

1. SAFETY INSTRUCTIONS

1.1 SAFETY LABELS & DECALS



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

SAFETY MESSAGES

Several labels for specific safety messages are attached to this machine. The exact location and description of the hazards are reviewed in this section.

Please read and understand all safety messages in this manual and on the machine.

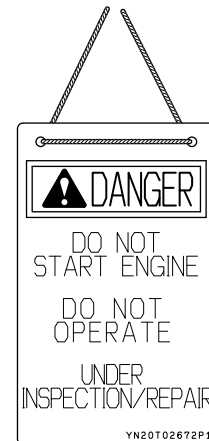
1.1.1 ALWAYS MAKE SURE ALL OF THE SAFETY LABELS ARE LEGIBLE AND NOT DAMAGED

- Clean the safety labels or replace the safety labels if you can not read the words or see the illustrations. To clean the safety labels, only use a cloth, water and soap. Do not use any solvent, gasoline or other harsh chemicals to clean the safety labels. Solvents, gasoline or harsh chemicals could loosen the adhesive that secures the safety labels and allow the label to fall off the machine.
- Always replace any safety label that is damaged or missing. If a safety label is attached to a part that is replaced, you will need to install a safety label on the replacement part. Your KOBELCO authorized dealer can provide new safety labels.
- Never remove any safety labels attached to this machine. For all other labels on the machine, clean and replace as needed in accordance with the instructions above.

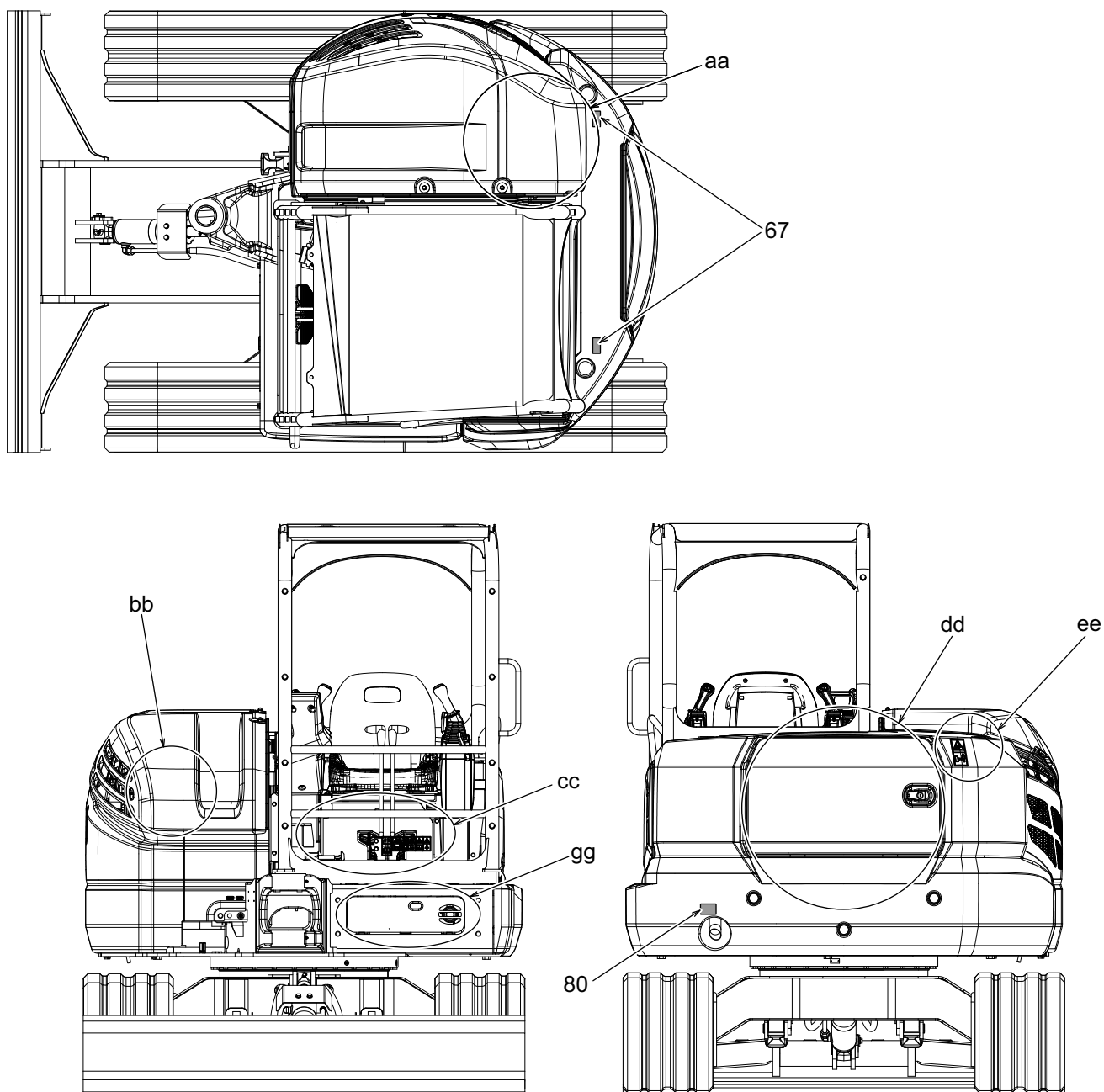
1.1.2 "DO NOT OPERATE" TAG

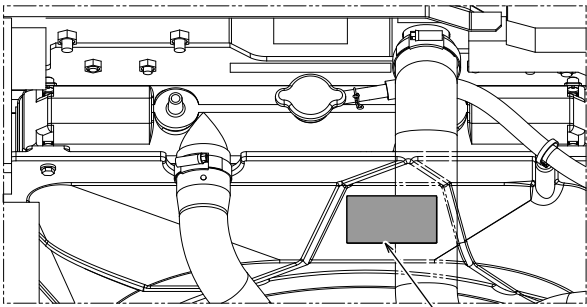
Part Number: YN20T02672P1

Use a temporary hang tag to communicate that the machine is out of service. You may need to use more than one temporary hang tag depending on the inspection and maintenance activities to be performed.

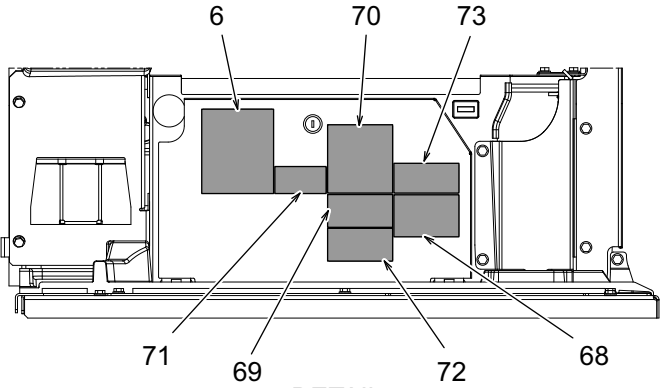


1.1.3 LOCATION OF SAFETY LABELS & DECALS

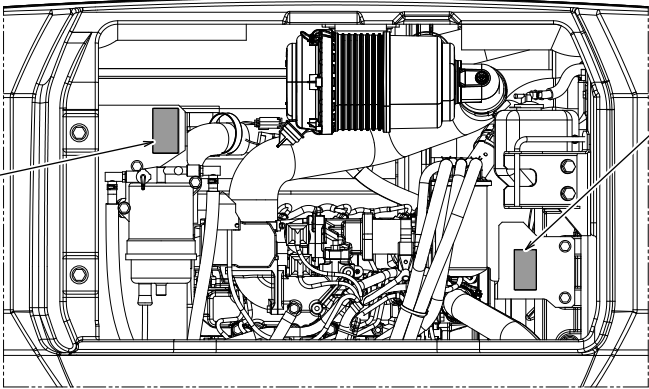




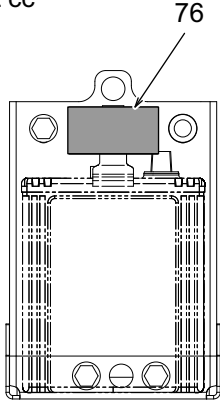
DETAIL aa
SHOWS INSIDE PANEL



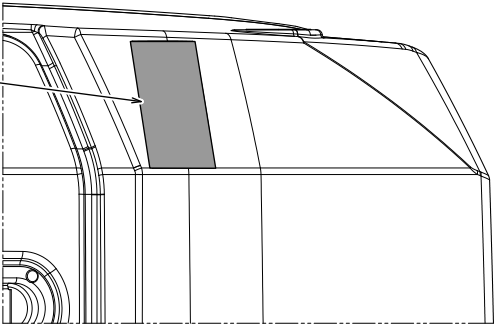
DETAIL cc



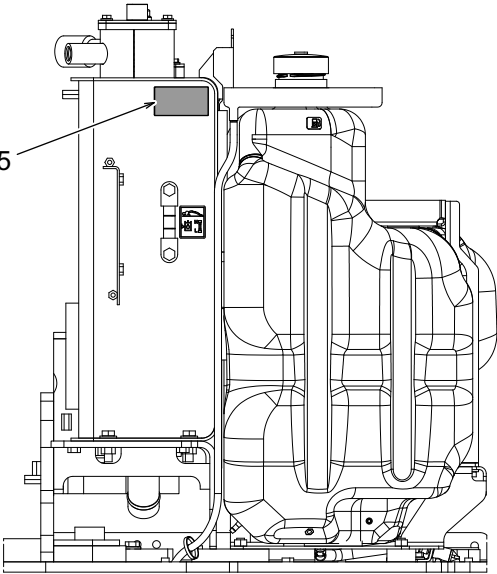
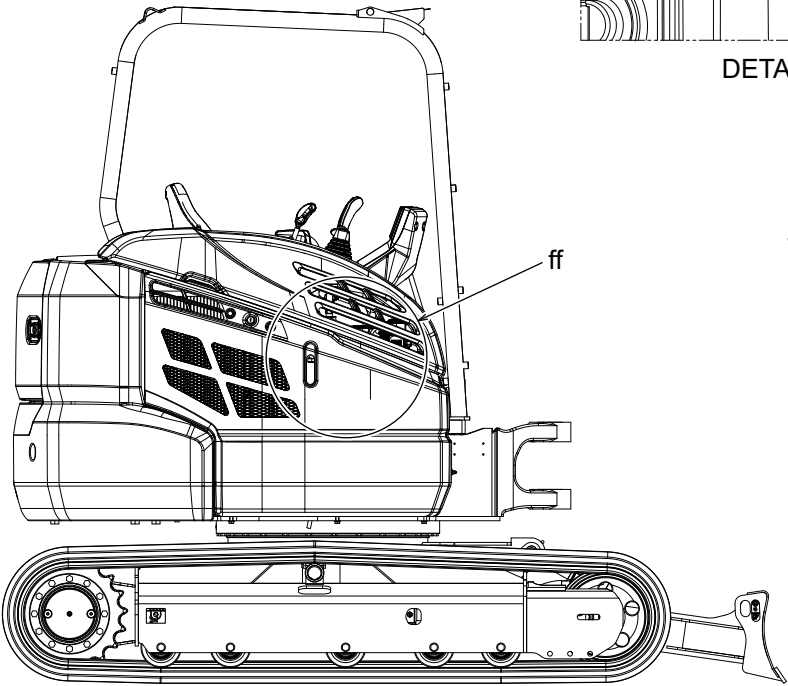
DETAIL dd
SHOWS INSIDE PANEL



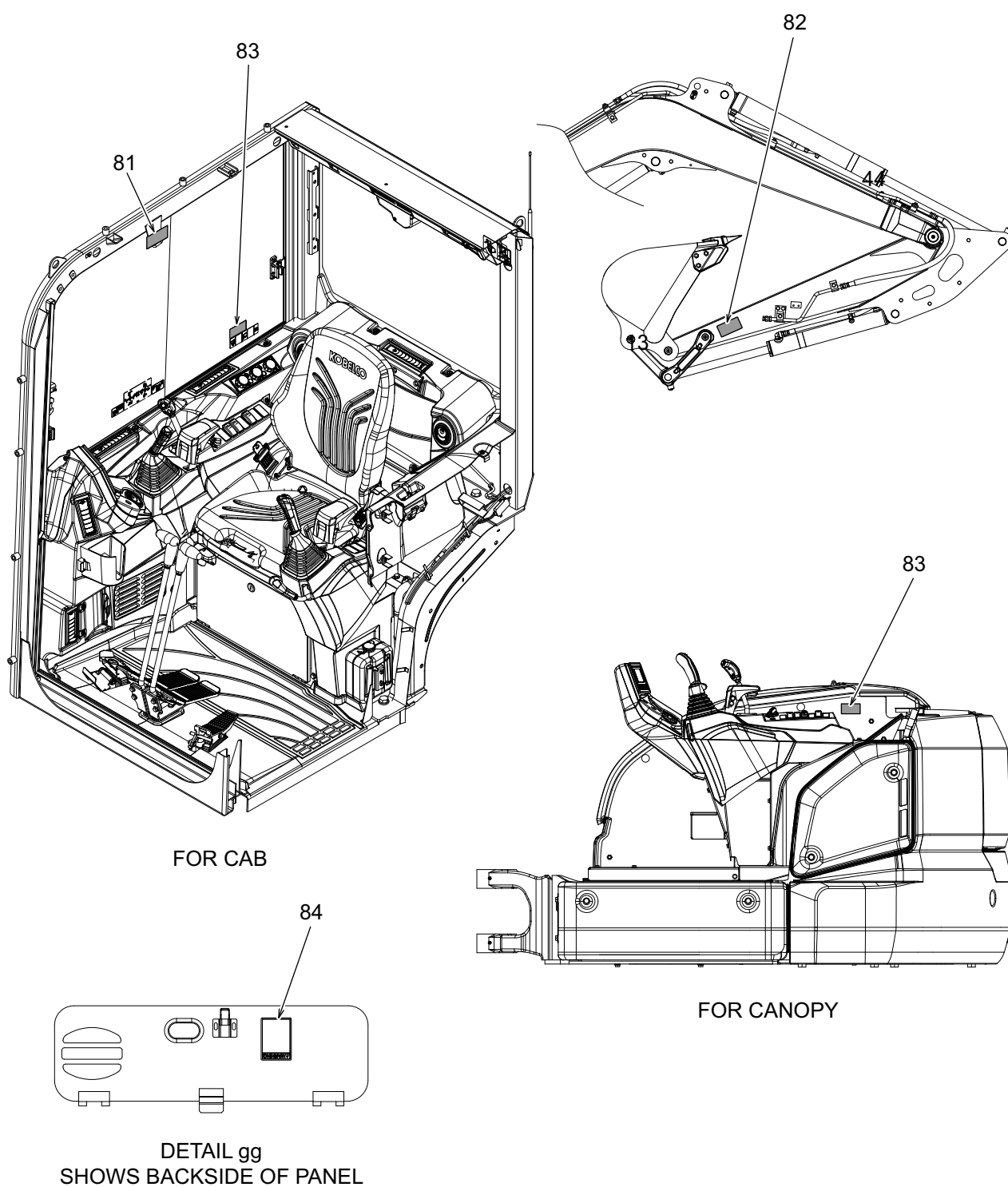
DETAIL bb



DETAIL ee



DETAIL ff



1.1.4 SAFETY LABELS

HANDLING BATTERY

Location:6

Part Number:YN20T02746P1



DO NOT USE COUNTERWEIGHT LIFTING EYES

Location:67

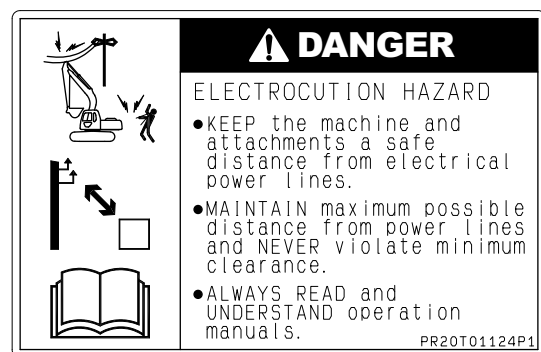
Part Number:PS20T01187P1



SAFETY PRECAUTIONS

Location:68

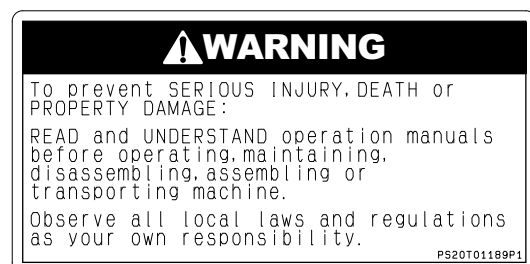
Part Number:PR20T01124P1



SAFETY PRECAUTIONS

Location:69

Part Number:PS20T01189P1

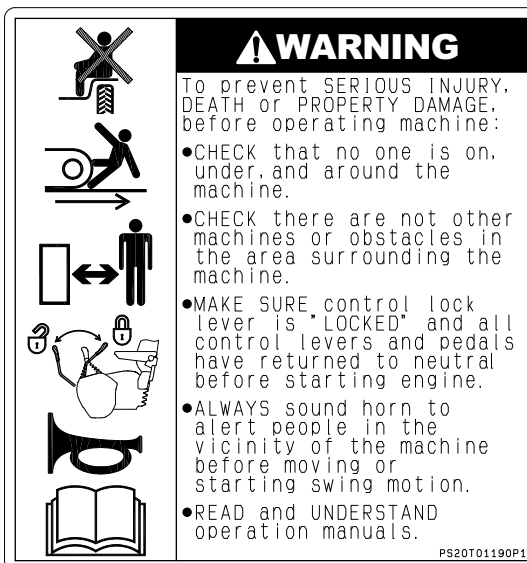


[1. SAFETY INSTRUCTIONS]

SAFETY PRECAUTIONS

Location:70

Part Number:PS20T01190P1



SAFETY PRECAUTIONS

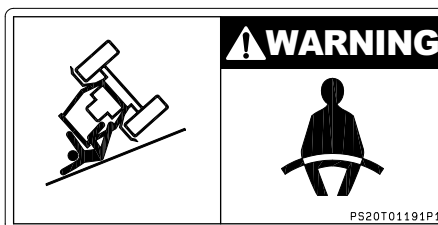
Location:71

Part Number:PS20T01191P1

PRECAUTIONS WHEN TIPPING OVER

When the machine tips over, the operator can be thrown out of the cab and crushed under the machine.

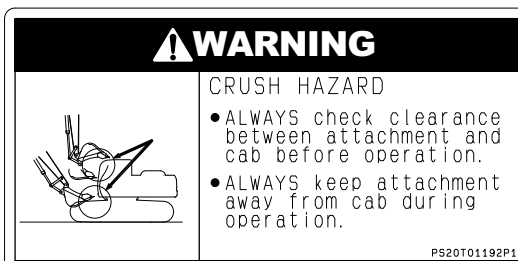
Be sure to fasten the seat belt during operation.



SAFETY PRECAUTIONS

Location:72

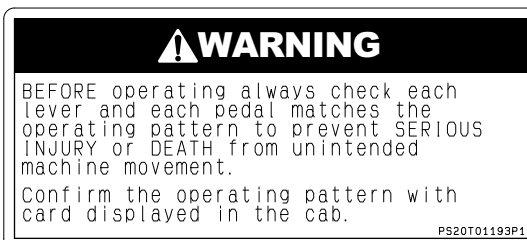
Part Number:PS20T01192P1



SAFETY PRECAUTIONS

Location:73

Part Number:PS20T01193P1



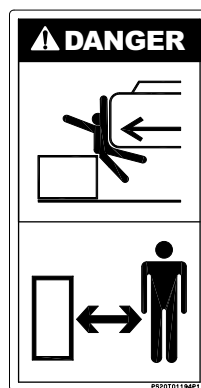
SWING

Location:74

Part Number:PS20T01194P1

Do not enter in the swing area.

Stay away from the machine during operation to prevent you from contacting with or being crushed between machine components.



PRESSURIZED HOT OIL

Location:75

Part Number:PS20T01195P1



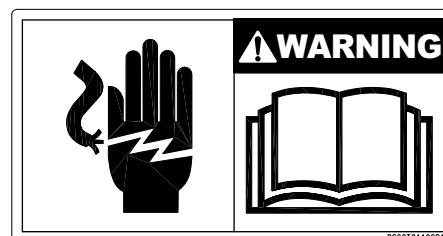
BATTERY CABLE

Location:76

Part Number:PS20T01196P1

Electric hazard may cause injury when mishandling the cable.

Read operator manual for safe and proper handling.



HOT COOLANT

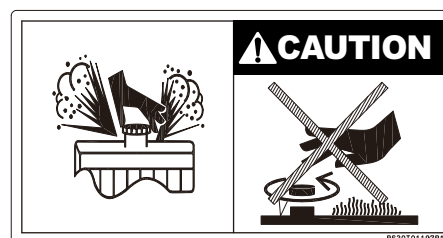
Location:77

Part Number:PS20T01197P1

Never loosen or open the radiator cap when coolant is hot. Stream of hot coolant will spout and could cause burns.

Before opening the radiator cap:

- Cool down the engine completely.
- Cover the radiator with cloth rag.
- Loosen the cap slowly to relieve pressure.



[1. SAFETY INSTRUCTIONS]

ENGINE ROTATING PARTS WARNING

Location:78

Part Number:PS20T01198P1



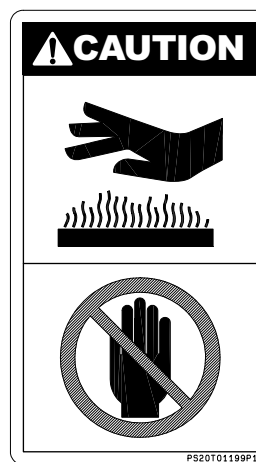
HOT PARTS

Location:79

Part Number:PS20T01199P1

Do not touch the engine until it cools down.

Because it could be high temperature and cause burns.



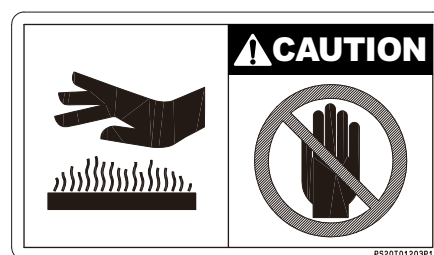
HOT PARTS

Location:80

Part Number:PS20T01203P1

Do not touch the engine until it cools down.

Because it could be high temperature and cause burns.

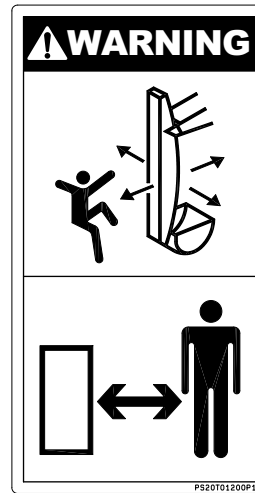


LOCK THE FRONT WINDOW AT THE OPENING POSITION

Location:81

Part Number:PS20T01188P1

Lock the front window at the opening position securely, or it may slip down and may personal injury.



KEEP CLEAR WORKING AREA

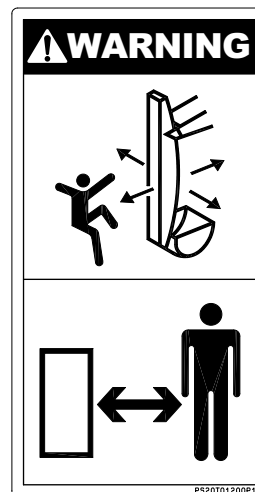
Location:82

Part Number:PS20T01200P1

Make sure the area is clear of obstacles and persons before beginning the operation of the machine.

Always look around before you start the swing operation.

Make sure everyone is cleared in your worksite. Sound horn before beginning swing operation.



PRECAUTIONS OF HANDLING QUICK HITCH

Location:83

Part Number:PS20T01201P1

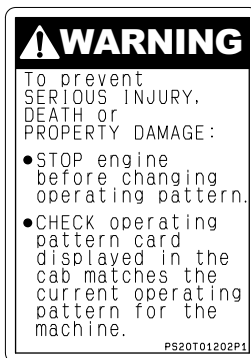


[1. SAFETY INSTRUCTIONS]

ROTARY MULTI CONTROL VALVE

Location:84

Part Number:PS20T01202P1



1.2 PRE-START SAFETY



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.2.1 OPERATION RULES

ALWAYS OBSERVE BASIC SAFETY RULES AND PRECAUTIONS

All operators are required to receive training before operating this machine.

If a license or other special qualification is required to operate a hydraulic excavator in the country where this machine will be operated, all operators of this machine must meet those requirements and have a valid (not expired) license or qualification.

- Follow all safety precautions and procedures described in this manual while operating, inspecting and maintaining this machine.
- Never operate this machine if you are under the influence of drugs or medicines (including those which may make you drowsy) or alcohol. If you are not alert, do not operate the machine.
- To prevent accidents, confirm all working procedures before starting work. If a signal person is needed, always agree on the hand signals and designate a signal person before starting work.
All personnel must know and understand all the signals. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time. The signal person must stand in a clearly visible location when giving the signals.

ENSURE WORKSITE SAFETY

Understand your task and the potential hazards:

- Before operation, conduct a risk assessment with the site manager and confirm that all necessary safety precautions have been taken for the task. Always ask the site manager if there are any additional safety precautions or regulations for the task.

Know your working area:

- Visually survey the area around the working site before operating the machine.
Look for mud or other soft ground that could cause the machine to become stuck or unstable when operating the machine. The ground near cliffs, trenches and road shoulders may be too soft to operate the machine. Be aware that rain, blasting activities, earthquakes, or other events may cause the ground be soft. Use signs to identify soft shoulders and soft ground. If needed, use a signal person.
- Choose operating locations where landslide will not occur or where falling rocks or building debris will not land on the machine.
- Set up barricades to prevent unauthorized personnel and/or machines from entering the working site.
- If working near a road, use a signal person and signs to alert vehicles and pedestrians of potential hazards and falling objects.

KEEP AWAY OTHER PEOPLE FROM THE MACHINE AND ATTACHMENT / EQUIPMENT DURING OPERATION

To prevent serious injury or death:

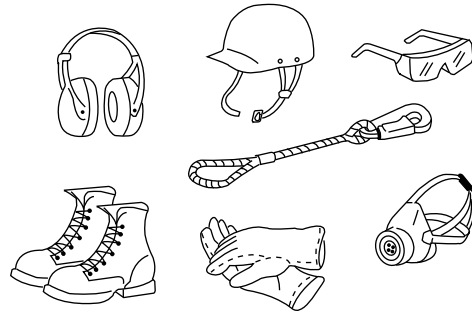
- Never allow anyone to stand on the machine, including the attachment /equipment and the upper structure, when operating.
- Never allow anyone to stand or to ride on a suspended load or the attachment/equipment.

1.2.2 PROTECTION TOOLS

PERSONAL PROTECTIVE EQUIPMENT

Wear fitted clothing and protective gears.

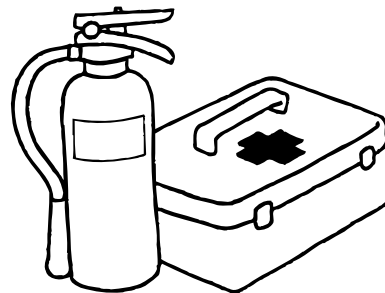
- Wear clothing not exposing your skin.
- Always change any clothing that has become contaminated with oil, fuel or other flammable substances.
- Do not wear loose fitting clothing, jewelry or any accessory and restrain long hair that can get caught in moving parts or that can catch on controls and result in unintended movement of the machine or the attachment /equipment.
- Always wear the proper personal protective equipment for the task you will be performing. This may include a hard hat, safety shoes, safety glasses, face shield, respirator, and/or a reflective vest. Consult with your supervisor to confirm you have the proper personal protective equipment for the task.
- Use ear protection when operating in noisy areas. Prolonged exposure to loud noises can cause hearing damage and even total hearing loss.
- Inspect all personal protective equipment for damage prior to use. If any personal protective equipment is damaged, or past its expiration date, do not use the equipment and contact your supervisor to obtain a replacement before operating machine.
- Other personnel working in the vicinity of the machine, including the signal person, should also wear the proper personal protective equipment appropriate for the worksite and for the task.
This may include a hard hat, safety shoes, safety glasses, face shield, respirator, gloves, ear protection, and/or a reflective vest. Consult with your supervisor to confirm that personnel working in the vicinity of the machine have the proper personal protective equipment for the worksite and the task.



PREPARE FOR EMERGENCY

In case of emergency, know where the fire extinguishers (type: ABC, ABE) and the first aid kit are located.

- Know how to use a fire extinguisher.
- Inspect and maintain the fire extinguishers in compliance with your local/national regulations.
- Determine what emergency communication devices are necessary for your location and have a list of important telephone numbers available.
- Periodically inspect the first aid kit. Replenish items and replace expired items as necessary.



1.2.3 ABNORMAL AND EMERGENCY CONDITION

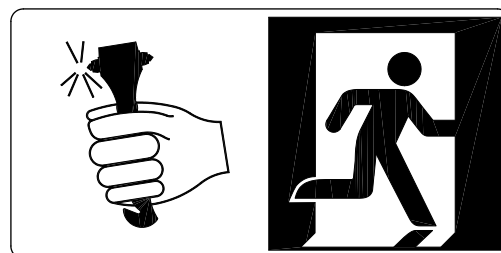
WHEN A FAILURE IS FOUND

When operating, inspecting or maintaining the machine, if there is an unusual noise, vibration, smell, instrument malfunction, smoke, oil leak, a warning light illuminates or a warning is on the multi-display, do not continue to operate the machine.

- Always park on a firm, level location, lower the attachment to the ground, pull the control lock lever to the locked (up) position, stop the engine, and remove the key.
- Contact your Supervisor.
- Contact your KOBELCO authorized dealer for repair.

EMERGENCY ESCAPE FROM THE CAB

If the normal operator's exit is blocked in an emergency, stop the engine, use the life hammer to break a window, and exit the cab. See "EMERGENCY ESCAPE FROM OPERATOR'S STATION" in Chapter 2 in the standard operation & maintenance manual.



IN THE EVENT OF A FIRE OR OTHER EMERGENCY

- Stop the engine.
- Use hand rails and steps to dismount machine. Do not jump from machine.

IN THE EVENT OF A THUNDERSTORM

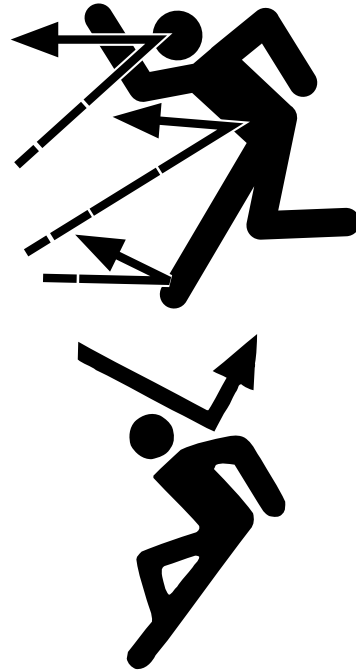
- Lower the attachment to the ground and if possible anchor the digging tool into the soil.
- Leave the cab and move away from the machine before a thunderstorm breaks out. Otherwise, you must stop the excavator, turn off the radio and keep inside the closed cab until the end of a thunderstorm.

1.2.4 POTENTIAL HAZARDS WHEN OPERATING

PAY ATTENTION TO FALLING MATERIALS AND FLYING DEBRIS

To prevent serious injury or death, confirm the appropriate cab guards are installed for your task and for the attachment /equipment prior to operation. If needed, contact your KOBELCO authorized dealer before starting work.

- Always use the front guard, and the top guard when performing building demolition work or operating at working sites (including mining or quarry sites) where falling material and flying debris may occur.
- If working with the hydraulic breaker or another attachment and if objects will not fall on the machine, only the front guard may be needed.
- When performing work that may result in falling material and flying debris, keep people a safe distance away from the work area.
- Always close the front window and doors before operating.



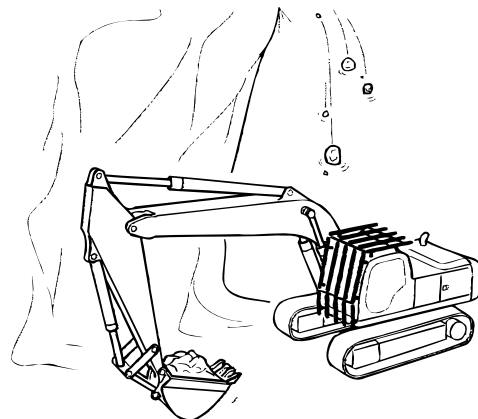
CHECK SAFETY RELATED GUARDS AND EQUIPMENT

- Check all safety related guards, covers, windows and mirrors are not damaged and secure prior to operation. If any damage or other issue is found, do not use the machine until the safety related parts and equipment has been replaced. Never attempt to repair safety related parts and equipment.
- Understand how the safety systems and the safety related equipment protects you as the operator and others around the machine.
- Never remove safety related parts and equipment from the machine.

LIMITED PROTECTION FROM OBJECTS FALLING ON THE CAB

When operating near areas where landslides may occur or where rocks or other debris may fall, be aware that the cab and the guards installed provide limited protection for the operator and may not prevent serious injury or death.

- Never weld, drill or modify the top guard or other protective structures. Any modification could weaken the structural integrity of these protective structures, resulting in serious injury or death in case of collision, falling objects or landslides.
- Do not install any cab lifting device to the top guard or other protective structures.
- If an accident occurs, do not try to straighten or repair the top guard or other protective structures. Contact your KOBELCO authorized dealer for functional verification or replacement of any of the protective structures.

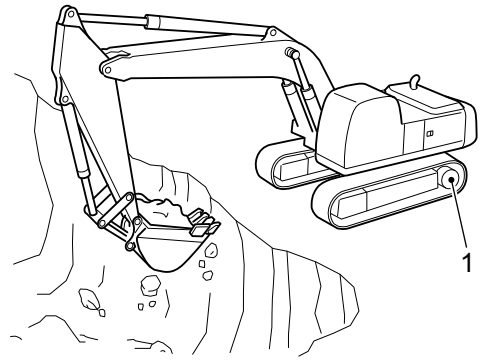


GROUND CONDITIONS

Always place tracks perpendicular (at a 90 degree angle) to the edge of a cliff or the road shoulder with the travel motors(1) positioned away from the edge to prevent the machine from falling over the edge.

Visually inspect for soft ground near the edge, especially either any raised ground or any wet ground following a rain.

Do not dig close to the machine or undercut the bank in front of the machine to prevent the machine from falling over the edge.

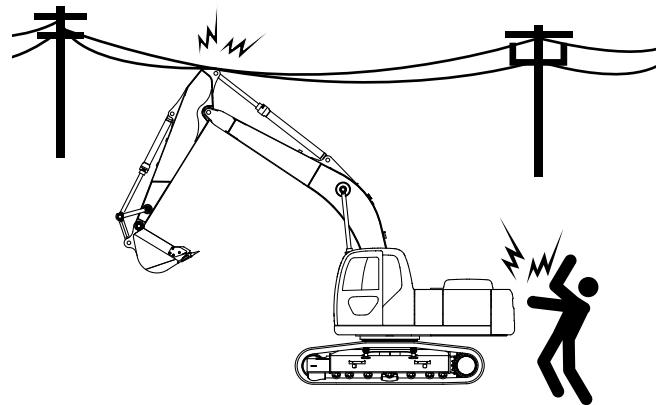


ELECTRICAL POWER LINES

Keep a safe distance from electrical power lines.

Never approach power lines with any part of the machine and its load unless all local and national required safety precautions have been taken. Electrocuting and death can result from arcing, touching or even being close to a machine that is in contact with or near an electrical source.

- Maintain the maximum possible distance from power lines and never violate the minimum clearance.
- Always contact the nearest electric utility and determine jointly what specific precautions must be taken to ensure safety.
- Consider all lines to be power lines and treat all power lines as energized even though it is known or believed that the power is shut off and the line is visibly grounded.
- Use a signal person to observe the approach of any part of the machine or load to the power line.
- Caution all ground personnel to stand clear of the machine and the load at all times.
- If the machine should come in contact with a live electrical source, do not leave the operator's seat. Do not allow anyone to approach or touch the machine.
- Observe the applicable rules or regulations for clearance distances for power lines and other electrical equipment for the country where the machine is operating. Always maintain the following clearances when operating near high voltage power lines.



The reference of the safe distances from high voltage cables are as follows.

LINE VOLTAGE(V)	MINIMUM DISTANCE m(feet)
0 to 50,000	3.0(10) or more
50,000 to 200,000	4.5(15) or more
200,000 to 350,000	6.0(20) or more
350,000 to 500,000	7.5(25) or more
500,000 to 750,000	10.5(35) or more
750,000 to 1,000,000	13.5(45) or more

USE WORK LIGHTS

- When operating in dark locations, turn on the work light. If necessary, use additional lighting devices to make the work areas bright enough to operate.
- Stop work if you have poor or limited visibility because of darkness, fog, rain, especially lightning, snow, or other causes.

OPERATING ON SOFT GROUND

When working on soft or wet ground, place logs or lumber horizontally beneath the crawler tracks to prevent the machine from becoming stuck.

Be aware frozen ground may become soft or wet as the ambient temperature rises during the day and could cause the machine to become unstable or stuck.

VISUALLY INSPECT GROUND CONDITIONS BEFORE OPERATING

The ground near cliffs, trenches and road shoulders may be too soft to operate the machine. Visually inspect for soft ground before travelling or working in these areas. Be aware that rain, blasting activities, earthquakes, or other events may cause the ground to be soft.

To prevent serious injury, death, and property damage, only travel or work on firm ground when the machine is close to sudden elevation changes, including cliffs, trenches and road shoulders. The weight of the machine or vibration from the machine may cause the ground to collapse and cause the machine to tip or roll over.

1.2.5 FIRE PREVENTION

FIRE CAUSED BY FLAMMABLE SUBSTANCES

Fuel, oil, electrolyte, windshield washer fluid and other chemicals are flammable.

To prevent serious injury or death from possible fire:

- Remove flammables such as leaves, wooden debris, paper waste, etc. from the areas of exhaust manifold, muffler, battery, and undercover, etc.
- Do not smoke or bring other ignition sources near areas where flammables are stored and/or handled.
- Refuel only after stopping the engine.
- Do not leave the machine when refueling or when refilling with oil.
- Try not to spill fuel on heated surfaces or on electrical parts. Clean any spills immediately.
- After refueling or refilling with oil, securely tighten the fuel and the oil caps and clean up any spills immediately.
- Store fuel and oil in designated areas and restrict access to only authorized personnel.
- Remove all flammable materials in the area before performing grinding or welding work.
- Do not weld or perform gas cutting on pipes and tubes which contain combustible liquids.
- Only use nonflammable oils to wash parts. Do not use flammable oils, such as diesel fuel or gasoline, to wash parts.



FIRE CAUSED BY THE ELECTRIC SYSTEM

Short-circuits in the electrical system may cause fire.

- Check all wiring harness connections are clean and secure.
- Inspect wiring harnesses, connectors, and clamps periodically. Repair, replace, or tighten connectors and clamps if any damage or loose connections are found.

FIRE CAUSED BY LEAK

Check all clamps, guards, protective cushions for the hoses and the tubes are secure.

During operation, machine vibration may cause loose hoses or loose tubes to be damaged from contact with other parts and leak high pressure oil or other fluids and result in a fire and serious injury or death.

If any issue is found, immediately tighten, repair or replace it.

Do not operate machine with damaged or bent hoses or tubes.

USE ANTI-EXPLOSION WORK LIGHTS

Use only work lights with anti-explosion specification to prevent serious injury or death.

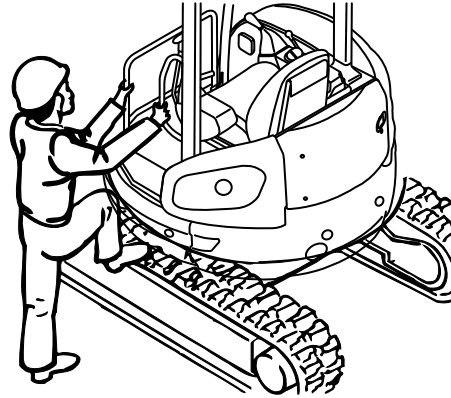
Lighting must meet the requirements for areas where explosive concentrations of vapors and dusts could exist to prevent a fire or explosion when performing inspection and maintenance activities.

1.2.6 GETTING ON AND OFF THE MACHINE

PRECAUTIONS OF GETTING ON AND OFF THE MACHINE

To prevent serious injury or death:

- Clean all slippery substances such as grease, oil, mud, ice, and others attached to the steps and handrails.
- Inspect the steps and handrails for damage or loose parts. Replace any damaged parts and tighten any loose bolts or nuts.
- Always use the steps and handrails to get on and off the machine.
- Always face the machine and maintain three points of contact with the steps and handrails.
- Do not use the control lock lever and control levers as hand holds.
- Do not have anything in your hands, including tools, when getting on and off the machine.
- Never jump on and off the machine or attempt to get on or off a moving machine.



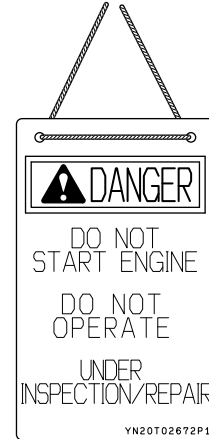
1.2.7 PRE-START UP INSPECTION ON THE MACHINE

Always perform a pre-startup inspection before operating this machine to check for any potential issues. For more information, refer to "EVERYDAY CHECK-UP" in Chapter 3 in the standard operation & maintenance manual.

ATTACH A "DO NOT OPERATE" TAG

To prevent serious injury or death, never allow unauthorized personnel to start the engine or touch the control levers during inspection and maintenance activities. Always lower the attachment, pull the control lock lever to the locked(up) position, stop the engine, and remove the key before performing inspection and maintenance.

Use a temporary hang tag to communicate that the machine is out of service. You may need to use more than one temporary hang tag depending on the inspection and maintenance activities to be performed.



CHECK THE MACHINE LOG BOOK

Check machine log book to check that periodic maintenance and inspections have been performed and all necessary repairs made.

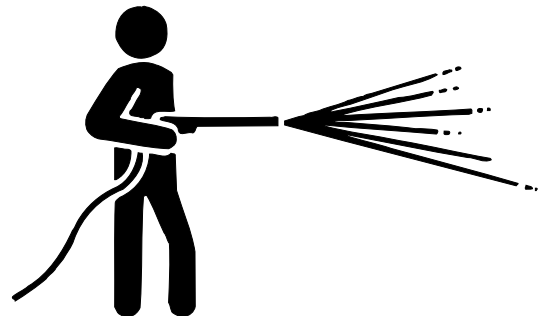
ALWAYS KEEP THE MACHINE CLEAN

Always keep the machine clean and free of scattered debris, and spilled lubricant and oil.

If electrical components or systems get wet, then equipment malfunction, short circuit, or fire may result in serious injury or death.

Never use pressurized water or steam to clean inside the operator cab or any electrical components, such as sensors and connectors.

Also never wash the vent hole of covers or guards with high-pressure cleaning machine.



KEEP INSIDE OF OPERATOR CAB CLEAN

- To prevent slippery pedals, always remove mud, grease, oil, and other substances from the soles of your shoes before entering the cab.
- Secure parts and tools inside the cab before operating.

To prevent fire:

- Do not bring explosive or flammable materials into the cab.
- Do not leave your cigarette lighter inside the cab.
If the cab temperature becomes too hot, the lighter may explode.
- After smoking, always put out your cigarette.
- Do not leave plastic bottles inside the cab or attach suction cups to the windows.
These items may act as lenses and could start a fire.

SEAT BELT INSPECTION

Check if seatbelt is cut or frayed and check if mounting hardware is damaged or loose before fastening the seatbelt. If an issue is found with the seatbelt or the mounting hardware, do not use machine until the issue has been repaired.

Replace seatbelts every 3 (three) years or more frequently if damaged or frayed.

1.3 SECURE VISIBILITY



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.3.1 BE AWARE OF YOUR SURROUNDINGS

When operating or traveling in the machine, the operator may not observe people and obstacles near the machine. To prevent serious injury, death or damage to the machine.

- Keep windows clean.
- Replace cracked or broken glass.
- Adjust the mirrors for maximum visibility around the machine before operating. If needed, clean the mirrors.
- Move the attachment /equipment as needed to improve visibility of the right side during machine travel.
- There are blind areas the mirror views. Confirm for safety around the machine before operating the machine.
- If needed, use a signal person. The operator should always be alert and follow the signals from the signal person. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.
- When operating in dark locations, turn on the work light. Additional lighting may be needed to illuminate the work area.
- Stop work if you have poor or limited visibility because of darkness, fog, rain, especially lightning, snow, or other causes.
- Never attach mirrors or other articles to the handrails. Over time, excessive vibration may weaken the handrail and cause it to fail.

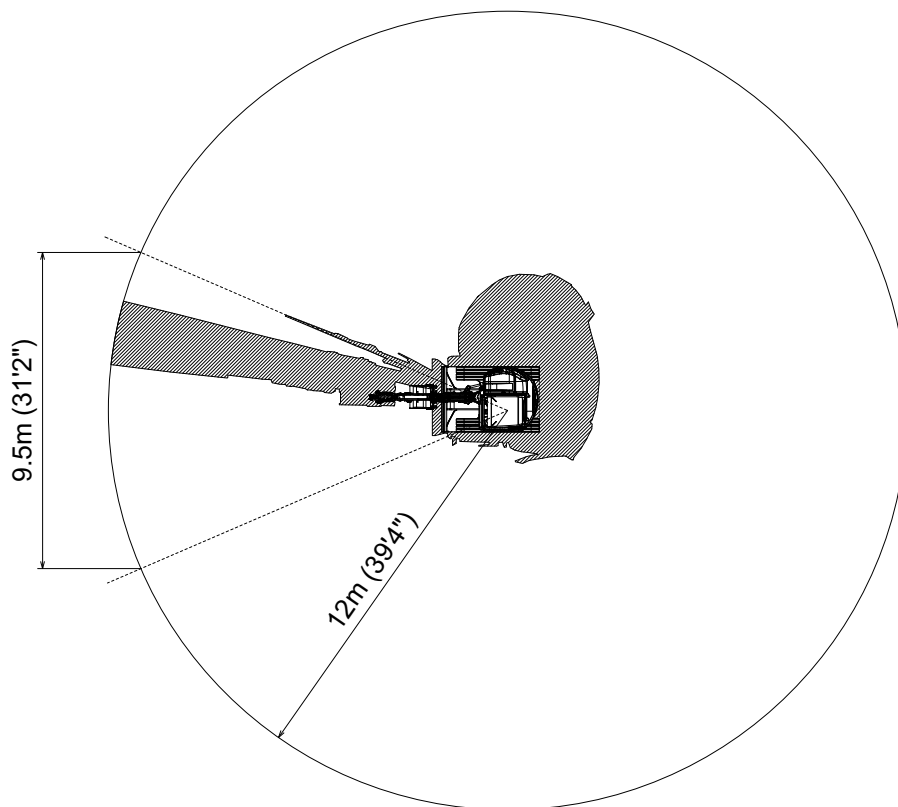
1.3.2 VISIBILITY MAP

- The following visibility map is a rough standard of areas (hatched areas) where the operator cannot see both directly and indirectly (through the mirrors and the cameras). The operator can use this map as a reference to improve field rules or enhance visibility by adding an auxiliary device.
- This machine complies with the visibility requirements stipulated in EN474-1.
- This map is not the same as the visibility requirements stipulated in EN474-1.
- This map was made according to the standard specification. Be cautious that the map may change according to the machine specification.

Note

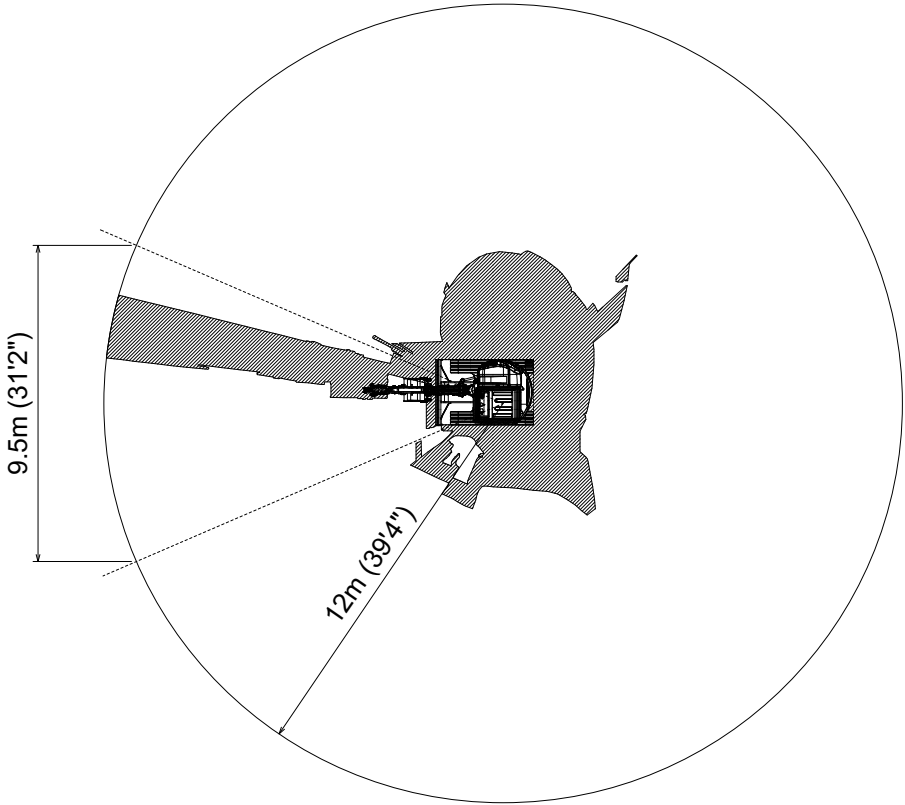
This map is a rough standard at the ground surface within the radius of 12 m, centering the operator reference point (680 mm above and 20 mm forward from Seat Index Point) from near areas of the machine.

Direct visibilities (CANOPY SPECIFICATION)



Hatched area: blind spot

Direct visibilities (CAB SPECIFICATION)



Hatched area: blind spot

1.4 PRECAUTIONS FOR OPERATION



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.4.1 STARTING

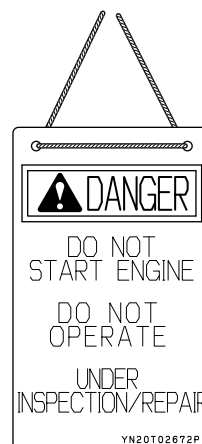
CHECK A "DO NOT OPERATE" TAG

Before starting the engine, check display of warning tags.

If warning tags are displayed, do not start the engine.

The warning tags are used to notify that the machine is in an inoperable condition.

Report this situation to a supervisor of the machine and do not start the engine until the warning tags are removed.



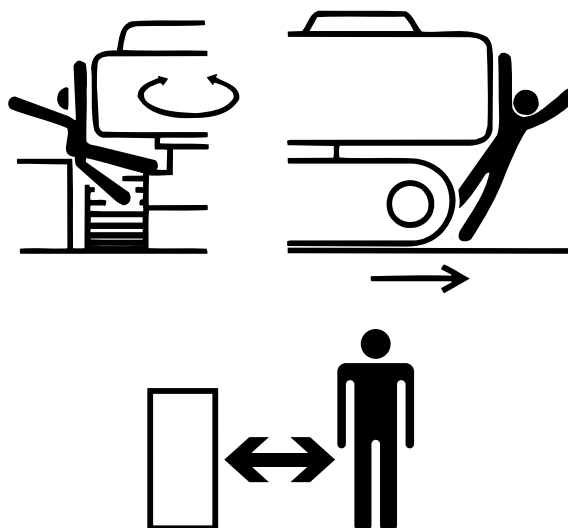
ONLY THE OPERATOR IS ALLOWED IN THE CAB

The operator is the only person that should be on or near the machine and in the cab. Do not allow any other personnel to be present in the cab or on the machine.

CHECK WORKING SITE AND SET UP BARRICADES

To prevent serious injury, death and property damage, before you start the engine and before you move the machine:

- Check that no one is on, under, and around the machine. Make sure that all personnel are clear of the machine and surrounding area.
- Check there are no other machines or obstacles in the area surrounding the machine.
- Set up barricades to prevent unauthorized personnel and / or machines from entering the working site.



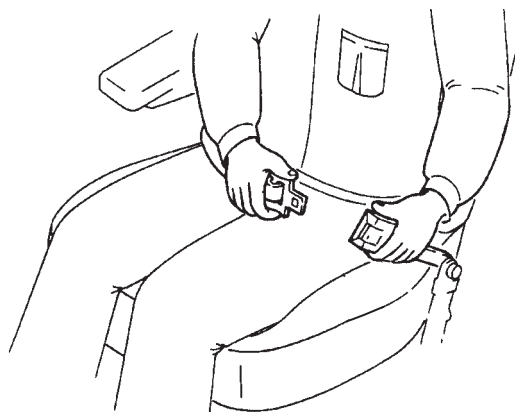
PRE-OPERATION SAFETY CHECK

To prevent serious injury or death, before operating:

- Close and lock the doors and windows.
- Close and lock the access panels and doors.
- Adjust mirrors for maximum visibility around the machine. See "ADJUSTMENT OF MIRRORS" in Chapter 3 for additional information.

FASTEN YOUR SEATBELT

To prevent serious injury or death, always fasten your seatbelt before starting the machine and keep your seatbelt fastened during operation.
Sit in operator's seat and adjust seat so you can properly operate all of the machine controls.



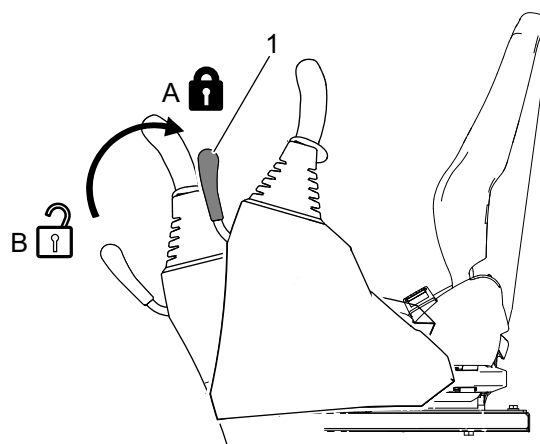
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BEFORE STARTING ENGINE

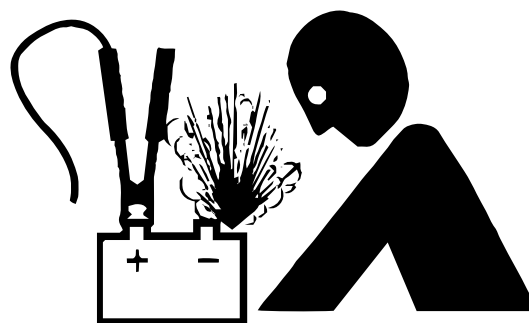
- Check the control lock lever is in the "LOCKED" (up) position.
If not locked, incidental contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
- Confirm that all control levers and pedals have returned to neutral.
- Sound horn to alert personnel near the machine.
- Always be seated in the operator's seat with your seatbelt fastened.

A: Locked Position

B: Unlocked Position



Only start the engine from the operator's seat. Never attempt to start the engine by connecting the starter terminals to the batteries.



WARM UP

To prevent serious injury or death, always allow the machine to warm up prior to operation, especially in cold weather. Do not start operation as soon as the engine is started. If not warmed up, there could be a delay between when the control levers are moved and when the machine or the attachment /equipment responds, resulting in unintended or unexpected movement of the machine or attachment /equipment.
After starting the engine, check all gauges indicate properly.

[1. SAFETY INSTRUCTIONS]

CHECK CONTROL PATTERN BEFORE OPERATING

Before operation, always check the operation of each control lever and each pedal.

If the movement of the machine does not match selected control pattern which is shown on the card, stop the work and shut down the machine. The machine movement must match with the operating pattern.

If the machine movement does not match the card displayed in the cab, change the card so as to match the machine control pattern.

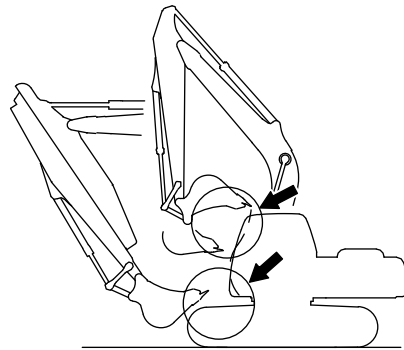
If any issue is found, do not operate machine until the issue had been corrected. If needed, contact your KOBELCO authorized dealer.

CHECK WARNING DEVICES

Make sure that the horn, the travel alarm, the swing flashers and all other warning devices are warning properly.

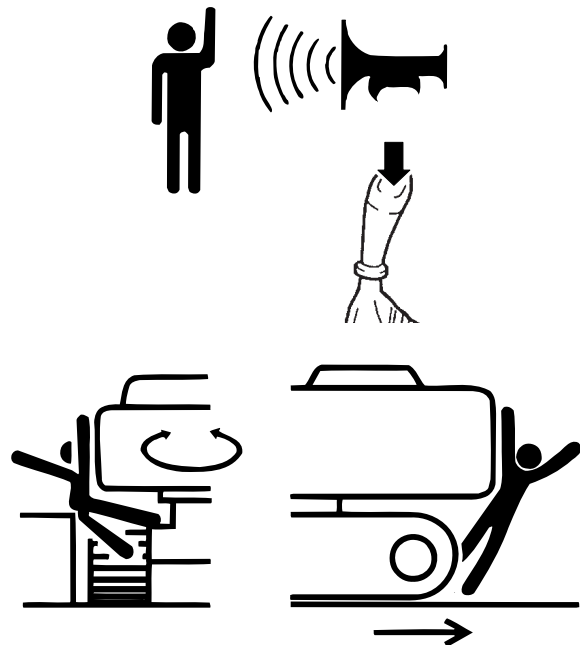
AVOID INTERFERENCE BETWEEN THE ATTACHMENT AND THE MACHINE

Check clearance between the attachment and the cab before starting operation because a certain kinds of attachment and a certain combination of the option and the machine may cause the contact of the attachment and the cab or some other parts of the machine.



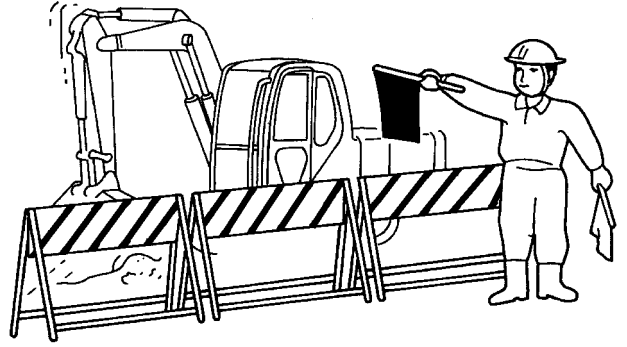
PRECAUTIONS OF SWINGING / TRAVELING

- Always sound the horn before starting the engine, traveling the machine, or swinging the upper structure to alert people in the vicinity of the machine.
- Always operate at a safe distance from other machines or obstacles in the vicinity of the machine.
- Place a signal person at poor visibility area.



WORKSITES IN URBAN AREAS

Set up barricades to prevent unauthorized personnel and/or vehicles from entering the worksite. If working near a road, use a signal person and signs to alert vehicles and pedestrians of potential hazards and falling objects. If needed, use a signal person to direct traffic. The operator should always be alert and follow the signals from the signal person. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.

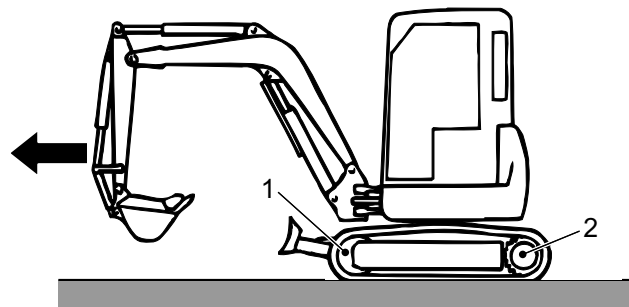


1.4.2 TRAVELING

ALWAYS CONFIRM DIRECTION OF TRAVEL

Before moving the machine, check the position of the undercarriage (tracks). The normal travel position is for the idler wheels(1) to the front under the cab and the travel motors(2) to the rear.

When the undercarriage (tracks) is reversed, the travel controls operate in the opposite directions compared to when the idler wheels(1) are in the front. Move the travel levers slowly and travel at a low speed.



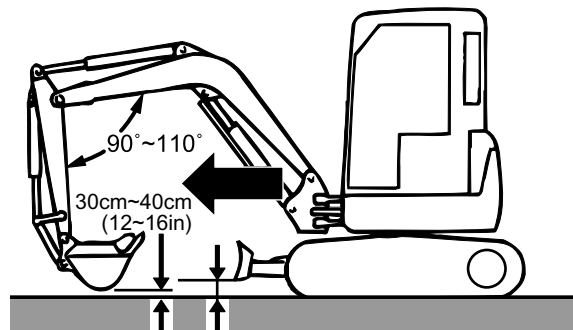
MOVE TRAVEL LEVERS IN A SLOW AND DELIBERATE MANNER

- Gradually increase speed. Moving the travel levers quickly will cause the machine to accelerate quickly and result in a sudden start or sudden acceleration.
- Do not move the travel levers from forward to reverse or vice versa rapidly.
- Do not perform an abrupt pivot turn or spin turn.
- Do not stop quickly by releasing your grip on the levers during travel.

PRECAUTIONS IN TRAVELING

Travel on a level and firm ground as much as possible.

- Move the attachment /equipment as needed to improve visibility of the right side during machine travel.
(The bucket at the height of 30 to 40 cm (12 to 16 inch) above the ground.)
- Travel slowly on a rough terrain.
- Do not go over obstacles. When going over obstacles inevitably, go slowly with the attachment positioned close to the ground as much as possible. Because the machine may tip/roll over.



TRAVELING ON FROZEN OR SNOW COVERED GROUND

Use extreme care when operating on frozen or snow covered ground.

- The ground may be extremely slippery and the machine can slide or skid.
- Do not perform abrupt start, stop, or movements or the machine could become unstable and tip or roll over.
- Snow can make elevation changes (e.g., road shoulders or steep banks) hard to perceive.
- Snow can cover obstacles or obstructions and make them difficult to recognize.
- During the day as ambient temperatures rise, frozen ground may thaw and become soft and cause the machine to become unstable or stuck.

TRAVEL ON WET OR LOW TRACTION SURFACES

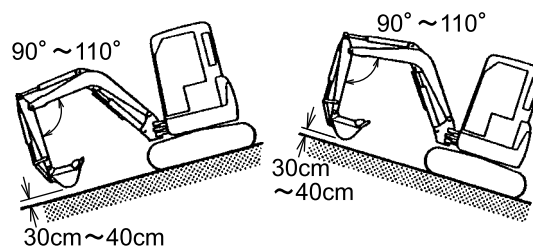
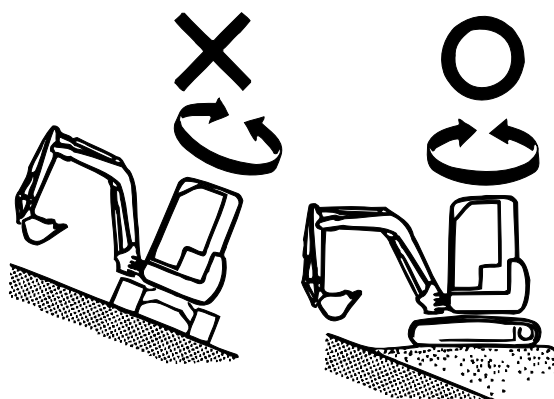
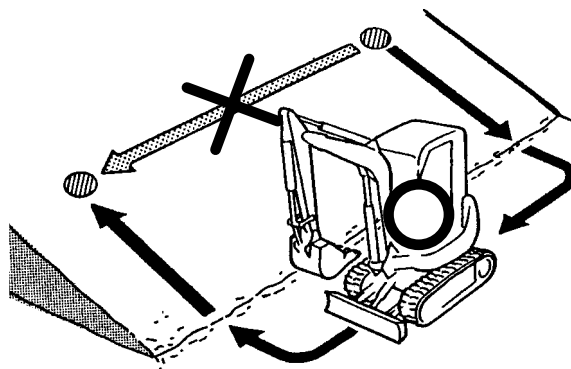
Use caution when travelling on an incline over wet surfaces, including wood, steel, and piles of wet leaves and branches. The machine could slide or skid and result in serious injury, death or property damage.

GOING UPWARD SLOPE OR DOWNWARD SLOPE



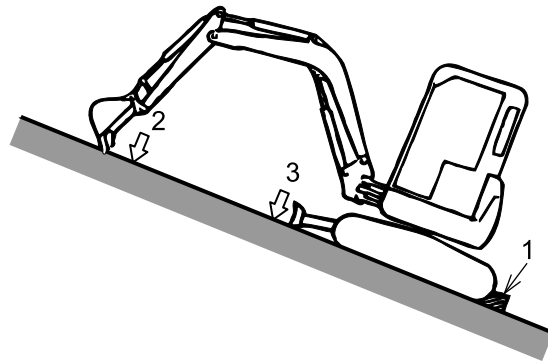
PRECAUTION OF TRAVELING ON SLOPES

- Never turn or go across on a slope. Go down to a flat space and take a detour-route for safety.
 - When traveling, keep the bucket at a height of 30 to 40 cm (12 to 16 inch) above the ground. Do not go downward slope with the reverse travel.
 - When the machine becomes slipped or unstable, immediately lower the bucket and put on the brake.
 - There is a risk of the machine losing the balance to tip/roll over during swinging when operating on a slope. It is dangerous to swing downhill with the bucket filled with soil. Make an embankment for the machine to be as level as possible to swing on a slope.
 - The traveling up and down on a slope of 30 degree or more is not allowed because there is a risk of tipping/rolling over.
 - When parking on a slope is unavoidable, be sure to lower the bucket to the ground and chock the crawler tracks.
-
- The maximum gradability of this machine is 58% (30 degrees).
 - Operate the travel levers slowly when going downhill.
 - Use the low (1st) speed when going downhill and uphill.
 - When traveling on a slope, keep the bucket at a height of 30 to 40 cm (12 to 16 inch) above the ground and the low speed.
 - When the engine was stalled, put down the bucket on the ground and return every lever to the neutral position, and then start the engine again.



[1. SAFETY INSTRUCTIONS]

- When the machine cannot go uphill with the crawlers (travel motor) due to slip of the shoes, you can pull the arm to utilize the machine power for assistance.
- When parking or stopping the machine on a slope, be sure to lower bucket (2) and dozer (3) to the ground even if it is a short time, set all levers to the "neutral position", set the control lock lever to the "LOCKED" position, and then chock crawlers (1).



Downward slope/Upward slope

Notice

If the hydraulic oil is not warmed up, sufficient gradability may not be acquired. Warm up the machine sufficiently before going uphill.

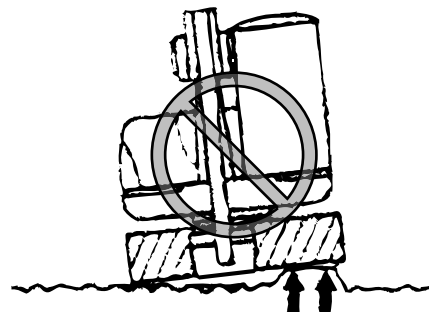
DOZER COLLISION

Be careful not to strike the dozer against large rocks, etc. It may cause a premature damage of the dozer or the cylinder.



OFFSET LOAD OF DOZER

If the machine is supported by the dozer, be sure to ground the dozer bottom evenly, avoiding an offset or concentrated load.



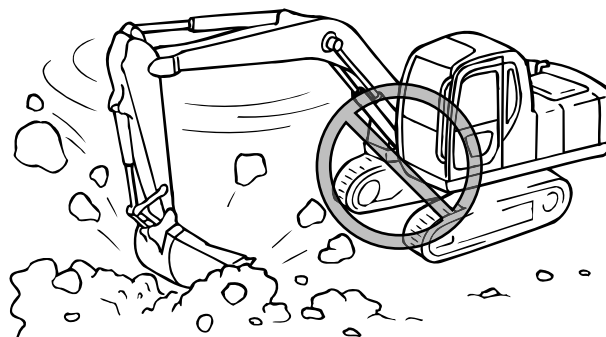
1.4.3 PROHIBITED OPERATIONS

Always follow the procedures in this manual when operating this machine. Abuse and misuse may result in serious injury, death, property damage and reduce the life of the machine. Never attempt the following under any circumstances.

NEVER USE THE SWING POWER TO PERFORM WORK

Never apply swinging force (slewing force) to rock sliding work and side wall breaking work.

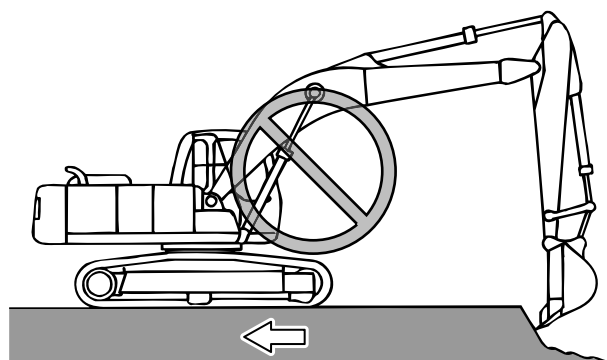
If the swing power is used to perform work, excessive force may be exerted on the machine and the attachment /equipment resulting in damage and may reduce the life of the swing system.



NEVER USE THE TRAVEL POWER TO PERFORM WORK

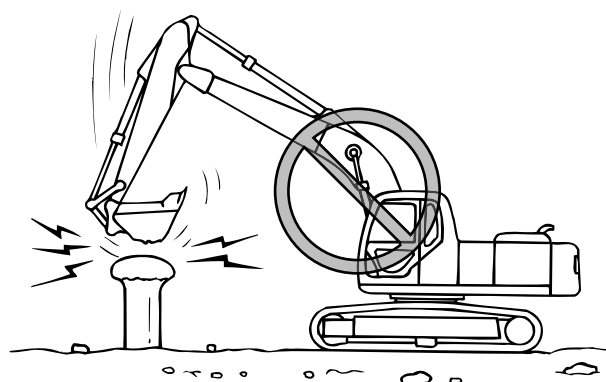
Do not use the travel power to perform digging or leveling work with the attachment in contact with the ground.

If the travel power is used to perform work, excessive force may be exerted on the machine and the attachment /equipment resulting in damage.



DO NOT PERFORM "HAMMERING" OPERATIONS WITH THE BUCKET

Never use the bucket for hammering and piling. It will cause severe damage to the machine and its components.

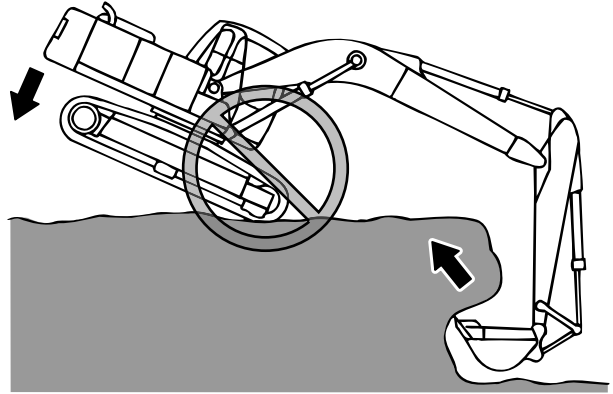


[1. SAFETY INSTRUCTIONS]

DO NOT USE MACHINE WEIGHT FOR DIGGING OPERATION

Do not use the machine weight to obtain power to dig. This could cause severe damage to the machine and its components.

Before digging concrete or hard rock, use a breaker/hammer to break it up before digging. This will prevent damage to the machine and allow for easier loading.



OPERATING ON A SLOPE

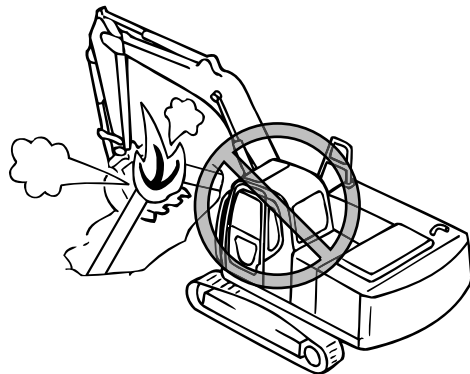
Use extreme caution when operating machine on a slope. The machine may become unstable and could tip or roll over.

- Place the crawlers parallel to the slope.
- Always swing the upper structure slowly when rotating it toward the downhill side with a load. The extra weight from the load may make the machine unstable.
- Be aware the weight of the upper structure could cause it to rotate when the machine stops on a slope.
- When the machine stops on the slope, lower the attachment to the ground on the downhill side of the machine and wedge the bucket into the ground if equipped.

CALL BEFORE YOU DIG

Confirm the local government or the public service company for locations of underground utilities of gas, water, phone, electrical power, and so forth before working in the area seemingly with these lines.

Always inspect the worksite for evidence of unmarked utilities and piping and contact others if necessary.

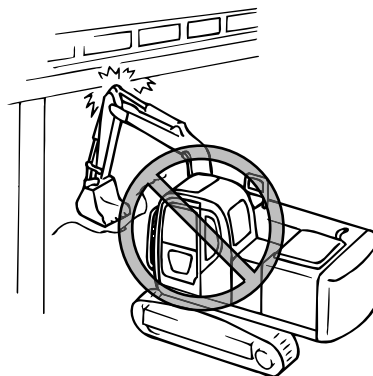


LIMITED MOVEMENT IN WORK AREA

Use extreme caution when working in areas that constrain or limit the movements of the machine, including tunnels, bridges, around electrical power lines, or inside structures, to prevent the machine or the attachment /equipment from contacting these obstacles during operation.

To prevent serious injury, death or property damage, always use a signal person to assist the operator with maneuvering in these areas and keep the machine and the attachment /equipment a safe distance from these obstacles.

The operator should always be alert and follow the signals from the signal person. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.

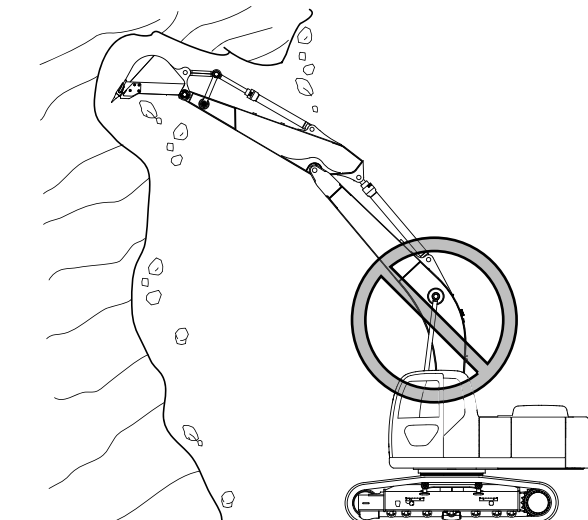


OPERATING UNDER CLIFF OR OVERHANG

Never undercut or dig beneath a cliff or overhang. It can cause rocks and debris to fall.

Be aware that the cab guard installed provide limited protection for the operator and may not prevent serious injury or death.

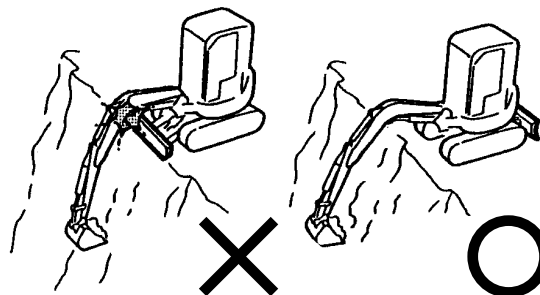
The cab top guard was designed conforming to ISO10262 and should not allow every possible loads to penetrate the cab.



DEEP EXCAVATION OPERATION

To prevent damage to the machine, during deep excavation or diagonal digging.

- When operating the machine with the dozer positioned at the front side, it can cause the dozer to contact the boom cylinder or the bucket. So pay attention to it.
- Do not allow the arm or the hydraulic piping to contact the side of the trench or hole.
- Do not allow the arm to contact the crawler shoe when operating with the arm below horizontal.



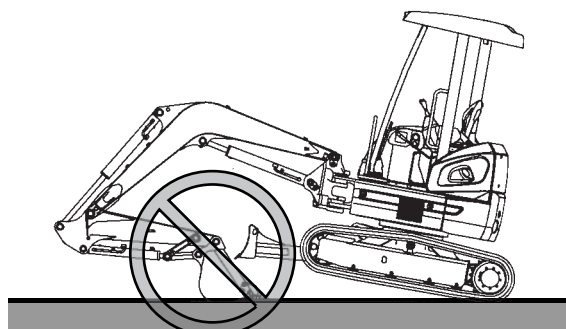
DO NOT LIFT OR MOVE PERSONNEL

Never lift or move personnel by using the attachment. The lifted personnel may fall off, causing severe accidents.



DO NOT LIFT UP THE MACHINE WITH ARM CYLINDER STROKE END

Never lift up the machine with arm cylinder fully extended. It may cause damage to the equipment/ attachment and cylinder.



[1. SAFETY INSTRUCTIONS]

BUCKET/ARM IN OPERATION WITH DOZER POSITIONED AT FRONT

Be careful not to hit the dozer with the bucket when operating arm in or bucket in with the travel/transport position.



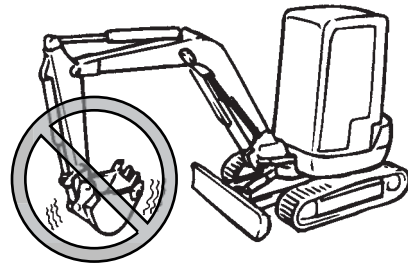
NO PERSONNEL ALLOWED UNDER THE BUCKET OR ATTACHMENT / EQUIPMENT

Never move a suspended load or the bucket over a person or above the driver's cab of a truck. The load could fall and cause serious injury or death.



REMOVING DIRT OF BUCKET

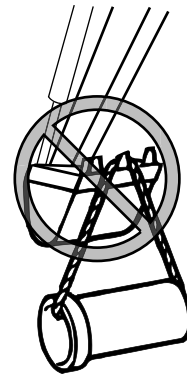
With the bucket in the retracted position, do not give impact on the bucket to remove soil. It may cause damage to the equipment/attachment and cylinders.



LIFTING WORK

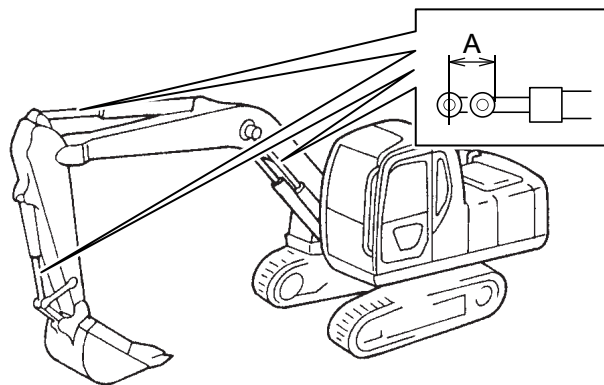
This machine is designed for the application of digging, loading, and leveling using the bucket, or for use with a crusher, breaker/hammer, shear or other attachment. When lifting a load by using this machine, observe the laws and others of the country or area in which this machine is to be used.

Even though lifting with this machine is allowed according to the laws of the country or area in which this machine is to be used, do not lift the load by using the teeth of the bucket, the breaker, the crusher, or others. It can cause the lifting tools to come off and result in falling off of the load, leading to serious accidents or death. Always use a certified lifting device.



DO NOT OPERATE THE CYLINDERS TO THE STROKE END

Operate the bucket, boom and arm cylinders to leave some clearances (A) to the both stroke ends. If the cylinder is operated to the stroke end, it will generate an excessive load and cause damage to not only the cylinder but also the pin, boom and arm.



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DO NOT OPERATE IN ENCLOSED SPACES

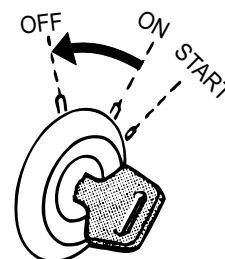
Do not operate the machine in enclosed spaces or, in any case, without appropriate ventilation.

PRECAUTIONS FOR POTENTIALLY EXPLOSIVE ENVIRONMENT

Do not operate the machine in a potentially explosive environment.

PRECAUTIONS FOR LEAVING THE OPERATOR'S SEAT

Do not leave the machine with the engine running.

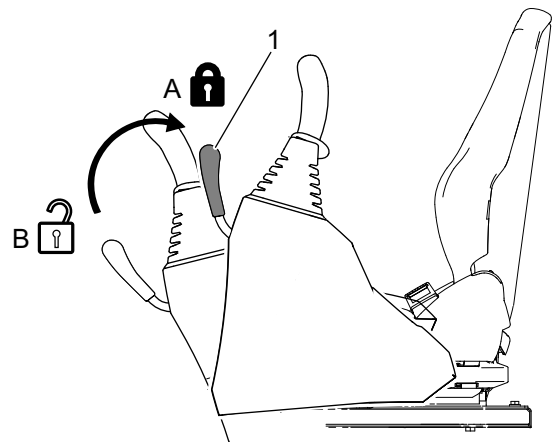
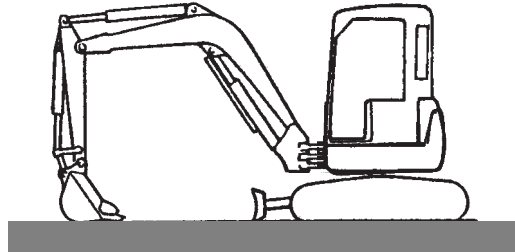


1.4.4 SAFETY CHECK ON THE PARKING MACHINE

There are risks of creeping, unexpected movement at the time of coming start if the machine is not parked properly. Park the machine following the safety parking procedures shown below.

ALWAYS PARK MACHINE PROPERLY

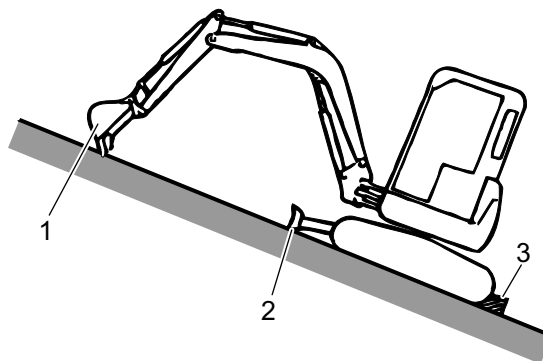
1. Travel machine to a safe location on firm, level ground.
2. Lower the attachment to the ground.
If equipped with a dozer blade, lower it to the ground.
3. Set the auto deceleration switch to the "OFF" position.
4. Turn engine throttle to the low idle position.
5. Pull the control lock lever(1) to the locked(up) position(A).
If not locked, accidental or unintended contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
6. Turn the starter switch to the "OFF" position and remove the key.
Close and lock the windows and the cab door.
Check the windows, doors and all other machine access covers are locked and secured..



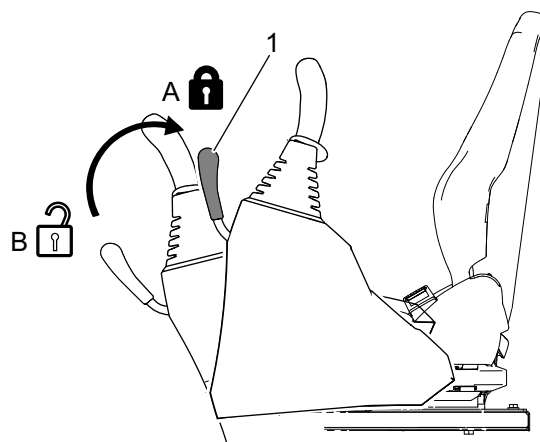
PARKING MACHINE ON SLOPE

If the machine must be parked on a slope.

1. The bucket (1) and dozer (2) into the ground so that the machine does not move.
2. Set the auto deceleration switch to the "OFF" position.
3. Turn engine throttle to the low idle position.



4. Pull the control lock lever(1) to the locked(up) position(A).
If not locked, accidental or unintended contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
5. Turn the starter switch to the "OFF" position and remove the key.
Close and lock the windows and the cab door.
Check the windows, doors and all other machine access covers are locked and secured.
6. Block(3) the tracks in the front and the rear.



1.5 AT THE END OF EACH SHIFT

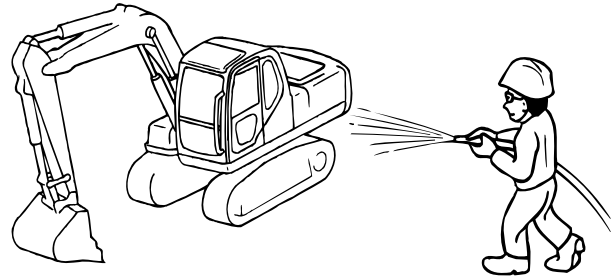


READ THE OPERATOR'S MANUAL

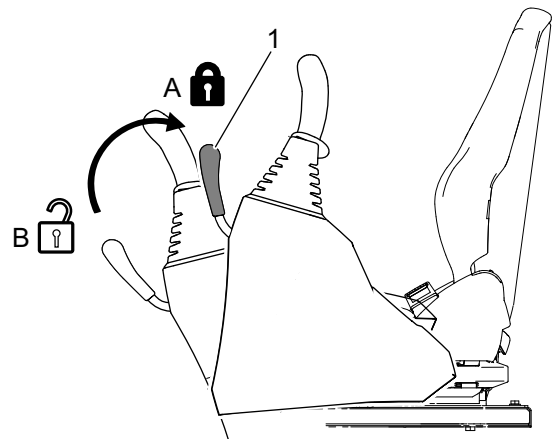
Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

Always make sure the machine is secure and ready to be used for the next shift or moved to another job site.

1. Park the machine on a firm, level ground.
2. Lower attachment to the ground.



3. Pull the control lock lever(1) to the locked(up) position(A) and check all control levers and pedals have returned to neutral.
4. Close and secure all windows in place to prevent water or moisture from damaging any electrical components.
5. Remove the key from the key switch and lock all doors and access panels.
6. Refill the fuel tank to the full mark to reduce air volume and condensation (moisture).
This will decrease the possibility of freezing in the fuel tank, rusting due to moisture and other potential issues.



7. Thoroughly clean and inspect the machine. If any issues are found, always lubricate, repair, or replace any machine parts and systems prior to restarting the machine. As needed, contact your KOBELCO authorized dealer.
8. If the machine is stored in cold climates, it may be necessary to remove the batteries from the machine and store them in a warm, well ventilated area. Re-install the batteries before the next start up. This helps prevent premature battery deterioration.

1.6 PRECAUTIONS OF INSPECTION & MAINTENANCE



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.6.1 PERIODIC INSPECTIONS

- Every year, the machine should be inspected by a qualified inspector or a registered inspection agency. If needed, contact your KOBELCO authorized dealer for that inspection.
- Every month inspect the machine for the following.

See chapter 4. "INSPECTION AND MAINTENANCE" for additional information about the monthly inspection & maintenance requirements for your machine.

Always keep all maintenance and all inspection records, including both the monthly and the yearly inspections, according to local codes and regulations of your country.

1.6.2 BEFORE INSPECTION & MAINTENANCE

READ OPERATION/MAINTENANCE PROCEDURES CAREFULLY

Improper maintenance could cause serious injury (crush or burn) and damage the machine. Read and understand the maintenance procedures (preparation for safe work, proper tools, qualifications, important parts, supervisor designation and wear the appropriate personal protective equipment, etc.) described in the manuals before safely and carefully inspecting and performing maintenance on the machine.

CONFIRM JOB PROCEDURES

To prevent accidents, confirm all work procedures before starting.

USE A SIGNAL PERSON AND A FLAGMAN

Know and use the hand signals required for particular jobs and confirm who has the responsibility for signaling:

All personnel must know and understand all the signals.

The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.

The signal person must stand in a clearly visible location when giving the signals.

ORGANIZE AND CLEAN UP WORK SITE

Inspecting and maintaining the machine at an unorganized and cluttered working site may cause personal injury. Clear obstacles, grease, oil, paint, debris, etc., from the work site.

ATTACH A "DO NOT OPERATE" TAG

To prevent serious injury or death:

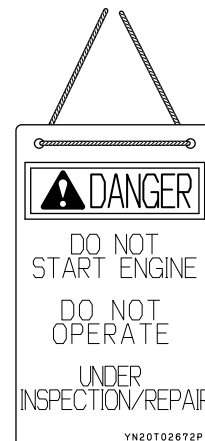
- Never allow unauthorized personnel to start the engine or touch the control levers during inspection and maintenance activities.
- Always lower the attachment, pull the control lock lever to the locked(up) position, stop the engine, and remove the key before performing maintenance.
- Use a temporary "DO NOT OPERATE" hang tag to communicate that the machine is out of service. You may need to use more than one temporary hang tag depending on the work to be performed.
- Always have an operator at the controls to shut down the machine if the machine needs to be running for maintenance activities or an inspections. The

operator and the maintenance personnel must have a means of communication when performing these tasks.

If any issues are found, always contact your KOBELCO authorized dealer before repairing or replacing any machine parts and systems prior to restarting the machine.

USE PROPER TOOLS

To prevent serious injury or death, do not use of damaged tools or tools not intended for the task.



1.6.3 DURING INSPECTION & MAINTENANCE

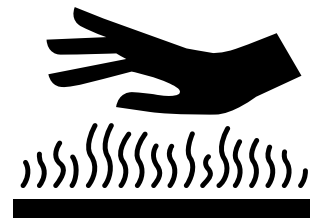
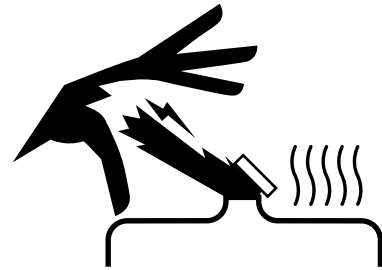
STOP ENGINE BEFORE PERFORMING INSPECTION AND MAINTENANCE

Always stop the engine and allow the engine and other components to cool before performing inspection or maintenance activities. Do not touch engine components when the engine is running or immediately after it has stopped to prevent serious injury or death. There are many hazards that can cause harm, including rotating parts, high voltage, high pressure fluids, and high temperature.

HOT FLUIDS

To prevent burn injuries.

- Do not remove the radiator cap immediately after stopping operation. Hot radiator fluid may cause burns. Wait until the radiator cap is cool to the touch, then slowly loosen to release the internal pressure. Then remove the cap.
- Do not remove the oil cap or plug immediately after stopping operation. Hot oil may cause burns. Wait until the oil cap or plug is cool to the touch, then slowly loosen it to release the internal pressure. Then remove the oil cap or plug.



HIGH PRESSURE OIL

Do not attempt to repair or tighten hydraulic hoses or fittings when the engine is running or when the hydraulic circuit is pressurized.

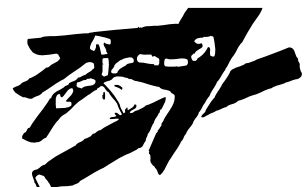
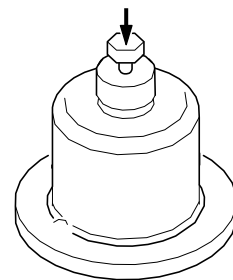
Pressure can be maintained in the hydraulic circuit long after the engine has been shut down.

- Even though the hydraulic circuit has been left for a long time after engine stop, sometimes the pressure still remains inside the hydraulic circuit. Before refilling or draining the hydraulic oil, or inspecting or maintaining the machine, always release the pressure in the hydraulic lines by using the "Pressure Release" function as described in Chapter 2, or by pressing the air breather of the hydraulic oil tank and loosening the connecting parts of the related hoses and connectors.

High pressure oil can penetrate the skin or eyes and cause injury, blindness or death. Fluid escaping from a small hole can be almost invisible.

- Always wear a face shield, protective glasses and gloves when inspecting for leaks.
- Always use a piece of cardboard or wood to inspect for suspected leaks.

If oil is injected into the skin, it must be removed within a few hours by a doctor familiar with this type of injury. High pressure oil from even a pin hole leak can penetrate the skin or eyes and cause severe injury or blindness.



OK



[1. SAFETY INSTRUCTIONS]

HIGH PRESSURE FUEL IN THE FUEL LINES

During engine running, high pressure is generated inside the fuel lines of the engine.
After engine stop, wait 1 minute before starting inspection and maintenance.

HIGH PRESSURE OIL HOSE/PIPING

Leakage of oil or fuel from the hose or piping may cause a fire or malfunction of the machine. Stop working immediately whenever looseness of or leakage from the installation parts of the hoses or piping are found and tighten or repair them using proper repair procedures and tightening torque.
Consult with your KOBELCO authorized dealer if damage or deformation of the hoses or piping is found.
The hoses in below-mentioned conditions are required to be replaced.

- A damaged hose or hose with a deformed fitting.
- The sheathing material of the hose has scratches or cuttings, or exposes the wire reinforcement layer.
- A part of the sheathing material is swelled.
- A part of the hose shows a sign of twist or crush.

ELECTRIC SHOCK

Work on the machine's electrical equipment may only be carried out by skilled electrical personnel or trained personnel under the supervision of an electrician in accordance with electrical regulations for the country in which this machine is to be used.

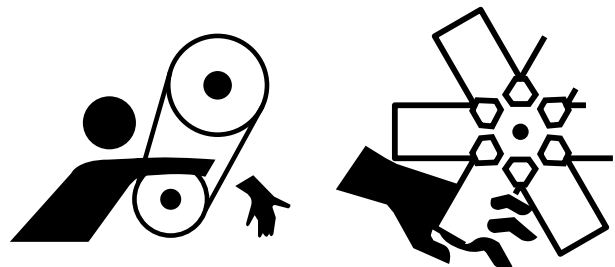
When working on energized equipment, always have another person positioned near the emergency-off or main switch and overvoltage release.

Contact your authorized KOBELCO dealer for assistance.

ROTATING PARTS

Stay clear of all rotating and moving parts.

- Wrapping or entanglement may result in serious injury or death. Keep hands, clothing and tools away from the rotating fan and running fan belts. Never operate machine without guarding in place.
- Do not drop or insert tools into the fan or fan belt area while machine is running. They may be ejected at high speed and cause serious personal injury or death.
- Always have an operator at the controls to shut down the machine if the machine needs to be running for maintenance activity or an inspection. The operator and the maintenance personnel must have a means of communication when performing these tasks.

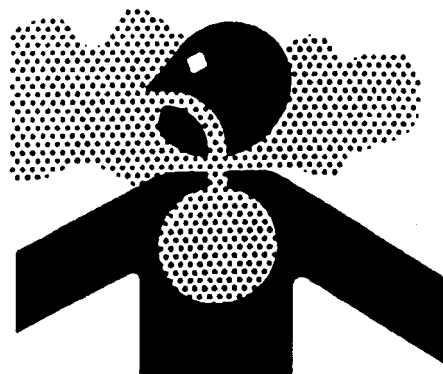


VENTILATION PRECAUTIONS

Never operate the engine in an enclosed area without adequate ventilation. Engine exhaust contains carbon monoxide. Inspecting and maintaining the machine indoors or in a place with poor ventilation could cause serious injury or death.

Adequate ventilation is needed when inspecting, maintaining or running the machine indoors. Fully ventilate the work area, especially when handling fuel, cleaning solvent or paint.

If the natural ventilation is poor, install ventilators, fans, exhaust extension pipes or other artificial venting devices.



CONNECTING, DISCONNECTING AND STORING ATTACHMENT / EQUIPMENT

To prevent serious injury or death:

- Always follow the instructions from your supervisor and the instructions in this manual when connecting or disconnecting the attachment /equipment.
- Secure the attachment /equipment to prevent them from falling over when stored.



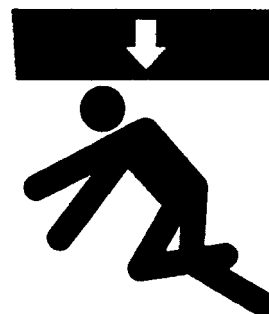
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SECURELY BLOCK THE MACHINE OR ANY COMPONENT THAT MAY FALL

To prevent serious injury or death, always support all the attachment /equipment when performing maintenance or inspecting underneath the machine or any raised attachment /equipment.

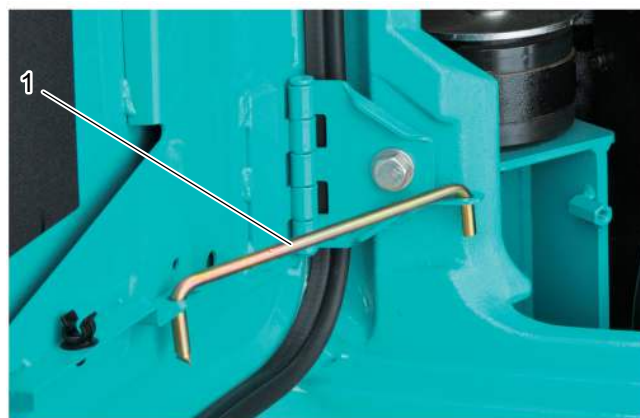
- Before performing maintenance or repairs under the machine, park the machine on firm level ground, lower the attachment to the ground, pull the control lock lever to the locked(up) position, stop engine, and remove the key.
- Securely block the tracks.
- If you must work beneath the raised machine or equipment, always use wood blocks, jack-stands or other rigid and stable supports to support them. Never get under the machine, the attachment /equipment, if they are not sufficiently supported.

This procedure is especially important when working on hydraulic cylinders.



LOCK THE ACCESS PANEL

To prevent serious injury, always secure the opened door panel with the stay(1) when maintaining the machine. If the door panel is not secure, it could move and you may be injured.



DO NOT DROP TOOLS OR PARTS

Falling tools or parts may cause damage to the machine or cause unintended movement of the machine and result in serious injury or death.

- Retrieve any tools that fall immediately.
- Always secure tools or parts that are near the machine and store tools properly after maintenance is complete.

[1. SAFETY INSTRUCTIONS]

USE CAUTION WHEN ADJUSTING THE CRAWLER TENSION

The crawler adjuster contains high pressure grease. If the tension is adjusted without following the prescribed procedure below, the grease fitting may fly off and discharge grease, resulting in serious injury. Always wear suitable protective gears.

- Always wear suitable protective gear.
- Do not put your face, arms, legs or body in front of the grease fitting. If grease contacts your skin, wash completely with soap and water to avoid skin irritation.
- Loosen the grease fitting one turn to gradually relieve pressure. If grease does not come out after one turn of the grease fitting, there is a problem. Call your KOBELCO authorized dealer for assistance.
- Loosen the grease fitting slowly.
After relieving the grease pressure, see "ADJUSTING CRAWLER TENSION" in Chapter 4 for additional information about how to adjust the crawler tension.



DO NOT DISASSEMBLE THE RECOIL SPRING

Never attempt to disassemble the recoil spring. The recoil spring assembly acts as a shock absorber for the front idler and contains a powerful spring under tension. If it is disassembled, the spring will eject from the assembly and may result in severe personal injury or death.

If there is an issue with the recoil spring assembly, contact your KOBELCO authorized dealer for repair.

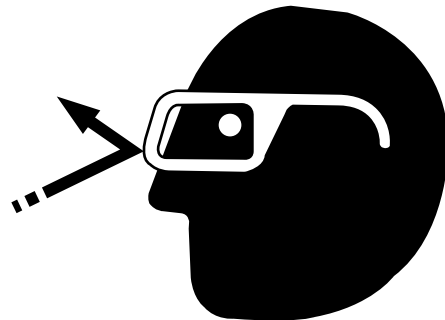
BEFORE HAMMERING METAL PINS, TEETH OR BEARINGS

Always wear required personal protective equipment such as safety glasses when using hammers, as metal fragments or other objects can fly and cause serious personal injury.

Broken metal pieces may cause severe personal injury when hammering metal pins, teeth or bearings.

To avoid injury:

- Wear protective gears such as safety glasses, gloves, hardhat, protective shoes, etc.
- Confirm the work area is clear of personnel before using hammer.
- Use a piece of wood or similar material to absorb the direct impact of the hammer when removing metal pins, teeth or bearings.



BE AWARE OF THE HAZARDS WITH THE REFRIGERANT AND THE AIR CONDITIONING SYSTEM

- Do not loosen the refrigerant circuit parts. If refrigerant gets in your eyes, it may cause loss of sight including potential blindness. Do not touch the refrigerant circuit parts. If refrigerant gets on your skin, it may cause frostbite.
- Do not inhale refrigerant gas.
- Keep refrigerant gas away from heat sources.

Dispose of refrigerant according to local codes and regulations of each country.

If you need additional assistance, contact your KOBELCO authorized dealer about proper disposal of refrigerant. The temperature of the refrigerant gas compressed by the compressor becomes a high temperature. Until the temperature of the refrigerant gas goes down, do not touch the compressor, the hose, and the condenser by bare hand.

1.6.4 CAUTION WHEN WELDING

NEVER USE HEAT NEAR HYDRAULIC EQUIPMENT, PIPING OR HOSES

When welding, soldering or using a torch, do not expose piping and hoses containing pressurized oil to heat. Heat may create the potential for exposure to flammable gas and result in a fire.

Always cover hydraulic equipment, piping, hoses and other flammable items with fire-proof blankets.

Keep a suitable fire extinguisher readily available.



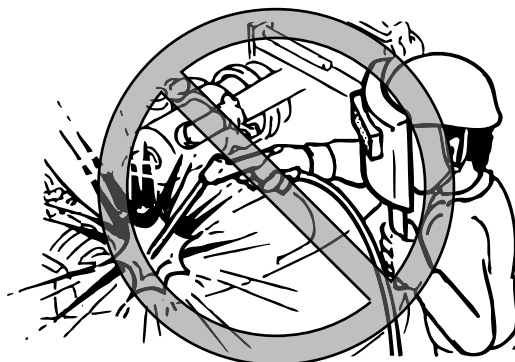
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DO NOT HEAT PIPING WITH FLAMMABLE OIL

- Do not weld or perform gas cutting on pipes and tubes filled with flammable oil.
- Remove flammable oil from pipes and tubes using nonflammable solvent before welding and gas cutting.

DO NOT MODIFY MACHINE WITHOUT APPROVAL FROM KOBELCO

- Any and all modifications to this machine must be approved by KOBELCO.
- Unauthorized modification of the machine is not covered by the warranty provided with this machine.



GENERAL GUIDELINES FOR WELDING

Contact manufacturer, or authorized KOBELCO dealer before welding on machine. Welding could damage wires, electronic processors, hoses, and tubes. Any welding on structural parts (as undercarriage, upper frame, equipment parts,...) should only be done by the manufacturer, or authorized KOBELCO dealer. Welding performed by others will void the warranty for your machine.

Do not weld tanks or lines that contain flammable fluids or flammable material. Empty and purge the lines and tanks. Then clean the lines and tanks with a nonflammable solvent prior to welding or flame cutting.

To prevent serious injury or possible fire, welding work must be performed by a certified welder at a facility with welding devices suitable for the task.

[1. SAFETY INSTRUCTIONS]

BASIC PRECAUTIONS FOR WELDING AND GRINDING

- Always wear protective gears appropriate for welding.
- Perform work in a well-ventilated area.
- Before welding, select a location away from flammable items and have a fire extinguisher nearby. Ensure adequate ventilation.
- Turn the engine off and remove the key.
- Disconnect the negative (-) cable from its battery terminal. When the battery power-off switch is provided, set it to "OFF".
- Remove or adequately shield all components, hoses, tubes, and wires in the area.
- Ensure that the components are properly grounded in order to avoid unwanted arcs. Attach the welder ground cable directly to the area within 1 m (3 ft.) from the part to be welded and on the same parent material. If the welder ground cable is attached to the area near electric parts/connectors, these electric parts/connectors may be damaged.
- Make sure neither the bearing nor the bearing seal is between the welder ground cable and the part to be welded.
- Do not attach the welder ground cable near the pin or cylinder. It will damage the plating on the pin or cylinder.
- Remove paint from any surface to be welded to avoid generating poisonous gas.
- After grinding or welding, confirm there is no smoke or fire near the work area.

1.6.5 AFTER COMPLETION OF MAINTENANCE

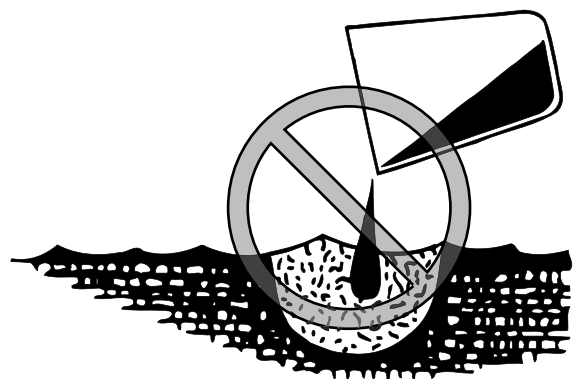
AFTER MAINTENANCE

Before returning machine to service, always confirm there are no leaks and the controls are functioning properly.

- Run the engine at low idle speed and check for oil or water leaks.
- Slowly operate each control lever and check that it is functioning properly.
- Then gradually increase the engine speed and check for oil or water leaks again.
- Manipulate each control lever again and check that it is functioning properly.
- Close the doors, guards, engine hood, etc.

PROPER WASTE DISPOSAL

- Drain used fluids from the machine into leak proof containers. Clearly mark the type of fluid on the containers.
- Never pour used oil or other fluids onto the ground, down a drain or into any body of water. Improper disposal can harm the environment. Contact your local government or public service company to ask about proper disposal methods.
- Properly dispose of oil, fuel, engine coolant, urea water, refrigerant, solvents, filters, batteries and other harmful substances according to local, state and federal environmental regulations for the country in which the machine is located.



1.7 PRECAUTIONS FOR BATTERY



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.7.1 HANDLING THE BATTERY

PREVENTION OF ELECTROLYTE BURNS

Wear safety glasses or face shield, and chemical resistant gloves and clothing when handling or servicing batteries.

Battery electrolyte contains dilute sulfuric acid. Electrolyte will damage eyes or skin on contact. If battery electrolyte contacts skin or eyes, flush affected areas immediately with a large amount of fresh water, then seek medical attention.

Wash hands after touching batteries and connectors.



BATTERY EXPLOSION PREVENTION

- Always keep cigarettes, flames and other ignition sources away from batteries.
Batteries give off hydrogen gases that can explode and cause serious injury or death.
- Always keep all battery caps tightly secured.



CHARGING THE BATTERY

See "USING JUMPER CABLES" in Chapter 3.

REPLACING THE BATTERY

See "CHECKING BATTERY VOLTAGE" in Chapter 4.

BATTERY DISPOSAL

Dispose of batteries according to local codes and regulations of each country.

If you need additional assistance, contact your KOBELCO authorized dealer about proper disposal of used batteries.

1.8 HANDLING OF THE ACCUMULATOR OR GAS SPRING



WARNING

READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

High pressured nitrogen gas is sealed inside the accumulator or gas spring.

To prevent serious injury or death:

- Never attempt to disassemble accumulator or gas spring.
- Never drill or weld, or perform gas cutting on accumulator or gas spring.
- Keep fire and other ignition sources away from the accumulator or gas spring.
- Never throw accumulator or gas spring into fire.
- Ask your KOBELCO authorized dealer to vent the gas from the accumulator or to remove the gas spring before disposal.

