

OPERATOR'S MANUAL

TB219

Serial No. 121900003~

Book No. AD6E000

MINI EXCAVATOR

TAKEUCHI



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

SAFETY ALERT SYMBOL



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

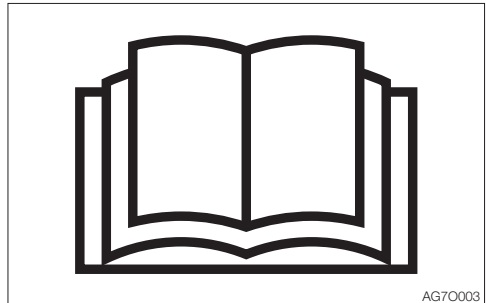
Read and understand the message to avoid personal injury or death.

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

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

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

WARNING



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

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

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

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

SIGNAL WORDS

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



DANGER

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



WARNING

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



CAUTION

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

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

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

INTRODUCTION

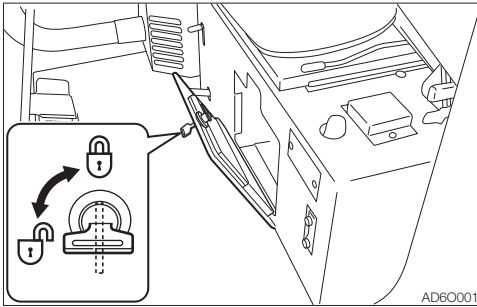
FOREWORD

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

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

MANUAL STORAGE COMPARTMENT

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

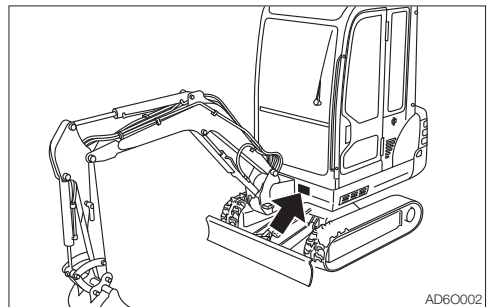


1. Insert the starter key and turn it counterclockwise to open the cover under the seat.
2. After using the manual, place it in the plastic pouch and store it back in the manual storage compartment.

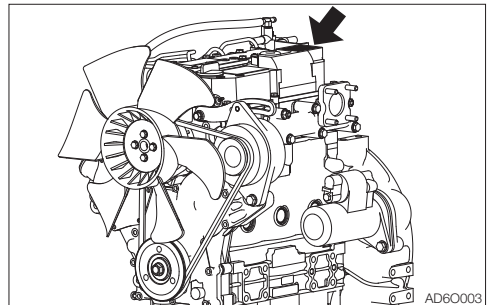
SERIAL NUMBERS

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

Machine number: _____

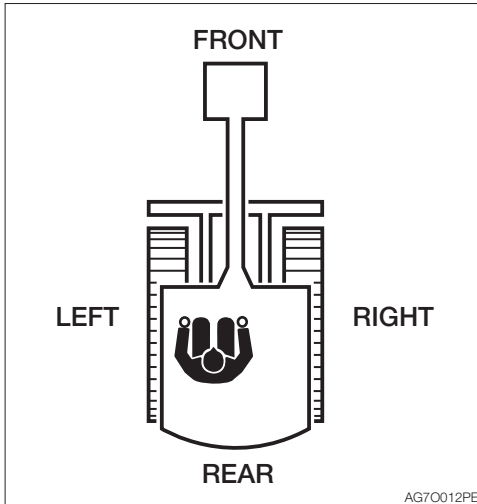


Engine number: _____



MACHINE DESCRIPTION

FRONT, REAR, LEFT AND RIGHT



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

DESIGNATED OPERATIONS

Use this machine primarily for the following operations:

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

FEATURES

- “Flexible machine width mechanism” for crawler width
- Low engine noise and exhaust emissions

BREAK-IN PERIOD

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

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

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

NOTES ON READING THIS MANUAL

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

The numbers used in the illustration are with circles around them. The same numbers appear between the parentheses in the text.
(Example: ① → (1))

Symbols used in this manual

The symbols used in this manual have the following meanings.

⊘, X..... Prohibition

🔒 Lock

🔓 Unlock

CONTENTS

Introduction	0-2
---------------------------	------------

Machine description	0-3
----------------------------------	------------

Safety	1-1
---------------------	------------

General precautions	1-2
Precautions when preparing	1-8
Precautions when starting	1-10
Precaution when operating	1-12
Precautions when stopping	1-21
Precautions when transporting	1-22
Precautions on maintenance	1-24
Safety signs (decals)	1-33

Controls	2-1
-----------------------	------------

Names of components	2-2
Covers	2-4
Starter key	2-4
Storage box	2-4
Maintenance cover	2-4
Fuse box	2-5
Fuel filler port	2-5
Tool case	2-6
Engine hood	2-6
Cab	2-7
Cab door	2-7
Front window	2-8
Lower front window	2-9
Side window	2-9
Seat and seat belt	2-10
Seat	2-10
Seat belt	2-11
High-back seat (optional)	2-12
Seat belt	2-13
Instrument cluster	2-14
Warning lamps	2-14
Indicators	2-15
Meters	2-15
Switches	2-16
Starter switch	2-16
Horn button	2-16
Travel speed switch	2-16
Light switch	2-17
Wiper switch	2-17
Levers and Pedals	2-18
Safety lock lever	2-18
Throttle lever	2-18
Operating levers	2-19
Blade lever	2-19

Travel levers/pedals	2-20
Boom swing pedal	2-20
Auxiliary hydraulic pedal	2-21
Selector lever	2-21
Accessories	2-22
Heater	2-22
Cigarette lighter	2-24
Ashtray	2-24
Interior light	2-25
Inside rear view mirror (cab)	2-25
External power sockets	2-25
Radio (for cab)	2-26
Auxiliary hydraulic lines	2-30

Operation	3-1
------------------------	------------

Before starting operation	3-2
Getting on or off the machine	3-2
Walk-around inspection	3-2
Daily inspection	3-2
Starting and stopping the engine	3-3
Before starting the engine	3-3
Starting the Engine	3-4
Warming up the engine	3-5
Stopping the engine	3-5
Operating the machine	3-6
Lever pattern (ISO pattern)	3-6
Lever pattern (JCB pattern)	3-7
Warming up the machine (hydraulic oil)	3-8
Inspection after warm-up	3-9
Crawler width switching	3-10
Switching the blade width	3-11
Operating the travel levers	3-12
Stopping travel	3-15
Operating the working equipment	3-16
Operating procedures	3-18
Prohibited operations	3-18
Cautions on operating	3-21
Cautions on traveling on slopes	3-22
Getting out of mud	3-24
Operations possible with this machine	3-24
Parking the machine	3-26
Parking	3-26
Inspection and checks after stopping the engine	3-26
Handling in cold climates	3-27
Preparing for cold climates	3-27
Cautions after operations	3-27
After the cold climate	3-27
Handling rubber crawlers	3-28
Prohibitions	3-28

Cautions 3-29
 Preventing the rubber crawlers from
 coming off 3-29

Transport4-1

Loading and unloading 4-2
 Hoisting the machine 4-4
 Securing the machine 4-6
 Precautions to be taken during
 transportation 4-6

Maintenance5-1

General 5-2
 Maintenance overview 5-2
 Cautions on maintenance 5-2
 Service data 5-4
 Fuel and lubricant table 5-4
 Regularly replace the hydraulic oil 5-6
 List of consumables 5-7
 List of tools 5-8
 List of tightening torques 5-9
 Safety-critical parts 5-10
 Maintenance list 5-12
 Walk-around inspection 5-14
 Inspecting by opening the engine hood
 and covers 5-14
 Inspecting by walking around the machine 5-15
 Inspecting while sitting in the
 operator's seat 5-15
 Daily inspection (every 10 hours) 5-16
 Inspecting and replenishing the coolant ... 5-16
 Inspecting and replenishing the engine oil 5-17
 Inspecting the dust indicator 5-17
 Inspecting the water separator 5-18
 Inspecting the fuel level 5-18
 Inspecting the hydraulic oil tank level
 and replenishing 5-19
 Lubricating the working equipment ... 5-21
 After the initial 50 hours (only for new
 machines) 5-22
 Replacing the engine oil and the oil filter... 5-22
 Inspecting and adjusting the fan belt.. 5-23
 Replacing the hydraulic oil return filter 5-24
 Every 50 hours 5-26
 Inspecting and adjusting the crawler
 tension 5-26
 Lubricating the slew bearing 5-28
 Lubricating the slew motor pinion 5-28
 Draining the water from the fuel tank.. 5-29

Inspecting the battery fluid level and
 replenishing 5-30
 Every 100 hours 5-32
 Cleaning the water separator 5-32
 Cleaning the fuel filter 5-32
 After the initial 250 hours (only for new
 machines) 5-33
 Replacing the travel motor gear oil.... 5-33
 Every 250 hours 5-34
 Replacing the engine oil and the oil filter... 5-34
 Inspecting and adjusting the fan belt.. 5-34
 Cleaning the air cleaner 5-34
 Cleaning the radiator fins and oil cooler
 fins 5-36
 Every 500 hours 5-38
 Replacing the hydraulic oil return filter 5-38
 Replacing the water separator filter 5-38
 Replacing the fuel filter 5-39
 Every 1000 hours 5-40
 Replacing the travel motor gear oil 5-40
 Cleaning the engine cooling system... 5-40
 Replacing the air cleaner element 5-42
 Inspecting and adjusting the engine
 valve clearance 5-43
 Retightening the engine cylinder head bolt 5-43
 Every 1500 hours 5-44
 Inspecting and cleaning the engine fuel
 injectors 5-44
 Inspecting the crankcase breather system 5-44
 Every 2000 hours 5-45
 Lapping the engine valve seats 5-45
 Every 4000 hours 5-46
 Replacing the hydraulic oil and cleaning
 the suction strainer 5-46
 When required 5-48
 Replacing the bucket teeth 5-48
 Replacing the bucket 5-50
 Inspecting and replenishing
 the windshield washer fluid 5-52
 Lubricating the levers 5-53
 Inspecting the rubber crawlers 5-54
 Replacing the rubber crawlers 5-56
 Maintenance during extended storage period 5-58

Troubleshooting6-1

Symptoms that are not malfunctions 6-2
 If the engine overheats 6-3
 If the battery goes dead 6-4
 If a fuse blows 6-6

- Inspecting and replacing the fuse..... 6-6
- Inspecting the fusible link..... 6-7
- Restarting after adding fuel..... 6-8
 - Bleeding air from the fuel system 6-8
- If a warning lamp flashes 6-9
- Other symptoms..... 6-10
- Lowering the boom to the ground 6-12
- Towing..... 6-13

Specifications 7-1

- Basic Specifications..... 7-2
- Machine dimensions..... 7-4
- Operating ranges..... 7-8
- Lifting Capacities 7-11

Options 8-1

- General precautions 8-2
 - Safety precautions 8-2
 - Cautions when installing attachments .. 8-2
 - Cautions when operating attachments. 8-3
- Attachment combination table 8-4
- Battery switch..... 8-5
- Hydraulic breaker 8-6
 - Replacing the hydraulic oil regularly 8-8
- Selecting a lever pattern 8-9
 - Switching the lever pattern 8-9
- Load safety device..... 8-10
 - Emergency shut-off valve..... 8-10
 - Overload warning device 8-11
- Travel alarm 8-12
- Optional equipment mass 8-13

SAFETY



GENERAL PRECAUTIONS

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

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

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

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

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

Observe all safety rules

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

When a problem is found on the machine

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

Operating temperature range

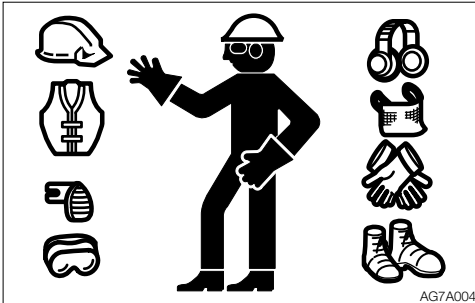
To maintain the machine performance and to prevent the engine from early wear, observe the following the operating conditions.

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



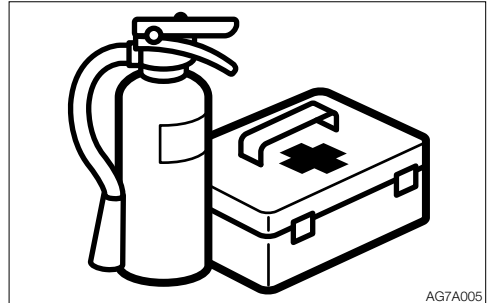
SAFETY GENERAL PRECAUTIONS

Wear appropriate clothing and protective equipment



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

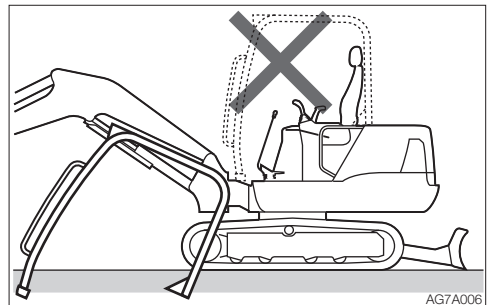
Install a fire extinguisher and first aid kit



Be prepared for fire and accidents

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

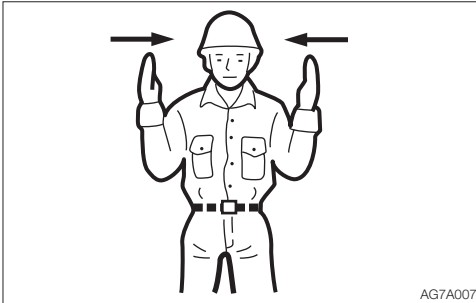
Never remove safety equipment



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



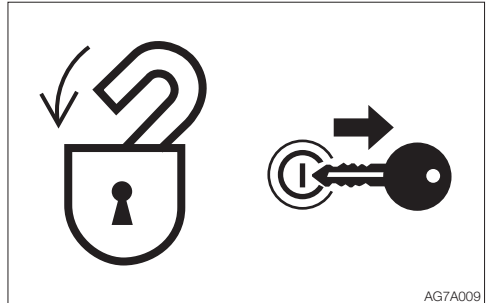
Use a signal person and a flag person



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

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

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

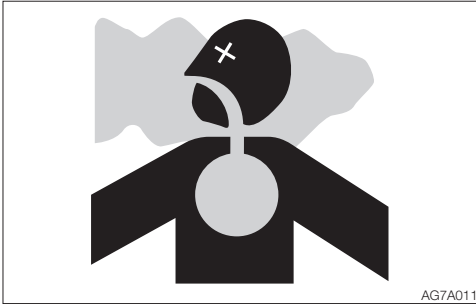


- Before standing up from the operator's seat to open/close the window or remove/install the lower window, lower the working equipment to the ground, raise the safety lock lever to engage the lock and stop the engine. If any controls should be accidentally touched when the safety lock lever is lowered (unlocked), the machine will suddenly move and cause serious injury or death.
- Note that the dozer blade, boom swing and auxiliary hydraulic controls cannot be locked, even when the safety lock lever is set to the locked position. Do not carelessly touch these controls.
- Be careful not to touch the operating levers when raising or lowering the safety lock levers.
- Before leaving the operator's seat, lower the working equipment to the ground, raise the safety lock levers to engage the lock and stop the engine. Also, be sure to remove the key, lock the door and covers, take it with you and store it in a specified place.

**Avoid fire and explosion hazards**

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

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

**Exhaust fumes from the engine is poisonous**

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

Handling asbestos dust

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

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

Be careful not to get crushed or cut

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



Using optional products

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

Never modify the machine

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

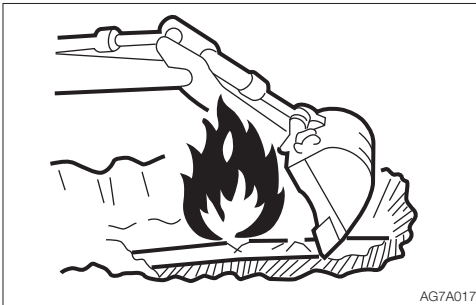


PRECAUTIONS WHEN PREPARING

Know the work area

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

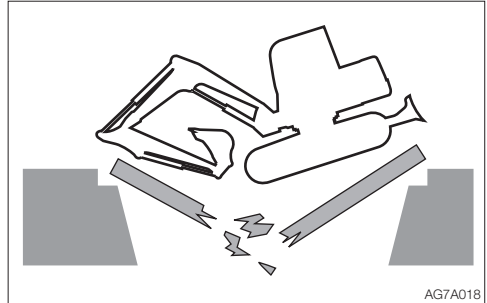
- Inspect the topography and ground condition of the working area, or the structure of the building when working indoors, and take the safety precautions as necessary.
- Be sure to avoid all hazards and obstructions such as ditches, underground lines, trees, cliffs, overhead electrical wires, or places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



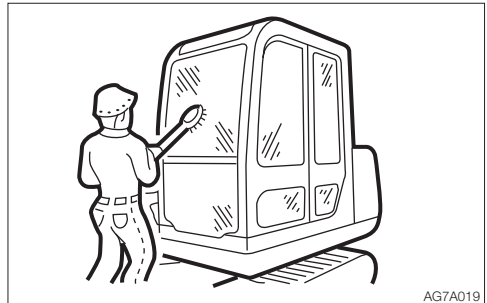
- Check with the administrator for the locations of buried gas pipes, water pipes and power cables. If necessary, determine what specific precautions must be taken to insure safety by consulting with the administrator.
- When working on roads, be sure to consider the safety of pedestrians and vehicles.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

Check the strength of the bridge

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

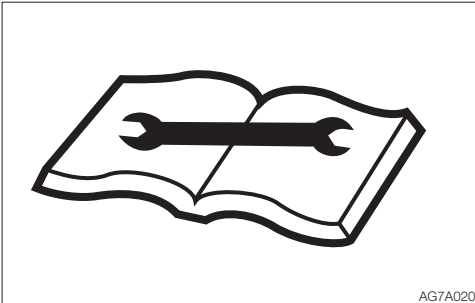


Always keep the machine clean



- Clean windows, mirrors and lights to ensure good visibility.

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

**Perform inspection and maintenance every day**

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

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

Cautions in the operator's compartment

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



PRECAUTIONS WHEN STARTING

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

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



- Climb up/down the steps facing the machine and holding the handrail to support your weight in a three point secure stance (hand and feet).
- Never use the safety lock lever or control levers as hand holds.

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

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

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



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

Sit in the operator's seat and start the engine

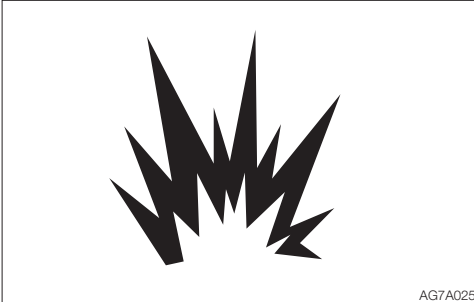
- Adjust the seat to securely latch it.



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



Starting with jumper cables



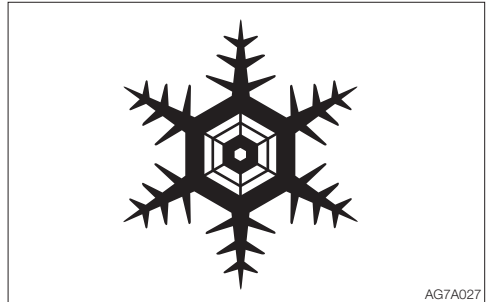
Use jumper cables only in the recommended manner. Improper use of jumper cables can result in battery explosion or unexpected machine motion. Refer to “If the battery goes dead” for further instructions.

After starting the engine

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

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

In cold climates



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

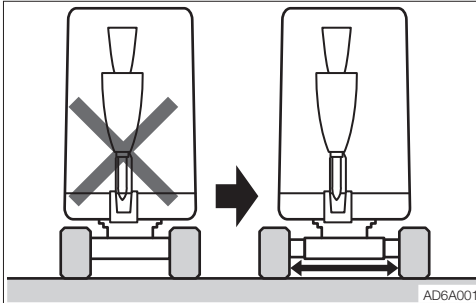


SAFETY

PRECAUTION WHEN OPERATING

PRECAUTION WHEN OPERATING

Operate the machine with the maximum crawler width



- Always operate the machine with the crawler width extended to 1370 mm (53.9 in.) to maximize the machine stability. If the machine is operated with the crawler width narrowed (980 mm, 38.6 in.), the machine may tip over due to its poor stability.
- If the machine must be operated with the narrowed crawler width (980 mm, 38.6 in.), traveling should be done after folding the hoe attachment, lowering the boom to lower the center of gravity and keeping the machine facing forward.

Ensure good visibility

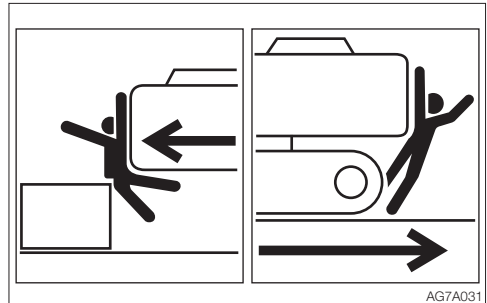
- When working in dark places, turn on the machine's working lights and headlights and additional lighting equipment installed, as necessary.
- When visibility is poor due to bad weather (fog, snow, rain or a cloud of dust), stop operating the machine and wait until visibility improves.

Do not permit riders on the machine



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

Check if the work area is safe and secure before operation



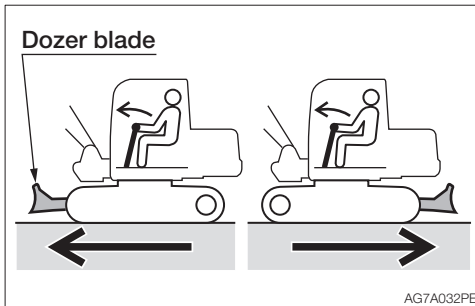
- Confirm the performance limits of the machine.
- Use a signal person at road shoulders, narrow places or where your vision is obstructed.
- Never allow anyone to enter the machine's slewing radius and path.
- Signal your intention to move by sounding the horn.
- There is a blind spot in the rear of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



SAFETY

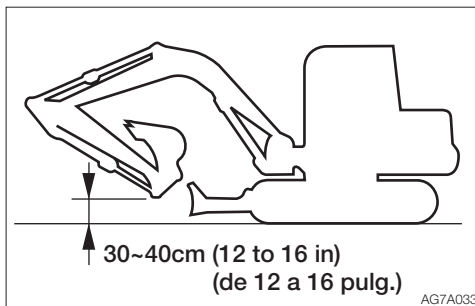
PRECAUTION WHEN OPERATING

Check the position of the undercarriage (tracks) before traveling

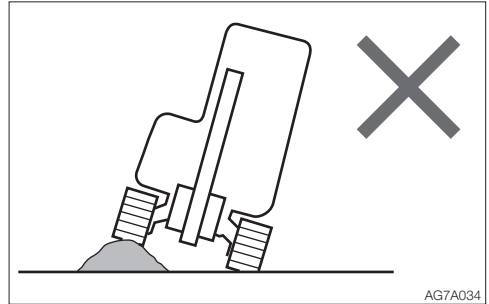


Before operating the travel levers/pedals, make sure that the dozer blade is to the front of the operator's seat. Remember that when the dozer blade is to the rear of the operator's seat, the travel levers/pedals must be operated in the reverse direction from when it is to the front.

Travel safely



- Travel with the dozer blade raised, the hoe attachment folded as shown on the figure above, and the bucket raised 30 to 40 cm (12 to 16 in.) above the ground.
- Do not slew while traveling. If you must operate the hoe attachment while traveling, operate at speeds slow enough so you have complete control at all times.



- Avoid crossing over obstacles whenever possible. If you must do so, keep the hoe attachment close to the ground level and travel slowly. Never cross obstacles which will tilt the machine to an angle of 10° or greater.
- On uneven ground, maintain the low speed and avoid starting, stopping or changing directions abruptly. Otherwise, the working equipment may come in contact with the ground, causing the machine to lose its balance and get damaged or to damage the structures in the surrounding area.



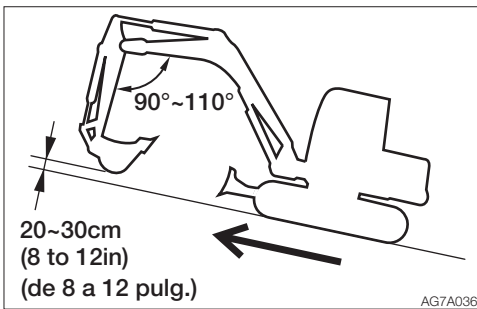
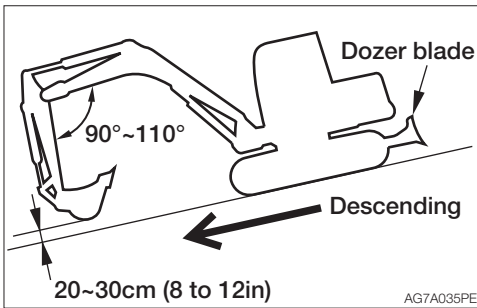
SAFETY

PRECAUTION WHEN OPERATING

Cautions on traveling on slopes

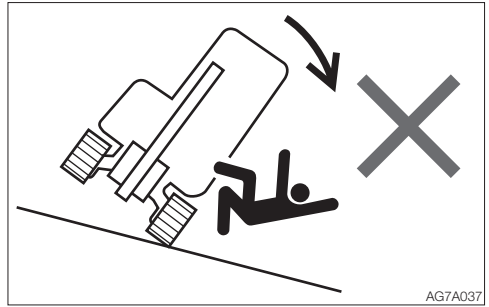
When traveling on slopes or grades, be careful that the machine does not tip (roll) over or slide.

- Never travel on slopes that are too steep for the machine to maintain its stability (maximum gradeability: 30°, lateral tipping angle: 10°). Note that in reality, the machine's stability becomes lower than the above values depending on the working condition.



- When climbing a hill, keep the operator's seat facing the hillside. When descending a hill, keep the operator's seat facing the downhill direction. In either case, travel must be done while paying attention to the ground in front of the machine.
- When traveling on slopes, lower the bucket to a height of 20 to 30 cm (8 to 12 in.) above the ground. When climbing a steep slope, extend the hoe attachment to the front. In emergencies, lower the bucket to the ground and stop the machine.

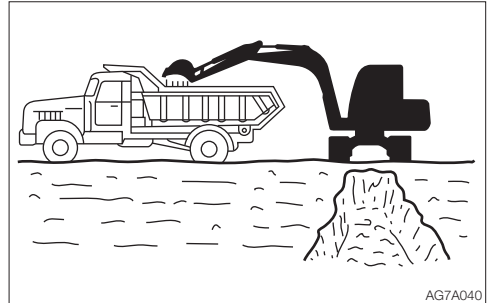
- When traveling on slopes or grades, drive slowly in 1st (low) speed. When descending a slope, slow down the engine speed.
- Do not descend slopes in reverse.



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

**Operate the machine on snow or ice with extra care**

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

Ensure driver's safety when loading

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

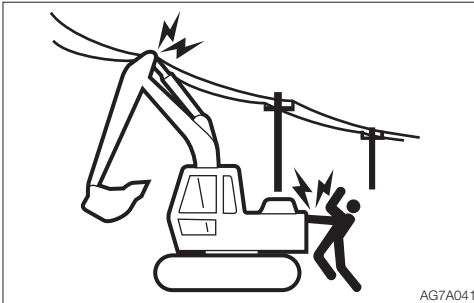
- Never swing or position the bucket over a person or the cab room.
- Load the truck from the rear.



SAFETY

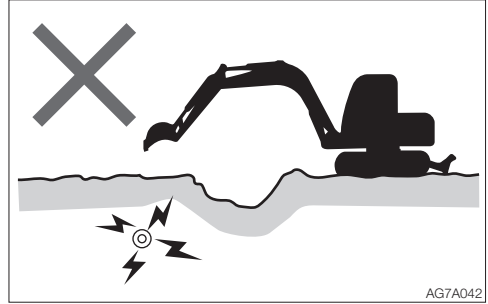
PRECAUTION WHEN OPERATING

Keep a safe distance from the overhead high-voltage cables

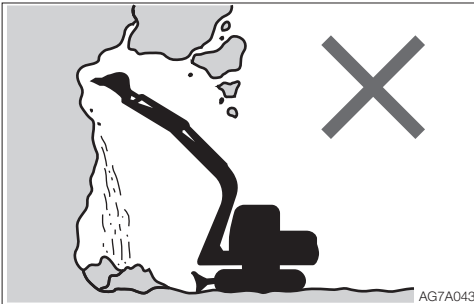


Never bring any part of the machine or loaded material too near to the high voltage cables unless all safety precautions required by the local and national authorities have been installed. If a person comes near to the machine that is discharging sparks or located near to or in contact with the power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

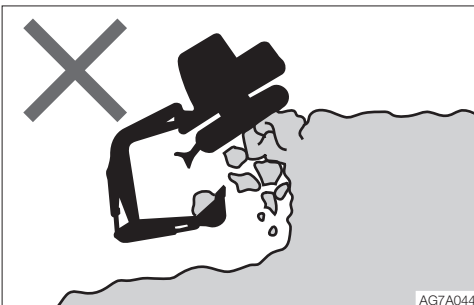
- Always maintain a safe distance between the machine and the high-voltage electric cable.
- Check with the local power company about safe operating procedure before starting operations.
- Consider all cables to be high-voltage cables and treat all cables as energized even though it is known or believed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



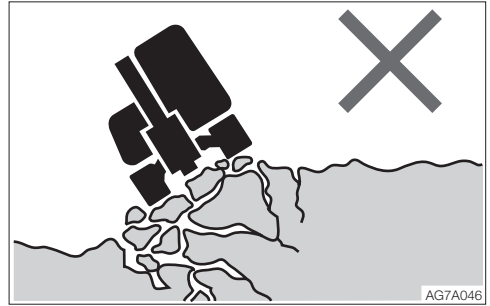
- Pay also careful attention to the high-voltage electric cables buried underground.

**Watch out for hazardous working conditions**

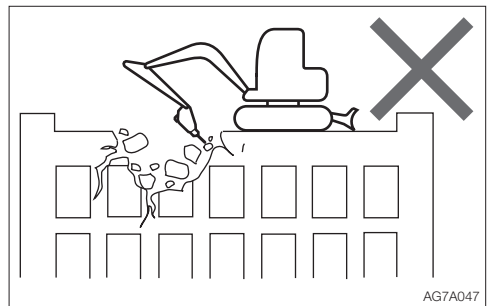
- Never undercut a high bank. Doing so is dangerous as it may cause ground collapse.
- Do not operate in places where there is a danger of falling rocks.



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



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

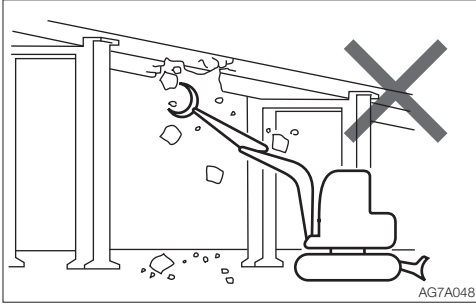


- Do not perform demolition work under the machine. There is a hazard that the machine may fall down, because the ground becomes unstable.
- When working on or from the top of buildings or other structures, check the strength and the structure before starting operations. If a building or structure collapses,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

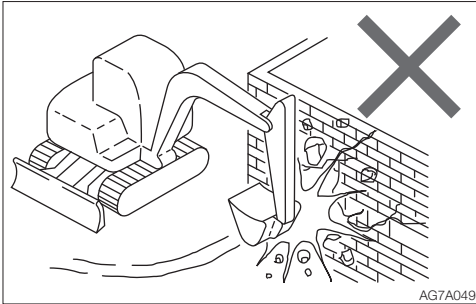


SAFETY

PRECAUTION WHEN OPERATING



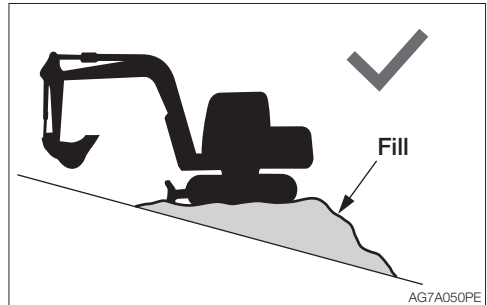
- When doing demolition work, do not perform demolition above your head. There is a hazard of broken parts falling or of the building collapsing and causing serious injury or damage.



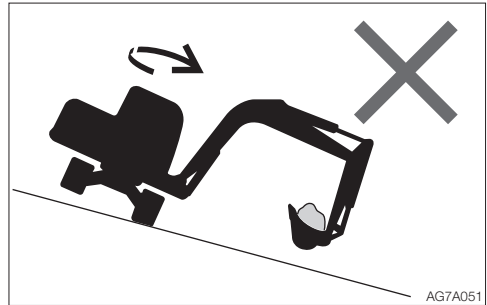
- Do not use the impact force of the hoe attachment for breaking work. There is a hazard of serious injury being caused by flying pieces of broken materials and by the damaged hoe attachment.

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.



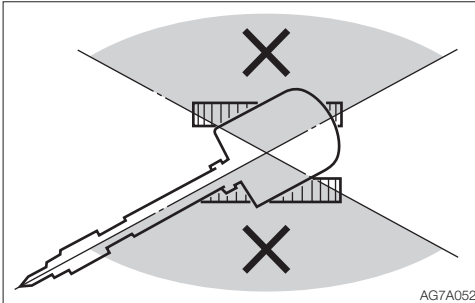
- Avoid slewing to the downhill direction with the bucket full of loaded material. This will reduce the stability of the machine and may result in tipping over.



SAFETY

PRECAUTION WHEN OPERATING

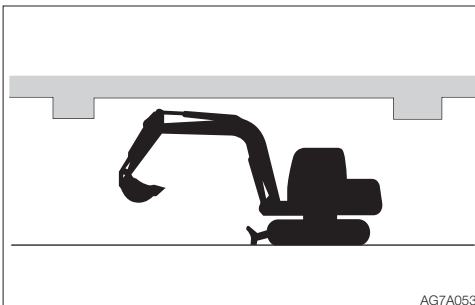
Never slew sideways with a heavy load



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.

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.

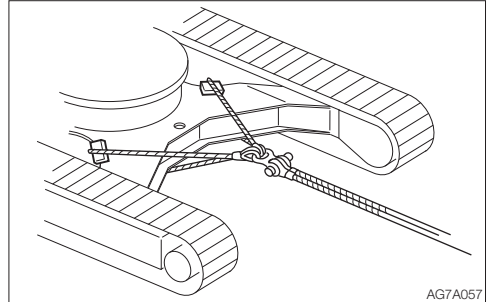
- Never lift loads in excess of capacity. Overload will cause the machine to roll and can result in serious injury or death.
- All rated lift capacities are determined by using a machine placed on a stable and flat ground. For a safe lifting work, the user is expected to make due allowance for the particular 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.

Cautions when towing



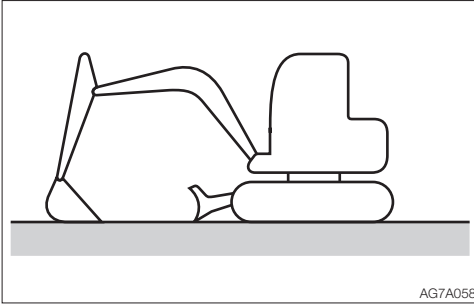
When towing, serious injury or death could result if a disabled machine is towed incorrectly or if there is a mistake in the selection or inspection of the wire rope.

- Wire becomes dangerous if it breaks or becomes disengaged. Use a wire rope appropriate for the required towing force.
- Do not use a wire rope that is kinked, twisted or otherwise damaged.
- Do not apply strong loads abruptly to the wire rope.
- Wear protective 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.
- Do not tow machines that are not operable. Doing so will damage the hydraulic devices.
- Never tow on slopes.
- Do not let anyone come near to the wire rope while towing.

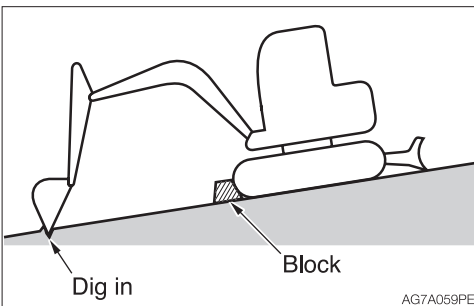


PRECAUTIONS WHEN STOPPING

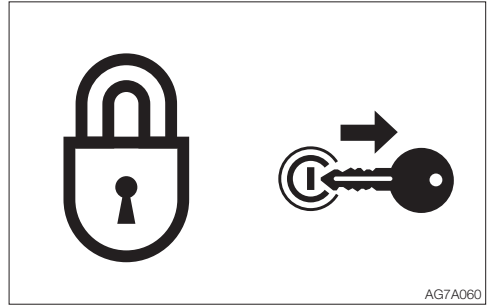
Park safely



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



- If you must park on a slope or incline, park the machine securely and block the movement of the machine.
- When parking on a street, use barriers, caution signs, lights, etc., so that the machine can easily be seen even at night to avoid collision with other vehicles.

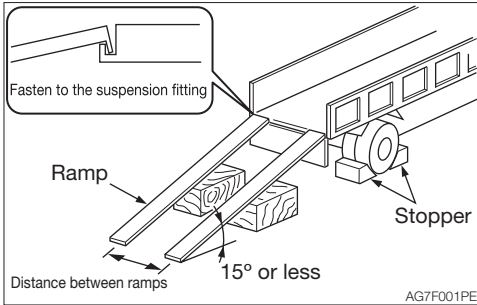


- Before leaving the machine, do the followings:
 1. Lower the bucket and the dozer blade to the ground.
 2. Raise the safety lock lever to the locked position.
 3. Stop the engine and remove the starter key.
 4. Lock the cab and covers and take the key with you.



PRECAUTIONS WHEN TRANSPORTING

Load/unload the machine safely



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

- Select a firm, level surface and keep sufficient distance from road shoulders.
- Use ramps of adequate strength and size. Maintain the slope of loading ramps within 15 degrees.
- Secure the ramps to the truck bed.
- Never use the working equipment to load or unload the machine. Doing so may result in tipping over or falling down of the machine.
- Keep the truck bed and loading ramps clean of oil, soil, ice, snow, and other materials to prevent the machine from sliding sideways. Clean the crawlers.
- Chock the transporter wheels to prevent movement.
- When being loaded or unloaded, travel slowly in 1st (low) gear by 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 on the truck bed, do it slowly as the footing should be unstable.

- Lock the cab door after being loaded, if applicable. Otherwise, the door may open during transport.
- Chock the tracks and secure the machine to the truck bed with wire rope or chain.



Hoist the machine safely

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

Transport the machine safely

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



PRECAUTIONS ON MAINTENANCE

Display a “DO NOT OPERATE” alert sign

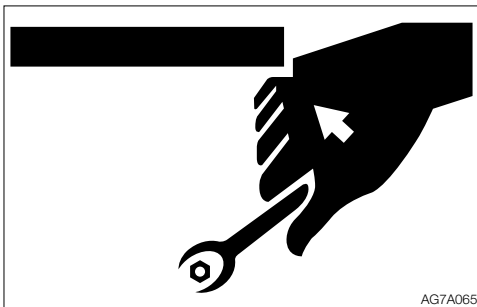
Severe injury could result if an unauthorized person should start the engine or touch controls during inspection or maintenance.

- Before performing maintenance, stop the engine, remove the key and take it with you.



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

Use the correct tools



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

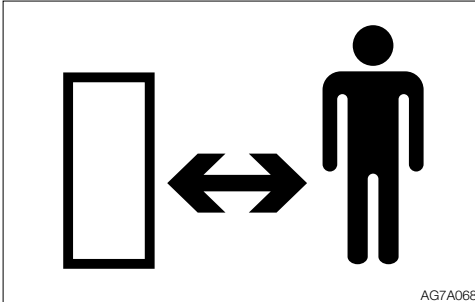
Replace safety-critical parts periodically

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

Explosionproof lighting



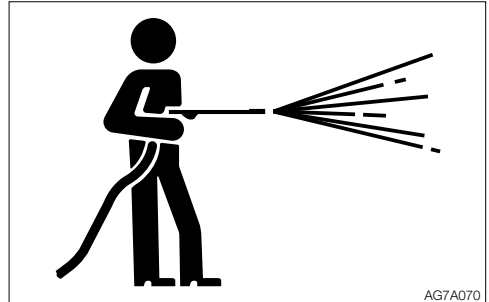
To prevent an ignition or explosion, use explosion-proof lights when inspecting fuel, oil, coolant or battery fluid. Otherwise, explosion could result causing serious injury or death.

**Prohibit access by unauthorized persons**

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

Prepare work area

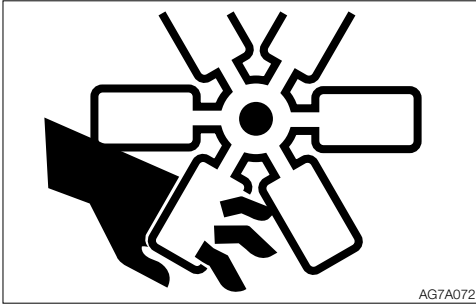
- Select a firm, level work area. Make sure there is adequate light and, if indoors, ventilation.
- Clear obstacles and dangerous objects. Eliminate slippery areas.

Always keep the machine clean

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

Stop the engine before performing maintenance

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

**Stay clear of the moving parts**

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

Firmly secure the machine or any component that may fall

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

Secure the working equipment

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

Secure the engine hood or cover when opened

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

Place heavy objects in a stable position

When it is necessary to 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



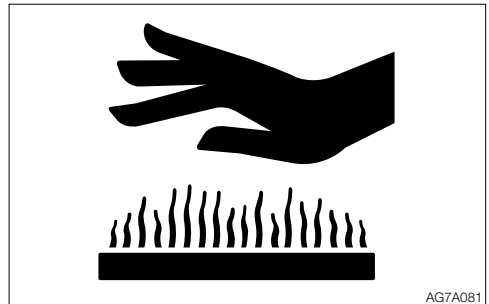
- Do not smoke or permit open flames while fueling or near fueling operations.
- Never remove the fuel cap or add fuel when the engine is running or still hot. Do not spill fuel on the hot surface of the machine.
- Fill the fuel tank in a well ventilated place.
- Do not fill the fuel tank to capacity. 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.

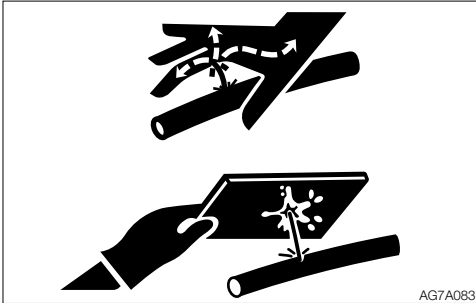
**Be careful with hot cooling systems**

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

Be careful with oil internal pressure

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

- Completely relieve the internal pressure before performing maintenance work.



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

Release pressure before working on the hydraulic system

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

- Slowly loosen the air bleeding plug to relieve the internal pressure.
- When removing plugs or screws, or when disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.
- Oil or plug may spurt out according to the pressure in the travel motor case. Loosen the plug slowly and release the internal pressure.

Be careful with debris when the hammer is being used

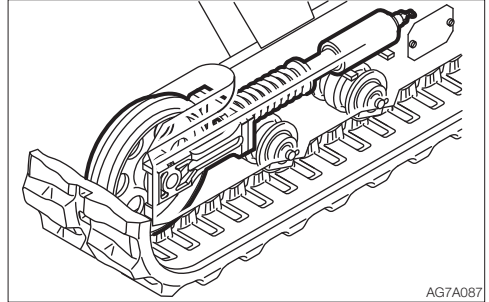
When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious injury.

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

**Be careful with the high-pressure grease**

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

- Never loosen the grease fitting.
- Loosen the grease discharge valve slowly.
Do not turn it more than 1.5 turns.
- Do not put your face, arms, legs or body in front of the grease discharge valve.
- If grease does not come out when the grease discharge valve is loosened, the valve is faulty. Ask a Takeuchi service agent for repair.

Never disassemble the track adjuster

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



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 safety, replace the safety-critical parts like hoses and seat belts periodically. Refer to “List of safety-critical parts” for further details.
- The “safety-critical parts to be periodically replaced” are the parts which deteriorate, wear and fatigue after repeated use and whose properties change over time. While these characteristics of these parts could cause serious physical or personal damage, judging the remaining life of these parts is difficult from external inspection or the feeling when operating.
- Replace the “safety-critical parts to be periodically replaced” 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 goggles 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 the 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

Ask a Takeuchi service agent to repair any welding problems detected. If this is not feasible, make sure the welding is done by a qualified person in a properly equipped workplace.

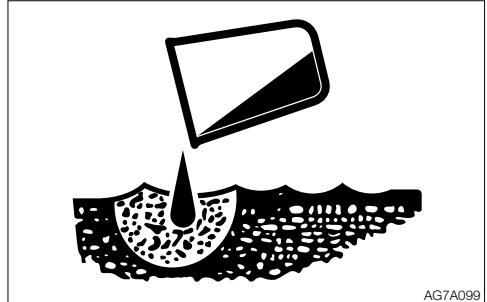
Vibrations operators are subject to

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.



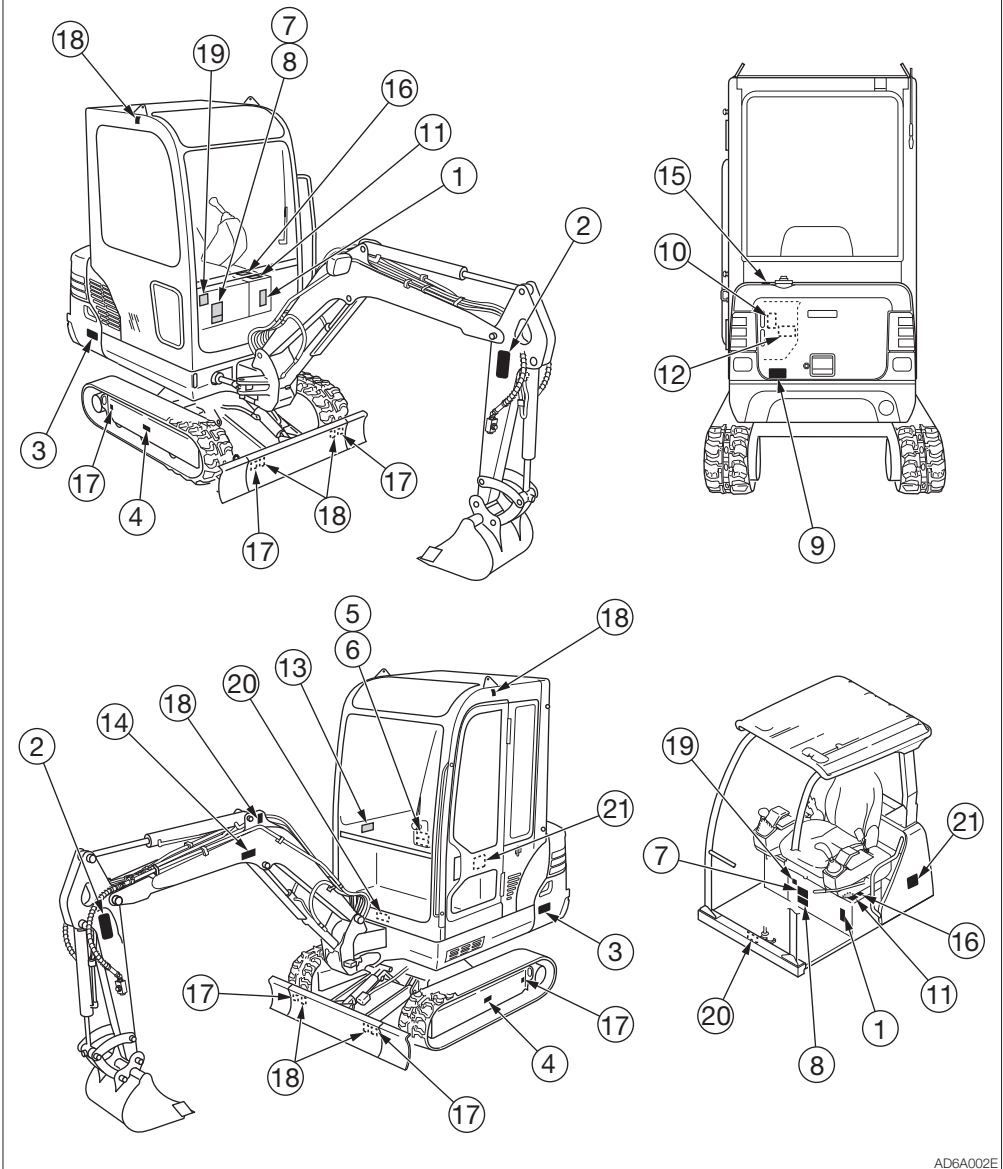
SAFETY SIGNS (DECALS)

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

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



SAFETY
SAFETY SIGNS (DECALS)

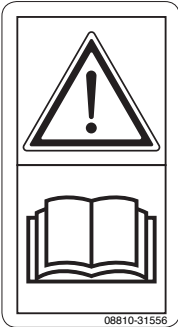


AD6A002E



1. No.08810-31556

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



4. No.05793-00052

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



2. No.05793-00049

Safety Distance
Hazard of being hit by the working device of the machine
Keep away from machine during operation.



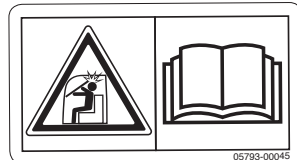
5. No.08810-31557

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



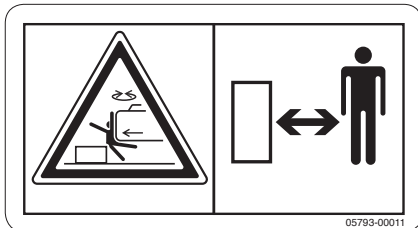
6. No.05793-00045

Hazard at lifting or lowering window
When the front window is opened or closed, it will come close to the head. Be careful that the window does not strike the head.



3. No.05793-00011

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



7. No.03593-13700

**WARNING**

- 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.

03593-13700



SAFETY
SAFETY SIGNS (DECALS)

8. No.03393-79820



12. No.05693-21980



9. No.03593-07400



13. No.03593-47020



10. No.03393-75040



14. No.03593-47010



11. No.03393-75050





SAFETY

SAFETY SIGNS (DECALS)

15. No.03593-06600



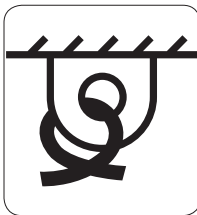
Diesel fuel

16. No.03593-06700



Hydraulic oil

17. No.08810-31549



Tie down point

18. No.03993-00500

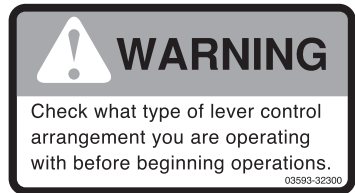


Position of hoisting

19. No.05693-53810 (Option)



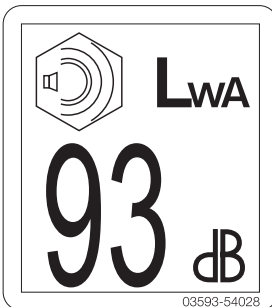
20. No.03593-32300 (Option)



21. Noise Outside the Cab / for EU

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.

No.03593-54028

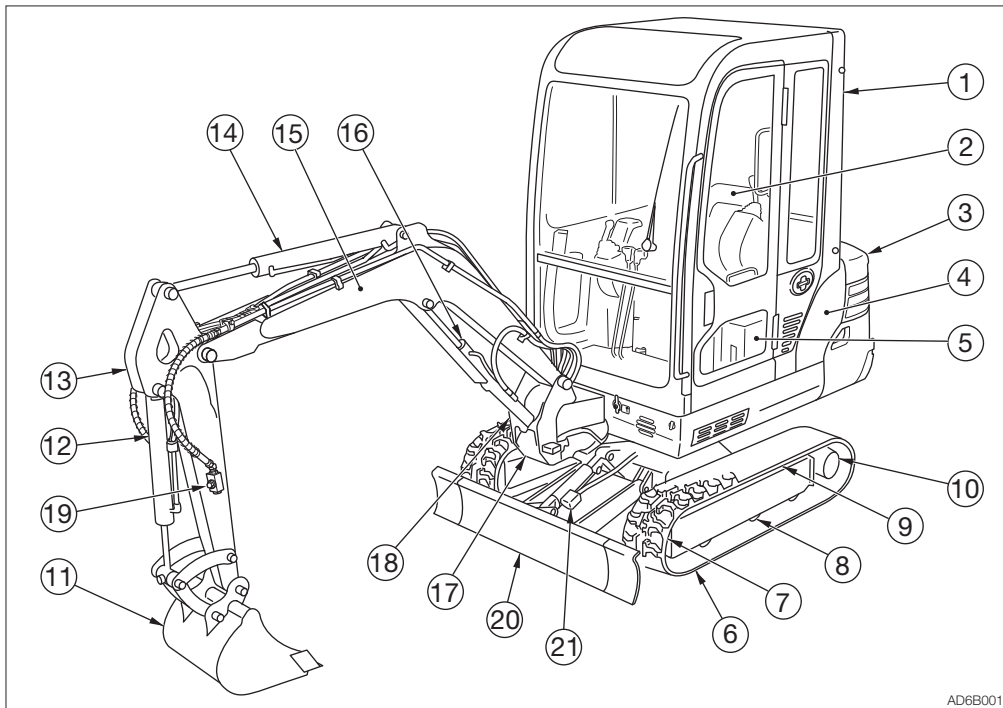


CONTROLS





NAMES OF COMPONENTS



AD6B001

Upperstructure

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

Undercarriage

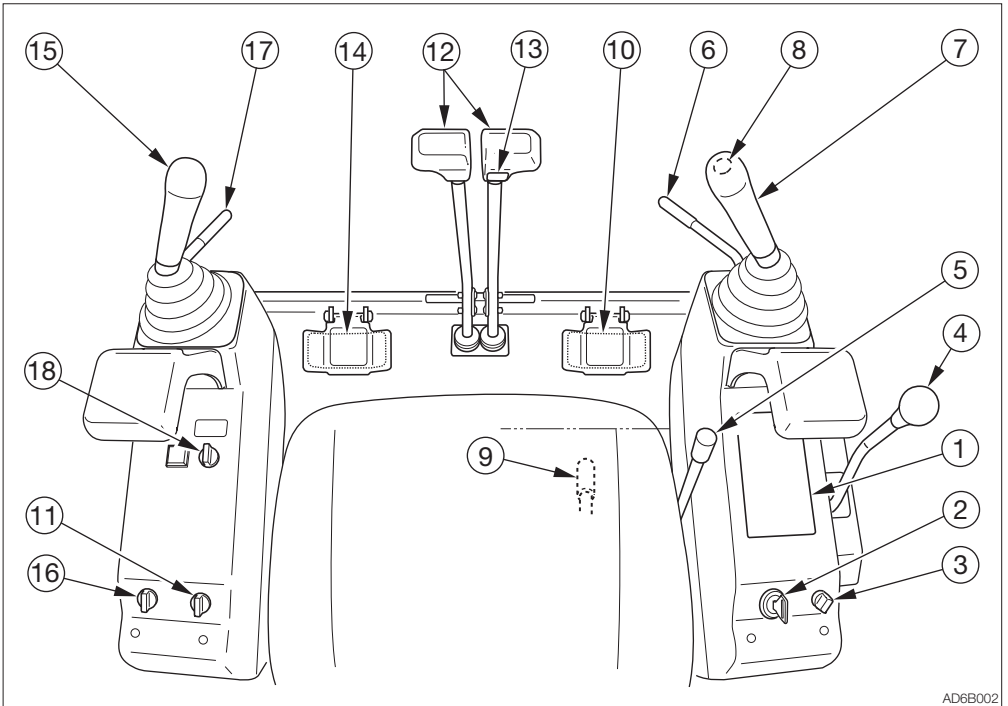
6. Crawler belt
7. Idler
8. Track roller
9. Shoe slide
10. Travel motor

Working equipment

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



CONTROLS
NAMES OF COMPONENTS



AD6B002

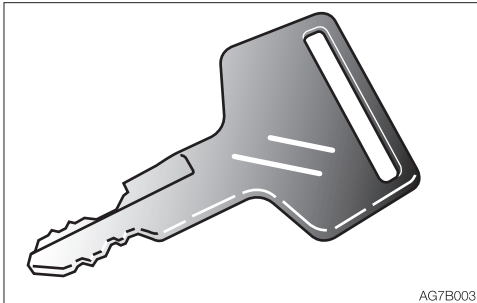
- | | |
|------------------------------|-------------------------------|
| 1. Instrument cluster | 10. Boom swing pedal |
| 2. Starter switch | 11. Wiper switch |
| 3. Light switch | 12. Travel lever/Pedal |
| 4. Blade lever | 13. Travel speed switch |
| 5. Throttle lever | 14. Auxiliary hydraulic pedal |
| 6. Safety lock lever (R.H.)* | 15. Left operating lever |
| 7. Right operating lever | 16. Heater fan switch* |
| 8. Horn button | 17. Safety lock lever (L.H.) |
| 9. Selector lever | 18. Overload warning switch* |

*: Subject to the specifications or optional products selected



COVERS

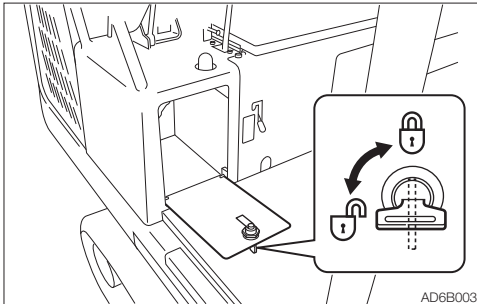
STARTER KEY



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
- Manual storage compartment
- Engine hood
- Covers

STORAGE BOX



This box cannot be used for storage for the machine with a heater because of the heater unit installed inside.

1. To unlock this box, insert the starter key and turn it counterclockwise.

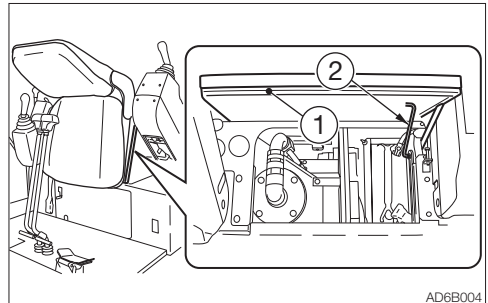
MAINTENANCE COVER



CAUTION

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

For inspection and maintenance of the hydraulic oil system or fuse system, open this cover.



Opening

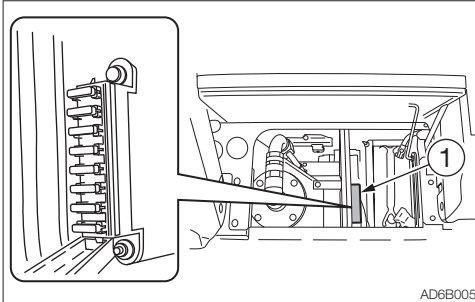
1. Tilt the seat forward, and then open the maintenance cover (1) until it is secured.
2. Make sure it is properly secured with the stay (2).

Closing

1. Hold the seat and lift up the stay (2) to release it.
2. Return the seat to the original position, and then close the cover.



FUSE BOX



This box is used to protect the electric system from overcurrent.

Opening

1. Push in the front tab on the fuse box cover (1), and then pull the cover (1) backward.

Closing

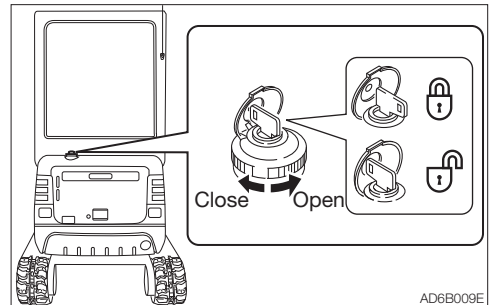
1. Close the cover by engaging the back of the cover (1) into the rear tab on the fuse box.

FUEL FILLER PORT

WARNING

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

Opening



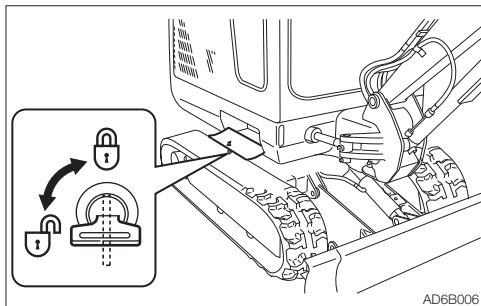
1. Open the cover, insert the key and turn it counterclockwise to unlock the cap.
2. Turn the fuel filler cap counterclockwise and remove it.

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.

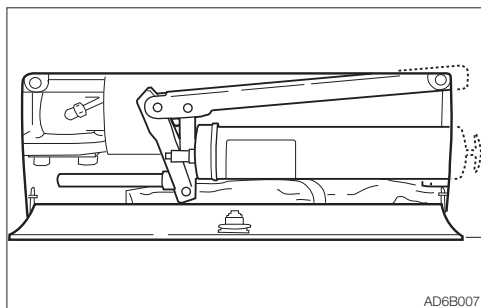


TOOL CASE



1. Insert the starter key and turn it counterclockwise to unlock the box.

Grease gun holder

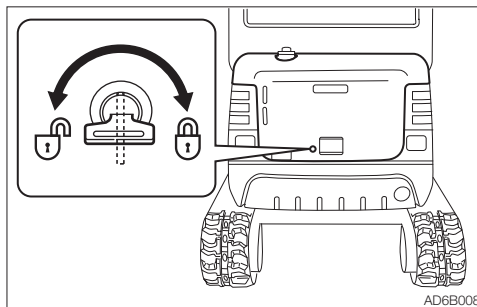


ENGINE HOOD

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. Insert the starter key and turn it counterclockwise to unlock the engine hood (1).
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.



CAB

CAB DOOR

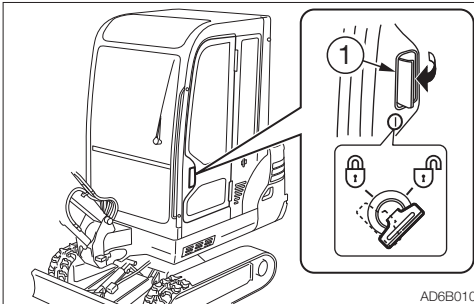
WARNING

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

Open the door fully and press it against the catch at the back of the door to secure it in place.

The door must be locked when getting on or off the machine and while in operation.

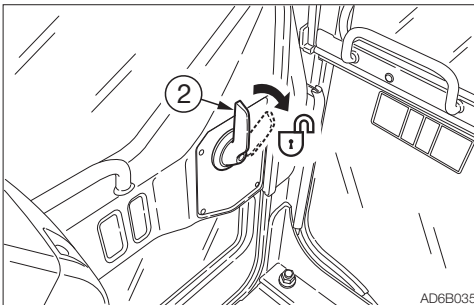
Locking and unlocking



Insert the starter key and turn it.

Opening

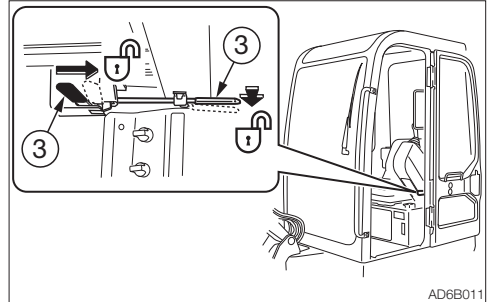
1. Pull the knob (1) towards you and open the door.



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

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

Closing



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



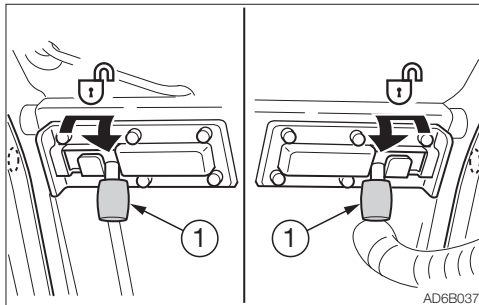
FRONT WINDOW

WARNING

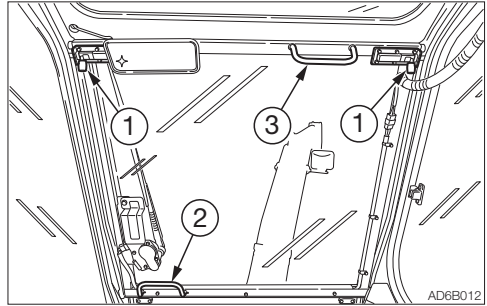
- Grasp the handles firmly with both hands when opening and closing the front window. Your head or hands may get caught if it slips from your hands.
- When the front window is opened or closed, it will come close to the head. Be careful that the window does not strike the head.
- When you open the front 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

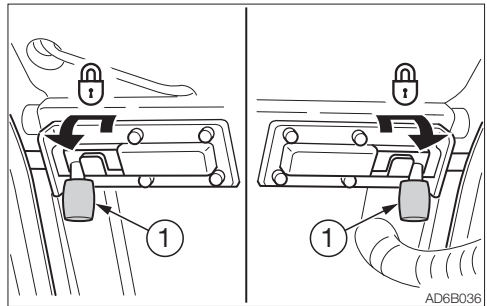
1. Park on a level surface and stop the engine.
2. Set the safety lock lever to the locked position.



3. Unlock the window by pulling the lock pins (1) (right and left) inward. Be sure that the lock pins (1) are turned until they are secured.



4. Grasp the lower handle (2) with your left hand and the upper handle (3) with your right handle.
5. Lift the front window by pulling it toward you.



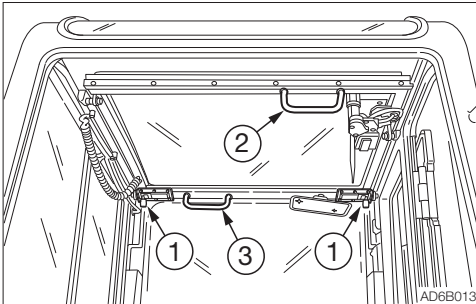
6. When the window frame hits against the stopper, move the lock pins (1) outward to lock the window.



Closing

WARNING

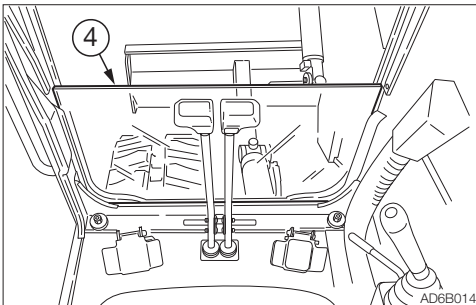
When closing the front window slowly so as not to hit your head. Lowering the window abruptly may result injury or damage the front window.



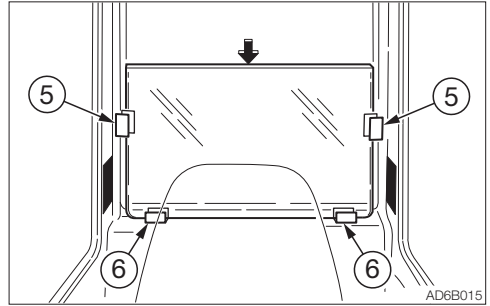
1. Pull the right and left lock pins (1) inward and turn them to the secured position to unlock the window.
2. Grasp the front handle (2) with your left hand and the back handle (3) with your right hand.
3. Slowly pull down the front window by sliding it forward.
4. Move the right and left lock pins (1) outward to lock the window.

LOWER FRONT WINDOW

Removing

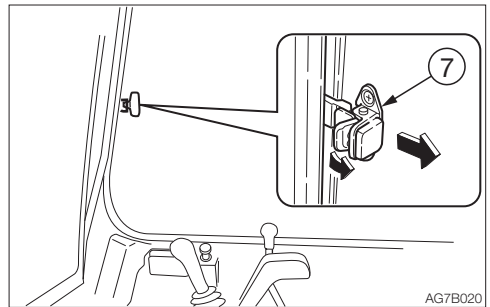


1. Open the front window and stow it in the ceiling.
2. Slowly lift the lower front window.



3. Place the lower front window 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.

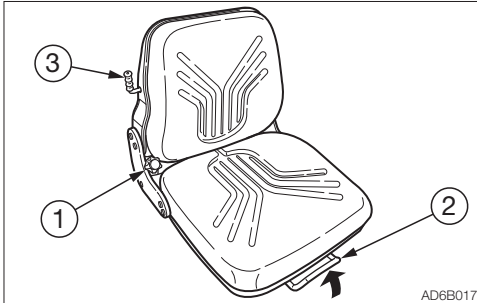


SEAT AND SEAT BELT

SEAT

! WARNING

Adjust and secure the seat.



(A) Adjusting the backrest

! WARNING

- 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.

1. Sit up and sit back in the chair.
2. Set the backrest to the desired angle by turning the handle (1).

(B) Fore-and-aft adjustment

1. Pull up the lever (2) and slide the seat backward or forward to the desired position for operation of machine.
2. Release the lever (2) at the desired position to secure the seat.
Adjustment range: 10 positions, in 150 mm (5.9 in.)

(C) Adjusting according to operator's weight

1. Move the lever (3) to set it according to the weight of operator.

Position of the lever (3)

Upper Light weight operator
Middle Medium weight operator
Lower Heavy weight operator



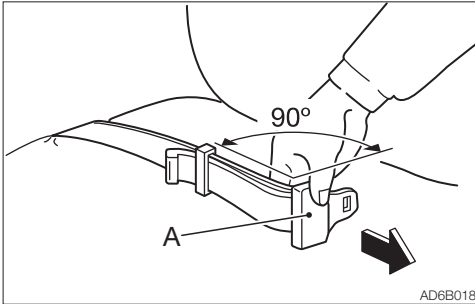
SEAT BELT

CAUTION

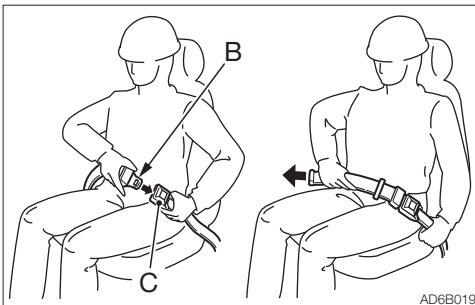
Be sure to fasten the seat belt securely before starting the engine.

Fastening the seat belt

1. Adjust the seat to the desired position for operation, sit up and sit back in the chair.

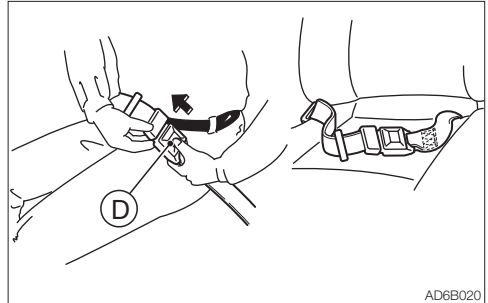


2. Pull the adjuster (A) as shown in the figure above and draw it to the desired length.



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

Releasing the seat belt



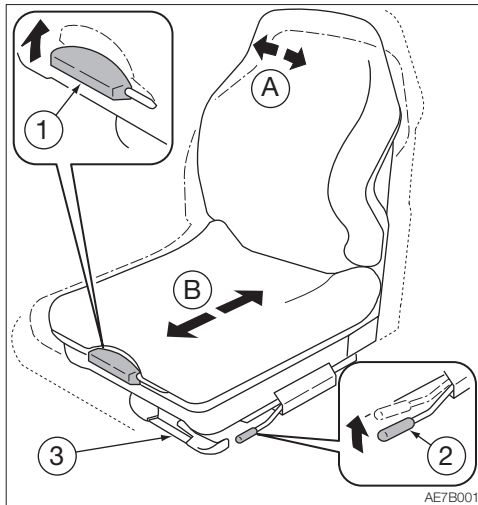
1. To release the seat belt, simply press the red button (C) located on the buckle (D).
2. Connect the tongue plate with the buckle after releasing the seat belt.



HIGH-BACK SEAT (OPTIONAL)

WARNING

Adjust and secure the seat.



(A) Adjusting the backrest

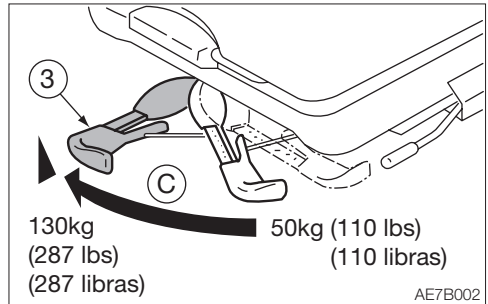
WARNING

- 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.

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

(B) Fore-and-aft adjustment

1. Pull up the lever (2) and slide the seat backward or forward to the desired position for operation of machine.
2. Release the lever (2) at the desired position to secure the seat.
Adjustment range: 10 positions, in 150mm (5.9in.)



(C) Adjusting according to operator's weight

1. Turn the handle (3) until the display indicates the weight of operator.
Adjustment range: 50 to 130 kg (110 to 287 lbs)
2. When adjusting for a weight lower than the currently set weight, first turn the handle (3) as far as it goes to cancel the setting, then readjust.



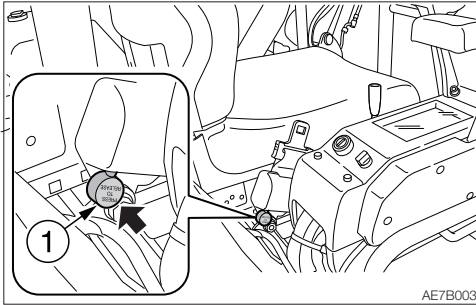
SEAT BELT

CAUTION

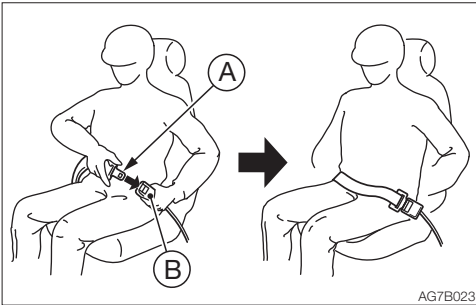
Be sure to fasten the seat belt securely before starting the engine.

Fastening the seat belt

1. Adjust the seat to the desired position for operation, sit up and sit back in the chair.

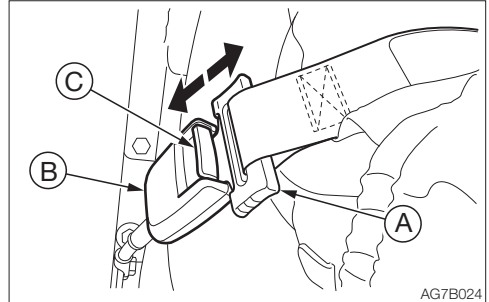


2. Press the button (1) to release the seat belt and pull the seat belt to the desired length.



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. Press the button (1) to fasten the belt until you can feel the pressure on your pelvis with the belt firmly in place.
5. Check if the belt is securely locked by pulling it, and arrange the belt around your waist.

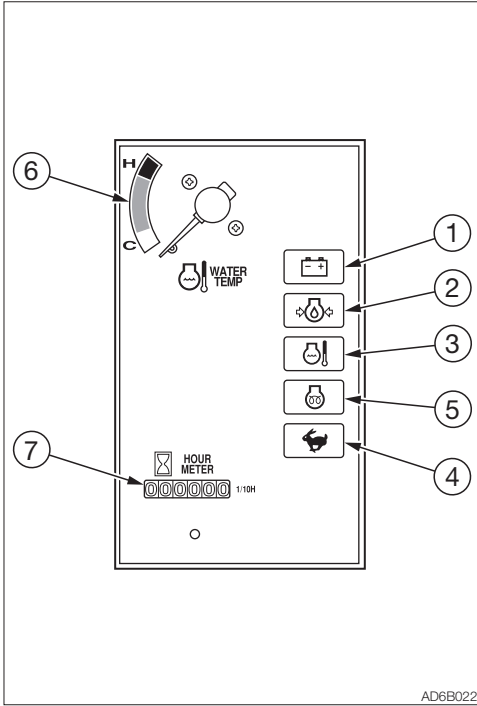
Releasing the seat belt



1. To release the seat belt, simply press the red button (C) located on the buckle (B).
2. Hold the tongue plate (A) and press the button (1).
The seat belt retracts back into its original position.



INSTRUMENT CLUSTER



WARNING LAMPS

IMPORTANT: If a warning lamp flashes and an alarm is sounded, immediately stop all operations and check the corresponding component. Refer to “Troubleshooting” on page 6-9.

1. 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.

2. Engine oil pressure warning lamp

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

3. Coolant temperature warning lamp

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



INDICATORS

4. Travel speed lamp

This lamp lights up when the travel speed switch is set to 2nd (high) speed.

5. Glow lamp

This lamp goes out when the engine preheating is completed.

METERS

6. 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.

7. Hour meter

Displays the total engine running time in hours.

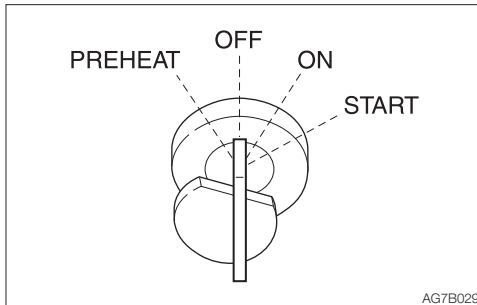
The rightmost digit indicates tenths of hours (6 minutes).

Set the inspection and maintenance intervals according to the time displayed on the hour meter.



SWITCHES

STARTER SWITCH



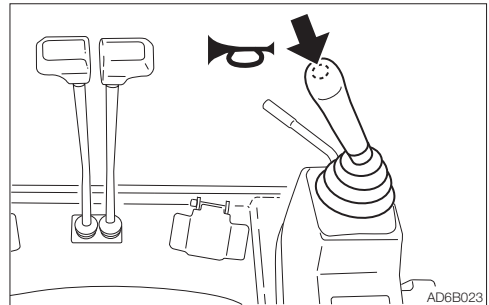
AG7B029

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.

- PREHEATPosition for preheating the engine.
- OFFPosition for stopping the engine and inserting or removing the key.
- ONPosition in which the engine is running. At this position, all the electrical equipment is functional.
- STARTPosition for starting the engine. When the key is released, the switch automatically returns to the ON position.

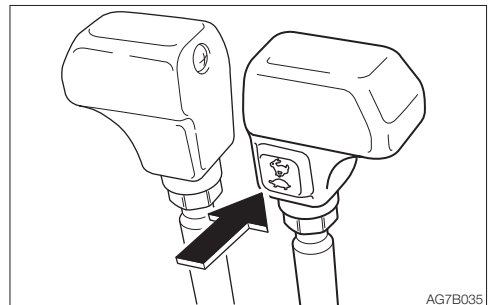
Note: For a machine with an optional battery switch, the engine cannot be turned on even when the starter switch is turned to this position if the battery switch is off. Make sure that the battery switch is on before starting the engine.
Refer to “Battery switch” on page 8-5.

HORN BUTTON



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

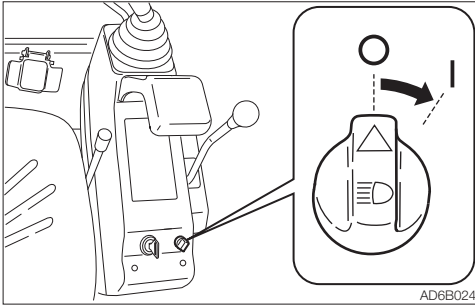
TRAVEL SPEED SWITCH



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



LIGHT SWITCH



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

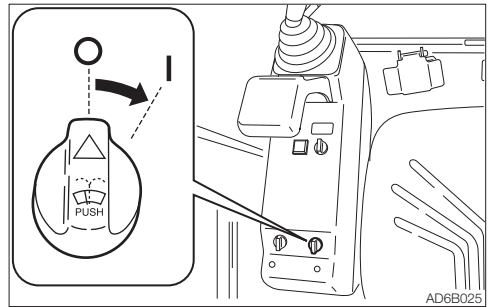
- O Off
- I Meter light, front light, boom light and tail lamps will be lit.

WIPER SWITCH

IMPORTANT: If no washer fluid is discharged, do not operate the washer. Doing so may damage the pump.

IMPORTANT: Operating the wiper with no moisture on the windshield will scratch the glass. Use water or washer fluid when operating the wiper.

IMPORTANT: In cold climates, the wiper blade may freeze to the glass. Operating the wiper forcibly may damage the wiper motor.



- O Off
- I Wiper operates
- PUSH Sprays washer fluid when pressed. Stops when released.

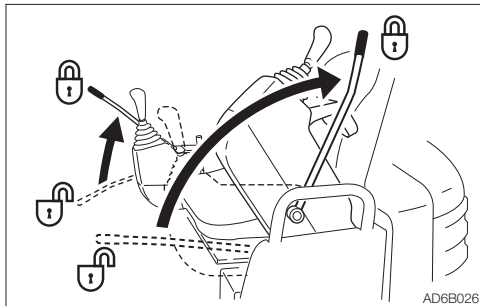


LEVERS AND PEDALS

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 levers to engage the lock and stop the engine. If any controls should be accidentally touched when the safety lock levers is lowered (unlocked), the machine will suddenly move and cause serious injury or death.
- Note that the dozer blade, boom swing and auxiliary hydraulic controls cannot be locked, even when the safety lock lever is set to the locked position. Do not carelessly touch these controls.
- Be careful not to touch the operating levers when raising or lowering the safety lock lever.
- Before leaving the operator's seat, lower the working equipment to the ground, raise the safety lock levers to engage the lock and stop the engine. Also, be sure to remove the key, lock the door and covers, take it with you and store it in a specified place.



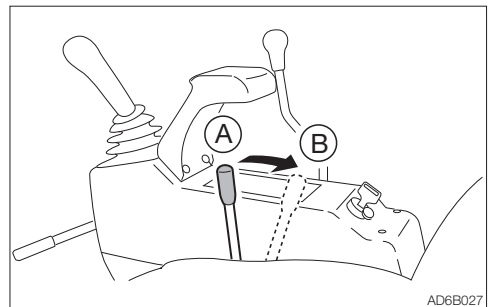
This device is for locking the hoe attachment, slewing and traveling.

When the lever is raised, the lever stand springs up and the controls are locked. Cab types only have left safety lock lever.

Canopy types

- Locking is possible by operating only one side.
- To unlock, both sides must be operated.

THROTTLE LEVER



This controls the engine speed.

(A).....Low idling

(B)Maximum speed

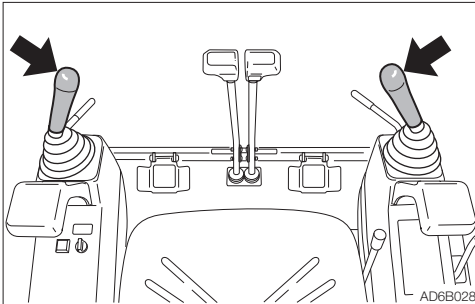


OPERATING LEVERS



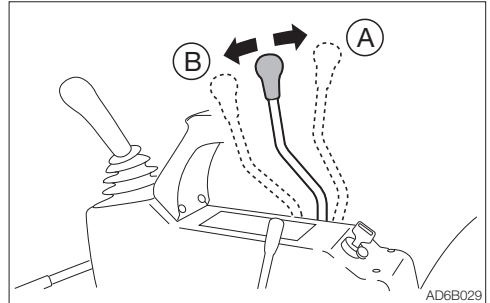
WARNING

- 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



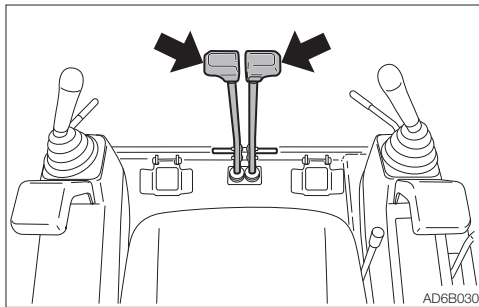
Use this lever to operate the dozer blade.
(A).....Blade up
(B)Blade down
Refer to “Operating the dozer blade” on page 3-17.



TRAVEL LEVERS/PEDALS

WARNING

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

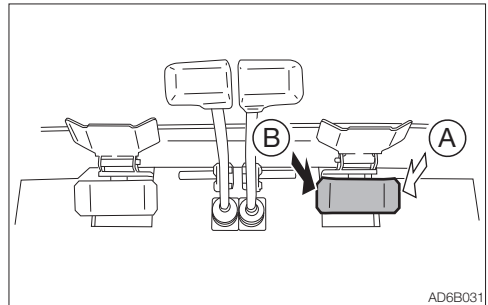


Use these levers/pedals to move forward or backward and to change directions. Refer to "Operating the travel levers" on page 3-12.

BOOM SWING PEDAL

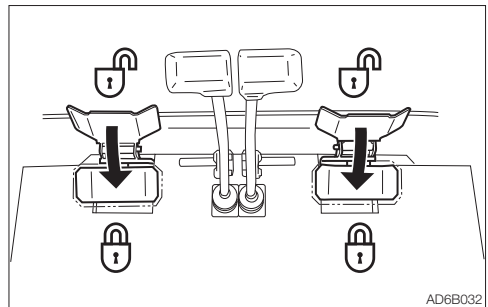
WARNING

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



Use this pedal to operate the boom swing.
(A).....Boom swing right
(B)Boom swing left
Refer to "Operating the boom swing" on page 3-17.

Pedal lock



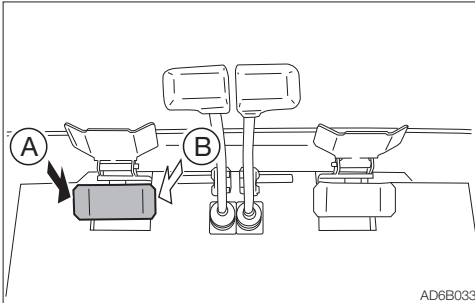
Set the pedal cover over the pedal to lock it. Open the pedal cover from the pedal to unlock it.



AUXILIARY HYDRAULIC PEDAL

WARNING

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



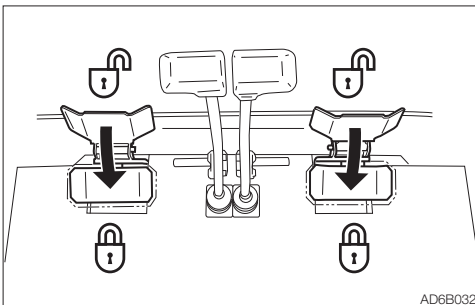
This pedal controls the flow of the oil in the auxiliary hydraulic circuit.

(A)..... Hydraulic oil flows to left auxiliary hose.

(B) Hydraulic oil flows to right auxiliary hose.

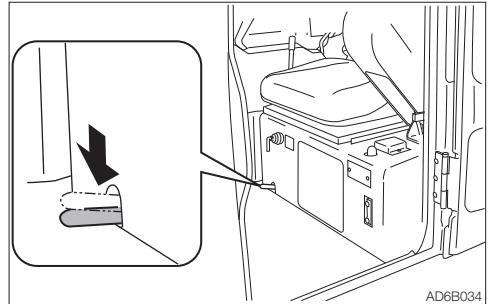
Refer to “Auxiliary hydraulic lines” on page 2-30.

Pedal lock



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

SELECTOR LEVER



This lever is used to change the crawler width. The operation of the dozer blade cylinder and the span cylinder is switched with this lever.

1. Change the crawler width by moving the blade lever while depressing this lever.



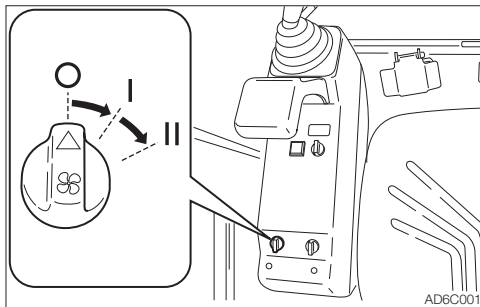
ACCESSORIES

HEATER

WARNING

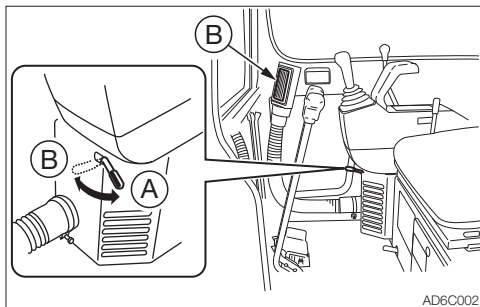
- Always be sure to allow sufficient ventilation.
- Do not place combustible or explosive objects near the air outlets.

Heater fan switch



- OOff
ILow
IIHigh

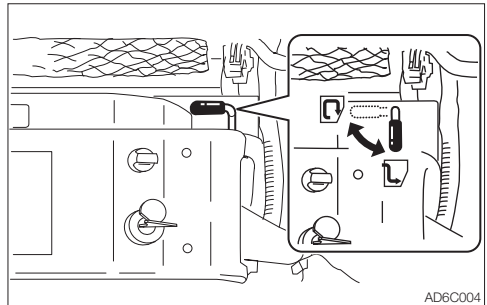
Heater/Defroster lever



Use this lever to switch between the heater and the defroster.

- AHeater
BDefroster

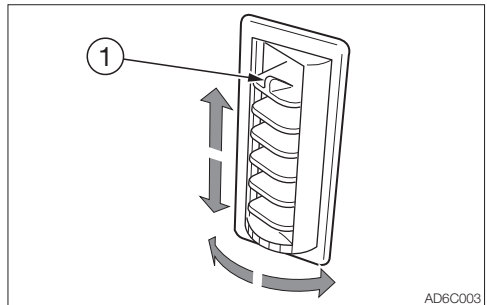
Ventilation/Circulation lever



Use this lever to switch between Ventilation and Circulation.

-Full ventilation: For heating with ventilation. Intake of external air. Defrosting the windows.
-Circulation: Quick heating or when external air is dirty.

Outlets



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



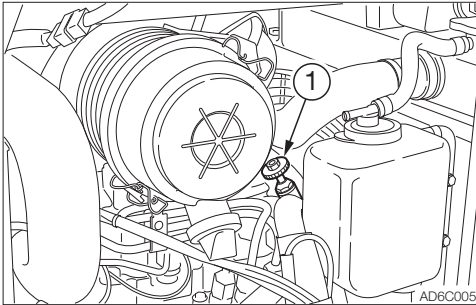
Heater valve

Coolant circulates in the heater even when the heater switch is turned off.

When the heater is no longer needed, stop coolant circulation as follows:

IMPORTANT: Use the valve (1) either fully open or fully closed.

Cooling water could leak when the valve is partly opened.



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



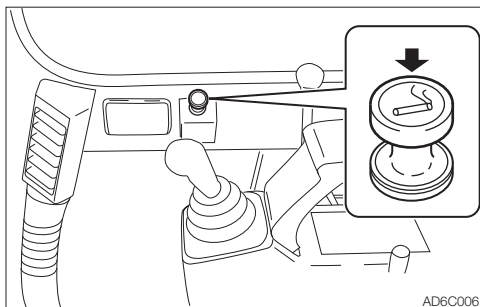
CIGARETTE LIGHTER

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 12V/5A.

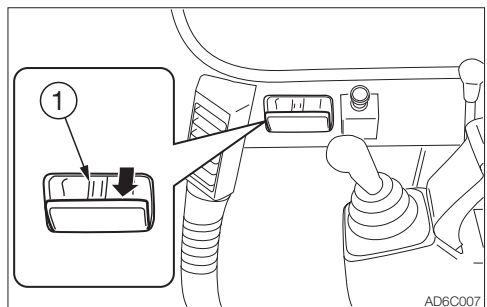


1. Push the lighter in.
2. Release the lighter and wait for it to pop out. The lighter pops out automatically when the heater becomes red hot.
3. Once the lighter pops out, pull it out.

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.

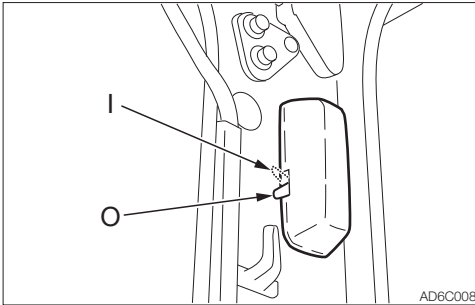


Pull the ashtray towards you to use it. To clean, press the ash discharge button (1) and pull out the ashtray.



INTERIOR LIGHT

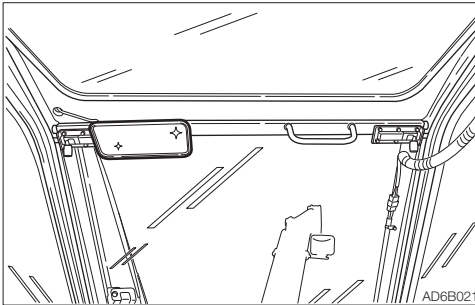
IMPORTANT: The battery capacity decreases if the interior light is left on for a long time when the engine is stopped.



O.....Remains off all the time.

I.....Lights up all the time.

INSIDE REAR VIEW MIRROR (CAB)

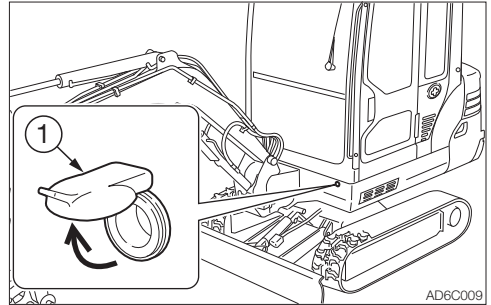


Adjust the rear view mirror to have a better rear view.

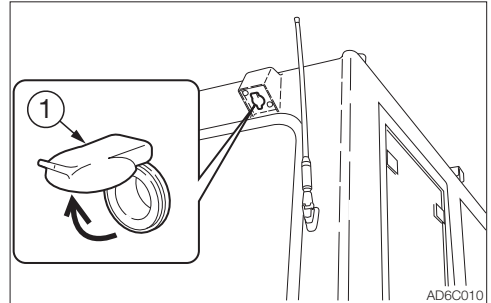
EXTERNAL POWER SOCKETS

WARNING

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



For beacon



Use these sockets to connect the external power supply. When using, be careful not to exceed 12V/5A.

To use, open the cap (1).

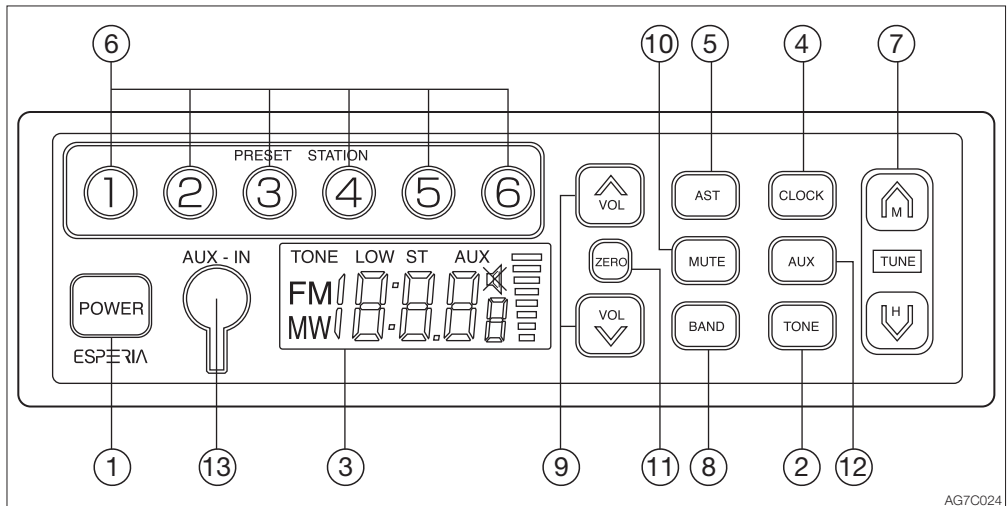


RADIO (FOR CAB)

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



AG7C024

(1) POWER button

Use this button to turn on or off the radio.

(2) TONE control button

Use this button to select the tone. Press the button to select low tone. The TONE LOW display appears on the LCD. Press the button again to select high tone.

(3) LCD

Displays the time/the receiving frequency and the operation mode.

(4) CLOCK button

Use this button to switch between the clock display and the receiving frequency display on the LCD. If this button is not pressed for six seconds while the frequency is displayed, the LCD returns to the clock display.

(5) AST button

Use this button to automatically seek the station information, store it into memory and assign each preset button (1 to 6) a station.

(6) PRESET STATION buttons (1 to 6)

Use these buttons to store station information. Each button can store information on one FM station and one AM station. For how to use these buttons, refer to "Presetting stations".



(7) TUNE button

Use this button to tune to a radio station. Press and hold this button (▲ or ▼) for two seconds or more to start seeking the audible stations. The seeking stops when a station is found. To cancel tuning in progress, press the button again.

Pressing the ▲ button will start seeking stations with higher frequency. Pressing the ▼ button will start seeking stations with lower frequency. The frequency will continuously be increased/decreased if the ▲ or ▼ button is held pressed.


(8) BAND button

Use this button to select FM or AM. The selected band and the receiving frequency will be displayed on the LCD.

(9) 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.

(10) MUTE button

Use this button to temporarily turn off the sound output. If pressed, the “mute is on” mark  appears on the LCD. Press this button again to cancel mute.

(11) ZERO button

Use this button to set the minute to “00” when it is between “55” and “59” or “01” and “05”.

(12) AUX button

Use this button to choose which to listen to, the radio or the external audio source connected to the AUX-IN. If the external source is chosen, the AUX display appears on the LCD.

(13) AUX-IN jack

Use this jack to connect an external audio source. Pull off rubber cap and plug the stereo mini-plug of the external audio device into this jack. Be sure that jack is closed with the rubber cap when not in use.

Playing the radio

1. Turn the ignition key to the ACC or ON position, and then press the power button (1) to turn on the radio.
2. Select the band FM or Am with 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 turn button ▲ for two seconds or one to start seeking stations in the higher frequencies direction. Press and hold the button ▼ for two seconds or more to start seeking stations in the lower frequencies direction. The radio will stop seeking when it finds an audible 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. Select the band (FM or AM) and the station you want to preset.
 2. To set the selected station to a preset button, choose the button to be set and then press and hold the button for three seconds or more. The number of the preset button chosen appears on the LCD.
 3. For more stations, repeat the steps (1) and (2) above.
- If the preset button on which a station has been set to is pressed and held for two seconds or more, the preset information will be modified.
 - If the stored information is erased during battery replacement on the vehicle, set the stations again to the preset buttons.
 - Each preset button can store information on one FM station and one AM station.

AUTO storing

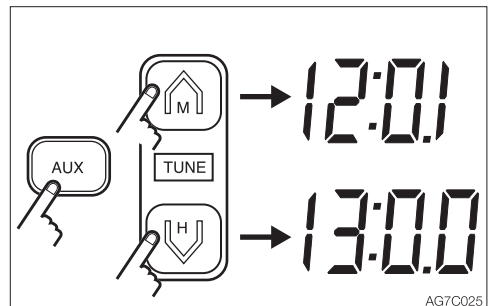
Press the AST button for two seconds or more while playing the radio. The radio starts seeking the audible stations obtained into memory, and assign each preset button (1 to 6) a station.

Note: The previous station setting stored in memory will be overwritten. If the arrangement of the preset buttons to the corresponding stations is not desirable, try the “Presetting stations” described above.

AUX audio connection

- Connect a favorite stereo headphone set to enjoy music on the radio, or 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 the audio player, press the AUX button. (The AUX display appears 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 time



AG7C025

- Be sure that the time is displayed on the LCD. If not, press the AUX button to display the time.
- Use the tune (M) button to set the minute. Use the tune (H) button to set the hour.
- To set the minute digits to “00” when they are from “55” to “59” or from “01” to “05”, press the ZERO button.



Resetting the radio

If there are any problems, such as the abnormal display of frequency or failure of selection, reset the radio by pressing the power button and the ZERO button together. Note: That the memory containing the clock setting and the channel setting is cleared after reset.

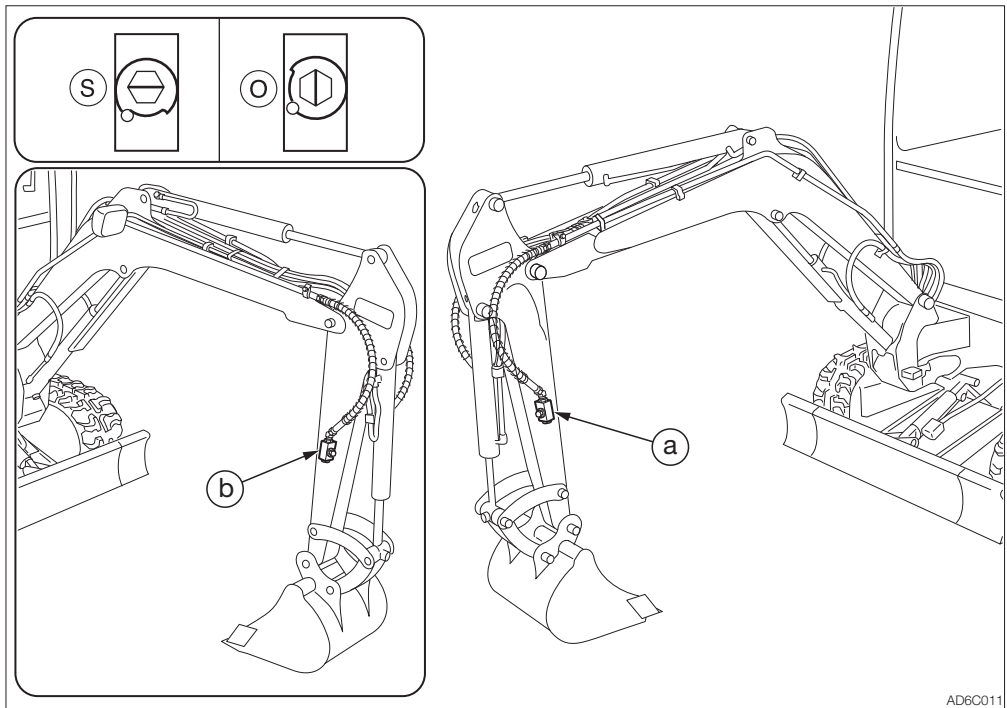
SPECIFICATIONS

Power source:DC 12V to 24V
(negative ground)
Power consumption:5A
Rated output power:20W +20W (4Ω) (at DC
24V input)
16W + 16W (10%
distortion, 4Ω) (at DC
24V input)
Dimension: 178 (W) X 50 (H) X92
(D) mm (without
projections)
Receiving frequency: MW (AM) 522 to
1629kHz
FM 76.1 to 89.9 MHz
Practical sensitivity: ...MW (AM) 20μV (S/N 20
dB)
FM 3μV (S/N 30 dB)
S/N ratio:FM 50 dB
AUX IN:Stereo mini jack (3.5
mm); max. input, 1V;
rated input, 90mV

Note: Specifications and dimensions may be changed without notice.



AUXILIARY HYDRAULIC LINES



AD6C011

WARNING

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

- Immediately after the engine is stopped, press each auxiliary hydraulic pedal several times to release the pressure from the auxiliary hydraulic circuit.
- Slowly loosen the air bleeding plug to relieve the internal pressure of the hydraulic oil tank.
- 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.

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



Connecting the hydraulic circuits

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

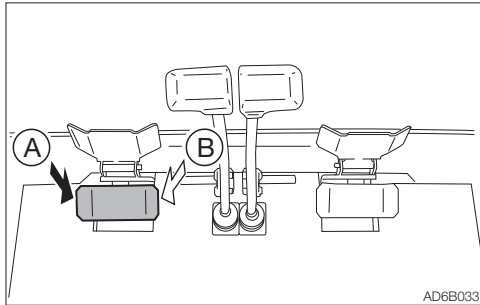
1. Release the pressure remaining in the lines, and then close the stop valve. Refer to “Releasing residual pressure” on page 2-32.
2. Remove the plugs.
3. Connect the attachment hydraulic lines to ports (a) and (b). When installing a hydraulic breaker, connect the supply circuit to the port (a) and 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 2-32.
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 residual pressure” on page 2-32.
2. Disconnect the lines from the ports (a) and (b).
3. Install the plugs.



Operating

Press this pedal to control the flow of the oil in the auxiliary hydraulic lines.

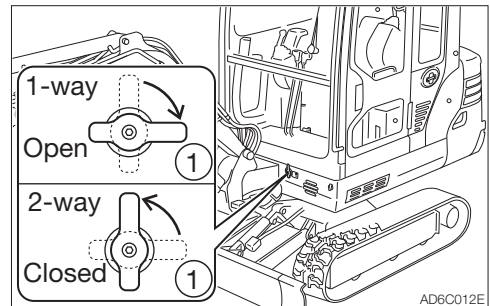
- (A)..... Hydraulic oil flows to left auxiliary line (a).
- (B) Hydraulic oil flows to right auxiliary line (b).

Releasing 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.

1. When the engine is stopped, depress the auxiliary hydraulic pedals from side to side several times.

Selector valve (Option)



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 on the machine body.

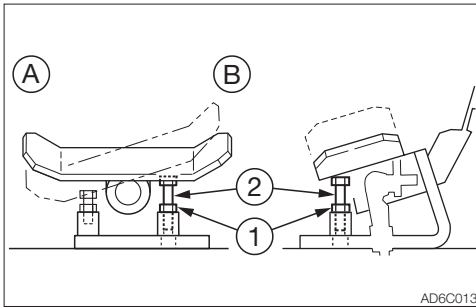


Adjusting the stroke of auxiliary hydraulic pedal

When a breaker is used, the pedal stroke must be adjusted so as not to activate the right auxiliary hydraulic line even if the B side of the pedal is accidentally depressed.

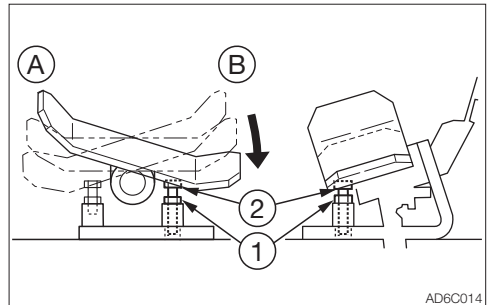
When a general attachment is used, the pedal stroke must be readjusted. Adjust it so that the right auxiliary hydraulic line is activated when the B side of the pedal is depressed.

When using a hydraulic breaker (1-way flow)



1. Make sure that the auxiliary hydraulic pedal is in the neutral position.
2. Loosen the lock nut (1).
3. Loosen the adjustment bolt (2) until it touches the pedal.
4. Fasten the lock nut (1) to secure the adjustment bolt (2).

When using a reversible attachment (2-way flow)



1. Loosen the lock nut (1) and screw in the adjustment bolt (2) to the end.
2. Depress the B side of the auxiliary hydraulic pedal to the stroke end and hold its position.
3. Loosen the adjustment bolt (2) until it touches the pedal.
4. Fasten the lock nut (1) to secure the adjustment bolt (2).

OPERATION



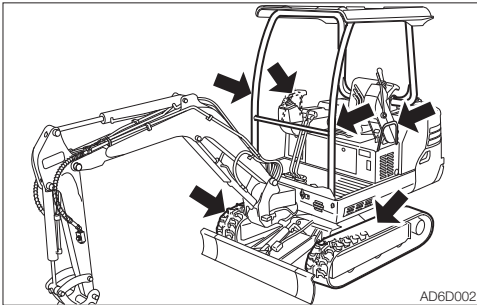
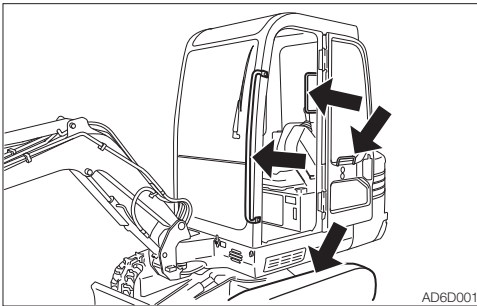


BEFORE STARTING OPERATION

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 5-14 and 5-15.

DAILY INSPECTION

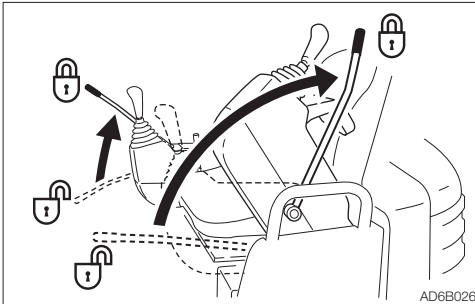
Perform the daily inspections once a day before starting the engine for the first time. Refer to "MAINTENANCE, Daily inspection", on pages 5-16 to 5-21.



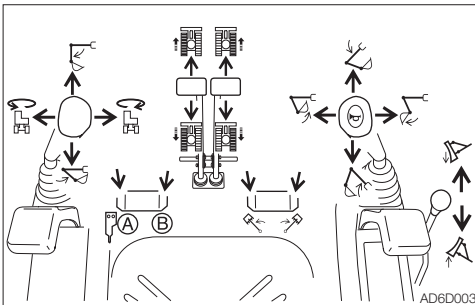
STARTING AND STOPPING THE ENGINE

BEFORE STARTING THE ENGINE

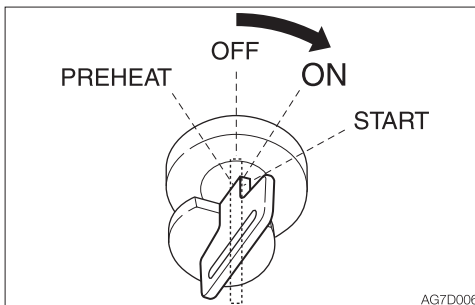
1. Adjust the seat for a comfortable operating position.
2. Fasten the seat belt.



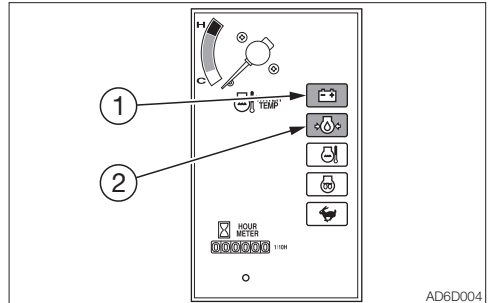
3. Check that the safety lock lever is in the locked position.



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:



- All warning lamps flash and an alarm is sounded for 2 seconds. The meters also start functioning. After 2 seconds, only the battery charge warning lamp (1) and the engine oil pressure warning lamp (2) start flashing, and the other lamps go out.
- Turn the light switch to check that the boom light, front light, tail lamps and meter light turn on.

If a lamp does not light or the alarm is not sounded, the bulb may be burnt out or a wire may be damaged. Ask a Takeuchi service agent for repair.



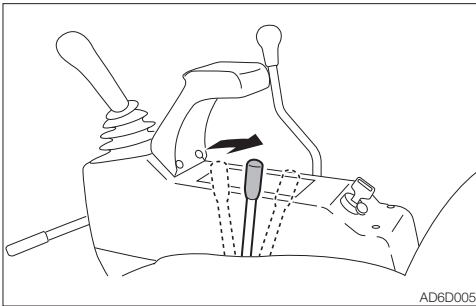
STARTING THE ENGINE

WARNING

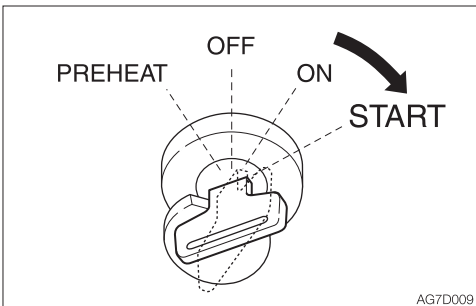
- Clear all personnel from the work area.
- Sound the horn to warn people around the machine.

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.

Normal starting



1. Pull the throttle lever to the middle position.

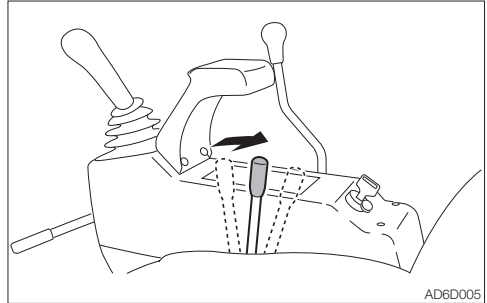


2. Turn the starter key to the START position and start the engine.
3. Once the engine starts, release the key. The key automatically returns to the ON position.
4. Check that the warning lamps are off.
5. Return the throttle lever and warm up the engine. Refer to "Warming up the engine" on page 3-5.

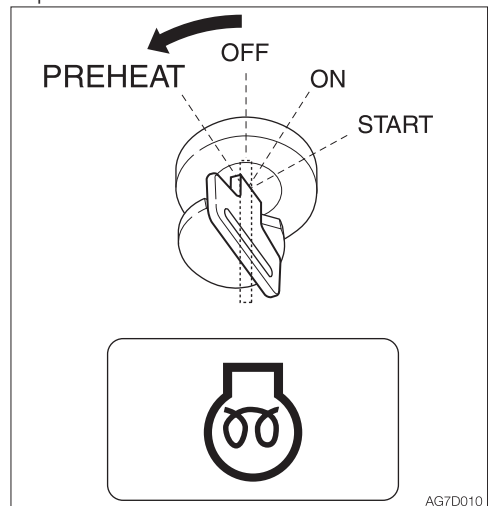
Starting in cold climates

WARNING

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



1. Pull the throttle lever to the middle position.



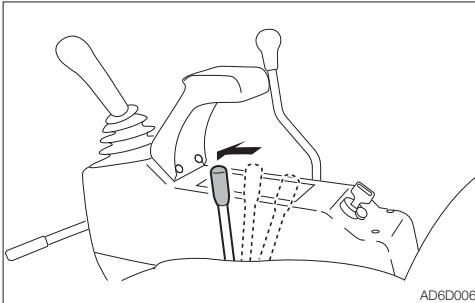
2. Turn the key to the PREHEAT position and hold it there while the glow lamp is lit (about 5 seconds).
3. After the glow lamp goes out, turn the key to the START position to start the engine.
4. Once the engine starts, release the key. The key automatically returns to the ON position.
5. Check that the warning lamps are off.
6. Return the throttle lever 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.

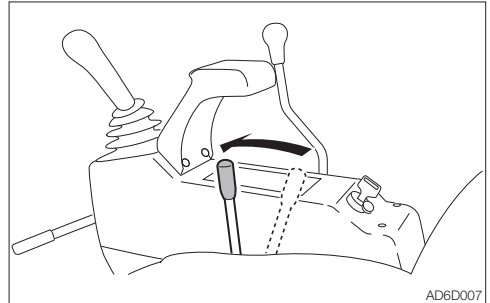
Do not warm up the engine for a long time (20 minutes or more). When idling is required, occasionally place a load or run the engine at medium speed.



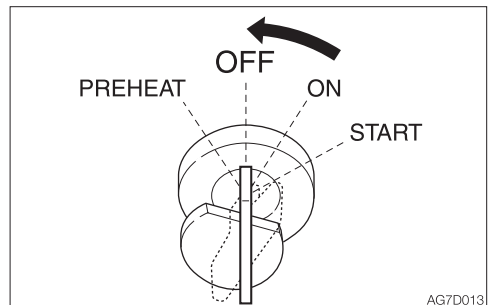
1. Return the throttle lever, then run the engine at a low idle speed with no load for 5 minutes.

STOPPING THE ENGINE

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



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



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

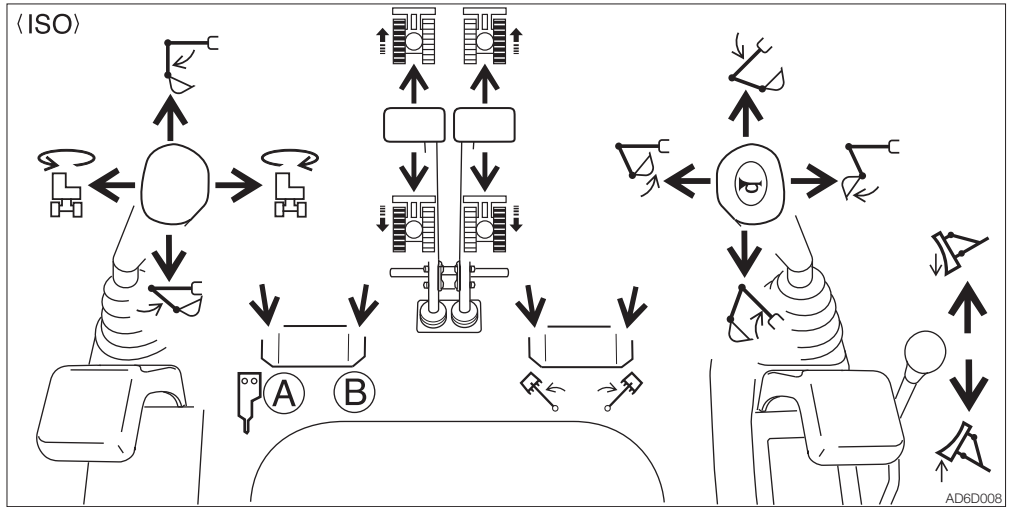


OPERATING THE MACHINE

LEVER PATTERN (ISO PATTERN)

WARNING

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



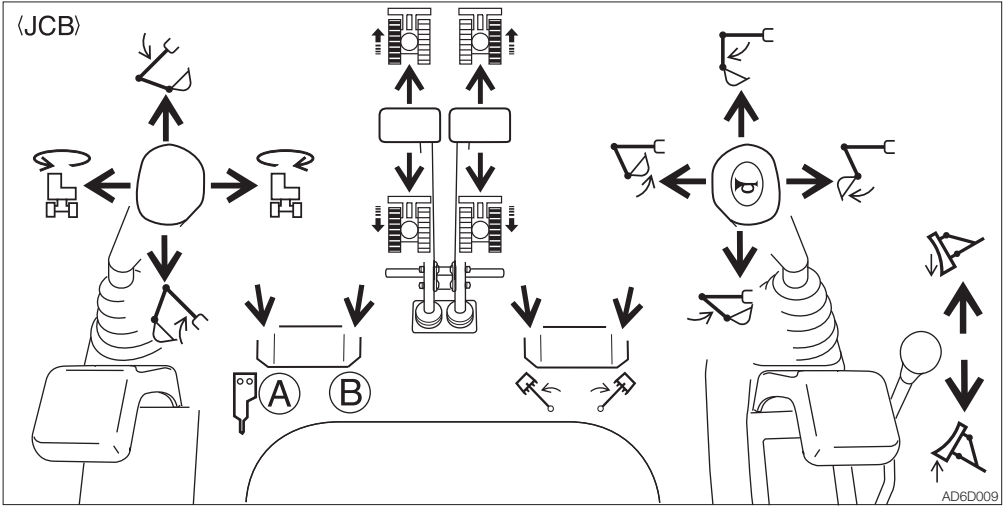
	Left crawler forward		Right crawler forward
	Left crawler reverse		Right crawler reverse
	Arm out		Boom lower
	Arm in		Boom raise
	Upperstructure slew left		Bucket load
	Upperstructure slew right		Bucket dump
	Boom swing left		Dozer blade lower
	Boom swing right		Dozer blade raise



LEVER PATTERN (JCB PATTERN)

⚠ WARNING

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



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



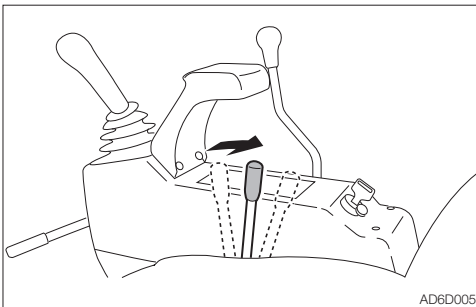
WARMING UP THE MACHINE (HYDRAULIC OIL)

WARNING

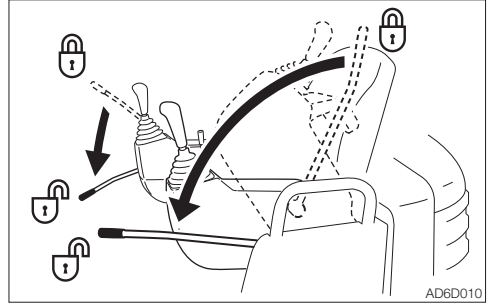
Operating the working equipment without warming up the machine (hydraulic oil) is dangerous, as the working equipment cannot respond to controls quickly or may move in unexpected ways, and the safety devices may not operate properly. Be sure to sufficiently warm up the machine.

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).

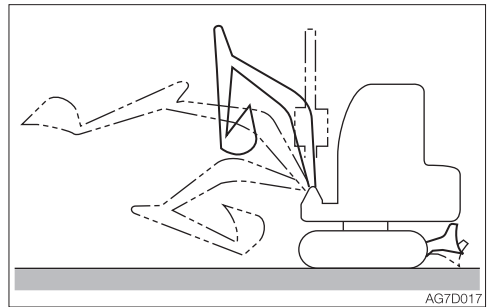
Normal warm-up



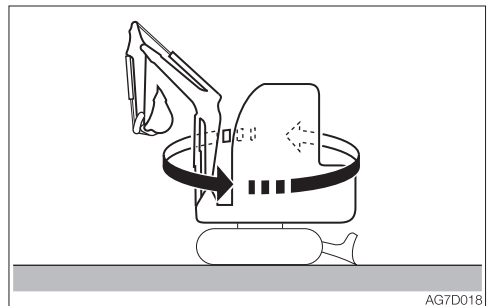
1. Pull the throttle lever to the middle position, then run the engine at medium speed for about 5 minutes with no load.



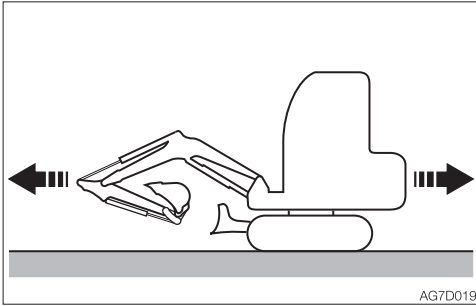
2. Fully lower the safety lock lever to disengage the lock and lift the bucket from the ground.



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



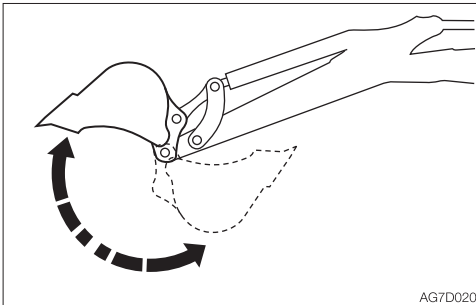
4. Slew slowly to the left and the right several times.



- Travel slowly forward and in reserve several times.

Warm-up in cold climates

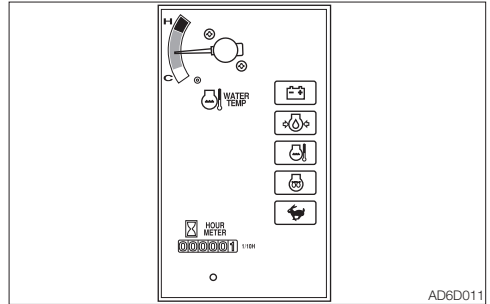
- Perform the normal warm-up procedure.



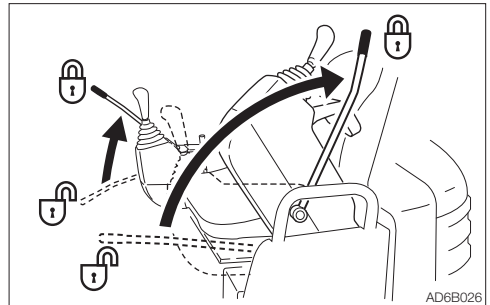
- Set the bucket cylinder at the stroke end and keep it there. Do not keep this condition for more than 30 seconds.
- Repeat Step 2 until the bucket operating speed becomes normal.

INSPECTION AFTER WARM-UP

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



- Check that the warning lamps and meters are as follows:
 - Are all warning lamps off?
 - Is the needle on water temperature gauge seen within the green range?
- Check that there are no irregularities in the exhaust color, sound and vibrations.



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



CRAWLER WIDTH SWITCHING

WARNING

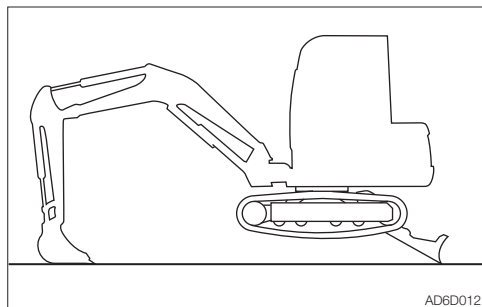
Operate the machine with the maximum crawler width

- Always operate the machine with the crawler width extended to 1370 mm (53.9 in.) to maximize the machine stability. If the machine is operated with the crawler width narrowed (980 mm, 38.6 in.), the machine may tip over due to its poor stability.
- If the machine must be operated with the narrowed crawler width (980 mm, 38.6 in.), traveling should be done after folding the hoe attachment, lowering the boom to lower the center of gravity and keeping the machine facing forward.

This machine is able to change the crawler width. Normally, it is best to operate with the crawler width extended for machine's stability.

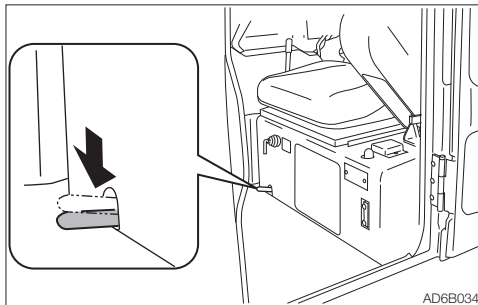
Switching the crawler width

Perform the operation on a flat and rigid ground where no obstacles around.

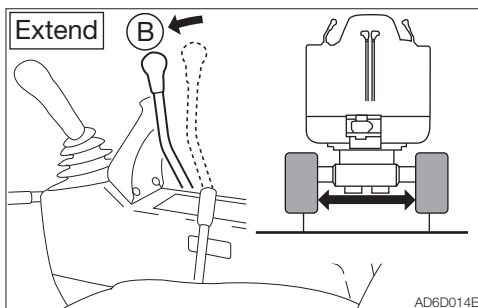


1. Raise the machine body by using the hoe attachment and the dozer blade.

IMPORTANT: Be sure to raise the machine body before switching the crawler width. If the operation is attempted when the crawler is rested on the ground, the travel frame or span cylinder may be damaged.



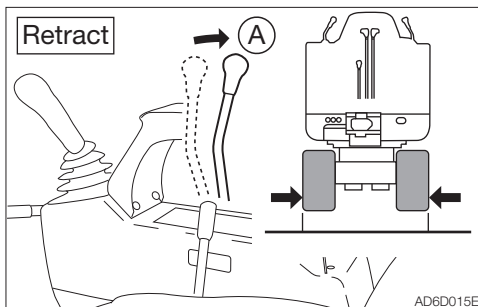
2. Depress the selector lever.



3. Push the blade lever forward (B) to increase the crawler width (1370 mm or 53.9 in.).

If necessary, extend the blade width by changing the plate (2).

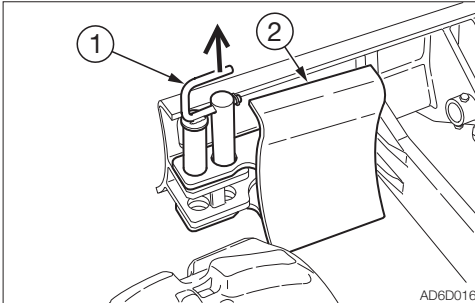
Refer to "Switching the blade width" on page 3-11.



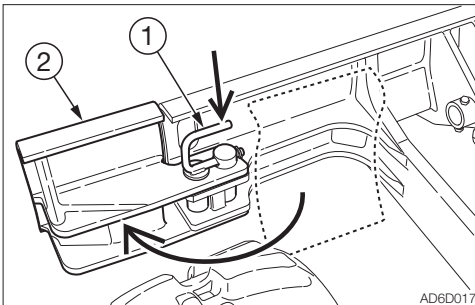
4. Pull the blade lever toward you (A) to decrease the crawler width (980 mm or 38.6 in.).



SWITCHING THE BLADE WIDTH



1. Pull out the lock pin (1).



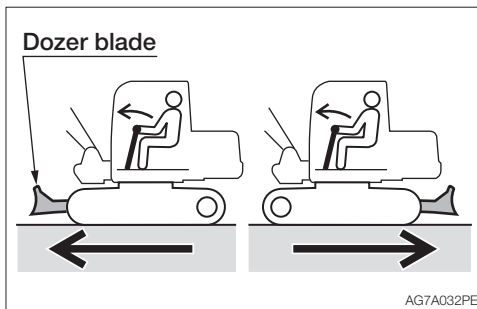
2. Rotate the plate (2).
3. Insert the lock pin (1) to secure the plate (2).



OPERATING THE TRAVEL LEVERS

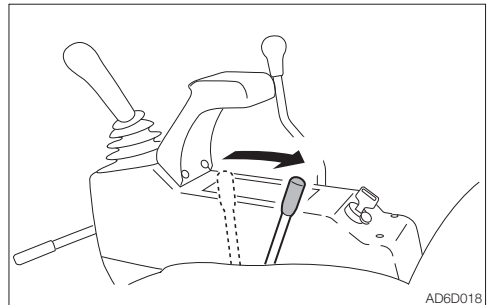
WARNING

- Never allow anyone to enter the machine's slewing radius and path.
- Signal your intention to move by sounding the horn.
- There is a blind spot in the rear of the machine. Before traveling in reverse, as necessary, swing the cab around in reverse to check that the area is safe and clear.

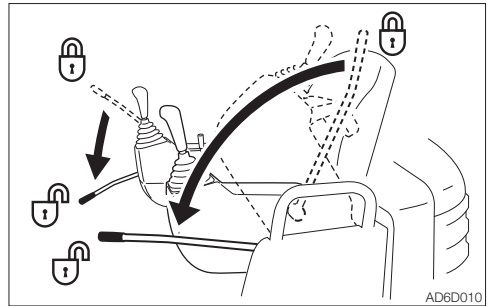


- Before operating the travel levers/pedals, make sure that the dozer blade is to the front of the operator's seat. Remember that when the dozer blade is to the rear of the operator's seat, the travel levers/pedals must be operated in the reverse direction from when it is to the front.
- Clear all obstacles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

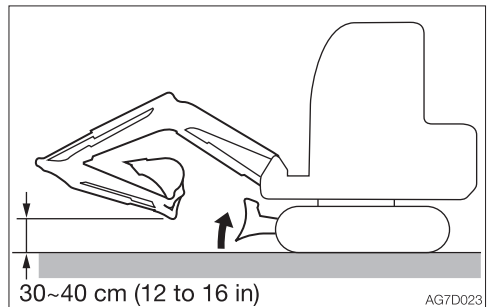
Moving the machine forward and backward



1. Pull the throttle lever and increase the engine speed.



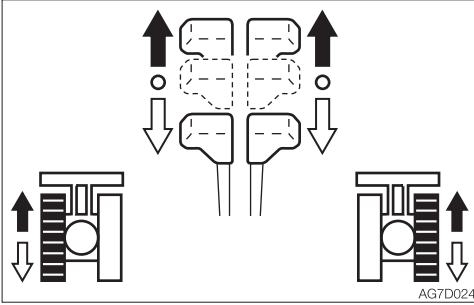
2. Fully lower the safety lock lever to disengage the lock.



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

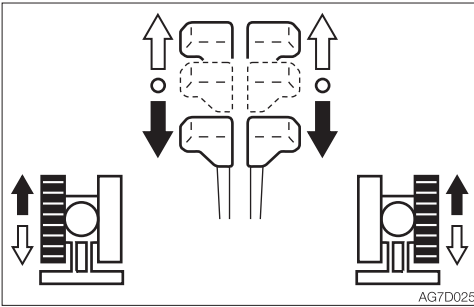


OPERATION OPERATING THE MACHINE



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

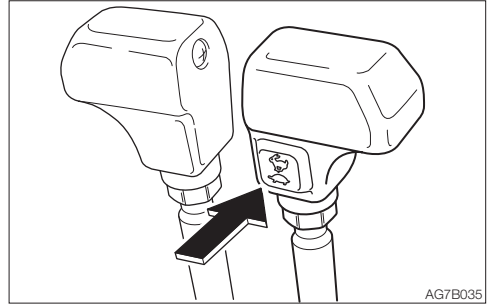
- ➔ To move forward:
Tilt the levers forward.
- ⇨ To move backward:
Tilt the levers backward.



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

- ➔ To move forward:
Tilt the levers backward.
- ⇨ To move backward:
Tilt the levers forward.

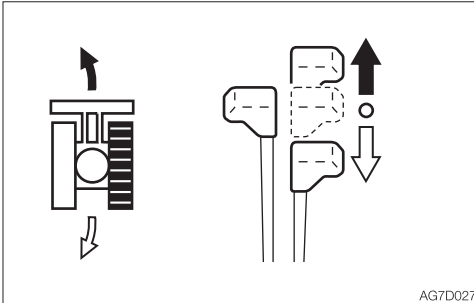
Traveling in 2nd (High) speed



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



Pivot turn



AG7D027

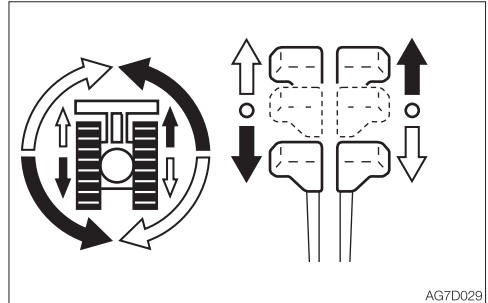
Turning to the left when stopped:

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

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

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

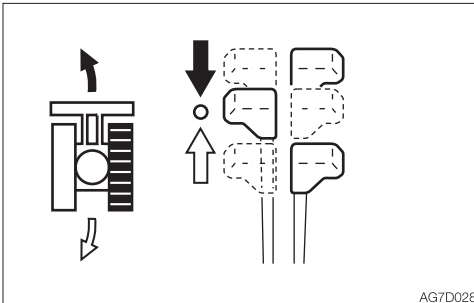
Spin turn



AG7D029

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

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



AG7D028

Turning to the left while traveling:

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

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

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



STOPPING TRAVEL



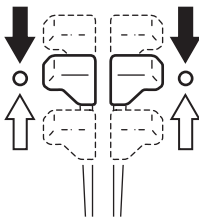
WARNING

- 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 control is accidentally touched when the safety lock lever is not locked, the machine may suddenly move and cause serious injury or death.
- Note that the dozer blade, boom swing and auxiliary hydraulic controls cannot be locked, even when the safety lock lever is set to the locked position.
Do not carelessly touch these controls.



CAUTION

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



AG7D030

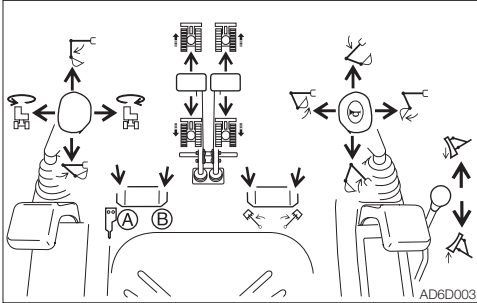
1. Set the left and right travel levers slowly to the neutral position. The machine stops.



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.

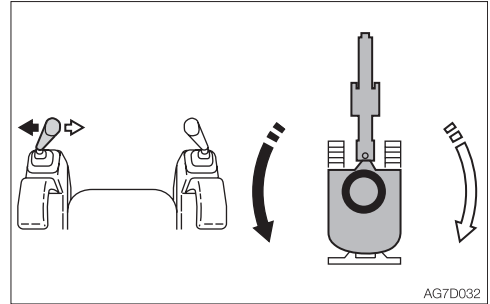
Return the operating levers to the neutral position to stop the hoe attachments.

1. Lower the safety lock lever to the unlocked position.
2. Set the pedal cover to the unlocked position.

Slewing

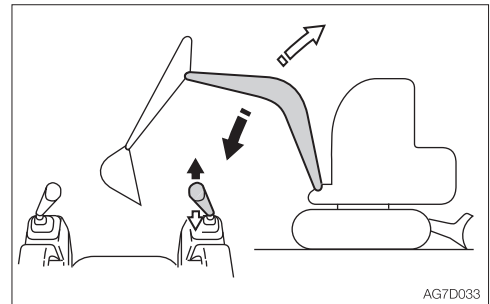
WARNING

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.

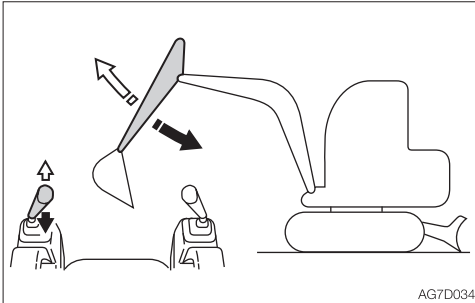
Operating the boom



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



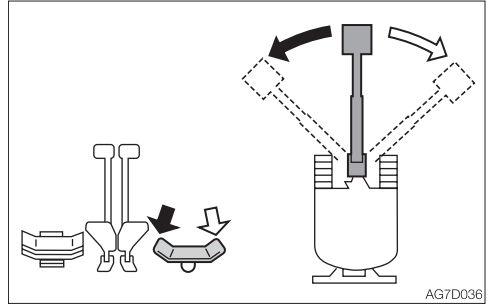
Operating the arm



AG7D034

- ➔ Arm in:
Tilt the left operating lever backward.
- ⇨ Arm push:
Tilt the left operating lever forward.

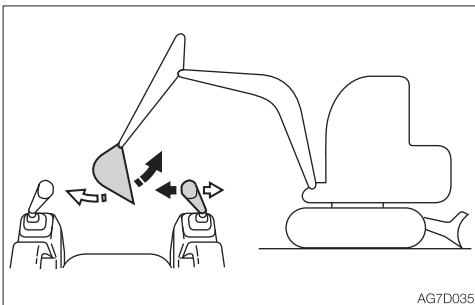
Operating the boom swing



AG7D036

- ➔ Boom swing left:
Step on the left side of the pedal.
- ⇨ Boom swing right:
Step on the right side of the pedal.

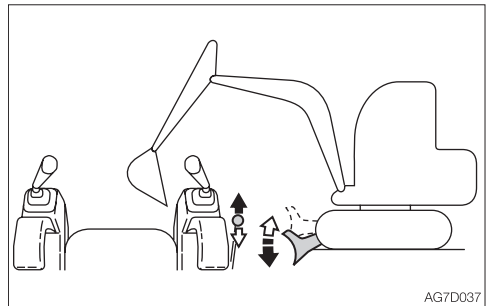
Operating the bucket



AG7D035

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

Operating the dozer blade



AG7D037

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



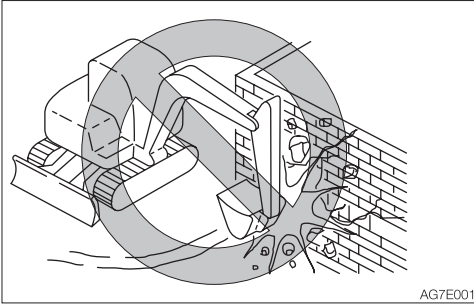
OPERATING PROCEDURES

PROHIBITED OPERATIONS

WARNING

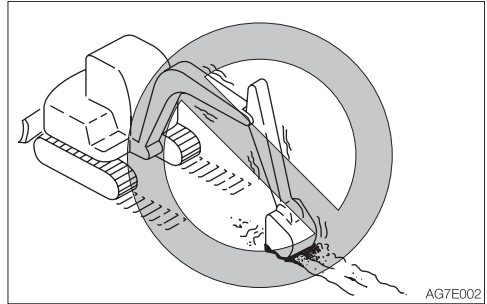
- Do not operate on bedrock (hard or soft).
- Do not slew while traveling. If you must operate the hoe attachment while traveling, operate at speeds slow enough so you have complete control at all times.

Do not perform demolition or leveling using slew force



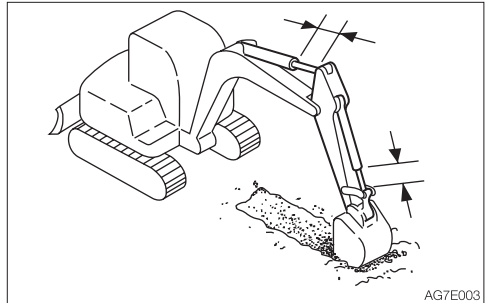
Do not demolish walls or level ground using slew force. Also, do not dig the bucket teeth into the ground during slewing. Doing so will damage the hoe attachment.

Do not dig while traveling

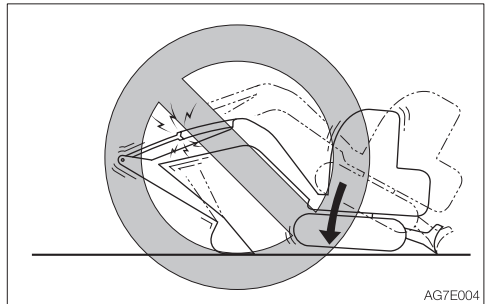


Do not dig the bucket into the ground and use the traveling force to dig.

Be gentle when using the hydraulic cylinder



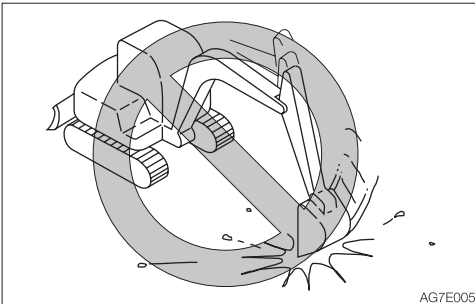
Do not extend the hydraulic cylinders to the stroke ends. Operate them with leeway.



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.

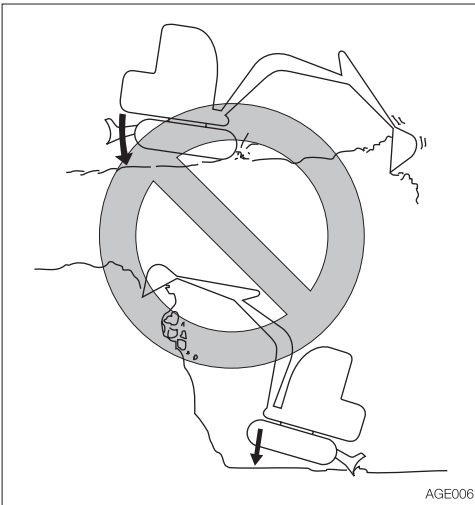


Do not drive piles with the bucket or dig by banging the bucket



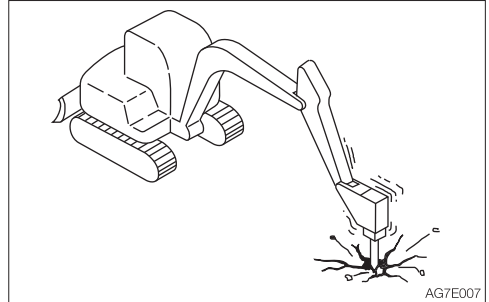
Doing so will shorten the service life of the hoe attachment. Use the hydraulic force to dig.

Do not perform operations using the machine's dropping force



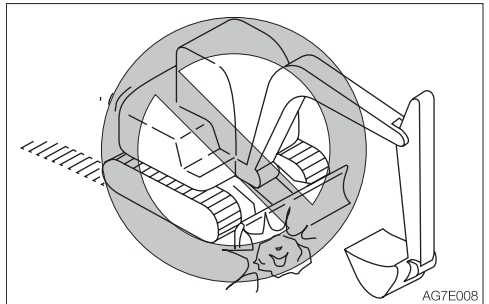
Putting excessive strain on the machine will shorten its service life. When digging, use the hydraulic force of the cylinders and the shallow and long strokes.

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.

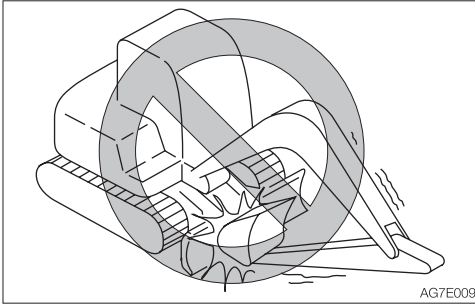
Caution on exposing the dozer blade to shocks



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

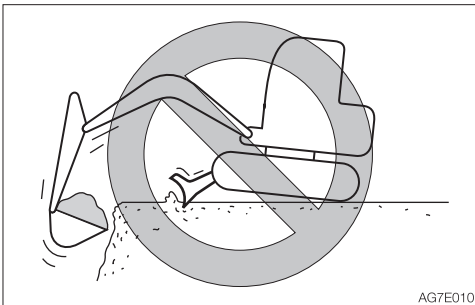


Caution on folding the hoe attachment

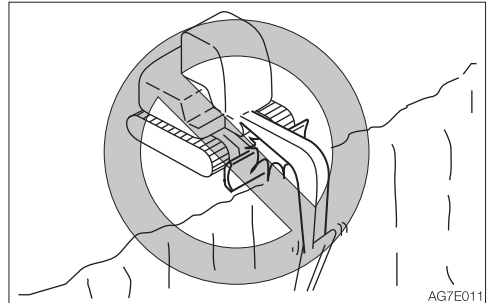


Be careful not to let the bucket hit the dozer blade when the hoe attachment is being folded.

Do not use the dozer blade as an outrigger



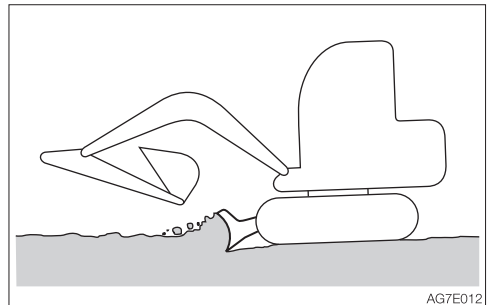
Pay attention to the dozer blade when digging



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

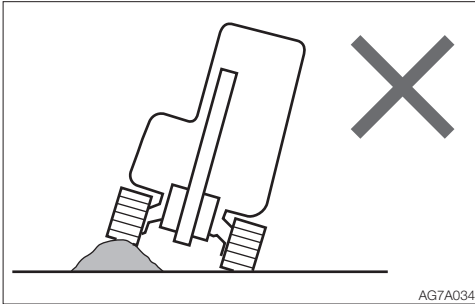


This dozer blade is designed for simple earth pushing. Do not dig down deeply with the dozer blade. Doing so could damage the dozer blade and undercarriage.



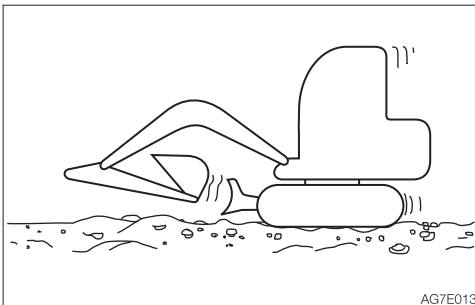
CAUTIONS ON OPERATING

Cautions on traveling



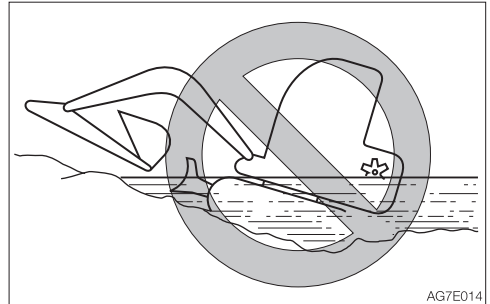
Traveling over obstacles (rocks, stumps, etc.) may put a great load on the machine body and may cause damage to it. Avoid crossing over obstacles whenever possible. If you must do so, keep the hoe attachment near the ground, travel at a low speed, and go over the obstacle at the center of the crawler.

Cautions on traveling in 2nd (High) speed

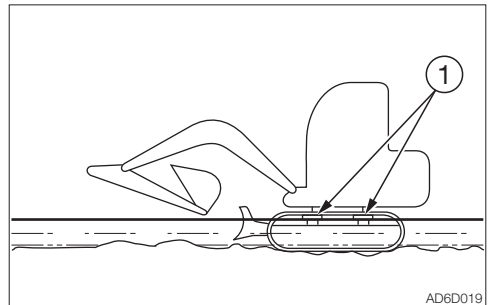


- On uneven ground, maintain the low speed and avoid starting, stopping or changing directions abruptly.
- When traveling in 2nd speed, do so with the dozer blade at the front.

Cautions on using machine in water



If the rear of the machine is submerged in water as shown in the figure above, it causes the radiator fan to turn in water, resulting in damage to the fan. The rear of the machine must not be submerged.



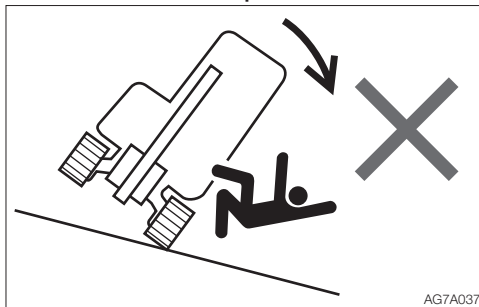
- Allowable water depth
Use the machine in water only when the water is up to the middle of the shoe slide (1).
- For those parts used in water for a long time, apply enough grease until the old grease is expelled.
- Never submerge the slew bearing or main body in water or sand. If submerged, contact a Takeuchi service agent for inspection.



CAUTIONS ON TRAVELING ON SLOPES

WARNING

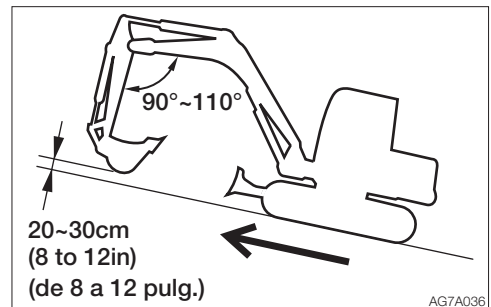
- Never travel on slopes that are too steep for the machine to maintain its stability (maximum gradeability: 30°, lateral tipping angle: 10°). Note that in reality, the machine's stability becomes lower than the above values depending on the working condition.
- When traveling on slopes, lower the bucket to a height of 20 to 30 cm (8 to 12 in.) above the ground. When climbing a steep slope, extend the hoe attachment to the front. In emergencies, lower the bucket to the ground and stop the machine.
- When traveling on slopes or grades, drive slowly in 1st (low) speed.
- When climbing a hill, keep the operator's seat facing the hillside. When descending a hill, keep the operator's seat facing the downhill direction. In either case, travel must be done while paying attention to the ground in front of the machine.
- Do not descend slopes in reverse.



- Do not change directions on slopes or traverse slopes. First return to a flat surface, and then take an alternative path.
- The machine may slip sideways even on a slight slope if they are covered with grass or dead leaves, or when traveling on a wet metal plate or frozen surfaces. Do not allow the machine to position sideways to slopes.

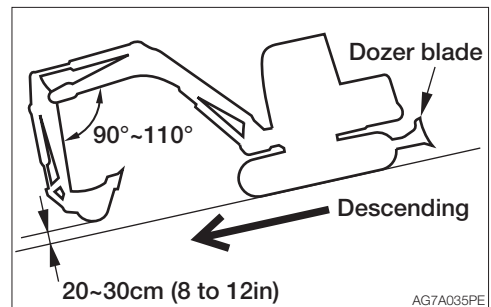
Traveling posture on slopes

Climbing slopes



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

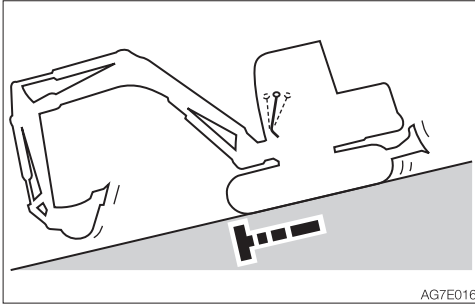
Descending slopes



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

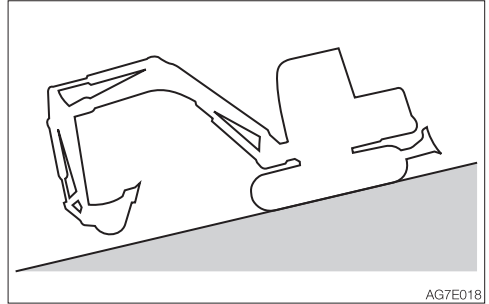


Braking when descending slopes



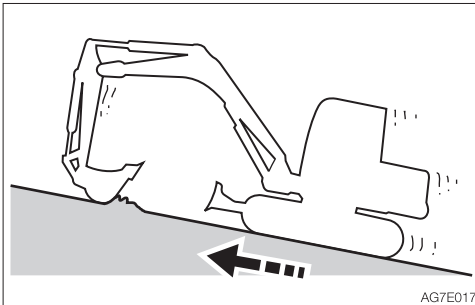
When descending slopes, the brakes are applied automatically once the travel levers are returned to the neutral position.

If the engine stops



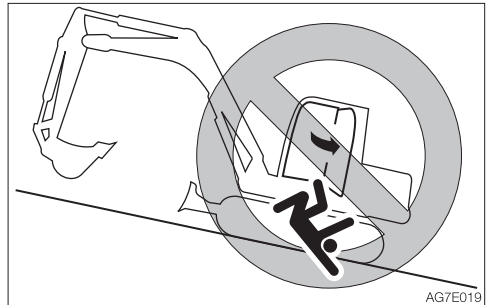
If the engine stops when descending a slope, set the travel levers to the neutral position, stop the machine, then start the engine.

If the crawler slips



If the crawler slips while climbing a slope and impossible to travel, use the pulling force of the arm to climb the slope.

Do not open the door while traveling on slopes



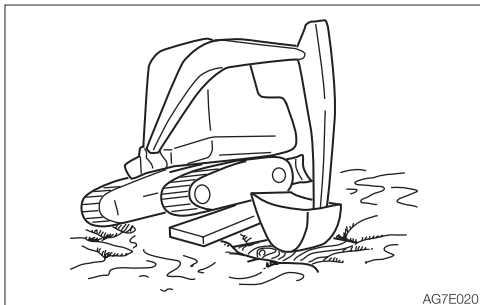
Opening the door while traveling on slopes is dangerous, as the force required to open and close the door changes abruptly. Always keep the door closed when traveling on slopes.



GETTING OUT OF MUD

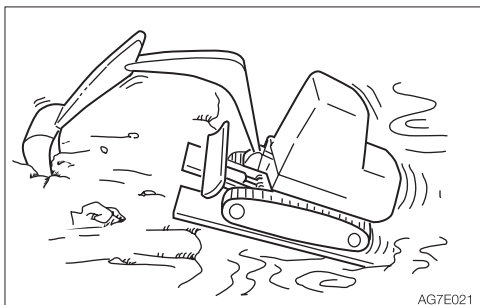
If the machine gets stuck in mud, use the procedure below to get it out.

If one crawler is stuck



1. Swing the bucket to the side of the crawler 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.
4. Place a plank or the like under the lifted crawler.
5. Lift the bucket and slowly move the machine out of the mud.

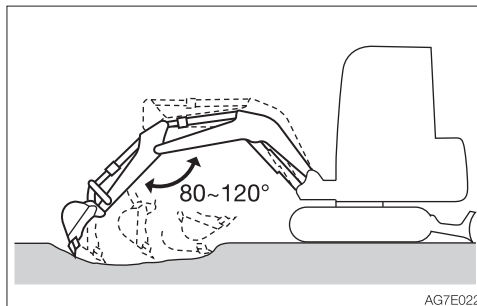
If both crawlers are stuck



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

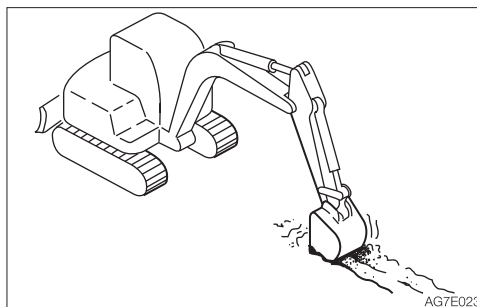
OPERATIONS POSSIBLE WITH THIS MACHINE

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.

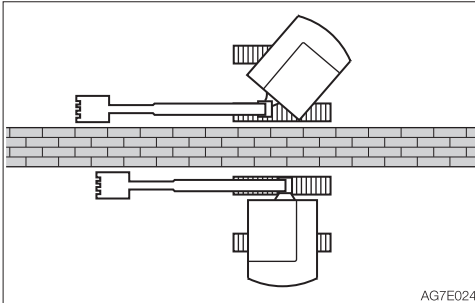
Digging ditches



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

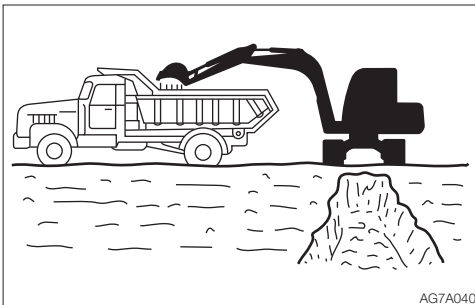


Digging side drains



Use the boom swing function to dig side ditches as shown in the figure.

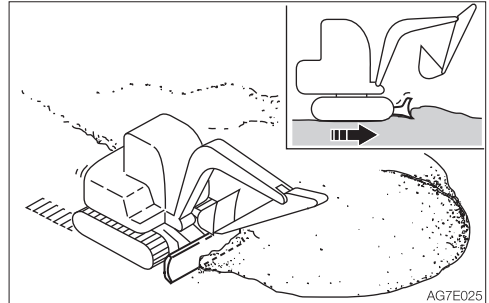
Loading



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

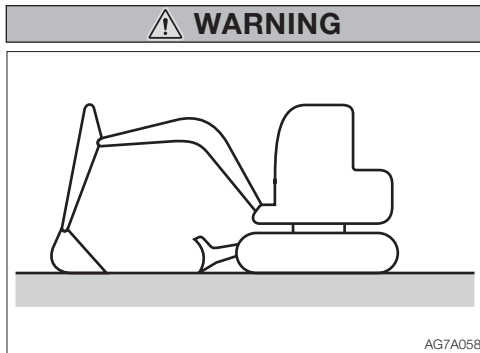


1. Bring the hoe attachment close to the body.
2. Gradually remove the dirt from the side of the mound.
3. Once the mound is low, remove the dirt from the top. If the load becomes too heavy for the machine body, adjust by raising or lowering the dozer blade.

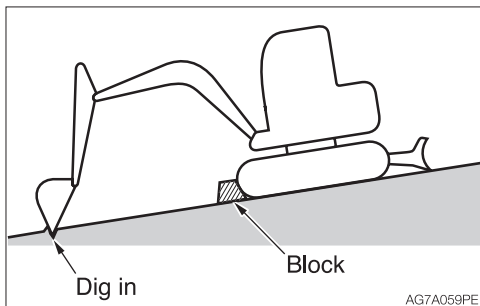


PARKING THE MACHINE

PARKING



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



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

- When parking on a street, use barriers, caution signs, lights, etc., so that the machine can easily be seen even at night to avoid collision with other vehicles.
- Before leaving the operator's seat, raise the safety lock lever to engage the lock and stop the engine. Also, be sure to remove the key, lock the door and covers, take it with you and store it in a specified place.

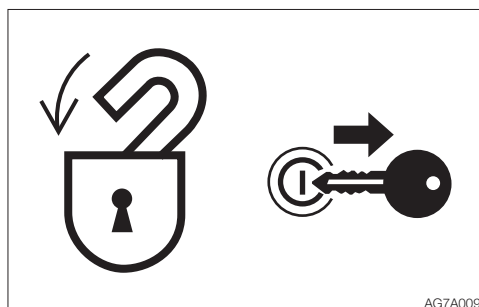
1. Set the left and right travel levers to the neutral position.
2. Return the throttle lever to idle the engine at low speed.
3. Lower the bucket and the dozer blade to the ground.
4. Raise the safety lock lever to the locked position.
5. Stop the engine and remove the key.
Refer to "Stopping the engine" on page 3-5.

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 5-18.
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:



- Fuel filler cap
- Cab door
- Manual storage compartment
- Engine hood
- 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 5-30.

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 5-29.

- 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 5-40.

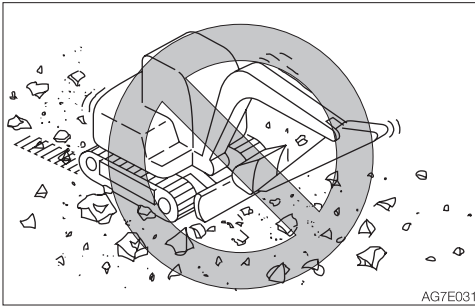


HANDLING RUBBER CRAWLERS

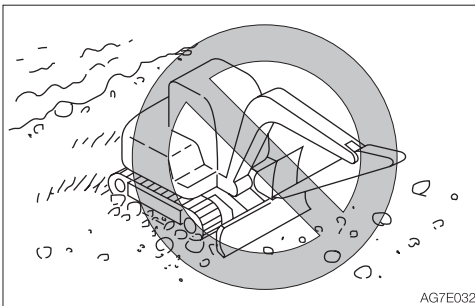
Rubber crawlers have an inherent weakness, lack of strength, due to their use of rubber. Be sure to observe the prohibitions and cautions below to prevent the crawlers from being damaged or coming off.

PROHIBITIONS

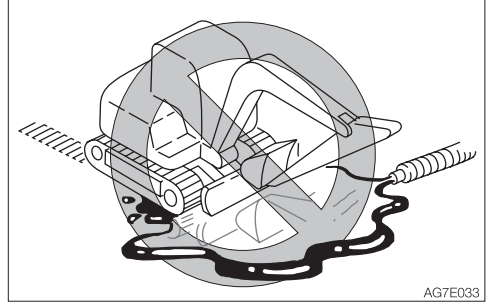
Do not travel or operate the machine in the following places:



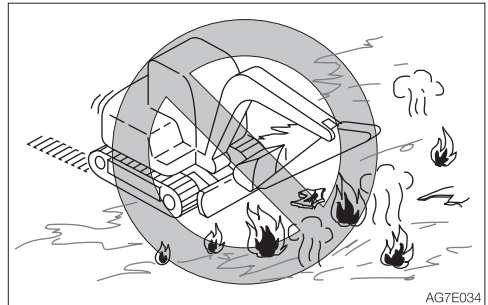
- Traveling and slewing on crushed rock, extremely rough hard rock, steel beams, scrap iron, or near the edges of steel plates will cause damage to the rubber crawlers.



- Traveling on riverbeds or places where there are large numbers of boulders may cause the stones to get caught and damage the crawler or make the crawler come off.
- Do not use the machine on the seashore. The salt may corrode the steel core.



- Do not let fuel, oil, salt or chemical solvents get on the crawlers. These substances may corrode the bonding of the steel cores on the crawlers, resulting in rust or peeling. If any of these substances gets on the crawler, immediately clean it off with water.

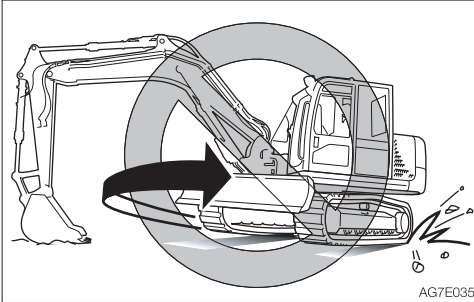


- It will cause an irregular wear or damage to the lugs, if the machine travels on irregular surfaces such as recently paved with asphalt, exposed to a bonfire or of hot iron sheets under the blazing sun.
- Do not move earth in places where the rubber crawlers may slip. Doing so may speed up lug wear.

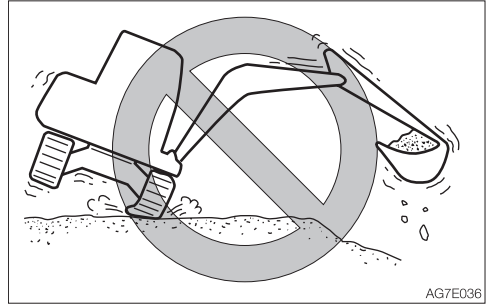


CAUTIONS

Observe the following cautions 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 crawlers with the load concentrated on a single point on the crawler belt, causing rapid damage to the crawlers.
- Avoid changing course abruptly or spin-turning on concrete surfaces whenever possible. Doing so may wear or damage the rubber crawlers.
- Avoid drops that may expose the rubber crawlers to strong shocks.
- Salt, potassium chloride, ammonium sulfate, potassium sulfate, and triple superphosphate of lime can damage the crawler belts. If any of these substances gets on the crawler belts, wash it off thoroughly with water.
- Do not let the sides of the rubber crawlers rub against concrete or walls.
- Do not damage the rubber crawlers by hitting the bucket against them.
- Be especially careful on snowy or frozen surfaces in winter, as the crawler belts tend to slip in such conditions.
- Use rubber crawler belts at temperatures between -25°C to $+55^{\circ}\text{C}$ (-14°F to 131°F).
- When storing the rubber crawlers for long periods of time (three months or more), do so indoors in a place not exposed to direct sunlight or rain.

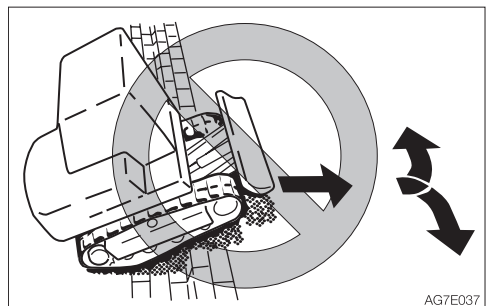


- Rubber crawler belts are not as stable as steel crawler belts since the entire lugs are made of rubber. Be very careful when slewing and swinging sideways.

PREVENTING THE RUBBER CRAWLERS FROM COMING OFF

Observe the following cautions to prevent the crawler from coming off.

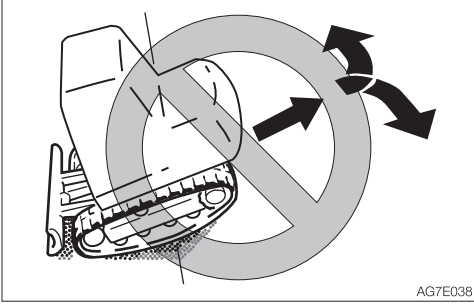
- Always keep the crawlers at the proper tension.



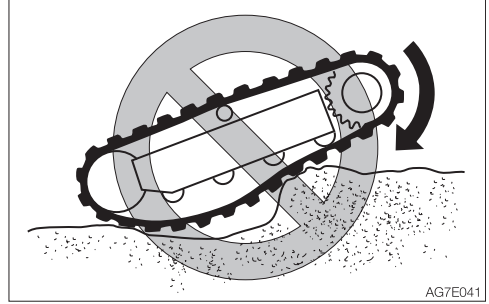
- When traveling over a large step such as a cobblestone or rock (20 cm (8 in.) or more deep), climb up the step at the right angle and do not change courses on top of the step.



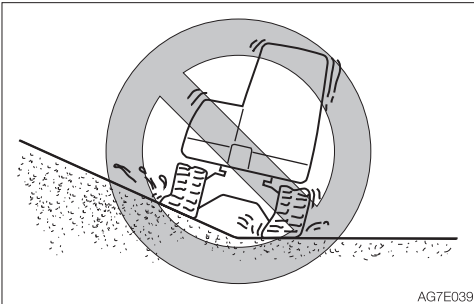
OPERATION HANDLING RUBBER CRAWLERS



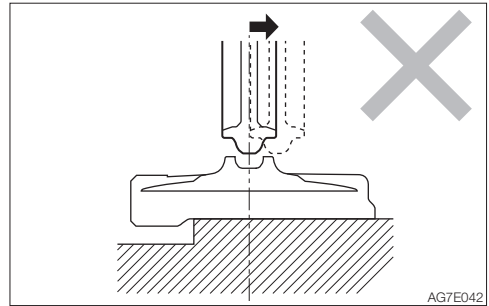
- When climbing in reverse, do not change directions at the point where the slope starts.



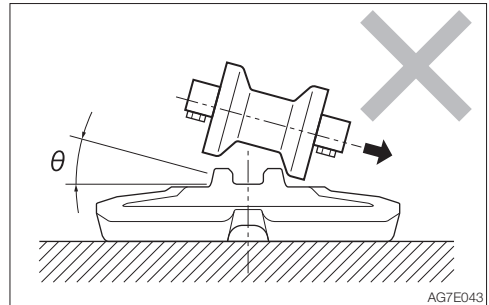
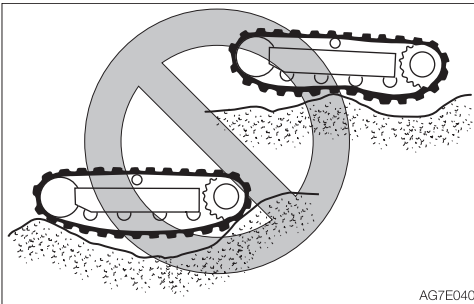
- Do not change directions when the crawler belts are slack as shown in the figure.



- Avoid traveling by setting one crawler on a slope or projecting portion and the other crawler on a flat surface (with the machine at a tilt of 10° or more). Travel with both crawlers set on flat surfaces.



- The rubber crawler belts will come off if the machine travels backward in this condition.



- The rubber crawler belts will come off if the machine turns in this condition.

TRANSPORT



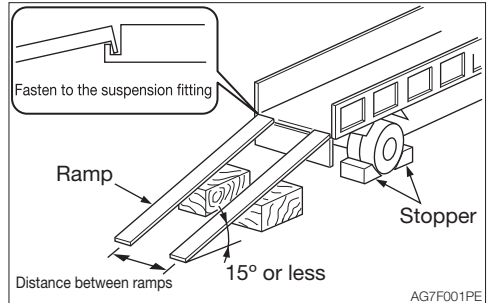
LOADING AND UNLOADING

WARNING

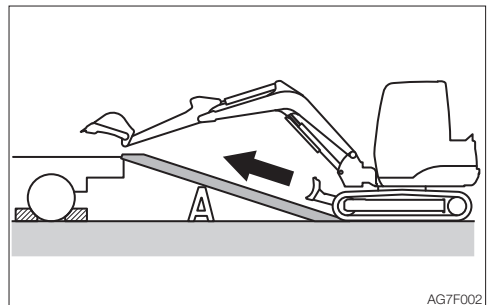
The machine may roll or tip over or fall while being loaded or unloaded. Take the following precautions:

- Select a firm, level surface and keep sufficient distance from road shoulders.
- Never use the working equipment to load or unload the machine. Doing so may result in tipping over or falling down of the machine.
- Chock the transporter wheels to prevent movement.
- Secure ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°.
- Keep the truck bed and loading ramps clean of oil, soil, ice, snow, and other materials to prevent the machine from sliding sideways. Clean the crawlers.
- When being loaded or unloaded, travel slowly in 1st (low) gear by following the signal from the signal person.
- Never change courses on the ramps.
- Do not slew on the ramps. 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.

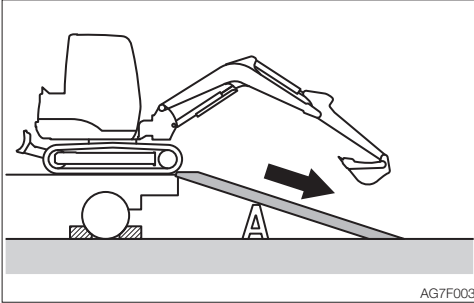


1. Set the parking brake on the transporter and chock the wheels.
2. Fix the ramps securely to the truck bed. The slope of the ramps must not exceed 15°.
3. Align the center of the truck bed with the center of the machine, and of the ramp with the center of the crawler.
4. Make sure the dozer blade does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





TRANSPORT LOADING AND UNLOADING



7. Drive the machine straight toward the ramps and travel up or down the ramps at 1st (low) speed, 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.

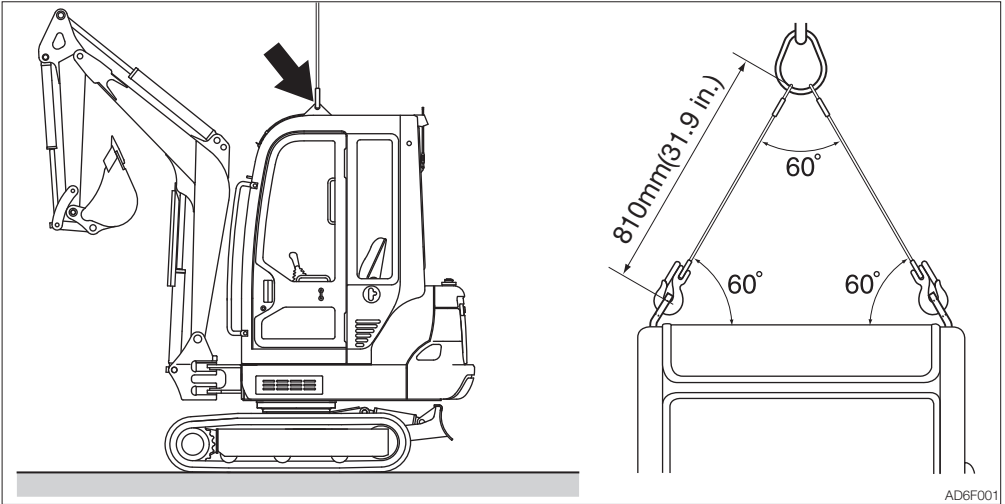
IMPORTANT: This hoisting method applies to machines with standard specifications. The center of gravity differs according to the attachments and optional equipment installed. Contact your Takeuchi service agent for details.

Hoisting

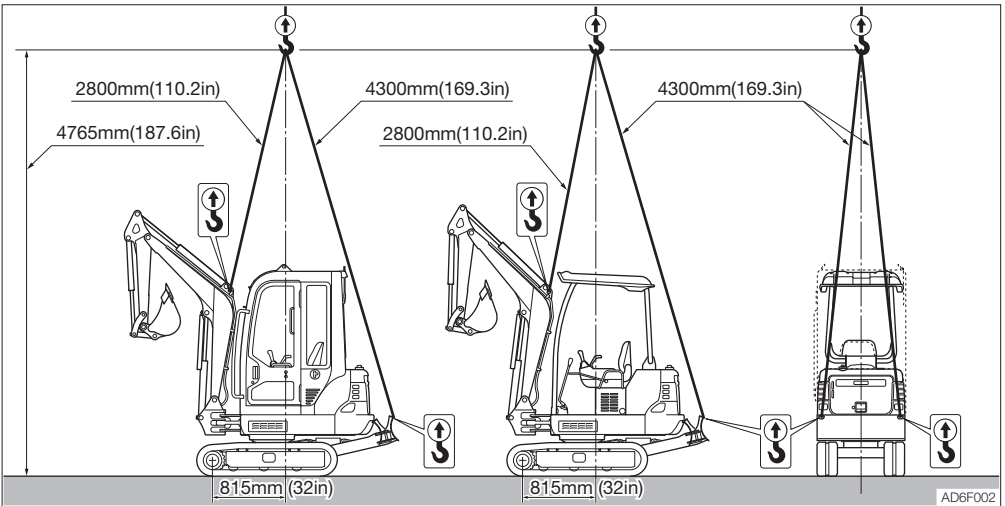
1. Slew the upperstructure so that the dozer blade is at the rear of the machine (set the upperstructure parallel to the track frame).
2. Raise the dozer blade fully.
3. Extend the bucket cylinder and arm cylinder fully to raise the boom to its uppermost position.
4. If the boom is swung to either the left or right side, set it in the neutral position.
5. Raise the safety lock lever to the locked position.
6. Stop the engine, remove the starter key and get off the machine.
7. Cab:
Install the wire ropes as shown on the figure below. The hoisting angle must be 60°; otherwise, the hook may be damaged.
Three-point suspension:
Install the wire ropes and hoisting attachment without letting them touch the machine body.
8. Hoist the machine slowly until it leaves the ground.
9. Stop hoisting until the machine becomes stable, and then start hoisting the machine slowly again.



<Cab>



<Three-point suspension>

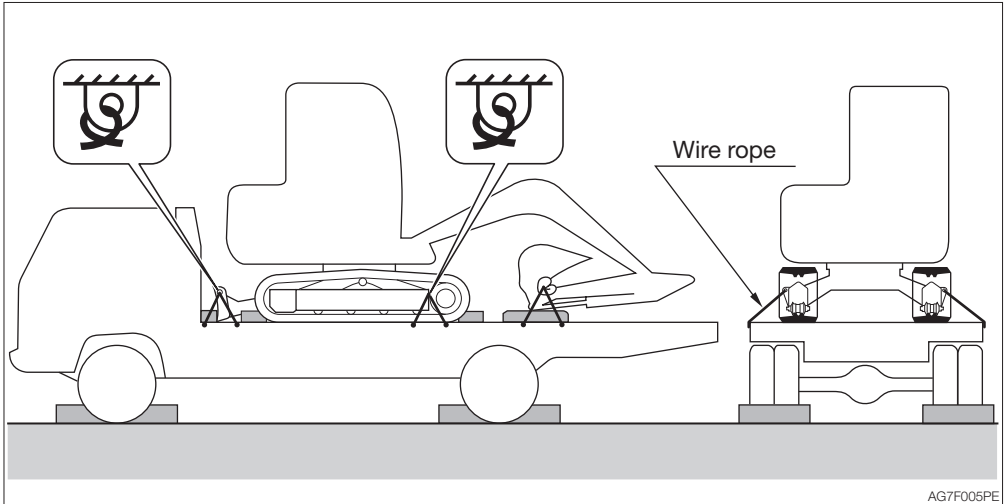




SECURING THE MACHINE

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

Transporting posture



1. Lower the dozer blade.
2. Extend the bucket cylinder and arm cylinder fully, and then lower the boom.
3. Raise the safety lock lever to the locked position.
4. Stop the engine, remove the starter key and lock all locks.
5. Place the stoppers (chocks) in front and behind the crawlers.
6. Install a chain or wire rope over the lower frame of the machine and fasten it securely to prevent the machine from slipping sideways.
7. Secure the bucket with a chain or wire rope.

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.

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.
- When washing the machine with water, stop the engine first. Cover the electrical parts with vinyl to prevent water from entering, as this could cause a short-circuit or malfunction. Do not use water or steam to wash the battery, sensors, connectors or the operator's seat area.

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.



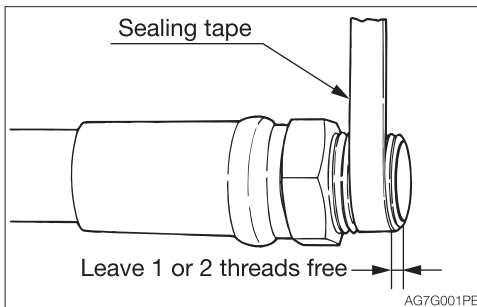
Clean the installation surfaces

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.



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	Location	Diesel fuel specification	Location
No.2-D, No.1-D, ASTM D975-94	USA	ISO 8217DMX	International
EN590: 96	European union	BS2869-A1 or A2	United kingdom

Fuel tank	Diesel fuel	<p>To maintain the performance and service life of the engine, always use clean and high-quality fuel.</p> <ul style="list-style-type: none"> • To avoid freezing in cold climates, use a diesel fuel that still functions when the temperature is at least 12°C 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. • The sulfur content must not exceed 0.5% by volume. Less than 0.05% is preferred. For electronically controlled EGR engines, use fuel with sulfur content of less than 0.05%. A higher sulfur content fuel may cause sulfuric acid corrosion in the cylinders of the engines. • Never mix kerosene, used engine oil, or residual fuels with the diesel fuel. • 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.
------------------	--------------------	--



Lubricant

Location	Type	Type by air temperature								When to replace
		-4 -20	14 -10	32 0	50 10	68 20	86 30	104°F 40°C		
Engine oil pan	Diesel engine oil API: CD class ACEA: E-3, E-4 or E-5	SAE 10W-30								Every 250 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		ISOVG68						
Engine cooling system	Cooling water (water + coolant)** SAE: J814C, J1941, J1034 or J2036 ASTM: D6210 or D4985(USA)	Mixture of 50% coolant								Every 1000 hrs.
		Mixture of 30% coolant								
Travel reduction gear	Gear oil API: GL-4	SAE 90								Every 1000 hrs after the initial 250 hrs*.
Slew motor pinion	Lithium based grease EP-2 NLGI No.2									Every 50 hrs.
Slew bearing										Every 50 hrs.
Working equipment										Daily or every 10 hrs.
Levers										When required

- * : If the ratio of traveling time to total operating time is high, 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, 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.



Volume

Engine oil pan	Engine cooling system	Hydraulic oil tank	Fuel tank	Travel reduction gear
Upper limit 2.8 L (3 US qt.) Lower limit 1.6 L (1.7 US qt.)	3.7 L (3.9 US qt.)	System 35 L (9.2 US gal.) Tank 23 L (6.1 US gal.)	24 L (6.3 US gal.)	0.33 L X 2 (0.35 US qt.) X 2

REGULARLY REPLACE THE HYDRAULIC OIL

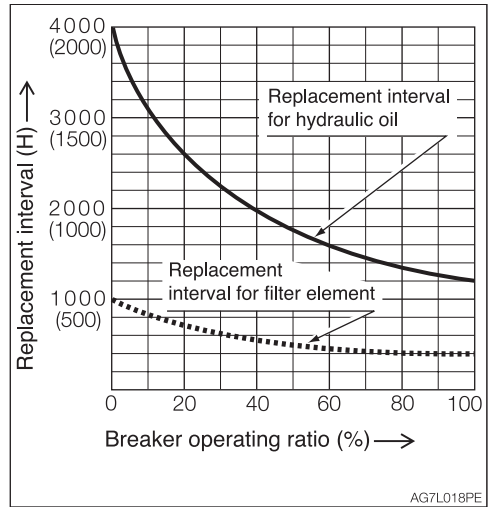
When a hydraulic breaker is used, the oil deteriorates more quickly than that used for a usual excavation operation. Be sure to replace the hydraulic oil and the return filter elements.

- 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 8-6.



(): 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	15511-01300	Every 500 hrs after the initial 50 hrs.
Engine lubrication system	Engine oil filter	Cartridge	119305-35160	Every 250 hrs after the initial 50 hrs.
Fuel system	Water separator filter	Element	171081-55910	Every 500 hrs.
	Fuel filter		119810-55650	
Air cleaner system	Air cleaner	Primary (Outer) element	119515-12520	Every 1000 hrs. or after 6 cleanings (whichever comes first)
		Secondary (Inner) element	19111-01342	When the primary elements are replaced.



LIST OF TOOLS

Code	Part name	Part No.	Remarks
1	Spanner	19100-47081	10 - 12
2	Spanner	19100-47082	14 - 17
3	Screwdriver	19100-06112	(+) (-) replaceable shank
4	Filter wrench	19100-96081	
5	Monkey wrench	16904-00250	250 mm
6	Pliers	16905-00200	200 mm
7	Spanner	16901-00013	13
8	Spanner	16900-01922	19 - 22
9	Spanner	16909-00026	26
10	Tool case	16914-00001	
11	Grease gun	16910-60600	600 cc
12	Drain connector	15545-12201	

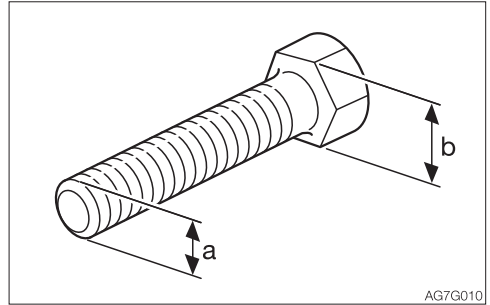
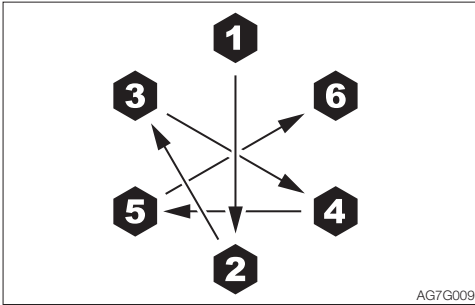


LIST OF TIGHTENING TORQUES

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	
Heater		Heater 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 (arm cylinder piping)	
		Hydraulic hoses (bucket cylinder piping)	
		Hydraulic hoses (swing cylinder)	
		Hydraulic hoses (blade cylinder)	
		Hydraulic hoses (span cylinder)	
	Hydraulic hoses (pilot valve)		
	Hydraulic hoses (auxiliary piping)		
		Seat belt	Every 3 years



MAINTENANCE
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
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



MAINTENANCE LIST

Inspection and maintenance item	Page
Walk-around inspection	
Inspecting by opening the engine hood and covers	5-14
Inspecting by walking around the machine	5-15
Inspecting while sitting in the operator's seat	5-15
Daily inspection (every 10 Hours)	
Inspecting and replenishing the coolant	5-16
Inspecting and replenishing the engine oil	5-17
Inspecting the dust indicator	5-17
Inspecting the water separator	5-18
Inspecting the fuel level	5-18
Inspecting the hydraulic oil tank level and replenishing	5-19
Lubricating the working equipment	5-21
After the initial 50 hours (only for new machines)	
Replacing the engine oil and the oil filter	5-22
Inspecting and adjusting the fan belt	5-23
Replacing the hydraulic oil return filter	5-24
Every 50 hours	
Inspecting and adjusting the crawler tension	5-26
Lubricating the slew bearing	5-28
Lubricating the slew motor pinion	5-28
Draining the water from the fuel tank	5-29
Inspecting the battery fluid level and replenishing	5-30
Every 100 hours	
Cleaning the water separator	5-32
Cleaning the fuel filter	5-32
After the initial 250 hours (only for new machines)	
Replacing the travel motor gear oil*	5-33
Every 250 hours	
Replacing the engine oil and the oil filter	5-34
Inspecting and adjusting the fan belt	5-34
Cleaning the air cleaner	5-34
Cleaning the radiator fins and oil cooler fins	5-36

*: If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.



MAINTENANCE
MAINTENANCE LIST

Inspection and maintenance item	Page
Every 500 hours	
Replacing the hydraulic oil return filter	5-38
Replacing the water separator filter	5-38
Replacing the fuel filter	5-39
Every 1000 hours	
Replacing the travel motor gear oil *	5-40
Cleaning the engine cooling system	5-40
Replacing the air cleaner element	5-42
Inspecting and adjusting the engine valve clearance	5-43
Retightening the engine cylinder head bolt	5-43
Every 1500 hours	
Inspecting and cleaning the engine fuel injectors	5-44
Inspecting the crankcase breather system	5-44
Every 2000 hours	
Lapping the engine valve seats	5-45
Every 4000 hours	
Replacing the hydraulic oil and cleaning the suction strainer	5-46
When Required	
Replacing the bucket teeth	5-48
Replacing the bucket	5-50
Inspecting and replenishing the windshield washer fluid	5-52
Lubricating the levers	5-53
Inspecting the rubber crawlers	5-54
Replacing the rubber crawlers	5-56

*: If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.



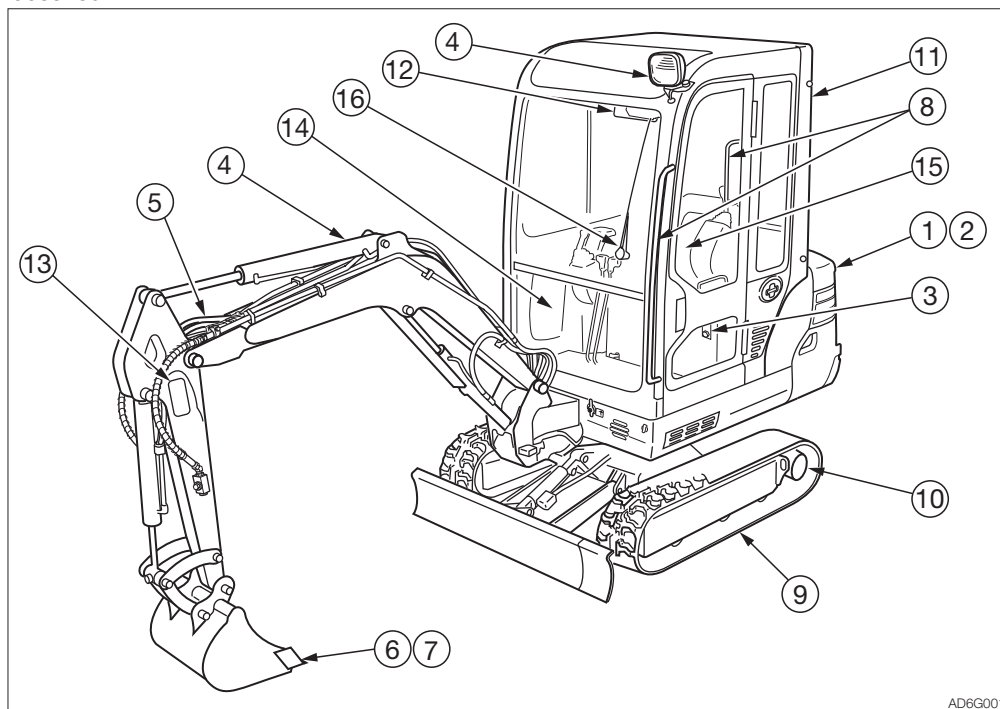
WALK-AROUND INSPECTION

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 or bolts are loosened.



AD6G001

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 and steps for damage and loose bolts.
9. Check the crawlers, shoe slides, track rollers, idlers and sprockets for damage, wear and loose bolts.
10. Check for oil leakage from the travel motor.
11. Check the canopy, 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.

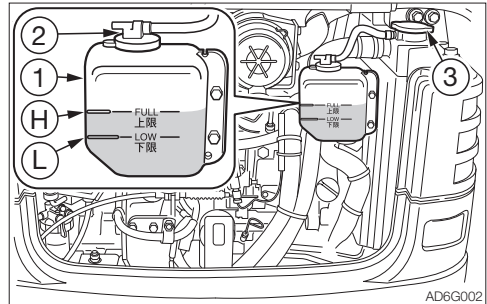
INSPECTING AND REPLENISHING THE COOLANT



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.

Inspection



1. Open the engine hood.
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.

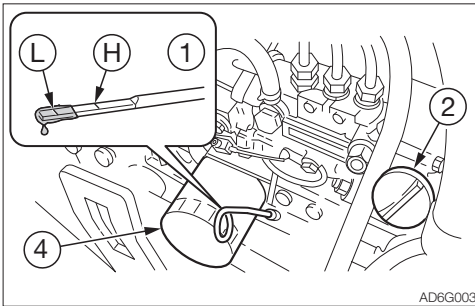


INSPECTING AND REPLENISHING THE ENGINE OIL

WARNING

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

Inspection



1. Open the engine hood.
2. Take out the dipstick (1) and wipe the oil off with a rag.
3. Fully reinsert the dipstick (1), and then pull it back out.
4. Check the oil 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

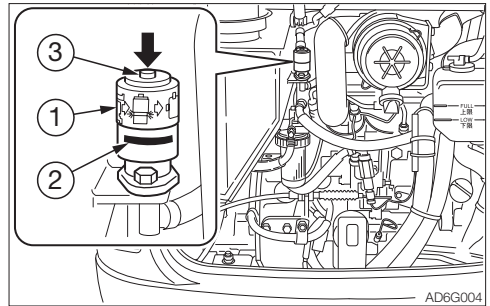
1. Remove the oil filler cap (2).
2. Add oil up to between the upper limit (H) and the lower limit (L) of the dipstick (1).
Problems could arise if the oil level is either too low or too high.
3. Tighten the oil filler cap (2).
4. Start the engine, run it at low idle for about 5 minutes, then stop it.
5. After about 10 minutes, inspect the oil level.

INSPECTING THE DUST INDICATOR

WARNING

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

The dust indicator is the equipment to be used to find out if there is clogging in the air cleaner.



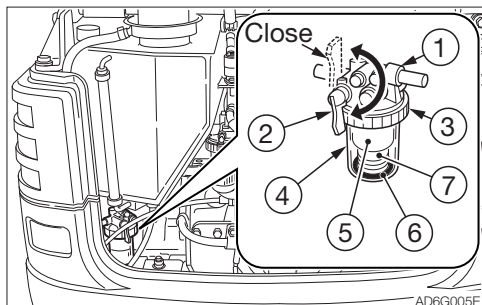
1. Open the engine hood.
2. Check that if the red piston (2) is shown in the dust indicator (1).
3. If the red piston (2) is visible, immediately clean or replace the element.
Refer to "Cleaning the air cleaner" on page 5-35.
4. After cleaning/replacement, push the button (3) on the dust indicator to reset the red piston (2).



INSPECTING 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.

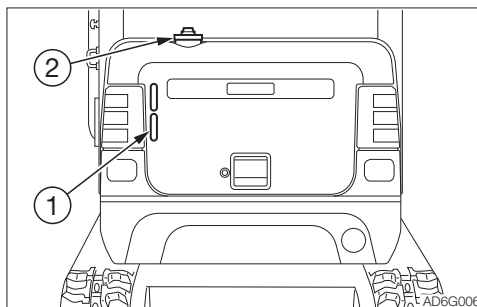


1. Open the engine hood.
2. Inspect the water separator (1).
If the red indicator ring (6) is sunk to the bottom of case (4), no water is mixed in. If the red indicator ring (6) is floating, there is water up to the ring. Drain the water and clean.
Refer to “Cleaning the water separator” on page 5-32.
Refer to “Bleeding air from the fuel system” on page 6-8.

INSPECTING THE FUEL LEVEL

WARNING

- 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 sight gauge (1).
2. If the level is low, add fuel from the fuel port (2) while watching the sight gauge (1). Refer to “Fuel filler port” on page 2-5.



INSPECTING THE HYDRAULIC OIL TANK LEVEL AND REPLENISHING

WARNING

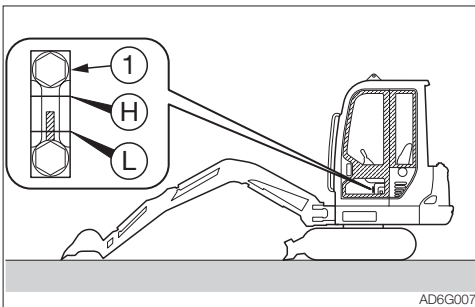
Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.

- Gradually loosen the vent plug to relieve tank pressure.

Inspection

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

- Machine posture for inspecting the hydraulic oil level



1. Start the engine and run it at low speed.
2. Fully retract the cylinders (arm and bucket), and lower the bucket to the ground.
3. Lower the dozer blade, and then stop the engine.
4. Inspect the oil level using the sight gauge (1).

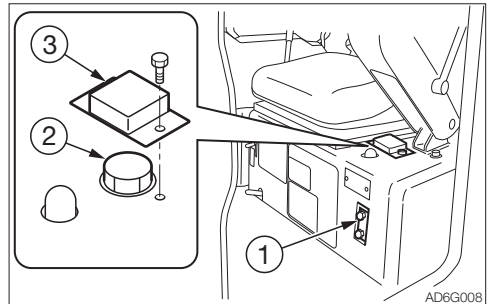
When the oil temperature is about 20°C (68°F):

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 spurting. 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.

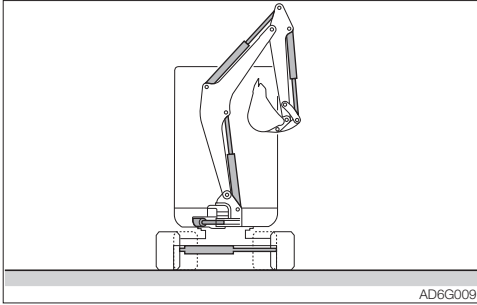
IMPORTANT: Do not forget to apply pressure to the hydraulic tank to avoid damage to the pump caused by air sucking.

1. Raise the left safety lock lever to the locked position.
2. Loosen the bolts and remove the cover (3). (for cab)
3. Slowly loosen the air bleeding plug (2) to relieve the internal pressure, and then remove it.
4. Add the hydraulic oil up to the middle of the sight gauge (1).
5. Pressurize the hydraulic oil tank as follows.



Pressurizing the hydraulic tank

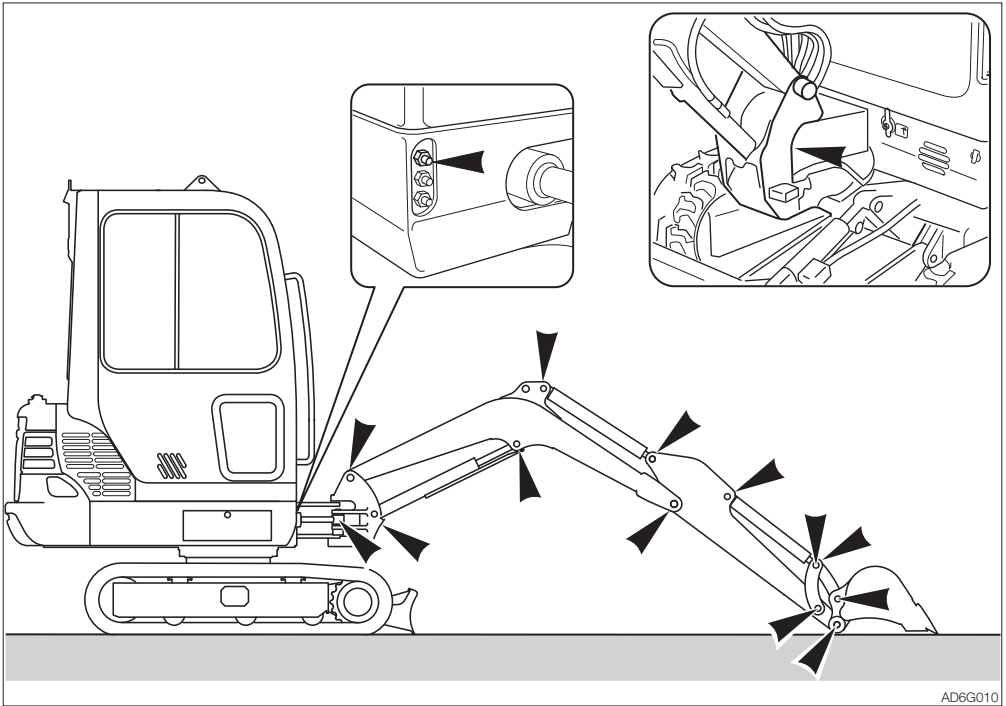
1. Start the engine and run it at low speed.
2. With the vent plug (2) removed, set the safety lock levers to the released position.
 - Hydraulic tank pressurization posture



3. Fully extend the bucket, arm, boom and swing cylinders.
4. Stop the engine and raise the left safety lock lever to engage the lock.
5. Tighten the vent plug (2), and then pressurize by retracting the cylinders.



LUBRICATING THE WORKING EQUIPMENT



AD6G010

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.

Note: It is not necessary to lubricate the dozer blade, as it is using a “self-lubrication bush”.



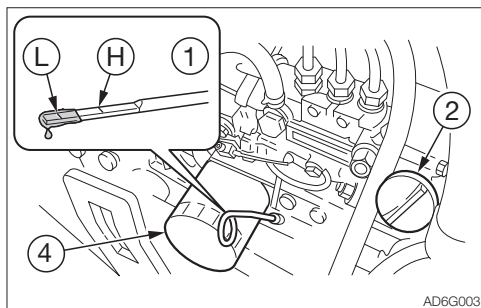
AFTER THE INITIAL 50 HOURS (ONLY FOR NEW MACHINES)

REPLACING THE ENGINE OIL AND THE OIL FILTER

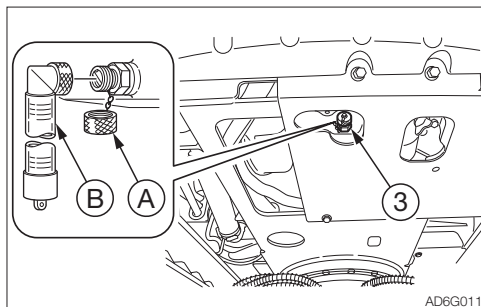
WARNING

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.



1. Open the engine hood and remove the oil filler cap (2).



2. Place a pan for catching the waste oil under the drain plug (3).
3. Remove the cap (A), install connector (B) and drain the oil. (The oil comes out when the screw is tightened.)
4. Remove the connector (B) and install the cap (A).

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

5. Turn the filter (4) counterclockwise with the filter wrench and remove it.
6. Clean the surface of installation of the filter stand.
7. Apply a thin layer of oil on the packing of the new filter.
8. Install the new filter by hand.
9. Tighten one more turn (with the filter wrench) after the filter packing comes in contact with the surface of installation. (Torque when tightening with filter wrench: 19.6 to 23.5 N·m or 14 to 17 ft·lb)
10. 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.
11. Tighten the oil filler cap (2).
12. Start the engine, run it at low idle for about 5 minutes, then stop it.
13. After about 10 minutes, inspect the oil level.



INSPECTING AND ADJUSTING THE FAN BELT

WARNING

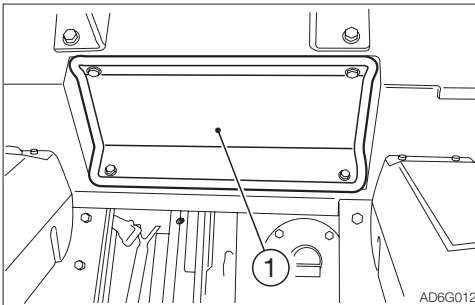
Stop the engine and allow the machine to cool down before performing maintenance.

- 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.

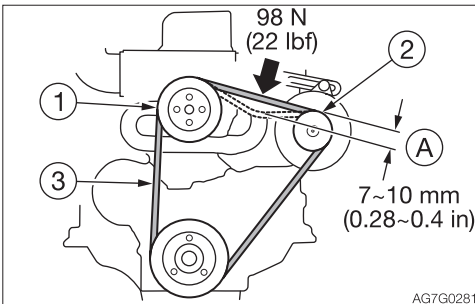
IMPORTANT: The loose belts could result in bad battery charge, overheat of engine or early wear of belt. Too tight belts could damage the water pump or bearing and belt used to drive the alternator.

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

Inspection

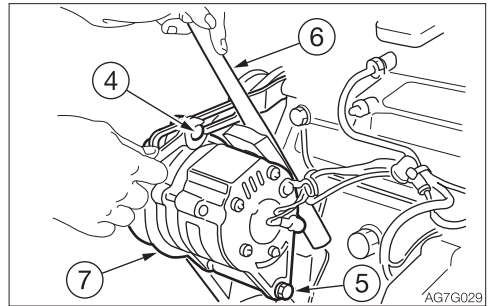


1. Open the maintenance cover.
2. Take out the four bolts and remove the cover (1).



3. Press at the center of the fan pulley (1) and alternator pulley (2) to check the tension (approx. 98 N or 22 lbs.). The slack (A) should be 7 to 10 mm (0.28 to 0.4 in.).
4. Inspect the fan belt (3) 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 adjusting bolt (4) and locking nut (5).
2. Move the alternator (7) by using the lever (6) to adjust the slack.
3. Tighten the adjusting bolt (4) and locking nut (5).

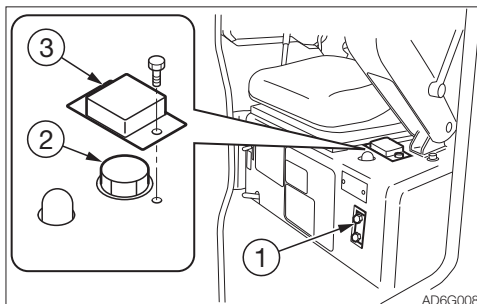
Note: When replacing with a new belt, run the engine at low idle speed for about 3 to 5 minutes to break in the new belt, before adjusting the tension.



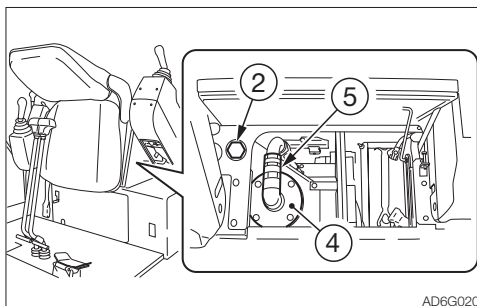
REPLACING THE HYDRAULIC OIL RETURN FILTER

WARNING

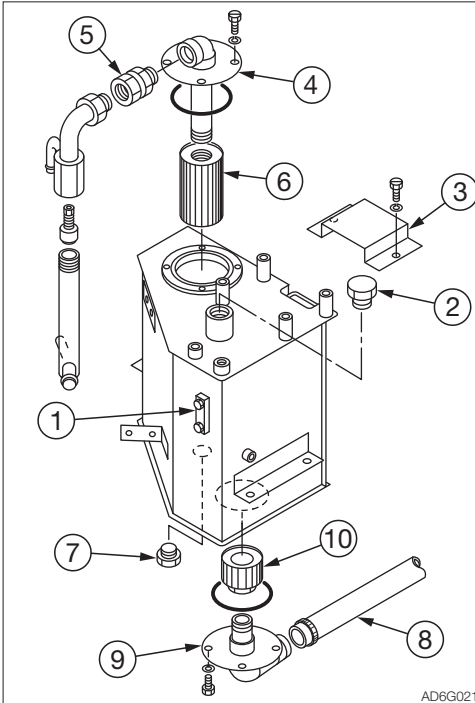
- Stop the engine and allow the machine to cool down before performing maintenance.
 - The engine and the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
 - The hydraulic oil is also hot and under high pressure. 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.
- Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.
 - Slowly loosen the air bleeding plug to relieve the internal pressure.
 - 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. Raise the left safety lock lever to the locked position.
2. Loosen the bolts and remove the cover (3) (for cab).
3. Slowly loosen the air bleeding plug to relieve the internal pressure, and then remove the plug.



4. Open the maintenance cover.
5. Loosen the bolts securing the flange (4).



6. Loosen the adapter (5) and remove the flange (4).
7. Remove the return filter (6).
8. Install a new return filter.
9. Reinstall the flange (4) and the adapter (5).
10. Inspect the level with the sight gauge (1), and replenish if the level is too low.
Refer to "Inspect the hydraulic oil tank level and replenishing" on page 5-19.



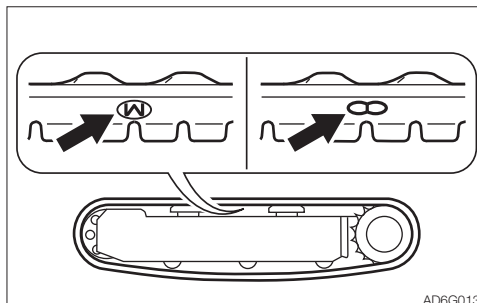
EVERY 50 HOURS

INSPECTING AND ADJUSTING THE CRAWLER TENSION

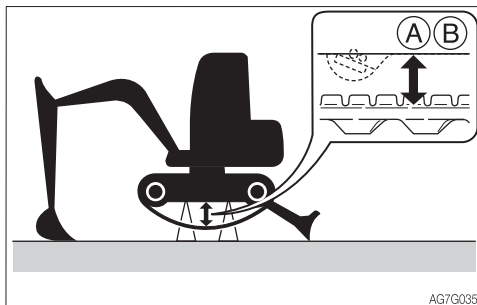
WARNING

- If you must work beneath the raised machine or working 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.
- Be careful with the high-pressure grease. In the track adjuster, the grease has been injected under high pressure. If the tension is adjusted without following the prescribed procedure, the grease discharge valve may fly off, resulting in injury.
 - Never loosen the grease fitting.
 - Loosen the grease discharge valve slowly. Do not turn it more than 1.5 turns.
 - Do not put your face, arms, legs or body in front of the grease discharge valve.
 - If grease does not come out when the grease discharge valve is loosened, the valve is faulty. Ask a Takeuchi service agent for repair.

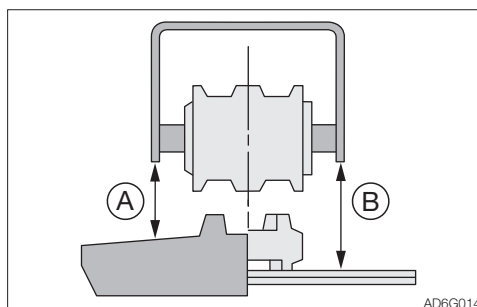
Inspection



1. For rubber crawlers, move the machine so that the “M” or “∞” mark at the joint is at the top center of the crawler frame.



2. Use the working equipment to lift the machine body. Operate the levers slowly.



3. Inspect the gap (A or B) between the bottom surface of the frame at the center of the crawler frame and the top surface of the crawler.
The gap (A or B) must be within the following range:

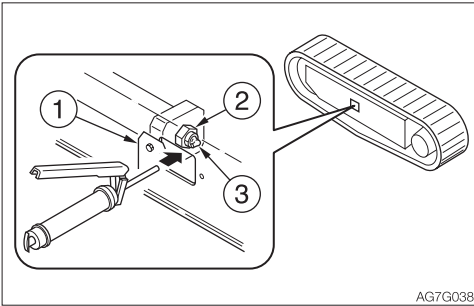


MAINTENANCE EVERY 50 HOURS

- (A) Rubber crawler
65 to 70 mm (2.6 to 2.8 in.)
- (B) Steel crawler
100 to 115 mm (3.9 to 4.5 in.)
- (B) Rubber pads
100 to 115 mm (3.9 to 4.5 in.)

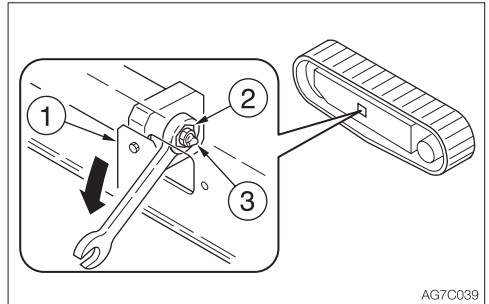
Adjustment

Increasing the tension



1. Remove the cover (1).
2. Inject grease through the grease fitting (3) of the grease discharge valve (2) with a grease gun.
3. Inspect the crawler tension.

Decreasing the tension



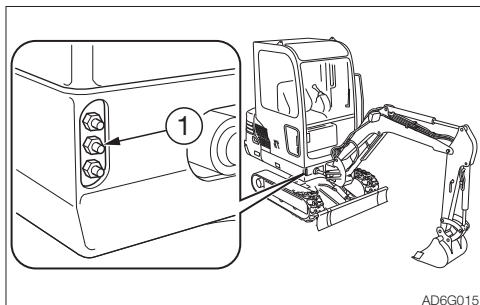
1. Remove the cover (1).
2. Slowly loosen (one turn) the grease discharge valve (2) with a spanner to discharge grease. If grease does not come out well, move the machine back-and-forth.
3. Tighten the grease discharge valve (2).
 - Tightening torque: 177 N·m (130 ft·lb.)



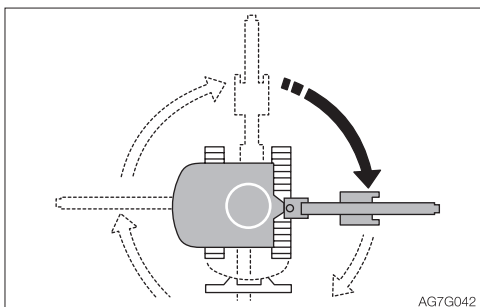
LUBRICATING THE SLEW BEARING

WARNING

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

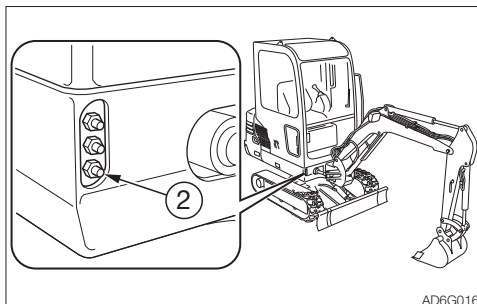


1. Stop the engine with the machine in the posture shown on the figure above.
2. Use the grease gun to grease the grease fitting (1).



3. Start the engine, lift the bucket and slew clockwise 90°C.
4. Lower the dozer blade 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.

LUBRICATING THE SLEW MOTOR PINION



1. Use the grease gun to lubricate the grease fitting (2).
2. Wipe off the excess grease.

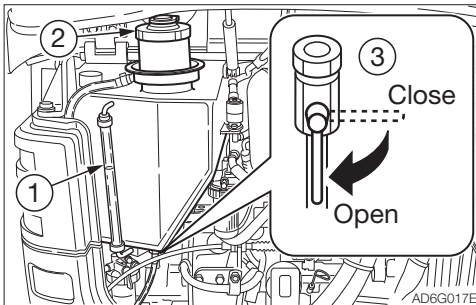


DRAINING THE WATER FROM THE FUEL TANK

⚠ WARNING

- 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.

Do the draining operation before starting the machine.



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 sight 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 6-8.

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.



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.

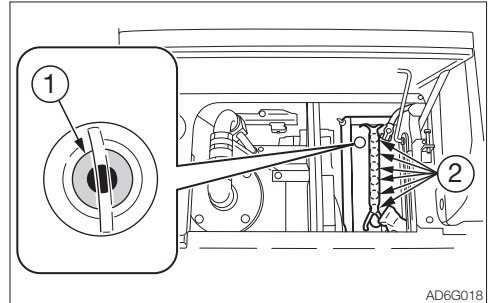
WARNING

- 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.

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 maintenance cover.

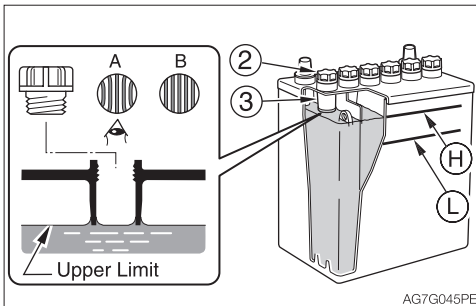


2. Inspect the indicator (1).
 - Blue: Good
 - White: Charging needed
 - Red: Insufficient battery fluid
3. Inspect the fluid level.

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.

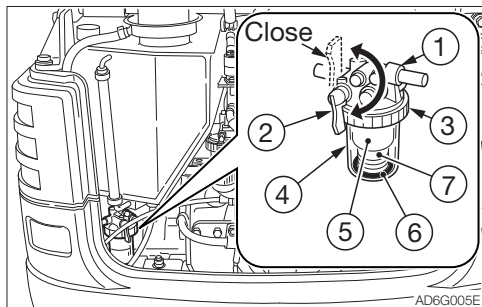


EVERY 100 HOURS

CLEANING 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.

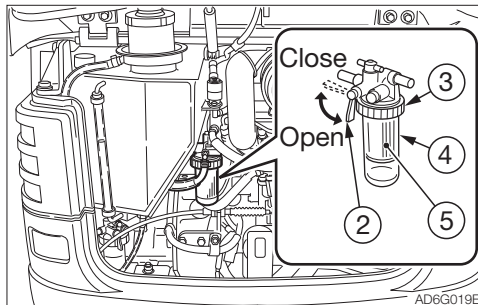


1. Open the engine hood.
2. Close the valve (2).
3. Loosen the ring (3), and then remove and clean the case (4), element (5) indicator ring (6) and spring (7).
4. Inspect the O-ring and the element (5). If there are any scratches or other irregularities, replace them.
5. Install the indicator ring (6), element (5) and case (4), and then tighten the ring (3).
6. Open the valve (2) to bleed air.
Refer to "Bleeding air from the fuel system" on page 6-8.

CLEANING THE FUEL 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.



1. Open the engine hood.
2. Close the valve (2).
3. Loosen the ring (3), remove and clean the case (4) and the element (5).
4. Inspect the O-ring and the element (5). If there are any scratches or other irregularities, replace them.
5. Install the element (5) and the case (4) and tighten them with the ring (3).
6. Open the valve (2) to bleed air.
Refer to "Bleeding air from the fuel system" on page 6-8.



AFTER THE INITIAL 250 HOURS (ONLY FOR NEW MACHINES)

REPLACING THE TRAVEL MOTOR GEAR OIL

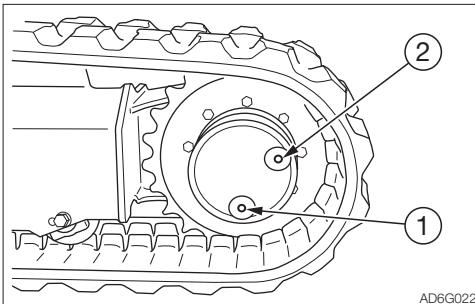


WARNING

- Stop the engine and allow the machine to cool down before performing maintenance.
 - The travel 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 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 travel motor may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.

1. Set the travel motor so that plug (1) is at the very bottom.
2. Place a pan under the plug (1).
3. Remove the plugs (1) and (2) and drain the oil.
4. Rewrap the plugs with new sealing tape.
5. Tighten the plug (1).
6. Add oil through the hole of the plug (2) until oil flows out of the hole of the plug (2).
7. Tighten the plug (2).

IMPORTANT: If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.





EVERY 250 HOURS

REPLACING THE ENGINE OIL AND THE OIL FILTER

Refer to “Replacing the engine oil and the oil filter” on page 5-22.

INSPECTING AND ADJUSTING THE FAN BELT

Refer to “Inspecting and adjusting the fan belt” on page 5-23.

CLEANING THE AIR CLEANER

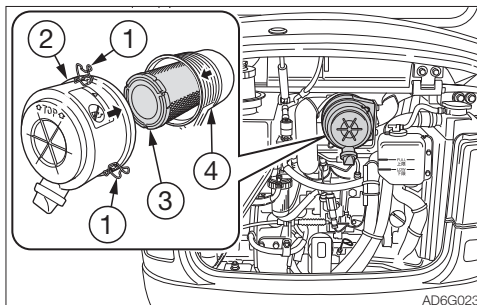
WARNING

- 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.

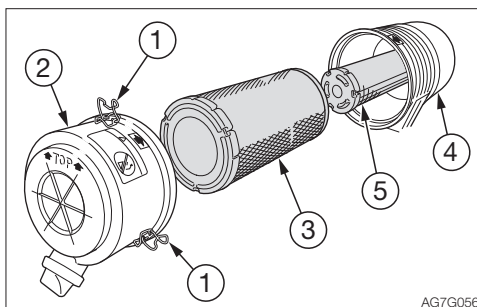
IMPORTANT: Be careful not to scratch the element. Do not use an element if it is damaged.

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.



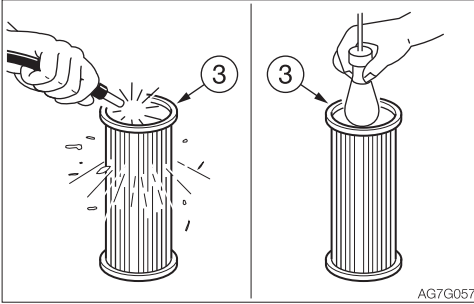
1. Open the engine hood.
2. Loosen the clamps (1) and remove the dust cup (2).



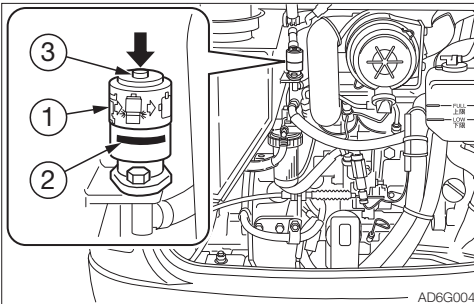
3. Clean the inside of the dust cup (2).
4. Remove the primary element (3).
5. Cover the intake hole at the back of the body (4) with cloth or tape to prevent dirt from getting in.
<If equipped with the secondary element>
To prevent dirt from getting inside the engine, do not remove the secondary element (5).
6. Clean the inside of the body (4).



MAINTENANCE
EVERY 250 HOURS



7. 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.
8. 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.
9. Remove the cloth or tape applied in step 5.
10. Install the primary element (3).
11. Install the dust cup (2) with its “↑ TOP ↑” mark facing up or by aligning the arrows “→/←”, and then fasten it with the clamps (1).



12. Push the button (3) on the dust indicator to reset the red piston (2).



CLEANING THE RADIATOR FINS AND OIL COOLER FINS

⚠ WARNING

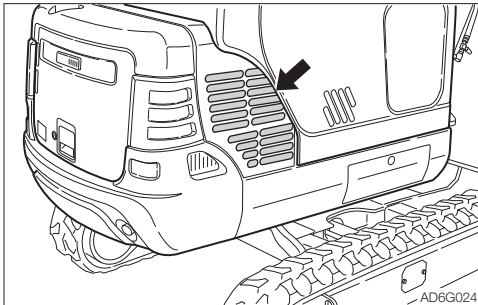
Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.

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. Blow compressed air on the fins to remove mud and dirt stuck on them.

MEMO



EVERY 500 HOURS

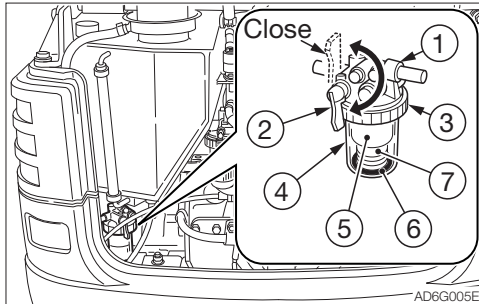
REPLACING THE HYDRAULIC OIL RETURN FILTER

Refer to “Replacing the hydraulic oil return filter” on page 5-24.

REPLACING THE WATER SEPARATOR 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.



1. Open the engine hood.
2. Close the valve (2).
3. Loosen the ring (3) and remove the case (4).
4. Remove the spring (7) and the indicator ring (6) from the case (4).
5. Clean the case (4).
6. Inspect the O-ring. If there are any scratches or other irregularities, replace it.
7. Replace the element (5) with a new one.
8. Install the indicator ring (6) and the spring (7) in the case (4).
9. Install the case (4) to the bracket and tighten the ring (3) by hand.
10. Open the valve (2) to bleed air.
Refer to “Bleeding air from the fuel system” on page 6-8.

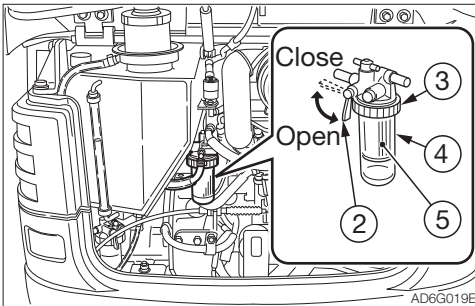


REPLACING THE FUEL FILTER



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.



1. Open the engine hood.
2. Close the valve (2).
3. Loosen the ring (3) and remove the case (4).
4. Clean the case (4).
5. Inspect the O-ring. If there are any scratches or other irregularities, replace it.
6. Replace the element (5) with a new one.
7. Install the case (4) to the bracket and tighten the ring (3) by hand.
8. Open the valve (2) to bleed air.
Refer to "Bleeding air from the fuel system" on page 6-8.



EVERY 1000 HOURS

REPLACING THE TRAVEL MOTOR GEAR OIL

Refer to "Replacing the travel motor gear oil" on page 5-33.

CLEANING THE ENGINE COOLING SYSTEM

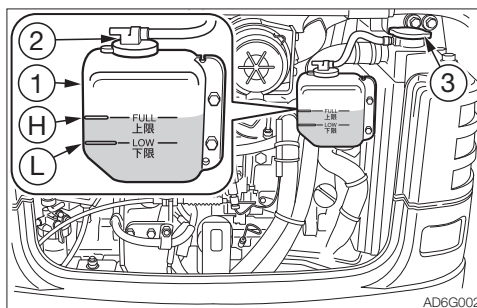
WARNING

- 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.

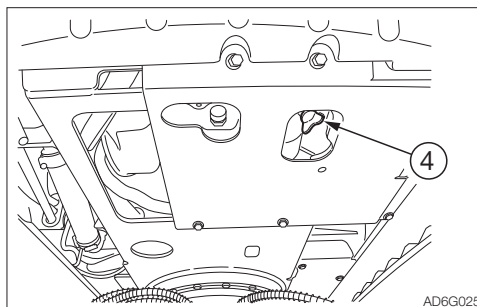
- Do not remove the radiator cap or the drain plug when the cooling water is hot. Stop the engine and wait until the engine and the cooling water cool. Then, slowly loosen the radiator cap and the drain plug to remove them.

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. Place a pan for catching the waste coolant under the drain plug (4), and then loosen the drain plug (4) to drain the coolant.
4. Tighten the drain plug (4).
5. 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.
6. Close the radiator cap (3).



7. 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.
8. Stop the engine, wait until the cooling water temperature becomes lower, and then remove the drain plug (4) to drain the water.
9. After draining, clean the cooling system using a cleaning agent. When using the cleaning agent, follow the instructions included with the agent.
10. Repeat the steps 4 to 8 to rinse the cooling system.
11. Tighten the drain plug (4).
12. 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.
13. Close the radiator cap (3).
14. Warm up the engine. Use the meters to check that there are no irregularities in the cooling system at this time.
15. Increase the water temperature to at least 90°C (194°F). Then, run the engine for about 10 minutes.
16. 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.
17. Close the radiator cap (3).
18. Clean the interior of the reserve tank (1), and then add coolant to the upper limit (H).
19. 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

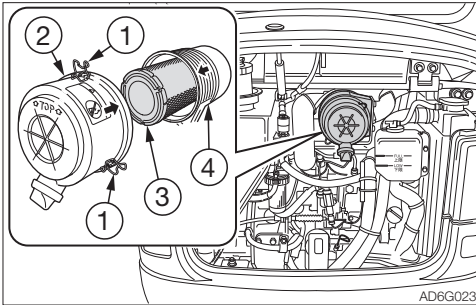
WARNING

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

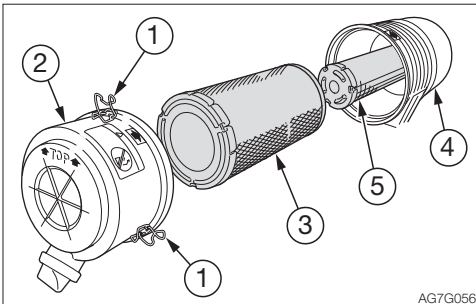
- The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.

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.

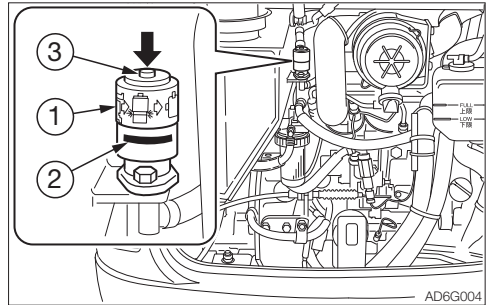
1. Open the engine hood.



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. Cover the intake hole at the back of the body (4) with cloth or tape to prevent dirt from getting in.
<If equipped with the secondary element>
Do not yet remove the secondary element (5).
6. Clean the inside of the body (4).
7. Remove the cloth or tape applied in step 5.
<If equipped with the secondary element>
Remove the secondary element (5).
8. Install the new elements.
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).



10. Push the button (3) on the dust indicator to reset the red piston (2).



INSPECTING AND ADJUSTING THE ENGINE VALVE CLEARANCE

This operation requires experience. Ask your sales or service dealer for it.

RETIGHTENING THE ENGINE CYLINDER HEAD BOLT

This operation requires experience. Ask your sales or service dealer for it.



EVERY 1500 HOURS

INSPECTING AND CLEANING THE ENGINE FUEL INJECTORS

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE CRANKCASE BREATHER SYSTEM

This operation requires experience. Ask your sales or service dealer for it.



EVERY 2000 HOURS

LAPPING THE ENGINE VALVE SEATS

This operation requires experience. Ask your sales or service dealer for it.



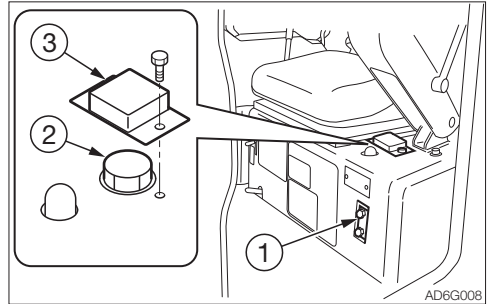
EVERY 4000 HOURS

REPLACING THE HYDRAULIC OIL AND CLEANING THE SUCTION STRAINER

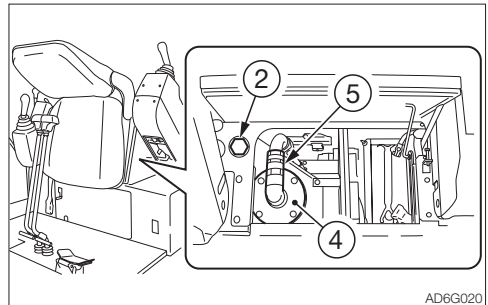
WARNING

- Stop the engine and allow the machine to cool down before performing maintenance.
 - The engine and 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 when loosening the caps or plugs. 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.
 - Gradually loosen the vent plug to relieve tank pressure.
 - 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.

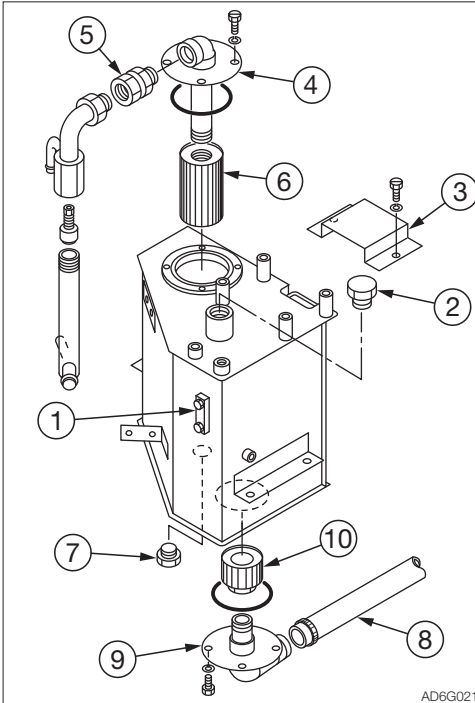
1. Set the machine to the hydraulic oil level inspection posture. Refer to "Inspecting the hydraulic oil tank level and replenishing" on page 5-19.
2. Raise the left safety lock lever to the locked position.



3. Loosen the bolts and remove the cover (3) (for cab).
4. Gradually loosen the vent plug (2) to relieve tank pressure.



5. Open the maintenance cover.
6. Remove the bolts from the flange (4).
7. Loosen the adapter (5) and remove the flange (4).



AD6G021

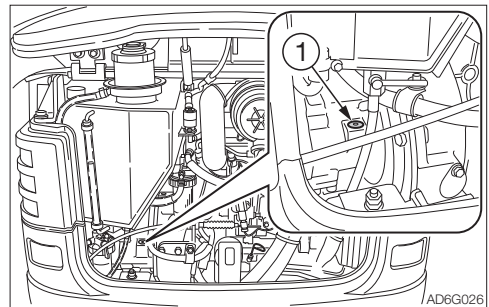
8. Remove the return filter (6).
9. Place a pan for catching the waste oil under the drain plug (7).
10. Loosen the drain plug (7) and drain the hydraulic oil.
11. Loosen the hose clip and remove the hose (8).
12. Loosen the bolts and remove the flange (9).
13. Remove the suction strainer (10) and clean it.
14. Clean the inside of the hydraulic tank.
15. Install the suction strainer (10) to the flange (9).
16. Reinstall the flange (9) and the hose (8) to their original positions.
17. Install a new return filter to the flange (4).
18. Reinstall the flange (4) and the adapter (5) to their original positions.
19. Tighten the drain plug (7).
20. Add hydraulic oil from the hole of plug (2) up to the level between the upper limit (H) and the lower limit (L) in the sight gauge (1).

21. Tighten the plug (2).
22. Bleed air from the hydraulic oil circuit following "Bleeding air" below.
23. Set the machine to the hydraulic oil level inspection posture and inspect the oil level when the oil temperature drops. Refer to "Inspect the hydraulic oil tank level and replenishing" on page 5-19.

Bleeding air

IMPORTANT: After replacing the hydraulic oil, bleed air from the hydraulic circuit and hydraulic devices. Failure to do so may damage the hydraulic devices.

• Hydraulic pump



AD6G026

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).

• 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 let them reach the stroke end.
3. Run the engine at high speed, then extend and retract each cylinder 4 or 5 times, without let them reach the stroke end.
4. Set the engine back to a low idle, then extend and contract all the cylinders 4 or 5 times to the stroke ends.



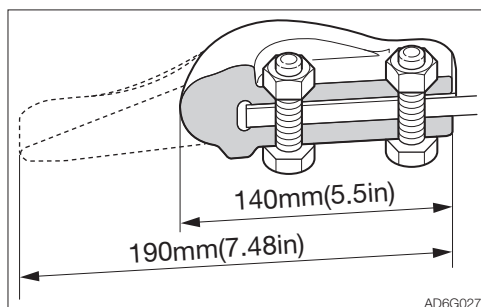
WHEN REQUIRED

REPLACING THE BUCKET TEETH

Replace the bucket teeth if the tooth points are worn. Do not wait until the bucket is damaged.

WARNING

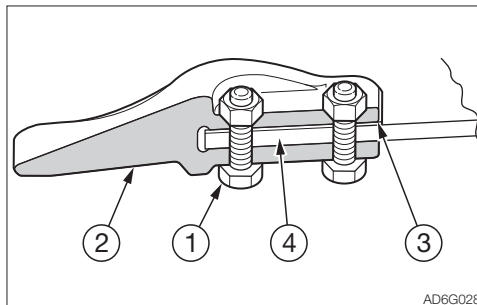
- Before performing maintenance or repairs under the machine, lower all moveable working equipment to the ground or in the lowermost position.
- To prevent unexpected movement, firmly secure the working equipment when repairing or replacing the bucket teeth or side cutter.
- When using a hammer, pins 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.



Replace the teeth if they are worn to 140 mm (5.5 in.).

Removal

1. Clean the bucket and park the machine in a flat, safe place where the ground is hard.
2. Set the bottom surface of the bucket flat and lower it on a block so that the bolt (1) can be taken out.
3. Remove the starter key, and then check that the bucket is stable.

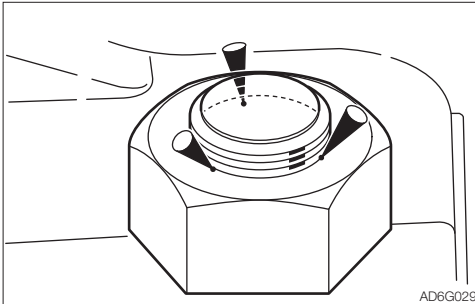


4. Remove the bolt (1).
5. Remove the teeth (2) and the shim (3).



Installation

1. Clean the section where the teeth are to be installed. If there is gravel or mud on the section, the tooth point may not go in all the way.
2. Put the teeth into the bucket.
3. If the teeth are not secured, insert a shim to reduce the clearance.
4. Insert the bolt from the outside of the bucket and tighten it with the nut.
Tightening torque: 102 N m (75.2 ft-lb)



5. Caulk the bolt with a punch or weld it at three spots on the threaded portion (nut side).

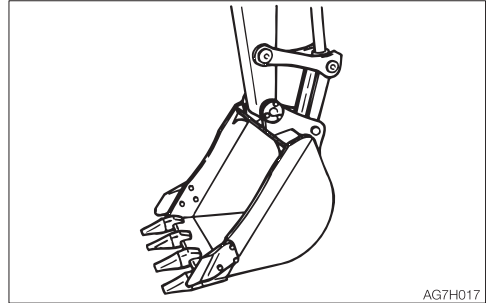


REPLACING THE BUCKET

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.

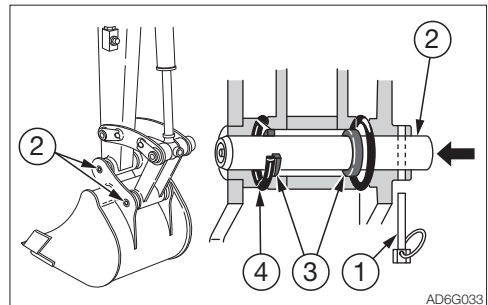
Removing



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.

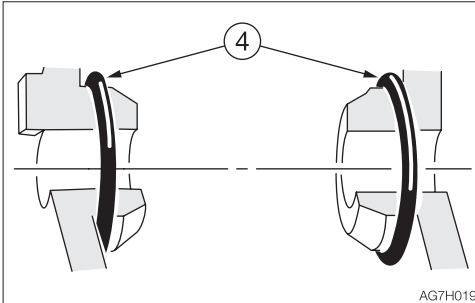
2. Set the safety lock lever to the locked position and stop the engine.



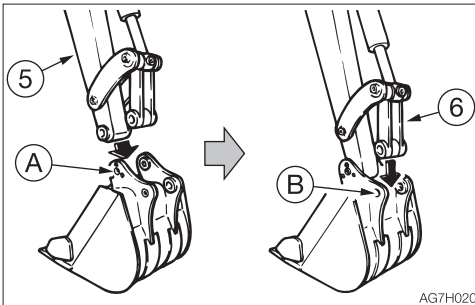
3. Disengage the ring of the lock pin (1) and remove the lock pin (1).
4. Hammer the pin (2) out of the bucket.
5. Remove the bucket.
Inspect the pin seal (3) and replace it if it is deformed or damaged. (See next page.)



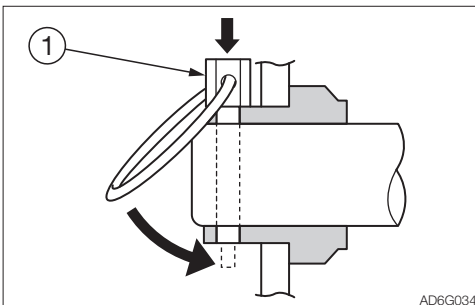
Installation



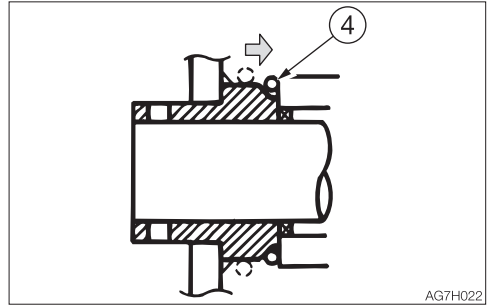
1. Set the O-ring (4) on the bucket as shown on the figure above.



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).

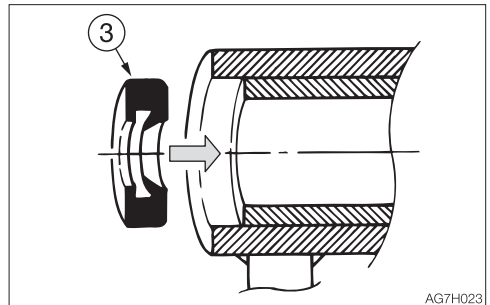


4. Align the turn prevention holes, install the lock pin (1), and then engage the ring inside.



5. 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.

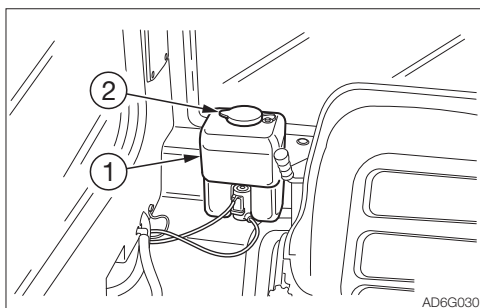


INSPECTING AND REPLENISHING THE WINDSHIELD WASHER FLUID

⚠ WARNING

Choose ethyl alcohol as washer solution. Do not use methyl alcohol as washer solution. It could damage the eyes.

Use a windshield washer fluid designed specifically for motor vehicles. Follow the instructions included with the washer fluid.



Inspection

1. Open the cab door.
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).



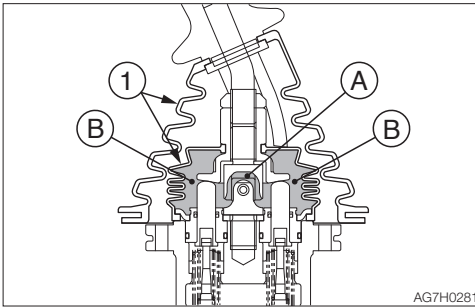
LUBRICATING THE LEVERS

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.

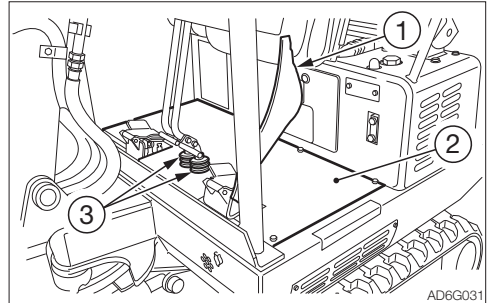
If the levers or pedals no longer move smoothly, grease them.

Operating levers

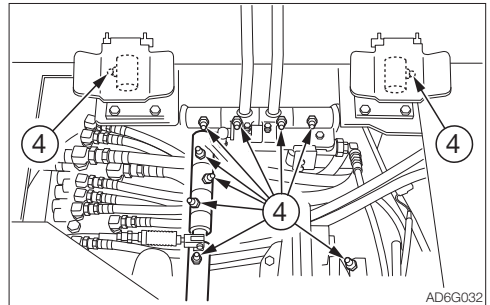


1. Remove the lower mount section of the boot (1) and turn it upward.
2. Wipe off the old grease.
3. Apply grease to points (A) and (B).
4. Set the boot (1) back as it was.

Travel levers, dozer blade lever, pedals



1. Remove the floor mat (1).
2. Loosen the bolts and remove the cover (2).
3. Remove the lower mount section of the boot (3) and turn it upward.



4. Use the grease gun to lubricate the grease fitting (4).
5. Wipe off the excess grease.
6. For installation, follow the same procedure as for removal in the reverse order.



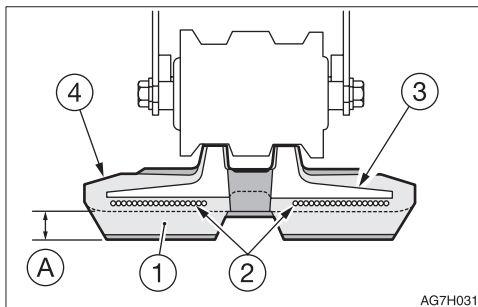
INSPECTING THE RUBBER CRAWLERS

Repair or replace the rubber crawlers if their condition becomes as described below. Consult your sales or service dealer for repair or replacement.

Rubber crawler

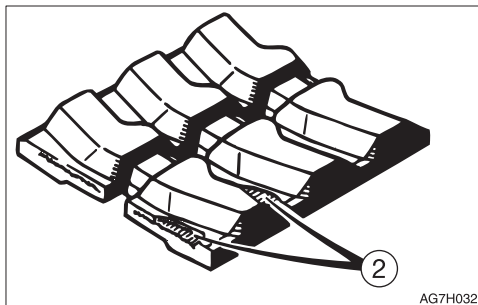
Replace the crawler if the entire crawler is stretched and cannot be adjusted.

(1) Lug



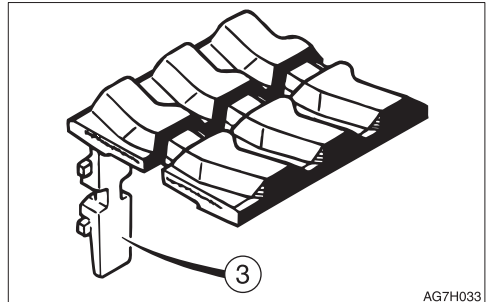
Replace if the height of (A) is 5 mm (0.2 in.) or below.

(2) Steel cord



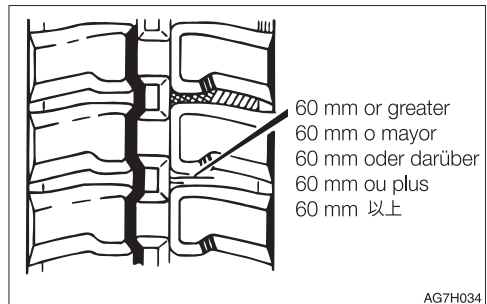
Replace if the steel cord is exposed for two links or more.
Replace if the half or more of the steel cords on one side are cut.

(3) Metal core



Replace if even one metal core is off.

(4) Rubber



Repair if there are cracks of 60 mm (2.4 in.) or greater in length.

If the steel cord is visible, repair as soon as possible, regardless of the length of the crack.

60 mm or greater
60 mm o mayor
60 mm oder darüber
60 mm ou plus
60 mm 以上

MEMO



REPLACING THE RUBBER CRAWLERS

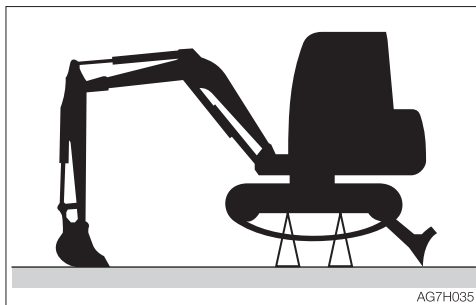
WARNING

- If you must work beneath the raised machine or working 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.
- 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.

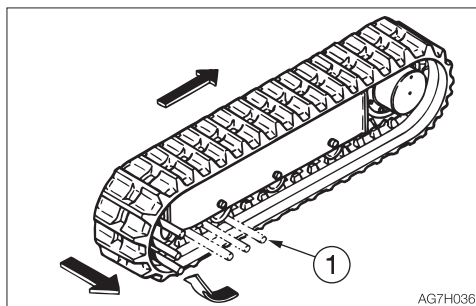
Removal

1. Fully release the tension of the rubber crawler.

Refer to "Inspecting and adjusting the crawler tension" on page 5-26.



2. Use the working equipment to lift the body.

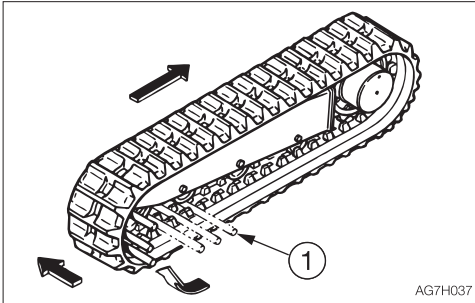


3. Set an iron pipe (1) in the rubber crawler and turn the sprocket slowly in the reverse direction.
4. Turn until the iron pipe (1) is directly next to the idler and the rubber crawler lifts away from the idler, then stop turning the sprocket.
5. Slide the rubber crawler sideways and remove it from the crawler frame. Remove the other rubber crawler using the same procedure.



Installation

1. Use the working equipment to lift the body.



2. Set the rubber crawler on the sprocket.
3. Set an iron pipe (1) in the rubber crawler and turn the sprocket slowly in the reverse direction.
4. Turn until the iron pipe (1) is directly next to the idler and the rubber crawler lifts away from the idler, then stop turning the sprocket.
5. Slide the rubber crawler inward, engage it on the idler, then pull out the iron pipe.
6. Check that the rubber crawler is securely engaged on the sprocket and idler.
7. Tighten the rubber crawler to the standard tension.
Refer to "Inspecting and adjusting the crawler tension" on page 5-26.
8. Install the other rubber crawler using the same procedure.



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 5-40.
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.

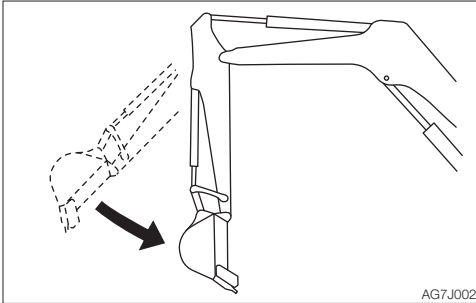
TROUBLESHOOTING



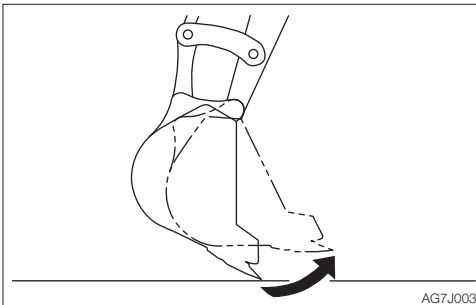
SYMPTOMS THAT ARE NOT MALFUNCTIONS

The symptoms listed below are not malfunctions.

- It becomes less easy to operate the machine when an attachment weighing more than a standard arm or bucket is installed.



- The arm retracting speed momentarily slows down when it reaches an almost vertical position while the engine is running at low speed.



- 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.

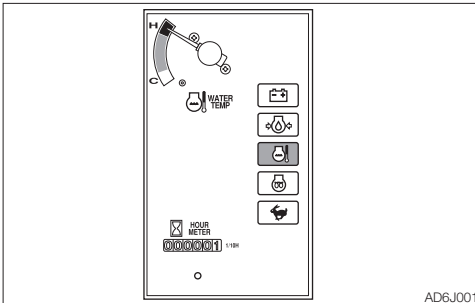


IF THE ENGINE OVERHEATS

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 try to remove the radiator cap or the drain plug when the cooling water is hot. Stop the engine, wait until the engine and the radiator cool, and then slowly loosen the radiator to release the internal pressure.
- Before performing maintenance, stop the engine and allow the machine to cool down.

The symptoms listed below indicate overheating.



- An alarm is sounded and the coolant temperature warning lamp is flashing.
- The water temperature gauge needle is in the red zone.
- The engine slows down and the engine power decreases.
- Steam comes from the engine room.

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.
 - Fan belt slack..... Adjust
Refer to page 5-23.
 - Coolant level Add
Refer to page 5-16.
 - Water leakage Repair
 - Radiator fins..... Clean
Refer to page 5-36.
 - Sediment in cooling system . Clean
Refer to page 5-40.

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.

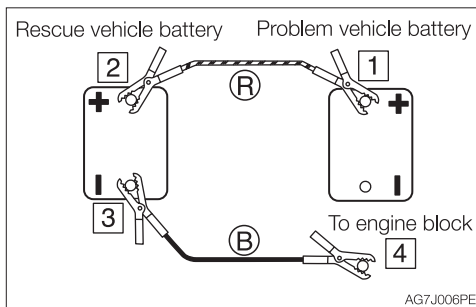
IMPORTANT: Use the jumper cables and clips of a size suited to the capacity of battery. Do not use damaged or corroded jumper cables and clips.

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

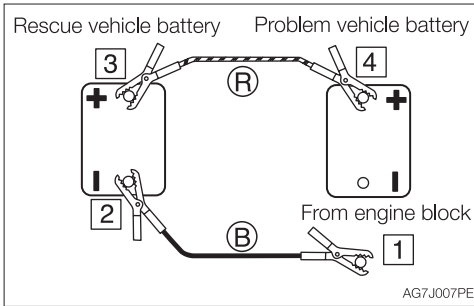
1. Check that the clips are securely connected to the terminals.
2. Start the engine of the booster vehicle and run it at high speed.
3. Start the engine of the dead machine.



TROUBLESHOOTING 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

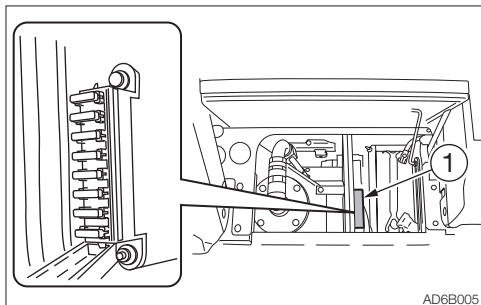
If a light does not come on or the electrical system does not work, a fuse may be blown. Inspect the fuses.

INSPECTING AND REPLACING THE FUSE

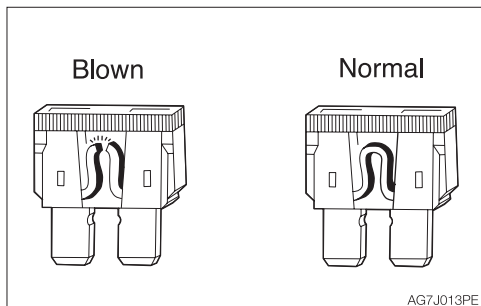
! WARNING

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 cover under the seat.



3. Open the fuse box cover (1).
4. Check for any blown fuses.



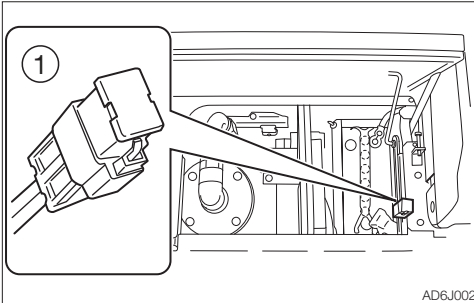
5. If a fuse is blown, replace it with a spare fuse of the same capacity.

Fuse layout and circuits protected

Capacity	Protected circuit
30A	Stop solenoid
5A	Lever lock
5A	Second travel speed
20A	Light, Tail lamp
15A	Heater, Radio
10A	Instrument cluster, Feed pump
25A	External power socket, Cigarette Lighter, Wiper, Travel alarm (option)
10A	Horn, Interior light



INSPECTING THE FUSIBLE LINK



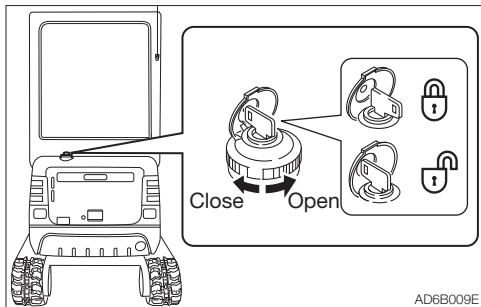
If the machine is not turned on after turning the starter switch to the ON position, the cartridge type fusible link (1) is likely blown. Open the maintenance cover and inspect. If the fusible link is blown, please contact your sales or service dealer.

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.

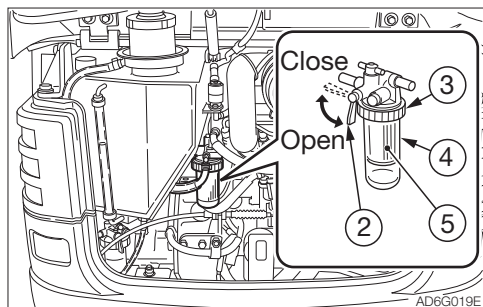
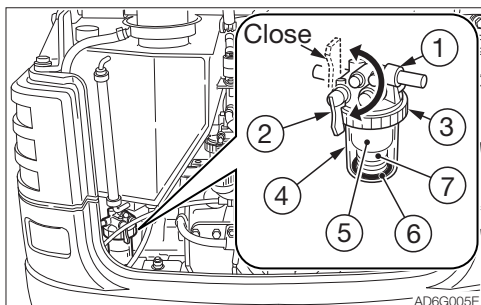


RESTARTING AFTER ADDING FUEL

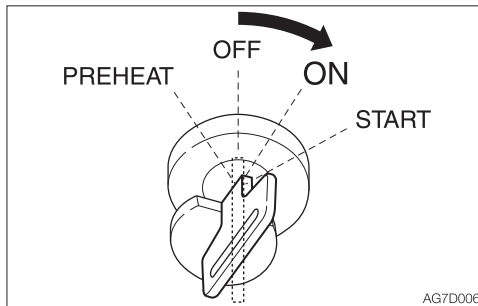
BLEEDING AIR FROM THE FUEL SYSTEM



1. Add fuel.



2. Open the valve (2) of the water separator and the fuel filter.






3. Turn the starter key to the ON position and hold it for about 10 to 15 seconds. The automatic air bleeder bleeds air from the fuel system.

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.



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
 AG7J019	Battery charge warning lamp	<p>There is a problem with the fan belt or charger.</p> <p>Check the fan belt for slack or breakage and adjust as necessary.</p> <p>If the lamp continues flashing after maintenance, there is likely a problem with the charger. Consult your sales or service dealer for help.</p> <p>Refer to “Inspecting and adjusting the fan belt” on page 5-23.</p>
 AG7J017	Engine oil pressure warning lamp	<p>A problem has occurred in the engine lubrication system. Inspect the engine oil level.</p> <p>If the lamp is flashing when the oil is normal or if it continues flashing after replenishment of oil, consult your sales or service dealer.</p> <p>Refer to “Inspecting and replenishing the engine oil” on page 5-17.</p>
 AG7J018	Coolant temperature warning lamp	<p>The coolant temperature is too high and the engine is overheating.</p> <p>Refer to “If the engine overheats” on page 6-3.</p>



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	Remedies
Left and right operating levers do not move smoothly	<ul style="list-style-type: none">• Insufficient grease on the left and right operating levers	<ul style="list-style-type: none">• Grease the levers. Refer to page 5-53.
Travel levers, blade lever and pedals do not move smoothly	<ul style="list-style-type: none">• Insufficient grease on travel levers, blade lever and pedals• Wire is stretched too loose	<ul style="list-style-type: none">• Grease the levers and pedals. Refer to page 5-53.• Adjust or replace (ask your sales or service dealer).
Hoe attachment, slewing or traveling operation not possible	<ul style="list-style-type: none">• Safety lock lever is raised (locked)• Fuse is blown• Adjustment of travel lock is faulty	<ul style="list-style-type: none">• Lower (release) the safety lock lever. Refer to page 2-18• Replace the fuse. Refer to page 6-6.• Adjust the travel lock (ask your sales or service dealer).
Digging force is insufficient	<ul style="list-style-type: none">• Hydraulic oil level too low• Hydraulic oil is not warm enough• Air cleaner is clogged• Hydraulic oil is not of suitable type	<ul style="list-style-type: none">• Add to the specified level. Refer to page 5-19.• Perform the warm-up. Refer to page 3-8.• Clean the air cleaner. Refer to page 5-34.• Replace the hydraulic oil. Refer to page 5-46.
Traveling is not possible or not smooth	<ul style="list-style-type: none">• Stones or foreign objects are stuck	<ul style="list-style-type: none">• Remove the foreign object.
Machine veers to the right/left.	<ul style="list-style-type: none">• Stones or foreign objects are stuck• Faulty crawler tension adjustment	<ul style="list-style-type: none">• Remove the foreign object.• Adjust the crawler to the prescribed tension. Refer to page 5-26.
Travel speed cannot be changed	<ul style="list-style-type: none">• Fuse is blown	<ul style="list-style-type: none">• Replace the fuse. Refer to page 6-6.



TROUBLESHOOTING OTHER SYMPTOMS

Symptoms	Major causes	Remedies
Slewing is not possible or not smooth.	<ul style="list-style-type: none">• Insufficient grease on slew bearing	<ul style="list-style-type: none">• Grease the bearing. Refer to page 5-28.
Hydraulic oil temperature is too high	<ul style="list-style-type: none">• Hydraulic oil level too low	<ul style="list-style-type: none">• Add up to the specified level. Refer to page 5-19.
Starter motor turns but engine does not start	<ul style="list-style-type: none">• Insufficient fuel• Air in fuel system• Water in fuel system	<ul style="list-style-type: none">• Add fuel. Refer to page 5-18.• Bleed air. Refer to page 6-8.• Drain water. Refer to page 5-29.
Crawlers come off	<ul style="list-style-type: none">• Crawlers too loose	<ul style="list-style-type: none">• Increase the tension. Refer to page 5-26.
Engine exhaust is white or bluish	<ul style="list-style-type: none">• Excessive engine oil• Poor fuel	<ul style="list-style-type: none">• Adjust to the specified level. Refer to page 5-17.• Replace the fuel.
Engine exhaust is occasionally black	<ul style="list-style-type: none">• Air cleaner is clogged	<ul style="list-style-type: none">• Clean the air cleaner. Refer to page 5-34.
Irregular noise is produced from the engine (combustion or mechanical noise)	<ul style="list-style-type: none">• Low quality fuel is being used• Engine is overheating• Damage inside the muffler	<ul style="list-style-type: none">• Replace the fuel.• Refer to “If the engine overheats” on page 6-3.• Replace the muffler. For replacement, ask your sales or service dealer.



LOWERING THE BOOM TO THE GROUND

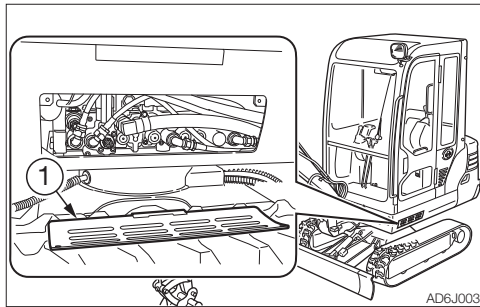
If the hoe attachment must be lowered to the ground while the engine is stopped, use the following procedure.

This operation is dangerous and requires experience. Ask your sales or service dealer for it.

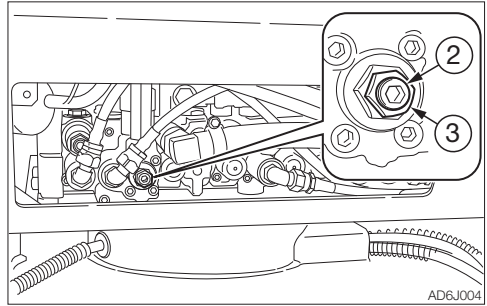
Procedure

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 slowly by slowly turning the set screw on the shut-off valve. Do not turn the screw more than the specified amount.**



1. Loosen the bolts and remove the left cover (1).



2. Loosen the lock nut (3) while holding the adjuster screw (2) in place with a hexagonal wrench.
3. Turn the adjuster screw (2) slowly 1/4 turn to lower the boom.
4. Check for safety and stability of the machine.
5. Return the adjuster screw (2) to the original position.
6. Tighten the lock nut (3) while holding the adjuster screw (2) in place with a hexagonal wrench.
Tightening torque: 19.6 N·m (14.5 ft·lb)
7. Reinstall the left cover (1).



TOWING



WARNING

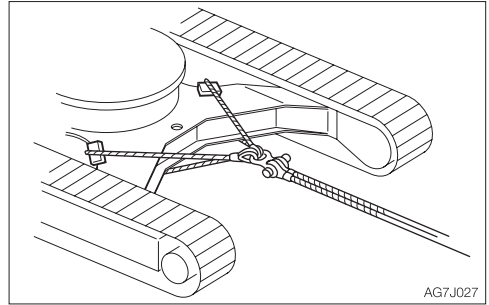
When towing, serious injury or death could result, if performed incorrectly or the wire being used is appropriate or not properly inspected.

- It becomes dangerous if the wire breaks or becomes disengaged. Use a wire rope appropriate for the required towing 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.

IMPORTANT: Do not tow a machine if its engine does not start or if the machine does not run. Doing so could damage the machine being towed.

Towing the machine

Use the procedure described below to tow heavy objects or the machine itself if it should get stuck in the mud and not be able to get out on its own.



1. Fasten the wire rope to the frame. Fit splints or other objects between the wire rope and frame to prevent the machine and wire rope from being damaged.
2. Move the machine to tension the wire rope.
3. Move the machine slowly and tow.

SPECIFICATIONS





SPECIFICATIONS
BASIC SPECIFICATIONS

BASIC SPECIFICATIONS

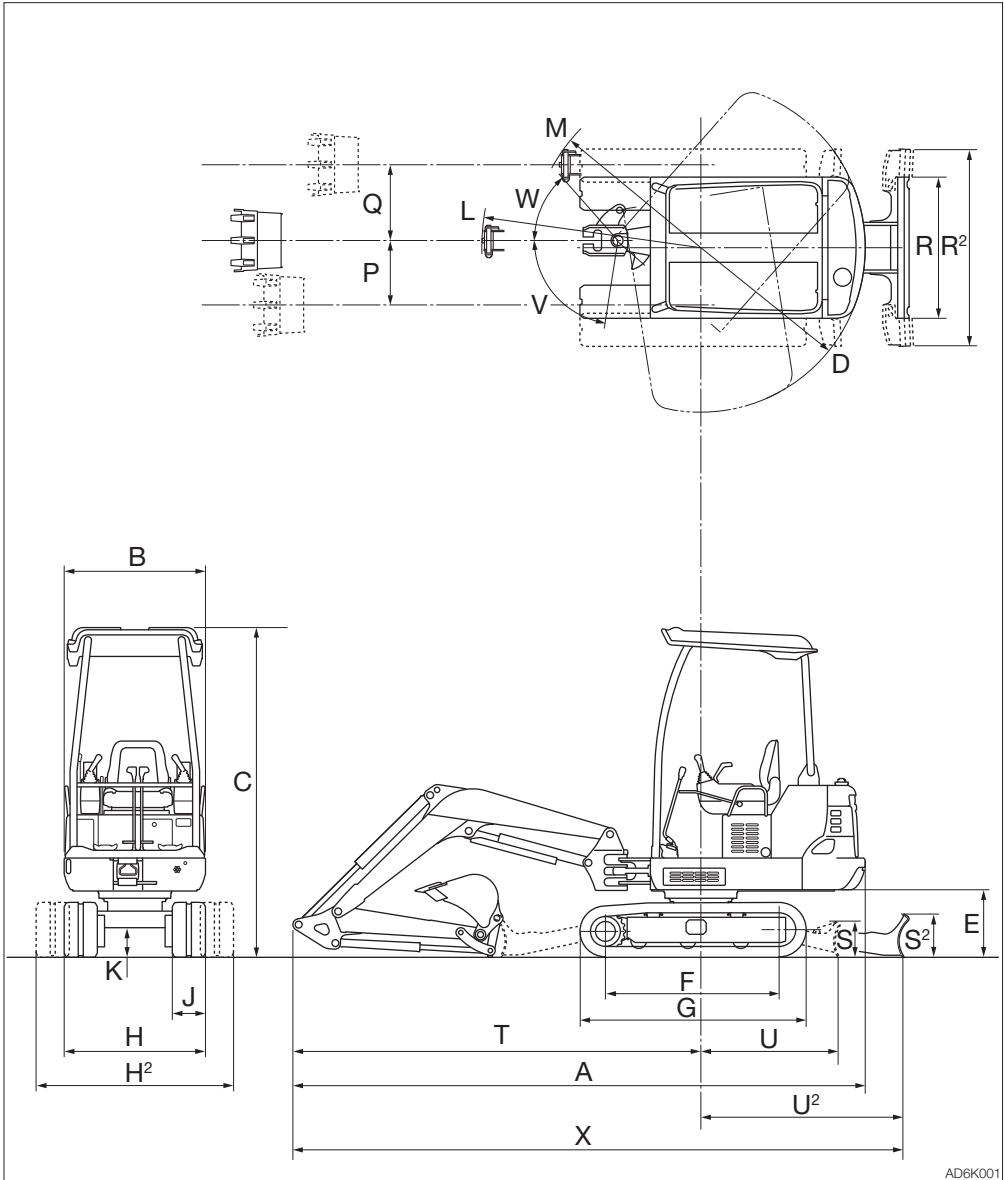
Type		Canopy	Cab	
MASS				
Operating mass	kg (lb)	Rubber crawlers	1945 (4290)	2070 (4560)
		Steel crawlers	2005 (4420)	2130 (4695)
PERFORMANCE				
Bucker capacity (Standard bucket)	m ³ (cu. ft.)	Heaped	0.046 (1.62)	
		Struck	0.033 (1.17)	
Slew speed	min ⁻¹ (rpm)	8.7 (8.7)		
Travel speed	km/h (mph)	Rubber crawlers	1st	2.4 (1.49)
			2nd	4.0 (2.49)
		Steel crawlers	1st	2.3 (1.43)
			2nd	3.8 (2.36)
Gradeability	(degrees)	30		
Ground pressure	kPa (psi)	Rubber crawlers	31.1 (4.51)	33.1 (4.81)
		Steel crawlers	32.1 (4.65)	34.1 (4.95)
Noise level	dB (A)	Sound power level	LWA 94	
		Sound pressure level	LPA 73	
ENGINE				
Manufacturer and model		Yanmar 3TNV70		
Rated output	kW/min ⁻¹ (hp/rpm)		11.5/2500 (15.4/2500)	
Displacement	ml (cu.in.)		854 (52.1)	
Starter	V-kW		12-1.0	
Alternator	V-kW		12-0.48	
Battery	V-A·h		12-38	

With a 1000 mm (39.3 in.) arm and a long dozer blade.

MEMO

MACHINE DIMENSIONS

<Canopy>



AD6K001



SPECIFICATIONS
MACHINE DIMENSIONS

<Canopy>

Unit: mm (inch)

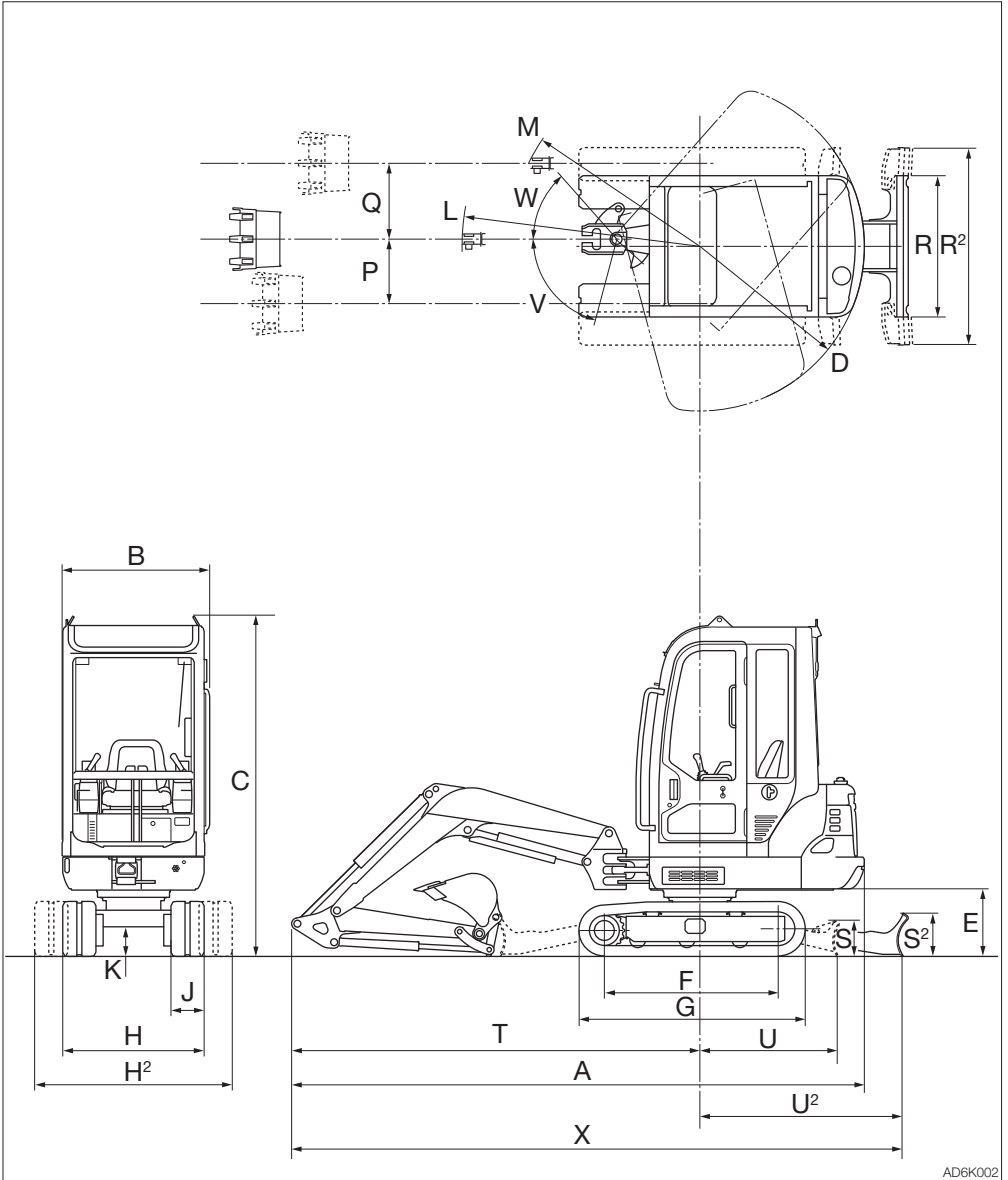
	Item	Standard arm	Long arm
		Rubber crawlers	
A	Overall length	3970 (156.3)/ 4010 (157.9)*	3985 (156.9)/ 4055 (159.6)*
B	Upperstructure overall width	980 (38.6)	←
C	Overall height	2290 (90.2)	←
D	Slew radius	1140 (44.9)	←
E	Clearance height under upperstructure	470 (18.5)	←
F	Crawler base	1205 (47.4)	←
G	Crawler overall length	1570 (61.8)	←
H	Crawler overall width (narrow)	980 (38.6)	←
H²	Crawler overall width (wide)	1370 (53.9)	←
J	Crawler shoe width	230 (9.1)	←
K	Ground clearance of undercarriage	205 (8.1)	←
L	Minimum radius of equipment and attachment	1520 (59.8)	1535 (60.4)
M	Minimum radius of equipment at maximum front offset	1175 (46.3)	1185 (46.6)
P	Offset distance of bucket (Left)	445 (17.5)	←
Q	Offset distance of bucket (Right)	525 (20.7)	←
R	Dozer blade width (narrow)	980 (38.6)	←
R²	Dozer blade width (wide)	1370 (53.9)	←
S	Dozer blade height	250 (9.8)	←
S²	Dozer blade height	300 (11.8)*	←
T	Front distance to axis of rotation	2830 (111.4)/ 2870 (113)*	2845 (112)/ 2915 (114.8)*
U	Dozer blade distance to axis of rotation	950 (37.5)	←
U²	Dozer blade distance to axis of rotation	1400 (55.1)*	←
V	Boom swing angle (Left)	80°	←
W	Boom swing angle (Right)	50°	←
X	Overall length (dozer blade at rear)	4275 (168.3)*	4290 (168.9)*

*: With a long dozer blade



SPECIFICATIONS
MACHINE DIMENSIONS

<Cab>



AD6K002



SPECIFICATIONS
MACHINE DIMENSIONS

<Cab>

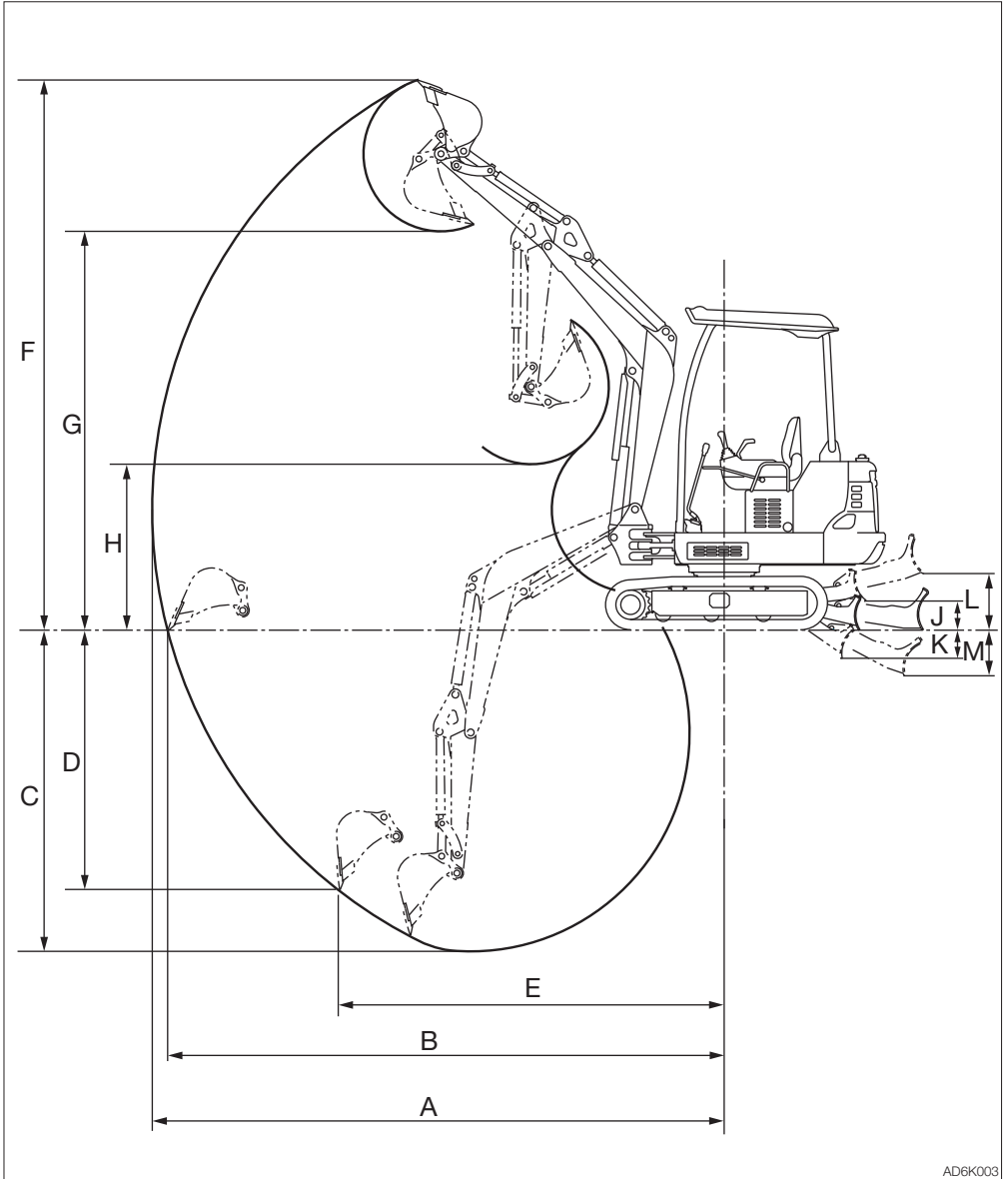
Unit: mm (inch)

	Item	Standard arm	Long arm
		Rubber crawlers	
A	Overall length	3970 (156.3)/ 4010 (157.9)*	3985 (156.9)/ 4055 (159.6)*
B	Upperstructure overall width	1030 (40.6)	←
C	Overall height	2360 (93)	←
D	Slew radius	1140 (44.9)	←
E	Clearance height under upperstructure	470 (18.5)	←
F	Crawler base	1205 (47.4)	←
G	Crawler overall length	1570 (61.8)	←
H	Crawler overall width (narrow)	980 (38.6)	←
H²	Crawler overall width (wide)	1370 (53.9)	←
J	Crawler shoe width	230 (9.1)	←
K	Ground clearance of undercarriage	205 (8.1)	←
L	Minimum radius of equipment and attachment	1650 (65)	1655 (65.2)
M	Minimum radius of equipment at maximum front offset	1320 (52)	1325 (52.2)
P	Offset distance of bucket (Left)	445 (17.5)	←
Q	Offset distance of bucket (Right)	520 (20.5)	←
R	Dozer blade width (narrow)	980 (38.6)	←
R²	Dozer blade width (wide)	1370 (53.9)	←
S	Dozer blade height	250 (9.8)	←
S²	Dozer blade height	300 (11.8)*	←
T	Front distance to axis of rotation	2830 (111.4)/ 2870 (113)*	2845 (112)/ 2915 (114.8)*
U	Dozer blade distance to axis of rotation	950 (37.5)	←
U²	Dozer blade distance to axis of rotation	1400 (55.1)*	←
V	Boom swing angle (Left)	75°	←
W	Boom swing angle (Right)	50°	←
X	Overall length (dozer blade at rear)	4275 (168.3)*	4290 (168.9)*

*: With a long dozer blade



OPERATING RANGES



AD6K003



SPECIFICATIONS
OPERATING RANGES

<Canopy>

Unit: mm (inch)

	Item	Standard arm	Long arm
		Rubber crawlers	
A	Maximum reach	4045 (159.3)	4160 (163.8)
B	Maximum reach at ground reference plane	3935 (154.9)	4055 (159.6)
C	Maximum digging depth	2270 (89.4)	2395 (94.4)
D	Maximum vertical digging depth	1835 (72.2)	1955 (77)
E	Reach at maximum vertical digging depth	2740 (107.8)	2770 (109.1)
F	Maximum height of cutting edge	3890 (153.1)	3975 (156.4)
G	Maximum dumping height	2820 (111)	2905 (114.3)
H	Minimum dumping height	1175 (46.3)	1050 (41.3)
J	Dozer blade maximum lifting	205 (8.1)	←
K	Dozer blade maximum lowering	200 (7.8)	←
L	Long dozer blade maximum lifting	400 (15.7)	←
M	Long dozer blade maximum lowering	325 (12.8)	←

<Cab>

Unit: mm (inch)

	Item	Standard arm	Long arm
		Rubber crawlers	
A	Maximum reach	4045 (159.3)	4160 (163.8)
B	Maximum reach at ground reference plane	3935 (154.9)	4055 (159.6)
C	Maximum digging depth	2270 (89.4)	2395 (94.4)
D	Maximum vertical digging depth	1835 (72.2)	1955 (77)
E	Reach at maximum vertical digging depth	2740 (107.8)	2770 (109.1)
F	Maximum height of cutting edge	3770 (148.4)	3845 (151.3)
G	Maximum dumping height	2710 (106.7)	2785 (109.7)
H	Minimum dumping height	1115 (43.9)	990 (39.1)
J	Dozer blade maximum lifting	205 (8.1)	←
K	Dozer blade maximum lowering	200 (7.8)	←
L	Long dozer blade maximum lifting	400 (15.7)	←
M	Long dozer blade maximum lowering	325 (12.8)	←

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

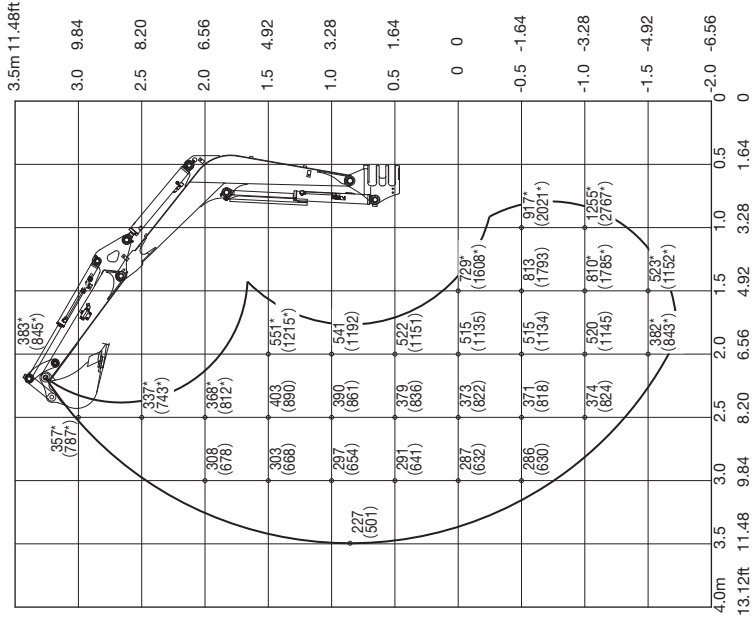
- Do not attempt to lift or hold any load that is greater than these rated values at their specified load radii and height.
- The rated lift capacities are based on the machine being level and situated on a firm supporting surface. For safe lifting, the operator is expected to make due allowance for the particular job conditions such as soft or uneven ground, non-level condition, side loads, 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.



SPECIFICATIONS
LIFTING CAPACITIES

<Canopy> Standard arm

Over Front ; Dozer Blade Up

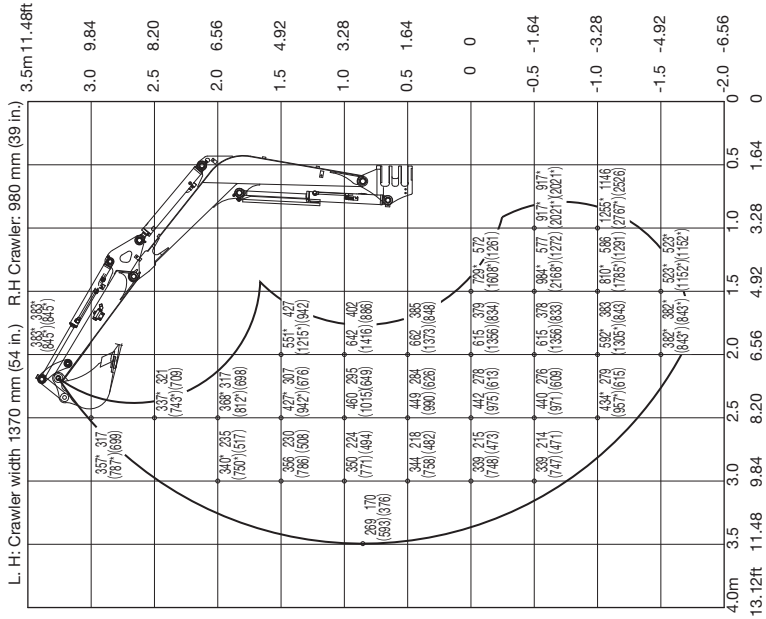


Units: daN(lbs.)

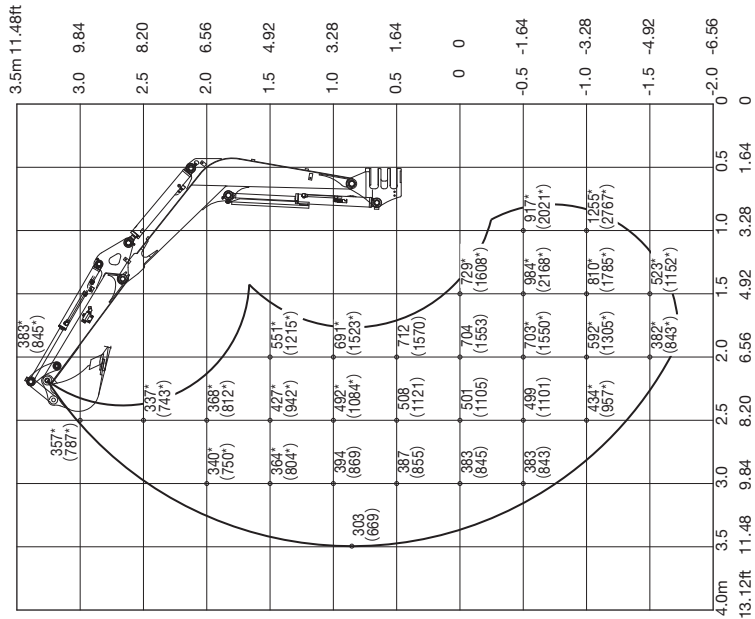


<Canopy> Standard arm

Over Side



Over Rear

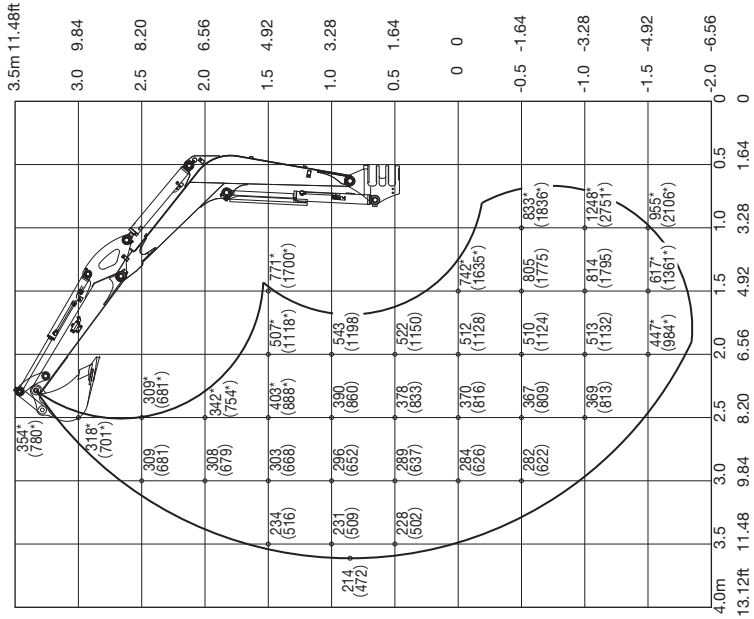


Units: daN(lbs.)



<Canopy> Long arm

Over Front ; Dozer Blade Up

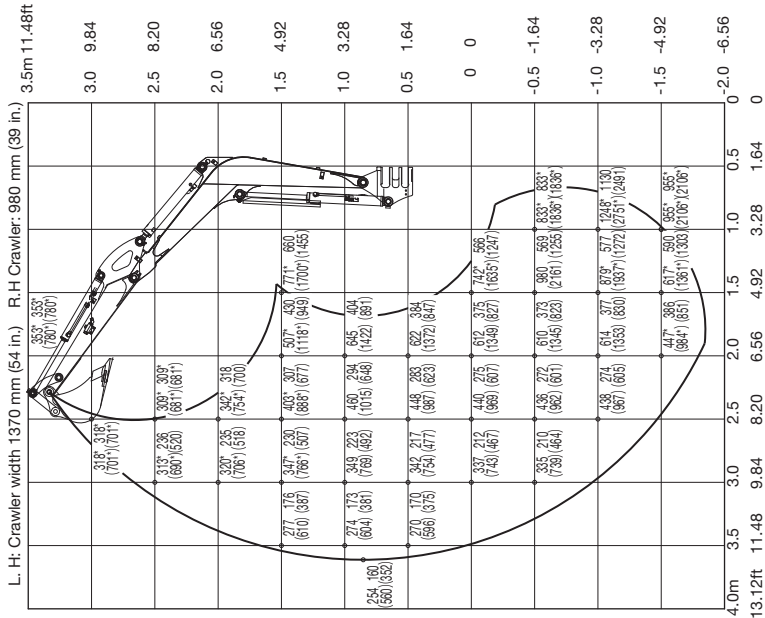


Units: daN(lbs.)

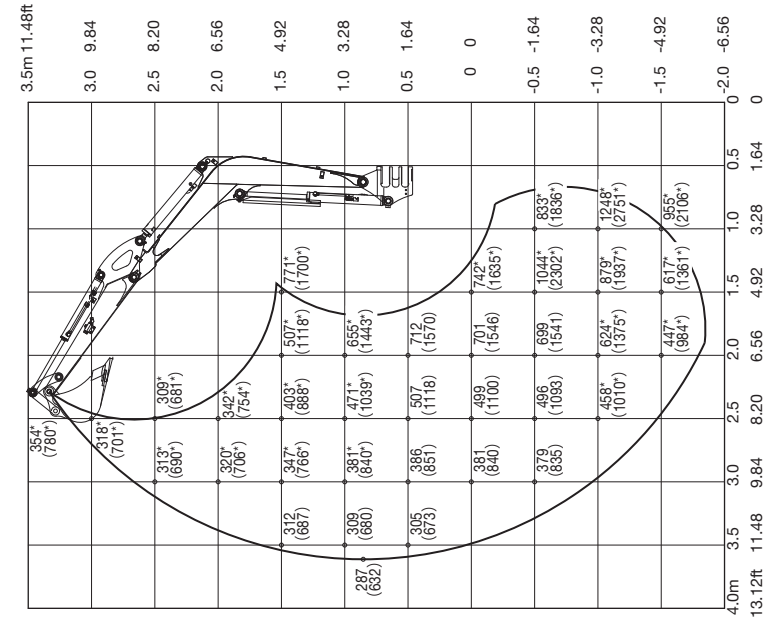


<Canopy> Long arm

Over Side



Over Rear



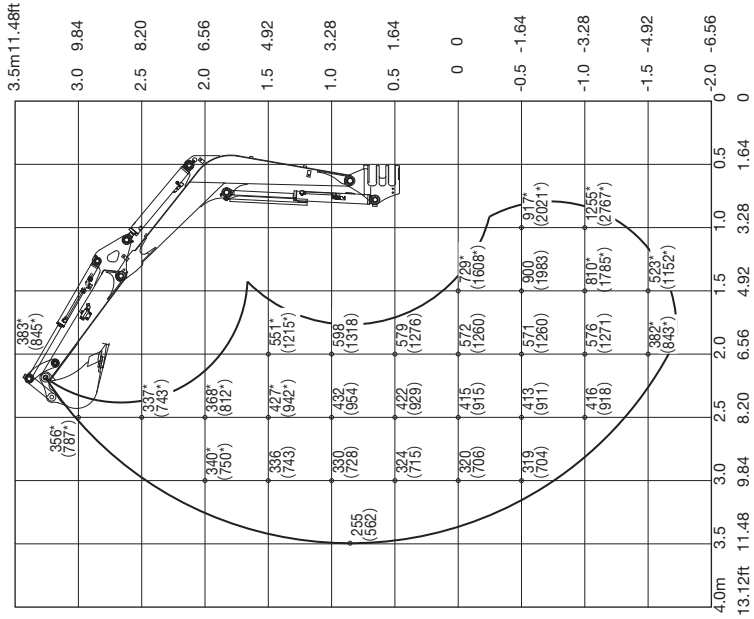
Units: daN(lbs.)



SPECIFICATIONS
LIFTING CAPACITIES

<Cab> Standard arm

Over Front ; Dozer Blade Up



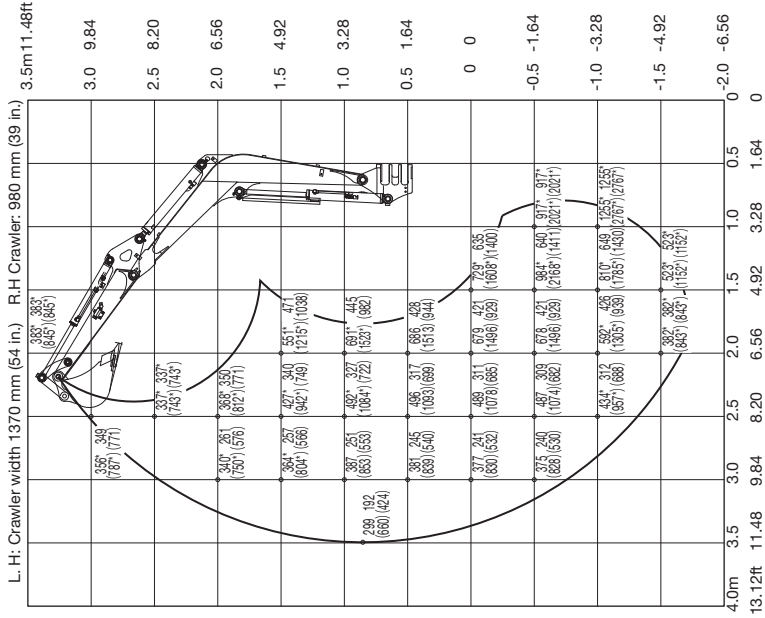
Units: daN(lbs.)



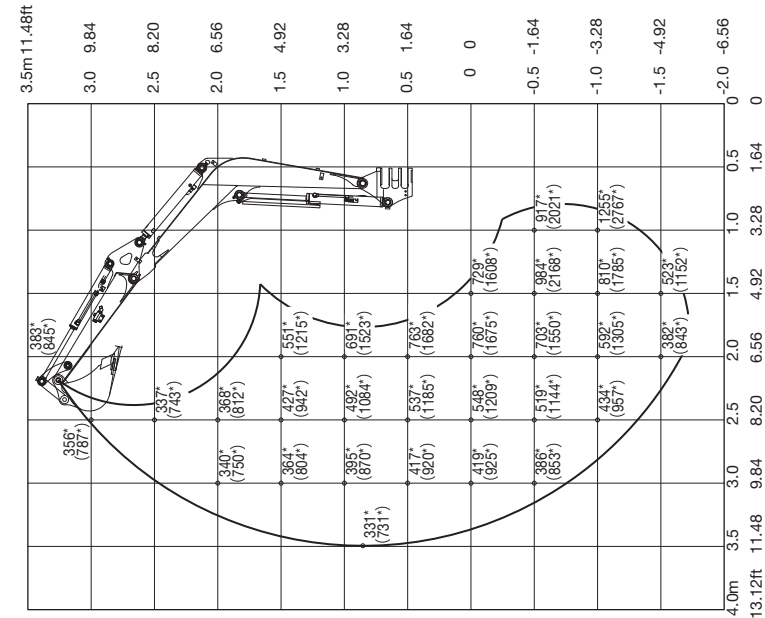
SPECIFICATIONS
LIFTING CAPACITIES

<Cab> Standard arm

Over Side



Over Rear



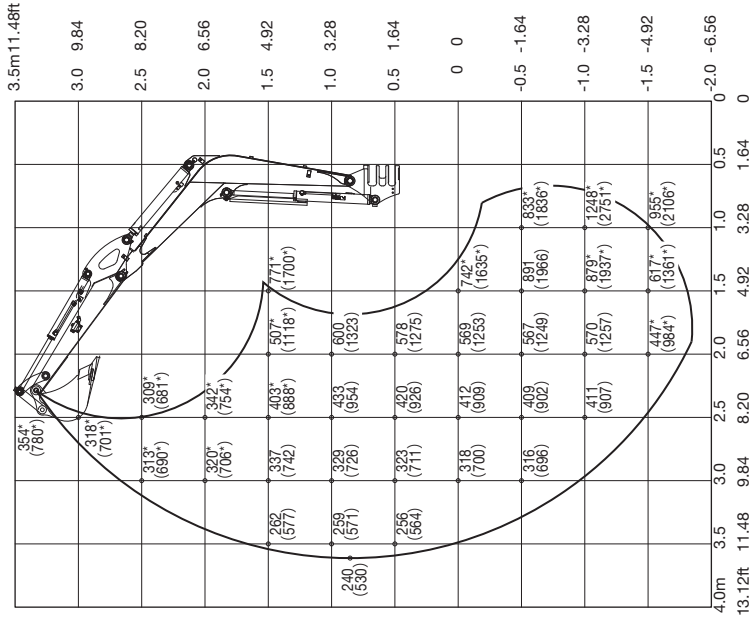
Units: daN(lbs.)



SPECIFICATIONS
LIFTING CAPACITIES

<Cab> Long arm

Over Front ; Dozer Blade Up



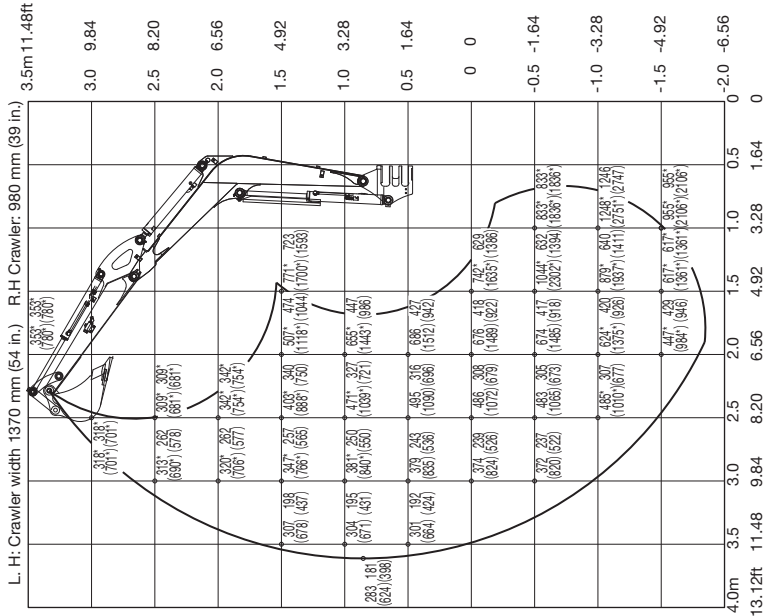
Units: daN(lbs.)



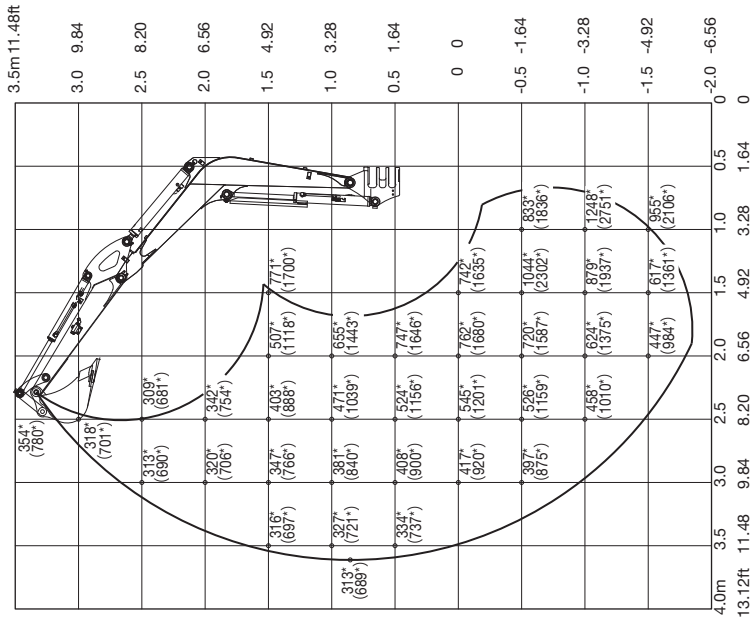
SPECIFICATIONS
LIFTING CAPACITIES

<Cab> Long 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 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 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.
-

CAUTIONS 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.

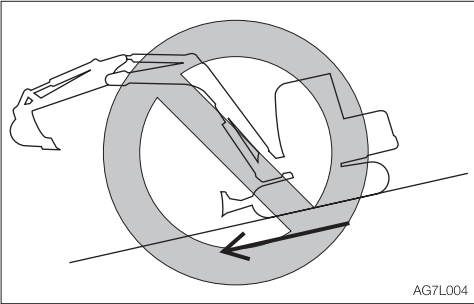


CAUTIONS WHEN OPERATING ATTACHMENTS

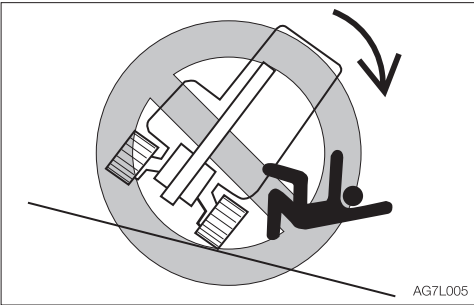
WARNING

Long attachments reduce stability of the machine. The machine may tip over if it loses the balance when traveling or slewing on slopes.

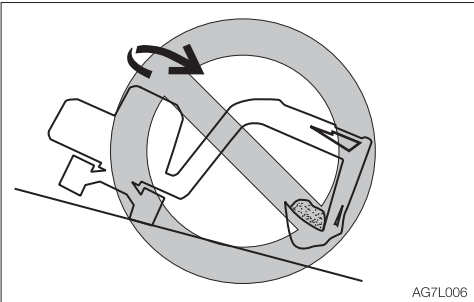
Never perform the operations listed below as they are extremely dangerous.



- 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.



ATTACHMENT COMBINATION TABLE

The table below shows which bucket should be installed when the machine is using a standard arm or long arm. Select a proper bucket by following the table.

⚠ WARNING

- Consult with your sales or service dealer before installing an optional attachment.
- Do not use any attachments not approved by your sales or service dealer. 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.
- The swing stopper must be mounted when a bucket wider than a 450W bucket is mounted. Failure to mount the swing stopper may result in the bucket hitting the machine body.

√ :Can be used.

Δ :Can be used only for light operations (digging and loading of dry and loose soil or mud)

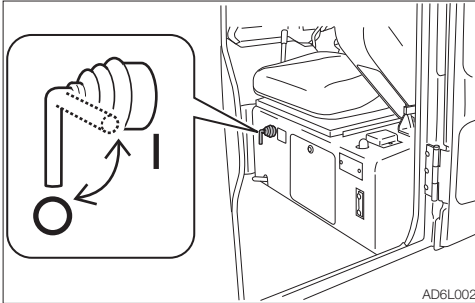
— :Cannot be used.

Bucket	Rated capacity m ³ (cu. yd.)	Bucket cutting width mm (inch)	Standard arm 1000 mm (39.4 in.)	Long arm 1125 mm (44.3 in.)
450W (Standard)	0.046 (1.62)	435 (17.1)	√	√
Hydraulic Breaker (TKB-71)			√	√



BATTERY SWITCH

IMPORTANT: Never set this switch to the OFF (O) position while the engine is running. Doing so will cause engine breakdown.



OFF (O).... Cut off the electrical circuit. Be sure to set this switch to the OFF (O) position when storing the machine for a long period, or when performing maintenance of the electrical system.

ON (I)..... Connects the electrical system. Check that this switch is in the ON (I) position before starting the engine.

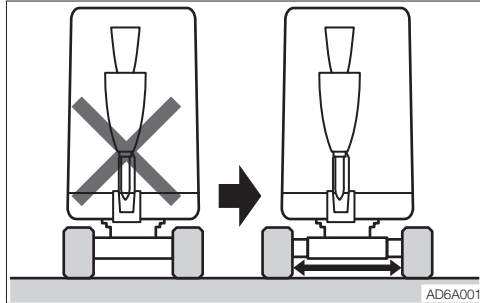
Note: Setting this switch to the OFF (O) position will shut down all electrical circuits, but the memory of the radio preset tuning keys will be retained.



HYDRAULIC BREAKER

For handling of the breaker, read the hydraulic breaker's manual, provided separately.

WARNING



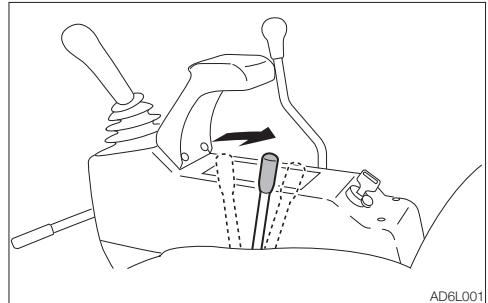
Do not use the breaker when the crawler width is narrowed!

- Always operate the machine with the crawler width extended to 1370 mm (53.9 in.) to maximize the machine stability. If the machine is operated with the crawler width narrowed (980 mm, 38.6 in.), the machine may tip over due to its poor stability.
- If the machine must be operated with the narrowed crawler width (980 mm, 38.6 in.), traveling should be done after folding the hoe attachment, lowering the boom to lower the center of gravity and keeping the machine facing forward.

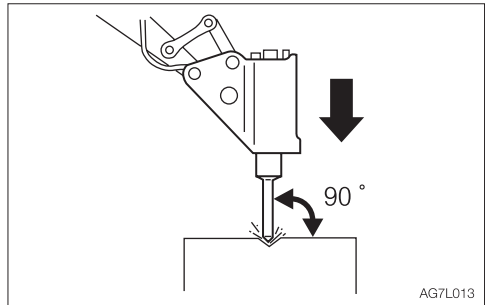
When an optional attachment, such as a breaker, tilted bucket or clamshell, is operated, be sure that the crawler width is extended to 1370 mm (53.9 in.).

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.

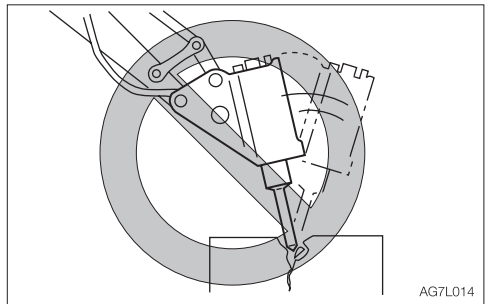
Cautions on operating



- Start the engine and run it at 75% of the maximum speed.



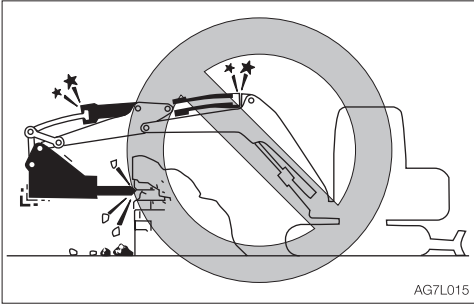
- Pound with the chisel pressed perpendicular to the surface to be pounded.
- When pounding, press the chisel properly against the object to be broken so as to avoid pounding the air.



- 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.

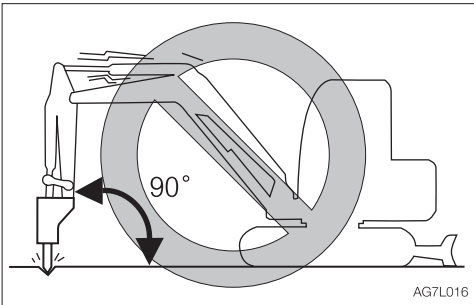


OPTIONS HYDRAULIC BREAKER



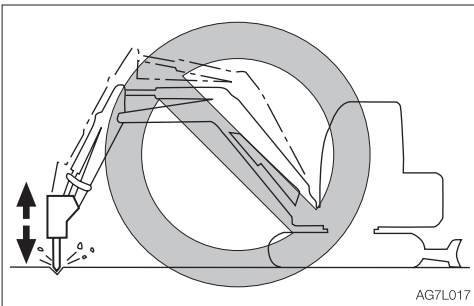
AG7L015

- Do not pound with the cylinder fully extended or retracted (at the stroke end). Leave a margin of at least 50mm(2 in).



AG7L016

- Do not pound with the arm placed perpendicular to the ground surface.



AG7L017

- 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

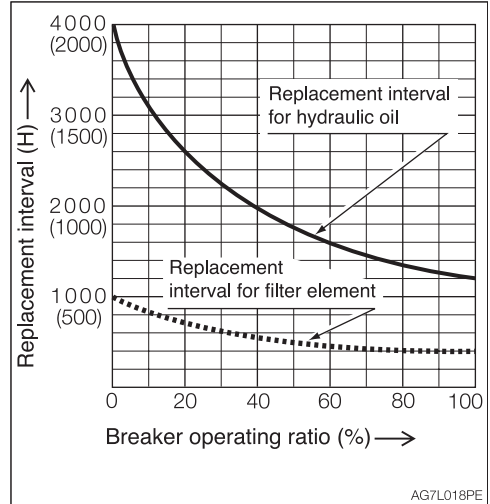
When a hydraulic breaker is used, the oil deteriorates more quickly than that used for a usual operation. Be sure to replace the hydraulic oil and the return filter elements.

- 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.

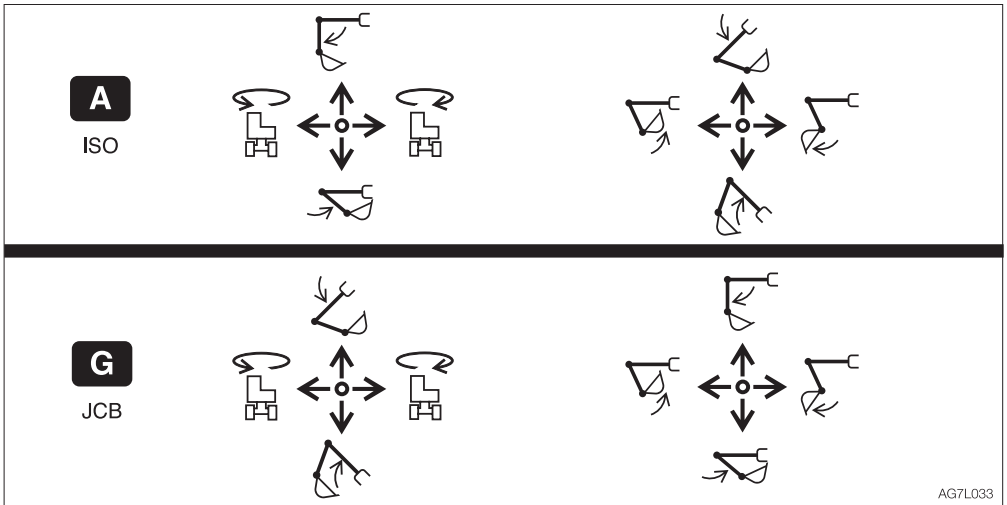


SELECTING A LEVER PATTERN

The operating pattern of the left and right operating levers can be selected.

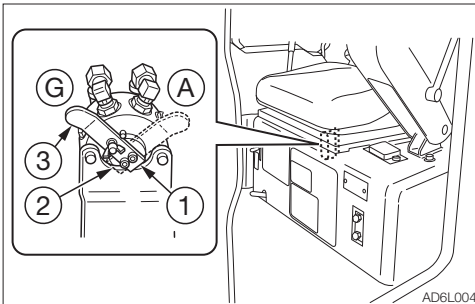
WARNING

Before starting the engine, check the selector to see which operating pattern the left and right operating levers are set.



AG7L033

SWITCHING THE LEVER PATTERN



AD6L004

(A): ISO pattern
(G): JCB pattern

1. Park the machine on a flat and rigid ground, and stop the engine.
2. Open the maintenance cover.
3. Loosen the wing bolt (2).
4. Turn the selector valve lever (3) to switch the pattern.
5. Tighten the wing bolt (2) and fasten the lever (3) in place.
6. Close the maintenance cover .
7. Confirm the lever pattern.



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 or arm from falling. The overload warning device sounds an alarm when an excessive load is detected.

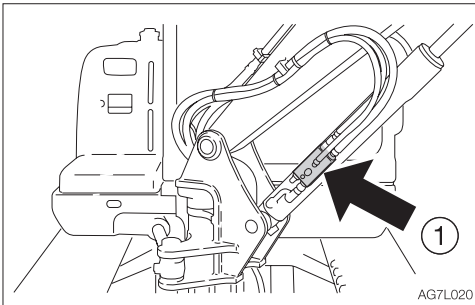
EMERGENCY SHUT-OFF VALVE

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

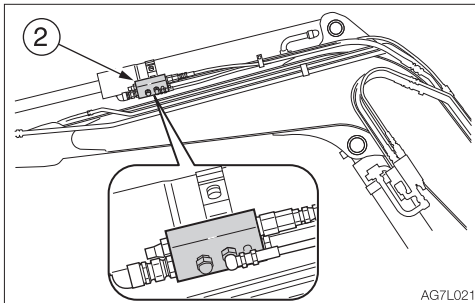
WARNING

If the boom or arm falls and the emergency shut-off valve is activated, immediately move away from the load being lifted.

Boom



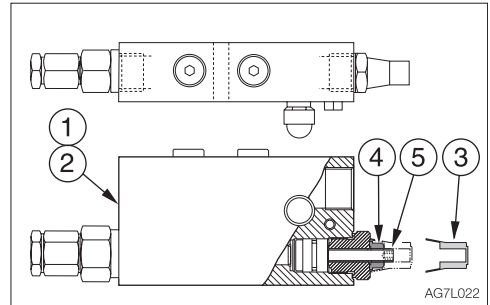
Arm



If the emergency shut-off valve (1) or (2) is activated, immediately set the operating levers to the neutral position. Do not move the operating lever to the boom or arm lowering side. Ask your sales or service dealer for repair.

If the engine can be started without problems, the boom or arm can be lowered with the operating lever. Slowly lower the boom or arm while ensuring safety.

If the engine fails to start, lower the boom or arm by performing the following steps.



1. Check that the load being lifted and the machine are secure and the work area is safe.
2. Remove the cap (3).
3. Loosen the lock nut (4).
4. Tighten the stem (5) slowly to lower the boom or arm.
5. Check that the load and the hoe attachment are secure.
6. Loosen the stem (5) and secure it with the lock nut (4).



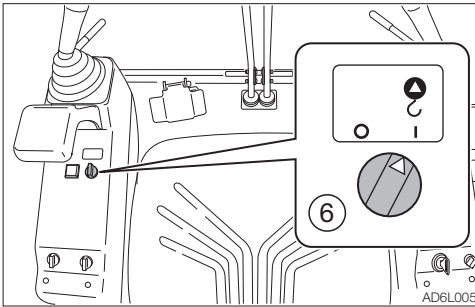
OVERLOAD WARNING DEVICE

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



WARNING

If the overload is not removed after the overload warning horn is sounded, the machine may tip over or the emergency shut-off valve may be activated. If the horn starts sounding, stop operating the machine and lighten the load.



Overload warning switch (6)

O.....OFF

I.....ON

If the emergency shut-off valve is activated, the overload warning horn stops.

(This is because the pressure sensor can no longer detect hydraulic pressure.)



TRAVEL ALARM

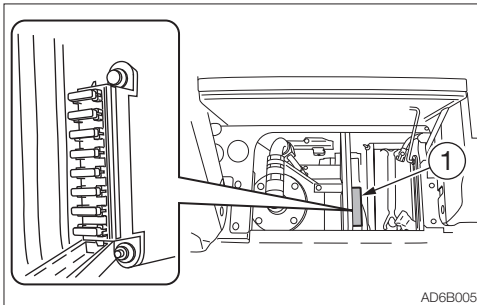
The alarm sounds while the machine is traveling and stops when the machine stops traveling.

If the alarm does not sound when the machine travels, the fuse may be blown. Inspect the fuses.

WARNING

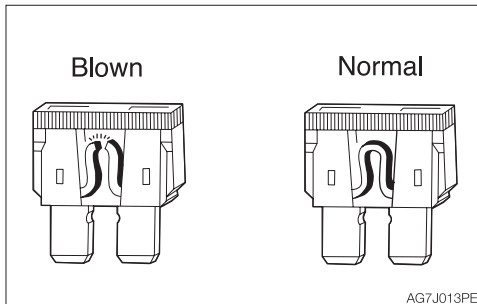
If the fuse blows again soon after replacement, then the electric system is likely faulty. It may pose a fire hazard if not properly repaired. Contact your sales or service dealer for advice.

1. Turn the starter key to the OFF position to stop the engine.
2. Open the maintenance cover.



AD6B005

3. Open the fuse box cover (1).
4. Check for fuse.



AG7J013PE

5. If a fuse is blown, replace it with a spare fuse of the same capacity.

Fuse layout and circuits protected

Capacity	Protected circuit
30A	Stop solenoid
5A	Lever lock
5A	Second travel speed
20A	Light, Tail lamp
15A	Heater, Radio
10A	Instrument cluster, Feed pump
25A	External power socket, Cigarette lighter, Wiper, Travel alarm
10A	Horn, Interior light



OPTIONAL EQUIPMENT MASS

Standard machine mass (rubber crawlers, not including operator)		Canopy	Cab
		1870 (4125)	1995 (4400)
OPTION			
Steel crawlers		60 (130)	
Rubber pads		120 (265)	
Emergency shut-off valve	Boom + Arm	10 (20)	

Units: kg (lb)

*: Mass of optional equipment is added to the standard machine mass.

*: This table only contains the optional equipment of 10kg (20lb) or more in mass.

First Published September 2008

No.31368

OPERATOR'S MANUAL

TB219 Mini 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.