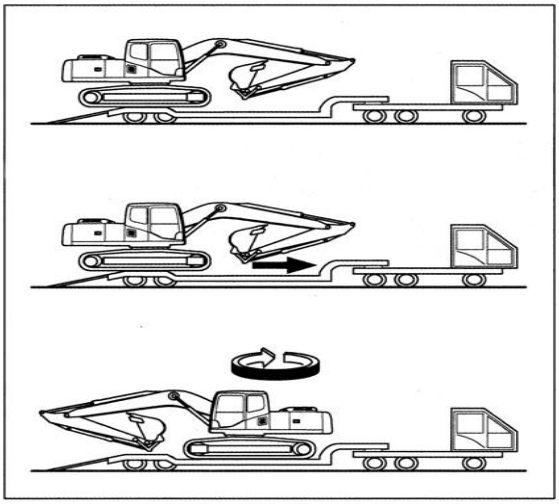
The following rules shall be followed for loading:

The orientation of the machine is as follows:

- With working device: put the working device at the front and walk forward.
- Without working device: walk backwards as shown in the figure (trailer with ladder must be used).
- The center line of the machine shall correspond to the center line of the trailer.
- Slowly drive the machine onto the slope.







1) With working device: support the flat surface of the bucket on the trailer

The included angle between the stick and the boom should be between 90 and 110 degrees.

When the machine is about to begin to tilt towards the trailer platform, turn the

The bucket is supported on the trailer. Walk slowly forward until

About 1/3 of the track length drives the trailer and firmly contacts the

Up to the plate.

2) Lift the bucket slightly, stow the stick and hold it down,

Slowly rotate the upper carriage 180 degrees.

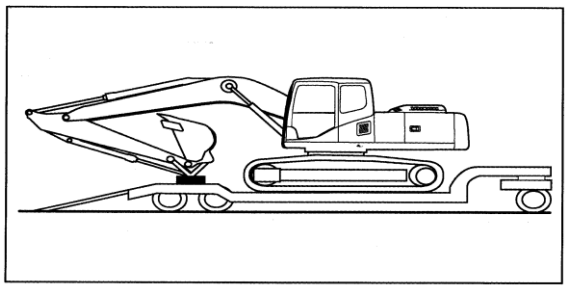
3) With working device: support the flat surface of the bucket on the ground,

The angle between the stick and the boom should be between 90 and 110 degrees. decline

The boom makes the bucket support the whole vehicle, and then slowly retracts the whole vehicle

Until the whole track contacts the flat plate.

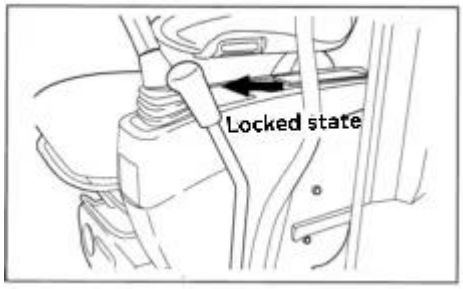
4) Fully extend the bucket and stick cylinder and slowly lower it Boom.



- To prevent damage to the bucket cylinder during transportation, the bucket one end of the oil cylinder shall be padded with wood blocks to prevent it from touching the bottom plate.
- Stop the engine and remove the key from the switch.
- Operate the control lever several times until the pressure in the hydraulic cylinder is completely

released.

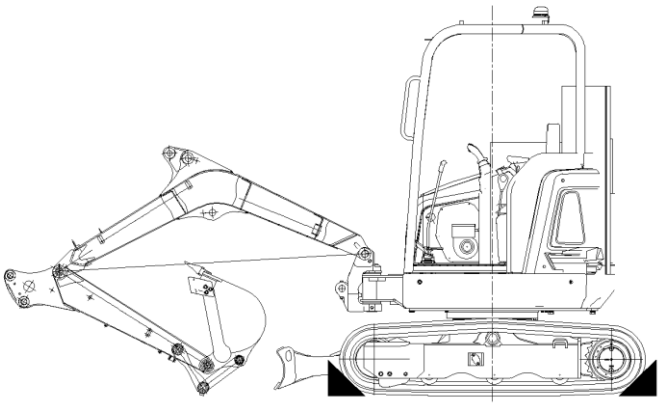
- Pull the pilot control switch lever to the locked position.
- Close the windows, ventilation skylights and doors of the cab, and cover the exhaust port to prevent the entry of wind and rain.



11.5 Transport

(a) Place spacer blocks at the front and rear of the track. To prevent the machine from moving during transportation. The machine shall be tied firmly with iron chain or steel wire rope of appropriate strength.

(b) Pay special attention to fixing the machine firmly so that it will not slide to one side.



⚠ CAUTION

- Horizontal servo mechanism, outriggers and other movable devices that may cause danger during transportation or driving shall be reliably locked at their transportation position.
- Tie the chain or rope to the frame of the machine, and do not cross or press the chain or cable on the hydraulic pipeline or hose.

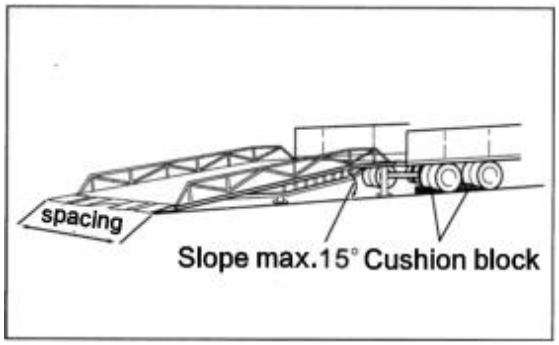
In the transportation should enable hinged locking mechanism in figure 1:

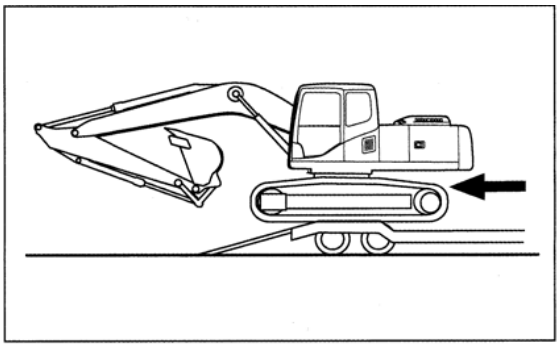
Non transport should enable hinged locking mechanism in Figure 2

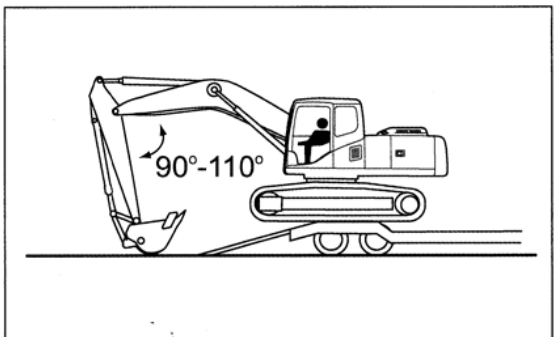
Figure 1

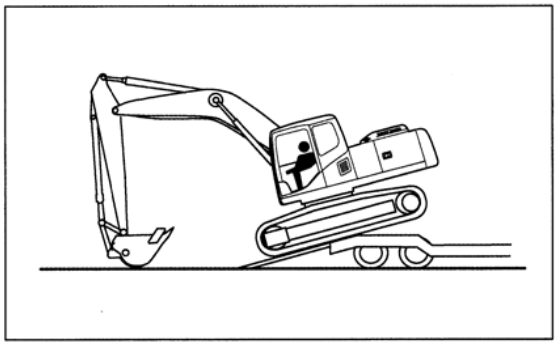
Figure 2

11.6 Unloading









(a) Loading and unloading can only be carried out on a solid and flat ground, and a safe distance shall be kept from the edge of the road.

(b) Apply proper braking to the trailer, and put blocks under the tires to ensure that the trailer does not move. Then install a ramp between the trailer and the machine. Ensure that the ramps on both sides are on the same horizontal plane. The maximum gradient of the ramp shall not exceed 15 ° . Adjust the distance between ramps to match the track center.

(c) Remove the iron chain or steel wire rope that secures the machine.

(d) Start the engine.

(e) Adjust the safety lock lever to the free position.

(f) Raise the work unit, put the stick under the boom, and then move the machine slowly.

(g) Stop moving the machine as it moves over the rear wheels of the trailer toward the ramp.

(h) Adjust the included angle between the stick and the boom to 90 ~ 110 degrees, support the flat surface of the bucket on the ground, and then slowly move the machine into the ramp.

(i) When the machine moves to the ramp, slowly operate the boom and stick, and carefully lower the machine until it completely leaves the ramp.

⚠ CAUTION

- The rear end of the trailer flat plate meets the slope in a protruding shape, so drive carefully.
- Prevent possible damage to the working device. When unloading, always keep the included angle between the stick and the boom at 90 ° .
- Prevent possible damage to the hydraulic cylinder. Do not let the bucket of the machine collide violently with the ground.

12 Precautions for Servicing

Do not use any inspection or servicing procedures that are not described and recommended in this manual.

Park the machine on solid, level ground to inspect and service it.

Attach the warning tag

When the oil or the cooling water is drained, attach the "SERVICING IN PROGRESS" tag to the operator's seat so that other persons will not start the engine.

Observe the precautions for welding

- Make sure to disconnect the battery cables (positive and negative terminals).
- Do not apply more than 200 V continuously.
- Ground the machine within 1 m from the welded part.
- Make sure that there is no seal or bearing between the welded part and the grounded part.
- Do not ground around the pins on the implement or the hydraulic cylinder.

Observe the precautions for cleaning the machine

- Do not spray steam directly at the connectors.
- Do not splash water on the monitors in the cabin.
- Do not spray high-pressure water directly at the radiator and the oil cooler.

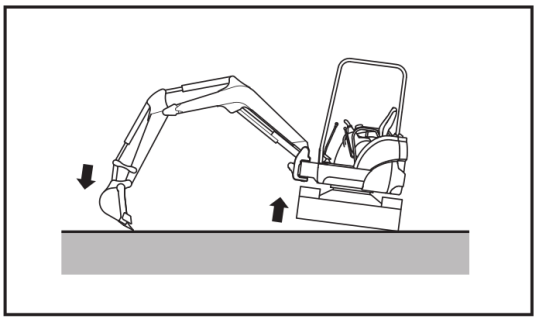
Do not mix oils

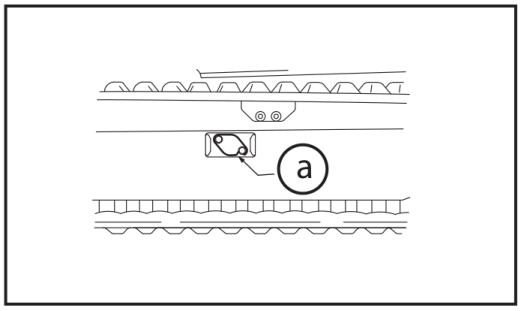
- Never mix oils of different makes or types.
- If you have to replenish an oil with a different make or type than the one already in the tank, remove the remaining oil completely.

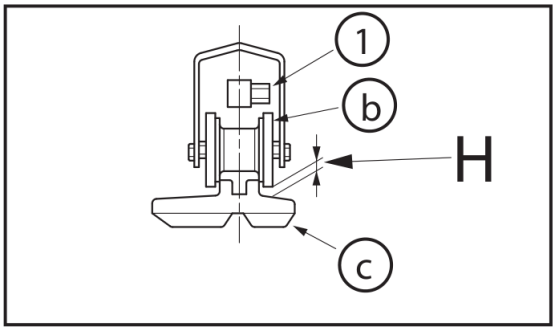
Specification of auxiliary materials: refer to the attached table "specification of auxiliary materials" for the specification of consumable materials used for maintenance

For the maintenance interval of the machine, refer to the "maintenance interval table" in the attached table

12.1 Checking and adjusting the rubber crawler tension







⚠ CAUTION

- **When adjusting the crawler tension while raising the machine, do not support the machine with the implement only. The control levers could move or the hydraulic oil could flow out accidentally so that the ma- chine would fall.**
- **When raising the machine, support it with safety blocks of sufficient strength. When the machine is being checked or adjusted by two persons, one must operate the machine in response to signs from the other.**

How the crawler wears out depends on the working conditions and the nature of the ground. Be sure to check the crawler for wear and tension from time to time. When a new crawler is mounted, perform the first check after 30 hours operation.

Working with the crawler loosened can cause the detrack of the crawler or an earlier wear out.

1) Lift the machine with the implement. To do this, operate the control lever slowly.

2) The tension of rubber crawlers is proper if the clearance between the outside rolling surface of the second track roller from the idler side and the inside surface of the crawler is within the specified value: H (see the specification table)

1 ： Nipple valve

a ： Cap

b ： Track roller

c ： Crawler

3） The tension of steel crawlers is proper if the clearance between the lower center of the track frame and the upper surface of the shoe plate is within the specified value: H (see the specification table)

Increasing the crawler tension

4） By using a grease gun, inject grease through the nipple valve (1) until the crawler tension is within the specified value: H

Loosening the tension

5） Slowly loosen the nipple valve (1) and discharge the grease to adjust the crawler tension to the specified value: H (If the grease is not discharged completely, put down the machine and move the machine back and forth slightly.)

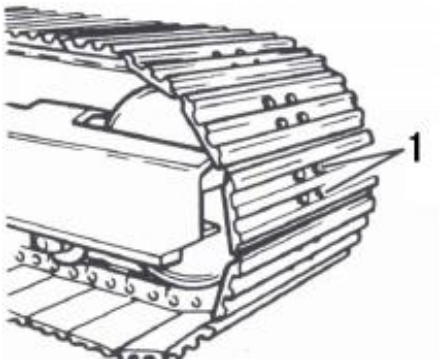
Tighten the nipple valve (1). Tightening torque : 49.0 N•m

⚠ CAUTION

- **Grease is under high pressure. If the nipple valve (1) is loosened suddenly, the grease could be ejected or the valve could blow, which causes bodily injury.**
- **Do not look at the valve to determine whether grease has been discharged or not, but check that by the tension of the crawler.**
- **Do not loosen the nipple valve more than one turn.**
- **It is very dangerous to discharge the grease by any procedure other than that described above.**
- **If the rubber crawler cannot be loosened, contact your dealer and ask for intervention.**

6） To check that the tension is proper, put down the machine and move the machine back and forth slightly.

7） Put back the cap (a).



IMPORTANT

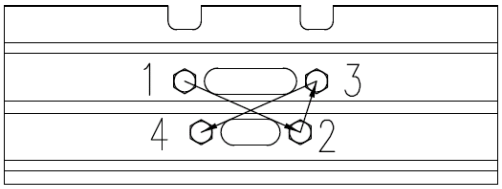
The rubber crawler is not grease-resistant.

Completely wipe off the grease because grease will shorten its service life.

Tightening of track shoe screws

- Check the screws of the track shoes every day

If the bolts (1) of the track shoe are loose, the track shoe



is often damaged,

- Therefore, always check the looseness of the bolts and tighten the bolts to specified tightening torque.

Retighten

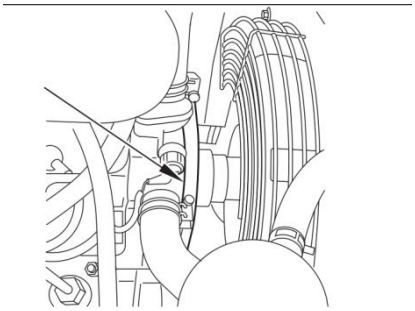
After tightening according to the specified tightening torque, the bolts, nuts and

Whether the track shoes are in full contact.

Tightening sequence

Tighten the bolts in the sequence shown in illustration.

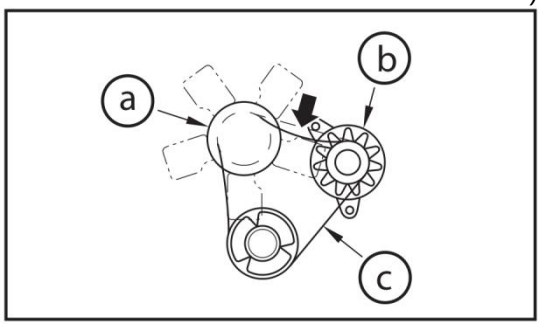
12.2 Checking and adjusting the fan belt tension



1) Stop the engine.
2) Open the engine hood rear cover.
3) Press the fan belt between the fan pulley and the genera- tor with a finger to check the fan belt tension.

   Pressing load : Approximately 98,1 N•m

   Adequate slack : 10 to 15 mm
4) Adjust the tension if necessary.



A： Fan pulley

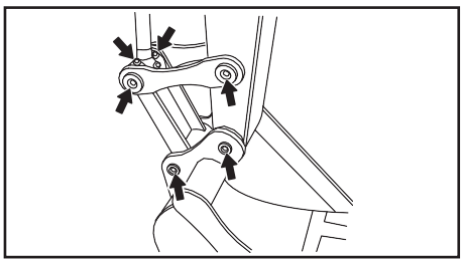
B： Generator

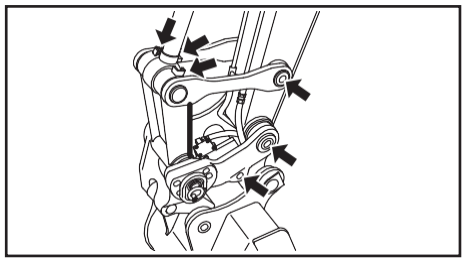
C： Belt

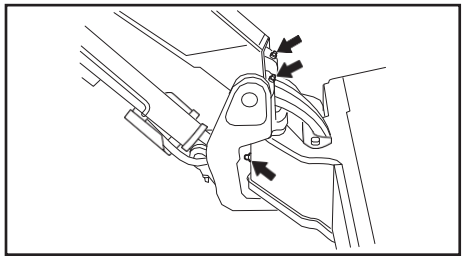
12.3 Greasing

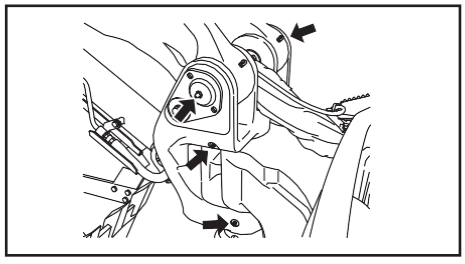
IMPORTAN

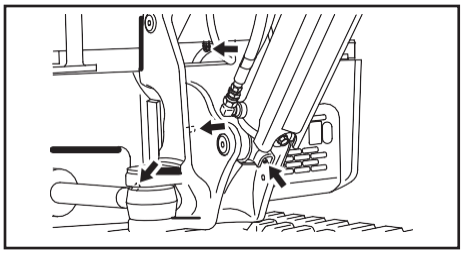
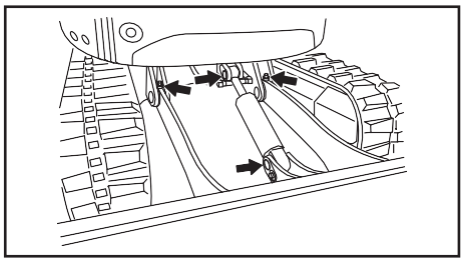
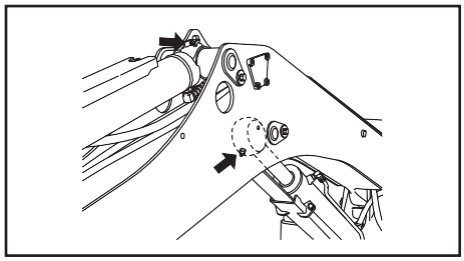
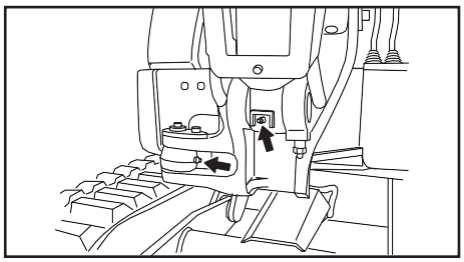
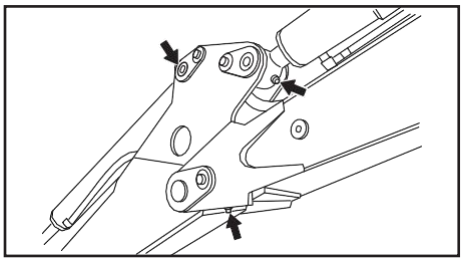
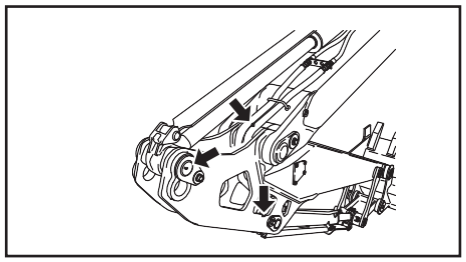
Grease the fittings thoroughly after washing the machine or after operation in rain, on soft ground, or







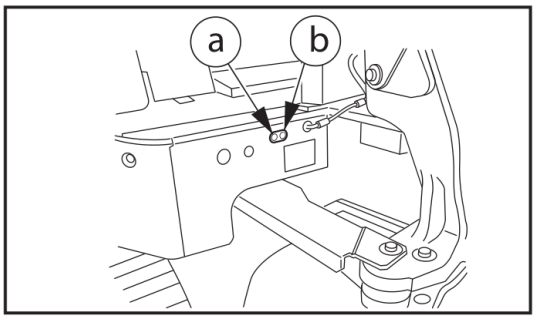


1) Put the bucket and the blade on the ground and stop the engine.

2) Clean the grease nipples indicated with the arrows in the above figures and grease them using a grease gun.

3) After greasing, wipe off the excessive grease with waste cloth or the like.

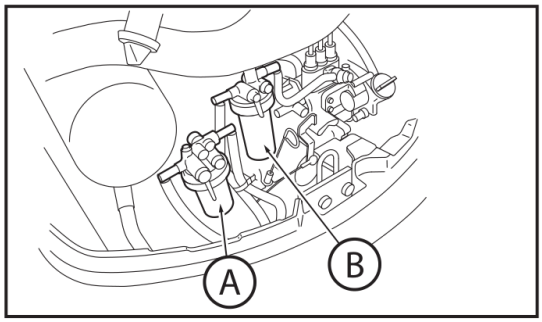


12.4 Greasing the swing gear and the swing bearing

a： Swing bearing

b：Swing gear

12.5 Changing the water separator element

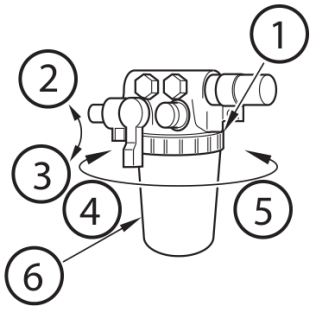


A : Fuel filter

B: Water separator

1) Retainer ring
2) Close
3) Open
4) Loosen
5) Tighten
6) Water separator
7) Ring

12.6 Changing the fuel filter element



1) Retainer ring
2) Close
3) Open
4) Loosen
5) Tighten
6) Fuel filte

13 Schedule

13.1 Auxiliary material specification

Components	**Ambient temperature and applicable oil**	**Liquid type**
	(°F) -22 -4 14 32 50 68 86 104 (°C) (-20) (-20) (-10) (0) (10) (20) (30) (40)	
Engine fuel tank	-10～-35＃ diesel oil 0＃ diesel oil	Diesel oil
Slewing transmission case	ISO VG46	Lubrication with hydraulic
Traveling transmission case	GL-5 85W-90	Gear oil
Hydraulic oil tank	ISO VG32 ISO VG46 ISO VG68	Hydraulic oil
Engine oil pan	※SAE10W-30 SAE15W-40	Engine oil
Other lubricating parts	2# and3# lithium grease	Grease
Engine coolant	Antifreeze	Soft water

IMPORTANT

If the excavator fails due to the use of inferior oil, the consequences shall be borne by the user.

13.2 List of auxiliary material consumption

Serial number	model	Engine oil (L)	Hydraulic pressure required for maintenance Oil capacity (L)	Travel motor reduction oil	Fuel tank (L)	Coolant (L)
1	TP26	3	35	0.8	35	11

Note: the slewing motor reducer is self lubricated by hydraulic oil.

13.3 Maintenance schedule

◇: Check ○: Supply ☆: Replace first time ●: Replace □: Adjust (clean) ■: Oil and grease

Check & service items Machine		Daily	Every 50h	Every 250h	Every 500h	Every 1000h **
General	Falling off or breakage of parts	◇				
	Retighten bolts and nuts	◇				
	Engine condition	◇				
Lube oil	*Swing gear case		☆	○		●
	Travel reduction gear		☆	○		●
Hydraulic system	Hydraulic oil	◇				●
	Suction filter					□
	Return filter			☆	●	
Grease	Grease-up positions	■				
	Swing gears and Swing bearings		■			
Undercarriage	Track tension	◇				
Pilot	Steering lever	◇				
	Travel lever	◇				
	*Speed change	◇				

	Accelerator lever	◇		□		
Electric equipment	Lights, horn	◇				
	Hourmeter	◇				
	Warning lights	◇				
	Function of electric wiring and	◇				

◇: Check ○: Supply ☆: Replace first time ●: Replace □: Adjust (clean) ■: Oil and grease

Check & service items Engine	**Daily**	**Every 50h**	**Every 250h**	**Every 500h**	**Every 1000h ****
Fuel tank	○				
Oil/water separator		□			
Fuel filter				●	
Engine oil	○	☆	●		
Oil filter		☆	●		
Cooling water	○				●
Radiator fins			□		
Fan-belt tension			□		
Rubber hose (fuel and cooling water)					○
*Turbocharger					○
Air filter			□	●	
Valves					□
Nozzle valves and injection pressure					□
Fuel pump					□

***Applicable to models with the relevant equipment**

**** Every 1000 hours or once a year**

IMPORTANT *:*

- **When machine is used at dusty worksites clean and re- place filter element twice or more frequently than specified in the table.**
- **Execution of periodic inspection and servicing is indispensable to conform to the EPA emission control regulations. Keep a record of the results.**

13.4 Torque table

Bolts or nuts in the metric system should be tightened at the torque described below unless specified otherwise.

Item		Thread size X pitch	Tightening torque N•m	Remarks
Screw (7T) Nut	Coarse threads	M6 × 1	9,8 - 11,8	1) Apply 80 % tightening torque if screws or nuts are in aluminium. 2) Apply 60 % tightening torque for 4T bolt and lock nut. 3) Use fine thread screws for engine only.
		M8 × 1,25	22,6 - 28,4	
		M10 × 1,5	44,1 - 58,8	
		M12 × 1,75	78,5 - 98,1	
		M14 × 2	117,7 - 147,1	
		M16 × 2	166,7 - 206,0	
		M18 × 2,5	235,4 - 284,4	
		M20 × 2,5	323,6 - 402,1	
	Fine threads	M14 × 1,5	127,5 - 147,1	
		M16 × 1,5	210,9 - 240,3	
PT plug		1/8	9,8	
		1/4	19,6	
		3/8	29,4	
		1/2	58,8	
Pipe joint bolt		M8	12,7 - 16,7	
		M12	24,5 - 34,3	
		M14	39,2 - 49,0	
		M16	49,0 - 58,8	

IMPORTANT

If a part to be tightened is made of resin like a panel board, excessive tightening torque may damage the tightened part. Be careful when tightening.

13.5 Lifting capacity

13.5.1 Lifting capacity for TP26

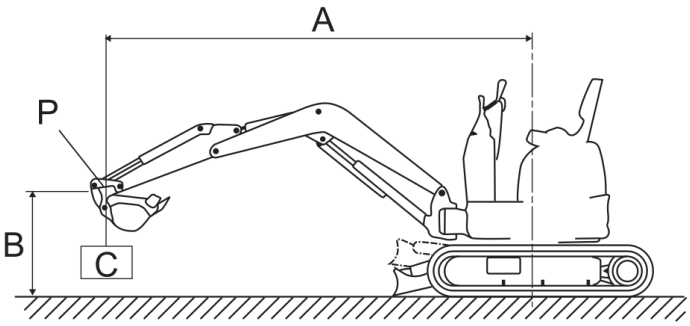
Standard condition, machine with rubber track.

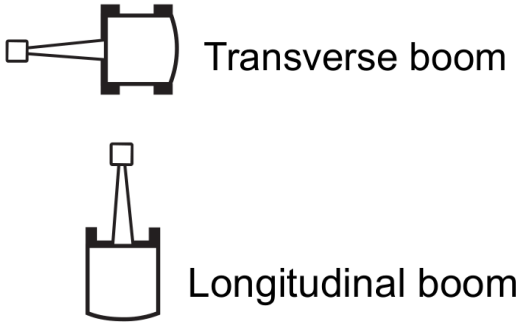
Bucket width: 505 mm Bucket weight: 71 kg

A : Overhang from the axis of rotation

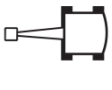
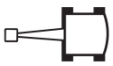
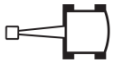
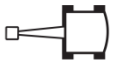
B : Bucket height in meters

C : Load point





Blade down **Unit:(kg)**

A (m)	max		3.0m		2.5		2.0	
B (m)								
3.0	395	*520	—	—	—	—	—	—
2.5	320	*510	*450	*450	—	—	—	—
2.0	275	*490	*510	*510	—	—	—	—
1.0	250	*510	385	*655	530	*820	730	*1160
0	250	*525	380	*725	490	*920	680	*1310
-1.0	340	*525	370	*620	490	*840	700	*1135
-1.5	*480	*480	—	—	*600	*600	*839	*830

Blade up **Unit:(kg)**

A (m)	max		3.0m		2.5		2.0	
B (m)								
3.0	395	*490	—	—	—	—	—	—
2.5	320	395	*450	*450	—	—	—	—
2.0	275	335	*510	*510	—	—	—	—
1.0	250	305	385	470	530	635	730	910
0	250	310	380	455	490	605	680	845
-1.0	340	395	370	455	490	605	700	890
-1.5	*480	*480	—	—	*600	*600	*830	*830

The data in the table represents the lifting capacity according to is010567 standard. Corresponds to 75% of the maximum dead load before tilting or 87% of the hydraulic working load. The data marked with * indicates the hydraulic limit of the working load.

13.5.2 Lifting capacity for TP26 ARM LONG

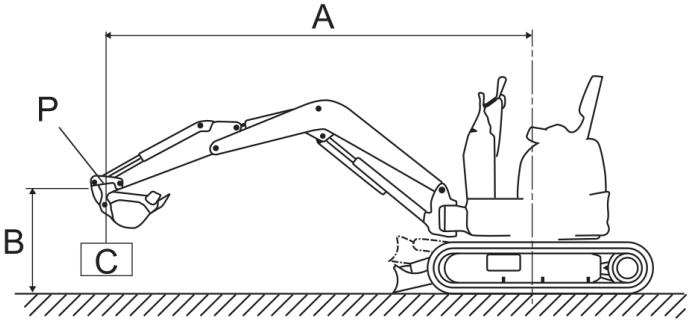
Note: It is not advisable to use the hydraulic breaker with the ARM LONG..

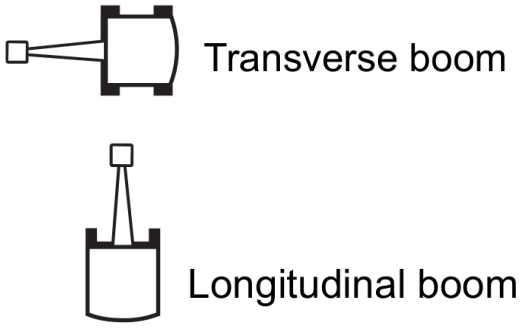
Bucket width: 505 mm Bucket weight: 71 kg

A : Overhang from the axis of rotation

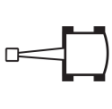
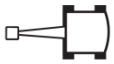
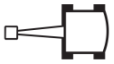
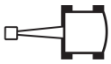
B : Bucket height in meters

C : Load point

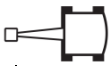
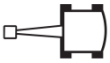
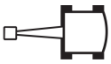
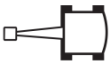




Blade down **Unit:(kg)**

A (m)	max		3.0m		2.5		2.0	
B (m)								
3.0	*390	*390	—	—	—	—	—	—
2.5	280	*395	—	—	—	—	—	—
2.0	250	*415	*400	*400	—	—	—	—
1.0	210	*445	380	*565	510	*685	730	*930
0	220	*465	360	*730	500	*945	695	*1150
-1.0	285	*485	365	*685	495	*895	655	*980
-1.5	355	*440	—	—	470	*695	360	*940

Blade up **Unit:(kg)**

A (m)	max		3.0m		2.5		2.0	
B (m)								
3.0	*390	*390	—	—	—	—	—	—
2.5	280	*395	—	—	—	—	—	—
2.0	250	285	*400	*400	—	—	—	—
1.0	210	265	380	455	510	*685	730	*930
0	220	275	360	455	500	620	695	780
-1.0	285	350	365	460	495	615	655	660
-1.5	355	*400	—	—	470	555	360	940

The data in the table represents the lifting capacity according to is010567 standard. Corresponds to 75% of the maximum dead load before tilting or 87% of the hydraulic working load. The data marked with *

indicates the hydraulic limit of the working load.

13.6 Configuration option

Project	TP26
5-inch large screen display	Standard configuration
HD display	Nothing
USB charging port	Standard configuration
Boom and stick explosion-proof valve	Optional
Deflection boom	Standard configuration
Telescopic chassis	Nothing
LED headlamp (shed, chamber, boom)	Standard configuration
Radio	Standard configuration
Warm wind	Standard configuration
Fan	Standard configuration
Warning light	Standard configuration
Rubber track	Standard configuration
Steel track	Optional
Auxiliary line	Standard configuration
Hydraulic control double pipeline	Optional
Electric proportional double circuit	Optional
Hydraulic quick change pipeline	Optional
Boom, bulldozer cylinder protection plate	Standard configuration
Protection plate for stick and bucket cylinder	Optional
Boom extension 400	Optional
Stick extension 250	Optional

13.7 TP26 packing list

TP26 **packing list**

Number	Model	Item name	Company	Quantity	Remarks
1	TP26	Hydraulic excavator	Platform	1	Bare pager
2	TP26	Random data	Set	1	See data list
3	TP26	Random tools	Set	1	See tool list
4	TP26	Random spare parts	Set	1	See spare parts list
5	TP26	Start key	Hold	2	
6	TP26	Hood key	Hold	2	Common with cab door key
7	/	Tool kit	Individual	1	Store spare parts, document bags, gifts, etc

Attached data list of TP26 excavator

Number	Item name	Specification and model	Company	Quantity	Remarks
1	Complete machine certificate	TP26	Book	1	Copy
2	Engine instructions	TP26	Book	1	
3	Operation and maintenance manual	TP26	Book	1	
4	Excavator maintenance manual	/	Book	1	
5	File pocket	/	Individual	1	Store instructions, certificates, etc

List of attached tools for TP26 excavator

Number	Item name	Specification and model	Quantity	Remarks
1	Plastic tool box	12.5cun	1	Storage of accompanying tools
2	Filter element wrench	Belt type	1	
3	Double end wrench	8-10	1	
4	Double end wrench	11-13	1	
5	Double end wrench	14-17	1	
6	Double end wrench	16-18	1	
7	Double end wrench	19-22	1	
8	Adjustable wrench	300mm	1	
9	Multipurpose screwdriver	Short handle6*38mm	1	
10	Inner hexagon spanner	4、5、6、8、10	1	
11	Pressure bar grease gun	200cc	1	

List of attached spare parts for TP26 excavator

Number	Name	Standard	Quantity	Remarks
1	Grease fitting	Z-PT1/8-180°	5	
2	Oil filter	119305-35170	1	YANMAR 3TNV80F
3	Diesel filter	119802-55801/55810	1	YANMAR 3TNV80F
4	Air filter element	C100504	1	YANMAR 3TNV80F
5	Safety filter element	CF504	1	YANMAR 3TNV80F
6	engine oil	CI-4（15W-40） 4L/bucket	1	YANMAR

				engine
7	O-ring for flange	150*3.55	1	
8	O-ring for flange	109*3.55	1	
9	O-ring for flange	37.5*3.55	1	
Note: the model and quantity of engine oil supplied with the excavator are different due to different power.				

13.8 Noise emitted by the machines

Results of inspections:

	TP26
LwA (dBA)	93
LpA/LAeq (dBA)	82
LpCrête (dBC)	< 130

Rounded values

LwA: Weighted sound power level A.

LpA/LAeq: Weighted sound pressure level A on the operator's ears.

LpCrête: Maximum value of the instantaneous sound pressure measured with frequency weighting C.

Measurements made:

- Machine in static position
- Motor running at rated power

LwA: Determined and guaranteed in accordance with the directive 2000/14/CE amended by the directive 2005/88/ CE.

LpA/LAeq: Measured and guaranteed in accordance with the NF-ISO 6396: 1997 standard.

Note: These values are declared in accordance with the directive 98/37/CE and do not correspond to exposure values for 8 hours of work.

13.9 Vibrations emitted by the machines

Results of inspections:

Machine	Entire body in m/s ² (Threshold value < 0.5)			Arms in m/s ²(Threshold value < 2.5)		
	VRD trench	Backfill	Travel on grass	VRD trench	Backfill	Travel on grass
TP26	< 0,5	1,0	0,9	< 2,5	< 2,5	< 2,5

These are mean acceleration values established according to the cycles below. Rounded values

Measurements made:

- **VRD Trench:** 5 digging and dumping cycles to the left at 45°.
- **Backfill:** 3 backfill cycles.
- **Travel on grass:** One to and fro trip of about 1 minute with numerous changes in direction.

Measured in accordance with the ISO EN 1032 (2003) standard for the entire body and with the NF EN ISO 5349- 1 (2002) and NF EN ISO 5349-2 (2001) standards for the arm system.

Note: These values are declared in accordance with the directive 98/37/CE and do not correspond to exposure values for 8 hours of work.

To transmit minimum vibrations over the entire body during operation of the machine and avoid harming the operator's health, it is recommended that the following measures be ta- ken:

- Adjust the seat according to the operator's height.
- Maintain the ground in a good condition.
- Use the machine under suitable conditions, by considering the actual ground conditions and the specific effects of vibrations caused by the actual operating mode of the ma- chine.
- It is recommended that the operator acquaint himself with and retain the instructions relating to the setting up and use of attachments.

13.10 Details of TP26 vulnerable parts and maintenance parts

Details of TP26 series vulnerable parts and maintenance parts							
System classification	**Product No**	**Part name**	**Specifications**	**Unit consumption (piece / set)**	**Part properties**		
					Wearing parts	**Maintenance parts**	**Non production parts**
Hydraulic system	10025192	Oil return filter	SOI-200×10	1	√	√	
	10025191	Oil suction filter	WU-160×100-J（G1 1/2)	1	√	√	
	10000500	O-ring AS568(Parker)	24.99*3.53	1	√		
	10012661	O-ring GB/T3452.1	109*3.55	1	√		
	10001107	O-ring GB/T3452.1	37.5*3.55	2	√		
	10025211	O-ring GB/T3452.1	150*3.55	1	√		
	10000451	Combined pad	JB 982 ZHD-27	1	√		
	10000490	O-ring JIS	10.8*2.4	5	√		Yes
	10000493	O-ring JIS	13.8*2.4	4	√		Yes
Electrical system	10005392	Battery	6-QW-60(580)-L	1	√		
	10005637	Main power switch	34B0087	1	√		
	10019361	LED work lights	KD-0803S	1	√		
	10014306	Oil level sensor	RG4154	1	√		
	10013795	Electric horn	DL125-80/12V	1	√		
	10005432	Intermediate relay 14V DC	JD1912	1	√		
	10012863	Travel switch	OMRON4MC-5020	1	√		

	10020359	Electromagnetic master switch	JCC200	1	√		
	10025292	Combination instrument	LDW-5.0	1	√		
Structural member	10000590	Oil cup	M10＊1-90°	2	√		
	10021625	Oil cup	M10*1	5	√		
	10026096	Sharp bucket tooth		3	√		
	10025220	Toothed pin		3	√		
	10025217	Right tooth		1	√		
	10025216	Left flank tooth		1	√		
Dynamic system	10025141	Engine shock absorber		4	√		
	10013741	Auxiliary water tank		1	√		
	10021399	Tank cap		1	√		
	10025432	Diesel tank strainer	DH60	1	√		
	10025437	Air filter element		1	√	√	
	10025438	Safety filter element		1	√	√	
	10015045	Diesel filter	129004-55801	1	√	√	Yes
	10015044	Oil filter	119305-35151	1	√	√	Yes

14 Specification of complete machine

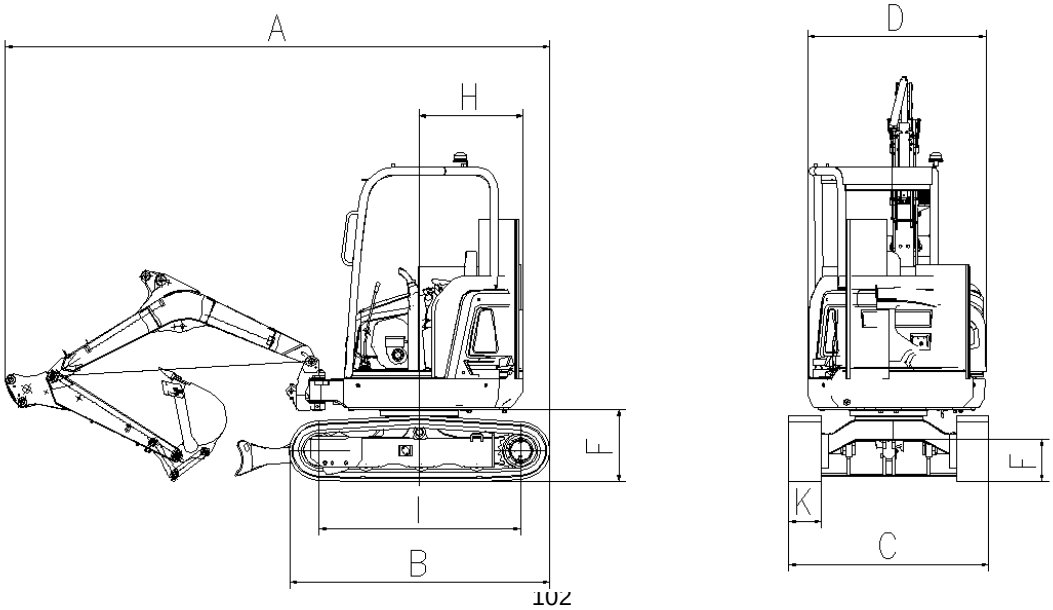
14.1 The product label

The product label, together with the factory number of the whole machine (product model, bucket capacity, machine weight, engine power and other information), is located on the side of the upper frame near the cab.

14.2 The engine model, serial number and other relevant contents are on the engine block

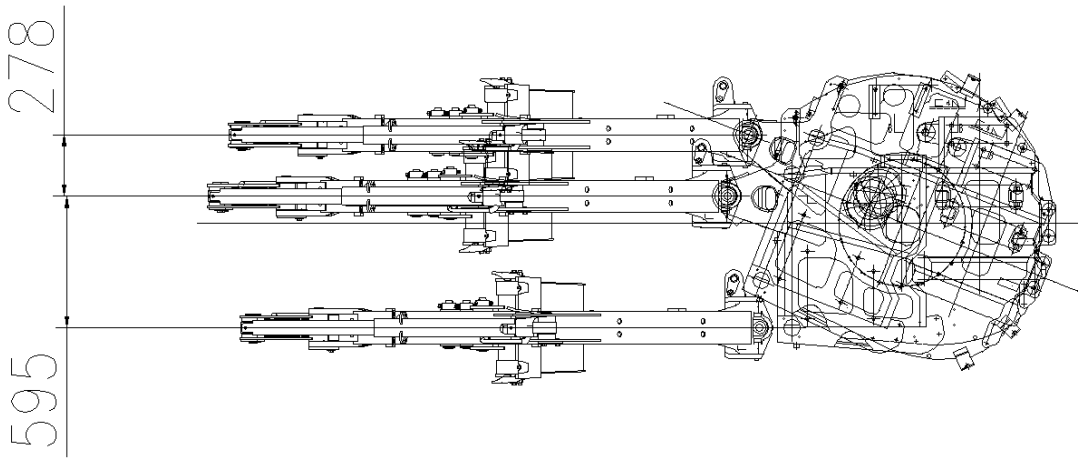
- Never remove the nameplate for any reason.
- The engine serial number and EPA identification plate are located on labels on the top of the cylinder head and inside the engine head.

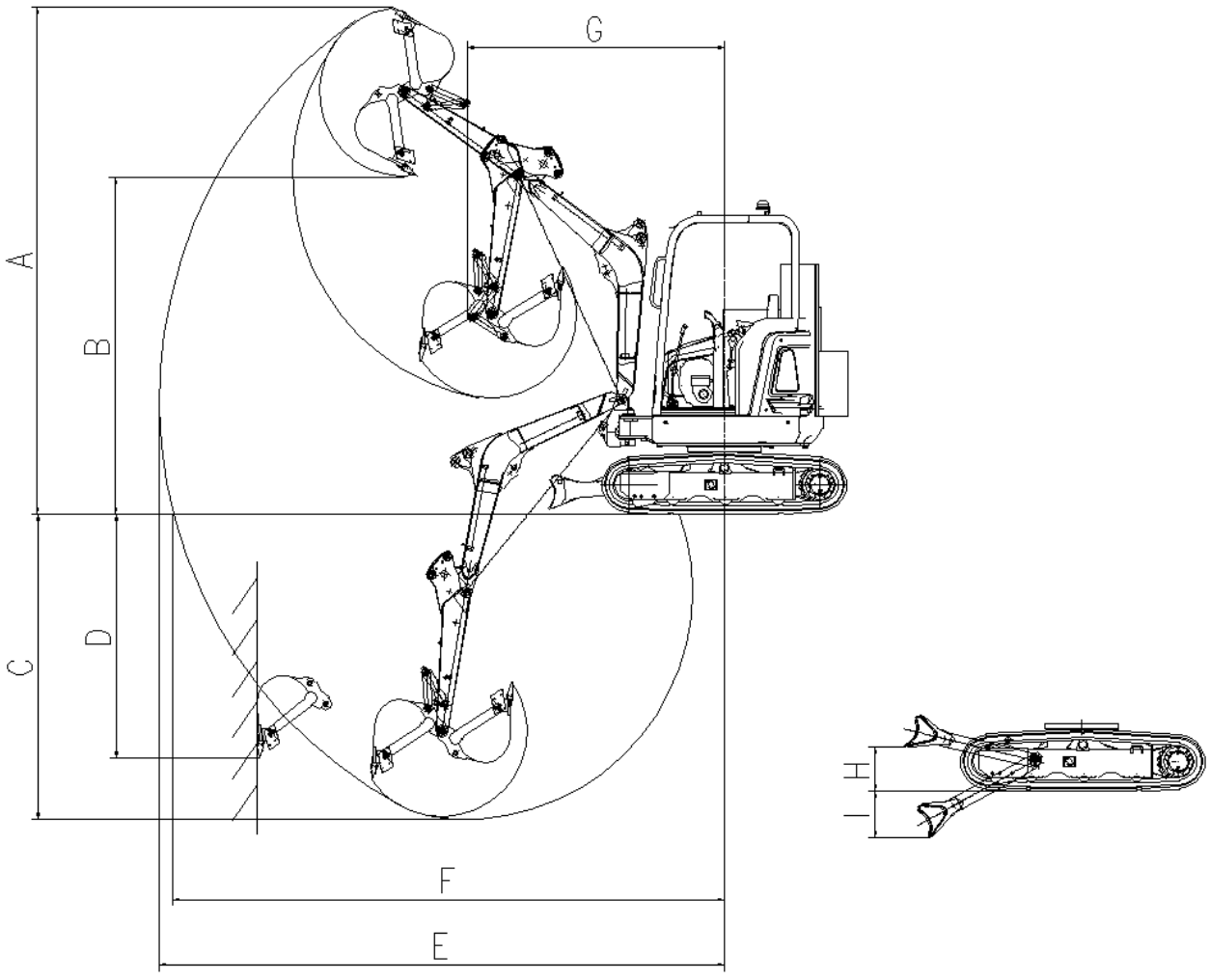
14.3 Overall performance parameters and dimensions



Model		**TP26**
Bucket capacity (M3)		0.08
Operating mass (Kg)		2650/2690
Engine	Model	YANMAR 3TNV80F
	Specification (kw/rpm)	15.2/2500
A: Total length (mm)		4159
B: Track length (mm)		2040
C: Track width min/max (mm)		1550
D: Total width (mm)		1550
E: Total height (CAB / roof) (mm)		2560
F: Ground clearance of counterweight (mm)		535
G: Minimum ground clearance (mm)		320
H: Tail turning radius (mm)		775
1: Track grounding length (mm)		1600
K: Track shoe width (mm)		250
Grounding specific pressure (kPa)		30.5
Slewing speed (RPM)		11.5
Traveling speed (km/h)		2.0/3.2
Gradeability		24.9
Maximum flow of main pump l/m		72
System set pressure Mpa		22
Arm length (mm)		1150
Boom length (mm)		2015

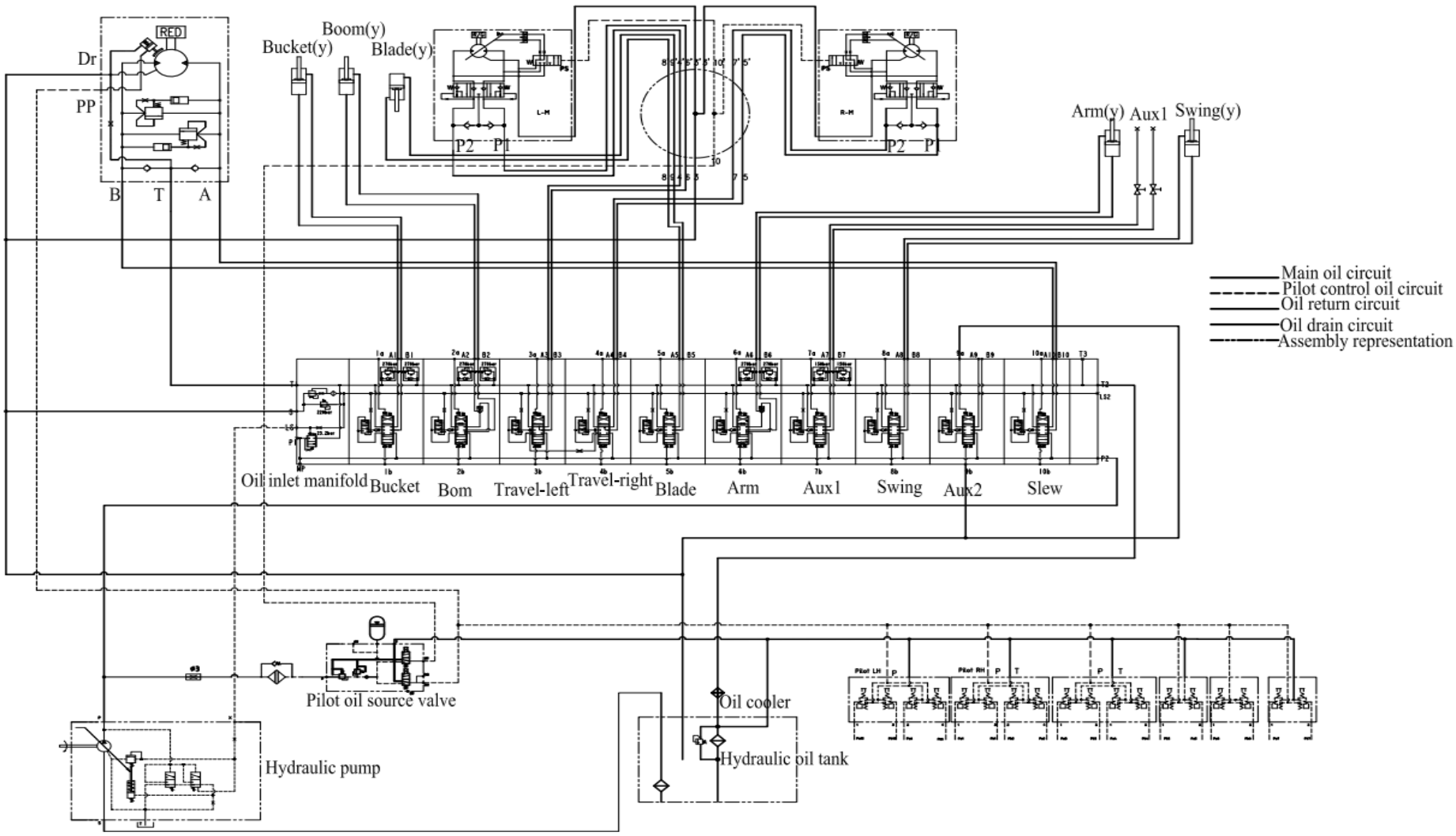
14.4 Scope of work

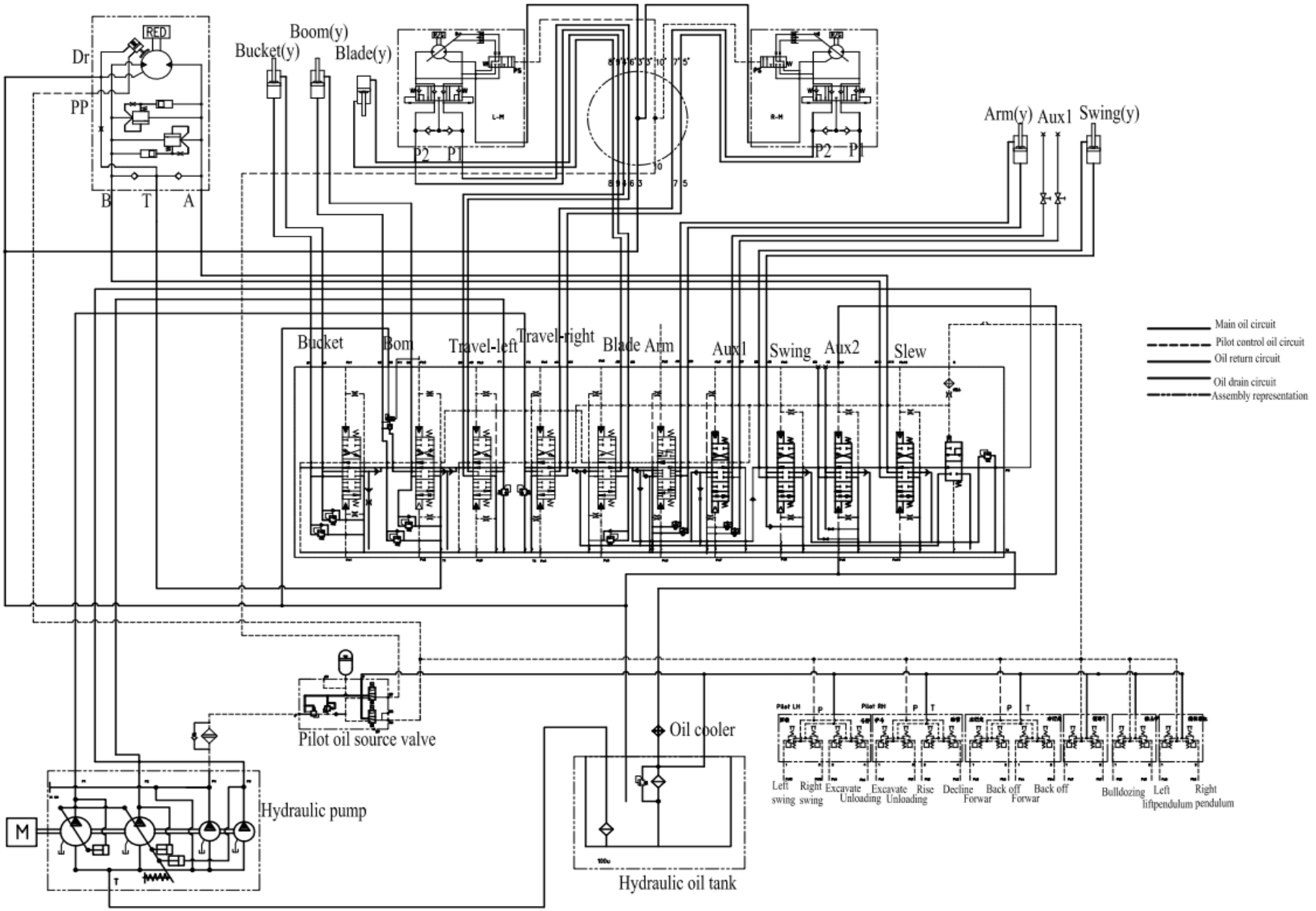


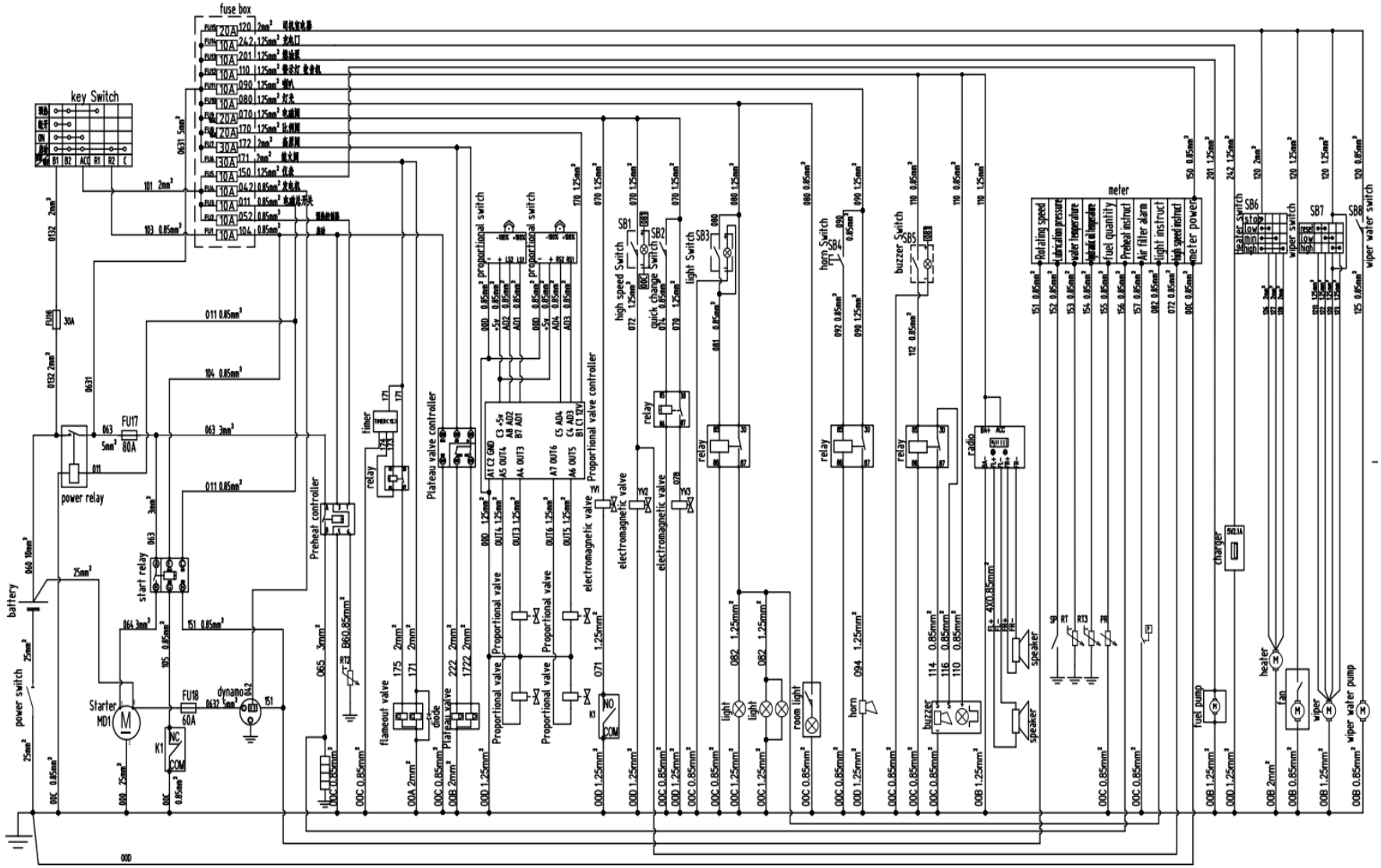


Model	TP26
A: Maximum excavation height (mm)	4132
B: Maximum unloading height (mm)	2742
C: Maximum excavation depth (mm)	2485
D: Maximum vertical excavation depth (mm)	2240
E: Maximum excavation radius (mm)	4610
F: Maximum excavation radius of ground (mm)	4494
G: Minimum radius of gyration (mm)	2096
H: Maximum bulldozing height (mm)	362
I: Maximum bulldozing depth (mm)	383
X-Distance between center of rotation and tail length (mm)	775

15 Hydraulic and electrical schematic diagram




RED
Dr
PP
B
T
A
Boom(y)
Bucket(y)
Blade(y)
P2
P1
Arm(y)
Aux1
Swing(y)
Bucket
Bom
Travel-left
Travel-right
Blade Arm
Aux1
Swing
Aux2
Slew
Main oil circuit
Pilot control oil circuit
Oil return circuit
Oil drain circuit
Assembly representation
Pilot oil source valve
Oil cooler
Hydraulic pump
M
Hydraulic oil tank
Left swing
Right swing
Excavate Unloading
Excavate Unloading
Rise
Decline Forwar
Back off Forwar
Back off
Bulldozing
Left liftpendulum
Right pendulum


fuse box
key Switch
power relay
start relay
battery
power switch
Starter
MD1
dynamo
FU17
80A
FU18
60A
Preheat controller
flameout valve
diode
Plateau valve
Plateau valve controller
Proportional valve
proportional switch
Proportional valve controller
electromagnetic valve
high speed Switch
quick change Switch
light Switch
horn Switch
buzzer Switch
relay
timer
light
room light
horn
buzzer
radio
speaker
meter
Rotating speed
Lubrication pressure
water temperature
Hydraulic oil temperature
fuel quantity
Preheat instruct
Air filter alarm
light instruct
high speed instruct
meter power
charger
fuel pump
heater switch
heater
fan
wiper
wiper water pump
wiper water switch

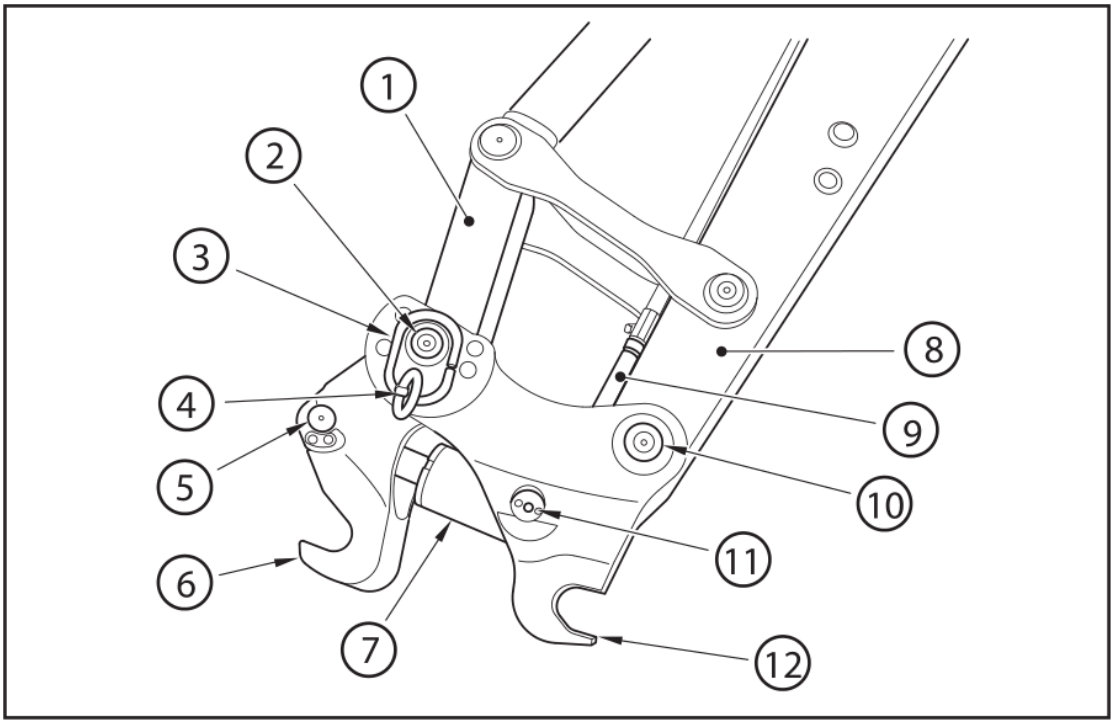
16 Assistive devices

16.1 Hydraulic quick change

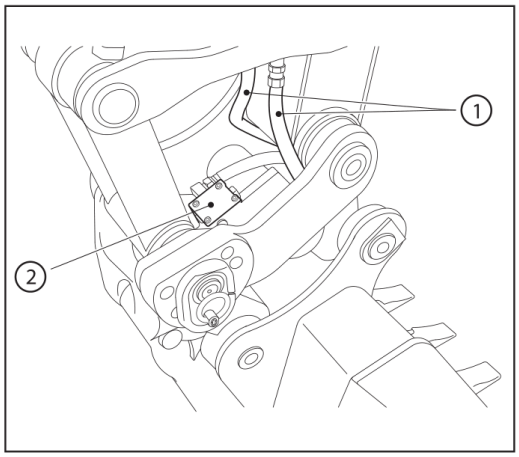
16.1.1 Hydraulic quick change is a quick change hydraulic device connected with machines and tools.

The distance between pins is adjustable so that the attachments with different distances between pins are available.

Hydraulic quick change structure



1) Bucket link
2) Bucket link pin
3) Lock plate
4) Lock pin
5) Cylinder pin
6) Movable hook
7) Cylinder
8) Arm
9) Hose
10) Arm link pin



1) Hose
2) Pilot chec valve

16.1.2 Attachment types

1） As long as the two pin shafts of the bucket are the same, the auxiliary tools installed on the machine can be replaced through hydraulic quick change.

As long as there is one pin with different styles, such as flip type, it cannot be installed in the hydraulic quick change.

2) The following 2 types of auxiliary tools of pin shaft style cannot be installed in the quick coupler.

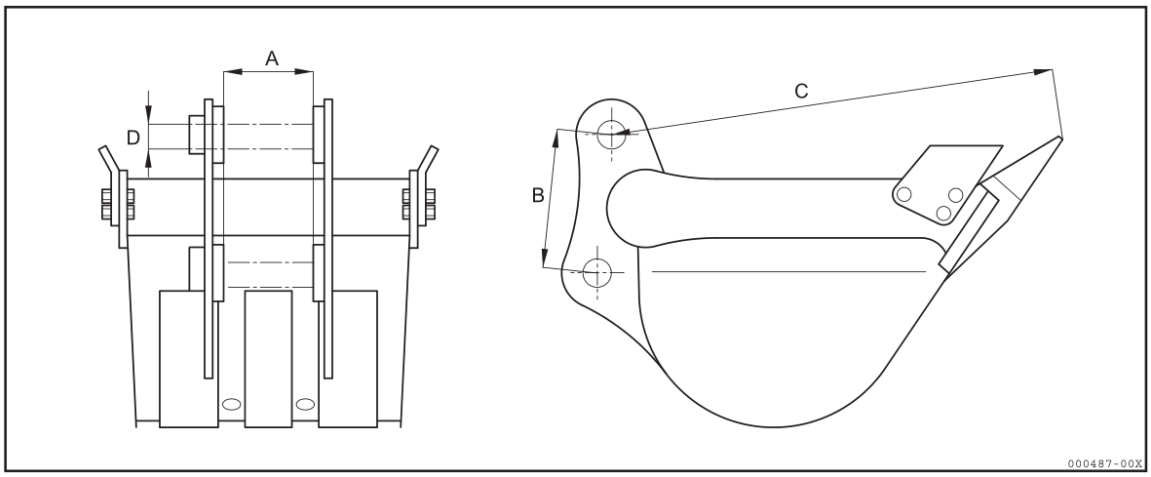
(1) The shape of the installation part of the auxiliary tools is very different from that of the standard bucket

(2) The axis spacing of auxiliary tools is too long or too short

3） Do not use any auxiliary tools that are not suitable for hydraulic quick change machines.

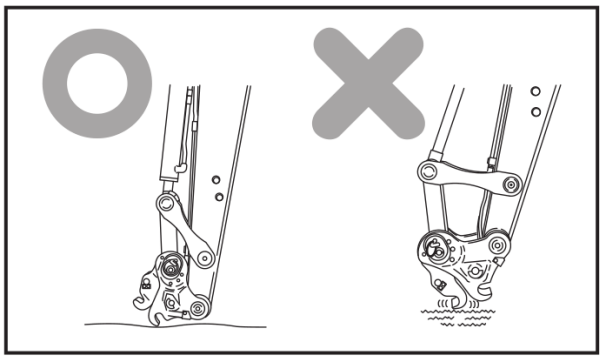
Allowable size of bucket

Sign	Spare parts	Model TP26
A	Attachment width	141 or less
B	Pin shaft distance	213
C	Bucket working radius	650 or less
D	Pin diameter	38



IMPORTANT

Posture for storing the machine without attachment

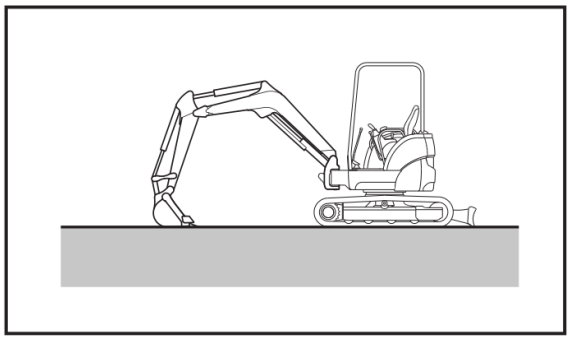


- Place the Hydraulic quick change on the ground as illustrated in the right figure for a long-term storage.
- If the Hydraulic quick change is placed on the ground when the control switch is in the dismounting mode, the hook will open when the engine is restarted, causing the floor surface scratches or the machine breakdown.

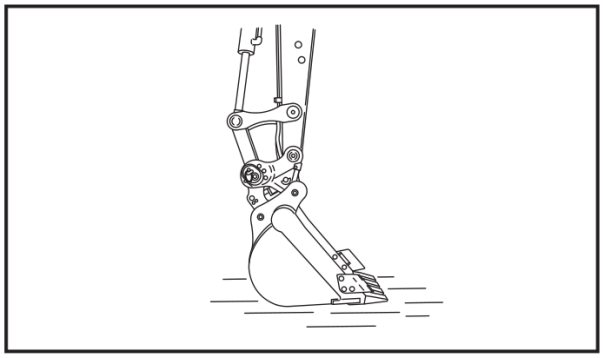
16.1.3 Dismounting attachment

⚠ WARNING

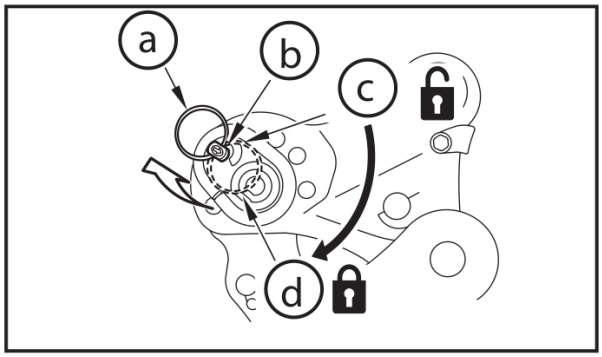
- **Never dismount the Attachment while it is still elev ted, as it will drop to the ground and could cause bodily injury.**
- **Never dismount the Attachment unless it is resting on stable level ground, as it could otherwise fall over.**



1) Park the machine on stable level ground.



2) Lower the attachment onto the ground.



3) Set up the handle of the lock pin.

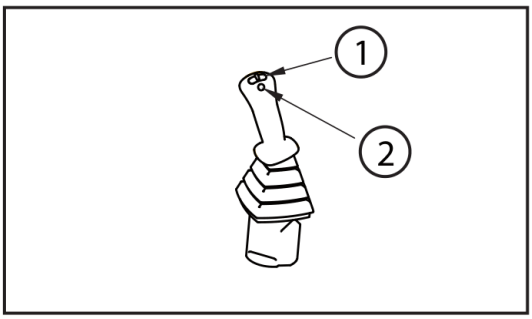
a) Handle

b) Lock pin

c) Unlock

d) Lock

4） Turn the arrow on the head of the lock pin from the lock position to the unlock position, and then pull it up.



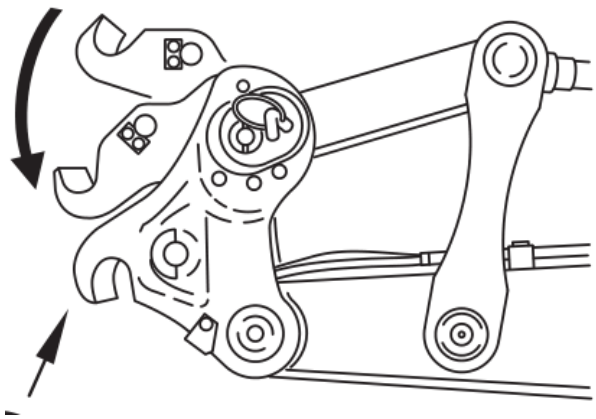
IMPORTANT

The lock pin cannot be removed from the body.

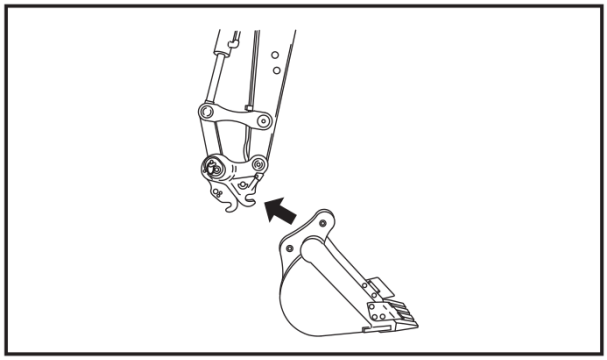
5) Press the power switch

(1) Pilot joystick

(2) Power switch



6) Press and hold the control switch to start the removal

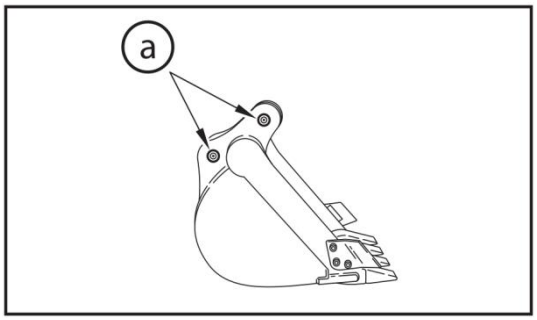


7) Auxiliary tools removed from hydraulic quick change

16.1.4 Mounting attachment

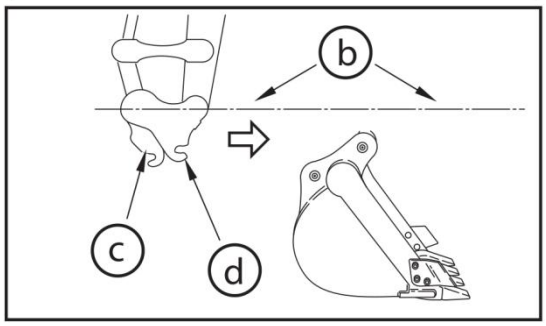
⚠ WARNING

- **Never place your hands or any other part of your body between the Hydraulic quick change and the Attachment to prevent bodily injury.**
- **Never stand near the Attachment unless it is resting on stable level ground to avoid bodily injury.**
- **Never use a newly mounted Attachment before confirming that it has been properly secured to the Hydraulic quick change, and that the Lock Pin has been correctly installed, as accidental detachment could otherwise result.**
- **Always replace the Lock Pin if damaged or lost.**
- **Failure to do so could result in death or serious injury.**



1) Place the attachment on stable level ground. Be sure to install the pins into the attachment.

a) Pin



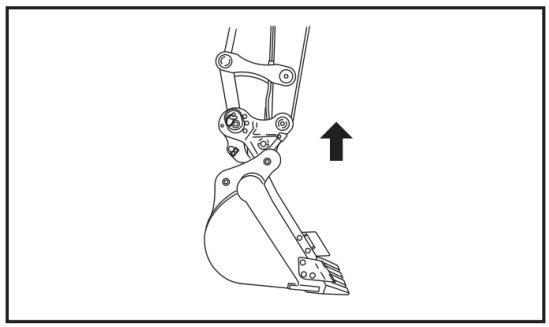
2) Close the movable hook.

3) Put the fixed hook onto the pin of the attachment on the arm side and set the quick hitch level with the ground as illustrated in the right figure.

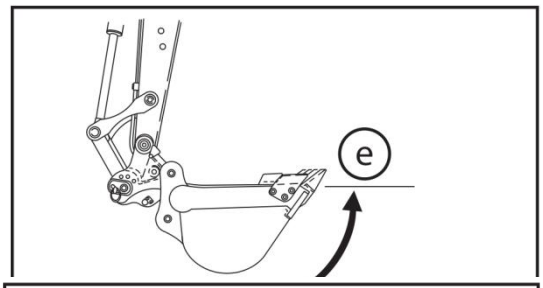
b）Level with the ground

c）Movable hook

d）Fixed hook

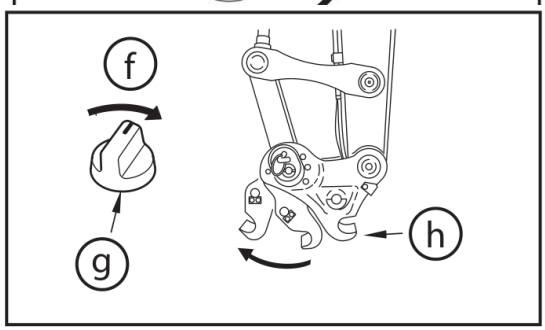


4) Lift the attachment up in that state.



5) Curl the attachment so that it is level.

e）Level



6) Turn the control switch to the mounting position on the right side, and the attachment is mounted.

f) Turn to the right

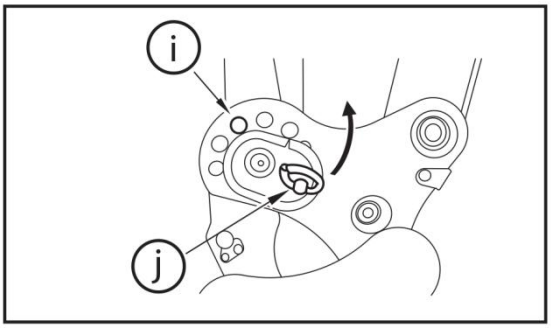
g) Control switch

h) Hydraulic quick change

7) Only one of the bores allows the whole lock pin. Install the lock pin to that bore.

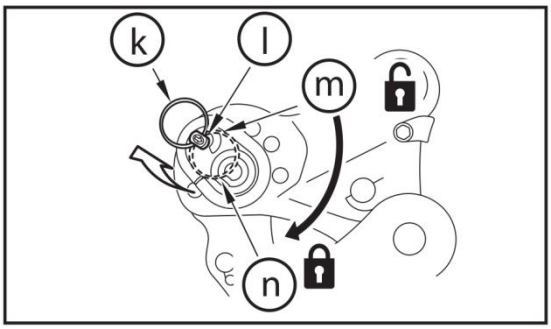
i) Bores

j) Lock pin



8) Turn the arrow on the lock pin to the lock side.

9) Put the handle of the lock pin down to the arrowed side.



k) Handle

l) Lock pin

m) Unlock

n) Lock

9) Make sure the attachment is securely mounted in the Hydraulic quick change before pressing the power supply switch on.

Maintenance

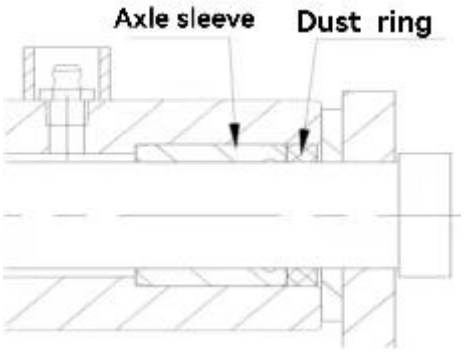
- Checking specifications
- Check there are no cracks and plays.
- Check the bolts and nuts for looseness.
- Check the hydraulic piping for oil leak.

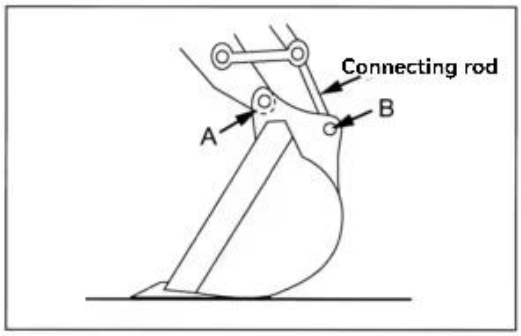
16.2 Use of the bucket

16.2.1 Removing the bucket

⚠ WARNING

- **When using a hammer to strike and remove the bucket pin, metal debris may splash, so you must wear goggles, safety helmet and gloves when working.**
- **The bucket that has been removed must be placed stably.**



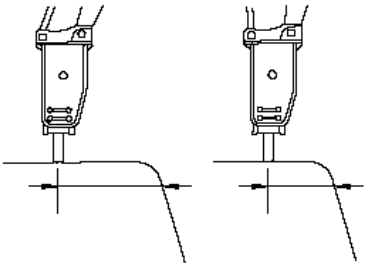


- **Drop the working device to make the bucket contact the ground;**
- **Remove the tightening bolts and nuts;**
- **Remove bucket connecting pins a and B;**

16.2.2 Installing the bucket

⚠ WARNING

Do not put your finger into the pin hole to check whether the pin shaft is aligned, otherwise serious crushing accidents may occur.



- Align the stick with the bucket connecting hole;
- Apply an appropriate amount of grease in the hole;
- Put the dust ring on the outer ear groove of the inner bushing of the bucket mounting base (2);
- Install pin shafts a and B respectively;
- Install the locking bolt and nut.

IMPORTANT

Adjust bucket connection clearance of pins a and B. Refer to how to adjust the bucket connection clearance. The pin shaft must be greased.

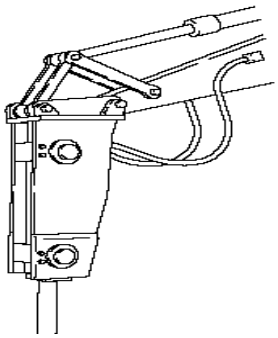
16.3 Hydraulic breaking hammer

-Broken stone

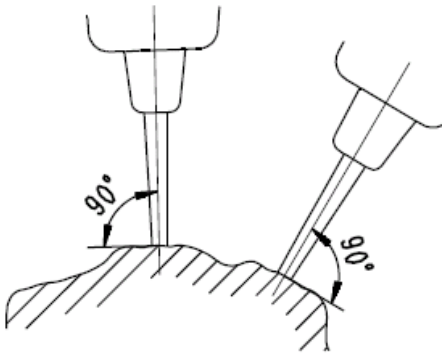
- Demolition work

-Road repair

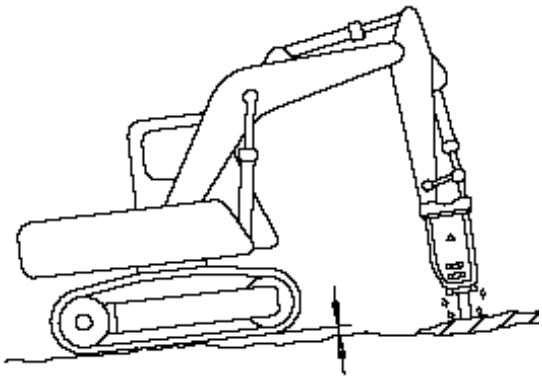
Hydraulic breaking hammer is widely used to demolish buildings, break road surfaces, excavate tunnels, and crush slag or stone.



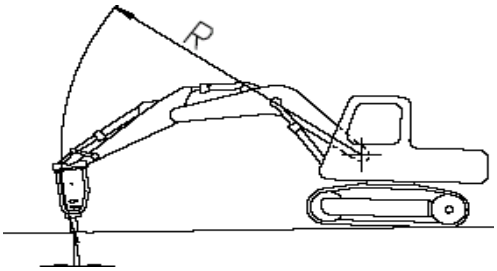
16.3.1 Operation method of hydraulic crushing hammer



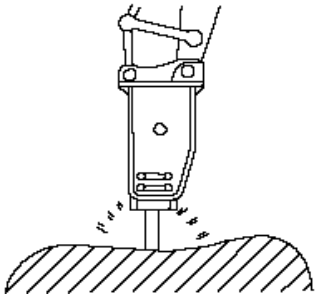
1) Press the hammer head on the surface at right angles, as shown in the figure.



2) When striking, press the hammer head tightly on the surface and lift the car body by 5cm. Do not lift the car body too high.



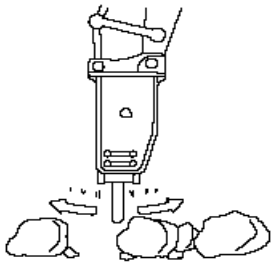
3) If the surface is repeatedly struck and does not break within 1 minute, the crusher shall be moved to break from the end.



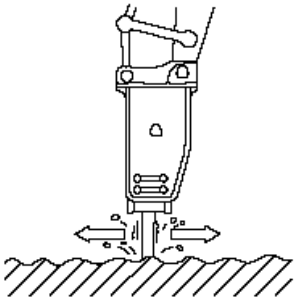
4) There is a slight deviation between the striking direction of the hammer and the direction of the crusher body. Therefore, always correct the direction of the bucket cylinder so that it is always aligned.

5) The hammer head shall be properly pressurized to avoid air strike

16.3.2 Precautions for operation of hydraulic crushing hammer

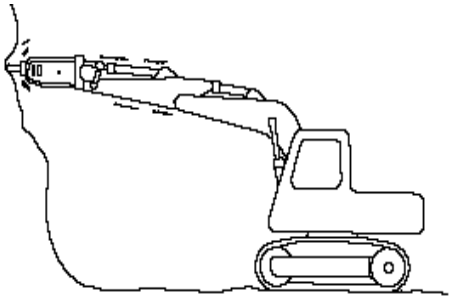


1) When operating the cylinder, do not reach the end of its stroke and keep a distance of 5cm.



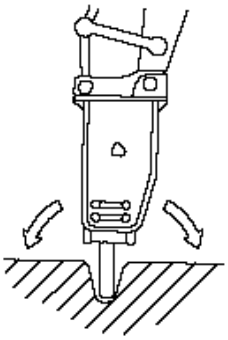
2) Do not swing the hydraulic breaking hammer against rocks, concrete, etc

3) Do not move the hammer during impact.

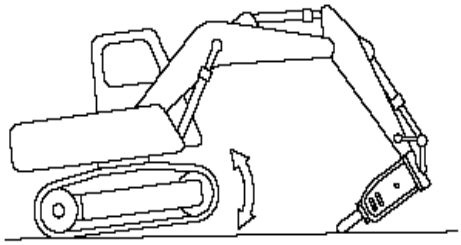


4) Do not strike horizontally or upwards.

5) Do not twist the hammer when drilling on the ground.



6) When lifting the machine, do not extend the bucket cylinder to the maximum position.



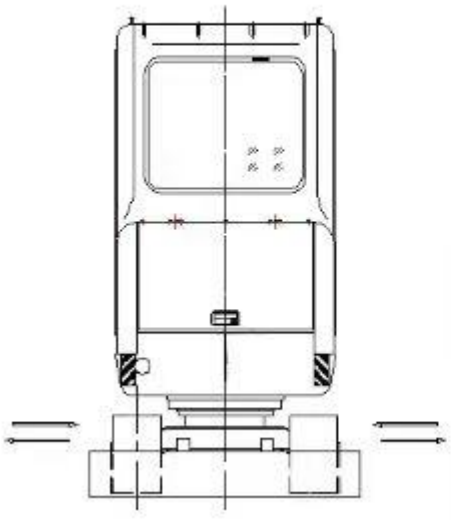
IMPORTANT

When a hydraulic breaker is used, the hydraulic oil will quickly become contaminated and the viscosity will decrease. Because this working condition is much worse than that during excavation. The maintenance cycle of the corresponding hydraulic system is half that of the standard machine.

16.3.3 Telescopic chassis

- The distance between the tracks of the telescopic chassis must be completed before the work. Changing the distance between the tracks during the work may cause great damage to the machine.
- Use the bulldozer pilot plus its own button switch combination to control the action of the telescopic chassis cylinder.
- When changing the distance between the tracks of the telescopic chassis, the bulldozer and the working device shall be used to lift the machine off the ground; Then pull out the limit pin, operate the hydraulic cylinder to control the track to stretch to the corresponding position, and finally install the limit pin and tighten it.

See the following figure:



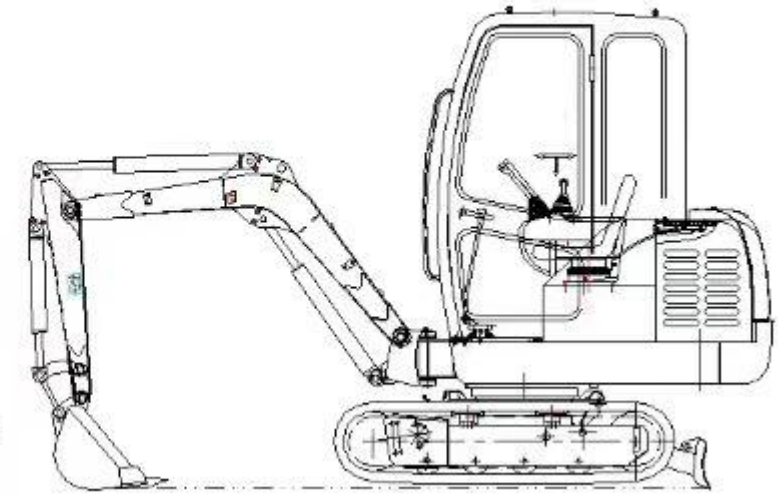
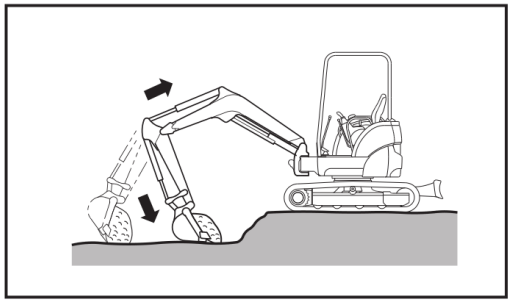


Figure 1; Left and right telescoping

Figure 2: lift the machine off the ground with working device and bulldozer

17 Troubleshooting

17.1 Phenomena that are not breakdowns



The following phenomena are not breakdowns:

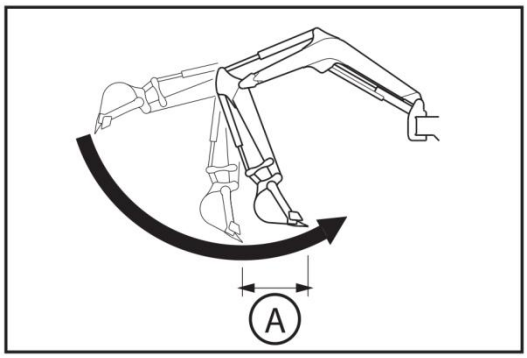
1) Shaking of the bucket.

When the boom is raised immediately after extending the arm while curling the bucket, the bucket may shake. This phenomenon is not a breakdown.

2) Discontinuous arm movement.

When digging the ground with the arm, the arm may slow down at the almost vertical position momentarily. This phenomenon is not a breakdown. Especially, this phenomenon will occur when the engine speed is low.

A:Slow-down is remarkable over this range.



3) Movement of superstructure position

When turning the machine sharply such as spin-turning or pivot-turning, the upper structure may be slightly shifted. This phenomenon is not a breakdown.

4) Thermal shock of the travel motor.

If, in cold weather, the temperature of the hydraulic oil is raised 60°C higher than the outside temperature by relief operation without traveling after the engine has started, sometimes the machine cannot pivot-turn because of thermal shock. This phenomenon is not a breakdown.

5) The swing cylinder is extended when digging.

The swing cylinder may be extended in some digging situations or postures. This phenomenon is not a breakdown.

6)Time lag in travel speed change response.

At low engine speed, a time lag in response may occur when the travel speed is changed from high-speed to low- speed. This phenomenon is not a breakdown.

17.2 Troubleshooting

IMPORTANT

- **If the machine breaks down, diagnose it according to the following table and handle it properly.**
- **If there are any unexplained abnormalities or faults, please consult your dealer for maintenance**

17.2.1 Engine fault

Problem		Cause	Measure
Engine	Steam comes out of top of radiator.	● Shortage of cooling water	● Check cooling water level. Refill, if necessary. (Check cooling water for leak from water port.)
	Water temp alarm lamp lights.	● Loose fan belt	● Adjust belt tension.
		● Buildup of dust and water scale on cooling system	● Replace cooling water. Clean inside of cooling water system.
		● Defective thermostat	● Replace thermostat.
		● Clogged radiator fin or inclined fin	● Clean or repair fin.
		● Defective electrical system	● Check or replace electrical system.
	Turning on starter motor does not start engine.	● Shortage of fuel	● Refill fuel tank.
		● Air mixed in fuel system	● Repair air leak.
		● Defective fuel injection pump or deteriorated nozzle performance	● Release air from fuel system.
			● Replace pump or nozzle.
		● Improper compression	
		● Blown out fusible link	

		● Damaged key stop solenoid. Link disengagement	● (Check and repair.) ● Replace fusible link. ● (Check and repair.)
	Dark fumes come out of machine.	● Clogged air cleaner element ● Deteriorated nozzle performance ● Improper compression	● Clean or repair element. ● (Check and repair.) ● (Check and repair.)
	Exhaust color is white or bluish white.	● Too much oil in oil pan ● Improper fuel ● Worn cylinder or piston ring	● Drain oil from oil pan to specified level. ● Replace fuel with recommended one. ● (Repair.)

17.2.2 Electrical equipment

IMPORTANT

- **Contact your dealer about the measures shown in parentheses in the list below.**
- **If there is any abnormality or trouble whose cause is unknown other than those shown below, ask your dealer for repair.**

Problem		Cause	Measure
Electrical equipment	Turning starter switch to "START" dose not start starter motor.	● Defective wiring system ● Defective starter switch ● Insufficiently charged battery ● Defective starter motor	● Check and repair wiring system. ● Replace starter switch. ● Recharge battery. ● (Check and repair.)
	Maximum engine speed does not pro- vide enough brightness of lamps.	● Defective wiring system ● Defective generator or regulator	● Check terminals for looseness and disconnection. Repair terminal, if necessary. ● (Check and repair.)
	During engine operation, lamp is extremely bright, and frequently burns out.	● Defective regulator	● Replace regulator.
	Electrolyte leaks from battery.		
	Speed of starter motor is too low.	● Defective wiring system ● Insufficiently charged battery ● Defective starter motor	● Check and repair wiring system. ● Recharge battery. ● (Check and repair.)

17.2.3 Machine body

IMPORTANT

- **Contact your dealer about the measures shown in parentheses in the list below.**
- **If there is any abnormality or trouble whose cause is unknown other than those shown below, ask your dealer for repair.**

Problem		Cause	Measure
Machine body	Power or speed of moving part is low.	● Deteriorated function caused by worn hydraulic pump ● Pressures of main relief valve, or port relief valve of control valve are dropped below set value. ● Damaged hydraulic cylinder ● Insufficient amount of hydraulic oil ● Clogged filter	● (Replace hydraulic pump.) ● (Check and repair valves.) ● (Check and repair.) ● Replenish hydraulic oil up to specified level. ● Clean or replace filter.
	Upper structure does not swing or does not swing smoothly.	● Swing brake is not released ● Insufficient amount of grease ● Defective swing brake valve ● Defective swing motor	● (Check and repair.) ● Check and grease. ● (Check and repair.) ● (Check and repair.)
	Temperature of hydraulic oil is too high.	● Insufficient amount of hydraulic oil ● Overload	● Replenish hydraulic oil up to specified level. ● Lower load.
	Machine does not move straight.	● Improperly adjusted crawler or trapped foreign material ● Damaged hydraulic motor. ● Defective hydraulic pump ● Defective control valve ● Damaged sprocket, idler or track roller.	● Adjust or clean. ● (Check and repair.) ● (Check and repair.) ● (Check and repair.) ● (Check and repair.)