

YANMAR[®]

MIDI-EXCAVATORS

OPERATION & MAINTENANCE MANUAL (GB)

Models: **ViO75-A (EP)**
B7 Σ -A (EP)
SV100 (EP)



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AMMANN - YANMAR

THANK YOU FOR PURCHASING

YANMAR CONSTRUCTION MACHINERY

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 machine 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.
- Warranty is provided as a part of Yanmar's product support program for customers who operate and maintain their equipment as described in this manual. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements under warranty may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.
- All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. Ammann-Yanmar reserves the right to modify the information and illustrations in this manual without notice. For additional information, contact your authorized Ammann-Yanmar distributor.
- 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.**

REFERENCE INFORMATION

Write the correct information for your YANMAR machine in the spaces below.
Always use these numbers when referring to your YANMAR machine.

Model name : _____

Serial Number : _____

Engine Serial Number : _____

Your YANMAR Machine Dealer : _____

Address : _____

Phone : _____

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1 Introduction

This Operation and Maintenance Manual for the YANMAR machine is designed to provide you with important 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.**
- **We at YANMAR provide customers with products in compliance with all applicable your country's regulations and industrial standards. If you are using a YANMAR machine purchased abroad, the machine may lack some safety devices. Please consult your dealer to confirm whether or not that machine is in compliance with all applicable your country's regulations and industrial standards.**
- **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.**
- **Important 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 "IMPORTANT" 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 machine 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.

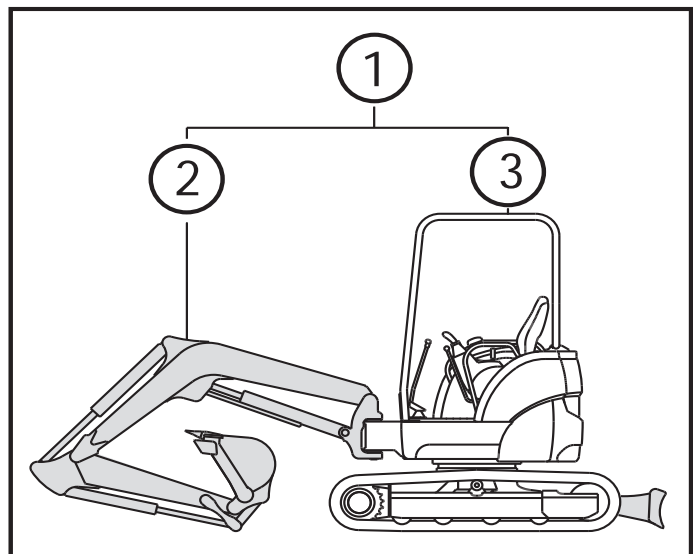
Furthermore, since those actions would expressly violate the terms of Yanmar's Product Warranty, the applicable Warranty would also be voided.

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 upperstructure 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 89/655/CE modified by the 95/63/CE Directive for the member states of the European Union and to the specific legislation of each country that is not part of the EU. In case of use not complying with the instructions in this standard, the AMMANN YANMAR company declines any responsibility.

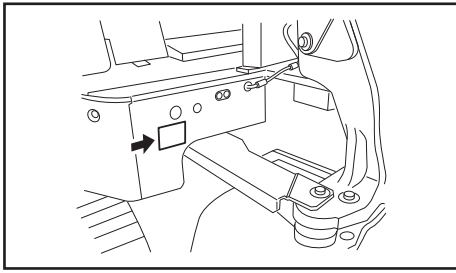


It is prohibited to transport or hoist persons with this machine.



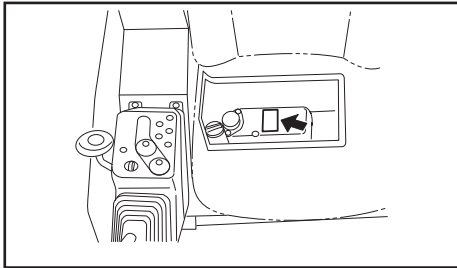
Refer to your AMMANN-YANMAR dealer for more information.

4 Ordering Replacement Parts and Service Call



4.1 Location of machine serial number plate

Never remove the plate for any reason.

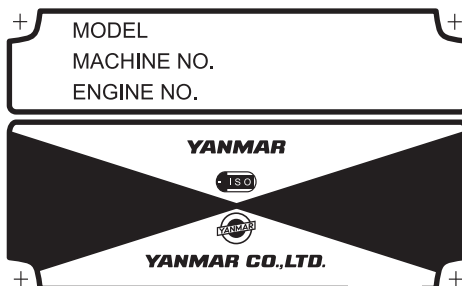


4.2 Location of engine serial number plate

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 EPA identification plate

The EPA identification plate is fixed on the engine. Never remove the EPA identification plate 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 hourmeter.

- 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

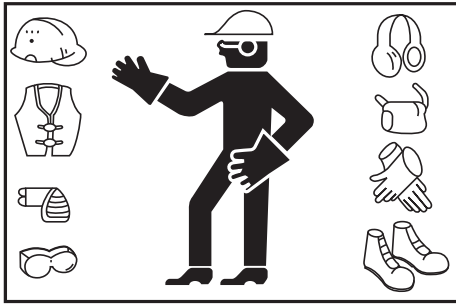
The machines are not equipped to operate in explosive environments.

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 seatbelt

- For your safety, ROPS (Roll-Over Protective Structure)/ FOPS (Falling Objects Protective Structures) with a seatbelt is installed.
- Always fasten the seatbelt and adjust snugly before you operate the machine.
- The seatbelt 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 operation.
- 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 YANMAR 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 YANMAR'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 YANMAR. 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 YANMAR'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.

Emergency escape from operator's cab

- 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.

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

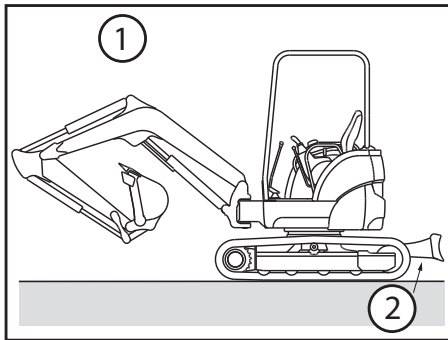
- Check the machine carefully before initial start up for the day.
- Make sure there are no persons near the machine before getting on it.
- Never start the engine when the "SERVICING IN PROGRESS" tag is attached to the control system.
- Sound the horn to alert people nearby before starting the engine.
- 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

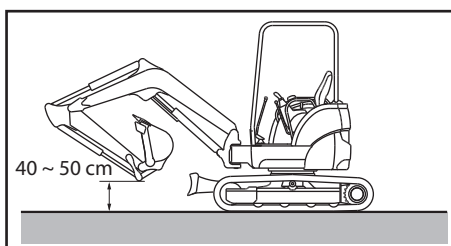
ROPS / FOPS / TOPS

- 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

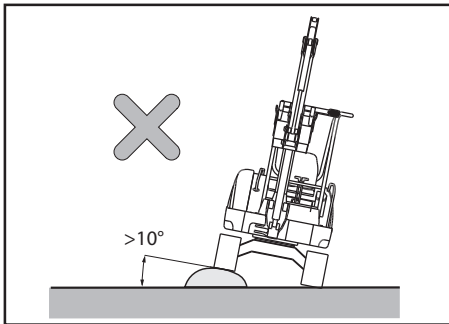
Make sure there are no persons nearby when turning or reversing the machine

- 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.

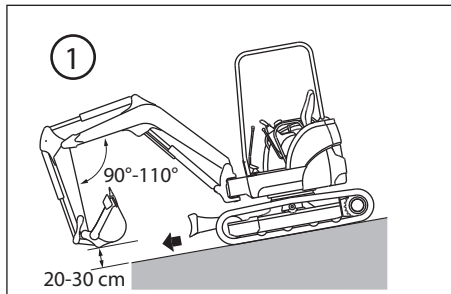


Precautions for traveling

- 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.

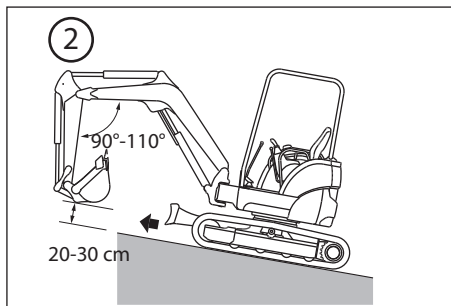


- Avoid running over obstacles if possible. If unavoidable, run the machine at a low speed while keeping the implement close to the ground. Never run over obstacles that may cause the machine to tilt more than 10 degrees.

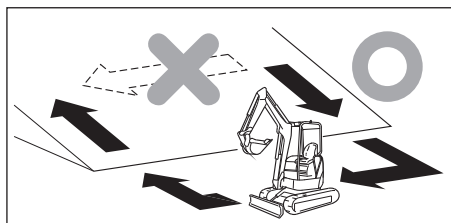


Running the machine on a slope

- Run the machine carefully on a slope to avoid overturning or skidding sideways.
- 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

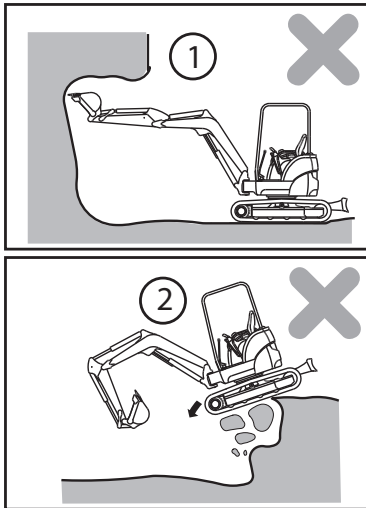
- When going down a slope, you can automatically brake the machine by setting the travel levers to the neutral position.

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 rockslide 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 machine 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 is 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

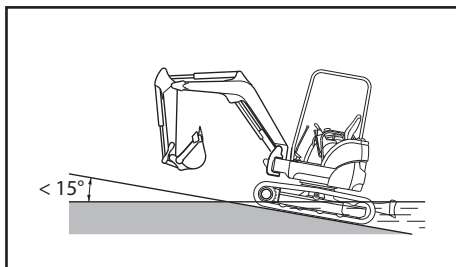
- A snow-covered ground and icy roads are dangerous as they may cause the machine to skid even on a slight slope. Run the machine at low speed, and never start, stop or turn abruptly on such ground or under such road conditions.
- Be careful removing snow as road shoulders or other hazards may be buried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

Unstable ground creates a high possibility of overturn

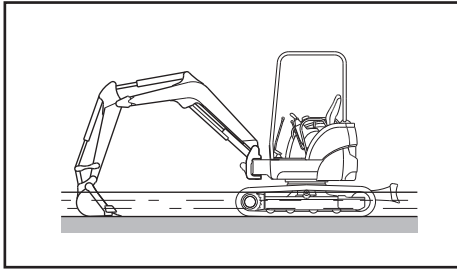
- Keep away from cliffs, road shoulders or trenches if possible as the ground near them is unstable. The ground may crumble due to the weight or vibrations of the machine, resulting in an overturn or fall of the machine. Be particularly careful when working immediately after rainstorm or after blasting 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 machine, 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

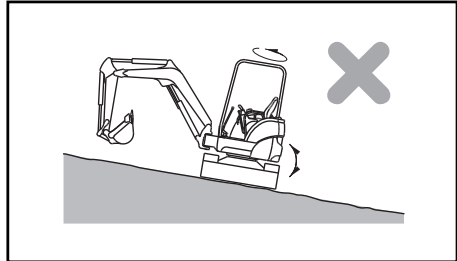
IMPORTANT



When driving out of water, if the machine climbs a slope at an angle of more than 15 degrees, the rear of the upperstructure 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.

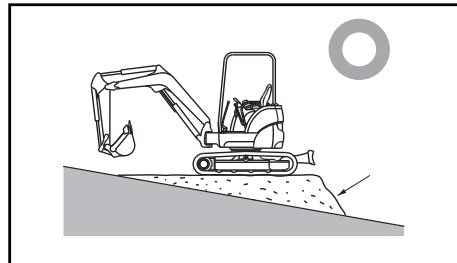


- The limit of the water depth in which the machine can be used in is up to the center of the shoe slide plate.
- Apply a generous amount of grease to the moving parts (especially bucket pin) that have been submerged in the water for a long time until the used grease is extruded out of the bearings.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



Working on a slope

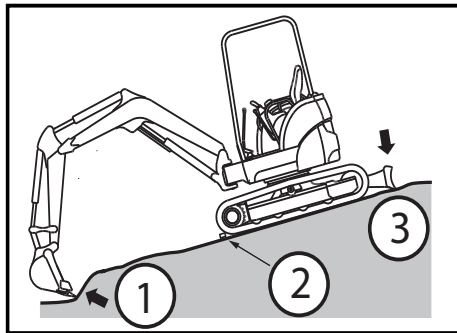
- Be aware that the machine may tip over when swinging the upperstructure or swinging the implement on a slope.
- Never swing the upperstructure toward the downward side of the slope with earth loaded in the bucket. (See the illustration)
- If swinging is unavoidable, level off a work area to maintain 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

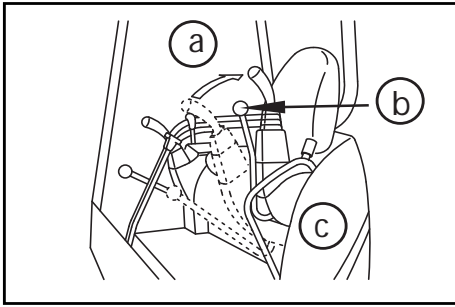
Parking the machine



- 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. Otherwise, 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

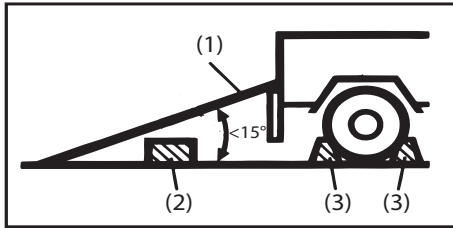
Be careful when setting up and dismantling the attachments. An attachment not adapted to the machine can destabilise it.

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



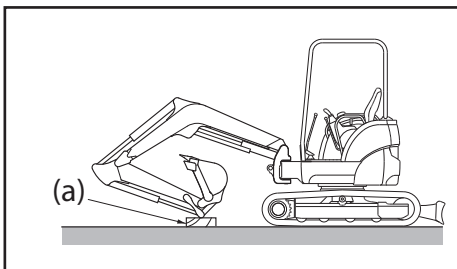
Precautions for loading and unloading the machine

- (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 machine will not move during transit.

Precautions for transporting

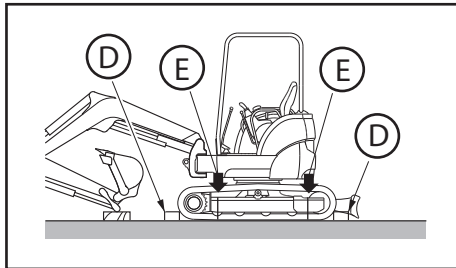
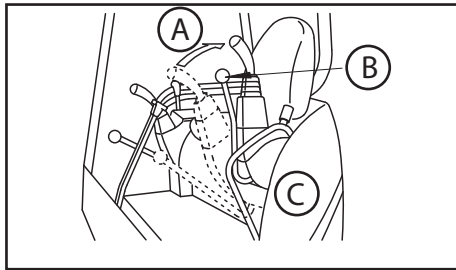
- Transport the machine safely in accordance with the laws associated with applicable law.
- Select a travel route consistent with the width, height and weight of the machine loaded on the truck.



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 to 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

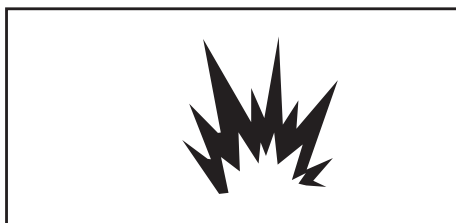
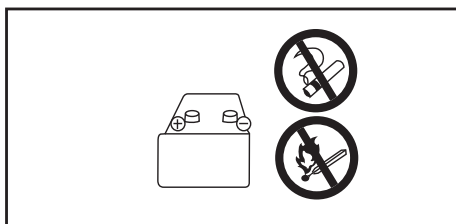
IMPORTANT

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 generated.
- Do not connect the booster cables to the terminals in reverse 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

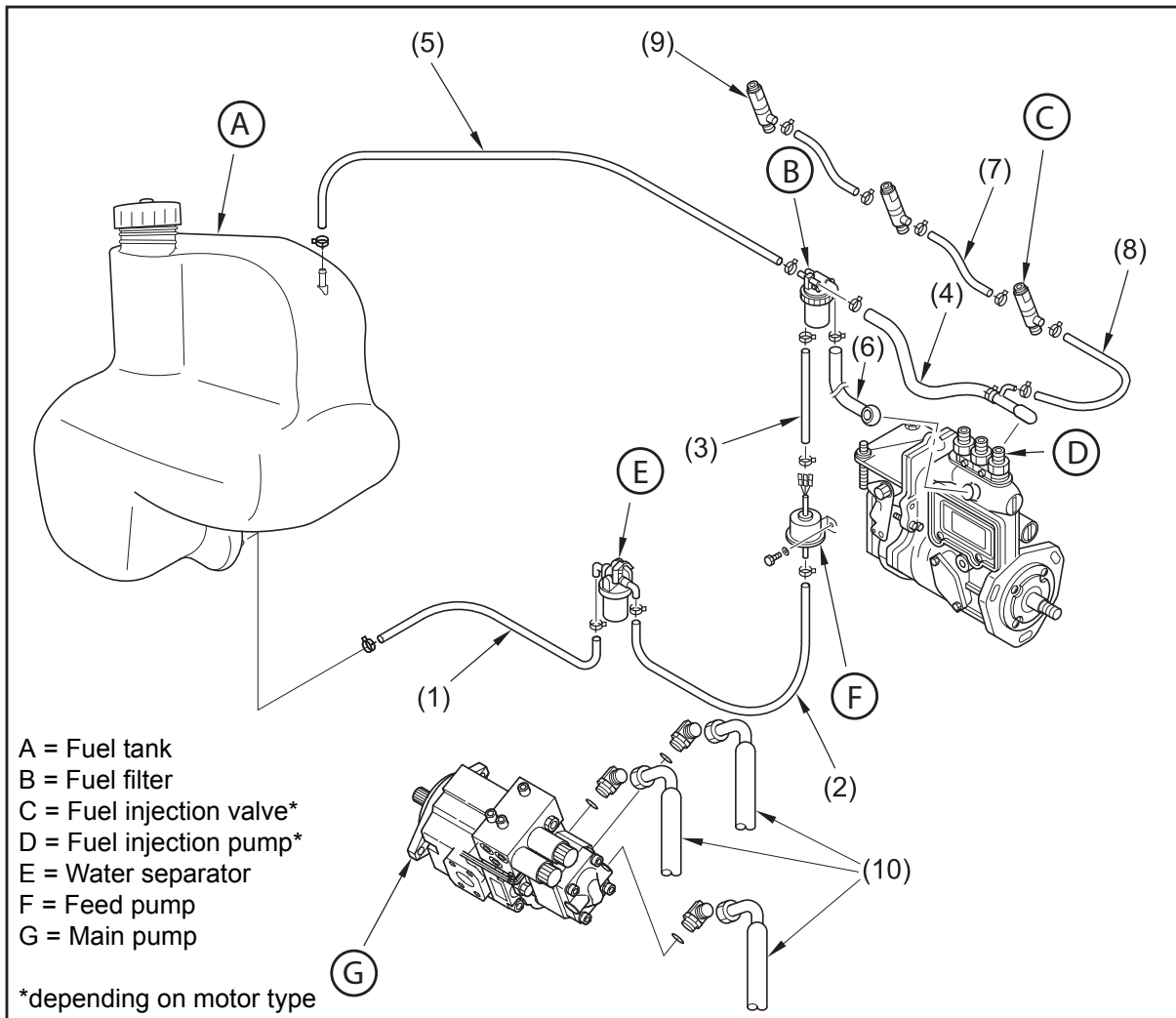
- For safe operation, the machine must be serviced periodically. To increase safety, be sure to periodically replace the parts listed in the table of safety parts on the next page. A fire could result if they deteriorate or are damaged.
- These parts are vulnerable to age and wear or deterioration and 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, replace 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.

7 Precautions for Servicing

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

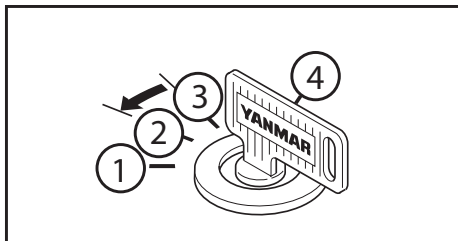
Check categories	Check points
Start-up check	Oil leak from the connections or bodies of the fuel and hydraulic hoses
Voluntary monthly check	Oil leak from the connections or bodies of the fuel and hydraulic hoses Damage (crack, wear, or peeling) of the fuel and hydraulic hoses
Prescribed annual check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

List of safety parts



No.	Safety parts to be replaced periodically	Qté	Replacement time intervals
1	Fuel hose (fuel tank to water separator)	1	Earlier of either every 2 years or every 4000 service hours
2	Fuel hose (water separator to feed pump)	1	
3	Fuel hose (feed pump to fuel filter)	1	
4	Fuel hose (fuel filter to fuel injection pump)	1	
5	Fuel hose (fuel filter to fuel tank)	1	
6	Fuel hose (fuel injection pump to fuel filter)	1	
7	Fuel hose (fuel injection valve to fuel injection valve)	2	
8	Fuel hose (fuel injection valve to fuel injection pump)	1	
9	Fuel tube cap	1	
10	Main pump outlet hose (P1, P2, P3)	3	

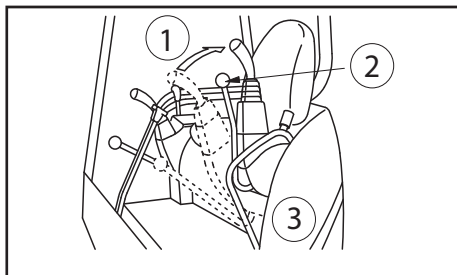
Stop the engine before beginning the inspection and servicing



- Be sure to stop the engine before performing inspection and servicing.

- 1) Pre-heat
- 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 machine, 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. Repair, 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 cooled 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 piping, 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.

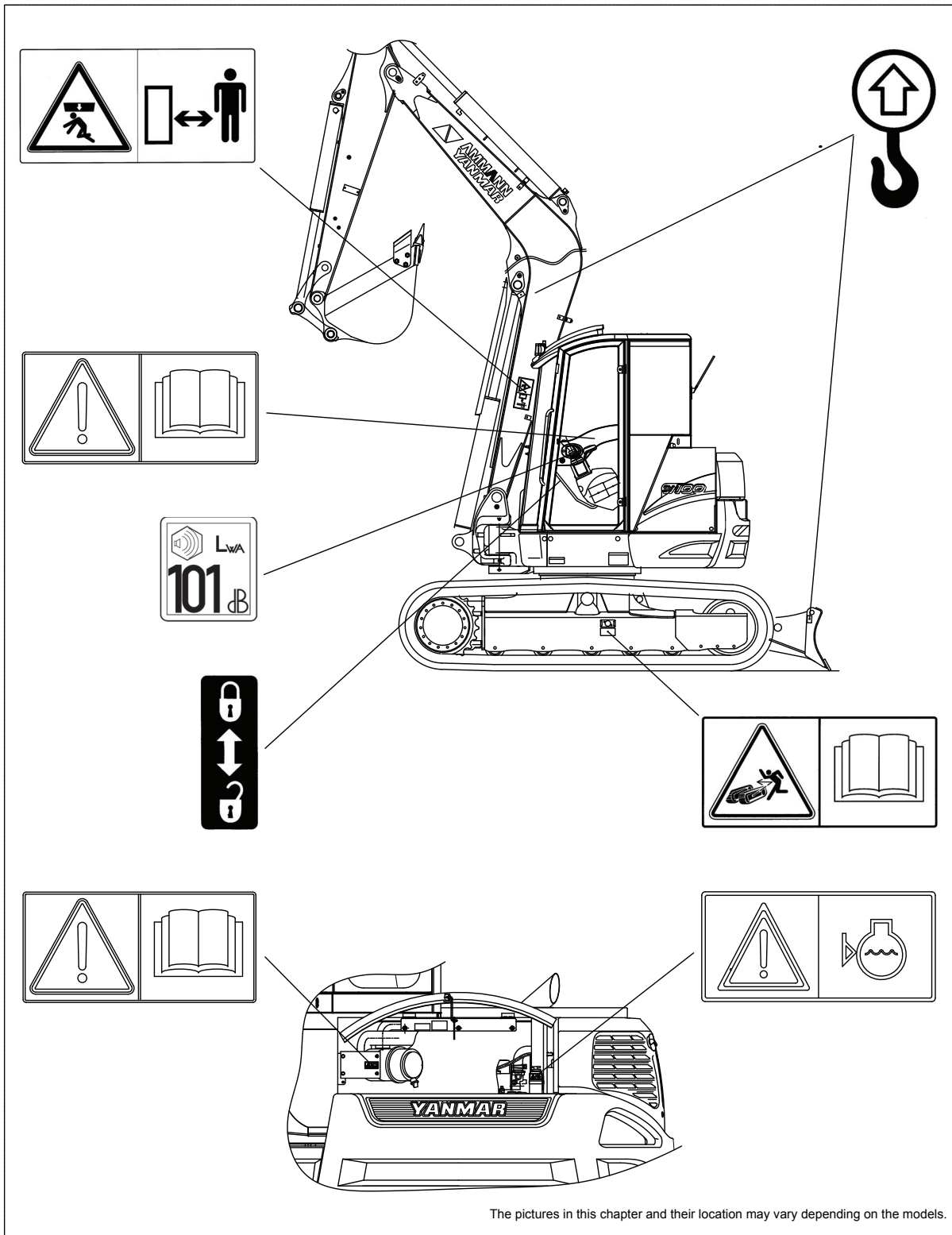
8 Safety Messages (Warning Labels)

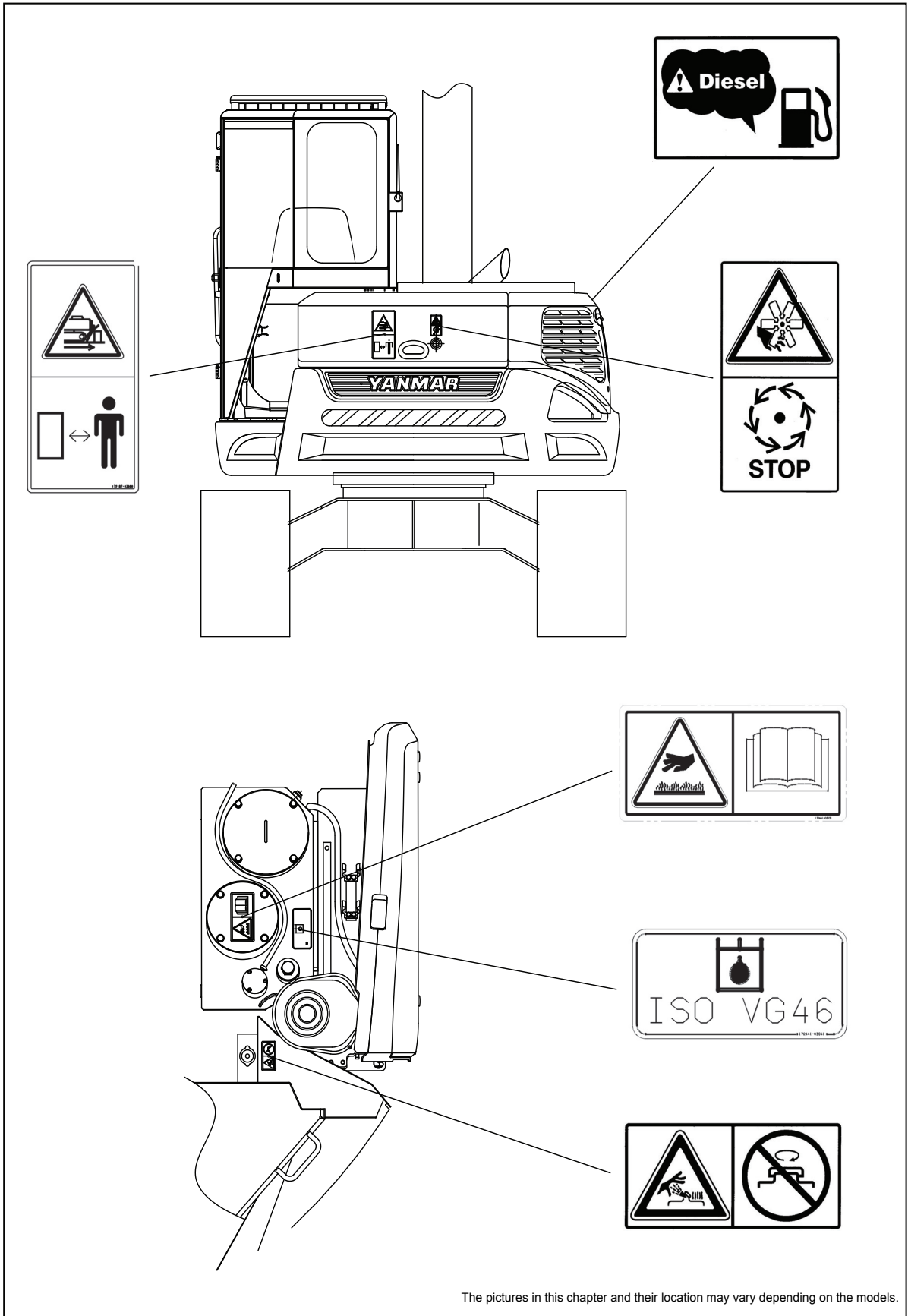
There are a number of Warning Labels on the machine. Full descriptions of all Warning Labels and their locations are reviewed in this section. Periodically confirm whether all Warning Labels are still mounted in their correct locations and can be easily read.

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.

8.1 Location of warning labels





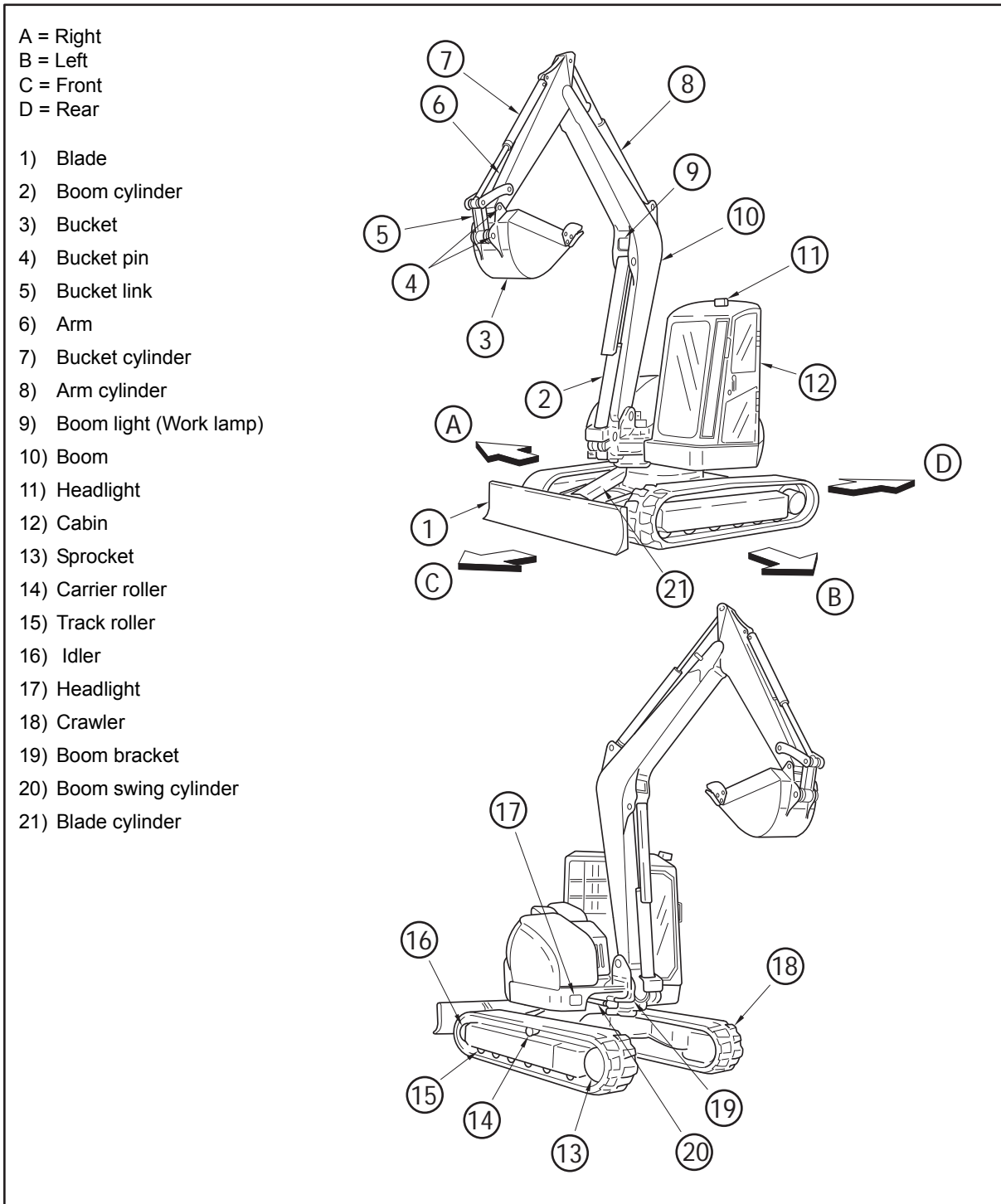
The pictures in this chapter and their location may vary depending on the models.

OPERATION



9 Identification of Important Parts

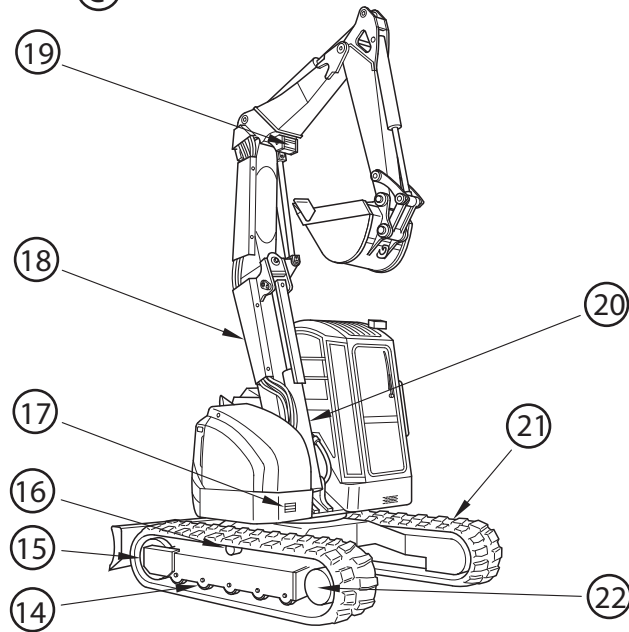
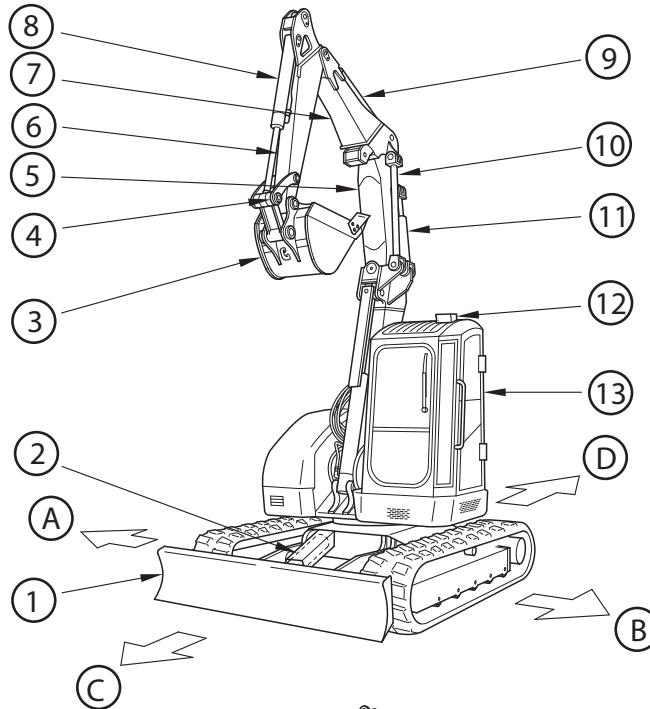
9.1 Overview of the machine ViO75-A et SV100



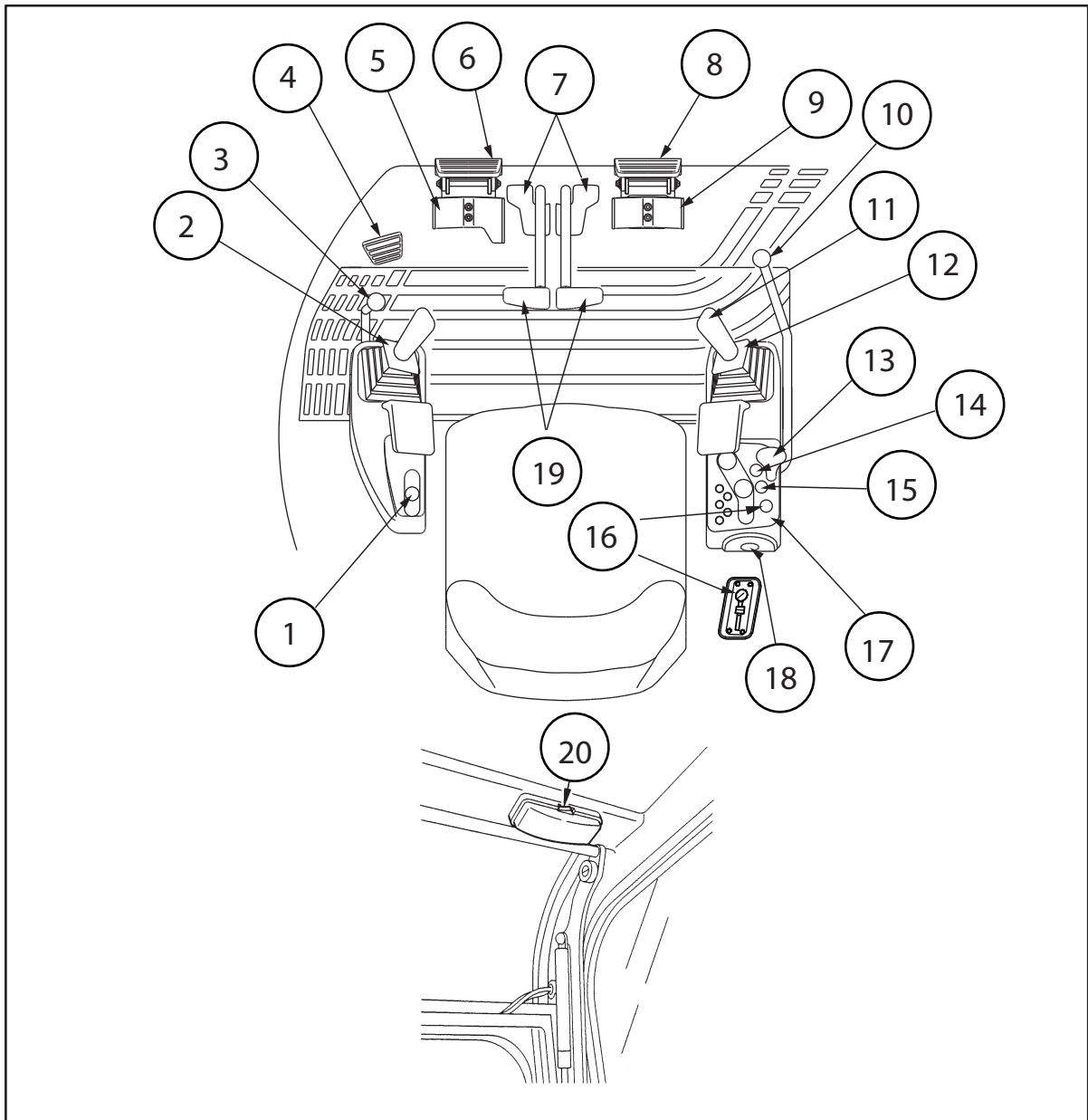
B7 Σ-A

A = Right
 B = Left
 C = Front
 D = Rear

- 1) Blade
- 2) Blade cylinder
- 3) Bucket
- 4) Bucket link
- 5) Boom B
- 6) Arm
- 7) Boom C
- 8) Bucket cylinder
- 9) Arm cylinder
- 10) Offset rod
- 11) Offset cylinder
- 12) Headlight
- 13) Cabin
- 14) Track roller
- 15) Idler
- 16) Carrier roller
- 17) Headlight
- 18) Boom A
- 19) Boom light (Work lamp)
- 20) Boom cylinder
- 21) Crawler
- 22) Sprocket



9.2 Controls and switches

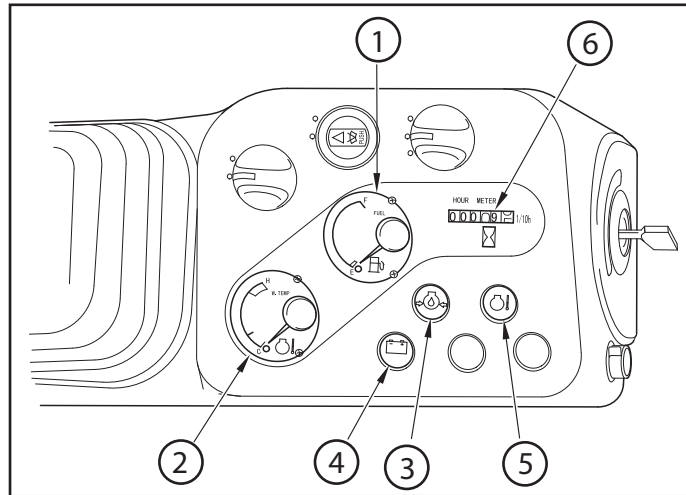


- | | | |
|----------------------|-----------------------|--|
| 1) Accelerator lever | 8) Pedal guard | 15) Wiper switch |
| 2) Control lever (L) | 9) Boom swing pedal | 16) Switch / selector for fan (depending on model) |
| 3) Lock lever | 10) Lock lever | 17) Monitor |
| 4) High speed pedal | 11) Horn switch | 18) Starter switch |
| 5) P.T.O. pedal | 12) Control lever (R) | 19) Travel lever |
| 6) Pedal guard | 13) Blade lever | 20) Room lamp switch |
| 7) Travel pedal | 14) Light switch | |

10 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.

10.1 Monitor



- 1) Fuel gauge
- 2) Water temp meter
- 3) Engine oil pressure alarm lamp
- 4) Battery charge alarm lamp
- 5) Water temp alarm lamp
- 6) Hourmeter

CAUTION

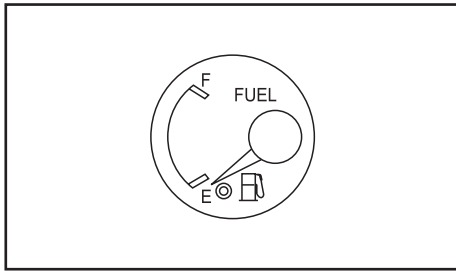
When an indicator lamp lights and a buzzer sounds during operation, immediately stop operation and check and service the abnormality.

When the starter switch key is in the "ON" position, the monitor lamps (3), (4) and (5) light and buzzer sounds.

(Only the water temp alarm lamp (5) goes off in a few seconds.)

Normally, all monitor lamps go off after the engine starts.

When there is any failure during operation, a lamp lights and buzzer sounds. (If the starter switch key is in the "ON" position and a monitor lamp does not light, its bulb must be burnt out.)



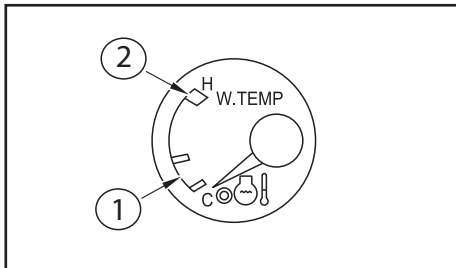
(1) Fuel gauge

The fuel gauge works while the starter switch key is in the "ON" position and indicates the fuel amount in the fuel tank.

- It is not abnormal that the fuel gauge may not indicate properly immediately after the starter switch key is turned to the "ON" position.
- The reading on the fuel meter scale is affected by how much the machine is slanted.

F = Full

E = Empty

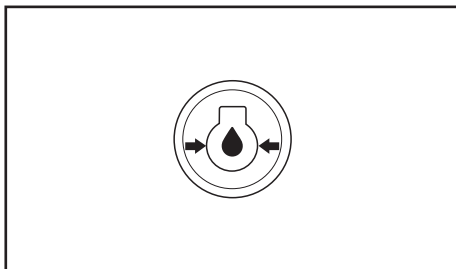


(2) Water temp meter

This indicates water temperature for engine. During operation, the normal water temperature is within the limit (1). When the cooling water temperature rises till the limit (2) during operation, idle the engine at low speed until the water temperature cools down.

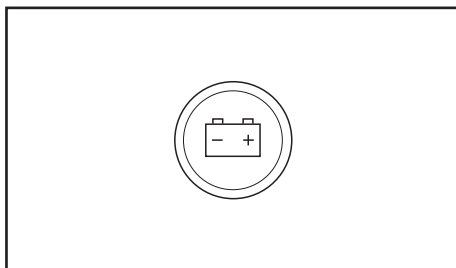
1 = White

2 = Red



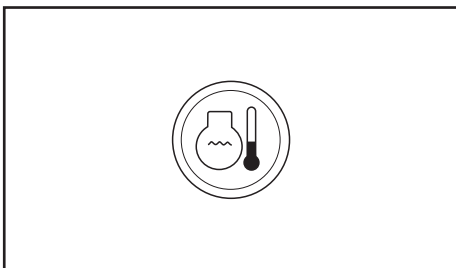
(3) Engine oil pressure alarm lamp

If engine oil pressure falls below the normal level, the alarm lamp will turn on and the buzzer will sound. In this event, stop the engine and inspect it.



(4) Battery charge alarm lamp

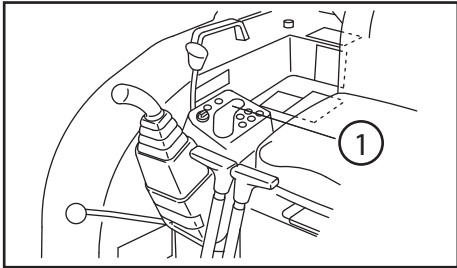
If the battery is not charged properly, the alarm lamp will flash. In this event, inspect the battery charging circuit. If you find something abnormal with it, take corrective action.



(5) Water temp. alarm lamp

When the starter switch is turned to the "ON" position, the alarm lamp goes on and then goes off in a few seconds. When the cooling water temperature rises abnormally during operation, the alarm lamp goes on and the buzzer sounds, indicating engine overheating.

Idle the engine for a while, and stop the engine. After the engine has cooled, take corrective actions.



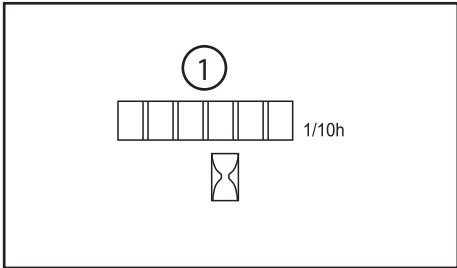
(6) Hourmeter

The hourmeter indicates the accumulated service hours for the machine.

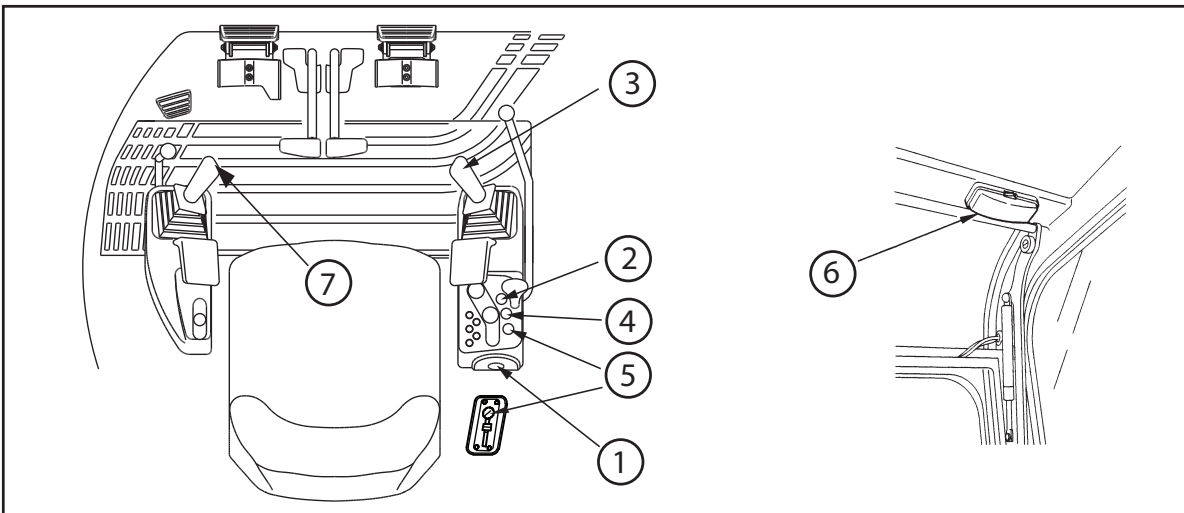
The reading of the hourmeter helps you set time intervals for periodic servicing of the machine. While the engine is running, the hourmeter will continue registering even if the machine is not being operated.

- The hourmeter registers "1" per hour regardless of engine rotational speed. The digit at the far right registers "1" per 0.1 hour (6 min.).

1 = Hourmeter



10.2 Switches (depending on model)



- 1) Starter switch
- 2) Light switch
- 3) Horn switch
- 4) Wiper and windshield washer switch
- 5) Switch / selector for fan (location depending on model)
- 6) Room lamp switch
- 7) One decel switch

(1) Starter switch

Use this switch to start and stop the engine.

- OFF position

Turn the key to "OFF" to stop the engine and disconnect electrical circuit or remove the key.

- ON position

Turn the key to "ON" to connect the electrical fuel solenoid circuit and the electrical charging circuit. (Keep the key in this position while running the engine.)

- START position

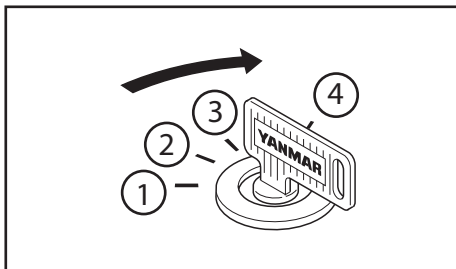
Turn the key to "START" to start the engine. Release the key after the engine is started and it will return to the "ON" position.

- AIR HEATER position

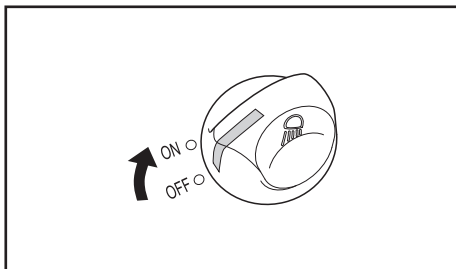
Turn the key to activate the preheating circuit and warm up intake air to start the engine easier in cold weather. (Set the key to this position when the outside temperature is low.)

- When the engine is not running and the switch is in the "ON" position, the buzzer keeps sounding.

Turn the switch to the "OFF" position to stop sounding.



- 1) Air heater
- 2) Off
- 3) On
- 4) Start



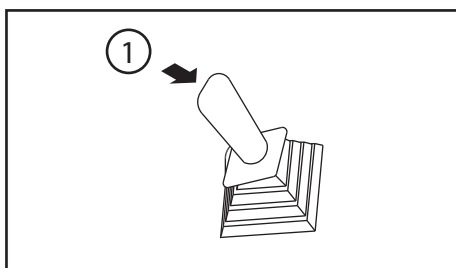
(2) Light switch

The boom light and the headlight go on when the switch is turned on with the starter switch set to the "ON" position.

- ON : The lamps go on.
- OFF : The lamps go off.

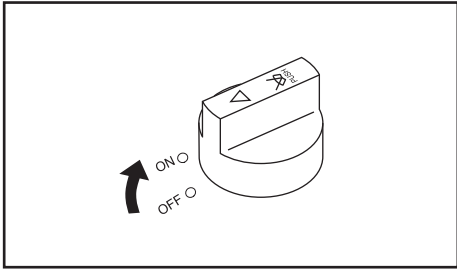
IMPORTANT

Do not keep the lamps on for a long time while the engine is not running. The battery runs down and the engine cannot be started.



(3) Horn switch

Press the switch on the top of the right control lever (1) to sound the horn.



(4) Wiper and windshield washer switch

This switch serves both wiper switch and windshield washer switch.

Wiper:

Move the switch to the "ON" position to actuate the wiper of the windshield.

- ON : Wiper works.
- OFF : Wiper stops.

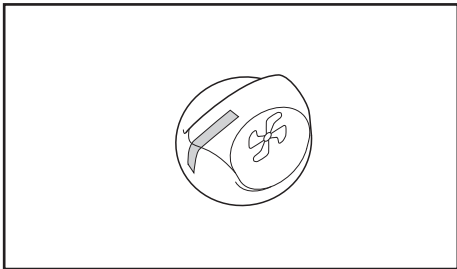
Windshield washer:

Push the wiper switch.

The windshield will be sprayed with windshield washer fluid.

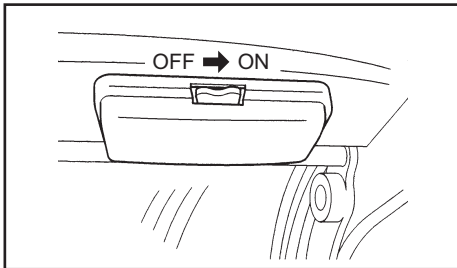
IMPORTANT

- Do not push the switch when the tank is empty, it could cause pump failure.
- Wiping the windshield when dry could damage the glass. Use the wiper only when the windshield is wet.
- The wiper blade may freeze in cold weather. Do not attempt to move it; otherwise the wiper motor will be damaged.



(5) Switch / selector for ventilator

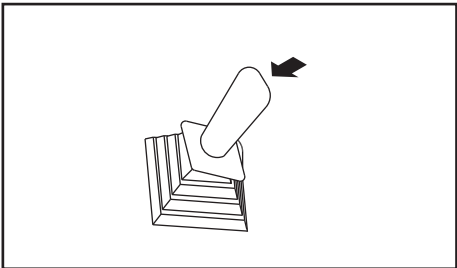
Use this switch to warm up the air in cabin. Move the switch to select fan speed. The heater switch allows you to select a high or low draft volume by setting it as follows:



(6) Room lamp switch

The room lamp goes on when the switch is turned on with starter switch set to "ON" position.

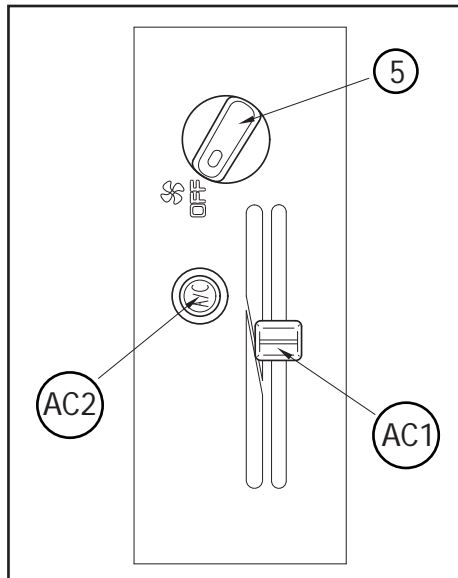
- ON : The lamp goes on.
- OFF : The lamp goes off.



(7) One decel switch

Press the switch located on the top of the left control lever to activate or deactivate the one decel.

10.3 Air conditioner / Heater (depending on model)



Description of lever and switches

AC1: Temperature control lever:


It is used to control the temperature.

5: Switch / selector for fan

It is used to adjust the air volume of the fan

AC2: Air conditioner switch

 The compressor is turned OFF (The lamp goes off)

 The compressor is turned ON (The lamp goes on)

When the switch / selector for fan (5) is in the OFF position, the lamp does not go on and the compressor does not work even if the air conditioner switch (AC2) is turned ON.

Handling

CAUTION

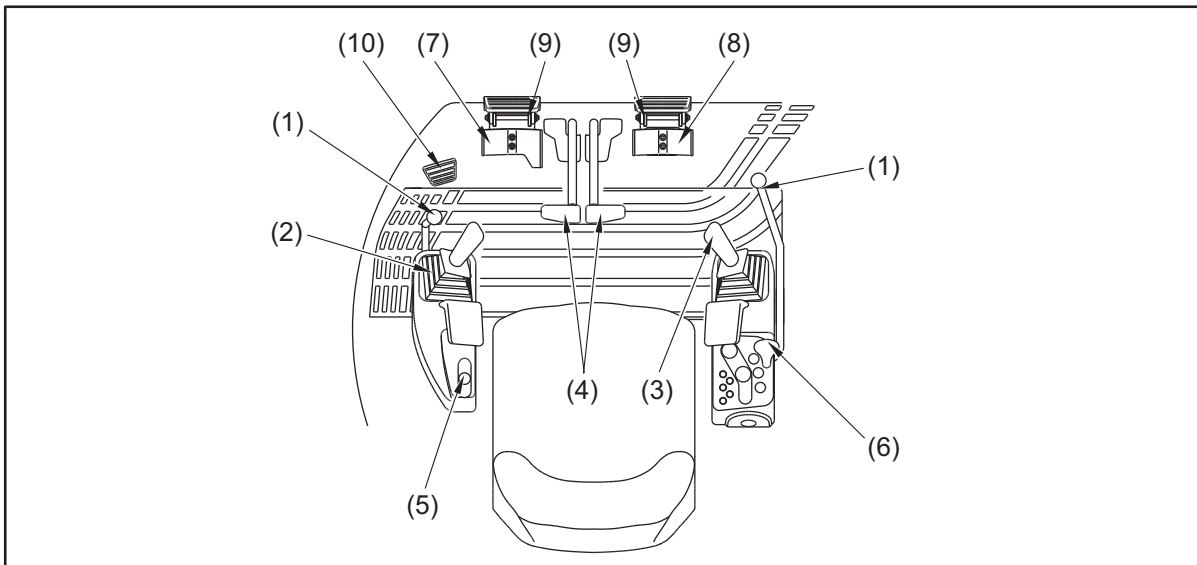
- Some mist might blow off with cooled air when the air conditioner is being used in the cabin. This occurs because the water particles in the wet air are frozen and blown out. It is not abnormal.
- When using the air conditioner after parking the machine in the hot weather, ventilate the cabin by opening the door and windows to let the hot air inside go out of the cabin so that the air-conditioning can work efficiently.
- Take care not to cool the inside of the cabin too long because it is not good for the operator's health. Control the air temperature properly.
- If the air conditioner blows no air, the air volume is too low or the cabin is not air conditioned well when the air conditioner is turned on, ask your dealer to check the air conditioner. If you keep using the air conditioner in such an abnormal state, it will cause damage to the fan motor or the compressor.
- Operate the air conditioner for a few minutes once or twice every week. That prevents the rotating parts such as the compressor from running out of oil, which prevents malfunction of the parts in turn

- 1) Set the switch / selector for fan at any level.
 - 2) Set the temperature control lever to the appropriate position.
 - 3) Turn the air conditioner switch (AC2) ON if you wish to activate air conditioner (the lamp goes on).
 - 4) The control of the temperature can be chosen by acting the temperature lever and the switch / selector for fan.
 - 5) Adjust the air direction with the air outlet grille.
- It may be useful to set the fan switch for ventilation to apply preload to the inside of the cabin, so that no dust can come into the cabin easily during operation.

IMPORTANT

Be sure to turn on the air conditioner after starting the engine to prevent excessive force to the compressor.

10.4 Control levers and pedals



- | | |
|-----------------------------|----------------------------|
| 1) Lock lever | 6) Blade lever |
| 2) Control lever (L) | 7) P.T.O. pedal |
| 3) Control lever (R) | 8) Boom swing pedal |
| 4) Travel levers and pedals | 9) Pedal guard (foot rest) |
| 5) Accelerator lever | 10) High-speed pedal |

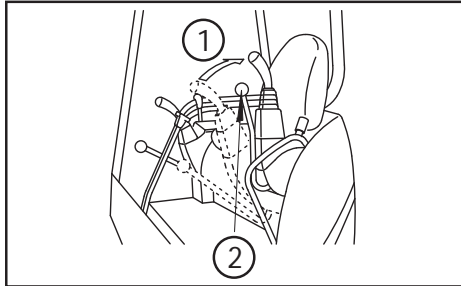
(1) Lock levers (for implement control levers on both sides and travel lever)

The lock levers lock the implement control and travel levers. When pulling the left lock lever back, the control lever stand (L) comes up. While the control lever stand (R) does not come up when pulling the right lock lever back. (Canopy version)

IMPORTANT

The machine uses a hydraulic lock system. If the lock levers are in the lock position, all the hydraulic cylinders for the boom, arm, and bucket as well as the swing and travel motors will not activate although the right and left implement control levers are free to move.

The blade lever is not locked by setting the lock lever to the lock position.

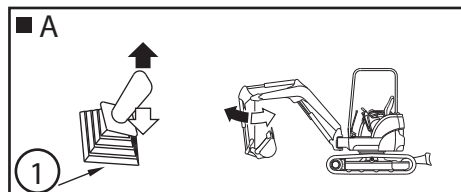


- 1) Locked
- 2) Lock lever (left side)

⚠ CAUTION

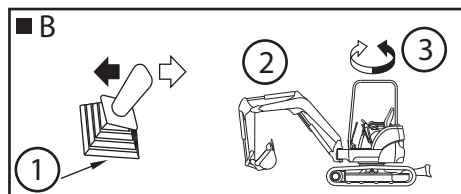
The relationship between the control lever shift configuration and the implement movement is detailed in this manual. To prevent an accident due to operational error, therefore, the hydraulic system must not be modified by reconnecting the hydraulic hoses and valves.

(2) and (3) Control levers (left and right)



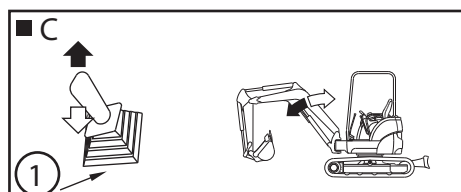
A = Operating the arm

- 1) Control lever (L)



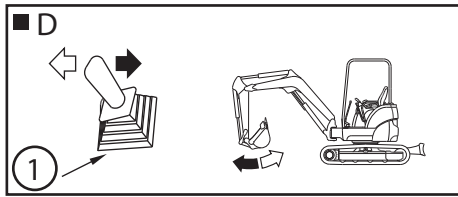
B = Swing the upperstructure

- 1) Control lever (L)
- 2) Right swing
- 3) Left swing



C = Operating the boom

- 1) Control lever (R)

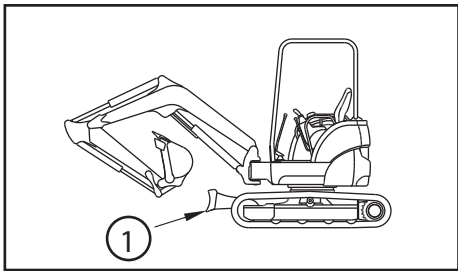


D = Operating the bucket
 1) Control lever (R)

(4) Travel levers and pedals

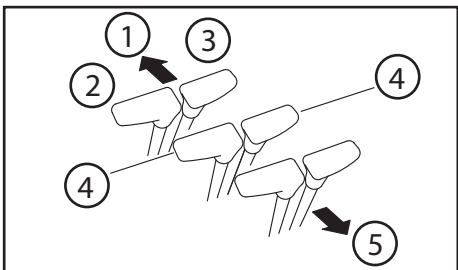
The travel levers control the traveling of the machine.

⚠ CAUTION

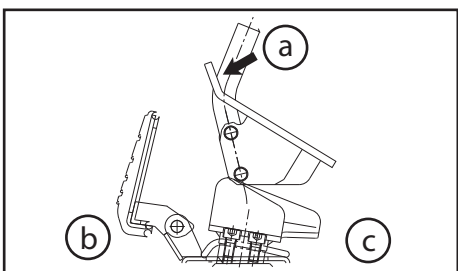


- If the blade is in the reverse direction, the travel levers should also be operated in reverse for forward and backward travel.
- When operating the travel levers, you must check to see if the blade is in the normal position or in the reverse position. Note that the blade is in the normal position when the sprocket is on the rear side.

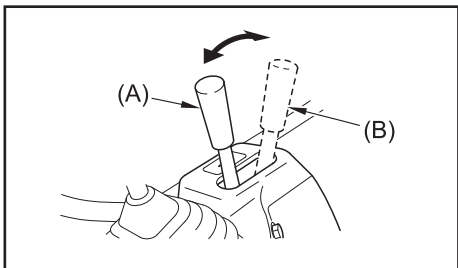
1) Blade



When the blade is in the normal position:
 Forward : Push the travel lever forward (1).
 (2) left
 (3) right
 Step on the frontside
 Reverse : Pull the travel lever backward (5).
 (4) (Neutral) : The machine stops.



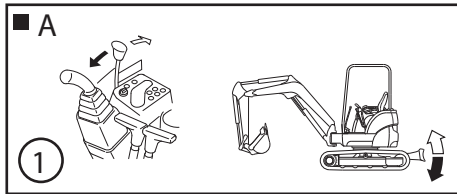
a = Forward
 b = Front
 c = Rear



(5) Accelerator lever

The accelerator lever controls the engine speed (output).

- (A) Idling : Push the lever forward fully.
 (B) Run : Pull the lever backward fully.



(6) Blade lever

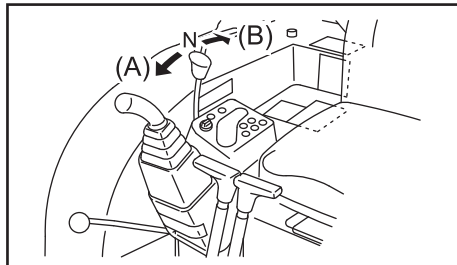
Use this lever to control the blade.

A = Operating the blade

- 1) Blade lever

IMPORTANT

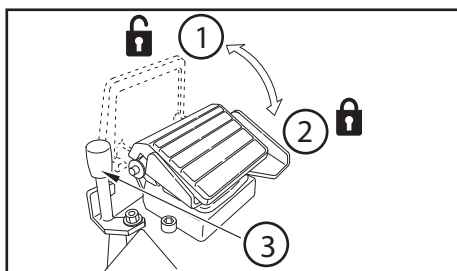
The blade lever is not locked by setting the lock lever to the lock position. Do not touch the blade lever when not operating the blade.



(A) : Down : Push the lever forward.

(B) : Up : Pull the lever backward.

(N) : Neutral...When released, the lever will return to the neutral position and the blade is held as it is.

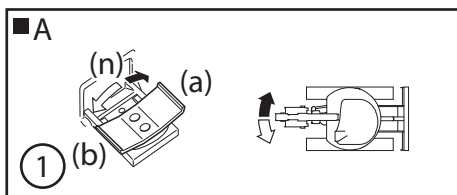


(7) P.T.O. pedal

Use this pedal to control the attachment.

Refer to Section "Handling hydraulic P.T.O.".

- 1) Unlock
- 2) Lock
- 3) P.T.O. pedal lock



(8) Boom swing pedal

Use this pedal to swing the boom or the offset boom (depending on model) to right and left.

A = Operating the boom or the offset boom swing (depending on model)

- 1) Boom swing pedal

(a) : Swing right : move to the right

(b) : Swing left : move to the left

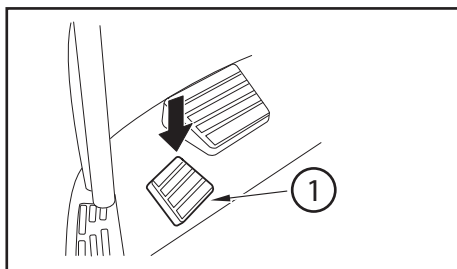
(n) : Neutral...When released, the pedal will return to the neutral position and the boom is held as it is.

(9) Pedal guard (foot rest)

The boom swing pedal and the P.T.O. pedal have respective pedal guards.

⚠ CAUTION

To avoid bodily injury, securely place the pedal guard in the lock position when the boom swing or P.T.O. pedal is not being operated.



(10) High-speed pedal

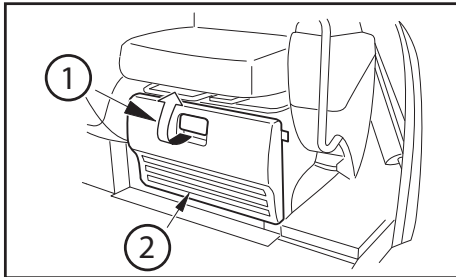
Step on this pedal to control the travel speed. Step on the pedal while the travel levers are in operation to increase the travel speed.

- 1) High-speed pedal

IMPORTANT

Do not travel at high speed for many hours.

Do not step on the pedal while operating the blade.



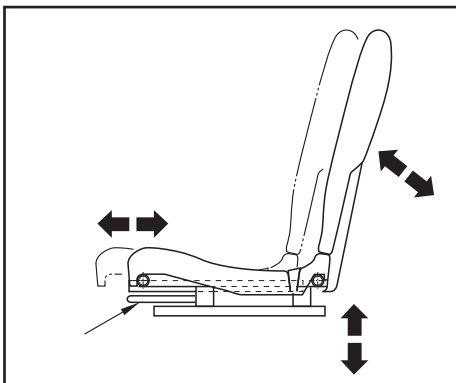
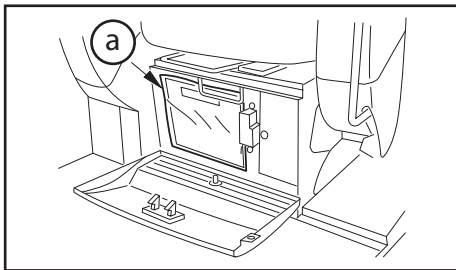
10.5 Storage space for the operation & maintenance manual

Storage space for the operation and maintenance manual is under the operator's seat (a).

Pull the lever (1) and open the cover (2).

The storage space for the operation and maintenance manual is on the upper side of the compartment.

Press the cover until it clicks when closing.



10.6 Operator's seat

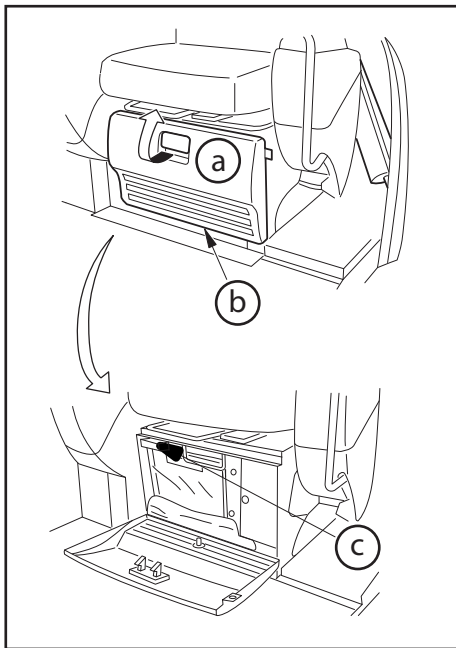
CAUTION

Do not adjust the operator's seat while operating the machine.

Seat position control adjustment (depending on model)

10.7 Fuses

CAUTION



- When replacing the fuse, be sure to turn off the power by setting the starter switch at the OFF position.
- Using a wire, aluminum foil or the like instead of the fuse could cause burnouts of the gauges, the electrical equipment and the wiring due to overheating.
- If a new fuse is blown out immediately after replacement, there may be a problem with the electrical system. Ask the nearest dealer for check and service.

The fuse protects the electrical equipment and wiring from becoming overheated. If the fuse is corroded with white deposits or if the fuse is loose in the holder, the fuse must be replaced with a new one.

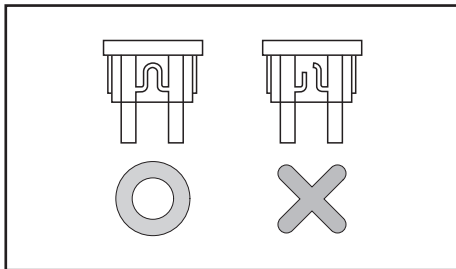
Position of the fuse box

Fuse box is on the front of sheet mount.

a = Open

b = Storage box cover

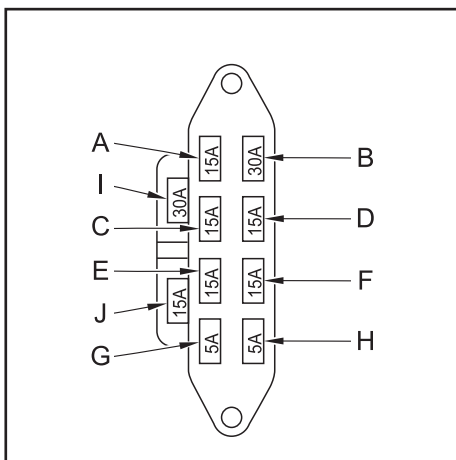
c = Fuse box



Replacing the fuses

If the electrical equipment does not operate, the fuse may have been blown out. Follow the procedure below:

- 1) Set the starter switch at the "OFF" position.
- 2) Remove the fuse box cover.
- 3) If the fuse is blown out, replace it with a spare fuse of rated capacity.

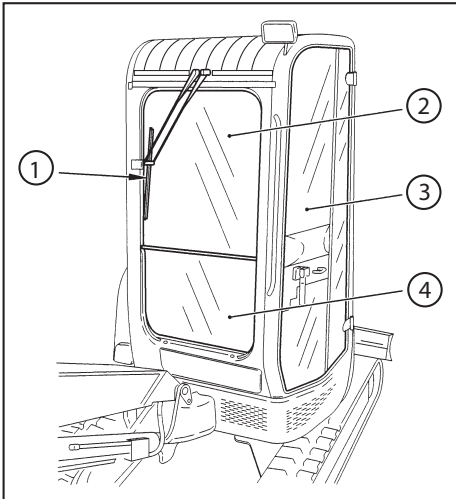


Symbol	Fuse capacity	Circuit name
A	15 A	Room lamp, Heater, Wind washer
B	30 A	Air conditioner (depending on model)
C	15 A	Indicator box light, Horn, Boom light, Headlight, High-speed travel valve, Room lamp
D	15 A	Heater relay, Wiper
E	15 A	Timer, Safety relay, Fuel feed pump, Generator
F	15 A	Indicator box, Cut off valve
G	5 A	Engine stop
H	5 A	Spare fuses
I	30 A	
J	15 A	

10.8 Windshield

ATTENTION

- To avoid bodily injury while operating the machine, make sure the door and windshield are locked in either the open or shut position.
- When the side door or the windshield are opened and are not securely locked, they may be closed suddenly on impact during operation. They may cause bodily injury : for example, your hands are put between the door or the windshield and the cabin frame or your head is hit against them.
- Do not put your hand or head out of the opened side door or windshield. When opening the side door or the windshield, lock it securely.



- 1) Wiper
- 2) Upper windshield
- 3) Side door
- 4) Lower windshield

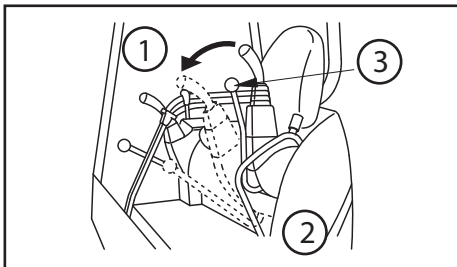
CAUTION

Both the upper and lower windshields can be opened and closed.

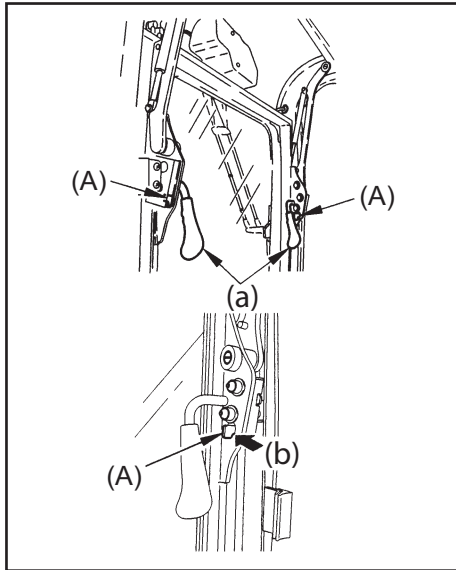
When opening or closing the upper and / or lower windshields, they may go down suddenly. To prevent this, lock them securely with the lock levers.

CAUTION

- To avoid bodily injury, securely grasp the handles with both hands when opening and closing the windshield.
- Securely lock the windshield using the lock levers and the window locks when storing or closing the upper and lower front windshields.
- When opening or closing the front windshield, be sure to place the lock levers securely in the lock position.



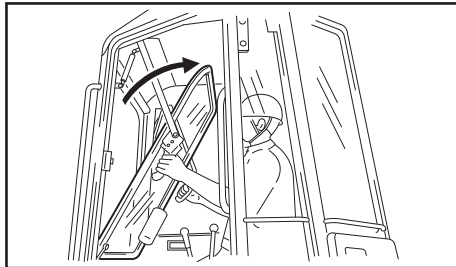
- 1) Unlock
- 2) Left side
- 3) Lock lever



Opening the upper windshield

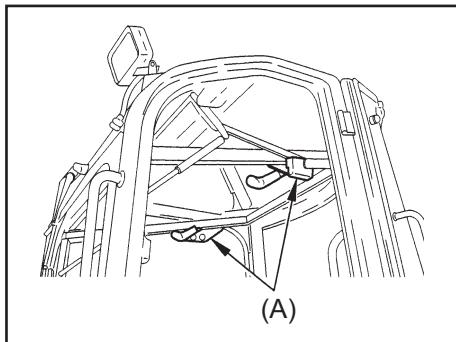
- 1) Hold the handles with your hands and push the right and left lock levers (A) to the arrowed direction to release the lock.
- 2) Slide the windshield to the upper rear side while pulling it to this side.
- 3) Slide the front windshield to the storage position under the ceiling and push it up until it is securely locked with a click.

a = Handle
b = Push



Closing the upper windshield

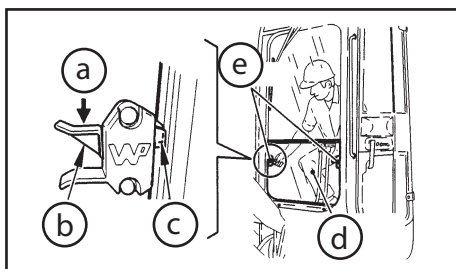
- 1) Hold the handles with your hands and release the right and left lock levers (A).
- 2) Slowly lower the front windshield by grasping the handles.
- 3) Push the front windshield forward until it is locked with a click.



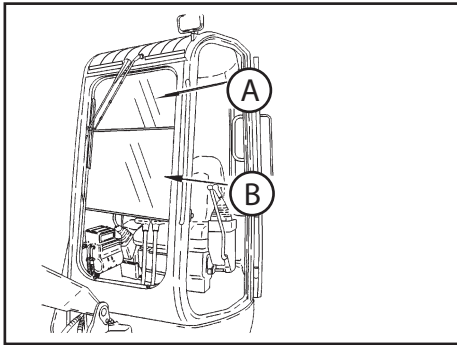
Opening and closing the lower windshield

ATTENTION

Open and close the lower windshield after housing the upper windshield.



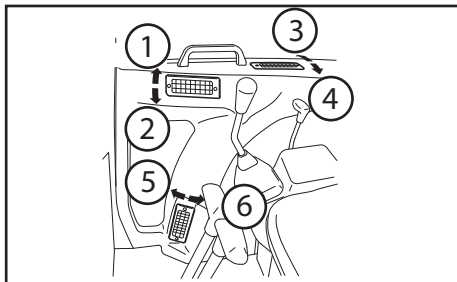
a = Push
b = Lever
c = Lock position
d = Lower windshield
e = Lever



- 1) Hold the lower windshield with both hands to lift it up.
- 2) Put the lower windshield in the storage area on the rear left of the cabin.
- 3) Lock the lower windshield securely by pressing it against the window locks.
- 4) Push the upper side of each window lock to remove the windshield put in storage.

A = Upper windshield
B = Lower windshield

10.9 Air outlet



The wind direction is adjusted by changing the grille direction.

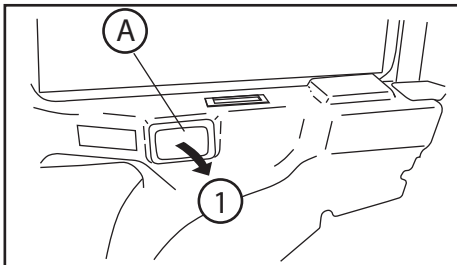
Move the grille to the desired position with a knob in the center of the grille.

- | | |
|--------------------------|---------------------|
| 1) Up and open | 4) Inward and close |
| 2) Down and close | 5) Outward and open |
| 3) Outward side and open | 6) Inward and close |

10.10 Ash tray

CAUTION

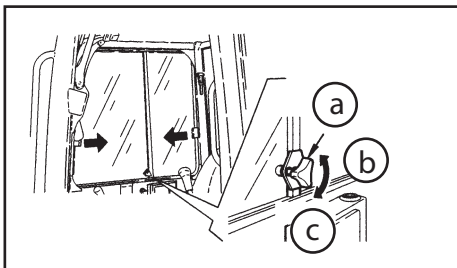
Do not place any combustible matter in the ash tray.



Open the ash tray by pulling the lid (1) to use it. Be sure to close the ash tray lid when it is not in use. When cleaning the ash tray, remove it by pressing down and pulling it toward you. To install the ash tray, press it into place, keeping it level.

A = Ash tray

10.11 Right window glass

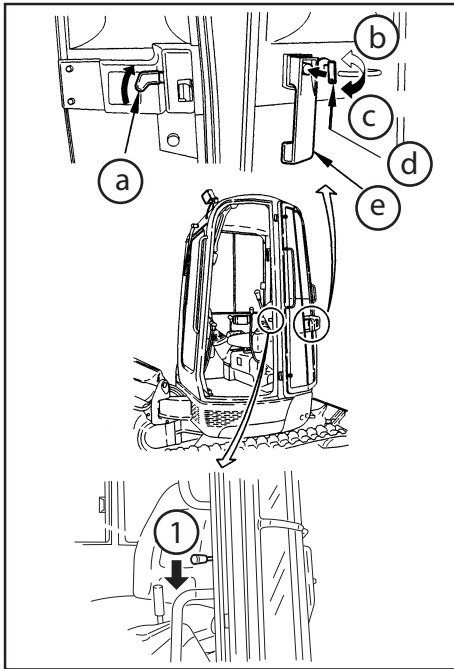


- 1) Open the window by sliding the glass on each side in the direction indicated in the figure at the right.
- 2) Tighten the slide stopper to fasten the glass at that position.
- 3) When closing the window, loosen the slide stopper.

a = Slide stopper
b = Loosen
c = Tighten

10.12 Cabin side door

Opening and closing the cabin side door



(1) From outside.

- 4) Turn the starter switch key counterclockwise to unlock the side door.
- 5) Push the button of the outer handle and pull the outer handle to open the side door.
- 6) Close the side door and turn the key clockwise to lock the door.

(2) From the inside.

- 1) Pull the inner handle to open the side door.

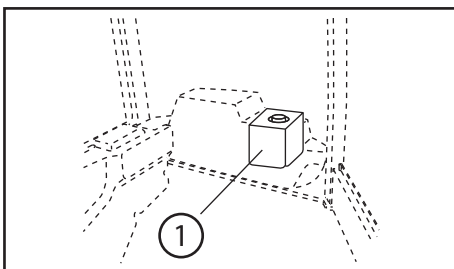
a = Inner handle
 b = Unlock
 c = Lock
 d = Key
 e = Outer handle

Door lock

The door lock is used to hold the side door open.

- 1) Press the side door into the lock section to hold it open.
- 2) Press the lever (1) on the left side of the seat down to release the locked side door.

10.13 Replenishment of windshield washer fluid



- 1) Add windshield washer fluid, if necessary, to the reservoir (1).

ATTENTION

- When you add the reservoir with windshield washer fluid, take care not to enter dust into the reservoir.
- Determine the mixing ratio of the windshield washer fluid to water on the basis of the lowest past temperature

11 Instructions

11.1 Break in period

The machine should not be subjected to severe stresses and loads during the initial break in period although it has been prepared well and stringently inspected before shipping. Otherwise the machine's performance may be affected and its service life shortened. Thus it is essential to break in the machine for the first approx. 100 service hours (reading of the hourmeter).

In breaking in the machine:

- You should warm up the engine by idling for 5 minutes before starting operations.
- You should not operate the machine under heavy loads or at high speed.
- You should not start and accelerate the engine too abruptly, or stop it too abruptly.
- You should not change travel direction too abruptly.

The safety instructions for operation and maintenance that are presented in this Manual are applicable to each of the intended tasks. Never misuse this machine by violating the applicable safety instructions or by attempting to perform unintended tasks, because of the danger of serious bodily injury.

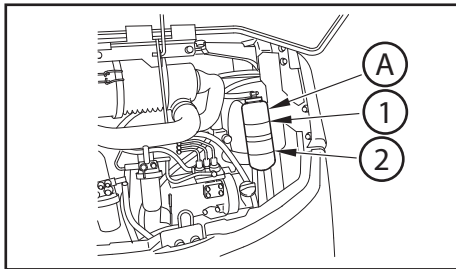
11.2 Checking before starting the engine

Walking check (visual inspection) around the machine

CAUTION

- **If there are any combustibles in any heat build-up areas, or if there are any fuel and/or oil leaks, a fire can result.**
 - **Check for possible fire causes carefully. If there is anything abnormal, be sure to take corrective action or contact your dealer.**
- 1) **Checking the implement, hydraulic cylinders, linkages, and hoses for damage, wear and loose connections.**
 - 2) **Removing dust deposits from around the engine, battery, and radiator.**

- 3) Checking the engine and its accessories for oil or water leakage.
- 4) Checking the hydraulic system, hydraulic oil tank, hoses, and joints for oil leakage.
- 5) Checking the grease piping for grease leakage.
- 6) Checking the undercarriage (crawler, sprockets, and idlers) for breakage, wear, loose bolts, and oil leakage around the rollers.
- 7) Checking the handrails and steps for breakage and loose bolts.
- 8) Checking the water separator to see whether the red ring has sunk down at the cup bottom.



Checking and replenishing the cooling water

A = Sub-tank

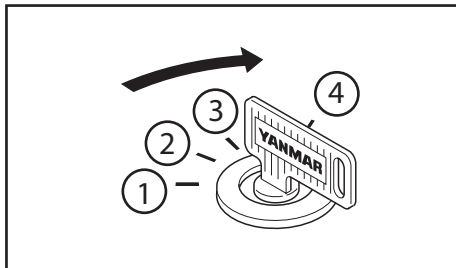
- 1) Maxi.
- 2) Mini.

CAUTION

- Normally do not open the radiator cap.
- Check the cooling water in the sub-tank when the engine is cool.

Checking and replenishing the engine oil

CAUTION

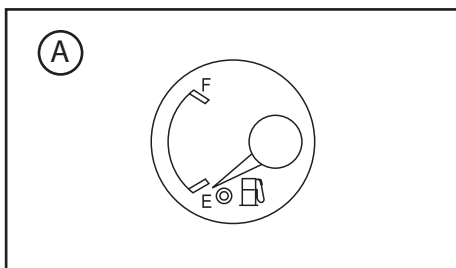


- At operating temperature, the oil and dipstick areas are hot.
- Do not allow hot oil or components to contact the skin to prevent bodily injury such as a burn.
- Check oil level and refill oil after engine has cooled down sufficiently.

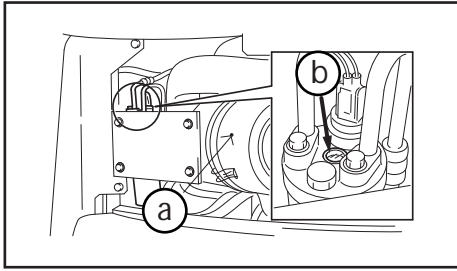
Checking the fuel level in the fuel tank and refueling

CAUTION

Be careful not to overfill the fuel tank because it could cause a fire. If the tank is overfilled, completely wipe off the spilled fuel.




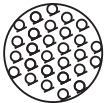
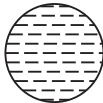
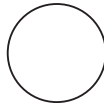
A = Fuel
F = Full
E = Empty



Checking the refrigerant quantity (depending on model)

a = Air cleaner
b = Sight glass

- 1) Start the engine and run it at the maximum speed.
- 2) Set the switch / selector for fan at the High level.
- 3) Set the temperature control lever to the COOL position. (The blue position.)
- 4) Turn the air conditioner switch ON. (The lamp goes on.)
- 5) Check the refrigerant condition from the sight glass and compare it with the check list shown below.

Condition	Normal	Anormal		
Sight glass				
Refrigerant quantity	Refrigerant quantity is adequate and normal	Refrigerant might leak in a small amount from some part	Almost all refrigerant leaks and does not remain	Refrigerant quantity is too large

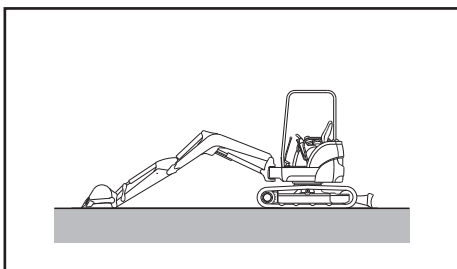
IMPORTANT

If the refrigerant quantity is not normal, ask your dealer for check and repair.

Checking and replenishing the hydraulic oil tank

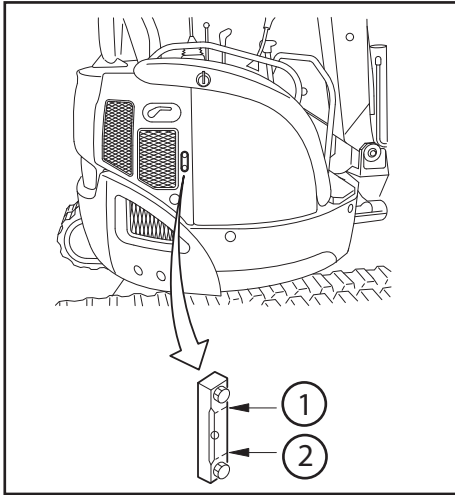
 **CAUTION**

When removing the plug of the oil supply port, slowly loosen it to release the pressure in the tank to prevent a dangerous high-pressure leak.



IMPORTANT

Do not replenish hydraulic oil above the upper limit mark on the oil level gauge. An excessive amount of hydraulic oil may damage the hydraulic system by placing stress on its components, causing a dangerous high-pressure leak.



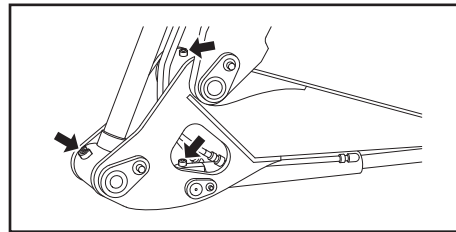
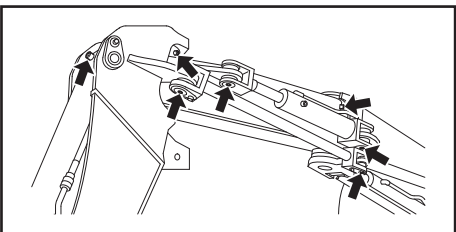
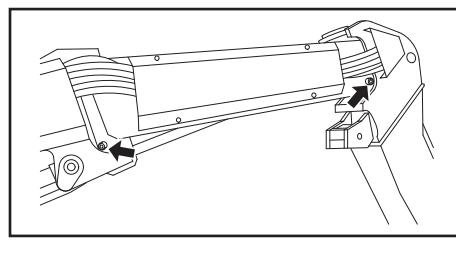
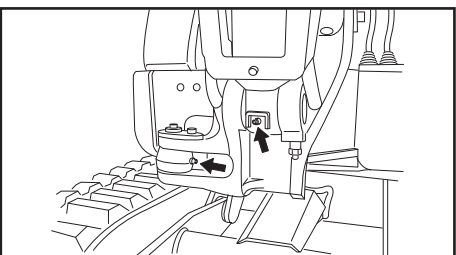
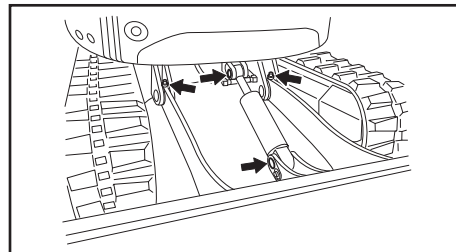
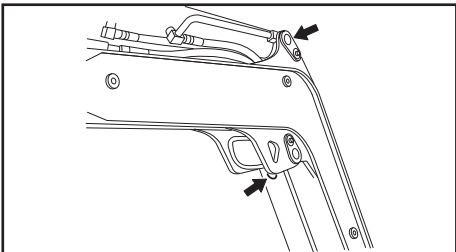
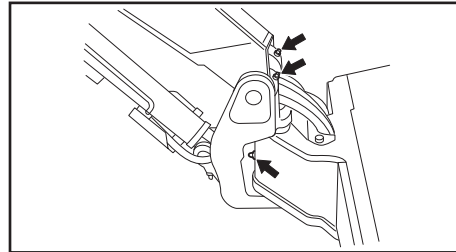
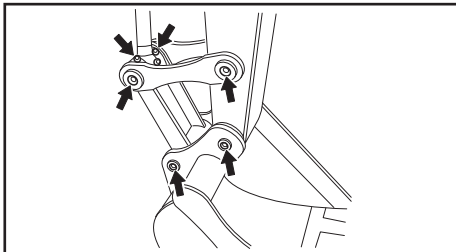
Note:

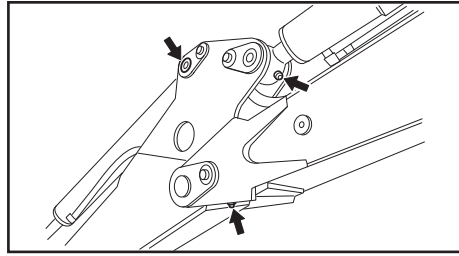
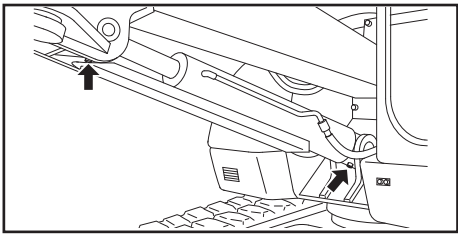
Note that the oil level varies with the oil temperature. When reading the oil level, follow these guidelines:

- Before start-up, the oil level gauge should read the level around the midpoint of the gauge scale [oil temperature : 50 to 86°F (10 to 30°C)].
- During normal operation, the oil level gauge should read the level around the upper limit mark of the gauge scale [oil temperature : 122 to 176°F (50 to 80°C)].

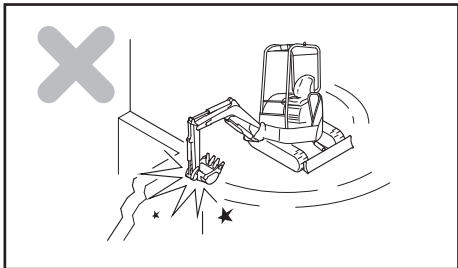
- 1) Upper limit
- 2) Lower limit

Checking the greasing points

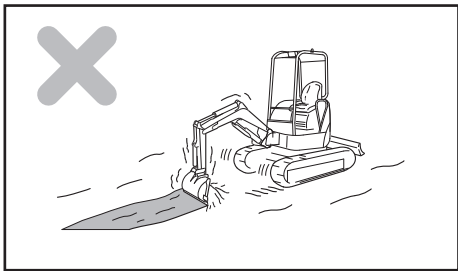




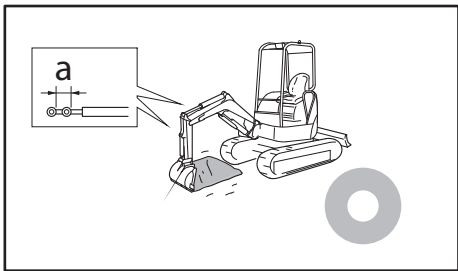
11.3 Precautions for operating the implement



Do not use the implement's swing force

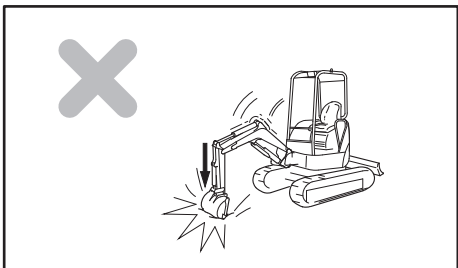


Do not use the implement's travel force

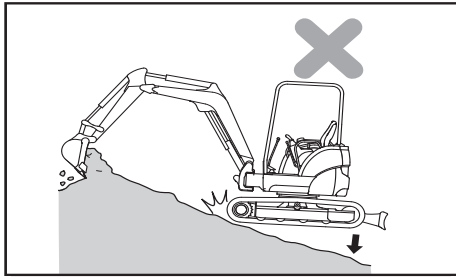


Take care not to operate the hydraulic cylinder to the stroke end

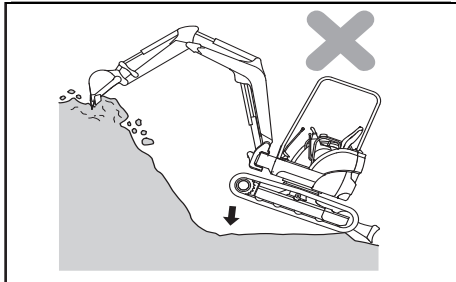
a = Margin



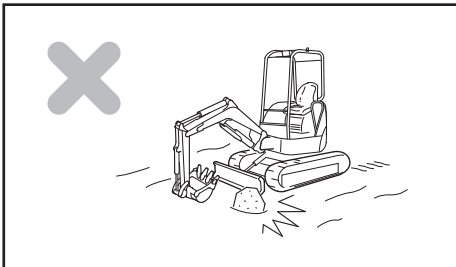
Do not operate the implement by the using the dropping force of the bucket



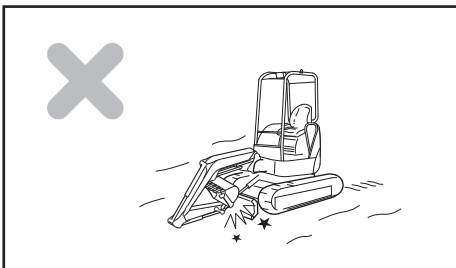
Do not operate the implement by using the dropping force of the machine



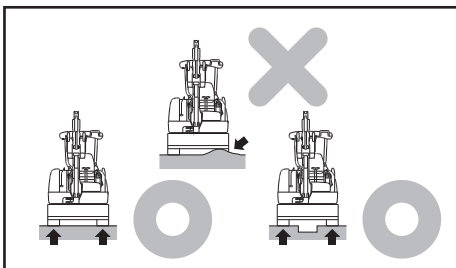
Excavating a hard rock



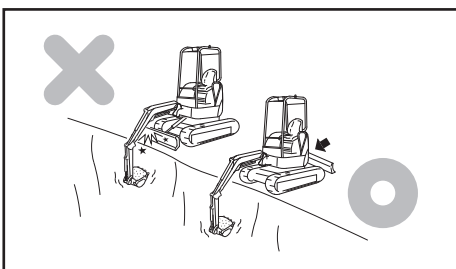
Do not bump the blade against a large rock or boulder



Be careful when retracting the implement



Support the blade on both sides



Be careful not to bump the blade when excavating

11.4 Handling the rubber crawler

Using the rubber crawler properly

The rubber crawler has some advantages over the steel crawler.

However, you cannot take full advantage of it if you use it in the same manner as for the steel one. Take care in operating with the rubber crawler according to the conditions of the work site and the type of work.

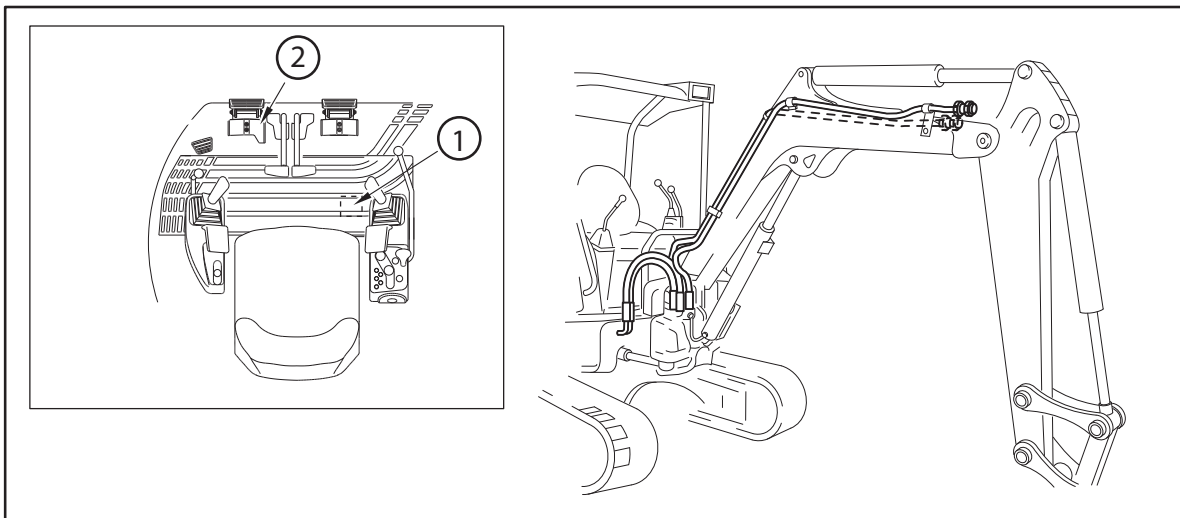
Comparison Table of Rubber and Steel Crawlers

	Rubber	Steel
Low vibration	◇	□
Smooth travel (with no creak)	◇	○
Silent travel	◇	□
Less damage to paved roads	◇	□
Simple handling	◇	□
Susceptibility to damage (strength)	□	◇
Tractive force	◇	◇

◇ : Excellent ○ : Good □ : Ordinary

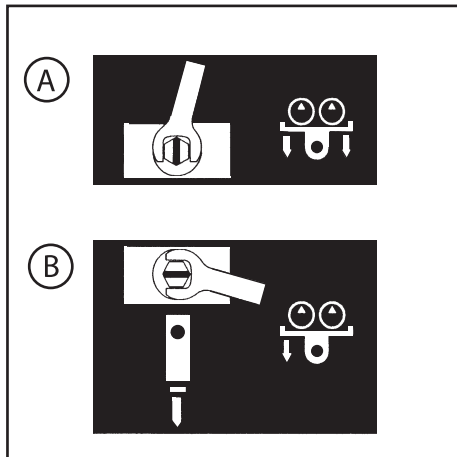
Rubber crawler has many advantages inherent in the unique properties of the material. On the other hand, however, it is low in strength. It is essential that you fully understand the properties of rubber crawler, and observe the precautions for operating and handling it to prolong its life and get the most out of it.

11.5 Handling hydraulic P.T.O



1) P.T.O. selector valve

2) P.T.O. pedal

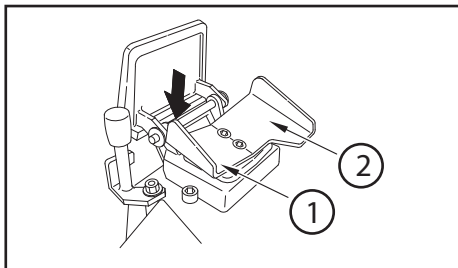
**(1) P.T.O. selector valve**

Use this valve, located under the mat, to select single-acting or double-acting P.T.O.

A = Double acting P.T.O.
B = Single acting P.T.O.

 **CAUTION**

When changing the hydraulic piping connection, stop the engine and slowly loosen the connection to release the inner pressure.

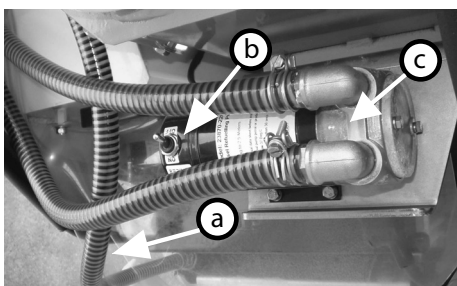
**(2) P.T.O. pedal**

- Use this pedal to operate the attachment.
- Move the P.T.O. pedal to the left side (1) for operating the single acting actuator type of attachments, when the P.T.O. selector valve is in the single acting position. [Example of the P.T.O. : Breaker]

- 1) Left
- 2) Right

IMPORTANT

Before disconnecting the attachments, shutdown the machine, leave the key in the "ON" position and press the pedal of the 3rd circuit to release the residual pressure.

11.6 Electric fuel tank filling pump (depending on model)

- 1) Insert the suction hose (a) into the fuel filling tank.
- 2) Turn the electric pump (c) switch (b) located under the right-hand machine cover to "ON".
- 3) The fuel will be pumped directly to the machine's fuel tank by the electric pump.

 **ATTENTION**

Do not over-fill the fuel tank.

12 Transportation

12.1 Precautions for transporting the machine

Shipping weight: Refer to the specification table.

CAUTION

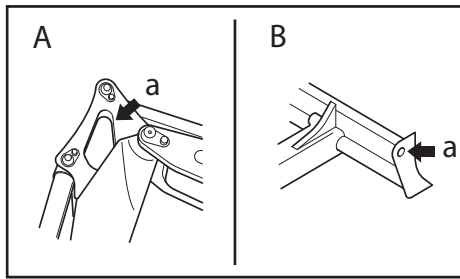
- Select a route for transporting the machine based on the road width and clearance, and the height and weight of the machine.

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

12.2 Suspending the machine

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 suspending 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.

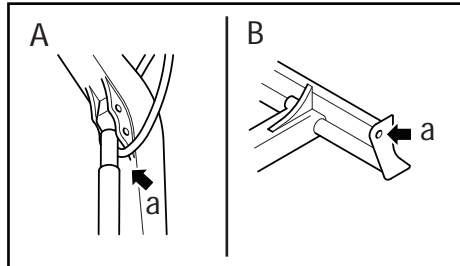


For safety in suspending the machine, comply with all applicable regulations.

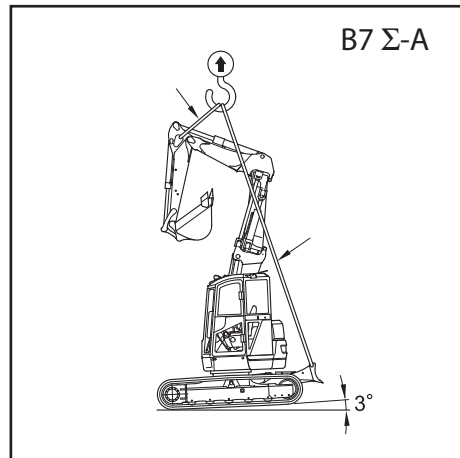
Suspend the machine on the level ground as follows:

A = Front side
B = Rear side

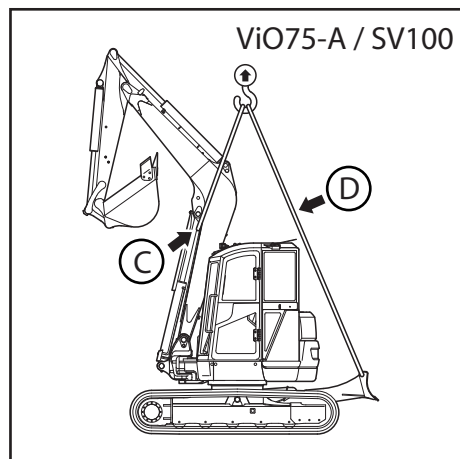
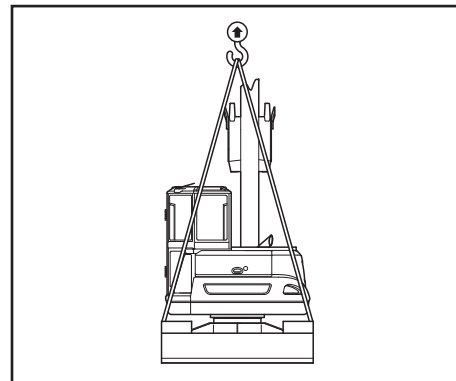
a = Hook bores are on both ends.



- 1) Swing the upperstructure 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) Stop the engine, and make sure that nothing is left around the operator's seat before leaving the machine.

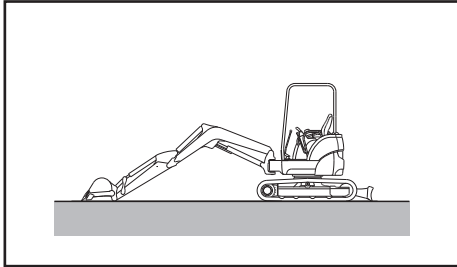


- 5) Fit the shackles to the suspending hooks on the front side (one point) and the rear side (two points), and securely fasten a sling belt (or a wire rope) to the shackles.



	ViO75-A	B7 Σ-A	SV100
C	3,4 m	1,8 m	3,4
D	3,8 m x 2	6,5 m x 2	3,8 ~ 4,0 m x 2

13 Long-term Storage



IMPORTANT

When storing the machine, set up the machine as illustrated in the left figure to protect the hydraulic cylinder rods from being corroded.

- Apply lube oil and grease to the machine and replace the engine oil.
- Apply a little amount of antirust to exposed parts of the hydraulic cylinder rods.
- Add an anti-freeze to the cooling water if the air temperature can fall below 0°C.
- To prevent condensation inside the fuel tank, either drain off the fuel tank or fill the tank.

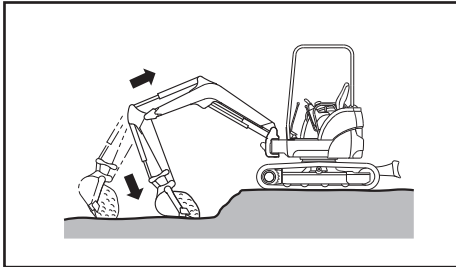
Move the machine at least once a month to form new oil films on all the moving parts during long-term storage, and recharge the battery at the same time.

Note:

Store the machine in accordance with the ISO 6749/1984 Standard.

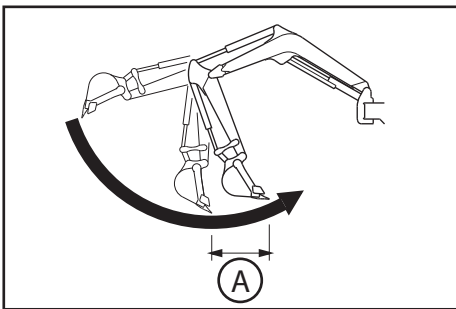
14 Troubleshooting

14.1 Phenomena that are not breakdowns



The following phenomena are not breakdowns:

- 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.
- 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.

- Shift in upperstructure position.
When turning the machine sharply such as spin-turning or pivot-turning, the upperstructure may be slightly shifted. This phenomenon is not a breakdown.
- 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.
- 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.
- 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.

14.2 Troubleshooting

Engine

- 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
Engine	Steam comes out of top of radiator.	<ul style="list-style-type: none"> • Shortage of cooling water 	<ul style="list-style-type: none"> • Check cooling water level. Refill, if necessary. (Check cooling water for leak from water port.) • Adjust belt tension. • Replace cooling water. Clean inside of cooling water system. • Replace thermostat. • Clean or repair fin.
	Water temp alarm lamp lights.		
	Turning on starter motor does not start engine.	<ul style="list-style-type: none"> • Shortage of fuel • Air mixed in fuel system • Defective fuel injection pump or deteriorated nozzle performance • Improper compression • Blown out fusible link • Damaged key stop solenoid. Link disengagement 	<ul style="list-style-type: none"> • Refill fuel tank. • Repair air leak. Release air from fuel system. (Replace pump or nozzle.) • (Check and repair.) • Replace fusible link. • (Check and repair.)
	Dark fumes come out of machine.	<ul style="list-style-type: none"> • Clogged air cleaner element • Deteriorated nozzle performance • Improper compression 	<ul style="list-style-type: none"> • Clean or repair element. • (Check and repair.) • (Check and repair.)
Exhaust color is white or bluish white.	<ul style="list-style-type: none"> • Too much oil in oil pan • Improper fuel • Worn cylinder or piston ring 	<ul style="list-style-type: none"> • Drain oil from oil pan to specified level. • Replace fuel with recommended one. • (Repair.) 	

Electrical equipment

- 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.	<ul style="list-style-type: none"> • Defective wiring system • Defective starter switch • Insufficiently charged battery • Defective starter motor 	<ul style="list-style-type: none"> • Check and repair wiring system. • Replace starter switch. • Recharge battery. • (Check and repair.)
	Maximum engine speed does not provide enough brightness of lamps.	<ul style="list-style-type: none"> • Defective wiring system • Defective generator or regulator 	<ul style="list-style-type: none"> • Check terminals for looseness and disconnection. Repair terminal, if necessary. • (Check and repair.)
	During engine operation, lamp is extremely bright, and frequently burns out.	<ul style="list-style-type: none"> • Defective regulator 	<ul style="list-style-type: none"> • Replace regulator.
	Electrolyte leaks from battery.		
	Speed of starter motor is too low.	<ul style="list-style-type: none"> • Defective wiring system • Insufficiently charged battery • Defective starter motor 	<ul style="list-style-type: none"> • Check and repair wiring system. • Recharge battery. • (Check and repair.)

Machine body

- 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.	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • (Replace hydraulic pump.) • (Check and repair valves.) • (Check and repair.) • Replenish hydraulic oil up to specified level. • Clean or replace filter.
	Upperstructure does not swing or does not swing smoothly.	<ul style="list-style-type: none"> • Swing brake is not released • Insufficient amount of grease • Defective swing brake valve • Defective swing motor 	<ul style="list-style-type: none"> • (Check and repair.) • Check and grease. • (Check and repair.) • (Check and repair.)
	Temperature of hydraulic oil is too high.	<ul style="list-style-type: none"> • Insufficient amount of hydraulic oil • Overload 	<ul style="list-style-type: none"> • Replenish hydraulic oil up to specified level. • Lower load.
	Machine does not move straight.	<ul style="list-style-type: none"> • Improperly adjusted crawler or trapped foreign material • Damaged hydraulic motor. • Defective hydraulic pump • Defective control valve • Damaged sprocket, idler or track roller. 	<ul style="list-style-type: none"> • Adjust or clean. • (Check and repair.) • (Check and repair.) • (Check and repair.) • (Check and repair.)

MAINTENANCE



15 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.

16 Basic Servicing Practices

16.1 Filter

The filters are very important parts which prevent impurities from getting into critical devices through the lube oil, fuel and air systems. Replace the filter elements periodically according to the instructions of the Operation Manual. Under difficult conditions, you need to replace the filter elements earlier than suggested in the Operation Manual depending on the type of oil and fuel (sulfur content).

- Never reuse the filter elements (cartridge type) by cleaning them.
- When replacing an oil filter element, check that no metallic dust or foreign solids are present on the old filter.
- If they are found to be present, contact the nearest dealer.
- Do not unpack the filter element before use.
- Use YANMAR genuine filter elements.

17 Fueling, Oiling and Greasing Based on Temperature Range

17.1 Fuel and oil

Select fuel and oil based on the temperature range. If you start the engine at air temperatures lower than 32°F (0°C), use SAE10W, SAE10W-30, or SAE15W-40 even if the temperature in the daytime rises to 50°F (10°C) or so.

17.2 Cooling water

Because a YANMAR genuine long-life coolant (LLC) is added to the cooling water, you need not change it unless the temperature falls below -31°F (-35°C).

Components	Fluid	Recommendations with regard to temperature ranges						Prescribed amount (litre)			
		(°F) -4	14	32	50	68	86	ViO75-A	B7 Σ-A	SV100	
		(°C) (-20)	(-10)	(0)	(10)	(20)	(30)				
Engine	Engine oil	SAE 10WCD						10,2 + 0,4	10,2 + 0,4	10,5 + 0,4	with filter
		SAE 10W-30CD									
		SAE 15W-40CD									
Swing reduction gear	Gear oil	SAE 90 (GL-4)						1,5	1,5	1,5	
Travel reduction gear	Gear oil	SAE 90 (GL-4)						1,3	1,3	2,5	for each reduction gear
Hydraulic oil system	Hydraulic oil	ISO VG46						57,0	57,0	57,0	in the tank
								43,0	43,0	53,0	the rest
Fuel tank	Ligh oil	No.2-D						100,0	100,0	120,0	
		No.3-D									
		No.3-D (S)									
Cooling system	Water	YANMAR genuine long-life coolant (LLC) added						8,3	8,3	10,4	radiator
								0,4	0,4	0,4	subtank

18 Standard Tightening Torque for Bolts and Nuts

18.1 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.

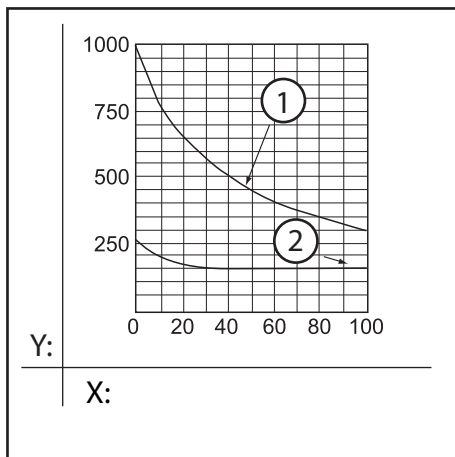
19 Maintenance Table

Daily and periodic inspection are important to keep the machine in its best condition. The following is a summary of inspection and servicing items by inspection interval. Periodic inspection intervals vary depending on the use, loads, fuels and lube oils used and handling conditions. The following should be treated only as a general standard.

When the time for an inspection approaches, study the relevant pages in the Operation & Maintenance Manual. Keep a record of daily operation and the results of maintenance work.

19.1 Service intervals when using the hydraulic breaker

When a hydraulic breaker is used, the hydraulic oil deteriorates earlier than in usual bucket excavating work. Set up the service time intervals as follows:



- **Replacing the hydraulic oil return filter element**

Replace the hydraulic oil return filter element on the new machine once after the first 100 to 150 hours. After that, replace it referring to the chart at left.

- **Replacing the hydraulic oil in the hydraulic oil tank**

Replace the hydraulic oil according to the chart at left.

- 1) Hydraulic oil
- 2) Return filter

X: Hydraulic breaker operation rate (%)

Y: Replacement intervals (H)

19.2 List of periodic inspection and servicing

◇: Check ○: Supply ①: 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		①	○		●
	Travel reduction gear		①	○		●
Hydraulic system	Hydraulic oil	◇				●
	Suction filter					□
	Return filter			①	●	
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 battery	◇				
Air conditioner (Depending on model)	Exchanger	◇				
	Tension of compressor driving belt			□		
	Hoses					●

◇: Check ○: Supply ①: 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	◇	①	●		
Oil filter		①	●		
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

Note :

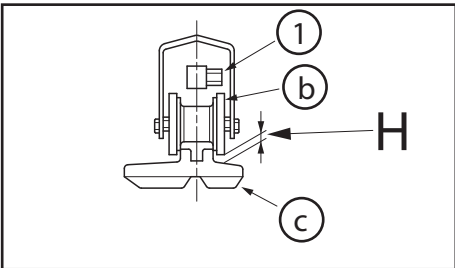
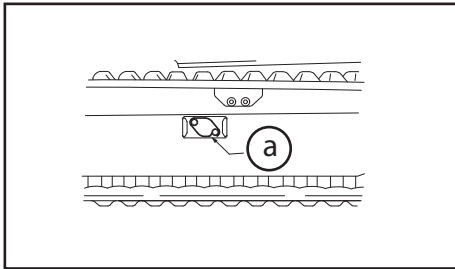
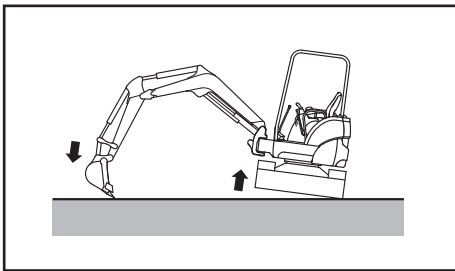
- When machine is used at dusty worksites clean and replace filter element twice or more frequently than specified in the table.
- Execution of periodic inspection and servicing is indispensable to conform to the EPA emission control regulations. Keep a record of the results.

20 Procedures for Maintenance

20.1 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 machine 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.



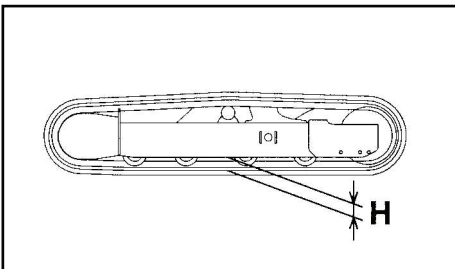
How the crawler wears out depends on the working conditions and the nature of the ground. Be sure to check the crawler for wear and tension from time to time. When a new crawler is mounted, perform the first check after 30 hours operation. Working with the crawler loosened can cause the detrack of the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

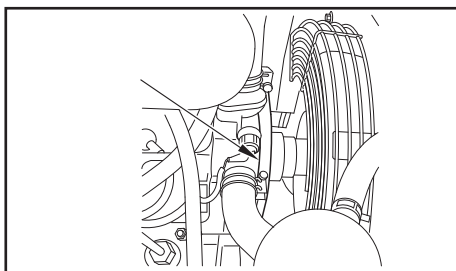
⚠ CAUTION

- 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.

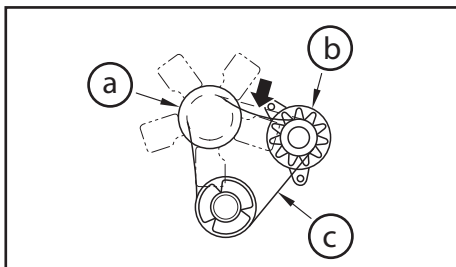
Completely wipe off the grease because grease will shorten its service life.

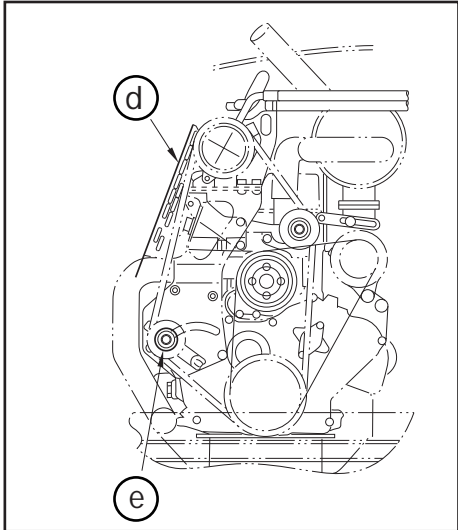


20.2 Checking and adjusting the fan belt tension

- 1) Stop the engine.
- 2) Open the engine hood rear cover.
- 3) Press the fan belt between the fan pulley and the generator 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





20.3 Checking and adjusting the compressor driving belt tension (depending on model)

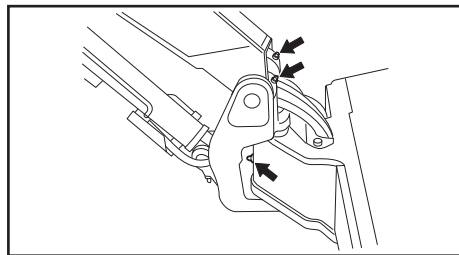
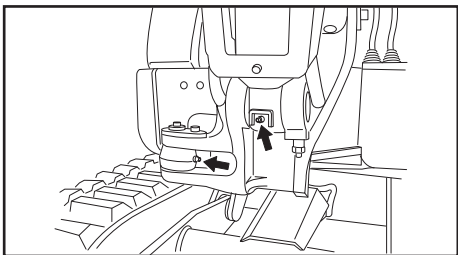
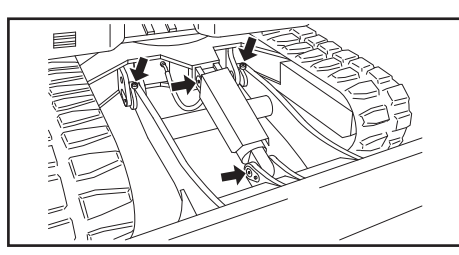
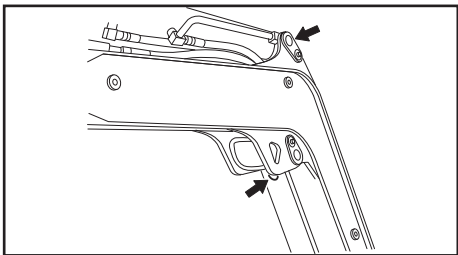
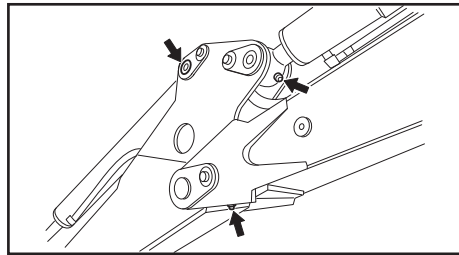
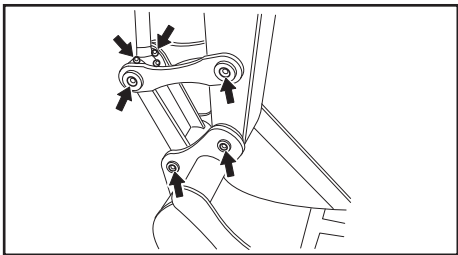
d = Cover
e = Tension pulley bolt

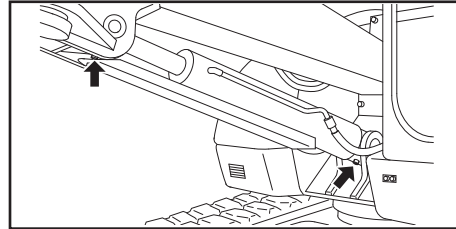
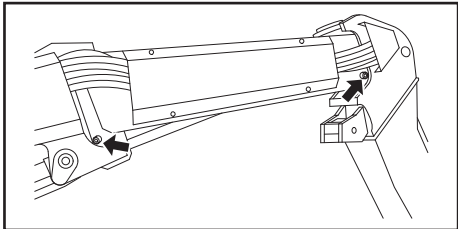
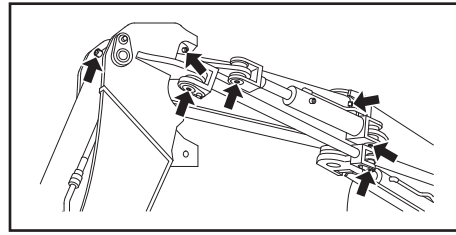
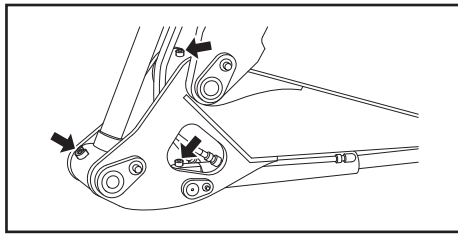
- 1) Remove the cover and press the belt in the middle with a force of approximately 98,1 N.m
Adequate slack : 23 to 24 mm
- 2) If necessary, adjust the belt tension by loosening the tension pulley bolt so that the slack of the belt will be correct.
- 3) Tighten the tension pulley bolt after adjusting.

20.4 Greasing

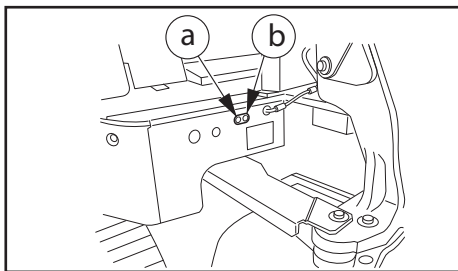
IMPORTANT

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



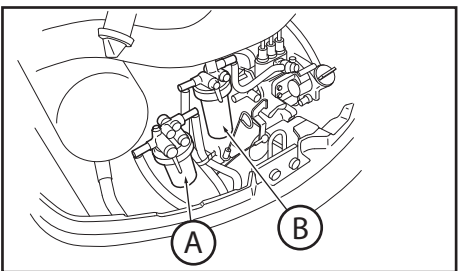


- 1) Put the bucket and the blade on the ground and stop the engine.
- 2) Clean the grease nipples indicated with the arrows in the above figures and grease them using a grease gun.
- 3) After greasing, wipe off the excessive grease with waste cloth or the like.



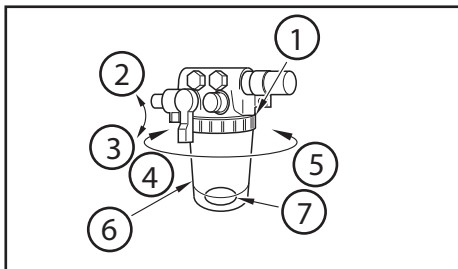
20.5 Greasing the swing gear and the swing bearing

a = Swing bearing
b = Swing gear

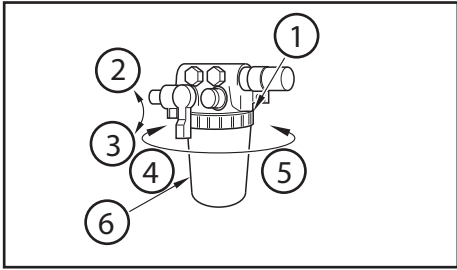


20.6 Changing the water separator element

A = Fuel filter
B = Water separator

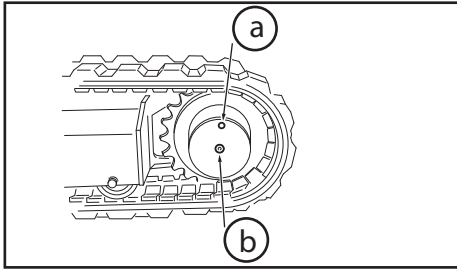


- 1) Retainer ring
- 2) Close
- 3) Open
- 4) Loosen
- 5) Tighten
- 6) Water separator
- 7) Ring



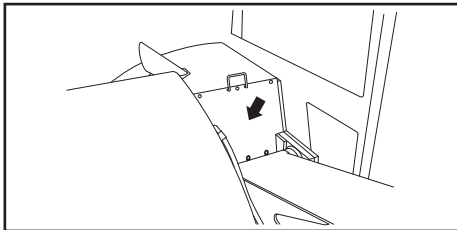
20.7 Changing the fuel filter element

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

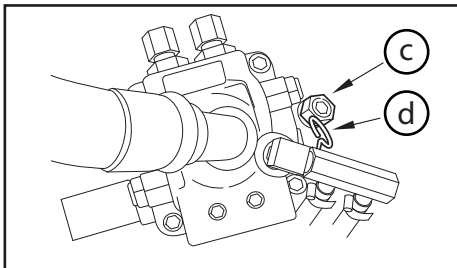


20.8 Checking and replenishing the lube oil for the travel reduction gearbox

- a = Oil supply port (drain port)
- b = Oil level check port (level port)



20.9 Checking and replenishing the lube oil for the swing reduction gearbox



- c = Oil supply port
- d = Dipstick

SPECIFICATIONS



21 Specifications

21.1 Specifications

		ViO75-A	B7 Σ-A	SV100
Crawlers		rubber / steel	rubber / steel	rubber / steel
H (crawler tension)	mm	20~25 / 145~155	20~25 / 145~155	20~25 / 170~180
Items		Cabin	Cabin	Cabin

Weight (in compliance with CE standards)

Operating mass (with operator + 75 kg)	kg	7720 / 7770	8030 / 8080	9250 / 9350
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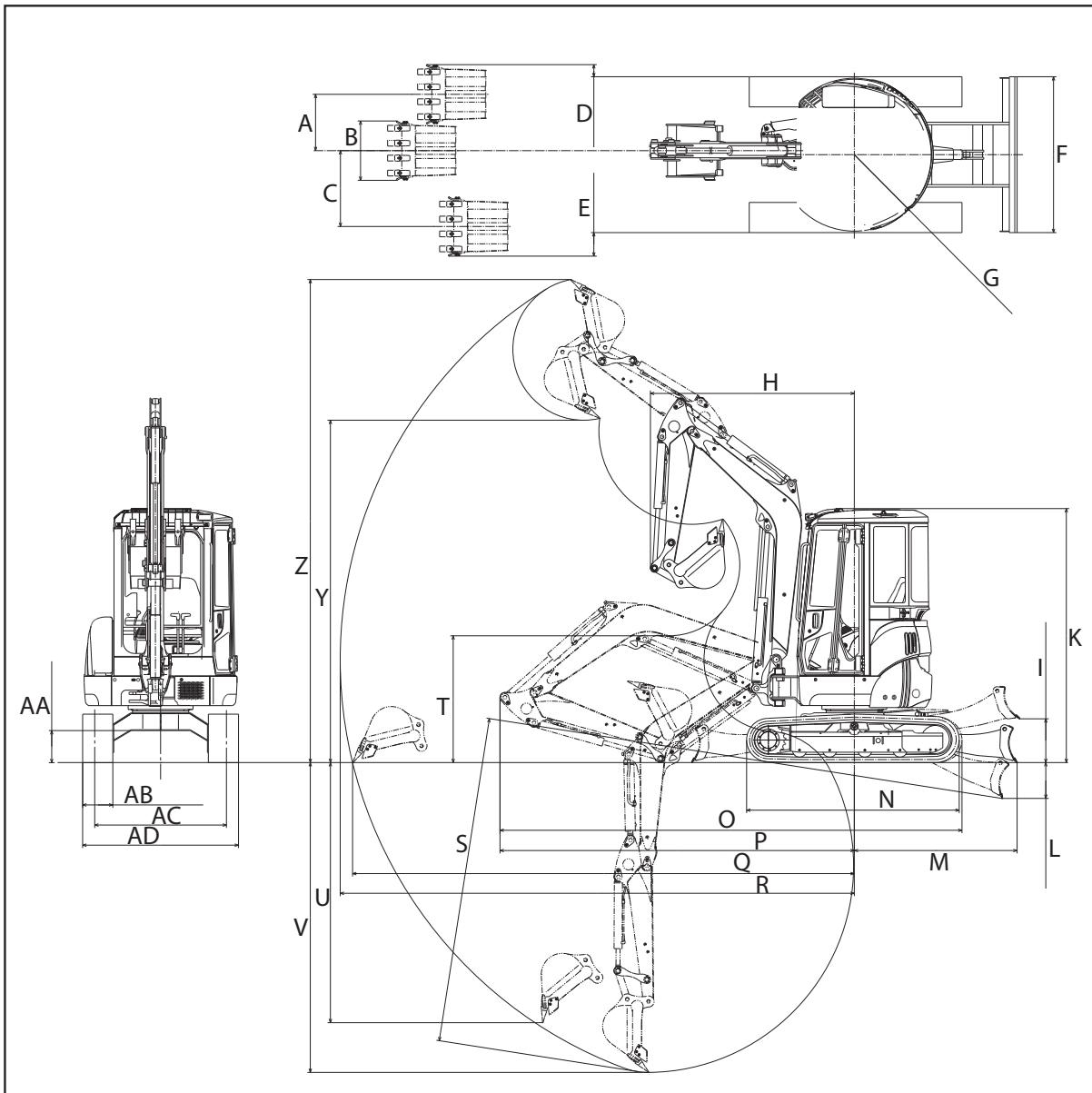
Working range and performance

Bucket capacity, standard	m ³	0,28	0,28	0,30
Bucket width, standard	mm	750	750	800
Maximum digging depth	mm	4200	4350	4400
Maximum vertical wall digging depth	mm	3500	3770	4000
Maximum cutting height	mm	7050	7600	7320
Maximum dumping height	mm	4920	5490	5200
Maximum digging radius of the ground	mm	6740	6410	7000
Front minimum swing radius <at swinging the boom>	mm	2120 <1700>	1200	2290 <1860>
Boom swing angle : left / right		68° / 68°	-	68° / 68°
Maximum digging force (bucket)	kN	54,8	54,8	68,5
Travel speed : high / low	km / h	4,7 / 2,7 - 4,5 / 2,5	4,7 / 2,7 - 4,5 / 2,5	4,5 / 2,5
Maximum gradient		30°	30°	30°
Swing speed	rpm	10,0	10,0	9,6
Average ground pressure, standard crawler	kg / cm ²	0,342 / 0,346	0,356 / 0,360	0,36 / 0,37
Hydraulic pump displacement	L / min	74,0 X 2 <Variable displacement pumps> 60,4 X 1 <Gear pump>	74,0 X 2 <Variable displacement pumps> 60,4 X 1 <Gear pump>	81,4 X 2 <Variable displacement pumps> 61,6 X 1 <Gear pump>
System relief set pressure	MPa	24,5 X 2 20,6 X 1	24,5 X 2 20,6 X 1	27,5 X 2 24,5 X 1

Engine		ViO75-A	B7 Σ-A	SV100
Type	-	Vertical four cycle water-cooled direct injection diesel engine	Vertical four cycle water-cooled direct injection diesel engine	Vertical four cycle water-cooled direct injection diesel engine
Model	-	4TNV98-XBV	4TNV98-XBV	4TNV98T-SBV
Rated output / revs	kW / rpm	43,4 / 2000	43,4 / 2000	54,8 / 2200
Displacement	cm ³	3318	3318	3318
Compression pressure	MPa	2,94 +/- 0,1 at 250 rpm	2,94 +/- 0,1 at 250 rpm	2,94 +/- 0,1 at 250 rpm
Nozzle injection pressure	MPa	21,6 ~ 22,6	21,6 ~ 22,6	21,6 ~ 22,6
Generator capacity	V / A	12 / 40	12 / 40	12 / 40
Battery	V / Ah	12 / 92	12 / 92	12 / 92

Subject to technical modifications

21.2 Model view and working range



Unit: mm	ViO75-A	B7 Σ-A	SV100
A	550	965	550
B	750	750	800
C	770	1020	770
D	30	350	25
E	180	125	175
F	2270	2260	2320
G	1130	1130	1330
H / (swing)	2120 / (1700)	1200 / -	2290 / (1860)
I	460	400	520
K	2715	2715	2830
L	400	355	420
M	1890	1760	1980
N	2890	2890	3070
O	6245	5795	6370
P	6690	4350	4835
Q	6740	6410	7000
R	6880	6550	7150
S	4400	4500	4600
T	2150	2625	1940
U	3500	3770	4000
V	4200	4350	4400
Y	4920	5490	5200
Z	7050	7600	7320
AA	380	380	450
AB	450	450	485
AC	1870	1870	1870
AD	2270	2270	2320

21.3 Noise emitted by the machines

Results of inspections:

	ViO75-A	B7 Σ-A	SV100
LwA (dBA)	100	101	101
LpA/LAeq (dBA)	80	81	79
LpCrête (dBC)	< 130	< 130	< 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.

21.4 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
ViO75-A	< 0,5	0,9	0,9	< 2,5	< 2,5	< 2,5
B7 Σ-A	< 0,5	0,9	0,8	< 2,5	3,2	3,3
SV100	< 0,5	1,0	0,8	< 2,5	< 2,5	2,6

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 taken:

- 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 machine.
- It is recommended that the operator acquaint himself with and retain the instructions relating to the setting up and use of attachments.

21.5 Lifting capacity

Lifting capacity for ViO75-A

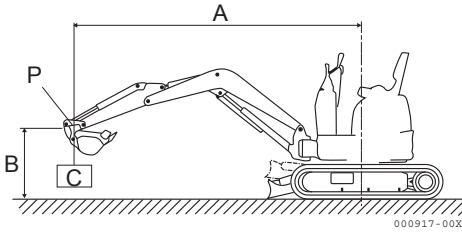
Machine with rubber tracks.

Bucket width: 700 mm Bucket weight: 126 kg

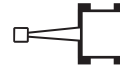
A: Overhang from the axis of rotation

B: Bucket height in meters

C: Load point



Longitudinal boom



Transverse boom

Blade down

Unit : (kg)

A (m)	Max.		5,0 m		4,0 m		3,0 m	
B (m)								
5,0	*1510	*1510	-	-	*1580	*1580	-	-
4,0	1080	*1530	-	-	*1530	*1530	-	-
3,0	900	*1530	1060	*1580	1510	*1790	-	-
2,0	790	*1530	1010	*1730	1470	*2160	2330	*3230
1,0	710	*1580	980	*1870	1400	*2500	2170	*3690
0	790	*1600	980	*1930	*1370	*2550	2160	*3580
-1,0	860	*1580	970	*1800	1370	*2410	2190	*3450
-2,0	1100	*1530	-	-	1330	*2020	2300	*2810
-3,0	*1300	*1300	-	-	-	-	*1490	*1490

Blade up

Unit : (kg)

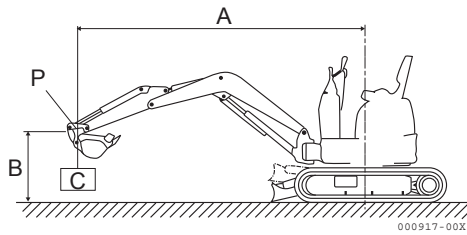
A (m)	Max.		5,0 m		4,0 m		3,0 m	
B (m)								
5,0	*1510	*1510	-	-	*1580	*1580	-	-
4,0	1080	1100	-	-	*1530	*1530	-	-
3,0	870	900	1040	1130	1510	*1790	*2280	*2280
2,0	770	830	1010	1070	1470	1540	2300	2410
1,0	760	800	980	1040	1400	1460	2120	2260
0	800	820	970	1010	1320	1400	2120	2150
-1,0	850	950	950	1010	1340	1400	2130	2270
-2,0	1070	1100	-	-	1330	1400	2130	2300
-3,0	*1300	*1300	-	-	-	-	*1490	*1490

The data in these tables represents the lifting capacity according to the ISO 10567 standard. It corresponds to 75% of the maximum static load before tipping or to 87% of the hydraulic working load. The data marked with * conveys the hydraulic limits of the working load.

Lifting capacity for B7 Σ -A

Machine with rubber tracks.

Bucket width: 750 mm Bucket weight: 195 kg



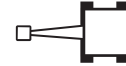
A: Overhang from the axis of rotation

B: Bucket height in meters

C: Load point



Longitudinal boom



Transverse boom

Blade down

Unit : (kg)

A (m)	Max.		5,0 m		3,5 m		2,5 m	
B (m)								
5,0	1600	*1940	-	-	*2040	*2040	-	-
4,0	1210	*1900	-	-	*2170	*2170	-	-
3,0	960	*1850	-	-	2070	*2440	-	-
2,0	860	*1810	1010	*1970	1870	*2710	3280	*3970
1,0	800	*1780	970	*2000	1680	*3010	2680	*3920
0	820	*1770	-	-	1580	*2840	2700	*3750
-1,0	870	*1710	-	-	1530	*2640	2680	*3450
-2,0	1070	*1610	-	-	1550	*2190	*2650	*2650

Blade up

Unit : (kg)

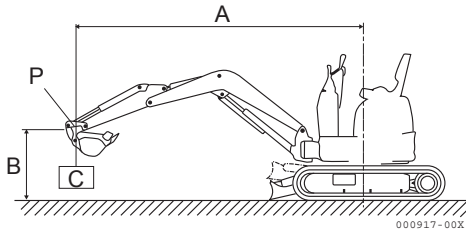
A (m)	Max.		5,0 m		3,5 m		2,5 m	
B (m)								
5,0	1600	1610	-	-	*2040	*2040	-	-
4,0	1190	1250	-	-	*2170	*2170	-	-
3,0	960	1010	-	-	2060	2030	-	-
2,0	830	870	1010	1050	1870	1960	3280	3300
1,0	800	820	950	980	1680	1760	2680	2820
0	820	850	-	-	1570	1650	2670	2820
-1,0	870	910	-	-	1510	1580	2660	2940
-2,0	1070	1100	-	-	1570	1580	*2650	*2650

The data in these tables represents the lifting capacity according to the ISO 10567 standard. It corresponds to 75% of the maximum static load before tipping or to 87% of the hydraulic working load. The data marked with * conveys the hydraulic limits of the working load.

Lifting capacity for SV100

Machine with rubber tracks.

Bucket width: 800 mm Bucket weight: 260 kg



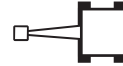
A: Overhang from the axis of rotation

B: Bucket height in meters

C: Load point



Longitudinal boom



Transverse boom

Blade down

Unit : (kg)

A (m)	Max.		5,0 m		4,0 m		3,0 m	
B (m)								
5,0	*1600	*1600	-	-	-	-	-	-
4,0	1160	*1620	1320	*1620	*1600	*1600	-	-
3,0	1010	*1610	1380	*1690	*1910	*1910	-	-
2,0	920	*1610	1310	*1870	1930	*2320	*3340	*3340
1,0	860	*1610	1270	*2100	1840	*2770	2810	*4180
0	890	*1610	1230	*2110	1700	*2940	2620	*4190
-1,0	1000	*1660	1210	*2090	1770	*2870	2630	*4000
-2,0	1240	*1600	-	-	1740	*2390	2640	*3210

Blade up

Unit : (kg)

A (m)	Max.		5,0 m		4,0 m		3,0 m	
B (m)								
5,0	*1600	*1600	-	-	-	-	-	-
4,0	1160	1360	1320	1380	*1600	*1600	-	-
3,0	1010	1220	1380	1400	*1910	*1910	-	-
2,0	920	1090	1310	1540	1930	*2320	*3340	*3340
1,0	860	1050	1270	1580	1840	2230	2810	3460
0	890	1090	1230	1500	1700	2120	2620	3300
-1,0	1000	1170	1210	1510	1770	2110	2630	3410
-2,0	1240	*1600	-	-	1740	2050	2640	2850

The data in these tables represents the lifting capacity according to the ISO 10567 standard. It corresponds to 75% of the maximum static load before tipping or to 87% of the hydraulic working load. The data marked with * conveys the hydraulic limits of the working load.

22 Options

22.1 Options

Installing options not authorised by Ammann-Yanmar can cause accidents and reduce the machine's service life. The installation and use of the unauthorised options or parts can result in the cancellation of the guarantee.

			ViO75-A	B7 Σ-A	SV100
1	A	3rd hydraulic circuit	○	○	○
	B	4th hydraulic circuit	○	○	○
2	A	Hoisting ring	○	○	○
	B	Hoisting hook	○	○	○
3		FOPS protective grille on the cab roof	○	○	○
4	A	Safety valves on boom cylinder, and dipper cylinder + overload indicator	○		○
	B	Safety valves on boom, dipper and blade cylinder + overload indicator	○		○
	C	Safety valves on boom, offset boom, dipper and blade cylinder + overload indicator		○	
	D	Safety valves on boom, offset boom and dipper cylinder + overload indicator		○	
5		MED theft protection device with lock	○	○	○
6		Radio	○	○	○
7		Air conditioning	○		◇
8		Electric fuel tank filling pump	○	○	◇

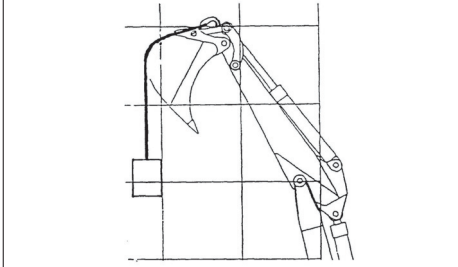
○ = Possible options on this machine
 ◇ = Standard options on this machine

(1A) 3rd hydraulic circuit:

To use the 3rd circuit, refer to Chapter 11.5 "Handling hydraulic P.T.O." in this manual.

(1B) 4th hydraulic circuit:

For a machine with a 4th circuit, it can be used through a switch installed on the left control lever.

**(2A) Hoisting ring:**

Hoisting ring welded onto a connecting rod to be installed with safety valves. Refer to Chap. 3.3 "Lifting" in this manual.

Check if the ring and the ring assembly base are damaged.

If you detect any damage, ask your dealer to intervene.

A suitable ring is required to hang a load on the machine.

For more details, contact your dealer.

The wire or the suspension hook can get detached from the ring if the hook does not remain in the vertical position.

This option is subjected to regular inspections.

(2B) Hoisting hook:

Hoisting hook welded on the connecting rod to be installed with safety valves. Refer to Chap. 3.3 "Lifting" in this manual.

Check if the hook, the locking devices and the assembly base of the hook are damaged.

If any damage is detected, ask your dealer to intervene.

A suitable hook is required to hang a load on the machine.

For more details, contact your dealer.

The wire or the hang-up ring may come off the hook if the hook does not remain in the vertical position.

This option is subjected to a periodic inspection.

(3) FOPS protective grille on the cab roof:

FOPS 2 protective grille for demolition work.

(4A) Safety valves on boom cylinder and dipper cylinder + overload indicator:

Safety valves to be installed with the hook or the ring.

These valves are installed on the boom and dipper cylinder of the machine to avoid the attachment from falling to the ground in case of rupture of hoses.

An overload warning indicates that the overload zone is approaching. An ON/OFF button is used to select this function.

(4B) Safety valves on boom, dipper and blade cylinder + overload indicator:

Safety valves to be installed with the hook or the ring.

These valves are installed on the boom, dipper and blade cylinders of the machine to prevent the attachment from falling to the ground in case of rupture of hoses.

An overload warning indicates that the overload zone is approaching. An ON/OFF button is used to select this function.

(4C) Safety valves on boom, offset boom, dipper and blade cylinder + overload indicator:

Safety valves to be installed with the hook or the ring.

These valves are installed on the boom, offset boom, dipper and blade cylinders of the machine to prevent the attachment from falling to the ground in case of rupture of hoses.

An overload warning indicates that the overload zone is approaching. An ON/OFF button is used to select this function.

(4D) Safety valves on boom, offset boom and dipper cylinder + overload indicator:

Safety valves to be installed with the hook or the ring.

These valves are installed on the boom, offset boom and dipper cylinders of the machine to prevent the attachment from falling to the ground in case of rupture of hoses.

An overload warning indicates that the overload zone is approaching. An ON/OFF button is used to select this function.

(5) MED theft protection device with lock:

To start the engine, insert the MED electronic key in its slot, remove it and start the engine within 30 seconds. If 30 seconds have elapsed, repeat the entire procedure. The theft protection device gets activated 30 seconds after the ignition key is turned to the OFF position.

(6) Radio:

Refer to the operating instructions provided with the radio.

(7) Air-conditioning:

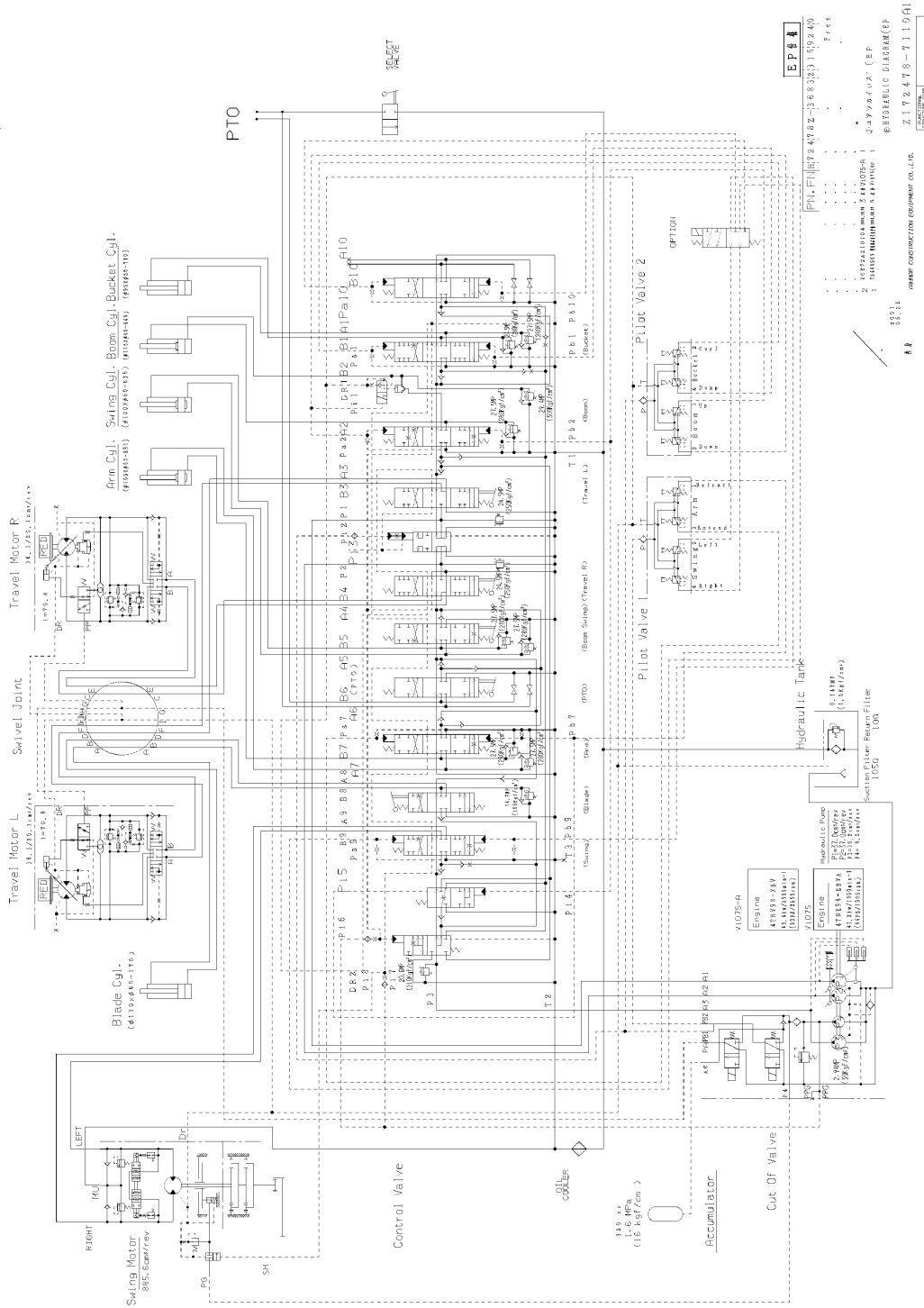
Refer to the "OPERATION" part in the user manual.

(8) Electric fuel tank filling pump

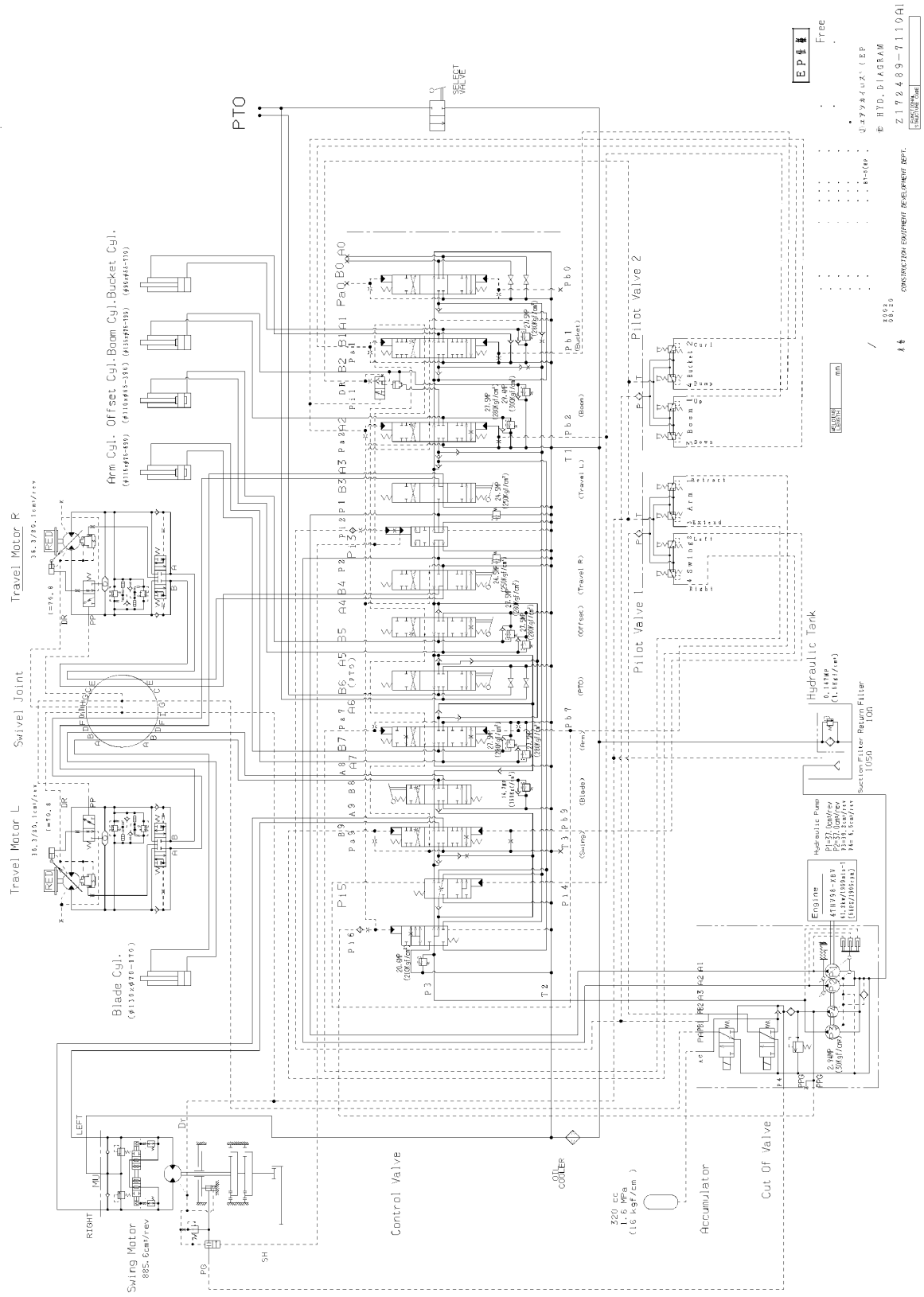
See chapter 11.6 "Electric fuel tank filling pump" in this manual.

23 Hydraulic and wiring diagrams

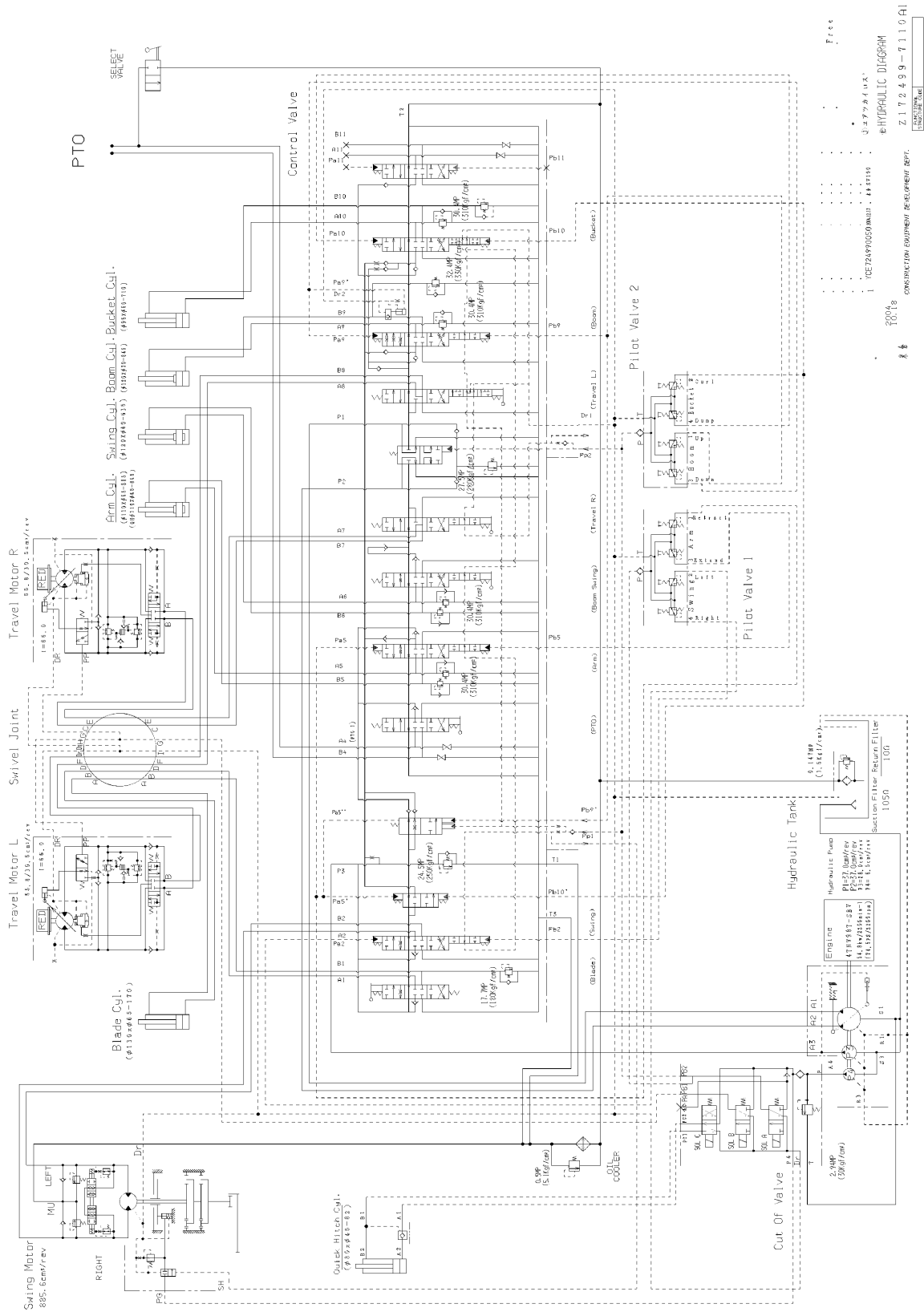
23.1 Hydraulic diagrams Vi075-A



B7Σ-A

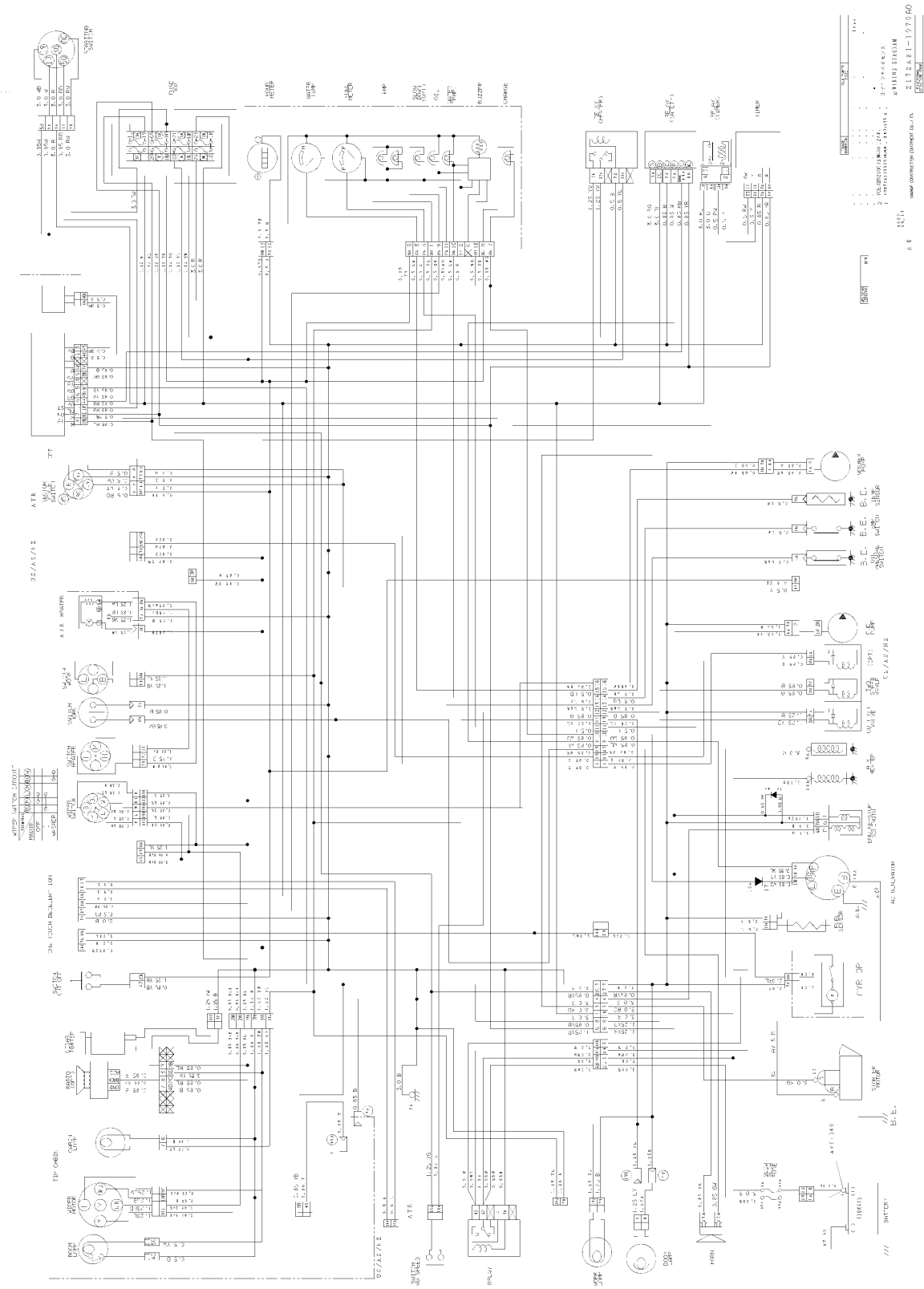


SV100

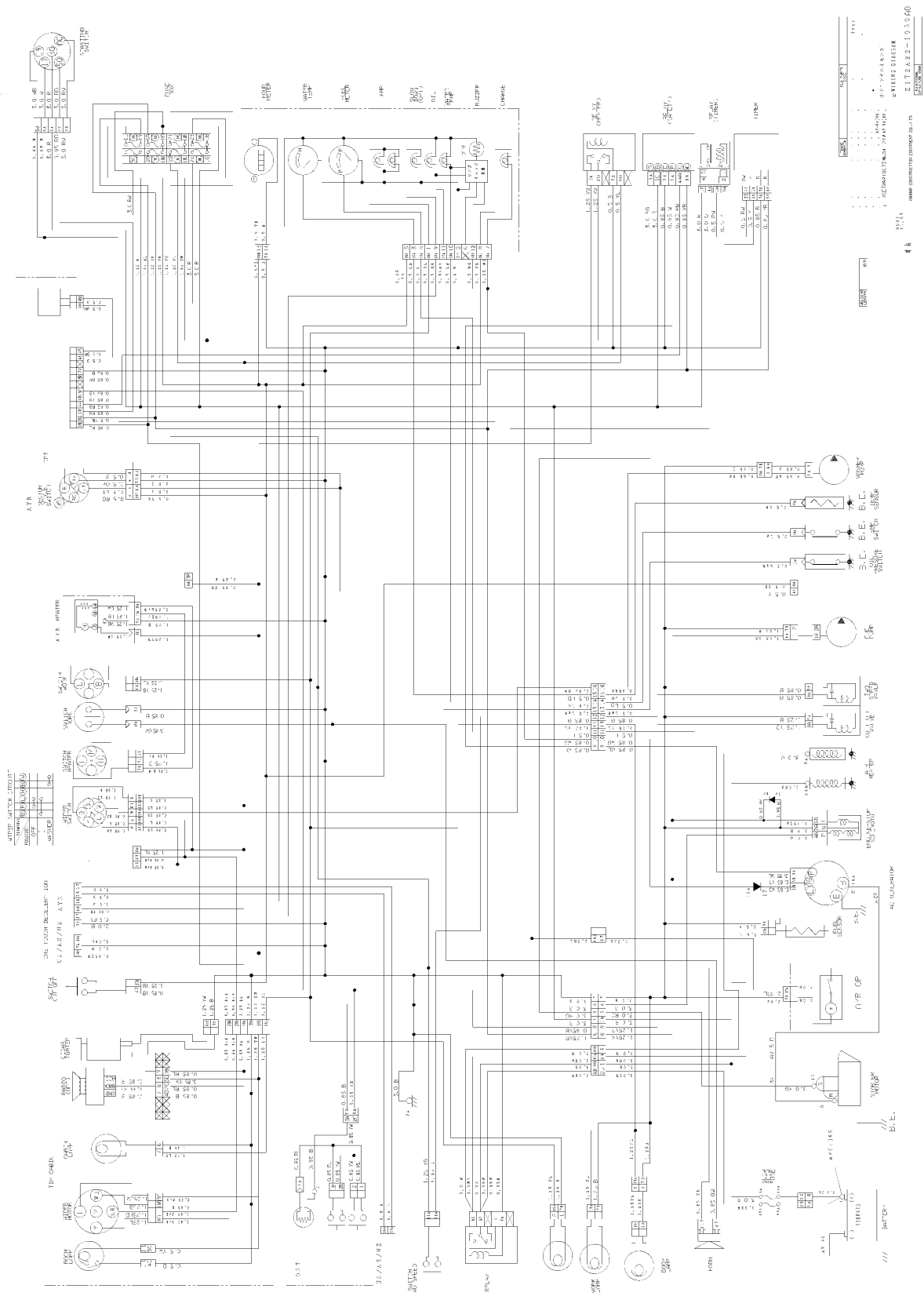


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 HYDRAULIC DIAGRAM
 Z 1 7 2 4 9 9 - 7 1 0 A1

23.2 Wiring diagrams ViO75-A



B7Σ-A




NOTES



Inspection after 1 year or 1000 hours (first term reached)


Customer's copy

INSPECTION AFTER 1 YEAR OR 1000 HOURS (first term reached)		
Machine:	Serial number:	
Customer:	Delivery date:	
Inspection's date:	Hours:	
The inspection was carried out according to the Ammann Yanmar schedule		
Note:		
Dealer's signature and stamp:	Customer's signature:	



This copy to be retained by the dealer



INSPECTION AFTER 1 YEAR OR 1000 HOURS (first term reached)		
Machine:	Serial number:	
Customer:	Delivery date:	
Inspection's date:	Hours:	
The inspection was carried out according to the Ammann Yanmar schedule		
Note:		
Dealer's signature and stamp:	Customer's signature:	

***The inspection date must be notified to AMMANN YANMAR**

YANMAR MIDI-ECAVATORS
V1075-A(EP) - B7 Σ -A(EP) - SV100(EP)

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