OPERATOR'S MANUAL

Original instructions

TB230

Serial No. 130000003~

Book No. AE8E001

OETB230_F-XB



MINI EXCAVATOR

TAKEUCHI

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

SAFETY ALERT SYMBOL



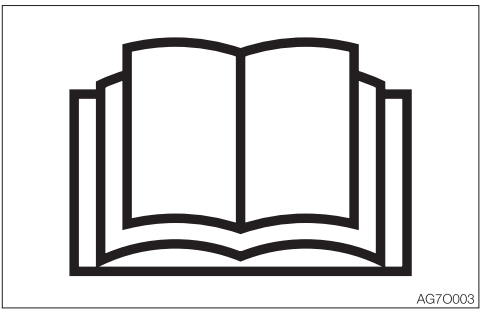
This symbol represents the safety alert. The message that follows the symbol contains important information about safety.
Read and understand the message to avoid personal injury or death.

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

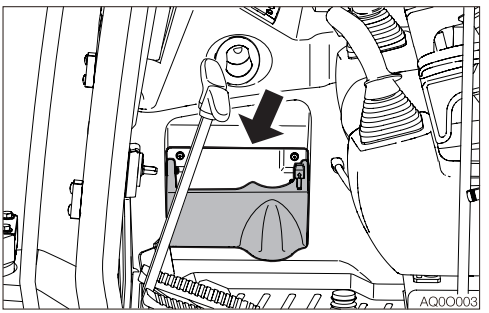
FOREWORD

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.

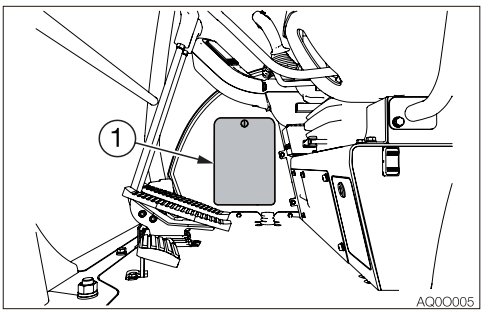
MANUAL STORAGE COMPARTMENT

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

Cabine



Canopy

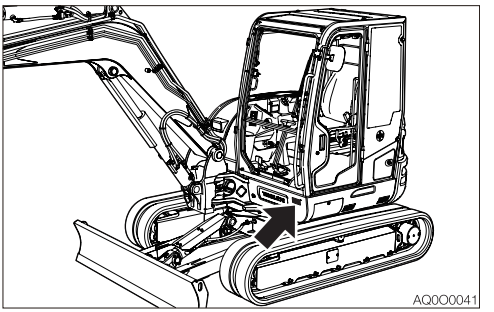


1. Insert the ignition key and turn it counterclockwise to open the cover (1).
2. After using the manual, place it in the plastic pouch and store it back in the manual storage compartment.

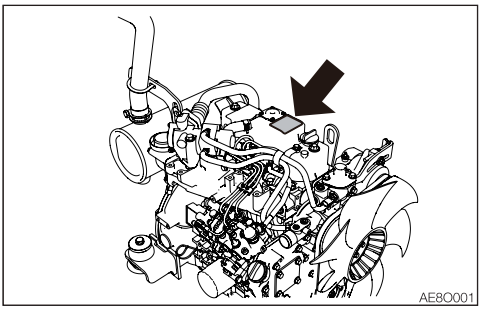
SERIAL NUMBERS

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:

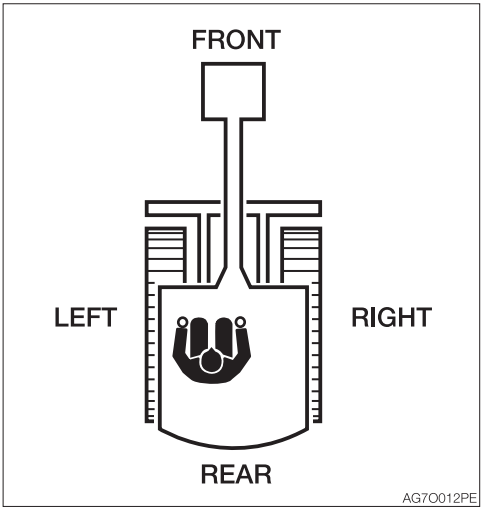


Engine number:



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

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.
⃠, ✕ ..... 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

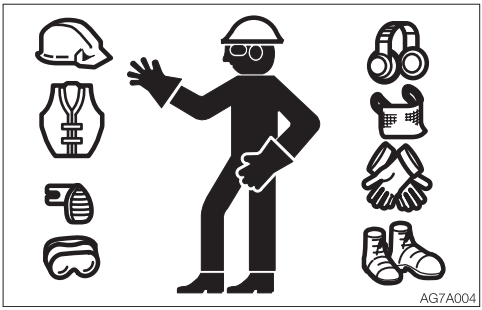
If any problem (noise, vibration, smell, disorder of instrument, smoke, oil leak, wrong indication of alarm or unusual indication in the instrument cluster, etc.) is detected during the operation or inspection and maintenance of the machine, immediately inform your sales or service dealer and take proper 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.

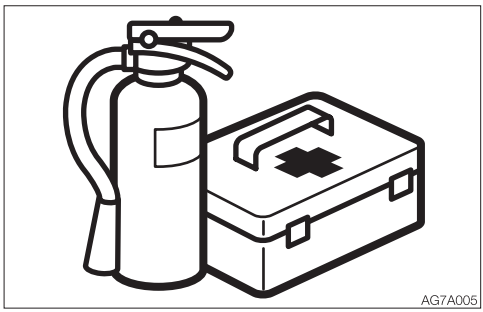
- Do not operate the machine if the ambient temperature is higher than +45°C (+113°F) or lower than –15°C (+5°F).
  - If operated at an ambient temperature of higher than +45°C (+113°F), the engine may overheat and cause the engine oil to degrade. Also, the hydraulic oil may become very hot, causing damage to the hydraulic equipment.
  - 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.

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.

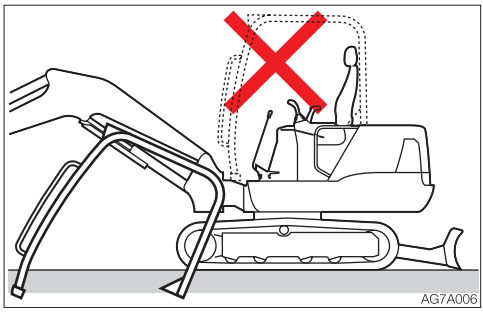
Install a fire extinguisher and first aid kit



Be prepared for fire and accidents

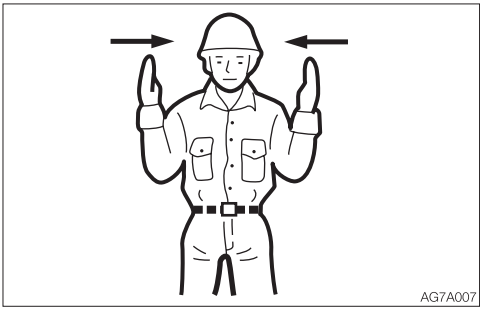
- Install an extinguisher and a first aid kit, and learn how to use them.
- Lean how to fight a fire and how to deal with accidents.
- Know how to contact emergency assistance and make a list of emergency contacts.

Never remove safety equipment



- Make sure all protective guards, covers 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.

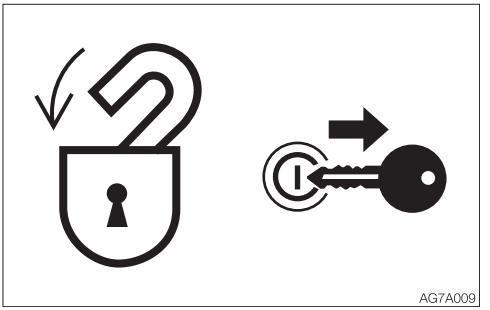
Use a signal person and a flag person



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.
- 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.

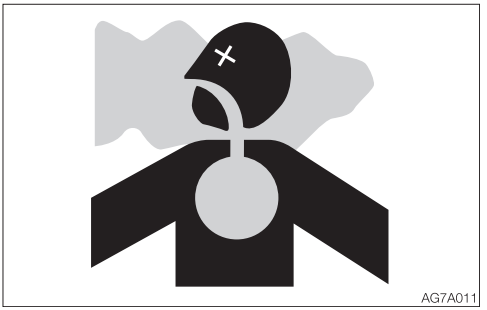
Avoid fire and explosion hazards



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

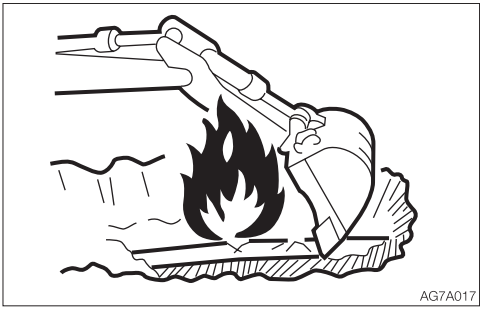
Unauthorized modifications to this machine can cause injury or death. Never make unauthorized modifications to any part of this machine.

PRECAUTIONS WHEN PREPARING

Know the work area

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

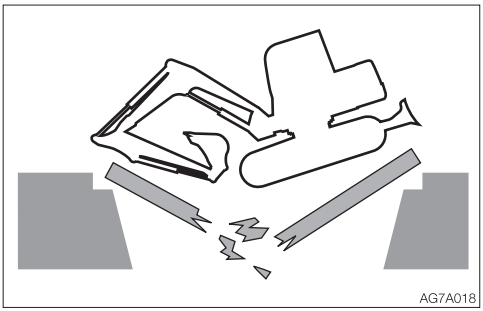
- Inspect the topography and ground condition of the working area, or the structure of the building when working indoors, and take the safety precautions as necessary.
- Be sure to avoid all hazards and obstructions such as ditches, underground lines, trees, cliffs, overhead electrical wires, or places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



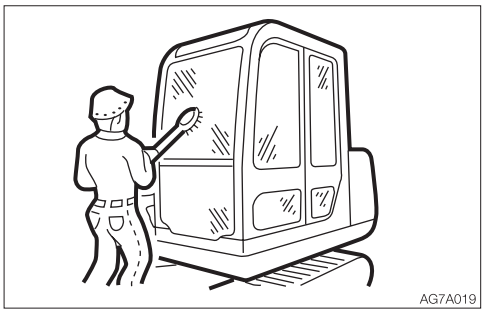
- Check with the administrator for the locations of buried gas pipes, water pipes and power cables. If necessary, determine what specific precautions must be taken to insure safety by consulting with the administrator.
- When working on roads, be sure to consider the safety of pedestrians and vehicles.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

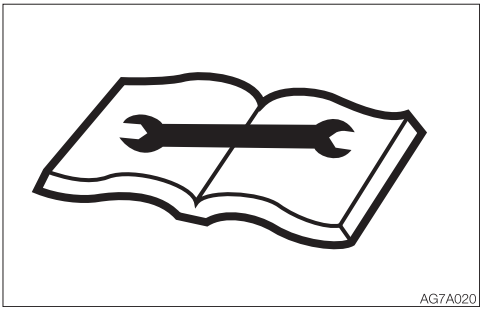


Always keep the machine clean



- 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.

Perform inspection and maintenance every day



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

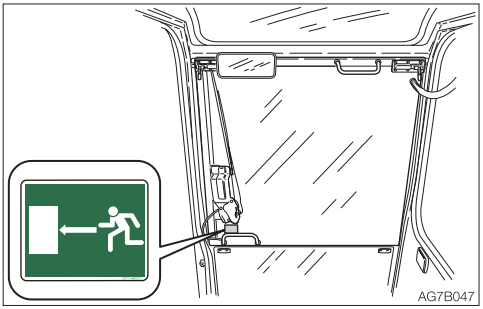
- Before operating, perform the specified inspection and make prompt repairs where necessary.
- If a failure occurs and the operation becomes impossible or the engine fails, immediately stop the machine by following the shutdown procedure, and keep machine securely parked until the malfunction is corrected.

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 explore.

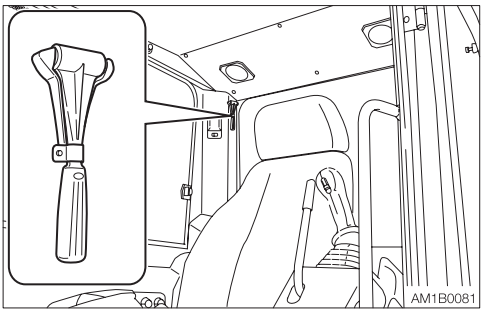
Emergency exit

Front window (excluding machines with a front guard)



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

Emergency hammer (optional)



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

- When breaking the window pane with a hammer, take great care not to injure yourself with the broken glass pieces.
- Remove the glass pieces from the window sill so as not to cut yourself when evacuating. Broken glass will fall from the window, so be careful of your footing and do not slip on the glass.

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.

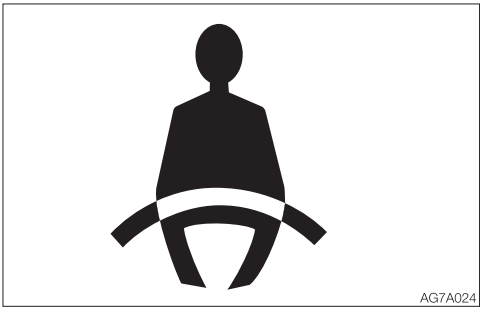
- Walk around the machine and warn the person who is servicing the machine or is walking near the machine. Do not start the machine until you are certain that no one is around the machine.



- 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.

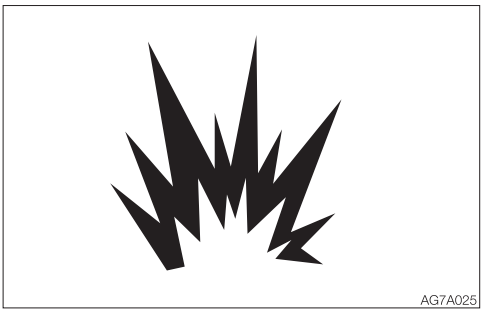
Sit in the operator’s seat and start the engine

- 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.

Starting with jumper cables



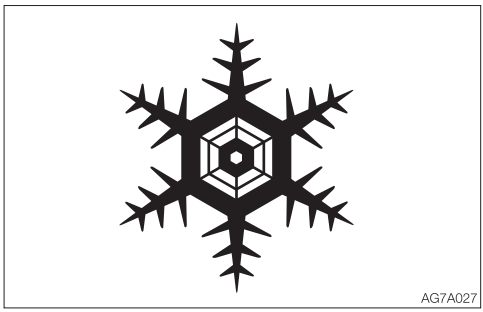
Use jumper cables only in the recommended manner. Improper use of jumper cables can result in battery explosion or unexpected machine motion.
Refer to “If the battery goes dead” for further instructions.

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.

PRECAUTIONS WHEN OPERATING

Ensure good visibility

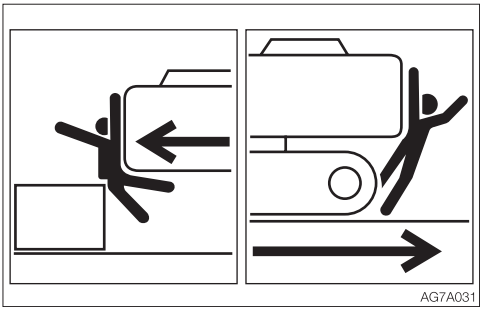
- When working in dark places, turn on the machine's working lights and headlights and additional lighting equipment installed, as necessary.
- When visibility is poor due to bad weather (fog, snow, rain or a cloud of dust), stop operating the machine and wait until visibility improves.

Do not permit riders on the machine



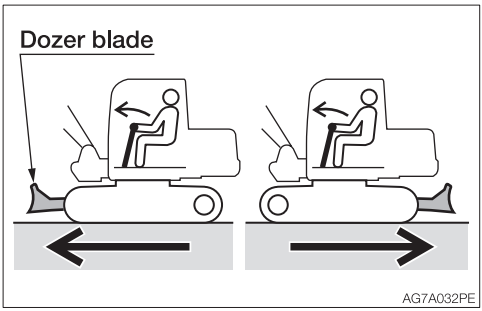
Do not allow anyone to ride on any part of the machine at any time while traveling or operating.

Check if the work area is safe and secure before operation



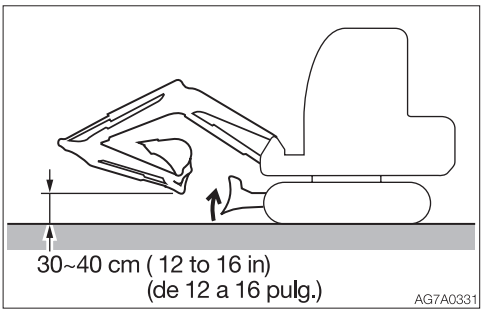
- Confirm the performance limits of the machine.
- Use a signal person at road shoulders, narrow places or where your vision is obstructed.
- Never allow anyone to enter the machine's slewing radius and path.
- Signal your intention to move by sounding the horn.
- There is a blind spot in the rear of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

Check the position of the undercarriage (tracks) before traveling

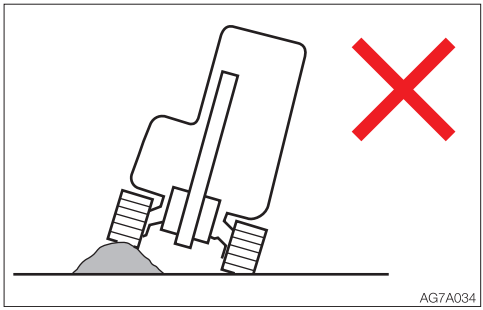


Before operating the travel levers/pedals, make sure that the dozer blade is to the front of the operator's seat. Remember that when the dozer blade is to the rear of the operator's seat, the travel levers/pedals must be operated in the reverse direction from when it is to the front.

Travel safely



- Travel with the dozer blade raised, the hoe attachment folded as shown on the figure above, and the bucket raised 30 to 40 cm (12 to 16 in.) above the ground.
- Do not slew while traveling. If you must operate the hoe attachment while traveling, operate at speeds slow enough so you have complete control at all times.
- When a load greater than a set value is applied during traveling in 2nd (high) speed, the speed will automatically slow down to 1st (low) speed. When the load becomes lighter, the speed will increase and return to 2nd (high) speed. It should be noted that the travel speed changes depending on the load condition (for machines with the automatic travel shift-down system).
- When traveling on the uneven road or sharp slope, turn off the deceleration switch and the auto-deceleration switch. If the machine is operated on such roads with these switches turned on, the engine speed may increase, causing the machine to travel unexpectedly rapidly (for machines with the deceleration and auto-deceleration switches).

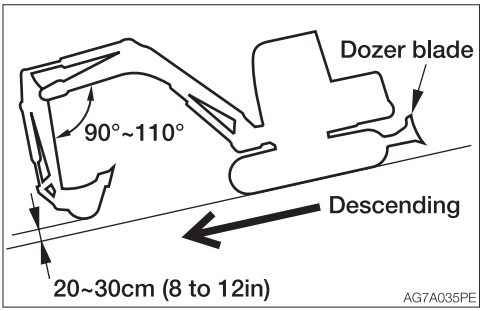


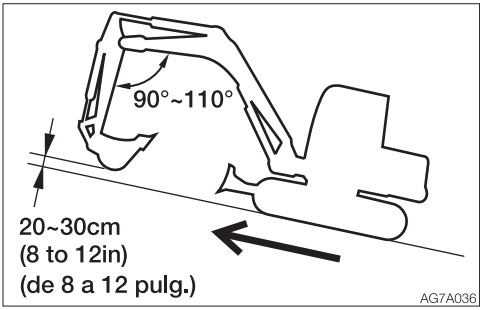
- Avoid crossing over obstacles whenever possible. If you must do so, keep the hoe attachment close to the ground level and travel slowly. Never cross obstacles which will tilt the machine to an angle of 10° or greater.
- On uneven ground, maintain the low speed and avoid starting, stopping or changing directions abruptly. 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.

Cautions on traveling on slopes

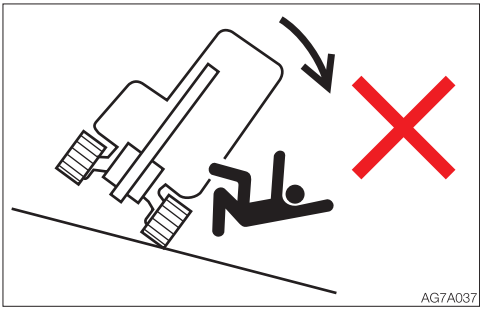
When traveling on slopes or grades, be careful that the machine does not tip (roll) over or slide.

- 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 climbing a hill, keep the operator's seat facing the hillside. When descending a hill, keep the operator's seat facing the downhill direction. In either case, travel must be done while paying attention to the ground in front of the machine.
- When traveling on slopes, lower the bucket to a height of 20 to 30 cm (8 to 12 in.) above the ground. When climbing a steep slope, extend the hoe attachment to the front. In emergencies, lower the bucket to the ground and stop the machine.
- When traveling on slopes or grades, drive slowly in 1st (low) speed. When descending a slope, slow down the engine speed.
- Do not descend slopes in reverse.

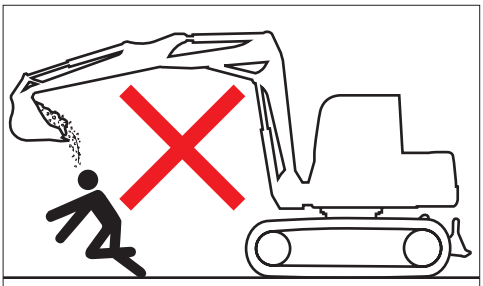


- Do not change directions on slopes or traverse slopes. First return to a flat surface, and then take an alternative path.
- The machine may slip sideways even on a slight slope if the ground is covered with grass or dead leaves, or when traveling on a wet metal plate or frozen surfaces. Make sure the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

Operate the machine on snow or ice with extra care

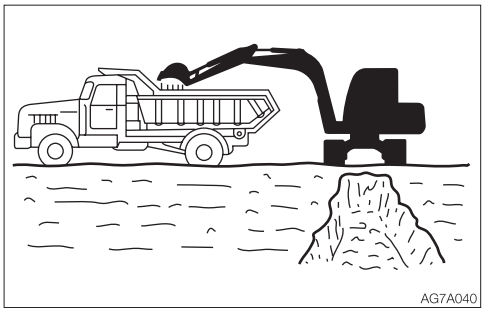
- When traveling on snow or on frozen surfaces, drive at a low speed and avoid starting, stopping or changing directions abruptly.
- In the snowy area, the road shoulder and objects placed beside the road are buried in the snow and cannot be seen. There is a hazard of the machine tipping over or hitting 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 dozer blade.

Do not move the bucket over the heads of people



Moving the bucket over the heads of people entails the danger of the load spilling or the sudden dropping of the bucket.

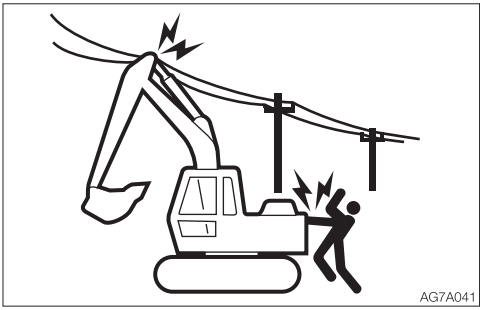
Ensure driver's safety when loading



Do not load a truck unless the truck driver is in a safe place.

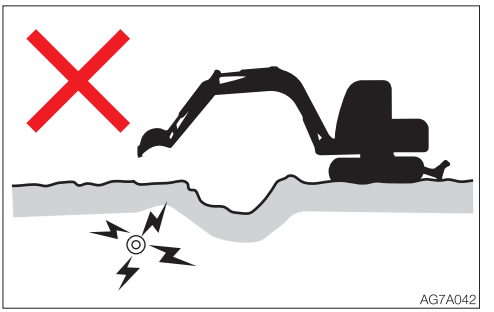
- Never swing or position the bucket over a person or the cab room.
- Load the truck from the rear.

Keep a safe distance from the overhead high-voltage cables



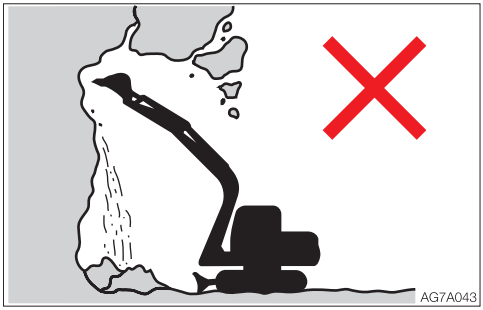
Never bring any part of the machine or loaded material to near to the high voltage cables unless all safety precautions required by the local and national authorities have been installed. If a person comes near to the machine that is discharging sparks or located near to or in contact with the power source, there is a hazard of electric shock and death.

- Always maintain a safe distance between the machine and the high-voltage electric cable.
- Check with the local power company about safe operating procedure before starting operations.
- Consider all cables to be high-voltage cables and treat all cables as energized even though it is known or believed that the power is shut off and the cables are visibly grounded.
- Use a signal person to give warning if the machine approaches too close to the high-voltage electric cables.
- Caution all personnel in the work area not to come close to the machine or the loaded material.

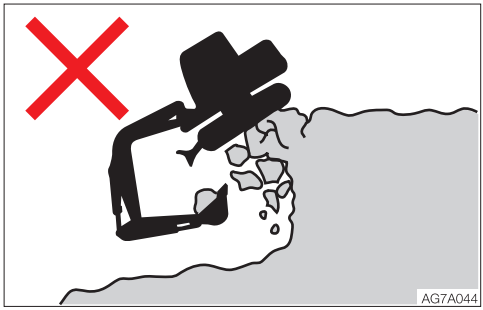


- Pay also careful attention to the high-voltage electric cables buried underground.

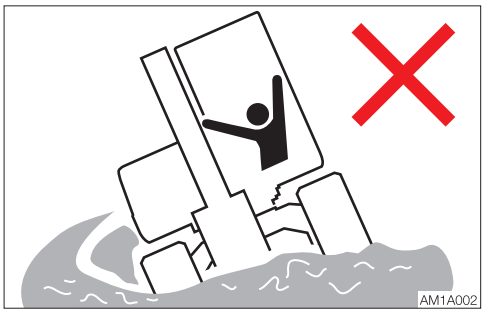
Watch out for hazardous working conditions



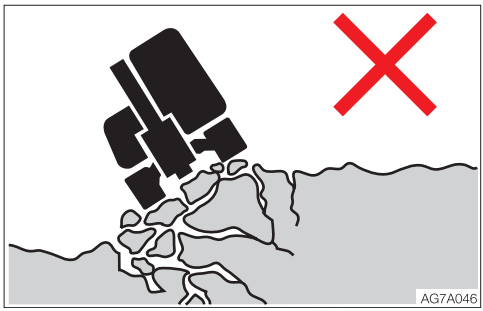
- Never undercut a high bank. Doing so is dangerous as it may cause ground collapse.
- Do not operate in places where there is a danger of falling rocks.



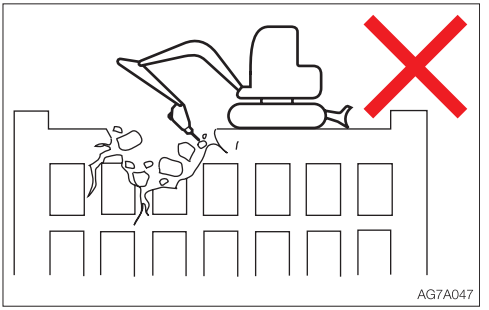
- Maintain a safe distance between the machine and the edge of the digging site. Do not dig the ground under the front of the machine.
- When working close to the cliffs or road shoulders, to make it easier to escape if there is any problem, set the crawlers at right angles to the cliff or road shoulder and the dozer blade to the front when carrying out operations.



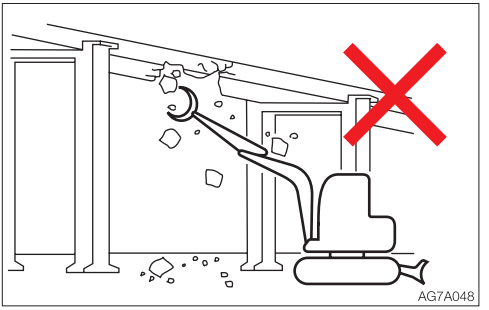
- Do not enter areas where there is soft ground. Doing so could cause the machine to tilt under its own weight, resulting in a machine tipping over or sinking into the ground.



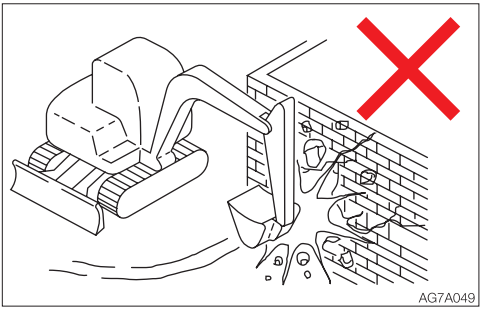
- Do not come close to unstable grounds (cliffs, road shoulders, deep ditches). If the ground should collapse under the weight or vibration of the machine, there is a hazard that the machine may fall or tip over.
  - Remember that the soil after heavy rain or blasting is weak.
  - The ground of top of the embankment and of the circumferences of the excavated ditches are also weak.



- Do not perform demolition work under the machine. There is a hazard that the machine may fall down, because the ground becomes unstable.
- When working on or from the top of buildings or other structures, check the strength and the structure before starting operations. If a building or structure collapses, serious injury or damage will result.



- When doing demolition work, do not perform demolition above your head. There is a hazard of broken parts falling or of the building collapsing and causing serious injury or damage.



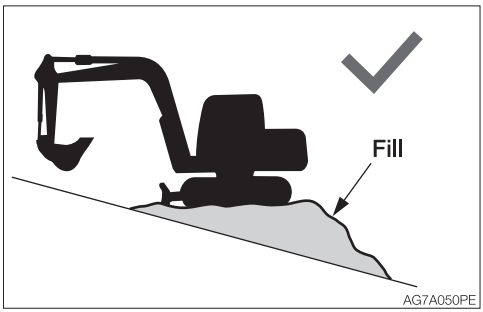
- Do not use the impact force of the hoe attachment for breaking work. There is a hazard of serious injury being caused by flying pieces of broken materials and by the damaged hoe attachment.

Be careful with flying objects

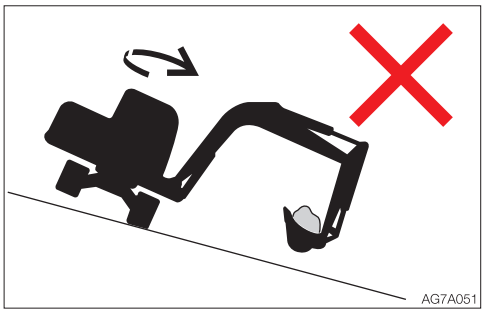
This machine is not equipped with protective equipment to protect the operator from flying objects. Do not use this machine in places where there are risks of the operator being hit by flying objects.

Operating on slopes is dangerous

When operating on slopes or grades, slewing or operation of working equipment may cause the machine to lose stability and tip over. Avoid operating on slopes whenever possible.

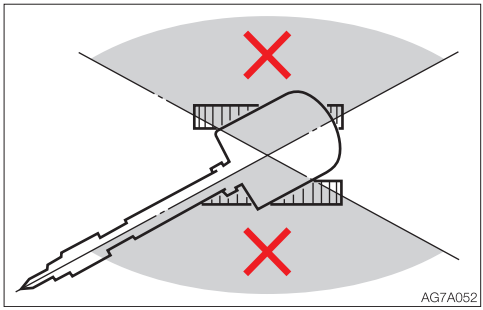


- Level off the work area.



- Avoid slewing to the downhill direction with the bucket full of loaded material. This will reduce the stability of the machine and may result in tipping over.

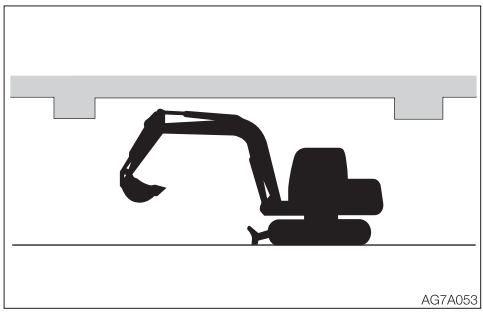
Never slew (swing) sideways with a heavy load



The machine can tip over more easily in the lateral direction than in the longitudinal direction.

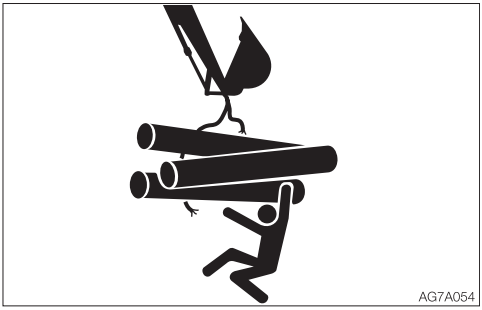
- Do not slew (swing) sideways with a heavy load at the tip of the hoe attachment. In particular, do not slew (swing) sideways on slopes.
- The tip of the attachment is heavier for machines equipped with breakers, crushers or long arms than for machines equipped with the standard bucket. For such machines with heavier tips, do not perform excavation with the digging arm (boom) facing the downhill direction or operate toward sideways.

Be careful with the overhead objects



When operating under bridges, in tunnels, near electric cables or indoors, be careful not to let the boom or arm hit overhead objects.

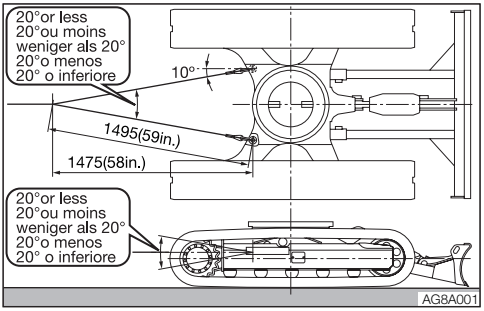
Excavators are not designed for lifting loads



This machine is specifically designed for excavation work. Therefore, it has no safety equipment for crane operation. Extreme caution should be paid if the excavator is used for lifting.

- Never lift loads in excess of capacity. Overload will cause the machine to roll and can result in serious injury or death.
- All rated lift capacities are determined by using a machine placed on a stable and flat ground. For a safe lifting work, the user is expected to make due allowance for the particular job conditions. They include, soft or uneven ground, non-level condition, side loads, dynamic or jerked loads, hazardous conditions, and experience of personnel. The operator and other personnel should fully acquaint themselves with the operator's manual before operating this machine, and rules for safe operation of equipment shall be adhered to at all times.
- The bucket linkage or lifting device may fail if chains or lifting device are incorrectly attached, resulting in serious injury or death.
- Do not attempt to pull stumps out of the ground when using the machine as a crane. The loads imposed on the machine under this use are completely unknown.
- Do not allow anyone to stand on or under the lifted loads or come close to the work area.

Cautions when towing

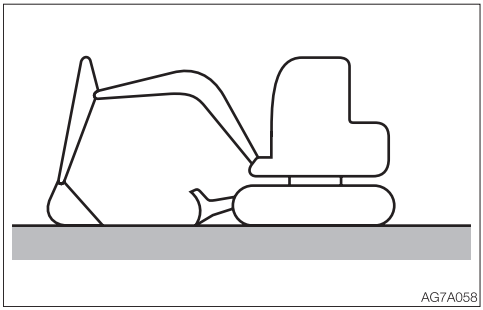


When towing, serious injury or death could result, if performed incorrectly or the wire rope being used is inappropriate or not properly inspected.

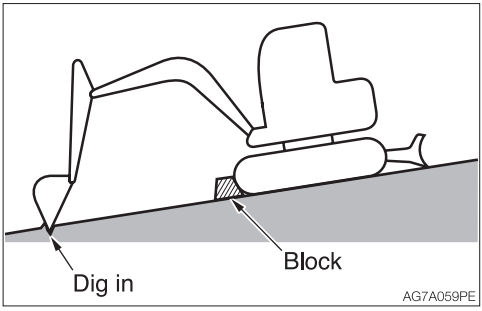
- Do not tow using only a towing hole on one side.
- It becomes dangerous if the wire rope breaks or becomes disengaged. Use a wire rope appropriate for the required tractive force.
- Do not use a wire rope that is kinked, twisted or otherwise damaged.
- Do not apply heavy loads abruptly to the wire rope.
- Wear safety gloves when handling the wire rope.
- Make sure there is an operator on the machine being towed as well as on the machine that is towing.
- Never tow on slopes.
- Do not let anyone come near to the wire rope while towing.
  Refer to "Towing" for further instructions.

PRECAUTIONS WHEN STOPPING

Park safely

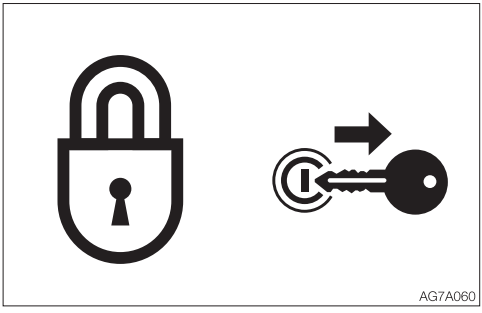


- Park the machine on a flat, rigid and safe ground. Set the parking brake.



If you must park on a slope or incline, park the machine securely and block the movement of the machine.

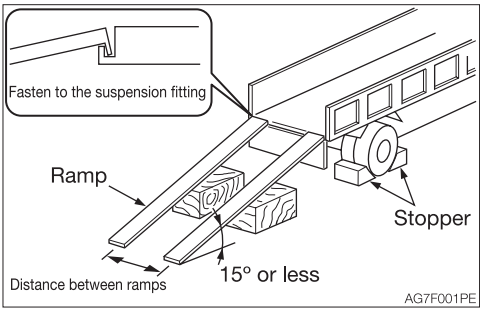
- When parking on a street, use barriers, caution signs, lights, etc., so that the machine can easily be seen even at night to avoid collision with other vehicles.



- Before leaving the machine, do the followings:
  1. Lower the bucket and the dozer blade to the ground.
  2. Raise the safety lock lever to the locked position.
  3. Stop the engine and remove the starter key.
  4. Lock the cab and covers and take the key with you.

PRECAUTIONS WHEN TRANSPORTING

Load/unload the machine safely



The machine may roll or tip over or fall while being loaded or unloaded. Take the following precautions:

- Select a firm, level surface and keep sufficient distance from road shoulders.
- Secure the ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°. If the rumps are bowed down too low, support them with poles or blocks.
- Never use the working equipment to load or unload the machine. Doing so may result in tipping over or falling down of the machine.
- Keep the truck bed and loading ramps clean of oil, soil, ice, snow, and other materials to prevent the machine from sliding sideways. Clean the crawlers.
- Chock the transporter wheels to prevent movement.
- Turn off the deceleration switch and auto-deceleration switch. Otherwise, the engine speed may suddenly increase to cause troubles.
- When being loaded or unloaded, travel slowly in 1st (low) gear by following the signal from the signal person.
- Never change courses on the ramps.
- Do not slew/swing on the ramps. The machine may tip over.
- When slewing/swinging on the truck bed, do it slowly as the footing should be unstable.
- Lock the cab door after being loaded, if applicable. Otherwise, the door may open during transport.
- Chock the tracks and secure the machine to the truck bed with wire rope or chain.

Hoist the machine safely

- Know and use correct crane signals.
- Check the hoisting equipment for damaged or missing parts on a daily basis and replace as necessary.
- When hoisting, use a wire rope capable of lifting the machine mass.
- Hoist the machine in such a manner described in the procedure below. Do not do it in any other manner, as it may result in the machine losing its balance.
  Refer to “Hoisting the machine” for further instructions.
- Do not hoist the machine with an operator on it.
- When hoisting, hoist slowly so that the machine does not tip.
- Keep everyone out of the area when hoisting. Do not move the machine over the heads of the persons.

Transport the machine safely

- Know and follow the applicable safety rules, vehicle code and traffic laws when transporting the machine.
- Select the best transport route by considering the length, width, height and weight of the truck with the machine loaded on it.
- Never abruptly start or stop or run at a high speed at the sharp curves during transport. Doing so will move or lose the balance of the loaded machine.

PRECAUTIONS ON MAINTENANCE

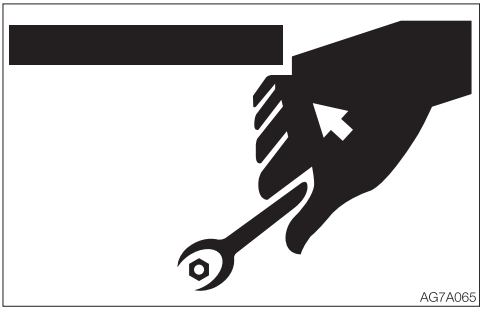
Display a “DO NOT OPERATE” alert sign

Severe injury could result if an unauthorized person should start the engine or touch controls during inspection or maintenance.
- Before performing maintenance, stop the engine, remove the key and take it with you.



- Display a “DO NOT OPERATE” alert sign on easy-to-see locations such as on the starter switch or on control levers.

Use the correct tools



Do not use damaged or weakened tools or tools designed for other purposes. Use tools appropriate for the work involved.

Replace safety-critical parts periodically

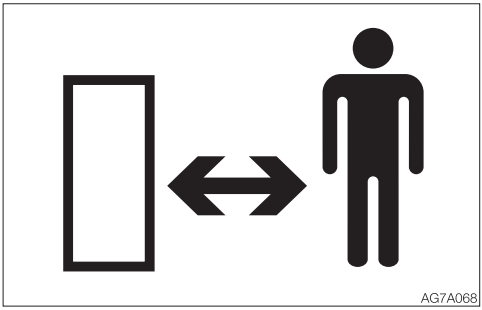
- Replace fuel hoses periodically. Fuel hoses wear out over time, even if they do not show any symptom of wear.
- Regardless of the replacement schedule, replace immediately if a symptom of wear is found.
  Refer to “List of safety-critical parts” for further details.

Explosionproof lighting



To prevent an ignition or explosion, use explosion-proof lights when inspecting fuel, oil, coolant or battery fluid. Otherwise, explosion could result causing serious injury or death.

Prohibit access by unauthorized persons

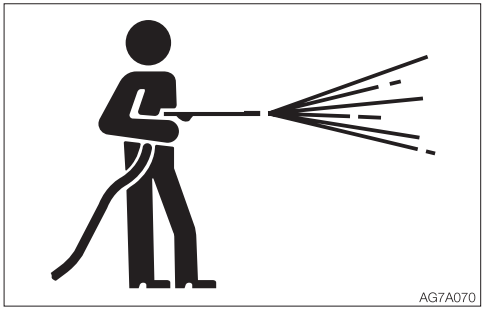


Do not allow unauthorized personnel in the work area while working. Be careful when grinding, welding or using a hammer. You could be injured by flying debris from the machine.

Prepare work area

- Select a firm, level work area. Make sure there is adequate light and, if indoors, ventilation.
- Clear obstacles and dangerous objects. Eliminate slippery areas.

Always keep the machine clean

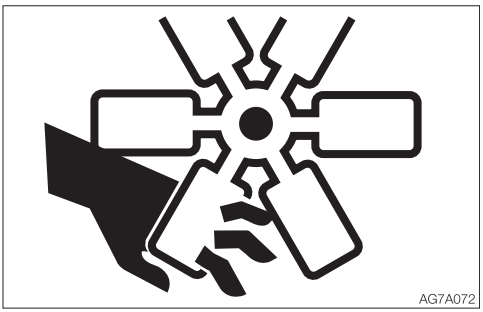


- Clean the machine before performing maintenance.
- Stop the engine before washing the machine. Cover the electrical parts so that water cannot enter. Water on electrical parts could cause short-circuits or malfunctions. Do not use water or steam to wash the battery, electronic control components, sensors, connectors or the operator's compartment.

Stop the engine before performing maintenance

- Avoid lubrication or mechanical adjustments while the machine is moving or while the engine is running when the machine is not moving.
- If maintenance must be performed with the engine running, always work as a two person team communicating each other.
  - One person must sit in the operator's seat so that he/she can immediately stop the engine when necessary. He/she must take care not to touch the lever or pedal unless necessary.
  - The one who performs maintenance must make sure to keep his/her body or clothing away from the moving part of the machine.

Stay clear of the moving parts



- Stay clear of all rotating and moving parts. If a hand or tool becomes trapped in the rotating or moving part, serious injury or death could result.
- If a tool or other objects is dropped or inserted in the fan or fan belt, it will be flown or cut in pieces. Do not drop or insert anything in the fan or fan belt.

Firmly secure the machine or any component that may fall



- Before performing maintenance or repairs under the machine, lower all moveable working equipment to the ground or in the lowermost position.
- Chock the tracks.
- If you must work beneath the raised machine or equipment, always use wood blocks, jack-stands or other rigid and stable supports. Never get under the machine or working equipment if they are not sufficiently supported. This procedure is especially important when working on hydraulic cylinders.

Secure the working equipment

To prevent unexpected movement, firmly secure the working equipment when repairing or replacing the bucket teeth or side cutter.

Secure the engine hood or cover when opened

Be sure to secure the engine hood or cover before working the inside. Do not keep the hood or cover open on a windy day or if the machine is parked on a slope.

Place heavy objects in a stable position



When it is necessary to temporally place a heavy object or an attachment on the ground during removal or installation, be sure to place it in a stable position. Keep off unauthorized persons from the storage place for such object.

Cautions when refueling



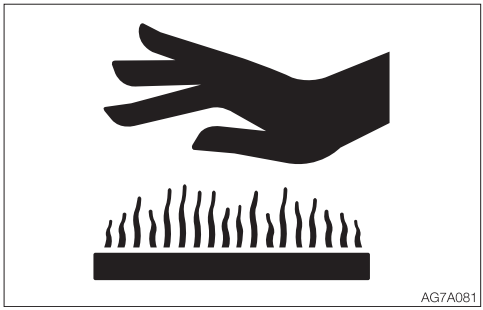
- Do not smoke or permit open flames while fueling or near fueling operations.
- Never remove the fuel cap or add fuel when the engine is running or still hot. Do not spill fuel on the hot surface of the machine.
- Fill the fuel tank in a well ventilated place.
- Do not fill the fuel tank to capacity. Allow room for oil expansion.
- Clean up spilled fuel immediately.
- Securely tighten the fuel filler cap. If the fuel cap is lost, replace it only with the genuine cap. Use of a non-approved cap without proper venting may result in pressurization of the tank.
- Never use fuel for cleaning.
- Use the correct grade of fuel for the operating season.

Handling of hoses

Oil leak or fuel leak can cause a fire.

- Do not twist, bend or hit the hoses.
- Never use twisted, bent or cracked pipes, tubes or hoses; otherwise, they may burst.
- Retighten loose connection.

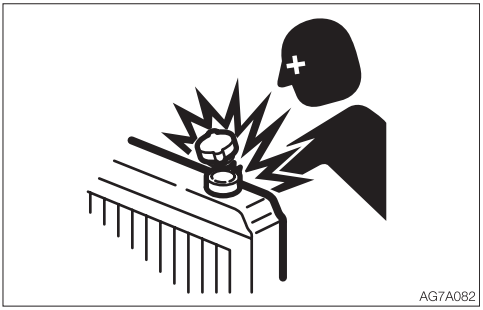
Be careful with hot and pressurized components



Stop the engine and allow the machine to cool down before performing maintenance.

- The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- The engine coolant, hydraulic oil and other oils are also hot and under high pressure. Be careful not to touch the hydraulic oil when loosening the cap or plug. Working on the machine under these conditions could result in burns or injuries due to the hot oil spurting out.
- The DPF and the exhaust gas emitted from the exhaust line can be very hot while the engine is running or the regeneration is under way, as well as immediately after the engine is stopped. Be careful not to accidentally touch them; doing so could cause burns.

Be careful with hot cooling systems

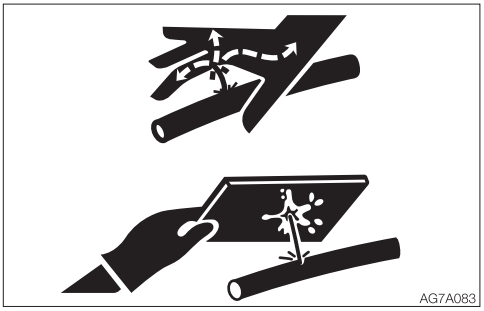


Do not remove the radiator cap or the drain plug when the cooling water is hot. Stop the engine and wait until the engine and the cooling water cool. Then, slowly loosen the radiator cap to release the internal pressure and remove it.

Be careful with oil internal pressure

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

- Completely relieve the internal pressure before performing maintenance work.



- The hydraulic oil is high enough pressure to penetrate the skin or eyes and cause serious injury, blindness or death. Remember that the hydraulic oil escaping from a small hole is almost invisible. When checking for leaks, wear protective goggle and thick gloves, and use a paperboard or plywood to keep your skin from oil spurting.
  If oil penetrates the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury.

Release pressure before working on the hydraulic system

Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.

- Immediately after the engine is stopped, and while the safety lock lever is still in the unlock position, turn the starter switch to ON and move all the control levers and pedals several times all the way in each direction to release the pressure from the working equipment circuitry.
- Press the air breather button to relieve the internal pressure from the tank.
- When removing plugs or screws, or when disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.
- Oil or plug may spurt out according to the pressure in the travel motor case. Loosen the plug slowly and release the internal pressure.

Be careful with debris when the hammer is being used

When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious injury.

- If hard metal parts such as pins, bucket teeth, side cutter or bearings are hit with a hammer, wear protective gear such as safety goggles and gloves.
- When hitting pins or bucket teeth, always check that there is no one in the surrounding area.

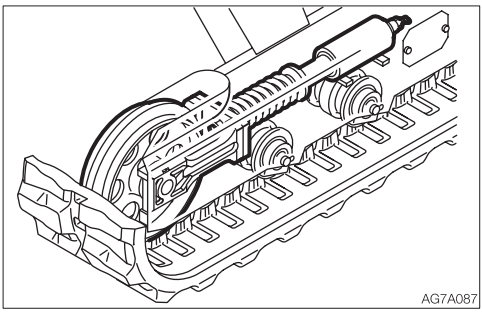
Be careful with the high-pressure grease



In the track adjuster, the grease has been injected under high pressure. If the tension is adjusted without following the prescribed procedure, the grease discharge valve may fly off, resulting in injury.

- Never loosen the grease fitting.
- Loosen the grease discharge valve slowly. Do not turn it more than one turn.
- Do not put your face, arms, legs or body in front of the grease discharge valve.
- If grease does not come out when the grease discharge valve is loosened, the valve is faulty. Ask a Takeuchi service agent for repair.

Never disassemble the track adjuster



There is a very strong spring contained in the track adjuster. If the track adjuster is accidentally disassembled, the spring can pop out, resulting in serious injury Never disassemble the track adjuster.

Cautions when servicing the air conditioner

If the refrigerant comes in contact with eyes, it damages your eyesight. If the refrigerant comes in contact with skin, it may cause frostbite. Never touch the refrigerant.

Handling of the accumulator



Be sure to handle the high-pressure nitrogen gas enclosed in the accumulator with care. If handled incorrectly, it could explode and cause serious injury. Strictly observe the following precautions:

- Do not disassemble.
- Do not allow flame near or throw it into a fire.
- Do not drill, weld or fuse.
- Do not subject it to physical shock such as hitting, rolling or dropping.
- Before disposing of the unit, the sealed gas must be drained. Contact a Takeuchi service agent for help.

Disconnect the battery wiring



Disconnect the battery wiring before working on the electrical system or doing electric welding. Disconnect the negative (–) battery cable first. When reconnecting, connect the negative (–) battery cable last.

Use caution when handling batteries

- Batteries contain sulfuric acid which will damage the eyes or skin in case of contact.
  - · If eye contact occurs, flush immediately with clean water and get prompt medical attention.
  - · If accidentally swallowed, drink large quantities of water or milk and call a physician immediately.
  - · If acid contacts skin or clothing, wash off immediately with a lot of water.
- Wear protective goggle and gloves when working with batteries.
- Batteries generate flammable hydrogen gas which may explode. Keep away from flame, sparks, fire or lighted cigarettes.
- When checking the level of the battery fluid, use a flashlight.
- Be sure to stop the engine by turning off the starter switch before inspecting or handling the battery.
- Be careful not to let metal tools or any metal objects come into contact with the battery terminals and cause a short circuit.
- Loose battery terminals may result in sparks. Be sure to fasten terminals tightly.
- Make sure the battery caps are tightened securely.
- Do not charge a battery or jump-start the engine if the battery is frozen; otherwise it may explode. Warm the frozen battery to 15°C (60°F) before use.
- Do not use or charge the battery when the battery indicator is white. The battery is at its end of life. Immediately replace the battery.
- Do not tilt the battery. Doing so could cause the battery fluid to leak out of the exhaust hole. If contacted, it may cause skin irritation or the machine part corrosion.
- Use a dampened cloth to clean the battery indicator and check the fluid level. Do not clean with a dry cloth; it can cause static electricity to build up, resulting in ignition or explosion.

Periodically replace the safety-critical parts

- To use the machine safely for a longer period, periodically add oil and perform inspection and maintenance. To improving the safely, replace the safety-critical parts like hoses and seat belts periodically. Refer to “Safety-critical parts to be replaced periodically” for further details.
- The “Safety-critical parts to be replaced periodically” are the parts which deteriorate, wear and fatigue after repeated use and whose properties change over time. While these characters of these parts could cause serious physical or personal damage, judging the remaining life of these part are difficult from external inspection or the feeling when operating.
- Replace the “Safety-critical parts to be replaced periodically” if any defect is found from external inspection, even when they have not reached the time specified interval.

Jump starting with booster cables

- When starting the engine using the booster cables, be sure to connect the cables in the proper order described below. Wrongly connected cables can result in sparking and battery explosion.
  - Do not allow the “machine in trouble” and “rescue machine” to touch each other.
  - Do not allow the positive (+) and negative (–) clips of the booster cables to touch each other or to come in contact with the machine.
  - When connecting, attach the positive booster cable to the positive (+) terminals first. When disconnecting, remove the negative cable from the negative (–) terminal (ground) first.
  - Be sure to connect the clips securely.
  - Connect the last clip of the booster cable to a point as far away from the battery as possible.
- Always wear the protective goggle and gloves when starting the engine by using the booster cables.
- Use the booster cables and clips of a size suited to the capacity of battery. Do not use damaged or corroded booster cables and clips.
- Be sure that the battery of the “rescue machine” has the same capacity as the battery of the “machine in trouble”.

Have a Takeuchi service agent repair welding

If welding must be performed, make sure that it is done by a qualified person in a properly equipped workplace. To prevent any part from breaking down or being damaged due to overcurrent or sparks, observe the following.

- Disconnect the wiring from the battery before doing electric welding.
- Do not continuously apply 200 V or more.
- The earth ground must be connected within one meter from the welding section. Do not connect the earth ground near to an electronically controlled device/ instrument or connectors.
- Make sure that there are no seals or bearings between the welding section and the earth ground.
- Do not connect the earth ground around the pins for the working equipment or hydraulic cylinders.
- When welding is to be done on the machine body, disconnect the connectors for the electronically controlled devices before working.

Vibrations operators are subject to

According to the results of the tests conducted to determine the vibrations transmitted to the operator by the machine, the upper limbs are subjected to vibrations lower than 2.5 m/s^2 (8.2 ft/s^2) while the seated part of the body is subjected to vibrations lower than 0.5 m/s^2 (1.64 ft/s^2).

Checks after maintenance

- Gradually increase the engine speed from a low idle to maximum speed and check that there is no oil or water leaking from the serviced parts.
- Operate each control lever and check that the machine is operating properly.

Disposing of wastes



- Always collect oil that is drained from the machine in containers. Improperly disposed waste oil can cause environmental harm.
- Follow appropriate laws and regulations when disposing of harmful objects such as oil, fuel, coolant, solvent, filters and batteries.

Handling of poisonous chemicals

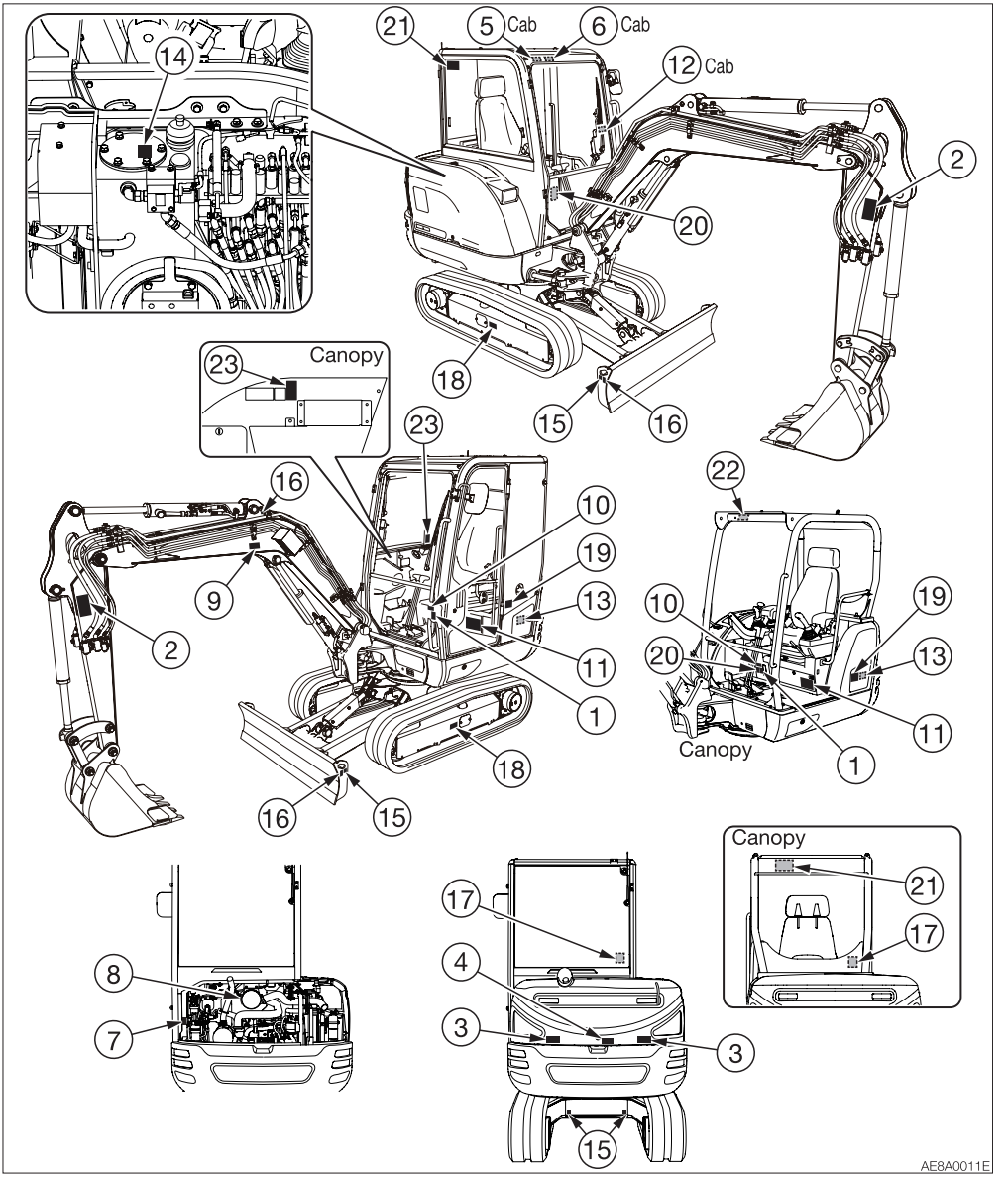
Poisonous chemicals will cause serious injury if directly contacted.
Poisonous chemistry used in this machine includes grease, battery solution, coolant, paint and adhesive agent.
Handle the poisonous chemicals properly with care.

SAFETY SIGNS (DECALS)

For the safety of the operator and the personnel working around the site, safety signs (decals) are placed at certain locations on the machine as shown below. Walk around the machine with this manual, and check the content and location of these safety signs. Review these signs and the operating instructions in this manual with your machine operators.

- Keep the signs clean and legible. If any of the safety labels is peeling or damaged and becomes difficult to read, replenish it with a new one. Please include your product serial number when ordering a new sign from the Takeuchi service agent.
- When a part/unit to which a safety sign is attached is replenished, a new sign must be attached to the new part/unit.

SAFETY SIGNS (DECALS)



1. No.08810-31556
Warning
Read and understand this manual before performing any operation, inspection or maintenance on this machine.



2. No.05793-00049
Safety Distance
Hazard of being hit by the working device of the machine.
Keep away from machine during operation.



3. No.00085-01011
Safety Distance
Do not get near or stand within the machine working area.



4. No.03793-66006
Hazard of rotating parts
Turn off before inspection and maintenance.



5. No.08810-31557
Hazard from falling window
After raising window, be sure to lock it in place with lock pins.



6. No.05793-00045
Hazard at lifting or lowering window
When the front window is opened or closed, it will come close to the head. Be careful that the window does not strike the head.



7. No.05793-03630
Sign indicates a burn hazard from touching heated parts, such as engine, pump, or muffler during or right after operation.
Never touch when hot.



AG8A003E

8. No.03393-75040



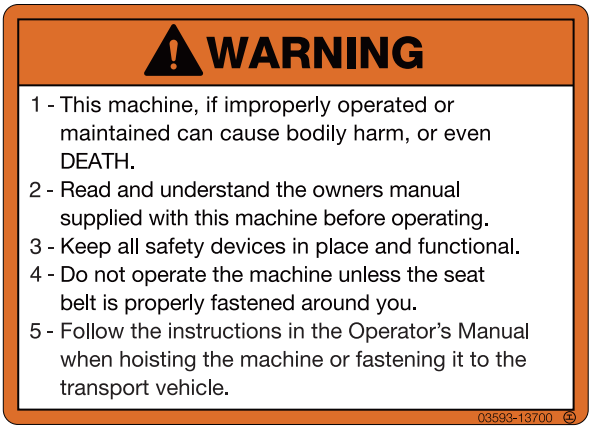
9. No.03593-47010 (if equipped)



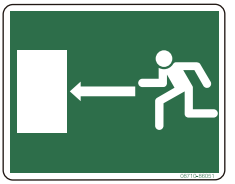
10. No.03593-47020



11. No.03593-13700



12. No.08710-86051
Position of Emergency Exit



13. No.03593-06600
Diesel fuel



14. No.03593-06700
Hydraulic oil



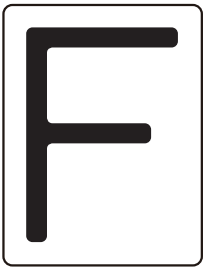
15. No.08810-31549
Tie down point



16. No.03993-00500
Position of hoisting



17. No.03993-00400
For EU
Position of Fire extinguisher



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18. No.05793-00052

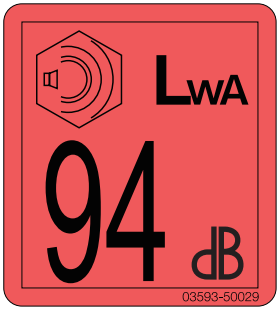
Hazard of a flying plug from track adjuster
Read manual before adjusting track for safe and proper handing.



19. No.03593-50029

Noise Outside the Cab (if equipped)

This value indicates the noise level outside the machine and refers to the noise perceived by the persons who are in the vicinity of the work area.



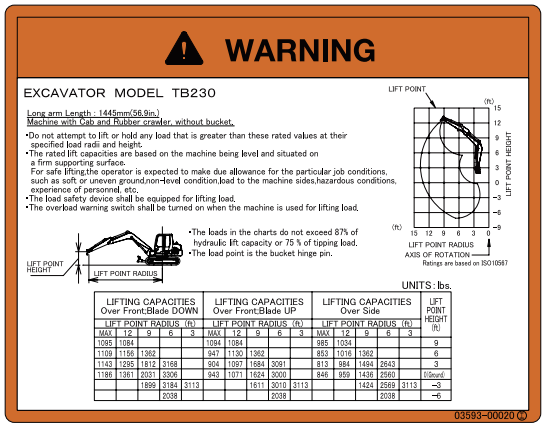
20. No.05793-03643



Be careful about the hoe attachment interference
When lowering the hoe attachment, be careful not to let it hit the undercarriage or dozer blade.
Also, make sure that the boom cylinder hose does not contact the chassis.

21. No.03593-00020(Cab)
No.03593-00021(Canopy)

For USA



22. No.03593-32300(Option)



23. No.03793-69110 (Option)



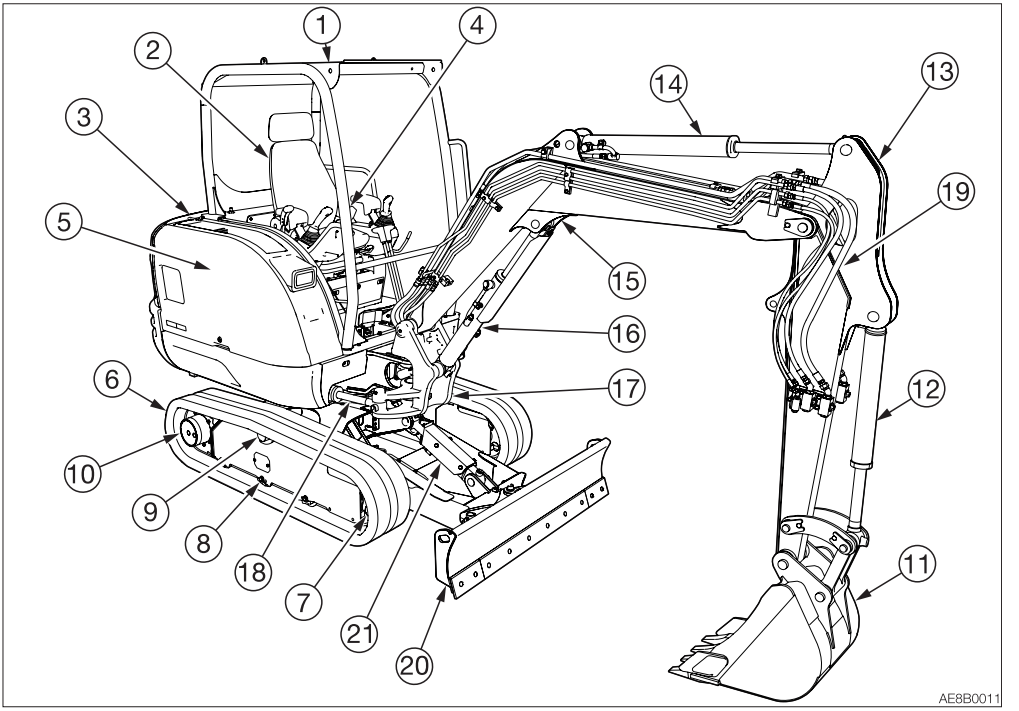
WARNING!
Do not press the float switch while the machine is raised by the dozer blade. Doing so may cause the machine to fall.

AE8A0031E

CONTROLS



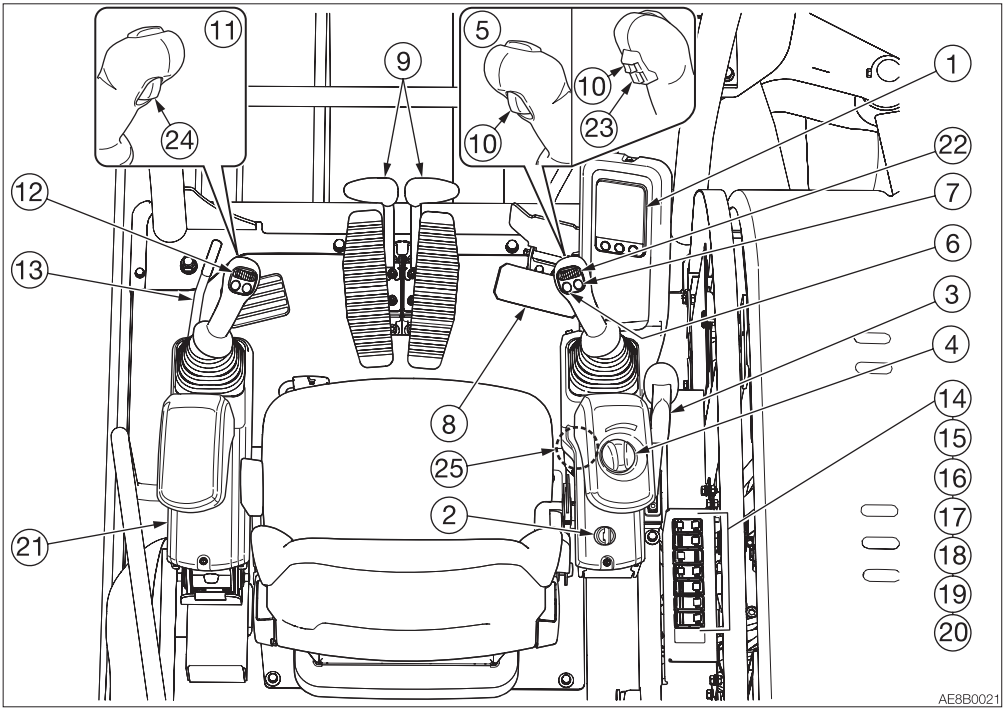
NAMES OF COMPONENTS (CANOPY)



Upperstructure
1. Canopy
2. Seat
3. Engine hood
4. Fuel tank
5. Hydraulic oil tank

Undercarriage
6. Crawler belt
7. Idler
8. Track roller
9. Carrier roller
10. Travel motor

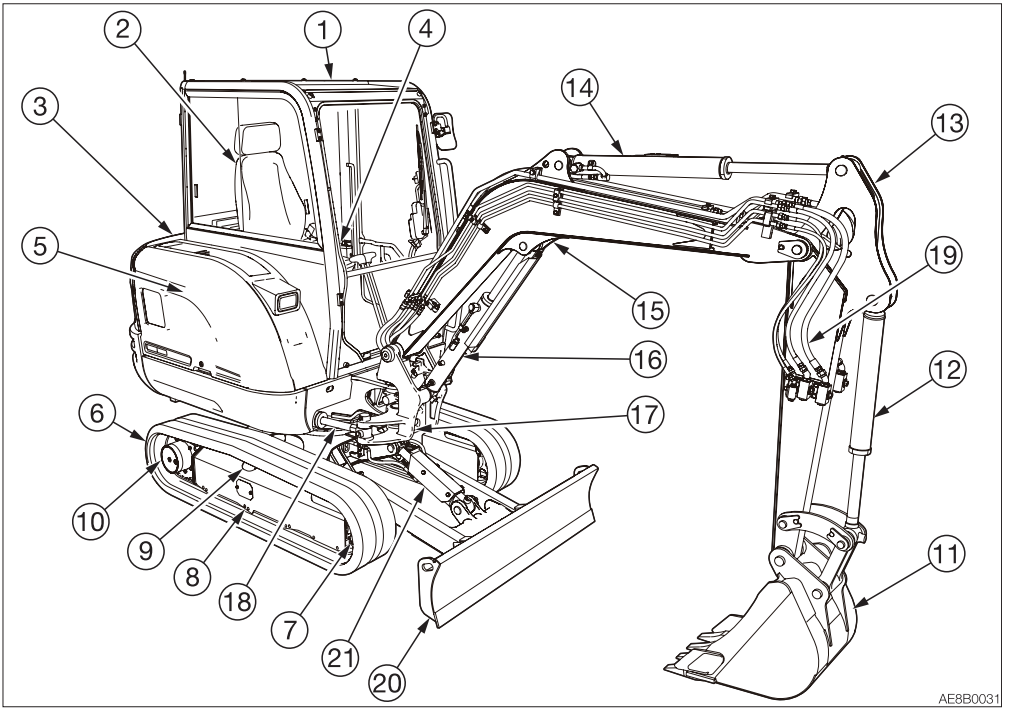
Working equipment
11. Bucket
12. Bucket cylinder
13. Arm
14. Arm cylinder
15. Boom
16. Boom cylinder
17. Boom bracket
18. Swing cylinder
19. Auxiliary hydraulic lines
20. Dozer blade
21. Blade cylinder



1. Instrument cluster
2. Starter switch
3. Blade lever
4. Throttle controller
5. Right operating lever*
6. Horn button
7. Deceleration button
8. Boom swing pedal
9. Travel levers/pedals
10. Travel speed button
11. Left operating lever
12. Auxiliary 1st switches
13. Safety lock lever
14. Light switch
15. Automatic deceleration switch
16. Power/Highland mode switch
17. Detent mode switch
18. Auxiliary 1st auto tank switch*
19. Lift overload warning switch*
20. Beacon lamp switch*
21. Engine shutdown switch*
22. Auxiliary 2nd/4th switch*
23. Auxiliary 2/4 select button*
24. Third auxiliary hydraulic button*
25. Third auxiliary hydraulic switch*

*: Subject to the specifications or optional products selected

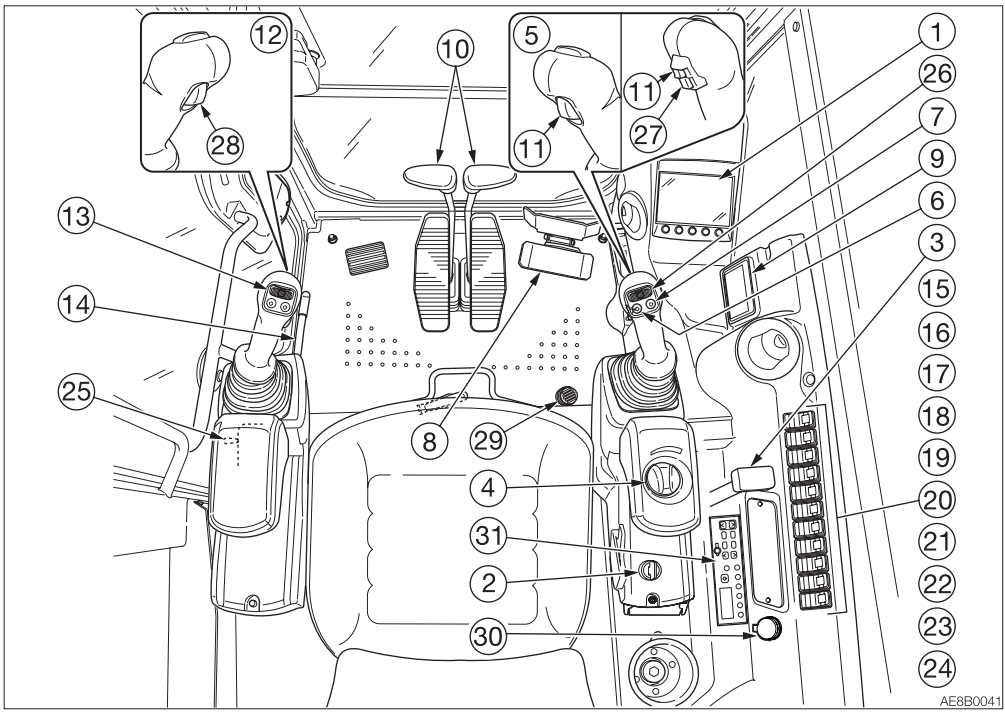
NAMES OF COMPONENTS (CAB)



Upperstructure
1. Cab
2. Seat
3. Engine hood
4. Fuel tank
5. Hydraulic oil tank

Undercarriage
6. Crawler belt
7. Idler
8. Track roller
9. Carrier roller
10. Travel motor

Working equipment
11. Bucket
12. Bucket cylinder
13. Arm
14. Arm cylinder
15. Boom
16. Boom cylinder
17. Boom bracket
18. Swing cylinder
19. Auxiliary hydraulic lines
20. Dozer blade
21. Blade cylinder

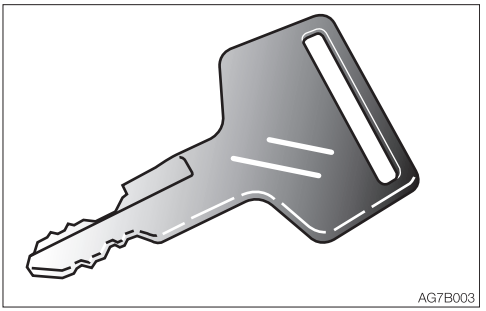


1. Multi-information display
2. Starter switch
3. Blade lever
4. Throttle controller
5. Right operating lever*
6. Horn button
7. Deceleration button
8. Boom swing pedal
9. Ashtray
10. Travel levers/pedals
11. Travel speed button
12. Left operating lever
13. Auxiliary 1st switches
14. Safety lock lever
15. Light switch
16. Wiper switch
17. Washer switch
18. Heater switch
19. Automatic deceleration switch
20. Power/Highland mode switch
21. Detent mode switch
22. Auxiliary 1st auto tank switch*
23. Lift overload warning switch*
24. Beacon lamp switch*
25. Engine shutdown switch*
26. Auxiliary 2nd/4th switch*
27. Auxiliary 2/4 select button*
28. Third auxiliary hydraulic button*
29. Third auxiliary hydraulic switch*
30. Power supply socket*
31. Radio*

*: Subject to the specifications or optional products selected

COVERS

STARTER KEY



The starter key is used to start and stop the engine, as well as to lock and unlock the following components:
- Cab door
- Engine hood
- Covers

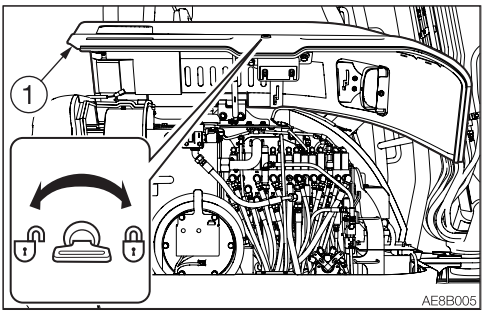
RIGHT SIDE COVER

⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
- **Do not keep the right side cover open on a windy day or if the machine is parked on a slope.**
- **When opening and closing the right side cover, be careful not to get your hands or other parts of your body caught by the cover.**

For inspection and maintenance of the hydraulic oil system, electrical system or window washer, open this cover. The selector valve switching in the auxiliary 1st and the lever pattern (optional) switching are also performed.
The grease gun and the tools are stored under the cover.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the right side cover (1).
2. Push in the key hole with your thumb and open the right side cover (1) all the way.

Closing

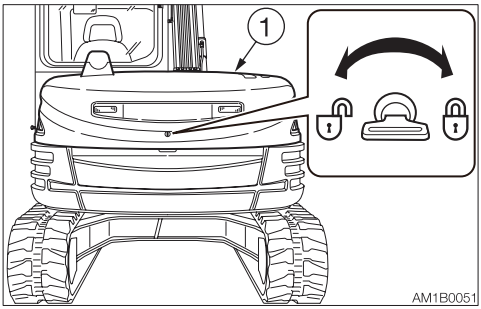
1. Close the right side cover (1) and press it down until a click is heard.
2. Insert the starter key and turn it clockwise to lock the right side cover (1).

ENGINE HOOD

⚠ WARNING

- **Before opening the engine hood, be sure to stop the engine. If a hand or tool becomes trapped in the rotating or moving part, serious injury could result.**
- **When opening or closing the engine hood, be careful not to get your hands or other parts of your body caught by it.**

Opening



1. Insert the starter key and turn it counterclockwise to unlock the engine hood (1).
2. Push in the key hole with your thumb and open the engine hood (1).

Closing

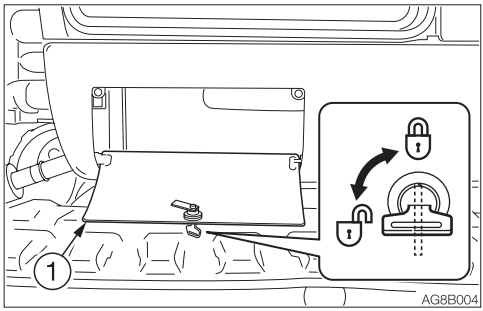
1. Close the engine hood (1) and press down the edge of it until a click is heard.
2. Insert the starter key and turn it clockwise to lock the engine hood (1).

LEFT SIDE COVER

⚠ CAUTION

Be sure to close the cab door before opening the left side cover and work inside. If not, the wind-blown door could cause injury by striking you in the head or body.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the left side cover (1).
2. Open the left side cover (1).

Closing

1. Close the left side cover (1) and turn the key clockwise to lock it.

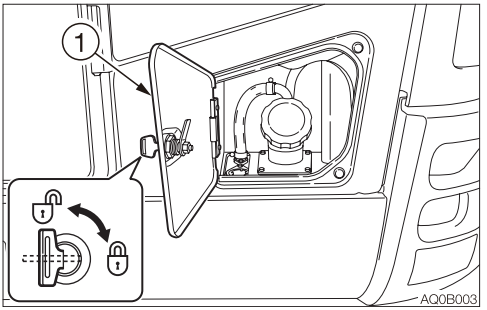
FUEL LID

⚠ CAUTION

Be sure to close the cab door before opening the fuel lid for fueling. If not, the wind-blown door could cause injury by striking you in the head or body.

For adding fuel or checking its level, open this cover.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the fuel lid (1).
2. Open the fuel lid (1).

Closing

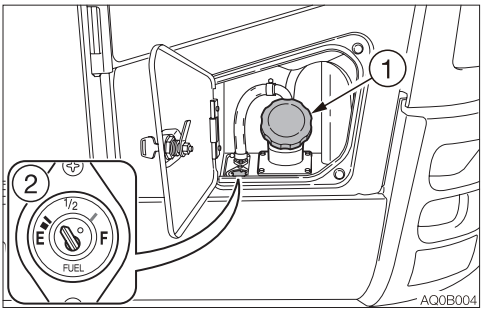
1. Close the fuel lid (1).
2. Insert the starter key and turn it clockwise to lock the fuel lid (1).

FUEL FILLER PORT

⚠ WARNING

- **Do not smoke and keep away from heat or flame while filling the fuel tank.**
- **Fill the fuel tank in a well ventilated place, with the engine turned off.**
- **Clean up spilled fuel immediately.**
- **Do not fill the fuel tank to capacity. Allow room for oil expansion.**
- **Securely tighten the fuel filler cap.**

Opening



1. Open the fuel lid.
2. Turn the fuel cap (1) counterclockwise and remove it.

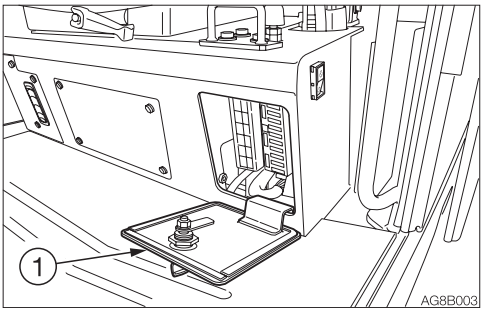
Closing

1. Turn the fuel cap (1) it clockwise and close it.
2. Close the fuel lid and lock it.

FUSE BOX COVER

For inspection and maintenance of the fuse, open this cover.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the fuse box cover (1).
2. Tilt the fuse box cover (1) forward.

Closing

1. Close the fuse box cover (1) and turn the key clockwise to lock it.

CAB

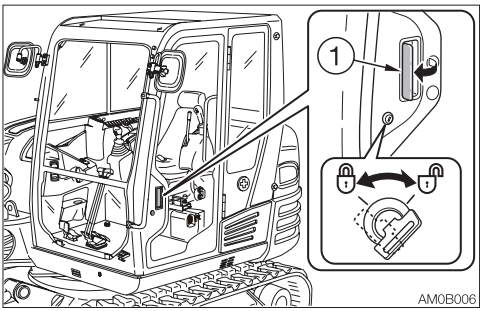
CAB DOOR

⚠ WARNING

When getting on or off the cab, first open the door all the way until it is secured in the catch and check that it does not move.

Open the door fully and press it against the catch at the back of the door to secure it in place.
The door must be locked when getting on or off the machine and while in operation.

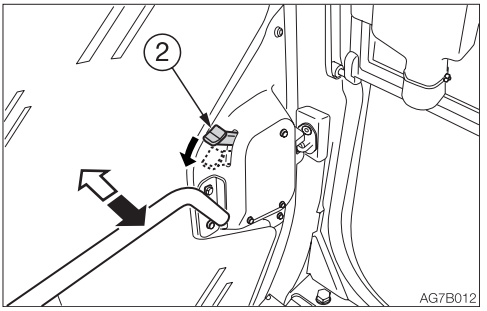
Locking and unlocking



Insert the starter key and turn it.

Opening

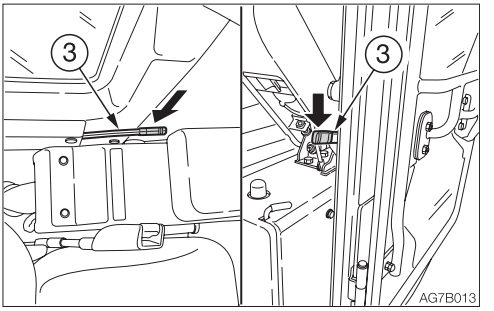
1. Pull the knob (1) towards you and open the door.



To open the door from inside the cab, push the lever (2) to the lower.

2. Open the door fully and press it against the cab to secure it in place.

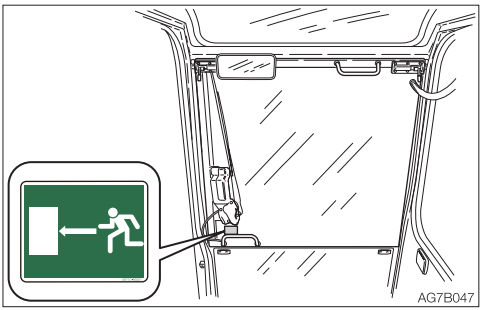
Closing



1. Push the release lever (3) to the lower.
2. Close the released door.

EMERGENCY EXIT

Front window (excluding machines with a front guard)



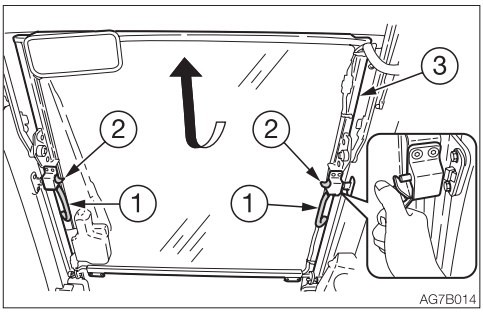
If you should become trapped inside the cab, open the front window to get out.

FRONT WINDOW

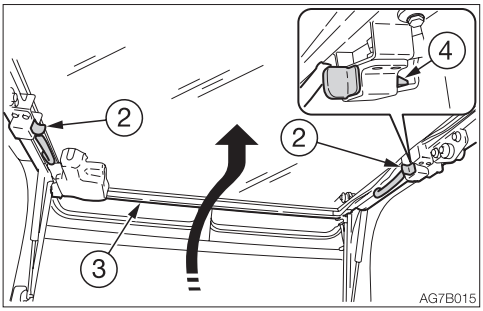
⚠ WARNING

- **Grasp the handles firmly with both hands when opening and closing the front window. Your head or hands may get caught if it slips from your hands.**
- **When the front window is opened or closed, it will come close to the head. Be careful that the window does not strike the head.**
- **When you open the front window, be sure to lock it in place with the lock pins on the left and right sides. The window may fall if it is not locked in place.**

Opening



1. Park on a level surface and stop the engine.
2. Set the safety lock lever to the locked position.
3. Grasp the left and right handles (1) and press the knobs (2) with your thumb to release the lock.
4. Pull the front window (3) toward you and lift while doing so.

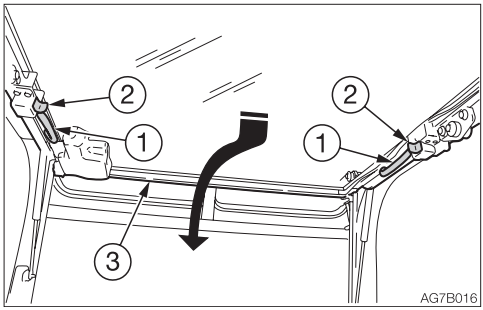


5. Release your thumb from the knobs (2) and then lift the front window (3) fully and lock the front window with lock pin (4).

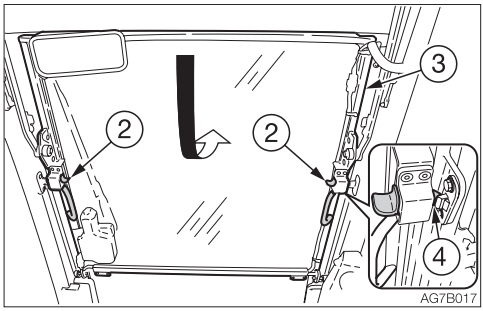
Closing

⚠ WARNING

When closing the front window slowly so as not to hit your head. Lowering the window abruptly may result injury or damage the front window.



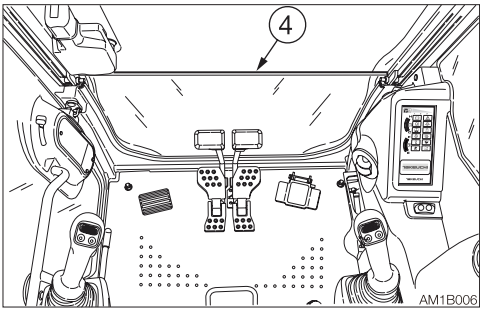
1. Grasp the left and right handles (1) and press the knobs (2) with your thumb to release the lock.
2. Pull down the front window (3) and while doing so, slide it to the front and slowly lower it.



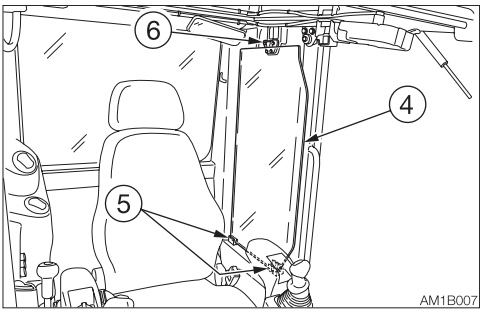
3. Release your thumb from the knobs (2) and then press the front window toward front and lock the front window with lock pin (4).

LOWER FRONT WINDOW

Removing

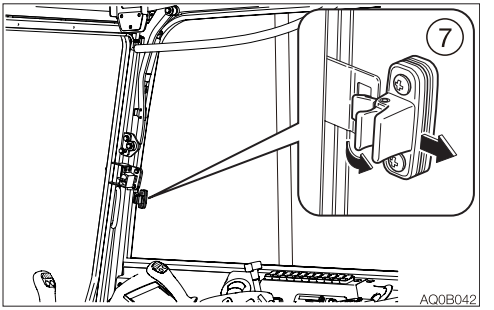


1. Open the front window and stow it in the ceiling.
2. Slowly lift the lower front window (4).



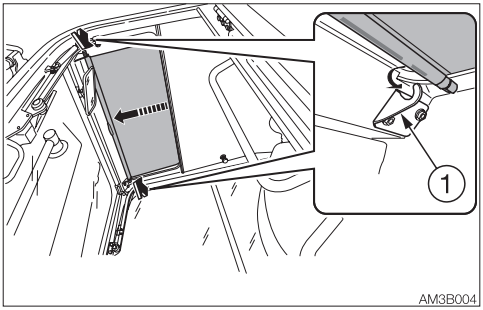
3. Hold the window in a vertical position (the bottom of the window should be in front of you), place it through the guide (5) on the left side of the cab, and then secure it with the support (6).

SIDE WINDOW



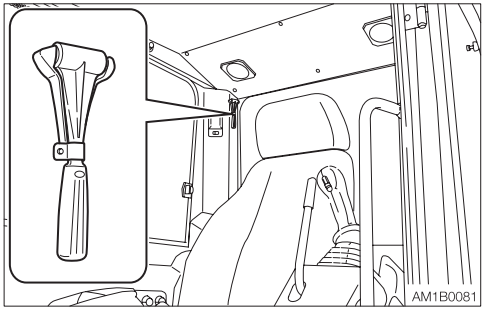
1. Grasp the catch (7), unlock it and open the side window.
2. To close the side window, close it until a click is heard.

SUN SHADE



1. Pull out the sun shade forward.
2. Hook the sun shade to the two catches (1)

EMERGENCY HAMMER (OPTIONAL)



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

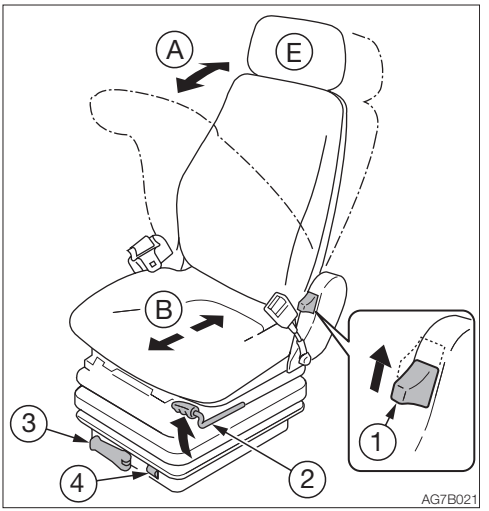
- When breaking the window pane with a hammer, take great care not to injure yourself with the broken glass pieces.
- Remove the glass pieces from the window sill so as not to cut yourself when evacuating. Broken glass will fall from the window, so be careful of your footing and do not slip on the glass.

SEAT AND SEAT BELT

SEAT

⚠ WARNING

- **Adjust and secure the seat.**
- **Do not make any adjustments while operating the machine.**
- **Do not set the backrest to its maximum reclining position and slide the seat backwards at the same time. Doing so may damage the rear window or cause injury.**
- **Remember that the backrest returns to the forward position abruptly due to the spring force.**

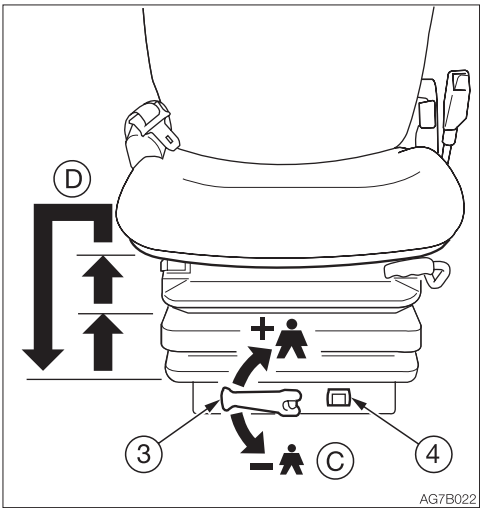


(A) Adjusting the backrest angle

1. Sit up and sit back in the chair.
2. Pull up the lever (1), recline the backrest by using the spring force. Release the lever (1) at the desired angle to secure the backrest.

(B) Fore-and-aft adjustment

1. Pull up the lever (2) and slide the seat backward or forward to the desired position for operation of machine.
2. Release the lever (2) at the desired position to secure the seat.
   Adjustment range: 15 positions, in 150 mm (5.9 in.)



(C) Adjusting according to operator's weight

1. Turn the handle (3) until the scale (4) indicates the weight of operator.
   Adjustment range: 50 to 130 kg (110 to 287 lbs)

(D) Adjusting the height of the seat

Upward

1. Lift the seat to first or second position click-stop.
   Adjustment ranges: 2positions, in 60mm (2.36 in.)

Downward

1. First lift the seat to highest position, then the seat can be lowered to lowest position.

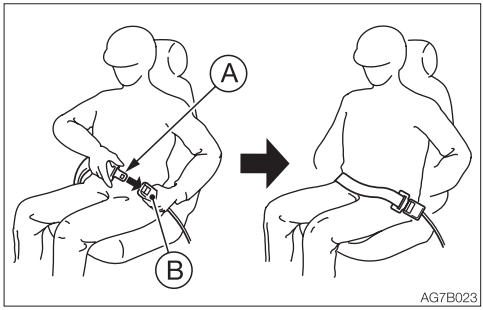
(E) Adjusting the headrest (Option)
The headrest (E) can be moved upward or downward.
1. Grab the headrest (E) with both hands, and move upward or downward to the desired position.

SEAT BELT

⚠ WARNING

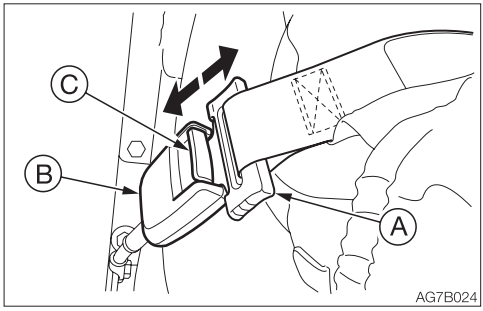
Be sure to fasten the seat belt securely before starting the engine.

Fastening the seat belt
1. Adjust the seat to the desired position for operation, sit up and sit back in the chair.
2. Pull the seat belt to the desired length.



3. Make sure that the belt is not twisted and then insert the tongue plate (A) into the buckle (B) of the seat belt until you hear a clicking sound as it locks in place.
4. Check if the belt is securely locked by pulling it, and arrange the belt around your waist.

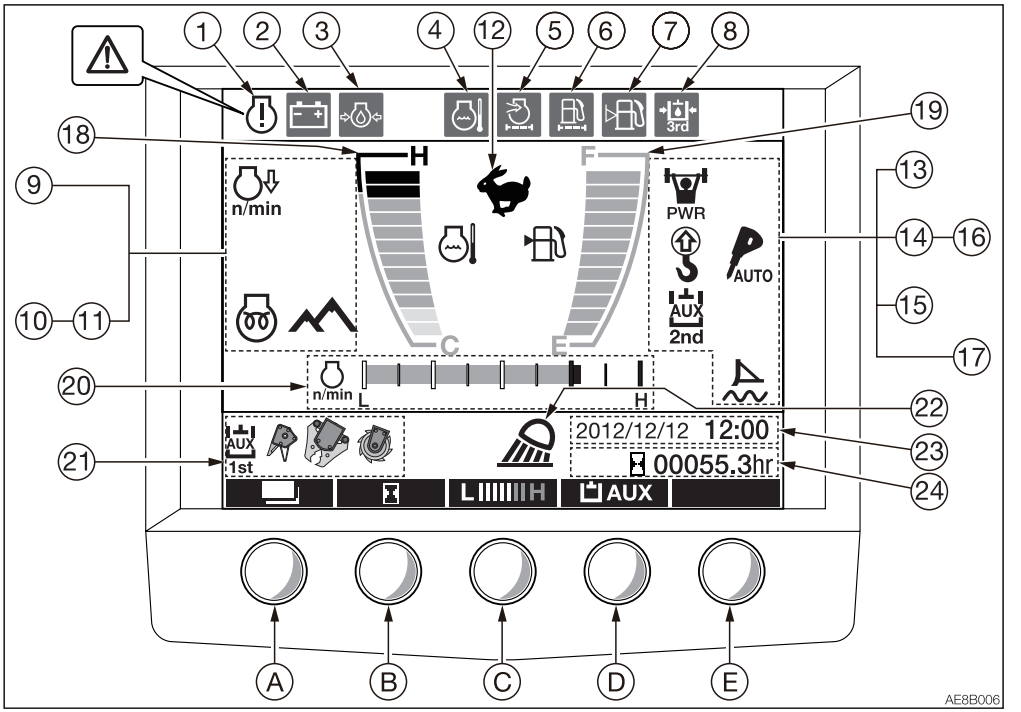
Releasing the seat belt



1. Grasp the tongue plate (A) and press the button (C) on the buckle (B).
   The seat belt retracts back into its original position.

MULTI-INFORMATION DISPLAY

MAIN MENU SCREEN



For explanation purposes, all lamps on this page are in the lit condition. This screen image is quite different from that of the real operation. In the actual operation, if a warning is given or any function is selected, the corresponding symbol appears enlarged at the center of the display for approx. one second.
When the starter switch is set to ON, the battery charge warning lamp and the engine oil pressure warning lamp first appear enlarged, and then turn on with an alarm at their original locations. The machine system is normal if the lamps turn off after the engine is started.

WARNING LAMPS

IMPORTANT: If a warning lamp flashes and an alarm is sounded, immediately stop all operations and check the corresponding component.
Refer to "If a warning lamp flashes" on pages 6-10 and 6-11.

1. ECM error warning lamp
This warning lamp flashes if the Electronic Control Module (ECM) detects an engine problem while the starter switch is in the ON position. The problem detected is recorded as an ECM error.
Refer to "Engine error code list" on pages 6-14 to 6-15.

1-1. Vehicle and engine emergency lamp
This lamp is displayed enlarged for one second, and then flashes and an alarm sounds if there is a problem with the machine. Go to the (7) Error code display from the Menu screen, get the vehicle or engine error code number, and consult your sales or service dealer referring to the "Vehicle error code list" or "Engine error code list" in this manual.
Refer to "Menu screen" on page 2-22.
Refer to "(7) Error code display" on page 2-25.
Refer to "Vehicle error code list" on pages 6-12 and 6-13.
Refer to "Engine error code list" on pages 6-14 to 6-15.

2. Battery charge warning lamp
This lamp flashes and an alarm is sounded if a problem rises in the charging system while the engine is running.

3. Engine oil pressure warning lamp
This lamp flashes and an alarm is sounded if the lubricant oil pressure abnormally low while the engine is running.

4. Coolant temperature warning lamp
This lamp flashes and an alarm is sounded if the engine coolant temperature becomes abnormally high while the engine is running.

5. Air cleaner warning lamp
This lamp flashes and an alarm is sounded if the air cleaner filter is clogged while the engine is running.

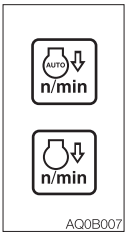
6. Fuel filter warning lamp
This lamp flashes and an alarm is sounded if the fuel filter is clogged while the engine is running.

7. Fuel level warning lamp
This lamp flashes when the fuel level is low while the starter switch is in the ON position.

8. Third auxiliary hydraulic warning lamp
This lamp starts flashing and an alarm sounds if the fixed side (left "e") pressure of the auxiliary 3rd drops abnormally while the engine is running, or while the quick-hitch is being removed or installed.

INDICATORS

9. Deceleration indicator lamp



..... Automatic deceleration indicator

..... Deceleration indicator

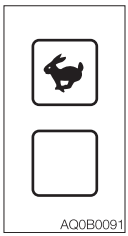
Automatic deceleration indicator
It flashes when the automatic deceleration switch is pressed and remains lit while in the deceleration mode.
Refer to “Deceleration button” on page 2-49.
Refer to “Automatic deceleration switch” on page 2-53.

Deceleration indicator lamp
This lamp turns on when the deceleration button is pressed. The lamp lights up to indicate that the engine is in the deceleration mode at low idling speed (1100 rpm).

10. Glow indicator lamp
This indicator lamp turns off when the engine preheating is completed.

11. Highland mode indicator lamp
Highland mode is selected.
Refer to “Power/Highland mode switch” on page 2-53.

12. Travel speed indicator lamp



..... High-speed travel

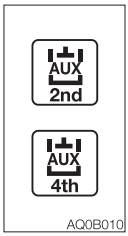
..... Low-speed travel

This lamp turns on when the travel speed button is set to the 2nd (high) speed.

13. Power mode indicator lamp
This lamp lights up when the power mode side of the Power/Highland mode select switch is pressed. The maximum engine output is maintained for as long as this lamp is lit.

14. Lift overload warning indicator lamp
This lamp turns on when the lift overload warning switch is turned on.

15. Auxiliary 2nd/4th select indicator lamp



..... Auxiliary 2nd is selected.

..... Auxiliary 4th is selected.

16. Auxiliary 1st one-way (one-way circuit) indicator lamp



..... Auxiliary 1st auto tank is selected.

..... Auxiliary 1st one-way is selected.

No display: .... Two-way (two-way circuit) is selected.

17. Dozer blade float indicator lamp (If equipped)

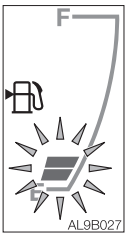


..... This lamp lights up when the float switch on the blade lever is pressed.

18. Water temperature gauge

Indicates the temperature of the engine coolant water. The indicator level must be within the green range during machine operation. The red range indicates overheating.

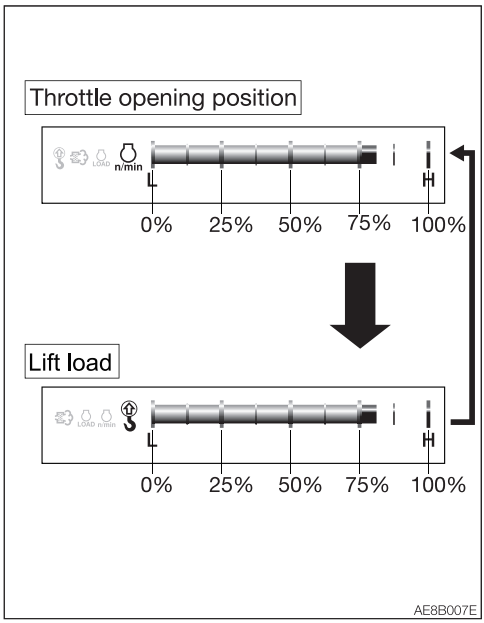
19. Fuel gauge



IMPORTANT: If the fuel gauge changes the color from green to orange while traveling on a flat ground, do not go to a sloping land. Engine stalling may occur on the sloping land. Before operating on the sloping land, be sure to add enough fuel.

Indicates the amount of fuel in the tank. Be sure to fill up the tank before running out of fuel.

20. Throttle opening position indicator

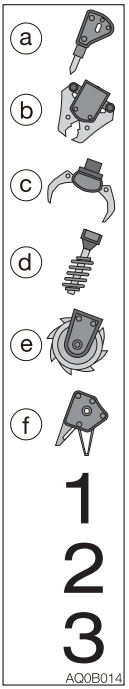


The red range increases as the engine load increases, indicating higher fuel consumption. When the button (C) (Bar meter key) is pressed in a normal screen, the display is changed from the throttle opening position to the lift load factor and the PM accumulation amount, in this order.

- The lift load factor is displayed if there is no change in the throttle opening position for five seconds after the lift alarm switch is turned on.
- The throttle opening position is displayed if the highland mode switch is turned on or there is a change in the throttle opening position.

21. Auxiliary 1st flow rate indicator lamp

This lamp lights up to indicate which flow rate setting is selected in the auxiliary 1st.



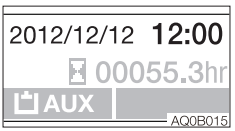
..... a Flow rate setting 1
..... b Flow rate setting 2
..... c Flow rate setting 3
..... d Flow rate setting 4
..... e Flow rate setting 5
..... f Flow rate setting 6
..... 1 Flow rate setting 7
..... 2 Flow rate setting 8
..... 3 Flow rate setting 9

Refer to “Auxiliary 1st flow rate setting” on page 2-23.

22. Working light indicator

Lights up when the working light is turned on.

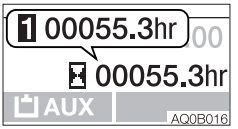
23. Date and time indicator



Displays the date and time set.
Refer to “Date and time setting” on page 2-25.

24. Hour meter/Trip meter

• Hour meter

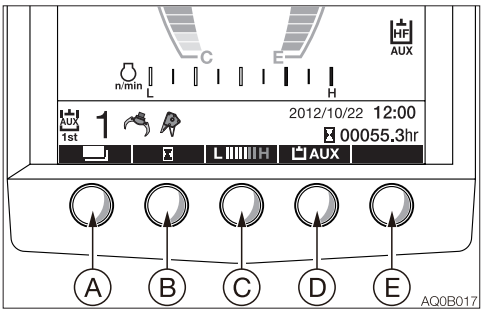


Displays the total engine running time in hours.
The rightmost digit indicates tenths of hours (6 minutes).
Set the inspection and maintenance intervals according to the time displayed on the hour meter.

• Trip meter

Three patterns of desired operating hours can be displayed.
Refer to “Trip meter setting” on page 2-23.

SCREEN CONTROL KEY



Note: Do not press the symbol keys on the display. The LCD could be damaged if the symbol keys are pressed hard. For actual operation, press the push button keys located at the bottom of the screen.

A. Menu key

Use this key to switch between the Home screen and the Menu screen. This key is also used to cancel changes made in each setting. The screen returns to the Home screen if this key is pressed in the information screen.

B. Hour meter key

This hour meter symbol is displayed in the initial screen. Pressing this key changes the meter display in the following order. Trip meter 1, Trip meter 2, Trip meter 3, Hour meter.

Down (↓) key
Use this key to move the cursor ▶ downward and to decrease the value in each setting. Press and hold this key for one second to rapidly decrease the value.

C. Bar meter key

This hour meter symbol is displayed in the initial screen. Pressing this key changes the meter display in the following order. Throttle opening position, Lift load factor, PM accumulation amount

Up (↑) key
Use this key to move the cursor ▶ upward and to increase the value in each setting. Press and hold this key for one second to rapidly increase the value.

D. Auxiliary 1st key

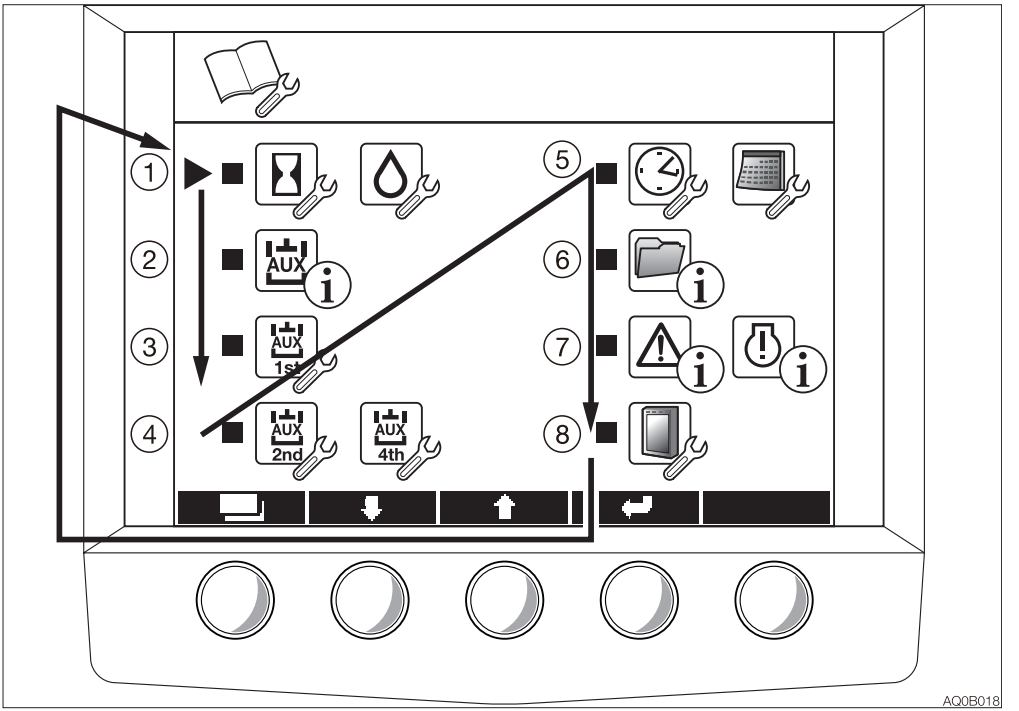
The auxiliary 1st symbol is displayed in the initial screen. Pressing this key changes the symbol display in the following order. Auxiliary 1st setting 1, Auxiliary 1st setting 2, Auxiliary 1st setting 3.

Enter key
Use this key to confirm or execute the setting made by each key.
To clear the trip meter being displayed, press and hold this key for three seconds.

E. —

SCREEN NAVIGATION

• Menu screen

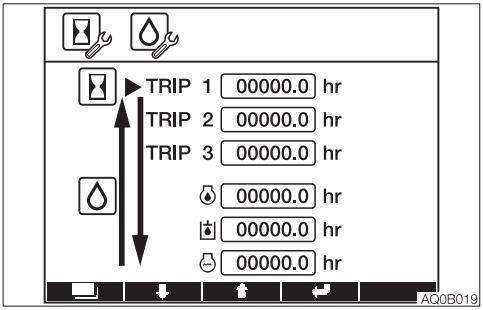


Press the Menu key to go the Menu screen while in the Home screen.

(1) Trip meter setting
(2) Auxiliary line flow rate display
(3) Auxiliary 1st flow rate setting
(4) Auxiliary 2nd/4th flow rate setting
(5) Date and time setting
(6) Data display
(7) Error code display
(8) LCD setting

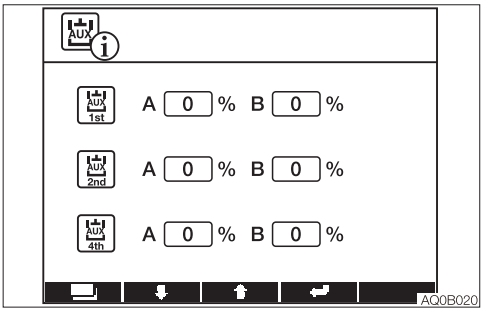
Move the cursor ▶ with the Up (↑) or Down (↓) key to go to the desired item to be set, and then press the Enter key to confirm. To return to the Menu screen, press the Menu key.
The wrench symbol indicates the “setting is possible state” and the (i) mark indicates information only.

(1) TRIP METER SETTING



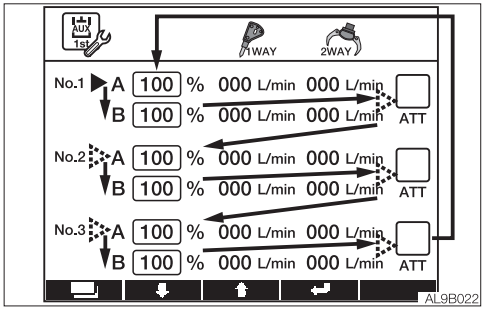
Six patterns of desired operating hours can be set.
To start setting, press the Enter key. The value flashes while being set.
Up (↑) key: Increases the value or moves the cursor ▶ upward. Rapidly increases the value when pressed and held for one second.
Down (↓) key: Decreases the value or moves the cursor ▶ downward. Rapidly decreases the value when pressed and held for one second.
Enter key: Confirms setting
Menu key: Cancels setting or returns to the Menu screen.
Pressing and holding the Enter key for three seconds clears the trip meter pointed by the cursor.

(2) AUXILIARY LINE FLOW RATE DISPLAY



Displays the flow rate of the Auxiliary 1st, 2nd and 4th.
The flow rate cannot be changed.

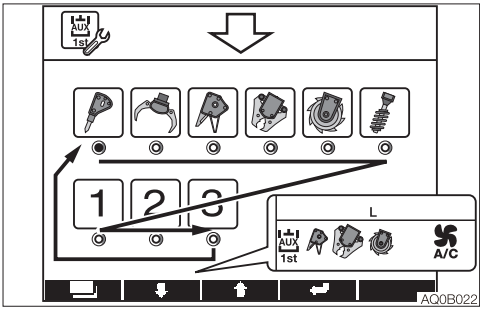
(3) AUXILIARY 1ST FLOW RATE SETTING



Three flow rate patterns can be set in the auxiliary 1st.
Refer to the trip meter setting for the key operation. To move the cursor ▶ in the direction of the arrow, use the Down (↓) key. To move the cursor ▶ in the opposite direction of the arrow, use the Up (↑) key.

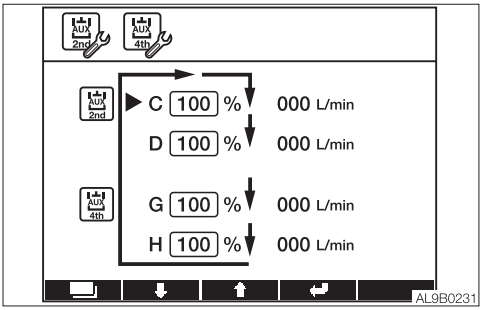
Initial condition	A/B common, standard flow	Variable range
Auxiliary 1st-1	100% = 54 L/min (14.3 US gpm)	10 to 100%
Auxiliary 1st-2	75% = 40.5 L/min (10.7 US gpm)	10 to 100%
Auxiliary 1st-3	50% = 27 L/min (7.1 US gpm)	10 to 100%

The table shows the 1-way flow rate when there is no load.



Pressing the Enter key while the cursor ◉ is at “Select ATT” goes to the attachment select screen.
Pressing the Down (↓) key will move the blue flashing light in the direction of the arrow.
Pressing the UP (↑) key will move the blue flashing light in the opposite direction of the arrow.
Move the blue flashing light to the desired symbol or the number, and then press the Enter key to confirm.
The selected symbol will appear at the lower left of the Home screen.

(4) AUXILIARY 2ND/4TH FLOW RATE SETTING



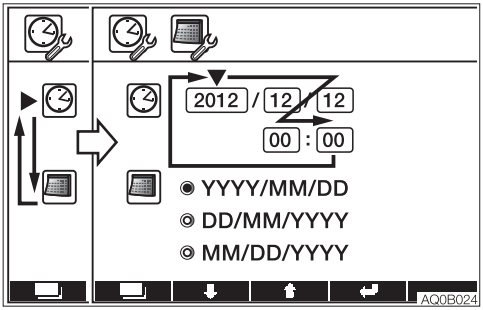
One pattern of the auxiliary 2nd/4th flow rate can be set.

Initial condition	Standard flow	Variable range
Auxiliary 2nd	C/D 100% =21.6 L/min (5.7 US gpm)	10 to 100%
Auxiliary 4th	G/H 100% =21.6 L/min (5.7 US gpm)	10 to 100%

The table shows the 1-way flow rate when there is no load.

Refer to the trip meter setting for the key operation. To move the cursor ▶ in the direction of the arrow, use the Down (↓) key. To move the cursor ▶ in the opposite direction of the arrow, use the Up (↑) key.

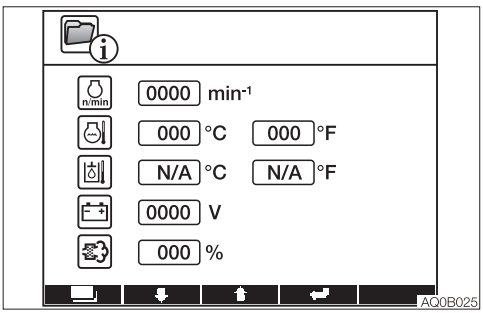
(5) DATE AND TIME SETTING



The year, month, date, hour and minute can be set. (Effective year range: 2010 to 2099)

- Move the cursor ▶ to the clock symbol, and then press the Enter key. The cursor ▼ will be shifted to the place for setting the year.
  Press the Enter key again, and then enter the year. (The year display keeps flashing during editing.)
  Press the Enter key to confirm. The month, date, hour and minute can be set using the same procedure for the year.
- Move the cursor ▶ to the calendar symbol, and then press the Enter key to change the format of “Year-Month-Date” to “Date-Month-Year” or “Month-Date-Year”.
  Refer to the trip meter setting for the key operation.

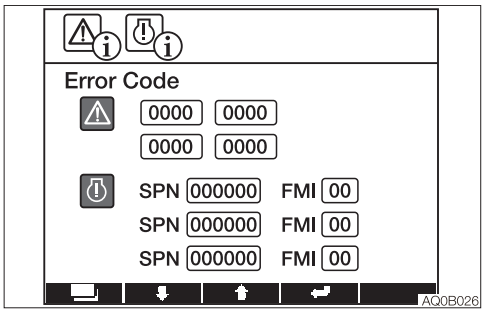
(6) DATA DISPLAY



Displays various data. The setting cannot be changed.

Display items
- Engine RPM
- Coolant temperature
- —
- Battery voltage
- PM accumulation amount

(7) ERROR CODE DISPLAY



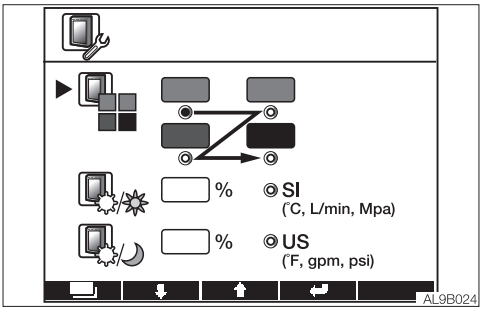
⚠.....Vehicle error code
Displays four error codes, with the latest code in the upper left.
Refer to “Vehicle error code list” on pages 6-12 and 6-13.

.....ECM error code
Engine ECM (Engine Control Module) error code
Displays three error codes, with the latest code at the top.
Refer to “Engine error code list” on pages 6-14 to 6-15.

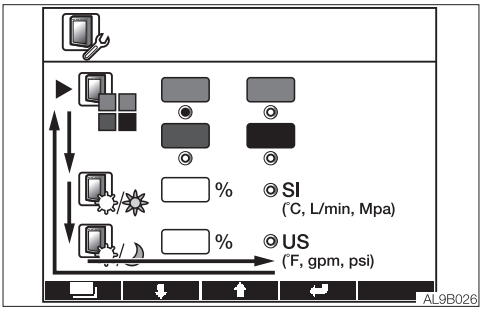
IMPORTANT: If an error code appears, immediately stop the operation and contact a Takeuchi sales or service outlet for help.

(8) LCD SETTING

• Background color setting



Move the cursor ▶ to the background color symbol, and then press the Enter key. The blue flashing light moves from blue gray to gray, blue and black, in this order. Move the blue flashing light to the desired color position, and then press the Enter key to confirm.
The background color can be changed in this screen, regardless of mode (day or night).

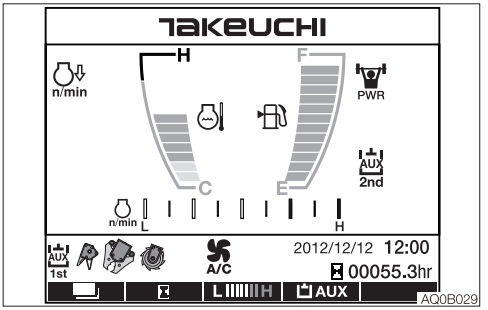


• The brightness of the LCD is set to between 0 and 100%. The brightness changes each time the adjustment is made.
Day mode: initial setting value is 50%
Night mode: initial setting value is 50%
While in the day (night) mode, adjustment is possible only for the brightness set to the night (day) mode.
Refer to the trip meter setting for the key operation.

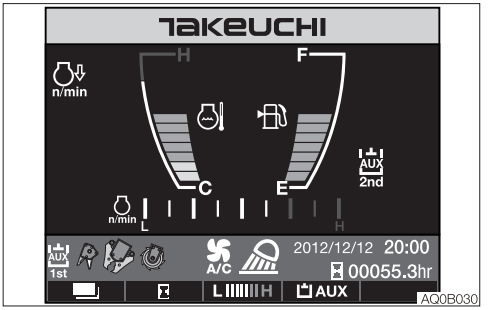
• Unit setting
Switch between SI unit and US units.
Move the blue flashing light to the desired unit position, and then press the Enter key to confirm.

Menu key: returns to the Menu screen. Pressing the Menu key again returns to the Home screen.

SWITCHING IMAGES

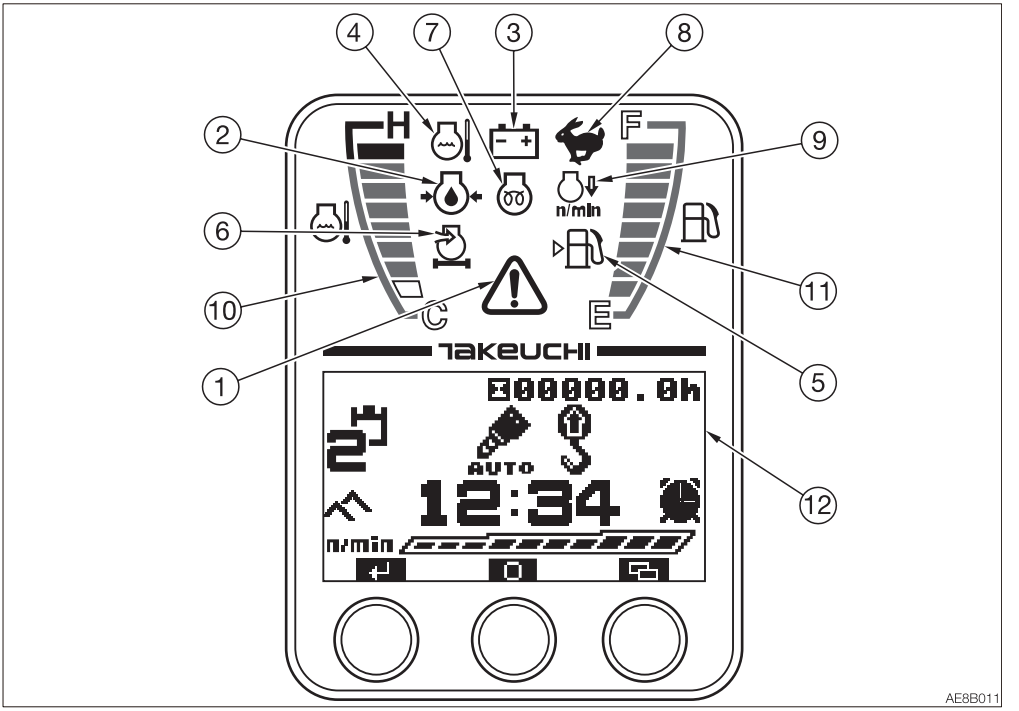


- Changing the background color (day/night)



Turn on the light switch on any screen to decrease the display brightness and to enter the “evening mode”.

INSTRUMENT CLUSTER



For explanation purposes, all lamps on this page are in the lit condition. This screen image is quite different from that of the real operation.
Once the starter switch is turned to ON, all lamps on the instrument cluster light up and the alarm sounds.
Then, the battery charge warning lamp (3) and the engine oil pressure warning lamp (2) start flashing and an alarm sounds. The machine system is normal if the lamps turn off after the engine is started.
If any lamp is not lit when the starter switch is turned to ON, there is something wrong in the machine. Consult your sales or service dealer.

WARNING LAMPS

IMPORTANT: If a warning lamp flashes and an alarm is sounded, immediately stop all operations and check the corresponding component.
Refer to “If a warning lamp flashes” on pages 6-10 and 6-11.

1. Vehicle and engine emergency lamp
This lamp flashes and an alarm sounds if there is a problem with the machine. Go to the “Failure Record (FAILURE RECORD)” from the side menu screen, get the vehicle or engine error code number, and then consult your sales or service dealer referring to the “Vehicle error code list” or “Engine error code list” in this manual.
Refer to “Side menu screen” on page 2-39.
Refer to “Failure Record (FAILURE RECORD)” on page 2-46.
Refer to “Vehicle error code list” on pages 6-12 and 6-13.
Refer to “Engine error code list” on pages 6-14 to 6-15.

2. Engine oil pressure warning lamp
This lamp flashes and an alarm is sounded if the lubricant oil pressure abnormally low while the engine is running.

3. Battery charge warning lamp
This lamp flashes and an alarm is sounded if a problem rises in the charging system while the engine is running.

4. Coolant temperature warning lamp
This lamp flashes and an alarm is sounded if the engine coolant temperature becomes abnormally high while the engine is running.

5. Fuel level warning lamp
This lamp turns on if the fuel level becomes low while the starter switch is in the ON position.

6. Air cleaner warning lamp
This lamp flashes and an alarm is sounded if the air cleaner filter is clogged while the engine is running.

INDICATORS

7. Glow lamp
This lamp goes out when the engine preheating is completed.

8. Travel speed lamp
This lamp turns on when the travel speed button is set to the 2nd (high) speed.

9. Deceleration lamp
This lamp turns on when the deceleration button is pressed. The lamp lights up to indicate that the engine is in the deceleration mode at low idling speed (1200 rpm).
It flashes When the automatic deceleration switch is pressed to indicate that the machine is in the automatic deceleration mode.
Refer to “Deceleration button” on page 2-49.
Refer to “Automatic deceleration switch” on page 2-53.

METERS

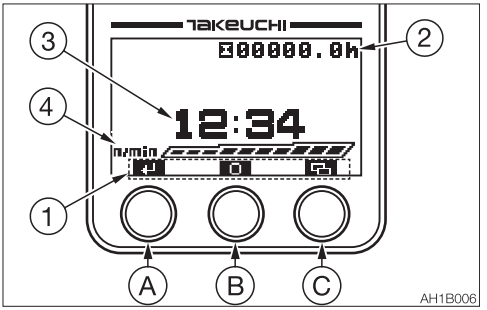
10. Water temperature gauge
Indicates the temperature of the engine coolant water.
The LED should be within the green range during machine operation.
The red range indicates overheating.

11. Fuel gauge
Indicates the amount of fuel in the tank. Be sure to top off the tank before running out of fuel.

MULTI-DATA DISPLAY

12. LCD (Liquid Crystal Display)
It displays various functions and data on hour meter, trip meter, clock, tachometer and the machine.

Home screen



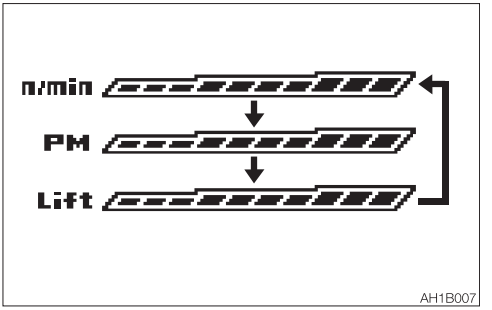
1. Key function display
The key function display changes depending on the screens (Home, Menu and each setting)
For actual operation, use the buttons, “A”, “B” and “C”, located beneath each symbol.
Refer to “Function of each key” on pages 2-34 to 2-47.

2. Hour meter/Trip meter
- Hour meter
  Displays the total engine running time in hours.
  The rightmost digit indicates tenths of hours (6 minutes).
  Set the inspection and maintenance intervals according to the time displayed on the hour meter.

- Trip meter
  Three patterns of desired operating hours can be displayed.
  Refer to “Trip meter display” on page 2-34.

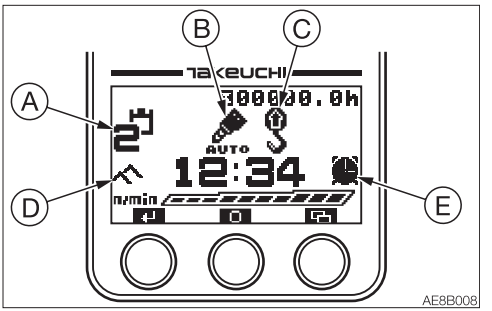
3. Time display
Displays the time set.
Refer to “Time setting” on page 2-37.

4. Tachometer

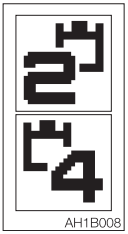


Displays the engine RPM in 10 levels.
Pressing the (B) key while the tachometer is displayed changes to the display of the PM accumulation rate and lift load factor, in this order.
- The throttle opening position is displayed if the lift alarm switch is turned on and there is no change in the throttle opening position.
- The tachometer is displayed if the highland mode switch is turned on or there is a change in the throttle opening position.
- For TB230, the PM accumulation rate does not change.

5. Functions (Page 1)



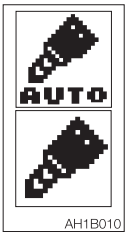
A. Auxiliary 2nd/4th selection



..... Auxiliary 2nd is selected.

..... Auxiliary 4th is selected.

B. Auxiliary 1st One-way (one-way circuit)

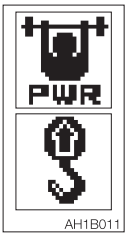


..... Auxiliary 1st auto tank is selected.

..... Auxiliary 1st one-way is selected.

No display: ..... Two-way (two-way circuit) is selected.

C. Lift overload warning/power mode



..... Displays when the power mode select switch is pressed. It indicates the maximum engine output is selected.

..... Display the symbol when the lift overload warning switch is turned on.

D. Highland Mode (If equipped)



This mode is used to reduce the engine load due to the hydraulic pump. When the machine is operated at a high-altitude site, the engine output is decreased due to thin air. In such cases, the hydraulic horse power is automatically adjusted to prevent the engine from stalling.

Refer to “Power/Highland mode switch” on page 2-53.

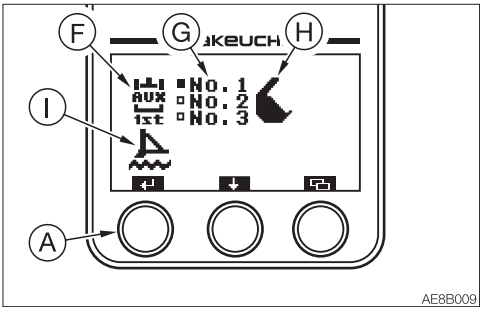
E. Alarm



Displays the clock symbol when the alarm function is turned on. Refer to “Alarm setting” on page 2-37.

6. Function indicators (Page 2)

When the (A) key is pressed, the display changes as the following.

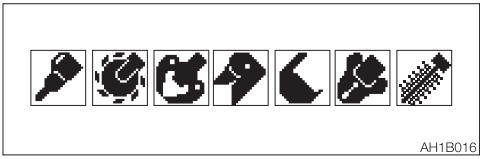


F. Auxiliary 1st indicator

G. Auxiliary 1st flow rate selection indicator

Press the (B) key to move the ■ and select the desired flow rate.
Refer to “Auxiliary 1st Flow Rate Setting” on page 2-40.

H. Attachment symbol indicator



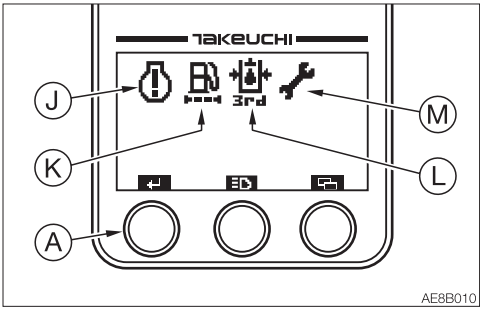
Displays the symbol of the attachment selected in the “Auxiliary 1st Flow Rate Setting” section.

I. Dozer blade float indicator

Displays the symbol of the dozer blade float when the float button is pressed.

7. Warning indicators (Page 3)

When the (A) key is pressed, the display changes as the following. If there is no warning, the screen returns to the “Functions” on Page 1.



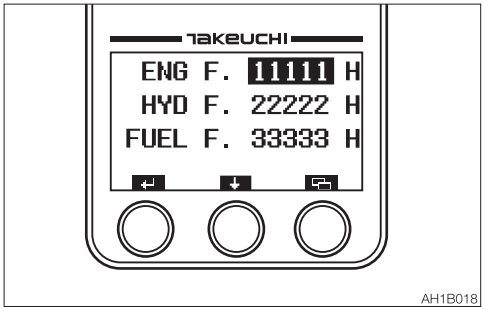
Warning display is first flashed and enlarged for three seconds and then stays displayed, if there is a problem with the machine. If multiple warnings are to be displayed, the highest priority warning is displayed. Priority from the highest to the lowest: ECM error warning, Auxiliary 3rd hydraulic pressure warning, water separator warning and fuel filter warning.
No enlarged display for the maintenance warning.
Go to the “MAINTENANCE/FAILURE RECORD/Error cord display” from the Side menu screen, get the vehicle or engine error code number, and consult your sales or service dealer referring to the “Vehicle error code list” or “Engine error code list” in this manual.

J. ECM error warning indicator
This warning lamp flashes if the Electronic Control Module (ECM) detects an engine problem while the starter switch is in the ON position. The problem detected is recorded as an ECM error.
Refer to “Engine error code list” on pages 6-14 to 6-15.

K.Fuel filter warning indicator
This lamp flashes and an alarm is sounded if the fuel filter is clogged while the engine is running.

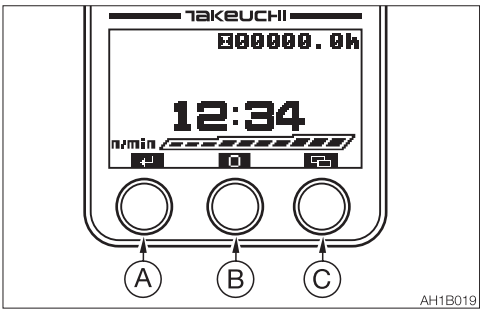
L. Auxiliary 3rd hydraulic pressure warning indicator (If equipped)
This warning lamp starts flashing and an alarm sounds if the pressure in the fixed side (left “e”) of the Auxiliary 3rd drops abnormally while the engine is running, or while the quick-hitch is being used for changing the bucket.

M.Maintenance warning indicator
When the time for maintenance set by the trip meter is reached, this warning lamp flashes and an alarm sounds.



When the time for maintenance set by the trip meter is reached, the screen is changed from the Main to the Trip Meter for Maintenance on the DATA screen. Each value remains flashing until its corresponding key is pressed. At this stage, the trip meter values cannot be reset. Pressing any key returns to the Warning (Page 3) of Main screen in which the maintenance warning lamp is flashing and the alarm is sounding. Promptly inspect and service the relevant item.
Refer to “Menu/Trip meter reset” on page 2-35.
Refer to “Maintenance” on page 5-1.

FUNCTION OF EACH KEY



The functions are as below in the Home screen. The different functions appear in the other screens.

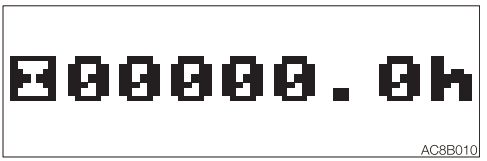
A. Stopping the alarm or switching the display between Functions and Warnings

- Pressing the (A) key while the alarm is sounding stops the alarm.
- Pressing the (A) key to switch the display; Functions (Page 1), Functions (Page 2), and Warnings (Page 3).

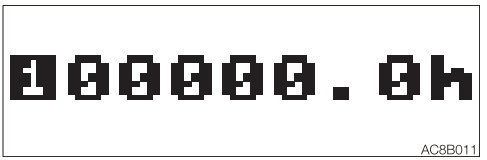
B. Meter switching

Pressing and holding the (B) key for two seconds or more each time the display changes as follows:

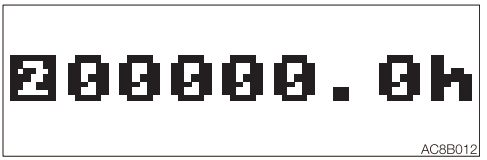
1. Hour meter



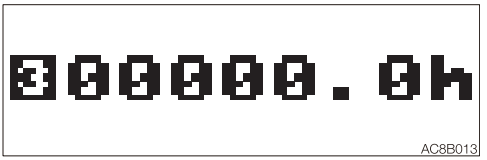
2. Trip meter 1



3. Trip meter 2



4. Trip meter 3



5. Returns to the hour meter

- When the (B) key is pressed, the display changes in the following order.

1. Tachometer



2. PM accumulation rate



3. Lift load factor

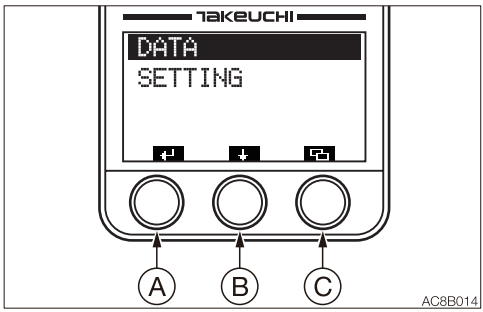


4. Return to the engine RPM.

C. Menu/trip meter reset

- Pressing the (C) key switches to the Menu screen.
- Pressing and holding the (C) key for three seconds or more while the trip meter is displayed returns the trip meter to “0”.

MENU SCREEN

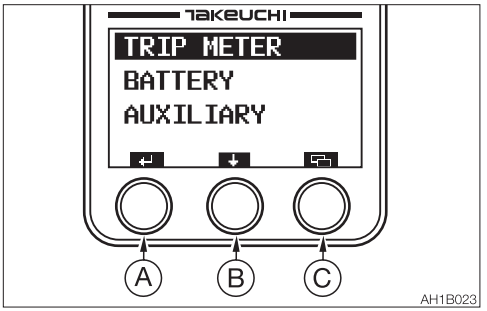


Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the Home screen.

- DATA
  The trip meter for maintenance, battery and auxiliary circuits can be checked. Unlike the trip meter displayed on the Main screen, data items on the engine oil filter, hydraulic oil filter and fuel filter are included so that you can use them as a guideline for replacement.

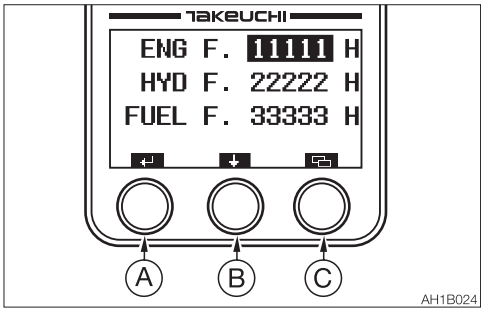
- SETTING
  Time, alarm and contrast can be set.

DATA SCREEN (DATA)



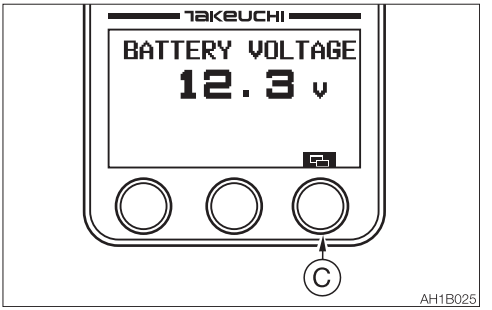
Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the Menu screen.

- **Trip meter (TRIP METER) for maintenance**
  The trip meters for the engine oil filter, hydraulic oil filter or fuel filter are displayed.



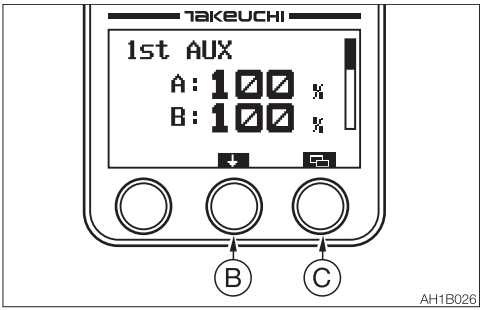
Press and hold the (A) key for at least five seconds resets the selected trip meter to "0".
Press the (B) key to move the selection bar.
Press the (C) key to return to the DATA screen.

- **Battery (BATTERY)**
  Displays the battery voltage.



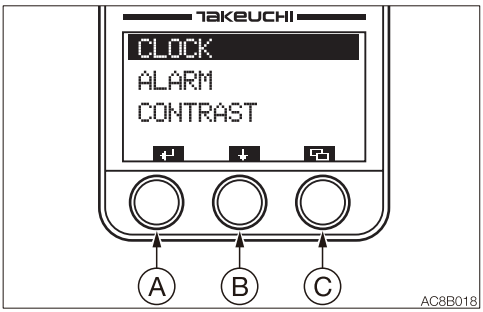
Press the (C) key to return to the DATA screen.

- **Auxiliary circuit (AUXILIARY)**
  Displays the flow rate in the auxiliary circuits of the 1st, 2nd or 3rd.



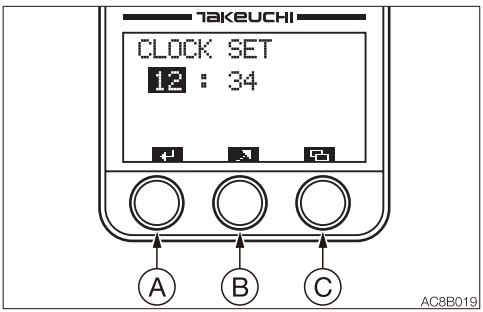
Each time the (B) key is pressed, the auxiliary circuit is displayed in this order: Auxiliary 1st, Auxiliary 2nd and Auxiliary 4th.
Press the (C) key to return to the Data screen.

SETTING SELECTION SCREEN (SETTING)



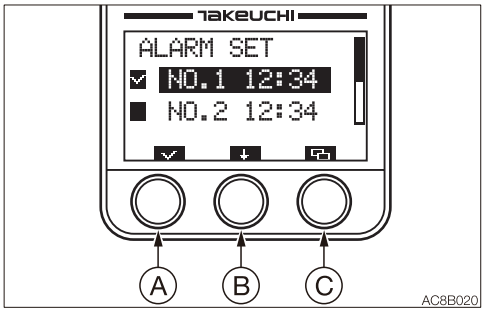
Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the Menu screen.

- **Time setting (CLOCK)**
  The time to be displayed on the Home screen can be set here.



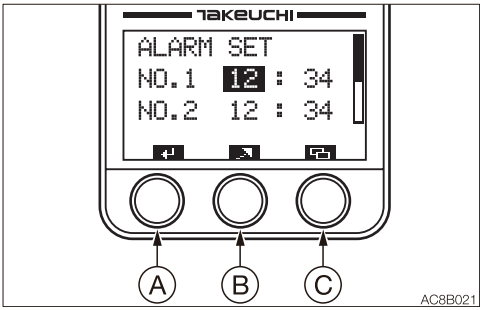
a. When the selection bar is at CLOCK, press the (A) key to proceed to the time setting screen (CLOCK SET).
b. Pressing the (A) key in this screen moves the selection bar and flashes the figures on the bar.
   Setting range: hours, 1 to 24; minutes, 00 to 59
c. Press the (B) key to increase the number value selected.
   Press and hold the (B) key to rapidly increase the number value selected.
d. Press and hold the (A) key for at least two seconds to complete the setting and to return to the Setting Selection screen.
e. Press the (C) key cancels editing and to return to the Setting Selection screen.

- **Alarm setting (ALARM)**
  Five patterns of alarm setting are available.
  Alarm function can be set to on or off within the five patterns.



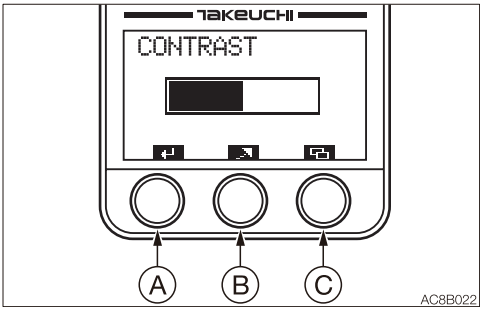
a. When the selection bar is at ALARM, press the (A) key to proceed to the alarm setting screen (ALARM SET).
b. Press the (A) key in this screen to place a checkmark in the box at the left of the setting bar. Press the (A) key again to remove the checkmark.
   The alarm setting cannot be changed only by placing or removing a checkmark.
c. Press and hold the (A) key for at least two seconds to complete the setting and to return to the Setting Selection screen.
   Be sure to perform the above operation when you wish to set the alarm.
   A clock symbol is displayed on the Home screen.
d. Press the (B) key to move the selection bar.
e. Press and hold the (B) key for at least three seconds to enter the alarm time setting mode.
f. Press the (C) key to cancel editing and to return to the Setting Selection screen.
   Checked .....On
   Unchecked .....Off

- **Alarm time setting mode**
  Sets the time for alarm.



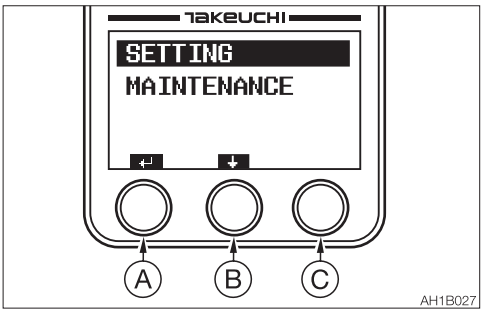
a. Select the item to be set in the alarm setting screen (ALARM SET).
b. Press and hold the (B) key for at least three seconds to enter the alarm time setting mode.
c. Press the (A) key in this screen to move the selection bar and to flash the figures on the bar.
   Setting range: hours, 1 to 24; minutes, 00 to 59
d. Press the (B) key to increase the number value selected.
   Press and hold the (B) key to rapidly increase the number value selected.
e. Press and hold the (A) key for at least two seconds to complete the setting and to return to the Setting Selection screen.
f. Press the (C) key to cancel editing and to return to the Setting Selection screen.

- **Contrast setting (CONTRAST)**
  Adjust the LCD contrast.



a. When the selection bar is at CONTRAST, press the (A) key to proceed to the contrast setting screen (CONTRAST).
b. To increase contrast, press the (B) key. The bar advances to the right.
   Press and hold the (B) key to rapidly advance the bar.
   Once the bar reaches the right end (highest contrast), it returns to the left end (lowest contrast).
c. Press and hold the (A) key for at least three seconds to complete the setting and to return to the Setting Selection screen.
d. Press the (C) key to cancel editing and to return to the Setting Selection screen. The changes made to the setting are reflected, but they will be removed when the starter switch is turned off.

SIDE MENU SCREEN

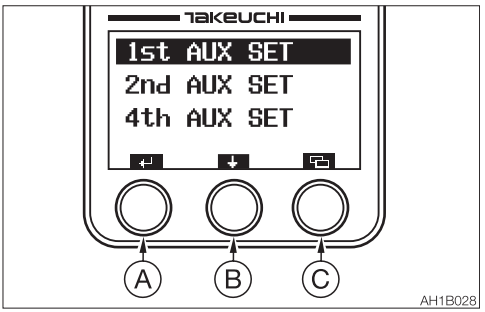


To display the side menu, turn the starter switch from the OFF to the ON position while pressing the (C) key.
Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.

- SETTING
  The flow rate ratio of the auxiliary circuits (Auxiliary 1st, Auxiliary 2nd and Auxiliary 4th) can be set.

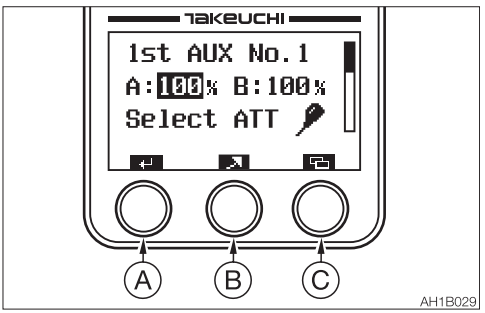
- MAINTENANCE
  Diagnosis and failure record can be checked.

SETTING SELECTION SCREEN (SETTING)



Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the side menu screen.

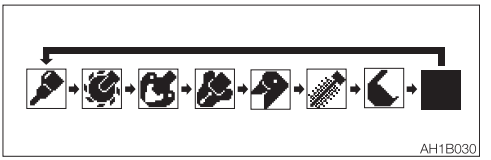
- **Auxiliary 1st flow rate setting (1st AUX SET)**
  Set the flow rate ratio for the No. 1, No. 2 and No. 3rd in the Auxiliary 1 circuit.



a. Pressing the (A) key in this screen moves the selection bar and flashes the figures on the bar.
b. Press the (B) key to increase the number value selected.
   Press and hold the (B) key for at least one second to rapidly increase the number value selected.

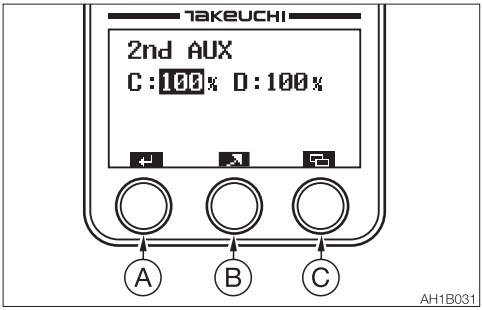
Initial condition	A/B common, standard flow	Variable range
Auxiliary 1st No. 1	100% = 54 L/min (14.3 US gpm)	10 to 100%
Auxiliary 1st No. 2	75% = 40.5 L/min (10.7 US gpm)	10 to 100%
Auxiliary 1st No. 3	50% = 27 L/min (7.1 US gpm)	10 to 100%

The table shows the 1-way flow rate when there is no load.



c. When the selection bar is at a symbol of attachment, press the (B) key to change it to the desired symbol.
   Select the symbol representing the attachment to be used.
d. The setting for Auxiliary 1 No. 2 and Auxiliary 1 No. 3 can be done using the same procedure as above.
e. Press and hold the (A) key for three seconds or more to complete the setting and return to the setting selection screen.
f. Press the (C) key to cancel editing and to return to the setting selection screen.

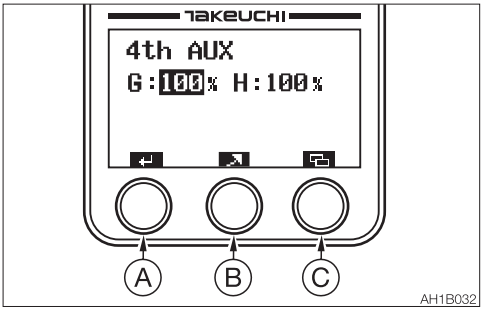
- **Auxiliary 2nd flow rate setting (2nd AUX SET)**
  Set the flow rate ratio for the Auxiliary 2nd circuit.



a. For the key operation, refer to the Auxiliary 1st flow rate setting section.

Initial condition	Standard flow	Variable range
Auxiliary 2nd	C/D 100% = 21.6 L/min (5.7 US gpm)	10 to 100%

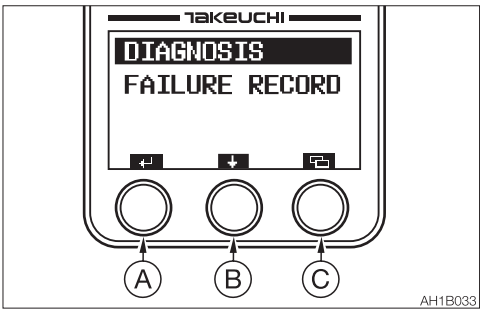
- **Auxiliary 4th flow rate setting (4th AUX SET)**
  Set the flow rate ratio for the Auxiliary 4th circuit.



a. For the key operation, refer to the Auxiliary 1st flow rate setting section.

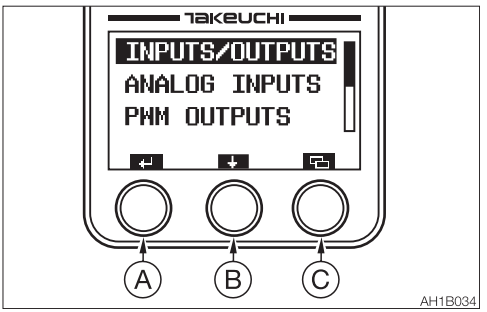
Initial condition	Standard flow	Variable range
Auxiliary 4th	G/H 100% = 21.6 L/min (5.7 US gpm)	10 to 100%

MAINTENANCE



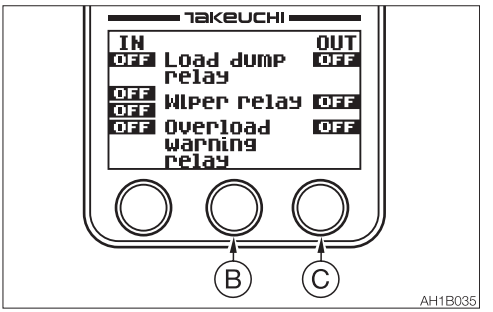
Diagnosis and failure record can be checked.
Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the side menu screen.

- Diagnosis (DIAGNOSIS)
  Input/Output, Analog Input, PWM Output, Engine Control Module (ECM) can be checked.



Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the Maintenance screen.

· Inputs/outputs (INPUTS/OUTPUTS)



The 9-page diagnosis data can be displayed.
Press the (B) key to display a different page.
Press the (C) key to return to the Diagnosis screen.

IN	1 page	OUT
OFF/ON	Load dump relay	OFF/ON
OFF/I	Wiper relay	OFF/ON
OFF/C		
OFF/ON	Overload warning relay	OFF/ON

IN	2 page	OUT
OFF/ON	Blade float relay	OFF/ON
OFF/ON	Safety lock SOL.	OFF/ON
OFF/ON	Buzzer	OFF/ON
OFF/ON	AUX auto depress SOL.	OFF/ON

IN	3 page	OUT
OFF/G	Travel speed SOL.	OFF/ON
OFF/L		
OFF/G	AUX3 SOL.	OFF/ON
OFF/F		
OFF/2	AUX2/4 SOL.	OFF/ON
OFF/S	Swing/Adjust SOL.	OFF/ON

IN	4 page	OUT
OFF/ON	Blade right angle SOL.	OFF/ON
OFF/ON	Blade left angle SOL.	OFF/ON
OFF/ON	1 Way SOL.	OFF/ON

IN	5 page	OUT
OFF/ON	Option AUX4	OFF/ON
OFF/ON	Deceleration button	OFF/ON
OFF/ON	AUX2/4 SW	OFF/ON
OFF/ON	PWR mode SW	OFF/ON
OFF/ON	Highland mode SW	OFF/ON

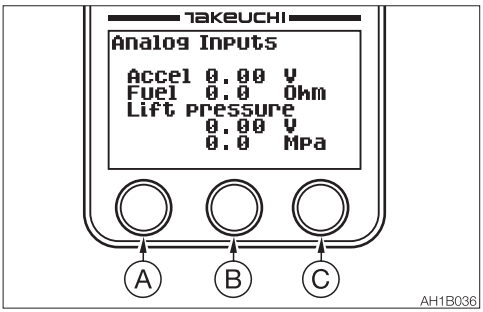
IN	6 page	OUT
OFF/ON	Engine discriminate (Yanmar)	OFF/ON
OFF/ON	Automatic deceleration SW	OFF/ON

IN	7 page	OUT
OFF/ON	AUX1 flow rate select SW	OFF/ON
OFF/ON	Option 2 piece boom	OFF/ON
OFF/ON	Selector button (2 piece boom)	OFF/ON

IN	8 page	OUT
OFF/ON	AUX3 pressure SW	OFF/ON
OFF/ON	Pressure SW(auto decel)	OFF/ON
OFF/ON	Air cleaner filter clogging	OFF/ON

IN	9 page	OUT
OFF/ON	Water separator warning SW	OFF/ON
OFF/ON	Glow	OFF/ON
OFF/ON	AC compressor	OFF/ON
OFF/ON	BAT charge	OFF/ON

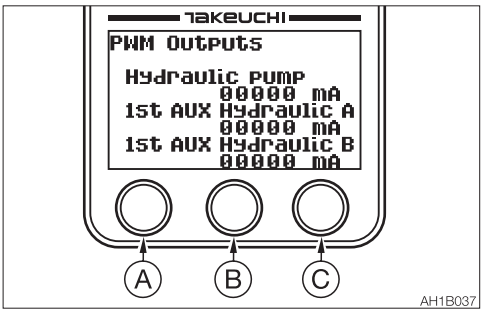
· Analog inputs (ANALOG INPUTS)



Displays the analog input information in one page.

Accel	0.00 V
Fuel	0.0 Ohm
Lift pressure	0.00 V
	0.0 Mpa

· PWM outputs (PWM OUTPUTS)



Displays the output information on the pump and the auxiliary circuits in two pages.

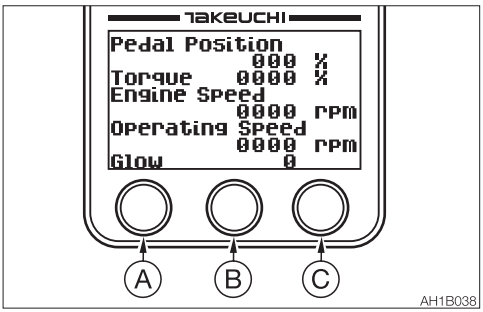
Page 1

Hydraulic pump	00000 mA
1st AUX Hydraulic A	00000 mA
1st AUX Hydraulic B	00000 mA

Page 2

2/4 AUX Hydraulic C/G	00000 mA
2/4 AUX Hydraulic D/H	00000 mA

· Engine Control Module (ECM)



Displays the engine output information in three pages.

Page 1

Pedal Position	000 %
Torque	0000 %
Engine Speed	0000 rpm
Operating Speed	0000 rpm
Glow	0

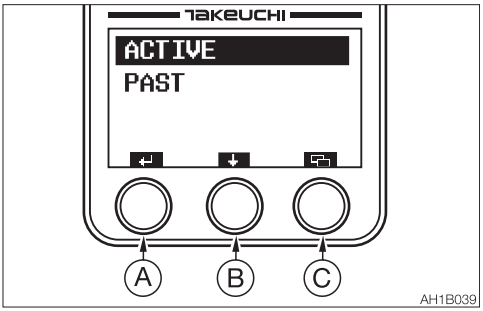
Page 2

Coolant Temp.	000 °C
Fuel Temp.	000 °C
Oil Pressure	0000 kPa
Fuel Rate	0000 L/h
Barometric Pressure	000 kPa

Page 3

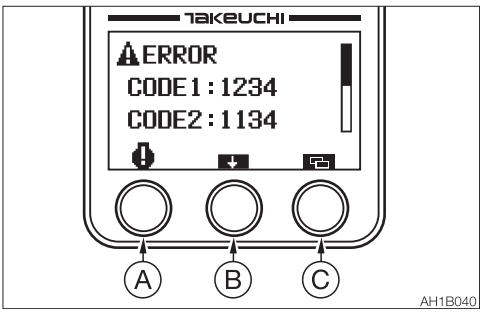
Air Inlet Temp.	000 °C
Boost Pressure	000 kPa
Boost Temp.	000 °C
Battery Voltage	0000 V

• Failure Record (FAILURE RECORD)
The Active Failure Record data and the Past Failure Record data can be checked.



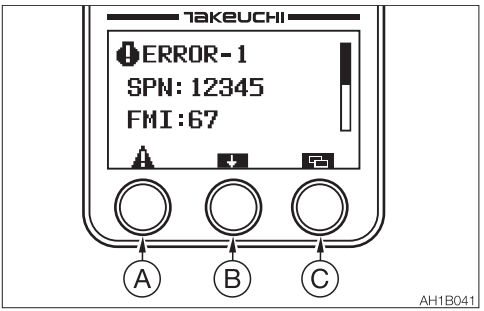
Press the (A) key to proceed to the screen selected by the bar.
Press the (B) key to move the selection bar.
Press the (C) key to return to the Maintenance screen.

· **Active Failure Record (ACTIVE)**



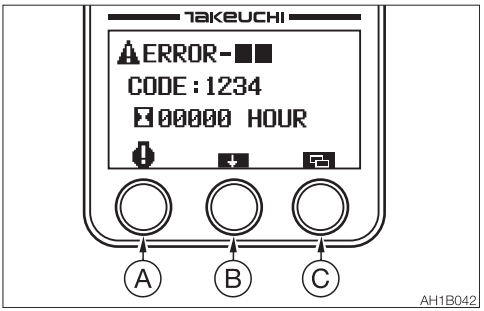
⚠..... Vehicle error code list
Pressing the (A) key while the Engine Error Code List is displayed changes the screen to the Vehicle Error Code List. Four latest codes are displayed.

..... Engine error code



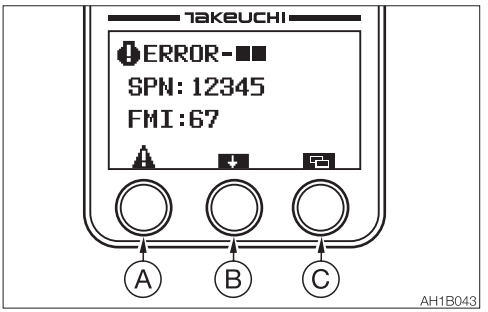
Pressing the (A) key while the Vehicle Error Code List is displayed changes the screen to the Engine Error Code List. The three latest code SPNs and the FMIs are displayed.
Press the (B) key to display a different page.
Pressing the (C) key returns to the Failure Record screen.

· **Past Fault History (PAST)**



⚠..... Vehicle Error Code 1 to 12
When the (A) key is pressed while the past engine error codes are displayed, the display changes to the past vehicle error code screen. The fault history data is displayed with the latest one at the top, as well as with the serial numbers (1 to 12) attached. The most recent time of fault occurrence recorded by the hour meter is also displayed.

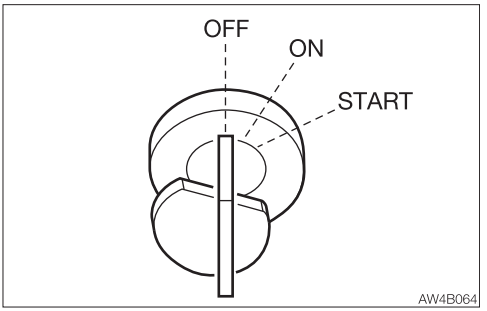
..... Engine error code 1 to 12



Pressing the (A) key while the past vehicle error codes are displayed changes to the past engine error code screen. The fault history data is displayed with the latest code SPNs and FMIs as well as the serial numbers of 1 to 12.
Press the (B) key to display a different page.
Pressing the (C) key returns to the Failure Record screen.

SWITCHES

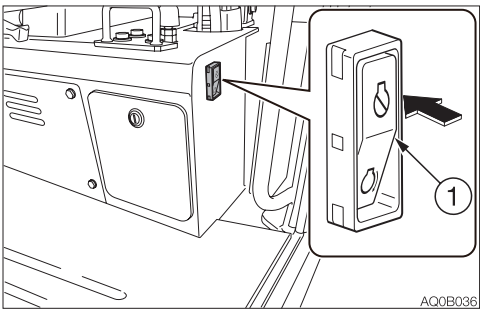
STARTER SWITCH



IMPORTANT: Do not repeatedly switch the key from OFF to ON and ON to OFF over a short period. Doing so will cause engine breakdown.

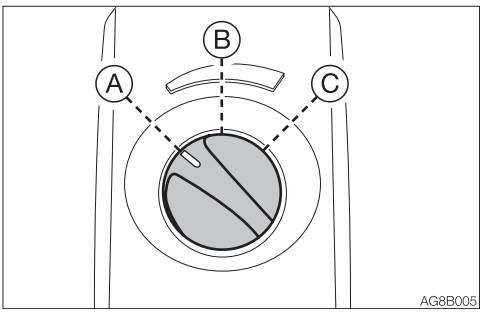
OFF ..... Position for stopping the engine and inserting or removing the key.
ON ..... Position in which the engine is running. At this position, all the electrical equipment is functional. When the coolant temperature is too low, the engine is automatically preheated.
START ..... Position for starting the engine. When the key is released, the switch automatically returns to the ON position.

ENGINE SHUTDOWN SWITCH



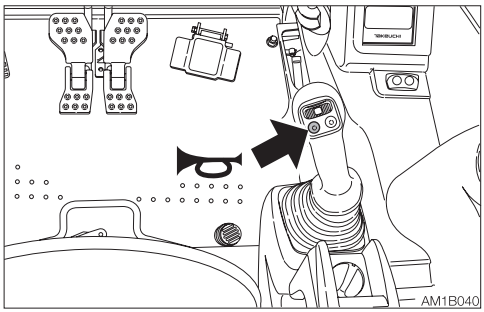
This switch is used to shutdown the engine if it fails to stop, due to machine failure or breakage, when the starter switch is set to the OFF position.
1. Press the switch (1).
2. After use, reset the switch (1).

THROTTLE CONTROLLER



This controls the engine speed.
(A).....Low idling
(B) .....Medium speed
(C) .....Maximum speed

HORN BUTTON

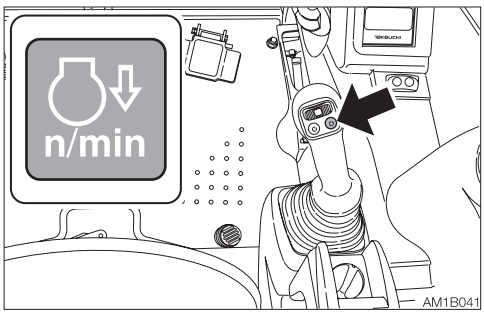


Press the button situated on the right operating lever to blow the horn.

DECELERATION BUTTON

⚠ WARNING

Before operating the deceleration button, set the operating lever to the neutral position and take your foot off the pedals. If the deceleration button is pressed while driving, the machine's operating speed will abruptly change to result in a dangerous situation.



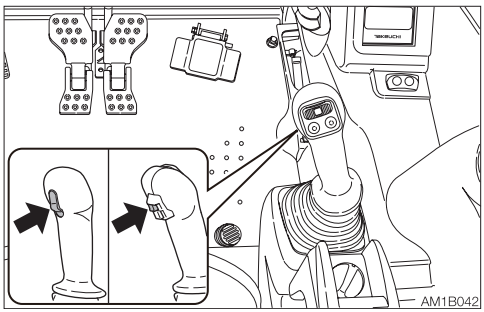
Press this button on the right operating lever to lower the engine speed to low idling. Press the button again to return to the engine speed set with the throttle controller. For safety reasons, it is designed that the deceleration function is activated to set the engine revolutions to low idling whenever the engine is started.
Cancel the deceleration mode by pressing the deceleration button as necessary.

Note: This deceleration button is capable of decreasing the engine speed and reducing the fuel consumption, with a simple operation, in a situation such as when little engine output is required and thus the operating or the travel levers are in neutral.

TRAVEL SPEED BUTTON

⚠ WARNING

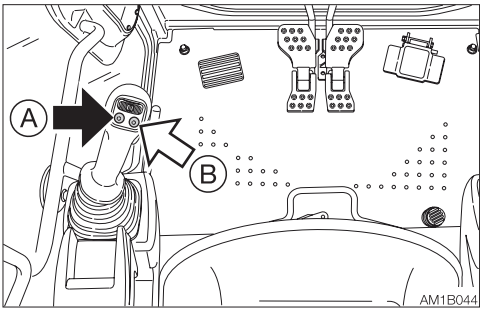
When a load greater than a set value is applied during traveling in 2nd (high) speed, the speed will automatically slow down to 1st (low) speed. When the load becomes lighter, the speed will increase and return to 2nd (high) speed. It should be noted that the travel speed changes depending on the load condition (for machines with the automatic travel shift-down system).



Press this switch to set the travel speed to 2nd (high) speed. Press it again to return to 1st (low) speed.

AUXILIARY 1ST SWITCHES

Auxiliary hydraulic buttons



Press those buttons to control the flow of the oil in the first auxiliary hydraulic lines.

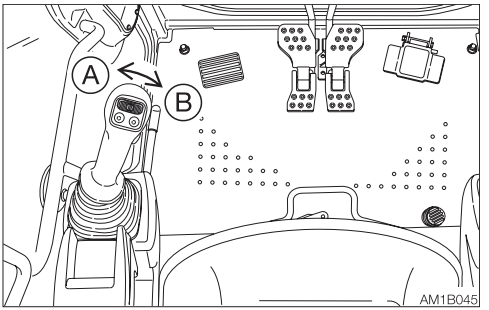
- Proportional control of the auxiliary hydraulic circuit is not possible.

(A).....Hydraulic oil flows to the left auxiliary line (a).

(B) .....Hydraulic oil flows to the right auxiliary line (b).

Slider switch (Proportional control)

Proportional control allows for slow-to-fast/ fast-to-slow movement of attachment. Example: If you move the slider switch half way, the attachment will move at approximately one-half the speed.



Move this switch to control the flow of the oil in the first auxiliary hydraulic lines.

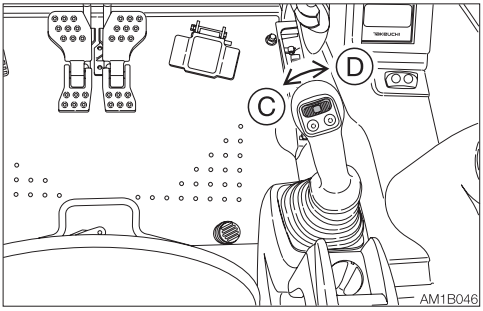
(A).....Hydraulic oil flows to the left auxiliary line (a).

(B) .....Hydraulic oil flows to the right auxiliary line (b).

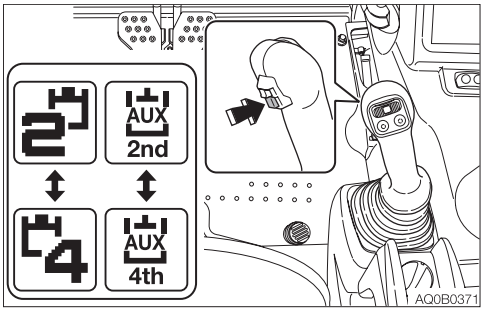
Refer to “Auxiliary hydraulic lines (If equipped)” on pages 2-70 to 2-74.

AUXILIARY 2ND/4TH SWITCH (IF EQUIPPED)

Slider switch
(Proportional control)
Proportional control allows for slow-to-fast/ fast-to-slow movement of attachment.
Example: If you move the slider switch half way, the attachment will move at approximately one-half the speed.



Move this switch to control the flow of the oil in the second auxiliary hydraulic lines.
(C): .....Hydraulic oil flows to the left auxiliary line (c).
(D): .....Hydraulic oil flows to the right auxiliary line (d).



To use the auxiliary 4th hydraulic line, press the auxiliary 2/4 select button to change to the operation of the auxiliary 4th.
Refer to “Auxiliary hydraulic lines (If equipped)” on page 2-70 to 2-74.

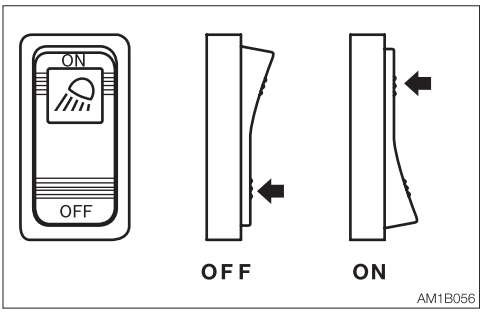
THIRD AUXILIARY HYDRAULIC SWITCH AND BUTTON (IF EQUIPPED)

Refer to “Third auxiliary hydraulic switch and button (If equipped)” on page 2-73.

AUXILIARY 2/4 SELECT BUTTON (IF EQUIPPED)

Refer to “Auxiliary 2/4 select button (If equipped)” on page 2-74.

LIGHT SWITCH

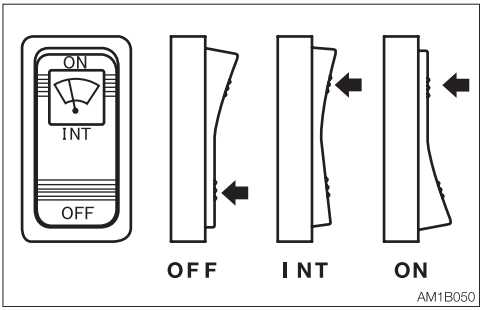


When this switch is turned while the starter switch is at ON, the lights turn on as follows:

OFF ....Off
ON .....Switch lamps, front light, boom light, side lights and tail lamps will be lit. (switch lamp is lit)

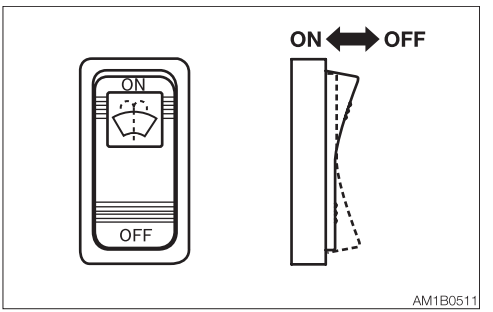
WIPER SWITCH

IMPORTANT: If no washer fluid is discharged, do not operate the washer. Doing so may damage the pump.
IMPORTANT: Operating the wiper with no moisture on the windshield will scratch the glass. Use water or washer fluid when operating the wiper.
IMPORTANT: In cold climates, the wiper blade may freeze to the glass. Operating the wiper forcibly may damage the wiper motor.



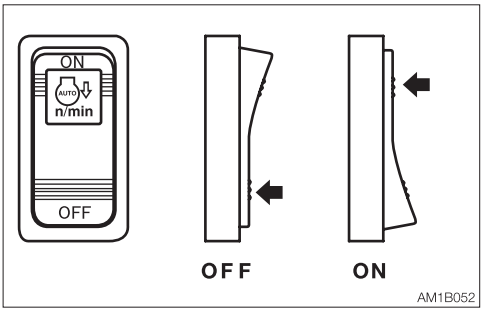
OFF ....Off
INT .....Intermittence operation
ON .....Continuous operation

WASHER SWITCH



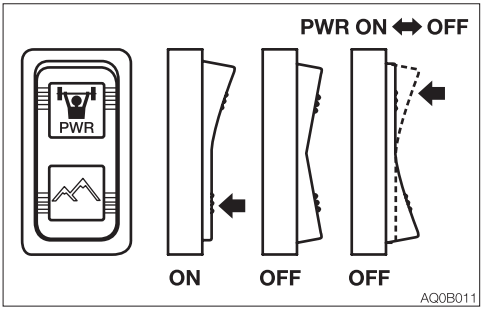
ON .....Pressing the ON side of the switch causes the washer to spray washer fluid. To stop spraying, release the switch.

AUTOMATIC DECELERATION SWITCH



When the ON side of the switch is pressed, the deceleration lamp in the instrument cluster flashes. This flashing stops when the deceleration function starts working, and the lamp remains lit while in the deceleration mode. The engine speed automatically drops to low idle (deceleration mode) four seconds after the control levers are set to neutral, to reduce fuel consumption. Moving the control levers will cause the speed to return to the original engine speed.
Switching from the deceleration button to the auto-deceleration switch will first return to the engine speed set with the throttle controller. Then, the engine will automatically enter the deceleration mode (low idling) if the control levers are not operated within four seconds.

POWER/HIGHLAND MODE SWITCH

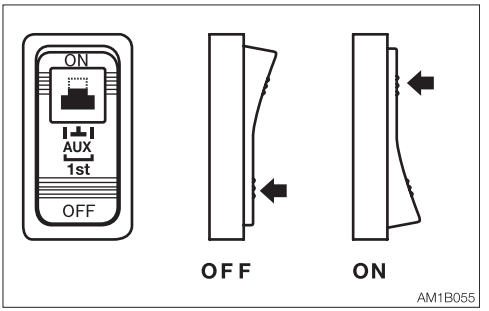


- **Power mode**
  - Pressing the PWR symbol side of the switch turns on the Power mode indicator lamp on the instrument cluster. The maximum engine output is obtained.
  - STD mode: Pressing the PWR symbol side of the switch again turns off the power mode indicator lamp.

- **Highland mode**
  This switch is used to reduce the engine load due to the hydraulic pump. When the machine is operated at a high-altitude site, the engine output is decreased due to thin air. In such cases, the hydraulic horse power is automatically adjusted to prevent the engine from stalling. Use this switch when the machine is operated at a high-altitude site.
  - Pressing the PWR symbol side of the switch turns on the Power mode indicator lamp on the instrument cluster.
  - To cancel the highland mode, press the PWR symbol side halfway to set to the neutral position. The highland mode indicator lamp goes out and enters the lowland mode.
    Refer to “Multi-information display” on page 2-16.
    Refer to “Instrument cluster” on page 2-28.

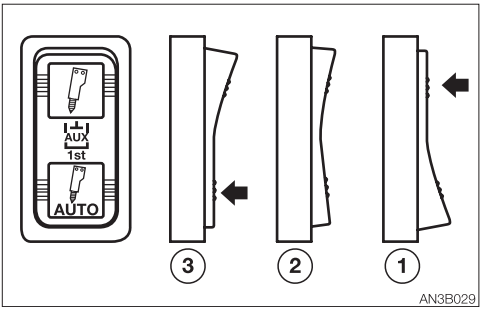
DETENT MODE SWITCH (AUXILIARY 1ST) (IF EQUIPPED)

IMPORTANT: Do not operate the machine in the detent mode for a long time. Doing so will increase the hydraulic oil temperature and shorten the service life of the hydraulic units.



This switch is used to change the operation mode of the auxiliary 1st button (A). Pressing the ON side of the switch causes the auxiliary button (A) to enter the detent mode. Pressing the OFF side changes to the momentary mode.

AUXILIARY 1ST AUTO TANK SWITCH (IF EQUIPPED)



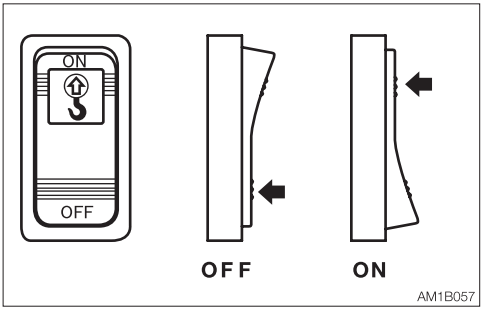
Use this switch to change the direction of hydraulic oil flow in the Aux. 1st line.

(1) When using a hydraulic breaker (1-way flow)
(2) When using a reversible attachment (2-way flow)
(3) The one-way flow can be set only when the button “A” of the Aux. 1 is pressed. (The tank circuit is automatically opened.)

LIFT OVERLOAD WARNING SWITCH (IF EQUIPPED)

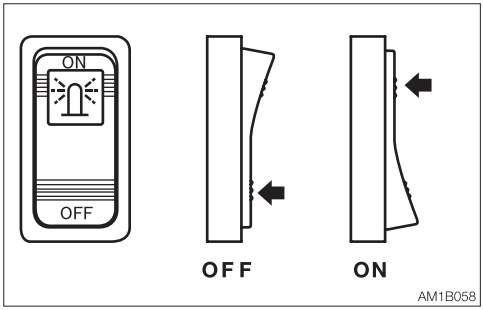
⚠ WARNING

If the overload is not removed after the overload warning horn is sounded, the machine may tip over. If the horn starts sounding, stop operating the machine and lighten the load.



If a weight greater than the lifting capacity is applied or lifted, the overload warning device is activated and the horn sounds. (When the lift overload warning switch is turned on.)
OFF ....Off
ON .....On

BEACON LAMP SWITCH (IF EQUIPPED)



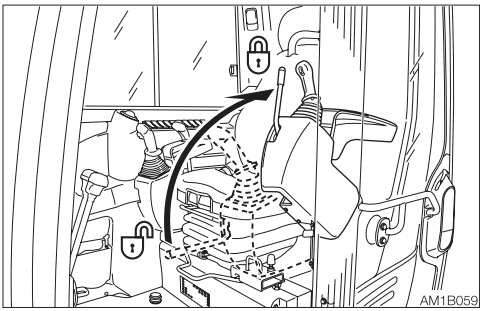
When this switch is turned on while the starter switch is at ON, the lamp turns on as follows:
OFF ....Off
ON .....Beacon lamp is lit

LEVERS AND PEDALS

SAFETY LOCK LEVER

⚠ WARNING

- **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.**
- **Be careful not to touch the operating levers when raising or lowering the safety lock lever.**
- **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.**

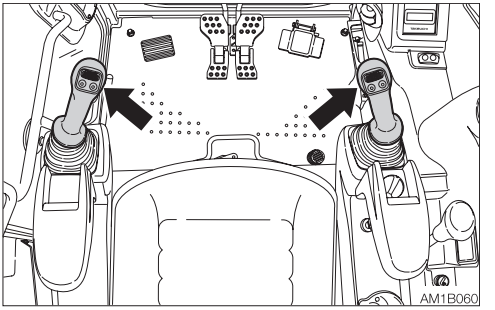


This device is for locking the operations of hoe attachment, slewing, auxiliary, dozer blade and traveling.
When the lever is raised, the lever stand springs up to lock the lever.

OPERATING LEVERS

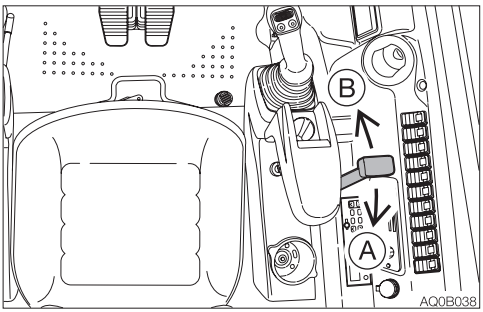
⚠ WARNING

- **Before starting operation, carefully check which lever pattern you are going to use.**
- **It is described using the ISO pattern in this manual.**



Use these levers to operate the boom, arm, bucket and upperstructure.
Refer to "Lever pattern" on pages 3-6 and 3-7.
Refer to "Operating the working equipment" on pages 3-14 and 3-15.

BLADE LEVER



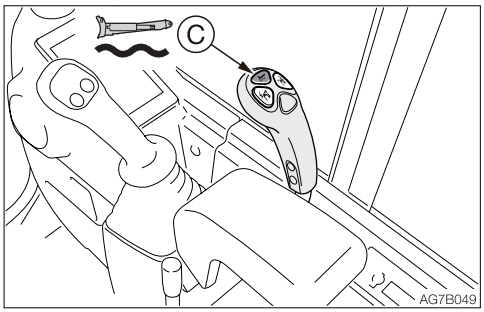
Use this lever to operate the dozer blade.
(A).....Blade up
(B) .....Blade down
Refer to “Operating the dozer blade” on page 3-15.

Float button (if equipped)

⚠ WARNING

- **Do not press the float button while the machine is raised by the blade. Doing so will cause the machine to fall. If you must work beneath the raised machine, always use a secure support to keep the machine raised.**
- **Do not press the float button while the blade is raised. Doing so will cause the blade to fall. Lower the blade to the ground before pressing the float button.**
- **Do not travel forward while the blade is in the float mode.**

Float operation

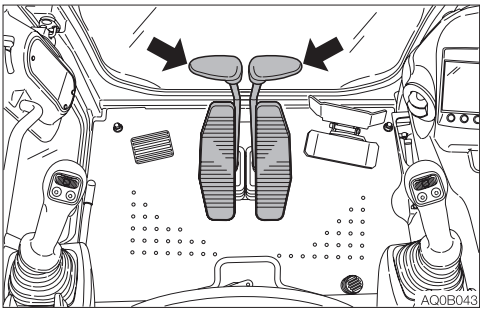


Button (C).....Float mode
Press the float button (C) to set the dozer blade to the float mode.
To cancel the float mode, press the float button (C) again. The float mode is temporally cancelled when the blade lever is tilted backward. To return to the float mode, tilt the blade lever back to the neutral position. Take caution when returning to the float mode.

TRAVEL LEVERS/PEDALS

⚠ WARNING

- **Before operating the travel levers/pedals, make sure that the dozer blade is to the front of the operator's seat. Remember that when the dozer blade is to the rear of the operator's seat, the travel levers/pedals must be operated in the reverse direction from when it is to the front.**
- **Do not rest your foot on the pedal unless operating it for traveling. If the pedal is accidentally stepped while working, the machine may suddenly move and cause serious injury or death.**

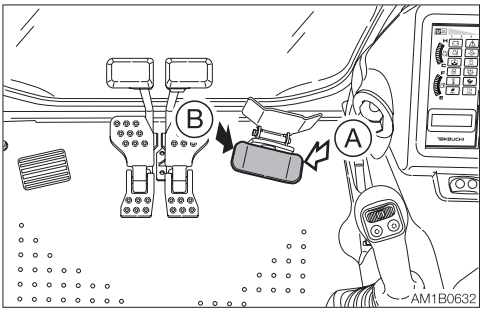


Use these levers/pedals to move forward or backward and to change directions.
Refer to "Operating the travel levers/pedals" on page 3-10.

BOOM SWING PEDAL

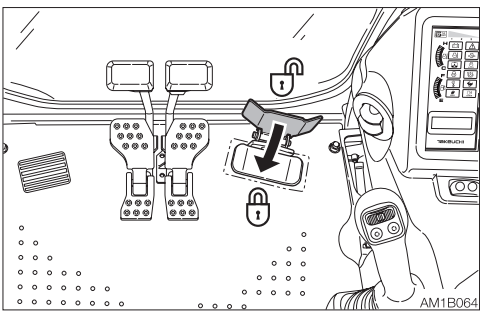
⚠ WARNING

Keep the pedal cover to the locked position when not using the pedal. Stepping on a pedal accidentally when it is not locked may cause accidents.



Use this pedal to operate the boom swing.
(A).....Boom swing right
(B) .....Boom swing left
Refer to "Operating the boom swing" on page 3-15.

Pedal lock



Set the pedal cover over the pedal to lock it. Open the pedal cover from the pedal to unlock it.

MEMO

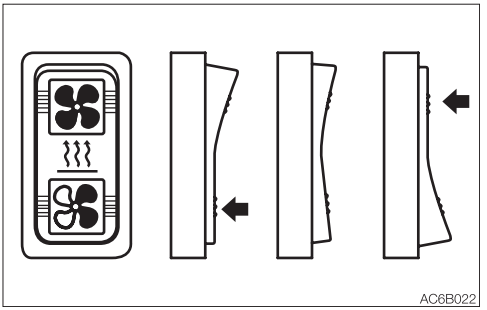
ACCESSORIES

HEATER

⚠ WARNING

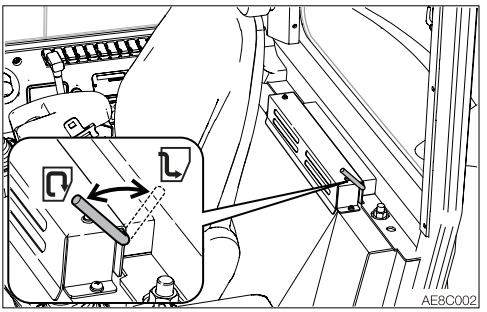
- Always be sure to allow sufficient ventilation.
- Do not place combustible or explosive objects near the air outlets.

Heater fan switch



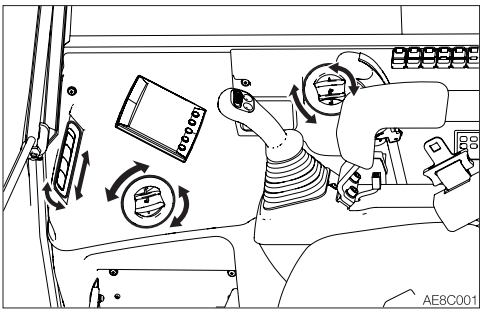
Low
Neutral .... OFF
High

Ventilation/Circulation lever



Use this lever to switch between Ventilation and Circulation.
...Full ventilation: For heating with ventilation. Intake of external air. Defrosting the windows.
..... Circulation: Quick heating or when external air is dirty.

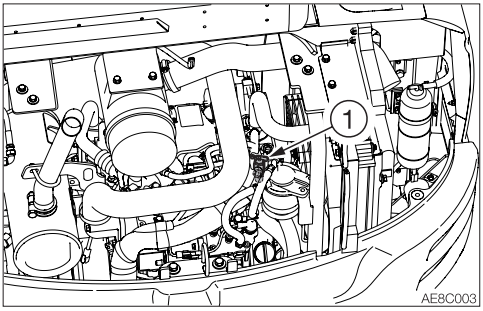
Outlets



Move the louver up and down or left and right to adjust the air flow direction and amount.

Heater valve
Coolant circulates in the heater even when the heater switch is turned off.
When the heater is no longer needed, stop coolant circulation as follows.

IMPORTANT: Use the valve (1) either fully open or fully closed.
Cooling water could leak when the valve is partly opened.



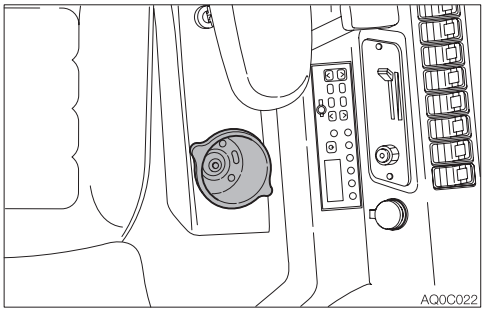
1. Park the machine on a level surface and stop the engine.
2. Open the engine hood.
3. Turn the valve (1) clockwise until it stops to close it.

Filters
Clean the filters immediately after operating in dusty places.
If the filters are clogged, the air flow is reduced and a booming sound is heard from the heater unit.
Refer to “Cleaning the air filter (CAB)” on page 5-41.

CUP HOLDER

⚠ CAUTION

- **Drinks may be spilled due to vibration when the machine is operating or traveling. Be particularly careful not to burn yourself with hot drinks.**
- **Note that the power supply socket or other electric parts may be damaged if drinks are spilled on them. Be careful not to spill fluid on them.**

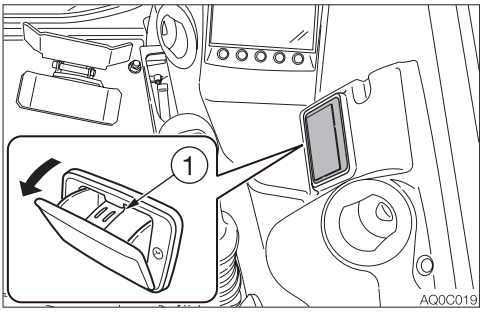


Use to hold cups or bottles.

ASHTRAY

⚠ WARNING

- **Be sure to extinguish cigarettes and matches completely before putting them in the ashtray, and close the ashtray after each use.**
- **Do not overfill the ashtray with cigarette butts or put in paper or other easily burnable objects. Doing so could cause fire.**



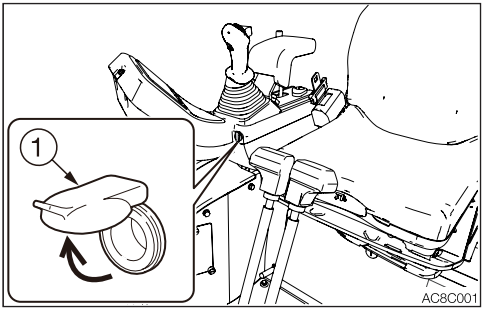
Pull the ashtray out towards you to use it. To clean, press the ash discharge button (1) and pull out the ashtray.

POWER SUPPLY SOCKET

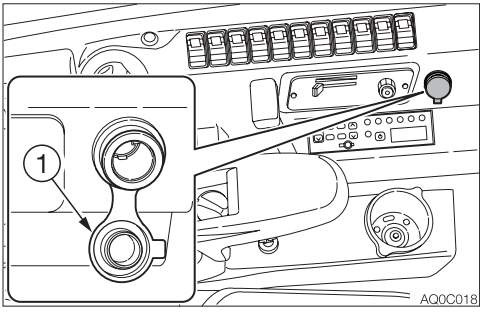
⚠ WARNING

Use only those electric products which comply with the specifications of these sockets.

<Canopy>



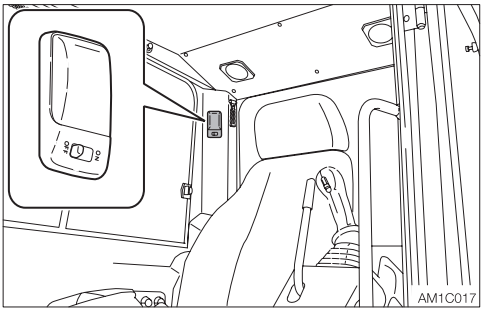
<Cab>



This socket is used to supply power to the interior electrical components. When using, be careful not to exceed 12V/5A.
To use, open the cap (1).

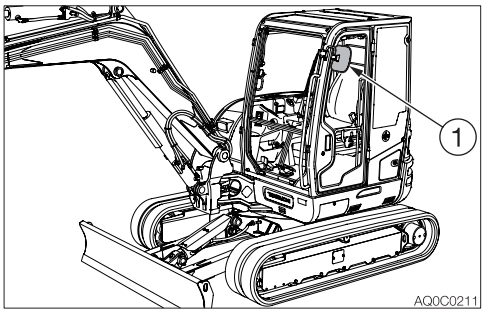
INTERIOR LIGHT

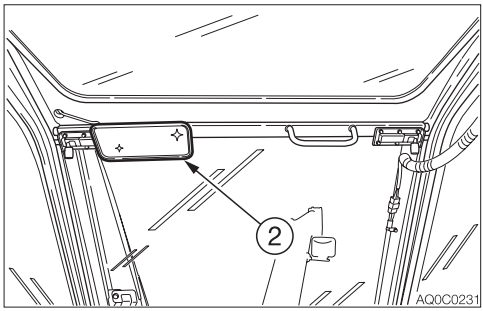
IMPORTANT: The battery capacity decreases if the interior light is left on for a long time when the engine is stopped.



OFF ..... Remains off all the time.
Neutral position
..... Lights up for 30 seconds when the starter switch is turned to OFF from ON.
ON ..... Lights up all the time.

MIRRORS



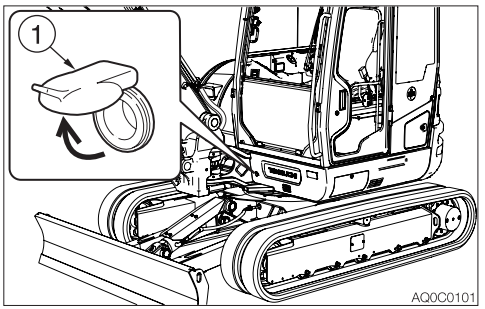


Adjust the rear view mirrors and side view mirrors so that you have a better view.
1. Check the left side rear view
2. Check the rear view.

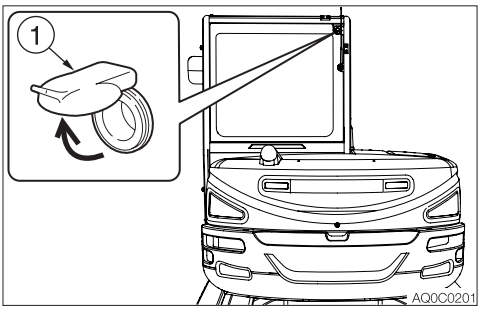
EXTERNAL POWER SOCKETS

⚠ WARNING

Use only those electric products which comply with the specifications of these sockets.



For beacon



Use these sockets to connect the external power supply. When using, be careful not to exceed 12V/5A.
To use, open the cap (1).

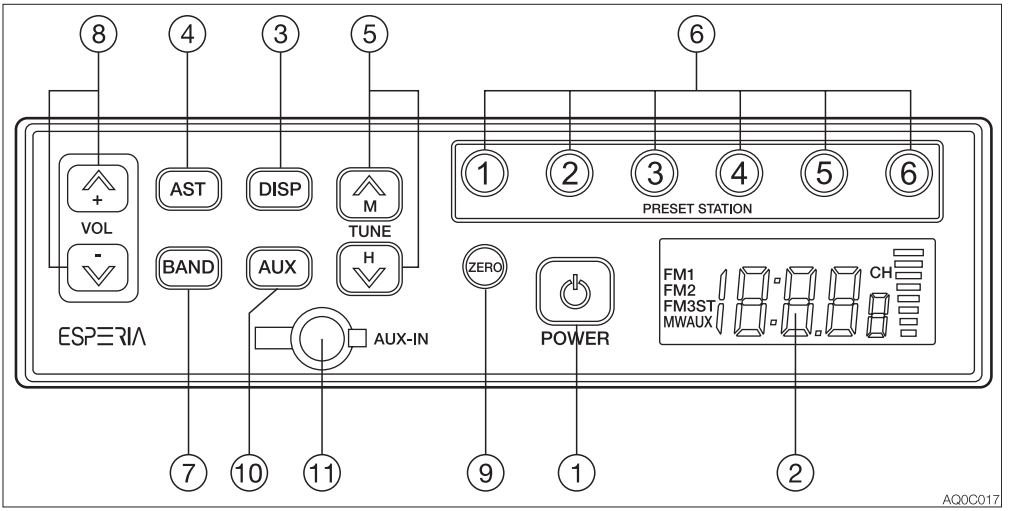
MEMO

RADIO (FOR CAB)

CAUTIONS ON USE

- **To ensure safe operation of the machine, always be sure to keep the volume of the radio down to a level where you can easily hear sounds from outside the machine.**
- **Do not use the radio for a long time when the engine is stopped. Doing so will drain the battery and make it difficult or impossible to restart the engine.**
- **Be careful not to allow water or other liquids to come into contact with the radio. Otherwise, it may result in malfunction.**

NAMES OF COMPONENTS



(1) POWER button
Use this button to turn on or off the radio.

(2) LCD
Displays the time/the receiving frequency and the operation mode.

(3) Display button (DISP)
Pressing this button while the frequency is displayed on the LCD changes the display to the clock. Pressing the button again returns to the frequency. If the button is not pressed for five seconds, the display returns to the frequency.

(4) Auto store/Auto seek station (AST)
Press this button to automatically assign receivable radio stations to preset buttons (1 to 6).

(5) Tuning button (TUNE ▲ ▼)
Press and hold this button (▲ or ▼) for one second or more to start seeking the receivable stations. The seeking stops when a station is found. To cancel tuning halfway, press the button again.
Pressing the TUNE button ▲ starts seeking stations with higher frequency.
Pressing the TUNE button ▼ starts seeking stations with lower frequency.
The frequency changes as either button is pressed in one second intervals.

(6) Preset buttons (1 to 6) (PRESET STATION)
Each button can store three FM stations (FM1, FM2, FM3) and one MW (AM) station. For how to set these buttons, refer to “Presetting stations”.

(7) Band button (BAND)
Pressing this button changes the band from FM1 to FM2, FM3 and MW (AM) in this order. The received band and its frequency appear on the display.

(8) VOL buttons
Use these buttons to control the sound volume. Press the button ⏶ to increase the volume and the button ⏷ to decrease the sound volume. Press and hold each button to continuously increase/decrease the volume.

(9) Clock zero set button (ZERO)
Use this button to set the minute to “00” when it is between “55” to “59” or “01” to “05”.
The LCD returns to the frequency display if no more operation is performed for five seconds.

(10) Auxiliary input select button (AUX)
Pressing this button changes the input source to the external device connected to the AUX-IN (11) jack. The display of “AUX” appears on the LCD. Pressing the button again returns to the radio.

(11) Auxiliary input jack (AUX-IN)
Use this jack to connect an external audio source such as a portable music player. Pull off the rubber cap and connect the output terminal (headphone jack) of the portable player to the AUX-IN with the stereo mini-plug (3.5 mm) cord. Be sure that jack is closed with the rubber cap when not in use.

Playing the radio
1. Turn the ignition key to the ACC or ON position, and then press the power button (1) to turn on the radio.
2. Select the band, FM or MW (AM) by pressing the BAND button.
3. Select the station with the preset button or the tuning button, and adjust the volume with the volume button.
4. To turn off the radio, press the power button.

Selecting a station-auto select
Press and hold the TUNE button ⏶ for one second or more to start seeking stations in the higher frequencies direction. Press and hold the TUNE button ⏷ for one second or more to start seeking stations in the lower frequencies direction. The radio will stop seeking when it finds an receivable station and start playing.

Selecting a station-manual select
The selection can be done manually. Press the tune ⏶ button to seek stations with higher frequencies. Press the tune ⏷ button to seek stations with lower frequencies.

Presetting stations

1. Press the BAND button to select a band (MW (AM) or FM), and then select the station by pressing the TUNE button for seeking.
2. To assign the selected station to a preset button, press and hold the button to be assigned for one second or more. The number of the preset button appears on the LCD.
3. For more stations to preset, repeat the steps 1 and 2 above.
   - If the preset button on which a station has been assigned is pressed and held for one second or more, the preset information will be modified.
   - If the stored information is erased during battery replacement on the vehicle, assign the stations again to the preset buttons.
   - Each preset button (1 to 6) can store three FM stations (one from each FM1, FM2, FM3) and one AM station.

Auto storing (AST)

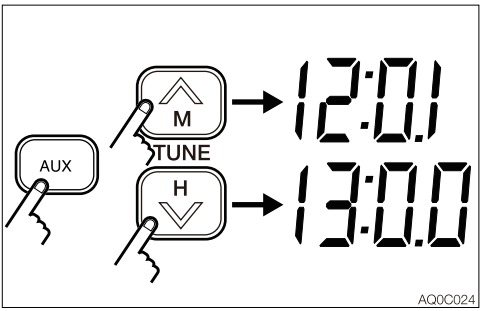
Press the AST button while playing the radio. The radio automatically starts seeking the receivable stations within the band currently selected and assign each preset button (1 to 6) a station.

Note: The previous stations stored will be cleared (cancelled) by the auto storing. If the station stored in the preset button is not desirable, try to preset the station manually.

Auxiliary input (AUX)

- Connect a portable audio player and listen to your favorite music.
- Plug a patch cord (without resistor) into the headphone jack of the audio player.
- Plug a stereo mini plug (3.5 mm) into the AUX-IN jack on the radio.
- To listen to an external portable audio player, press the AUX button. (The “AUX” display appears on the LCD and the frequency display is changed to the clock display.)
- To return to the radio, press the AUX button again.
- When connecting, adjust the sound volume level of the audio player so that it is same as that of the radio.
- Adjust the sound volume of the audio player by using the volume control buttons on the radio.
- Do not connect a device with a larger output compared with a portable audio player.

Setting the clock



- If a frequency is displayed on the LCD, press the AUX button (auxiliary input) to display the clock.
- Use the tune ⏶M button to set the minute. Use the tune ⏷H button to set the hour.
- To set the minute digits to “00” when they are from “55” to “59” or from “01” to “05”, press the ZERO button.

Resetting

If there are any problems, such as the abnormal display of frequency or failure of selection, reset the radio by pressing the “4” button while pressing the AST button and the AUX button together. Then, “JP” and the clock display appear on the LCD, indicating that the radio is turned off. Note that the memory stored in the preset button is cleared.

Switching the volume mode when the radio is on

Switch the modes between SU and FI by pressing the (1) button while pressing the AST and AUX buttons together, when the radio is on.

The SU or FI display appears on the LCD, followed by the radio turning off by itself.

SU mode: .....The volume at power-off is retained.

FI mode: .....The volume at power-off is reset.

SPECIFICATIONS

Power source: .... 12/24 VDC (negative ground)

Maximum power consumption: ..... 3A or less (at max. volume, 24 V)

Maximum output power: ..... 16 W + 16 W (4Ω) (at 28.8 VDC input)
5W+5W (4Ω) (at 14.4 VDC input)

Rated output power: ..... 12 W + 12 W (10% distortion, 4Ω) (at 28.8 VDC input)
3.5 W + 3.5 W (10% distortion, 4Ω) (at 14.4 VDC input)

Dimensions:..... 178 (W) x 50 (H) x 65 (D) mm (excluding protrusions)

Receiving frequency: ..... MW (AM) 531 to 1602 kHz (Europe, Asia), 530 to 1710 kHz (North, Central and South America)
FM 87.5 to 108 MHz (Europe, Asia), 87.9 to 108 MHz (North, Central and South America)

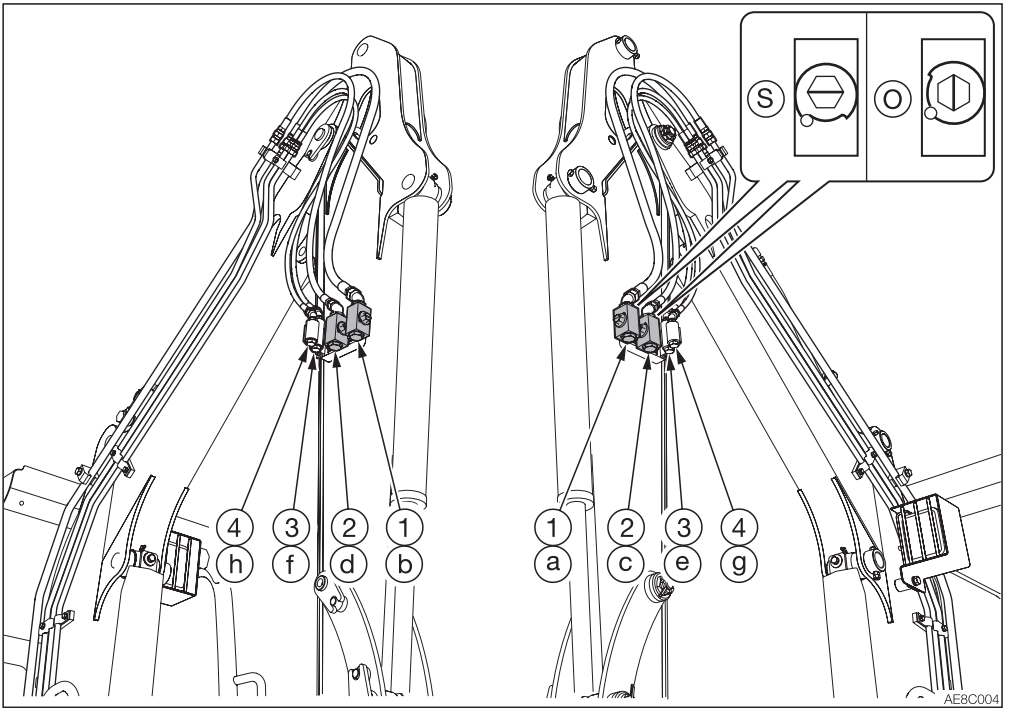
Practical sensitivity: ..... MW (AM) 32 dB or less (S/N 20 dB)
FM 12 dB or less (S/N 30 dB)

S/N ratio:..... MW (AM) 40 dB or more
FM 50 dB or more

AUX-IN: ..... Stereo mini jack (3.5 mm); rated input, 90 mV; 20 kΩ impedance

Note: Specifications and dimensions may be changed without notice.

AUXILIARY HYDRAULIC LINES (IF EQUIPPED)



⚠ WARNING

Oil may spurt out if pipes disconnected before releasing the pressure in the hydraulic system.

- **Immediately after the engine is stopped and while the safety lock lever is still in the unlock position, turn the starter switch to ON and press each auxiliary hydraulic switch several times to release the pressure from the auxiliary hydraulic circuit.**
- **Press the air breather button to relieve the tank pressure.**
- **When disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.**

These lines deliver the hydraulic oil necessary for operating a hydraulic breaker, crusher or other attachments.

(1).....First auxiliary hydraulic lines
(2).....Second auxiliary hydraulic lines
(3).....Third auxiliary hydraulic lines
(4).....Fourth auxiliary hydraulic lines

Stop valve
(S) : Closed
(O) : Open

Connecting the hydraulic circuits

To connect the attachment hydraulic lines, observe the following procedures:

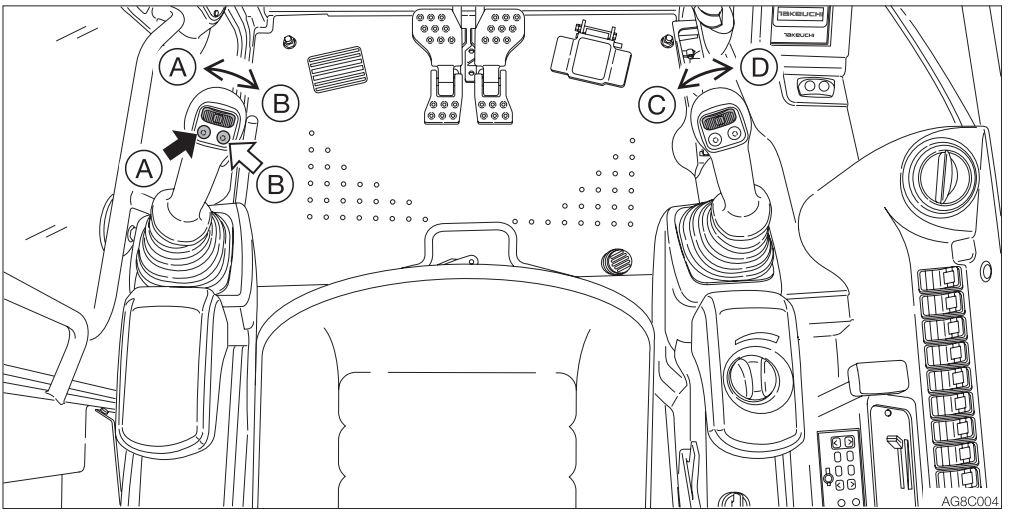
1. Release the pressure remaining in the lines, and then close the stop valve.
   Refer to “Releasing the residual pressure” on page 2-72.
2. Remove the plugs.
3. Connect the attachment hydraulic lines to ports (a/c) and (b/d). When installing a hydraulic breaker, connect the supply circuit to the port (a) and the return circuit to port (b).
4. Open the stop valves. When installing a hydraulic breaker, open the selector valve (1).
   Refer to “Selector valve” on page 2-73.
5. When connecting is complete, purge air from the hydraulic lines.
   a. Start the engine and run it at a low idle speed with no load for 10 minutes.
   b. With the engine running in low idle, operate the auxiliary hydraulic switches repeatedly (approx. 10 times) to purge air from the hydraulic lines.
   c. Stop the engine and wait for at least 5 minutes until bubbles escape from the hydraulic oil in the tank.

IMPORTANT: Follow the procedures for purging air as instructed by the attachment manufacturer, if applicable.

6. Check for oil leaks.

Disconnecting the hydraulic circuits

1. Release the pressure remaining in the lines, and then close the stop valve.
   Refer to “Releasing the residual pressure” on page 2-72.
2. Disconnect the lines from the ports (a/c) and (b/d).
3. Install the plugs.



Operating

Press those buttons to control the flow of the oil in the first/second auxiliary hydraulic lines.

(A).....Hydraulic oil flows to left auxiliary line (a).

(B) .....Hydraulic oil flows to right auxiliary line (b).

(C) .....Hydraulic oil flows to left auxiliary line (c).

(D) .....Hydraulic oil flows to right auxiliary line (d).

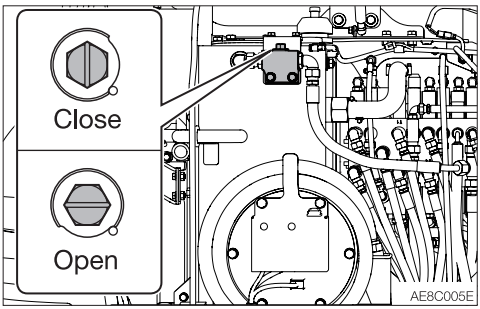
Releasing the residual pressure

After the auxiliary hydraulic circuits have been used, pressure remains in the circuits. This is called the residual pressure. Release this residual pressure before disconnecting the lines.

Perform the residual pressure releasing within 10 minutes after the engine stopping.

1. Park the machine on a flat, rigid and safe ground.
2. Stop the engine.
3. Lower the safety lock lever to the unlocked position.
4. Turn the starter switch to the ON position.
5. Press the auxiliary hydraulic switches several times to release the residual pressure in the auxiliary hydraulic circuitry.

Selector valve



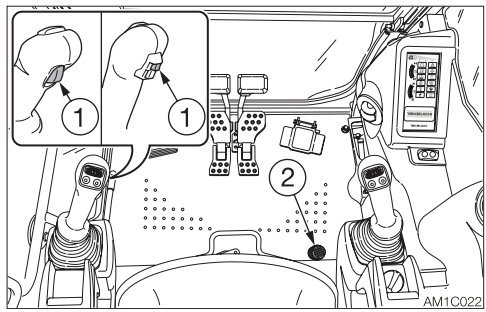
Open ..... When using a hydraulic breaker (1-way flow)
Closed..... When using a reversible attachment (2-way flow)

Change the direction of the hydraulic oil flow by opening or closing the selector valve (1) inside the right side cover.

For the machine with the auxiliary 1st auto tank switch, use the switch to select the flow.

Refer to “Auxiliary 1st auto tank switch (If equipped)” on page 2-54.

Third auxiliary hydraulic switch and button (If equipped)

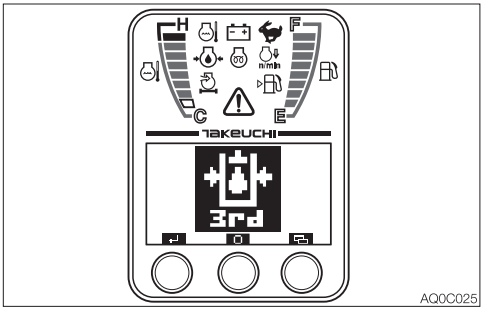


The auxiliary 3rd is mainly used for the attachment that can quickly connect/ disconnect the bucket. After the engine is started, hydraulic oil constantly flows into the pipe (e). This allows the pressure in the (e) side to increase, preventing the pin inserted on the bucket from coming out. If the pressure in the (e) side drops, the warning lamp starts flashing to warn that the bucket may come out. For a safety reason, the bucket can be disconnected only when the button (1) and the switch (2) are pressed at the same time. When they are pressed, the hydraulic oil flows into the line (f) to increase the pressure there. As the result, the pin on the bucket comes out and the bucket is removed from the machine.

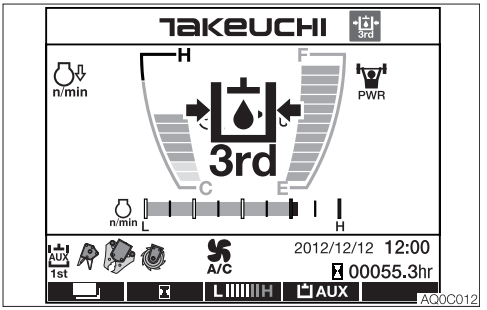
- **Bleeder unit for simultaneous use with the auxiliary 1st and 2nd (if equipped)**
  Pressing both the auxiliary 3rd button (1) and the switch (2) makes it possible to release internal pressure from the auxiliary 3rd (e side), auxiliary 1st and auxiliary 2nd at the same time. (The pressure is kept drawn for six seconds after the button and the switch are released.) This enables faster attachment change.

Third auxiliary hydraulic warning lamp

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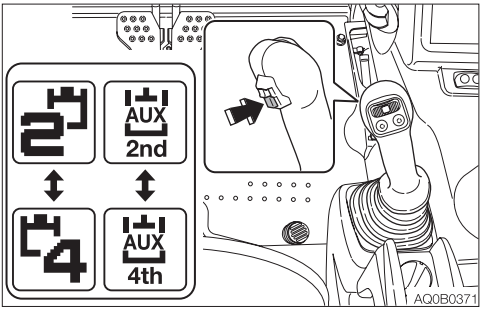


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This lamp illuminates and an alarm sounds if the auxiliary 3rd hydraulic pressure drops abnormally while the engine is running.

Auxiliary 2/4 select button (If equipped)



This button is used to change from the second auxiliary operation to the fourth auxiliary operation.
Pressing this button displays the second auxiliary on the LCD to indicate that the second auxiliary operation is enabled.
Pressing this button again displays the auxiliary 4th on the LCD to indicate that the auxiliary 4th operation is enabled.
The actual operation is performed with the auxiliary 2nd/4th switch (slider switch).
Refer to “Auxiliary 2nd/4th switch (If equipped)” on page 2-51.

OPERATING THE MACHINE WITH AN ACCUMULATOR

⚠ WARNING

Be sure to handle the high-pressure nitrogen gas enclosed in the accumulator with care. If handled incorrectly, it could explode and cause serious injury. Strictly observe the following precautions:

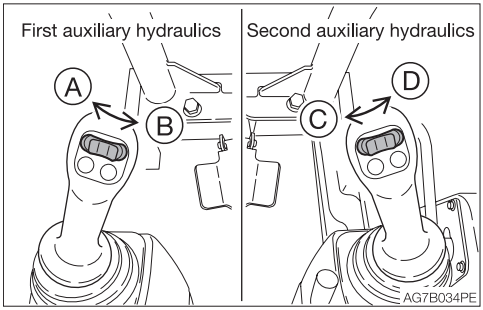
- **Do not disassemble.**
- **Do not allow flame near or throw it into a fire.**
- **Do not drill, weld or fuse.**
- **Do not subject it to physical shock such as hitting, rolling or dropping.**
- **Before disposing of the unit, the sealed gas must be drained. Contact a Takeuchi service agent for help.**

For a machine with an accumulator, the residual pressure in the auxiliary hydraulic circuit or the working equipment circuit can be released even after the engine is stopped.

Releasing residual pressure

Residual pressure refers to the pressure that remains in the hydraulic circuit after the operation. Release the residual pressure as necessary by using the following steps. Perform the residual pressure releasing within 10 minutes after the engine stopping.

1. Return the throttle controller to idle the engine at low speed.
2. Lower the bucket and dozer blade to the ground.
3. Check that the safety lock lever is in the released position.
4. Stop the engine.
5. Turn the starter switch to the ON position.



6. Move or press the auxiliary hydraulic switches several times to release the residual pressure in the circuitry.
7. Move all the control levers and pedals several times in all directions to release the pressure from the working equipment circuitry.
8. Raise the safety lock lever to engage the lock.

Lowering the boom when the engine has stopped

Perform this operation within 10 minutes after the engine stopping.

1. Sit at the operator's seat.
2. Turn the starter switch to the ON position.
3. Lower the safety lock lever to the unlock position
4. Slowly push the operating lever forward to lower the boom.

LOAD SAFETY DEVICE (IF EQUIPPED)

The load safety devices include an emergency shut-off valve and an overload warning device.

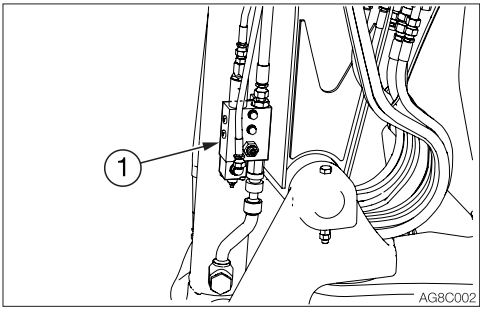
Emergency shut-off valve

⚠ WARNING

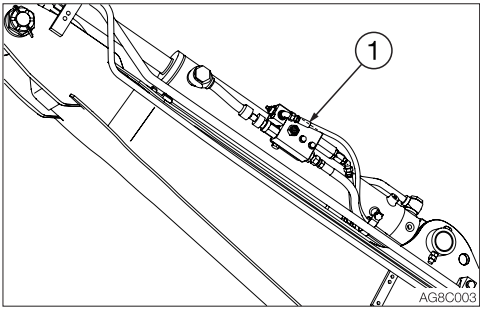
If the boom or arm stops due to the breakage of hose, immediately move away from the load being lifted and go to a safe location.

The emergency shut-off valve (1) prevents the boom or arm from falling rapidly in case the hydraulic hose is broken.

Boom



Arm (option)



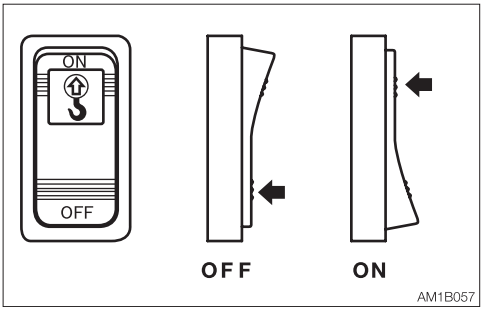
If the hose breaks and the emergency shut-off valve (1) is activated to stop the operation of boom or arm, lower the boom or arm by slowly operating the lever while ensuring safety. Ask your sales or service dealer for repair.

Overload warning device

⚠ WARNING

If the overload is not removed after the overload warning horn is sounded, the machine may tip over. If the horn starts sounding, stop operating the machine and lighten the load.

If a weight greater than the lifting capacity is applied or lifted, the overload warning device is activated and the horn sounds. (When the lift overload warning switch is turned on.)



Lift overload warning switch
OFF ....Off
ON .....On

OPERATION

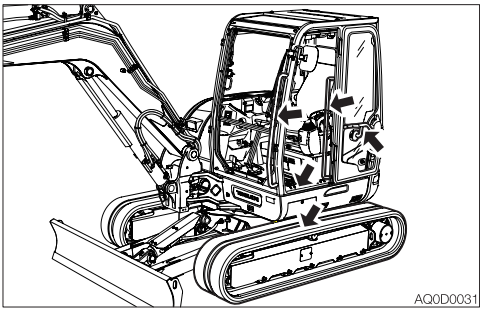


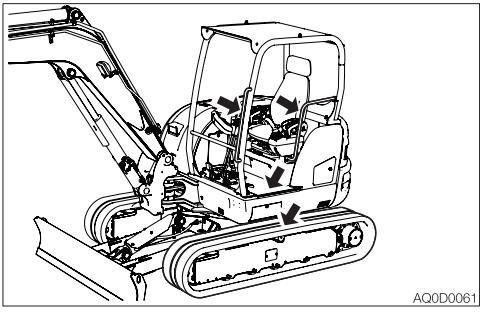
BEFORE STARTING OPERATION

GETTING ON OR OFF THE MACHINE

⚠ WARNING

- **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.**





- **Climb up/down the steps 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.**

WALK-AROUND INSPECTION

Perform the walk-around inspections once a day before starting the engine for the first time that day.
Refer to “MAINTENANCE, Walk-around inspection”, on pages 5-16 and 5-17.

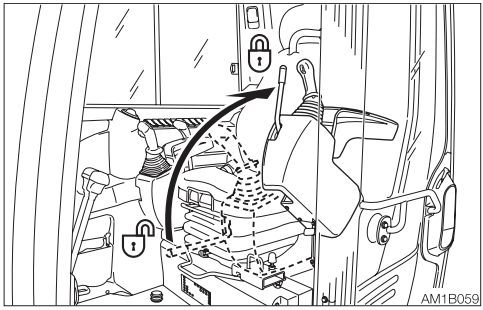
DAILY INSPECTION

Perform the daily inspections once a day before starting the engine for the first time.
Refer to “MAINTENANCE, Daily inspection”, on pages 5-18 to 5-23.

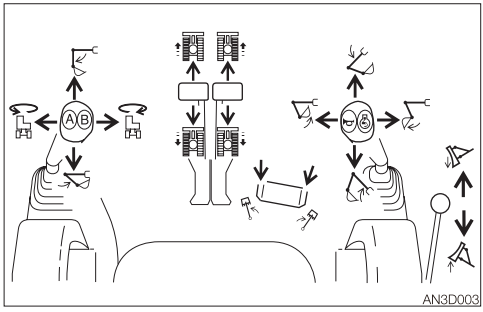
STARTING AND STOPPING THE ENGINE

BEFORE STARTING THE ENGINE

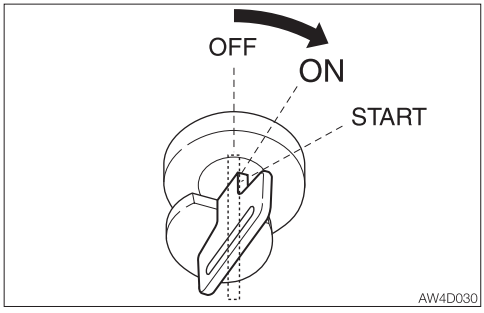
1. Adjust the seat for a comfortable operating position.
2. Fasten the seat belt.



3. Check that the safety lock lever is in the locked position.

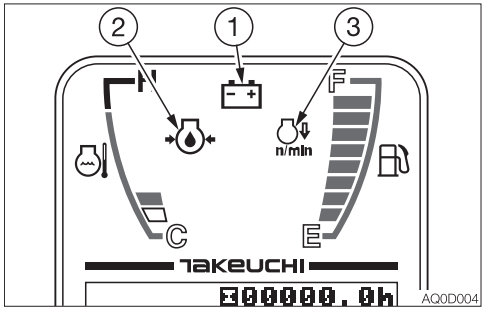


4. Check that all levers and pedals are in the neutral position.

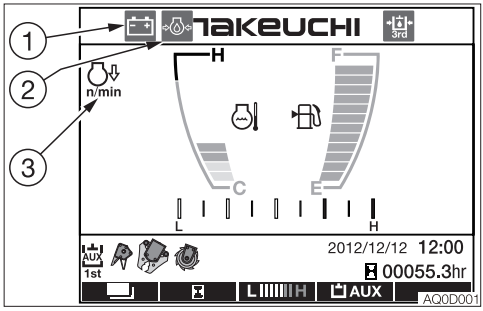


5. Insert the key into the starter switch, turn it to the ON position, then perform the following inspections:

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- All warning lamps flash and an alarm is sounded for two seconds. The meters also start functioning. After two seconds, the deceleration lamp (3) stops flashing and remains lit, while the battery charge warning lamp (1) and engine oil pressure warning lamp (2) remain flashing. (If the auxiliary 3rd is selected, it is also flashing.) The other lamps go out.
- Turn on the light switch to check that the boom light, front light and tail lamps turn on.
- Check the fuel level.

If a lamp does not light or the alarm is not sounded, the display or a wire may be damaged. Ask your sales or service dealer for repair.

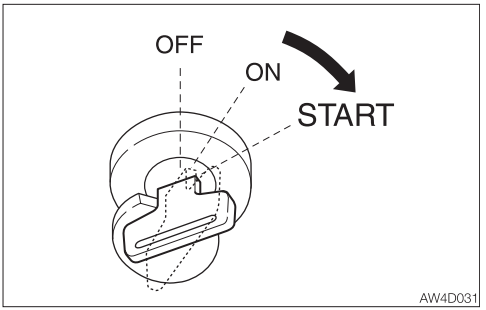
STARTING THE ENGINE

⚠ WARNING

- Clear all personnel from the work area.
- Sound the horn to warn people around the machine.

IMPORTANT: Do not run the starter motor for more than 15 consecutive seconds. If the engine fails to start, wait for 30 seconds, and then try again to start the engine.
IMPORTANT: If the engine stalls due to fuel shortage, add fuel, turn the key to the ON position for 60 seconds, and then turn it to the START position. Running the starter for a long time before there is enough fuel is going through can cause the starter to fail.

Normal starting

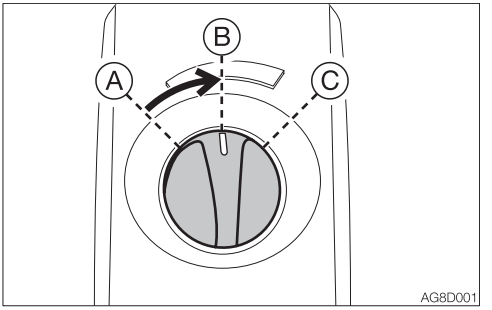


1. Turn the starter key to the START position and start the engine.
2. Once the engine starts, release the key. The key automatically returns to the ON position.
3. Check that the warning lamps are off. For safety reasons, it is designed that the deceleration function is activated to set the engine revolutions to low idling whenever the engine is started. Cancel the deceleration mode by pressing the deceleration button as necessary.
4. Warm up the engine. Refer to “Warming up the engine” on page 3-5.
5. After the completion of the warming up, press the deceleration button to cancel the deceleration mode.

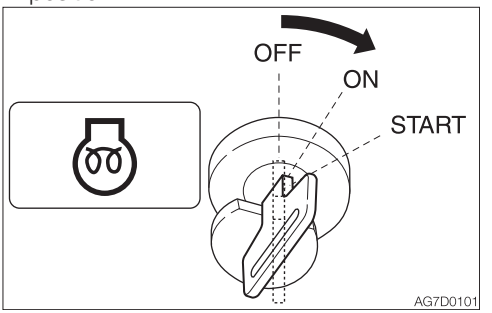
Starting in cold climates

⚠ WARNING

Never use starting fluid on this engine, as the starting fluid could cause an explosion.



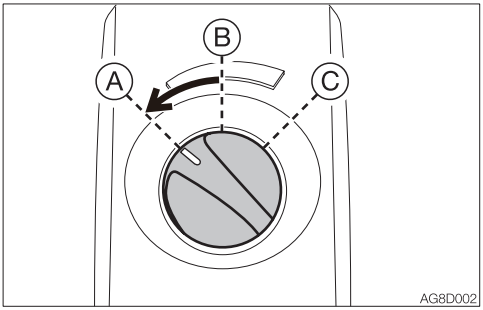
1. Turn the throttle controller to the middle position.



2. Turn the starter key to the ON position, and confirm that the glow lamp is on. (The glow lamp stays lit for 15 seconds when the coolant temperature is –10°C (14°F).)
3. After the glow lamp goes out, press the deceleration button (to cancel the deceleration mode), and then turn the key to the START position to start the engine.
4. Once the engine starts, release the key. The key automatically returns to the ON position.
5. Check that the warning lamps are off.
6. Return the throttle controller to the original position and warm up the engine. Refer to “Warming up the engine” on page 3-5.

WARMING UP THE ENGINE

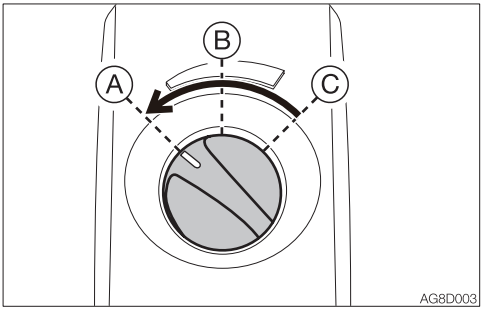
IMPORTANT: Avoid racing the engine until it has warmed up.
Do not warm up the engine for a long time (20 minutes or more). When idling is required, occasionally place a load or run the engine at medium speed.



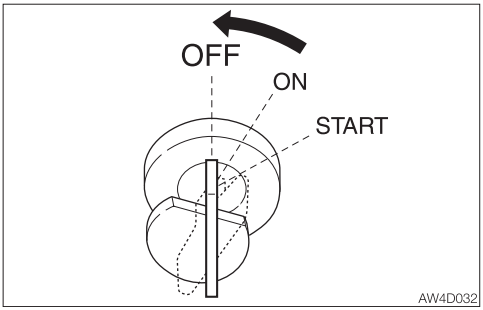
1. Return the throttle controller, and then run at a low idle with no load for 5 minutes.

STOPPING THE ENGINE

IMPORTANT: Do not stop the engine suddenly when operating with heavy loads or at the maximum speed. Doing so may cause the engine to overheat or seize. Never stop running the engine suddenly except in emergency.



1. Return the throttle controller.
2. Idle the engine for about 5 minutes to gradually let it cool.



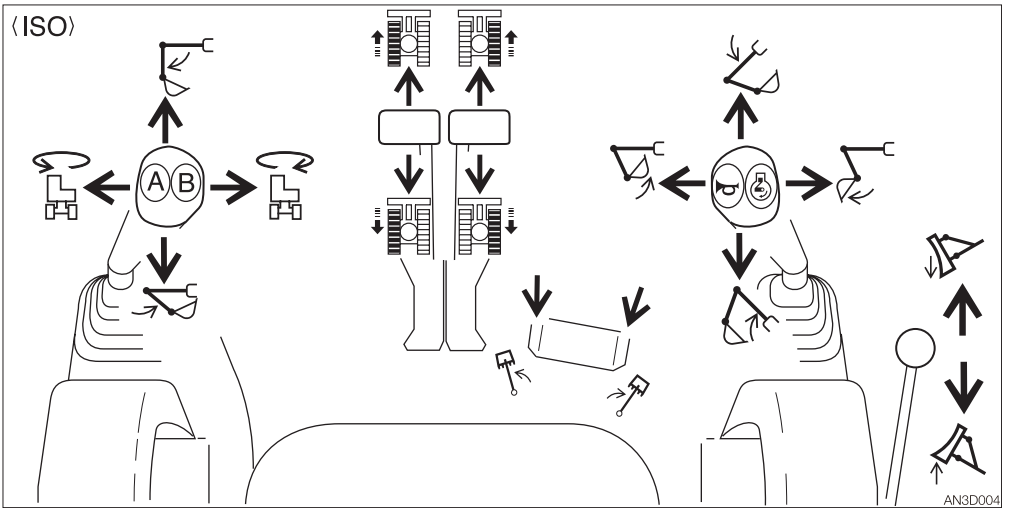
3. Turn the starter key to the OFF position to stop the engine.

OPERATING THE MACHINE

LEVER PATTERN (ISO PATTERN)

⚠ WARNING

- Before starting operation, carefully check which lever pattern you are going to use.
- It is described using the ISO pattern in this manual.

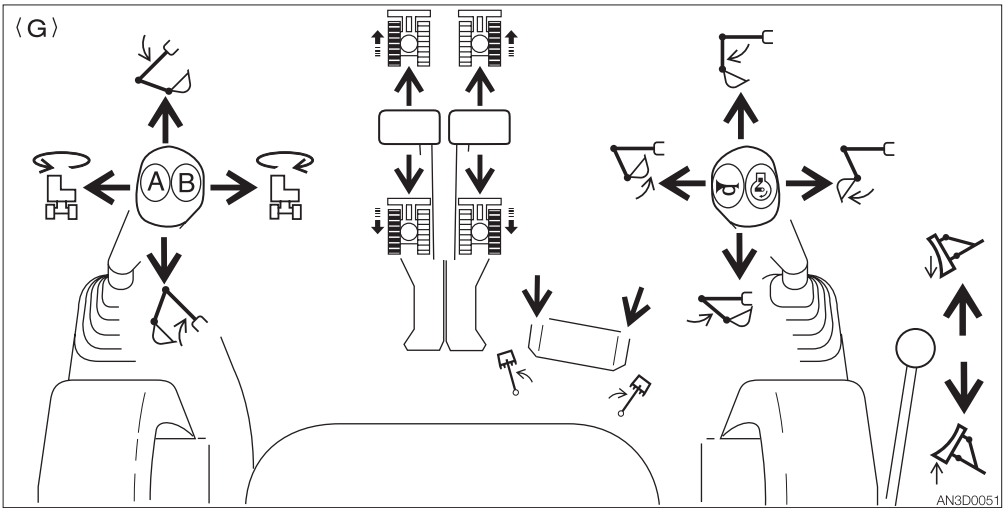


	Left crawler forward		Right crawler forward
	Left crawler reverse		Right crawler reverse
	Arm out		Boom lower
	Arm in		Boom raise
	Upperstructure slew left		Bucket load
	Upperstructure slew right		Bucket dump
	Boom swing left		Dozer blade lower
	Boom swing right		Dozer blade raise

LEVER PATTERN (G PATTERN) (IF EQUIPPED)

⚠ WARNING

- **Before starting operation, carefully check which lever pattern you are going to use.**
- **It is described using the ISO pattern in this manual.**



	Left crawler forward		Right crawler forward
	Left crawler reverse		Right crawler reverse
	Boom lower		Arm out
	Boom raise		Arm in
	Upperstructure slew left		Bucket load
	Upperstructure slew right		Bucket dump
	Boom swing left		Dozer blade lower
	Boom swing right		Dozer blade raise

Refer to “Selecting a lever pattern” on page 8-5.

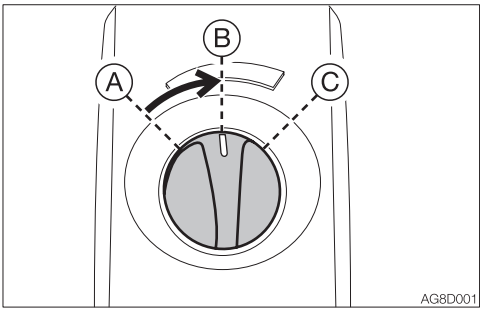
WARMING UP THE MACHINE (HYDRAULIC OIL)

⚠ WARNING

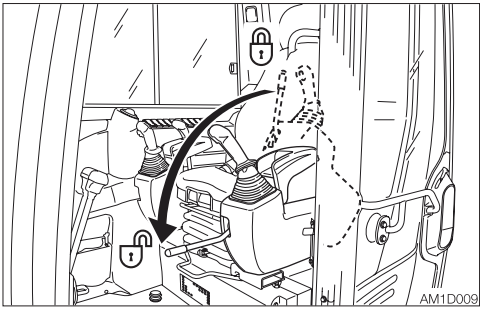
Operating the working equipment without warming up the machine (hydraulic oil) is dangerous, as the working equipment cannot response to controls quickly or may move in unexpected ways, and the safety devices may not operate properly. Be sure to sufficiently warm up the machine.

IMPORTANT: Do not operate the levers too quickly when the hydraulic oil temperature is below 20°C (68°F). The proper hydraulic oil temperature during operation is 50 to 80°C (122 to 176°F). If operations must be performed at lower temperatures, heat up the hydraulic oil to at least 20°C (68°F).

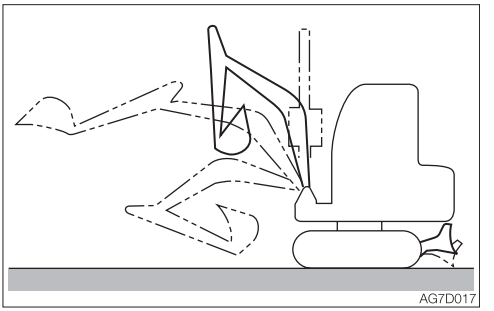
Normal warm-up



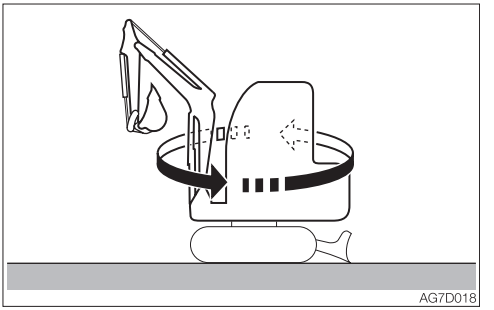
1. Turn the throttle controller to the middle position, and then run the engine at medium speed for about five minutes with no load.



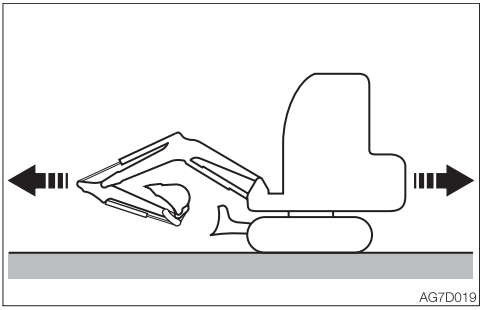
2. Fully lower the safety lock lever to disengage the lock and lift the bucket from the ground.



3. Extend and retract each of the cylinders slowly several times with no load.



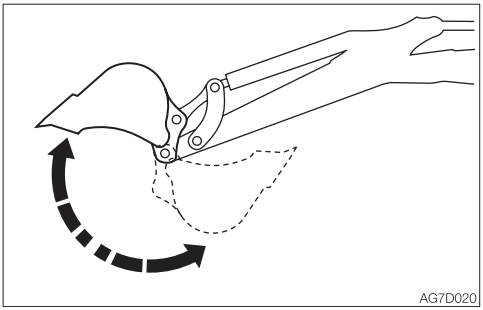
4. Slew slowly to the left and the right several times.



5. Travel slowly forward and in reverse several times.

Warm-up in cold climates

1. Perform the normal warm-up procedure.

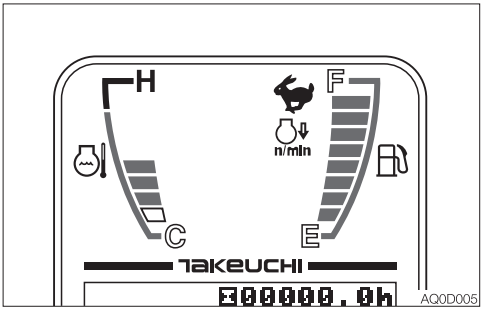


2. Set the bucket cylinder at the stroke end and keep it there.
   Do not keep this condition for more than 30 seconds.
3. Repeat Step 2 until the bucket operating speed becomes normal.

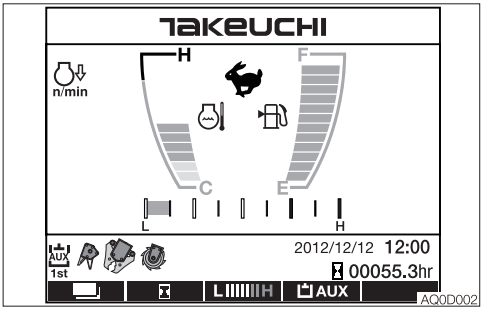
INSPECTION AFTER WARM-UP

After warming up the engine and machine (hydraulic oil), perform the checks and inspections described below, and repair if necessary.

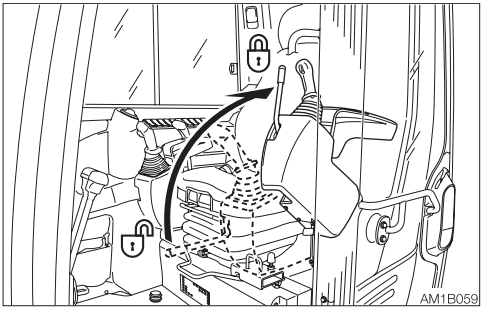
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1. Check that the warning lamps and meters are as follows:
   · Are all warning lamps off?
   · Is the water temperature level within the green range?
2. Check that there are no irregularities in the exhaust color, sound and vibrations.

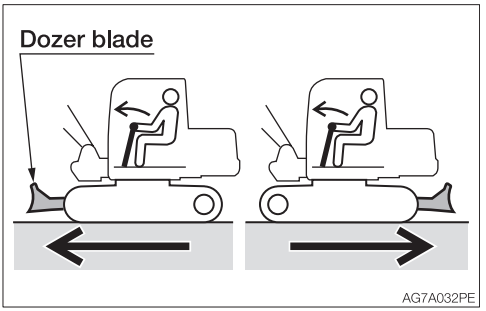


3. Raise the safety lock lever to the locked position, and then check that the operating and travel levers are locked.

OPERATING THE TRAVEL LEVERS/ PEDALS

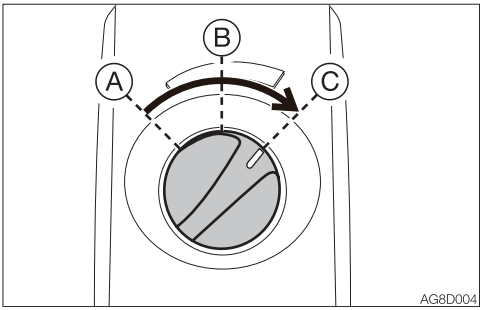
⚠ WARNING

- Never allow anyone to enter the machine's slewing 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, as necessary, swing the cab around in reverse to check that the area is safe and clear.

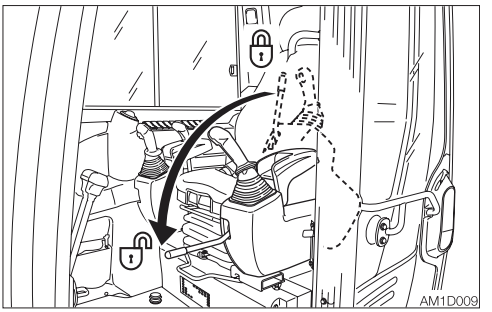


- Before operating the travel levers/ pedals, make sure that the dozer blade is to the front of the operator's seat. Remember that when the dozer blade is to the rear of the operator's seat, the travel levers/pedals must be operated in the reverse direction from when it is to the front.
- Clear all obstacles from the path of the machine.

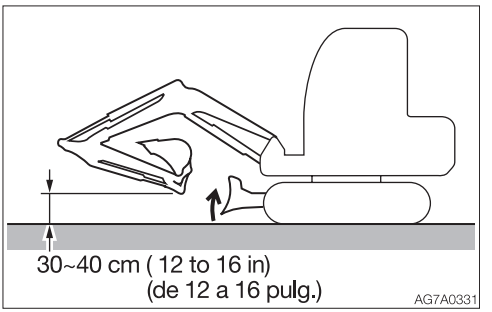
Moving the machine forward and backward



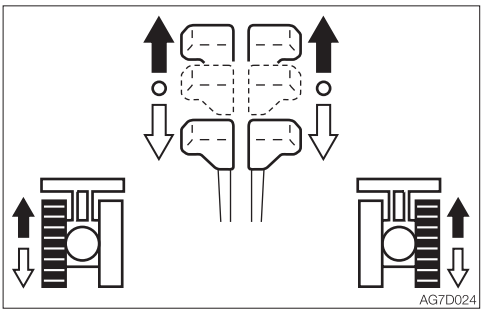
1. Turn the throttle controller and increase the engine speed.



2. Fully lower the safety lock lever to disengage the lock.



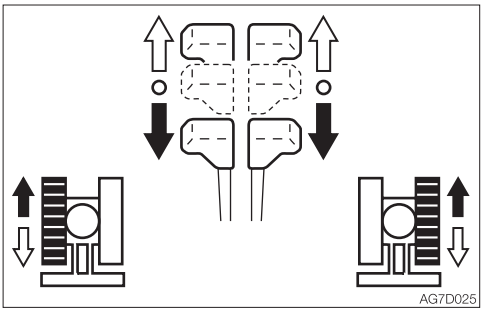
3. Fold the hoe attachment and lower it 30 to 40 cm (12 to 16 in.) above the ground.
4. Lift the dozer blade.
5. Operate the left and right travel levers as below.



When the dozer blade is in front of the operator's seat:

➡ To move forward:
Tilt the levers forward.

⇨ To move backward:
Tilt the levers backward.



When the dozer blade is behind the operator's seat:

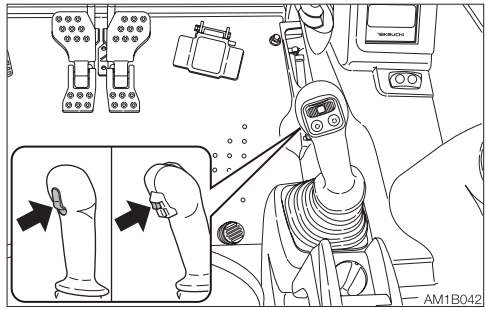
➡ To move forward:
Tilt the levers backward.

⇨ To move backward:
Tilt the levers forward.

Traveling in 2nd (High) speed

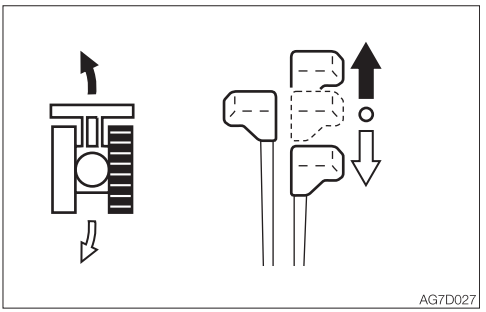
⚠ WARNING

When a load greater than a set value is applied during traveling in 2nd (high) speed, the speed will automatically slow down to 1st (low) speed. When the load becomes lighter, the speed will increase and return to 2nd (high) speed. It should be noted that the travel speed changes depending on the load condition (for machines with the automatic travel shift-down system).



Press the travel speed switch to set to the 2nd (high) speed, and press it again to return to the 1st (low) speed.

Pivot turn

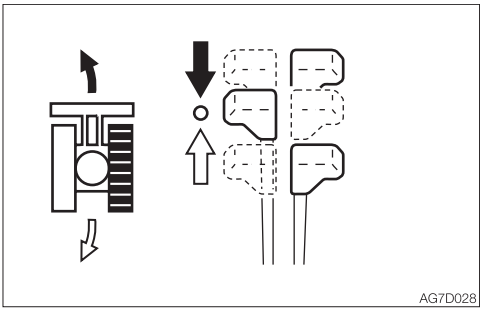


Turning to the left when stopped:

➡ To turn forward to the left:
Tilt the right lever forward.

⇨ To turn backward to the left:
Tilt the right lever backward.

To turn to the right, operate the left lever in the same way as for the right lever.



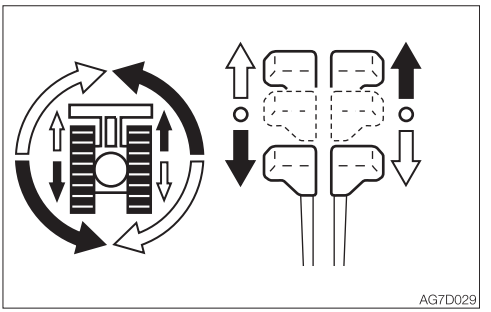
Turning to the left while traveling:

➡ To turn left while traveling forward:
Set the left lever to neutral.

⇨ To turn left while traveling backward:
Set the left lever to neutral.

To turn to the right while traveling, operate the right lever in the same way as for the left lever.

Spin turn



➡ To spin left:
Tilt the left lever backward and the right lever forward.

⇨ To spin right:
Tilt the right lever backward and the left lever forward.