

Product: Takeuchi TL230 Crawler Loader Operators Manual(Book No. AU5E001)
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OPERATOR'S MANUAL

Original instructions

TL230

Serial No. 223100002~

Book No. AU5E001

OE-TL230-B

TRACK LOADER

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TAKEUCHI



WARNING Read and understand these instructions.
Failure to do so can cause injury or death.

SAFETY ALERT SYMBOL

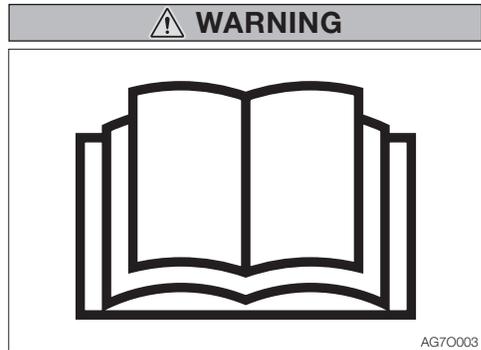


This symbol represents the safety alert. The message that follows the symbol contains important information about safety. Read and understand the message to avoid personal injury or death.

It is the owner or employer's responsibility to fully instruct each operator in the proper and safe operation of all equipment. All persons using this machine should thoroughly familiarize themselves with the contents of this manual.

All operators must be instructed on the proper functions of this machine before running the machine.

Learn and practice correct use of the machine controls in a safe, clear area before operating this machine on a job site.



Improper operation, inspection and maintenance of this machine can cause injury or death.

Read and understand this manual before performing any operation, inspection or maintenance on this machine.

Always store this manual near at hand preferably on the machine itself. If it should be lost or damaged, immediately order a new one from your Takeuchi dealer. When transferring ownership of this machine, be sure to hand this manual to the next owner.

Takeuchi supplies machines complying with the local regulations and standards of the country of export. If your machine has been purchased in another country or from a person or company of another country, it may not have the safety devices or safety standards required for use in your country. Should you have any question about whether your machine complies with the regulations and standards of your country, contact a Takeuchi dealer.

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SIGNAL WORDS

Safety messages appearing in this manual and on machine decals are identified by the words “DANGER”, “WARNING” and “CAUTION”. These signal words mean the following:



DANGER

DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor moderate injury.

IMPORTANT: The word **IMPORTANT** is used to alert operators and maintenance personnel about situations which could result in damage to the machine and its components.

It is impossible to foresee every possible circumstance that might involve a potential hazard. The warnings in this manual or on the machine can not cover all possible contingencies. You must exercise all due care and follow normal safety procedures when operating the machine so as to ensure that no damage occurs to the machine, its operators or other persons.

INTRODUCTION

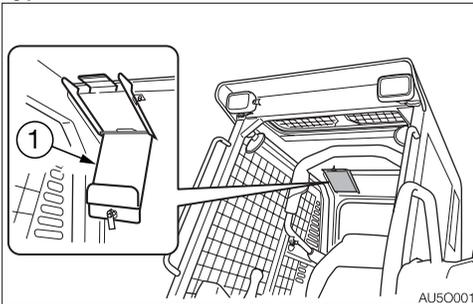
FOREWORD

This manual describes operation, inspection and maintenance of the machine, as well as safety instructions to be heeded during these operations. If you have any questions about the machine, please contact a Takeuchi sales or service outlet.

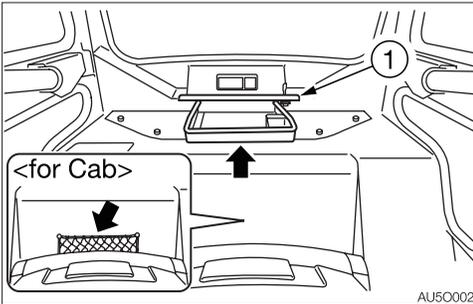
MANUAL STORAGE COMPARTMENT

A compartment for storing this manual is provided at the position shown on the diagram below.

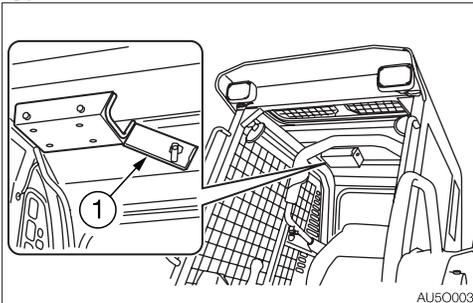
Type A



Type B



Type C

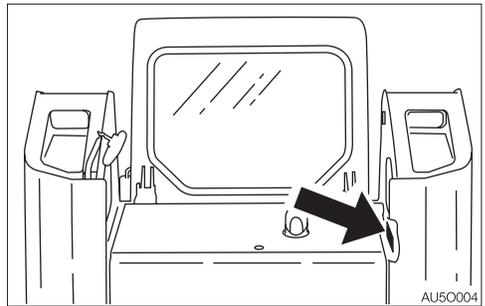


1. Insert the ignition key and turn it counterclockwise to open the cover.
2. After using the manual, place it in the plastic pouch and store it back in the manual storage compartment.

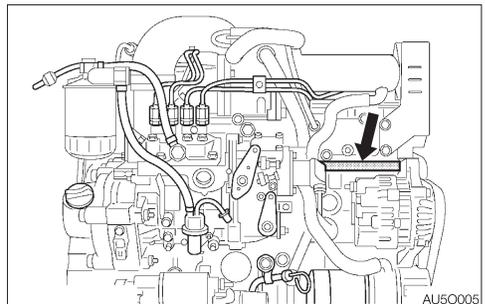
SERIAL NUMBERS

IMPORTANT: Do not remove the machine name plate with the serial number. Check the serial numbers of the machine and engine and write them down in the spaces below.

Machine number:

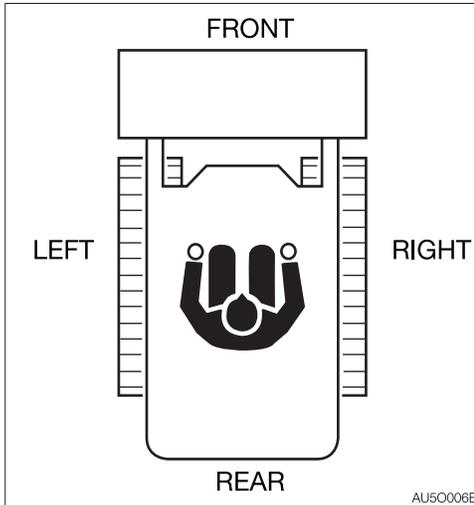


Engine number:



MACHINE DESCRIPTION

FRONT, REAR, LEFT AND RIGHT



This manual refers the front, rear, left and right of the machine as seen when sitting in the operator's seat with the bucket visible to the front.

DESIGNATED OPERATIONS

Use this machine primarily for the following operations:

- Hauling
- Leveling
- Loading

FEATURES

- Hydrostatic drive system
- Tilt-up canopy and cab with ROPS/FOPS
- Engine emergency stop system
- Low engine noise and exhaust emissions
- Electronic control of auxiliary hydraulic circuit

BREAK-IN PERIOD

When the machine is new, operate the machine for the first 100 hours (as indicated on the hour meter) by following the instructions below.

Using a new machine without a break-in period will lead to quicker deterioration of machine performance and may shorten the machine's service life.

- Sufficiently warm up the engine and hydraulic oil.
- Avoid heavy loads and rapid operations. Operate with a load of about 80% the maximum load.
- Do not abruptly start up, accelerate, change directions, or stop unless necessary.

NOTES ON READING THIS MANUAL

Please note that the descriptions and diagrams included in this manual may not be applicable to your machine.

The numbers used in the illustration are with circles around them. The same numbers appear between the parentheses in the text.

(Example: ① → (1))

Symbols used in this manual

The symbols used in this manual have the following meanings.

⊘, X Prohibition

🔒 Lock

🔓 Unlock

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SAFETY 



GENERAL PRECAUTIONS

It is your responsibility to observe all pertinent laws and regulations and to follow the manufacture's instructions on machine operation, inspection and maintenance.

Virtually all accidents occur as the result of a failure to observe basic safety rules and precautions.

Most accidents can be prevented by identifying the potentially hazardous situations beforehand.

Read and understand all safety messages which describe how to prevent accidents. Do not operate the machine until you are sure that you have gained a proper understanding of its operation, inspection and maintenance.

Observe all safety rules

- Operation, inspection and maintenance of this machine must be performed only by a trained and qualified person.
- All rules, regulations, precautions and safety procedures must be understood and followed when performing operation, inspection and maintenance of this machine.
- Do not perform any operation, inspection and maintenance of this machine when under the adverse influence of alcohol, drugs, medication, fatigue or insufficient sleep.

When a problem is found on the machine

If any problem (noise, vibration, smell, disorder of instrument, smoke, oil leak or wrong indication of alarm and panel, etc.) is detected during the operation or inspection and maintenance of the machine, please inform the administrator and take proper actions. Do not operate the machine until the trouble is cleared.

Operating temperature range

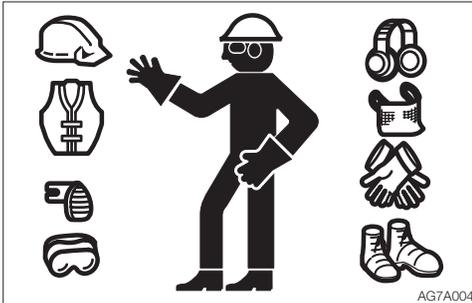
To maintain the performance of machine and to prevent it from early wear, observe the following operating conditions.

- Do not operate the machine if the ambient temperature is higher than +45°C (+113°F) or lower than -15°C (+5°F).
 - If operated at an ambient temperature of higher than +45°C (+113°F), the engine may overheat and cause the engine oil to degrade.
 - If operated at an ambient temperature of lower than -15°C (+5°F), the parts made of rubber such as gaskets may get hardened to cause an early wear or damage to the machine.
 - If the machine is to be used outside the ambient temperature range described above, consult your sales or a service dealer.



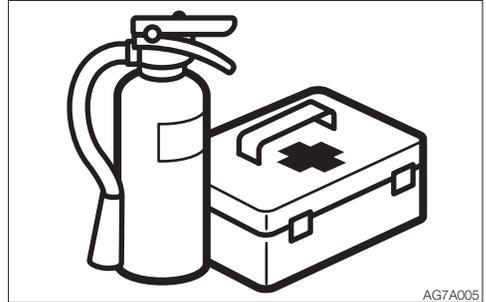
SAFETY GENERAL PRECAUTIONS

Wear appropriate clothing and protective equipment



- Do not wear loose clothing or any accessory that can catch on controls or in moving parts.
- Do not wear oily or fuel stained clothing that can easily catch fire.
- Wear a hard hat, safety shoes, safety glasses, filter mask, heavy gloves, ear protection and other protective equipment as required by job conditions. Wear required appropriate equipment such as safety glasses and filter mask when using grinders, hammers or compressed air, as metal fragments or other objects can fly and cause serious injury.
- Use hearing protection when operating the machine. Loud prolonged noise can cause hearing impairments, even the total loss of hearing.

Install a fire extinguisher and first aid kit



Be prepared for fire and accidents

- Install an extinguisher and a first aid kit, and learn how to use them.
- Learn how to fight a fire and how to deal with accidents.
- Know how to contact emergency assistance and make a list of emergency contacts.

Never remove safety equipment

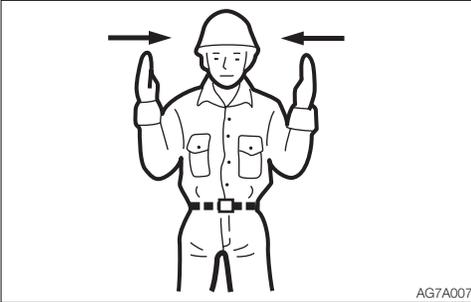


- Make sure all protective guards, covers, canopies, cabs and doors are in place and secured. Repair or replace damaged parts before operating the machine.
- Know how to use the safety bar, seat belt and other safety equipment and use them properly.
- Never remove any safety equipment except for servicing. Keep all safety equipment in good operating condition.



SAFETY GENERAL PRECAUTIONS

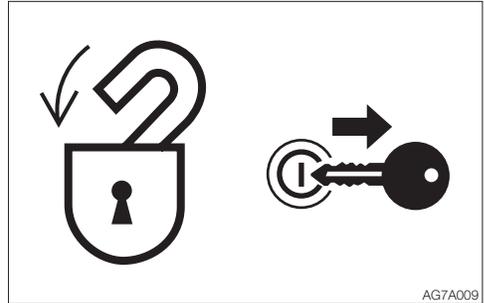
Use a signal person and a flag person



Learn how to use the hand signals required for particular jobs and make sure who has the responsibility for signaling.

- All personnel must fully understand all the signals.
- The operator must respond to signals only from the appointed signal person, but must obey a stop signal at any time from anyone.
- The signal person must stand in a clearly visible location when giving signals.

Cautions when standing up from or leaving the operator's seat



- Before standing up from the operator's seat, lower the bucket to the ground. If the arm must be left in a raised position, engage the arm stopper, set the safety bar to the lock position and stop the engine. If any controls should be accidentally touched when the safety bar is lowered (unlocked), the machine will suddenly move and cause serious injury or death.
- Be careful not to touch the control levers when raising or lowering the safety bar.
- Before leaving the operator's seat, lower the working equipment to the ground, raise the safety bar to engage the lock and stop the engine. Also, be sure to remove the key, lock the door and covers, take it with you and store it in a specified place.



SAFETY GENERAL PRECAUTIONS

Avoid fire and explosion hazards



Keep flames away from fuel, oil, grease and antifreeze. Fuel is particularly flammable and dangerous.

- When handling these combustible materials, keep lit cigarettes, matches, lighters and other flames or sources of flames away.
 - Do not smoke or permit open flames while handling fuel or working on the fuel system.
 - Do not leave the location while refilling with fuel or oil.
 - Never remove the fuel cap or add fuel when the engine is running or still hot. Also, do not spill the fuel on the hot surface of the machine or the component of the electric system.
 - Clean up spilled fuel or oil immediately.
 - Check for fuel, oil leak. Stop all leaks and clean the machine before operating.
 - When operating with grinder or welding, move inflammables to a safe place.
 - Do not cut or weld on pipes or tubes that contain flammable fluids. Clean thoroughly with nonflammable solvent before cutting or welding.
 - Remove all trash or debris from the machine. Make sure that oily rags or other flammable material are not stored on the machine.
 - Handle all solvents and dry chemicals (foam type fire extinguisher) according to procedures identified on manufacturer's containers. Work in a well-ventilated area.
 - Never use fuel for cleaning purposes. Always use a nonflammable solvent.
- When handling the fuel, washing oil or paint, open the door and windows to ventilate thoroughly.
 - Store all flammable fluids and materials in a safe and well-ventilated place.
 - The short circuit of the electric system may cause the fire. Check for any loosened connections or damage to the wires every day. Retighten the loosened connector and wire clamp. Fix or change the damaged wire.
 - Fire from the pipes:
Make sure that the clamps, guards and cushions of the hoses and tubes are securely fixed. If not, hoses or tubes may be damaged due to vibration or contact with other parts during operation. This can cause the high-pressure oil to spurt out, resulting in the fire or injury.



SAFETY GENERAL PRECAUTIONS

Fire prevention



When working in a certain environment, it is impossible to prevent combustible debris from collecting in the machine. This debris, in itself, may cause a fire; however, when mixed with fuel, oil or grease in a hot or confined place, the danger of fire is greatly increased. The following fire prevention guidelines should be used to supplement the operator's fire prevention efforts. In no case should the guidelines be used, or assumed, as replacements for diligent operator efforts at preventing fires (that include regular schedule of cleaning and inspecting the machine as conditions require).

The following guidelines will help to keep your equipment up and running efficiently and keep the risk of fire to a minimum.

1. Maintain a CHARGED fire extinguisher on or near the machine at all times and KNOW HOW TO USE IT.
2. Remove debris and blow out dust regularly from side air intake areas, engine radiator, hydraulic oil cooler, air conditioning condenser core to prevent overheating of the engine and hydraulics and to maintain efficient operation of the machine.
3. Blow off all accumulated debris near hot engine exhaust components (turbocharger and exhaust manifold as well as exhaust pipes and muffler) at the completion of each work shift or more frequently when working in severe conditions where large amounts of combustible debris are present. Engine exhaust systems provide numerous small pockets where flammable debris can gather. Even small accumulations close to hot exhaust components can ignite and smolder.
4. Clean out all accumulated debris (twigs, pine needles, branches, bark, leaves, saw dust, small wood chips) and any other combustible materials from inside the machine belly pans or lower machine structures as well as from areas in proximity to the engine, fuel and hydraulic oil systems no less frequently than at the completion of each work shift.
5. Inspect the machine regularly for any signs of diesel fuel or hydraulic system leakage. Check for worn or damaged fuel or hydraulic lines before starting up any equipment.
6. Clean up any grease, diesel fuel, hydraulic and lubricating oil accumulation and spillage immediately.
7. Steam clean the engine, and belly pan areas at least once a month or more frequently when working in severe conditions where large amounts of combustible debris are present.
8. Use only nonflammable solutions for cleaning the machine and components.
9. Inspect the exhaust system daily for any signs of leakage. Check for worn, cracked, broken or damaged pipes or muffler. Also check for missing or damaged bolts or clamps. Should any exhaust leaks or defective parts be found, repairs must be made immediately. Engine exhaust leaks can cause fires. Do not operate the machine until the exhaust leak is repaired.



10. During daily operation of the machine, the occurrence of exhaust leaks are usually accompanied by a change or increase in engine exhaust noise levels. These audible warnings cannot be ignored. Should any exhaust leaks occur during operation, the machine must be shut down immediately and not put back to work until the necessary repairs have been completed.
11. Before starting repair work, such as welding, the surrounding area should be cleaned and a fire extinguisher should be close by.
12. Do not use the machine on top of or to push piles of burning timber. A machine fire will likely result.

What to do to prepare for a machine fire

- Prevent the fire from happening in the first place by ensuring that all machine systems are frequently inspected and always well maintained.
- Ensure that any hand held fire extinguishers are charged and in working order. Fire extinguishers require routine care. Follow the manufacturer's instructions for inspection and maintenance shown on the label of the fire extinguisher and in the extinguisher manufacturer's manual.
- Ensure that you follow all national, state / provincial and local regulations dealing with fire fighting in effect in your specific geographic region.
- Ensure that all information necessary for you to immediately contact all sources of help (local fire department, etc) in the event of a fire emergency is recorded and readily available at all times.

What to do if a machine fire occurs

If operating the machine when a fire occurs:

1. Lower all working attachments to the ground.
2. Shut the engine off.
3. Exit the machine. Call for help. Be certain to report a fire immediately.
4. At all times ensure your own personal safety and the safety of anyone that may be in the area. Approach any fire with extreme caution. All fires can be very dangerous and life threatening.

Before deciding to fight the fire, be certain that:

1. The fire is small and not rapidly spreading.
 2. There is always a clear, safe escape route.
 3. You have received training in the use of the available fire extinguishing devices and are confident that you can operate them effectively.
- Be aware that engine coolant, diesel fuel or hydraulic hoses could fail during a fire. If this happens, hot coolant, fuel or oil could possibly be ignited by the fire.
 - If in any doubt about whether or not to fight the fire ? DON'T. Instead stand well clear of the fire and wait for help to arrive.



- Use the **PASS** method. This is the most effective use of a fire extinguisher.
 - **P**ull the pin at the top of the extinguisher that keeps the handle from being pressed. Break the plastic seal as the pin is pulled.
 - **A**im the nozzle at the base of the fire. Do not aim the nozzle at the flames. In order to put out the fire, you must extinguish the fuel, not the flames. Hose nozzles are often clipped to the extinguisher body. Release the hose before taking aim.
 - **S**queeze the handle to release the pressurized extinguishing agent. The handle can be released at any time to stop the discharge.
 - **S**weep from side to side at the base of the fire until the fire is completely out or the fire extinguisher is empty
- Only if you can safely do so, open the access panels to the machine in the area of the fire.
- Failing all attempts to access the machine compartment, discharge the extinguisher through the mesh or any available openings on the machine.
- Ensure that the machine and all components have cooled down sufficiently after a fire so that re-ignition does not occur.
- Remain in the area until help arrives.

What to do after a machine fire has occurred

- Before returning the machine to work.
 1. Ensure that the cause of the fire is determined and all appropriate repairs are completed.
 2. Ensure that all extinguishers used in fighting the fire are replaced or recharged.
- Notify your equipment dealer and/or Takeuchi Manufacturing.



SAFETY
GENERAL PRECAUTIONS

Exhaust fumes from the engine is poisonous



- Do not operate the engine in an enclosed area without adequate ventilation.
- If natural ventilation is not possible, install ventilators, fans, exhaust extension pipes or other venting devices.

Handling asbestos dust

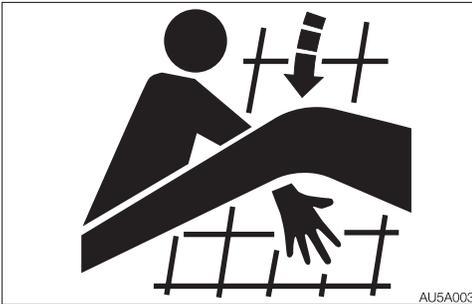
Inhaling asbestos dust can cause lung cancer. When handling the materials which may contain asbestos, take the following precautions:

- Never use compressed air for cleaning.
- Avoid brushing or grinding parts containing asbestos.
- For clean up, use a vacuum equipped with a high efficiency particulate air filter (HEPA).
- Wear the stipulated respirator if there is no other way to control the dust. When working indoors, install a ventilation system with a macromolecular filter.
- Do not allow unauthorized personnel in the work area while working.
- Follow the rules and environmental standard applicable to the work area.



SAFETY GENERAL PRECAUTIONS

Be careful not to get crushed or cut



- Never put your hands, feet or other parts of your body between the machine body or bucket and lift arms, or between a cylinder and moving part on the working equipment. The sizes of these gaps change when the machine moves, and a person could suffer severe injury or death.
- The lift arms move closely along the outside of the side screens; never put your arm or other part of your body out of the side screens.
- The lift arms move closely along the canopy/cab; do not stand on or lean against the machine.

Using optional products

- Consult with Takeuchi before installing optional attachments. Depending on the type of attachments or the combination of them, the attachment may come into contact with the operator's compartment or the other parts of the machine. Make sure that the optional attachment installed is not contacted with other parts before use.
- Do not use attachments that have not been approved by Takeuchi. Doing so may compromise safety or adversely affect the machine's operation or service life.
- Takeuchi will not be held responsible for any injuries, accidents or damage to its products caused by the use by a non-approved attachment.

Product usage

Note that the high-output type brush cutter attachment can be used only if it is equipped with the easy brush-cleaning function and the proper cooling system, for a short period of time at a moderate ambient temperature. Pay careful attention not to damage the undercarriage when using such attachment. These precautions also apply to any other high-performance and/or highly functional attachment.

Never modify the machine

Unauthorized modifications to this machine can cause injury or death. Never make unauthorized modifications to any part of this machine.

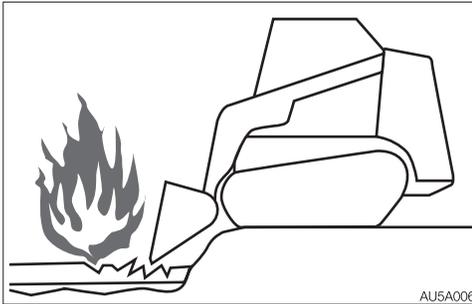


PRECAUTIONS WHEN PREPARING

Know the work area

Before starting operation, know the working area condition to ensure a safety operation.

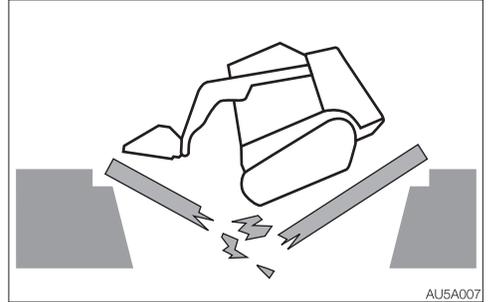
- Inspect the topography and ground condition of the working area, or the structure of the building when working indoors, and take the safety precautions as necessary.
- Be sure to avoid all hazards and obstructions such as ditches, underground lines, trees, cliffs, overhead electrical wires, or places where there is a danger of falling rocks or slides.



- Check with the administrator for the locations of buried gas pipes, water pipes and power cables. If necessary, determine what specific precautions must be taken to insure safety by consulting with the administrator.
- When working on roads, be sure to consider the safety of pedestrians and vehicles.
 - Use a flag person and/or a signal.
 - Fence off the working area and keep off unauthorized persons.
- When working in water or crossing shallow streams or creeks, check the depth of the water, the solidity of the ground and the water flow speed beforehand. Refer to "Precautions on operation" for further instructions.

Check the strength of the bridge

When traveling over a bridge or a structure, check the permissible load. If the strength is insufficient, reinforce the bridge or the structure.





SAFETY

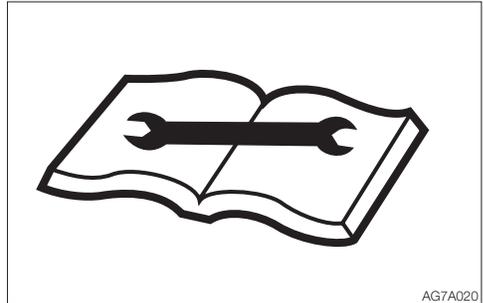
PRECAUTIONS WHEN PREPARING

Always keep the machine clean



- Clean windows, mirrors and lights to ensure good visibility.
Adjust the mirror to the best position for the operator to see the rear view (blind spot) from the operator's seat.
- Wipe off any oil, grease, mud, snow or ice, to prevent accidents due to slipping.
- Remove all loose objects and unnecessary devices from the machine.
- Remove any dirt, oil or grease from the engine area to prevent fires.
- Clean around the operator's seat and remove any unnecessary object from the machine.

Perform inspection and maintenance every day



Failure to identify or repair the irregularities or damage on machine can lead to accidents.

- Before operating, perform the specified inspection and make prompt repairs where necessary.
- If a failure occurs and the operation becomes impossible or the engine fails, immediately stop the machine by following the shutdown procedure, and keep machine securely parked until the malfunction is corrected.



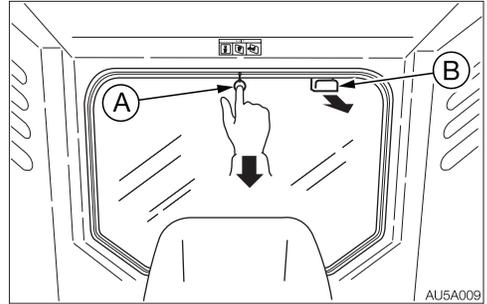
Cautions in the operator's compartment

- Remove mud and grease from shoe soles before entering the operator's compartment.
Pedaling the machine with the shoes with mud and grease will cause a slip accident.
- Do not leave the parts or tools around the operator's seat.
- Do not leave any plastic bottles in the operator's compartment or attach any suction cups on the window glass. The plastic bottle or suction cup act as a lens and can cause fire.
- Do not use the mobile phone during traveling or working.
- Do not bring combustibles or explosives into the operator's compartment.
- After smoking, be sure to tightly close the lid of the ashtray to put out the match or cigarette.
- Do not leave the cigarette lighter in the operator's compartment. When the room temperature rises, the lighter may explode.

Emergency exit

Rear window

If you are trapped inside the cab, remove the rear window to get out.



There are two ways to remove the rear window.

In case of emergency

Kick off the rear window. Note that the glass may break. Be careful not to get injured.

When necessary

1. Pull off the ring (A) and remove the tip of the rubber wedge.
2. Grasp the tip, pull and remove the entire rubber wedge.
3. Pull the knob (B) toward you and remove the rear window.



PRECAUTIONS WHEN STARTING

Support your weight in a three point secure stance when getting on/off the machine

- Do not jump on or down from the machine. Never attempt to get on or off the moving machine.
- When getting on or off the cab, first fully open the door to the locked position and check that it does not move (for machines with cab).



- Climb up/down the steps facing the machine and holding the handrail to support your weight in a three point secure stance (hand and feet).
- Never use the safety bar or control levers as hand holds.
- Do not go under the raised lift arms to get in and out of the operator's compartment. Always lower the lift arms to the ground beforehand.

Before starting the machine, ask any unauthorized personnel to leave the area

Do not start the engine until you are sure it is safe to start the machine by checking the following items.

- Walk around the machine and warn the person who is servicing the machine or is walking near the machine. Do not start the machine until you are certain that no one is around the machine.



- Check if there is a “DO NOT OPERATE” alert sign or similar sign is on the cab door, controls or starter switch. If there is one, do not start the engine or touch any levers.
- Sound the horn to warn people around the machine.

Sit in the operator's seat and start the engine

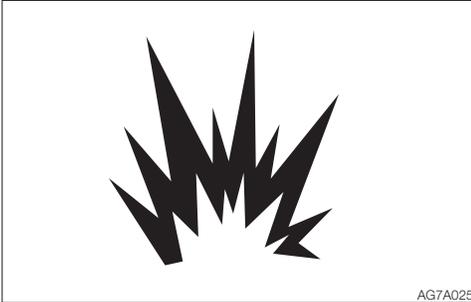
- Adjust the seat to securely latch it.



- Fasten the seat belt.
- Check if the parking brake is on and control levers and pedal are in the neutral position.
- Check if the safety bar is in the lock position.
- Make sure that no one is near the machine.
- Start and operate the machine only from the operator's seat.
- Never attempt to start the engine by shorting across the starter terminals.



Starting with jumper cables



Use jumper cables only in the recommended manner. Improper use of jumper cables can result in battery explosion or unexpected machine motion.

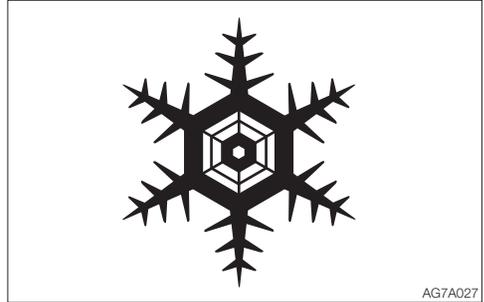
Refer to “If the battery goes dead” for further instructions.

After starting the engine

After starting the engine, perform the operations and checks described below in a safe place with no persons or obstacles in the area. If any malfunction is found, follow the shutdown procedure and report the malfunction.

- Warm up the engine and hydraulic oil.
- Check if all gauges and warning devices are properly working.
- Check for any noises.
- Test the engine speed control.
- Operate each control to ensure they are properly working.

In cold climates



- Be careful of slippery conditions on freezing ground, steps and hand holds.
- In severe cold climates, do not touch any metal parts of the machine with bare hands. The skin will freeze to the metal, resulting in severe injury.
- Do not use ether or starting fluid on this engine. The starting fluids can cause explosion and serious injury or death.
- Warm up the engine and hydraulic oil. If the levers are operated without warming, the machine will not react or move promptly or properly, resulting in accident.



SAFETY PRECAUTIONS WHEN OPERATING

PRECAUTIONS WHEN OPERATING

Ensure good visibility

- When working in dark places, turn on the machine's working lights and headlights and additional lighting equipment installed, as necessary.
- When visibility is poor due to bad weather (fog, snow, rain or a cloud of dust), stop operating the machine and wait until visibility improves.

Do not permit riders on the machine



Do not allow anyone to ride on any part of the machine at any time while traveling or operating.

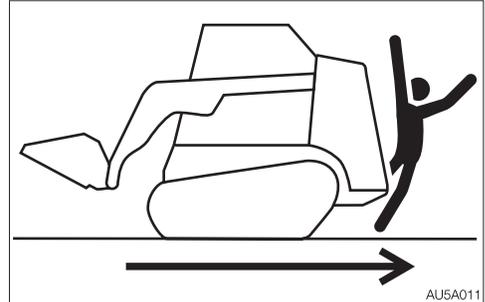
Operate the machine only from the operator's seat



When operating any lever, pedal or switch, always do it while sitting in the operator's

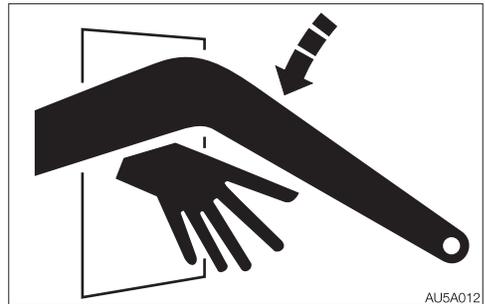
seat. Failure to do so could cause serious injury or death.

Check if the work area is safe and secure before operation



- Confirm the performance limits of the machine.
- Use a signal person at road shoulders, narrow places or where your vision is obstructed.
- Never allow anyone to enter the machine's turning radius and path.
- Signal your intention to move by sounding the horn.
- There is a blind spot in the rear of the machine. Before traveling in reverse, check that the area is safe and clear.

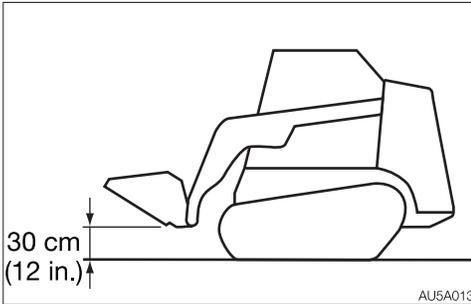
Keep your body inside the operator's cab



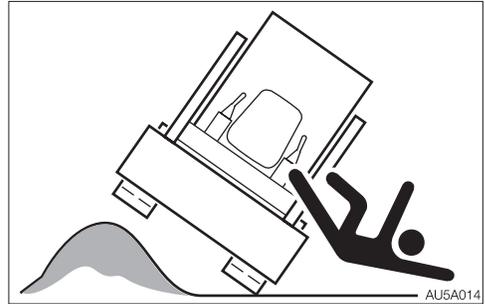
It is dangerous to operate the machine while putting your arms, feet or legs out of the operator's compartment. Never do it.



Precautions on traveling and turning



- Traveling and turning should be performed with the bucket cylinder fully retracted and the bucket at a height of approximately 30 cm (12 in.) from the ground.
- Avoid sudden stops, starts and turns. Otherwise, the working equipment may come in contact with the ground, causing the machine to lose its balance and get damaged or to damage the structures in the surrounding area.
- Do not raise the safety bar while traveling. This is dangerous, because raising the safety bar will cause the parking brakes of the travel motors to operate and apply the brakes abruptly.
- Do not switch off the ignition switch while traveling. Doing so will cause sudden braking and is dangerous.
- Before backing up, visually check for safety to the rear. Backing up without checking could result in contact with a worker or obstacle.
- If the working equipment must be operated while traveling, do so with extra care.
- When traveling on rough terrain or when carrying a load, lower the load and travel slowly.



- Avoid crossing over obstacles whenever possible. If you must do so, keep the bucket close to the ground level and travel slowly. Never cross obstacles which will tilt the machine to an angle of 10° or greater.

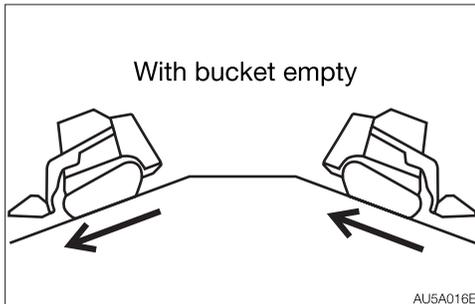
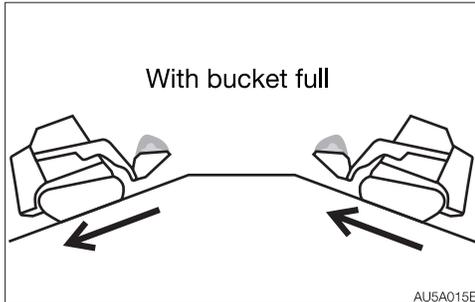


SAFETY

PRECAUTIONS WHEN OPERATING

Cautions on traveling on slopes

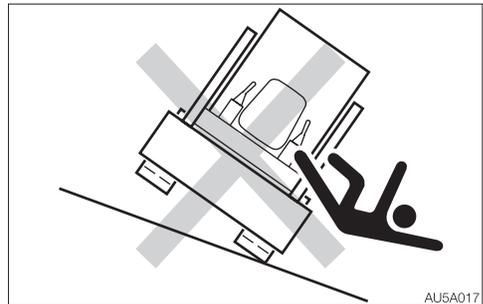
Do not perform any operation on a slope. The machine may lose its balance and tip over if the working equipment is operated on a slope.



When traveling on a slope of 15 degrees or more, position the heavier end of the machine (front or back, whichever is heavier) pointing up the slope. Also, be careful not to tip over or slide.

- Never travel on slopes that are too steep for the machine to maintain its stability (maximum gradeability: 30°, lateral tipping angle: 15°). Note that in reality, the machine's stability becomes lower than the above values depending on the working condition.
- When traveling on slopes, lower the bucket to a height of 20 to 30 cm (8 to 12 in.) above the ground. In emergencies, lower the bucket to the ground and stop the machine.

- When traveling on slopes or grades, drive slowly in 1st (low) speed. Especially on down slopes, slow down the engine speed and limit the stroke length of the left control lever to less than half. Going down a slope at high speed may lead to loss of control.
- Stopping abruptly on a slope may result in the machine losing its balance and tipping over.



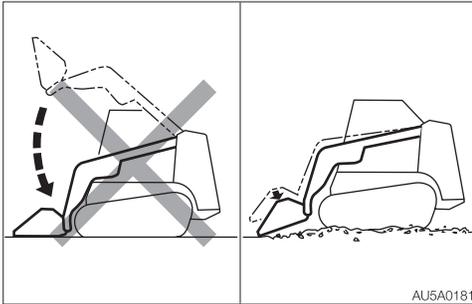
- Do not change directions on slopes or traverse slopes. First return to a flat surface, and then take an alternative path.
- The machine may slip sideways even on a slight slope if the ground is covered with grass or dead leaves, or when traveling on a wet metal plate or frozen surfaces. Make sure the machine is never positioned sideways on slopes.
- If the machine is stalled on the slope, return each control lever to the neutral position before restarting the engine.



SAFETY

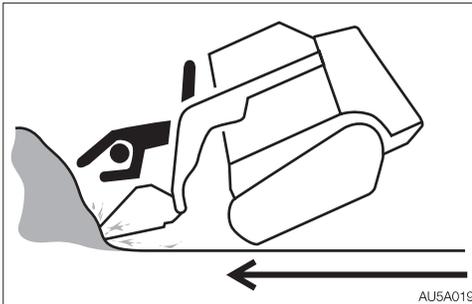
PRECAUTIONS WHEN OPERATING

Precautions when the lift arms are in the float mode



- It is very dangerous to set the lift arms to the float mode while the bucket is raised too high, as the bucket is likely to fall. Lower the bucket to a height of 30 cm (12 in.) or less above the ground before setting the lift arms to the float mode.
- Do not travel forward with the lift arms in the float mode.

Do not drive into materials at high speeds

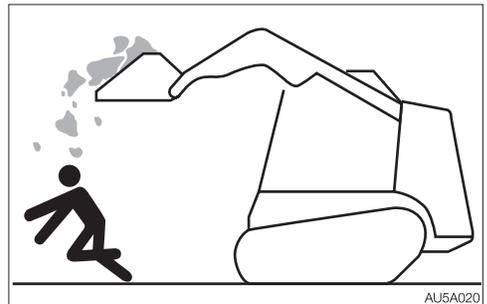


Driving at high speed into the materials you are handling can lead to your body striking the machine or being thrown from the machine. Before working the material, check the conditions of the area and work at low speeds.

Operate the machine on snow or ice with extra care

- When traveling on snow or on frozen surfaces, drive at a low speed and avoid starting, stopping or changing directions abruptly.
- In the snowy area, the road shoulder and objects placed beside the road are buried in the snow and cannot be seen. There is a hazard of the machine tipping over or hitting covered objects, so always carry out operations carefully.
- If the machine enters deep snow, there is a hazard that it may tip over or become buried in the snow. Be careful not to drive beyond the road shoulder or to get trapped in a snow drift.
- With frozen ground surfaces, the ground becomes soft when the temperature rises, and this may cause the machine to tip over, resulting in an operator trapped inside the machine.
- When parking the machine on an unstable ground, lower the bucket.

Do not move the bucket over the heads of people



The load spilling or the bucket dropping may occur while the bucket is over the heads of people.



SAFETY

PRECAUTIONS WHEN OPERATING

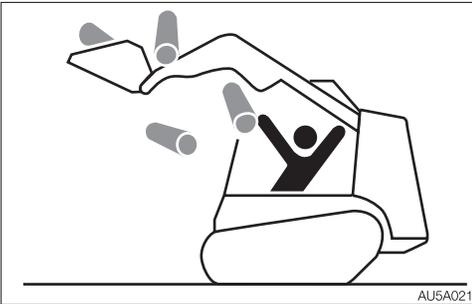
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Take care when handling unstable loads

Avoid overloading and off-center loading

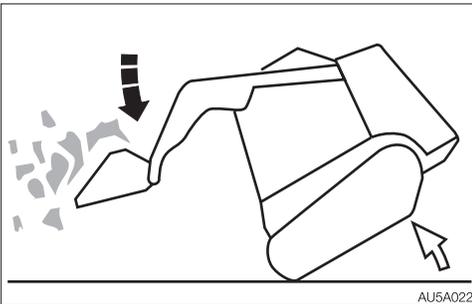


Unstable loads such as round items, cylindrical items, and stacked plates may fall from the bucket. When handling unstable load, do not raise the bucket too high or tilt it backward too far.

Filling the bucket in excess of the maximum load or loading an off-center load could cause the machine to become unstable and result in the machine tipping over. Loading should be done evenly, should be less than the:

maximum load	855 kg (1880 lbs)
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Do not suddenly stop or lower the working equipment



Sudden lowering or stopping of the working equipment could cause the machine to react and tip over. Operate the working equipment carefully, especially when the bucket is loaded.

Sample of manual. Download All 208 pages at:

<https://www.aresairmanual.com/downloads/takeuchi-tl230-crawler-loader-operators-manual>