

OPERATOR'S MANUAL

Original instructions

TB1160W

Serial No. 514500002~

Book No. AW5E002

OETB1160W_E-XC

HYDRAULIC EXCAVATOR

TAKEUCHI



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

SAFETY ALERT SYMBOL



This symbol represents the safety alert. The message that follows the symbol contains important information about safety.

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

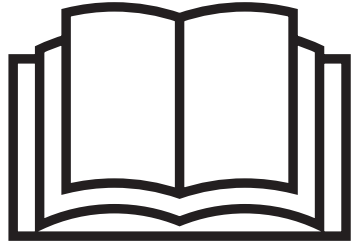
It is the owner or employer's responsibility to fully instruct each operator in the proper and safe operation of all equipment. All persons using this machine should thoroughly familiarize themselves with the contents of this manual.

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

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



WARNING



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

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

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

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

SIGNAL WORDS

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



DANGER

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



WARNING

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



CAUTION

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

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

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

INTRODUCTION

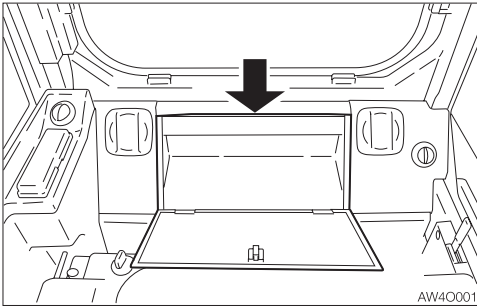
FOREWORD

This manual describes operation, inspection and maintenance of the machine, as well as safety instructions to be heeded during these operations.

If you have any questions about the machine, please contact a Takeuchi sales or service outlet.

MANUAL STORAGE COMPARTMENT

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

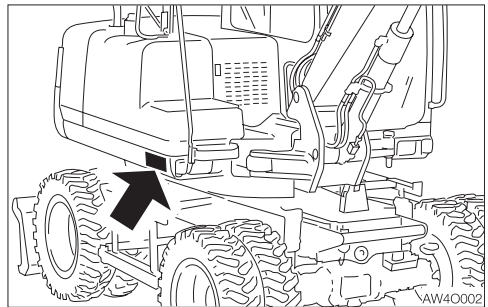


1. Open the cover behind the seat.
2. After using the manual, place it in the plastic pouch and store it back in the manual storage compartment.

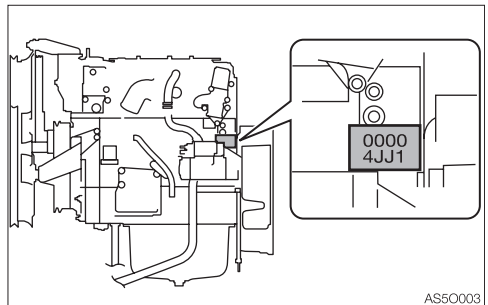
SERIAL NUMBERS

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

Machine number:

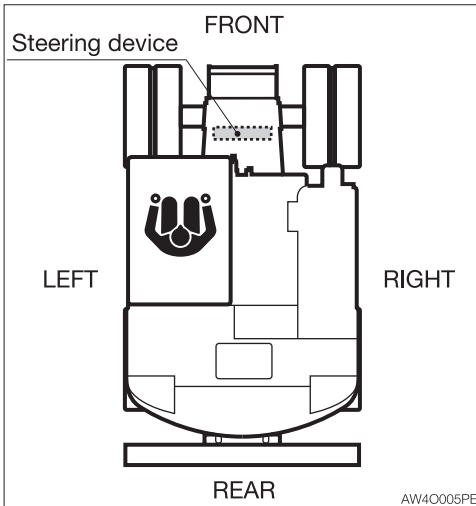


Engine number:

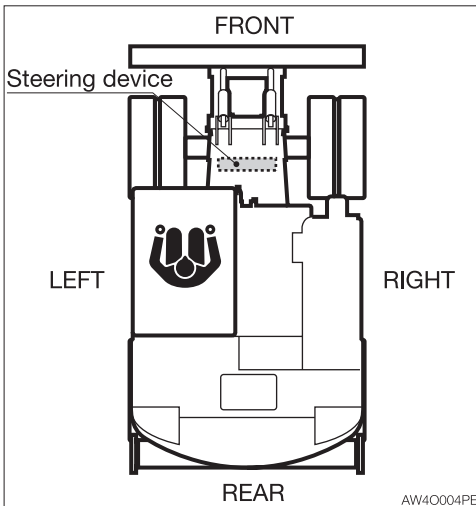


MACHINE DESCRIPTION

FRONT, REAR, LEFT AND RIGHT



Equipped with outrigger



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

DESIGNATED OPERATIONS

Use this machine primarily for the following operations:

- Excavation
- Digging ditches
- Leveling
- Loading

FEATURES

- Hydromounted cab minimizes vibration
- Low engine noise and exhaust emissions
- Electronic control of auxiliary hydraulic circuit
- Automatic and manual operation for engine deceleration
- Engine emergency stop system

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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GENERAL PRECAUTIONS

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

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

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

Read and understand all safety messages which describe how to prevent accidents.

Do not operate the machine until you are sure that you have gained a proper understanding of its operation, inspection and maintenance.

Observe all safety rules

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

When a problem is found on the machine

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

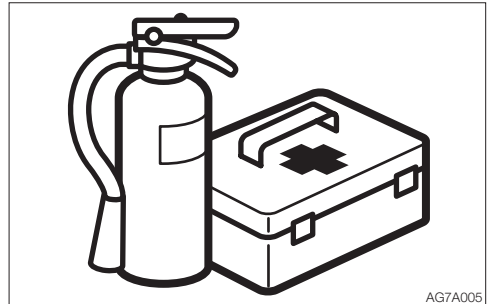
Operating temperature range

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

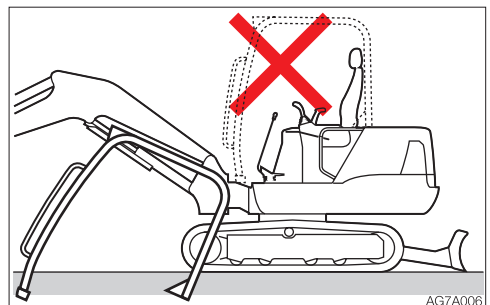
- Do not operate the machine if the ambient temperature is higher than +45°C (+113°F) or lower than -15°C (+5°F).
 - If operated at an ambient temperature of higher than +45°C (+113°F), the engine may overheat and cause the engine oil to degrade. Also, the hydraulic oil may become very hot, causing damage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

**GENERAL PRECAUTIONS****Wear appropriate clothing and protective equipment**

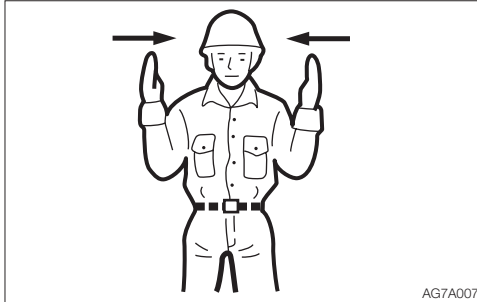
- Do not wear loose clothing or any accessory that can catch on controls or in moving parts.
- Do not wear oily or fuel stained clothing that can easily catch fire.
- Wear a hard hat, safety shoes, safety glasses, filter mask, heavy gloves, ear protection and other protective equipment as required by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

Install a fire extinguisher and first aid kit**Be prepared for fire and accidents**

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

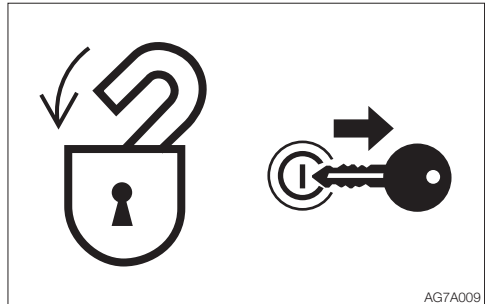
Never remove safety equipment

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

**GENERAL PRECAUTIONS****Use a signal person and a flag person**

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

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

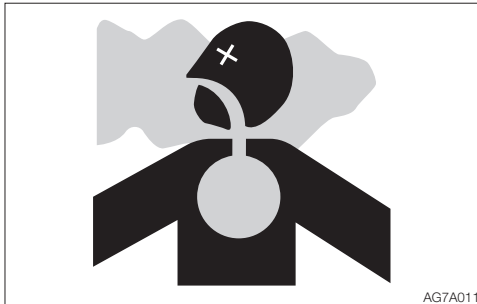
Precautions when standing up from or leaving the operator's seat

- 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 lever to engage the lock and stop the engine. If any control is 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, set the locking devices securely to the lock position and stop the engine. Also, be sure to remove the key, lock the cab, fuel filler cap and covers, take the key with you and store it in a specified place.

**GENERAL PRECAUTIONS****Avoid fire and explosion hazards**

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

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

**GENERAL PRECAUTIONS****Exhaust fumes from the engine is poisonous**

- Do not operate the engine in an enclosed area without adequate ventilation.
- If natural ventilation is not possible, install ventilators, fans, exhaust extension pipes or other venting devices.
- Do not perform the DPD regeneration in poorly-ventilated indoor spaces, as smoke may be generated during the regeneration.

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 tires, between the machine body and working equipment, or between a cylinder and a moving part on the working equipment. The sizes of these gaps change when the machine moves, and a person can suffer severe injury or death.

**GENERAL PRECAUTIONS**

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.

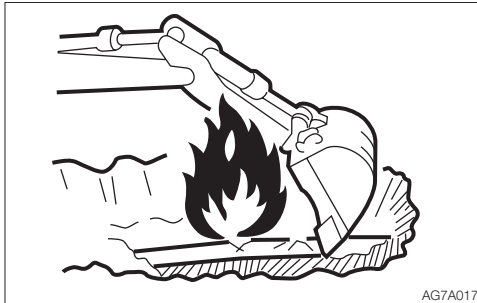


PRECAUTIONS WHEN PREPARING

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.



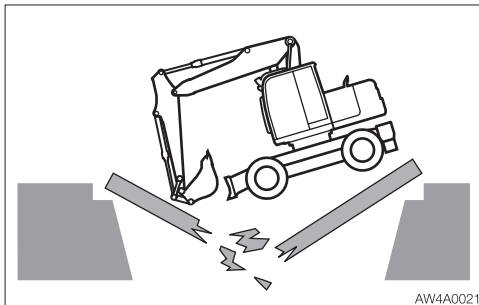
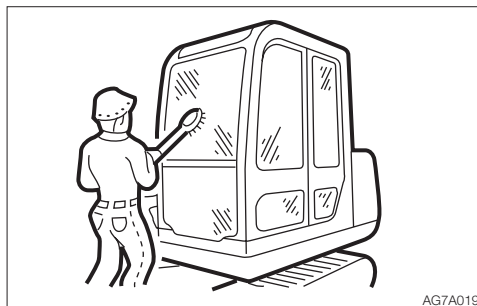
- Check with the administrator for the locations of buried gas pipes, water pipes and power cables. If necessary, determine what specific precautions must be taken to insure safety by consulting with the administrator.
- When working on roads, be sure to consider the safety of pedestrians and vehicles.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



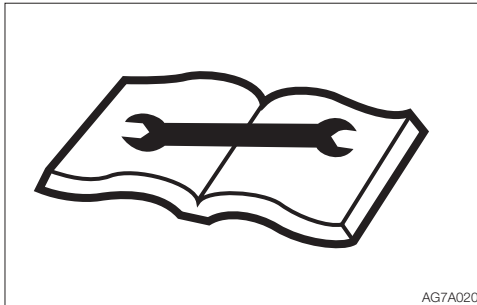
- Do not perform the DPD regeneration if the machine is surrounded by flammable items such as plants, trees, dry grass, wastepaper, oil and waste tires. There is a risk of fire due to the high-temperature exhaust gas emitted from the DPD.
DPD: Diesel Particulate Diffuser
- The DPD may automatically perform the regeneration while the engine is left running. Make sure that there are no flammable items around the DPD and the exhaust line, and also that the engine hood is closed to prevent fire. Be careful not to burn yourself on the high-temperature exhaust gas.
- Do not perform the DPD regeneration in poorly-ventilated indoor spaces, as smoke may be generated during the regeneration.

**PRECAUTIONS WHEN PREPARING****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.

**PRECAUTIONS WHEN PREPARING****Perform inspection and maintenance every day**

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

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

Cautions in the operator's compartment

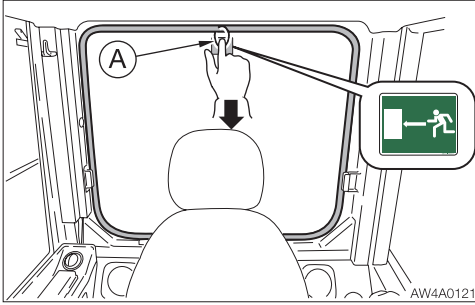
- Remove mud and grease from shoe soles before entering the operator's compartment. Pedaling the machine with the shoes with mud and grease will cause a slip accident.
- Do not leave the parts or tools around the operator's seat.
- Do not leave any plastic bottles in the operator's compartment or attach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



Emergency exit

Rear window

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



1. Pull off the ring (A) and remove the tip of the rubber wedge.
2. Grasp and pull the tip of the rubber wedge to remove the entire rubber wedge.
3. Kick out the rear window. Note that the glass may break. Be careful not to get injured.



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.



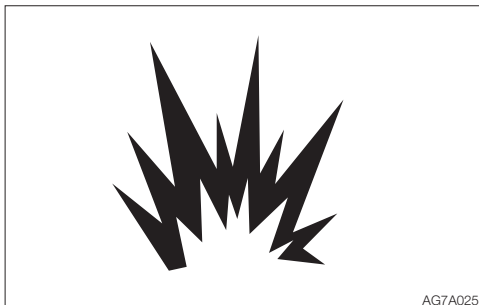
- Check if there is a “DO NOT OPERATE” alert sign or similar sign is on the cab door, controls or starter switch. If there is one, do not start the engine or touch any levers.
- Sound the horn to warn people around the machine.

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.

**PRECAUTIONS WHEN STARTING****Starting with jumper cables**

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

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

After starting the engine

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

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

In cold climates

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



PRECAUTIONS WHEN OPERATING

Ensure good visibility

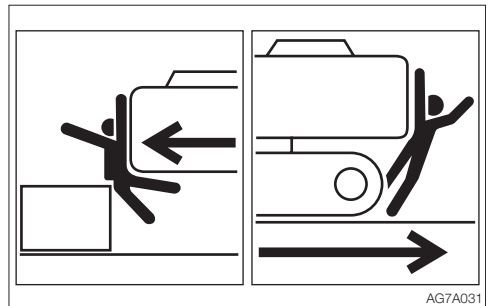
- When working in dark places, turn on the machine's working lights and headlights and additional lighting equipment installed, as necessary.
- When visibility is poor due to bad weather (fog, snow, rain or a cloud of dust), stop operating the machine and wait until visibility improves.

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

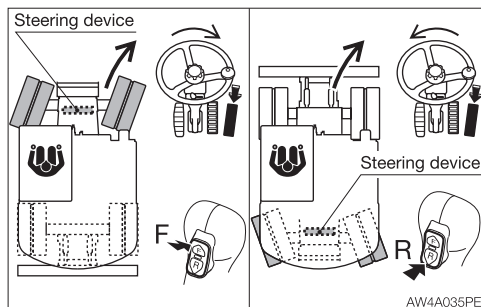
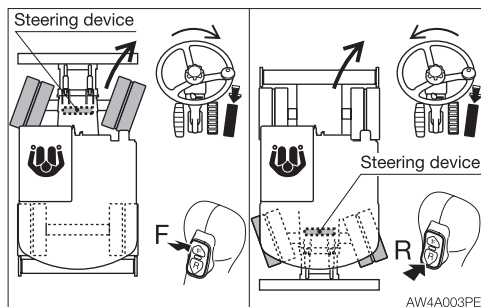


- Confirm the performance limits of the machine.
- Use a signal person at road shoulders, narrow places or where your vision is obstructed.
- Never allow anyone to enter the machine's slewing radius and path.
- Signal your intention to move by sounding the horn.
- There is a blind spot in the rear of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

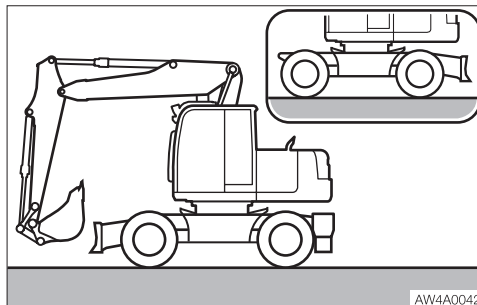
Safety precautions when performing the DPD regeneration

The DPD may automatically perform the regeneration while the engine is left running. Make sure that there are no flammable items around the DPD and the exhaust line, and also that the engine hood is closed to prevent fire. Be careful not to burn yourself on the high-temperature exhaust gas.

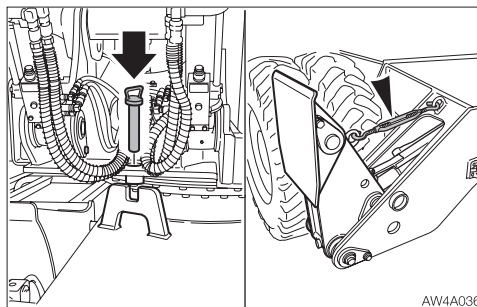
DPD: Diesel Particulate Diffuser

**PRECAUTIONS WHEN OPERATING****Check the position of the undercarriage (steering device) before start traveling****Equipped with outrigger**

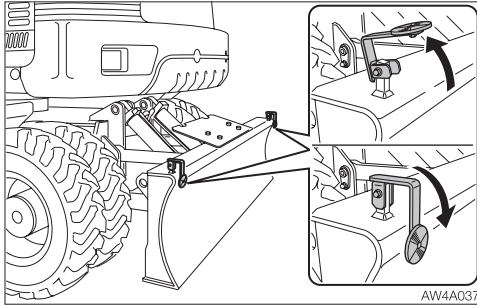
Before operating the travel pedal, make sure that the steering device is to the front of the operator's seat. Remember that when the steering device is to the rear of the operator's seat, the steering wheel must be operated in the reverse direction from when it is to the front.

Travel safely

- Before traveling, set the machine to the "travel posture". Refer to "Preparing for travel" for further details.
- When traveling on a road, be sure to lock the working equipment. If any of the controls is accidentally touched when it is unlocked, the machine may suddenly move and cause serious injury or death.
- Keep in mind that the steering wheel operation is not possible when the engine is stopped or if the steering pump becomes faulty.

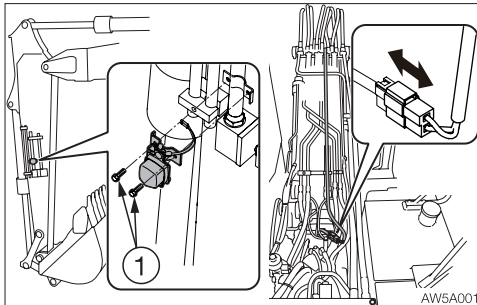


- When traveling on a public road, be sure to lock slewing with the slew lock pin. For machines with outriggers, retract the outriggers within the machine width and install the turnbuckles.
 - Make sure that the outrigger pads (the sections to contact the ground) are within the machine width. Failure to do so could cause minor collisions.

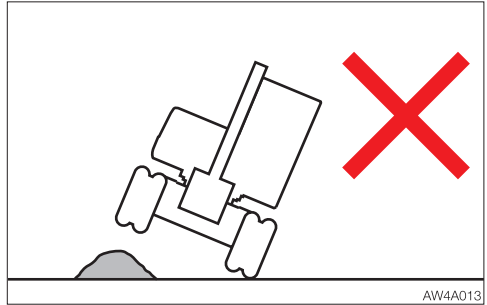
**PRECAUTIONS WHEN OPERATING**

- Before traveling on a road, tilt the reflector. When operating at a job site, raise the reflector to prevent it from being damaged.

<For Germany>



- When traveling during nighttime hours, be sure to install the position lights. To prevent damage, remove the position lights (including the brackets and harness) before working at the site.
- Do not slew while traveling. If slewed, the upperstructure position warning lamp lights up to alert the operator to the danger. If you must operate the hoe attachment while traveling, operate at speeds slow enough so you have complete control at all times.
- Do not raise the safety lock lever or turn the starter switch to the OFF position while traveling. Doing so is dangerous because it activates the parking brake and causes the machine to stop suddenly.

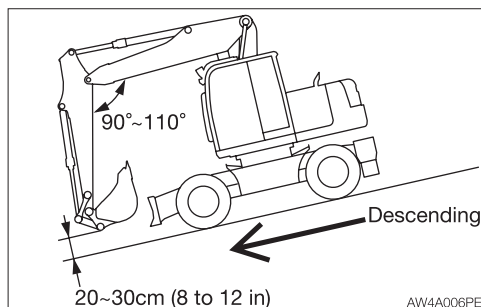
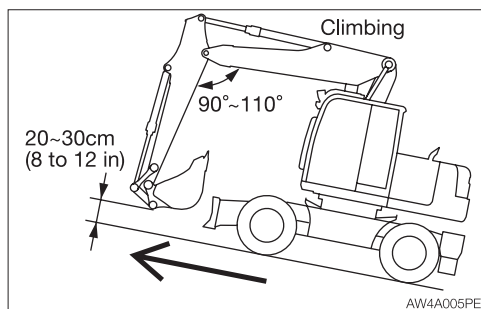


- Avoid crossing over obstacles whenever possible. If you must do so, keep the hoe attachment close to the ground level and travel slowly. Never cross obstacles which will tilt the machine to an angle of 10° or greater.
- Avoid starting, stopping or changing directions abruptly and maintain a proper speed. 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.
- 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).
- When traveling on a road, know and use the signaling devices required on the machine. Use an escort vehicle for road travel when required.

**PRECAUTIONS WHEN OPERATING****Precautions when traveling on slopes**

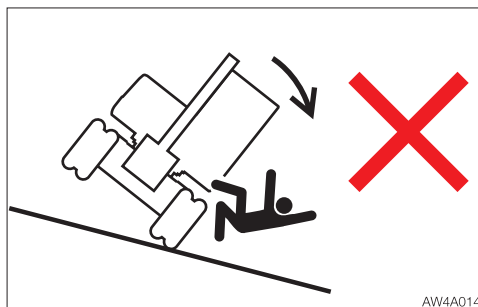
When traveling on slopes or grades, be careful that the machine does not tip (roll) over or slide.

- Never travel on slopes that are too steep for the machine to maintain its stability (maximum gradeability: 35°, 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 downhill. 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.

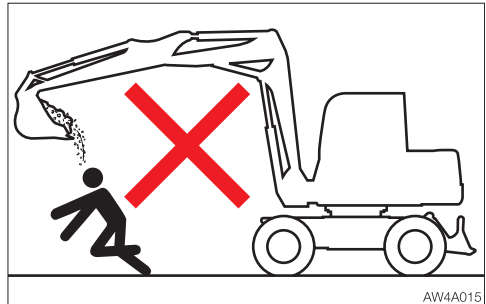
- When traveling on slopes or grades, travel slowly in low gear. When descending a slope, slow down the engine speed.
- Do not travel at speeds of over 20 km/h (12.4 mph) on long down slopes. Release the travel pedal from time to time to protect the travel motor and ensure travel stability.
- Do not travel downhill in reverse.



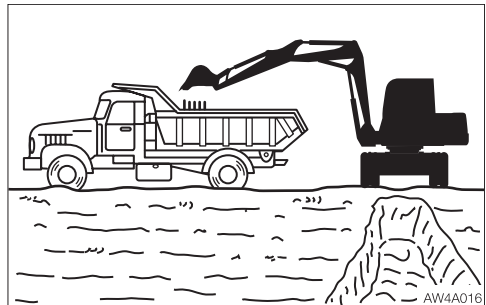
- Do not turn on slopes or travel across slopes. Go down to a flat surface, and then take an alternative path.
- The machine may slip sideways even on a slight slope if it is covered with grass or fallen leaves, or when traveling on wet metal plates or frozen surfaces. Do not allow the machine to position sideways to a slope.
- If the machine is stalled on the slope, return each operating lever to the neutral position before restarting the engine.

**PRECAUTIONS WHEN OPERATING****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.

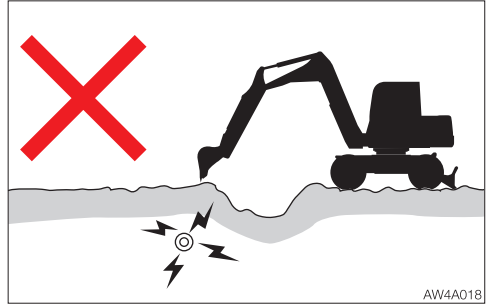
**PRECAUTIONS WHEN OPERATING**

Keep a safe distance from the overhead high-voltage cables

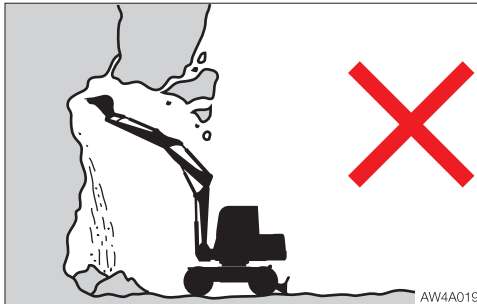


Never bring any part of the machine or loaded material to near to the high voltage cables unless all safety precautions required by the local and national authorities have been installed. If a person comes near to the machine that is discharging sparks or located near to or in contact with the power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

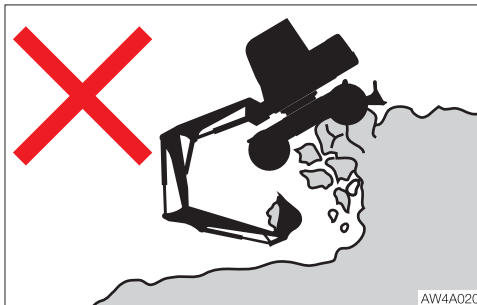
- Always maintain a safe distance between the machine and the high-voltage electric cable.
- Check with the local power company about safe operating procedure before starting operations.
- Consider all cables to be high-voltage cables and treat all cables as energized even though it is known or believed 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.



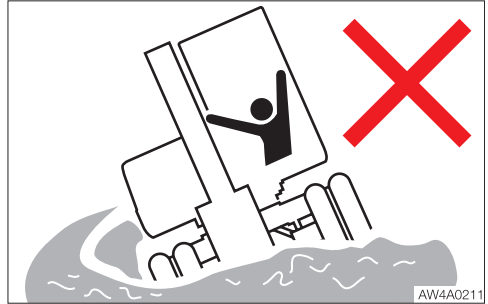
- Pay also careful attention to the high-voltage electric cables buried underground.

**PRECAUTIONS WHEN OPERATING****Watch out for hazardous working conditions**

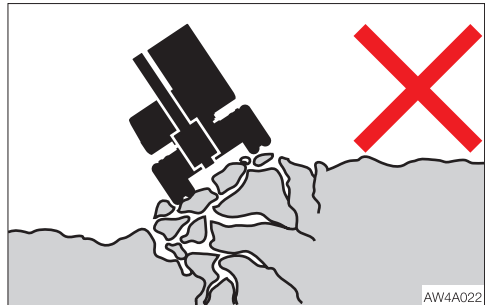
- Never undercut a high bank. Doing so is dangerous as it may cause ground collapse.
- Do not operate in places where there is a danger of falling rocks.



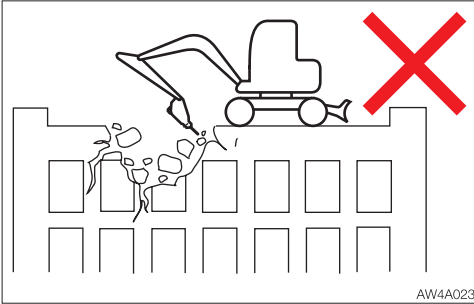
- Maintain a safe distance between the machine and the edge of the digging site. Do not dig the ground under the front of the machine.
- When working close to the cliffs or road shoulders, set the tires at right angles to the cliff or road shoulder and the dozer blade to the front so that it is easier to escape in case of an emergency.



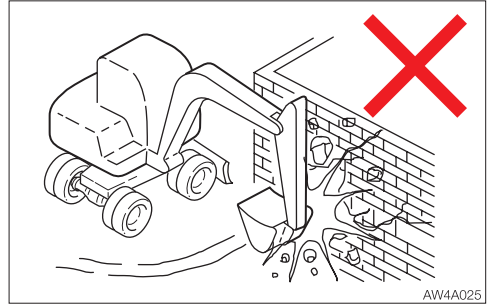
- Do not enter areas where there is soft ground. Doing so could cause the machine to tilt under its own weight, resulting in a machine tipping over or sinking into the ground.



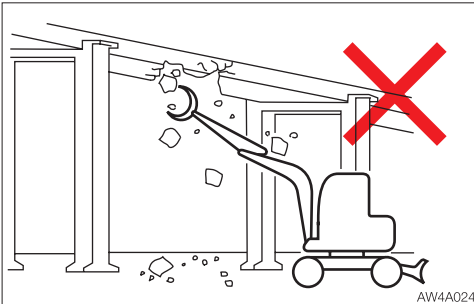
- Do not come close to unstable grounds (cliffs, road shoulders, deep ditches). If the ground should collapse under the weight or vibration of the machine, there is a hazard that the machine may fall or tip over.
 - Remember that the soil after heavy rain or blasting is weak.
 - The ground of top of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

**PRECAUTIONS WHEN OPERATING**

- 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.



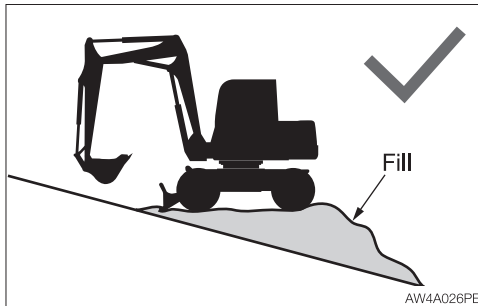
- Do not use the impact force of the hoe attachment for breaking work. There is a hazard of serious injury being caused by flying pieces of broken materials and by the damaged hoe attachment.



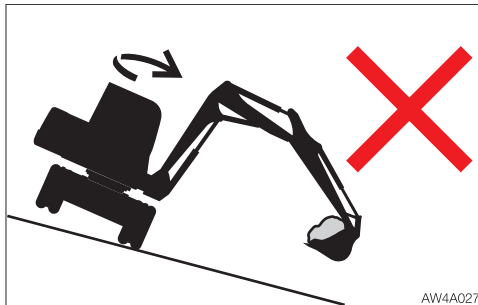
- When doing demolition work, do not perform demolition above your head. There is a hazard of broken parts falling or of the building collapsing and causing serious injury or damage.

**PRECAUTIONS WHEN OPERATING****Operating on slopes is dangerous**

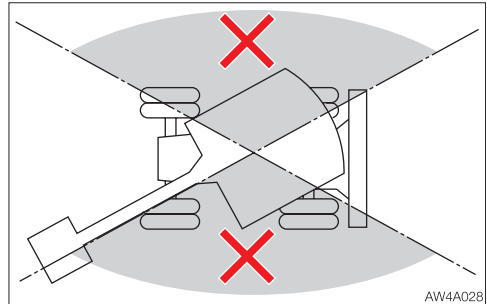
When operating on slopes or grades, slewing or operation of working equipment may cause the machine to lose stability and tip over. Avoid operating on slopes whenever possible.



- Level off the work area.

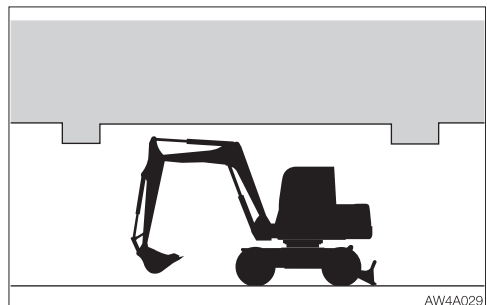


- Avoid slewing to the downhill direction with the bucket full of loaded material. This will reduce the stability of the machine and may result in tipping over.

Never slew sideways with a heavy load

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

- Do not slew sideways with a heavy load at the tip of the hoe attachment. In particular, do not slew 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.

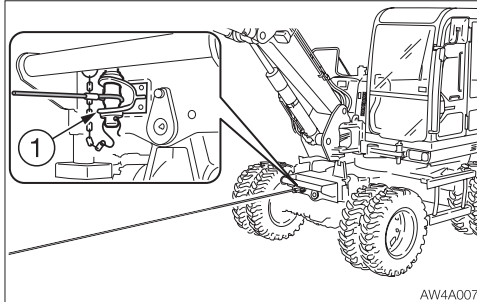
**PRECAUTIONS WHEN OPERATING****Excavators are not designed for lifting loads**

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.

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.

**PRECAUTIONS WHEN OPERATING****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.

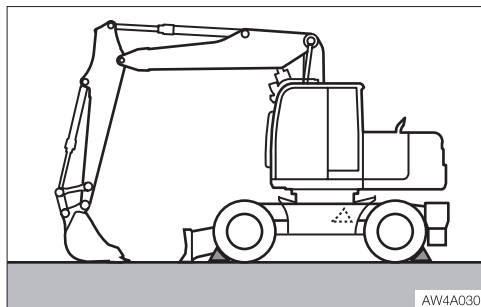
- It becomes dangerous if the wire rope breaks or becomes disengaged. Use a wire rope appropriate for the required tractive force.
- Do not use a wire rope that is kinked, twisted or otherwise damaged.
- Do not apply heavy loads abruptly to the wire rope.
- Wear safety gloves when handling the wire rope.
- 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.
- The machine should be towed only when it gets stuck in mud.
- Be sure to use a towing truck with sufficient braking power.

Refer to “Towing” for further instructions.

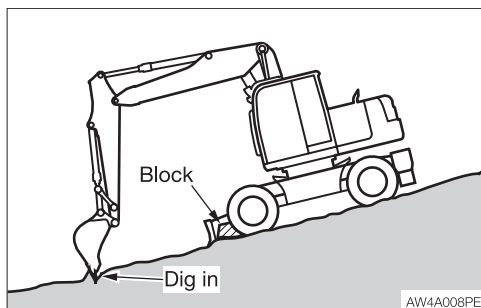


PRECAUTIONS WHEN STOPPING

Park safely



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



If you must park on a slope, chock the wheels to block 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 operator's seat, safely park the machine by referring to "Parking procedures" below.

Parking procedures

1. Slowly step on the brake pedal to stop the machine, and then further depress the pedal down to lock it.
2. Press the deceleration button to idle the engine at low speed.
3. Lower the bucket and the dozer blade to the ground.
When replacing the attachment or performing the inspection and maintenance on it, follow the procedure "Releasing the residual pressure from the working equipment circuit" described below, as necessary.
4. Raise the safety lock lever to the lock position.
5. Stop the engine and remove the starter key.
Refer to "Stopping the engine" on page 3-5.
6. Lock the cab, fuel filler cap and covers, take the key with you and store it in a specified place.

Releasing the residual pressure from the working equipment circuit

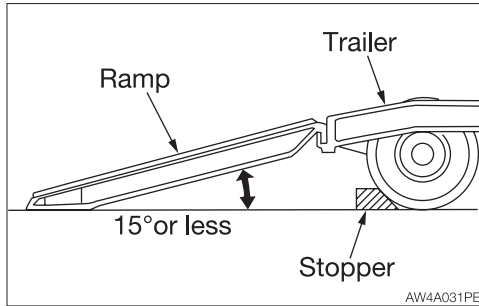
Perform the operation of releasing the residual pressure within 30 minutes after the engine comes to a complete stop.

1. Stop the engine.
2. Turn the starter switch to the ON position.
3. Lower the safety lock lever to the unlock position.
4. Release the lock of the attachment lock button.
5. Move all the control levers, pedals and auxiliary hydraulic switches several times in all directions to release the residual pressure in the working equipment circuit.



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 ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°. If the ramps 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 tires too.
 - 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 low gear while following the signal from the signal person.
 - Never change courses on the ramp.
 - Do not slew/swing on the ramp. 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.
 - Lock the slewing after loading.
 - Chock the wheels and secure the machine to the truck bed with wire rope or chain.

**PRECAUTIONS WHEN TRANSPORTING**

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.



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- 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



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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

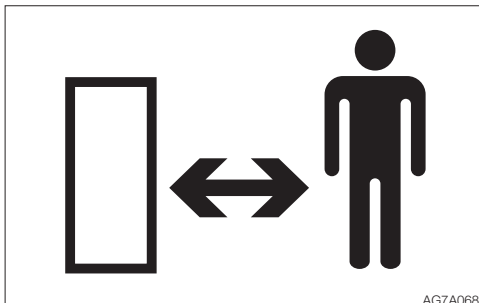
- Replace fuel hoses periodically. Fuel hoses wear out over time, even if they do not show any symptom of wear.
 - Regardless of the replacement schedule, replace immediately if a symptom of wear is found.
- Refer to “List of safety-critical parts” for further details.

Explosionproof lighting



AG7A067

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.

**PRECAUTIONS ON MAINTENANCE****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.

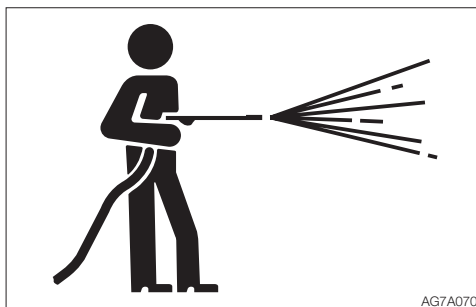
Prepare work area

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

Cautions on working on top of the machine

- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.

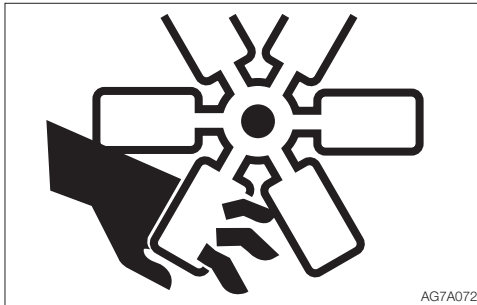
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

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.

**PRECAUTIONS ON MAINTENANCE****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 tires.
- 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 temporarily 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 DPD 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.

**PRECAUTIONS ON MAINTENANCE****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 stops, and while the safety lock lever is still in the unlock position, turn the starter switch to ON, move all the control levers, pedal and auxiliary hydraulic switches several times 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.

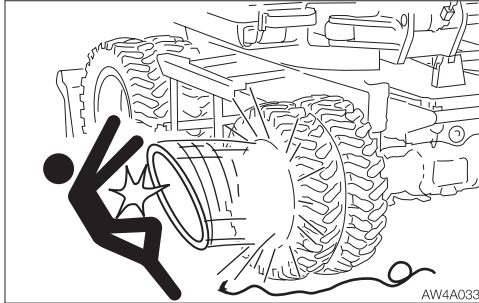
Be careful with debris when the hammer is being used

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

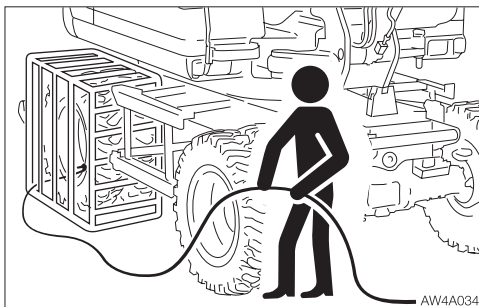
- If hard metal parts such as pins, bucket teeth, side cutter or bearings are hit with a hammer, wear protective gear such as safety goggles and gloves.
- When hitting pins or bucket teeth, always check that there is no one in the surrounding area.



Tire maintenance



- Disassembling a tire or rim can cause an explosion, resulting in serious injury or death. Always ask a service shop or dealer for maintenance.
- Special tools and procedures are required to change tires. To do it safely, it must be done correctly. Changing tires is a job better done by your tire service company.
- Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.
- Inspect tires and wheels every day. Do not operate the machine if the tire is underinflated or has cuts or bubbles, or if the rim is damaged.
- Replace the tire with a new one if there is a portion with no grooves.
- A rise in tire pressure during operation is normal, and should NOT be reduced.



- When putting air in a tire, do so from a distance. Use a long hose with self-attaching chuck. Always stand behind the tread when adjusting tire pressure.
- Do not inflate tires with flammable gases or from systems using an alcohol injector.

- Never cut or weld on a wheel with an inflated tire mounted on it. This could cause an explosive decompression.
- Tires should be replaced only by an authorized person using the proper procedures and safety equipment. New or replacement tires and wheels should always be checked for proper size before mounting.
- Always use a cable restraint device or safety cage when reinflating a repaired tire.



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.

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.



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 the battery when the fluid level is below the lower level limit. Doing so will hasten the deterioration of the internal portions of the battery and shorten the battery life. It also can cause rupturing (explosion).
- Do not add the distilled water above the upper level limit. Doing so could cause the fluid to leak. This fluid can cause skin damage if contacted, or can cause the machine components to corrode.
- Use a dampened cloth to clean around the fluid level line and check the fluid level. Do not clean with a dry cloth; otherwise it could 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 improve the safety, 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 parts 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.

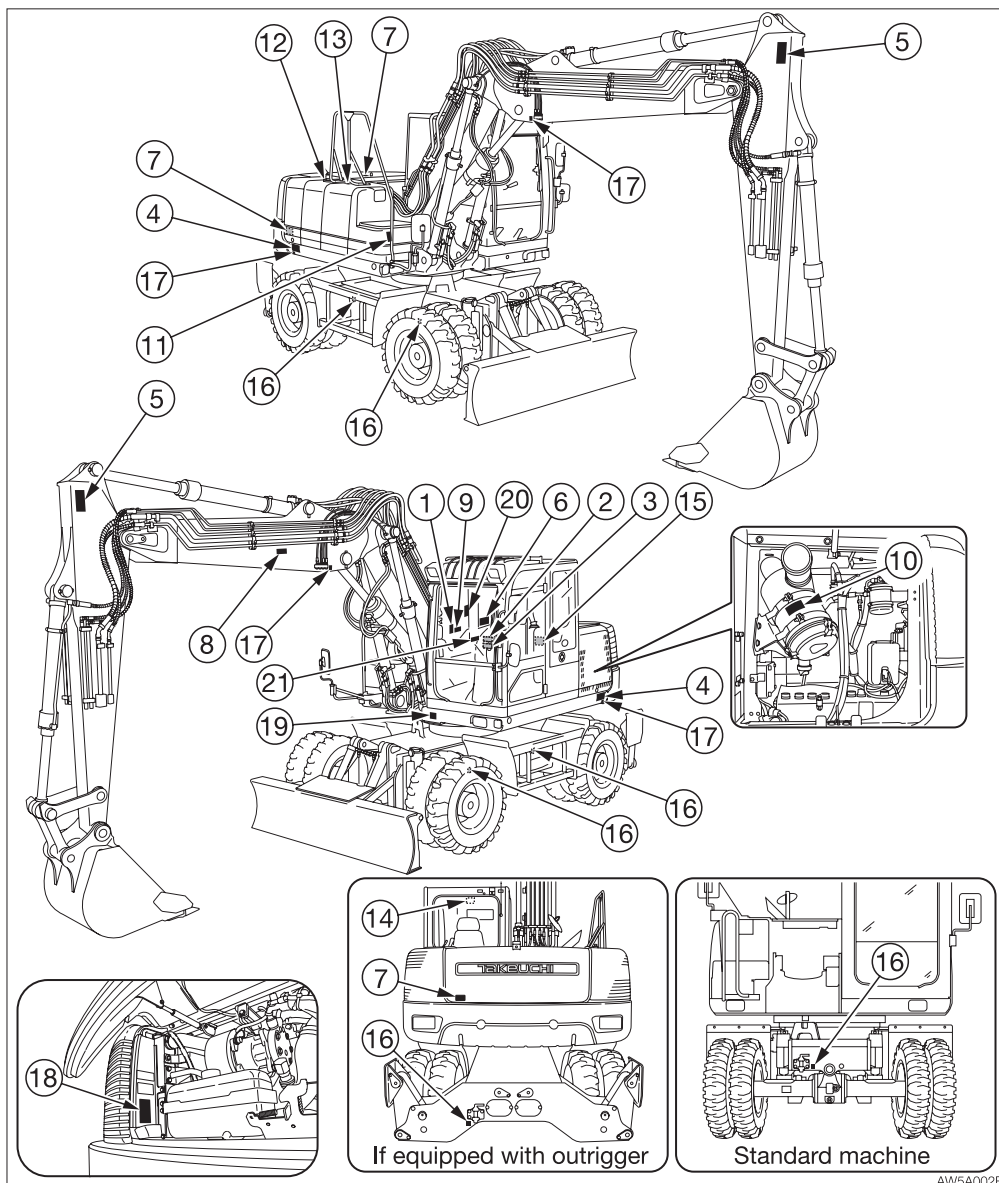
Handle the poisonous chemicals properly with care.



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.





1. No.08810-31556

**Warning**

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

2. No.08810-31557(Cab)

Hazard from falling window

After raising window, be sure to lock it in place with lock pins.



3. 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.



4. No.05793-00011

Safety Distance

Do not get near or stand within the machine working area.



5. No.05793-00049

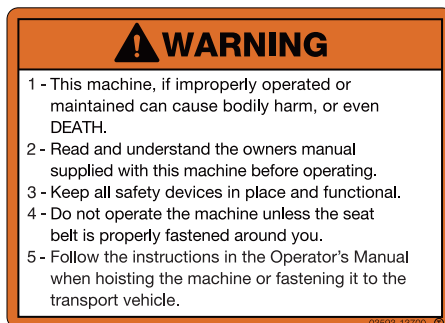
Safety Distance

Hazard of being hit by the working device of the machine.

Keep away from machine during operation.



6. No.03593-13700



- 1 - This machine, if improperly operated or maintained can cause bodily harm, or even DEATH.
- 2 - Read and understand the owners manual supplied with this machine before operating.
- 3 - Keep all safety devices in place and functional.
- 4 - Do not operate the machine unless the seat belt is properly fastened around you.
- 5 - Follow the instructions in the Operator's Manual when hoisting the machine or fastening it to the transport vehicle.

7. No.03793-66006

Hazard of rotating parts

Turn off before inspection and maintenance.





8. No.03593-47010 (if equipped)



9. No.05693-53131



10. No.03393-75040



11. No.03993-00400

For EU
Position of Fire extinguisher



12. No.03593-06700

Hydraulic oil



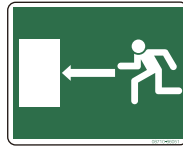
13. No.03593-06600

Diesel fuel



14. No.08710-86051

Position of Emergency Exit



15. No.05693-34080

Position of First Aid Kit



16. No.08810-31549

Tie down point



17. No.03993-00500

Position of hoisting



18. 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.

19. No.03993-54628



20. No.05793-03643

Be careful about the hoe attachment. 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.05693-68009

Before starting lifting operation, be sure to turn on the lift overload warning switch.
An alarm sounds if an excessive weight is lifted.



Noise Outside the Cab (if equipped)

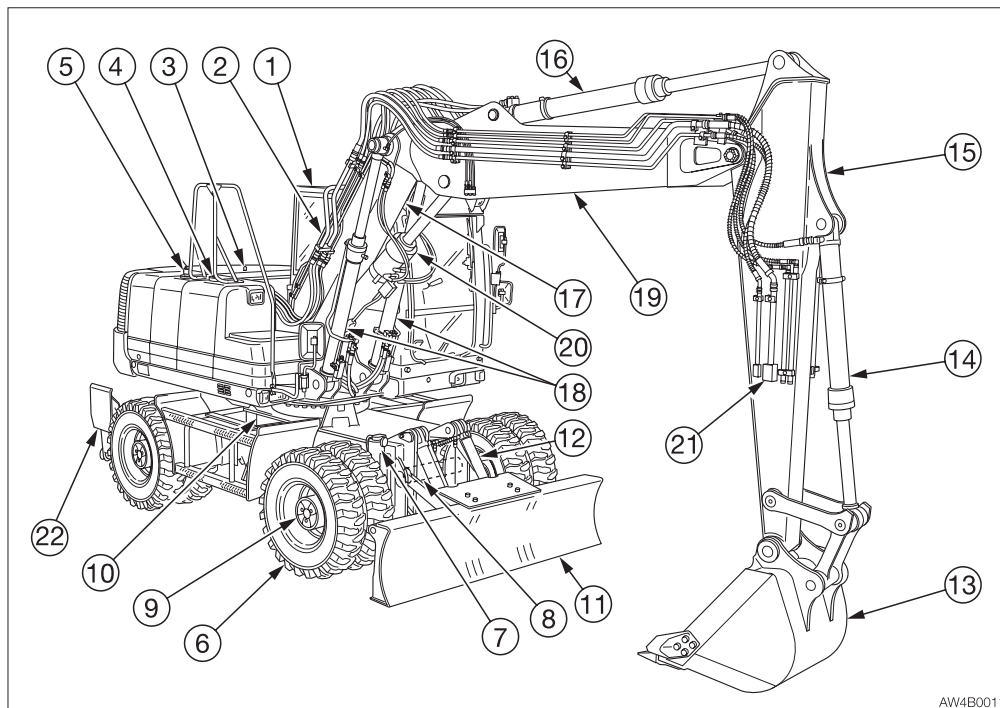
This value indicates the noise level outside the machine and refers to the noise perceived by the persons who are in the vicinity of the work area.

CONTROLS





NAMES OF COMPONENTS



AW4B0011

Upperstructure

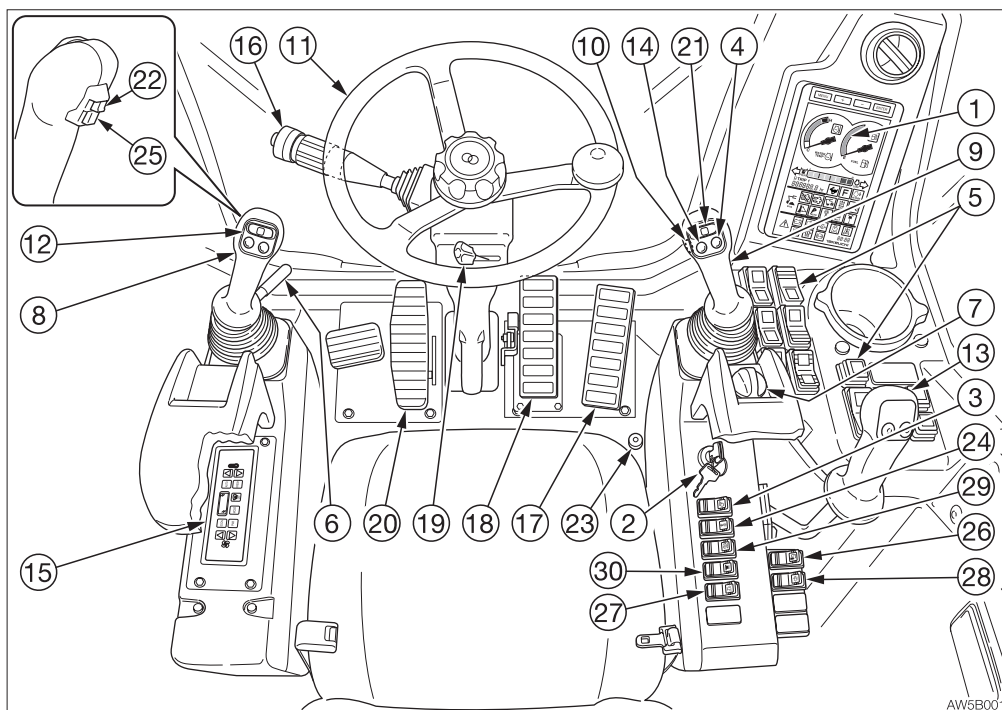
- 1. Cab
- 2. Seat
- 3. Engine hood
- 4. Fuel tank
- 5. Hydraulic oil tank

Undercarriage

- 6. Tire
- 7. Ram lock cylinder
- 8. Steering device
- 9. Hub
- 10. Chassis

Working equipment

- 11. Dozer blade
- 12. Blade cylinder
- 13. Bucket
- 14. Bucket cylinder
- 15. Arm
- 16. Arm cylinder
- 17. Boom
- 18. Boom cylinder
- 19. Second boom
- 20. Second boom cylinder
- 21. Auxiliary hydraulic line
- 22. Outrigger (option)



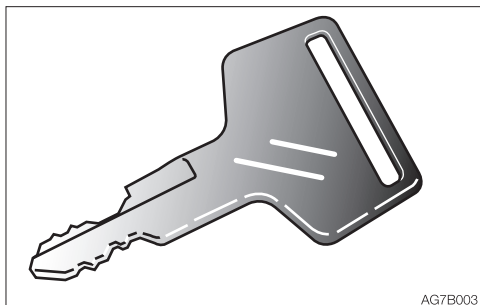
- | | |
|--|--|
| 1. Multi-information display | 16. Turn signal lever |
| 2. Starter switch | 17. Travel pedal |
| 3. Working light switch | 18. Brake pedal |
| 4. Deceleration button | 19. Tilt steering lever |
| 5. Control console | 20. Second boom pedal |
| 6. Safety lock lever | 21. Second /Fourth auxiliary hydraulic switch* |
| 7. Throttle controller | 22. Third auxiliary hydraulic button* |
| 8. Left operating lever | 23. Third auxiliary hydraulic switch* |
| 9. Right operating lever | 24. Over load warning switch* |
| 10. Travel select button | 25. Aux. 2/4 select button* |
| 11. Steering wheel | 26. Wiper switch (lower)* |
| 12. First auxiliary hydraulic switches | 27. Beacon lamp switch* |
| 13. Blade /Outrigger lever* | 28. Image select switch (CAMERA) |
| 14. Horn button | 29. Auxiliary 1st flow rate select switch |
| 15. AC Control panel | 30. Detent mode switch |

*: 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:

- Fuel filler cap
- Cab door
- Covers

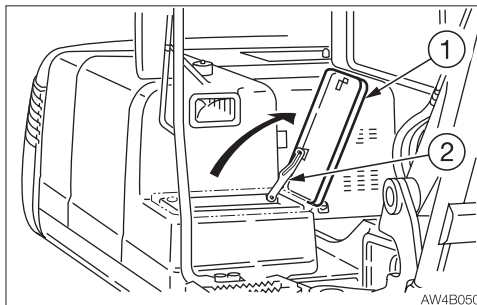
FRONT COVER (TOOL BOX)

CAUTION

- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- When opening the front cover, open it all the way to the position where it is securely stopped.
- When opening or closing the front cover, be careful not to get your hands or other parts of your body caught by the cover.

The grease gun and tools are stored under the cover.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the front cover (1).
2. Open the front cover (1) until it stops.

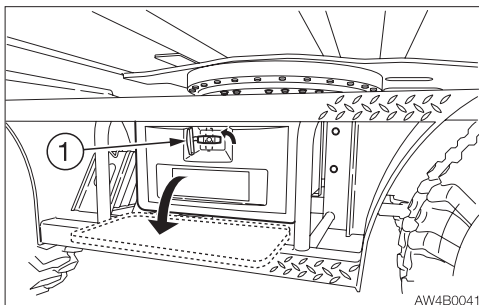
Closing

1. Support the front cover (1) by hand and release the stay (2).
2. Close the front cover (1).
3. Insert the starter key and turn it clockwise to lock the front cover (1).



TOOL BOX

Opening



1. Remove the cover (1) from the knob.
2. Insert the starter key and turn it counterclockwise to unlock the tool box.
3. Open the cover.

Closing

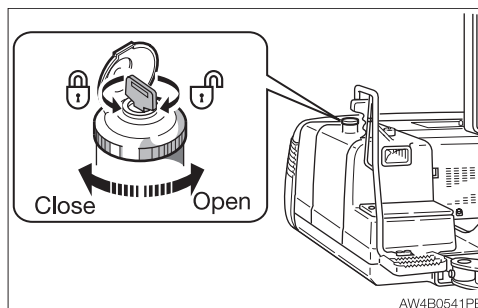
1. After using tools, store them back in the tool box.
2. Close the cover (1).
3. Insert the starter key and turn it clockwise to lock the tool box.
4. Install the cover (1) on the knob.

FUEL FILLER PORT

WARNING

- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- 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 cover, insert the key and turn it clockwise to unlock.
2. Turn the fuel filler cap counterclockwise and remove it.

Closing

1. Install the fuel filler cap to the fuel filler port, and then turn the cap clockwise to close it.
2. Lock the fuel filler cap.

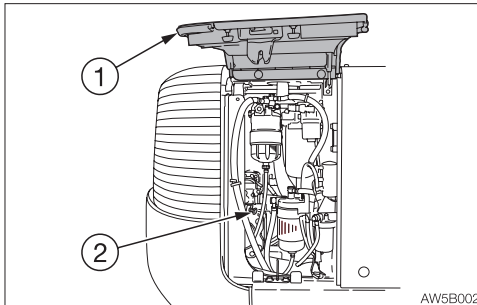


RIGHT SIDE COVER

WARNING

- Before opening the side cover, be sure to stop the engine.
- Do not keep the side cover open on a windy day or if the machine is parked on a slope.
- When opening or closing the side cover, be careful not to get your hands or other parts of your body caught by the cover.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the side cover (1).
2. Lift the side cover (1) all the way. Engine hood unlock knob (2) is located behind the right side cover.

Closing

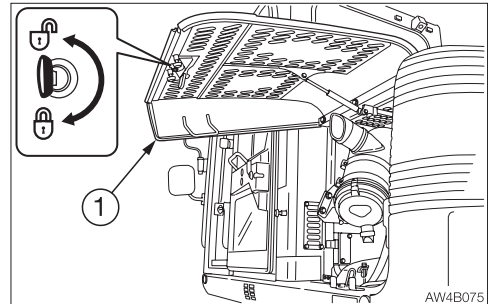
1. Close the side cover (1) and press it down until a click is heard.

LEFT SIDE COVER

WARNING

- Before opening the side cover, be sure to stop the engine.
- When opening or closing the side cover, be careful not to get your hands or other parts of your body caught by the cover.

Opening



1. Insert the starter key and turn it counterclockwise to unlock the side cover (1).
2. Lift the side cover (1) all the way.

Closing

1. Close the side cover (1) and press it down until a click is heard.

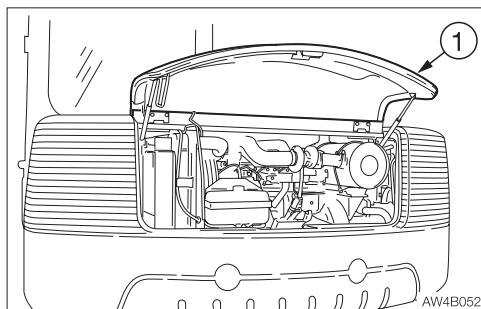


ENGINE HOOD

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.

Opening



1. Open the right side cover and pull the engine hood unlock knob (2). Refer to "Right side cover".
2. Open the engine hood (1).

Closing

1. Close the engine hood (1) and press down the edge of it until a click is heard.

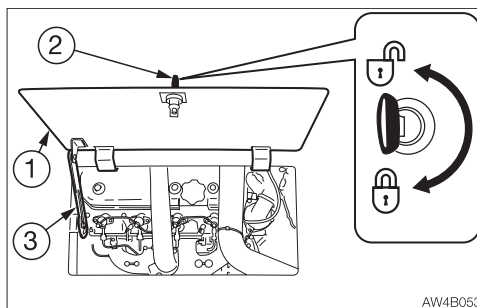
MAINTENANCE COVER

WARNING

- Before opening the maintenance cover, 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 the maintenance cover, open it all the way to the position where it is securely stopped.
- When opening or closing the maintenance cover, be careful not to get your hands or other parts of your body caught by the cover.

- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.

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



Opening

1. Insert the starter key (2) and turn it counterclockwise to unlock the maintenance cover (1).
2. Pull the key (2), and then lift the maintenance cover (1) until it stops.
3. Make sure it is properly secured with the stay (3).

Closing

1. Hold the maintenance cover (1) and lift up the stay (3) to release it.
2. Close the maintenance cover (1) and lock it.



CAB

CAB DOOR



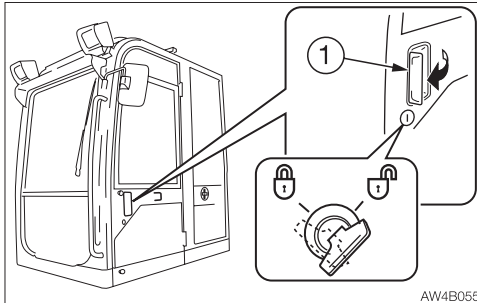
WARNING

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.

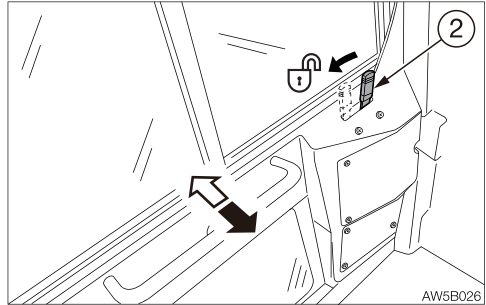
Locking and unlocking



Insert the starter key and turn it.

Opening

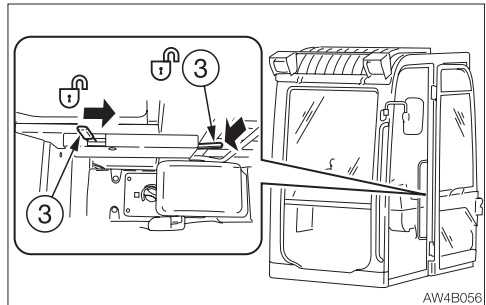
1. Pull the knob (1) towards you and open the door.



To open the door from inside the cab, pull the lever (2).

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

Closing



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

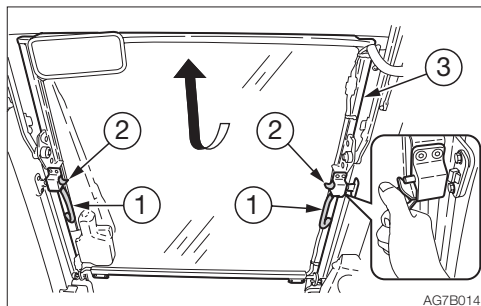


FRONT WINDOW

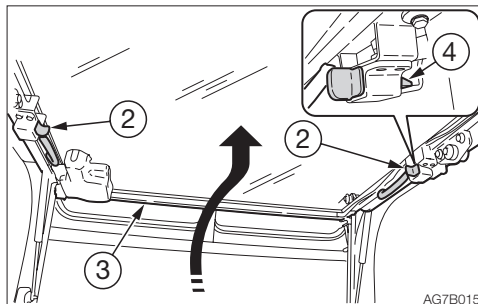
WARNING

- 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.

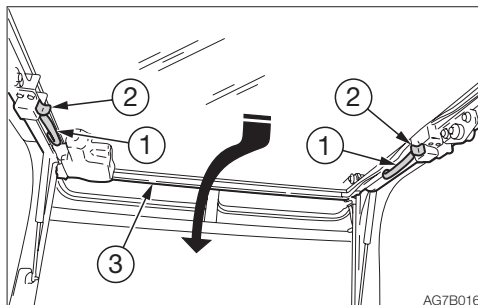


5. Release your thumb from the knobs (2) and then lift the front window (3) fully and lock the front window with lock pin (4).

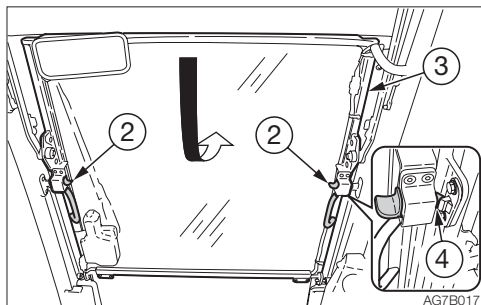
Closing

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.



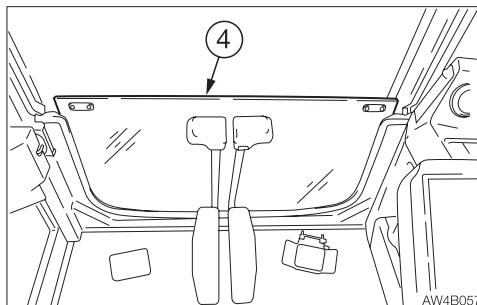
1. Grasp the left and right handles (1) and press the knobs (2) with your thumb to release the lock.
2. Pull down the front window (3) and while doing so, slide it to the front and slowly lower it.



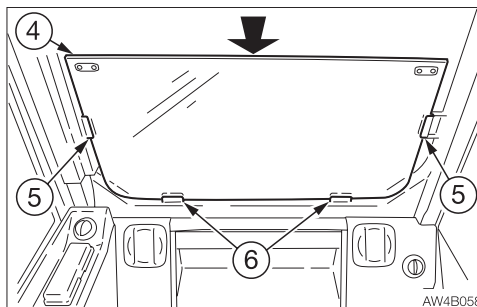
3. Release your thumb from the knobs (2) and then press the front window toward front and lock the front window with lock pin (4).

LOWER FRONT WINDOW

Removing



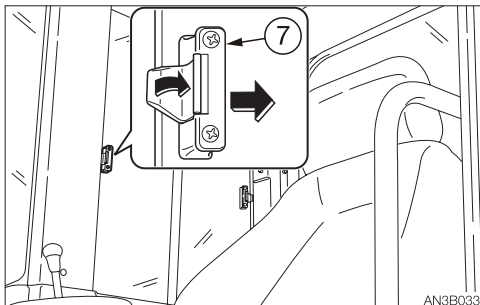
1. Open the front window and stow it in the ceiling.
2. Slowly lift the lower front window (4).



3. Place the lower front window (4) through the guides (5) at the rear, and then set it on the guide (6).



SIDE WINDOW

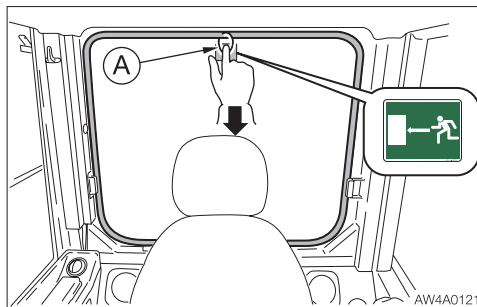


1. Grasp the catch (7), unlock it and open the side window.
2. To close the side window, close it until a click is heard.

EMERGENCY EXIT

Rear window

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



1. Pull off the ring (A) and remove the tip of the rubber wedge.
2. Grasp and pull the tip of the rubber wedge to remove the entire rubber wedge.
3. Kick out the rear window. Note that the glass may break. Be careful not to get injured.

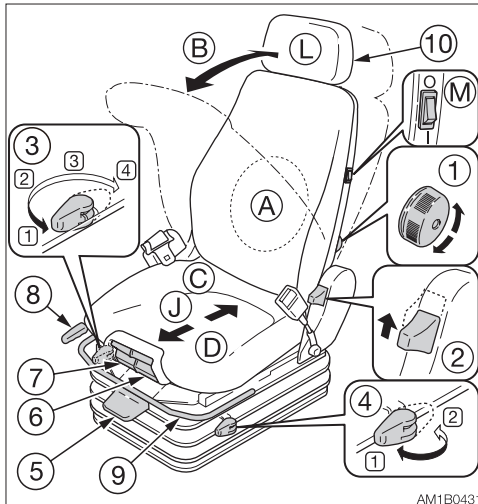


SEAT AND SEAT BELT

AIR SUSPENSION 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.



AM1B0431

(A) Adjusting the lumbar support

1. Turning the knob (1) in the direction of the arrow causes the lumbar of the backrest to curve outwards.
2. Turning the knob (1) further removes the curve and returns the seat to its original position.

(B) Adjusting the backrest angle

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

(C) Adjusting the absorber

The seat adjustment using the absorber is applicable for various traveling conditions on roads or off roads. The cushioning effect can be individually set for each case.

Turn the lever (3) to the desired position and release.

Positions between

1: Soft cushioning
and

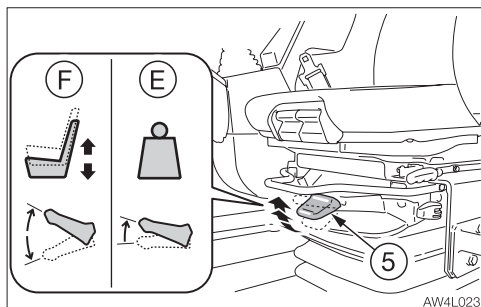
4: Hard cushioning

**(D) The fore /aft isolator**

It is activated under certain conditions such as crashing. Impacts of crash applied in the operating direction can be well absorbed by the operator's seat. Switching can be done with the lever (4).

Position 1: Fore /aft isolator on

Position 2: Fore /aft isolator off

(E) Adjusting according to operator's weight

IMPORTANT: Before performing the adjustment by weight, stop the machine and remain seated. Otherwise, the weight cannot be detected, resulting in malfunction.

IMPORTANT: Be sure to set the absorber to the soft cushioning position (1) when performing the adjustment by weight.

The seat should be adjusted according to the operator's weight. Briefly pull the actuator lever (5) of the automatic weight and height adjuster.

(F) Adjusting the seat height

IMPORTANT: Be sure to set the absorber to the soft position (1) when performing the height adjustment.

IMPORTANT: Do not operate the lever (5) (compressor) for one minute or more.

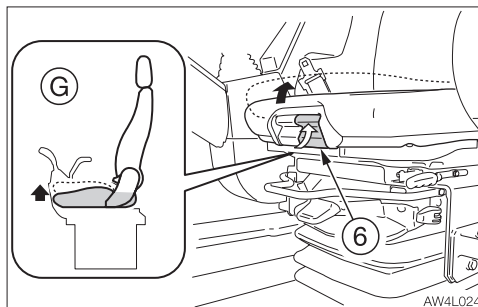
Doing so will cause compressor failure. To protect the compressor, wait for at least three minutes before operating the lever (5) again.

IMPORTANT: If the height adjustment function fails, first lower the seat to the lowest position. Then, adjust the height again.

The seat height can be steplessly adjusted using the pneumatic mechanism.

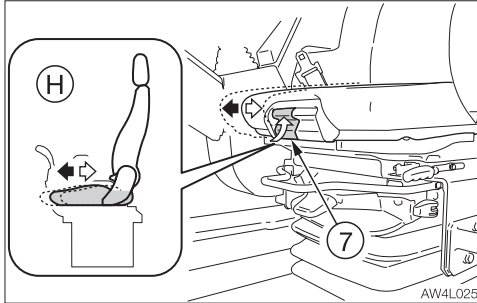
To adjust, push up or push down the lever (5) all the way up or down. When the seat reaches the level where it cannot be raised anymore even the lever (5) is pushed up, that level is the highest. If this happens, the height is automatically lowered a small distance to maintain the stroke of suspension.

Adjustment stroke: 80 mm (3.1 in.)

(G) Adjusting the seat pan angle

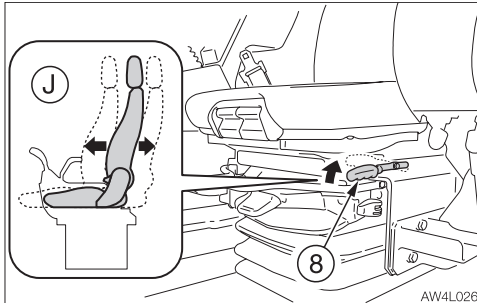
The angle of the seat pan can be individually adjusted.

To adjust, lift the left side handle (6). Use the pressure applied to the seat to set the seat pan to the desired angle.

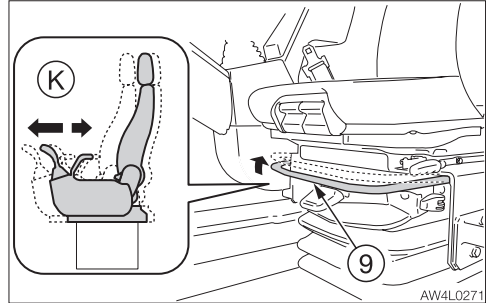
**(H) Adjusting the seat depth**

The depth of the seat pan can be individually adjusted.

To adjust, lift the right side handle (7). Move the seat cushion forward or backward until the desired seat depth is obtained.

(J) Adjusting fore-and-aft

1. Pull up the lever (8) and slide the seat backward or forward to the optimum position for operation.
2. Release the lever (8) at the optimum position to secure the seat.
Adjustment range: 17 positions, in 170 mm (6.7 in.)

(K) Adjusting the operating lever stand

1. Pull up the lever (9) and slide the lever stand (seat).
2. Release the lever (9) at the optimum position to secure the lever stand (seat).
Adjustment range: 7 positions, in 70 mm (2.8 in.)

(L) Adjusting the headrest height

1. Grab the headrest (10) with both hands, and move upward and downward. Adjust the height so that the headrest center is positioned behind your ears.

(M) Seat heater**CAUTION**

- Using the seat heater over an extended period of time may cause burns. People feeling ill or having sensitive skin, in particular, should be careful not to do so.
- Do not use it with a blanket or cushion placed on the seat.
- Clean up spilled water or soft drink immediately with a dry cloth. Dry the seat well before using the heater again.

IMPORTANT: The battery voltage becomes low if the seat heater is left on for a long time when the engine is stopped.

OOFF
ION



SEAT BELT

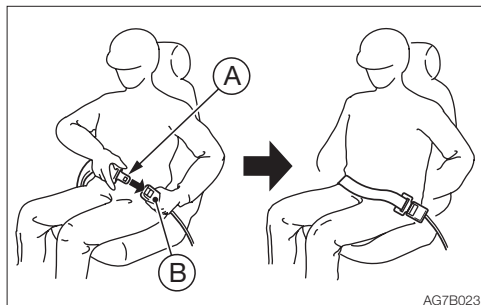


WARNING

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

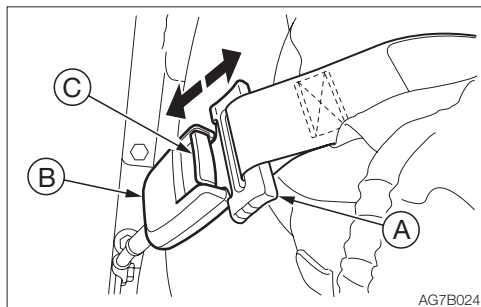
Fastening the seat belt

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

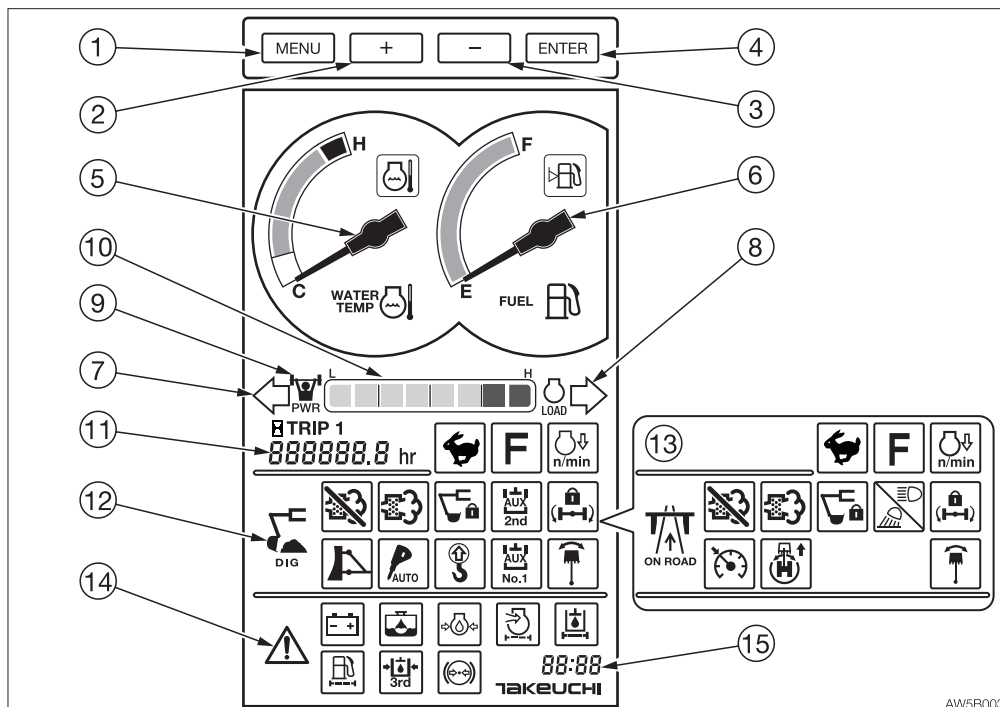


1. Grasp the tongue plate (A) and press the button (C) on the buckle (B).
The seat belt retracts back into its original position.



MULTI-INFORMATION DISPLAY

MAIN MENU SCREEN



AW5B003

For explanation purposes, all items 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.

When the starter switch is set to ON, the battery charge warning lamp and the engine oil pressure warning lamp turn on with an alarm sound. The machine system is normal if the lamps turn off after the engine is started.

- | | |
|--|---|
| 1. Menu key | 8. Turn signal indicator lamp (R) |
| 2. Plus (+) cursor key | 9. Power mode indicator lamp |
| 3. Minus (-) cursor key | 10. Engine load factor indicator |
| 4. Enter key | 11. Hour meter /Trip meter |
| 5. Water temperature gauge /Coolant temperature warning lamp | 12. Digging mode display (Function lamps) |
| 6. Fuel gauge /Fuel level warning lamp | 13. Traveling mode display (Function lamps) |
| 7. Turn signal indicator lamp (L) | 14. Warning lamps |
| | 15. Clock |

**1. Menu key**

Use this key to switch between the Main Menu screen and the Setting Menu screen. This key is also used to cancel changes made in each setting. The screen returns to the Main Menu, if this key is pressed while the screen is displaying data.

2. Plus (+) 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.

3. Minus (–) 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.

4. 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.

5. Water temperature gauge /Coolant temperature warning lamp

- Water temperature gauge
Indicates the temperature of the engine coolant water.
The needle should be within the green range during machine operation. The red range indicates overheating.
- Coolant temperature warning lamp
Coolant temperature warning lamp flashes and an alarm is sounded if the engine coolant temperature becomes abnormally high while the engine is running.

6. Fuel gauge /Fuel level warning lamp

- Fuel gauge
Indicates the amount of fuel in the tank.
Be sure to fill up the tank before running out of fuel.
- Fuel level warning lamp
Fuel level warning lamp flashes when the fuel level is low while the starter switch is in the ON position.

7. Turn signal indicator lamp (L)

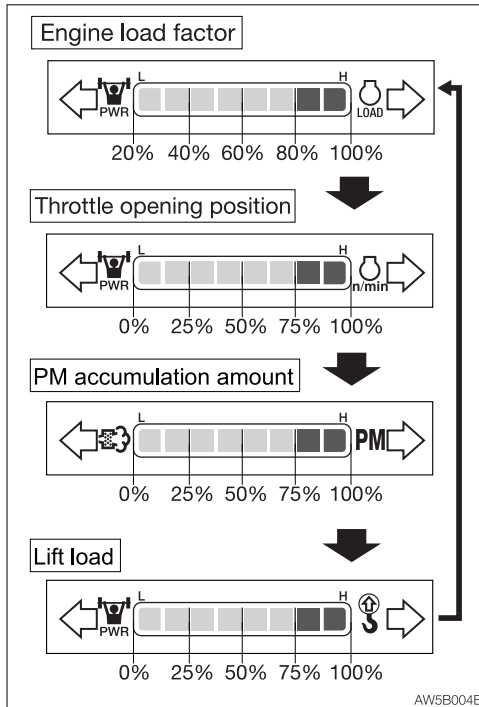
This lamp lights to indicate that the left turn signal indicator is flashing.

8. Turn signal indicator lamp (R)

This lamp lights to indicate that the right turn signal indicator is flashing.

9. Power mode indicator lamp

This lamp turns on when the power mode switch is pressed. The maximum engine output is maintained for as long as this lamp is lit.

**10. Engine load factor indicator**

This gauge displays the load condition of the work. When the gauge is in the green range, the work load is light to medium. When the gauge is in the red range (75% or more), the work load is high. When the Enter key is pressed in a normal screen, the display changes in the following order: the engine load factor, throttle opening position, PM accumulation amount display, and lift load factor.

Note: The machine is not faulty if the gauge is in the red range. Operating the machine with the gauge being in the green range is energy-saving and will help conserve the global environment.

- 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 there is a change in the throttle opening position.

11. 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.

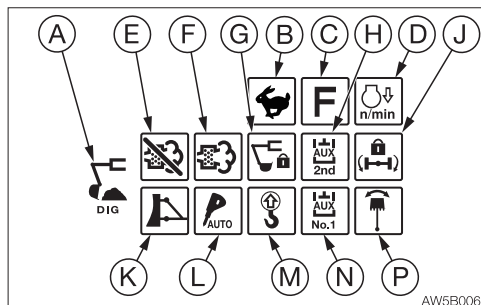
- **Trip meter**

Three patterns of desired operating hours can be displayed.

Refer to "Trip meter setting" on page 2-29.



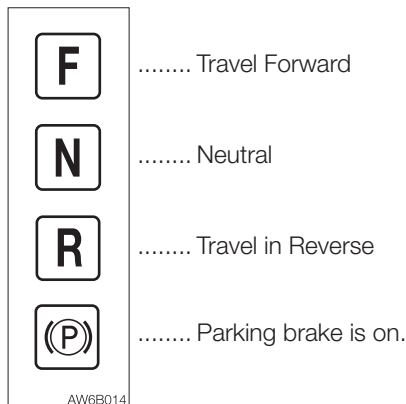
12. Digging mode display



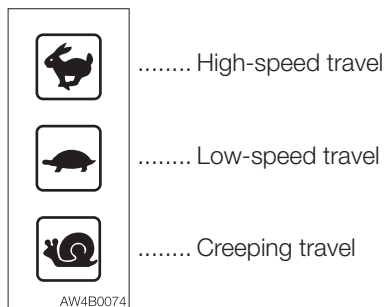
A. Digging mode symbol

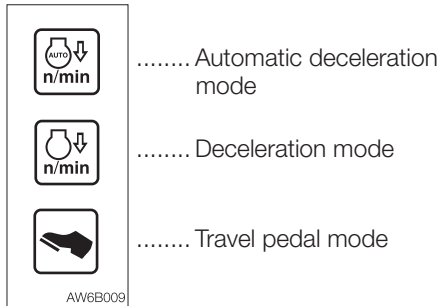
This symbol indicates that the machine is in the digging mode, and the icon suitable for the digging work is displayed. The machine enters the digging mode when the creeping travel switch is pressed or the brake pedal is depressed to the lock position.

C. Travel gear position /PB indicator lamp



B. Travel speed indicator lamps



**D. Deceleration indicator lamp**

- **Automatic deceleration mode**

It flashes when the automatic deceleration switch is pressed and remains lit while in the deceleration mode.

Refer to “Deceleration button” on page 2-42.

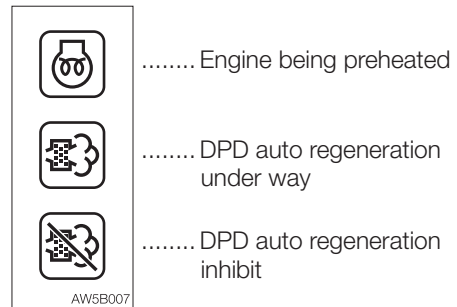
Refer to “Automatic deceleration switch” on page 2-39.

- **Deceleration mode**

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 (1000 rpm).

- **Travel pedal mode**

This lamp turns on when the travel pedal button is pressed. The engine RPM can be controlled with the travel pedal while this lamp is on.

E. Glow & DPD auto regeneration /inhibit indicator lamp

- **Glow indicator lamp**

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

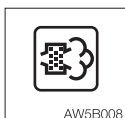
- **DPD auto regeneration under way**

The DPD regeneration is automatically performed by the engine, when certain criteria are met. The operator only has to check the display.

- **DPD auto regeneration inhibit**

The DPD manual regeneration inhibit symbol appears on the display when the DPD manual regeneration under way or the DPD auto regeneration under way is cancelled.

Refer to “DPD manual regeneration /inhibit select switch” on page 2-37.

**F. DPD manual regeneration under way
/regeneration promoting indicator**

The indicator starts flashing and an alarm starts sounding, if the accumulated PM exceeds the limited amount on the DPD.

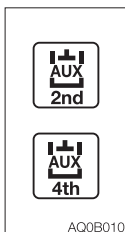
Immediately perform the manual

DPD regeneration.

Refer to “DPD manual regeneration/inhibit select switch” on page 2-37.

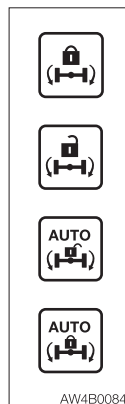
G.Attachment lock indicator lamp

This lamp lights to indicate that the operation of working equipment is locked.

**H.Auxiliary 2nd /4th select indicator lamp
(digging mode)**

..... Auxiliary 2nd is selected.

..... Auxiliary 4th is selected.

J. Ram lock indicator lamps

..... Lock: Digging

..... Release: Traveling

..... Automatic (blue): Traveling at low speed (ram lock)

..... Automatic (orange): Traveling at low speed (ram lock release) <Applicable machine models 514500042 or later>

Refer to “Ram lock switch” on page 2-36.

**K.Blade /Outriggers indicator lamp
(Digging mode)**

..... Dozer blade operation

..... Outrigger operation (both sides)

..... Outrigger operation (left side)

..... Outrigger operation (right side)

This lamp turns on when the blade or outrigger button is pressed. It remains lit while in the blade or outrigger mode.
Refer to “Blade /Outrigger lever (if equipped)” on page 2-52.

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

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

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

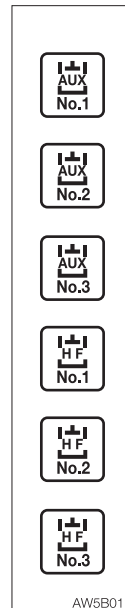
No display: Two-way (two-way circuit) is selected.

M. Lifting overload warning lamp

..... Lifting overload switch is ON.

N. Auxiliary 1st flow rate indicator lamp

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



..... Flow rate setting 1

..... Flow rate setting 2

..... Flow rate setting 3

..... High-flow setting 1

..... High-flow setting 2

..... High-flow setting 3

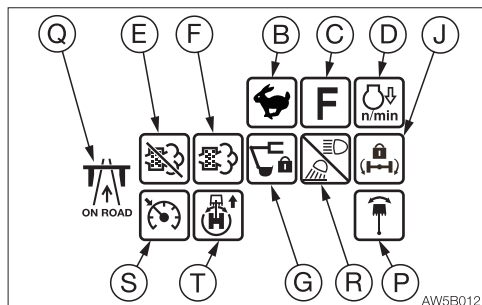
Refer to “Auxiliary line flow rate setting” on page 2-30.

P. Swing /Second boom indicator lamp

..... Swing is selected.

..... Second boom is selected.

13. Traveling mode display

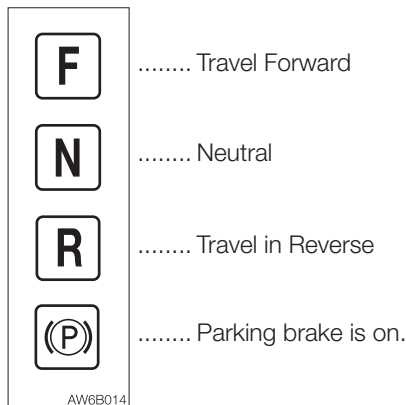


Q.Traveling mode symbol

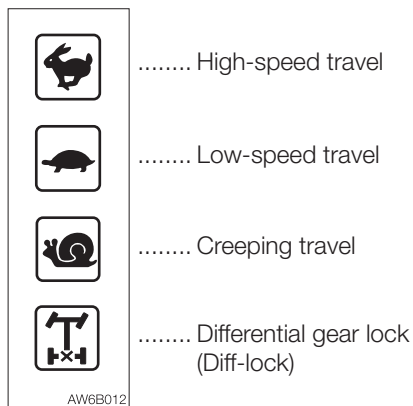
This symbol indicates that the machine is in the traveling mode, and the icon suitable for the traveling is displayed.

To enter the traveling mode, set the creeping travel switch to OFF, and release the brake pedal lock.

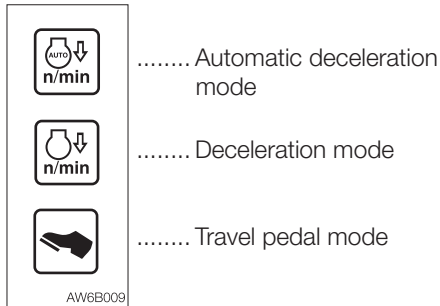
C.Travel gear position /PB indicator lamp



B.Travel speed /Diff- lock indicator lamp



This lamp turns on either when the travel speed is changed or the Diff-lock switch is pressed.

**D. Deceleration indicator lamp**

- **Automatic deceleration mode**

It flashes when the automatic deceleration switch is pressed and remains lit while in the deceleration mode.

Refer to “Deceleration button” on page 2-42.

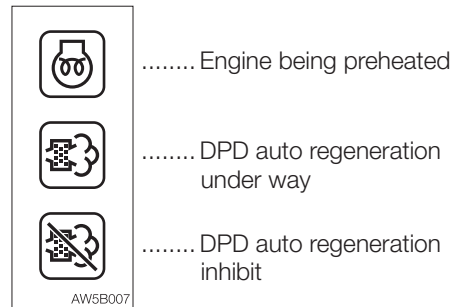
Refer to “Automatic deceleration switch” on page 2-39.

- **Deceleration mode**

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 (1000 rpm).

- **Travel pedal mode**

This lamp turns on when the travel pedal button is pressed. The engine RPM can be controlled with the travel pedal while this lamp is on.

E. Glow & DPD auto regeneration /inhibit indicator lamp

- **Glow indicator lamp**

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

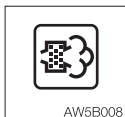
- **DPD auto regeneration under way**

The DPD regeneration is automatically performed by the engine, when certain criteria are met. The operator only has to check the display.

- **DPD auto regeneration inhibit**

The DPD manual regeneration inhibit symbol appears on the display when the DPD manual regeneration under way or the DPD auto regeneration under way is cancelled.

Refer to “DPD manual regeneration /inhibit select switch” on page 2-37.

**F. DPD manual regeneration under way / regeneration promoting indicator**

The indicator starts flashing and an alarm starts sounding, if the accumulated PM exceeds the limited amount on the DPD.

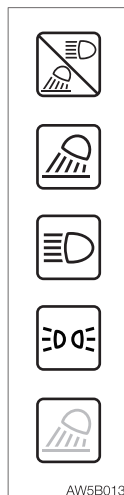
Immediately perform the manual

DPD regeneration.

Refer to “DPD manual regeneration /inhibit select switch” on page 2-37.

G.Attachment lock indicator lamp

This lamp lights to indicate that the operation of working equipment is locked.

R.Lamp /light indicator lamp

..... Working light /high beam is lit

..... Working light is lit.

..... High beam is lit.

..... Position lamp is lit.

..... Lamp /light is out.

- Working light /high beam indication
Displays that the working light or the high beam is lit.
- Working light indicator
Lights up when the working light is turned on.
- High beam indicator lamp
This lamp lights to indicate that the high beams are lit. It also lights when the passing operation is in progress.
- Position lamp indication
Lights up when the position lamp side of the light switch is pressed.
- Lamp /light is out.
Indicates that all of the working lights /high beams/position lamps are out.



S. Auto-cruise indicator lamp (Traveling mode)

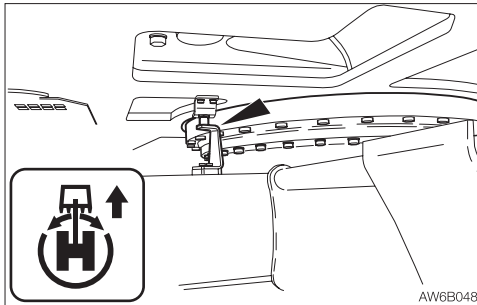


..... Auto-cruise is on.

This lamp turns on when the auto-cruise button is pressed. It remains lit as long as the auto-cruise is on.

Refer to “Auto-cruise button” on page 2-40.

T. Upperstructure position indicator lamp (traveling mode)

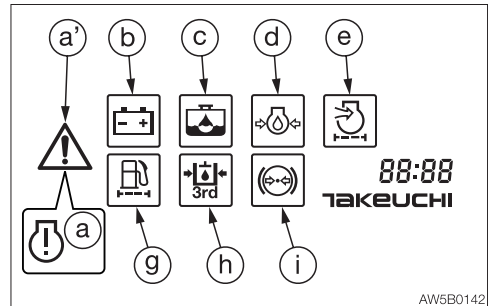


This lamp lights if the upperstructure and the undercarriage become misaligned to the right or left while traveling.

14. 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 6-12 and 6-13.



a. ECM 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 6-16 to 6-19.

a'. Vehicle and engine emergency lamp

This lamp flashes and an alarm sounds if there is a problem with the machine. Go to the (5) Data /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 2-28.

Refer to “(5) Data /Error code display” on page 2-31.

Refer to “Vehicle error code list” on page 6-14 to 6-15.

Refer to “Engine error code list” on pages 6-16 to 6-19.

b. 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.

**c. Water separator warning lamp**

This lamp flashes if the water is detected within the water separator while the starter switch is in the ON position.

d. 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.

e. Air cleaner warning lamp

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

g. Fuel filter warning lamp

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

h. 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.

i. Brake oil pressure warning lamp**CAUTION**

Wait five seconds after this lamp goes out before operating the machine.

If this lamp is lit while traveling on a road, pull off the road as soon as possible.

This lamp lights when the brake oil pressure becomes abnormally low while the engine is running.

15. Date and time indicator

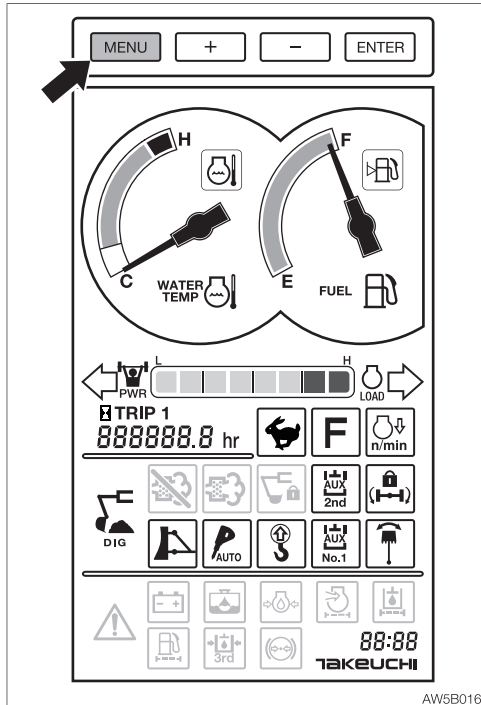
Displays the date and time set.

Refer to “Date and time setting” on page 2-32.



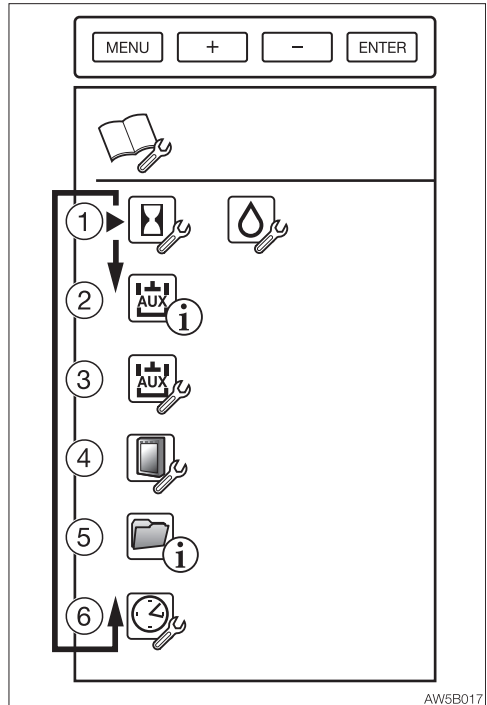
SCREEN NAVIGATION

• Main Menu screen



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

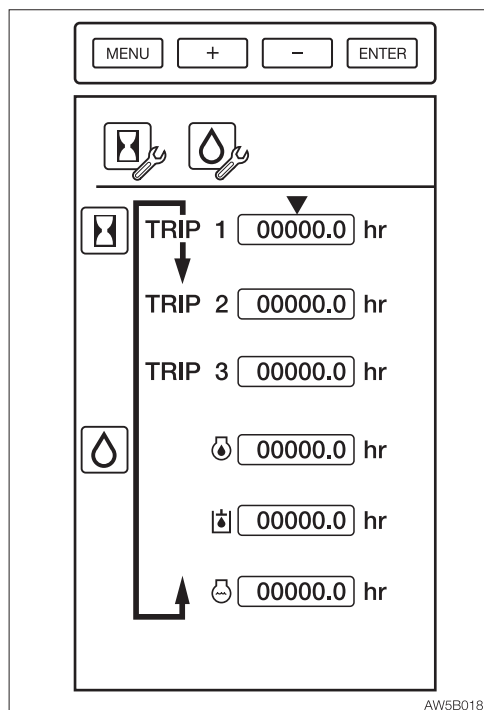
• Menu screen



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

Use the plus (+) or minus (-) 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.

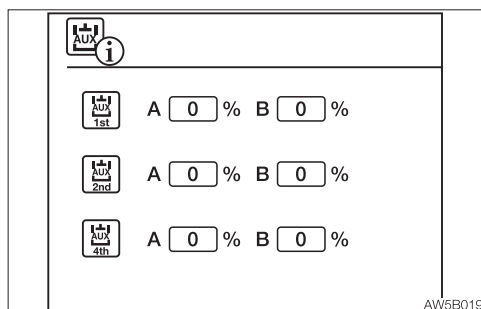
+ (↑) key: Increases the value or moves the cursor ▼ upward. Rapidly increases the value when pressed and held for one second.

– (↓) key: Decreases the value or moves the cursor ▼ downward. Rapidly decreases the value when pressed and held for one second.

Enter key: Confirms setting

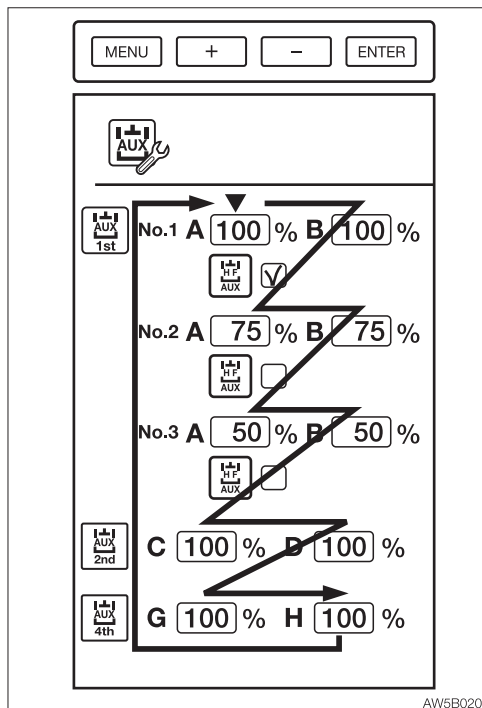
Menu key: Cancels setting or returns to the Menu screen.

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 output information of the Auxiliary 1st, 2nd and 4th.

The flow rate cannot be changed.

**(3) AUXILIARY LINE 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 minus (-) key. To move the cursor in the opposite direction of the arrow, use the plus (+) key.

Initial condition	A/B common, standard flow	Variable range
Auxiliary 1st-1	100%=112L/min (29.6 US gpm)	10 to 100%
Auxiliary 1st-2	75%=84L/min (22.2 US gpm)	10 to 100%
Auxiliary 1st-3	50%=56L/min (14.8 US gpm)	10 to 100%

Maximum flow rate	A/B common, high-flow	Variable range
Auxiliary 1st-1, 2, 3	200%=224L/min (59.2 US gpm)	100 to 200%

Initial condition	Standard flow	Variable range
Auxiliary 2nd	C/D 100%=112L/min (29.6 US gpm)	10 to 100%
Auxiliary 4th	G/H 100%=112L/min (29.6 US gpm)	10 to 100%

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

Pressing the minus (-) key will move the cursor in the direction of the arrow.

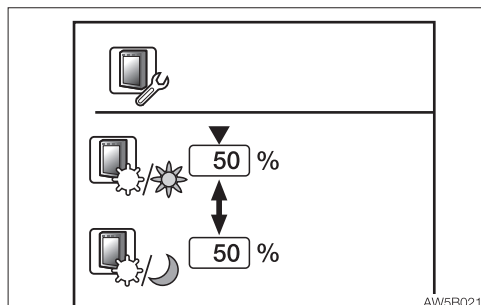
Pressing the plus (+) key will move the cursor in the opposite direction of the arrow.

To edit the setting, press the Enter key at the position of the cursor ▼. The value display keeps flashing during editing.

Set the flow ratio to the desired level, and then press the Enter key to confirm. The value display stops flashing.

Keep increasing the flow ratio to set to "high-flow" with the checkmark (✓) on the right of the flow symbol. The symbol of the selected flow rate setting will appear at the lower left of the Main screen.

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

**(4) LCD SETTING**

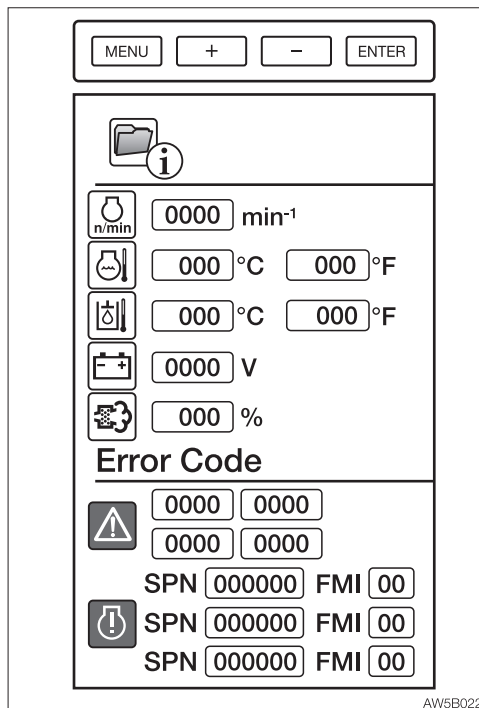
- The brightness of the LCD is set to between 0 and 100%. The brightness changes each time the adjustment is made.

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.

(5) DATA /ERROR CODE DISPLAY

Displays various data and error codes. The setting cannot be changed.

Display items

- Engine RPM
- Coolant temperature
- Hydraulic oil temperature
- Battery voltage
- PM accumulation amount

**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 page 6-14 to 6-15.

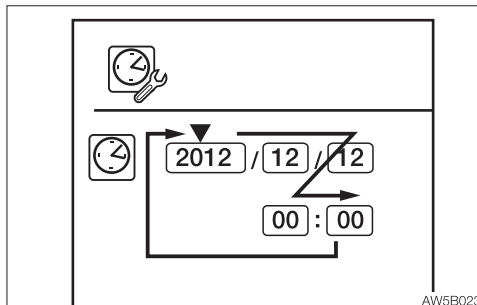
- ECM error code

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 6-16 to 6-19.

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

(6) 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.)

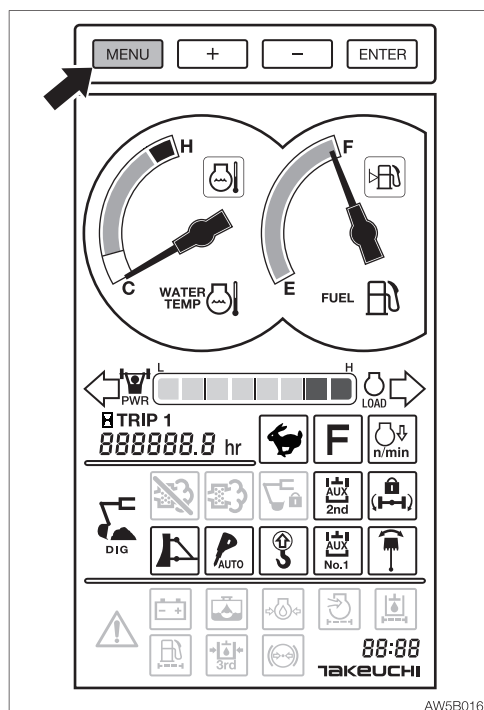
Press the Enter key to confirm. The month, date, hour and minute can be set using the same procedure for the year.

Refer to the trip meter setting for the key operation.



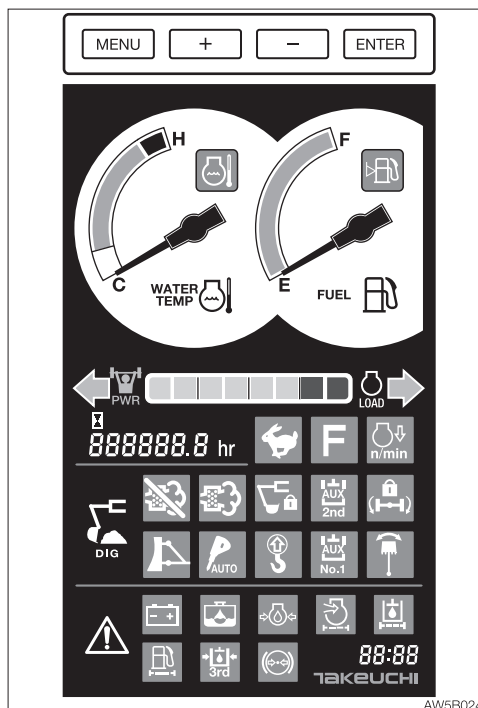
SWITCHING IMAGES

- Background color (daytime)



AW5B016

- Changing the background color (day / night)

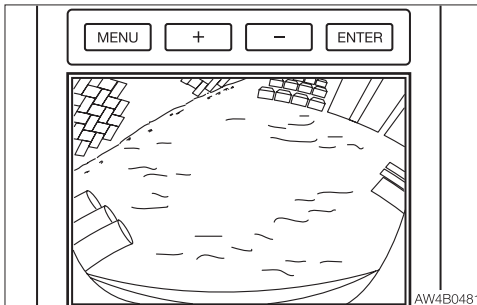
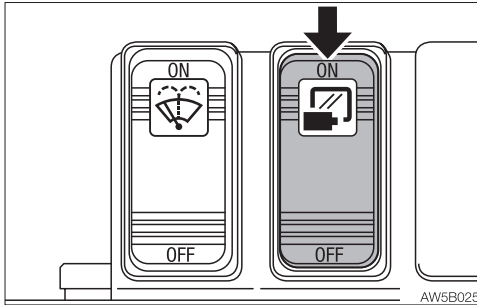


AW5B024

When one of the items (head light, signal light, working light, high beam switch) is turned on, the background will always be night mode in any screen even if the display brightness is lowered.

**• CAMERA****WARNING**

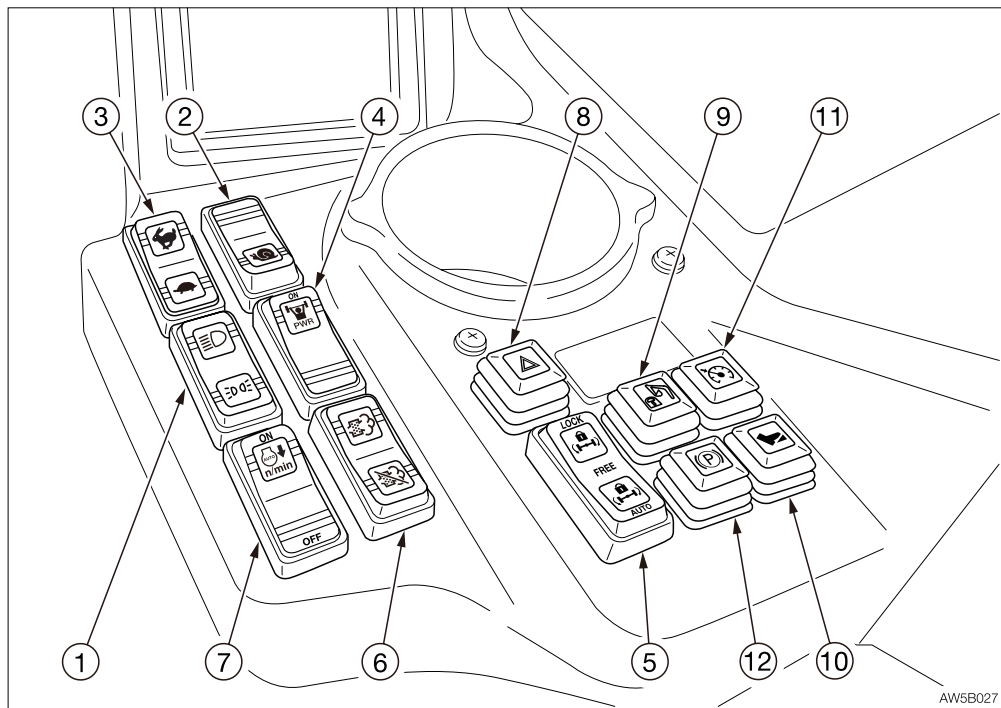
Do not look at the images produced by the camera while traveling in reverse. Move in reverse while looking at the direction of travel.



1. Press the ON (symbol) side of the image select switch (CAMERA) to show the camera image captured by the external camera at the top of the screen.
2. Press the OFF side of the switch to return to the Main screen from the camera screen.



CONTROL CONSOLE



AW5B027

SWITCHES

1. Light switch

When this switch is depressed, the lights are illuminated as follows.



.....Headlights, Position lamps

NeutralOFF



.....Position lamps

Note: This switch can be operated even when the power is turned off.

2. Creeping travel switch



Pressing this switch displays the digging mode.

Depress the “Snail” symbol on this switch to change the travel speed to creeping travel.

- Stop the machine before switching the travel gear.



Depress the other side of the switch to change to the high/low-speed travel gear.



3. Low /high-speed travel switch



Low-speed travel

Depress the “Turtle” symbol on this switch to change the travel gear from high-speed travel to low-speed travel.

It is possible to switch from the low-speed travel “Turtle” to the high-speed travel “Hare” while traveling. However, switching from the high-speed travel to low-speed travel must be done after stopping the machine, because it could cause an abrupt stopping or overspeeding, resulting in damage to the devices.

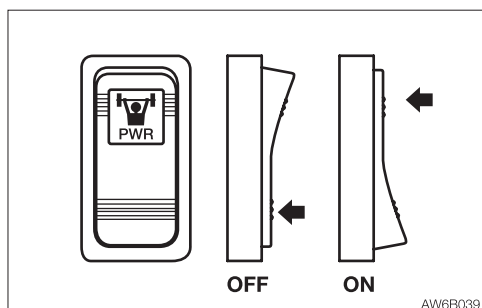


High-speed travel

Depress the “Hare” symbol on this switch to change to the high-speed travel gear.

Note: If the creeping travel switch has been depressed, the creeping travel switch takes a higher priority.

4. Power mode switch



While in the traveling mode, the power mode is always used.

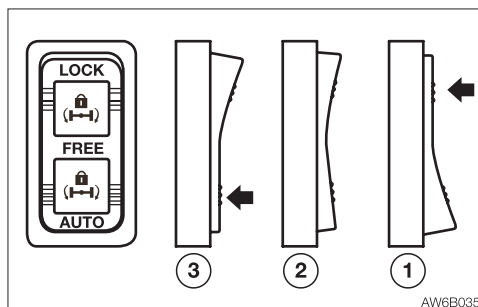
- Pressing the PWR symbol side of the switch turns on the Power mode indicator lamp on the Multi-information display. The maximum engine output is obtained.
- STD mode: Pressing the blank side of the switch will turn off the power mode indicator lamp. Refer to “Multi-information display” on page 2-16.

5. Ram Lock switch



WARNING

Do not lock the suspension while traveling. Doing so may create a dangerous situation. Be sure to lock the suspension only when working with the machine.



Lock the suspension of the front axle (wobbling) with this switch to prevent the cylinder from moving.

LOCK



..... Locks the suspension of the front axle.

Push the LOCK side of the switch to secure the machine when working.

FREE Unlocks the suspension. Keep the switch in this neutral position while traveling (High-speed travel: Low-speed travel switch is off).



AUTO

..... The suspension is automatically locked if the brake is pressed when traveling at low speed (low-speed travel: turtle symbol), and it is unlocked when the brake is released.

When traveling at high speed (high-speed travel: low-speed travel switch is off), the suspension is not locked even if the brake is pressed.

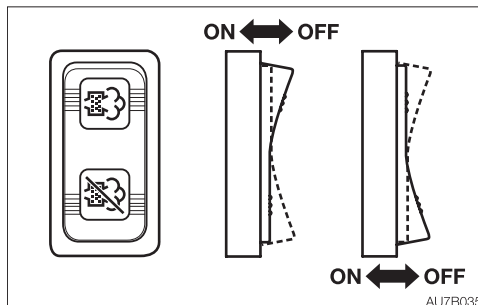


6. DPD manual regeneration /inhibit select switch

WARNING



- The DPD 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.
- Do not perform the DPD regeneration if the machine is surrounded by flammable items such as plants, trees, dry grass, wastepaper, oil and waste tires. There is a risk of fire due to the high-temperature exhaust gas emitted from the DPD.
- Do not perform the DPD regeneration in poorly-ventilated indoor spaces, as smoke may be generated during the regeneration.
- Do not perform regeneration when the engine hood is open. There is a risk of fire due to the high-temperature exhaust gas emitted from the DPD.

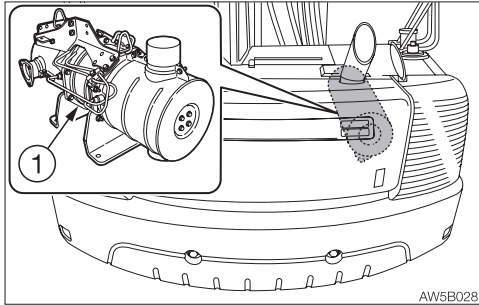


IMPORTANT: Press the manual regeneration side on the DPD manual regeneration/inhibit select switch to burn the particulate matter (PM), when the DPD manual regeneration lamp flashes and an alarm sounds. If the machine continues to be operated without performing the manual regeneration, the engine power will decrease and eventually the engine will stop running. The ECM warning display will also flash if the DPD needs to be repaired. A number appears on the engine error code screen. Refer to the “Engine error code list” and contact a Takeuchi sales or service dealer for repair.

• DPD manual regeneration

When the DPD manual regeneration symbol on the display starts flashing and an alarm starts sounding, perform the DPD manual regeneration by following the procedure below.

1. Park the machine in a safe place where there is no fire hazard.
2. Raise the safety lock lever to the lock position.
 - Do not lower the safety lock lever and move the control levers during regeneration. Doing so interrupts the regeneration.
3. Decrease the engine speed to low idling.
4. Press and hold the manual regeneration side on the DPD manual regeneration/inhibit select switch.



5. The manual regeneration symbol stops flashing and remains lit to indicate that the engine RPM is automatically increased and the DPD (1) regeneration (PM burning) has started.
6. Release the switch. Do not leave the machine during regeneration.
It takes approximately 15 to 20 minutes, depending on the ambient temperature, to complete the regeneration operation.
7. The manual regeneration symbol goes off to indicate the end of manual regeneration.

Note:

- Do not lower the safety lock lever and move the control levers during regeneration. Doing so interrupts the regeneration.
- In some cases smoke may be emitted from the tail pipe while the DPD regeneration is being performed. This is not a failure; it is due to burning of the particulate matter (PM).
- In some cases the noise associated with the DPD regeneration operation or cancel operation may change; this is not a failure.
- The DPD manual regeneration can be completed faster while the machine engine is warm rather than cold. Note that the manual regeneration does not start unless the coolant temperature is higher than a set value. The coolant temperature may increase while manual regeneration is being performed.

- Since the DPD regeneration is designed to work only when the accumulated particulate matter (PM) in the filter exceeds a certain amount, it will not start otherwise, even if you attempt to perform manual regeneration.

• DPD regeneration inhibit (cancel)

To cancel the DPD regeneration currently being processed (manual or auto), press the regeneration inhibit symbol side.

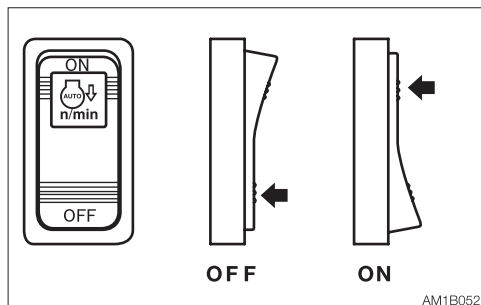
The DPD regeneration inhibit symbol appears on the display, and the regeneration operation must be performed again. Start the manual regeneration procedure from Step (1) above, as soon as possible. Do not press the DPD regeneration inhibit switch unless there is a risk of fire.

To cancel, press the switch again. Turning the starter switch to OFF will also cancel the operation.

Refer to “DPD manual regeneration/ regeneration inhibit /auto regeneration display” on page 2-20 and 2-21.



7. Automatic deceleration switch



When the ON side of the switch is pressed, the deceleration lamp in the Multi-information display 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.

BUTTONS

8. Hazard button



Press this button to turn on the hazard lamp. The turn signal indicator lamp also turns on.

Note: This switch can be operated even when the power is turned off.

9. Attachment lock button



WARNING

When traveling on a road, be sure to lock the working equipment. If any of the controls is accidentally touched when it is unlocked, the machine may suddenly move and cause serious injury or death.



This button is used when traveling on a road. Pressing this button will turn on the button lamp, indicating that the operations of the hoe attachment, slewing, auxiliary circuit and blade (outriggers) are locked. The attachment lock indicator lamp lights up on the display. Pressing this button again will turn off the lamp and the indicator lamp, indicating that the locking is released.

10. Travel pedal button (foot accelerator mode)



Pressing this button while the brake pedal is depressed will turn on the button lamp, indicating that the engine RPM can be controlled by operating the travel pedal. The travel pedal indicator lamp lights up on the display. Turn on this switch when traveling. This button can be used in the digging mode.

Pressing this button again will turn off the lamp and the indicator lamp, indicating that the foot accelerator mode is canceled.



11. Auto-cruise button (cruise control)



WARNING

Do not use this button on the following roads.

- Heavy traffic roads where a safe spacing between vehicles cannot be kept.
- Roads with many steep down slopes or curves.
- Slippery roads due to freezing or snowing.

Note: When traveling the slopes (up or down), a constant vehicle speed cannot be retained due to the gradient.



The cruise control (automatic constant speed traveling device) is a feature that enables to retain a desired vehicle speed without operating the travel pedal.

This function is available in the low-speed travel (Turtle) mode or in the high-speed travel (Hare) mode. Note that it only applies to the “forward” traveling.

Setting a speed

1. Fully depress the travel pedal.
2. Press the auto-cruise button to set to the maximum speed. The cruise indicator lamp lights up on the display, and the auto-cruise button lamp also lights up. The travel speed can be adjusted by increasing or decreasing the engine RPM (throttle control).

Canceling the speed setting

To cancel, do either of the following. The auto-cruise display lamp will also go out.

- Step on the brake pedal.
- Step on the travel pedal.
- Press this button again. The button lamp will also go out.

12. Parking brake button



Pressing this button will turn on the button lamp, indicating that the parking brake is engaged. The parking brake indicator lamp lights up on the display.

Pressing this button again will turn off the lamp and the indicator lamp, indicating that the parking brake is disengaged. (When the safety lock lever is fully lowered to the unlocked position while the engine is running.)

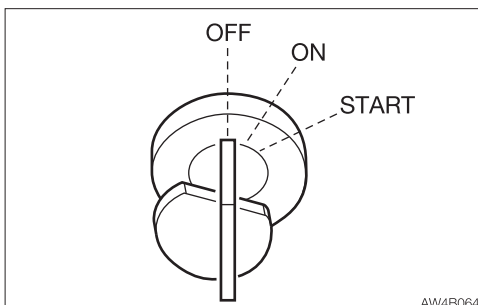
IMPORTANT: Do not activate the parking brake while digging. Doing so could damage the brake disk due to the excessive load acting on it. Lock the brake pedal by depressing it down.

Note: The parking brake is automatically activated when the power is turned off.



SWITCHES

STARTER SWITCH



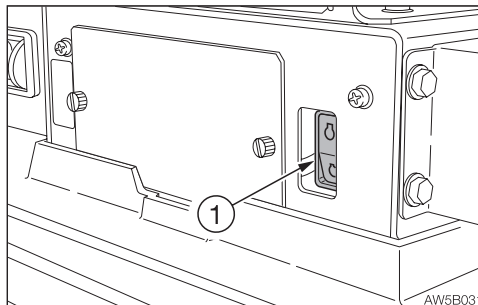
IMPORTANT: Do not repeatedly switch the key from OFF to ON and ON to OFF over a short period. Doing so will cause engine breakdown.

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.

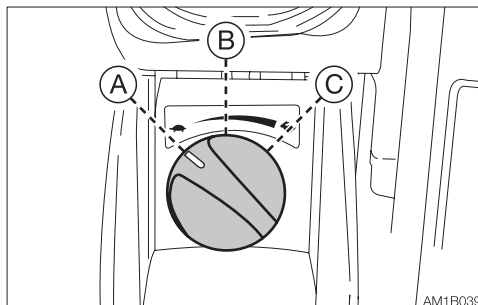
ENGINE SHUTDOWN SWITCH



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, return the switch (1) to the original position.

THROTTLE CONTROLLER



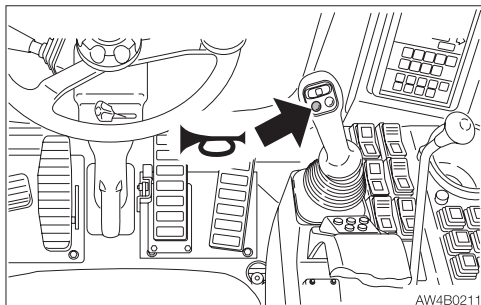
This controls the engine speed.

- (A) Low idling
- (B) Medium speed
- (C) Maximum speed

Note: The engine RPM can only be decreased up to "1250" with the throttle controller.



HORN BUTTON

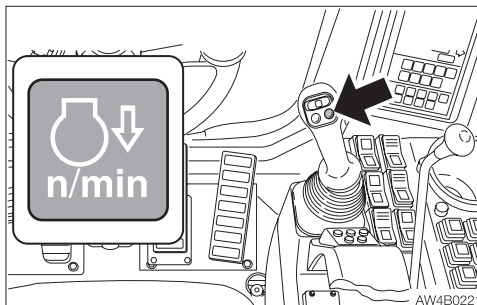


Press the button situated on the right operating lever to blow the horn.

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.

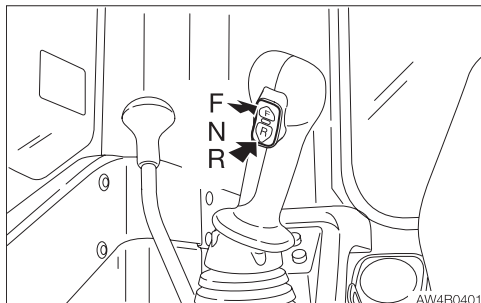


Press this button on the right operating lever to lower the engine speed to low idling. Press the button again to return to the engine speed set with the throttle controller. For safety reasons, it is designed that the deceleration function is activated to set the engine revolutions to low idling whenever 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 SELECT BUTTON



Use this button to change the travel direction.

Step on the brake pedal when the machine is stopped, and then shift the gear.

F.....Forward

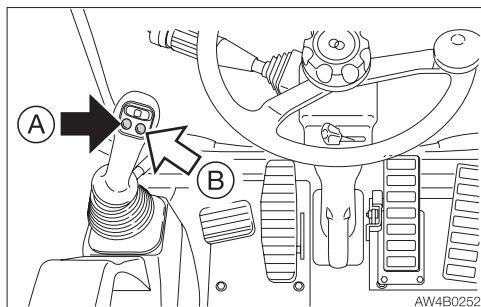
N.....Neutral

R.....Reverse (reverse light is lit)

For actual operation, step on the travel pedal for traveling.

FIRST AUXILIARY HYDRAULIC 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.

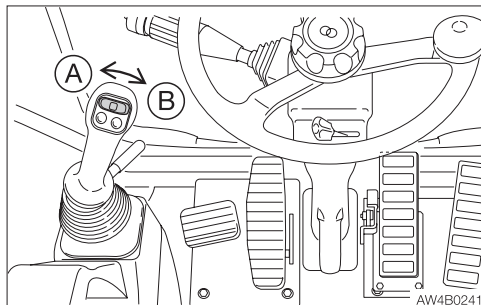
(A).....Hydraulic oil flows to the left auxiliary line (a).

(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” on page 2-65 to 2-69.



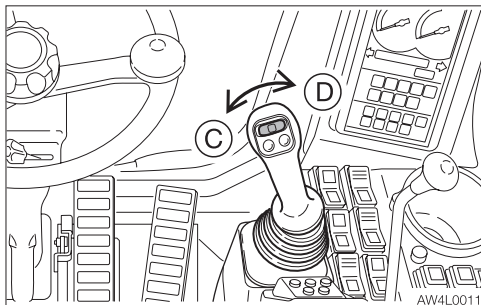
SECOND /FOURTH AUXILIARY HYDRAULIC SWITCH

Slider switch

(Proportional control)

Proportional control allows for slow-to-fast/ fast-to-slow movement of attachment.

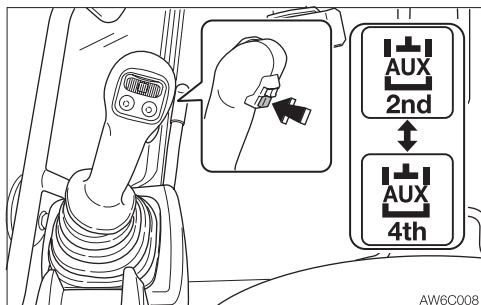
Example: If you move the slider switch half way, the attachment will move at approximately one-half the speed.



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

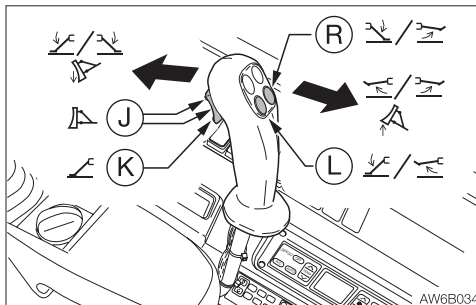
(C):Hydraulic oil flows to the left auxiliary line (c).

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



To use the fourth auxiliary hydraulic, press the Aux. 2/4 select button to change the line to the fourth auxiliary hydraulic. Refer to “Auxiliary hydraulic lines” on page 2-65 to 2-69.

OUTRIGGER SWITCHES (IF EQUIPPED)



JDozer blade operation (both sides)

KOutrigger operation (both sides)

LLeft outrigger operation

RRight outrigger operation

The outrigger operation is performed with the blade /outrigger lever.

THIRD AUXILIARY HYDRAULIC SWITCH AND BUTTON

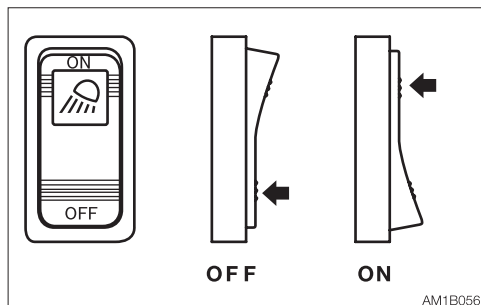
Refer to “Third auxiliary hydraulic switch and button” on page 2-68.

AUX. 2/4 SELECT BUTTON

Refer to “Aux. 2/4 select button (If equipped)” on page 2-69.



LIGHT SWITCH



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

OFF Off

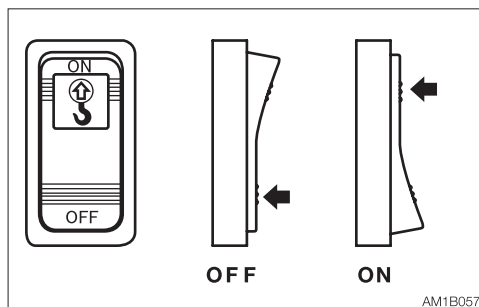
ON Switch lamps, front light, boom light, side lights and tail lamps will be lit. (switch lamp is lit)

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.



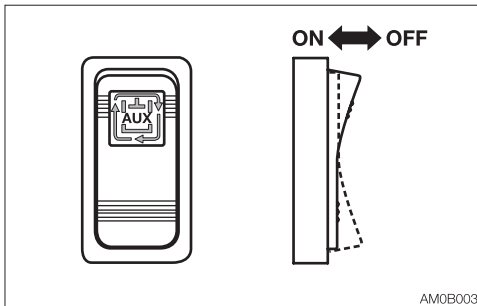
If a weight greater than the lifting capacity is applied or lifted, the overload warning device is activated and the horn sounds. (When the lift overload warning switch is turned on.)

OFF Off

ON On



AUXILIARY 1ST FLOW RATE SELECT SWITCH



This switch is used to select the flow rate of the auxiliary 1st.

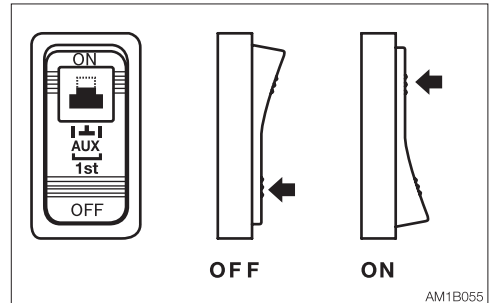
The auxiliary 1st flow rate indicator lamp in the Multi-information display turns on to indicate which flow rate setting is selected. The flow rate changes each time the ON side of the switch is pressed.

The flow rate is set by using the Multi-information display.

Refer to “Service flow setting” on page 2-30.

DETENT MODE SWITCH (AUXILIARY 1ST)

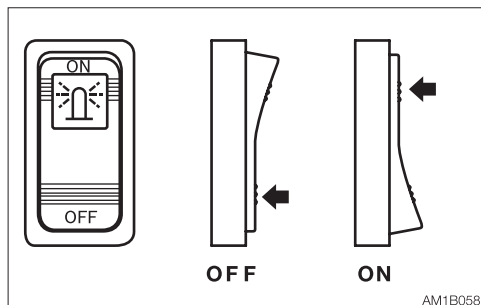
IMPORTANT: Do not operate the machine in the detent mode for a long time. Doing so will increase the hydraulic oil temperature and shorten the service life of the hydraulic units.



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.



BEACON LAMP SWITCH

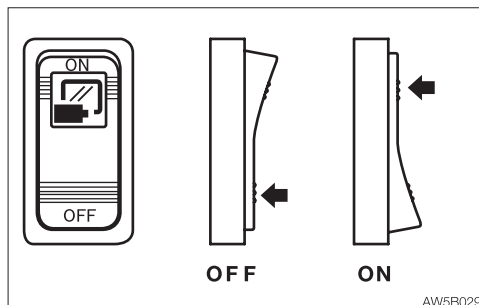


When this switch is turned on while the starter switch is at ON, the lamp turns on as follows:

OFF Out

ON Beacon lamp is lit

IMAGE SELECT SWITCH (CAMERA)



Press the ON (symbol) side of this switch to show the camera image captured by the external camera at the top of the screen.

OFF Original screen

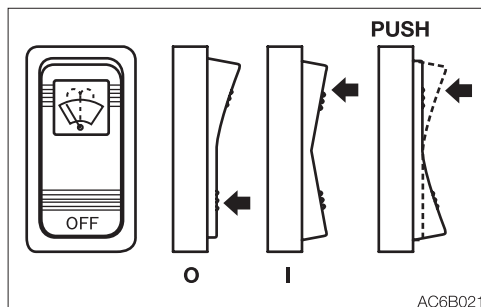
ON Rear camera

LOWER WIPER SWITCH (IF EQUIPPED)

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.



O Off

I Wiper operates

PUSH Sprays washer fluid when pressed. Stops when released.

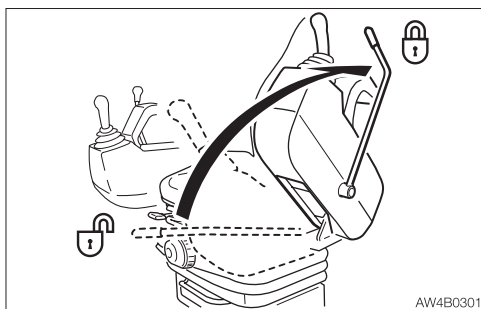


LEVERS AND PEDALS

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 lever to engage the lock and stop the engine. If any control is accidentally touched when the safety lock lever 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, set the locking devices securely to the lock position and stop the engine. Also, be sure to remove the key, lock the cab, fuel filler cap and covers, take the key with you and store it in a specified place.

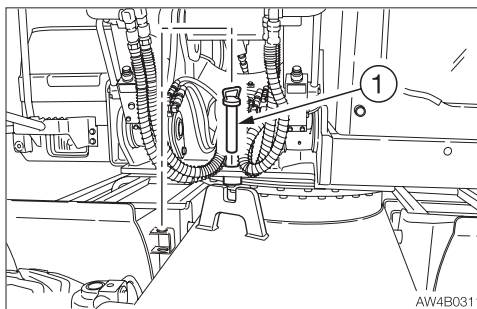


This device is for locking the operations of hoe attachment, slewing, auxiliary hydraulic circuits, blade (outriggers) and traveling. When the lever is raised, the lever stand springs up to lock the lever.

SLEW LOCK PIN

WARNING

When transporting or traveling on a road, be sure to lock slewing with the slew lock pin. Otherwise, the upperstructure could slew and cause a serious accident if a sudden load is applied to the upperstructure at times, such as when turning.



To lock the upperstructure for transport and on-road driving use the pin as follow:

1. Lift the pin (1).
2. Align the upperstructure in parallel with the undercarriage.
3. Lower the pin (1) fully into the lock.

IMPORTANT: The machine may be damaged if slewing is attempted by force while it is locked. Check the position of the slew lock pin before slewing.

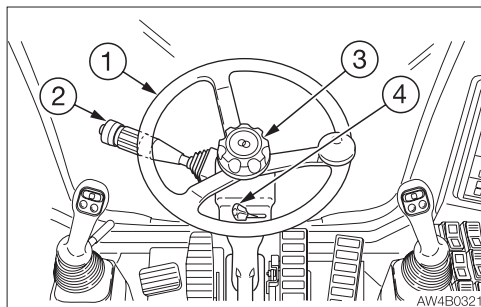


STEERING WHEEL



WARNING

- Check the position of the undercarriage (steering device) before traveling. Before operating the travel pedal, make sure that the steering device is to the front of the operator's seat. Remember that when the steering device is to the rear of the operator's seat, the steering wheel must be operated in the reverse direction from when it is to the front.
- Keep in mind that the steering wheel operation is not possible when the engine is stopped or if the steering pump becomes faulty.



The steering device contains the steering wheel (1) and the turn signal lever (2) for driving. Change direction by carefully turning the wheel. The additional steering knob makes the steering wheel movement easier. The steering wheel operation is available only when the engine is running or the steering pump is properly working.

< For Germany >

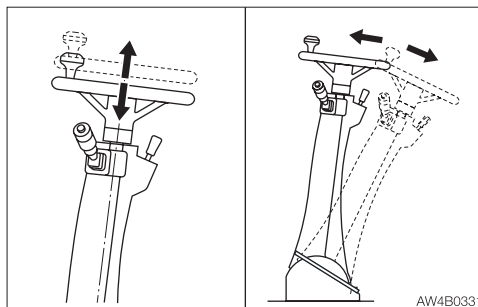
The machines for the German market are equipped with the emergency steering wheel function which allows steering wheel operation even if the engine is stopped. Note that, compared to a normal steering wheel operation, it requires twice as much force to turn the emergency steering wheel to turn to the desired turning angle of wheels.



WARNING

Adjusting the position of the steering wheel

- Adjust the position of the steering wheel before driving the machine. If you adjust it while driving the machine, steering will become unstable, possibly resulting in an accident.
- After adjusting, check that the steering wheel is securely fixed in place. Unsecured steering wheel is dangerous, as it could be moved unexpectedly.



The position of the steering wheel can be adjusted in up/down and front/back directions.

Up /Down

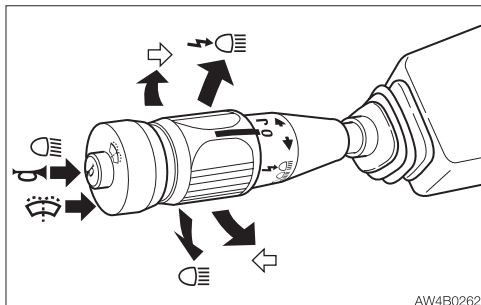
1. Turn the cap (3) counterclockwise and pull up or push down the wheel.
2. Tighten the cap (3).

Forward /backward

1. Press the lever (4) to the right and tilt the steering wheel forward or backward.
2. Release the lever (4) at the desired angle.



TURN SIGNAL LEVER



Use this lever to operate the turn signal lights, headlights, wiper and horn.

- ←.....Left turn lights
-Right turn lights
- ↔.....Flash passing
-Neutral:.....Low beam
-High beam
- ↔ Push.....Washer
- ↔ Push.....Horn

Note: The above (←), (→) and (↔) can be operated even when the power is turned off.

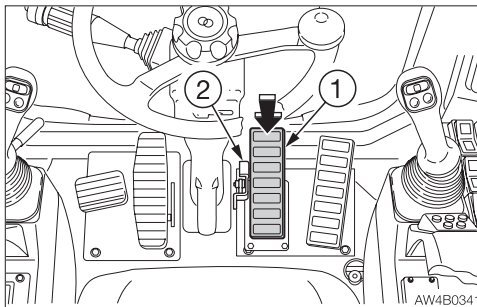
Wiper operation

- O.....Off
- J.....INT (intermittence)
- I.....On

BRAKE PEDAL

WARNING

- When parking, depress the braking pedal all the way down to engage the pedal lock so that the machine cannot start while parked.
- Release the brake pedal lock before start traveling.



The brake pedal (1) is used to activate a brake (arrow indicates the depression). The pedal (1) can be locked by fully depressing it. Press on the Release lever (2) to release the lock.

Locking the brake pedal will cause the machine to enter the digging mode.

IMPORTANT: Be sure to lock the brake pedal when using the bucket.

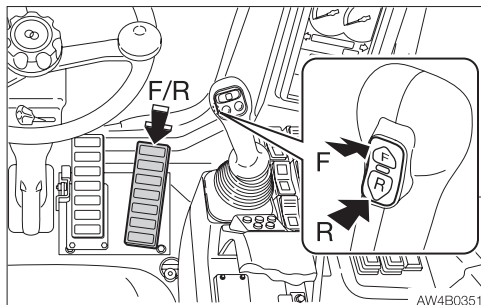


TRAVEL PEDAL



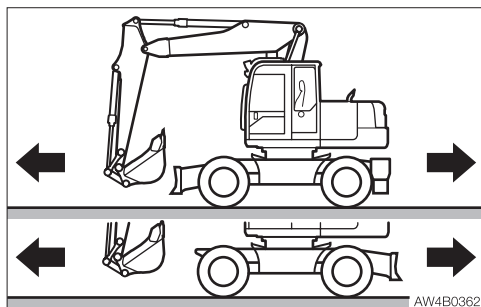
WARNING

- Check the position of the undercarriage (steering device) before traveling. Before operating the travel pedal, make sure that the steering device is to the front of the operator's seat. Remember that when the steering device is to the rear of the operator's seat, the steering wheel must be operated in the reverse direction from when it is to the front.
- Before traveling in reverse, check that the area in the rear is clear of any person.



Use this pedal to drive the machine and to control the travel speed.

This pedal can also be used to control the engine RPM if the travel pedal button has been pressed to enter the foot accelerator mode.

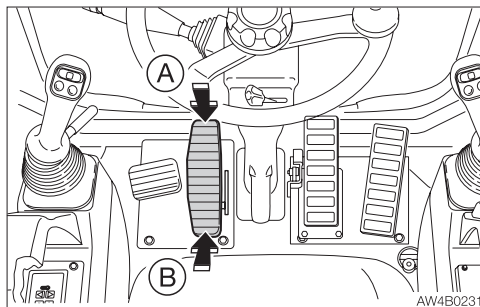


F.....Forward travel

R.....Reverse travel

Use the travel select button to change the travel direction (forward or reverse). Refer to "Travel select button" on page 2-43.

SECOND BOOM PEDAL (2-PIECE BOOM)



Use this pedal to operate the second boom.

(A).....Second boom raise

(B)Second boom lower

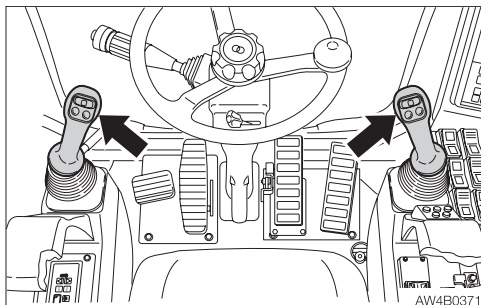
Refer to "Operating the second boom" on page 3-18.



OPERATING LEVERS

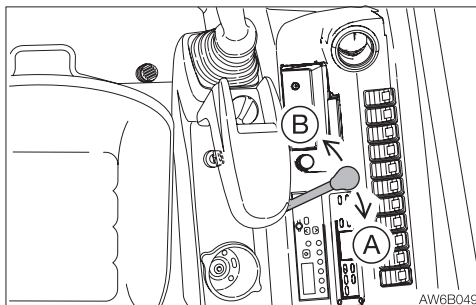
WARNING

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



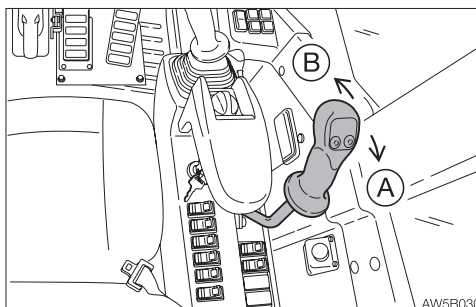
Use these levers to operate the boom, arm, bucket and upperstructure.
Refer to “Lever pattern” on page 3-6.
Refer to “Operating the working equipment” on page 3-16.

BLADE LEVER



Use this lever to operate the dozer blade.
(A).....Blade up
(B)Blade down
Refer to “Operating the dozer blade” on page 3-18.

BLADE /OUTRIGGER LEVER (IF EQUIPPED)



Use this lever to operate the dozer blade or the outrigger (if equipped).
Use the outrigger switch to select the dozer blade or outrigger operation.
(A).....Blade raise /Outriggers raise
(B)Blade lower /Outriggers lower
Refer to “Outrigger switches (If equipped)” on page 2-44.
Refer to “Operating the dozer blade” and “Operating the outriggers (If equipped)” on page 3-18.



AIR CONDITIONER

CAUTIONS ON USE

Ventilate periodically

- When using the air conditioner over an extended period of time, open the windows about once each hour to let in fresh air.
- Your eyes may become irritated if you smoke while using the air conditioner. If this happens, open the windows to let in fresh air. Smoking particularly irritates the eyes when the air conditioner is being used. Since the humidity in the cab drops, the cornea becomes dry.
- If the outside air is dirty, set the air conditioner to the circulation mode.

Always maintain good visibility

Working with the dirty windows or fogged windows restricts visibility and is dangerous. Always clean dirt and moisture off the windows before working.

- The windows tend to get foggy when the humidity is high. If this happens, turn on the air conditioner to use outside air and the defroster to get rid of the fog.
- If the air conditioner is set to high when using the defroster, the difference between the external and internal temperatures increases, resulting in frost on the outside of the windows. If this happens, either turn the air conditioner off or push the temperature control button to increase the internal temperature.
- Mist may blow out of the air outlets. This is not a malfunction. When moist air passes through the evaporator on the air conditioner unit, water particles in the air freeze and are emitted as mist.

Do not overcool

For health reasons, the air inside the cab should be kept at a temperature at which you feel a little cool when entering the cab from outside (a difference of 5 to 6°C (41 to 43°F)). Remember to adjust the temperature properly.

Do not turn on the air conditioner until the engine is started

To avoid placing an excessive load on the compressor, wait until the engine is started and is running smoothly before turning on the air conditioner.

Let hot air out first

If the machine has been parked in the sun, open the windows and door to let the hot air out of the cab before using the air conditioner.

Caution on refrigerant (gas)

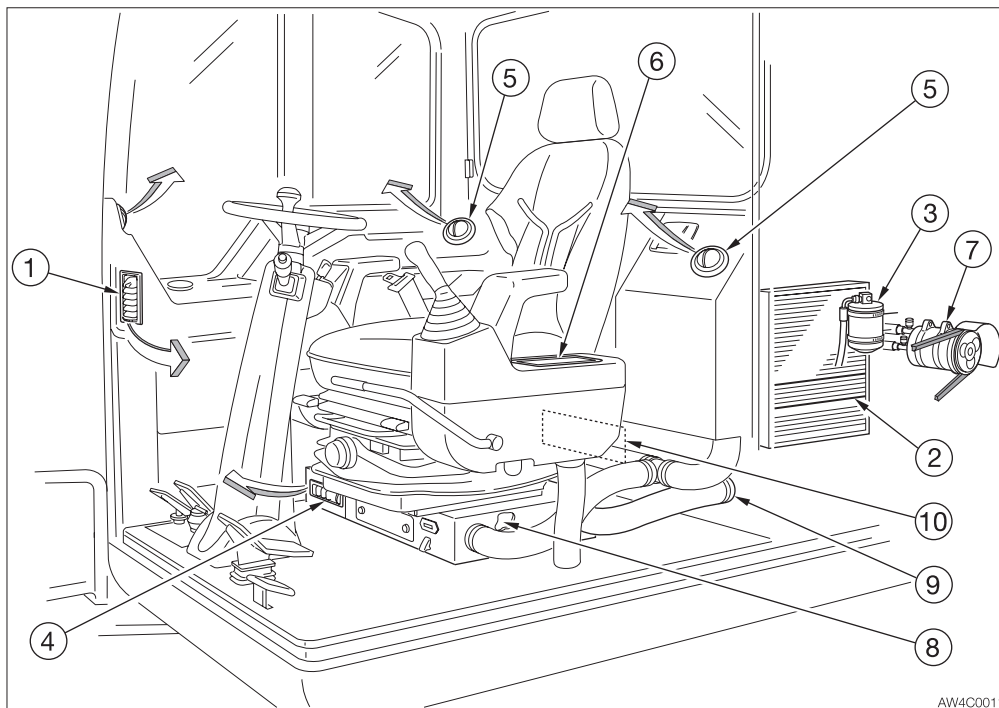
If the refrigerant comes in contact with skin or eyes, it may cause frostbite or eye damage. Never touch the refrigerant or loosen the parts on the cooling circuit. If the refrigerant gas leaks, keep flames away.

Off-season inspection

Even off season, run the air conditioner for 3 to 5 minutes at least once a week to maintain oil in the various parts of the compressor.



NAMES OF COMPONENTS

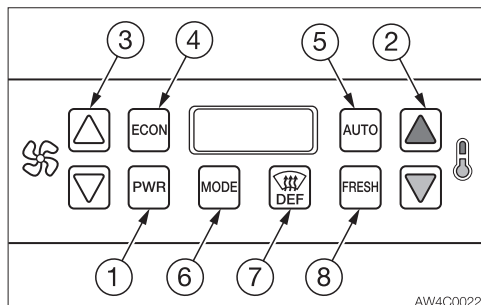


AW4C0011

1. Defroster
2. Condenser
3. Receiver dryer
4. Foot outlet
5. Back outlets
6. Control panel
7. Compressor
8. Air conditioner unit
9. External air duct
10. Filter



CONTROL PANEL OPERATION



(1) PWR

Powers vehicle Heater-A/C control system on or off. The LED numeric display is illuminated when the unit is turned on. The display will show the current set point temperature.

(2) TEMPERATURE UP /DOWN

Increments the set point temperature up or down. The system will control the electronic water valve and/or the A/C compressor clutch to hold the cab temperature as closely as possible to the set point temperature.

(3) FAN UP/ DOWN

Overrides the automatic fan speed control (AUTO) feature. Increments fan speed up or down in 11 steps. The digital display indicates the fan speed setting as a percentage or "HI" when maximum fan speed is reached or "LO" when the minimum fan speed is reached. The speed setting will be shown for 5 seconds before returning to the set point temperature display. The fan speed is maintained until it is changed or if the AUTO key is depressed.

(4) ECON (Economy Mode)

When depressed, locks out the A/C function. The control used only fresh air, fan speed, and water valve control to maintain the set point temperature. Depressing the ECON key will return the system back to normal operation. An indicator light on the digital display indicates when this mode is active. Note that defrost (DEF) overrides the ECON function.

(5) AUTO

Places the system in a fully automatic temperature control mode including fan speed. A panel indicator light indicates when this mode is active. The system will adjust the blower fan speed to the lowest setting necessary to maintain the cab temperature at the displayed set point temperature.

(6) MODE (°C/°F)

Toggles the display units between degrees Celsius and degrees Fahrenheit. The display will show the units selected.

(7) DEF (Defrost icon)

Positions the fresh /recirc air door to the fresh position and turns on the A/C compressor clutch for dehumidification. A panel indicator light indicates when this mode is active. Note that selecting defrost may override previous setting for ECON or FRESH. This will be indicated by the state of the ECON and FRESH key indicator lights. When the defrost mode is de-selected, the system will return to previously selected modes.

(8) FRESH

This key toggles the fresh or recirculation air modes. When the FRESH mode is enabled, outside air is allowed into the vehicle. A panel indicator light indicates when this mode is active. Note that the defrost mode (DEF) will override the FRESH function and enable the fresh air mode.



GENERAL SYSTEM OPERATION

Heater Operation

The ATC automatically controls the Heater-A/C to maintain the cab air temperature close to the set point selected by the temperature control pushbuttons. The ATC will adjust the air temperature blown through the ducts to maintain this temperature. If more heat is desired, increase the set point temperature by pushing the up temperature button. If less heat is desired, decrease the set point by pushing the down temperature button.

To obtain maximum heating, set the set point temperature to 32°C (90°F). The system will put out maximum heat continuously, even if the cab temperature exceeds the set point temperature. Turn the blower fan speed to maximum fan (not AUTO).

In AUTO mode, the fan speed will increase as necessary to warm up the cab to the set point temperature. Once the cab reaches the set point temperature, the fan speed will decrease.

Finer temperature control can be obtained by leaving the control panel in °F units. The temperature units can be changed from °C to °F or °F to °C by toggling the °C/°F button. The current temperature unit will then be shown on the digital display.

A comfortable set point for heating is between 22°C (72°F) and 26°C (78°F). Change the temperature set point in small amounts for best results. Once a comfortable temperature is reached, this temperature will be maintained without adjusting the set point

DEFROSTING OR DEFOGGING OPERATION

Note: If the air conditioner is set to high when using the defroster, the difference between the external and internal temperatures increases, and fog may form on the outside of the windows. If this happens, either turn the air conditioner OFF or push the temperature control button to increase the internal temperature.

This mode is used to be-ice, defrost, or defog the windows by pressing the key with the defrost icon. In certain cold or humid conditions, more heat and airflow is required to clear the windows. The set point temperature and the blower speed should be adjusted as necessary to maintain a clear windshield at all times. For maximum defrost, increase the set point temperature to the maximum setting (32°C or 90°F) and increase the blower speed to maximum fan (not AUTO).

The air conditioner is enabled when in defrost mode. The A/C is used to dehumidify the air entering the cab to remove the fog from the windshield.

The fresh/recirc door is forced to the fresh position in defrost mode. Fresh air is used to help remove the fog from the windshield. Pressing the defrost key when it is active (indicated by an illuminated light) will deactivate the defrost mode and the system will return to the settings that were in place before the defrost mode was enabled.



AIR CONDITIONER (A/C) OPERATION



CAUTION

- When the air conditioner is set to the recirculation mode, the air in the cab gradually becomes dirty, so switch to external air ventilate once a comfortable temperature is reached.
- Excessive cooling can be harmful to your health. It is best to keep the air inside the cab only about 5 to 6°C (41 to 43°F) cooler than the outside air.
- If the excavator has been parked in the sun, open the windows or door to let the hot air out of the cab before using the air conditioner.

The ATC automatically controls the Heater-A/C to maintain the cab air temperature close to the set point selected with the temperature control pushbuttons. The ATC will adjust the air temperature blown through the ducts to maintain this temperature. If more cooling is desired, decrease the set point by pushing the down temperature button.

To obtain maximum cooling, set the set point temperature to 16°C (60°F). The system will put out maximum cooling continuously, even if the cab temperature drops below the set point temperature. Turn the blower fan speed to maximum fan (not AUTO).

In AUTO mode, the fan speed will be adjusted as necessary to keep the cab at the set point temperature. The farther away the cab temperature is from the set point, the higher the fan speed.

Finer temperature control can be obtained by leaving the control panel in °F units. The temperature units can be changed from °C to °F or °F to °C by toggling the °C/°F button. The current temperature unit will then be shown on the digital display.

A comfortable set point for cooling is between 20°C (68°F) and 23°C (74°F). Change the temperature set point in small amounts for best results. Once a comfortable temperature is reached, this temperature will be maintained without adjusting the set point.

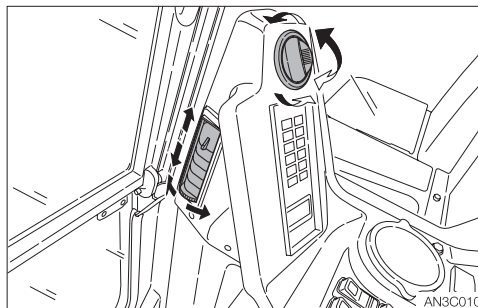
VENTILATION (FRESH /RECIRC)

The unit draws in a mix of outside and recirculated air when in fresh air mode. This allows the cab to maintain a positive cab air pressure to prevent excessive dust from entering the cab. In addition, the fresh air mode prevents the air from becoming stale and humid.

In recirculation mode, only recirculated air is pulled in through the unit. Use this mode for short periods of time to prevent fumes from entering the cab or to obtain maximum cooling or heating.

Inspect and replace both the fresh air and recirculated air filters regularly to obtain proper cab pressurization, optimized unit performance, and correct temperature regulation.

OUTLETS



Move the louvers to adjust the air flow direction.

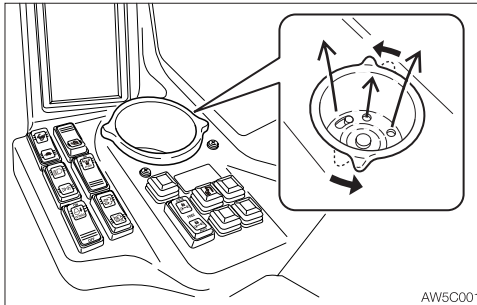


ACCESSORIES

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 cigarette lighter or other electric parts may be damaged if drinks are spilled on them.



AW5C001

Use to hold cups or bottles.
To warm or cool the cup, turn the cup holder in counterclockwise. Warm or cool wind blows from the bottom of the cup holder.

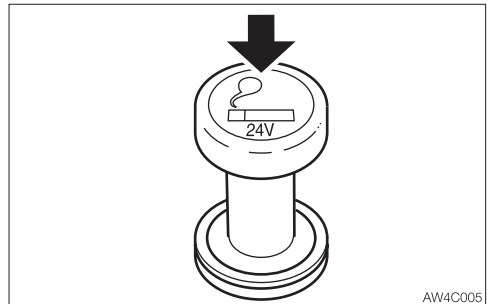
CIGARETTE LIGHTER

WARNING

- Do not leave the cigarette lighter knob pushed in for a long time. Doing so heats up the lighter, and could be dangerous.
- If the lighter knob does not pop out 30 seconds after it was pushed in, it may be broken. Pull it out by hand.
- Do not use any other cigarette lighters than Takeuchi's. They could be stuck in the middle and not pop out.
- Use only those electric products which comply with the specifications of these sockets.
- Do not touch the metallic parts of the lighter. Doing so could cause burns.

This is the cigarette lighter and internal power supply socket.

When using, be careful not to exceed 24V/5A.



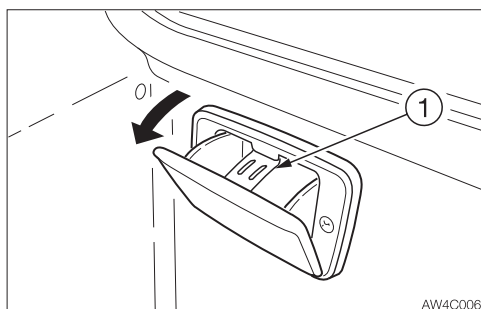
1. Push the lighter in.
2. Release the lighter and wait for it to pop out. The lighter pops out automatically when the heater becomes red hot.
3. Once the lighter pops out, pull it out.



ASHTRAY

WARNING

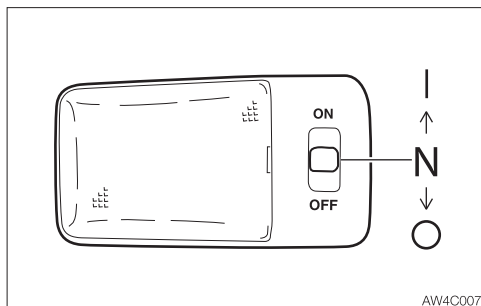
- Be sure to extinguish cigarettes and matches completely before putting them in the ashtray, and close the ashtray after each use.
- Do not overfill the ashtray with cigarette butts or put in paper or other easily burnable objects. Doing so could cause fire.



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

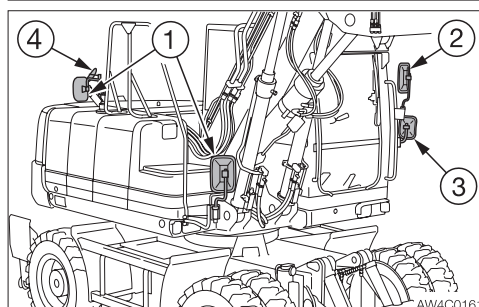
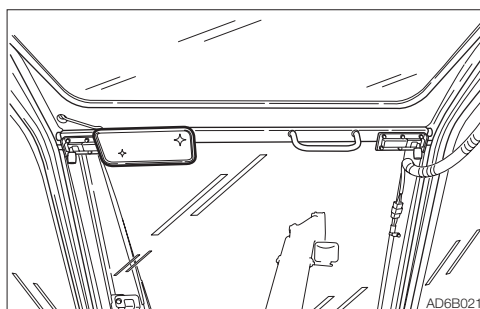
INTERIOR LIGHT

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



- OFF (O).....Lamp is turned off all the time, with no regard for the door being opened or closed.
- Neutral (N)Lamp is turned on when the door is opened, and it turned off when the door is closed.
- ON (I).....Lamp is turned on all the time, with no regard for the door being opened or closed.

MIRRORS



Adjust the rear view mirrors and side view mirrors so that you have a better view.

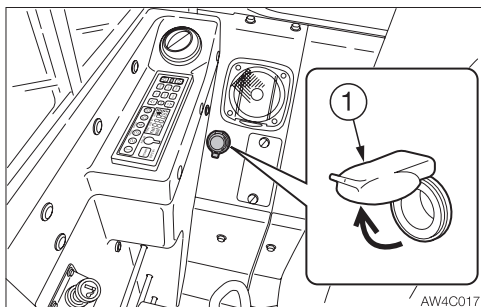
1. Check the rear right side view
2. Check the rear left side view
3. Check the left side view
4. Check the blind spot in the rear of the machine



12 V POWER SOCKET

WARNING

Use only those electric products which comply with the specifications of this socket.



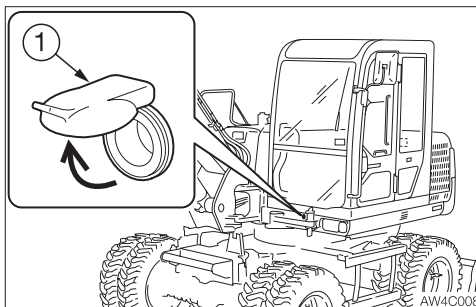
Use this socket to connect the 12 V power supply. When using, be careful not to exceed 12 V/5 A.

To use, open the cap (1).

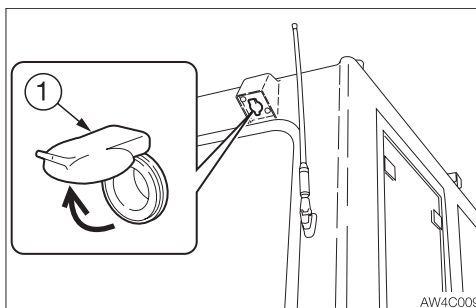
24 V EXTERNAL POWER SOCKETS

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 24 V/5 A.

To use, open the cap (1).

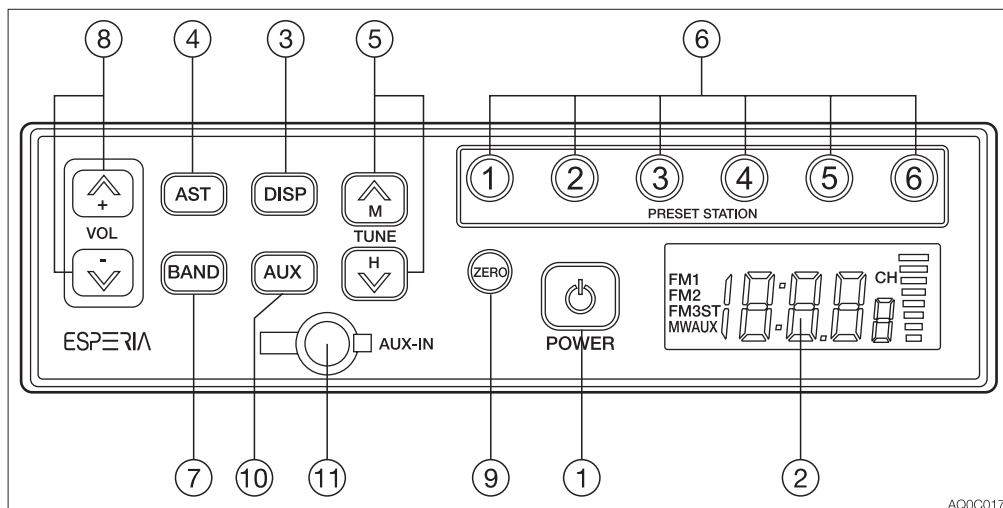


RADIO (FOR CAB)

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  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)

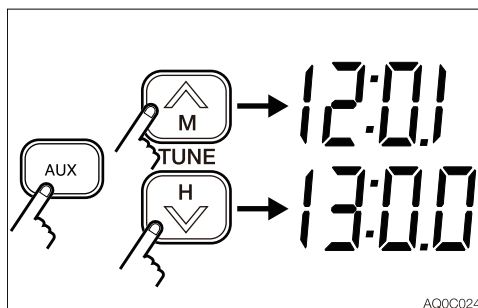
Press the AST button while playing the radio. The radio automatically starts seeking the receivable stations within the band currently selected and assign each preset button (1 to 6) a station.

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 button to set the minute. Use the tune 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 (North, Central and South America)

If there are any problems, such as the abnormal display of frequency or failure of selection, reset the radio by pressing the “3” button* while pressing the AST button and the AUX button together. Then, “US”** 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.

* : “6” button – (Europe, Asia, Oceania)
“5” button – (China)

** : EU – (Europe, Asia, Oceania)
CH - (China)

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)

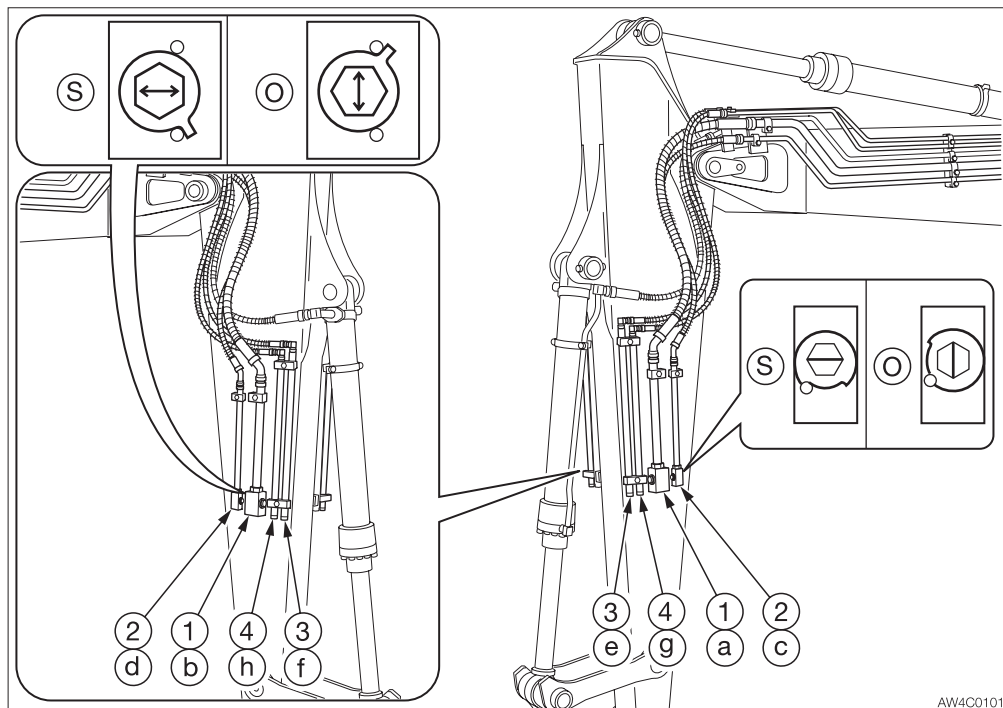
S/N ratio: MW (AM) 40 dB or more
FM 50 dB or more

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



AW4C0101



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:

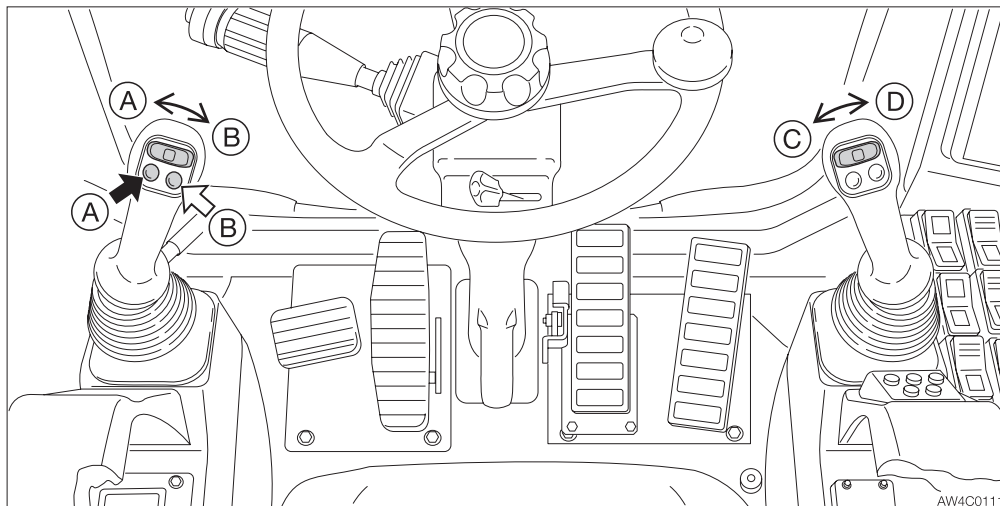
1. Release the pressure remaining in the lines, and then close the stop valve.
Refer to "Releasing the residual pressure" on page 2-67.
2. Remove the plugs.
3. Connect the attachment hydraulic lines to ports (a/c) and (b/d). When installing a hydraulic breaker, connect the supply circuit to the port (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 2-68.
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 2-67.
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

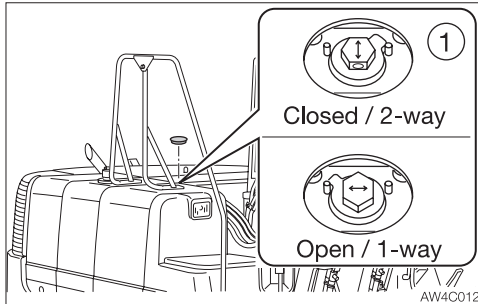
After the auxiliary hydraulic circuits have been used, pressure remains in the circuits. This is called the residual pressure. Release this residual pressure before disconnecting the lines.

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



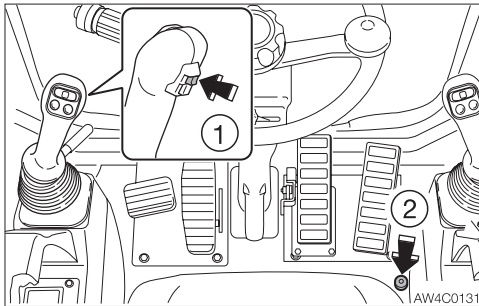
Open..... When using a hydraulic breaker (1-way flow)

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) on the machine body.

Use the high-flow only in the 2-way flow. If it is used in the one-way flow, the brake may overheat.

Third auxiliary hydraulic switch and button



The third auxiliary hydraulic lines are normally used to control the “quick attachment” installed to connect/disconnect the bucket. When the safety lock lever is released after the engine is started, hydraulic oil flows into the pipe (e). This allows the pressure in the (e) side to increase and to prevent the pin inserted on the bucket from coming out. If the pressure in the (e) side drops, the alert that the bucket may come out is indicated by the warning lamp and the alarm. 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.

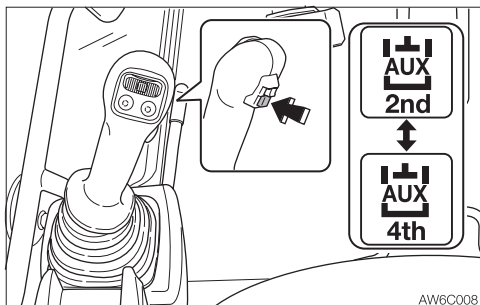
Third auxiliary hydraulic warning lamp



This lamp illuminates and an alarm sounds when the third auxiliary hydraulic pressure drops abnormally, when the safety lock lever is fully lowered to the unlocked position while the engine is running.



Auxiliary 2/4 select button (If equipped)



This button is used to switch the operation between the second auxiliary and the fourth auxiliary.

Pressing this button while the second auxiliary symbol is displayed on the LCD will switch to the fourth auxiliary operation.

Pressing this button one more time will display the second auxiliary symbol on the LCD to indicate that the second auxiliary operation is resumed.

The actual operation is performed with the 2nd/4th auxiliary hydraulic switch (slider switch).

Refer to “Second /Fourth auxiliary hydraulic switch” on 2-44.



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:

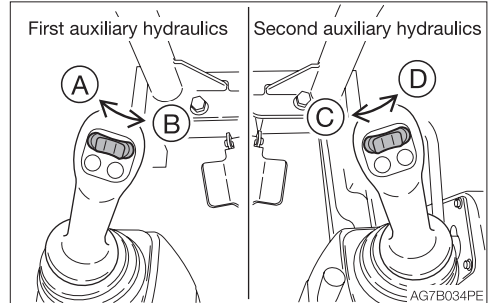
- Do not disassemble.
- Do not allow flame near or throw it into a fire.
- Do not drill, weld or fuse.
- Do not subject it to physical shock such as hitting, rolling or dropping.
- Before disposing of the unit, the sealed gas must be drained. Contact a Takeuchi service agent for help.

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, provided that the releasing is done within 10 minutes after the engine is stopping.

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

The load safety devices include an emergency shut-off valve and an overload warning device. The emergency shut-off valve prevents the boom, second boom or arm from falling rapidly. The overload warning device sounds an alarm when an excessive load is detected.

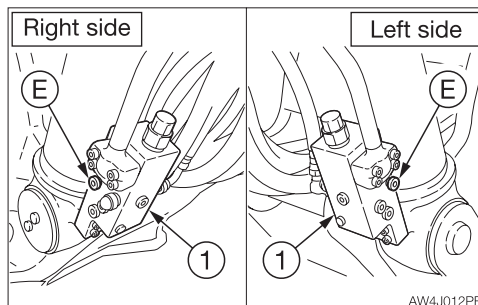
Emergency shut-off valve

If the boom, second boom or arm cylinder hose for lifting is ruptured, the emergency shut-off valve is activated to prevent the boom, second boom or arm from falling rapidly.

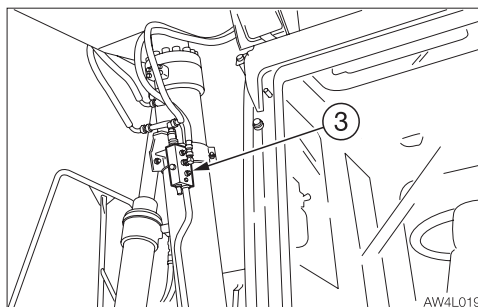
WARNING

- 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.
- Since the emergency shut-off valve (1), (2) or (3) is a safety device, you must not disassemble it and/or replace or adjust its internal part. Takeuchi shall not be held responsible for any injuries, accidents or product malfunction caused by disassembly.

Boom

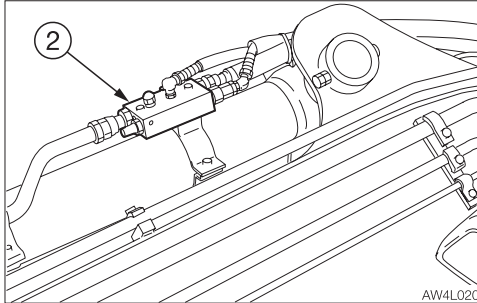


Second boom (2-Piece boom)





Arm



If the hose breaks and the emergency shut-off valve (1), (2) or (3) 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 switch

Refer to "Overload warning switch" on page 2-45.

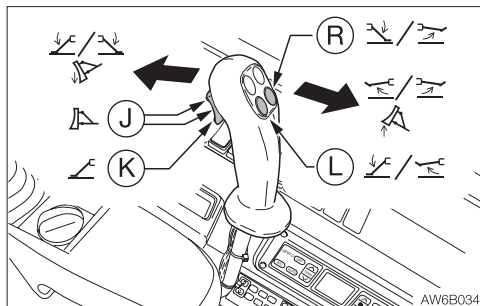


OUTRIGGER

WARNING

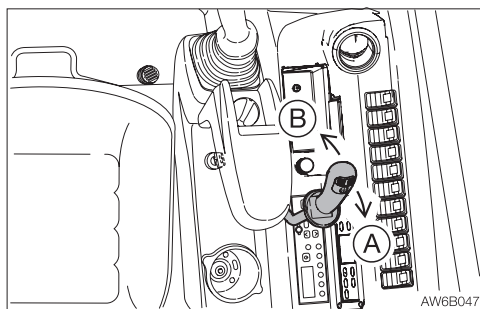
- Select a firm and uniform ground for outrigger pads (surfaces to contact the ground).
- When traveling on a public road, secure the outriggers with the turnbuckles. When retracting the outriggers, make sure that the outrigger pads (the surfaces to contact the ground) are within the machine width. Failure to do so could cause minor collisions.

Outrigger switch



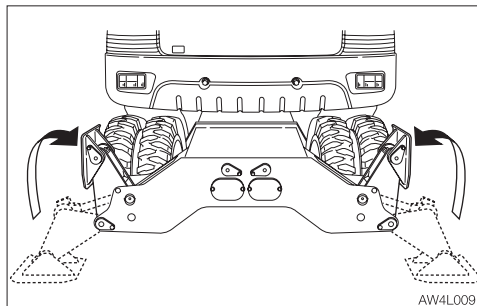
- (J)Dozer blade operation (both sides)
(K)Outrigger operation (both sides)
(L)Left outrigger operation
(R)Right outrigger operation

Operation



The outrigger operation is done by the blade lever.

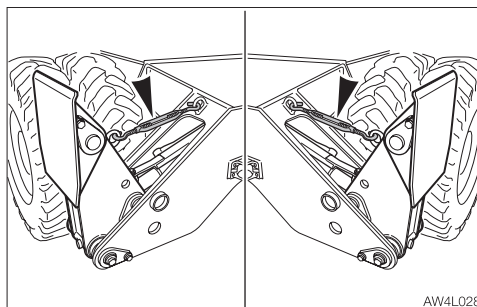
- (A)Outriggers Raise
(B)Outriggers Lower



Turnbuckles

WARNING

When traveling on a public road, retract the outriggers within the machine width and install the turnbuckles.



Remove the turnbuckles before lowering the outriggers. Failure to do so could damage the turnbuckles.



FUEL SUPPLY PUMP

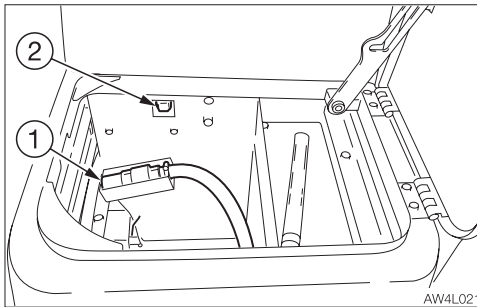
This device automatically supplies fuel to the fuel tank and stops automatically when the fuel tank is full.



DANGER

Do not use the fuel supply pump for gasoline or hydraulic oil. Doing so could result in explosion or damage.

Only use the fuel supply pump for diesel fuel.



1. Open the front cover.
2. Insert the pump's nozzle (1) in the fuel supply tank.
3. Press the switch (2).
The pump stops automatically once the fuel tank is full.

OPERATION





BEFORE STARTING

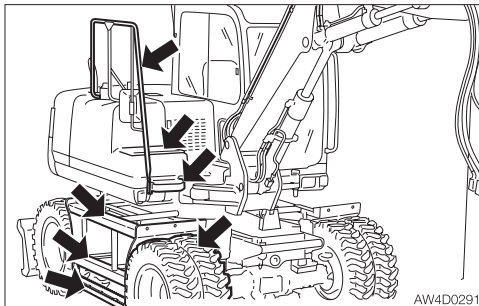
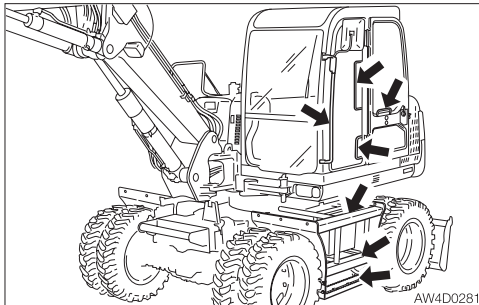
OPERATION

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 5-18 and 5-19.

DAILY INSPECTION

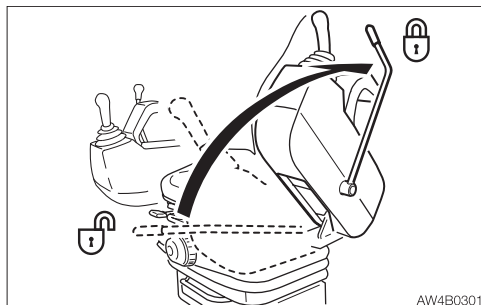
Perform the daily inspections once a day before starting the engine for the first time. Refer to "MAINTENANCE, Daily inspection", on pages 5-20 to 5-27.



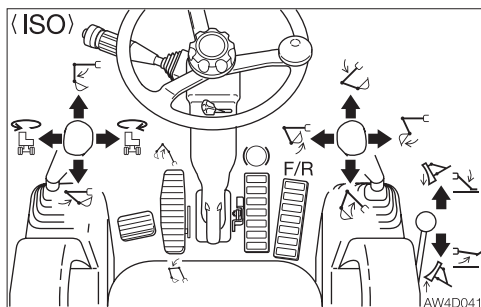
STARTING AND STOPPING THE ENGINE

BEFORE STARTING THE ENGINE

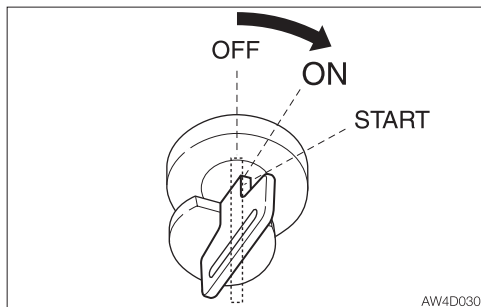
1. Adjust the seat for a comfortable operating position.
2. Fasten the seat belt.



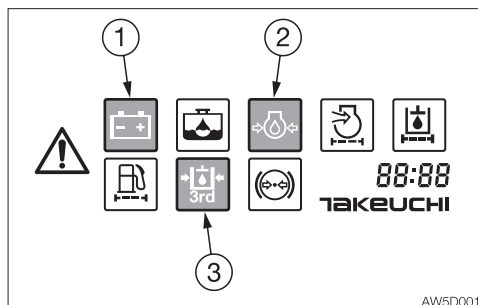
3. Check that the safety lock lever is in the locked position.



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, and then perform the following inspections:



- An alarm is sounded for two seconds. The meters also start functioning. After two seconds, only the battery charge warning lamp (1), engine oil pressure warning lamp (2) and third auxiliary hydraulic warning lamp (3) start flashing, and the other lamps turn off. The battery charge warning lamp (1), engine oil pressure warning lamp (2) and third auxiliary hydraulic warning lamp (3) remain lit until the engine starts.
- Turn the light switch to check that the all lights/lamps are lit
- 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

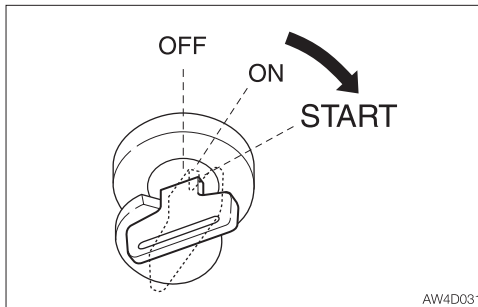
WARNING

- 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



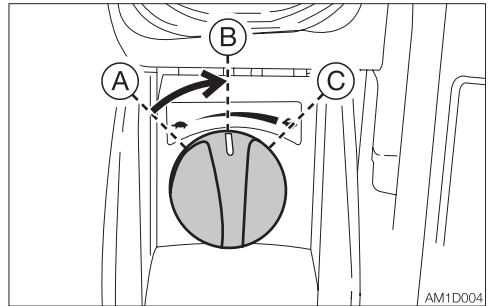
1. Turn the starter key to the START position and start the engine.
2. Once the engine starts, release the key. The key automatically returns to the ON position.
3. Check that the warning lamps are off. For safety reasons, it is designed that the deceleration function is activated to set the engine revolutions 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.

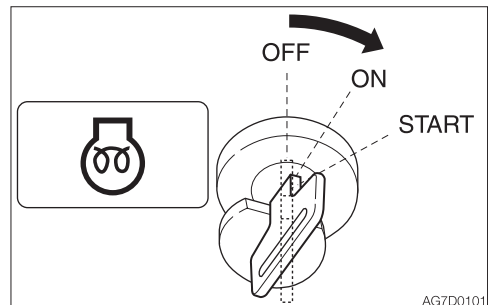
Starting in cold climates

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.



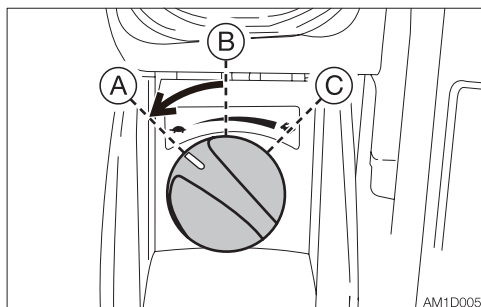
2. Turn the starter key to the ON position, and confirm that the glow lamp is on. (The glow lamp stays lit for 12 seconds when the coolant temperature is -10°C (14°F).)
3. After the glow lamp goes out, press the deceleration button (to cancel the deceleration mode), and then turn the key to the START 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".



WARMING UP THE ENGINE

IMPORTANT: Avoid racing the engine until it has warmed up.

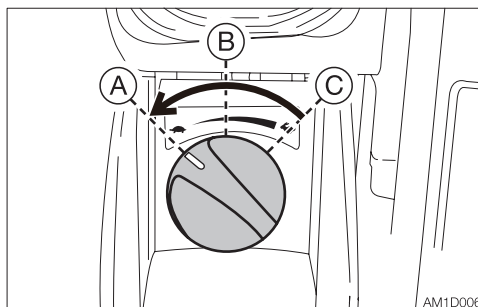
Do not warm up the engine for a long time (20 minutes or more). When idling is required, occasionally place a load or run the engine at medium speed.



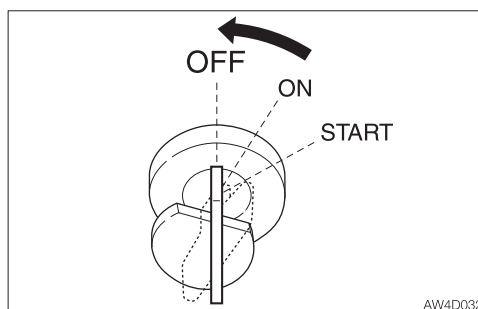
1. Return the throttle controller, and then run at a low idle with no load for 10 minutes.

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.

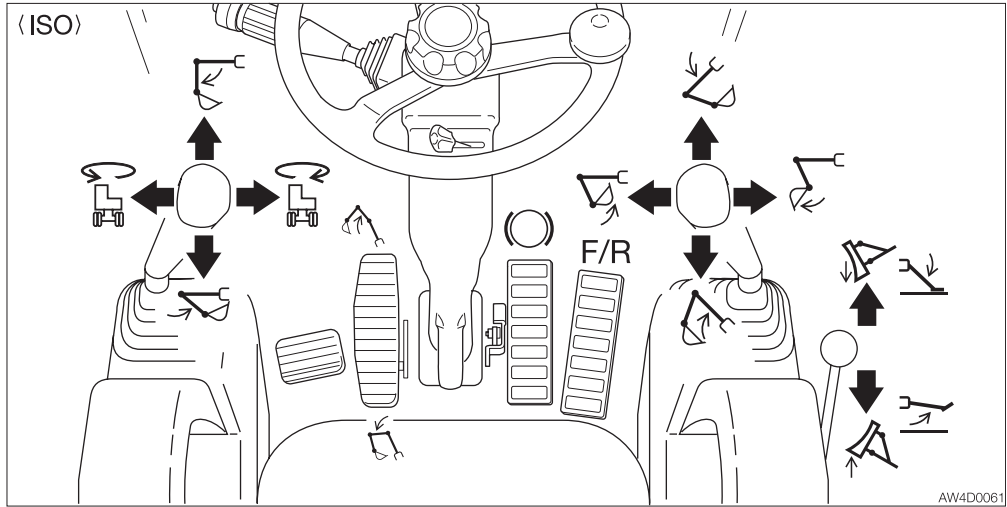


OPERATING THE MACHINE

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.



	Brake	F	Forward Travel	R	Reverse Travel
	Arm Out			Boom Lower	
	Arm In			Boom Raise	
	Upperstructure Slew Left			Bucket Load	
	Upperstructure Slew Right			Bucket Dump	
	Second Boom Raise (2-piece boom)			Second Boom Lower (2-piece boom)	
	Outrigger Lower			Dozer Blade Lower	
	Outrigger Raise			Dozer Blade Raise	

MEMO



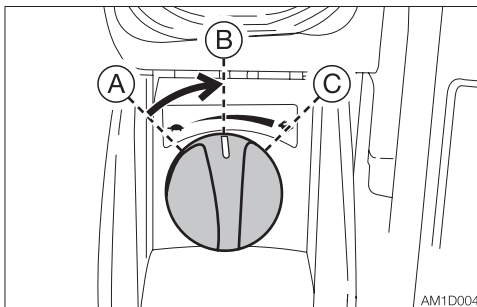
WARMING UP THE MACHINE (HYDRAULIC OIL)

WARNING

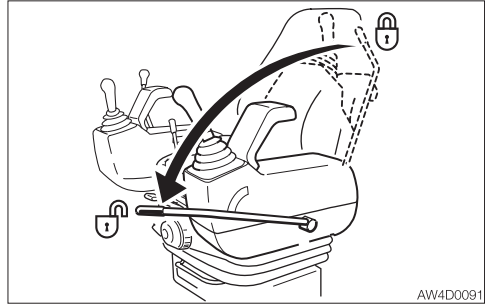
Operating the working equipment without warming up the machine (hydraulic oil) is dangerous, as the working equipment cannot respond to controls quickly or may move in unexpected ways, and the safety devices may not operate properly. Be sure to sufficiently warm up the machine.

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).

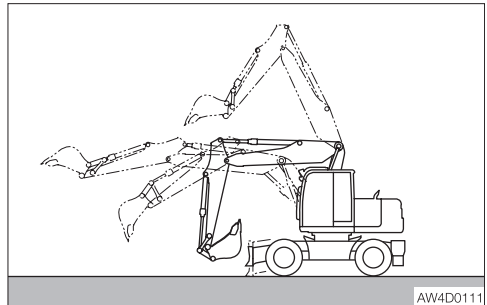
Normal warm-up



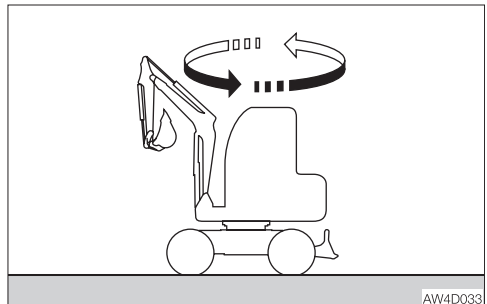
1. Turn the throttle controller to the middle position, and then run the engine at medium speed for about five minutes with no load.



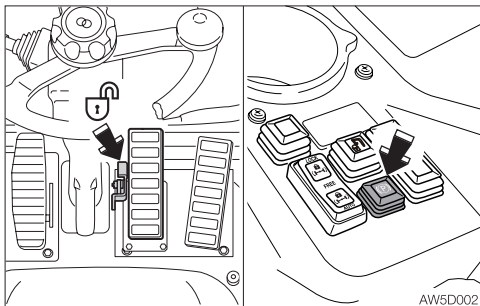
2. Fully lower the safety lock lever to disengage the lock and lift the bucket from the ground.



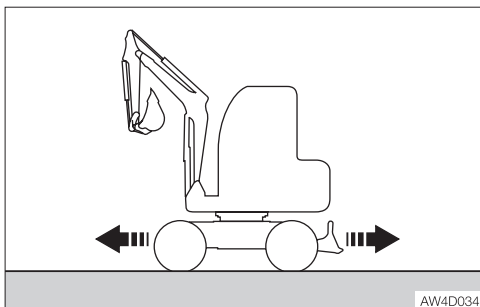
3. Extend and retract each of the cylinders slowly several times with no load.



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



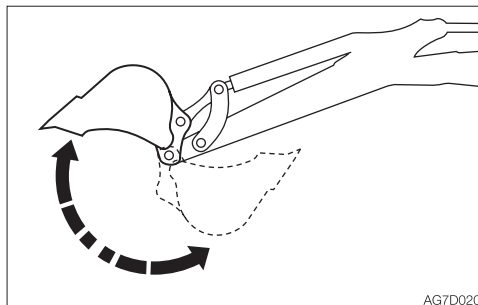
5. Disengage the locks of the brake pedal and the parking brake.



6. Travel slowly forward and in reverse several times.

Warm-up in cold climates

1. Perform the normal warm-up procedure.

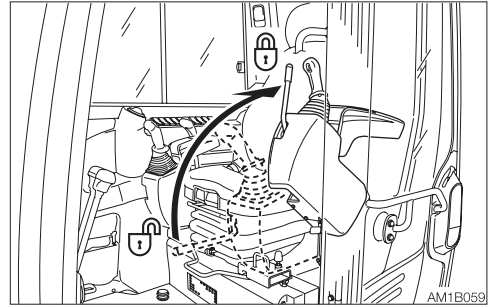
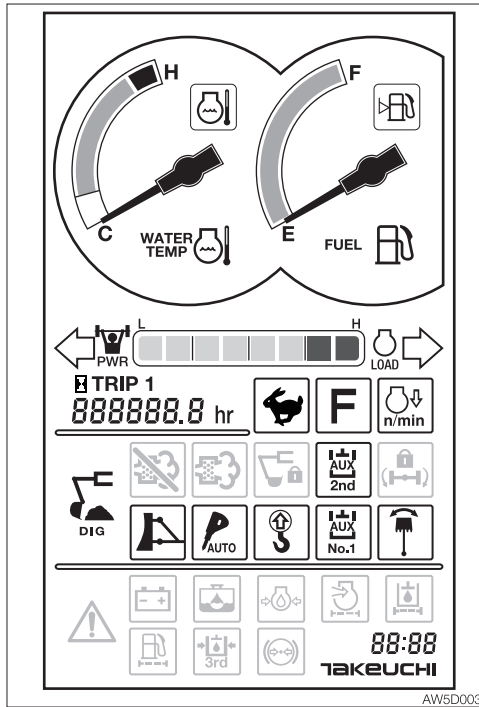


2. Set the bucket cylinder at the stroke end and keep it there.
Do not keep this condition for more than 30 seconds.
3. Repeat Step 2 until the bucket operating speed becomes normal.



INSPECTION AFTER WARM-UP

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



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

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.

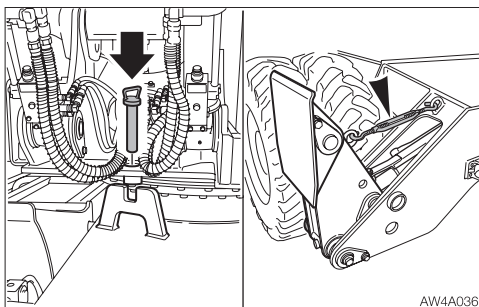


TRAVELING THE MACHINE

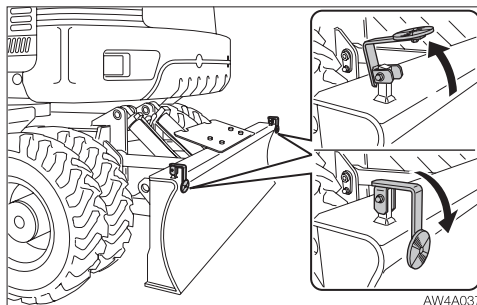


WARNING

- Before traveling, set the machine to the “travel posture”.
Refer to “Preparing for travel” for further details.
- When traveling on a road, be sure to lock the working equipment. If any of the controls is accidentally touched when it is unlocked, the machine may suddenly move and cause serious injury or death.
- Keep in mind that the steering wheel operation is not possible when the engine is stopped or if the steering pump becomes faulty.

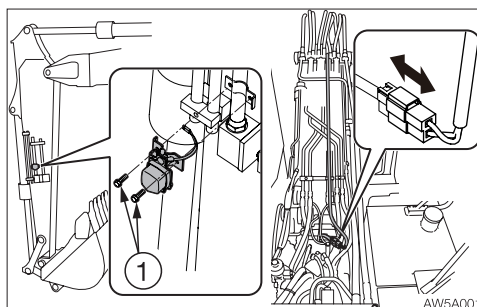


- When traveling on a public road, be sure to lock slewing with the slew lock pin. For machines with outriggers, retract the outriggers within the machine width and install the turnbuckles.
- Make sure that the outrigger pads (the sections to contact the ground) are within the machine width. Failure to do so could cause minor collisions.

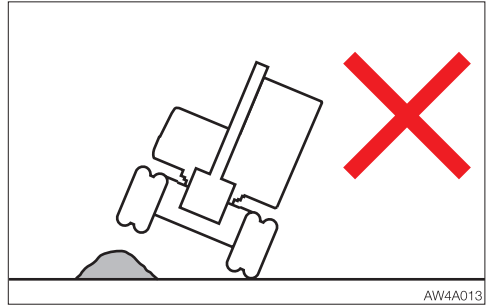
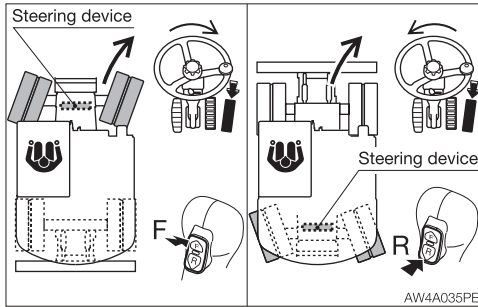


- Before traveling on a road, tilt the reflector. When operating at a job site, raise the reflector to prevent it from being damaged.

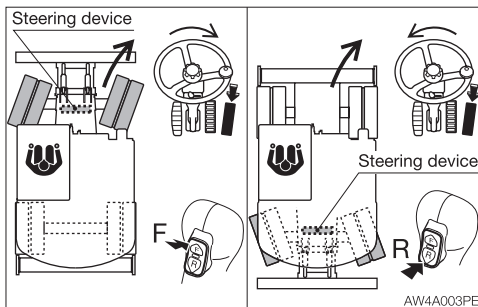
<For Germany>



- When traveling during nighttime hours, be sure to install the position lights. To prevent damage, remove the position lights (including the brackets and harness) before working at the site.
- 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. Check that the area is safe and clear for yourself. When necessary, use the rear camera.



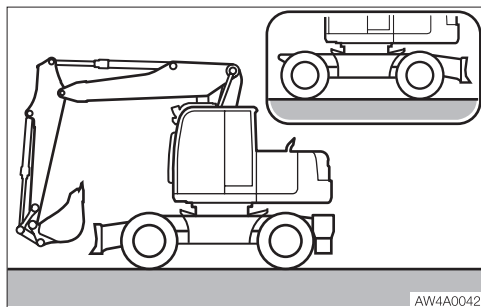
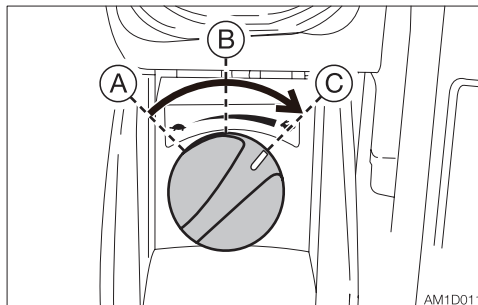
Equipped with outrigger



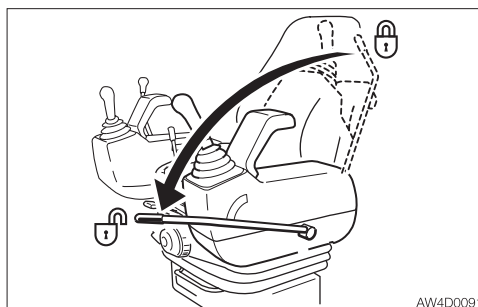
- Before operating the travel pedal, make sure that the steering device is to the front of the operator's seat. Remember that when the steering device is to the rear of the operator's seat, the steering wheel must be operated in the reverse direction from when it is to the front.
- Do not raise the safety lock lever or turn the starter switch to the OFF position while traveling. Doing so is dangerous because it activates the parking brake and causes the machine to stop suddenly.
- 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.
- Avoid starting, stopping or changing directions abruptly and maintain a proper speed. 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.
- 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).
- When traveling on a road, know and use the signaling devices required on the machine. Use an escort vehicle for road travel when required.
- Clear all obstacles from the path of the machine.

**Preparing for travel**

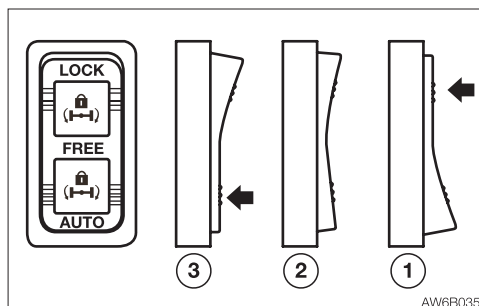
1. Set the steering device facing forward and to the front of the operator's seat.
2. Fully raise the boom, fully lower the second boom, and then set the arm vertically to rollback the bucket.
3. Fully raise the blade/outriggers (if equipped).
For machines equipped with outriggers, secure them with turnbuckles.
4. Engage the slew lock.
5. Tilt the reflector.

Travel Posture**Moving forward and in reverse**

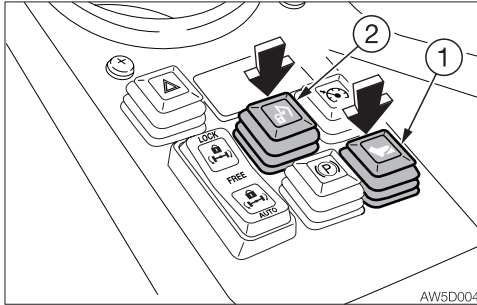
1. Increase the engine speed.



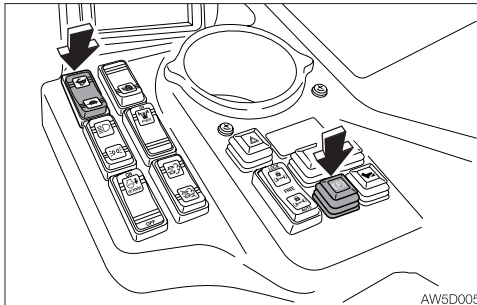
2. Fully lower the safety lock lever to disengage the lock.



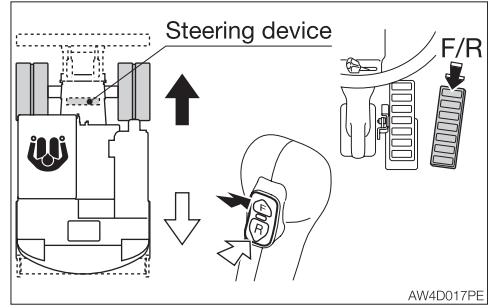
3. Press the ram lock switch to the neutral position to disengage the ram lock.



4. Press the travel pedal button (1) while the brake pedal is depressed.
(When entering the foot accelerator mode)
5. Press the attachment lock button (2) to lock the working equipment.

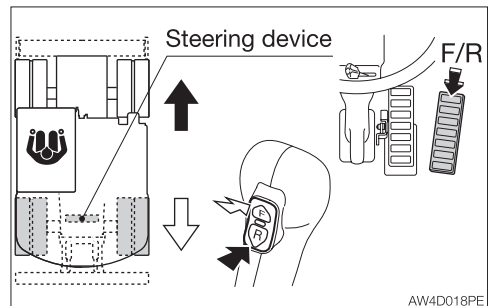


6. Press the low/high-speed travel switch to choose the proper speed.
7. Press the parking brake button to disengage the parking brake.
8. Operate the travel pedal as follows.



When the steering device is in front of the operator's seat:

- ➔ To move forward:
Press the travel select button (F) and step on the travel pedal.
- ➞ To move in reverse
Press the travel select button (R) and step on the travel pedal.

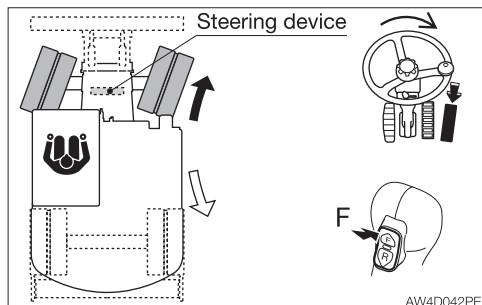


When the steering device is behind the operator's seat:

- ➔ To move forward:
Press the travel select button (R) and step on the travel pedal.
- ➞ To move in reverse:
Press the travel select button (F) and step on the travel pedal.



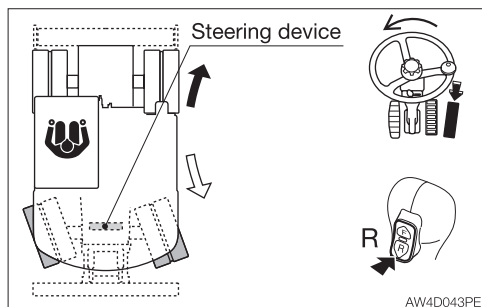
Turning



When the steering device is in front of the operator's seat:

- ➔ To turn forward to the right:
Press the travel select button (F) and turn the steering wheel to the right.
- ⇒ To turn backward to the right:
Press the travel select button (R) and turn the steering wheel to the right.

To turn to the left, turn the steering wheel to the left.



When the steering device is behind the operator's seat:

- ➔ To turn forward to the right:
Press the travel select button (R) and turn the steering wheel to the left.
- ⇒ To turn in reverse to the right:
Press the travel select button (F) and turn the steering wheel to the left.

To turn to the left, turn the steering wheel to the right.

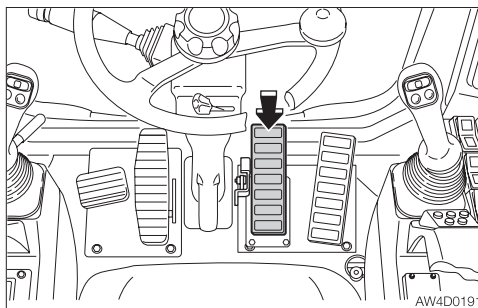
STOPPING TRAVEL

WARNING

- Park the machine on a flat, rigid and safe ground. Set the parking brake. If you must park on a slope, chock the tracks to block the machine.
- If any of the controls is accidentally touched when it is unlocked, the machine may suddenly move and cause serious injury or death.

CAUTION

Never stop running the machine suddenly except in emergency. Stop in good time, if possible.



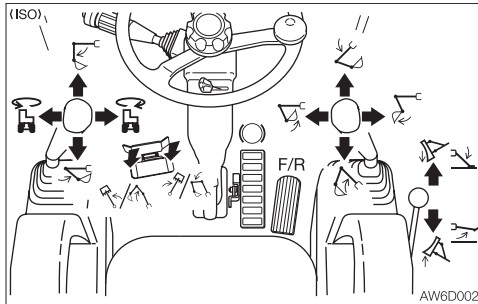
1. Slowly step on the brake pedal to stop the machine.
2. Depress the brake pedal all the way down to lock it.



OPERATING THE WORKING EQUIPMENT

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 the right operating lever to operate the boom and bucket.

Use the left operating lever to operate the arm and slewing.

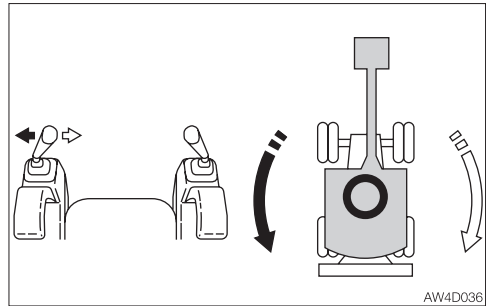
Return the operating levers to the neutral position to stop the working equipment.

1. Release the slew lock pin.
2. Depress the brake pedal all the way down to engage the pedal lock.
3. Press the ram lock switch to lock the suspension of the front axle.
4. Lower the dozer blade to the ground.
5. Lower the safety lock lever to the unlock position.

Slewing

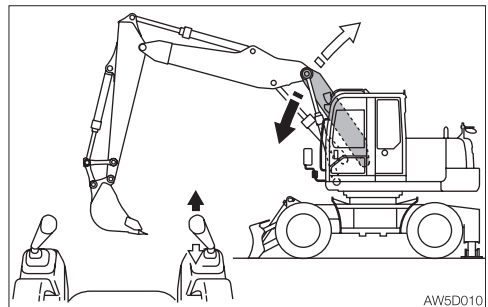
WARNING

Check the surrounding area for safety before slewing.



- ➔ Upperstructure slew left:
Tilt the left operating lever to the left.
- ➞ Upperstructure slew right:
Tilt the left operating lever to the right.

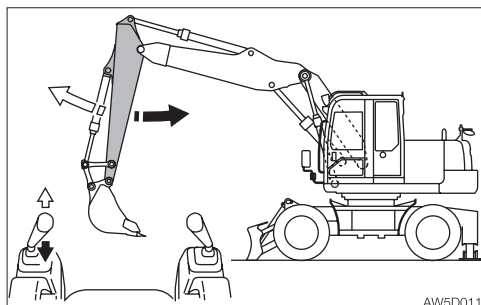
Operating the boom



- ➔ Boom lower:
Tilt the right operating lever forward.
- ➞ Boom raise:
Tilt the right operating lever backward.

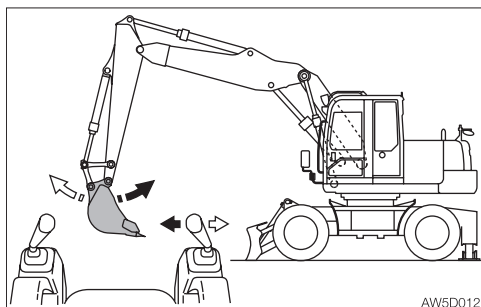


Operating the arm



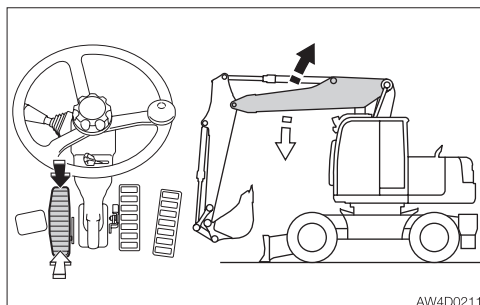
- ➔ Arm in:
Tilt the left operating lever backward.
- ⇒ Arm out:
Tilt the left operating lever forward.

Operating the bucket



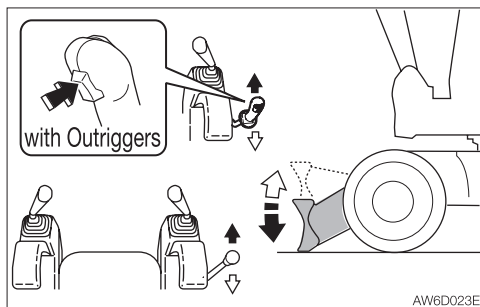
- ➔ Bucket load:
Tilt the right operating lever to the left.
- ⇒ Bucket dump:
Tilt the right operating lever to the right.

Operating the second boom



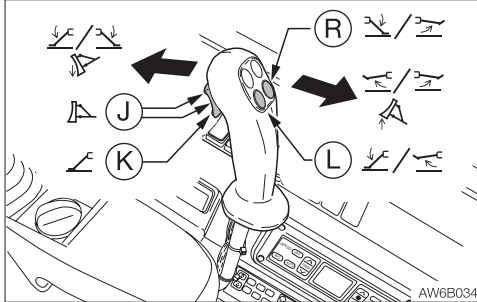
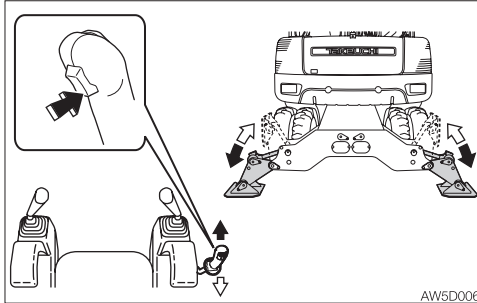
- ➔ Second boom raise:
Step on the toe side of the pedal.
- ⇒ Second boom lower:
Step on the heel side of the pedal.

Operating the dozer blade



For machines with outriggers, select the dozer blade operation with the outrigger switch.

- ➔ Dozer blade lower:
Tilt the blade lever forward.
- ⇒ Dozer blade raise:
Tilt the blade lever backward.

**Operating the Outrigger (If equipped)**

Select the outrigger operation with the outrigger switch.

➡ Outrigger lower:

Tilt the blade lever forward.

⇒ Outrigger raise:

Tilt the blade lever backward.

- Outrigger switch L:

Operating only the left side outrigger

- Outrigger switch R:

Operating only the right side outrigger



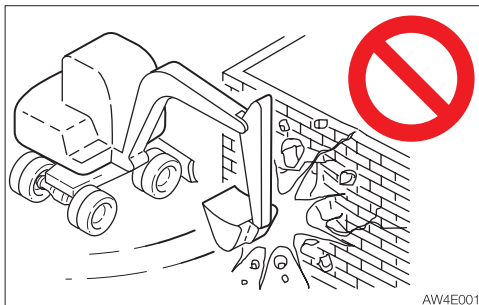
OPERATING PROCEDURES

PROHIBITED OPERATIONS

WARNING

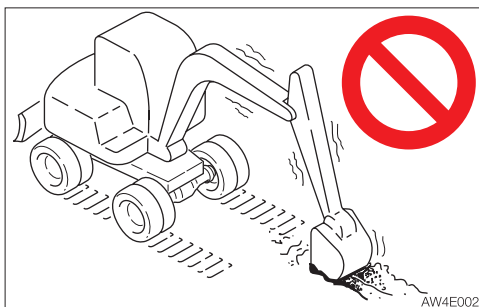
- Do not operate on bedrock (hard or soft).
- Do not slew while traveling. If you must operate the hoe attachment while traveling, operate at speeds slow enough so you have complete control at all times.

Do not perform demolition or leveling using slew force



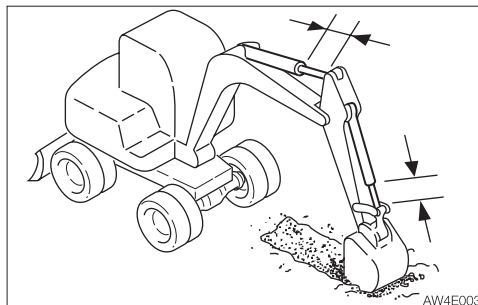
Do not demolish walls or level ground using slew force. Also, do not dig the bucket teeth into the ground during slewing. Doing so will damage the hoe attachment.

Do not dig while traveling

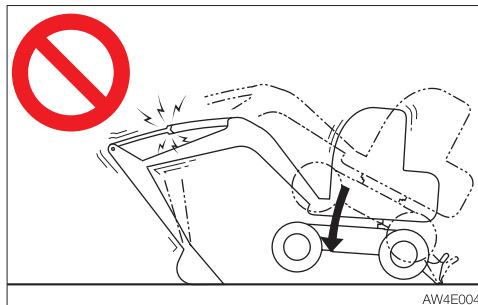


Do not dig the bucket into the ground and use the traveling force to dig.

Be gentle when using the hydraulic cylinder



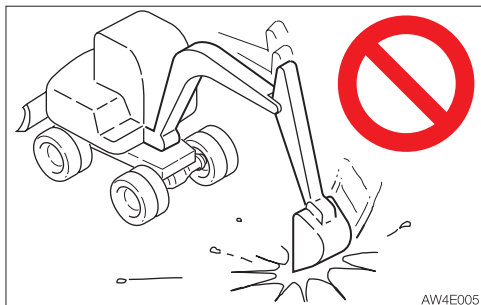
Do not extend the hydraulic cylinders to the stroke ends. Operate them with leeway.



Do not support the machine body with the hoe attachment when the body is lowering with the arm cylinder fully extended. Doing so concentrates the load on the arm cylinder and could damage the arm cylinder.

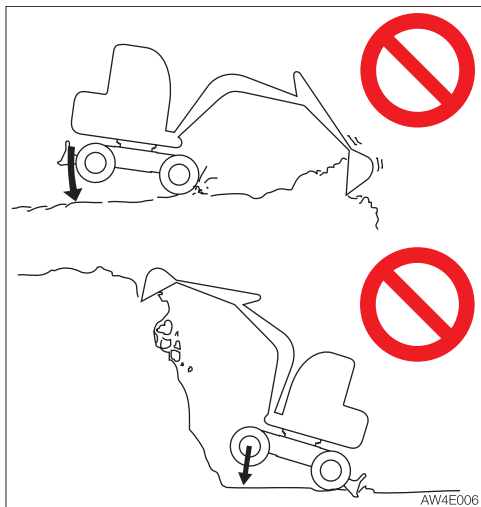


Do not drive piles with the bucket or dig by banging the bucket



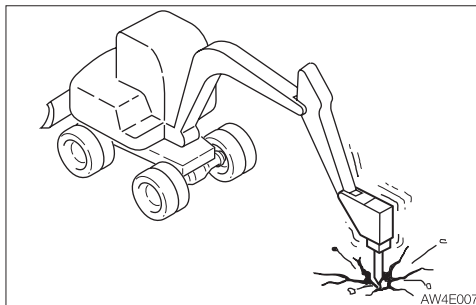
Doing so will shorten the service life of the hoe attachment. Use the hydraulic force to dig.

Do not perform operations using the machine's dropping force



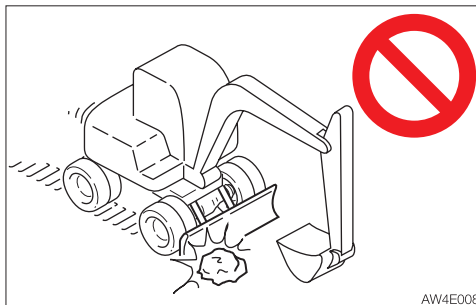
Putting excessive strain on the machine will shorten its service life. When digging, use the hydraulic force of the cylinders and the shallow and long strokes.

Digging bedrock

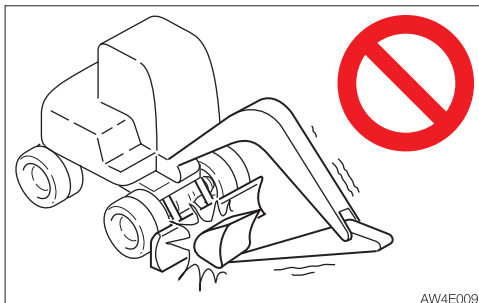


For hard base rock, break the rock up into small pieces with a breaker, etc., before digging. This prevents damage to the machine and is thus more economical in the end.

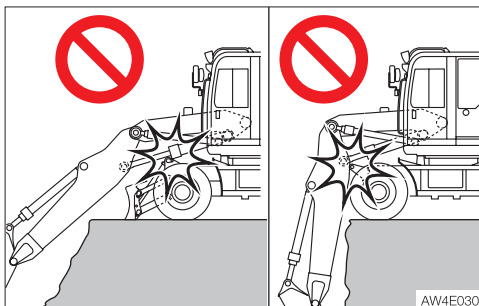
Caution on exposing the dozer blade to shocks



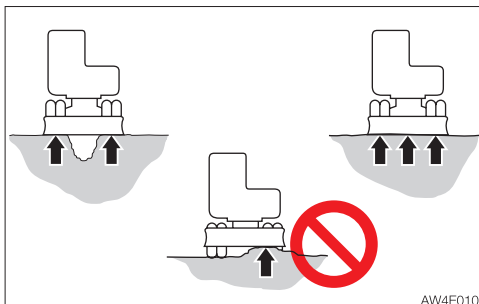
Hitting the dozer blade against rocks, etc., could damage the dozer blade or the blade cylinder.

**Caution on folding the hoe attachment**

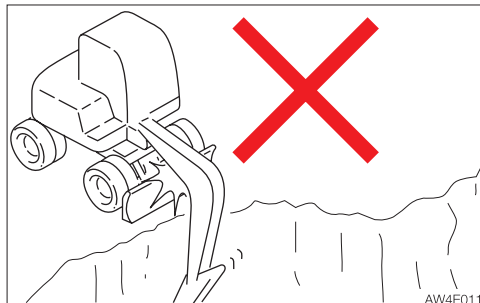
Be careful not to let the bucket hit the dozer blade when the hoe attachment is being folded.

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.

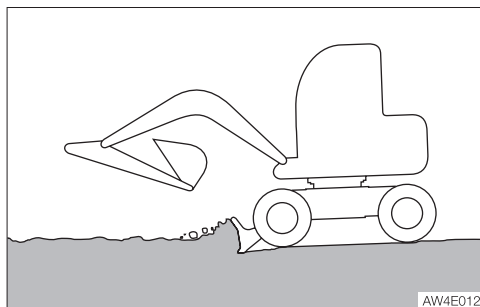
Do not support the machine with one side of the blade.

When using the dozer blade to stabilize or raise the machine, lower the both ends of the blade to the ground.

Pay attention to the dozer blade when digging

When digging deeply with the dozer blade positioned at the front, be careful that the boom cylinder and bucket do not hit the dozer blade.

Operate with the dozer blade at the rear whenever possible.

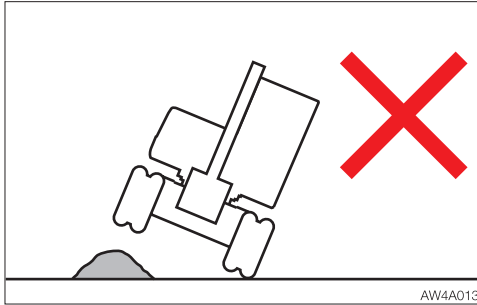
Caution on digging down with the dozer blade

This dozer blade is designed for simple earth pushing. Do not dig down deeply with the dozer blade. Doing so could damage the dozer blade and undercarriage.



PRECAUTIONS FOR OPERATION

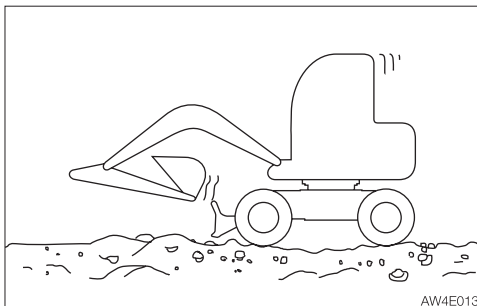
Precautions on traveling



AW4A013

Traveling over obstacles (rocks, stumps, etc.) may put a great load on the machine body and may cause damage to it. Avoid crossing over obstacles whenever possible. If you must do so, keep the hoe attachment near the ground, travel at a low speed, and go over the obstacle at the center of the tires.

Precautions when traveling at high speed



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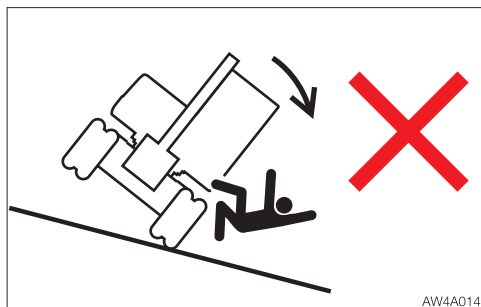
- On uneven ground, maintain the low speed and avoid starting, stopping or changing directions abruptly.
- When traveling at high speed, do so with the steering device set at the front.



PRECAUTIONS WHEN TRAVELING ON SLOPES

WARNING

- Never travel on slopes that are too steep for the machine to maintain its stability (maximum gradeability: 35°, 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 downhill. 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, travel slowly in low gear. When descending a slope, slow down the engine speed.
- Do not travel at speeds of over 20 km/h (12.4 mph) on long down slopes. Release the travel pedal from time to time to protect the travel motor and ensure travel stability.
- Do not travel downhill in reverse.



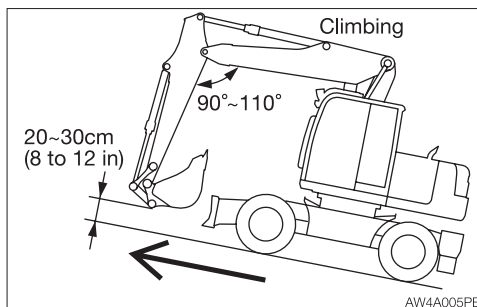
- Do not change directions on slopes or traverse slopes. Go down to a flat

surface, and then take an alternative path.

- The machine may slip sideways even on a slight slope if it is covered with grass or fallen leaves, or when traveling on wet metal plates or frozen surfaces. Do not allow the machine to position sideways to a slope.
- If the machine is stalled on the slope, return each operating lever to the neutral position before restarting the engine.

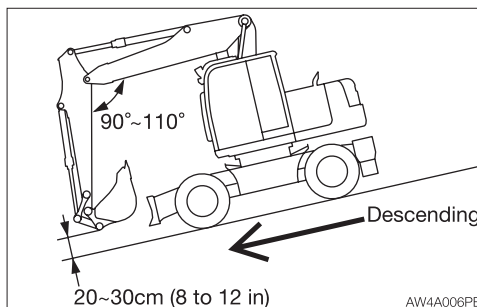
Traveling posture on slopes

Climbing slopes

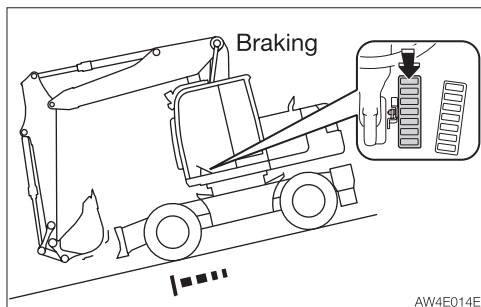


When climbing slopes of 15° or more, maintain the machine posture as shown in the figure above.

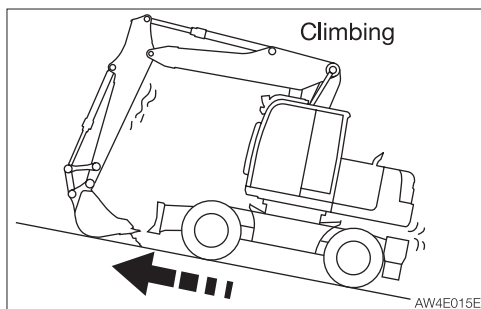
Descending slopes



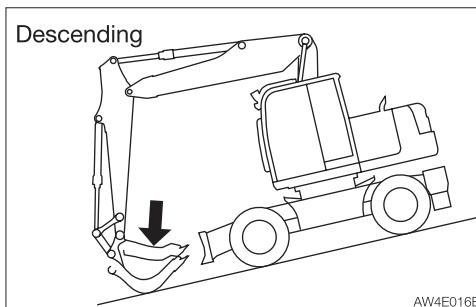
When descending slopes of 15° or more, slow down the engine speed to travel using the low-speed travel gear and maintain the machine posture as shown in the figure above.

**Braking when descending slopes**

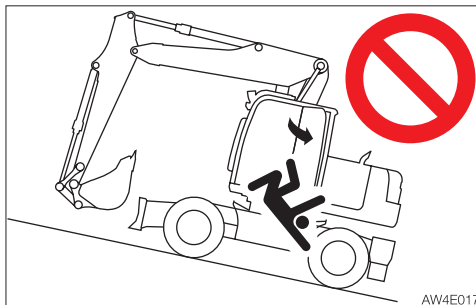
When descending slopes, apply the brake earlier than usual.

If the tire slips

If it is impossible to climb the slope due to tire slippage, use the pulling force of the arm to climb the slope.

If the engine stops

If the engine stops when descending a slope, depress the brake pedal to stop the machine, use the bucket to anchor the machine to the ground, and then start the engine.

Do not open /close the door while traveling on slopes

Opening/closing the door while traveling on slopes is dangerous, as the force required to open and close the door changes abruptly. Always keep the door closed when traveling on slopes.



GETTING OUT OF MUD

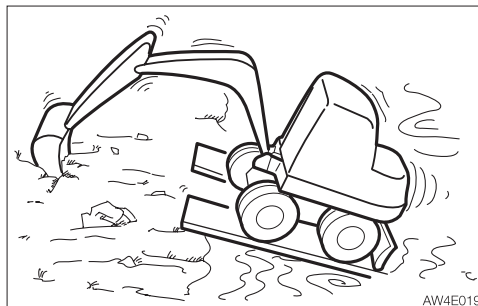
If the machine gets stuck in mud, use the procedure below to get it out.

If tires on one side are stuck



1. Slew the bucket to the side of the tires being stuck.
2. Set the arm and boom to an angle of 90 to 110°.
3. Press the bottom of the bucket (not the teeth) against the ground to raise the stuck tires.
4. Place a plank or the like under the raised tires.
5. Lift the bucket and slowly move the machine out of the mud.

If tires on both sides are stuck

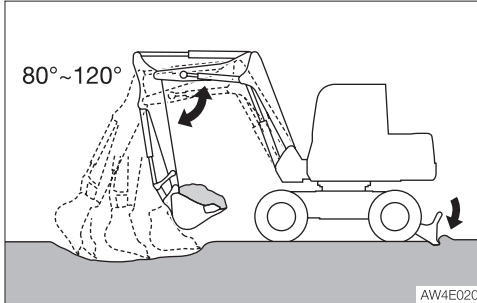


1. Perform the steps 1 to 4 above for both tires.
2. Dig the bucket into the ground in front of the machine.
3. Pull the arm while traveling forward to slowly move the machine out.



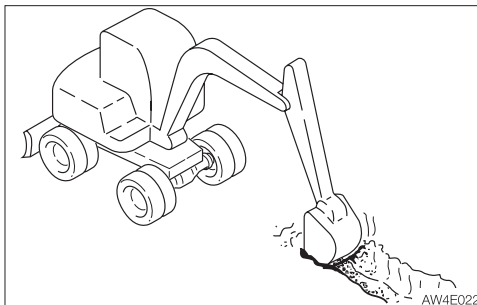
OPERATIONS POSSIBLE WITH THIS MACHINE

Excavating



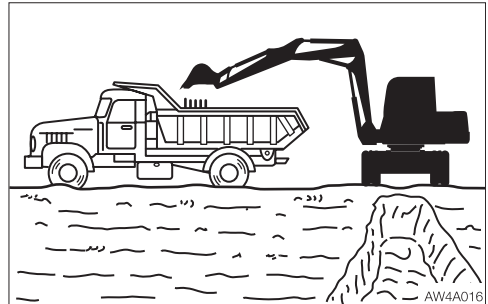
1. Set the dozer blade on the side opposite to the side you want to dig on.
2. Use the arm and bucket and dig with shallow, long strokes. The maximum digging force can be obtained when the boom and arm angle is 80 to 120°. Use this angle for effective digging.

Digging ditches



Install a bucket suited for digging ditches and set the tires parallel to the ditch to be dug for greater efficiency. When digging wide ditches, dig the sides first, and then dig the center.

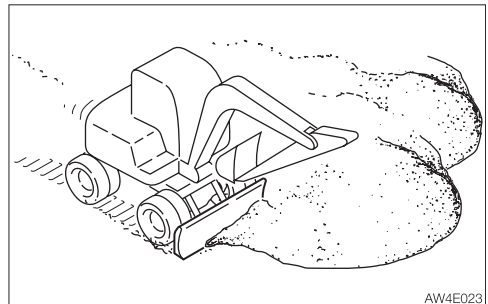
Loading



When loading dirt onto a truck bed, load from the back of the truck, as it is easier and able to load more load than doing it from the front.

Also, use a small slewing angle for greater efficiency.

Leveling



1. Bring the hoe attachment close to the body.
2. Gradually remove the dirt from the side of the mound.
3. Once the mound is low, remove the dirt from the top. If the load becomes too heavy for the machine body, adjust by raising or lowering the dozer blade.

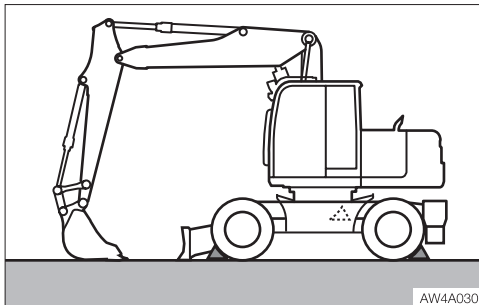


PARKING THE MACHINE

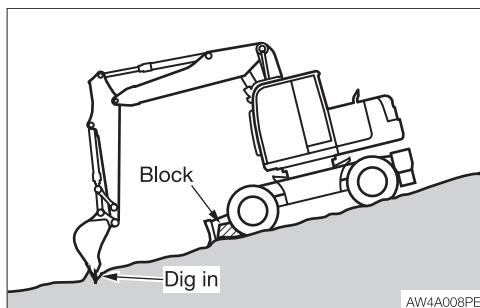
PARKING



WARNING



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



If you must park on a slope, chock the wheels to block 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 operator's seat, safely park the machine by referring to "Parking procedures" below.

Parking procedures

1. Slowly step on the brake pedal to stop the machine, and then further depress the pedal down to lock it.
2. Press the deceleration button to idle the engine at low speed.
3. Lower the bucket and the dozer blade to the ground.
When replacing the attachment or performing the inspection and maintenance on it, follow the procedure "Releasing the residual pressure from the working equipment circuit" described below, as necessary.
4. Raise the safety lock lever to the lock position.
5. Stop the engine and remove the starter key.
Refer to "Stopping the engine" on page 3-5.
6. Lock the cab, fuel filler cap and covers, take the key with you and store it in a specified place.

Releasing the residual pressure from the working equipment circuit

Perform the operation of releasing the residual pressure within 10 minutes after the engine comes to a complete stop.

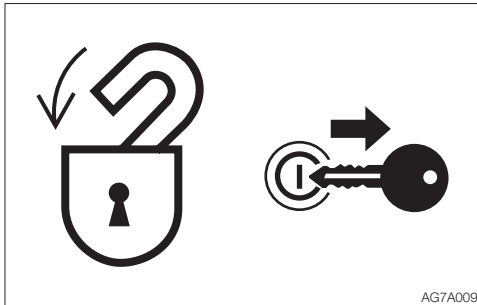
1. Stop the engine.
2. Turn the starter switch to the ON position.
3. Lower the safety lock lever to the unlock position.
4. Release the lock of the attachment lock button.
5. Move all the control levers, pedals and auxiliary hydraulic switches several times in all directions to release the residual pressure in the working equipment circuit.

**INSPECTION AND CHECKS AFTER STOPPING THE ENGINE**

1. Check for oil or water leak and inspect the working equipment, covers and undercarriage. If any irregularities are found, repair.
2. Fill up the fuel tank.
Refer to "Inspecting the fuel level" on page 5-23.
3. Remove any paper scraps or dirt from the engine room.
4. Remove any mud from the undercarriage.

Locking

Be sure to lock the following places:



AG7A009

- Fuel filler cap
- Cab door
- Covers



HANDLING IN COLD

CLIMATES

PREPARING FOR COLD CLIMATES

Starting engine in cold climates is not easy, and it becomes more difficult if the coolant freezes. Prepare for cold-climate problems as follows.

Replacing the fuel and lubricant

Replace the hydraulic oil, engine oil and fuel with those intended for cold climates. Refer to “Fuel and lubricant table” on page 5-4.

Engine coolant



WARNING

The engine coolant is combustible. Keep away from flame.

Use long-life coolant (antifreeze) and tap water for the engine coolant.

Note: New machines are delivered with JIS Type 2 long-life coolant (antifreeze) at a concentration of 50%.

Refer to “Fuel and lubricant table” on page 5-4.

Battery

As the temperature drops, the battery performance decreases.

Inspect the battery. If it is discharging, contact a Takeuchi service agent to have the battery recharged.

Refer to “Inspecting the battery fluid level and replenishing” on page 5-36.

CAUTIONS AFTER OPERATIONS

Observe the following cautions to prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move.

- Remove all mud and water from the machine body. In particular, wipe the hydraulic cylinder rod clean to prevent damage to the seal caused by mud or dirt on the rod surface getting inside the seal together with drops of water.
- Park the machine on hard and dry ground. If this is impossible, park the machine on a wooden board placed on ground.
- Drain any water in the fuel tank to prevent it from freezing.

Refer to “Draining the water from the fuel tank” on page 5-35.

- As the battery capacity drops markedly in low temperatures, cover the battery or remove it from the machine and keep it in a warm place.

If the electrolyte level is low, add distilled water in the morning before beginning work. To prevent the battery electrolyte from freezing in the night, do not add water after the day's work.

AFTER THE COLD CLIMATE

When the climate becomes warmer, do as follows:

- Replace the fuel and oil for all parts with those specified in the “Fuel and lubricant table”.
Refer to “Fuel and lubricant table” on page 5-4.
- If a coolant of “one season type” is used, drain the cooling system completely, clean out the inside of the cooling system thoroughly, and fill with tap water.
Refer to “Cleaning the engine cooling system” on page 5-57.

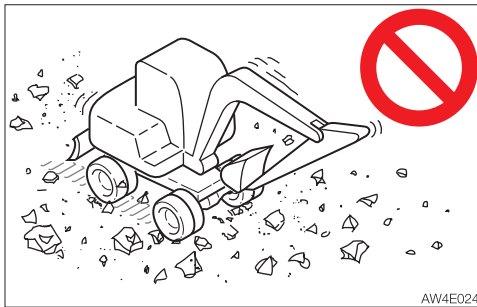


HANDLING TIRES

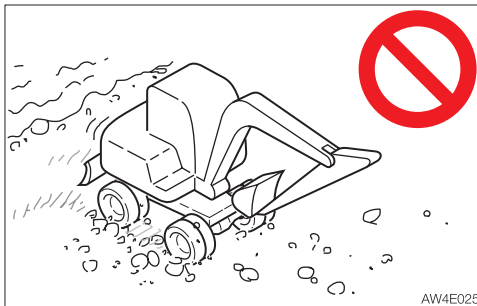
Tires are weak in strength due to the material they are made of. Be sure to observe the prohibitions and precautions below to prevent the tires from being damaged or coming off.

PROHIBITIONS

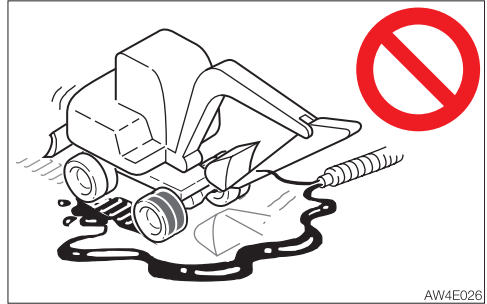
Do not travel or operate the machine in the following places:



- Traveling or slewing on crushed rock, extremely rough hard rock, steel beams, scrap iron or near the edges of steel plates will cause damage to the tires.



- Traveling on riverbeds or places where there are many boulders may cause the stones to get caught and damage the tires or make the tires come off.
- Do not use the machine on the seashore. The salt may corrode the metal wheels.



- Do not let fuel, oil, salt or chemical solvents get on the tires. These substances may corrode the metal wheels and tires, resulting in rust or peeling. If you find any of these on the tire, immediately wipe it off and clean the tire with water.

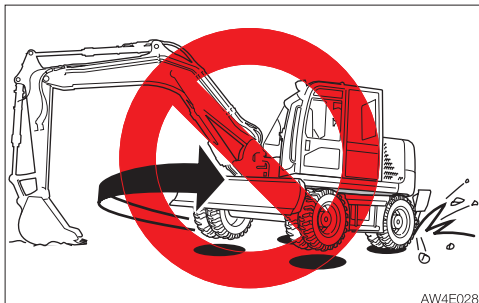


- The treads will show irregular wear or will be damaged, if the machine travels on recently paved asphalt road, ground around a bonfire or hot iron sheets under the blazing sun.
- Do not move earth in places where the tires may slip. Doing so may speed up tread wear.

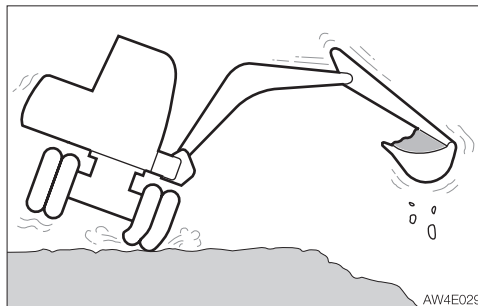


PRECAUTIONS

Observe the following precautions when operating the machine:



- Do not turn the undercarriage with the front of the machine body lifted using the hoe attachment (the upperstructure is not turned). Doing so will twist the tires with the load concentrated on a single point on the tire, causing rapid damage to the tires.
- Avoid changing courses abruptly whenever possible. Doing so may wear or damage the tires.
- Avoid falling of the machine that may expose the tires to strong shocks.
- Salt, potassium chloride, ammonium sulfate, potassium sulfate and triple superphosphate can damage the tires. If any of these substances gets on the tires, wash it off thoroughly with water.
- Do not let the sides of the tires rub against concrete or walls.
- Do not let the bucket hit the tires and damage them.
- Be especially careful on snowy or frozen surfaces in winter, as the tires easily slip in such conditions.
- Use tires at temperatures between -25°C to $+55^{\circ}\text{C}$ (-14°F to 131°F).
- When storing the tires for long periods of time (three months or more), do so indoors in a place not exposed to direct sunlight or rain.



- Tires are not very stable. Be very careful when slewing sideways.





LOADING AND UNLOADING

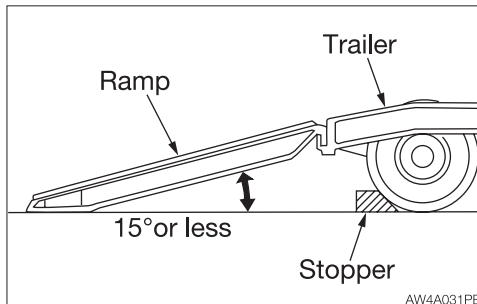


WARNING

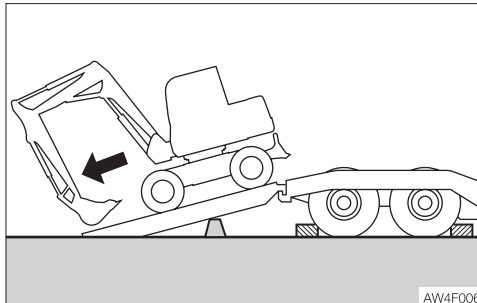
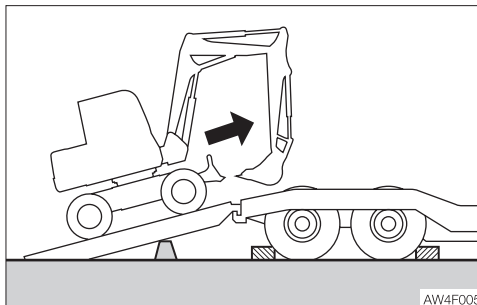
The machine may roll or tip over or fall while being loaded or unloaded. Take the following precautions:

- Select a firm, level surface and keep sufficient distance from road shoulders.
- Secure ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°.
- 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 tires too.
- Chock the transporter wheels to prevent movement.
- 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).
- When being loaded or unloaded, travel slowly in low gear by following the signal from the signal person.
- Never change courses on the ramp.
- Do not slew on the ramp. The machine may tip over.
- When slewing on the truck bed, do it slowly as the footing should be unstable.

When loading or unloading the machine, be sure to use ramps or a platform and follow the procedure below.



1. Set the parking brake on the transporter and chock the wheels.
2. Fix the ramps securely to the truck bed. The slope of the ramps must not exceed 15°.
3. Align the center of the truck bed with the center of the machine, and of the ramp with the center of the tires.
4. Make sure the dozer blade does not hit the ramps.
5. Lower the hoe attachment as far as possible without letting it touch the transporter.
6. Decrease the engine speed.





7. Drive the machine straight toward the ramps and go up or down the ramps slowly in low gear, by following the signal from the signal person.
8. Load the machine at the specified position on the transporter.
Refer to "Transporting posture" on page 4-6.



HOISTING THE MACHINE



WARNING

- Know and use the 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. Doing so is dangerous as it may result in the machine losing its balance.
- 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.

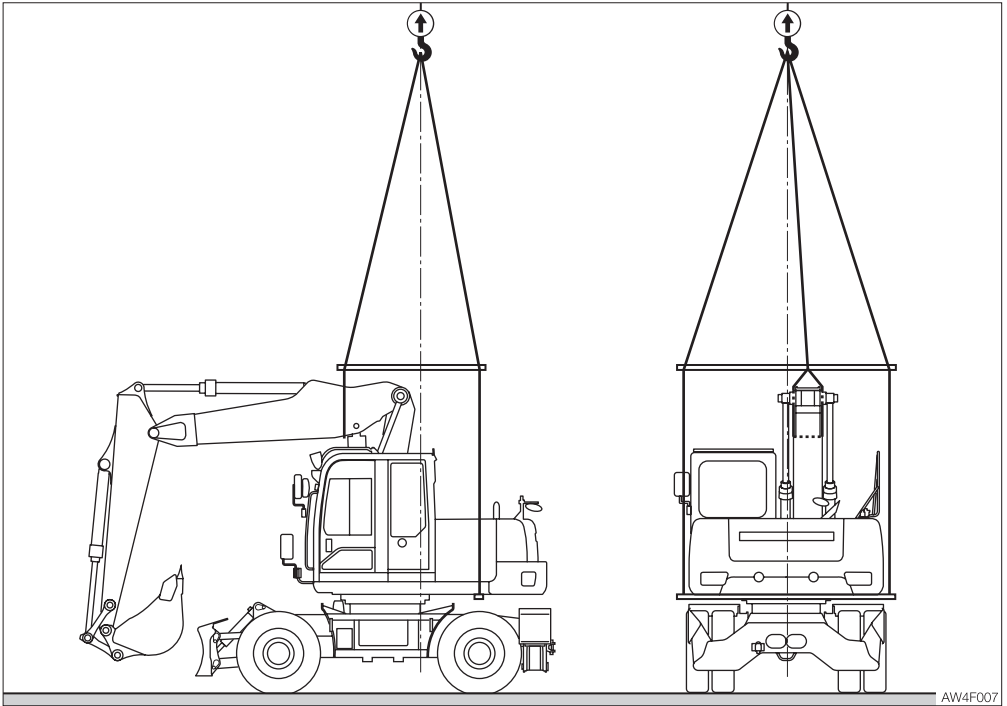
IMPORTANT: This hoisting method applies to machines with standard specifications. The center of gravity differs according to the attachments and optional equipment installed. Contact your Takeuchi service agent for details.

Hoisting

1. Keep the machine configuration as shown in the figure on the right.
For machines not having the outriggers, slew the upperstructure so that the dozer blade is at the rear of the machine (set the upperstructure parallel to the track frame).
2. Raise the safety lock lever to the locked position.
3. Stop the engine, remove the starter key and get off the machine.
4. Install the wire ropes as shown in the figure on the right.
Install the wire ropes and hoisting attachment without letting them touch the machine body.
5. Hoist the machine slowly until it leaves the ground.
6. Stop hoisting until the machine becomes stable, and then start hoisting the machine slowly again.



<Hoisting posture>

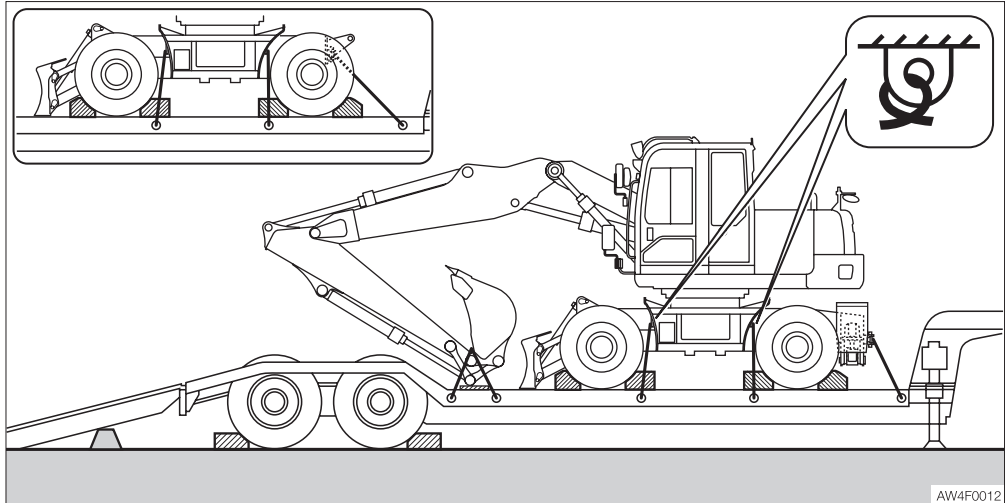




SECURING THE MACHINE

After loading the machine at the specified position, secure it as described below.

TRANSPORTING POSTURE



1. Lower the dozer blade.
2. Set the hoe attachment posture as above.
3. Raise the safety lock lever to the lock position, and engage the brake pedal lock and parking brake lock.
4. Stop the engine, remove the starter key and lock all locks.
5. Engage the slew lock with the slew lock pin.
6. Place the stoppers (chocks) in front of and behind the tires.
7. Install chains or wire rope over the lower frame of the machine and fasten it securely to prevent the machine from slipping sideways.
8. Secure the bucket with chains or wire rope.
9. For machines with outriggers, install the turnbuckles.

IMPORTANT: Place a wooden block under the bucket to protect the floor from damage caused by the bucket.



PRECAUTIONS TO BE TAKEN DURING TRANSPORTATION

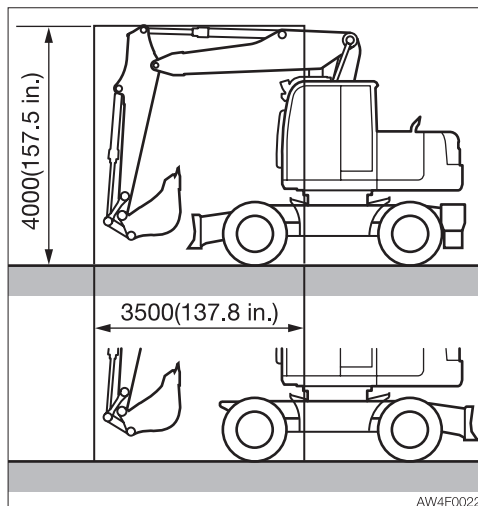
WARNING

- 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.

CAUTION

If the machine is to be transported complete, by sea, for example, the special tie bar provided by the manufacturer is to be used.
For enquiries, contact the manufacturer.

Road travel posture



Precautions for transportation by low loader and rail

For rail transport, the machine is to be carried on a suitable type of wagon. Information of loading procedures is available from the relevant rail authorities.

For road or rail transport, the upperstructure must be locked in position using the mechanism located near the operator's seat in order to prevent slewing; the slewing brake must be on; and the wheels must be chocked.

Any attached equipment is to rest on the floor of the transporter.

MAINTENANCE





GENERAL

MAINTENANCE OVERVIEW

To keep the machine in good condition and use it for a long period, perform the inspection and maintenance properly and safely following the procedures recommended by this manual.

The inspection and maintenance items are divided into groups according to the machine's total operating time: every 10 hours (walk-around and daily inspection), every 50 hours, every 250 hours, etc. Refer to the hour meter readings to determine when to schedule an inspection and maintenance. Items for which it is not possible to determine the inspection and maintenance interval are included under "When Required".

When operating the machine in extremely harsh environments (with high dust levels or high temperatures), inspection and maintenance should be performed earlier than the times specified on the Maintenance List.

CAUTIONS ON MAINTENANCE

Do not perform any other inspection and maintenance works than those listed in this manual.

For works not listed in this manual, ask your sales or a service dealer for help.

Keep the machine clean

- Clean the machine before performing inspection and maintenance and try to keep it clean.
- 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.

Fuel, lubricant and grease

- Choose fuel, lubricant and grease by following to the "Fuel and lubricant table".
- Use fuels, lubricants and greases which do not contain water, and be careful to keep dirt out when changing or replenishing fuel, lubricant or grease.
- Store fuels, lubricants and greases in the prescribed places and in such a way that no water or dirt can get in them.

Cautions on refueling

- If the port includes a strainer, do not remove the strainer when fueling.
- After fueling, be sure to securely tighten the fuel filler cap.
- Do not add more than the specified amount of fuel.



Do not use fuel to clean parts

Do not use fuel to clean parts. Use a non-combustible cleaning agent.

Keep dirt out

When mounting and removing parts, do so in a place where there is no dust, clean the working area and the part, and keep dirt out.

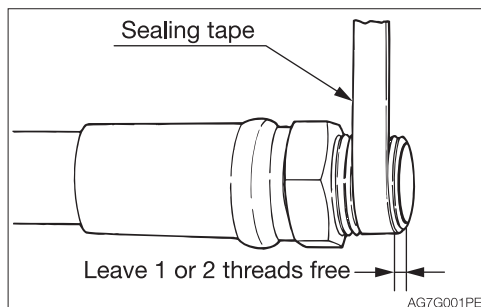
Clean the installation surfaces

When installing and removing parts, be sure that the surfaces of contact of the parts are clean. If the sealing grooves of the surface of contact are damaged, consult your sales or service dealer for repair or release.

Seals and split pins

- Be sure to replace all seals and cotter pins with new ones.
- When installing, be careful not to damage or twist the seal.

Sealing tape



- When wrapping the plug with sealing tape, remove any old sealing tape from the threads and clean the threads.
- Wrap the thread tight with seal tape starting 1 or 2 threads away from the thread end.

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, cooling water, coolant, filters and batteries.

Check 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 serviced parts.
- Operate each control lever and check that the machine is operating properly.

Cautions on handling of battery wiring

- Disconnect the wiring from the both terminals (+ and -) on the battery before working on the electrical system or doing electric welding. Always disconnect it from the earth side (-). When connecting, connect the earth side last.
- Do not disconnect the battery wiring while the engine is moving. Otherwise, the electric circuits of the rotary converter or others may be damaged.

Do not let the wheels spin

Do not let the wheels spin when the undercarriage is raised. Doing so may damage the differential gears.



SERVICE DATA

FUEL AND LUBRICANT TABLE

Select the appropriate fuel, lubricant and grease according to the temperature by referring to the table below.

- Regardless of the specified time, change the oil if it becomes too dirty or degraded.
- When refilling, never mix oils of different brands. If a brand is to be changed, replace the whole fuel/oil.

Fuel

Diesel fuel specifications

Diesel fuel should comply with the following specifications. The table lists several worldwide specifications for diesel fuels.

Diesel fuel specification	Area	Diesel fuel specification	Area
EN590: 2009	European union	BS2869-A1 or A2	United kingdom
Bio-diesel fuel Biodiesel blends up to B5 EN14214, EN590			
ASTM D975 No.1-D S15 No.2-D S15	USA Canada	ISO 8217DMX	International
Bio-diesel fuel Biodiesel blends up to B5 ASTM D6751, D7467			



Fuel tank	Diesel fuel	To maintain the performance and service life of the engine, always use clean and high-quality fuel. • To avoid freezing in cold climates, use a diesel fuel that still functions when the temperature is at least 12°C (53.6°F) below the lowest expected ambient temperature. • Use a diesel fuel that has a cetane number of 45 or higher. When operating at a very low temperature or at a high altitude, a higher cetane number fuel will be required. • Use fuel with sulfur content of less than 15 ppm by volume. Especially in the U.S.A. and Canada, ultra-low sulfur fuel should be used. A higher sulfur content fuel may cause sulfuric acid corrosion in the cylinders of the engines. • Never mix kerosene, used engine oil, or residual fuel with the diesel fuel. Use of kerosene is prohibited. • Poor quality fuel can reduce engine performance and / or cause engine damage. • Fuel additives are not recommended. Some fuel additives may cause poor engine performance. • The content of metal, such as zinc, sodium, magnesium, silicon and aluminum, must be 1 mass ppm or less. (JPI-5S-44-95 test analysis method) Precautions when using bio-diesel fuel The warranty of the engine manufacturer may be voided by using a bio-diesel fuel that does not meet the standard or that is deteriorated.
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Lubricant

Location	Type	Type by air temperature														When to replace
		-4	14	32	50	68	86	104°F								
		-20	-10	0	10	20	30	40°C								
Engine oil pan	Diesel engine oil API: CJ-4 class ACEA: E6 class			SAE 10W-30											Every 500 hrs. after the initial 50 hrs.	
				SAE 15W-40												
Hydraulic oil tank	Takeuchi genuine hydraulic oil 46			ISO VG46											Every 4000 hrs. ***	
	Anti-wear hydraulic oil			ISO VG32											Every 2000 hrs. ***	
				ISO VG46												
				ISO VG68												
Engine cooling system	Cooling water (water + coolant)** SAE: J814C or J1034	Mixture of 50% coolant												Every 1000 hrs.		
				Mixture of 30% coolant												
Slew reduction gear	Gear oil API: GL-4	SAE 90														Every 1000 hrs after the initial 250 hrs.
Transmission*	List of lubricants TE-ML 07-07B/07D/07E/07F														Every 2000 hrs.	
Differential*	List of lubricants TE-ML 05-05F/05G/05H															
Hub*																
Undercarriage	Lithium based grease EP-2 NLGI No.2	—														Every 250 hrs.
Slew bearing																Every 500 hrs.
Working equipment																Daily or every 10 hrs.
Levers																When required

* : If the percentage of the traveling time within the total operating time is high or the high-speed travel is often operated, replace the gear oil earlier than the specified time.

** : For water, use tap water (soft). Do not use well or river water. When the ambient temperature drops below 0°C (32°F), add coolant (antifreeze). Follow the coolant manufacturer's instructions to determine the mixture ratio.



***: The hydraulic oil replacement interval depends on the type of hydraulic oil being used. New machine are delivered with Takeuchi genuine hydraulic oil 46, and the hydraulic oil replacement intervals indicated in this manual assume that Takeuchi genuine hydraulic oil 46 is being used. When using conventional antiwear hydraulic oil, the hydraulic oil should be replaced every 2000 hours.

API standard: American Petroleum Institute

ACEA standard: Association des Constructeurs Européens d'Automobiles

Volume

Engine oil pan	Engine cooling system	Hydraulic oil tank	Fuel tank
Upper limit: 17 L (18 US qt.) Lower limit: 13 L (13.7 US qt.)	18.5 L (19.5 US qt.)	System: 215 L (56.8 US gal.) Tank: 96 L (25.4 US gal.)	Level capacity 231 L (61.0 US gal.)
Slew reduction gear	Transmission	Differential	Hub
5.3 L (5.6 US qt.)	2.5 L (2.6 US qt.)	9.0 L (9.5 US qt.)	2.4 L (2.5 US qt.)



REGULARLY REPLACE THE HYDRAULIC OIL

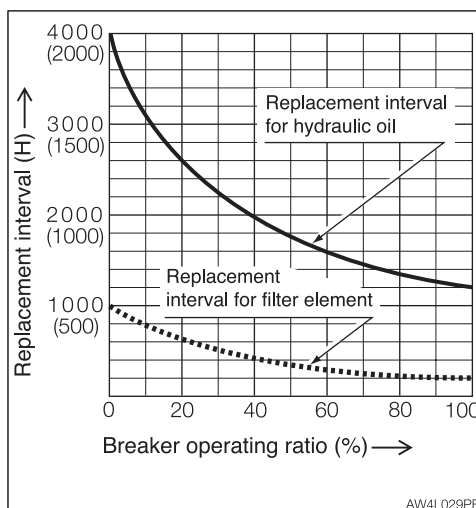
When a hydraulic breaker is used, the oil deteriorates more quickly than that used for a usual excavation operation. Be sure to replace the hydraulic oil and the return filter elements.

- Failure to replace these in time can lead to damage to the machine and the breaker hydraulic system. To prolong the service life of the hydraulic devices, properly replace the hydraulic oil and the return filter elements according to the table below.
- When replacing the hydraulic oil, clean the suction strainer.

Replacement interval (hours)

Item	Hydraulic oil	Filter element
1st time	—	25
2nd time	—	100
Periodically	1200 (600)	200

When the breaker operating ratio is 100%. Refer to “Hydraulic breaker” on page 8-4.



(): When a conventional antiwear hydraulic oil is used.



LIST OF CONSUMABLES

Periodically replace consumables such as filters and elements according to the table below.

System	Item	Part name	Part No.	When to replace
Hydraulic system	Hydraulic oil return filter	Element	15511-03400	Every 1000 hrs after the initial 50 hrs.
	Pilot line filter		15512-00601	
	Air breather filter		15520-00902	Every 1000 hrs.
Engine lubrication system	Engine oil filter	Cartridge	11-13240-2322	Every 500 hrs after the initial 50 hrs.
Fuel system	Pre-fuel filter	Element	15520-02910	Every 500 hrs.
	Main fuel filter		18-98135-4621	
	Feed pump filter	Repair kit	18-98173-1650	
Air cleaner system	Air cleaner	Primary (Outer) element	19111-02853	Every 1000 hrs. or after 6 cleanings (whichever comes first)
		Secondary (Inner) element	19111-02852	When the primary elements are replaced.
AC system	Receiver dryer		19115-08311	Every 2 year
	Ventilation filter	Element	05746-00334	Once a year or if clogging remains after cleaning
	Circulation filter		19115-06736	



LIST OF TOOLS (IF EQUIPPED)

Code	Part name	Part No.	Remarks
1	Spanner	16900-01012	10-12
2	Spanner	16900-01417	14-17
3	Screwdriver	16902-20205	(+) (-) replaceable shank
4	Filter wrench	16919-03560	
5	Hammer	16903-00330	3/4
6	Adjustable wrench	16904-00250	250 mm
7	Pliers	16905-00200	200 mm
8	Spanner	16900-01013	10-13
9	Spanner	16900-01922	19-22
10	Spanner	16900-02427	24-27
11	Spanner	16900-02730	27-30
12	Spanner	16900-03236	32-36
13	Spanner	16909-00019	19
14	Spanner	16901-00041	41
15	Hex. wrench	16906-00250	2.5 mm
16	Hex. wrench	16906-00500	5 mm
17	Hex. wrench	16906-00600	6 mm
18	Hex. wrench	16906-00800	8 mm
19	Hex. wrench	16906-01000	10 mm
20	Hex. wrench	16906-01200	12 mm
21	Tool case	16914-00005	
22	Case	16919-00001	
23	Grease gun	16910-60610	600 cc
24	Drain connector	15545-12600	
25	Nozzle	16911-10003	

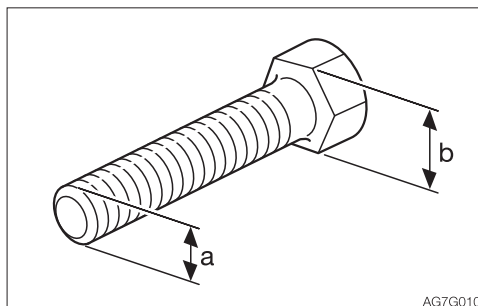
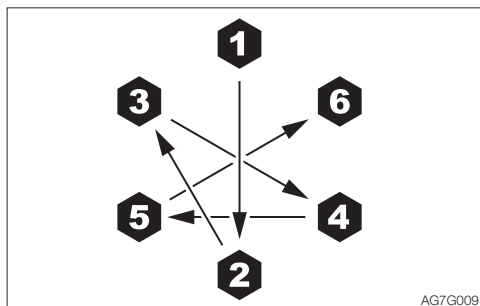


LIST OF TIGHTENING TORQUES

Nuts and Bolts (for ISO strength category 10.9)

Tighten nuts and bolts at the torques shown on the table below, unless otherwise specified.

- The tightening torques used for the mounted plastic covers are not listed in the table below. Consult your sales or service dealer for details. They will be damaged if over tightened.
- When replacing nuts and bolts, replace them with nuts and bolts of the same size and standards.
- Tighten nuts and bolts alternately (top, bottom, left then right) or in 2 or 3 times so that they are evenly tightened.



Classification	Head width (b)	Size (a) x pitch	Tightening torque	
			General connection points	
	mm	mm	N·m	ft·lb
Coarse	10	M6 x 1.0	9.8±0.5	7.2±0.4
	12, 13	M8 x 1.25	22.6±1.1	16.6±0.8
	14, 17	M10 x 1.5	47.1±2.4	34.7±1.7
	17, 19	M12 x 1.75	83.4±4.1	61.5±3.0
	19, 22	M14 x 2.0	134.4±6.7	99.1±4.9
	22, 24	M16 x 2.0	207.9±10.4	153.3±7.7
	27, 30	M20 x 2.5	410.9±20.5	303.1±15.1
Fine	12, 13	M8 x 1.0	24.5±1.2	18.1±0.9
	14, 17	M10 x 1.25	50±2.5	36.9±1.8
	17, 19	M12 x 1.5	87.3±4.3	64.4±3.2
	19, 22	M14 x 1.5	135.3±6.8	99.8±5.0
	22, 24	M16 x 1.5	220.6±11	162.7±8.1
	27, 30	M20 x 1.5	452.1±22.6	333.4±16.6



SAFETY-CRITICAL PARTS

To use the machine safely, periodically perform inspection and maintenance. The safety-critical parts listed below must be periodically replaced for an increased safety. Serious injury or a fire could result if they are worn or damaged.

List of safety-critical parts

Unit		Safety-critical parts to be replaced periodically	When to replace
Fuel system		Fuel hoses	Every 2 years
		Packing on fuel filler cap	
Engine		Engine oil filter hoses	
Cooling system		Rubber hoses	
Heater & Air conditioner systems		Heater hoses	
		Air conditioner hoses	
Hydraulic system	Main body	Hydraulic hoses (pump - delivery)	
		Hydraulic hoses (pump - suction)	
		Hydraulic hoses (slew motor)	
		Hydraulic hoses (travel motor)	
	Working equipment	Hydraulic hoses (boom cylinder piping)	
		Hydraulic hoses (second boom cylinder piping)	
		Hydraulic hoses (arm cylinder piping)	
		Hydraulic hoses (bucket cylinder piping)	
		Hydraulic hose (brake line)	
		Hydraulic hoses (outrigger cylinder)	
		Hydraulic hoses (blade cylinder)	
		Hydraulic hoses (ram lock cylinder)	
		Hydraulic hoses (pilot valve)	
		Hydraulic hoses (auxiliary piping)	
		Seat belt	Every 3 years

**SAFETY-CRITICAL PARTS**

The material of the safety-critical part listed on the left tends to change over time and cause wear or deterioration. It is difficult to determine the degree of deterioration at the periodic inspection, and thus they need to be replaced with new ones after a certain time to maintain their proper performance even if they appear in good condition. Note that regardless of the replacement schedule, replacement must be performed immediately if a symptom of wear is found. If a hose clamp is deformed or cracked, replace it together with the hose immediately. When replacing the safety-critical parts, ask your sales or service dealer.

In addition to the safety-critical parts, inspect the hydraulic hoses and retighten or replace as necessary. When replacing the hydraulic hoses, replace the O-rings and seals at the same time.

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

Refer to "Maintenance".

Type of inspection	Inspection item
Daily inspection	Leakage from the connecting parts of hydraulic or fuel hoses Damage to cab replace*
Monthly inspection	Leakage from the connecting parts of hydraulic or fuel hoses Damaged hydraulic or fuel hoses (cracks, wear and tear)
Annual inspection	Leakage from the connecting parts of hydraulic or fuel hoses Deteriorated, twisted, damaged hydraulic or fuel hoses (cracks, wear and tear) or hoses in contact with other parts of the machine

*: Cab parts No. 05786-05100



MAINTENANCE LIST

Inspection and maintenance item	Page
Walk-around inspection	
Inspecting by opening the engine hood and covers	5-18
Inspecting by walking around the machine	5-19
Inspecting while sitting in the operator's seat	5-19
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Inspecting and replenishing the engine oil	5-21
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Inspecting the fuel level	5-23
Inspecting the hydraulic oil tank level and replenishing	5-24
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Inspecting and adjusting the V-belt	5-30
Inspecting and adjusting the compressor belt (AC)	5-32
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*: (AC) / Air conditioner



Inspection and maintenance item	Page
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*: (AC) / Air conditioner



Inspection and maintenance item	Page
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Replacing the engine oil and the oil filter	5-49
Inspecting the transmission gear oil	5-49
Inspecting the differential gear oil	5-50
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Replacing the air cleaner element	5-59
Replacing the air breather filter	5-60
Inspecting and adjusting the engine valve clearance	5-61
Inspecting the engine compression pressure	5-61
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Inspection and maintenance item	Page
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Every 2 years	
Replacing the receiver dryer	5-78



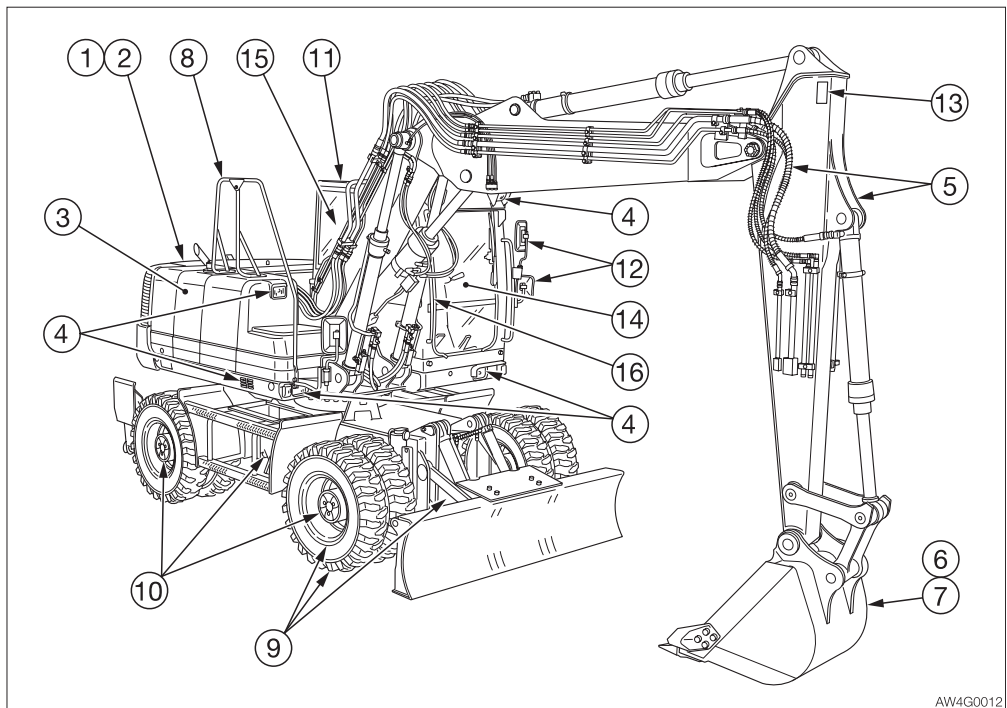
WALK-AROUND INSPECTION

Perform the following inspections every day before starting the engine for the first time.

WARNING

- Before operating, perform the walk-around inspections and make repairs immediately where necessary.
- 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.

Before starting the engine, look around the machine and clean any combustibles from the surroundings of the engine. Also, inspect if oil or water is leaking and any nuts, bolts or electric wiring are loosened or damaged.



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INSPECTING BY OPENING THE ENGINE HOOD AND COVERS

1. Check for any twigs, leaves, oil or other combustible materials around the engine and battery.
2. Check for oil or engine coolant water leakage around the engine.
3. Check for oil leakage from the hydraulic tank, hydraulic devices, hoses or connections.

**INSPECTING BY WALKING AROUND THE MACHINE**

4. Check lights for dirt, damage and burnt out bulbs.
5. Check attachments and hoses for damage.
6. Check the bucket, bucket teeth and side cutter for wear, damage and looseness.
7. Check the hook, slip stopper and hook mount of buckets with hooks for damage. (Option)
8. Check the handrail, the steps and the slip-resistant surfaces for damage and loose bolts.
9. Check the tires, wheels, axles and drive shaft for damage, wear and loose bolts.
10. Check for oil leakage from the travel motor, transmission, differential and hubs.
11. Check the cab and guard for damage and loose nuts and bolts.
12. Check the rear view mirror and room mirror for dirt, damage and angle adjustment.
13. Check the labels for dirt and damage.

INSPECTING WHILE SITTING IN THE OPERATOR'S SEAT

14. Check the windshield for dirt or damage.
15. Check the seat and seat belt for dirt or damage.
Check the operator's seat for dirt, oil or other combustible materials.
16. Check the monitor, instruments and switches for dirt or damage.



DAILY INSPECTION (EVERY 10 HOURS)

Perform the following inspections every day before starting the engine for the first time.



WARNING

- Before operating, perform the daily inspections and make repairs immediately where necessary.
- 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.

INSPECTING AND REPLENISHING THE COOLANT

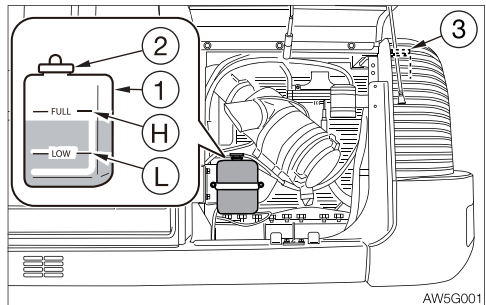


WARNING

- 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 radiator cool before slowly loosening the radiator cap and the drain plug to remove them.
- Always wear the protective goggle and gloves when handling coolant (antifreeze). If any coolant (antifreeze) comes in contact with eyes or skin, wash it off with clean water. Otherwise, it could result in injuries.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).

- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

Inspection



1. Open the engine hood and the left side cover.
2. Inspect the cooling water level in the reserve tank (1).
The level should be between the upper limit (H) and the lower limit (L).
If it is below the lower limit (L), replenish.

Replenishing

1. Remove the cap (2) of the reserve tank (1).
2. Add cooling water up to the upper limit (H) of the reserve tank (1).
If the reserve tank (1) is found empty at the inspection, check for water leakage and then the water level in the radiator (3). Add water to the radiator (3) as required, and then to the reserve tank (1).
3. Install the cap (2).

Note: Use only clean water (soft water) to replenish the cooling water loss due to evaporation. Use coolant (antifreeze) and clean water (soft water) of the specified mixing ratio to replenish the cooling water loss due to leaking.

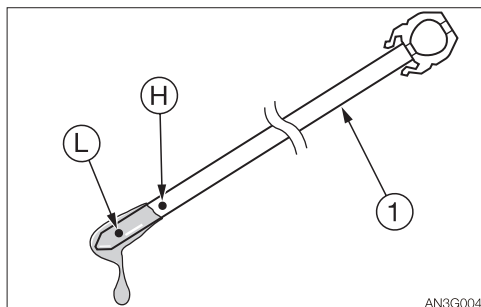
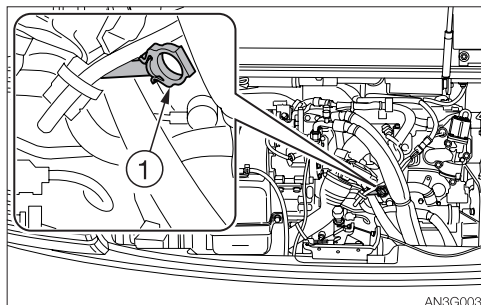


INSPECTING AND REPLENISHING THE ENGINE OIL

WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
- Before performing maintenance on the top of the machine or the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.

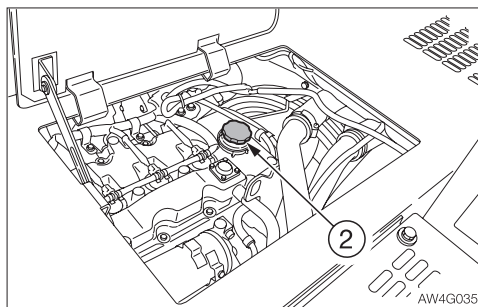
Inspection



1. Open the engine hood.
2. Take out the dipstick (1) and wipe off the oil with a rag.

3. Fully insert the dipstick (1) again, and then pull it out.
4. Check the oil left on the dipstick (1). The level should be between the upper limit (H) and the lower limit (L). If it is below the lower limit (L), replenish.

Replenishing



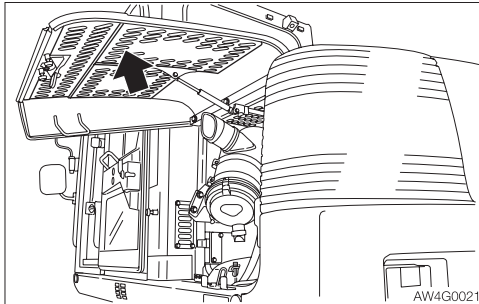
1. Open the maintenance cover.
2. Remove the oil filler cap (2).
3. Add oil up to between the upper limit (H) and the lower limit (L) of the dipstick (1). Problems could arise if the oil level is either too low or too high.
4. Tighten the oil filler cap (2).
5. Start the engine, run it at low idle for about 5 minutes, and then stop it.
6. After about 15 minutes, inspect the oil level.



CLEANING THE DUST SCREEN

WARNING

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



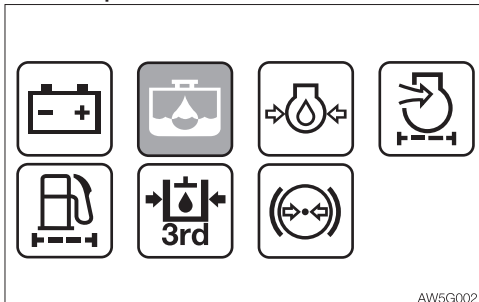
1. Open the left side cover.
2. Inspect if any dirt or bugs are on the dust screen.
3. Clean the dust screen.

INSPECTING THE WATER SEPARATOR AND THE FUEL FILTERS

WARNING

- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.
- Clean up spilled fuel immediately.

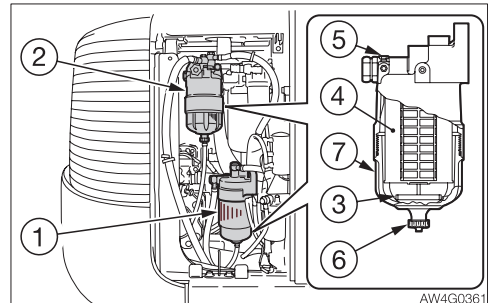
Water separator



1. Turn the starter switch to the ON position.
2. Inspect the water separator warning lamp.
3. If the warning lamp is flashing, drain the water.

Refer to “Draining the water from the water separator” on page 5-76.

Pre-fuel filter, main fuel filter



1. Open the right side cover.
2. Check if there is water in the pre-fuel filter (1) and the main fuel filter (2).
If water collects in the filter, the float (red ring) (3) goes up. Be sure to drain water before the float (3) goes up to the element (4).
3. Loose the vent plug (5) and then the drain plug (6) to discharge water collected inside.
4. After drainage of water, tighten each plug and bleed air from the fuel system.
Refer to “Bleeding air from the fuel system” on page 6-10.

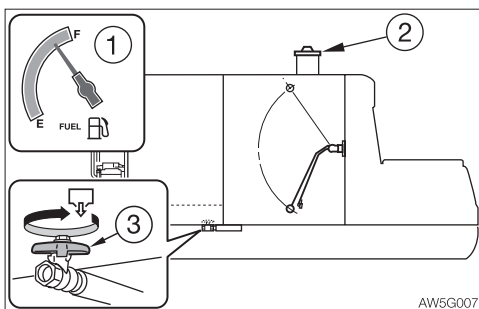


INSPECTING THE FUEL LEVEL



WARNING

- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- 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.
- Clean up spilled fuel immediately.
- Do not fill the fuel tank to capacity. Allow room for oil expansion.
- Securely tighten the fuel filler cap.
- Use the correct grade of fuel for the operating season.



1. Check the fuel level using the fuel gauge (1).
F: Full
E: Empty
2. If the level is low, add fuel from the fuel port (2) while watching the fuel gauge (1). Refer to "Fuel filler port" on page 2-5.



INSPECTING THE HYDRAULIC OIL TANK LEVEL AND REPLENISHING

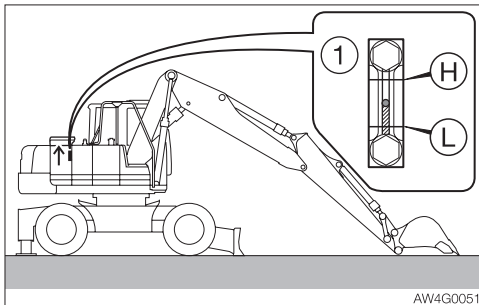
WARNING

- Before performing maintenance on the top of the machine or the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.
 - Press the air breather button to relieve the internal pressure from the tank.

Inspection

The oil level changes with the oil temperature. Inspect the oil by maintaining the machine posture as shown in the figure.

- Machine posture for inspecting the hydraulic oil level



1. Start the engine and run it at low speed.
2. Fully retract the cylinders (second boom, arm and bucket), and lower the bucket to the ground.
3. Lower the dozer blade, and then stop the engine.
4. Open the right side cover.

5. Inspect the oil level using the sight gauge (1).

- When the oil temperature is about 20°C (68°F):

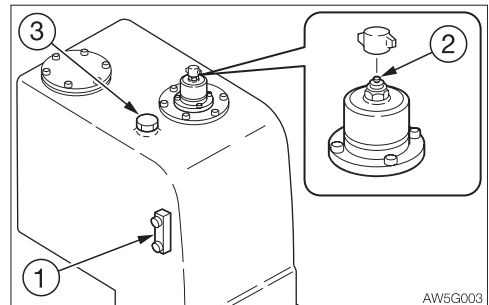
The level should be between the upper limit (H) and the lower limit (L).

If it is below the lower limit (L), replenish.

- When the oil temperature is about 50 to 80°C (122 to 176°F):

The level should be slightly below the upper limit (H).

Replenishing



IMPORTANT: Do not fill up to the level higher than the upper limit (H). It will damage the hydraulic circuits or result in oil spurring. If accidentally done, stop the engine and wait the hydraulic oil to cool, and then let the excessive oil to drain from the drain plug.

1. Remove the air breather cap and press the button (2) to relieve the internal pressure from the tank
2. Remove the plug (3).
3. Add the hydraulic oil up to the middle of the sight gauge (1).
4. Tighten the plug (3).

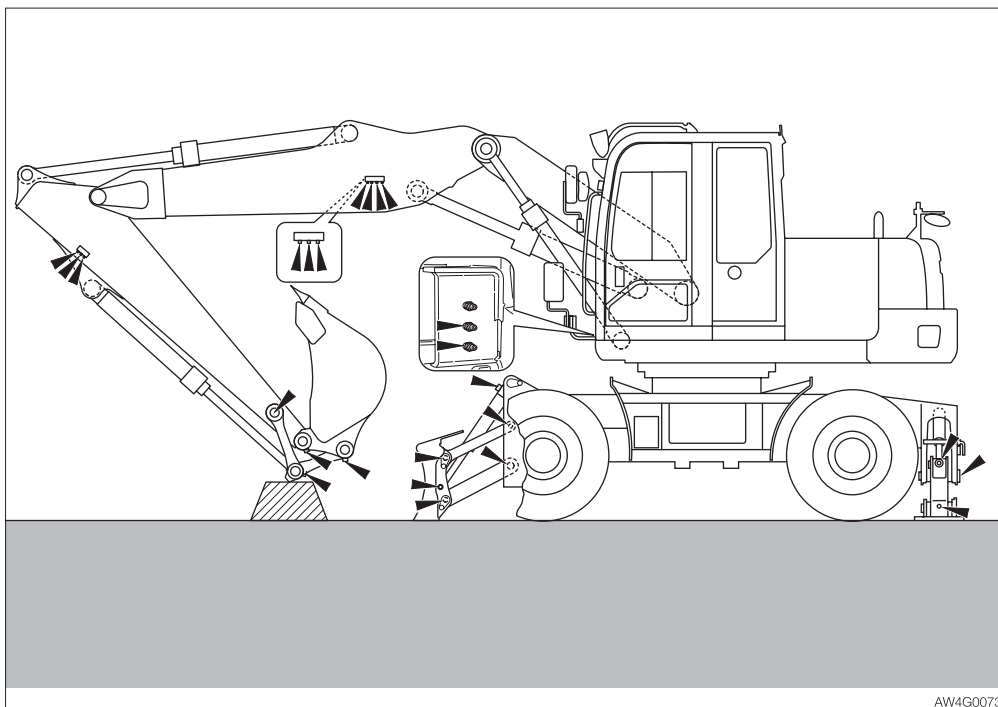


LUBRICATING THE WORKING EQUIPMENT



WARNING

- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.



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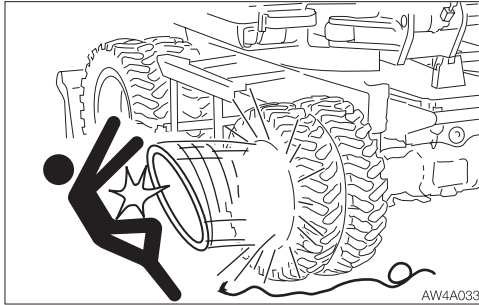
1. Keep the machine configuration as shown in the diagram above, lower the working equipment to the ground, and then stop the engine.
2. Use the grease gun to lubricate the grease fittings.
3. Wipe off the excess grease.



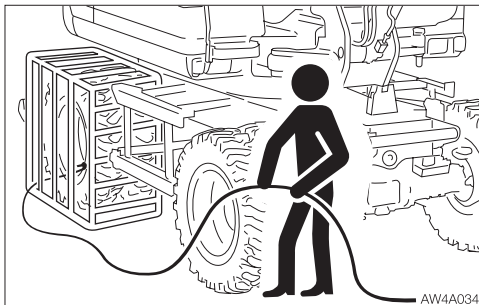
INSPECTING AND INFLATING THE TIRES



WARNING



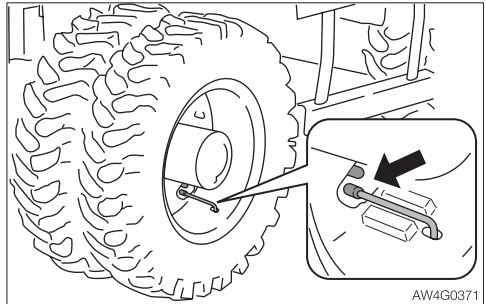
- Disassembling a tire or rim can cause an explosion, resulting in serious injury or death. Always ask a service shop or dealer for maintenance.
- Special tools and procedures are required to change tires. To do it safely, it must be done correctly. Changing tires is a job better done by your tire service company.
- Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.
- Inspect tires and wheels every day. Do not operate the machine if the tire is underinflated or has cuts or bubbles, or if the rim is damaged.
- A rise in tire pressure during operation is normal, and should NOT be reduced.



- When putting air in a tire, do so from a distance. Use a long hose with self-attaching chuck. Always stand behind the tread when adjusting tire pressure.

- Do not inflate tires with flammable gases or from systems using an alcohol injector.
- Never cut or weld on a wheel with an inflated tire mounted on it. This could cause an explosive decompression.
- Tires should be replaced only by an authorized person using the proper procedures and safety equipment. New or replacement tires and wheels should always be checked for proper size before mounting.
- Always use a cable restraint device or safety cage when reinflating a repaired tire.

Recommended air pressure must be maintained in every tire. Daily checks assure that inflation is correct. If your periodic check discloses a tire that is continuously losing air, a leak is indicated and must be repaired.



During your pressure checks, also inspect for:

- Objects wedged between duals or embedded in tires.
- Mismatched duals. Diameters should be equal as well as amount of tread wear.
- Any missing valve caps.
- Cuts, tears, and breaks that may need repair.
- Abnormal or uneven wear.
- Damaged or poor fitting rim or rim flanges.
- Projecting body hardware, loose fender bolts, spring clips - anything that could contact a tire.
- Any tire portions with no-grooves. Replace the tire with a new one if there is a portion with no grooves.



Inflating the tires

These instructions are for adding air to a tire which is already inflated. If the tire has lost all its air pressure, call in a qualified tire mechanic. The tire mechanic should use a tire inflation cage and the correct equipment to do the job.

1. Prepare the wheel.

Before you add air to the tire, make sure it is correctly fitted on the machine or installed in a tire inflation cage.

2. Prepare the equipment.

Use only an air supply system which includes a pressure regulator.

Set the regulator no higher than above the recommended tire pressure. (See below).

Use an air hose fitted with a self locking air chuck and remote shut-off valve.



3. Add the air.

Make sure that the air hose is correctly connected to the tire valve.

Clear other people from the area.

Stand behind the tread of the tire while adding the air.

Inflate the tire to the recommended pressure. Do not over-inflate.

- 10.00 - 20 Twin tires
- Tire pressure: 700 kPa (101.5 psi)

CHECKING THE WHEEL NUT TORQUES



WARNING

If, for whatever reason, wheel nut is renewed, all the nuts for that wheel must be changed as a set, since the remaining nuts may have been damaged.

On new machines, and whenever a wheel has been removed, check the wheel nut torques every two hours until they become proper.

Every day, before starting work, check that the wheel nuts are tight.

- Tightening torque:

M22 X P1.5: 653 N·m (481.8 ft-lb.)

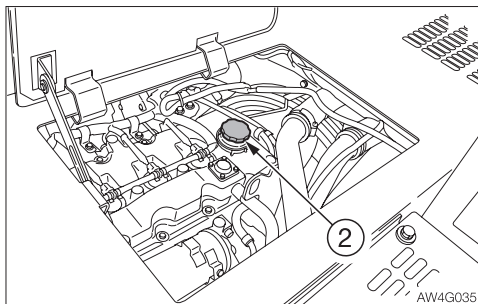


AFTER THE INITIAL 50 HOURS (ONLY FOR NEW MACHINES)

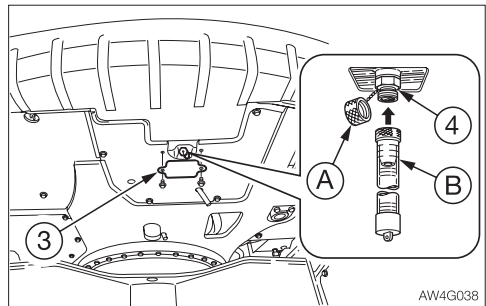
REPLACING THE ENGINE OIL AND THE OIL FILTER

WARNING

- 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 oil is also hot. 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.
- Before performing maintenance on the top of the machine or the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.



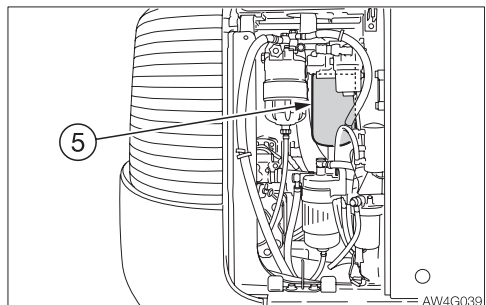
1. Open the maintenance cover and remove the oil filler cap (2).



2. Loosen the bolts and remove the under cover (3).
3. Place a pan under the plug (4) to catch the waste oil.
4. Remove the cap (A), install connector (B) and drain the oil. (The oil comes out when the screw is tightened.)
5. Remove the connector (B) and install the cap (A).

IMPORTANT: Check the waste oil for metal powder. If it contains large amount of metal powder, consult your sales or service dealer.

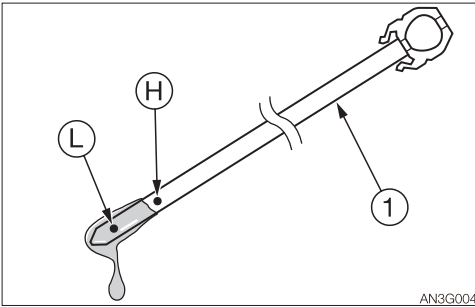
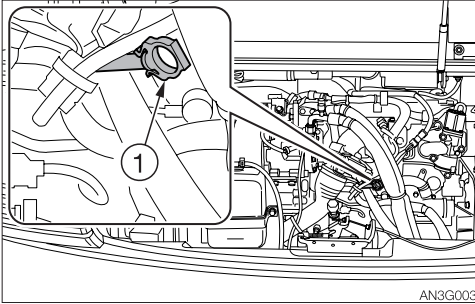
6. Install the under cover (3).



7. Open the right side cover.
8. Turn the filter (5) counterclockwise with the filter wrench and remove it.
9. Clean the surface on which the filter stand is installed.
10. Apply a thin layer of oil on the packing of the new filter.



11. Install the new filter by hand.
12. Tighten one more turn after the filter packing comes in contact with the surface of installation.



13. Add oil up to between the upper limit (H) and the lower limit (L) of the dipstick (1). Problems could arise if the oil level is either too low or too high. It takes around 15 minutes for all of the added oil to go down to the oil pan.
14. Tighten the oil filler cap (2).
15. After about 15 minutes, start the engine, run it at low idle for about 5 minutes, and then stop it.
16. After about 15 minutes, inspect the oil level.



INSPECTING AND ADJUSTING THE V-BELT



WARNING

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

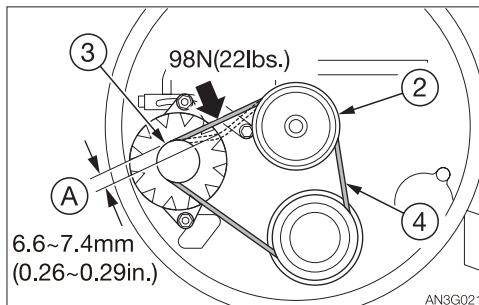
- The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.

IMPORTANT: The loose belts could result in bad battery charge, overheat of engine or early wear of belt. Too tight belts could damage the water pump or bearing and belt used to drive the alternator.

IMPORTANT: Do not let any oil or grease get on the belt.

Inspection

1. Open the engine hood and the maintenance cover.



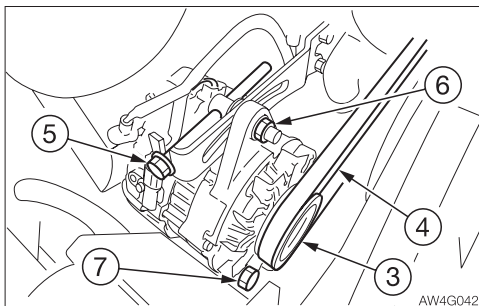
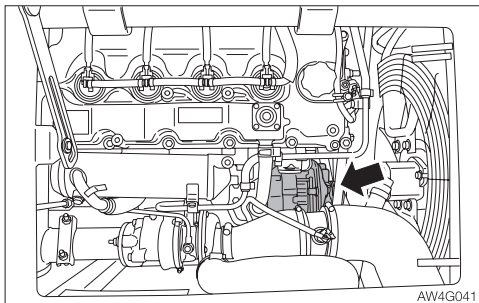
2. Press the midpoint of the V-belt between the pulley (2) and alternator pulley (3) to check the tension. (approx. 98 N or 22 lbs.).

The slack (A) should be 6.6 to 7.4 mm (0.26 to 0.29 in).

3. Inspect the V-belt (4) and replace it if it is as follows.
 - There are cuts or cracks.
 - The belt is worn and touches the bottom of the V groove in the pulley.
 - The belt stretched too loose to be adjusted.



Adjustment



1. Loosen the bolt (7) and locking nut (6).
2. Turn the adjustment bolt (5) to adjust the V-belt (4).
 - Tighten: Clockwise
 - Loosen: Counterclockwise
3. Tighten the bolt (7) and locking nut (6).
Tightening torque:
 - Locking nut (6) 25 N·m (18.1 ft-lb)
 - Bolt (7) 51 N·m (37.6 ft-lb)

Note: When replacing with a new belt, run the engine at low idle speed for about 3 to 5 minutes to break in the new belt, before adjusting the tension again.



INSPECTING AND ADJUSTING THE COMPRESSOR BELT (AC)

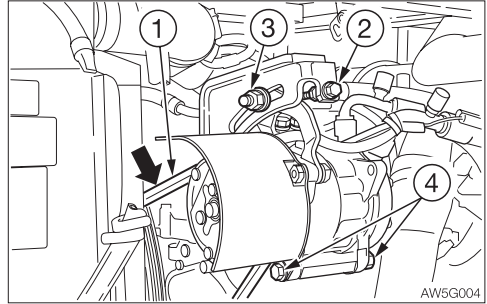


WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The engine, the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- The high-pressure pipes of the air conditioner can be very hot (80 to 120°C or 176 to 248°F). Be careful not to burn yourself.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.

IMPORTANT: Do not let any oil or grease get on the belt. It will cause the belt to slip, decrease the cooling capacity or shorten the service life of the air conditioner.

If the belt is too slack, it will slip and vibrate, resulting in decreased cooling capacity. The service life of the air conditioner also will be shortened. Adjust the belt tension to the standard value (approximately 8 mm or 0.31 in).



Inspection

1. Open the engine hood.
2. Press on the center of the belt (1) with a finger. The belt tension is normal if the slack in the belt is 8 mm (0.31 in.) when pressed with a force of 98 N (22 lbs).

Adjustment

If the belt tension is not normal, adjust it with the adjuster bolt (2).

1. Loosen the locking nut (3) and bolts (4).
2. Turn the adjuster bolt (2) as follows.
 - Tighten: Clockwise
 - Loosen: Counterclockwise
3. Tighten the locking nut (3) and bolts (4) after adjustment.

Note: When replacing with a new belt, run the engine at low idle speed for about 3 to 5 minutes to break in the new belt, before adjusting the tension again.

Replacing

Replace the belt in the following cases:

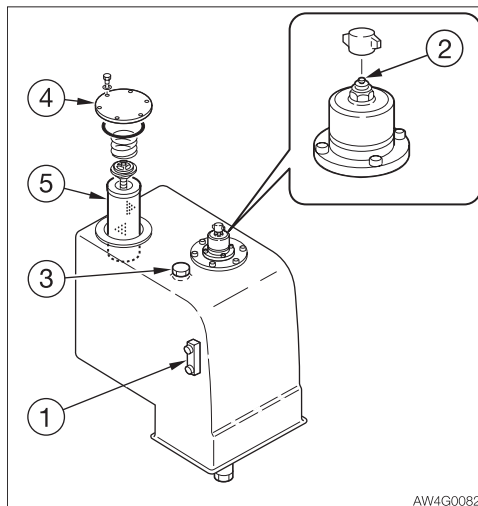
- There are cuts or cracks.
- The belt is worn and touches the bottom of the V groove in the pulley.
- The belt stretched too loose to be adjusted.



REPLACING THE HYDRAULIC OIL RETURN FILTER

WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The engine, the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
 - The hydraulic oil is 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.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.
 - 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.



AW4G0082

1. Press the air breather button (2) to relieve the internal pressure from the tank.
2. Loosen the bolts and remove the flange (4).
3. Remove the return filter (5).
4. Install a new return filter.
5. Install the flange (4) on its original position.
6. Inspect the level with the sight gauge (1), and replenish if the level is too low. Refer to "Inspecting the hydraulic oil tank level and replenishing" on page 5-24.

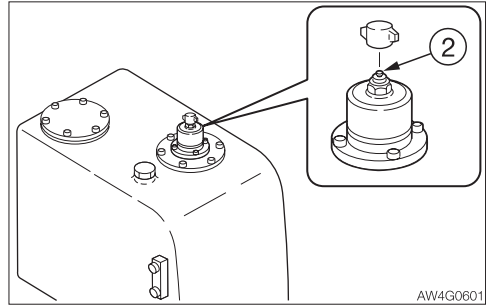


REPLACING THE PILOT LINE FILTER

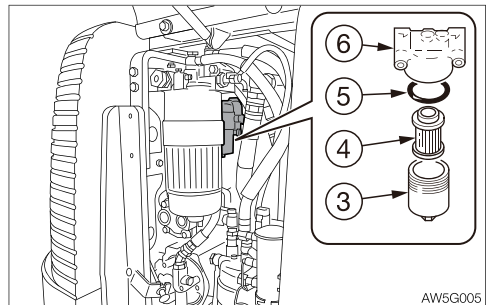


WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The engine, the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
 - The hydraulic oil is also hot and under high pressure immediately after the engine is stopped. Be careful not to touch the 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.
- Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.
 - Press the air breather button to relieve the internal pressure from the tank.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.



1. Press the air breather button (2) to relieve the internal pressure from the tank.



2. Open the right side cover.
3. Turn the case (3) counterclockwise and remove it.
4. Remove the element (4) and O-ring (5).
5. Clean the inside of the case (3).
6. Apply a thin layer of oil on the O-ring of the new filter.
7. Install the new element on the filter stand (6).
8. Apply a thin layer of oil on the new O-ring (5).
9. Install the new O-ring (5) and the case (3) on the filter stand (6).
10. Inspect the level with the sight gauge (1) and replenish if the level is too low. Refer to "Inspecting the hydraulic oil tank level and replenishing" on page 5-24.



EVERY 50 HOURS

DRAINING THE WATER FROM THE FUEL TANK



WARNING

- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- 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.
- Use the correct grade of fuel for the operating season.

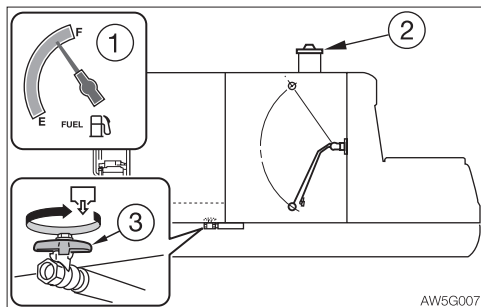
1. Remove the fuel filler cap (2).
2. Place a pan under the drain valve (3).
3. Open the drain valve (3) and drain the water and sediment buildup in the bottom of the tank.
4. Close the drain valve (3).
5. Add fuel while watching the fuel gauge (1).
6. Tighten the fuel filler cap (2) and lock it.
7. Bleed air.

Bleeding air from the fuel system

Refer to "Bleeding air from the fuel system" on page 6-10.

Note: Air in the fuel system causes the engine to fail to start or to have problems. Bleed air when the fuel tank is emptied, using the same procedure above.

Do the draining operation before starting the machine.





INSPECTING THE BATTERY FLUID LEVEL AND REPLENISHING



DANGER

- Do not use the battery when the fluid level is below the lower level limit. Doing so will hasten the deterioration of the internal portions of the battery and shorten the battery life. It also can cause rupturing (explosion).
- Batteries generate flammable hydrogen gas which may explode. Keep away from flame, sparks, fire or lighted cigarettes.
- Use a dampened cloth to clean above the fluid level line and check the fluid level. Do not clean with a dry cloth; otherwise it can cause static electricity to build up, resulting in ignition or explosion.



WARNING

- Wear protective goggle and clothing when working with batteries.
- Do not add the distilled water above the upper level limit. Doing so could cause the fluid to leak. This fluid can cause skin damage if contacted, or can cause the machine components to corrode.
- Batteries contain sulfuric acid which will damage eyes or skin if contacted.
 - 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.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off

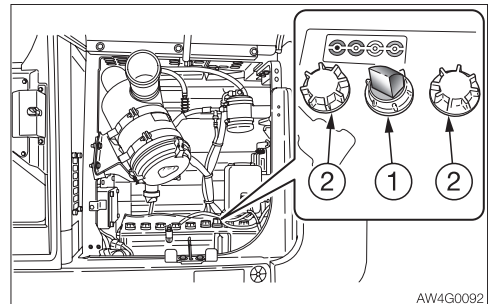
the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).

- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

Inspection

IMPORTANT: Check the fluid level of all cells following the steps below, even when the fluid level can be checked using the indicator.

1. Open the left side cover.

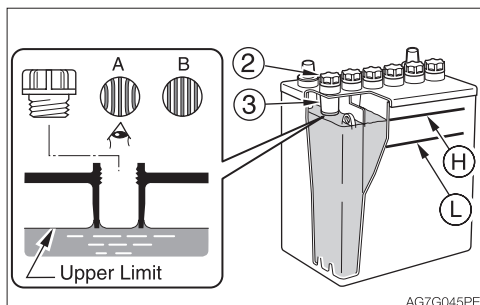


2. Inspect the indicator (1).
 - Blue: Charging complete
 - White: OK
 - Red/center White: Insufficient battery fluid
 - Red/center Red: Charging needed
3. Inspect the fluid level.

The fluid level must be between the upper level (H) line and lower level (L) line. If not, add distilled water up to the line (H).



- If the fluid level cannot be checked by fluid level lines:



Remove the caps (2) and look into the fluid filler holes to check the fluid level. If the fluid is below the sleeve (3), be sure to add distilled water up to the bottom edge of the sleeve (3).

Proper level (A)

If the fluid reaches up to the bottom edge of the sleeve (3), the surface tension causes the fluid to swell and the plate appears as if it is distorted.

Level too low (B)

If fluid does not reach up to the bottom edge of the sleeve (3), the plate looks laminar, not distorted.

4. Check the terminals for looseness and dirt.

Replenishing

When adding distilled water, do so before starting operations in order to prevent freezing.

1. Remove the caps (2), and add distilled water until the upper level (H).
2. Check that the indicator (1) turns blue.
3. Clean the exhaust hole on the cap, then tighten the caps (2) securely.

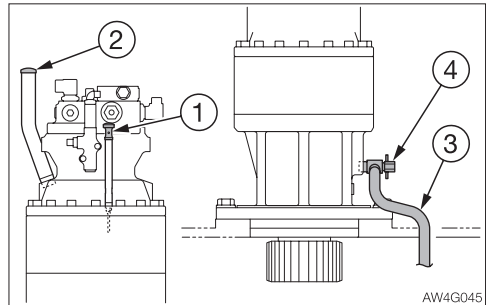
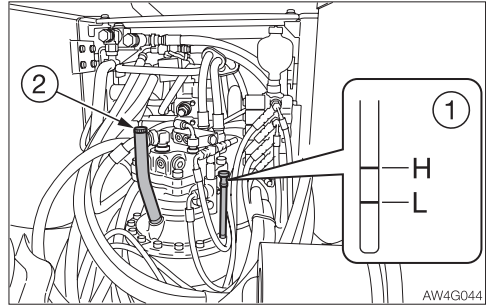


AFTER THE INITIAL 250 HOURS (ONLY FOR NEW MACHINES)

REPLACING THE SLEW MOTOR GEAR OIL

WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The slew motor is hot immediately after the engine is stopped. Touching it will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped. Be careful not to touch the oil when loosening the plug. Working on the machine under these conditions could result in burns or injuries.
- When performing maintenance on the machine, clean up the foot area and strictly observe the following so as not to fall:
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- The pressure in the reduction gear case of slew motor may cause oil or the cap to fly out. Loosen the cap slowly to release the pressure.



1. Remove the cap (2).
2. Place a pan under the hose (3) to catch the waste oil.
3. Loosen the drain valve (4) and drain the oil.
4. Tighten the drain valve (4).
5. Add oil up to the upper limit (H) of the level gauge (1).
Problems could arise if the oil level is either too low to too high.
6. Tighten the cap (2).



EVERY 250 HOURS

INSPECTING AND ADJUSTING THE V-BELT

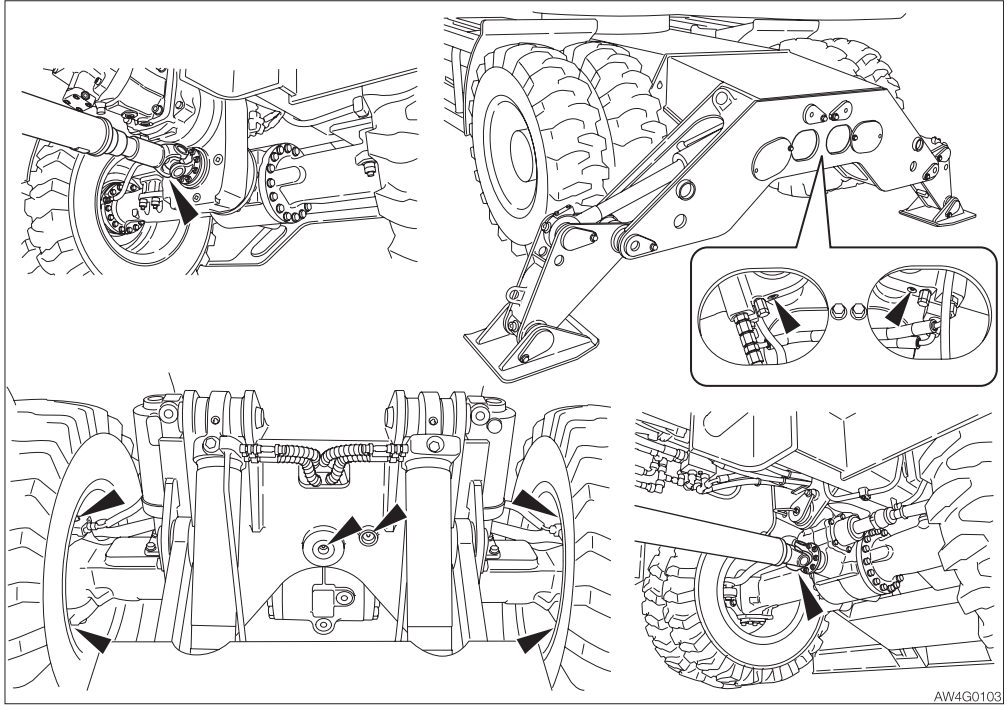
Refer to “Inspecting and adjusting the V-belt”
on page 5-30.

INSPECTING AND ADJUSTING THE COMPRESSOR BELT (AC)

Refer to “Inspecting and adjusting the
compressor belt (AC)” on page 5-32.



LUBRICATING THE UNDERCARRIAGE



1. Keep the machine configuration as shown in the diagram above, lower the working equipment to the ground, and then stop the engine.
2. Use the grease gun to lubricate the grease fittings.
3. Wipe off the excess grease.

INSPECTING THE SLEW MOTOR GEAR OIL

WARNING

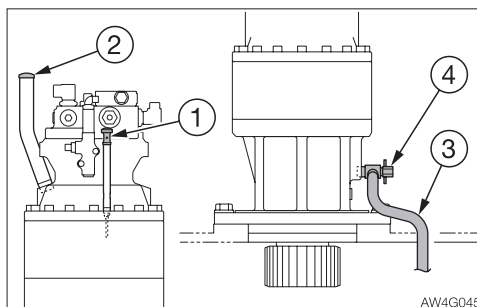
- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The slew motor is hot immediately after the engine is stopped. Touching it will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped.

Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- When performing maintenance on the machine, clean up the foot area and strictly observe the following so as not to fall:
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine.

Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- The pressure in the reduction gear case of slew motor may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

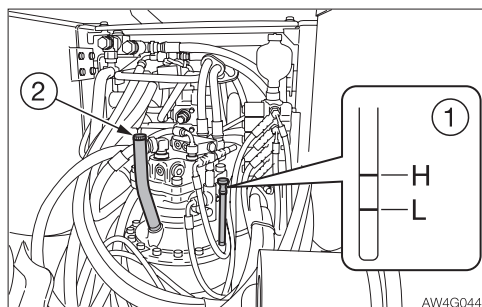
1. Take out the level gauge (1) and wipe off the oil with a rag.
2. Fully insert the level gauge (1) again, and then pull it out.
3. Check the oil left on the level gauge (1). The level should be between the upper limit (H) and the lower limit (L). If it is below the lower limit (L), replenish.

Replenishing



1. Remove the oil filler cap (2).
2. Add oil up to between the upper limit (H) and the lower limit (L) of the level gauge (1).
Problems could arise if the oil level is either too low or too high.
3. Tighten the oil filler cap (2).

Inspection





CLEANING THE COOLER FINS

WARNING

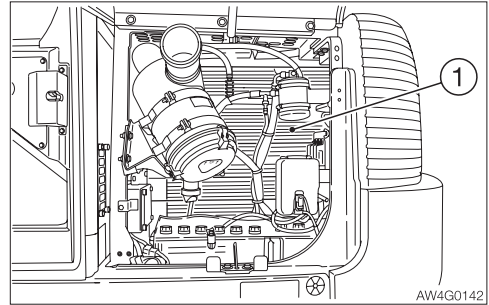
- Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

IMPORTANT: Be careful not to damage the fins when cleaning.

- When using compressed air or pressurized water, make sure the pressure is no higher than 200 kPa (28 psi) and hold the nozzle sufficiently away from the fins.

IMPORTANT: When using water, cover the electrical system to prevent water from getting in.

IMPORTANT: When operating the machine in very dusty places, perform inspection and maintenance operations every day.



1. Open the left side cover and the engine hood.
2. Blow compressed air on the fins to remove mud and dirt stuck on them.



CLEANING THE AIR CLEANER



WARNING

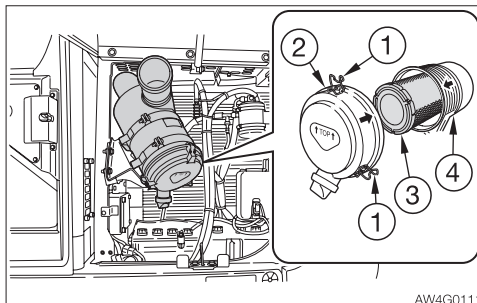
- Stop the engine and allow the machine to cool down before performing maintenance.
 - The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching it will cause burns.
- Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

IMPORTANT: Be careful not to scratch the element. Do not use an element if it is damaged.

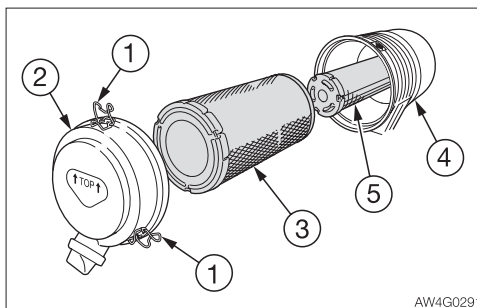
IMPORTANT: When operating the machine in very dusty places, perform inspection and maintenance operations every day.

IMPORTANT: Be sure to install the element and dust cap securely. If not, dust could be drawn into the cylinder, damaging the engine.

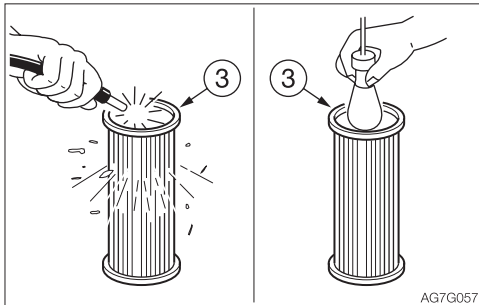
1. Open the left side cover.



2. Loosen the clamps (1) and remove the dust cup (2).



3. Clean the inside of the dust cup (2).
4. Remove the primary element (3).
To prevent dirt from getting inside the engine, do not remove the secondary element (5).
5. Clean the inside of the body (4).



6. Clean the primary element (3) with dried compressed air (294 to 490 kPa or 43 to 71 psi).
First blow the air from the inside of the element along the pleats. Then blow the air from the outside and finally from the inside again.
7. Light up the inside of the primary element (3) with a light bulb, inspect it, and replace it if there are small holes or thin spots.
8. Install the primary element (3).
9. Install the dust cup (2) with its “**↑ TOP ↑**” mark facing up or by aligning the arrows “**→/←**”, and then fasten it with the clamps (1).



CLEANING THE AIR FILTERS (AC)

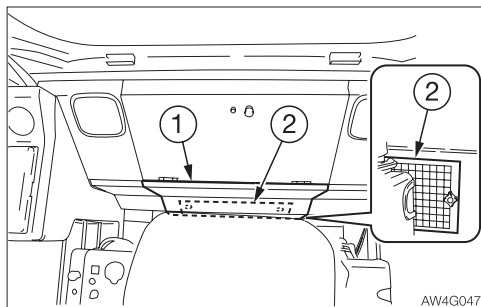
WARNING

Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.

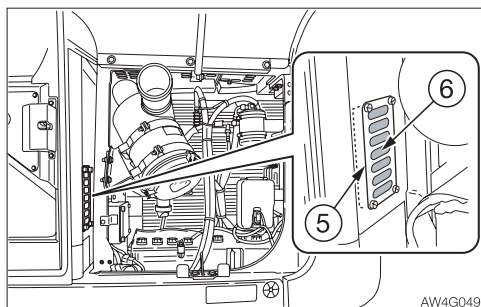
Clean the filters immediately after operating in dusty places.

If the filters are clogged, the air flow is reduced and a booming sound is heard from the air conditioner unit.

Removing the filters



1. Move the seat all the way forward, and then fold down the backrest toward the front.
2. Loosen the bolts and open the cover (1).
3. Loosen the knob and remove the filter (2).
Circulation filter (2) Part No. 19115-06736



4. Open the left side cover.
5. Loosen the knobs and remove the cover (3).

6. Remove the filter (4).
Ventilation filter (4): parts No. 05746-00334
7. Use compressed air or water to clean the filters, depending on how dirty they are.

Cleaning

1. Blow dry, compressed air (138 kPa or 20 psi or less) directly on the filters from the inside, moving up and down along the pleats.
Be sure to keep the nozzle at an adequate distance from the filters.
2. Wash the filter with neutral detergent if it is very dirty. Dry the filter completely after washing it.



CLEANING THE CONDENSER (AC)

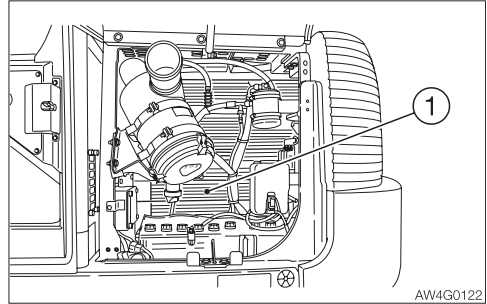
WARNING

- Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

IMPORTANT: Be careful not to damage the fins when cleaning.

- When compressed air or pressurized water is to be used, make sure the pressure is no higher than 200 kPa (28 psi) and hold the nozzle sufficiently away from the fins.

If the condenser is dirty, heat will not discharge properly. Wash dirt off the condenser with water.

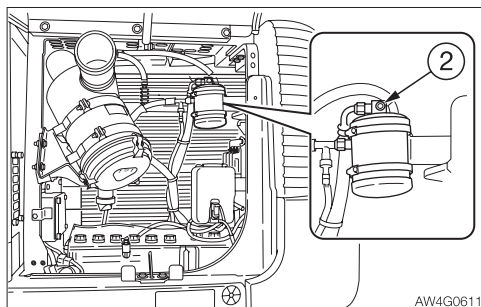


1. Open the left side cover.
2. Clean the condenser (1).



INSPECTING THE REFRIGERANT (GAS) LEVEL (AC)

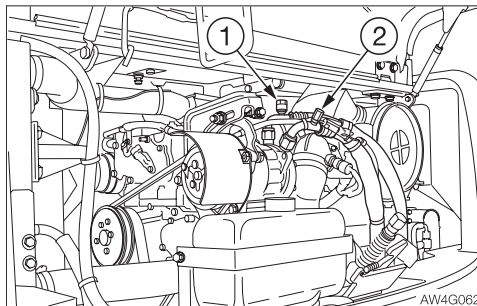
The cooling capacity decreases if the amount of refrigerant is insufficient. Inspect the refrigerant level using the sight glass (2) on the top of the receiver dryer .



1. Open the left side cover.
2. Inspect the places for the conditions below.

Places for inspection	Conditions
Cab door	Fully open
Temperature control dial	Set fully to the COOL side
Fan speed	High
Ventilation/circulation	Circulation
Engine speed	Maximum speed
Air conditioner switch	ON

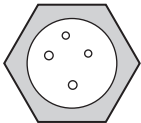
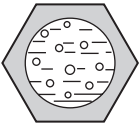
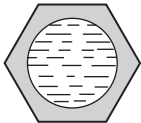
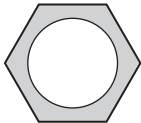
3. Inspect the refrigerant by watching the flow of air bubbles through the sight glass (2). Refer to “Check list for refrigerant volume” on page 5-48.
4. Open the engine food.



5. Check the temperature of the compressor's high pressure pipe (1) and low pressure pipe (2). Refer to “Check list for refrigerant volume” on page 5-48.



Check list for refrigerant volume

Air conditioner	Normal	Abnormal		
High/low pressure pipe temperature	High pressure pipe is hot (80 to 120°C or 176 to 248°F), low pressure pipe is cold (8 to 15°C or 46 to 59°F). Clear difference in temperature between the pipes.	High pressure pipe is warm, low pressure pipe is slightly cool. No significant difference in temperature between the pipes.	Little difference in temperature between the high-pressure pipe and the low-pressure pipe.	High pressure pipe is hot, low pressure pipe is slightly cool. A significant difference in temperature between the pipes.
Pipe connection	Normal	Some places are dirty with oil.	Some places are extremely dirty with oil.	Normal
Sight glass	 AG7G064 Almost transparent with some bubbles. Fully transparent when the engine speed is increased or decreased.	 AG7G065 Flow of bubbles can be seen constantly. Sometimes transparent or white with bubbles.	 AG7G066 Mist-like flow is faintly visible.	 AG7G067 No bubbles is visible, even when the fan is set to High and the engine is idling.
Refrigerant level	Proper level	Refrigerant may be leaking.	Refrigerant has leaked; little is left.	Refrigerant level too high

If the air conditioner is not working

If the air conditioner does not work well, set the fan switch to OFF and contact your sales or service dealer for inspection and/or repairs.

IMPORTANT: Continued use of the air conditioner when it is not working properly will damage its various parts.

IMPORTANT: Using the air conditioner when there is no refrigerant will damage the compressor.

IMPORTANT: Always consult your sales or service dealer for replacing the refrigerant. Be sure to use R134a refrigerant (1900 g or 4.19 lb).



EVERY 500 HOURS

REPLACING THE ENGINE OIL AND THE OIL FILTER

Refer to “Replacing the engine oil and the oil filter” on page 5-28.

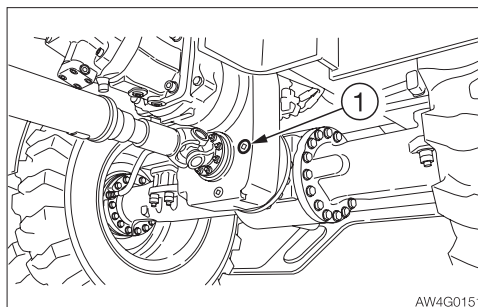
INSPECTING THE TRANSMISSION GEAR OIL



WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The transmission is hot immediately after the engine is stopped. Touching it will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped.
Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- The pressure in the reduction gear case of transmission may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

1. Park the machine on a level surface and stop the engine.



AW4G0151

2. Remove the plug (1).
3. If oil is left on your finger when it is inserted through the hole, the oil level is proper.
4. If the level is too low, add oil through the hole of the plug (1) until the oil flows from the hole.
5. Install the plug (1) and tighten it.
 - Tightening torque: 80 N·m (59.3 ft-lb.)



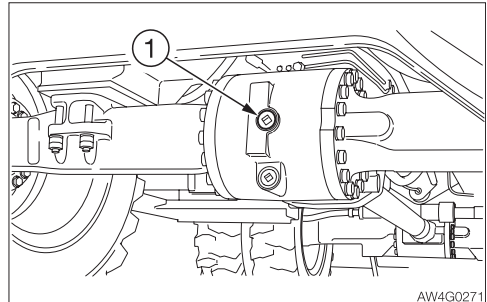
INSPECTING THE DIFFERENTIAL GEAR OIL

WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The differentials are hot immediately after the engine is stopped. Touching them will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped.
- Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- The pressure in the gear case of differentials may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

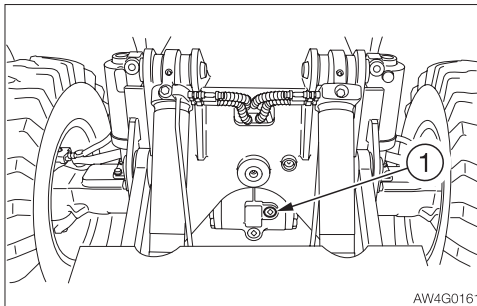
1. Park the machine on a level surface and stop the engine.

<Rear>



2. Remove the plug (1).
3. If oil is left on your finger when it is inserted through the hole, the oil level is proper.
4. If the level is too low, add oil through the hole of the plug (1) until the oil flows from the hole.
5. Install the plug (1) and tighten it.
 - Tightening torque: 50 N·m (36.9 ft-lb.)

<Front>





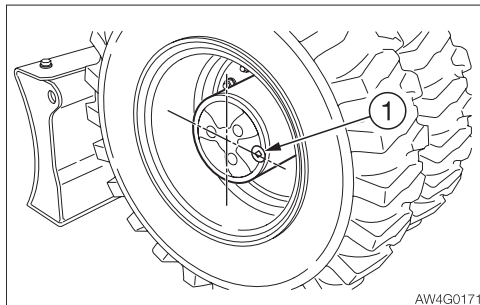
INSPECTING THE HUB GEAR OIL



WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The hubs are hot immediately after the engine is stopped. Touching them will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped.
Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- The pressure in the reduction gear case of hubs may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

1. Park the machine on a level surface and stop the engine.
2. Set the hub so that the plug (1) is in a level position.



3. Remove the plug (1).
4. If oil is left on your finger when it is inserted through the hole, the oil level is proper.
5. If the level is too low, add oil through the hole of the plug (1) until the oil flows from the hole.
6. Install the plug (1) and tighten it.
 - Tightening torque: 50 N·m (36.9 ft·lb.)



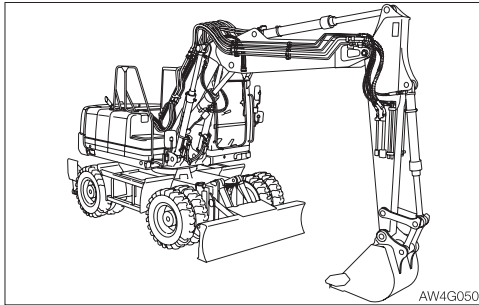
LUBRICATING THE SLEW BEARING



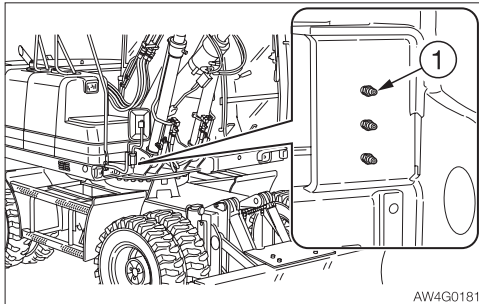
WARNING

Do not slew while lubricating. Doing so is dangerous, as you may get caught in the machine.

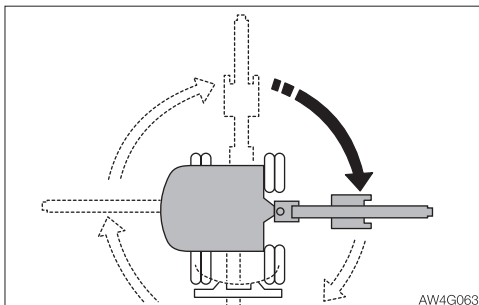
4. Lower the bucket to the ground, and then stop the engine.
5. Repeat the steps 2 to 4 above three times.
6. Wipe off the grease expelled from the slew bearing and grease fitting.



1. Stop the engine with the machine in the posture shown on the figure above.



2. Use the grease gun to grease the grease fitting (1).



3. Start the engine, lift the bucket and slew clockwise 90°.

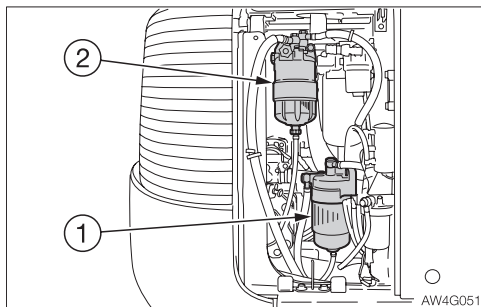


REPLACING THE FUEL FILTERS



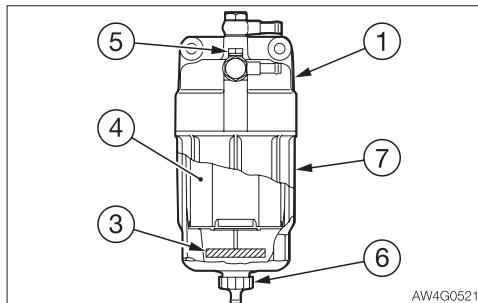
WARNING

- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.
- Clean up spilled fuel immediately.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.



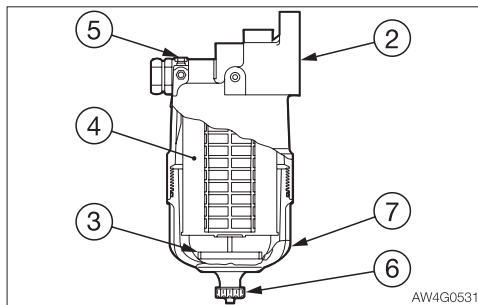
1. Open the right side cover.

Pre-fuel filter



2. Place a pan under the pre-fuel filter (1) to catch fuel.
3. Loosen the vent plug (5) and the drain plug (6) to drain the fuel inside.
4. Remove the case (7) by using a filter wrench.
5. Replace the seals with new ones and lubricate the new seals with diesel fuel.
6. Put the new element (length of 150 mm / 5.9 in) (4) in the case (7) and install by hand until the seal makes contact with the sealing surface.
7. Tighten the case (7) with the filter wrench.
 - Tightening torque: 30 N·m (22.1 ft-lb)
8. Bleed air.
Refer to "Bleeding air from the fuel system" on page 6-10.

Main fuel filter



2. Place a pan under the main fuel filter (2) to catch fuel.
3. Loosen the vent plug (5) and the drain plug (6) to drain the fuel inside.



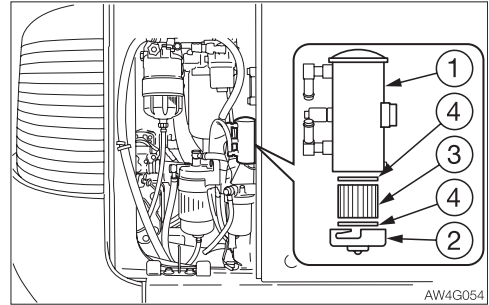
4. Remove the case (7) by using a filter wrench.
5. Replace the seals with new ones and lubricate the new seals with diesel fuel.
6. Put the new element (length of 131 mm / 5.2 in) (4) in the case (7) and install by hand until the seal makes contact with the sealing surface.
7. Tighten the case (7) with the filter wrench.
 - Tightening torque: 29.4 N·m (21.7 ft-lb)
8. Bleed air.
Refer to “Bleeding air from the fuel system” on page 6-10.

REPLACING THE FEED PUMP FILTER



WARNING

- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.
- Clean up spilled fuel immediately.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.



2. Place a pan under the feed pump (1) to catch fuel.
3. Remove the cover (2).
4. Remove the element (3) and gaskets (4).
5. Install the new element and gaskets.
6. Install the cover (2).
7. Bleed air.
Refer to “Bleeding air from the fuel system” on page 6-10.

1. Open the right side cover.



INSPECTING AND CLEANING THE SUPPLY PUMP STRAINER

WARNING

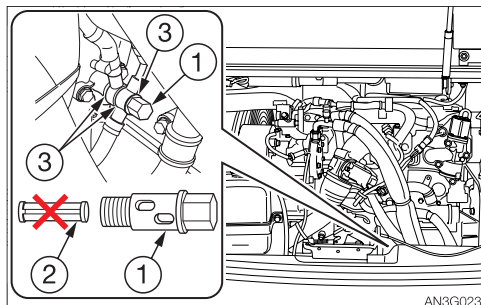
- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.
- Clean up spilled fuel immediately.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

When cleaning, do not remove the strainer (2) from the joint bolt. (Disassembly prohibited)

If the dirt is persistent or the joint bolt is clogged, replace the joint bolt with the strainer in it.

5. Arrange the joint bolt (1), hose and the new packing (3) together, and then install them on their original positions.
 - Joint bolt (1) tightening torque: 14.6 to 24.6 N·m (11 to 18 ft-lb)
6. Bleed air.
Refer to “Bleeding air from the fuel system” on page 6-10.

Note: Replace the supply pump strainer (integrated with the joint bolt), if the “lowered output” or “engine stopping” cannot be corrected after replacing the fuel filter element. When replacing the strainer, replace the packing on both sides of the hose with the new one at the same time.



1. Open the engine hood.
2. Place a pan under the joint bolt (1) to catch fuel.
3. Loosen the joint bolt (1) and remove it.
4. Check the strainer (2) inside the joint bolt (1), and clean it if it is dirty.



EVERY 1000 HOURS

REPLACING THE HYDRAULIC OIL RETURN FILTER

Refer to “Replacing the hydraulic oil return filter” on page 5-33.

REPLACING THE PILOT LINE FILTER

Refer to “Replacing the pilot line filter” on page 5-34.

REPLACING THE SLEW MOTOR GEAR OIL

Refer to “Replacing the slew motor gear oil” on page 5-38.



CLEANING THE ENGINE COOLING SYSTEM

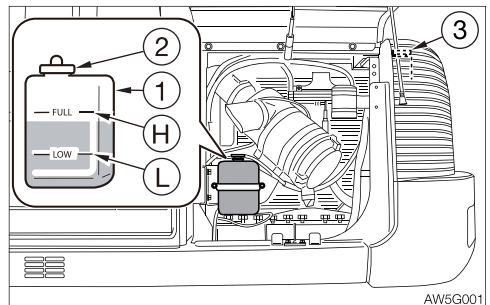
WARNING

- Stop the engine and allow the machine to cool down before performing maintenance.
 - The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
 - The engine coolant is also hot and under high pressure immediately after the engine is stopped. Be careful when loosening the caps or plugs. Working on the machine under these conditions could result in burns or injuries due to the hot coolant spurting out.
- 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.
- Standing at the back of the machine while the engine is running is extremely dangerous, as the machine could move suddenly. Never stand at the back of the machine while the engine is running.
- 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 and the drain plug to remove them.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.

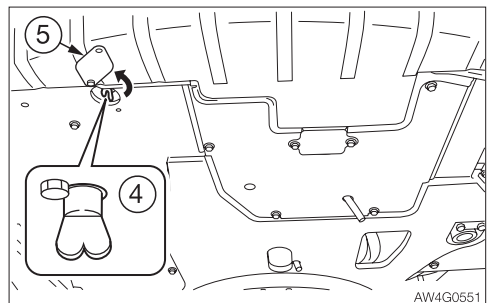
- Do not spill oil or grease.
- Do not leave tools scattered around.
- Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

When cleaning, if the temperature of the coolant is low, the thermostat will be closed and the coolant will not circulate in the radiator. Heat the coolant water to at least 90°C (194°F) before cleaning.

1. Open the engine hood.



2. Gradually loosen the radiator cap (3) to release the internal pressure, and then remove the cap.



3. Loosen the bolts and open the cover (5).



4. Place a pan for catching the waste coolant under the drain plug (4), and then loosen the drain plug (4) to drain the coolant.
5. Tighten the drain plug (4).
6. Add tap water to the radiator through the coolant fill port up to the top of the port. Take time and slowly add water, so that no air enters the radiator.
7. Close the radiator cap (3).
8. Start the engine and run it at a speed slightly above low idling. Raise the water temperature to at least 90°C (194°F), and then run the engine for about 10 minutes with the thermostat open.
9. Stop the engine, wait until the cooling water temperature becomes lower, and then remove the drain plug (4) to drain the water.
10. After draining, clean the cooling system using a cleaning agent. When using the cleaning agent, follow the instructions included with the agent.
11. Repeat the steps 5 to 9 to rinse the cooling system.
12. Tighten the drain plug (4).
13. Take time and slowly add the new coolant (mixture of antifreeze and tap water) to the radiator through the fill port until it is full.
14. Close the radiator cap (3).
15. Warm up the engine. Use the meters to check that there are no irregularities in the cooling system at this time.
16. Increase the water temperature to at least 90°C (194°F). Then, run the engine for about 10 minutes with the thermostat kept open.
17. Stop the engine, wait until the cooling water temperature becomes lower, and then check the level of coolant in the radiator.
If necessary, add cooling water until the radiator is full.
18. Close the radiator cap (3) and the cover (5).
19. Clean the interior of the reserve tank (1), and then add coolant to the upper limit (H).
20. When the coolant has been replaced, inspect the coolant level once again after operating the machine.
Once the machine is operated, the coolant is distributed throughout the entire system, resulting in the lower coolant level.
Replenish the cooling water that has been used.



REPLACING THE AIR CLEANER ELEMENT



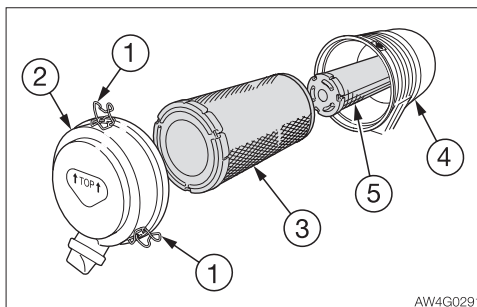
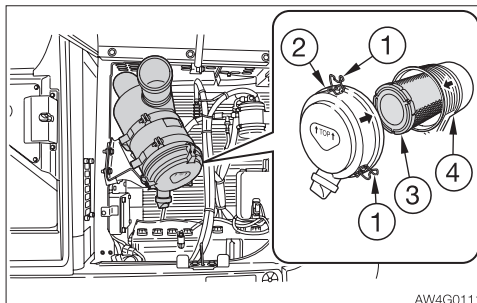
WARNING

- Stop the engine and allow the machine to cool down before performing maintenance.
 - The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

IMPORTANT: Do not use an element if its pleats, gaskets or seals are damaged.

IMPORTANT: Be sure to install the element and dust cap securely. If not, dust could be drain into the cylinder, damaging the engine.

1. Open the left side cover.



2. Loosen the clamps (1) and remove the dust cup (2).
3. Clean the inside of the dust cup (2).
4. Remove the primary element (3).
5. Clean the inside of the body (4).
6. Remove the secondary element (5).
7. Install the new elements.
8. Install the dust cup (2) with its "↑ TOP ↑" mark facing up or by aligning the arrows "→/←", and then fasten it with the clamps (1).

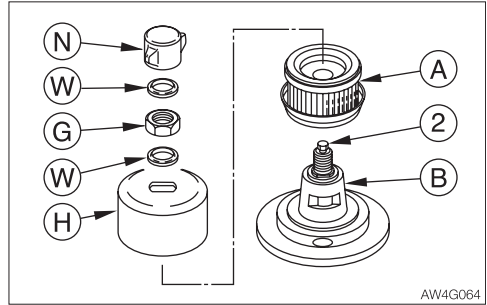


REPLACING THE AIR BREATHER FILTER



WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The engine, the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
 - The hydraulic oil is 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.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine.
Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.
 - Press the air breather button to relieve the internal pressure from the tank.



1. Remove the cap nut (N).
2. Press the button (2) to relieve the internal pressure from the tank.
3. Remove the seal washer (W) and the nut (G).
4. Remove the cover (H).
5. Install the filter (A) paying attention to the sides (top and bottom).
6. Install the body (B) and the cover (H) by aligning their notches.
7. Install the seal washer (W) and the nut (G).
8. Securely tighten the cap nut (N) by hand.



INSPECTING AND ADJUSTING THE ENGINE VALVE CLEARANCE

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE ENGINE COMPRESSION PRESSURE

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND CLEANING THE ENGINE STARTER AND THE ALTERNATOR

This operation requires experience. Ask your sales or service dealer for it.



EVERY 1500 HOURS

INSPECTING, CLEANING AND CHECKING OPERATION OF THE ENGINE FUEL INJECTORS

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND REPLACING THE AIR FILTER CASE FOR CRACKING

This operation requires experience. Ask your sales or service dealer for it.



EVERY 2000 HOURS

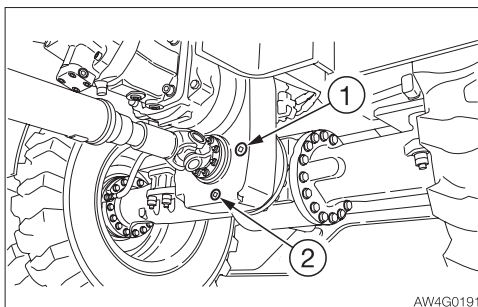
REPLACING THE TRANSMISSION GEAR OIL



WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The transmission is hot immediately after the engine is stopped. Touching it will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped.
Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- The pressure in the reduction gear case of transmission may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

1. Park the machine on a level surface and stop the engine.



2. Place a pan under the plug (2) to catch the waste oil.
3. Remove the plug (2) and drain the oil.
4. Tighten the plug (2).
 - Tightening torque: 80 N·m (59.3 ft-lb.)
5. Add oil through the hole of the plug (1) until the oil flows from the hole.
6. Tighten the plug (1).
 - Tightening torque: 80 N·m (59.3 ft-lb.)



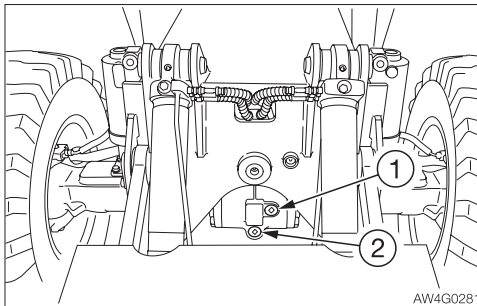
REPLACING THE DIFFERENTIAL GEAR OIL

WARNING

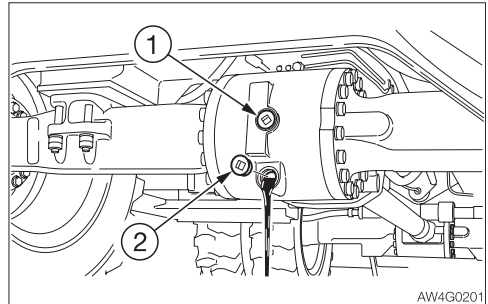
- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The differentials are hot immediately after the engine is stopped. Touching them will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped.
- Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- The pressure in the gear case of differentials may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

1. Park the machine on a level surface and stop the engine.

<Front>



<Rear>



2. Place a pan under the plug (2) to catch the waste oil.
3. Remove the plug (2) and drain the oil.
4. Tighten the plug (2).
 - Tightening torque: 50 N·m (36.9 ft-lb.)
5. Add oil through the hole of the plug (1) until the oil flows from the hole.
6. Tighten the plug (1).
 - Tightening torque: 50 N·m (36.9 ft-lb.)

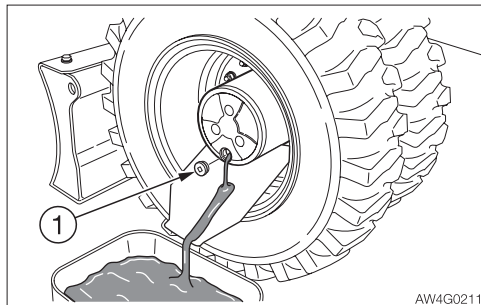


REPLACING THE HUB GEAR OIL

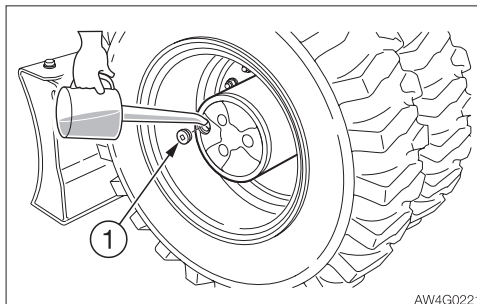
WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The hubs are hot immediately after the engine is stopped. Touching them will cause burns.
 - The gear oil is also hot and under high pressure immediately after the engine is stopped. Be careful not to touch the oil when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- The pressure in the reduction gear case of hubs may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

1. Set the hub so that the plug (1) is directly below the hub.
2. Park the machine on a level surface and stop the engine.



3. Place a pan under the plug (1) to catch the waste oil.
4. Remove the plug (1) and drain the oil.



5. Set the hub so that the plug (1) is in a level position.
6. Add oil through the hole of the plug (1) until the oil flows from the hole.
7. Tighten the plug (1).
 - Tightening torque: 50 N·m (36.9 ft-lb.)



EVERY 4000 HOURS

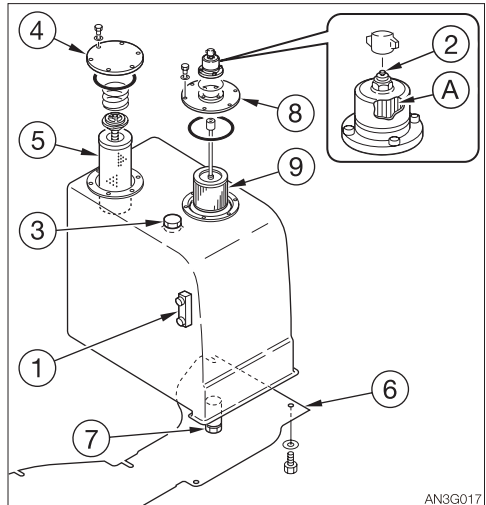
REPLACING THE HYDRAULIC OIL AND CLEANING THE SUCTION STRAINER



WARNING

- Stop the engine and allow each part of the machine to cool down before performing maintenance.
 - The engine, the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
 - The hydraulic oil is 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.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.
 - 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.

1. Slew 45° clockwise and set the machine to the hydraulic oil level inspection posture.
Refer to “Inspecting the hydraulic oil level and replenishing” on page 5-24.



2. Press the button (2) to relieve the internal pressure from the tank.
3. Replace the air breather filter (A).
Refer to “Replacing the air breather filter” on page 5-60.
4. Remove the plug (3).
5. Loosen the bolts and remove the flange (4).
6. Remove the return filter (5).
7. Loosen the bolts and remove the under cover (6).
8. Place a pan under the plug (7) to catch the waste oil.
9. Loosen the drain plug (7) and drain the hydraulic oil.
10. Loosen the bolts and remove the flange (8).
11. Remove the suction strainer (9) and clean it.
12. Clean the inside of the hydraulic oil tank.
13. Install the suction strainer (9) on the tank and then install the flange (8).
14. Install the new return filter (5) and the flange (4) on the tank.

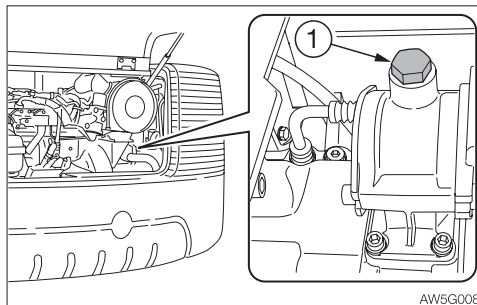


15. Tighten the drain plug (7).
16. Add hydraulic oil from the hole of plug (3) up to the level between the upper limit (H) and the lower limit (L) in the sight gauge (1).
17. Tighten the plug (3).
18. Bleed air from the hydraulic oil circuit following "Bleeding air" below.
19. Set the machine to the hydraulic oil level inspection posture and inspect the oil level after the oil cools.
Refer to "Inspecting the hydraulic oil tank level and replenishing" on page 5-24.
20. Tighten the under cover (6).

Bleeding air

IMPORTANT: After replacing the hydraulic oil or hydraulic devices, or after performing maintenance of the hydraulic devices, bleed air from the hydraulic circuits and hydraulic devices. Failure to do so may damage the hydraulic devices.

• Hydraulic pump



1. Open the engine hood.
2. Loosen the vent plug (1) on the hydraulic pump.
3. Once hydraulic oil overflows from the vent plug hole (1), tighten the vent plug (1).

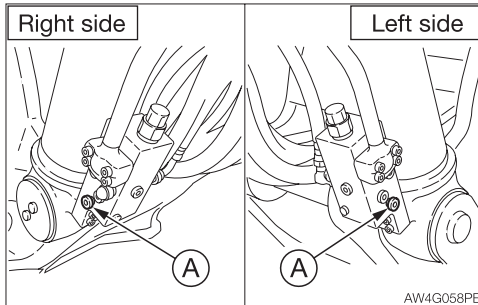
If the boom or arm does not move normally, air may be present in the following locations. This operation is dangerous and requires experience. Ask your sales or service dealer for help.



• Emergency shut-off valve

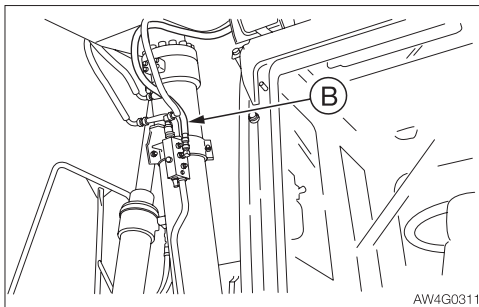
1. Place a pan under the plugs (A) or hose (B) to catch the waste oil.
2. Start the engine and run it at low idle.
3. Fully lower the safety lock lever to the unlock position.

Boom

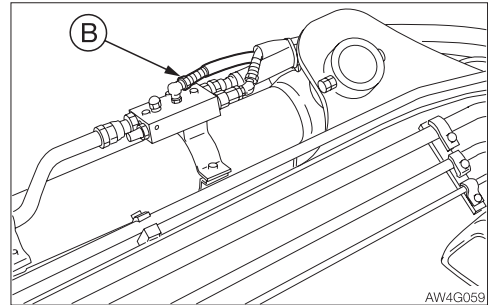


4. Loosen the plugs (A / PIL) slowly.
5. Slowly move the right operating lever fore and aft a little until there are no more air bubbles coming out of the plug hole (A).
6. Tighten the plugs (A).

Second boom



Arm



4. Loosen the hose (B) slowly.
5. Slowly move the right operating lever fore and aft a little until there are no more air bubbles coming out of the hose (B) connecting part.
6. Tighten the hose (B).

• Slew motor and cylinders

1. Start the engine, let it run at a low-idling speed for 10 minutes.
2. Maintain the engine at low idle, then extend and retract each cylinder 4 or 5 times, without letting them reach the stroke end.
3. Slew slowly left and right several times.
4. Run the engine at high speed, then extend and retract each cylinder 4 or 5 times, without letting them reach the stroke end.
5. Slew left and right several times.
6. Return the engine speed to low idle, then extend and retract each cylinder 4 or 5 times to the stroke end.



EVERY 4500 HOURS

INSPECTING THE TURBOCHARGER (BLOW WASH AS NECESSARY)

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND CLEANING THE EGR VALVE

This operation requires experience. Ask your sales or service dealer for it.

CLEANING THE EGR COOLER

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND MAINTENANCE THE DPD OR ITS RELATED PARTS

- Do not modify the DPD without permission. If modified, it may be damaged or malfunction may occur. As a result, an expensive repair work may be required.
- Do not reuse the DPD that has been dropped to the ground. There is catalyst fitted inside the DPD. It can be damaged if strong shocks are applied to it.

INSPECTING THE ENGINE CONTROLLER (ECM)

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND CLEANING THE INJECTOR

This operation requires experience. Ask your sales or service dealer for it.



WHEN REQUIRED

REPLACING THE BUCKET TEETH AND THE SIDE CUTTERS

Replace the bucket teeth if the tooth points are worn. Do not wait until the bucket is damaged.

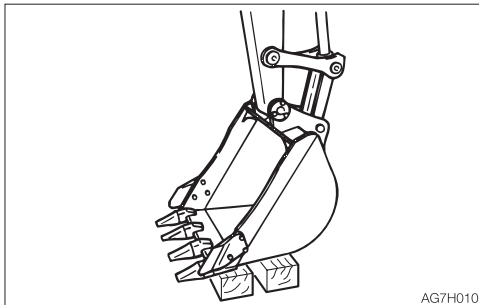


WARNING

- Before performing maintenance or repairs under the machine, lower all moveable working equipment to the ground or in the lowermost position.
- To prevent unexpected movement, firmly secure the working equipment when repairing or replacing the bucket teeth or side cutter.
- 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.
- Do not allow unauthorized personnel in the work area while working.

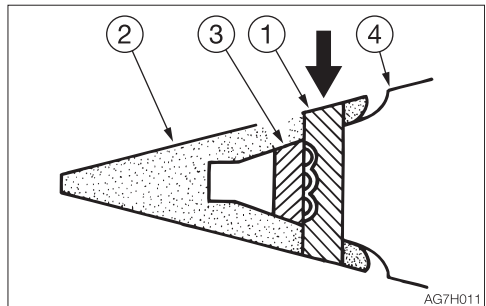
Removing

1. Clean the bucket and park the machine on a flat and rigid ground.



2. Place the bucket with its bottom flat on the blocks so that the locking pin can be knocked out.

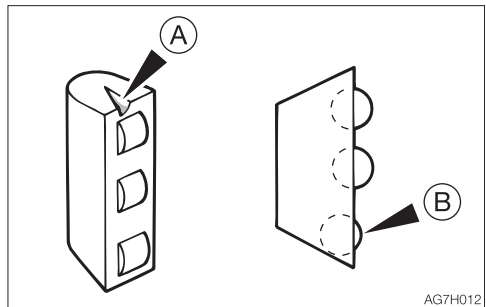
3. Remove the key, and then check that the bucket is stable.



4. Knock out the locking pin (1) and remove the point (2).

Note: If the drift is set against rubber pin lock (3) when it is hit, the rubber pin lock may break. Set it against the back of the locking pin.

5. Remove the rubber pin lock (3). Check if the rubber pin lock is still usable. Replace it if it is as follows.

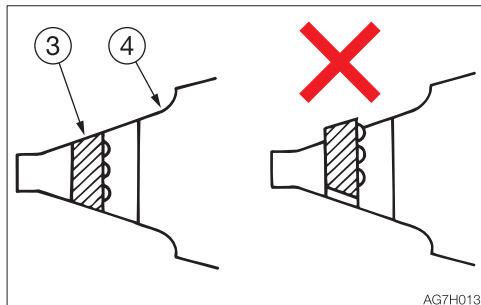


AThere are cracks in the rubber and the roller is coming off.

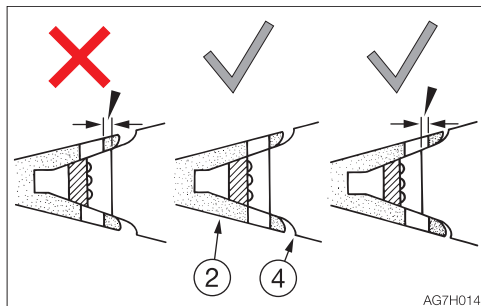
BThe roller is dented when pressed with a finger.



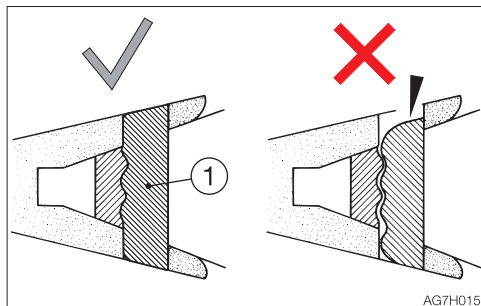
Installation



1. Remove the dirt on the surface of adaptor and the inner part of tooth, make the better contact on the mating part.
2. Push rubber pin lock (3) into the welding adaptor (4).
Do not let the rubber pin lock stick out from the welding adaptor surface.

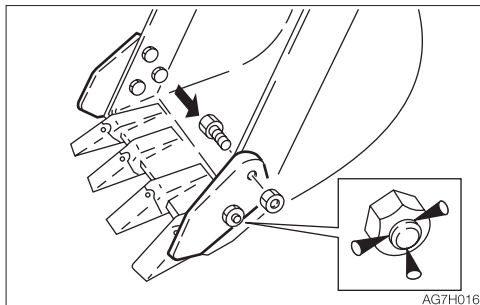


3. Install the point (2) onto the welding adaptor (4).
Insert the point so that the surface behind the point's pin hole is aligned with the surface behind the welding adapter's pin hole.



4. Knock out the locking pin (1).
Check that the end surfaces of the locking pin just knocked out are aligned with the upper and lower surface of the point. Do not use the worn locking pin.
The life of the teeth can be lengthened and the frequency of its replacement can be reduced by turning it upside down so that it will wear evenly.
Replace the rubber pin lock and locking pin at the same time as replacing the teeth. This makes it possible to prevent the teeth from falling out

• Side cutter Installation



1. Insert the bolts from the inner of the bucket and tighten the side cutter with nuts.
Tightening torque: 475 N·m (350 ft·lb)
2. Caulk the bolts with a punch at three spots along the periphery of the screw to prevent the nuts from coming loose.



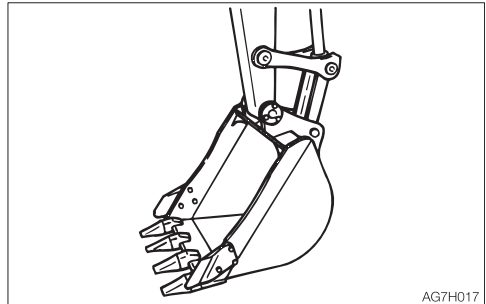
REPLACING THE BUCKET



WARNING

- Before performing maintenance or repairs under the machine, lower all working equipment to the ground or in the lowermost position.
- 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.
- 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.
- When aligning the pin holes, always do so by checking them visually. Do not insert your finger in the pin hole, or you could lose your finger.

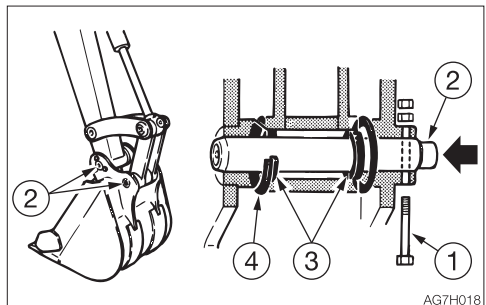
Removing



1. Lower the bucket to the ground as shown on the figure above in a stable position.

Note: When removing pins, set the bucket so that it is barely touching the ground. If the bucket is firmly touching the ground, the resistance will be great and it will be difficult to remove the pin.

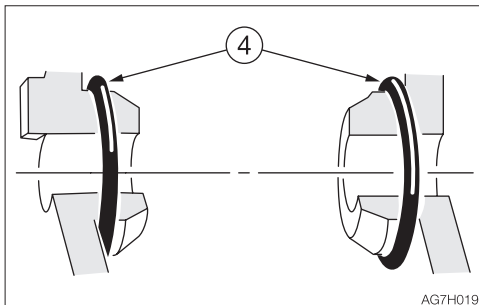
2. Set the safety lock lever to the locked position and stop the engine.



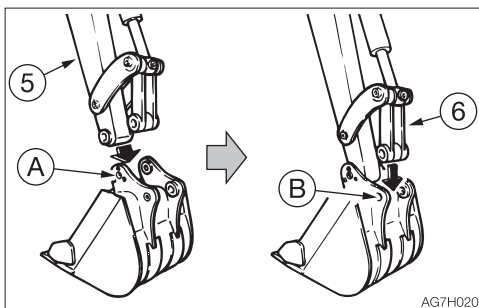
3. Remove the bolt (1).
4. Hammer the pin (2) out of the bucket.
5. Remove the bucket.
Inspect the pin seal (3) and replace it if it is deformed or damaged. (See next page.)



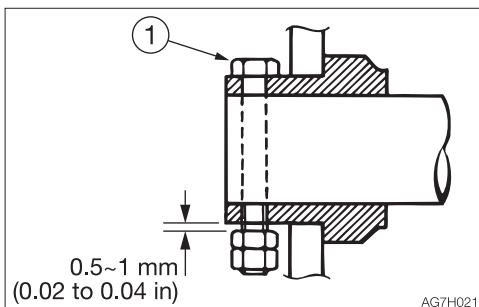
Installation



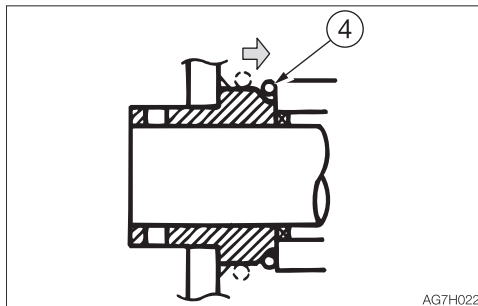
1. Set the O-ring (4) on the bucket as shown on the figure above.



2. Align the pin hole (A) on the bucket with the pin hole on the arm (5), and install the pin (2).
3. Operate the cylinder, align the pin hole (B) on the bucket with the pin hole on the link arm (6), and install the pin (2).



4. Align the turn prevention holes, and then install the bolt (1) and the nut. Be sure to leave a gap of about 0.5 to 1 mm (0.02 to 0.04 in.) between the nut and bucket bush, or the nut will come loose.

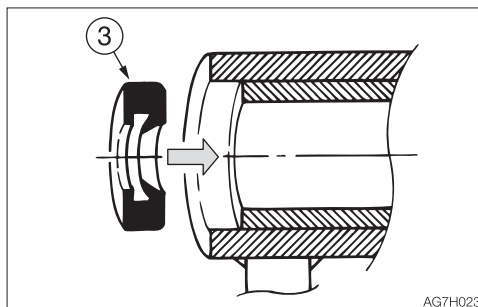


5. Adjust the gap between the bucket and the arm.

Refer to "Adjusting the gap between the bucket and arm (If equipped)" on page 5-74.

6. Slide the O-ring (4).

Replacing the pin seal



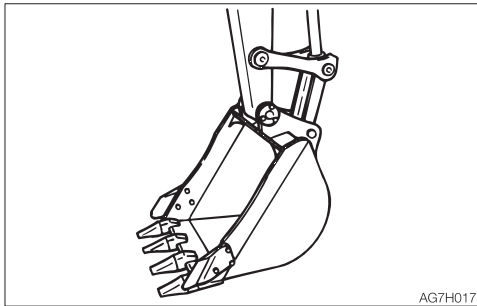
1. Set the pin seal (3) in the direction shown on the figure above.
2. Use a mallet to slowly press the pin seal in. Be careful not to damage the seal.



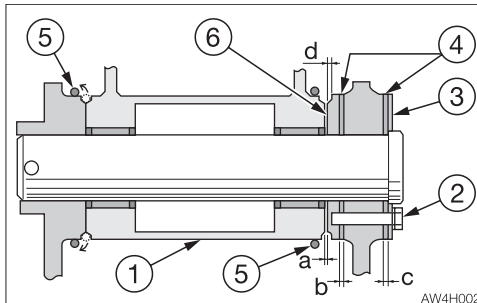
ADJUSTING THE GAP BETWEEN THE BUCKET AND ARM (IF EQUIPPED)

WARNING

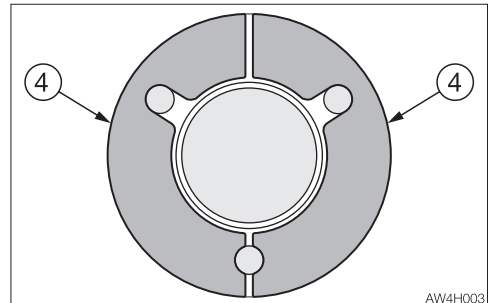
- Before performing maintenance or repairs under the machine, lower all working equipment to the ground or in the lowermost position.
- To prevent unexpected movement, securely block the working equipment when adjusting the gap.



1. Lower the bucket to the ground in a stable position as shown in the figure above.
2. Slew the upperstructure slightly to the left and lightly press the arm to the left side of the bucket (the side without an adjuster).
3. Set the safety lock lever to the lock position and stop the engine.



4. Slightly loosen the 3 bolts (2) (using a 22 mm (0.87 in) wrench) and remove the shims (4) from "gap c" between the blade (3) and bucket. The shims (4) are in two parts and can be removed easily when the bolts are slightly loosened by sticking a screwdriver in the seam between the left and right shims.
5. Move the O-ring (5) to bring the gap (a) into view and measure the width of the gap (a).



6. Press the head of the bolts (2) with a finger to eliminate gap (a). This increases gap (b). Insert the shims removed above into gap (b), using as many shims as can be inserted easily.
7. Set the remaining shims back in gap (c), then tighten the bolts. Tightening torque : 83 N·m (61.5 ft-lb). This completes the adjustment.

Note: The proper total number of shims for gaps (b) and (c) is $6 \times 2 = 12$. If you forget to set the shims remaining in step 7 above back in gap (c), the tip of bolts (2) will extend past the boss (6). This may damage the boss at the arm's tip or cause the bolt to break. If the end face of boss (6) wears and the width of the groove (d) for the O-ring reaches 5 mm (0.2 in), replace boss (6) with a new one.



INSPECTING AND REPLENISHING THE WINDSHIELD WASHER FLUID

WARNING

- Choose ethyl alcohol as washer solution.
Do not use methyl alcohol as washer solution. It could damage the eyes.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

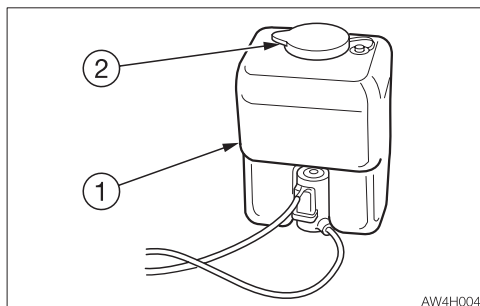
Use a windshield washer fluid designed specifically for motor vehicles. Follow the instructions included with the washer fluid.

Inspection

1. Open the left side cover.
2. Inspect the washer tank (1) and add washer fluid if the level is low.

Replenishing

1. Mix the washer fluid to the prescribed concentration.
2. Remove the cap (2) and add washer fluid. Keep the dust away while replenishing the washer fluid.
3. Install the cap (2).





DRAINING THE WATER FROM THE WATER SEPARATOR

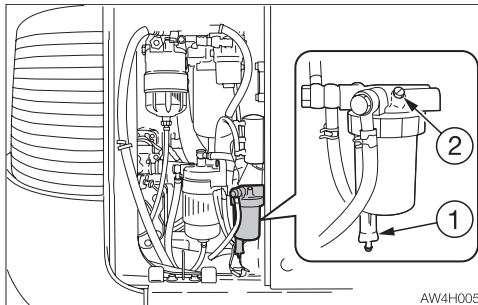
WARNING

- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.
- Clean up spilled fuel immediately.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

If the water does not drain easily, loosen the plug (2).

4. Close the drain valve (1) and tighten the plug (2).

Refer to “Bleeding air from the fuel system” on page 6-10.



1. Open the right side cover.
2. Place a pan under the drain valve (1) to catch fuel.
3. Open the drain valve (1) and drain the water.



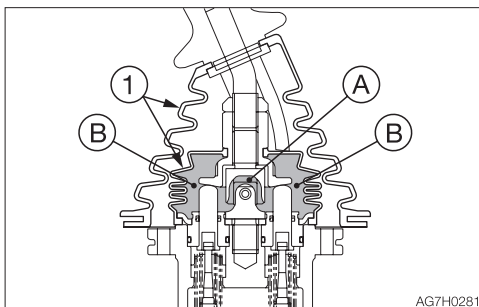
LUBRICATING THE LEVERS AND PEDAL

WARNING

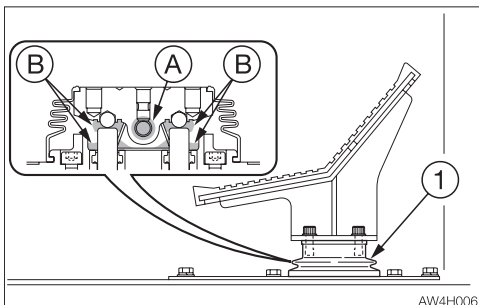
Set the machine to the parking posture, stop the engine, remove the starter key and store it. Failure to do so may result in the machine moving abruptly, leading to serious injury or death.

If the levers or pedals no longer move smoothly, grease them.

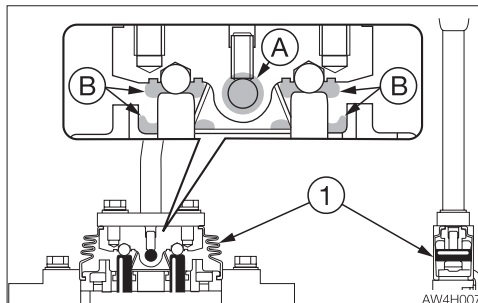
Operating levers



Second boom pedal



Dozer blade lever



1. Remove the lower mount section of the boot (1) and turn it upward.
2. Wipe off the old grease.
3. Apply grease to points (A) and (B).
4. Set the boot (1) back as it was.



EVERY 2 YEARS

REPLACING THE RECEIVER DRYER

This operation requires experience. Ask your sales or service dealer for it.



MAINTENANCE DURING EXTENDED STORAGE PERIOD

Storage procedures

If the machine is to be stored for 30 days or more, store it indoors. If it must be stored outdoors, park the machine on a surface laid with lumber on a flat ground, and place a waterproof cover over it so that it stays dry.

1. Clean the machine.
2. Inspect for oil leakage, water leakage, cracks and loose nuts and bolts.
3. Add fuel and replace the hydraulic oil and oil.
4. To prevent rusting and freezing, replace the engine coolant with long-life coolant (LLC).
Refer to "Cleaning the engine cooling system" on page 5-57.
5. Use the grease gun to lubricate the grease fittings.
6. Fully retract the bucket and arm cylinders and lower the bucket and dozer blade to the ground.
7. Apply rust-inhibiting oil to the hydraulic cylinder rods.
8. Disconnect the negative cable from the battery and cover the battery to prevent freezing.

During storage



WARNING

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

1. To prevent rusting, operate the machine once a month so that the oil can be circulated throughout the system.
2. Inspect the battery and recharge it as necessary.
Ask your sales or service dealer for recharging.

Starting the machine after storage

IMPORTANT: If the above "Storage procedures" have not been followed during the extended storage periods, consult your sales or service dealer before starting the machine again.

1. Wipe off the rust-inhibiting oil that was applied on the piston rods of the hydraulic oil cylinders.
2. Add oil or grease as necessary.

Returning the engine to service

1. Perform the daily checks.
2. The engine should be pre-oiled before startup.
 - a. Crank the engine, leaving the fuel system shut off so the engine will not start, for 15 seconds.
 - b. Then pause for 30 seconds.
 - c. Repeat the procedure until you have cranked the engine for a total of one minute. This will circulate the oil in the engine's lubrication system.
3. Prime the fuel system.
4. Start the engine. Allow the engine to idle for approximately 15 minutes while you check for:
 - Proper oil pressure
 - Fuel, engine oil or coolant leaks
 - Proper operation of the indicators and/or gauges
5. Avoid prolonged operation at minimum or maximum engine speeds and loads for the remainder of the first hour of operation.

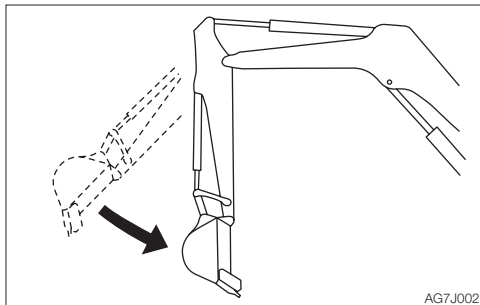
TROUBLESHOOTING





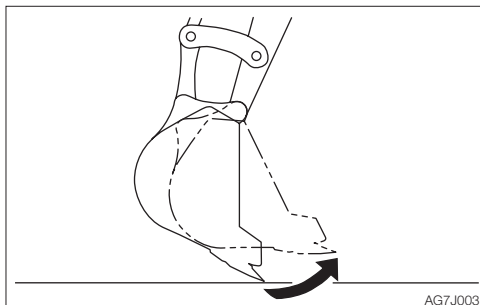
SYMPTOMS THAT ARE NOT MALFUNCTIONS

The symptoms listed below are not malfunctions.



AG7J002

- The arm retracting speed momentarily slows down when it reaches an almost vertical position while the engine is running at low speed.



AG7J003

- It becomes less easy to operate the machine when an attachment weighing more than a standard arm or bucket is installed.
 - In some cases smoke may be emitted from the tail pipe while the DPD regeneration is being performed. This is not a failure; it is due to burning of the particulate matter (PM).
 - In some cases the noise associated with the DPD regeneration operation or cancel operation may change; this is not a failure.
- The bucket teeth moving speed momentarily slows down when it reaches an almost horizontal position while the engine is running at low speed.
 - The slew motor produces noise at the beginning and end of the slewing.
 - The travel motor produces noise when stopped suddenly from its high speed traveling.
 - The control valve produces noise if excessive force is applied to the working equipment or when it moved to the stroke end.

MEMO

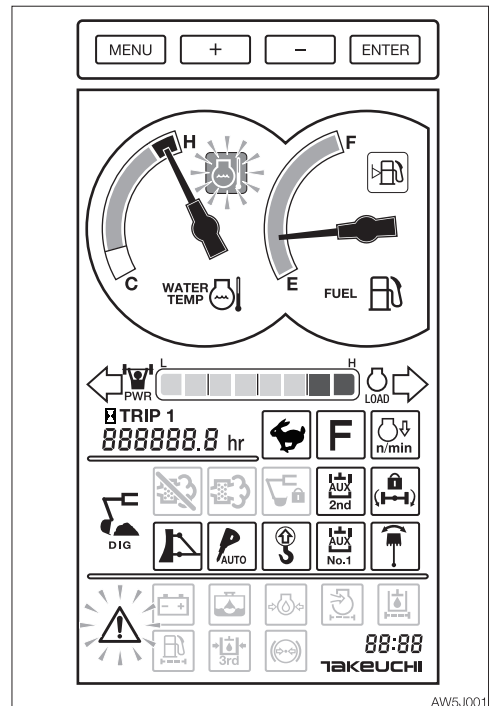


IF THE ENGINE OVERHEATS

WARNING

- Do not open the engine hood when steam is coming from it. The steam or hot water may spurt out and cause burns.
- Do not remove the radiator cap or the drain plug when the coolant is hot. Stop the engine and wait until the engine and the radiator cool. Then, slowly loosen the radiator cap to release the internal pressure.
- Before performing maintenance, stop the engine and allow the machine to cool down.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
 - Do not spill oil or grease.
 - Do not leave tools scattered around.
 - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).
- Do not stand on the dozer blade and perform maintenance work. Doing so is dangerous because of the unsteady foothold. Use the work bench.

The symptoms listed below indicate overheating.



- An alarm is sounded and the vehicle/engine emergency lamp and the coolant temperature warning lamp start flashing.
- The water temperature gauge needle is in the red zone.
- Steam comes from the engine room.



IF THE ENGINE OVERHEATS

Remedy procedure

1. Park the machine in a safe place.
2. Check if steam is coming out of the closed engine hood.
3. If there is steam, stop the engine immediately and contact your sales or service dealer for repair. If steam is not coming out run the engine at low idle and let the water temperature cool down.
4. When the water temperature gauge needle drops in the green zone, stop the engine.
5. Perform the inspections and the remedies listed below once the engine cools down.
 - V belt slack Adjust
Refer to page 5-30.
 - Coolant level Add
Refer to page 5-20.
 - Water leakage Repair
 - Radiator fins Clean
Refer to page 5-42.
 - Sediment in cooling system
..... Clean
Refer to page 5-57.

If the problem persists after the above remedies, contact your sales or service dealer for repair.



IF THE BATTERY GOES DEAD

The symptoms below indicate that the battery is dead.

- The starter motor does not turn or fails to start the engine.
- The horn is too weak.

Remedy procedure

Start the engine using the booster battery on the other vehicle (booster vehicle) and the jumper cables.



WARNING

- When starting the engine using the jumper cables, be sure to connect the cables by following the proper steps. Improper use of jumper cables can result in battery explosion or unexpected machine motion.
 - Do not allow the booster vehicle and the machine with a dead battery (dead machine) to touch each other.
 - Do not allow the positive (+) and the negative (-) clips of the jumper cables to touch each other.
 - When connecting, attach the jumper cable to the positive (+) terminals first. When disconnecting, remove the cable from the negative (-) terminal (ground) first.
 - Connect the last clip of the jumper cable to a point as far away from the battery as possible.
- Always wear the protective goggle when jump starting the engine by using the jumper cables.

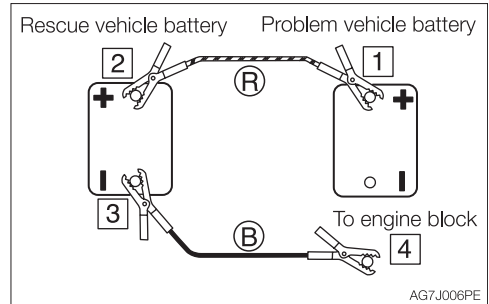
IMPORTANT: Use the jumper cables and clips of a size suited to the capacity of battery. Do not use damaged or corroded jumper cables and clips.

IMPORTANT: Be sure that the battery of the booster vehicle has the same capacity as the battery of the dead machine.

IMPORTANT: Be sure to connect the clips securely.

Connecting the jumper cables

IMPORTANT: Set the starter keys of the booster vehicle and the dead machine to the OFF position.



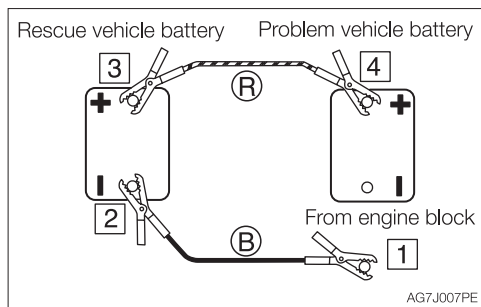
1. Connect the clip of jumper cable (R) to the positive (+) battery terminal of the dead machine.
2. Connect the other clip of jumper cable (R) to the positive (+) battery terminal of the booster vehicle.
3. Connect the clip of jumper cable (B) to the negative (-) battery terminal of the booster vehicle.
4. Connect the other clip of jumper cable (B) to the engine block of the dead machine. Connect the clip to a place as far from the battery as possible.

Starting the engine

1. Check that the clips are securely connected to the terminals.
2. Start the engine of the booster vehicle and run it at high speed.
3. Start the engine of the dead machine.

**IF THE BATTERY GOES DEAD****Disconnecting the jumper cables**

Once the dead machine is successfully running, remove the jumper cables by following the same steps as for connection in the reverse order.



1. Disconnect the clip of jumper cable (B) from the engine block of the dead machine.
2. Disconnect the other clip of jumper cable (B) from the negative (-) battery terminal of the booster vehicle.
3. Disconnect the clip of jumper cable (R) from the positive (+) battery terminal of the booster vehicle.
4. Disconnect the clip of jumper cable (R) from the positive (+) battery terminal of the dead machine.

Recharging

Ask your sales or service dealer for recharging the dead battery.



IF A FUSE BLOWS

If a light does not come on or the electrical system does not work, a fuse may be blown. Inspect the fuses.

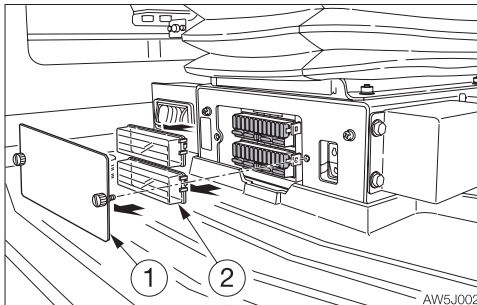
INSPECTING AND REPLACING THE FUSE



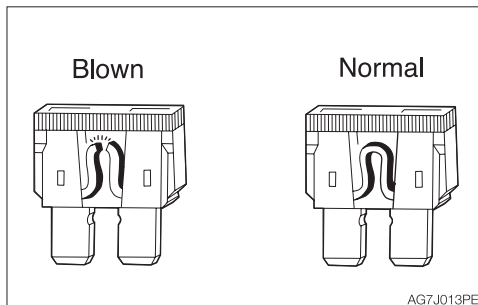
WARNING

If the fuse blows again soon after replacement, then the electric system is likely faulty. It may pose a fire hazard if not properly repaired. Contact your sales or service dealer for advice.

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



2. Open the fuse box covers (1) and (2).
3. Inspect for blown fuses.



4. If a fuse is blown, replace it with a spare fuse of the same capacity.

Fuse layout and circuits protected

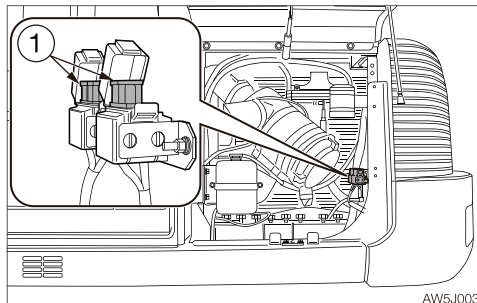
Capacity	Symbol	Protected circuit
10A		Head light low Beam (2)
10A		Head light low Beam (1)
3A		Position lamps (3)
10A		Turn Signal (3)
10A		Turn Signal (2)
10A		Starter switch
10A		Brake lamp /Reverse light
20A		Head light high Beam (2)
10A		Turn Signal (1)
5A		Head light high Beam (1)
20A		Air conditioner compressor
25A		AC motor

10A		Reverse light
10A		Brake lamp
10A		Head light high Beam (4)
10A		Head light high Beam (3)

**IF A FUSE BLOWS**

Capacity	Symbol	Protected circuit
10A	ECM (2) ⚡	ECM (2) power source
25A	OPT	Option
10A	🔌	Starter switch
5A	🔒	Immobilizer power source
20A	🕒	Multi-information display
30A	CAB 🌞	Cab power supply
5A	🚰	Feed pump
10A	CTL ⚡	Controller power supply
15A	🔒	Lever lock
10A	ECM (1) ⚡	ECM (1) power source
10A	🌧️	Wiper
20A	💡	Light

3A	🚗 (2)	Position lamps (2)
5A	CAB ⚡	Cab interior power supply
10A	📢	Horn
3A	🚗 (1)	Position lamps (1)

INSPECTING THE FUSIBLE LINK

If the machine is not turned on after turning the starter switch to the ON position, the cartridge type fusible links (1) is likely blown. Open the left side cover for inspection. If the fusible link is blown, contact your sales or service dealer.

Note: Fusible links are large type fuses used in high current applications. Like a regular fuse, they act as fuses by protecting the electric components and wirings from damage caused by excessive current draw.



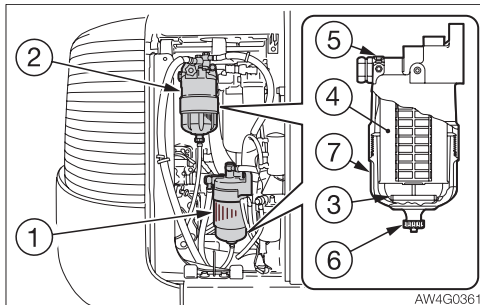
RESTARTING AFTER ADDING FUEL

BLEEDING AIR FROM THE FUEL SYSTEM

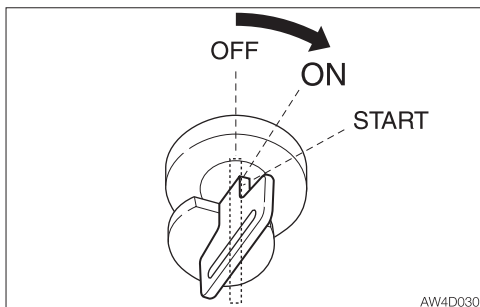
IMPORTANT: NEVER use the starter motor to crank the engine in order to prime the fuel system. This may cause the starter motor to overheat and damage the coils, pinion gear and/or ring gear.

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.

1. Add fuel.



2. Loosen the vent plug (5) of the main fuel filter (2).



3. Turn the starter key to the ON position and wait for the air to be bled from the vent plug (5).

4. Retighten the vent plug (5) when air bleeding is finished and fuel starts leaking out from around the vent plug (5).
 - Tightening torque: 8 to 12 N·m (6 to 9 ft-lb)
5. Turn and hold the starter key to the ON position for three minutes before turning it back to the OFF position.

Note: Air in the fuel system causes the engine to fail to start or to have other problems. Always bleed air when the fuel tank is emptied or when there is air in the fuel system.

MEMO



IF A WARNING LAMP FLASHES

If an alarm is sounded or a warning lamp starts flashing during operation, park the machine in a safe place and perform the remedy procedures described below.

Warning lamp	Lamp name	Causes and remedies
 AW4J007	Vehicle and engine emergency lamp	There is a problem in the machine. Refer to the respective warning lamp below. Get the vehicle or engine error code number from the multi-information display and consult your sales or service dealer referring to the “Vehicle error code list” or “Engine error code list”. Refer to “Vehicle error code list” on page 6-14. Refer to “Engine error code list” on page 6-16.
 AW4J0041	ECM error warning lamp	There is a problem in the engine. If an error code is displayed on the multi-information display, inform your sales or service dealer of the code and ask for help. Refer to “Multi-information display” on 2-16. Refer to “Engine error code list” on page 6-16.
 AG7J019	Battery charge warning lamp	There is a problem with the V-belt or charger. Check the fan belt for slack or breakage and adjust as necessary. If the lamp continues flashing after maintenance, there is likely a problem with the charger. Consult your sales or service dealer for help. Refer to “Inspecting and adjusting the V-belt” on page 5-30.
 AW4J009	Water separator warning lamp	Water is in the water separator. Drain water. Refer to “Draining the water from the water separator” on page 5-76.
 AG7J017	Engine oil pressure warning lamp	There is a problem in the engine lubrication system. Check the engine oil level. If the lamp is flashing when the level is normal or even after replenishment of oil or coolant, consult your sales or service dealer. Refer to “Inspecting and replenishing the engine oil” on page 5-21.
 AG7J020	Air cleaner warning lamp	The air cleaner is clogged. Clean it. Refer to “Cleaning the air cleaner” on page 5-43.

**IF A WARNING LAMP FLASHES**

Warning lamp	Lamp name	Causes and remedies
 AQ0J008	Fuel filter warning lamp	The fuel filter is clogged. Replace the fuel filter. Refer to “Replacing the fuel filter” on page 5-53.
 AQ0J004	Third auxiliary hydraulic warning lamp	Pressure in the third auxiliary hydraulic line is too low Consult your sales or service dealer for help.
 AW4J011	Brake oil pressure warning lamp	The brake oil pressure is too low. Consult your sales or service dealer for help.
 AG7J018	Coolant temperature warning lamp	The coolant temperature is too high and the engine is overheating. Refer to “If the engine overheats” on page 6-4.
 AW4J010	Fuel level warning lamp	The fuel level is too low. Add fuel. Refer to “Inspecting the fuel level” on page 5-23.



VEHICLE ERROR CODE LIST

If an error code appears on the display, consult your sales or service dealer.

Error code	Error details
9	Impossible to sense ACC key
19	Parameter version mismatching
402	CAN 0 communication error
502	CAN communication error (ECM)
602	CAN communication error (cluster gauge)
612	CAN communication error (MOX024)
622	CAN communication error (MIX024)
632	CAN communication error (SOX024)
642	CAN communication error (SIX024)
702	CAN communication error (HVAC)
1703	Main power supply voltage error (too high)
1704	Main power supply voltage error (too low)
1713	MOX024 power supply voltage error (too high)
1714	MOX024 power supply voltage error (too low)
1723	MIX024 power supply voltage error (too high)
1724	MIX024 power supply voltage error (too low)
1733	SOX024 power supply voltage error (too high)
1734	SOX024 power supply voltage error (too low)
1743	SIX024 power supply voltage error (too high)
1744	SIX024 power supply voltage error (too low)
2503	Sensor voltage error (too high) MMC
2504	Sensor voltage error (too low) MMC
2513	Sensor voltage error (too high) MIX
2514	Sensor voltage error (too low) MIX
2523	Sensor voltage error (too high) SIX
2524	Sensor voltage error (too low) SIX
3300	Alternator charge faulty
3401	Engine oil pressure error
3500	Overheat
3600	Air cleaner clogged
3700	Water separator alarm
3820	Hydraulic oil temp. overheat

**ERROR CODE LIST**

Error code	Error details
3825	Wire break in hydraulic oil temp. sensor
3350	Fuel filter clogged (phase 1)
3359	Fuel filter clogged (phase 2)
3360	DPD over trapping
5303	Accelerator sensor error (too high)
5304	Accelerator sensor error (too low)
5313	Foot accelerator sensor error (high pressure)
5314	Foot accelerator sensor error (low pressure)
5505	Fuel gauge resistance value error(too low)
5603	Lift alarm sensor error (too high)
5604	Lift alarm sensor error (too low)
6503	AUX1 slide switch voltage value error (too high)
6504	AUX1 slide switch voltage value error (too low)
6509	AUX1 slide switch neutral error
6519	AUX1 (L) switch error
6529	AUX1 (R) switch error
6603	AUX2 slide switch voltage value error (too high)
6604	AUX2 slide switch voltage value error (too low)
6609	AUX2 slide switch neutral error
6709	AUX3 button error (Grip)
6719	AUX3 switch error (Foot)
6809	Ram lock switch error
6819	Blade/outrigger switch error
8005	Pump PWM output voltage error (too low)
8006	Pump PWM output voltage error (too high)
8015	AUX1 (L) PWM output voltage error (too low)
8016	AUX1 (L) PWM output voltage error (too high)
8025	AUX1 (R) PWM output voltage error (too low)
8026	AUX1 (R) PWM output voltage error (too high)
8035	AUX2 (L) PWM output voltage error (too low)
8036	AUX2 (L) PWM output voltage error (too high)
8045	AUX2 (R) PWM output voltage error (too low)
8046	AUX2 (R) PWM output voltage error (too high)
8055	Fan drive PWM output voltage error (low pressure)
8056	Fan drive PWM output voltage error (high pressure)

PWM = Pulse width modulation



ENGINE ERROR CODE LIST

If an error code appears on the display, consult your sales or service dealer.

Error code		Error details	DTC
SPN	FMI		
81	0	DPD differential pressure high	P2453
	1	DPD differential pressure low	P2452
	2	Zero-point learning error in the DPD differential pressure sensor	P2456
	3	DPD differential pressure sensor error (high-voltage error)	P2455
	4	DPD differential pressure sensor error (low-voltage error)	P2454
91	3	Accelerator sensor 1 error (high-voltage error)	P2123
	4	Accelerator sensor 1 error (low-voltage error)	P2122
	2	Accelerator sensor 1-2 comparison error	P2138
	3	Accelerator sensor 2 error (high-voltage error)	P2128
	4	Accelerator sensor 2 error (low-voltage error)	P2127
100	3	Engine oil pressure sensor error (high-voltage error)	P0523
	4	Engine oil pressure sensor error (low-voltage error)	P0522
102	0	Turbo boost pressure, over	P0234
	1	Turbo boost pressure, under	P0299
	3	Boost pressure sensor error (high-voltage error)	P0238
	4	Boost pressure sensor error (low-voltage error)	P0237
105	3	Turbo boost temp. sensor error (high-voltage error)	P1113
	4	Turbo boost temp. sensor error (low-voltage error)	P1112
108	2	Barometric sensor error	P2227
	3	Barometric sensor error (high-voltage error)	P2229
	4	Barometric sensor error (low-voltage error)	P2228
110	0	Engine overheat	P0217
	2	Water temp. sensor error	P0116
	3	Water temp. sensor error (high-voltage error)	P0118
	4	Water temp. sensor error (low-voltage error)	P0117

**ENGINE ERROR CODE LIST**

Error code		Error details	DTC
SPN	FMI		
132	2	Air flow sensor error	P0101
	3	Air flow sensor error (high-voltage error)	P0103
	4	Air flow sensor error (low-voltage error)	P0102
157	3	Common rail pressure sensor error (high-voltage error)	P0193
	4	Common rail pressure sensor error (low-voltage error)	P0192
	0	Common rail pressure rise (2nd stage)	P0088
	15	Common rail pressure error (over pumping)	P0089
	16	Common rail pressure rise (1st stage)	P0088
158	3	Battery line high-voltage error	P0563
	4	Battery line low-voltage error	P0562
172	3	Air-intake temp. sensor error (high-voltage error)	P0113
	4	Air-intake temp. sensor error (low-voltage error)	P0112
173	0	Exhaust temp. sensor 1 high-temp. error (CSF inlet)	P0426
	1	Exhaust temp. sensor 1 low-temp. error (CSF inlet)	P0426
	3	Exhaust temp. sensor 1 error (CSF inlet) (high-voltage error)	P0428
	4	Exhaust temp. sensor 1 error (CSF inlet) (low-voltage error)	P0427
174	2	Fuel temp. sensor error	P0181
	3	Fuel temp. sensor error (high-voltage error)	P0183
	4	Fuel temp. sensor error (low-voltage error)	P0182
190	0	Engine overspeed	P0219
628	2	ROM error	P0601
633	7	Pressure limiter open	P0087
636	2	Cam sensor error (no signal)	P0340
	2	Cam sensor error (abnormal signal)	P0340
	7	Cam-Crank phase error	P0016
639	2	CAN timeout error	U0101
	19	CAN BusOff error	U0073
651	5	Injector #1 failure	P0201
652	5	Injector #2 failure	P0202
653	5	Injector #3 failure	P0203
654	5	Injector #4 failure	P0204
675	5	Glow lamp failure	P0381
676	5	Glow relay failure	P0380
677	5	Starter cut relay failure	P0615

**ENGINE ERROR CODE LIST**

Error code		Error details	DTC
SPN	FMI		
723	2	Crank sensor error (no signal)	P0335
	2	Crank sensor error (abnormal signal)	P0336
968	2	Idle up/down switch failure	P256A
987	5	Check engine lamp error	P0650
1077	2	CPU error	P0606
1079	2	5V power system 1 error	P0641
1080	2	5V power system 2 error	P0651
1131	3	Manifold temp. sensor error (high-voltage error)	P041C
	4	Manifold temp. sensor error (low-voltage error)	P041D
1239	1	Common rail pressure drop (no pumping)	P0093
	17	Common rail pressure drop (insufficient pumping)	P1093
	31	Common rail pressure drop (no pumping) <at low fuel temp.>	P0093
	31	Common rail pressure drop (insufficient pumping) <at low fuel temp.>	P1093
1347	3	SCV high-voltage error	P0092
	4	SCV low-voltage error	P0091
1381	3	Fuel filter clogging sensor error (high-voltage error)	P1294
	4	Fuel filter clogging sensor error (low-voltage error)	P1293
1485	5	Main relay system error (not activated)	P0685
	6	Main relay line error (not shut off)	P0687
2791	0	EGR Open faulty	P042F
	1	EGR Close faulty	P042E
	2	EGR flow rate error	P0401
10001	2	EGR position sensor error (brushless specified)	P0409
	13	EGR zero-point learning error	P1404
10002	2	EGR valve control error	P0404
10003	2	Injector com 1 error	P2146
10004	2	Injector com 2 error	P2149
10005	1	Charge circuit error (bank 1)	P1261
10006	1	Charge circuit error (bank 2)	P1262
10007	2	Sub CPU error	P0606
10008	2	A/D converter error	P060B
10009	2	5V power system 3 error	P0697
10010	2	5V power system 4 error	P1655
10012	2	12V power system error	P0560
10013	2	EEPROM error	P1621

**ENGINE ERROR CODE LIST**

Error code		Error details	DTC
SPN	FMI		
10022	2	Intake throttle control error	P0638
	3	Intake throttle position sensor error (high-voltage error)	P0123
	4	Intake throttle position sensor error (low-voltage error)	P0122
10023	3	EVRV vacuum sensor error (high-voltage error)	P2528
	4	EVRV vacuum sensor error (low-voltage error)	P2527
	20	Turbo EVRV error	P0045
10024	3	Exhaust temp. sensor 2 error (DOC inlet) (high-voltage error)	P042D
	4	Exhaust temp. sensor 2 error (DOC inlet) (low-voltage error)	P042C
10025	5	DPD lamp error	P1669
10026	0	DPD PM excessive trapping 2	P1455
	15	DPD PM excessive trapping	P242F
10027	0	DPD purification judgment error	P1471
10028	0	Exhaust temp. sensor 2 high-temp. error (DOC inlet)	P042B
	1	Exhaust temp. sensor 2 low temp. error (DOC inlet)	P042B
10029	0	DPD regeneration timeout count too many	P2458
10030	0	Starter degradation alarm	P1500
10031	2	Starter switch error	P0512
10032	2	QR code error	P0602
10033	2	RAM error	P0604
10034	2	Wheel loader CAN timeout error	U2106
10040	19	CAN bus error (ISO-CAN)	U0001



OTHER SYMPTOMS

For symptoms not included in the table below or if the problem persists after the proper remedies have been taken, consult your sales or service dealer.

Symptoms	Major causes	Action
Operating levers or pedals do not move smoothly	• Insufficient grease on the operating levers or pedals.	• Grease the levers and/or pedals. Refer to page 5-77.
Steering operation is not possible.	• Steering device is faulty	• Consult your sales or service dealer.
Operation of hoe attachment, dozer blade, auxiliary hydraulics, slewing or traveling is not possible.	• Safety lock lever is raised • Fuse is blown	• Lower the safety lock lever. Refer to page 2-48. • Replace the fuse. Refer to page 6-8.
Digging force is insufficient	• Hydraulic oil level is too low • Hydraulic oil is too cold • Air cleaner is clogged • Hydraulic oil is not of suitable type	• Add up to the specified level Refer to page 5-24. • Perform the warm-up . Refer to page 3-8 to 3-9. • Clean the air cleaner Refer to page 5-43. • Replace the hydraulic oil. Refer to page 5-66.
Traveling is not possible or not smooth	• Stones or foreign objects are stuck • Blake pedal is locked • Parking brake is activated	• Remove the foreign object. • Release the brake pedal lock. Refer to page 2-50. • Turn off the parking brake switch Refer to page 2-39. • Release the safety lock lever Refer to page 2-48.
Machine veers to the right/left.	• Stones or foreign objects are stuck • Tires have different air pressure in them.	• Remove the foreign object. • Make sure tires have the same air pressure. Refer to page 5-26.



Symptoms	Major causes	Action
Travel speed cannot be changed	• Fuse is blown	• Replace the fuse. Refer to page 6-8.
Slewing is not possible or not smooth.	• Insufficient grease on slew bearing	• Add grease. Refer to page 5-52.
Hydraulic oil temperature is too high	• Hydraulic oil level is too low	• Add up to the specified level Refer to page 5-24.
Starter motor turns but engine does not start	• Insufficient fuel • Air in fuel system • Water in fuel system • Fuel is frozen • Engine control system is faulty. • Fuel line is faulty. • Preheating device is faulty.	• Add fuel. Refer to page 5-23. • Bleed air. Refer to page 6-10. • Drain water. Refer to page 5-35. • Warm the fuel pipe with hot water or wait until the ambient temperature becomes high. • Adjust or repair (ask your sales or service dealer). • Adjust or repair (ask your sales or service dealer). • Adjust or repair (ask your sales or service dealer).
Engine exhaust is white or bluish	• Excessive engine oil • Insufficient engine warm-up. • Engine control system is faulty. • Fuel line is faulty. • Prolonged idling (approx. two hours or more) • Poor fuel	• Adjust to the specified level. Refer to page 5-21. • Perform the warm-up operation. Refer to page 3-5. • Adjust or repair (ask your sales or service dealer). • Adjust or repair (ask your sales or service dealer). • Increase the engine RPM and check for smoke. • Replace the fuel.



Symptoms	Major causes	Action
Engine exhaust is occasionally black	• Air cleaner is clogged • Engine control system is faulty. • Fuel line is faulty. • Clogging in the exhaust line. • DPD is faulty.	• Clean the air cleaner Refer to page 5-43. • Adjust or repair (ask your sales or service dealer). • Adjust or repair (ask your sales or service dealer). • Adjust or repair (ask your sales or service dealer). • Adjust or repair (ask your sales or service dealer).
Irregular noise is produced from the engine (combustion or mechanical noise)	• Low quality fuel is being used • Engine is overheating • Damage inside the muffler	• Replace the fuel. • Refer to “If the engine overheats” on page 6-4. • Replace the muffler. For replacement, ask your sales or service dealer.



LOWERING THE BOOM TO THE GROUND

If the hoe attachment must be lowered to the ground while the engine is stopped, use the following procedure.

Procedure



WARNING

- **Keep away from the working area when the hoe attachment is lowered. You may be hit by dirt falling out of the bucket or the hoe attachment as it drops.**
- **Gradually lower the boom by slowly turning the plug on the shut-off valve.**

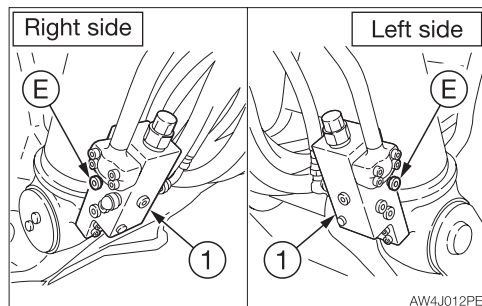
Perform the residual pressure releasing within 30 minutes after the engine stopping.

1. Check that the safety lock lever is in the released position.
2. Check that the starter switch is in the ON position.
3. Slowly push the operating lever forward to lower the boom.
4. Check that the load being lifted and the machine are secure and the work area is safe.

If the boom cannot be lowered using the above procedure, use the following procedure.

This operation is dangerous and requires experience. Ask your sales or service dealer for it.

1. Check that the load being lifted and the machine are secure and the work area is safe.
2. Place a pan under the plug (E) to catch the used oil.
3. Loosen the plugs (E) slowly to lower the boom. The hydraulic oil flows from the holes of plugs (E).
4. Check for safety and stability of the machine.
5. Tighten the plugs (E).





TOWING

WARNING

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

- 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.
- The machine should be towed only when it gets stuck in mud.
- Be sure to use a towing truck with sufficient braking power.

IMPORTANT: Do not tow machines that are not operable and no lubrication in the transmission. Doing so could damage the hydraulic devices due to a lack of oil supplied. It is best to use a low loader to transport the disabled vehicle for a long distance.

Manually releasing the parking brake

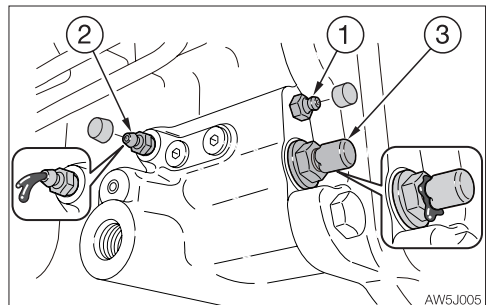
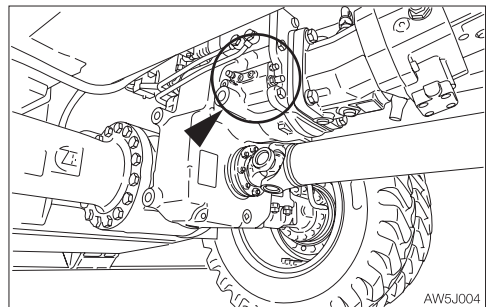
WARNING

- Brake malfunction can cause death or injury. Do not operate the machine with a faulty brake. Resolve the problems before trying to operate the machine.
- Be sure to secure the vehicle by chocking the wheels before releasing the parking brake.

IMPORTANT: The transmission could be damaged during operation if the emergency actuator is wrongly released. Be sure to follow the steps below to correctly release the parking brake.

In case of hydraulic oil pressure failure or hydraulic motor failure, the emergency actuator disconnects the reduction gear clutch (manual release of parking brake) so that the emergency machine towing can be performed.

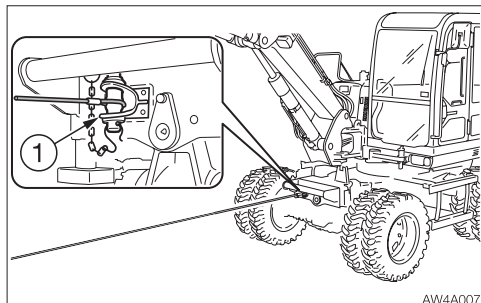
1. Stop the engine.
2. To prevent the vehicle from moving after the parking brake is released, chock the wheels.



3. Remove the cap, and then inject grease through the grease fitting (1) with the grease gun.
4. The vehicle towing can be performed when it is visually confirmed that the grease comes out of the pressure relief valve of the emergency actuator (3).



Towing the machine



1. Attach the wire rope to the shackle (1).
2. Make sure that the wire rope is horizontal and is lined up straight with the travel frame.
3. Move the machine to tension the wire rope.
4. Move the machine slowly and tow.
 - Towing speed: 2 km/h (1.24 mph) or less
 - Towing distance: 5 km (3.1 miles) or less

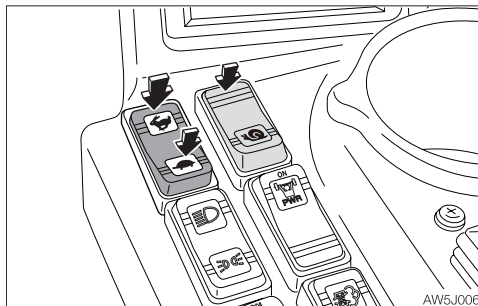
Reactivating the parking brake



WARNING

- **Completely drain the grease injected. Otherwise, it will be dangerous to travel; the parking brake cannot be operated due to the slipping clutch. Also, the clutch could be damaged due to the heat generated by the slipping clutch.**
- **Be sure to secure the vehicle by chocking the wheels before reactivating the parking brake.**

1. Park the machine on a flat, rigid and safe ground. Stop the engine.
2. To immobilize the vehicle, chock the wheels.
3. Remove the cap on the grease discharge valve (2), and then loosen the valve to open it, in order to release pressure and activate the parking brake.
4. Depress the brake pedal all the way down to lock it.
5. Start the engine.
6. Lower the safety lock lever to the unlock position.



7. Depress the "Hare" symbol on low/high-speed travel switch to change to the high-speed travel gear.
(Creeping travel switch: OFF)
8. Alternately switch between the low-speed and the high-speed until the grease is completely removed from the grease discharge valve (2). Be sure to thoroughly remove the grease even in cold climates when it becomes harder to discharge due to the hardened/thickened grease.
9. Raise the safety lock lever to the lock position.
10. Stop the engine.
11. Tighten the grease discharge valve (2), and then attach the cap.
12. Remove the wheel chocks.



IF THE CAB IS DAMAGED



WARNING

Immediately replace the damaged cab. Serious injury or death may occur if the machine is operated with damaged cab. Do not operate the machine until the replacement is complete. Do not try to repair the damaged cab by welding. Doing so could endanger the safety of the cab.

Cab part number: 05786-05100

SPECIFICATIONS





BASIC SPECIFICATIONS

Type			2-Piece boom	
MASS				
Operating mass***	kg (lb)	Machine with an Outriggers		15070 (33225)
		Equipped with a rear blade		14570 (32120)
Maximum Operating mass**			kg (lb)	16000 (35274)
PERFORMANCE				
Bucket capacity (Standard bucket)	m³ (cu. ft.)	Heaped		0.505 (17.83)
		Struck		0.369 (13.02)
Slew speed		min ⁻¹ (rpm)		10.8 (10.8)
Travel speed	km/h (mph)	Forward	Creep	0 to 4.3 (2.67)
			Low-speed travel	0 to 8.5 (5.28)
			High-speed travel	0 to 29.2 (18.14)/ 0 to 20 (12.43)*
		Reverse	Creep	0 to 4.3 (2.67)
			Low-speed travel	0 to 8.5 (5.28)
			High-speed travel	0 to 29.2 (18.14)/ 0 to 20 (12.43)*
Gradeability			(degrees)	35
Noise level dB (A)	Sound power level			L _{WA} 99
	Emission sound pressure level at the operator's position (ISO 6396,2008:)			L _{pA} 75
ENGINE				
Manufacturer and model				ISUZU AM-4JJ1XZSB-03
Rated output	Net (ISO 14396)	kW/min ⁻¹ (hp/rpm)		95.0/2200 (127.4/2200)
Displacement			ml (cu.in.)	2999 (183)
Starter			V-kW	24 - 4.0
Alternator			V-kW	24 - 1.2
Battery (IEC 60095-1)			V-A·h	12 - 104 X 2

* : Option

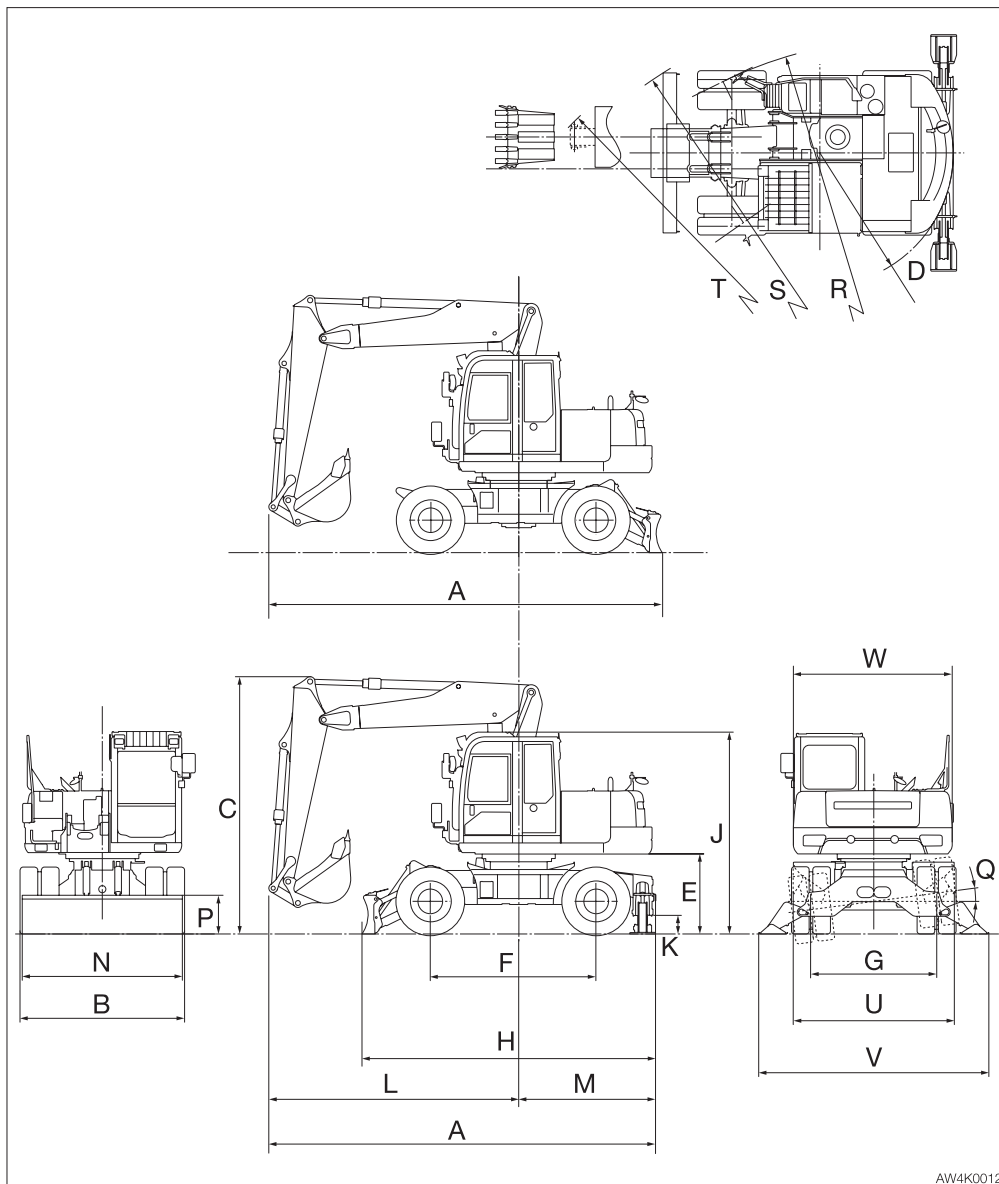
** : Maximum operating mass:

Optional parts can be added until the total mass of the machine reaches this mass value.

***: Equipped with fourth auxiliary hydraulic lines (15kg or 33lb.).

MEMO

MACHINE DIMENSIONS



AW4K0012

**MACHINE DIMENSIONS**

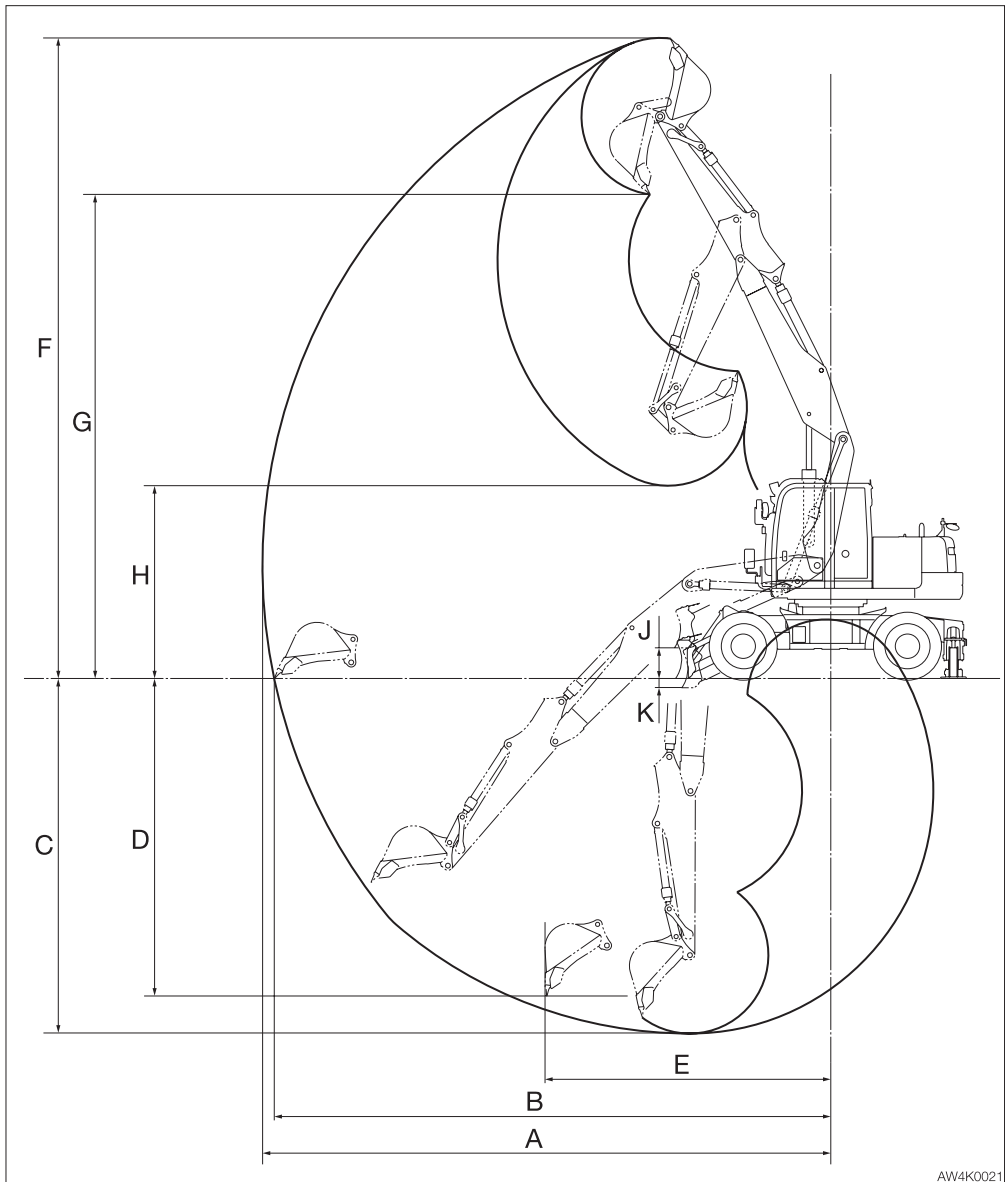
Unit: mm (inch)

	Item	2-Piece boom
A	Overall length	6030 (237.5)* / 6085 (239.5)
B	Overall width	2525 (99.4)
C	Overall height	3985 (156.9)
D	Slew radius	2065 (81.4)
E	Clearance height under upperstructure	1245 (49.0)
F	Wheel base	2565 (101)
G	Tread	1945 (76.5)
H	Overall length of undercarriage	4600 (181.1) *
J	Overall height of base machine	3130 (123.1)
K	Ground clearance of undercarriage	275 (10.8) *
L	Front distance to axis of rotation	3860 (152.0)
M	Rear distance to axis of rotation	2170 (85.4)
N	Dozer blade width	2480 (97.6)
P	Dozer blade height	600 (23.6)
Q	Swing angle of axles	7.5°
R	Minimum turning radius (Tire)	6380 (251.2)
S	Minimum turning radius (Dozer blade)	7025 (276.5)
T	Outside machine clearance radius	7295 (287.2)
U	Width of pad outrigger retracted	2500 (98.4) *
V	Width of pad outrigger extended	3555 (140.0) *
W	Overall width of upperstructure	2460 (96.9)

*: With an outrigger

OPERATING RANGES

2-Piece boom



**2-Piece boom**

Unit: mm (inch)

	Item	2570 mm (101.2 in) arm
A	Maximum reach	8885 (349.8)
B	Maximum reach at ground reference plane	8705 (342.8)
C	Maximum digging depth	5555 (218.7)
D	Maximum vertical digging depth	4965 (195.5)
E	Reach at maximum vertical digging depth	4480 (176.4)
F	Maximum height of cutting edge	10030 (394.8)
G	Maximum dumping height	7580 (298.3)
H	Minimum dumping height	3020 (118.8)
J	Dozer blade maximum lifting	480 (18.9)
K	Dozer blade maximum lowering	140 (5.6)

MEMO



LIFTING CAPACITIES

Rated lift capacity chart

- The loads in the charts do not exceed 87% of hydraulic lift capacity or 75% of tipping load.
- Figures marked with an asterisk (*) are hydraulically-limited capacities.
- The mass of slings and any other lifting devices shall be deducted from the rated load to determine the net load that may be lifted.
- The load point is the bucket hinge pin, and the bucket posture is with the standard bucket completely retracted under the arm.
- Unit: daN (lbs)

Load hooking system

A load hooking system must be provided with the following capabilities.

1. A system which can withstand twice the rated lift capacity no matter at what position the load is applied.
2. A system that poses no risk of the lifted load falling from the hooking device. For example, equipped with a hook slippage prevention device.
3. A system that poses no risk of the hooking system slipping from the hoe attachment.



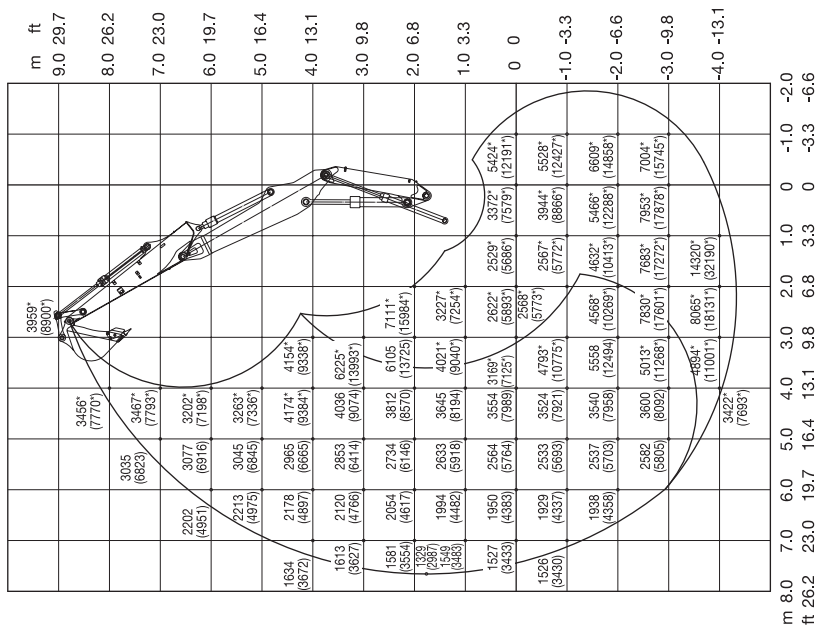
WARNING

- Do not attempt to lift or hold any load that is greater than these rated values at their specified load radii and height.
- The rated lift capacities are based on the machine being level and situated on a firm supporting surface. For safe lifting, the operator is expected to make due allowance for the particular job conditions such as soft or uneven ground, non-level condition, load to the machine sides, hazardous conditions, experience of personnel, etc. The operator and other personnel should fully acquaint themselves with the operator's manual furnished by the manufacturer before operating this machine. When operating the machine, the safety rules of the equipment must also be followed.
- Do not travel while lifting a load; It is very dangerous.

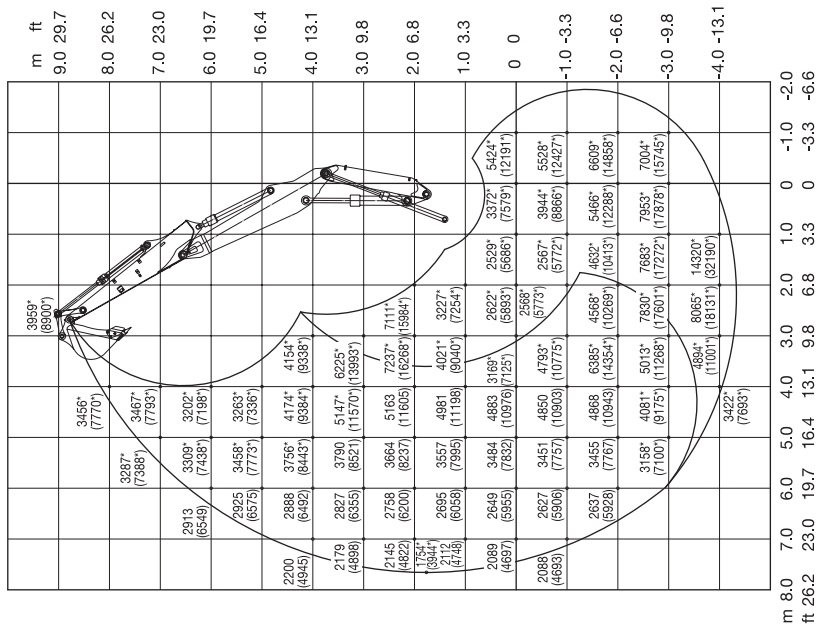


2-Piece boom, 2570 mm (101.2 in.) arm

Over Side



Over Rear



Units: daN(lbs.)

OPTIONS





GENERAL PRECAUTIONS

SAFETY PRECAUTIONS



WARNING

When removing or installing an attachment or optional part, take the following precautions.

- Consult with your sales or service dealer before installing an optional attachment.
- Do not use any attachments not approved by Takeuchi. Doing so may cause safety problems. Or, it may adversely affect the machine's operation or service life.
- We will not be held responsible for any injuries, accidents or damage to its products caused by the use by a non-approved attachment.
- Select a firm, level work area. Also, be sure to park in a well ventilated place.
- Clear obstacles and dangerous objects, and clean up spilled fuel immediately.
- When hoisting, be sure to designate a person to act as a signalman. Follow the instructions of the signalman regarding the procedure and measures.
- 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 everyone out of the area when hoisting. There is a hazard of objects falling or contacting with people in the area.
- Use a crane to move heavy objects (25 kg (55 lb.) or greater).
- Before removing a heavy object, be sure to put a support to it. When lifting with a crane, pay attention to the center of gravity of the load to keep the machine in balance.
- Do not operate the machine while the load is lifted by a crane stand.

- Use the proper procedure when mounting a boom or arm; otherwise serious damage could result. Consult your sales or service dealer for help.

PRECAUTIONS WHEN INSTALLING ATTACHMENTS

Be sure to perform a test operation after an optional or other special attachment has been replaced. Inspect the hydraulic oil level and recharge it as necessary. Consult your sales or service dealer for detailed procedures on installing/removing attachments.



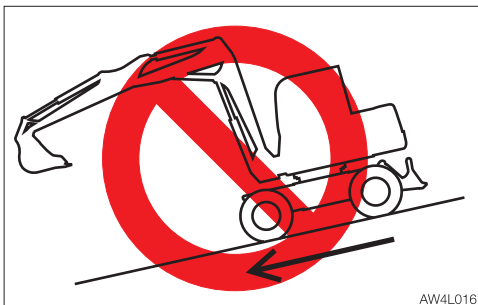
PRECAUTIONS WHEN OPERATING ATTACHMENTS



WARNING

Long attachments reduce stability of the machine. The machine may tip over if it loses the balance when traveling or slewing on slopes.

Never perform the operations listed below as they are extremely dangerous.



- Traveling down the slopes with the attachment raised



- Traveling across slopes



- Slewing on slopes
- If there is a heavy attachment is installed, the machine takes longer distance than usual to come to a complete stop when the stopping operation is performed. Carefully judge the distance so as not to bump into an object around the machine. Keep a safe distance from surrounding obstacles. When a heavy attachment is installed, natural drop (the gradual dropping of the attachment under its own weight when it is stopped in midair) increases.
- The machine can tip over more easily in the lateral direction than in the longitudinal direction.
 - Do not slew sideways with a heavy load at the how attachment. In particular, do not slew sideways on slopes.
 - The attachment is heavier for machines equipped with breakers or crushers than for machines equipped with the standard bucket. Do not operate such machines sideways, especially digging downhill.
- When a long arm is installed, the operating range increases. Carefully judge the distance so as not to bump into an object around the machine. Keep a safe distance from surrounding obstacles.

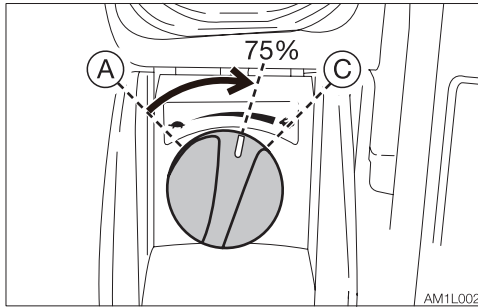


HYDRAULIC BREAKER

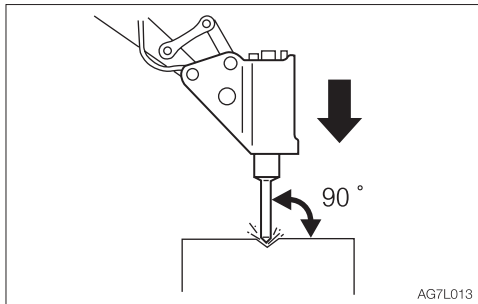
For handling of the breaker, read the hydraulic breaker's manual, provided separately.

IMPORTANT: When installing an attachment, make sure that it is appropriate for the machine being used. Contact your sales or service dealer for advice on selecting attachments.

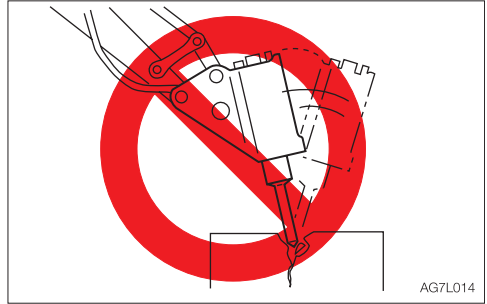
CAUTIONS ON OPERATING



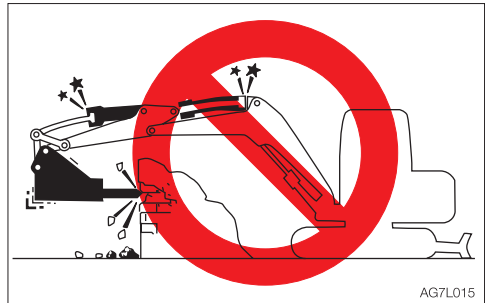
- Start the engine and run it at 75% of the maximum speed.



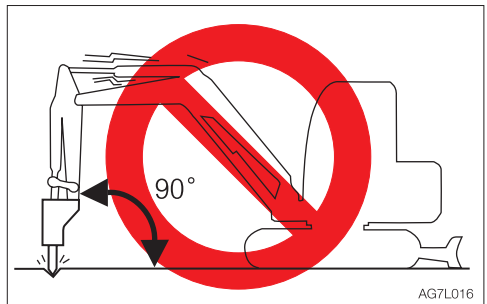
- Pound with the chisel pressed perpendicular to the surface to be pounded.
- When pounding, press the chisel properly against the object to be broken so as to avoid pounding the air.



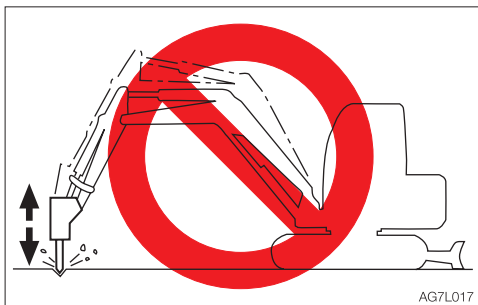
- Do not pry with the chisel or do not pry while pounding.
- Do not move the chisel while pounding.
- Do not pound continuously for over 30 seconds on the same surface.



- Do not pound with the cylinder fully extended or retracted (at the stroke end). Leave a margin of at least 50mm (2 in).



- Do not pound with the arm placed perpendicular to the ground surface.



- Do not drop the breaker itself on the object to be broken in order to break it.
- Do not move objects to be broken or rocks with the breaker itself.
- Slew the machine occasionally to cool the engine.
- If a hydraulic hose is vibrating abnormally, nitrogen gas may be leaking from the accumulator. Ask for an inspection early.

REPLACING THE HYDRAULIC OIL REGULARLY

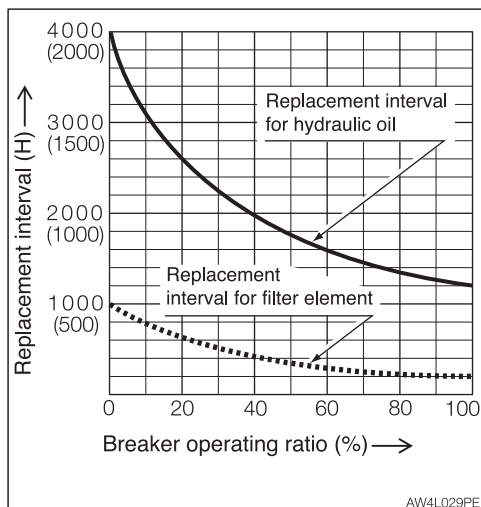
When a hydraulic breaker is used, the oil deteriorates more quickly than that used for a usual operation. Be sure to replace the hydraulic oil and the return filter elements.

- Failure to replace these in time can lead to damage to the machine and the breaker hydraulic system. To improve the service life of the hydraulic systems, be sure to replace the hydraulic oil and return filter element after the number of hours shown on the diagram below.
- When replacing the hydraulic oil, clean the suction strainer.

Replacement interval (hours)

Item	Hydraulic oil	Filter element
1st time	—	25
2nd time	—	100
Periodically	1200 (600)	200

When the breaker operating ratio is 100%.



(): When using conventional antiwear hydraulic oil.



BIODEGRADABLE OIL

Biodegradable oil is a new type of hydraulic oil that is decomposed into carbon dioxide and water by microorganisms in the soil and water. It is highly safe for living organisms and offers advantages in term of environmental protection.

- Recommended biodegradable oil: Mobile EAL EnviroSyn 46H (an ester synthetic oil). When replacing the hydraulic oil with biodegradable oil, use the above or an equivalent oil.
Note that other oils, even other brands of ester synthetic oils, may damage O-rings, packings and seals. Takeuchi products shipped with the optional biodegradable oil are shipped with the above brand of oil.
- When switching from a mineral oil to a biodegradable oil, the parking brake torque decreases by about 30%.

REPLACING THE HYDRAULIC OIL WITH BIODEGRADABLE OIL

Mixing mineral oil with biodegradable oil will result in a decrease of the hydraulic oil's performance as well as a decrease in biodegradability and safety. The hydraulic oil system must be flushed as described below before supplying the biodegradable oil. This operation is dangerous and requires experience. Have it performed by a Takeuchi sales or service outlet.

Flushing

To be performed by a Takeuchi sales or service outlet

1. Drain the hydraulic oil (mineral oil) from the hydraulic tank and clean the inside of the tank and suction strainer.
Refer to "Replacing the hydraulic oil and cleaning the suction strainer" on page 5-66.
2. Remove the cylinder hoses and drain the hydraulic oil (mineral oil) from inside the cylinders.
3. Supply new biodegradable oil to the hydraulic tank.

4. Bleed the air from the pump and cylinders and pressurize the hydraulic tank.
5. Operate the hydraulic devices for 30 minutes.
6. Drain the biodegradable oil from the tank and cylinders.
7. Replace the hydraulic oil return filter with a new filter.
8. Repeat steps 3 and 4.
9. Operate the hydraulic devices for 30 minutes.
10. Drain the biodegradable oil from the tank and cylinders.
11. Repeat steps 3 and 4.
12. Operate the hydraulic devices for 1 hour.
13. Drain the biodegradable oil from the tank and cylinders.
14. Replace the return filter with a new filter.
15. Repeat steps 3 and 4.
16. Operate the hydraulic devices, then check for oil leakage.

There is no need to flush the hydraulic oil system when switching from biodegradable to mineral hydraulic oil.

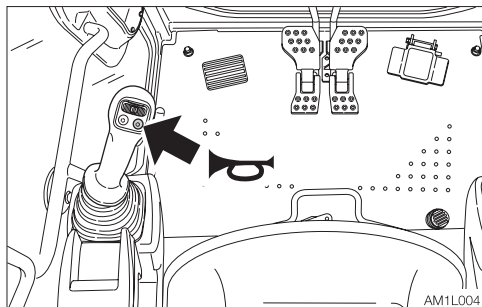
MEMO



OPERATING LEVER SWITCH

KIT 1

HORN BUTTON



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

engine revolutions to low idling whenever the engine is started.

Cancel the deceleration mode by pressing the deceleration button as necessary.

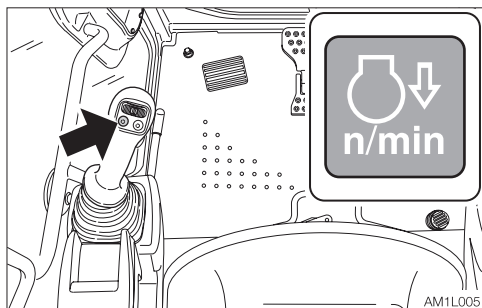
Note: This deceleration button is capable of decreasing the engine speed and reducing the fuel consumption, with a simple operation, in a situation such as when little engine output is required and thus the operating or the travel levers are in neutral.

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.

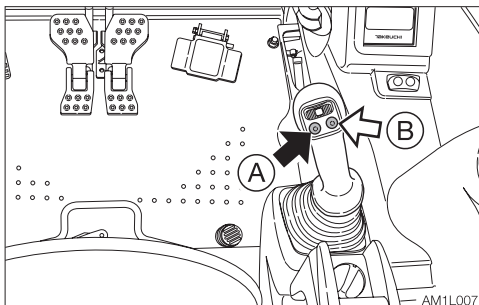


Press this button on the left operating lever to lower the engine speed to low idling. Press the button again to return to the engine speed set with the throttle controller. For safety reasons, it is designed that the deceleration function is activated to set the



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).

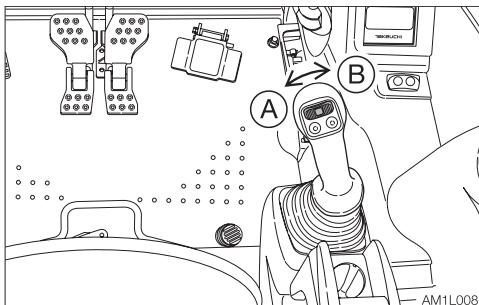
(B)Hydraulic oil flows to the right auxiliary line (b).

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” on pages 2-65 to 2-69.

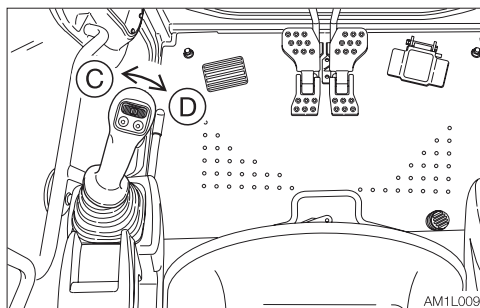
AUXILIARY 2ND/4TH SWITCH

Slider switch

(Proportional control)

Proportional control allows for slow-to-fast/ fast-to-slow movement of attachment.

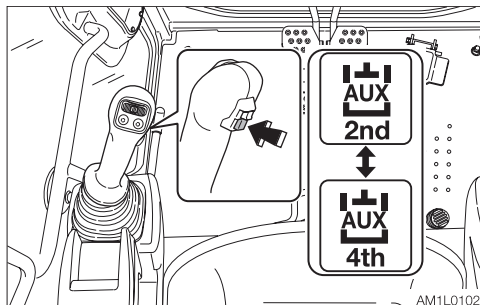
Example: If you move the slider switch half way, the attachment will move at approximately one-half the speed.



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).

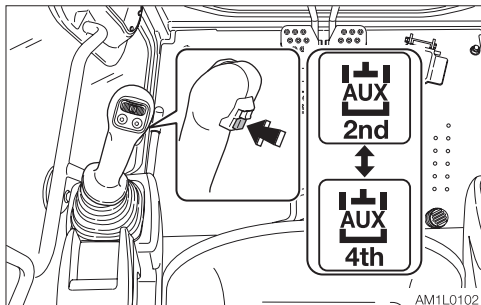


To use the auxiliary 4th hydraulic line, press the auxiliary 2/4 select button to change to the operation of the auxiliary 4th.

Refer to “Auxiliary hydraulic lines” on pages 2-65 to 2-69.



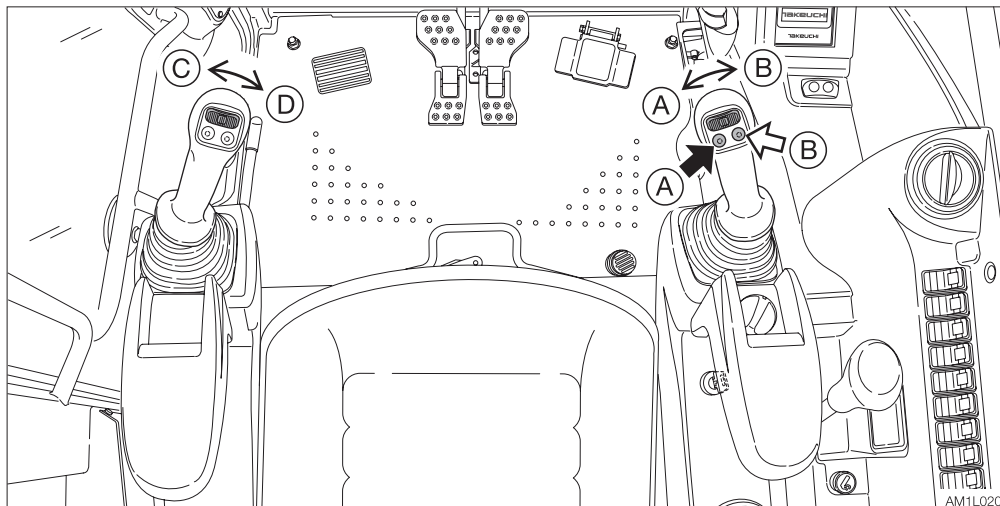
AUXILIARY 2/4 SELECT BUTTON



This switch is used to change from the second auxiliary operation to the fourth auxiliary operation.

Pressing this button displays the second auxiliary on the Multi-information display to indicate that the second auxiliary operation is enabled. Pressing this button again displays the auxiliary 4th on the Multi-information display to indicate that the auxiliary 4th operation is enabled.

The actual operation is performed with the auxiliary 2nd/4th switch (slider switch).

**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).

Refer to "Auxiliary hydraulic lines" on pages 2-65 to 2-69.

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.

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Third Published January 2016

No.41911

OPERATOR'S MANUAL

TB1160W Hydraulic excavator

Edited and issued by TAKEUCHI MFG. CO., LTD.

Printed in Japan by STATION M Co., Ltd.

CALIFORNIA

PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling battery.

DECLARATION OF CONFORMITY

We herewith declare that following named machine, based on its conception and design and in the form brought into service is in accordance with the relevant, basic safety and health requirements of the following EU directives. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Hydraulic Excavator
Manufacturer	TAKEUCHI MFG. CO., LTD 205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan

Model	TB1160W
Engine type	AM-4JJ1XZSB-03
Engine power	95kW @ 2200 rpm

The machine is in accordance with the requirements of EU directives:

- 1) Machine directive 2006/42/EC and appendix
- 2) Electromagnetic compatibility-regulation 2004/108/EC and appendix
- 3) Noise directive 2000/14/EC (Evaluation procedure according to appendix VI), 2005/88/EC and appendices.
- 4) Regulations on engine emissions: 2004/26/EC and appendices.

Harmonized norms: EN474-1:2006+A1:2009, EN474-5:2006+A2:2012.

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