

OPERATOR'S MANUAL

Original instructions

TB228

Serial No. 122800004~

TB235

Serial No. 123500004~

TB250

Serial No. 125000004~

Book No. AG7E011

OE-TB228-L

MINI EXCAVATOR

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.

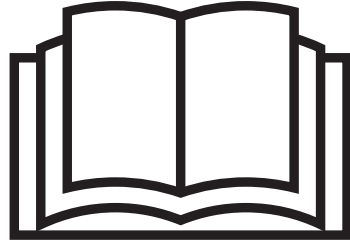
Read and understand the message to avoid personal injury or death.

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 the excavator 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.

WARNING



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.

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

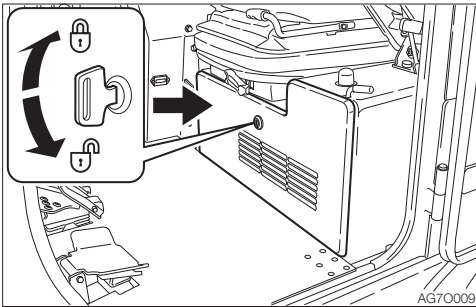
FOREWORD

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.

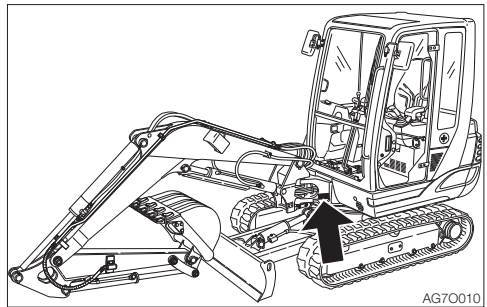


1. Insert the starter key and turn it counterclockwise to open the cover under the seat.
2. After using the manual, place it in the plastic pouch and store it back in the manual storage compartment.

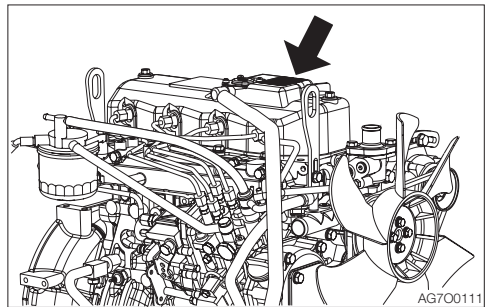
SERIAL NUMBERS

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:

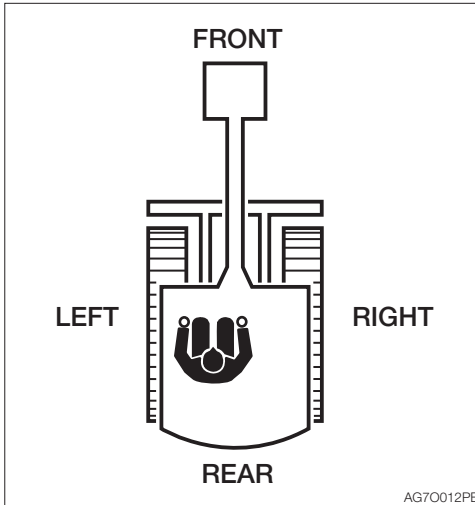


Engine number:



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 dozer blade visible to the front.

DESIGNATED OPERATIONS

Use this machine primarily for the following operations:

- Excavation
- Digging ditches
- Digging side ditches
- Leveling
- Loading

FEATURES

- Tilting up the operator seat floor for easier maintenance
- Automatic travel shift-down system
- Short pitch rubber crawler
- Low engine noise and exhaust emissions
- Electronic control of auxiliary hydraulic circuit
- Single button operation for engine deceleration
- Slew motors are equipped with shockless valves

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

CONTENTS

Introduction0-2

Machine description0-3

Safety1-1

General precautions	1-2
Precautions when preparing	1-7
Precautions when starting	1-9
Precautions when operating	1-11
Precautions when stopping	1-19
Precautions when transporting	1-20
Precautions on maintenance	1-21
Safety signs (decals)	1-30

Controls2-1

Names of components (Canopy)	2-2
Names of components (Cab)	2-4
Covers.....	2-6
Starter key	2-6
Front cover (tool box)	2-6
Fuel lid	2-7
Fuel filler port	2-7
Side cover	2-8
Engine hood	2-8
Cab	2-9
Cab door	2-9
Emergency exit	2-9
Front window.....	2-10
Lower front window	2-11
Side window	2-11
Emergency hammer (optional)	2-11
Seat and seat belt	2-12
Seat < TB228 >	2-12
Seat belt <TB228>	2-13
Seat < TB235 / TB250 >	2-14
Seat belt <TB235 / TB250>.....	2-15
Instrument cluster	2-16
Warning lamps.....	2-16
Indicators	2-17
Meters	2-17
Hour meter	2-17
Switches	2-18
Starter switch	2-18
Horn button	2-18
Deceleration button	2-18
Automatic deceleration switch	2-19
Auxiliary hydraulic switches.....	2-19
Third auxiliary hydraulic switch and buttons (Option).....	2-20

Travel speed switch	2-21
Light switch	2-21
Wiper switch.....	2-21
Levers and Pedals	2-22
Safety lock lever	2-22
Throttle lever	2-22
Operating levers	2-23
Blade lever.....	2-23
Travel levers/pedals	2-24
Boom swing pedal.....	2-24
Auxiliary hydraulic pedal (option)	2-25
Accessories.....	2-26
Heater	2-26
Heater (for cold climates)	2-27
Air conditioner	2-28
Cup holder	2-33
Cigarette lighter	2-34
Ashtray	2-34
Interior light.....	2-35
Mirrors.....	2-35
External power sockets (for EU)	2-35
Radio (Cab type).....	2-36
Auxiliary hydraulic lines	2-40

Operation3-1

Before starting operation	3-2
Getting on or off the machine.....	3-2
Walk-around inspection	3-2
Daily inspection.....	3-2
Starting and stopping the engine.....	3-3
Before starting the engine.....	3-3
Starting the Engine	3-4
Warming up the engine.....	3-5
Stopping the engine	3-5
Operating the machine	3-6
Lever pattern (ISO pattern).....	3-6
Lever pattern (JCB pattern).....	3-7
Warming up the machine (hydraulic oil)	3-8
Inspection after warm-up	3-9
Operating the travel levers	3-10
Stopping travel	3-13
Operating the working equipment.....	3-14
Operating procedures.....	3-16
Prohibited operations.....	3-16
Cautions on operating	3-19
Cautions on traveling on slopes	3-20
Getting out of mud	3-22
Operations possible with this machine.....	3-22
Parking the machine.....	3-24
Parking	3-24

Inspection and checks after stopping the engine	3-24
Handling in cold climates	3-25
Preparing for cold climates	3-25
Cautions after operations	3-25
After the cold climate	3-25
Handling rubber crawlers	3-26
Prohibitions	3-26
Cautions	3-27
Preventing the rubber crawlers from coming off	3-27

Transport4-1

Loading and unloading	4-2
Hoisting the machine	4-4
Securing the machine	4-5
Precautions to be taken during transportation	4-5

Maintenance5-1

General	5-2
Maintenance overview	5-2
Cautions on maintenance	5-2
Service data	5-4
Fuel and lubricant table	5-4
Regularly replace the hydraulic oil	5-6
List of consumables	5-7
List of tools	5-8
List of tightening torques	5-9
Safety-critical parts	5-10
Maintenance list	5-12
Walk-around inspection	5-14
Inspecting by opening the engine hood and covers	5-14
Inspecting by walking around the machine	5-15
Inspecting while sitting in the operator's seat	5-15
Daily inspection (every 10 hours)	5-16
Inspecting and replenishing the coolant ...	5-16
Inspecting and replenishing the engine oil	5-17
Inspecting the water separator	5-17
Inspecting the fuel level	5-18
Inspecting the hydraulic oil tank level and replenishing	5-18
Lubricating the working equipment ...	5-20
After the initial 50 hours (only for new machines)	5-21
Replacing the engine oil and the oil filter ...	5-21
Inspecting and adjusting the fan belt ..	5-22

Inspecting and adjusting the compressor belt (AC)	5-22
Every 50 hours	5-24
Inspecting and adjusting the crawler tension	5-24
Lubricating the slew bearing	5-26
Draining the water from the fuel tank ..	5-27
Inspecting the battery fluid level and replenishing	5-28
Every 100 hours	5-30
Cleaning the water separator	5-30
After the initial 250 hours (only for new machines)	5-31
Replacing the hydraulic oil return filter	5-31
Replacing the pilot line filter	5-32
Replacing the travel motor gear oil	5-33
Every 250 hours	5-34
Replacing the engine oil and the oil filter ..	5-34
Inspecting and adjusting the fan belt ..	5-34
Inspecting and adjusting the compressor belt (AC)	5-34
Cleaning the air cleaner	5-34
Cleaning the radiator fins and oil cooler fins	5-35
Cleaning the air filters	5-36
Cleaning the condenser (AC)	5-36
Inspecting the refrigerant (gas) level (AC) ..	5-37
Every 500 hours	5-39
Replacing the fuel filter	5-39
Every 1000 hours	5-40
Replacing the hydraulic oil return filter	5-40
Replacing the pilot line filter	5-40
Replacing the travel motor gear oil	5-40
Cleaning the engine cooling system ...	5-40
Replacing the air cleaner element	5-42
Replacing the air breather filter (If equipped)	5-43
Inspecting and adjusting the engine valve clearance	5-43
Retightening the engine cylinder head bolt	5-43
Every 1500 hours	5-44
Inspecting and cleaning the engine fuel injectors	5-44
Inspecting the crankcase breather system	5-44
Every 2000 hours	5-45
Lapping the engine valve seats	5-45
Every 4000 hours	5-46
Replacing the hydraulic oil and cleaning the suction strainer	5-46

When required	5-48	Selecting a lever pattern	8-12
Replacing the bucket teeth and the side cutters	5-48	Switching the lever pattern	8-12
Replacing the bucket	5-52	Travel alarm	8-13
Adjusting the gap between the bucket and arm (if equipped).....	5-54	3-hole bucket	8-14
Inspecting and replenishing the windshield washer fluid	5-55	Arm-in restriction system	8-15
Lubricating the levers and pedals.....	5-56	Optional equipment mass	8-16
Inspecting the rubber crawlers.....	5-57	Biodegradable oil.....	8-18
Replacing the rubber crawlers	5-58	Replacing the hydraulic oil with biodegradable oil	8-18
Tilting up the platform.....	5-60	Angle dozer blade.....	8-19
Maintenance during extended storage period	5-62		

Troubleshooting6-1

Symptoms that are not malfunctions	6-2
If the engine overheats.....	6-3
If the battery goes dead.....	6-4
If a fuse blows	6-6
Inspecting and replacing the fuse.....	6-6
Inspecting the fusible link.....	6-7
Restarting after adding fuel	6-8
Bleeding air from the fuel system	6-8
If a warning lamp flashes	6-9
Other symptoms.....	6-10
Lowering the boom to the ground	6-12
Towing.....	6-13

Specifications7-1

Basic Specifications.....	7-2
Machine dimensions.....	7-6
Operating ranges.....	7-12
Lifting Capacities	7-15

Options8-1

General precautions	8-2
Safety precautions	8-2
Cautions when installing attachments ..	8-2
Cautions when operating attachments.	8-3
Attachment combination table	8-4
Hydraulic breaker	8-6
Cautions on operating	8-6
Replacing the hydraulic oil regularly	8-7
Load safety device.....	8-8
Emergency shut-off valve.....	8-8
Overload warning device	8-9
Accumulator.....	8-10
Operating the machine with an accumulator	8-10
Battery switch.....	8-11

SAFETY 



GENERAL PRECAUTIONS

It is your responsibility to observe all pertinent laws and regulations and to follow the manufacturer'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

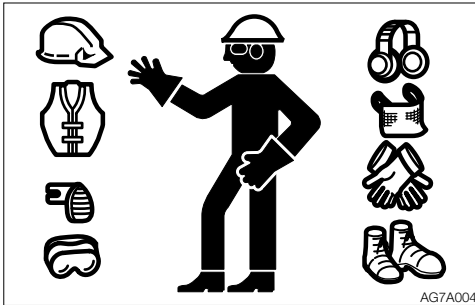
To maintain the performance of machine and to prevent it from early wear, observe the following operating conditions.

- 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.



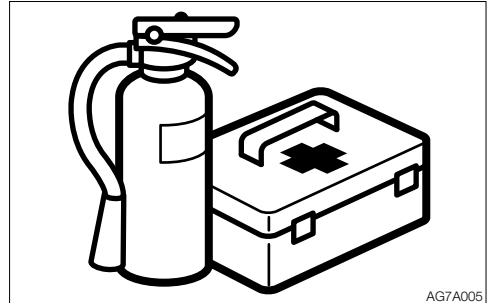
SAFETY GENERAL PRECAUTIONS

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.

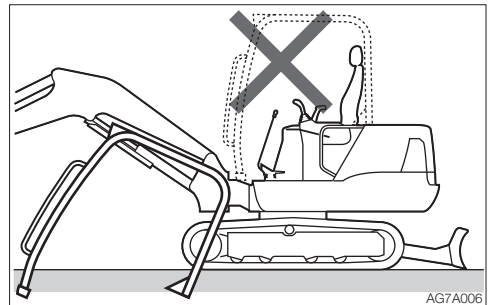
Install a fire extinguisher and first aid kit



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



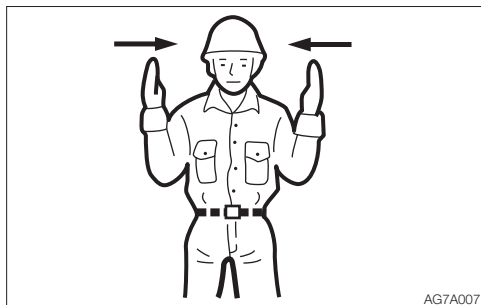
- Make sure all protective guards, canopies and doors are in place and secured. Repair or replace damaged parts before operating the machine.
- Know how to use the safety lock lever, seat belt and other safety equipment and use them properly.
- Never remove any safety equipment except for servicing.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



SAFETY

GENERAL PRECAUTIONS

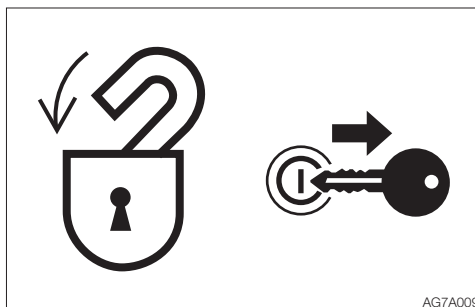
Use a signal person and a flag person



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 to open/close the window or remove/install the lower window, lower the working equipment to the ground, raise the safety lock levers to engage the lock and stop the engine. If any controls should be accidentally touched when the safety lock levers is lowered (unlocked), the machine will suddenly move and cause serious injury or death.
- Note that the dozer blade and boom swing controls cannot be locked, even when the safety lock levers is set to the lock position. Do not carelessly touch the blade and boom swing controls.
- Be careful not to touch the operating levers when raising or lowering the safety lock levers.
- Before leaving the operator's seat, lower the working equipment to the ground, raise the safety lock levers 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

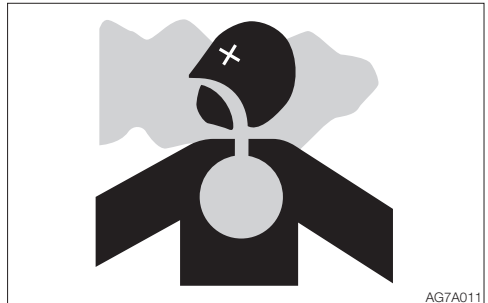


Keep flames away from fuel, oil, grease and antifreeze. Fuel is particularly flammable and dangerous.

- 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.

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.

Be careful not to get crushed or cut



Never put your hands, feet or other parts of your body between the upperstructure and the undercarriage or tracks, between the machine body and working equipment, or between a cylinder and moving part. The sizes of these gaps change when the machine moves, and a person can suffer severe injury or death.

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.

Never modify the machine

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

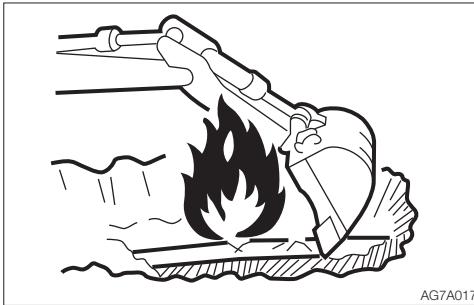


PRECAUTIONS WHEN PREPARING

Know the work area

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

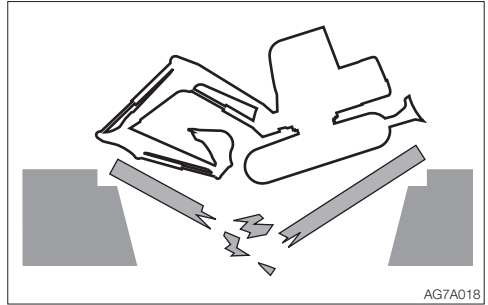
- Inspect the topography and ground condition of the working area, or the structure of the building when working indoors, and take the safety precautions as necessary.
- Be sure to avoid all hazards and obstructions such as ditches, underground lines, trees, cliffs, overhead electrical wires, or places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



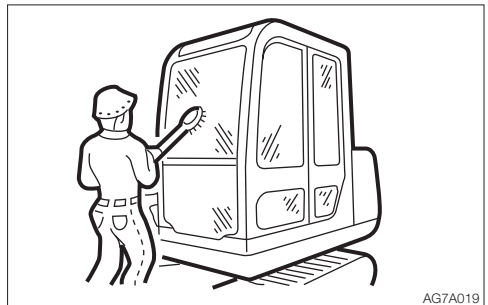
- Check with the administrator for the locations of buried gas pipes, water pipes and power cables. If necessary, determine what specific precautions must be taken to insure safety by consulting with the administrator.
- When working on roads, be sure to consider the safety of pedestrians and vehicles.
 - 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 “Cautions on operating” 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.



Always keep the machine clean



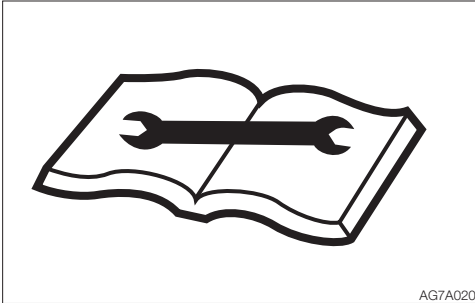
- Clean windows, mirrors and lights to ensure good visibility.
 - Adjust the mirror to the best position for the operator to see the rear view (blind spot) from the operator's seat.
- Wipe off any oil, grease, mud, snow or ice, to prevent accidents due to slipping.
- Remove all loose objects and unnecessary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



SAFETY

PRECAUTIONS WHEN PREPARING

Perform inspection and maintenance every day



AG7A020

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

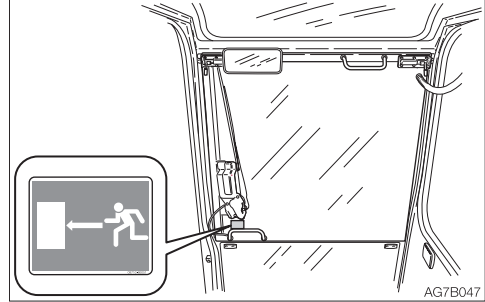
- Before operating, perform the specified inspection and make prompt repairs where necessary.
- If a failure occurs and the operation becomes impossible or the engine fails, immediately stop the machine by following the shutdown procedure, and keep machine securely parked until the malfunction is corrected.

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 explore.

Emergency exit

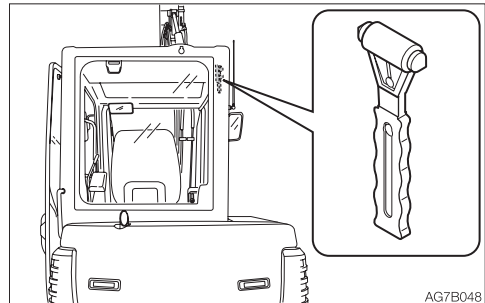
Front window (excluding machines with a front guard)



AG7B047

If you should become trapped inside the cab, open the front window to get out.

Emergency hammer (optional)



AG7B048

An emergency hammer is installed to be used to escape from the cab in an emergency. When escaping, break the windows with the hammer.

Applicable machine models
TB228: 122800611 or later
TB235: 123501067 or later
TB250: 125000793 or later



SAFETY PRECAUTIONS WHEN STARTING

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 lock lever or control levers as hand holds.

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.



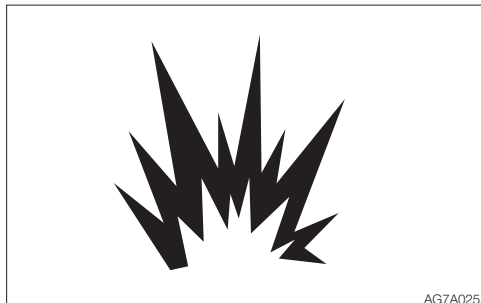
- Fasten the seat belt.
- Check if the parking brake is on and all control levers and pedals are in the neutral position.
- Check if the safety lock lever is in the lock position.
- Make sure that no one is near the machine.
- Start and operate the machine only from the operator’s seat.
- Never attempt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



SAFETY

PRECAUTIONS WHEN STARTING

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.