TB014 TB016

OPERATOR'S MANUAL

TAKEUCHI

E

Compact Excavator

TB014
TB016

Serial No.
- TB014: 114100752~
- TB016: 116110802~

Book No. AC4E029

OPERATOR'S MANUAL

Original instructions

TAKEUCHI

⚠ WARNING

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

SAFETY ALERT SYMBOL

This symbol means Attention! Be Alert! Your Safety Is Involved.
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 following sections.**

- **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.**

⚠ CAUTION

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 provide this manual to the next owner.

- Takeuchi supplies machines complying to 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.

- Please note that the contents and diagrams included in this manual may not match your machine exactly.

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. An accident can often be avoided by recognizing potentially hazardous situations beforehand. Read and understand all of the safety messages which explain how to prevent these accidents from occurring. Do not operate the machine until you are sure that you have gained a proper understanding of its operation, inspection and maintenance.

■ 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	⚠ WARNING	⚠ CAUTION
The word "DANGER" indicates an imminently hazardous situation which, if not avoided, can result in serious injury or death.	**The word "WARNING" indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.**	**The word "CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

IMPORTANT: The word "IMPORTANT" is used to alert against operators and maintenance personnel about situations which can result in possible 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.

■ EXPLANATION OF GRAPHICAL SYMBOLS

Following is an explanation of symbols used in this manual.

⃠, X ..... prohibition

/ ..... Lock

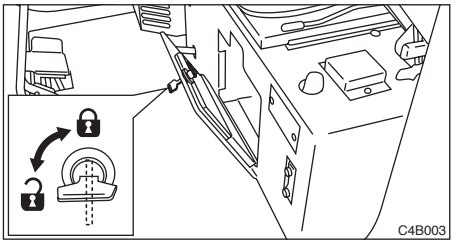
/ ..... Unlock

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.

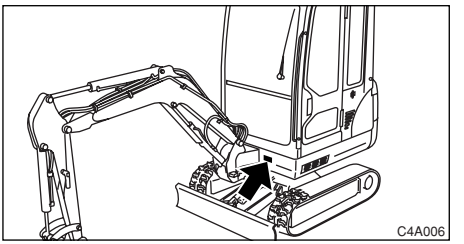


1. Insert the starter key and turn it counterclockwise to unlock the manual storage compartment.
2. After using the manual, place it in the plastic pouch and store it back in the manual storage compartment.

■ Serial numbers

Check the serial numbers of the machine and the engine and write them in the spaces provided below.

Machine number :



Engine number :

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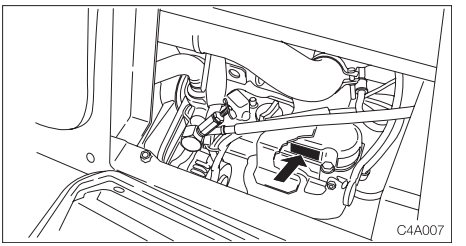

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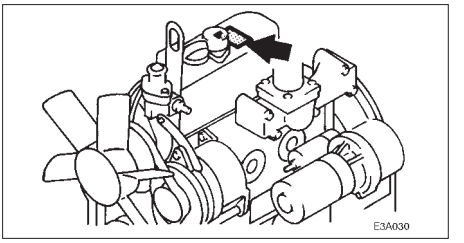
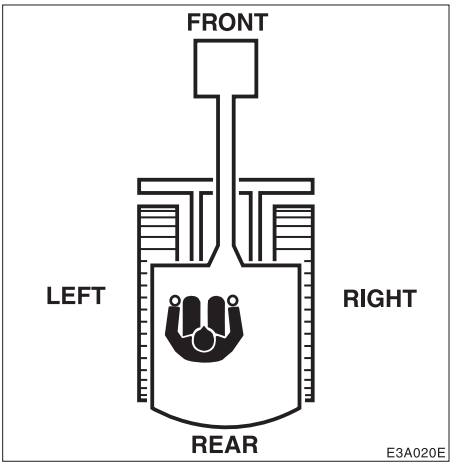


■ Front, rear, left and right

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:

- Excavating
- Digging ditches
- Digging side ditches
- Leveling
- Loading

■ Features

- Fast working speed and low-shock working equipment
- Excellent stability thanks to a low center of gravity
- The TB016 hydraulically adjustable crawler frame

■ Break-in period

When the machine is new, heed the instructions below when operating the machine for the first 100 hours (as indicated on the hour meter).
Using a new machine roughly without breaking it in will lead to quicker deterioration of machine performance and may shorten the machine's service life.

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

CONTENTS

SAFETY

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

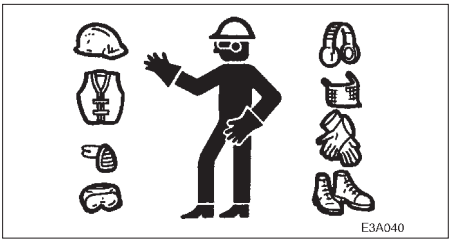
If any problem (noise, vibration, smell, disorder of instrument, smoke, oil leak or wrong indication of alarm and panel, etc.) is detected during the operation or inspection and maintenance of the machine, please inform the administrator and take proper actions. Do not operate the machine until the trouble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

Operating temperature range

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

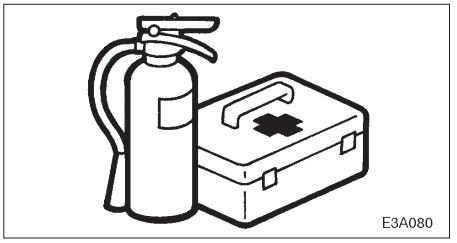
- Do not operate the machine if the ambient temperature is higher than +45°C (+113°F) or lower than -15°C (+5°F).
  - If operated at an ambient temperature of higher than +45°C (+113°F), the engine may overheat and cause the engine oil to degrade.
  - If operated at an ambient temperature of lower than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

Wear appropriate clothing and personal 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 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.

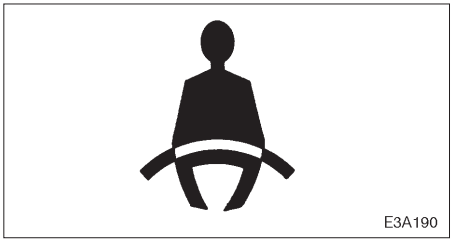
Provide a fire extinguisher and first aid kit



- Know where a fire extinguisher and first aid kit are located and understand how to use them.
- Know how to contact emergency assistance and first aid help.

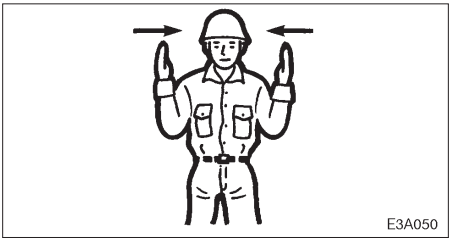
Never remove safety equipment

- Make sure all protective guards, canopies, doors, etc., are in place and secure. Repair or replace damaged components 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 service. Keep all safety equipment in good operating condition.

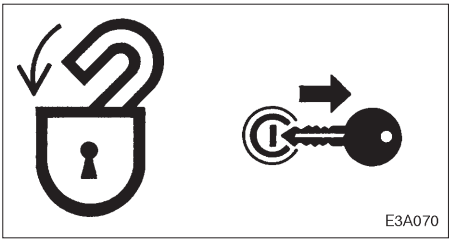
Use a signal person and flagman



Know and 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 shall respond to signals only from the appointed signal person, but shall obey a stop signal at any time from anyone.
- The signal person must stand in a clearly visible location when giving signals.

Be sure to lock the safety lock lever before leaving the operator's seat



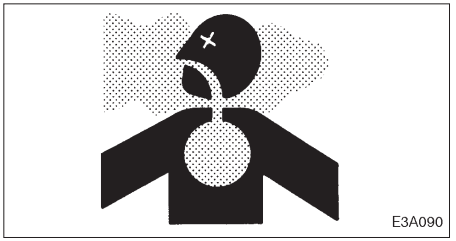
- Before leaving the operator's seat, set the safety lock lever securely to the lock position and stop the engine. If any controls should be touched accidentally when the safety lock lever has not be locked, the machine will move suddenly, and cause serious injury or death.
- Note that the dozer blade, boom swing and auxiliary hydraulics controls are not locked, even when the safety lock lever is set to the lock position. Do not touch these controls accidentally.
- Before leaving the operator's seat, lower the working equipment, lock the safety lock lever, and stop the engine. Also, be sure to remove the key and take it with you.

Avoid fire and explosion hazards

Keep flames away from fuel, hydraulic fluid, 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 fueling or near fueling operations.
- Never remove the fuel cap or refuel with the engine running or hot. Never allow fuel to spill on hot machine components.
- Clean up spilled fuel, oil or other flammable fluids immediately.
- Check for fuel, oil or hydraulic fluid leaks. Stop all leaks and clean the machine before operating.
- 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 according to procedures identified on manufacturers' containers. Work in a well-ventilated area.
- Never use fuel for cleaning purposes. Always use a nonflammable solvent.
- Store all flammable fluids and materials in a safe and well-ventilated place.

Exhaust fumes from the engine can kill



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

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 size of these gaps change when the machine moves and if caught a person can suffer severe injury or death.

Handling asbestos dust

Inhaling asbestos dust has been linked to lung cancer. When handling materials which may contain asbestos, take the following precautions:

- Never use compressed air for cleaning.
- Avoid brushing or grinding of the materials.
- For clean up, use wet methods or a vacuum equipped with a high efficiency particulate air (HEPA) filter.
- Wear an approved respirator if there is no other way to control the dust. When working indoors, install a ventilation system with a macro molecular filter.

Using optional products

- Consult with a Takeuchi before installing optional attachments.
- 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 of a non-approved attachment.

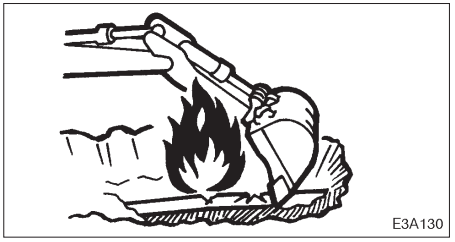
Never modify the machine

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

Know the working area

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

- Check the topography and ground condition of the working area, or the structure of the building when working indoors, and take the necessary safety measures in dangerous spots.
- Note and avoid all hazards and obstructions such as ditches, underground lines, trees, cliffs, overhead electrical wires or areas where there is danger of a slide.

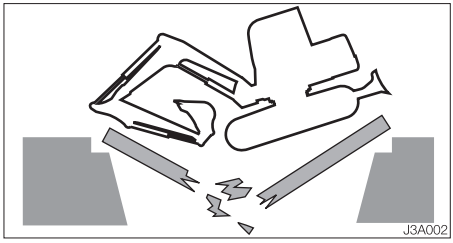


- Check with the local utilities for the locations of buried gas and water pipes and buried power cables. Determine jointly what specific precautions must be taken to insure safety.
- When working on roads, be sure to take into account the safety of pedestrians and vehicles.
  - Use a flagman and/or signals.
  - Fence off the working area and prohibit entry to 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 speed of the current beforehand. Make sure the water is not deeper than the allowable depth.

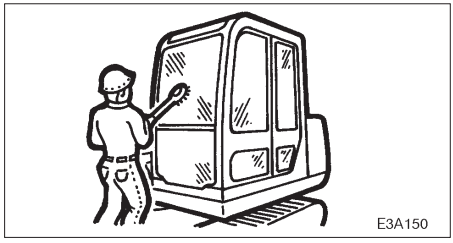
  Refer to the section titled “Cautions on Operating” for further instructions.

Check the strength of the bridge

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

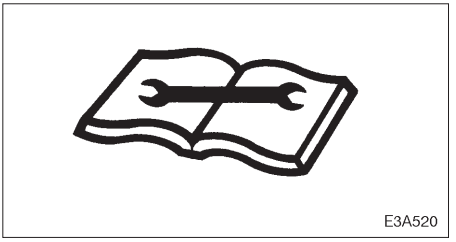


Always keep the machine clean



- Clean windows, mirrors and lights to ensure good visibility.
- Wipe off any oil, grease, mud, snow or ice, to prevent accidents due to slipping.
- Remove all loose objects stored in the machine and all objects which do not belong in or on the machine and its equipment.
- Remove any dirt, oil or grease from the engine area, to prevent fires.
- Clean the area around the operator’s seat, removing any potential obstacles.

Perform inspection and maintenance daily



Failure to notice or repair machine irregularities or damage can lead to accidents.

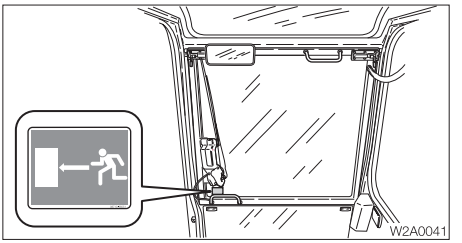
- Before operating, perform the prescribed inspections and make repairs immediately should any irregularities be found.
- If a failure that causes loss of control such as steering, service brakes or engine occurs, stop the machine motion as quickly as possible, follow the shutdown procedure, and keep machine securely parked until the malfunction is corrected.

Cautions in the operator's compartment

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

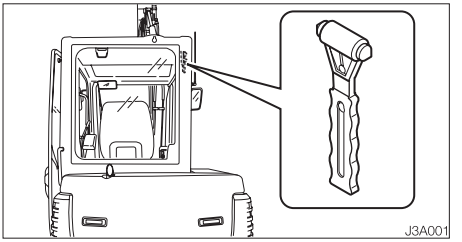
Emergency exit

Front window (excluding machines with a front guard)



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

Emergency hammer (optional)



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

Maintain three point contact when mounting and dismounting

- Do not jump on or off the machine. Never attempt to mount or dismount a moving machine.
- When mounting and dismounting the cab, first open the door fully to the locked position and check that it does not move. (For machines with cabs)

- Always face the access system and maintain a three point contact with the recommended handrails and steps while getting on and off the machine. Keep steps and platform clean.
- Never use the safety lock lever or control levers as hand holds.

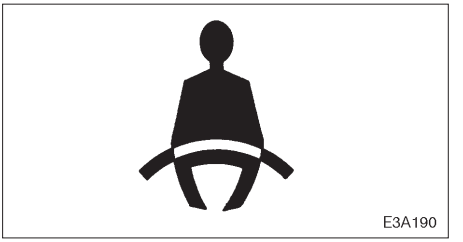
Clear the area of other persons before starting the machine

Do not start the engine until you are sure it is safe. Before starting, check or perform the following.

- Walk around the machine and warn all personnel who may be servicing the machine or are in the machine path. Do not start until all personnel are clearly away from the machine.
- Check for any “DO NOT OPERATE” tags or similar warning notices on the cab door, controls or starter switch.
- Sound horn to alert everyone around the machine.

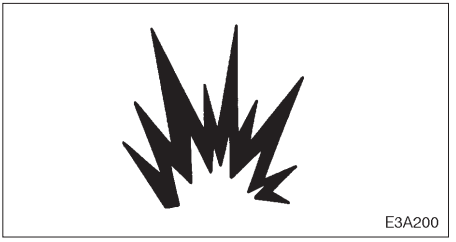
Start the engine from the operator’s seat

- Adjust, secure and latch the operator’s seat.



- Fasten the seat belt.
- Check that the parking device is applied and place all controls in the neutral position.
- Check that the safety lock lever is in the lock position.
- Clear the area of all persons.
- Start and operate the engine from the operator’s seat only.
- Never attempt to start the engine by shorting across the starter terminals.

Starting with jumper cables


E3A200

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

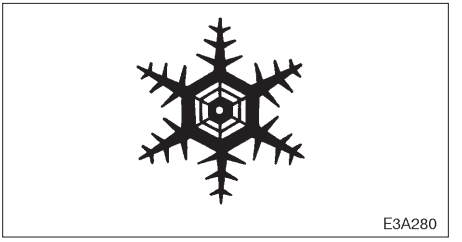
Refer to the section titled “If the Battery Goes Dead” for proper instructions.

After starting the engine

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

- Warm up the engine and hydraulic fluid.
- Observe all gauges or warning instruments for proper operation.
- Listen for unusual noises.
- Test engine speed control.
- Operate each control to insure proper operation.

In cold weather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- Be careful of slippery conditions on freezing ground, steps and hand holds.
- In severe cold weather, do not touch any metal parts of the machine with exposed flesh, as flesh can freeze to the metal and Cause injury.
- Do not use ether or starting fluids on this engine. These starting aids can cause explosion and serious injury or death.
- Warm up the engine and hydraulic fluid before operating.

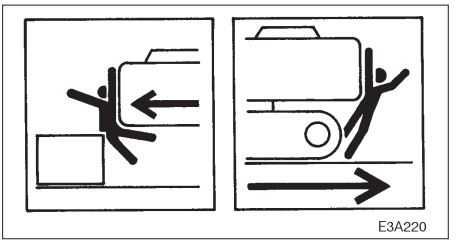
Ensure good visibility

- When working in dark places, turn on the machine's working lights and headlights and/or provide extra stationary lighting if necessary.
- When visibility is poor due to severe weather (fog, snow or rain), stop operating the machine and wait until conditions improves.

Do not permit riders on the machine

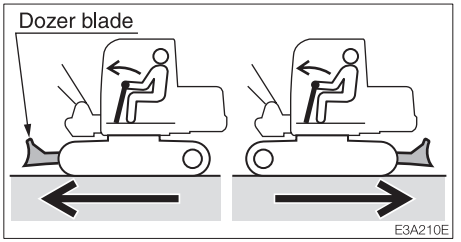
- Do not allow anyone to ride on any part of the machine at any time while traveling.
- Do not allow anyone to be on any part of the machine while operating.

Check for safety in the surrounding area before starting



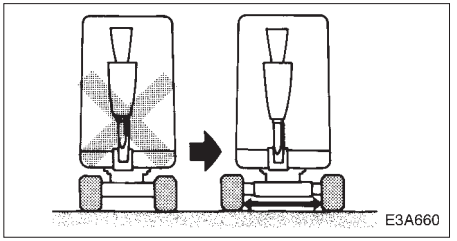
- Understand the machine limitations.
- Use a signal person where clearances are close or your vision is obstructed.
- Never allow anyone to enter the slew (swing) radius and machine path.
- Signal your intention to move by sounding the horn.
- There is a blind spot in the rear of the machine. Before traveling in reverse, check that the area is safe and clear.

Check the position of the undercarriage (tracks) before traveling



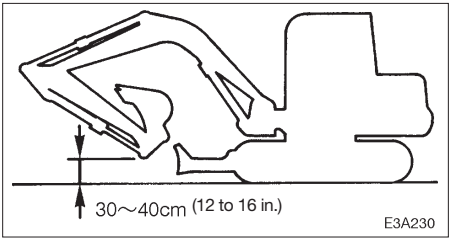
Before operating the travel levers, check to make sure that the dozer blade is to the front of the operator's seat. BE AWARE that when the dozer blade is to the rear of the operator's seat, the travel levers operate in the opposite direction to when the dozer blade is in the front.

Fully extend the crawler width when operating (TB016)

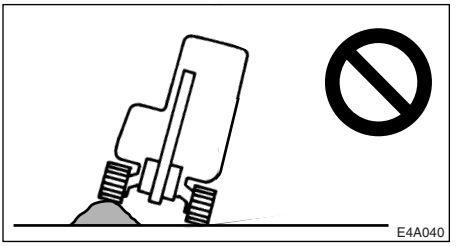


Always operate the machine with the crawler width at the maximum to increase machine stability. The smaller the crawler width, the greater the possibility the machine can tip over. If it is absolutely necessary to operate the machine with a narrow crawler width, do so with great care.

Travel safety



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

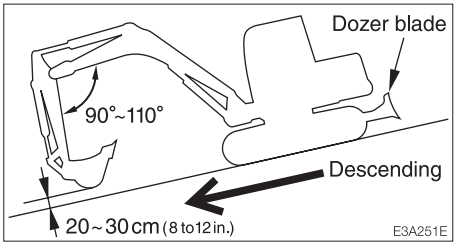


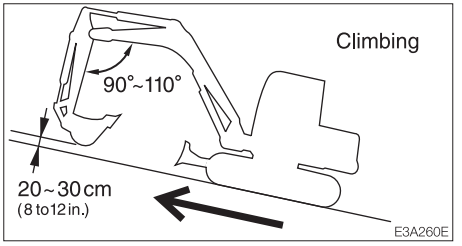
- Avoid crossing over obstacles whenever possible. If you must do so, keep the hoe attachment close to the ground and travel slowly. Never cross obstacles if they will seriously tilt the machine (to an angle of 10° or greater).
- On uneven ground, travel at low speed and avoid accelerating, stopping or changing directions abruptly.
- When roading a machine, know and use the signaling devices required on the machine. Provide an escort for road travel when required.

Cautions on traveling on slopes

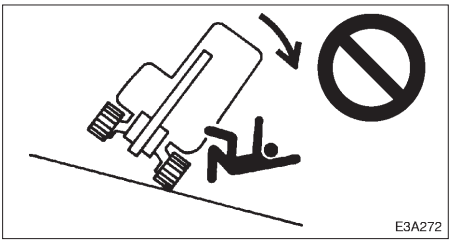
When traveling on slopes or grades, be careful that the machine does not tip (roll) over or slide.

- Never exceed the machine's stability capabilities (maximum gradeability - 25°, lateral tipping angle - 10°). Also note that when actual working area conditions are poor the machine's stability capabilities may be lower.





- When traveling on slopes or grades, lower the bucket to a height of 20 to 30 cm (8 to 12 in.) off the ground. In emergencies, lower the bucket to the ground and stop the machine.
- When traveling on slopes or grades, move slowly in first gear (low speed).
- Do not travel down slopes in reverse.
- On grass, dead leaves, wet metal or frozen surfaces, the machine may slide sideways even on very gentle slopes. Make sure the machine never faces sideways with respect to the slope.

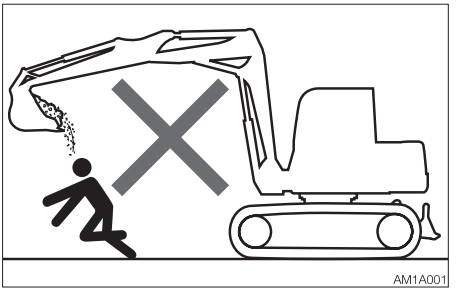


- Do not change directions or cross slopes sideways. First return to a flat surface then redirect the machine.

Operate on snow or ice with extra care

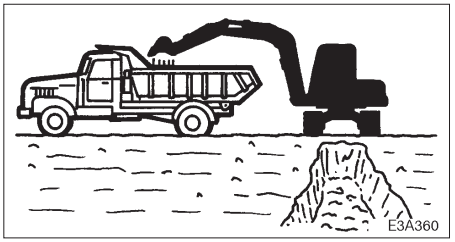
- When traveling on snow or frozen surfaces, keep the machine travel speed down and avoid accelerating, stopping or changing directions abruptly.
- Remember that the road shoulder, fences, etc., may be buried in the snow and not visible.
- Lower the dozer blade when parked on unsure ground conditions.

Do not move the bucket over the heads of people



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

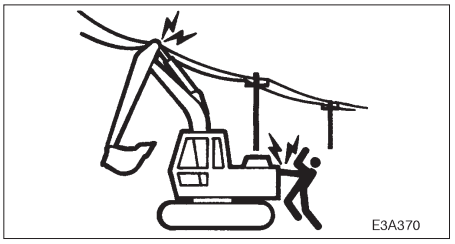
Insure driver safety before loading trucks



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

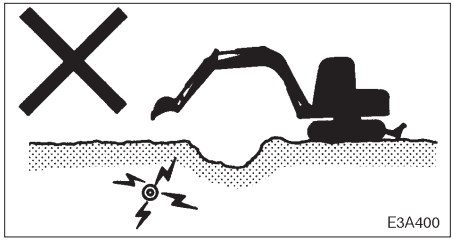
- Never swing or position the bucket over personnel or truck cabs.
- Load the truck from the rear.

Keep a safe distance from electrical power lines



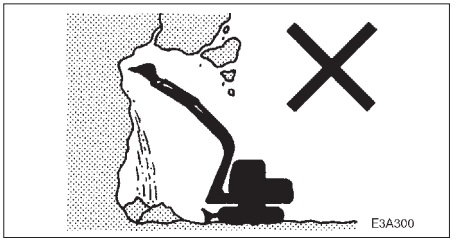
Never approach power lines with any part of the machine and its load unless all local and national required safety precautions have been taken. Electrocution and death can result from arcing, touching or even being close to a machine that is in contact with or near an electrical source.

- Maintain the maximum possible distance from power lines and never violate the minimum clearance.
- Always contact the nearest electric utility and determine jointly what specific precautions must be taken to insure safety.
- Consider all lines to be power lines and treat all power lines as energized even though it is known or believed that the power is shut off and the line is visibly grounded.
- Use a signal person to observe the approach of any part of the machine or load to the power line.
- Caution all ground personnel to stand clear of the machine and the load at all times.
- If the machine should come in contact with a live electrical source, do not leave the operator's seat. Do not allow anyone to approach or touch the machine.

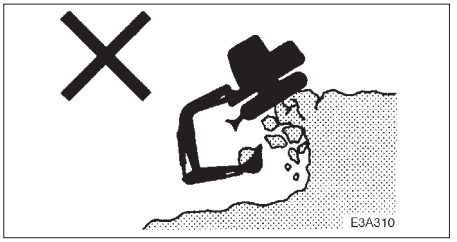


- Be especially careful of buried high voltage power lines.

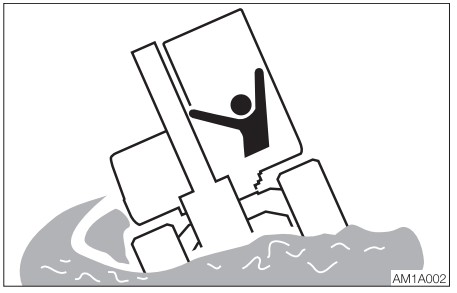
Watch out for hazardous working conditions



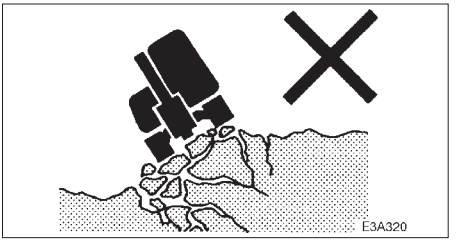
- Never undercut a high bank. Be particularly alert for the possibility of a cave-in.
- Do not operate in places where there is a danger of falling rocks.



- Keep machine well back from the edge of an excavation. Avoid undercutting the machine.



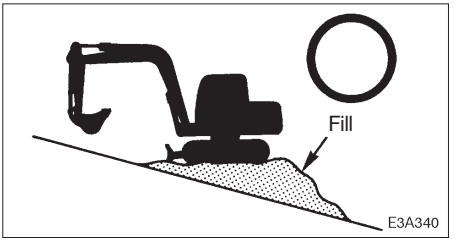
- Do not enter areas where there is soft ground. Doing so could cause the machine to tilt under its own weight, resulting in a machine tipping over or sinking into the ground.



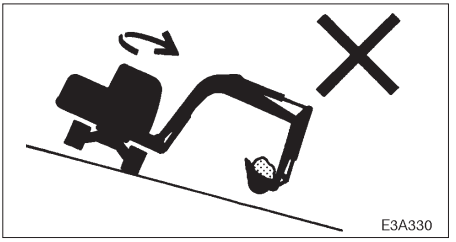
- Do not approach unstable surfaces (cliffs, road shoulders, deep trenches, etc.). The ground may give way under the machine's weight or vibrations, causing the machine to tip over.
  - The ground is weak after rain or explosions.
  - The ground is also unstable on banks and near dugout trenches.

Operating on slopes is dangerous

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

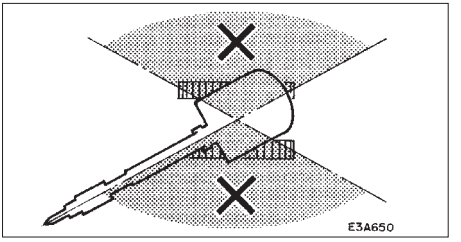


- Level off the work area.



- Avoid swinging the loaded bucket in a downhill direction. This will reduce the stability of the machine.

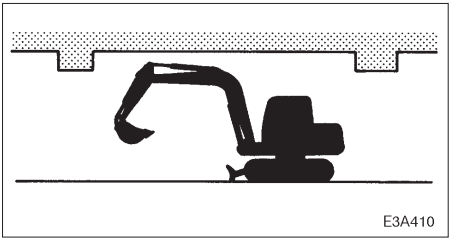
Never slew (swing) sideways with excessive weights



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

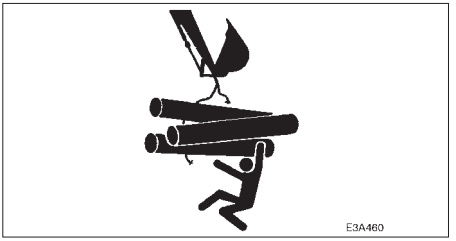
- Do not slew (swing) sideways with excessive weight at the front.
  In particular do not slew sideways on slopes.
- The front is heavier for machines equipped with breakers, crushers or telescopic arms than for machines equipped with the standard bucket. Do not operate such machines sideways especially with the digging arm (boom) downhill.

Watch boom clearance



When operating under bridges, in tunnels, near power lines or indoors, be careful not to hit the boom or arm against overhead objects.

Excavators are not designed for lifting loads



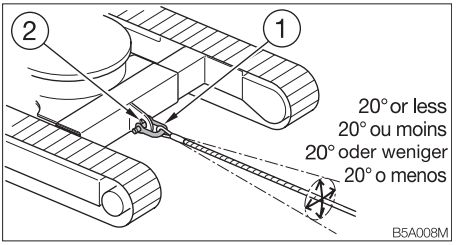
The machine is specifically designed for excavation work and has no safety devices for crane operation. Extreme caution should be used if the excavator is used for lifting.

- 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 based on the machine being level and on a firm supporting surface. For safe working loads, the user is expected to make due allowance for the particular job conditions such as soft or uneven ground, non-level condition, side loads, dynamic or jerked loads, hazardous conditions, experience of personnel, etc. 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.
- Failure of the bucket linkage or slings could result if chains or slings are incorrectly attached, resulting in serious injury or death.
- Do not attempt to pull stumps out of the ground while using the machine as a crane. The loads imposed on the machine under this use are completely unknown.
- Never allow any personnel to stand on or under lifted loads or even within the maneuvering area.

Danger of flying objects

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

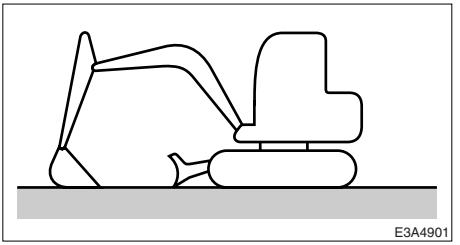
Cautions on Towing



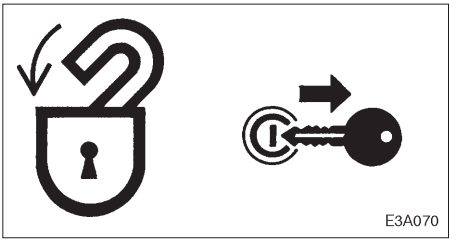
When towing, serious injury or death could result, if performed incorrectly or the wire rope being used is inappropriate or not properly inspected.

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

Park safely


E3A4901

- Park the machine on firm, level ground and apply the parking device.
- When parking on streets, use barriers, caution signs, lights, etc., so that the machine can easily be seen even at night to avoid collision with other vehicles.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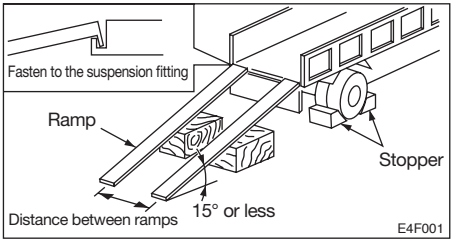
- Before leaving the machine, do the following:
  1. Lower the bucket and dozer blade to the ground.
  2. Place the safety lock lever in the lock position.
  3. Stop the engine and remove the key.
  4. Lock the cab and covers.

Load and unload the machine safely



The machine may roll or tip over or fall while loading or unloading it. Take the following precautions:

- Select a firm, level surface and keep sufficient distance from road shoulders.
- Secure the ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°. If the rumps are bowed down too low, support them with poles or blocks.
- Keep the truck bed and loading ramps clean of oil, clay, ice, snow, and other materials which can become slippery. Clean the tracks.
- Block the transport vehicle so it can not move.
- Use a signal person when loading and unloading the machine, and travel slowly in first gear (low speed).
- Never change course on the ramp.
- Do not slew (swing) on ramps. The machine may tip over.
- When slewing (swinging) on the truck bed, do so slowly as the footing can be unstable.
- Engage the slew (swing) lock after loading.
- Block both tracks and secure the machine to the truck bed with load binders.

Hoist the machine safely

- Know and use correct crane signals.
- Inspect the hoisting equipment daily for damaged or missing parts.
- Keep all other persons out of the area when hoisting. Do not move the machine over the heads of the persons.
- Do not hoist the machine with an operator(s) on it.
- When hoisting, use a wire rope with sufficient strength with respect to the machine's weight.
- Do not hoist with the machine in a posture other than the one described in the procedure below. Doing so is dangerous as it may result in the machine losing its balance.
  Refer to page 93 "Hoisting the machine".

Transport the machine safely

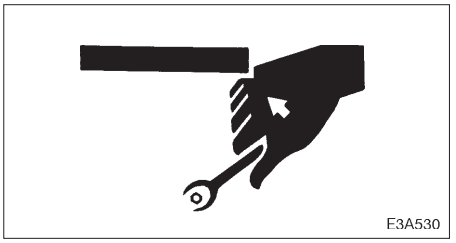
- Know and follow the safety rules, vehicle code and traffic laws when transporting the machine.
- Consider the length, width, height and weight of the truck with the machine loaded on it when determining the best route.

Attach a “DO NOT OPERATE” tag

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

- Stop the engine and remove the key before performing maintenance.
- Attach a “DO NOT OPERATE” tag to the starter switch or control lever.

Use the correct tools



Do not use damaged or weakened tools or tools designed for other purposes. Use tools suited for the operation at hand.

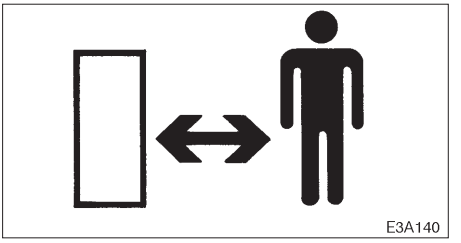
Replace important safety parts periodically

- Replace fuel hoses periodically. Fuel hoses become weaker over time, even if they appear to be in good shape.
- Replace important safety parts whenever an irregularity is found, even if it is before the normal time for replacement.
  Refer to the section titled “Important Parts” for further details.

Anti-explosive lighting

Use anti-explosive electrical fixtures and lights when inspecting fuel, oil, coolant, battery fluid, etc. If lighting that is not anti-explosive should break, the substance could ignite, resulting in serious injury or death.

Do not allow unauthorized personnel in the work area



Do not allow unauthorized personnel in the work area. Chips or other debris can fly off machine parts when grinding, welding or using a hammer.

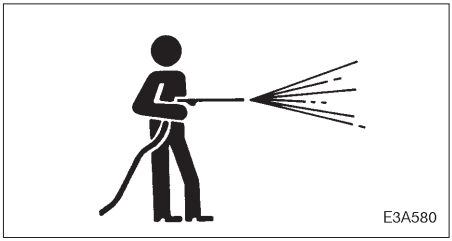
Prepare the work area

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

Stop the engine before performing maintenance

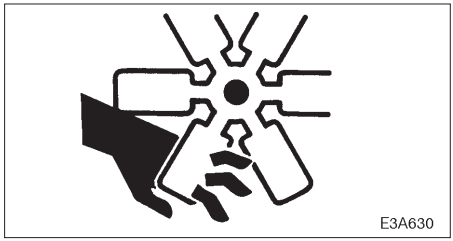
- Avoid lubrication or mechanical adjustments with the machine in motion or with the engine running while stationary.
- If maintenance must be performed with the engine running, always work as a two-person team with one person sitting in the operator's seat while the other works on the machine.
  - When performing maintenance, be sure to keep your body and clothing away from moving parts.

Always clean the machine



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

Stay clear of moving parts



- Stay clear of all rotating and moving parts. Wrapping or entanglement may result in serious injury or death.
- Keep hands, clothing and tools away from the rotating fan and running fan belts.

Securely block the machine or any component that may fall

- Before performing maintenance or repairs under the machine, set all working equipment against the ground or in the lowermost position.
- Securely block 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.

Securely block the working equipment

To prevent unexpected movement, securely block the working equipment when repairing or replacing the cutting edges or bucket teeth.

Secure the engine hood or cover when opened

Be sure to secure the engine hood or cover when opening it. Do not open the engine hood or cover on slopes or in strong wind.

Place heavy objects in a stable position

When removing or installing the hoe attachment, place it in a stable position so that it does not tip over.

Use caution when fueling

- Do not smoke or permit open flames while fueling or near fueling operations.
- Never remove the fuel cap or refuel with the engine running or hot. Never allow fuel to spill on hot machine components.
- Maintain control of the fuel filler nozzle when filling the tank.
- Do not fill the fuel tank to capacity. Allow room for expansion.
- Clean up spilled fuel immediately.
- Tighten the fuel tank cap securely. Should the fuel cap be lost, replace it only with the original manufacturer's approved cap. Use of a non-approved cap without proper venting may result in pressurization of the tank.
- Never use fuel for cleaning purposes.
- Use the correct fuel grade for the operating season.

Handling of hoses

Fuel, oil or hydraulic fluid leaks can cause a fire.

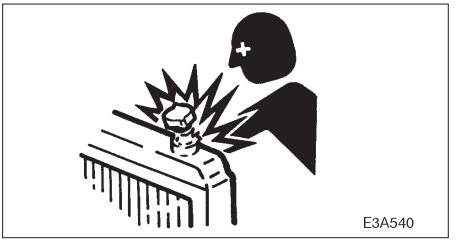
- Do not twist, bend or hit the hoses.
- Never use twisted, bent or cracked hoses, tubes and pipes. They may burst.
- Retighten loose connections.

Be careful with hot and pressurized components

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

- The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot directly after the engine is stopped. Touching these parts will cause burns.
- The engine coolant, oil and hydraulic fluid are also hot and under high pressure.
  Be careful when loosening caps and plugs. 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

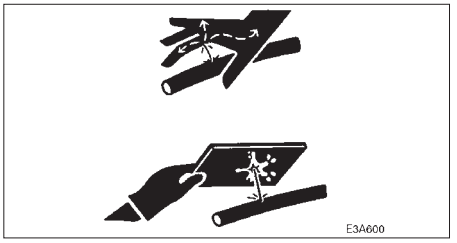


Do not remove the radiator cap or drain plugs when the coolant is hot. Stop the engine, let the engine and radiator cool and loosen the radiator cap or drain plugs slowly.

Be careful with fluids under pressure

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

- Release all pressure before working on the hydraulic system.



- Hydraulic fluid under pressure can penetrate the skin or eyes and cause injury, blindness or death. Fluid escaping from a small hole can be almost invisible. Wear a safety goggles and heavy gloves and use a piece of cardboard or wood to search for suspected leaks.
  If fluid is injected into the skin, it must be removed within a few hours by a doctor familiar with this type of injury.

Release all pressure before working on the hydraulic system

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

- Gradually loosen the vent plug to relieve tank pressure.
- Move all the control levers and pedals several times in all directions to release the pressure from the working equipment circuitry. (For link type controls)
- When removing plugs or screws or disconnecting hoses, stand to the side and loosen slowly to gradually release the internal pressure before removing.

Be careful with grease under pressure

The track adjuster contains highly pressurized grease. If the tension is adjusted without following the prescribed procedure, the grease discharge valve may fly off, resulting in injury.

- Do not loosen the grease nipple.
- Loosen the grease discharge valve slowly.
- Do not put your face, arms, legs or body in front of the grease discharge valve.
- If no grease is expelled when grease discharge valve is loosened, there is a problem. Contact your nearest service outlet for repairs. DO NOT disassemble, as this is very dangerous.

Disconnect the battery

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

Avoid battery hazards

- Batteries contain sulfuric acid which will damage eyes or skin on contact.
  - If acid contacts eyes, flush immediately with clean water and get prompt medical attention.
  - If acid is accidentally swallowed, drink large quantities of water or milk and call a physician immediately.
  - If acid contacts skin or clothing, wash off immediately with clean water.
- Wear safety glasses and gloves when working with batteries.
- Batteries generate flammable and explosive gases. Keep arcs, sparks, flames and lighted tobacco away.
- Use a flashlight to check battery electrolyte level.
- Stop the engine and shut off electrical equipment while inspecting or handling the battery.
- Do not short circuit the battery posts with metal items.
- Always unfasten the negative (–) battery cable first when disconnecting the battery cable. Always connect the negative (–) battery cable last when fastening the battery cable.
- Loose battery terminals may result in sparks. Be sure to fasten terminals tightly.
- Make sure the vent caps are tightened securely.
- Do not charge a battery or jump-start the engine if the battery is frozen. Warm to 15°C (60°F) or the battery may explode.
- Do not use the battery when the fluid level is below the lower level. Doing so will hasten the deterioration of the internal portions of the battery and shorten the battery life, and can also cause rupturing (or an explosion).
- Do not fill the battery above the upper level. Doing so could cause the fluid to leak, contact and damage the skin, or cause parts to corrode.

Have a Takeuchi service agent repair welding

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

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

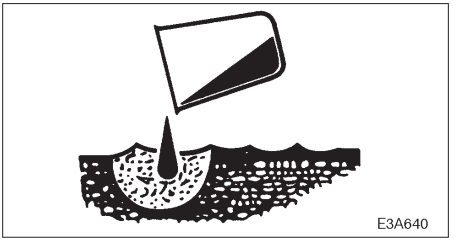
Vibrations operators are subject to

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

Checks after maintenance

- Gradually raise the engine speed from a low idle to maximum speed and check that no oil or water is leaking from serviced parts.
- Move the controls and check that the machine is operating properly.

Disposing of wastes



- Funnel spent fluids from the machine into containers. Disposing of fluids improperly destroys the environment.
- Follow the prescribed regulations when disposing of oil, fuel, engine coolant, refrigerant, solvents, filters, batteries or other harmful substances.

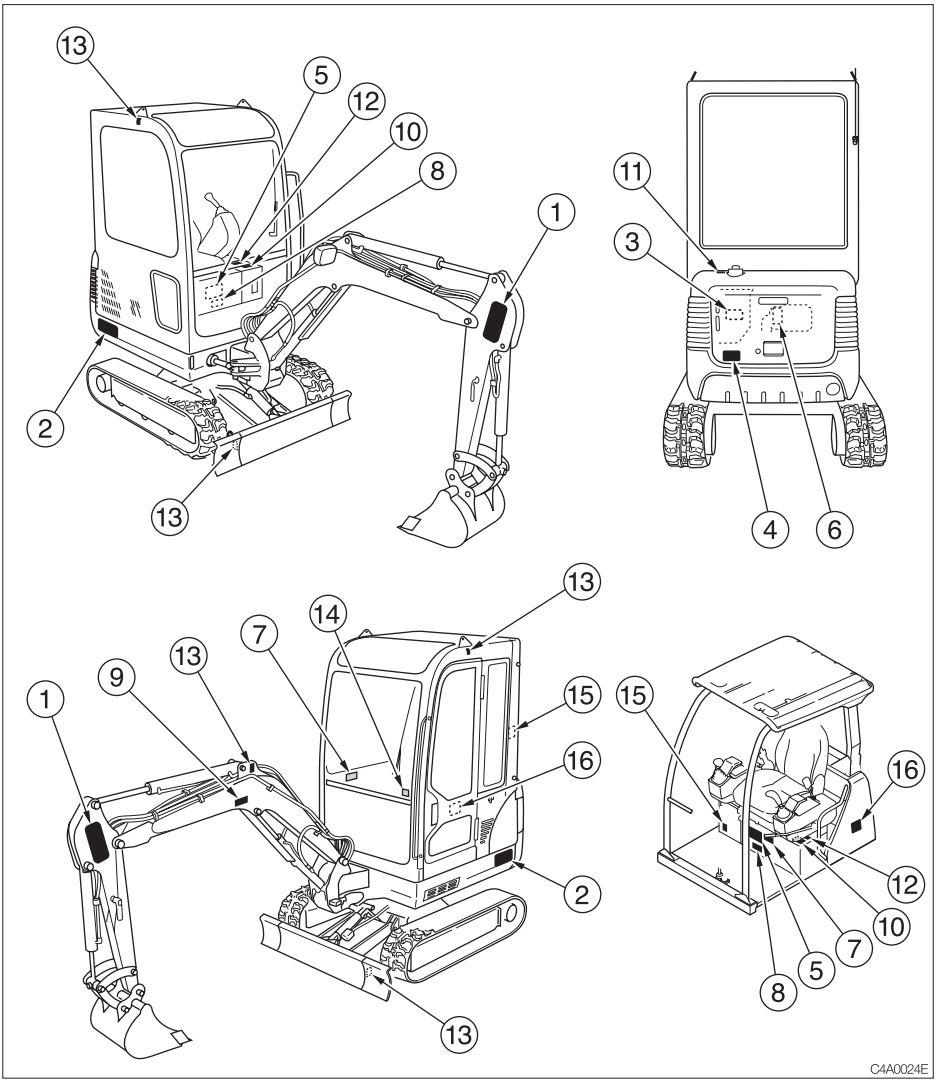
Handling of poisonous chemicals

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

Safety Signs (Decals)

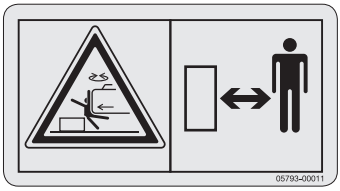
The following safety signs (decals) have been placed on your machine in the areas indicated. They are intended for the personal safety of you, and those working with you. Please take this manual, walk around your machine and note the content and location of these safety signs. Review these signs and the operating instructions in this manual with your machine operators.

- Keep the signs legible. If they are not, obtain replacements from your Service outlet.



1. No.0579300049
Safety Distance
Hazard of being hit by the working device of the machine
Keep away from machine during operation.

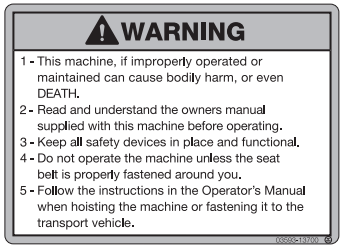
2. No.0579300011
Safety Distance
Do not get near or stand within the machine working area.



3. No.0579303630
Sign indicates a burn hazard from touching heated parts, such as engine, pump, or muffler during or right after operation.
Never touch when hot.

4. No.0379366006
Hazard of rotating parts
Turn off before inspection and maintenance.

5. No.0359313700

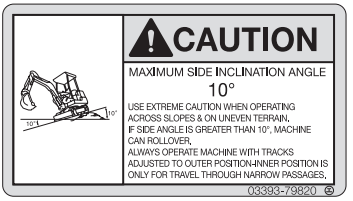


6. No.0339375040

7. No.0359347020

C4A0031E

8. No.0339379820



9. No.0359347010

10. No.0339375050

11. No.0359306600

Diesel fuel

12. No.0359306700

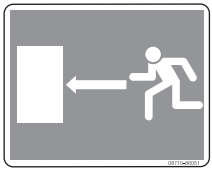
Hydraulic oil

13. No.0399300500

Position of hoisting

14. No.0871086051

Position of Emergency Exit



15. No.0399300400

For EU

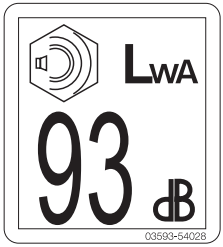
Position of Fire extinguisher

16. No.0359354028

for EU

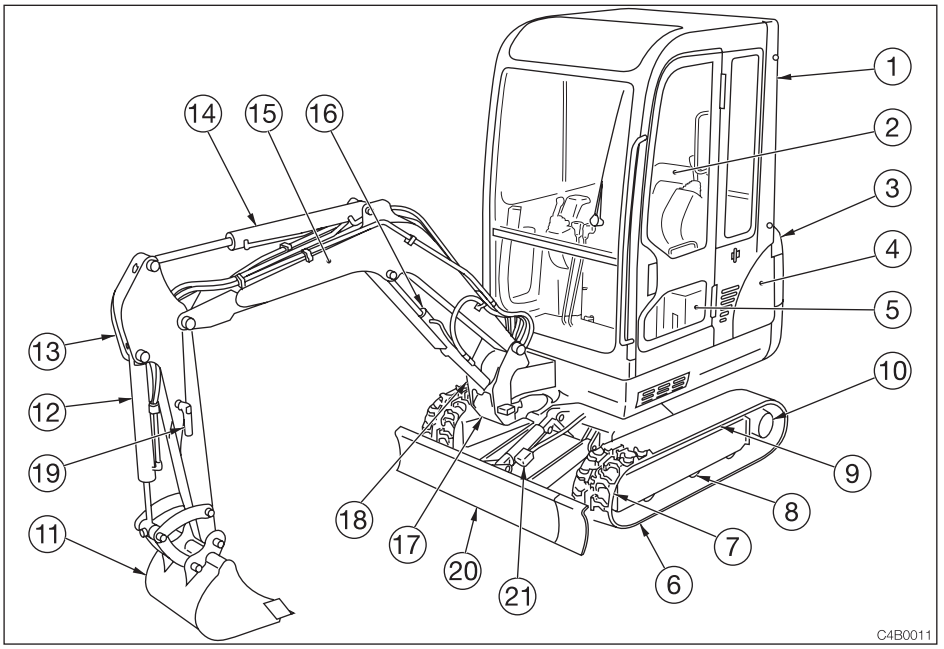
Noise Outside the Cab

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.



C4A0041E

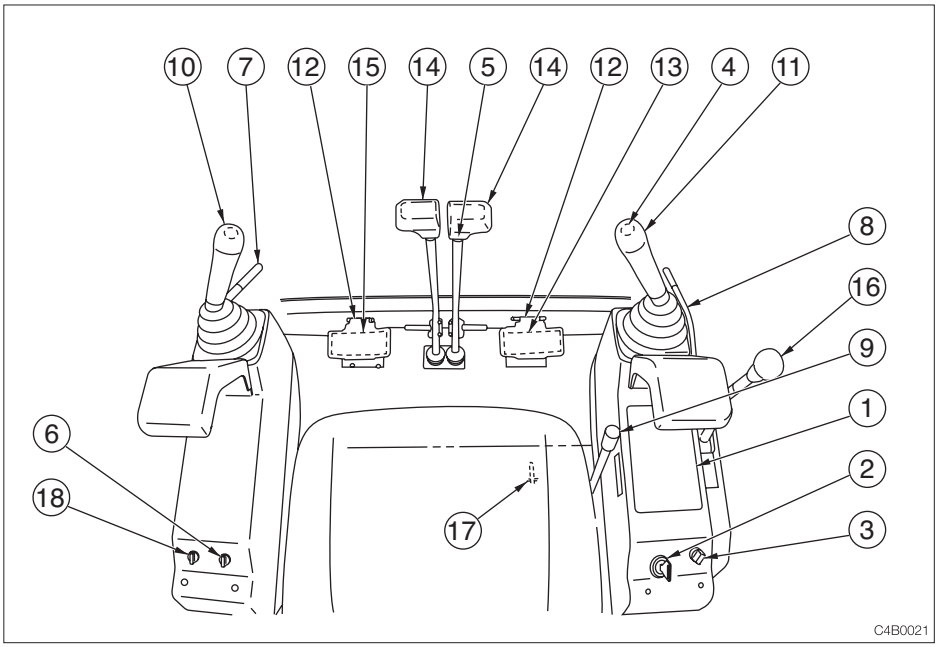
CONTROLS



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

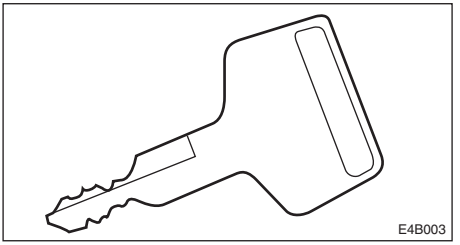
Undercarriage
6. Crawler belt
7. Idler
8. Track roller
9. Shoe slide
10. Travel motor

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



1. Instrument panel
2. Starter switch
3. Light switch
4. Horn switch
5. Travel speed switch
6. Wiper switch (Cab)
7. Safety lock lever
8. Safety lock lever (Canopy)
9. Throttle lever
10. Left operating lever
11. Right operating lever
12. Pedal lock
13. Boom swing pedal
14. Travel lever
15. Auxiliary pedal
16. Blade lever
17. Selector lever
18. Heater fan switch (Cab)

Starter Key



The starter key is used not only to start and stop the engine, but also to lock and unlock the cab door, engine hood, fuel cap, manual storage compartment, storage box and tool box.

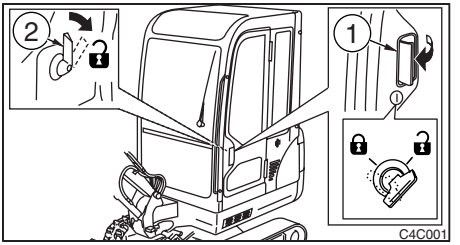
Cab Door (Cab)

⚠ WARNING

When mounting and dismounting the cab, first open the door fully to the locked position and check that it does not move.

Open the door fully and press it against the catch at the back of the door to lock it in place. Always lock the door when mounting and dismounting and when operating the machine.

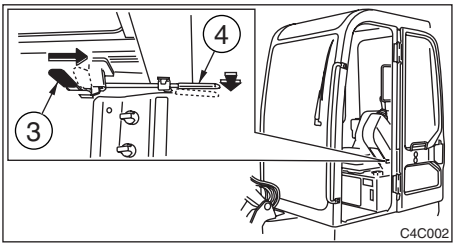
Opening



1. Insert the starter key and turn it clockwise to unlock the door.
2. Pull the knob (1) towards you and open the door.

   To open the door from inside the cab, push the lever (2) to the front.
3. Open the door fully and press it against the cab to lock it in place.

Closing



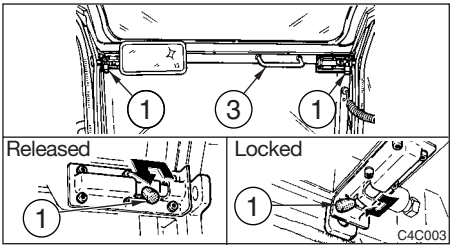
1. Either push release lever (3) to the front or lower release lever (4).
2. Close the released door.

Front Window (Cab)

⚠ WARNING

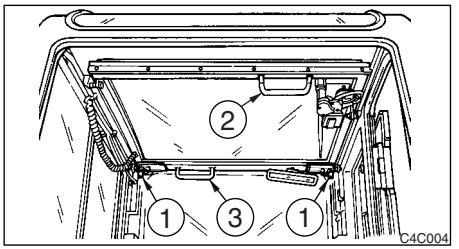
- **Grasp the handles firmly with both hands when opening and closing the front window. Your head or hands may get caught if they slip.**
- **If you open the front window, be sure to lock it in place with the lock pins on the left and right sides. The window may fall if it is not locked in place.**

Opening



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

2. Set the safety lock lever to the locked position.
3. Pull the left and right lock pins (1) to the inside then turn them to the locked position to unlock the front window. If the lock pins (1) are partially sticking out they may cause damage.



4. Grasp the lower handle (2) with the left hand, the upper handle (3) with the right hand, then lift and slide to the rear.
5. Once the window frame is against the stopper, move the lock pins (1) to the outside to lock front window.

Closing

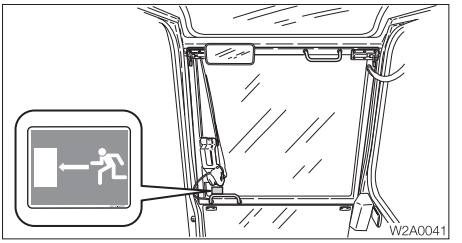
⚠ WARNING

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

1. Pull the left and right lock pins (1) to the inside and turn them to the locked position to unlock the front window. If the lock pins (1) are partially sticking out they may cause damage.
2. Grasp the front (lower) handle (2) with the left hand, the rear (upper) handle (3) with the right hand, then slowly lower the front window.
3. Move the lock pins (1) to the outside to lock the front window.

Emergency exit

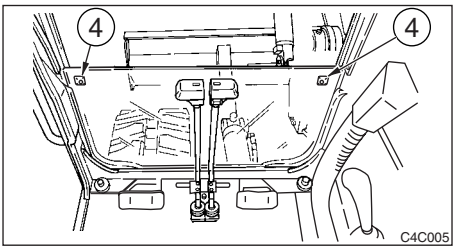
Front window (excluding machines with a front guard)



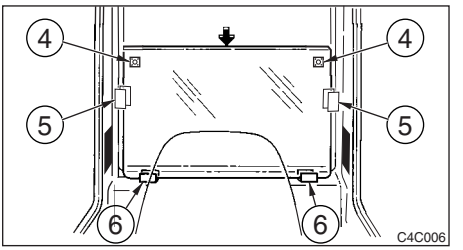
If you should become trapped inside the cab, open the front window to get out.

Lower Front Window (Cab)

Removing

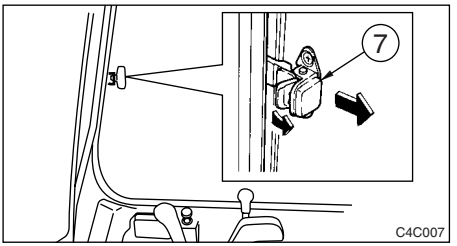


1. Open the front window and stow it in the ceiling.
2. Grasp the protruding parts (4) on the left and right with your fingers and slowly lift the lower front window off.



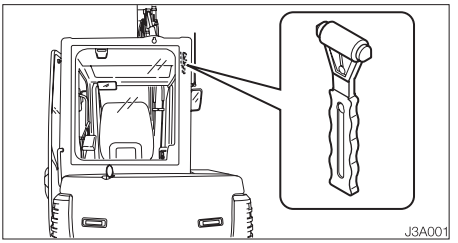
3. Hold the glass firmly, place the lower front window through the guides (5) at the rear, then set it on the supports (6) and fasten it in place.

Side Window (Cab)



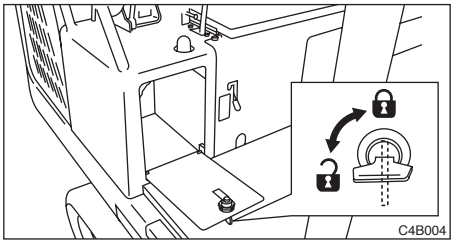
1. Grasp the catch (7), unlock it and open the side window.
2. To close the side window, close it until a click is heard.

Emergency hammer (optional)



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

Storage Box



For models equipped with heaters, the heater is mounted here, so this cannot be used as a storage box.

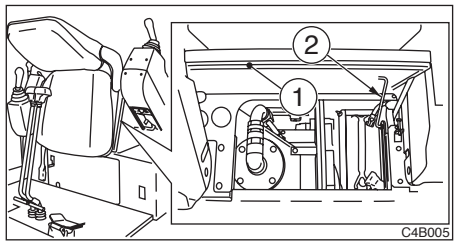
1. Insert the starter key and turn it counterclockwise to unlock the storage box.

Maintenance Cover

⚠ WARNING

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

Open this cover for inspection and maintenance of the hydraulic system, fuse system and battery.



Opening

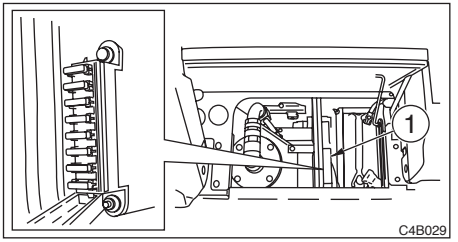
1. Tilt the seat forward and open the maintenance cover (1) forward until it locks.
2. Check that the maintenance cover is securely locked in place with the stay (2).

Closing

1. Holding the seat, lift the stay (2) to unlock the maintenance cover.
2. Set the seat back in place and close the cover.

Fuse Box

The fuses protect the electrical system from excess currents.



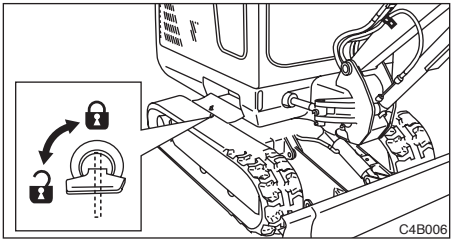
Opening

1. Press the catch at the front of the fuse box cover (1) and lift to the rear.

Closing

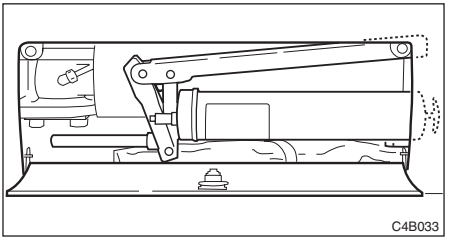
1. Fasten the rear of the cover (1) to the catch at the rear of the fuse box to close it.

Tool Box



1. Insert the starter key and turn it counterclockwise to unlock the tool box.
2. After using tools, store them back in the tool box.

Grease gun holder

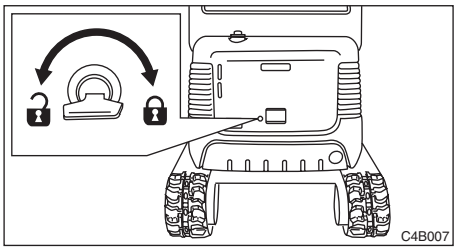


Engine Hood

⚠ WARNING

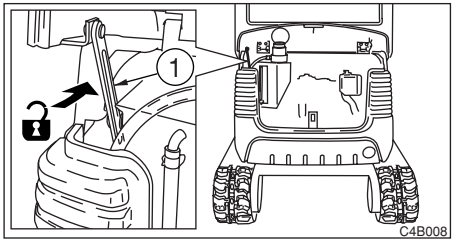
- **Before opening the engine hood, be sure to stop the engine. If your hands or tools should get caught in the fan or fan belt while the engine is running they may be severed.**
- **When leaving the engine hood open, be sure to lock it in place. Do not leave the engine hood open when there is a strong wind or when on slopes.**

Opening



1. Insert the starter key and turn it counterclockwise to unlock the engine hood.
2. Lift the engine hood fully until it stops. (It locks automatically.)
3. Check that the engine hood is securely locked in place.

Closing

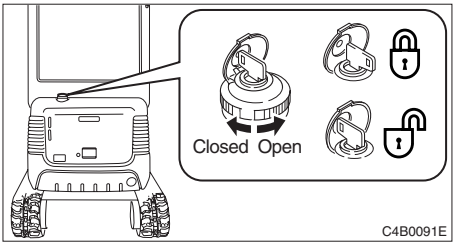


1. Support the engine hood with your hands, then press the stay (1) to the front to unlock it.
2. Close the engine hood and press it down until a click is heard at the front.
3. Insert the starter key and turn it clockwise to lock the engine hood.

Fuel Filler Cap

⚠ WARNING

- **Do not smoke or permit open flames while fueling or near fueling operations.**
- **Supply fuel in a well ventilated place and with the engine stopped.**
- **Clean up spilled fuel immediately.**
- **Do not fill the fuel tank to capacity. Allow room for expansion.**
- **Tighten the fuel filler cap securely.**



Opening

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

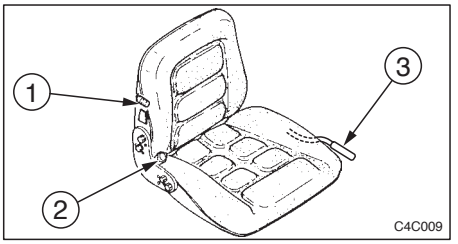
Closing

1. Set the fuel cap in place and turn it clockwise.
2. Turn the key clockwise to lock the fuel cap, then remove the key.

Seat

⚠ WARNING

Adjust, secure and latch the operator's seat.



Weight adjustment

- By pulling lever (1) upwards or downwards, the seat can be adjusted according to driver's weight.
  Up..... Light driver
  Middle .....Medium weight driver
  Down.....Heavy driver

Back angle adjustment

- Can be effected by turning handle (2).
  Adjustment scope ..... 15 deg.

Fore-and-aft adjustment

- After releasing adjustment rails by using lever (3) the seat can be adjusted by 150mm (5.9 in.) in increments of 15mm (0.6 in.).

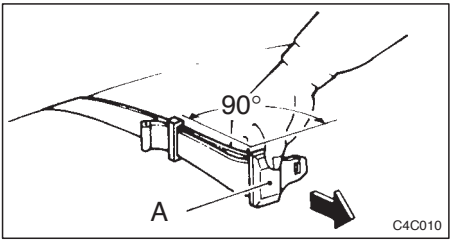
Seat Belt

⚠ CAUTION

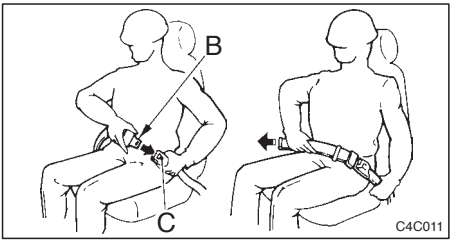
Always fasten the seat belt securely before starting the engine.

Fastening the seat belt

1. Adjust the seat to the optimum position for operating, raise your torso, and sit back firmly into the seat.

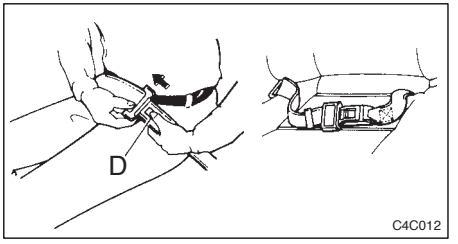


2. Pull on adjuster (A) in the manner shown in the diagram to adjust the seat belt to the desired length.

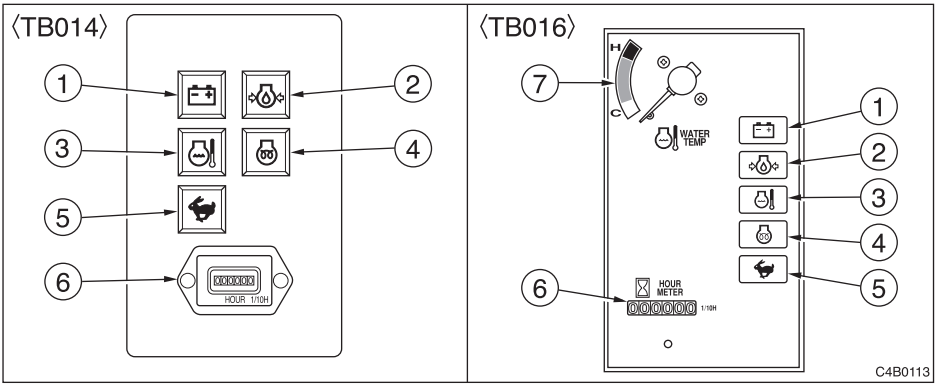


3. Make sure that the belt is not twisted and then insert the tongue plate (B) into the buckle (C) of the seat belt until you hear a clicking sound as it locks in place.
4. Pull the belt until you can feel the pressure on your pelvis with the belt firmly in place.

Releasing the seat belt



1. To remove the seat belt, simply press the button (D) located on the buckle. Once the belt has been removed, reinsert the tongue plate into the buckle so that seat belt remains in full view.

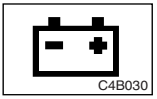


Warning Lamps

IMPORTANT: If a warning lamp flashes and an alarm is sounded, stop all operations immediately and inspect and maintain the appropriate part. For the TB014, the warning lamp lights but no alarm is sounded.

Refer to page 143 “Troubleshooting”.

1. Battery Charge Warning Lamp



This lamp flashes or lights and for the TB016 an alarm is sounded if a problem arises in the charging system while the engine is running.

2. Engine Oil Pressure Warning Lamp

This lamp flashes or lights and for the TB016 an alarm is sounded if the lubricant oil pressure drops abnormally while the engine is running.

3. Coolant Temperature Warning Lamp

This lamp flashes or lights and for the TB016 an alarm is sounded if the engine coolant temperature rises abnormally while the engine is running.

Indicators

4. Glow Lamp

< TB014 >
This lamp lights while the key is at the PREHEAT position.

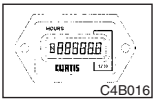
< TB016 >
This lamp turns off when engine preheating is completed (5 seconds).

5. Travel Speed Lamp

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

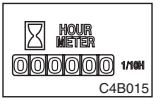
Meters

6. Hour Meter (TB014)



This 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.

6. Hour Meter (TB016)

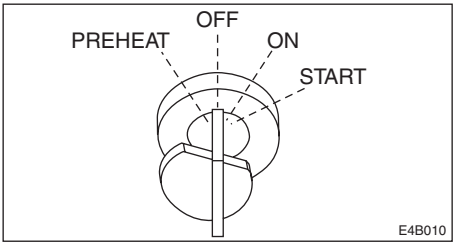


This displays the total engine running time in hours.
The rightmost digit indicates tenths of hours (6 minutes).
Set the inspection and maintenance intervals according to the time displayed on the hour meter.

7. Water Temperature Gauge (TB016)

This indicates the temperature of the engine coolant.
The needle should be within the green range during machine operation.
The red range indicates overheating.

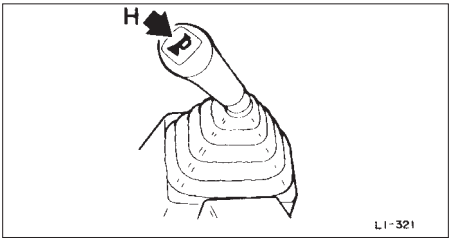
Starter Switch



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

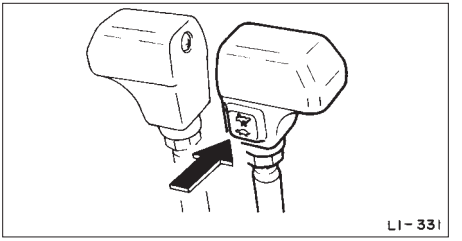
PREHEAT..... Position for preheating the engine.
OFF ..... Position for stopping the engine and inserting or removing the key.
ON..... Position in which the engine is running. At this position, all the electrical equipment is functional.
START ..... Position for starting the engine. When the key is released,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

Horn Switch



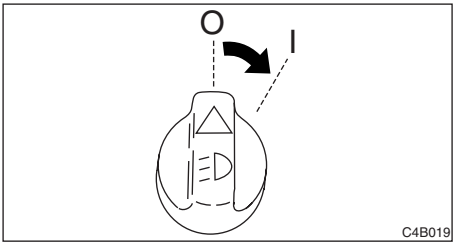
Press the switch on the right operating lever to blow the horn.

Travel Speed Switch



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

Light Switch

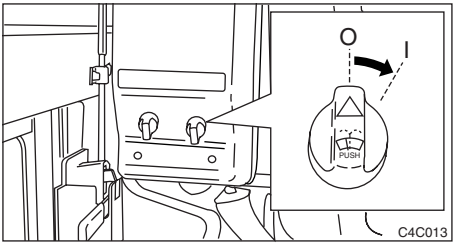


When this switch is turned while the starter switch is at ON, the lights turn on as follows:

O.....Off
I.....Meter light, tail lamp and boom light turn on.

Wiper Switch (Cab)

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. Apply water or washer fluid when operating the wiper.
IMPORTANT: In cold seasons, the wiper blade may freeze to the glass. Operating the wiper forcibly may damage the wiper motor.

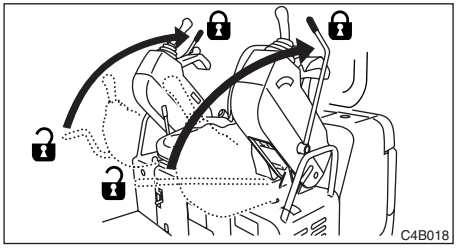


O.....Off
I.....Wiper operates.
PUSH.....Washer fluid is squirted from the nozzle while pressed, and stops when released.

Safety Lock Lever

⚠ WARNING

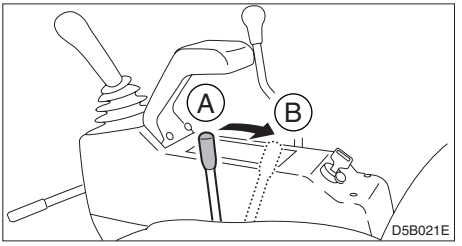
- **Before leaving the operator's seat, set the safety lock lever securely to the lock position and stop the engine. If any controls should be touched accidentally when the safety lock lever is lowered, the machine will move suddenly, and cause serious injury or death.**
- **Note that the dozer blade, boom swing and auxiliary hydraulics controls are not locked, even when the safety lock lever is set to the lock position. Do not touch these controls accidentally.**
- **Be careful not to touch the operating levers when raising and lowering the safety lock lever.**



This device is for locking the hoe attachment, slewing and traveling.
When the lever is lifted, the lever stand springs up and the lever is 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

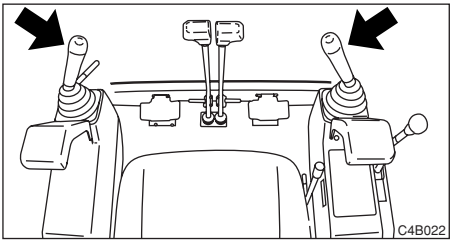


This controls the engine speed.
(A) ..... Low idling
(B) ..... Maximum speed

Operating Levers

⚠ WARNING

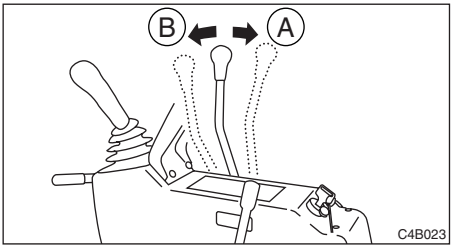
- **Be careful to check which pattern of lever control arrangement you are operating with before beginning operations.**
- **The explanations in this manual are for the ISO pattern.**



Use these levers to operate the boom, arm, bucket and upper structure (slew).

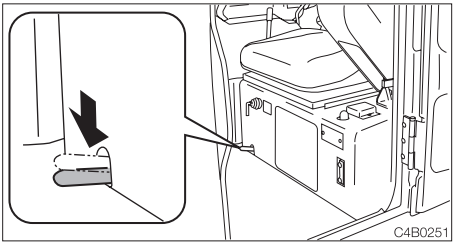
Refer to page 66 “Lever Pattern”.
Refer to page 74 “Operating the Working Equipment”.

Blade Lever



Use this lever to operate the dozer blade and for TB016 switch the crawler width.
(A) ..... Blade up/narrow crawler width
(B) ..... Blade down/wide crawler width
To change the crawler width, press the selector lever in before operating it.

Selector Lever (TB016)

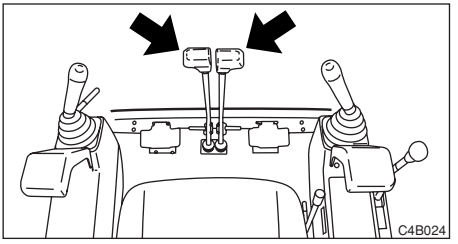


Use this lever when changing the crawler width. This lever switches the operation of the blade and span cylinders.
1. To change the crawler width, press this lever in, then move the blade lever and change the crawler width.

Travel Levers

⚠ WARNING

Before operating the travel levers, check to make sure that the dozer blade is to the front of the operator's seat. BE AWARE that when the dozer blade is to the rear of the operator's seat, the travel levers operate in the opposite direction to when the dozer blade is in the front.



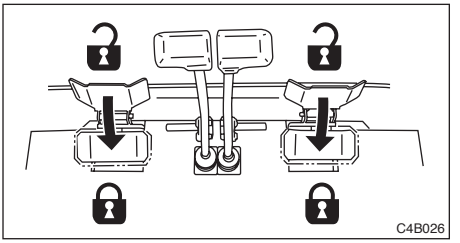
Use these to move forward and backward and to change directions.

Refer to page 71 "Operating the Travel Levers" .

Pedal Locks

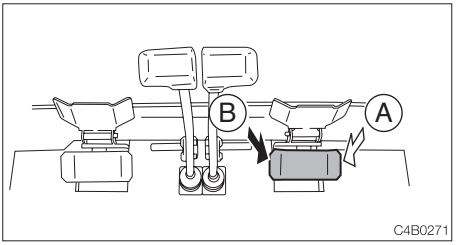
⚠ WARNING

When not using the pedals, set the pedal locks to the locked position. Stepping on a pedal accidentally when it is not locked may lead to unexpected accidents.



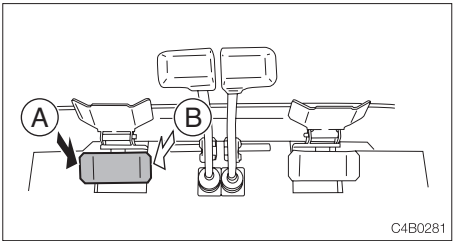
These devices are for locking the swing and auxiliary pedals.
Set the pedal locks over the pedals to lock them.

Boom Swing Pedal



Use this pedal to operate the boom swing.
(A) .....Boom swing right
(B) .....Boom swing left

Auxiliary Pedal



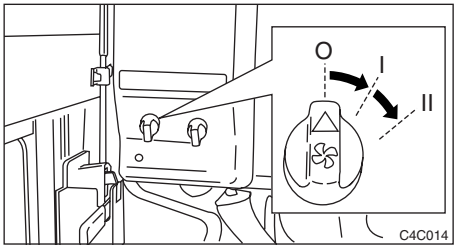
This pedal controls the flow of the oil in the auxiliary hydraulic circuit.
(A) .....Hydraulic oil flows to left auxiliary hose
(B) .....Hydraulic oil flows to right auxiliary hose

Heater (Cab)

⚠ WARNING

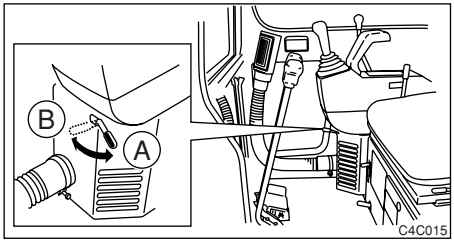
- **Always be sure to allow sufficient ventilation.**
- **Do not place combustible or explosive objects near the air outlets.**

Heater Fan Switch



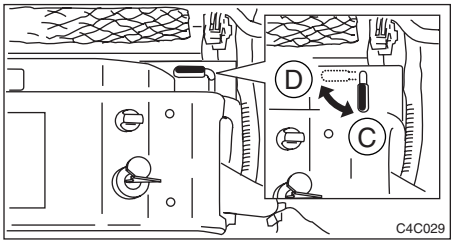
O.....Off
I .....Heater fan rotates at low speed.
II .....Heater fan rotates at high speed.

Heater / Defroster Switch



Use this switch to heat the cab and to defrost the windshield.
(A) .....Heater
(B) .....Windshield defroster

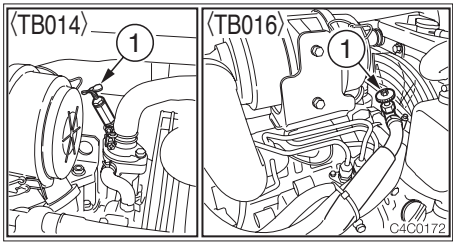
Ventilation / Circulation Switch



(C) .....Full ventilation
(D) .....Internal circulation

Supplement: Use the heater with care in warm seasons. 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 set at a halfway position.



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

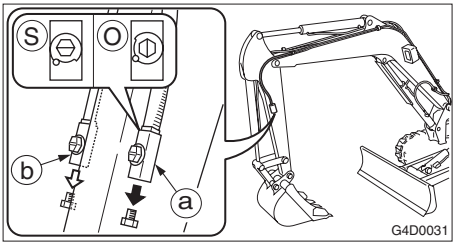
Auxiliary Hydraulic Lines

⚠ WARNING

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

- **When removing plugs or disconnecting hoses, release the internal pressure before removing.**

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



Stop valve..... Ⓢ : Closed Ⓞ : Open

Connecting the Hydraulic Circuits

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

1. Move the auxiliary pedal several times to relieve pressure on the lines.
2. Make sure the stop valves are closed.
3. Remove the plugs.
4. Connect the attachment hydraulic lines to ports (a) and (b).
5. Open the stop valves.
6. When connecting is complete, purge air from the hydraulic lines.
   a. Start and run the engine at low idle with no load for 10 minutes.
   b. With the engine running at low idle operate the auxiliary pedal repeatedly (approx. 10 times) to purge air from the hydraulic lines.
   c. Stop the engine and wait for more than 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 specified to do so.

7. Check for leaks.

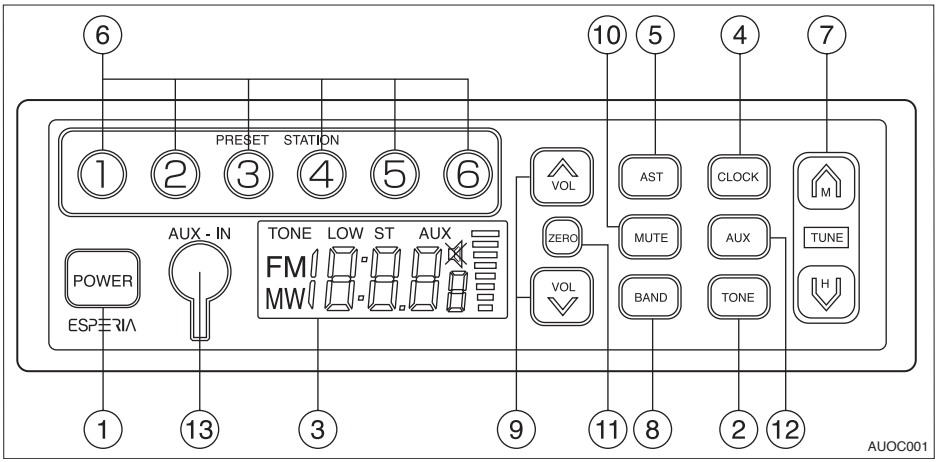
Before dismantling the attachment, move the auxiliary pedal several times to relieve pressure on the lines and be sure to close the stop valves.

Radio (Cab Type)

Operating precautions

- 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 keep the radio playing for long periods of time with the engine stopped. Doing so will drain the battery of its charge 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. Doing so may result in it being rendered inoperable.

Names of the components



(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 frequencies. 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” to “59” or “01” to “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 the rubber cap and plug the stereo mini-plug of the external audio device into this jack. Be sure that the 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 tune button for two seconds or more 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

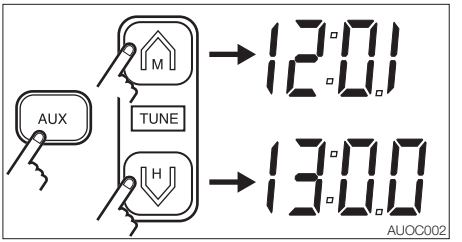
Press the AST button for two seconds or more while playing the radio. The radio starts seeking the audible stations within the band selected, store the information on the stations obtained into memory, and assign each preset button (1 to 6) a station.

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 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



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

Resetting 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

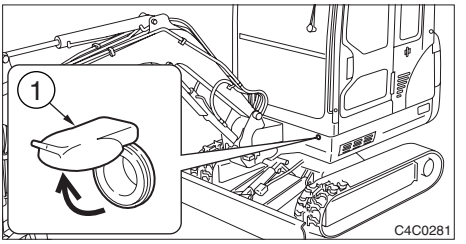
Power source	:	12/24 VDC (negative ground)
Power consumption	:	2A
Maximum output power	:	16 W + 16 W (4Ω) (at DC 28.8 V input) 5W+5W (4Ω) (at DC 14.4 V input)
Rated output power	:	14W + 14W (10% distortion, 4 Ω) (at DC28.8 V input) 3.8 W + 3.8 W(10% distortion, 4Ω) (at DC 14.4V input)
Dimensions	:	178 (W) x 50 (H) X 92 (D) mm (without projections)
Receiving frequency	:	MW (AM) 530 to 1602 kHz (EU, Asia), 1710 kHz (North, Central and South America) FM 87.9 to 108 MHz
Practical sensitivity	:	MW (AM) 32 dB or less (S/N 20 dB) FM 12 dB or less (S/N 30 dB)
S/N ratio	:	MW(AM) 40 dB or more FM 60 dB or more
AUX IN	:	Stereo mini jack (3.5 mm); rated input, 90 mV

Note: Specifications and dimensions may be changed without notice.

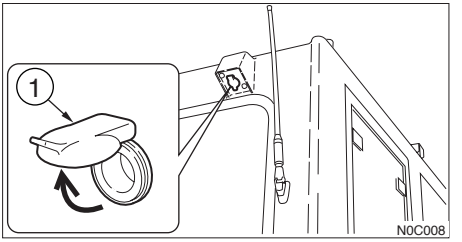
External Power Sockets (for EU)

⚠ WARNING

Only use applicable electric products with these sockets.



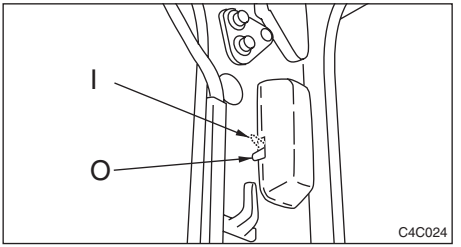
for Beacon



Use these sockets as an external power supply. When using these sockets, be careful not to exceed 12V/10A.
To use, raise the cap (1).

Interior Light (Cab)

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



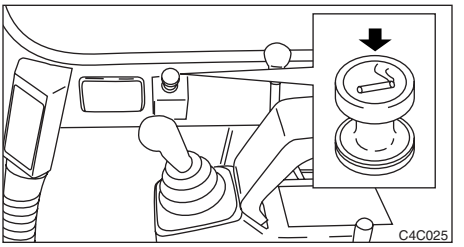
O.....Off
I .....Lit

Cigarette Lighter (Cab)

⚠ WARNING

- **Do not leave the cigarette lighter's knob pressed in. Doing so heats up the lighter, and could be dangerous.**
- **If the knob does not pop out after 30 seconds, it may be broken. Pull it out by hand.**
- **Do not use other cigarette lighters, as they may get stuck.**
- **Only use applicable electric products with this socket.**
- **Do not touch metal parts of the lighter. Doing so could cause burns.**

This is the cigarette lighter and internal power supply socket.
When using the external power supply socket, wiper and this socket simultaneously, be careful not to exceed 12V/10A.

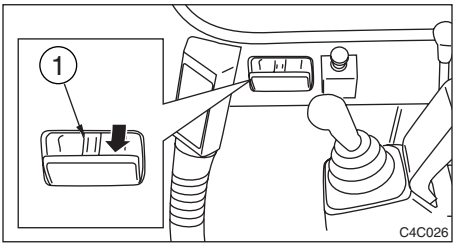


1. Press the lighter in.
2. Release the lighter and wait for it to pop out. The lighter pops out automatically when the heater becomes red.
3. Once the lighter pops out, pull it out.

Ashtray (Cab)

⚠ WARNING

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



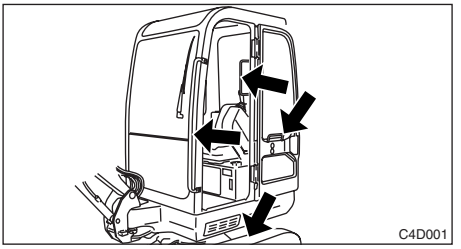
Pull the ashtray out towards you to use it.
To clean, press the ash discharge button (1) and pull out the ashtray.

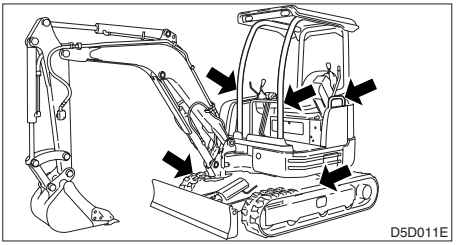
OPERATION

Mounting and Dismounting

⚠ WARNING

- **Do not jump on or off the machine. Never attempt to mount or dismount a moving machine.**
- **When mounting and dismounting the cab, first open the door fully to the locked position and check that it does not move. (For machines with cabs)**


C4D001


D5D011E

- **Always face the access system and maintain a three point contact with the recommended handrails and steps while getting on and off the machine. Keep steps and platform clean.**
- **Never use the safety lock lever or control levers as hand holds.**

Walk-Around Inspection

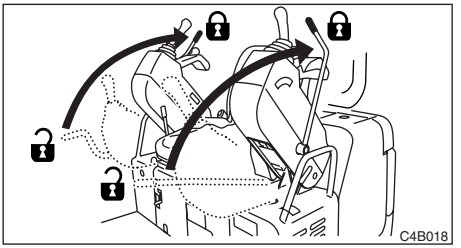
Perform the walk-around inspections once a day before starting the engine the first time that day.
Perform the inspections as described under “Maintenance - Walk-Around Inspection” (pages 105 and 106).

Daily Inspection

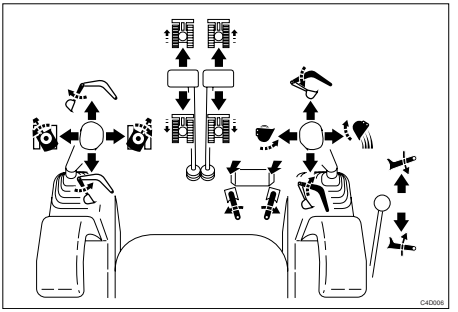
Perform the daily inspections once a day before starting the engine the first time that day.
Perform the inspections as described under “Maintenance - Daily Inspection” (pages 107 to 111).

Before Starting the Engine

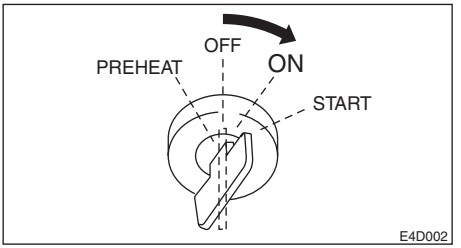
1. Adjust the seat for a comfortable operating position.
2. Fasten the seat belt.



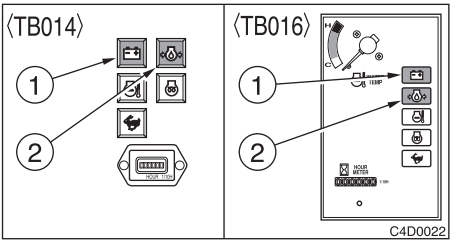
3. Check that the safety lock lever is in the locked position.



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



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



- TB016: All the 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 engine oil pressure warning lamp (2) flash, and the other lamps turn off.
  TB014: Warning lamps (1) and (2) light and no alarm is sounded.
- Turn the light switch to check that the boom light, tail lamp and meter light turn on.
- Check the fuel level.

If a lamp does not light or the alarm is not sounded, the bulb may be burnt out or a wire may be damaged. Contact a Takeuchi sales or service outlet for repairs.

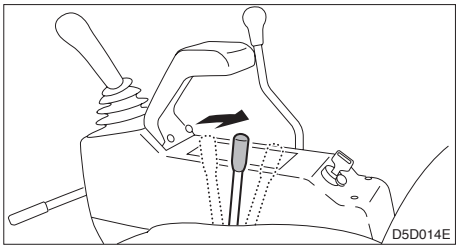
Starting the Engine

⚠ WARNING

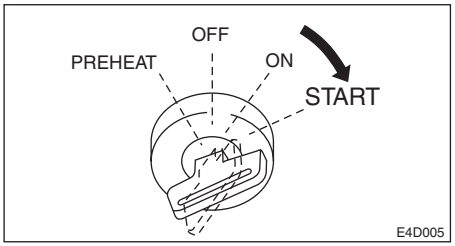
- **Clear the area of all persons.**
- **Sound horn to alert everyone around the machine.**

IMPORTANT: Do not run the starter motor for more than 15 consecutive seconds. If the engine fails to start, wait for 30 seconds to protect the battery, and then try again to start the engine.

Normal Starting

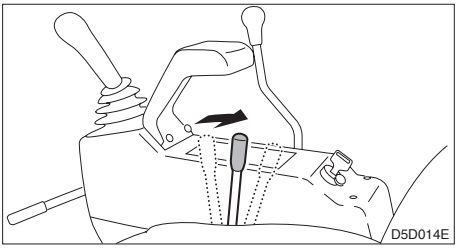


1. Pull the throttle lever to the middle position.

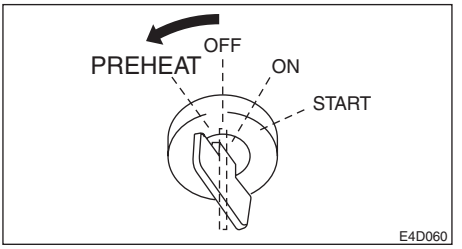


2. Turn the key to the START position and start the engine.
3. Once the engine starts, release the key. The key automatically returns to the ON position.
4. Check that the warning lamps are off.
5. Return the throttle lever and warm up the engine.
   Refer to page 65 “Warming Up the Engine”.

Starting in Cold Weather



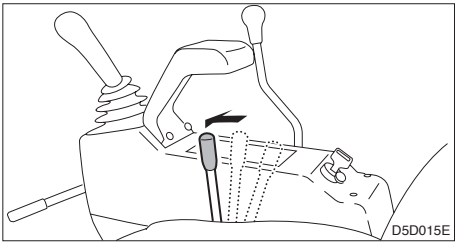
1. Pull the throttle lever to the middle position.



2. Turn the key to the PREHEAT position and hold it there for 5 seconds.
   < TB014 >
   The glow lamp is not automatically turns off.
   < TB016 >
   The glow lamp is automatically turns off.
3. After the glow lamp turns off, then turn it to the START position and 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 page 65 “Warming Up the Engine”.

Warming Up the Engine

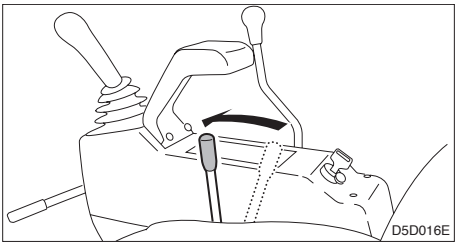
IMPORTANT: Avoid racing the engine until it is warmed up.
Do not warm up the engine for long periods of time (20 minutes or more).



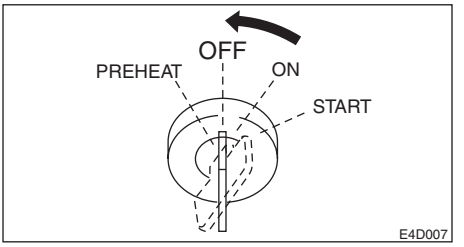
1. Return the throttle lever, then idle the engine and run it for about 5 minutes with no load.

Stopping the Engine

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



1. Idle the engine for about 5 minutes to gradually let it cool.



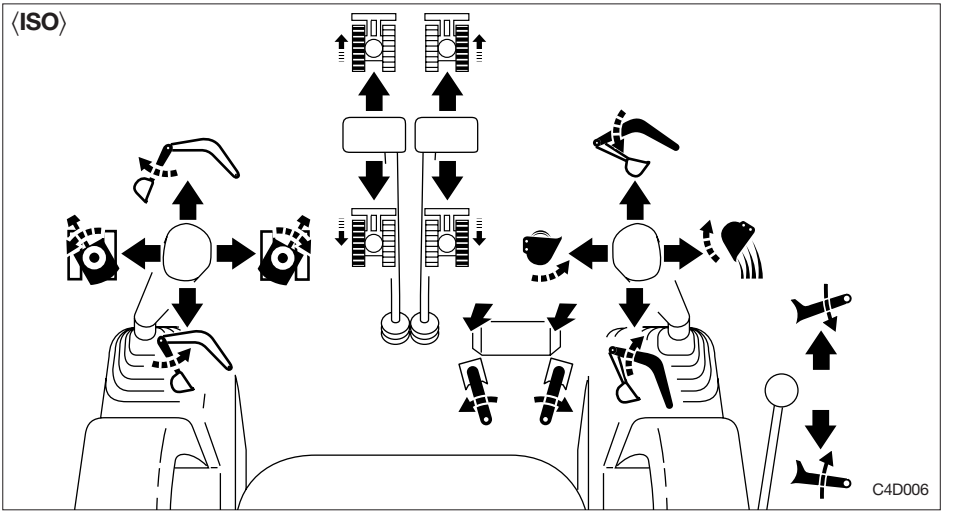
2. Turn the key to the OFF position to stop the engine.

Lever Pattern (ISO Pattern)

⚠ WARNING

- **Be careful to check which pattern of lever control arrangement you are operating with before beginning operations.**
- **The explanations in this manual are for the ISO pattern.**

⟨**ISO**⟩



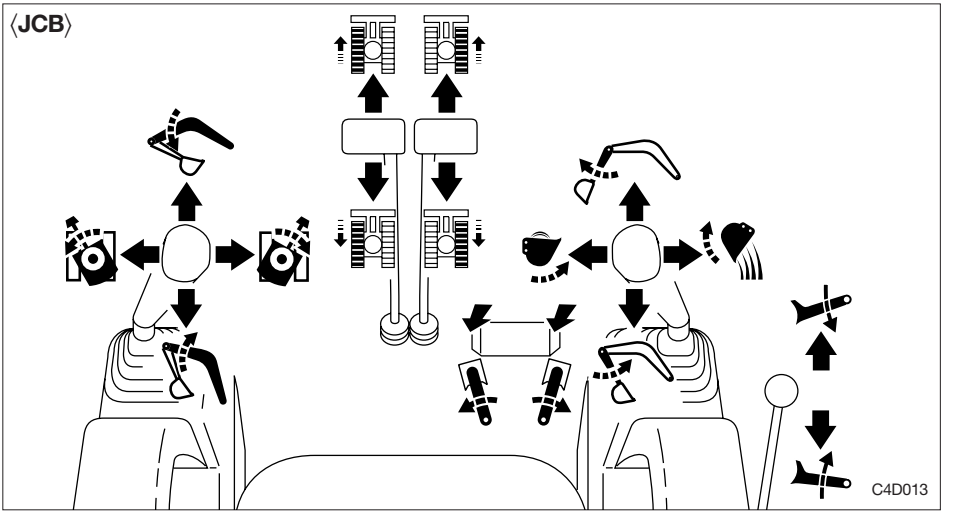
	Left Crawler Forward		Right Crawler Forward
	Left Crawler Reverse		Right Crawler Reverse
	Arm Out		Boom Lower
	Arm In		Boom Raise
	Upperstructure Slew Left		Bucket Load
	Upperstructure Slew Right		Bucket Dump
	Boom Swing Left		Dozer Blade Lower
	Boom Swing Right		Dozer Blade Raise

Lever Pattern (JCB Pattern)

⚠ WARNING

- **Be careful to check which pattern of lever control arrangement you are operating with before beginning operations.**
- **The explanations in this manual are for the ISO pattern.**

⟨**JCB**⟩



	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

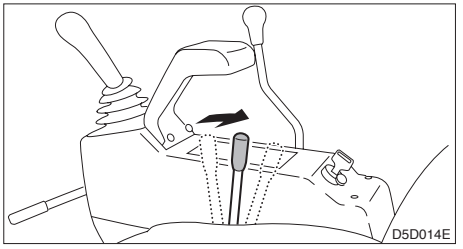
Warming Up the Machine (Hydraulic Oil)

⚠ WARNING

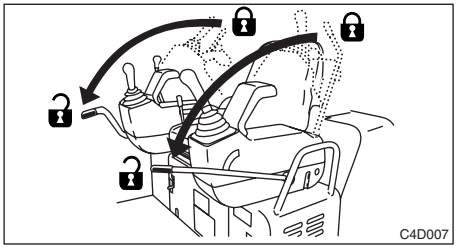
Operating the working equipment without warming up the machine (hydraulic oil) is dangerous, as response will be slow and the equipment may move in unexpected ways. Be sure to sufficiently warm up the machine.

IMPORTANT: Do not operate the levers suddenly 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), but if operations must be performed at lower temperatures, heat up the hydraulic oil to at least 20°C (68°F).

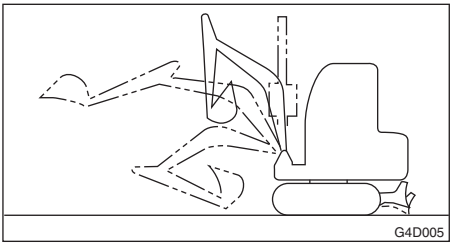
Normal Warm-up



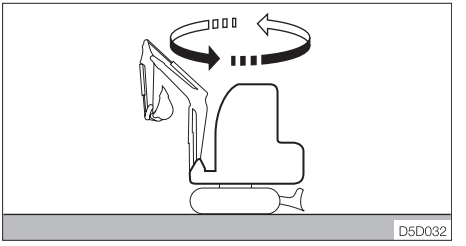
1. Pull the throttle lever to the middle position, then run the engine at medium speed for about 5 minutes with no load.



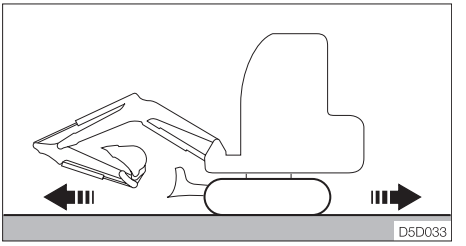
2. Set the safety lock lever to the released position and lift the bucket from the ground.



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



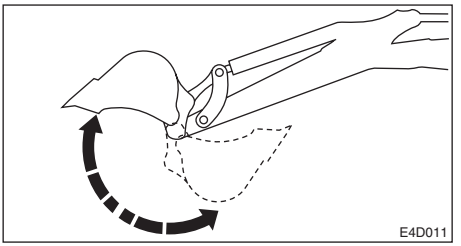
4. Slew slowly left and right several times.



5. Travel slowly forward and backward several times.

Warming Up in Cold Weather

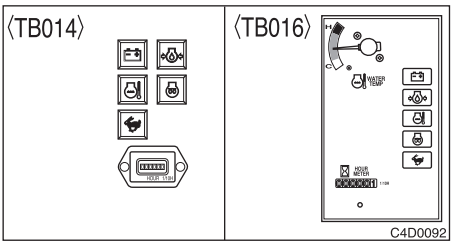
1. Perform the normal warm-up procedure. (Refer to the previous page.)



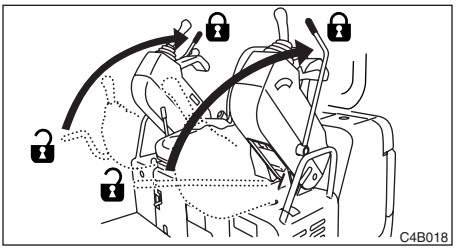
2. Set the bucket cylinder at the stroke end and keep it there.
   Do not do this for more than 30 seconds.
3. Repeat step 2 until the bucket operating speed is normal.

Inspection After Warm-up

After warming up the engine and hydraulic oil, perform the checks and inspections described below, and repair if there is a problem.



1. Check that the warning lamps and meters are as follows:
   - Are all the warning lamps off?
   - Is the water temperature gauge's needle within the green range? (TB016)
2. Check that there are no irregularities in the exhaust color, sound and vibrations.



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

Changing the Crawler Width (TB016)

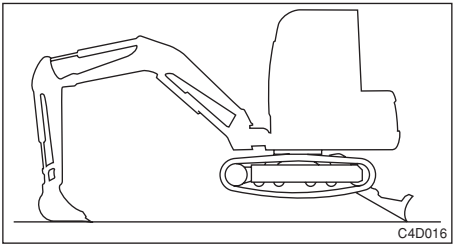
⚠ WARNING

Always operate the machine with the crawler width at the maximum to increase machine stability. The smaller the crawler width, the greater the possibility the machine can tip over. If it is absolutely necessary to operate the machine with a narrow crawler width, do so with great care.

With this excavator the crawler width can be changed. Normally use with extended crawlers for greater stability.

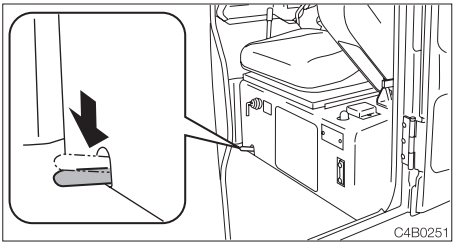
Change

Perform these operations on a flat, solid surface with no obstacles in the way.

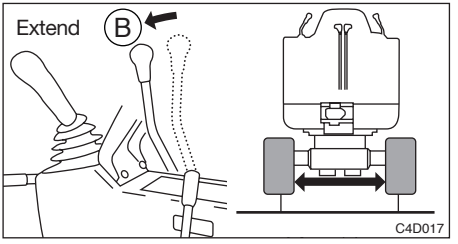


1. Lift the machine body using the hoe attachment and dozer blade.

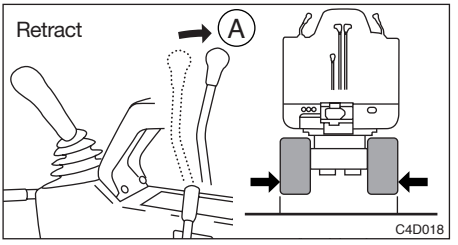
IMPORTANT: Always lift the body before changing the crawler width. Failure to do so can result in damage to the travel frame and spanner cylinder.



2. Stamp on the selector lever.

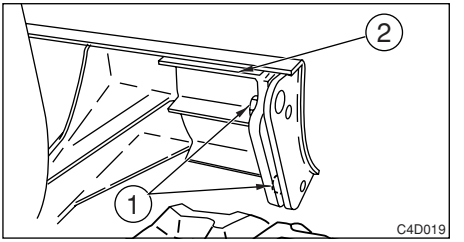


3. Push the blade lever forward to extend crawler width.
   • ➡1300mm (51 in.)
   If necessary, also replace the blade's plates and use the dozer blade with the extended width.

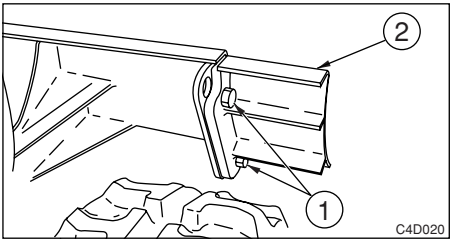


4. Pull the blade lever towards you to retract crawler width.
   • ➡980mm (39 in.)

Changing the Dozer blade width



1. Loosen bolts (1) and remove plate (2).

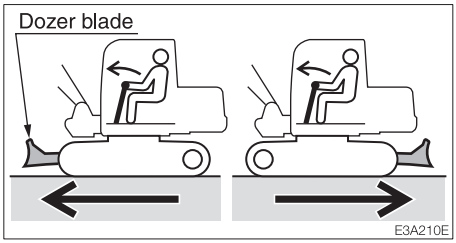


2. Attach the right plate (2) to the left, the left plate (2) to the right.
3. Tighten the plate (2) with bolts (1).

Operating the Travel Levers

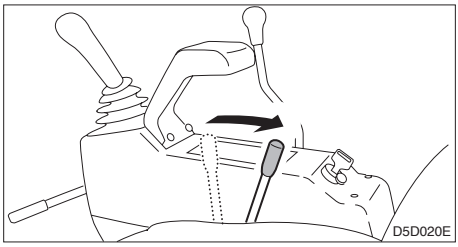
⚠ WARNING

- **Never allow anyone to enter the slew (swing) radius and machine path.**
- **Signal your intention to move by sounding the horn.**
- **There are blind spots to the rear of the machine.**
  If necessary, swing the cab around before backing up to check that the area is safe and clear.

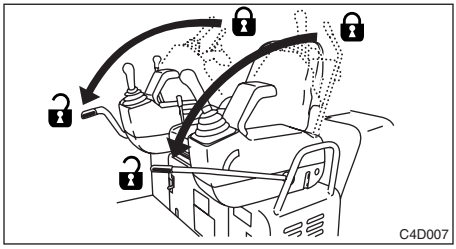


- **Before operating the travel levers, check to make sure that the dozer blade is to the front of the operator's seat. BE AWARE that when the dozer blade is to the rear of the operator's seat, the travel levers operate in the opposite direction to when the dozer blade is in the front.**
- **Remove any obstacles in the machine's path.**

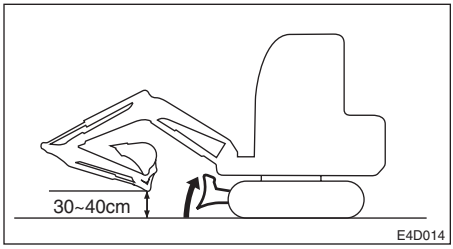
Traveling Forward and Backward



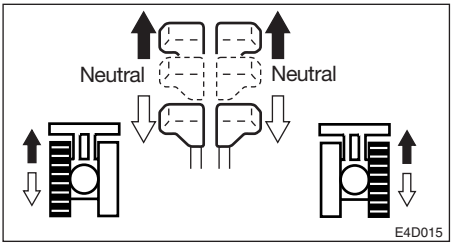
1. Pull the throttle lever and increase the engine speed.



2. Set the safety lock lever to the released position.



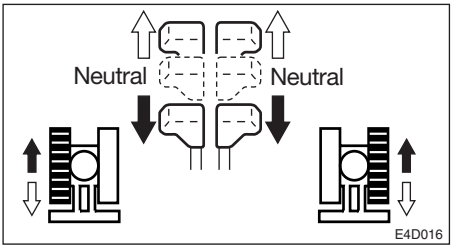
3. Fold the hoe attachment and lower it to 30 to 40 cm (12 to 16 in.) above the ground.
4. Lift the dozer blade.
5. Operate the left and right travel levers as described below.



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

➡To move forward:
Tilt the levers forward.

⇨To move backward:
Tilt the levers backward.

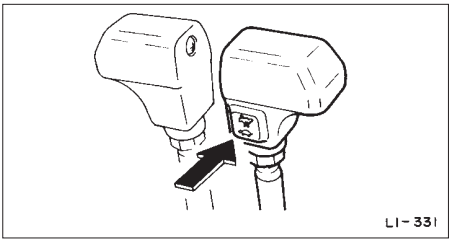


When the dozer blade is behind the operator's seat:

➡To move forward:
Tilt the levers backward.

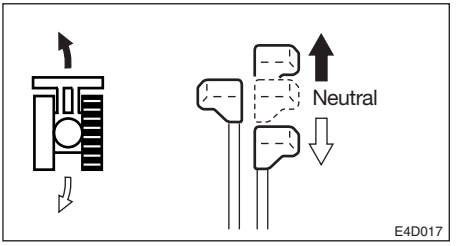
⇨To move backward:
Tilt the levers forward.

Traveling in 2nd (High) Speed



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

Pivot Turn

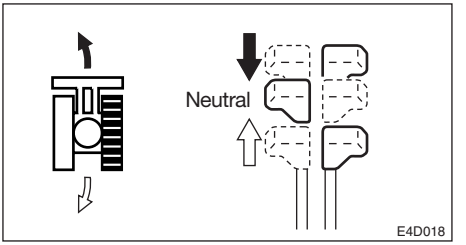


Turning to the left when stopped:

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

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

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



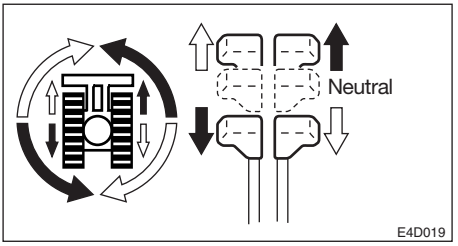
Turning to the left while traveling:

➡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.

Spin Turn



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

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

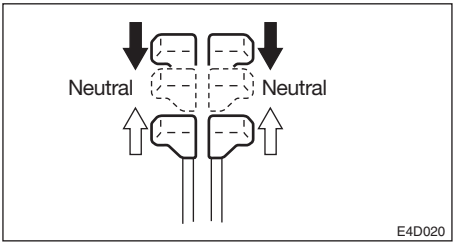
Stopping Travel

⚠ WARNING

- **Park the machine on firm, level ground and apply the parking device. If you must park on a slope or incline, block the machine securely to prevent movement.**
- **If any controls should be touched accidentally when the safety lock lever(s) is lowered, the machine will move suddenly, and cause serious injury or death.**
- **Note that the dozer blade and pedals controls are not locked, even when the safety lock lever is set to the lock position. Do not touch these controls accidentally.**

⚠ CAUTION

Never bring the machine to a sudden stop except in the case of a true emergency. Stop as gently as possible.

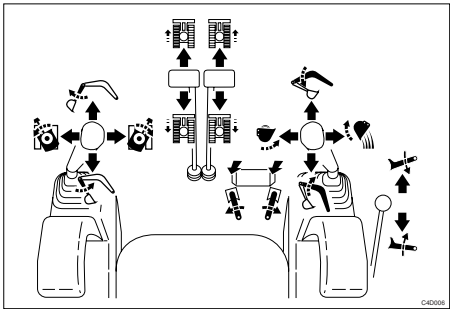


1. Slowly set the left and right travel levers to the neutral position. The machine stops.

Operating the Working Equipment

⚠ WARNING

- **Be careful to check which pattern of lever control arrangement you are operating with before beginning operations.**
- **The explanations in this manual are for the ISO pattern.**



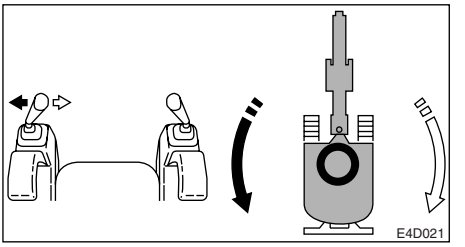
Use the right operating lever to operate the boom and bucket.
Use the left operating lever to operate the arm and for slewing.
Return the operating levers to the neutral position to stop the hoe attachments.

1. Set the safety lock lever to the released position.
2. Set the pedal locks to the released position.

Slewing

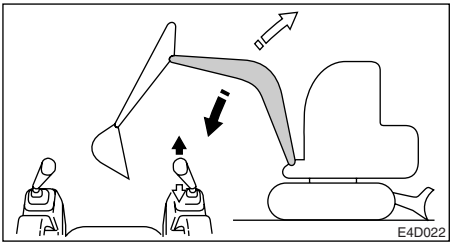
⚠ WARNING

Check the surrounding area for safety before slewing.



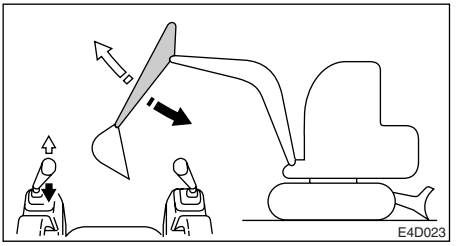
➡ To slew left:
Tilt the left operating lever to the left.
⇨ To slew right:
Tilt the left operating lever to the right.

Operating the Boom



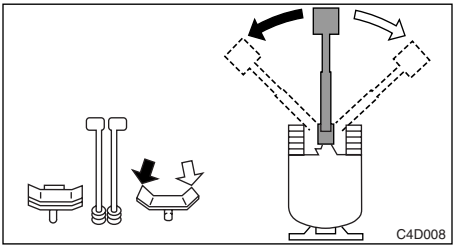
➡ To lower the boom:
Tilt the right operating lever forward.
⇨ To raise the boom:
Tilt the right operating lever backward.

Operating the Arm



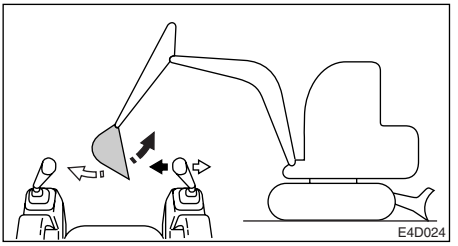
➡To contract the arm:
Tilt the left operating lever backward.
⇨To extend the arm:
Tilt the left operating lever forward.

Operating the Boom Swing



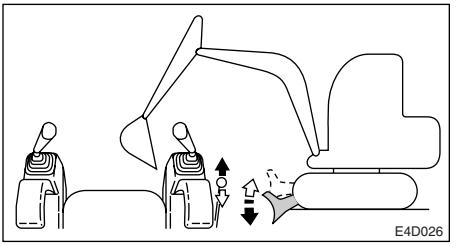
➡To swing left:
Press the left side of the pedal.
⇨To swing right:
Press the right side of the pedal.

Operating the Bucket



➡To dig:
Tilt the right operating lever to the left.
⇨To dump:
Tilt the right operating lever to the right.

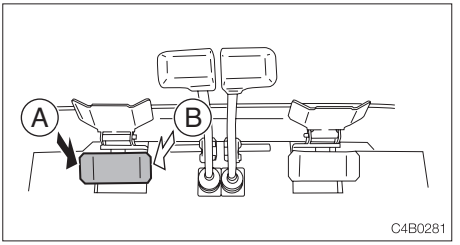
Operating the Dozer Blade

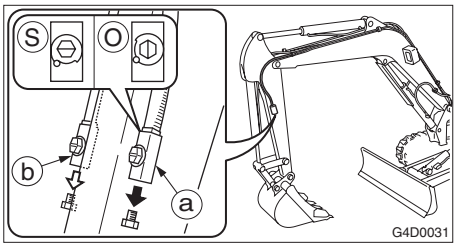


➡To lower the dozer blade:
Tilt the lever forward.
⇨To raise the dozer blade:
Tilt the lever backward.

Operating the Auxiliary Hydraulics

Use this to operate a breaker, crusher or other attachment.





When the pedal is pressed, hydraulic oil is delivered to the auxiliary hose's ports (a) and (b).

➡To deliver hydraulic oil to port (a):
Press the left side (A) of the pedal.

⇨To deliver hydraulic oil to port (b):
Press the right side (B) of the pedal.

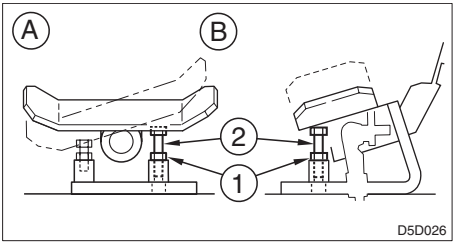
Refer to page 54 "Auxiliary Hydraulic Lines".

Adjusting the Stroke of the Auxiliary Pedal

When using a hydraulic breaker, adjust the stroke so that the auxiliary pedal will not pushed down to the side (B) when treaded on unintentionally.

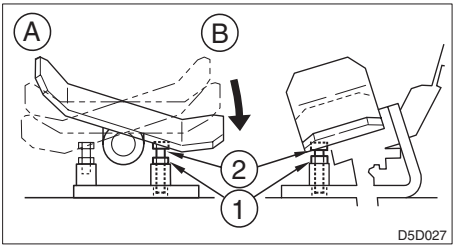
When using a reversible attachment, a readjustment is required to enable the auxiliary pedal operable at the side (B).

When using a hydraulic breaker (1-way flow)



1. Make sure the auxiliary pedal is in the neutral position.
2. Loosen the lock nut (1).
3. Screw out the adjusting bolt (2) until its head touches the pedal.
4. Tighten the lock nut (1) to secure the adjusting bolt (2).

When using a reversible attachment (2-way flow)



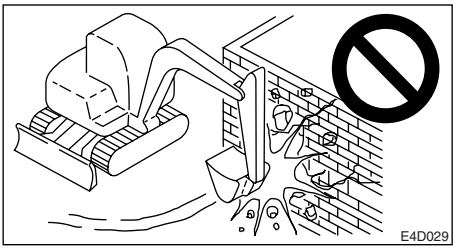
1. Loosen the lock nut (1) and screw in the adjusting bolt (2) completely.
2. Push down on the side (B) of the auxiliary pedal and hold it at the stroke end.
3. Screw out the adjusting bolt (2) until its head touches the pedal.
4. Tighten the lock nut (1) to secure the adjusting bolt (2).

Prohibited Operations

⚠ WARNING

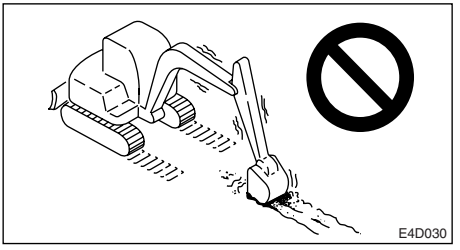
- **Do not operate on base rock (hard or soft).**
- **Do not slew (swing) while traveling. If you must operate the hoe attachment while traveling, operate at speeds slow enough so you have complete control at all times.**

Do not perform breaking or leveling operations using slew force



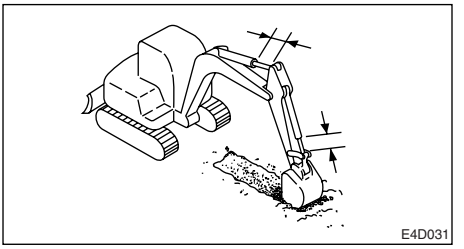
Do not break down walls or level ground using slew force. Also, do not dig the bucket teeth into the ground during slewing. Doing so will damage the hoe attachment.

Do not Dig while Traveling

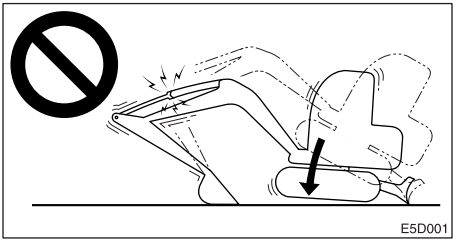


Do not dig the bucket into the ground and use the traveling force to dig.

Be Gentle on the Hydraulic Cylinders

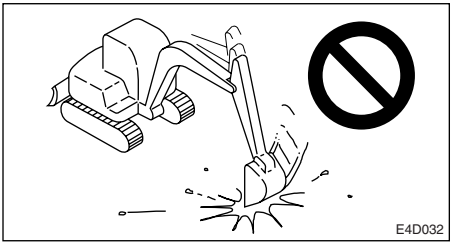


Do not extend the hydraulic cylinders to the stroke ends. Operate them with leeway.



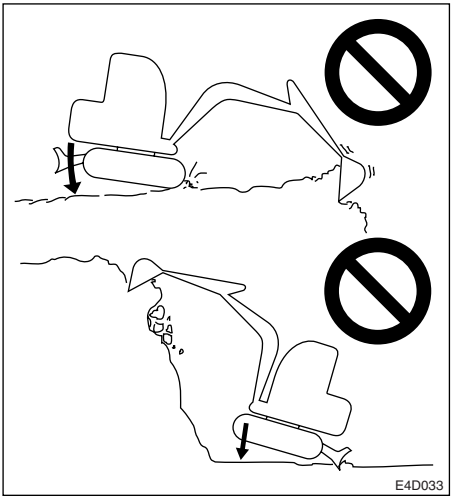
Do not support the machine body with the hoe attachment as it is lowering with the arm cylinder fully extended. Doing so concentrates the load on the arm cylinder and could damage the arm cylinder.

Do not Drive Piles with the Bucket or Dig with it Using Shock Force



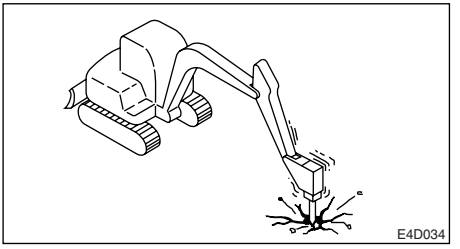
Doing so will shorten the service life of the hoe attachment. Use hydraulic force to dig.

Do not Perform Operations Using the Machine's Dropping Force



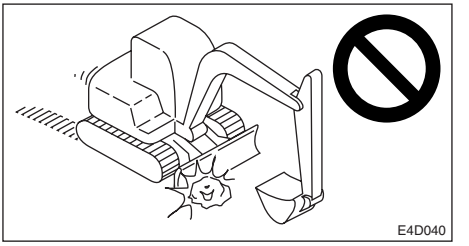
Putting excessive strain on the machine will shorten its service life. Use the hydraulic force of the cylinders and always dig with shallow, long strokes.

Digging Base Rock



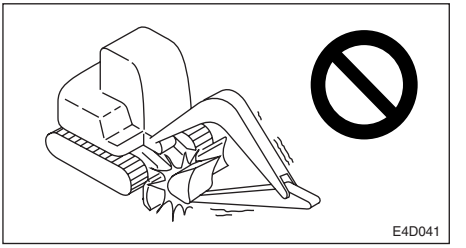
For hard base rock, break the rock up into small pieces with a breaker, etc., before digging. This prevents damage to the machine and is thus more economical in the end.

Caution on Exposing the Dozer Blade to Shocks



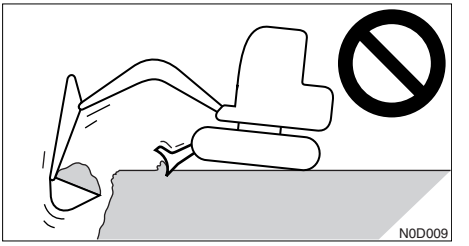
Hitting the dozer blade against rocks, etc., could damage the dozer blade or the blade cylinder.

Caution on Folding the Hoe Attachment

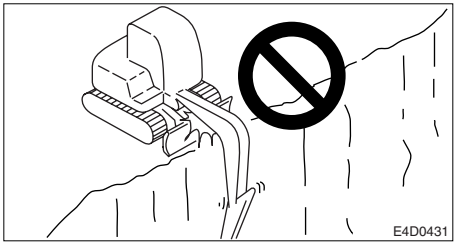


Be careful not to hit the bucket or dozer blade when folding the hoe attachment.

Do not Use the Dozer Blade as an Outrigger

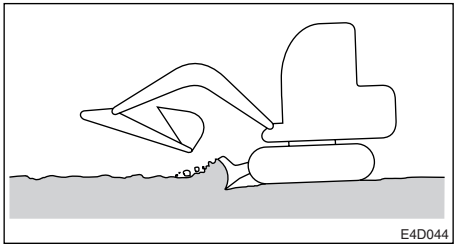


Pay Attention to the Dozer Blade when Digging



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.

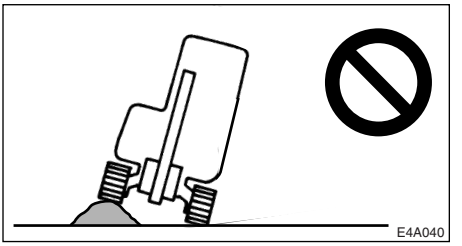
Caution on Digging Down with the Dozer Blade



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 lower body.

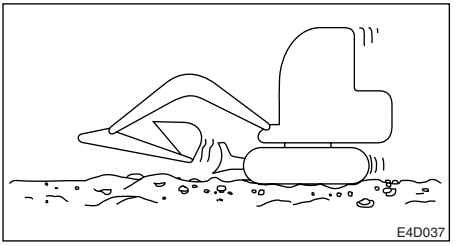
Cautions on Operating

Cautions on Traveling



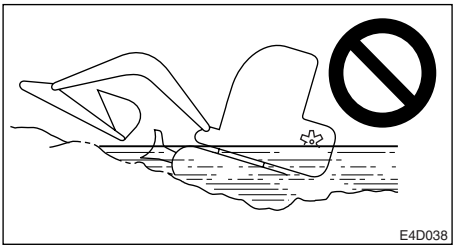
Traveling over obstacles (rocks, stumps, etc.) may subject the body to strong shocks and result in damage. Avoid traveling over obstacles whenever possible. If you must do so, keep the hoe attachment near the ground, travel at low speed, and go over the obstacle at the center of the crawler.

Cautions on Traveling in 2nd (High) Speed

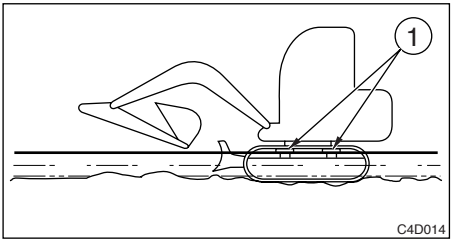


On uneven ground, travel at low speed and avoid accelerating, stopping or changing directions abruptly.
Also, when traveling in 2nd speed, do so with the dozer blade at the front.

Cautions on Use in Water



If you leave water at a sharp angle, the rear of the machine may be submerged, exposing the radiator fan to water and damaging them. Do not let the rear of the machine get submerged.

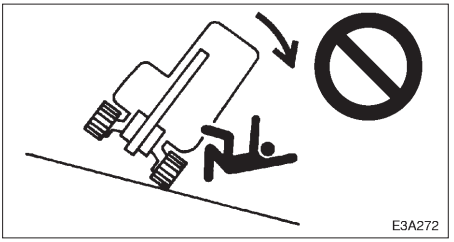


- Allowable water depth
  In water, only use the machine up to a depth at which the water comes up to the middle of the shoe slide (1).
- When greasing places used under water for long periods of time, apply enough grease so that the old grease is expelled.
- Never submerge the slew bearing or main body in water or sand. If the slew bearing or main body should get submerged, contact a Takeuchi sales or service outlet for inspection.

Cautions on Traveling on Slopes

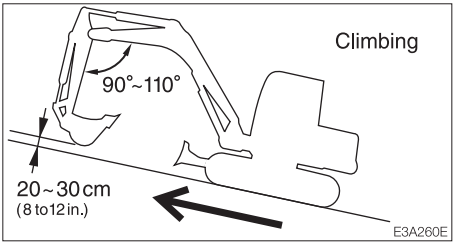
⚠ WARNING

- **Never exceed the machine's stability capabilities (maximum gradeability - 25°, lateral tipping angle - 10°). Also note that when actual working area conditions are poor the machine's stability capabilities may be lower.**
- **When traveling on slopes or grades, lower the bucket to a height of 20 to 30 cm (8 to 12 in.) off the ground. In emergencies, lower the bucket to the ground and stop the machine.**
- **When traveling on slopes or grades, move slowly in first gear (low speed).**
- **Do not travel down slopes in reverse.**



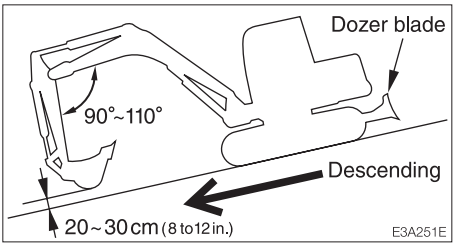
- **Do not change directions or cross slopes sideways. First return to a flat surface then redirect the machine.**
- **On grass, dead leaves, wet metal or frozen surfaces, the machine may slide sideways even on very gentle slopes. Make sure the machine never faces sideways with respect to the slope.**

Traveling Posture
Traveling up slopes



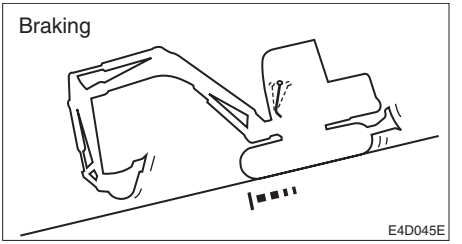
When traveling up slopes at an angle of 15° or greater, travel in the posture shown in the diagram above.

Traveling down slopes



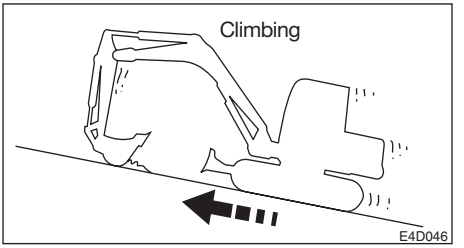
When traveling down slopes at an angle of 15° or greater, lower the engine speed and travel in the posture shown in the diagram above.

Braking when traveling down slopes



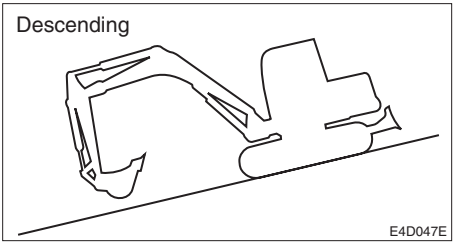
When traveling down slopes, the brakes are applied automatically when the travel levers are returned to the neutral position.

If the crawlers slip



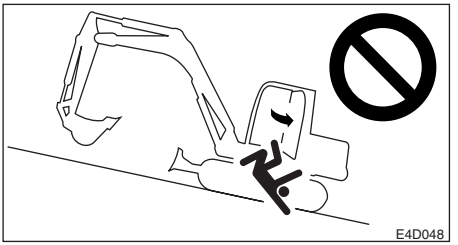
If the crawlers slip while traveling up a slope, use the pulling force of the arm to climb the slope.

If the engine stops



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

Do not open the door while traveling on slopes

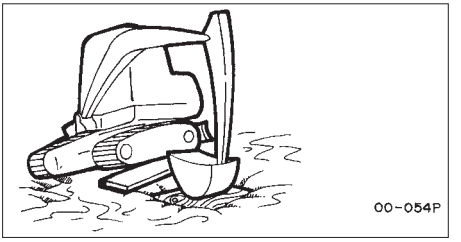


Opening the door while traveling on slopes is dangerous, as the force required to open and close the door changes abruptly. Always keep the door closed when traveling on slopes.

Getting Out of Mud

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

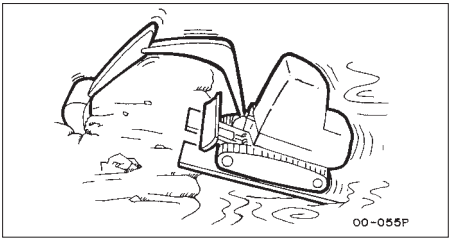
If one crawler is stuck



1. Slew the bucket to the side which is 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, etc., under the lifted crawler.
5. Lift the bucket and slowly move out of the mud.

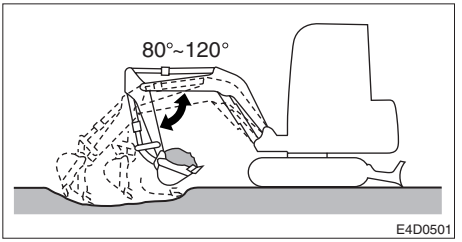
If both crawlers are stuck

1. Perform 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 and travel forward simultaneously to slowly move out of the mud.



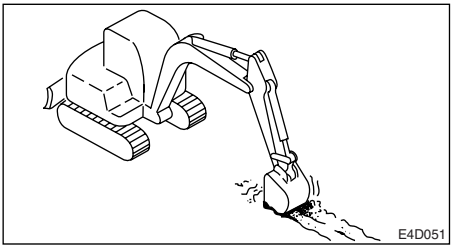
Operations Possible with this Machine

Excavating



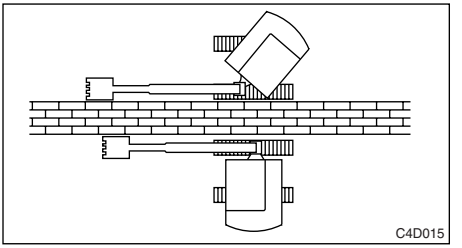
1. Set the dozer blade on the side opposite the side you want to dig on.
2. Use the arm and bucket and dig with shallow, long strokes. The digging force is strongest when the boom and arm angle is 80 to 120°. Use this angle for effective digging.

Digging Ditches



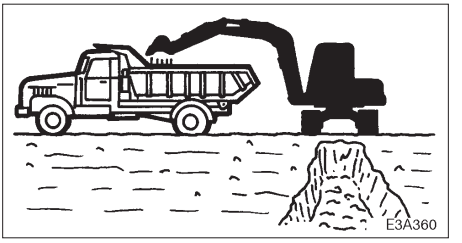
Mount a bucket suited for digging ditches and set the crawlers parallel to the ditch to be dug for greater efficiency.
When digging wide ditches, dig the sides first, the center later.

Digging Side Ditches



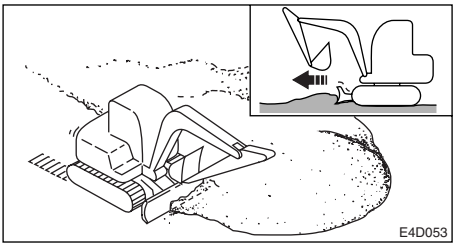
Use the offset function to dig side ditches as shown in the diagram.

Loading



When loading dirt in a truck, starting from the back of the truck's bed makes for easier loading and increases the amount of dirt that can be loaded.
Also, use a small slewing angle for greater efficiency.

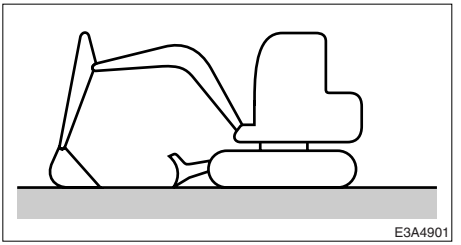
Leveling



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 on the body is too heavy, adjust by raising or lowering the dozer blade.

Parking

⚠ WARNING



- **Park the machine on firm, level ground and apply the parking device.**
- **Before leaving the operator's seat, set the safety lock lever securely to the lock position and stop the engine. If any controls should be touched accidentally when the safety lock lever is lowered, the machine will move suddenly, and cause serious injury or death.**

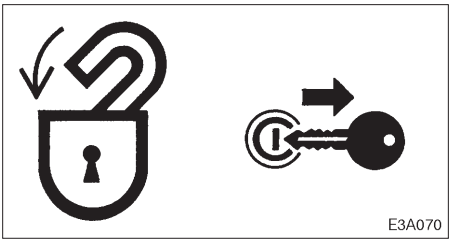
1. Set the left and right travel levers to the neutral position.
2. Return the throttle lever and idle the engine at low speed.
3. Lower the bucket and dozer blade to the ground.
4. Place the safety lock lever in the lock position.
5. Stop the engine and remove the key.
   Refer to page 65 "Stopping the Engine" .

Inspection and Checks After Stopping the Engine

1. Check for oil and water leakage and inspect the working equipment, covers and lower body. If any irregularities are found, repair.
2. Fill the fuel tank.
   Refer to page 109 "Checking the Fuel Level".
3. Remove any paper scraps or dirt from the engine room.
4. Remove any mud from the lower body.

Locking

Be sure to lock the following places:



- Cab door
- Fuel filler cap
- Engine hood
- Manual storage compartment
- Storage box
- Tool box

Preparing for Cold Weather

In cold weather, it may be difficult to start the engine and the coolant may freeze.
Make the preparations described below.

Changing the Fuel and Lubricant
Change the fuel, hydraulic oil and engine oil to types suited for cold conditions.
Refer to page 98 “Fuel and Lubricant Chart”.

Engine Coolant

⚠ WARNING

The coolant is combustible. Keep flames away.

Use long-life coolant (antifreeze) and tap water for the engine coolant.
Supplement: New machines are delivered with JIS Type 2 long-life coolant (antifreeze) at a concentration of 50%.
Refer to page 98 “Fuel and Lubricant Chart”.

Battery
As the temperature drops, the battery performance decreases.
Inspect the battery. If the charge is low, contact a Takeuchi sales or service outlet to have the battery charged.
Refer to page 117 “Inspecting the Battery Fluid Level and Replenishing”.

Cautions after Completing Operations

Heed the following in order to prevent dirt, water, or other objects stuck on the machine as well as the lower body from freezing:

- Remove any dirt or water from the body. In particular, water droplets on the hydraulic cylinder rod surfaces could freeze, and if dirt enters into the seals along with this, the seals could break.
- Park the machine on a dry, hard surface. If no appropriate place can be found, put boards down and park the machine on them.
- Drain any water from the fuel tank to prevent freezing.
  Refer to page 118 “Draining the Fuel Tank”.
- To prevent decreased battery performance, place a cover over the battery or remove it from the machine and store it in a warm place.
  Also add battery fluid before starting the next morning. If battery fluid is added after completing operations, the distilled water may not mix, resulting in freezing.

After Cold Weather is Over

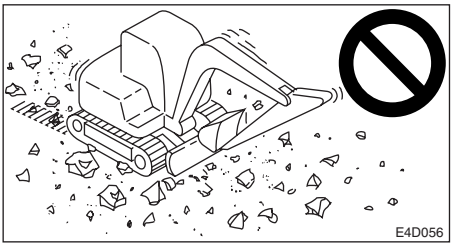
Perform the following after cold weather is over:

- Change the fuel and the oils for the different devices with those specified on the Fuel and Lubricant Chart.
  Refer to page 98 “Fuel and Lubricant Chart”.
- When using one-season type antifreeze coolant, completely drain the antifreeze coolant, carefully clean the inside of the coolant system, then add tap water.
  Refer to page 124 “Cleaning the Engine Cooling System”.

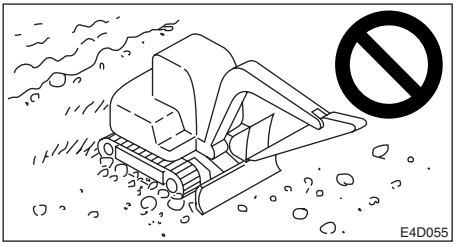
Rubber crawlers have an inherent weakness due to their use of rubber. Be sure to heed the prohibitions and cautions below so as to prevent damage to the crawlers and crawler slippage.

Prohibited Actions

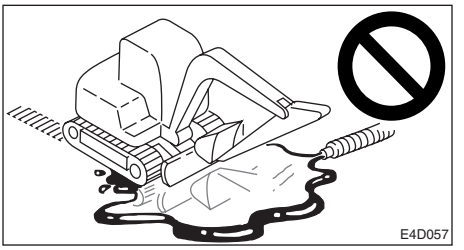
Do not travel or operate the machine in the following places:



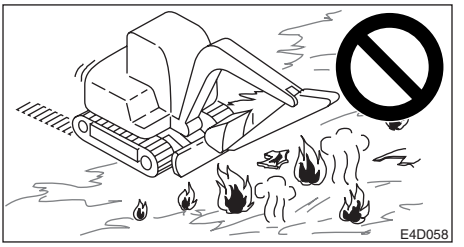
- Traveling or slewing on broken stone, jagged base rock, iron rods, iron scraps or the edges of iron sheets may damage or cut the crawlers.



- Traveling on riverbeds or places with many soft rocks may cause the crawlers to slip off or be damaged due to rocks getting stuck in them.
- Do not use on the seashore. The salt may corrode the metal cores.



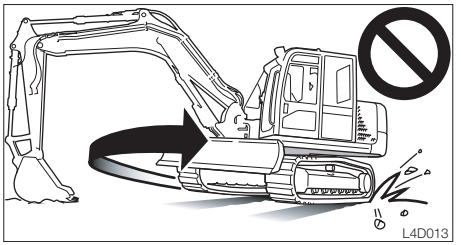
- Do not let fuel, oil, salt or chemical solvents get on the crawlers. These substances may corrode the couplings of the crawlers' metal cores, resulting in rust or peeling. If these substances should get on the crawlers, wipe them off immediately using water.



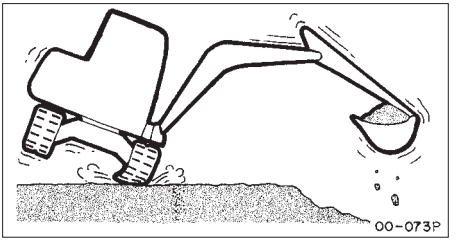
- Traveling on roads directly after asphalting or on hot surfaces such as over fires or on iron sheets under strong sunlight may result in irregular wear or damage of the lugs.
- Do not move earth in places where the rubber crawlers may slip. Doing so may speed up lug wear.

Cautions

Heed the following cautions when operating the machine:



- Do not turn the undercarriage with the front of the machine body lifted using the hoe attachment and the upperstructure left in this posture. Doing so will twist the crawler with the load concentrated on a single point on the crawler belt, rapidly leading to damage.
- Avoid changing course abruptly and spinning 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 should get on the crawler belts, wash them 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 in the winter on snowy or frozen surfaces as the crawler belts tend to slip.
- Use rubber crawler belts at temperatures between -25°C to +55°C (-14°F to 131°F).
- When storing the rubber crawlers for long periods of time (3 months or more), do so indoors in a place not exposed to direct sunlight or rain.

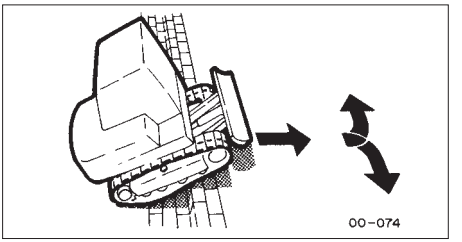


- Rubber crawler belts are not as stable as steel crawler belts since the entire lug is rubber. Be very careful when slewing and swinging sideways.

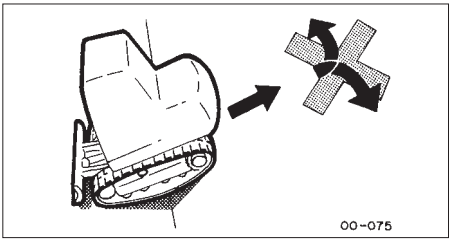
Preventing the Rubber Crawlers from Slipping Off

Heed the following in order to prevent the rubber crawlers from slipping off:

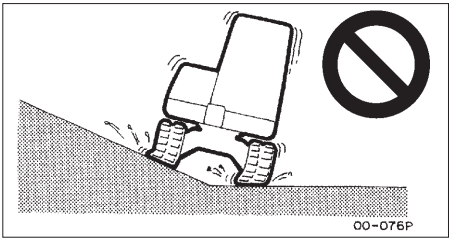
- Always keep the crawlers at the proper tension.



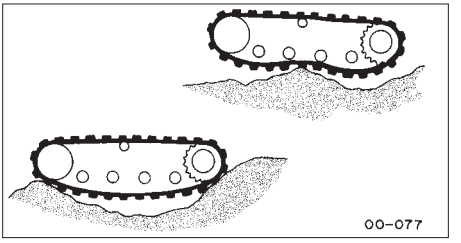
- When traveling up large cobblestone or rock steps (20 cm (8 in.) or greater), climb up the step at a direct angle and do not change course on top of the step.

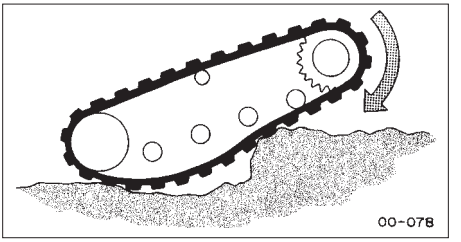


- When climbing in reverse, do not change course at the point where the slope starts.



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





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

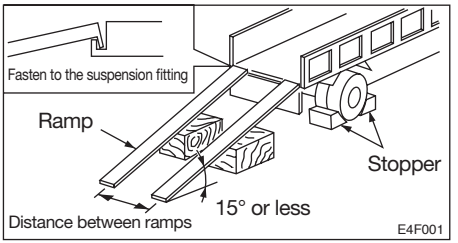
TRANSPORT

⚠ WARNING

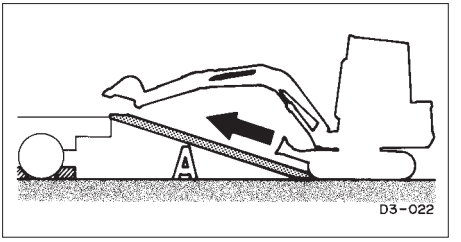
The machine may roll or tip over or fall while loading or unloading it. Take the following precautions:

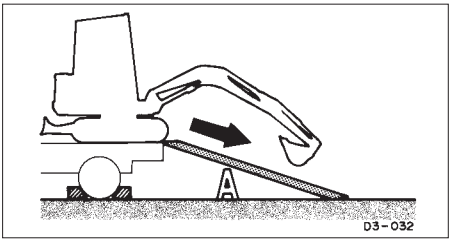
- **Select a firm, level surface and keep sufficient distance from road shoulders.**
- **Secure the ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°. If the rumps are bowed down too low, support them with poles or blocks.**
- **Keep the truck bed and loading ramps clean of oil, clay, ice, snow, and other materials which can become slippery. Clean the tracks.**
- **Block the transport vehicle so it can not move.**
- **Use a signal person when loading and unloading the machine, and travel slowly in first gear (low speed).**
- **Never change course on the ramp.**
- **Do not slew (swing) on ramps. The machine may tip over.**
- **When slewing (swinging) on the truck bed, do so slowly as the footing can be unstable.**
- **Engage the slew (swing) lock after loading.**
- **Block both tracks and secure the machine to the truck bed with load binders.**

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



1. Apply the truck's parking brake and place stoppers against its tires.
2. Fasten the ramps securely to the truck bed so that they will not come off. Set the ramps to an angle of 15° or less.
3. Line up the center of the truck bed with the center of the machine and the center of the ramps with the center of the crawlers.
4. Make sure the dozer blade does not hit the ramps.
5. Lower the hoe attachment as much as possible, making sure it will not hit the truck.
6. Lower the engine speed with the throttle lever.



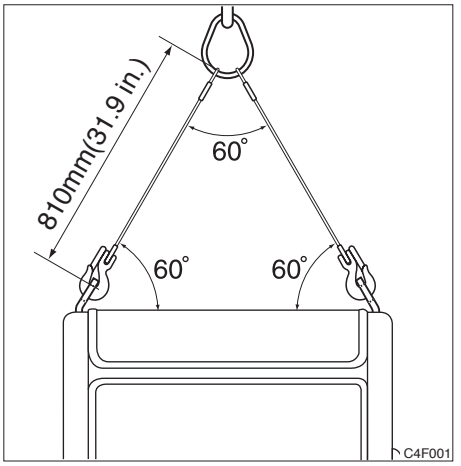


7. Determine the direction on the ramps, then slowly travel up or down the ramps in 1st speed (low speed), following the signals of a flagman.
8. Load the machine properly at the prescribed position on the bed.
   Refer to page 94 "Transporting Posture".

⚠ WARNING

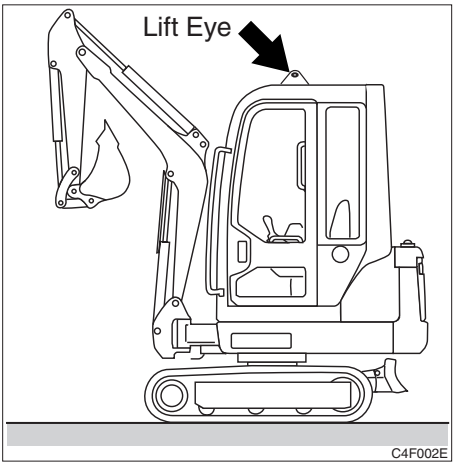
- **Know and use correct crane signals.**
- **Inspect the hoisting equipment daily for damaged or missing parts.**
- **Keep all other persons out of the area when hoisting. Do not move the machine over the heads of the persons.**
- **Do not hoist the machine with an operator(s) on it.**
- **When hoisting, use a wire rope with sufficient strength with respect to the machine's weight.**
- **Do not hoist with the machine in a posture other than the one described in the procedure below. Doing so is dangerous as it may result in the machine losing its balance.**

IMPORTANT: This hoisting method applies to machines with standard specifications.



When hoisting this machine with a crane, use a two leg sling with a 60 degree sling angle. Each leg of the sling must have a minimum length of 810 mm (31.9 in.).

Hoisting posture



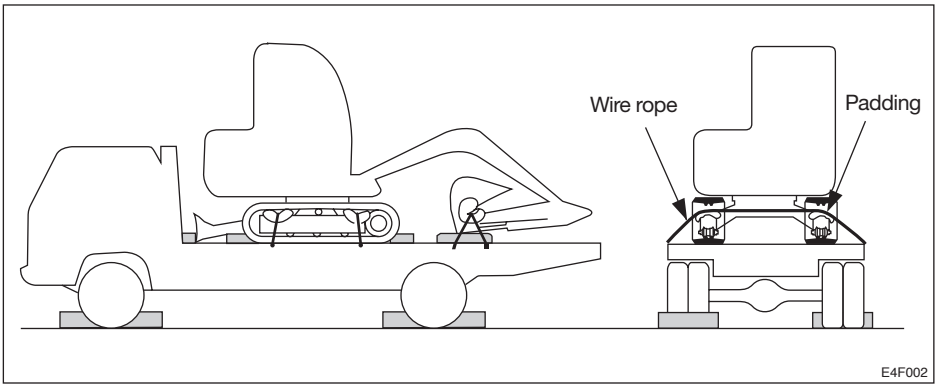
1. Park the machine on a level surface.
2. Slew the upper structure so that the dozer blade is positioned to the rear of the body (so that the crawler frame and upper structure are parallel).
3. Fully extend the bucket, arm and boom cylinders.
4. If the boom is swung to either the left or right side, set it so that it is straight ahead.
5. Raise the dozer blade.
6. Set the safety lock lever securely to the locked position.
7. Stop the engine and remove the starter key and get off the machine.
8. Fix the sling to the lift eyes.

Hoisting

1. Hoist slowly until the machine just leaves the ground.
2. Stop hoisting until the machine is stable.
3. Hoist slowly.

After loading the machine in the designated position, secure it as described below.

Transporting Posture



1. Lower the dozer blade.
2. Fully extend the bucket and arm cylinders, then lower the boom.
3. Stop the engine and remove the starter key.
4. Set the safety lock lever securely to the locked position.
5. Set stoppers in front and behind the crawlers.
6. Put a chain or wire rope over the lower frame and fasten it securely to prevent sideways slippage.
7. Secure the bucket with a chain or wire rope.

IMPORTANT: Place a wooden block under the bucket so that it is not damaged by hitting the floor.

Cautions on Transporting

⚠ WARNING

- **Know and follow the safety rules, vehicle code and traffic laws when transporting the machine.**
- **Consider the length, width, height and weight of the truck with the machine loaded on it when determining the best route.**

MAINTENANCE

Maintenance Description

For long-term use of the machine under good conditions, perform the inspection and maintenance procedures properly and safely as recommended in this manual.

The inspection and maintenance items are divided according to the machine's total operating time (inspection and maintenance to be performed every 10 hours (walk-around and daily inspection), every 50 hours, every 250 hours, etc.). Refer to the hour meter to determine when it is time to perform 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 indicated on the Maintenance Chart.

Cautions on Maintenance

Do not perform inspection and maintenance procedures not prescribed in this manual.
Have inspection and maintenance procedures not prescribed in this manual performed by a Takeuchi sales or service outlet.

Always keep the machine clean

- Always keep the machine clean, and wash it before performing inspection and maintenance.
- When washing the machine with water, stop the engine and cover the electrical system with plastic to protect it from water. Exposing the electrical system to water is dangerous and could result in short-circuits or malfunction. Do not wash the battery, electronic control components, sensors, connectors or the inside of the cab with water or steam.

Fuel, lubricant and grease

- For fuels, lubricant and grease, follow the instructions on the "Fuel and Lubricant Chart".
- Use pure 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 fueling

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

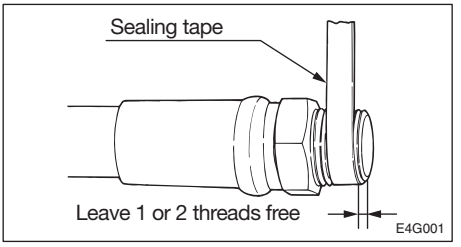
Do not clean parts with fuel
Do not use fuel to clean parts. Use a non-combustible cleaning agent.

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 mounting surfaces
When mounting 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 a Takeuchi sales or service outlet.

Seals and split pins
- Replace removed seals and split pins with new ones.
- When mounting, be careful not to damage or twist the seal.

Sealing tape



- When wrapping sealing tape around plugs, etc., remove any old sealing tape from the threads and clean the threads.
- Wrap the sealing tape tight, leaving 1 or 2 threads at the tip free.

Disposing of wastes
- Collect spent fluids from the machine in containers. Disposing of wastes irresponsibly damages the environment.
- Dispose of oil, fuel, cooling water, coolant, filters, batteries and other harmful substances as prescribed by law.

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 all the operating levers and check that the machine is operating properly.

Cautions on handling of battery cables
- Disconnect the battery cables (+,-) before working on the electrical system or doing any welding.
  Remove the negative (-) battery cable first.
  When reconnecting the battery, connect the negative (-) battery cable last.
- Do not disconnect the battery cables while the engine is running. Doing so could damage the electronic circuitry of the alternator and other parts.

Fuel and Lubricant Chart

Use different fuels, lubricants and greases according to the temperature, referring to the chart below.

- Change the lubricant earlier than as shown in the table if it is extremely dirty or its performance has deteriorated severely.
- Whenever possible, use the same brand of lubricant as before. If changing with a different brand, replace the entire quantity – do not mix different brands.

Part	Type	Type by temperature -22 -4 14 32 50 68 86 104 °F -30 -20 -10 0 10 20 30 40 °C	Replacement interval	Capacity L (US. qt.)
Engine oil pan	Diesel engine oil API - CD	SAE 5W-20 SAE 10W-30 SAE 15W-40	After first 50 hrs. Every 250 hrs.	Upper limit: TB014: 3.0 (3.2) TB016: 2.8 (3.0) Lower limit: TB014: 1.7 (1.8) TB016: 1.5 (1.6)
Hydraulic tank	Antiwear hydraulic oil (Option: Biodegradable oil)	ISO VG32 ISO VG46 ISO VG68	Every 2000 hrs.	System: TB014: 33 (34.9) TB016: 33.5 (35.4) Tank: 23 (24.3)
Engine cooling system	Coolant (water* + coolant**)	50% coolant mixture 30% coolant mixture	Every 1000 hrs.	3.4 (3.6)
Travel reduction gear	Gear oil API-GL-4	SAE 90	After first 250 hrs. Every 1000 hrs.	0.33 (0.35)each
Slew motor pinion	Lithium based grease EP-2 NLGI No. 2	——	Every 50 hrs.	As required
Slew bearing			Every 50 hrs.	
Working equipment			Daily or every 10 hrs.	
Levers			When required	

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

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
ASTM D975 No. 1D S15 No. 2D S15	USA	**ISO 8217 DMX**	International
EN590:96	European Union	**BS 2869-A1 or A2**	United Kingdom

Part	Type		Capacity Lit. (US. gal.)
Fuel tank	Diesel fuel	Use a clean, Quality fuel for good performance and optimum engine life. ● To prevent fuel flow problems in cold weather, use diesel fuel with a pour point of at least 12°C (53.6°F) below the lowest expected ambient temperature. ● Minimum cetane number is 45. Low temperature or high altitude operation may require the use of fuel with a higher cetane number. ● Use fuel with sulfur content of less than 0.05 to 0.0015% by volume. Especially in the U.S.A. and Canada, ultra-low sulfur fuel should be used. A higher sulfur content fuel may cause sulfuric acid corrosion in the cylinders of the engines. ● NEVER mix kerosene, used engine oil, or residual 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.	21 (22.2)

Expendables

Replace expendables such as filters and elements periodically, referring to the table below.

Item	Part name	Part No.	Replacement interval
Hydraulic oil return filter	Element	1551101300	After first 50 hrs. Every 500 hrs.
Fuel filter	Element	< TB014 > KRA211-51281 < TB016 > Y119810-55650	Every 500 hrs.
Engine oil filter	Cartridge	< TB014 > K15852-32431 < TB016 > Y119305-35160	After first 50 hrs. Every 250 hrs.
Air cleaner	Element (outer)	< TB014 > K1G659-11221 < TB016 > Y119515-12520	Every 1000 hrs. or after 6 cleanings (whichever comes first)
	Inner Element (option)	1911101342	When the outer elements are replaced.

Tools

No.	Part name	Part No.	Remarks
1	Spanner	1910212081	10-12 <TB014>
1	Spanner	1910047081	10-12 <TB016>
2	Spanner	1910212082	12-14 <TB014>
3	Spanner	1910212083	13-17 <TB014>
3	Spanner	1910047082	14-17 <TB016>
4	Socket wrench	1910212084	19-22 <TB014>
5	Screwdriver	1910212085	(+) (–) <TB014>
5	Screwdriver	1910006112	(+) (–) <TB016>
6	Filter wrench	0339222610	< TB014 >

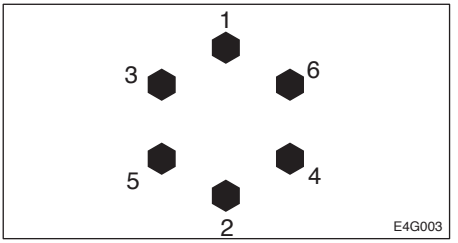
No.	Part name	Part No.	Remarks
7	Filter wrench	1910096081	< TB016 >
8	Monkey wrench	1690400250	250mm
9	Spanner	1690100013	13
10	Spanner	1690001922	19-22
11	Spanner	1690900026	26
12	Pliers	1690500200	200mm
13	Grease gun	1691060600	600cc
14	Tool case	1691400005	
15	Drain connector	1554512201	for EU

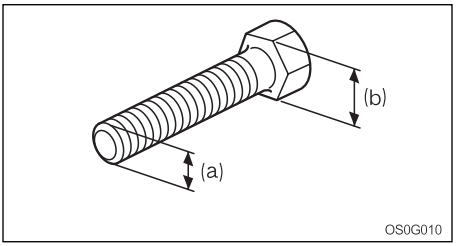
Tightening Torques

Nuts and Bolts (for ISO strength category 10.9)

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

- Tightening torques when mounting plastic covers differ from the values on the table below. Consult a Takeuchi sales or service outlet. Tightening too strongly will break the cover.
- 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 tightened uniformly.





Thread	Head width (b)	Size (a) X Pitch	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

For safe use, the machine must be serviced periodically. To increase safety, periodically replace the parts listed in the following table of important parts.
Serious injury or a fire could result if they deteriorate or are damaged.

Table of Important Parts

Unit		Important parts to be replaced periodically	Replacement Interval
Fuel system		Fuel hoses	Every 2 years
		Packing in fuel filler cap	
Heater & AC systems		Heater hoses	
		Air conditioner hoses	
Hydraulic system	**Machine body**	Hydraulic hoses (Pump - delivery)	
		Hydraulic hoses (Pump - suction)	
		Hydraulic hoses (Slew motor)	
		Hydraulic hoses (Travel motor)	
	Working equipment	Hydraulic hoses (Boom cylinder lines)	
		Hydraulic hoses (Arm cylinder lines)	
		Hydraulic hoses (Bucket cylinder lines)	
		Hydraulic hoses (Swing cylinder)	
		Hydraulic hoses (Blade cylinder)	
		Hydraulic hoses (Span cylinder)	
		Hydraulic hoses (Pilot valve)	
		Hydraulic hoses (Auxiliary lines)	
		Seat belt	Every 3 years

Above important parts are vulnerable to aging and wear or deterioration and it is difficult to determine the degree to which they have deteriorated on the occasion of periodic service. To maintain their proper function at all times, therefore, replace them with new ones after using them for a specific period of time even if no abnormality is found with the parts. If you find abnormalities in these parts before their scheduled replacement time is reached, repair or replace them immediately. If a hose clamp is deformed or cracked, replace it immediately.
When replacing the important parts, please contact a Takeuchi sales or service outlet .

Also check the hydraulic hoses other than the above important parts. If any abnormality is found in them, retighten them or replace them immediately.
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	Leakages from joints, hydraulic or fuel hoses.
Monthly inspection	Leakages from joints, hydraulic or fuel hoses. Damaged hydraulic or fuel hoses (cracks, wear and tear).
Annual inspection	Leakages from joints, 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 Items	See page
Walk-Around Inspection	
Inspecting by opening the engine hood and covers	105
Inspecting by walking around the machine	106
Inspecting while sitting in the operator's seat	106
Daily Inspection (Every 10 Hours)	
Inspecting and replenishing the coolant	107
Inspecting and replenishing the engine oil	108
Inspecting the dust indicator	108
Inspecting the water separator	109
Checking the fuel level	109
Inspecting the hydraulic oil level and replenishing	110
Lubricating the working equipment	111
After First 50 Hours (New Machines Only)	
Replacing the hydraulic oil return filter	112
Replacing the engine oil and oil filter	113
Inspecting and adjusting the fan belt	114
Every 50 Hours	
Inspecting and adjusting the crawler tension	115
Lubricating the slew bearing	116
Lubricating the slew motor pinion	117
Inspecting the battery fluid level and replenishing	117
Draining the fuel tank	118
Every 100 Hours	
Cleaning the fuel filter	119
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After First 250 Hours (New Machines Only)	
Replacing the travel motor gear oil	120

Maintenance Items	See page
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Inspecting and adjusting the fan belt	121
Cleaning the air cleaner	121
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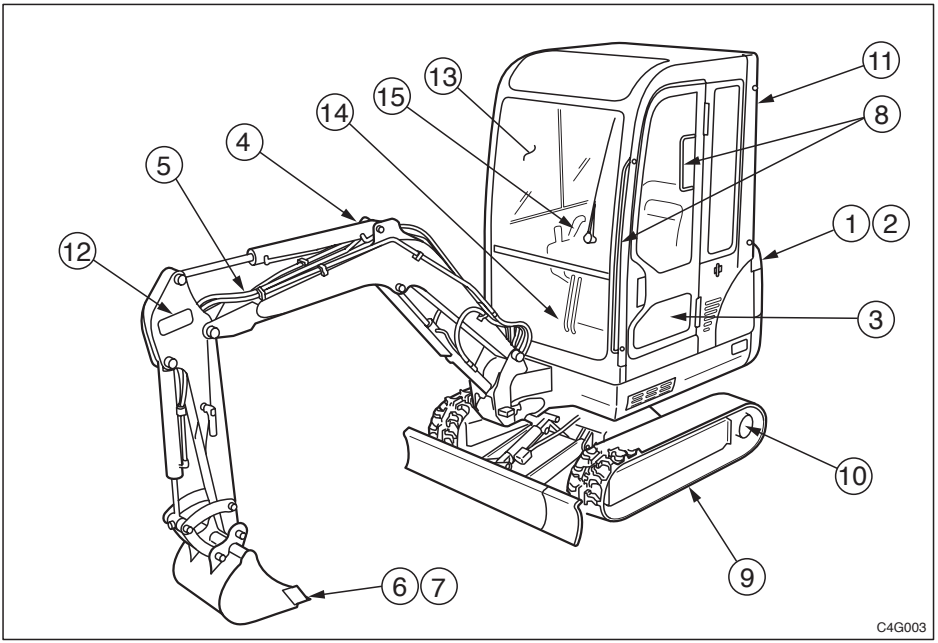
Perform the following inspections once every day before starting the engine the first time.

⚠ WARNING

- **Before operating, perform the walk-around inspections and make repairs immediately should any irregularities be found.**
- **Be sure to secure the engine hood or cover when opening it. Do not open the engine hood or cover on slopes or in strong wind.**

Before starting the engine, look around the machine and lower body, clean any combustible materials off high temperature parts of the engine, and inspect for such irregularities as oil leakage, water leakage and looseness of nuts and bolts.



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 and 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 step for damage and loose bolts.
9. Check the crawler, shoe slide, track roller, idler and sprocket 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.
    Check the rear view mirror and room mirror for dirt, damage, and angle adjustment.
12. Check the labels for dirt and damage.

Inspecting While Sitting in the Operator's Seat

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

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

⚠ WARNING

- **Before operating, perform the Daily inspections and make repairs immediately should any irregularities be found.**
- **Be sure to secure the engine hood or cover when opening it. Do not open the engine hood or cover on slopes or in strong wind.**

Inspecting and Replenishing the Coolant

⚠ WARNING

Do not remove the radiator cap or drain plugs when the coolant is hot. Stop the engine, let the engine and radiator cool and loosen the radiator cap or drain plugs slowly.

Inspection

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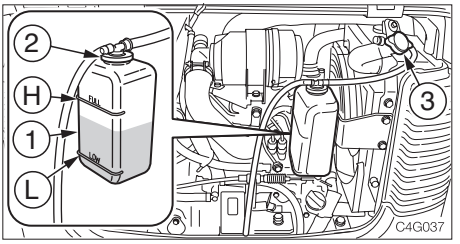

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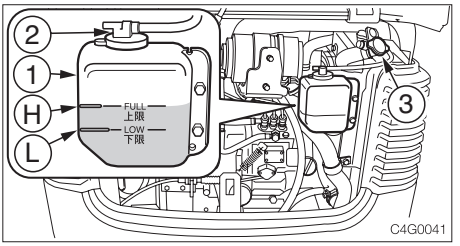

1. Open the engine hood.
2. Inspect the quantity of coolant in the reserve tank (1).
   The level should be between the upper limit (H) and lower limit (L).
   If it is below the lower limit (L), replenish.

Replenishing

1. Remove the reserve tank's cap (2).
2. Add coolant up to the upper limit (H) of the reserve tank (1).
   If the reserve tank is empty, inspect for fluid leakage, then inspect the radiator coolant level. If it is low, add water to the radiator first, then to the reserve tank.
3. Install the cap (2).

Inspecting and Replenishing the Engine Oil

⚠ WARNING

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

Inspection

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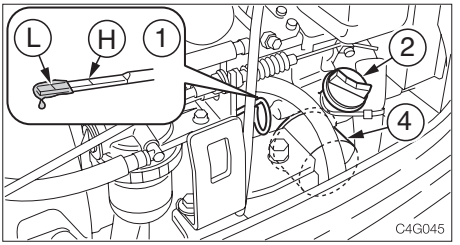

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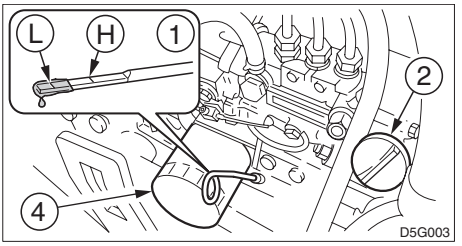


1. Open the engine hood.
2. Pull out the dipstick (1) and wipe off the oil with a rag.
3. Fully reinsert the dipstick (1), then pull it back out.
4. Check the oil on the dipstick (1).
   The level should be between the upper limit (H) and lower limit (L).
   If it is below the lower limit (L), replenish.

Replenishing

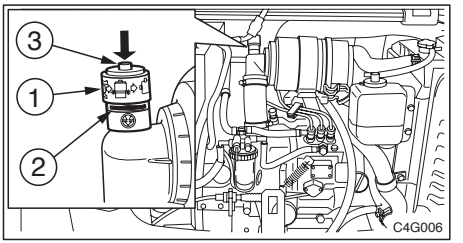
1. Remove the oil supply cap (2).
2. Add oil up to the upper limit (H) of the dipstick (1).
   Problems could arise if the oil level is either too low or too high.
3. Tighten the oil supply cap (2).
4. Start the engine, run it at low idle for about 3 minutes, then stop it.
5. After about 10 minutes,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

Inspecting the Dust Indicator

⚠ WARNING

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

The dust indicator indicates clogging of the air cleaner.



1. Open the engine hood.
2. Check that the red piston (2) is not sticking out of the dust indicator (1).
3. If the red piston (2) is sticking out, clean or replace the element immediately.
   Refer to page 121 “Cleaning the Air Cleaner”.
4. After the operation is completed, press the button (3) on the dust indicator (1) to push the red piston (2) back in.

Inspecting the Water Separator

⚠ WARNING

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

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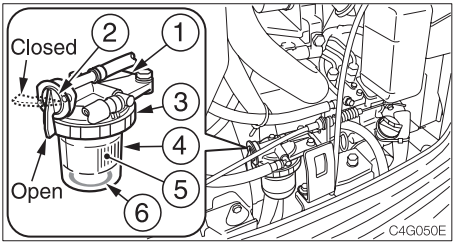

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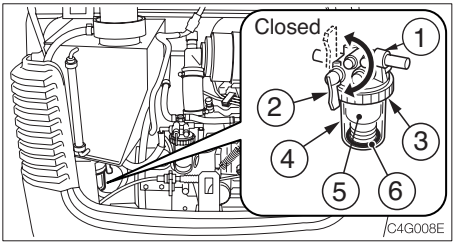
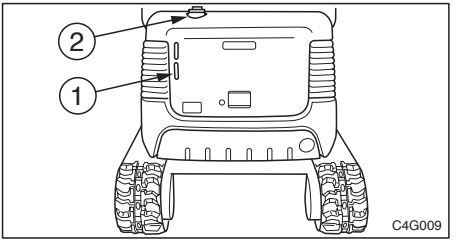


1. Open the engine hood.
2. Inspect the water separator (1).
   If the red indicator ring (6) is sunk to the bottom of the case (4), no water is mixed in.
   If the red indicator ring (6) is floating, there is water up to the bottom of the ring. Drain the water and clean.
   Refer to page 119 “Cleaning the Water Separator”.

Checking the Fuel Level

⚠ WARNING

- **Do not smoke or permit open flames while fueling or near fueling operations.**
- **Stop the engine in a well-ventilated place when adding fuel.**
- **Clean up spilled fuel immediately.**
- **Do not fill the fuel tank to capacity. Allow room for expansion.**
- **Tighten the fuel tank cap securely.**



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 page 42 “Fuel Filler Cap”.

Inspecting the Hydraulic Oil Level and Replenishing

⚠ WARNING

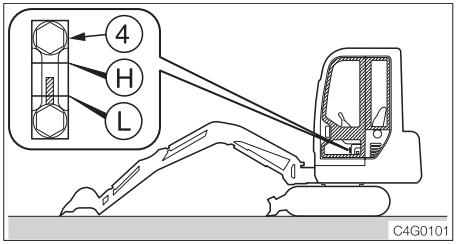
Oil may spurt out if caps or filters are removed or pipes disconnected before releasing the pressure in the hydraulic system.

- **Gradually loosen the vent plug to relieve tank pressure.**

Inspection

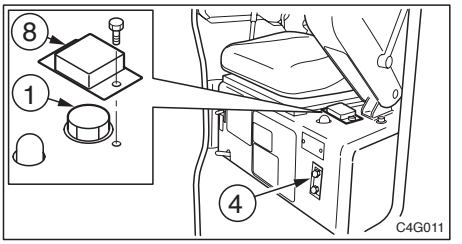
The oil level changes according to the oil temperature. Inspect the oil level in the hydraulic oil level inspection posture shown in the diagram.

- Hydraulic oil level inspection posture



1. Start the engine and run it at low speed.
2. Fully retract the arm and bucket cylinders and ground the bucket.
3. Ground the dozer blade, then stop the engine.
4. Inspect the oil level using the sight gauge (4).
   - When the oil temperature is about 20°C (68°F):
     The level should be halfway between the upper limit (H) and 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 near the upper limit (H).

Replenishing

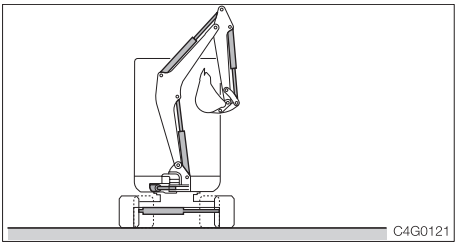


1. Set the left safety lock lever to the locked position.
2. Loosen the bolt and remove the cover (8).
   (For cab models)
3. Slowly turn the vent plug (1) to release the internal pressure, then remove.
4. Add hydraulic oil up to the middle of the sight gauge (4).
5. Pressurize the hydraulic tank using the procedure next.

Pressurizing the hydraulic tank

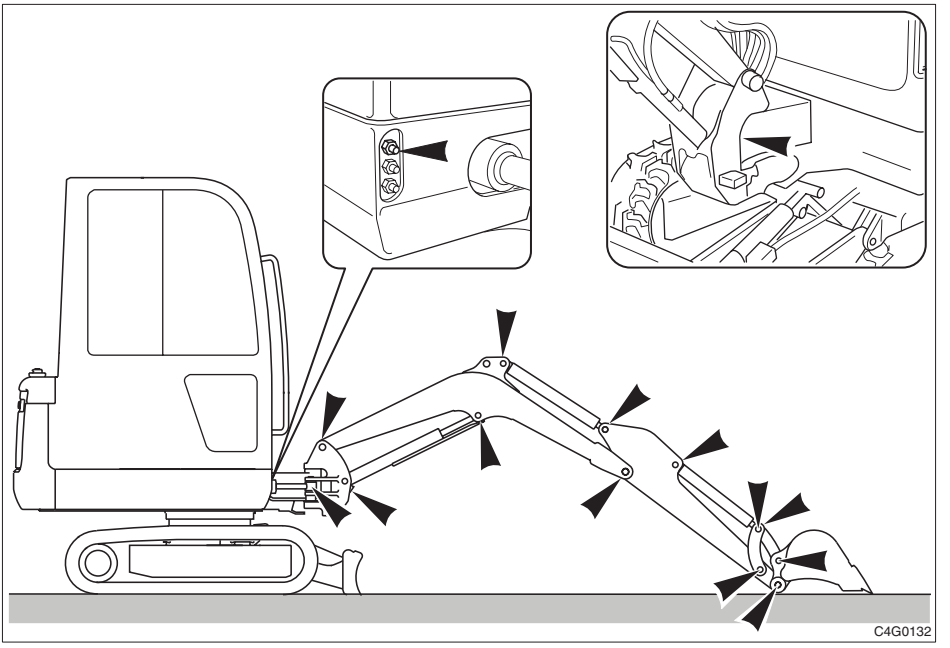
1. Start the engine and run it at low speed.
2. With the vent plug (1) removed, set the safety lock lever to the released position.

- Hydraulic tank pressurization posture



3. Fully extend the bucket, arm, boom and swing cylinders.
4. Stop the engine and set the left safety lock lever to the locked position.
5. Tighten the vent plug (1), then pressurize.

Lubricating the Working Equipment



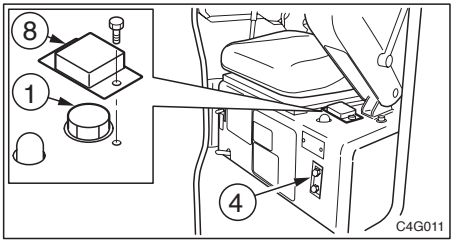
1. Set the machine to the lubrication posture shown in the diagram above, ground the working equipment, then stop the engine.
2. Use the grease gun to lubricate the grease nipples.
3. Wipe off the expelled grease.

Supplement: The dozer blade uses greaseless bushes, so there is no need to lubricate it.

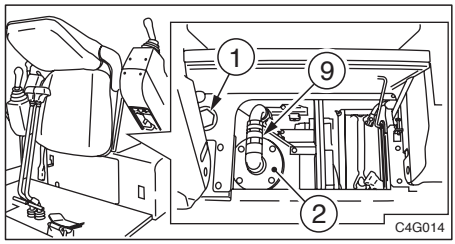
Replacing the Hydraulic Oil Return Filter

⚠ WARNING

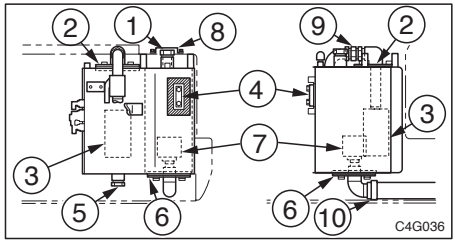
- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine, hydraulic lines and many other parts of the machine are hot directly after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic fluid is also hot and under high pressure.**
    Be careful when loosening caps and 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 disconnected before releasing the pressure in the hydraulic system.**
  - **Gradually loosen the vent plug to relieve tank pressure.**
  - **When removing plugs or screws or disconnecting hoses, stand to the side and loosen slowly to gradually release the internal pressure before removing.**



1. Set the left safety lock lever to the locked position.
2. Loosen the bolt and remove the cover (8).
   (For cab models)



3. Slowly turn the vent plug (1) to relieve tank pressure, then remove.
4. Open the maintenance cover.
5. Remove the four bolts from the cover (2).
6. Remove the adapter (9), then remove the cover (2).



7. Remove the return filter (3).
8. Install the new return filter.
9. Install the adapter (9) and cover (2).
10. Inspect the level with the sight gauge (4), and replenish if the level is low.
    Refer to page 110 “Inspecting the Hydraulic Oil Level and Replenishing”.
11. Pressurize the hydraulic tank.
    Refer to page 110 “Pressurizing the hydraulic tank”.

Replacing the Engine Oil and Oil Filter

⚠ 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 directly after the engine is stopped. Touching these parts will cause burns.**
- **The engine oil is also hot. Be careful when loosening caps and plugs. Working on the machine under these conditions could result in burns.**

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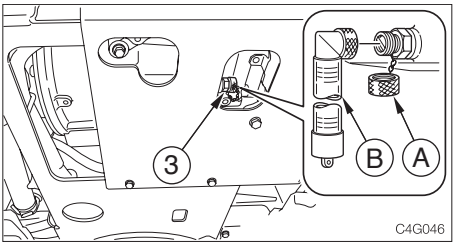

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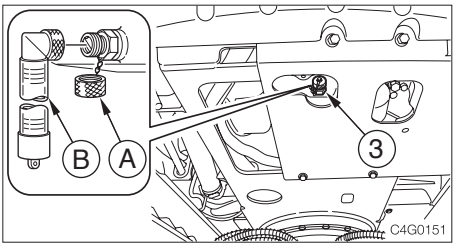

1. Place a pan for catching the spent oil under the drain plug (3).
2. Remove cap (A), install connector (B) and drain the oil. (The oil comes out when the screw is tightened.)
3. Remove connector (B) and install cap (A).

IMPORTANT: Check the spent oil. If it contains large amounts of metal powder, consult a Takeuchi sales or service outlet.

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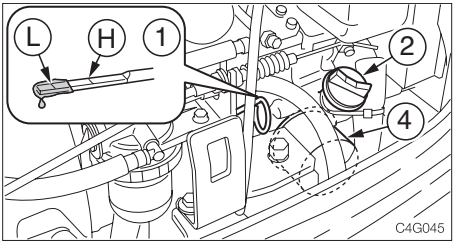

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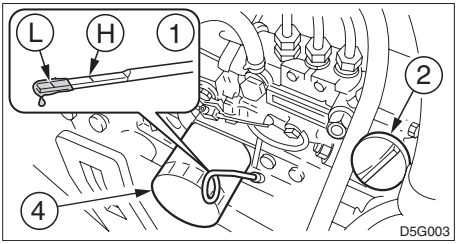


4. Using a filter wrench, turn the filter (4) counterclockwise and remove it.
5. Clean the surface of installation of the filter stand.
6. Apply a thin layer of oil to the packing of the new filter.
7. Install the new filter by hand.
8. Tighten 3/4 more turn after the filter packing comes in contact with the surface of installation.
9. Remove the oil supply cap (2).
10. Supply oil up to the upper limit (H) of the dipstick (1). Problems could arise if the oil level is either too low or too high.
11. Tighten the oil supply cap (2).
12. Start the engine, run it at low idle for about 3 minutes, then stop it.
13. After about 10 minutes, inspect the oil level.

Inspecting and Adjusting the Fan Belt

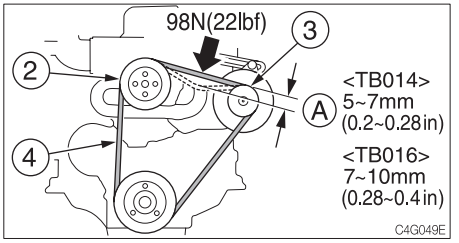
⚠ WARNING

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

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

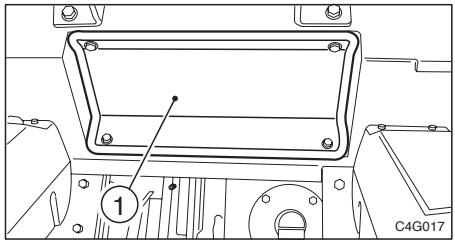
Inspection

1. Open the engine hood.

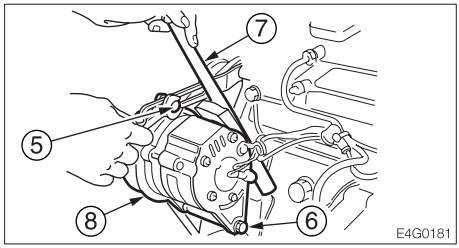


2. Press at the center of the fan pulley (2) and alternator pulley (3) and check the tension (about 98 N or 22 lbf).
   Proper slack (A) :
   < TB014 >
   5 to 7 mm (0.2 to 0.28 in)
   < TB016 >
   7 to 10 mm (0.28 to 0.4 in)
3. Inspect the fan belt (4) and replace it if:
   - there are cuts or cracks.
   - the belt is worn and touches the bottom of the V groove in the pulley.
   - the belt stretches and cannot be adjusted.

Adjustment



1. Open the maintenance cover.
2. Remove the four bolts, then remove the cover (1).



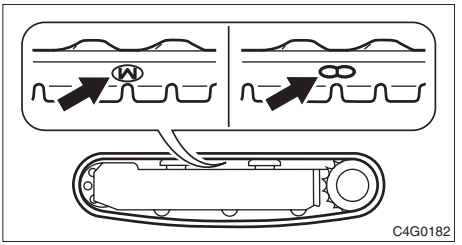
3. Loosen the adjustment bolt (5) and locking nut (6).
4. Using a lever (7), move the alternator (8) and adjust the slack.
5. Tighten the adjustment bolt (5) and locking nut (6).
6. Install the cover (1).

Inspecting and Adjusting the Crawler Tension

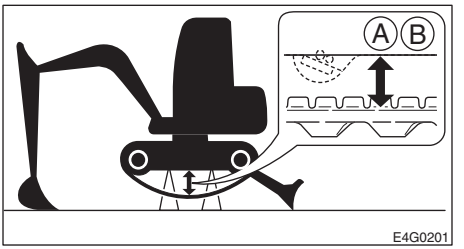
⚠ WARNING

- **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.**
- **The track adjuster contains highly pressurized grease. If the tension is adjusted without following the prescribed procedure, the grease discharge valve may fly off, resulting in injury.**
  - **Do not loosen the grease nipple.**
  - **Loosen the grease discharge valve slowly.**
  - **Do not put your face, arms, legs or body in front of the grease discharge valve.**
  - **If no grease is expelled when grease discharge valve is loosened, there is a problem. Contact your nearest service outlet for repairs. DO NOT disassemble, as this is very dangerous.**

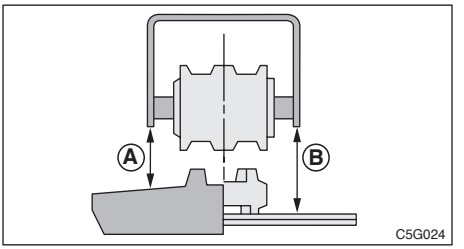
Inspection



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



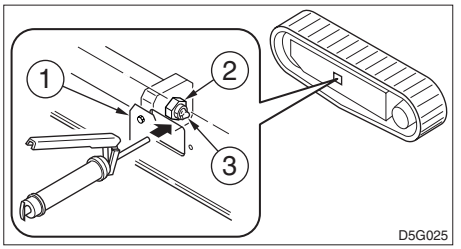
2. Use the operating devices to lift the body.
   Operate the levers slowly.



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) should be within the following range:
   (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.)

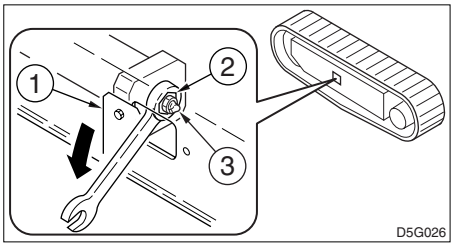
Adjustment

Increasing the tension



1. Remove the cover (1).
2. Using the grease gun, insert grease through the grease nipple (3) in the grease discharge valve (2).
3. Inspect the crawler tension.

Decreasing the tension

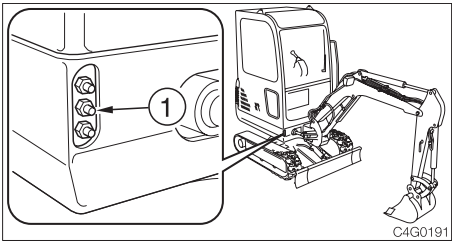


1. Remove the cover (1).
2. Using the Spanner, slowly loosen the grease discharge valve (2) and drain the grease.
   If the grease does not drain easily, move the machine forward or backward.
3. Tighten the grease discharge valve (2).
   - Tightening torque : 177 N·m (130 ft.lb.)

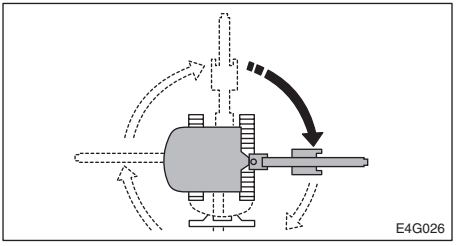
Lubricating the Slew Bearing

⚠ WARNING

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

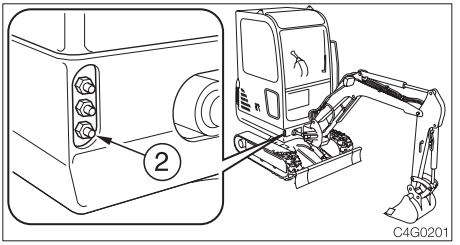


1. Stop the engine with the machine in the posture shown on the diagram above.
2. Use the grease gun to supply grease to the grease nipple (1).



3. Start the engine, lift the bucket and slew clockwise 90°.
4. Ground the bucket and stop the engine.
5. Repeat steps 2 to 4 above three times.
6. Wipe off the grease expelled from the slew bearing and grease nipple.

Lubricating the Slew Motor Pinion



1. Use the grease gun to supply grease to the grease nipple (2).
2. Wipe off the grease expelled from the grease nipple.

Inspecting the Battery Fluid Level and Replenishing

⚠ DANGER

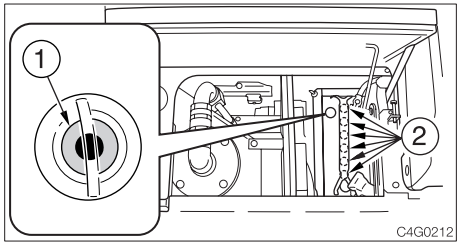
- **Do not use the battery when the fluid level is below the lower level. Doing so will hasten the deterioration of the internal portions of the battery and shorten the battery life, and can also cause rupturing (or an explosion).**
- **Batteries generate flammable and explosive gases. Keep arcs, sparks, flames and lighted tobacco away.**
- **Use a dampened cloth to clean the area of the fluid level lines and check the fluid level. Note that if this area is cleaned with a dry cloth, static electricity could cause ignition or explosion.**

⚠ WARNING

- **Do not fill the battery above the upper level. Doing so could cause the fluid to leak, contact and damage the skin, or cause parts to corrode.**
- **Batteries contain sulfuric acid which will damage eyes or skin on contact.**
  - **If acid contacts eyes, flush immediately with clean water and get prompt medical attention.**
  - **If acid is accidentally swallowed, drink large quantities of water or milk and call a physician immediately.**
  - **If acid contacts skin or clothing, wash off immediately with clean water.**

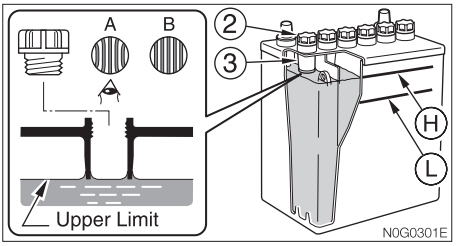
Inspection

IMPORTANT: Check the fluid level of all cells, even when the fluid level can be checked by 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 should be between the lines indicating the upper level (H) and lower level (L). If not, add distilled water up to line (H).

- If the fluid level can not be checked by fluid level lines.



Remove the caps (2) and look into the fluid supply 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 amount ..... (A)

The fluid reaches up to the bottom edge of the sleeve (3), so the surface tension causes the fluid to swell and the plate appears distorted.

Level too low ..... (B)

The fluid does not reach up to the bottom edge of the sleeve (3), so the plate appears laminar, not distorted.

4. Also check the terminals for looseness and dirt.

Replenishing

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

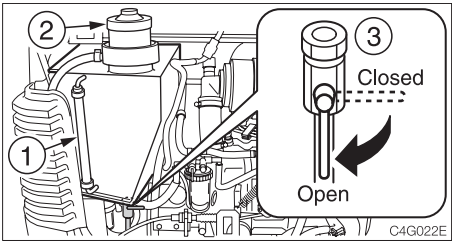
1. Remove the caps (2), and add distilled water until the upper level (H).
2. Inspect the indicator (1) then it turns blue.
3. Clean the cap's exhaust hole, then tighten the caps (2) securely.

Draining the Fuel Tank

⚠ 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.**

Do this before operating the machine.



1. Remove the fuel cap (2).
2. Place a pan under the drain cock (3).
3. Open the drain cock (3) and drain the water and sediment from the bottom of the tank.
4. Close the drain cock (3).
5. While watching the sight gauge (1), add fuel.
6. Tighten the fuel cap (2) and lock it with the key.

Refer to page 141 "Bleeding the air from the fuel system".

Cleaning the Fuel Filter

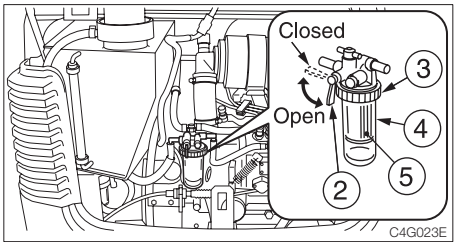
⚠ WARNING

- **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.**

< TB014 >

Refer to “Cleaning the Water Separator”.

< TB016 >



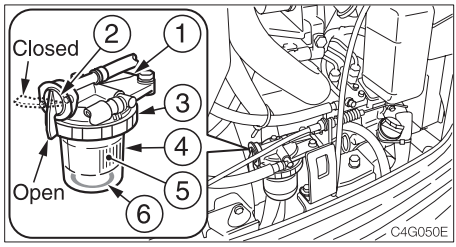
1. Open the engine hood.
2. Close the cock (2).
3. Loosen the ring (3), then remove the case (4) and element (5) and clean them.
4. Inspect the O-ring, and if there are any scratches or other irregularities, replace it.
5. Assemble the case (4) and element (5) and tighten the ring (3).
6. Open the cock (2) and bleed the air.
   Refer to page 141 “Bleeding the air from the fuel system”.
7. Start the engine and inspect for fuel leakage.

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.**

< TB014 >



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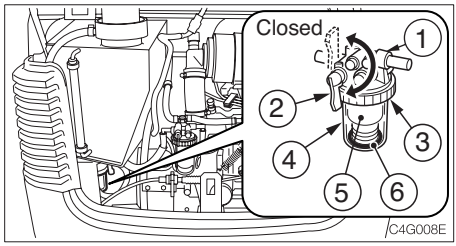
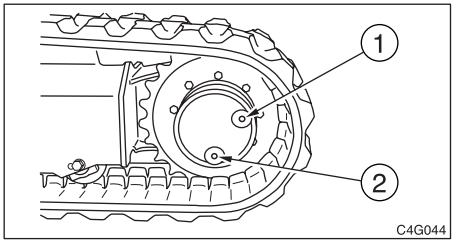


1. Open the engine hood.
2. Close the cock (2).
3. Loosen the ring (3), then remove the case (4), element (5) and indicator ring (6) and clean them.
4. Inspect the O-ring, and if there are any scratches or other irregularities, replace it.
5. Assemble the indicator ring (6), case (4) and element (5) and tighten the ring (3).
6. Open the cock (2) and bleed the air.
   Refer to page 141 “Bleeding the air from the fuel system”.

Replacing the Travel Motor Gear Oil

⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The travel motors are hot directly after the engine is stopped. Touching them will cause burns.**
  - **The gear oil is also hot and under high pressure.**
    Be careful when loosening plugs. Working on the machine under these conditions could result in burns or injuries.
- **The pressure in the travel motor reduction gears case 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 (2) is at the very bottom.
2. Place a pan for catching the spent oil under plug (2).
3. Remove plugs (1) and (2) and drain the oil.
4. Wrap new sealing tape around the plugs.
5. Tighten plug (2).
6. Supply oil through the hole for plug (1) until oil flows out of the hole.
7. Tighten plug (1).

Replacing the Engine Oil and Oil Filter

Refer to page 113 “Replacing the Engine Oil and Oil Filter”.

Inspecting and Adjusting the Fan Belt

Refer to page 114 “Inspecting and Adjusting the Fan Belt”.

Cleaning the Air Cleaner

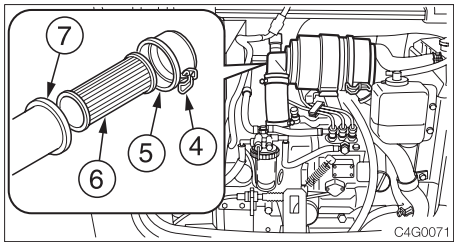
⚠ WARNING

- **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 directly after the engine is stopped. Touching these parts will cause burns.**
- **Wear required appropriate equipment such as safety glasses and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious personal injury.**

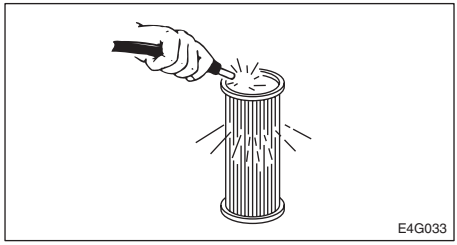
IMPORTANT: Be careful not to scratch the element. Do not use an element if it is damaged.
IMPORTANT: When operating the machine in very dusty places, inspection and maintenance should be performed every day.

Supplement: Do not remove and clean the inner element (option). Replace the inner element every 1000 hrs. or after every 3 cleaning of the outer element.
(whichever comes first)

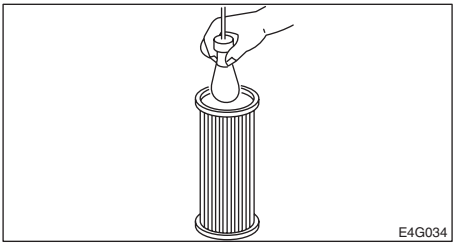
1. Open the engine hood.



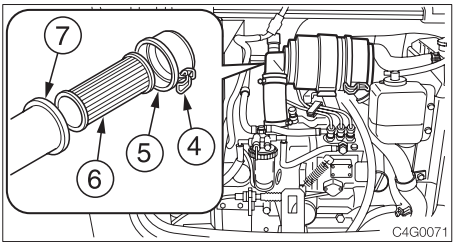
2. Loosen the clamps (4) and remove the dust cup (5).
3. Clean the inside of the dust cup (5).
4. Remove the element (6).
5. Cover the intake hole at the back of the body (7) with cloth or tape to prevent dirt from getting in.
6. Clean the inside of the body (7).



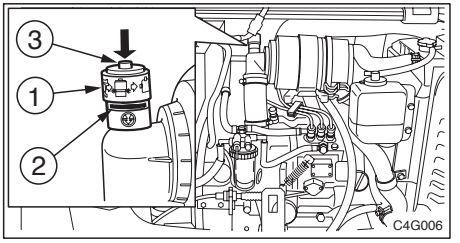
7. Clean the element (6) with dried compressed air {294 to 490 kPa (43 to 71 psi)}.
   First blow the air from the inside of the element along the flutes, then blow the air from the outside, and finally from the inside again.



8. Light up the inside of the element with a 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 element (6).
11. Install the dust cup (5) with the “TOP” mark at the top, then fasten it with the clamps (4).



12. Press the button (3) on the dust indicator (1) to push the red piston (2) back in.

Cleaning the Radiator Fins and Oil Cooler Fins

⚠ WARNING

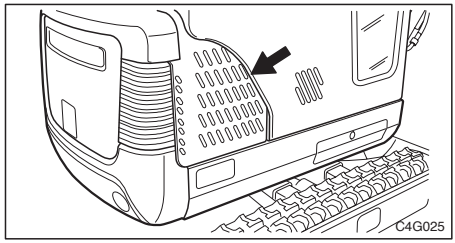
Wear required appropriate equipment such as safety glasses and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious personal injury.

IMPORTANT: Be careful not to damage the radiator fins and oil cooler fins when cleaning them.

- **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, inspection and maintenance should be performed every day.



1. Blow compressed air on the radiator fins and oil cooler fins to remove mud and dirt stuck on them.

Replacing the Hydraulic Oil Return Filter

Refer to page 112 “Replacing the Hydraulic Oil Return Filter”.

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.**

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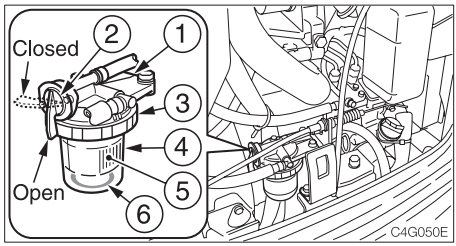

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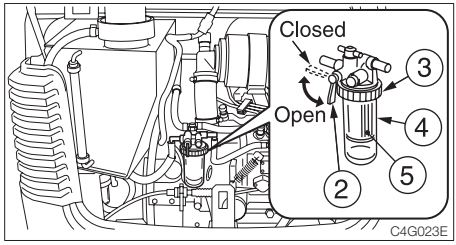


1. Open the engine hood.
2. Close the cock (2).
3. Loosen the ring (3), then remove the case (4), element (5) and the indicator ring (6) < TB014 >.
4. Clean the case (4).
5. Assemble the new element and the indicator ring (6) < TB014 > in the case (4), then tighten the ring (3).
6. Open the cock (2) and bleed the air.
   Refer to page 141 “Bleeding the air from the fuel system”.

Cleaning the Engine Cooling System

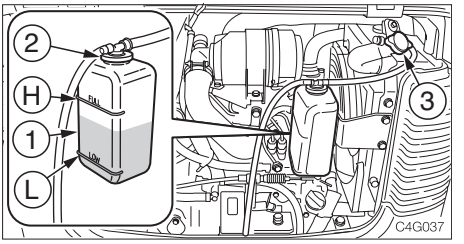
⚠ WARNING

- **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 directly after the engine is stopped. Touching these parts will cause burns.**
  - **The engine coolant is also hot and under high pressure. Be careful when loosening caps and 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 with one person sitting in the operator's seat while the other works on the machine.**
  - **When performing maintenance, be sure to keep your body and clothing away from moving parts.**
- **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 drain plugs when the coolant is hot. Stop the engine, let the engine and radiator cool and loosen the radiator cap or drain plugs slowly.**

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 before cleaning.

1. Open the engine hood.

< TB014 >



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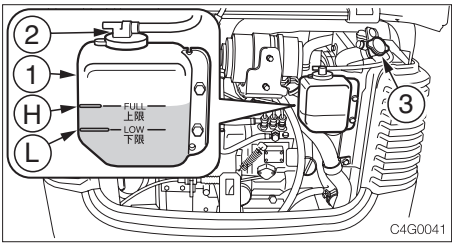

2. Gradually loosen the radiator cap (3) to release the internal pressure, then remove.

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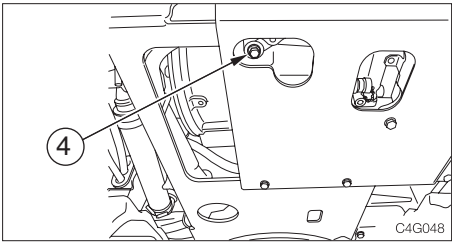

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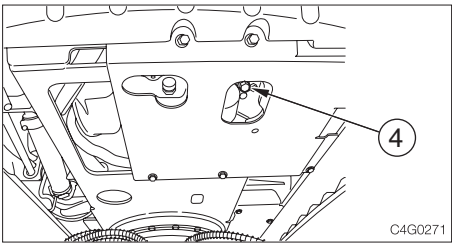


3. Place a pan for catching the spent coolant under the drain plug (4), then loosen the drain plug (4) and drain the coolant.
4. Tighten the drain plug (4).
5. Add tap water through the radiator's coolant supply port up to the top of the port. Take your time doing this, adding the water slowly to avoid any air from entering 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, then run the engine for about 10 minutes with the thermostat open.
8. Stop the engine, let the water's temperature lower, then loosen the drain plug (4) and drain the water.
9. After draining the water, clean using cleaning agent. Clean following the instructions included with the cleaning agent you are using.
10. Repeat steps 4 to 8 to rinse the cooling system.
11. Tighten the drain plug (4).
12. Slowly add the new coolant (mixture of antifreeze and tap water) through the radiator's coolant supply port up to the top of the port. Take your time doing this.
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. Raise the water temperature to at least 90°C, then run the engine as such for about 10 minutes.
16. Stop the engine, let the water's temperature lower, then check the level of coolant in the radiator, and replenish up to the top of the coolant supply port.
17. Close the radiator cap (3).
18. Clean the interior of the reserve tank (1), then add coolant to the upper limit (H).
19. After replacing the coolant, inspect the coolant level once again after operating the machine.
    The coolant permeates the entire system during operation, so the level decreases. Replenish by the amount the level has decreased.

Replacing the Air Cleaner Element

⚠ WARNING

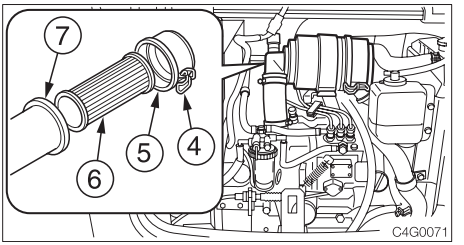
Stop the engine and allow the machine to cool down before performing maintenance.

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

IMPORTANT: Do not use an element if its flutes, gaskets or seals are damaged.

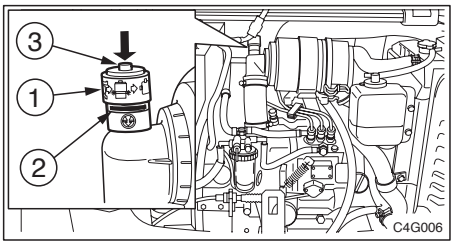
Supplement: Do not remove and clean the inner element (option). Replace the inner element every 1000 hrs. or after every 3 cleaning of the outer element.
(whichever comes first)

1. Open the engine hood.



2. Loosen the clamps (4) and remove the dust cup (5).

3. Clean the inside of the dust cup (5).
4. Remove the element (6).
5. Cover the intake hole at the back of the body (7) with cloth or tape to prevent dirt from getting in.
6. Clean the inside of the body (7).
7. Remove the cloth or tape applied in step 5.
8. Install the new element.
9. Install the dust cup (5) with the “TOP” mark at the top, then fasten it with the clamps (4).



10. Press the button (3) on the dust indicator (1) to push the red piston (2) back in.

Replacing the Travel Motor Gear Oil

Refer to page 120 “Replacing the Travel Motor Gear Oil”.

Inspecting and Adjusting the Engine Valve Clearance

This operation requires experience. Have it performed by a Takeuchi sales or service outlet.

Retightening the Engine Cylinder Head Bolts

This operation requires experience. Have it performed by a Takeuchi sales or service outlet.

Inspecting the Engine Fuel Injection Pressure and Spray Condition

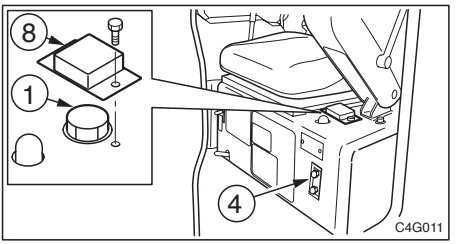
This operation requires experience. Have it performed by a Takeuchi sales or service outlet.

Replacing the Hydraulic Oil and Cleaning the Suction Strainer

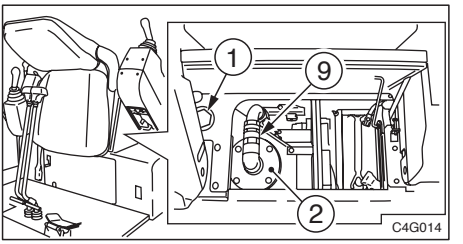
⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine, hydraulic lines and many other parts of the machine are hot directly after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic fluid is also hot and under high pressure.**
    Be careful when loosening caps and 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 disconnected before releasing the pressure in the hydraulic system.**
  - **Gradually loosen the vent plug to relieve tank pressure.**
  - **When removing plugs or screws or disconnecting hoses, stand to the side and loosen slowly to gradually release the internal pressure before removing.**

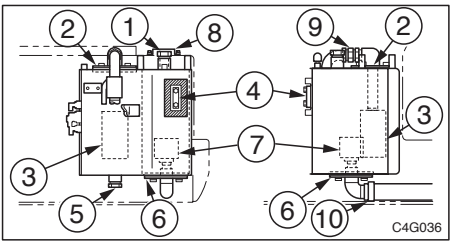
1. Slew 45° counterclockwise and set the machine to the hydraulic oil level inspection posture.
   Refer to page 110 “Inspecting the Hydraulic Oil Level and Replenishing”.
2. Set the left safety lock lever to the locked position.



3. Loosen the bolt and remove the cover (8).
   (For cab models)
4. Slowly turn the vent plug (1) to relieve tank pressure, then remove.



5. Open the maintenance cover.
6. Remove the four bolts from the cover (2).
7. Remove the adapter (9), then remove the cover (2).

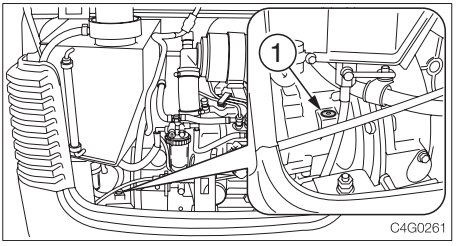


8. Remove the return filter (3).
9. Place a pan for catching the spent oil under the drain plug (5).
10. Loosen the drain plug (5) and drain the hydraulic oil.
11. Loosen the hose clip (10).
12. Remove the bolt, then remove the flange (6).

13. Remove the suction strainer (7) and clean it.
14. Clean the inside of the hydraulic tank.
15. Install the new return filter and suction strainer (7).
16. Install the cover (2) and connect the adapter (9).
17. Install the flange (6) and connect the hose.
18. Tighten the drain plug (5).
19. Insert hydraulic oil through the hole in the vent plug (1), adding hydraulic oil to between the upper limit (H) and lower limit (L) of the sight gauge (4).
20. Follow the procedure under “Bleeding the air” to bleed the air from the hydraulic oil circuit.
21. Set the machine to the hydraulic oil level inspection posture and inspect the level once the temperature of the oil has dropped.
    Refer to page 110 “Inspecting the Hydraulic Oil Level and Replenishing”.
22. Pressurize the hydraulic tank.
    Refer to page 110 “Pressurizing the hydraulic tank”.

Bleeding the air

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



1. Loosen the hydraulic pump’s air bleeding plug (1).
2. Once hydraulic oil overflows from the hole in the air bleeding plug (1), tighten the plug.
3. Start the engine and run it at low idle for 10 minutes.
4. Set the engine to a low idle, then extend and contract all the cylinders 4 or 5 times, without going to the stroke end.
5. Run the engine at high speed, then extend and contract all the cylinders 4 or 5 times, without going to the stroke end.
6. Set the engine back to a low idle, then extend and contract all the cylinders 4 or 5 times to the stroke ends.

Inspecting the Engine Fuel Injection Timing

This operation requires experience. Have it performed by a Takeuchi sales or service outlet.

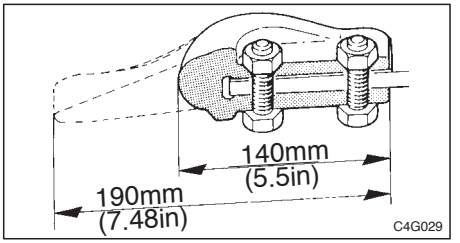
Inspecting the Engine Fuel Injection Valve

This operation requires experience. Have it performed by a Takeuchi sales or service outlet.

Replacing the Bucket Teeth

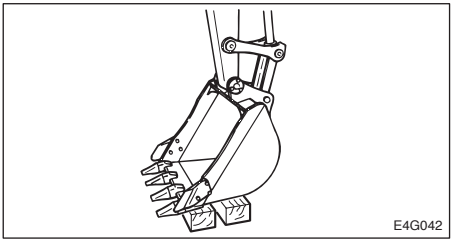
⚠ WARNING

- **Before performing maintenance or repairs under the machine, set all working equipment against the ground or in the lowermost position.**
- **To prevent unexpected movement, securely block the hoe attachment when repairing or replacing the cutting edges or bucket teeth.**
- **Wear required appropriate equipment such as safety glasses when using hammers, as metal fragments or other objects can fly and cause serious personal injury.**
- **Do not allow unauthorized personnel in the work area.**

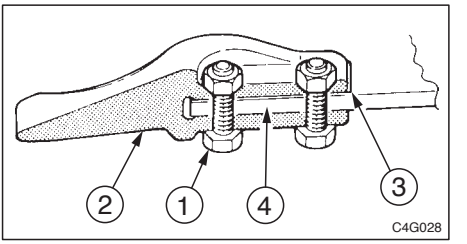


IMPORTANT: The bucket will be damaged if the teeth are not replaced at the proper interval. Replace the teeth if they wear down to 140 mm (5.5 in.).

Removal



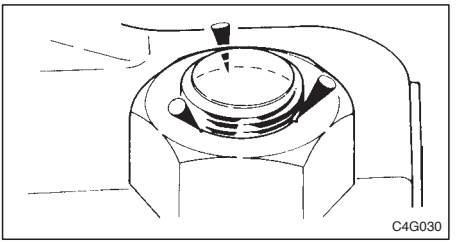
1. Set the bucket with its bottom flat on a block and the teeth sticking off the block.
2. Check that the bucket does not move, then set the safety lock lever to the locked position and stop the engine.



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

Installation

1. Insert the tooth (2) into the bucket (4).
2. If the tooth is loose, insert the shim (3) and adjust it.
3. Insert the bolt (1) from the outer (lower) side of the bucket and tighten it with a nut.
   - Tightening torque: 102 N·m (75.2 ft-lb.)



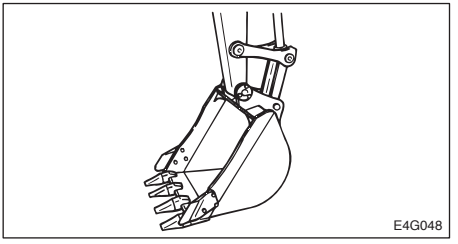
4. Use a punch to caulk or spot-weld the bolt's thread on the nut side at three places.

Replacing the Bucket

⚠ WARNING

- **Before performing maintenance or repairs under the machine, set all working equipment against the ground or in the lowermost position.**
- **If maintenance must be performed with the engine running, always work as a two-person team with one person sitting in the operator's seat while the other works on the machine.**
  - **When performing maintenance, be sure to keep your body and clothing away from moving parts.**
- **Wear required appropriate equipment such as safety glasses and filter mask when using hammers, as metal fragments or other objects can fly and cause serious personal injury.**
- **When lining up the pin holes, always do so by sight. Your finger may be cut off if you stick it into the hole.**

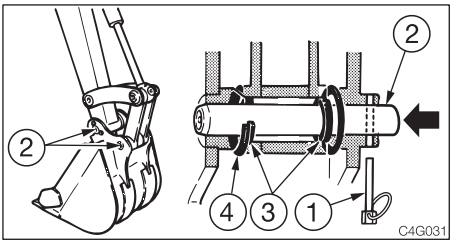
Removal



1. Ground the bucket as shown on the diagram above in a stable position.

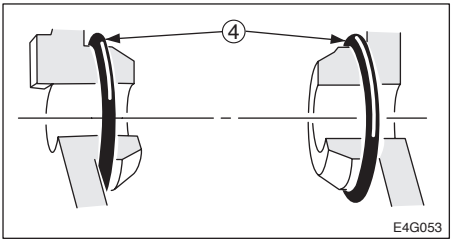
Supplement: When removing pins, set the bucket so that it is just gently against the ground. If it is strongly against the ground, the resistance will be great and it will be difficult to remove the pin.

2. Set the safety lock lever to the locked position and stop the engine.
3. Remove the ring of the lock pin (1) and remove the lock pin.

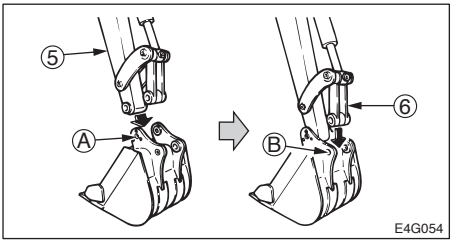


4. Hammer pin (2) out of the bucket.
5. Remove the bucket.
   Inspect the pin seal (3) and replace it if it is deformed or damaged. (See next page.)

Installation

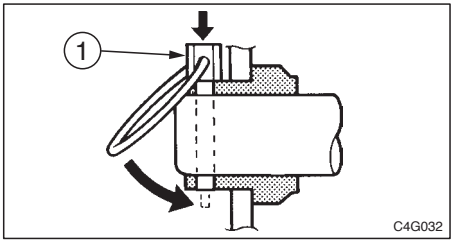


1. Set the bucket's O-ring (4) as shown on the diagram.

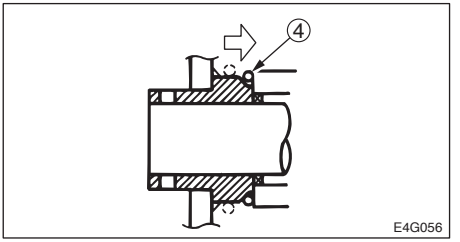


2. Line up pin hole (A) in the bucket with the pin hole in the arm (5), and install the pin (2).

3. Operate the cylinder, line up pin hole (B) in the bucket with the pin hole in the link arm (6), and install the pin (2).

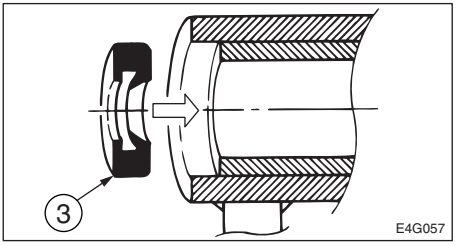


4. Line up the turn prevention holes, install lock pin (1), and set the ring on the inner side.



5. Slide the O-ring (4).

Replacing the pin seal



1. Set the pin seal (3) in the direction shown on the diagram above.
2. Use a mallet to slowly press the pin seal in. Be careful not to damage the seal.

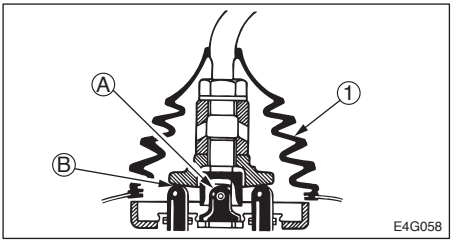
Lubricating the Levers

⚠ 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.

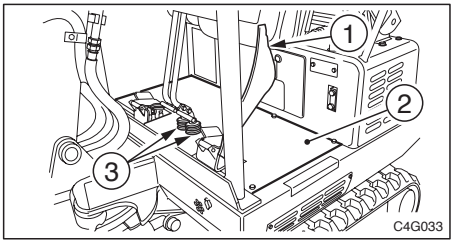
If the levers or pedals no longer move smoothly, supply grease.

Operating levers

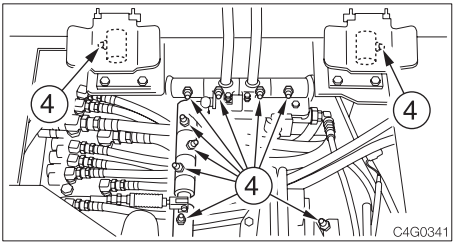


1. Remove the lower mount section of the boot (1) and turn it upwards.
2. Wipe off the old grease.
3. Supply grease to points (A) and (B).
4. Set the boot (1) back as it was.

Travel levers, blade lever and pedals



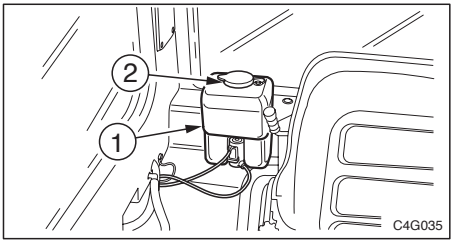
1. Remove the floor mat (1).
2. Loosen the bolts and remove cover (2).
3. Remove the lower mount section of the boot (3) and roll it up.



4. Use the grease gun to supply grease to the grease nipples (4).
5. Wipe off the expelled grease.
6. Reinstall the cover and floor mat, following the removal procedure in reverse order.

Inspecting and Replenishing the Windshield Washer Fluid

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



Inspection

1. Inspect the washer tank (1) and add washer fluid if the level is low.

Replenishment

1. Mix the washer fluid to the prescribed concentration.
2. Remove the cap (2) and add washer fluid.
3. Reinstall the cap (2).

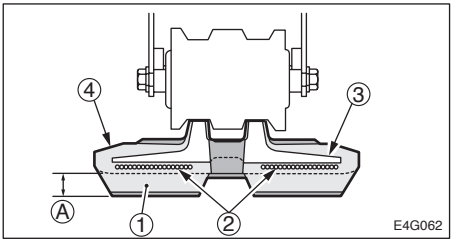
Inspecting the Rubber Crawlers

Repair or replace the rubber crawlers if their conditions are as described below. Consult a Takeuchi sales or service outlet about repairs or replacement.

Rubber crawler

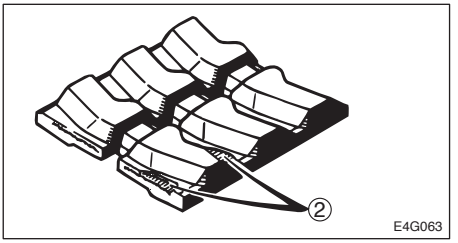
Replace the crawler if the entire crawler is stretched and cannot be adjusted.

(1) Lug



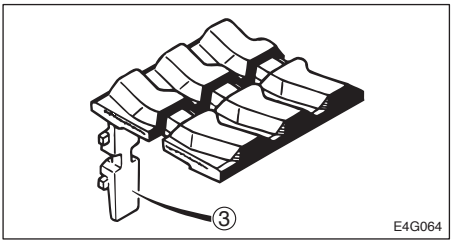
Replace if the height of (A) is 5 mm (0.2 in.) or below.

(2) Steel cord



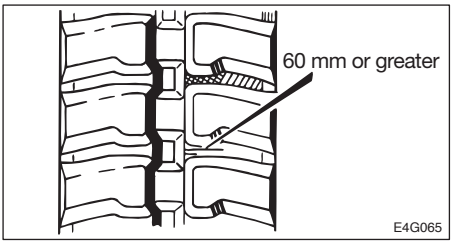
Replace if the steel cord is exposed over 2 or more links.
Replace if half or more of the steel cords on one side are cut.

(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.

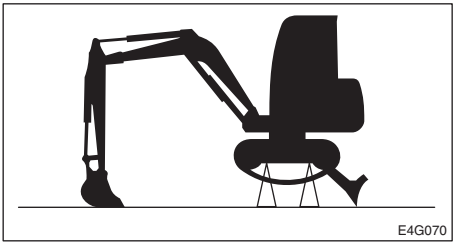
Replacing the Rubber Crawlers

⚠ WARNING

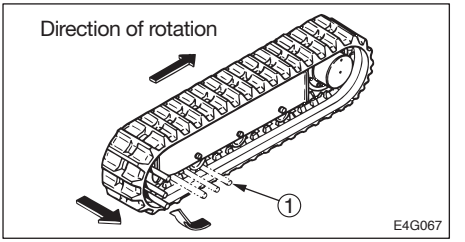
- **If you must work beneath the raised machine or equipment, always use wood blocks, jack-stands or other rigid and stable supports. Never get under the machine or working equipment if they are not sufficiently supported. This procedure is especially important when working on hydraulic cylinders.**
- **If maintenance must be performed with the engine running, always work as a two-person team with one person sitting in the operator's seat while the other works on the machine.**
  - **When performing maintenance, be sure to keep your body and clothing away from moving parts.**

Removal

1. Fully release the tension of the rubber crawler.
   Refer to page 115 "Inspecting and Adjusting the Crawler Tension".



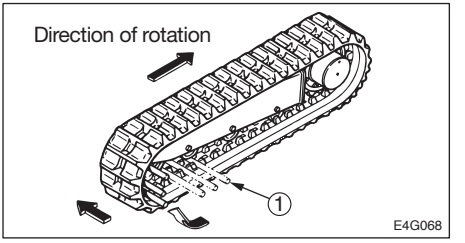
2. Use the working equipment to lift the body.



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 page 115 “Inspecting and Adjusting the Crawler Tension”.
8. Install the other rubber crawler using the same procedure.

Procedures for storage

If the machine is to be stored for 30 days or more, store it indoors. If it must be stored outdoors, stop it on wood laid out on a flat surface and place a waterproof cover over it so that it stays dry.

1. Clean the machine.
2. Inspect for oil leakage, water leakage 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 page 124 “Cleaning the Engine Cooling System”.
5. Use the grease gun to supply grease to the grease nipples.
6. Fully contract the bucket and arm cylinders and ground the bucket and dozer blade.
7. Apply rust-prevention oil to the hydraulic cylinder rods.
8. Disconnect the cable from the battery’s “–” terminal and cover the battery to prevent freezing.

During storage

⚠ WARNING

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

1. To prevent rusting, operate the machine once a month so that the oil is fully circulated.
2. Inspect the battery and recharge it if necessary.
   Have the battery charged by a Takeuchi sales or service outlet.

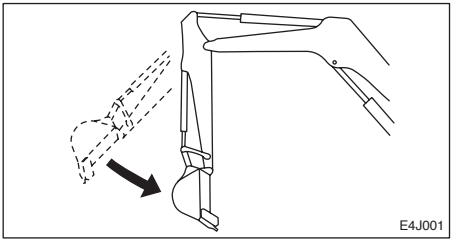
Starting the machine after storage

IMPORTANT: If the “Procedures for storage” have not been performed and the machine has been stored for a long period of time, consult a Takeuchi sales or service outlet before reusing the machine.

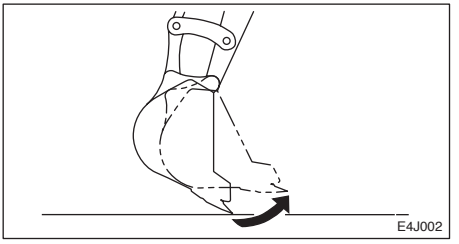
1. Wipe off the rust-prevention oil that was applied to the hydraulic oil cylinders’ piston rods.
2. Add fuel, oil and grease to all parts.

TROUBLESHOOTING

The following symptoms are not malfunctions:



- When the arm reaches the vertical position while contracting it while the engine is running at low speed, the contracting speed slows down momentarily.

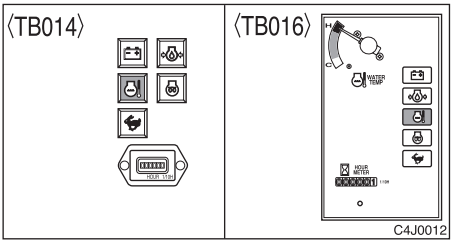


- When the bucket teeth reach the horizontal position while the engine is running at low speed, the speed of bucket movement slows down momentarily.
- The slew motor produces noise at the beginning and end of the slewing operation.
- The travel motor produces noise when stopped suddenly during high speed travel.
- The control valve produces noise if excessive force is applied to the working equipment and when the stroke end is reached.
- Performance decreases when an attachment weighing more than a standard arm or bucket is mounted.

⚠ WARNING

- **Do not open the engine hood when there is steam coming from the engine room. The steam or hot water may spurt out, resulting in burns.**
- **Do not remove the radiator cap or drain plugs when the coolant is hot. Stop the engine, let the engine and radiator cool and loosen the radiator cap or drain plugs slowly.**
- **Stop the engine and allow the machine to cool down before performing inspection and maintenance.**

The following symptoms indicate overheating:



- TB016: An alarm is sounded and the coolant temperature warning lamp flashes.
- TB014: The coolant temperature warning lamp lights.
- TB016: The water temperature gauge is in the red zone.
- The engine slows down and the force decreases.
- Steam comes from the engine room.

Procedure

1. Park the machine in a safe place.
2. With the engine hood closed, inspect whether steam is coming from the engine room.
3. If there is steam, stop the engine immediately and contact a Takeuchi sales or service outlet for repairs.
   If there is no steam, run the engine at low idle and let the water temperature decrease.
4. TB016: Once the water temperature gauge drops to the green zone, stop the engine.
   TB014: Once the coolant temperature Warning lamp turns off, stop the engine.
5. Once the engine is cool, perform the following inspections and procedures:
   - Fan belt slack ..... Adjust. Refer to page 114.
   - Coolant level ..... Add. Refer to page 107.
   - Water leakage ..... Repair.
   - Radiator fins ..... Clean. Refer to page 122.
   - Sediment in cooling system ..... Clean. Refer to page 124.

If the problem persists after the above procedures are taken, contact a Takeuchi sales or service outlet for repairs.

If the Battery Goes Dead

The following symptoms indicate that the battery is dead:

- The starter motor does not turn or turns weakly, and the engine does not start.
- The horn is weak.

Procedure

Use jumper cables and start the engine using the rescue vehicle's battery.

⚠ WARNING

- **Use jumper cables only in the recommended manner. Improper use of jumper cables can result in battery explosion or unexpected machine motion.**
  - **Do not let the problem vehicle and rescue vehicle touch each other.**
  - **Do not let the "+" and "–" clips of the jumper cables touch each other.**
  - **Connect the jumper cables to the "+" terminals first, and disconnect them from the "–" terminals (ground) first.**
  - **Connect the final clip of the jumper cable to a point as far away from the battery as possible.**
- **Use safety glasses when using jumper cables to start the machine.**

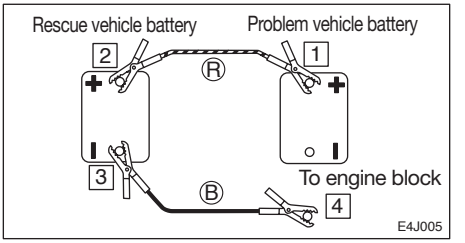
IMPORTANT: Use jumper cables and clips of a size suited to the battery's capacity. Do not used damaged or corroded jumper cables and clips.

IMPORTANT: The rescue vehicle's battery must have the same capacity as the problem vehicle's battery.

IMPORTANT: Connect the clips securely.

Connecting the jumper cables

IMPORTANT: Set the starter keys of both the rescue vehicle and problem vehicle to the OFF position.

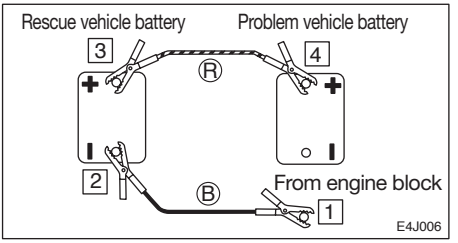


1. Connect the clip of jumper cable (R) to the problem vehicle's "+" terminal.
2. Connect the other clip of jumper cable (R) to the rescue vehicle's "+" terminal.
3. Connect the clip of jumper cable (B) to the rescue vehicle's "–" terminal.
4. Connect the other clip of jumper cable (B) to the problem vehicle's engine block. Connect the clip as far from the battery as possible.

Starting the engine

1. Check that the clips are securely connected to the terminals.
2. Start the rescue vehicle's engine and run it at high speed.
3. Start the problem vehicle's engine.

Disconnecting the jumper cables
Once the engine starts, disconnect the jumper cables following the connection procedure in reverse order.

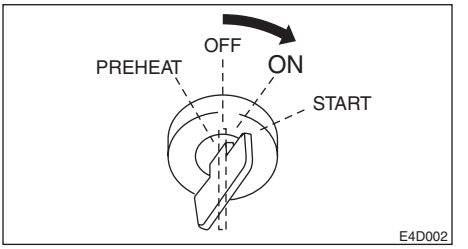


1. Disconnect the clip of jumper cable (B) from the problem vehicle's engine block.
2. Disconnect the other clip of jumper cable (B) from the rescue vehicle's "–" terminal.
3. Disconnect the clip of jumper cable (R) from the rescue vehicle's "+" terminal.
4. Disconnect the other clip of jumper cable (R) from the problem vehicle's "+" terminal.

Recharging
Have a Takeuchi sales or service outlet recharge batteries that have gone dead.

Bleeding the Air from the Fuel System

1. Add fuel.
2. Open the water separator and fuel filter cocks.



3. Turn the starter key to the ON position and hold it there for about 20 seconds.
   The automatic air bleeder bleeds the air from the fuel system.
4. Start the engine and inspect for fuel leakage.

Supplement: Air in the fuel system can make it difficult to start the engine and cause engine problems. Also bleed the air when the fuel tank is emptied or air in the fuel system.

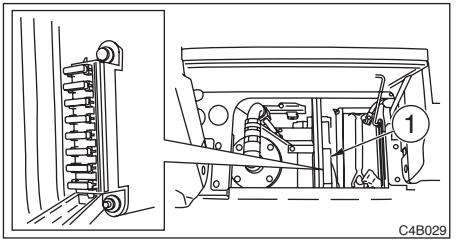
If a light does not turn on or the electric system does not operate, a fuse may be blown. Inspect the fuses.

Inspecting and Replenishing the Fuse

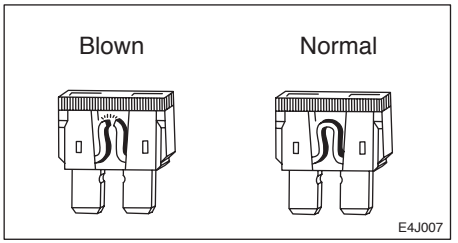
⚠ WARNING

If the fuse blows as soon as it is replaced, there is a problem with the electric system. Continued use may lead to fire. Consult a Takeuchi sales or service outlet.

1. Turn the starter key to the OFF position and stop the engine.



2. Open the maintenance cover.
3. Open the fuse box (1) and inspect for any blown fuses.

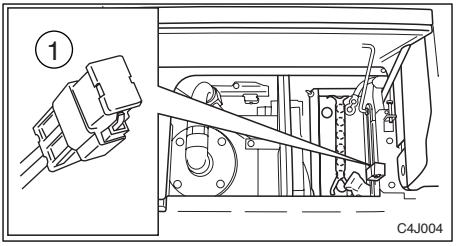


4. If a fuse is blown, replace it with a fuse of the same capacity.

Fuse Layout and Circuits Protected

Capacity	Protected circuit
30A	Stop solenoid
10A	Lever lock
10A	Second travel speed
20A	Lights, Tail lamp
15A	Heater, Radio
10A	Feed pump, Instrument panel
25A	External power socket, Cigarette lighter, Wiper (cab), Travel alarm (option)
10A	Horn, Clock(radio), Interior light

Inspecting the Fusible Link

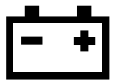


If the electric power is not switched on after turning the starter switch to the ON position, the cartridge type fusible link (1) might be blown open. Open the maintenance cover and inspect. If the fusible link is blown, please contact a Takeuchi sales or service.

Supplement: A fusible link is a large piece of fuse wiring which is mounted in a circuit which carries a large electrical current. Link a regular fuse, the fusible link protects the electrical parts and wiring from damage due to abnormally large currents.

If a Warning Lamp Lights

If an alarm is sounded or a warning lamp starts flashing during operation, park the machine in a safe place and perform the procedures described below.

Warning lamp	Lamp name	Procedure
 OSOB080	**Battery charge warning lamp**	There is a problem with the fan belt or charger. Inspect the fan belt for slack or breakage and adjust as necessary. If the lamp continues flashing or lights after maintenance, there is a problem with the charger. Consult a Takeuchi sales or service outlet. Refer to page 114 “Inspecting and Adjusting the Fan Belt”.
 OSOB070	**Engine oil pressure warning lamp**	Inspect the engine oil level. If the lamp is flashing or lit even though the level is normal or if it continues flashing or lights after oil is added, consult a Takeuchi sales or service outlet. Refer to page 108 “Inspecting and Replenishing the Engine Oil”.
 C4B012	**Coolant temperature warning lamp**	The coolant temperature has risen irregularly and the engine is overheating. Refer to page 139 “If the Engine Overheats”.

For symptoms not included on the table below or if the problem persists after the proper procedures have been taken, consult a Takeuchi sales or service outlet.

Symptom	Main cause	Procedure
Left and right operating levers do not move smoothly	● Insufficient grease on left and right operating levers	● Add grease. Refer to page 131.
Travel levers, blade lever or pedals do not move smoothly	● Insufficient grease on travel levers, blade lever or pedals ● Stretched wire	● Add grease. Refer to page 132. ● Adjust or replace. (Request at a sales or service outlet.)
Hoe attachment, slewing or traveling operation not possible	● Safety lock lever is raised ● Fuse is blown ● Faulty travel lock adjustment	● Lower the safety lock lever. Refer to page 49. ● Replace the fuse. Refer to page 142. ● Adjustment. (Request at a sales or service outlet.)
Digging force is insufficient	● Insufficient hydraulic oil level ● Hydraulic oil is not heated ● Air cleaner is clogged ● Hydraulic oil is not of suitable type	● Replenish to the prescribed level. Refer to page 110. ● Perform the warm-up procedure. Refer to page 68. ● Clean the air cleaner. Refer to page 121. ● Replace the hydraulic oil. Refer to page 127.
Traveling is not possible or not smooth	● Stones or foreign objects are stuck	● Remove the foreign object.
Machine does not travel straight forward	● Stones or foreign objects are stuck ● Faulty crawler tension adjustment	● Remove the foreign object. ● Adjust the crawler to the prescribed tension. Refer to page 115.
Travel speed cannot be changed	● Fuse is blown	● Replace the fuse. Refer to page 142.
Slewing is not possible or not smooth	● Insufficient grease on slew bearing	● Add grease. Refer to page 116.

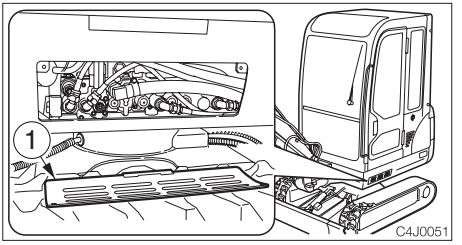
Symptom	Main cause	Procedure
Hydraulic oil temperature is too high	● Insufficient hydraulic oil	● Replenish to the prescribed level. Refer to page 110.
Starter motor turns but engine does not start	● Insufficient fuel ● Air in fuel system ● Water in fuel system	● Add fuel. Refer to page 109. ● Bleed the air. Refer to page 141. ● Drain the water. Refer to page 118.
Crawlers slip off	● Crawlers are too loose	● Adjust the tension. Refer to page 115.
Engine exhaust is white or bluish	● Excessive engine oil ● Insufficient fuel	● Adjust to the prescribed level. Refer to page 108. ● Replace the fuel.
Engine exhaust is occasionally black	● Air cleaner is clogged	● Clean the air cleaner. Refer to page 121.
Irregular noise is produced from the engine (combustion or mechanical noise)	● Low quality fuel is being used ● Engine is overheating ● Damage in muffler	● Replace the fuel. ● If the Engine Overheats Refer to page 139. ● Replace the muffler. (Request at a sales or service outlet.)

If the hoe attachment must be lowered to the ground while the engine is stopped, use the following procedure to do so.
This operation is dangerous and requires experience. Have it performed by a Takeuchi sales or service outlet.

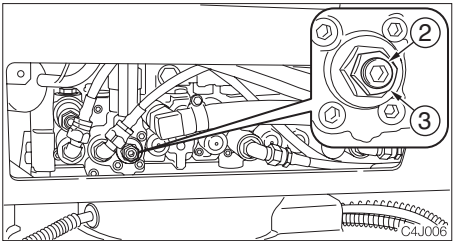
Procedure

⚠ WARNING

- **Do not approach in the area of the ground where the hoe attachment is to be lowered. You may be hit by dirt falling out of the bucket or the hoe attachment as it drops.**
- **Turn the shut-off valve's set screw slowly so that the boom lowers slowly. Do not turn the screw more than the specified amount.**



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



2. Gripping the set screw (2) with a hexagonal wrench so that it does not turn together with the lock nut (3), loosen the lock nut (3).
3. Turn the set screw (2) slowly 1/4 turns to lower the boom.
4. Check for safety and machine stability.
5. Turn the set screw (2) back to its original position.
6. Gripping the set screw (2) with a hexagonal wrench so that it does not turn together with the lock nut (3), tighten the lock nut (3).
   • Tightening torque: 19.6 N·m (14.5 ft-lb.)
7. Close the left side cover (1).

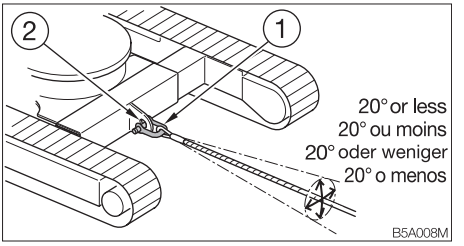
⚠ WARNING

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

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

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.
IMPORTANT: Be sure to follow the steps below closely when using the towing hole to tow. Failure to heed even one of the steps may cause damage to the towing hole or other parts of the frame.

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.



- Maximum tractive force:
  TB014: 22.3 kN (5013 lbf)
  TB016: 24.3 kN (5463 lbf)

1. Attach the wire rope to the shackle (1).
2. Fasten the shackle (1) to the towing hole (2).
3. Make sure that the wire rope is at a cone angle of 20° or less to the travel frame.
4. Move the machine to tension the wire rope.
5. Operate the machine slowly and tow.

Applicable machine models
TB014: 114100752 or later
TB016: 116110826 or later

SPECIFICATIONS

TB014 Equipped with 830 mm (33 in.) Arm

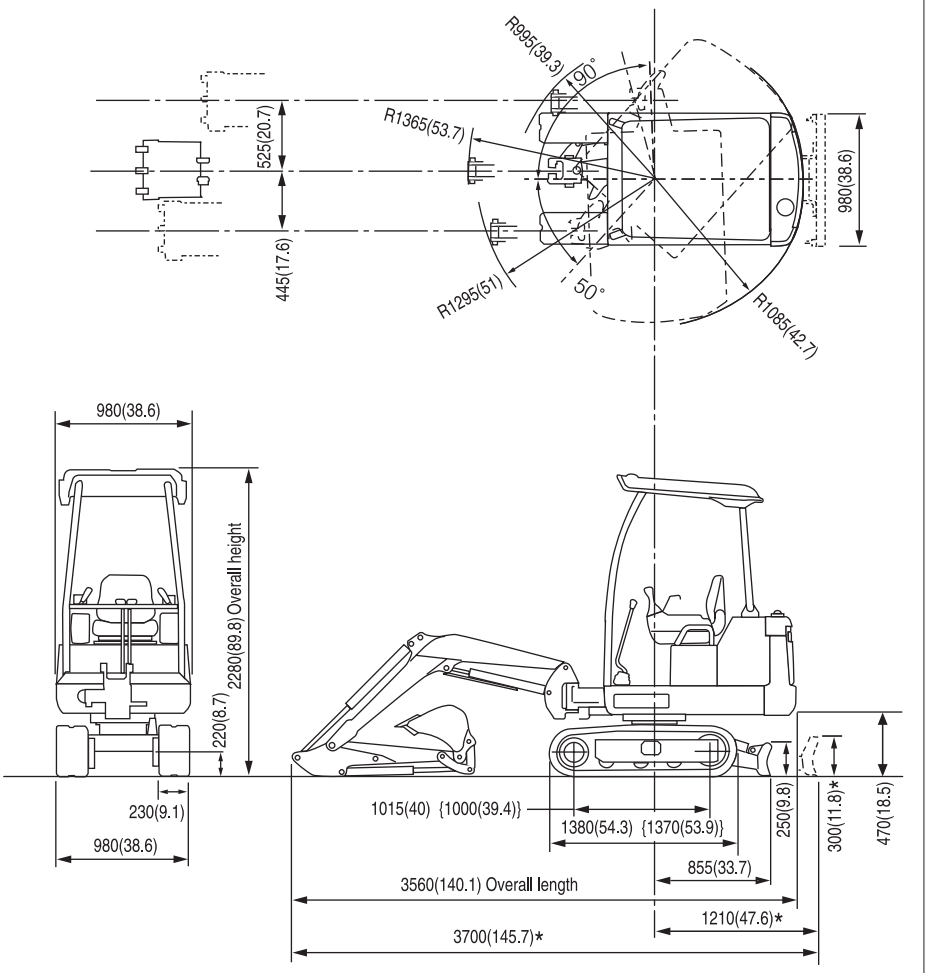
TYPE			CANOPY	CAB
MASS				
Machine mass kg (lb.) (not including operator)	With rubber crawlers		1465 (3230)	1595 (3520)
	With steel crawlers		1515 (3340)	1645 (3630)
PERFORMANCE				
Bucket capacity m^3 (cu.ft.) (standard bucket)	Heaped		0.038 (1.33)	
	Struck		0.028 (0.97)	
Slew speed min^{-1} (rpm)			9.0 (9.0)	
Travel speed km/h (mph)	Rubber crawlers	1st	2.0 (1.24)	
		2nd	3.9 (2.42)	
	Steel crawlers	1st	1.9 (1.18)	
		2nd	3.7 (2.3)	
Gradeability (degrees)			25	
Ground pressure kPa (psi)	With rubber crawlers		28.7 (4.17)	31.2 (4.52)
	With steel crawlers		30.0 (4.35)	32.5 (4.71)
Noise level dB(A)	Sound-power level		L_{WA} 93	L_{WA} 93
	Sound-pressure level		L_{pA} 77	L_{pA} 80
ENGINE				
Manufacturer and model			Kubota D782-E2B-BHTU-1 deasel engine	
Rated output	kW / min^{-1} (hp / rpm)		9 / 2200 (12 / 2200)	
Displacement	ml (cu.in.)		778 (47.5)	
Starter	V – kW		12 – 1.2	
Alternator	V – kW		12 – 0.48	
Battery	V – Ah		12 – 38	

TB016 Equipped with 930 mm (37 in.) Arm

TYPE			CANOPY	CAB
MASS				
Machine mass kg (lb.) (not including operator)	With rubber crawlers		1565 (3450)	1695 (3740)
	With steel crawlers		1615 (3560)	1745 (3850)
PERFORMANCE				
Bucket capacity m^3 (cu.ft.) (standard bucket)	Heaped		0.038 (1.33)	
	Struck		0.028 (0.97)	
Slew speed min^{-1} (rpm)			9.0 (9.0)	
Travel speed km/h (mph)	Rubber crawlers	1st	2.3 (1.43)	
		2nd	4.2 (2.61)	
	Steel crawlers	1st	2.1 (1.30)	
		2nd	3.9 (2.42)	
Gradeability (degrees)			25	
Ground pressure kPa (psi)	With rubber crawlers		27.3 (3.95)	29.4 (4.27)
	With steel crawlers		28.5 (4.14)	30.7 (4.45)
Noise level dB(A)	Sound-power level		L_{WA} 93	L_{WA} 93
	Sound-pressure level		L_{pA} 79	L_{pA} 79
ENGINE				
Manufacturer and model			Yanmar 3TNV70-STB deasel engine	
Rated output	kW / min^{-1} (hp / rpm)		10.1 / 2200 (13.5 / 2200)	
Displacement	ml (cu.in.)		854 (47.8)	
Starter	V – kW		12 – 1.0	
Alternator	V – kW		12 – 0.48	
Battery	V – Ah		12 – 38	

TB014 Equipped with Canopy and 830 mm (33 in.) Arm

Units: mm (inches)

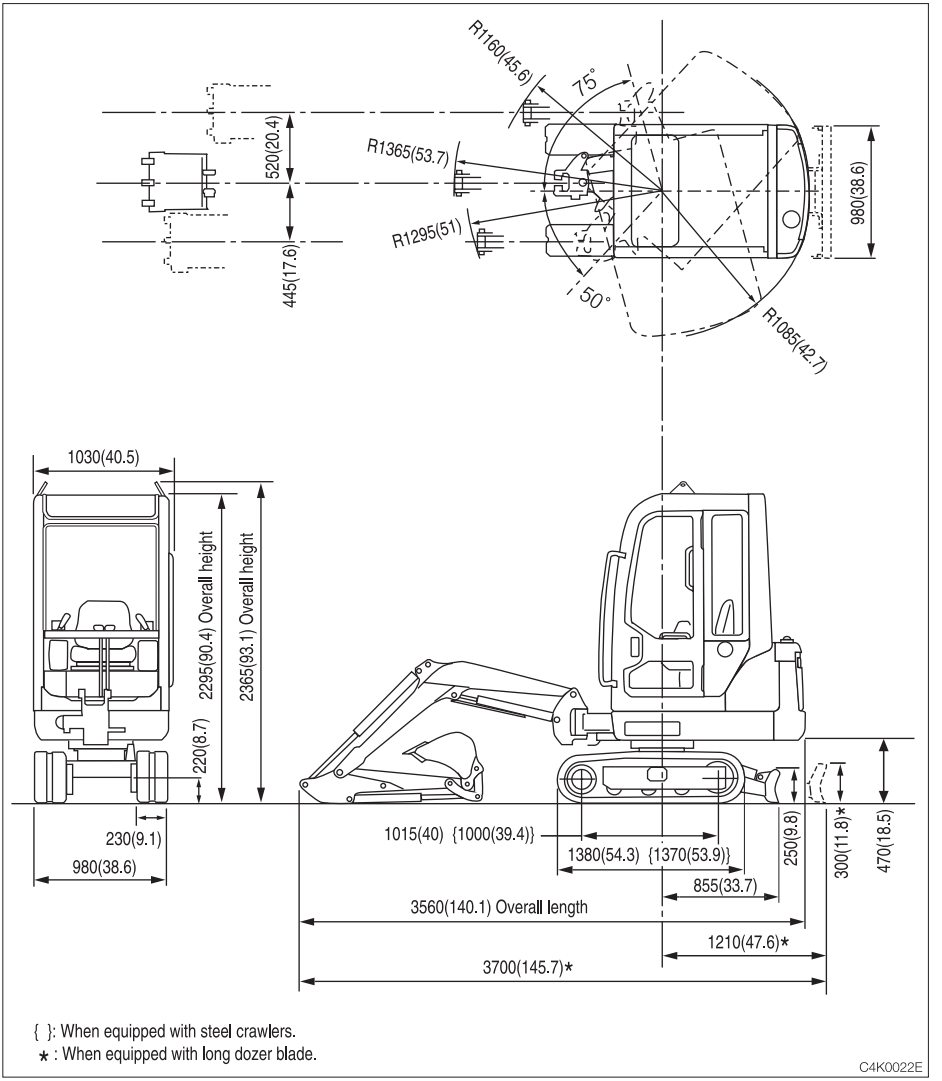


{ }: When equipped with steel crawlers.
★ : When equipped with long dozer blade.

C4K0012E

TB014 Equipped with Cab and 830 mm (33 in.) Arm

Units: mm (inches)

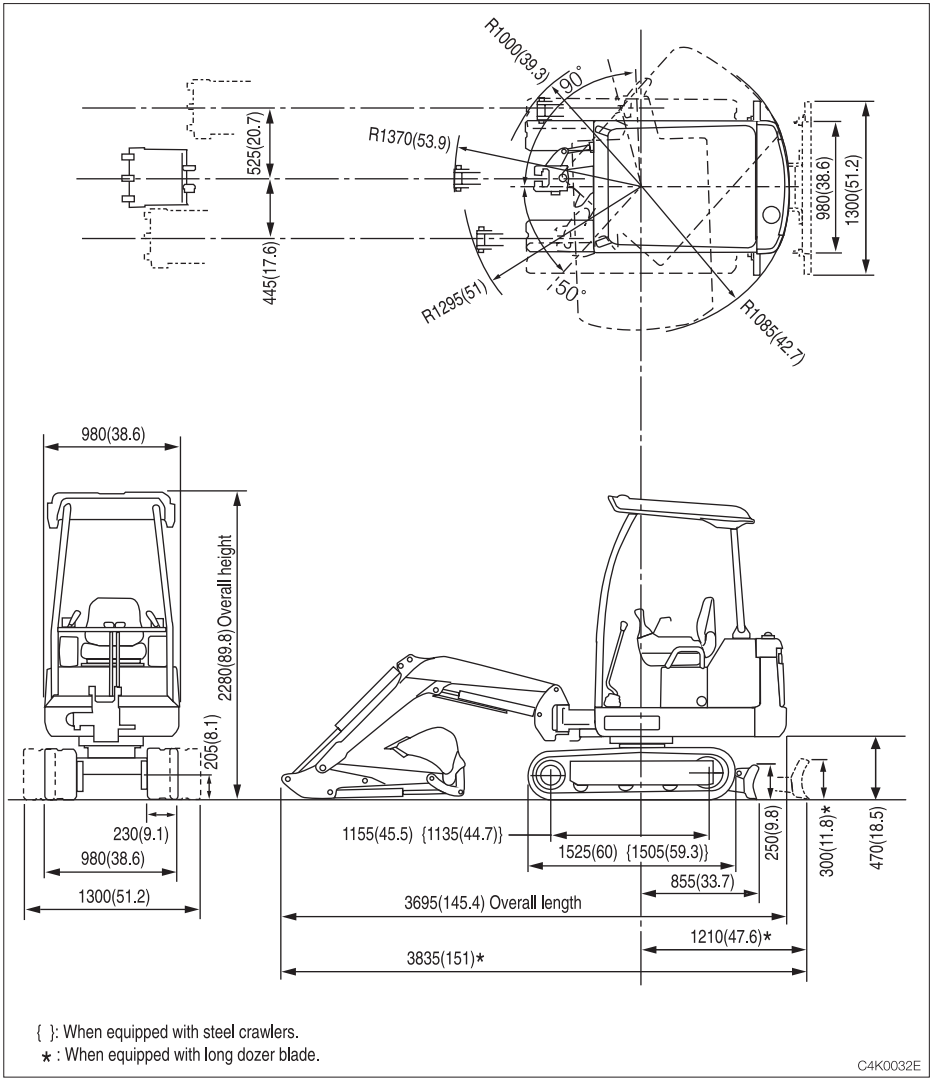


{ }: When equipped with steel crawlers.
* : When equipped with long dozer blade.

C4K0022E

TB016 Equipped with Canopy and 930 mm (37 in.) Arm

Units: mm (inches)

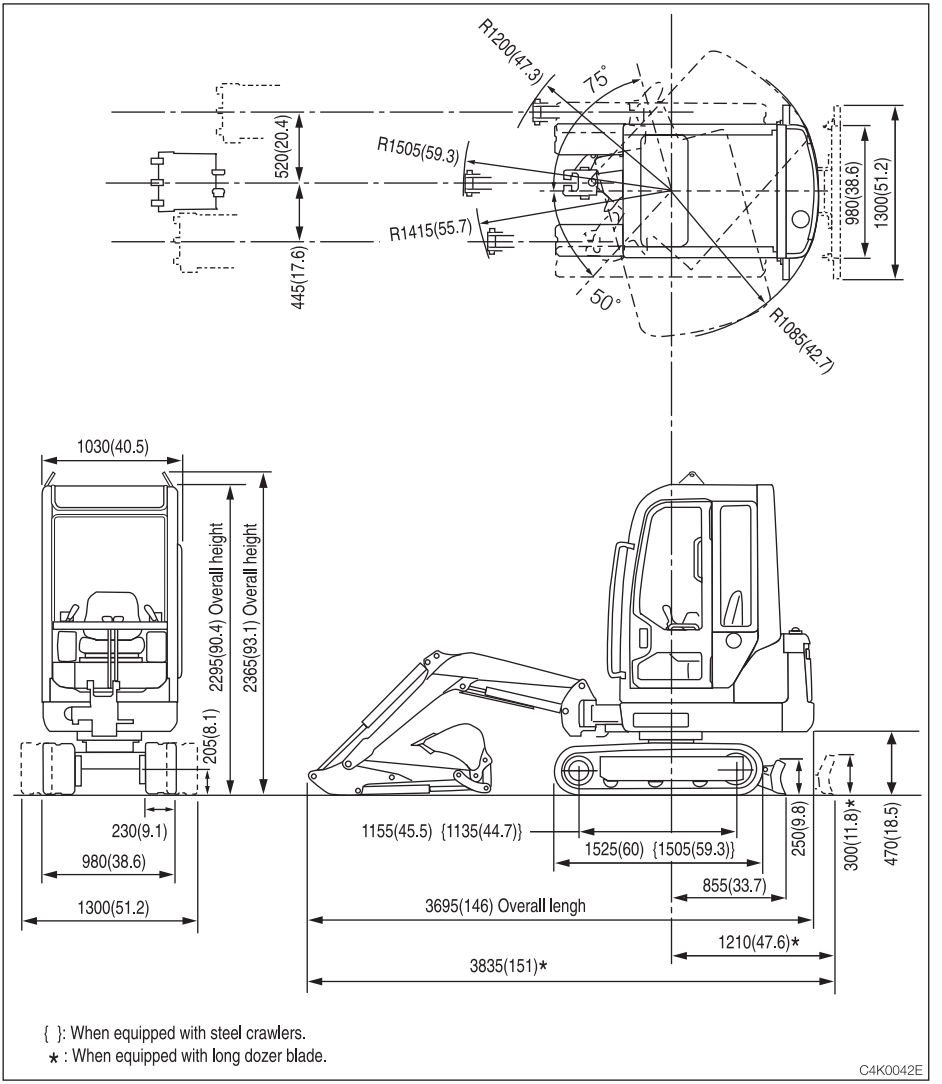


{ }: When equipped with steel crawlers.
* : When equipped with long dozer blade.

C4K0032E

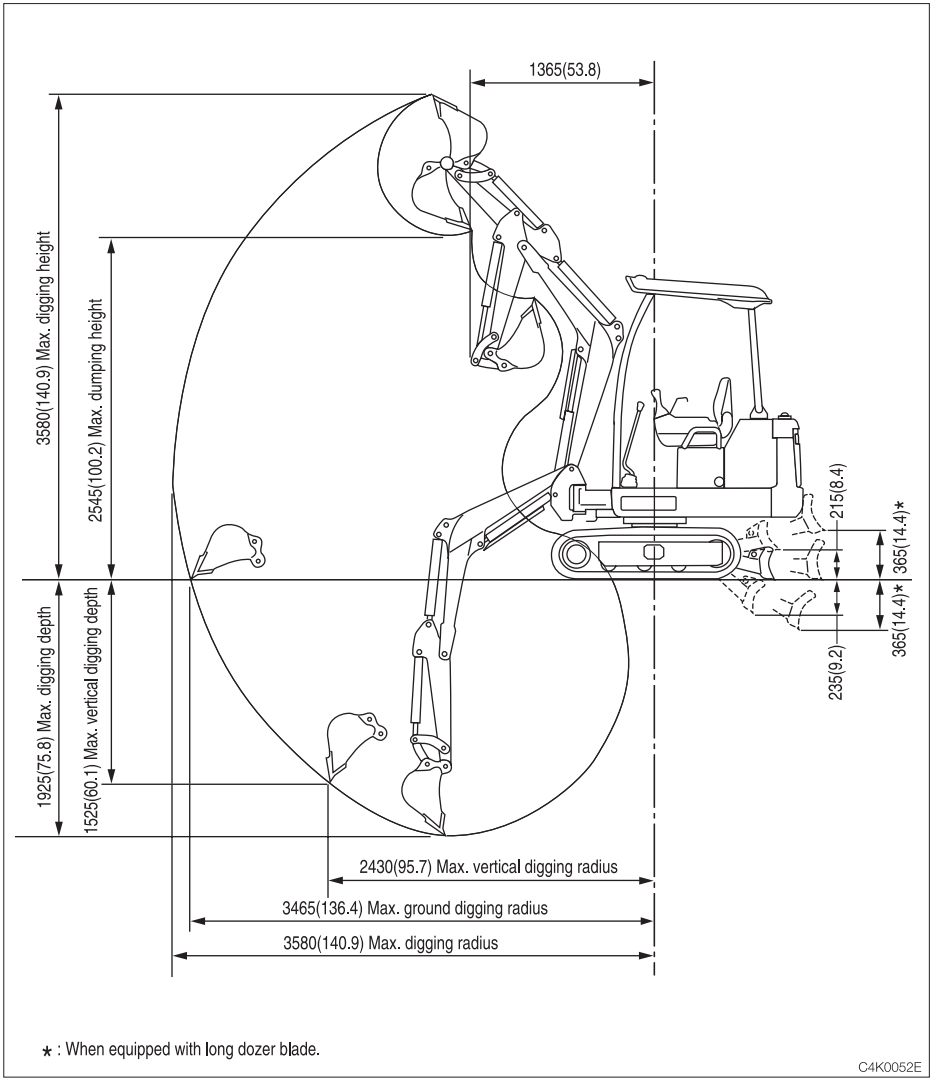
TB016 Equipped with Cab and 930 mm (37 in.) Arm

Units: mm (inches)



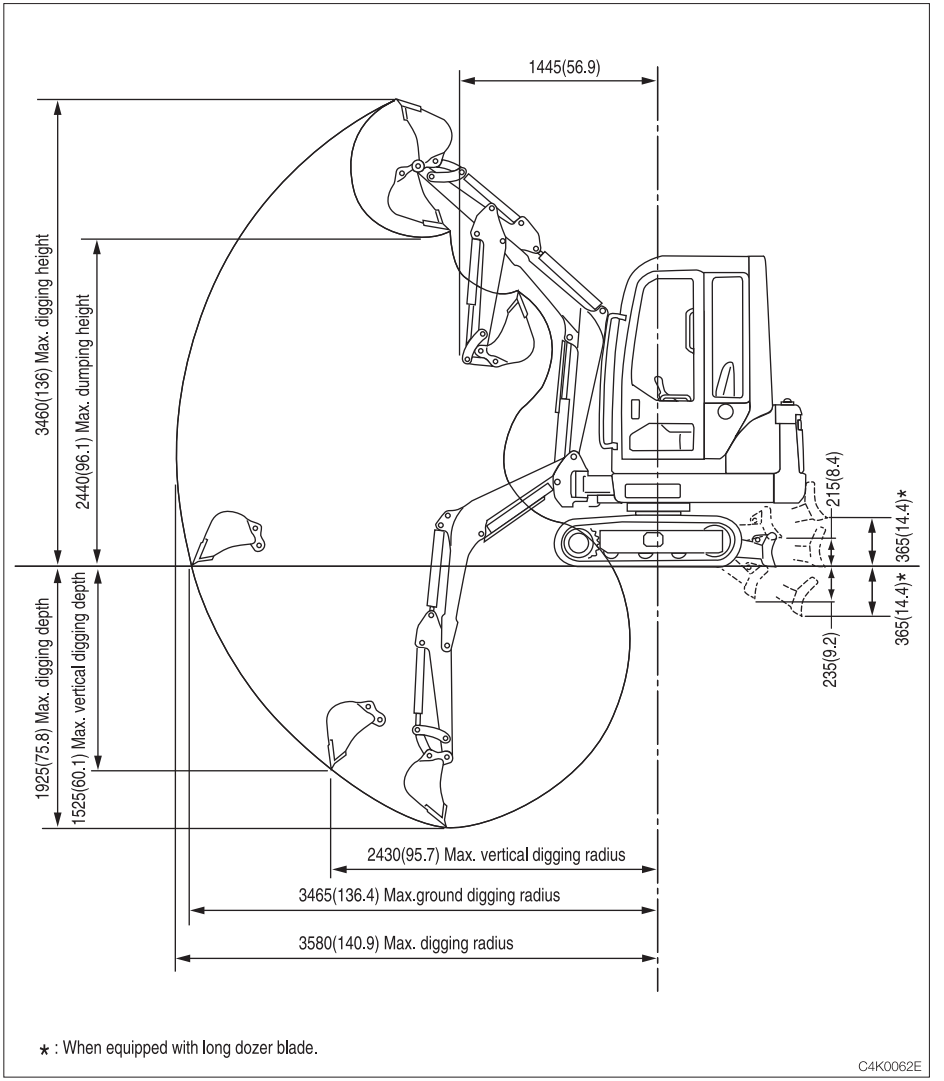
TB014 Equipped with Canopy and 830 mm (33 in.) Arm

Units: mm (inches)



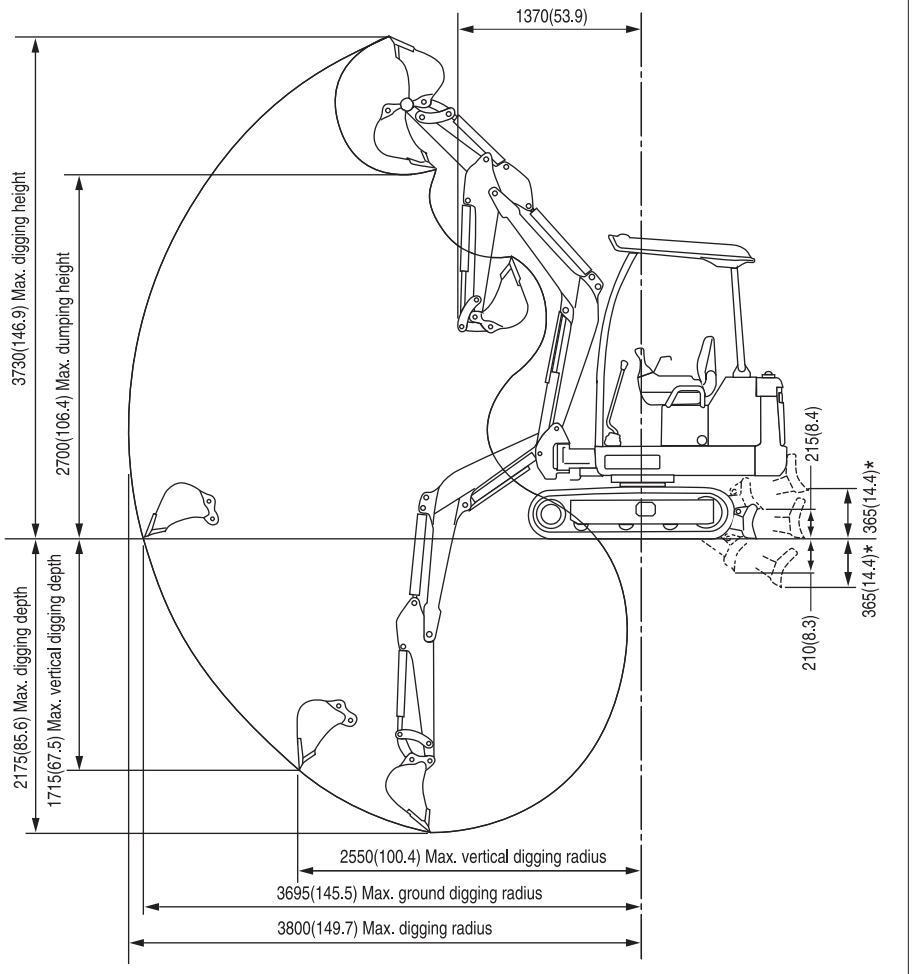
TB014 Equipped with Cab and 830 mm (33 in.) Arm

Units: mm (inches)



TB016 Equipped with Canopy and 930 mm (37 in.) Arm

Units: mm (inches)

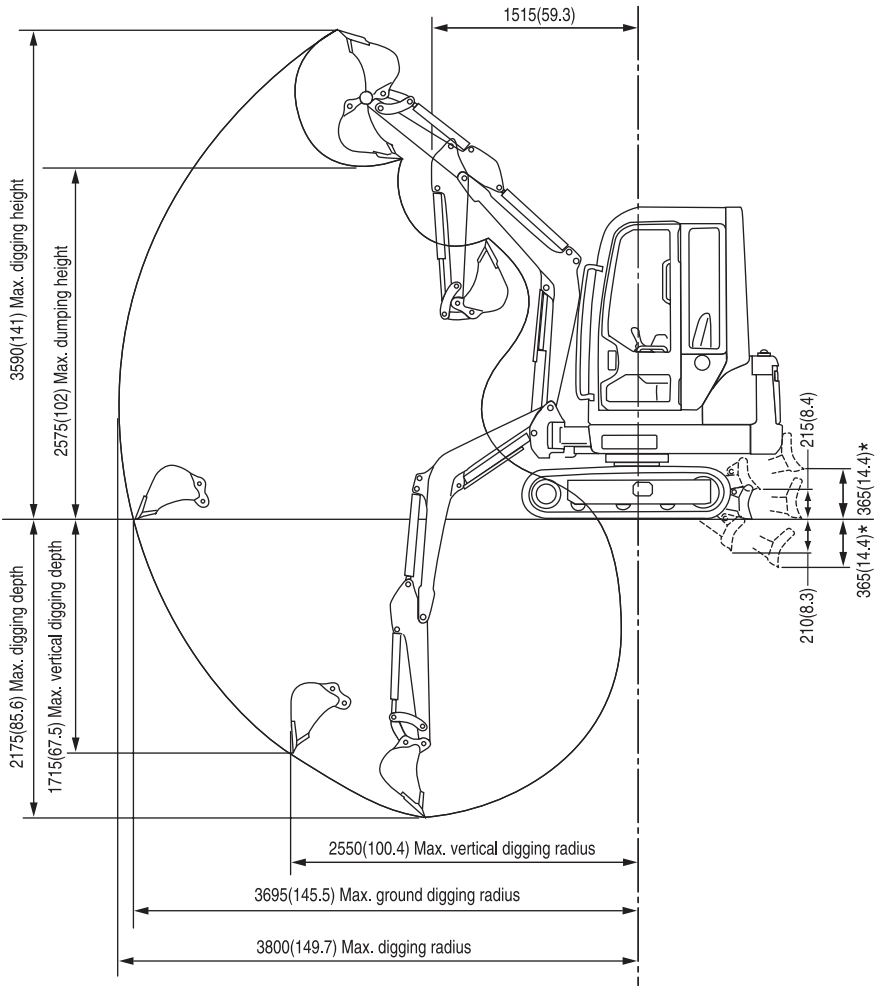


* : When equipped with long dozer blade.

C4K0072E

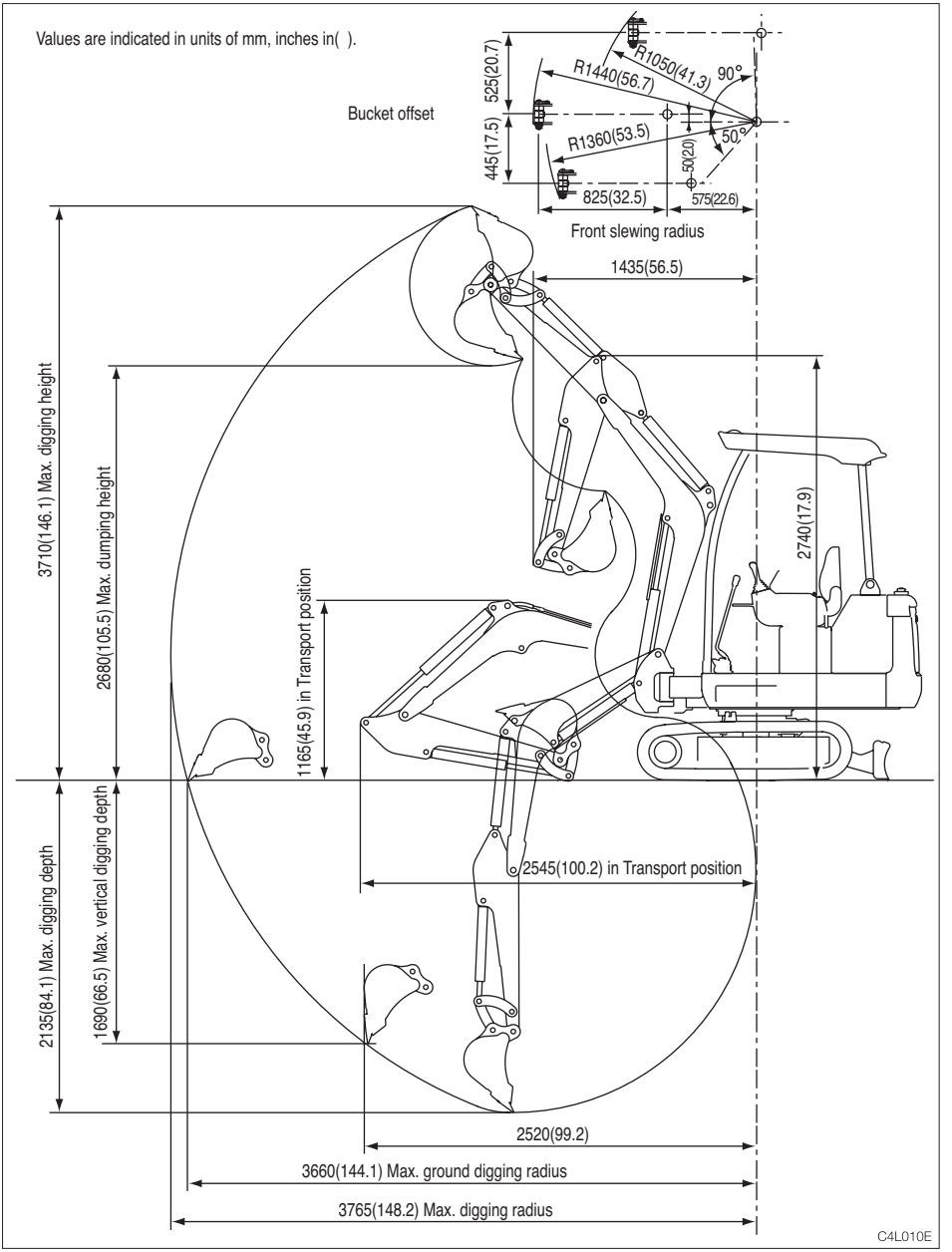
TB016 Equipped with Cab and 930 mm (37 in.) Arm

Units: mm (inches)



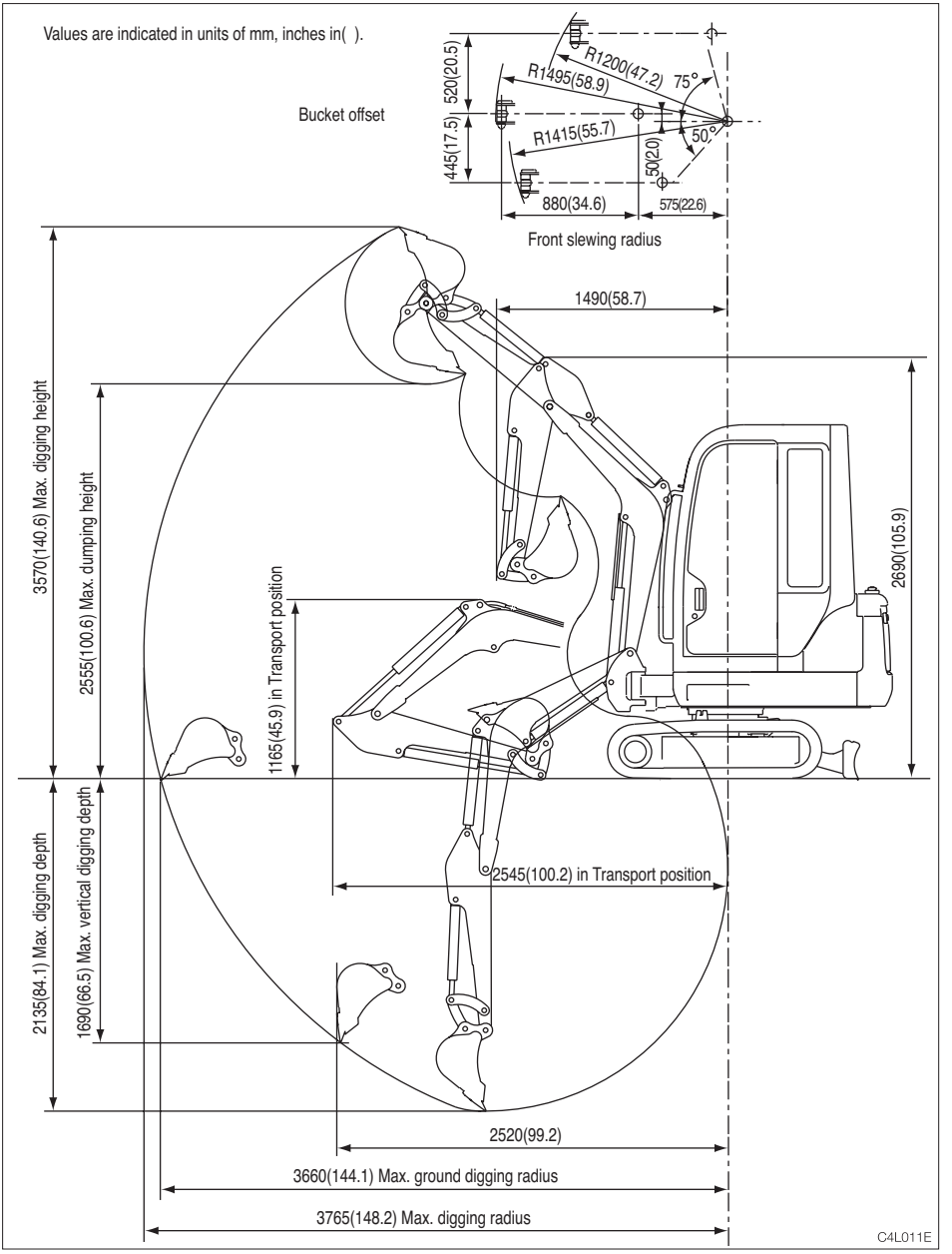
TB014 Equipped with Canopy and 1040 mm (41 in.) Arm

Units: mm (inches)



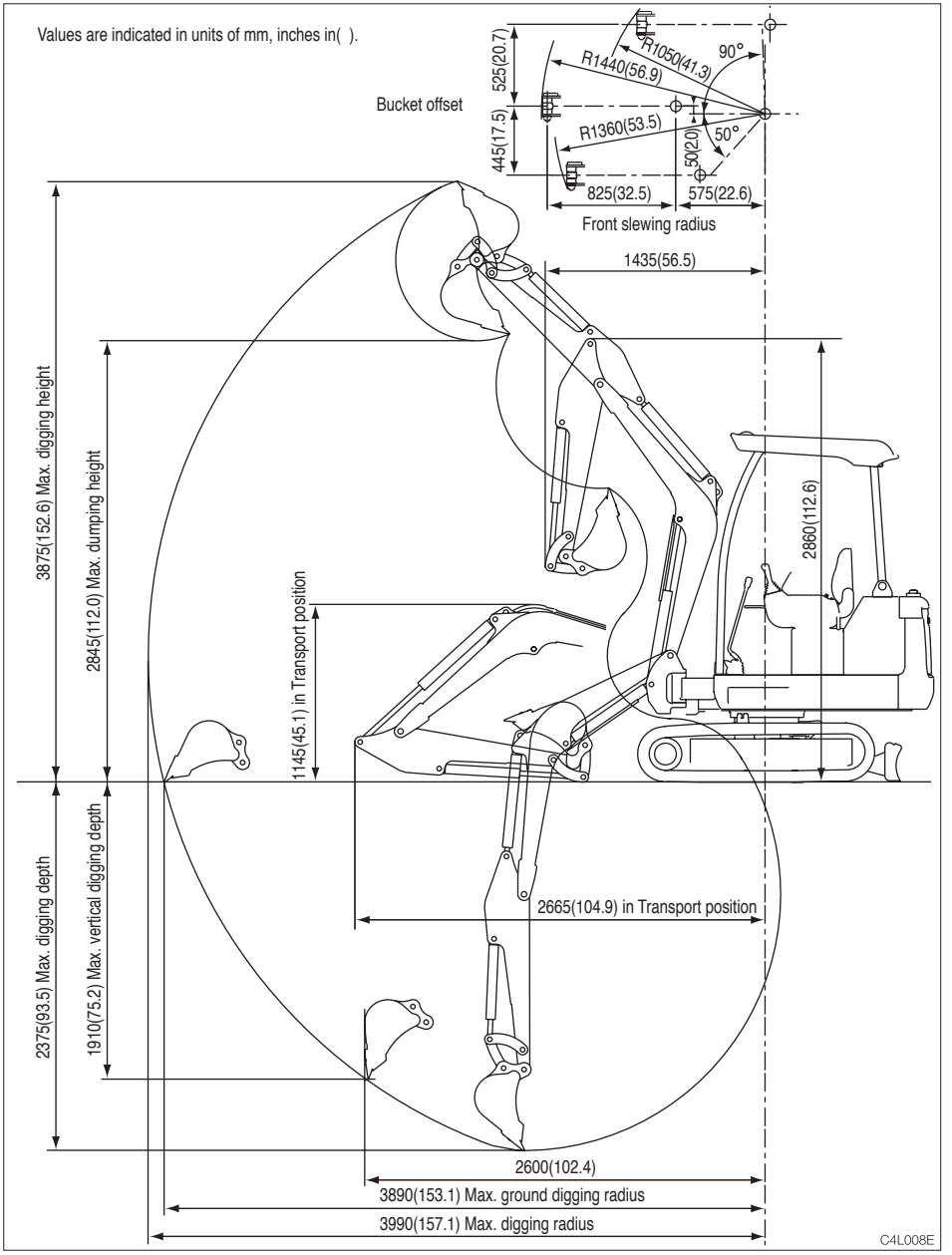
TB014 Equipped with Cab and 1040 mm (41 in.) Arm

Units: mm (inches)



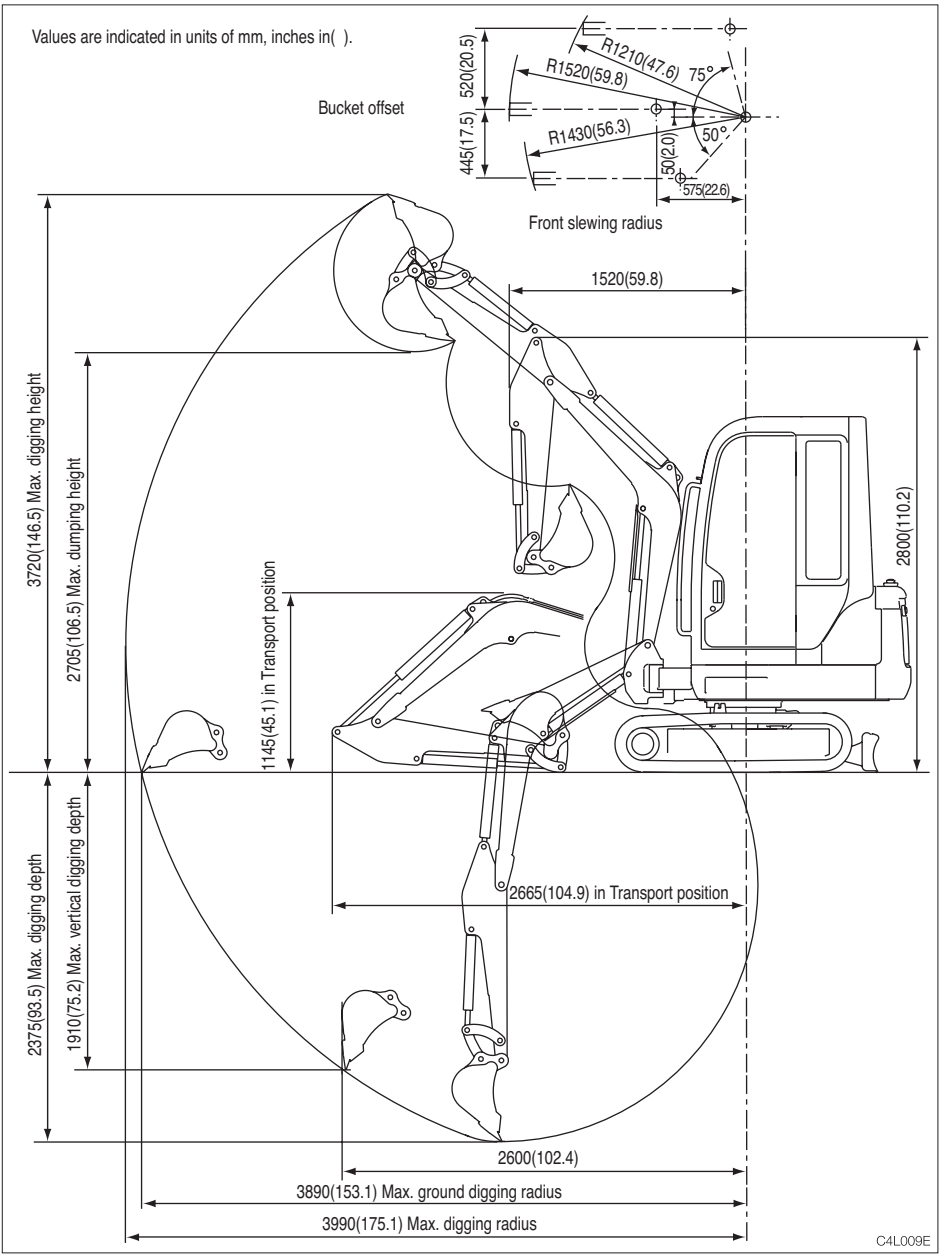
TB016 Equipped with Canopy and 1130 mm (44 in.) Arm

Units: mm (inches)



TB016 Equipped with Cab and 1130 mm (44 in.) Arm

Units: mm (inches)



Rated lift capacity chart

- The loads in the charts do not exceed 87% of hydraulic lift capacity or 75% of tipping load.
- Rated lift capacities limited by rated hydraulic lift capacity are identified by an asterisk(*)
- The mass of slings and any auxiliary 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.
- Units: kg (lbs.)

Load hooking system

A load hooking system with all of the following capacities must be provided and used.

1. A system which can withstand a weight of two times the rated lift capacity no matter at what position the load is applied.
2. A system in which there is no risk of the lifted load falling from the hooking device, for example one equipped with a hook slippage prevention device.
3. A system in which there is no risk of the hooking system slipping from the hoe attachment.

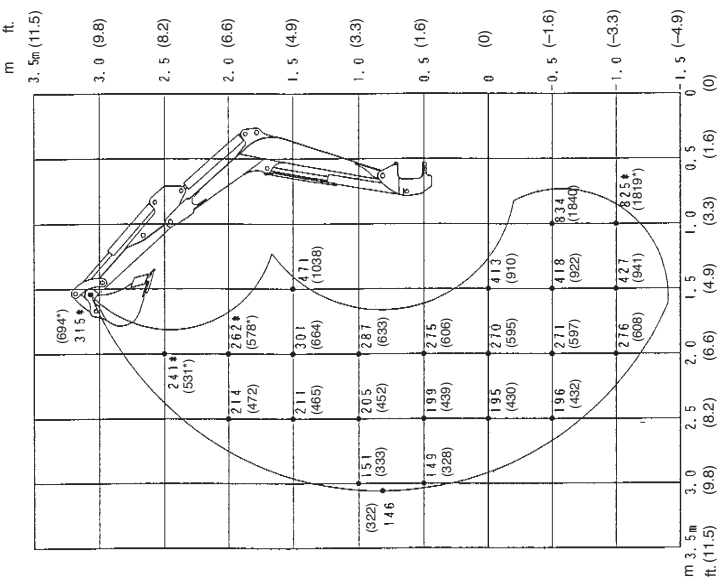
⚠ WARNING

- **DO NOT attempt to lift or hold any load that is greater than these rated values at their specified load radii and height.**
- **All rated lift capacities are based on the machine being level and on a firm supporting surface. For safe working loads, the user 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, and rules for safe operation of equipment shall be adhered to at all times.**
- **Do not travel while lifting a load; It is very dangerous.**

TB014 Equipped with 830 mm (33 in.) Arm

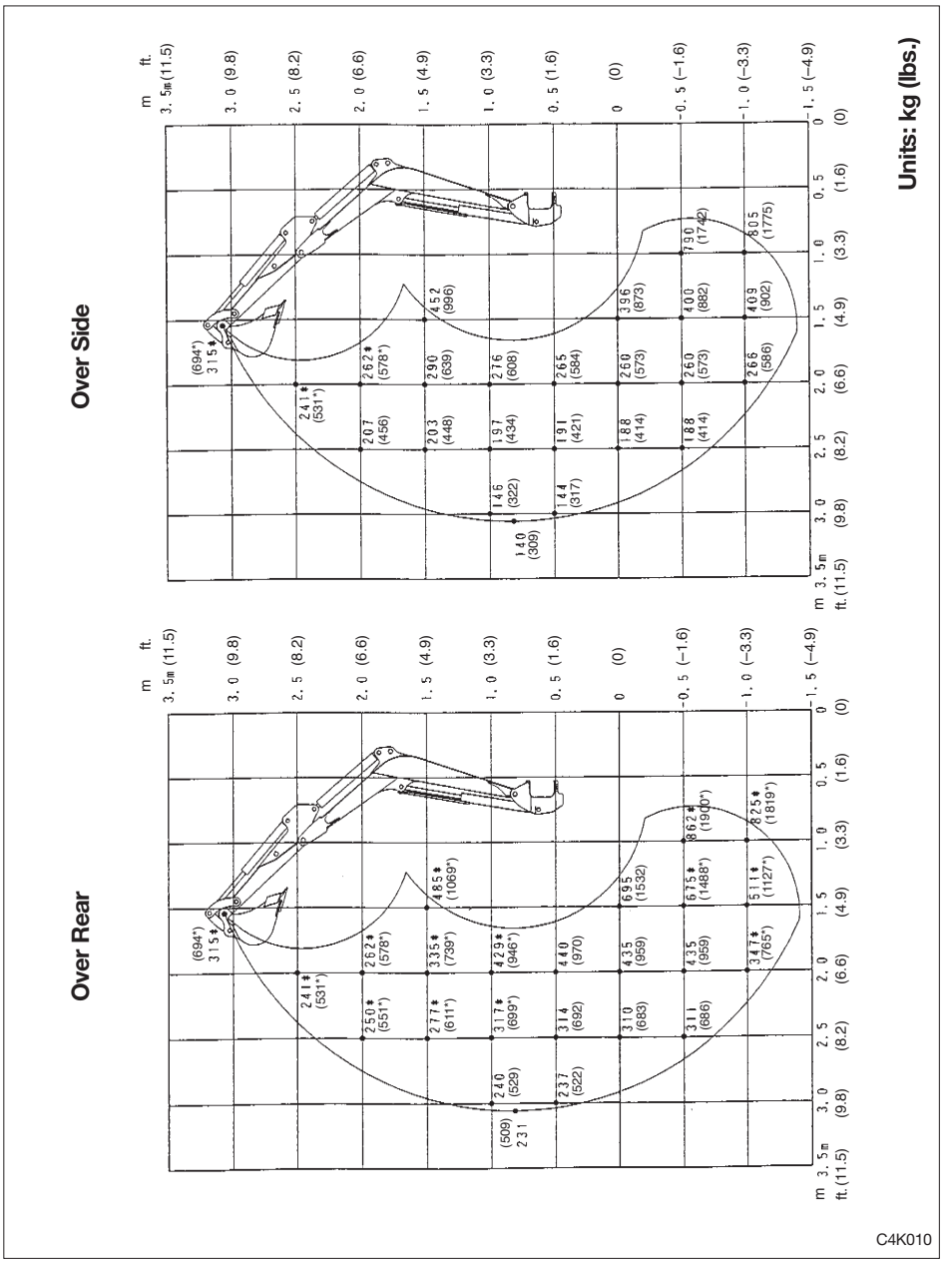
Over Front ; Dozer Blade Up

Units: kg (lbs.)



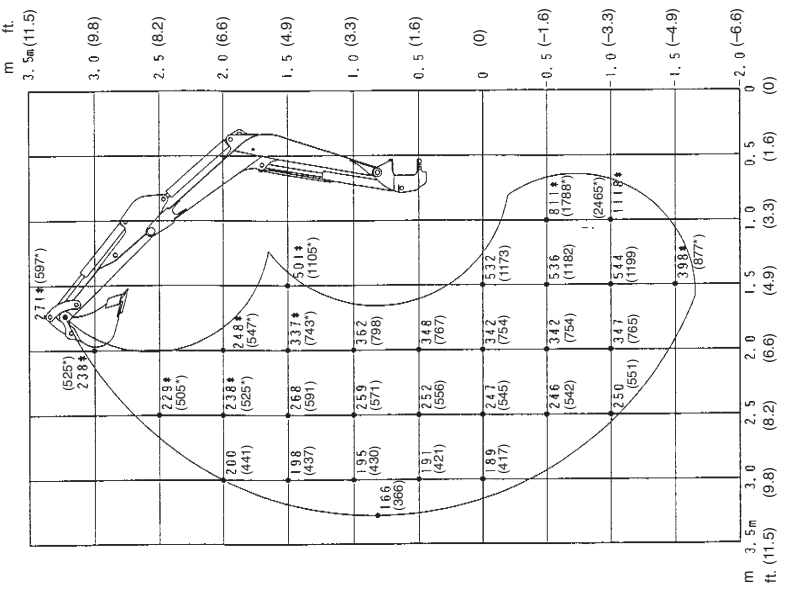
C4K0091

TB014 Equipped with 830 mm (33 in.) Arm



TB016 Equipped with 930 mm (37 in.) Arm

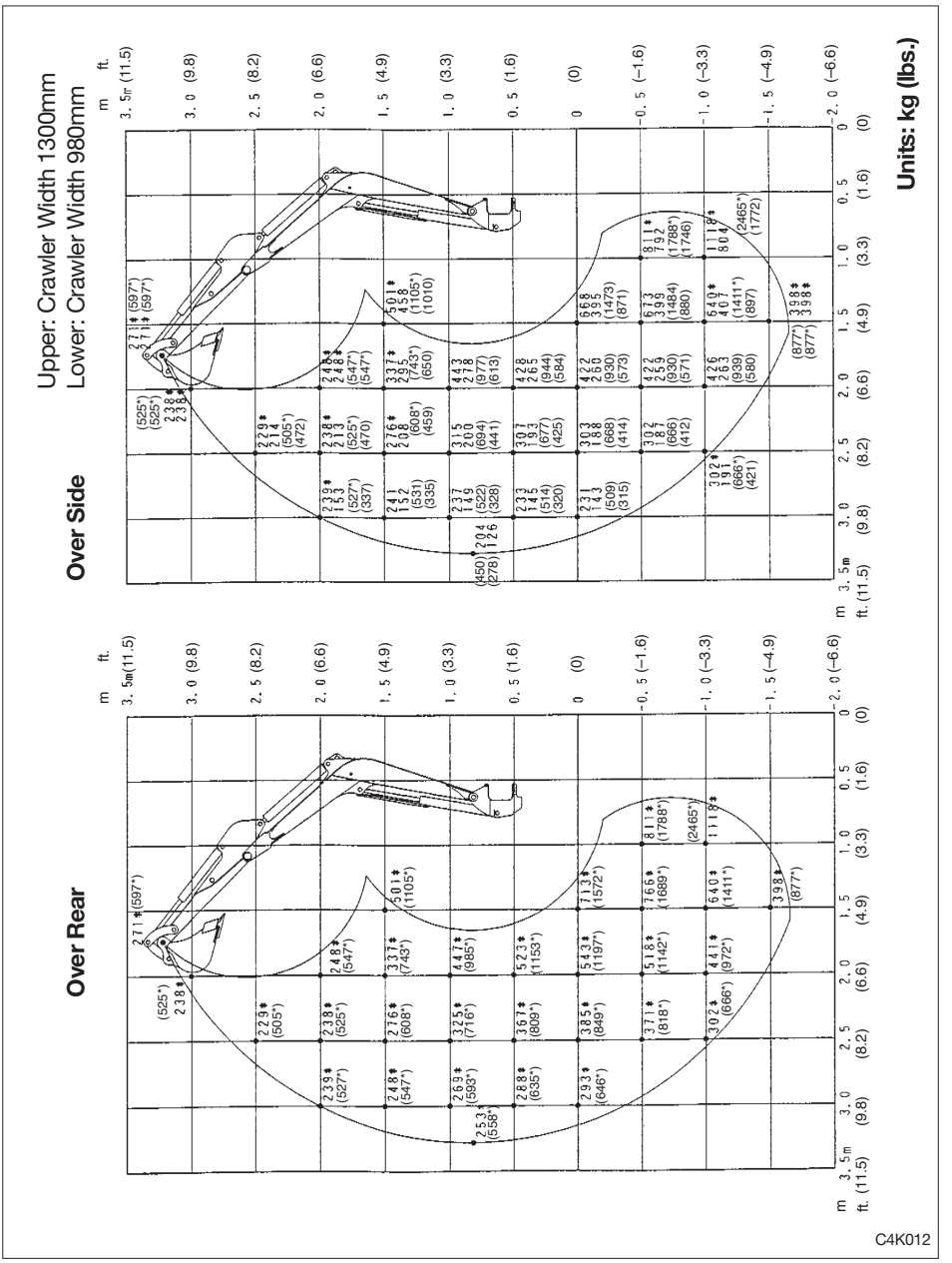
Over Front ; Dozer Blade Up



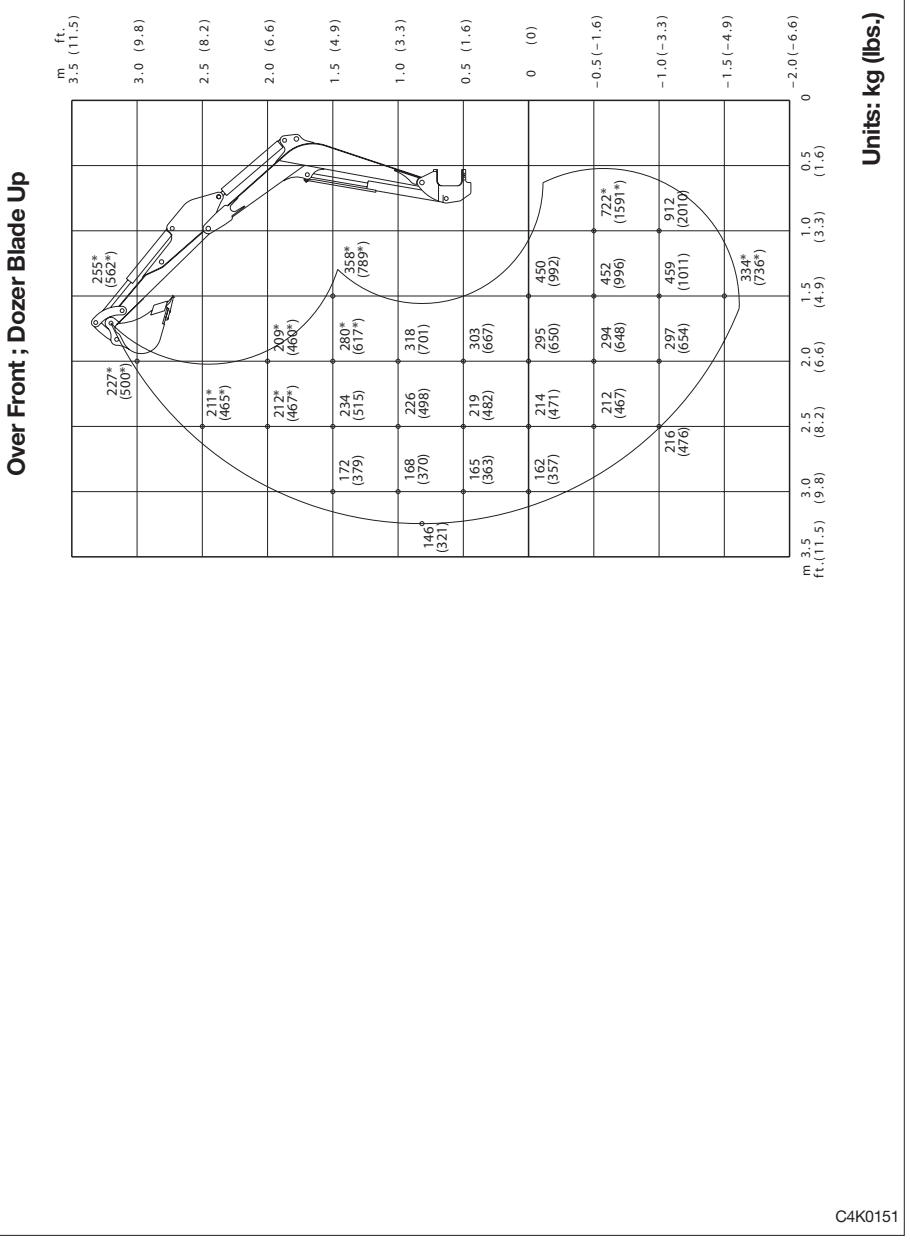
Units: kg (lbs.)

C4K0111

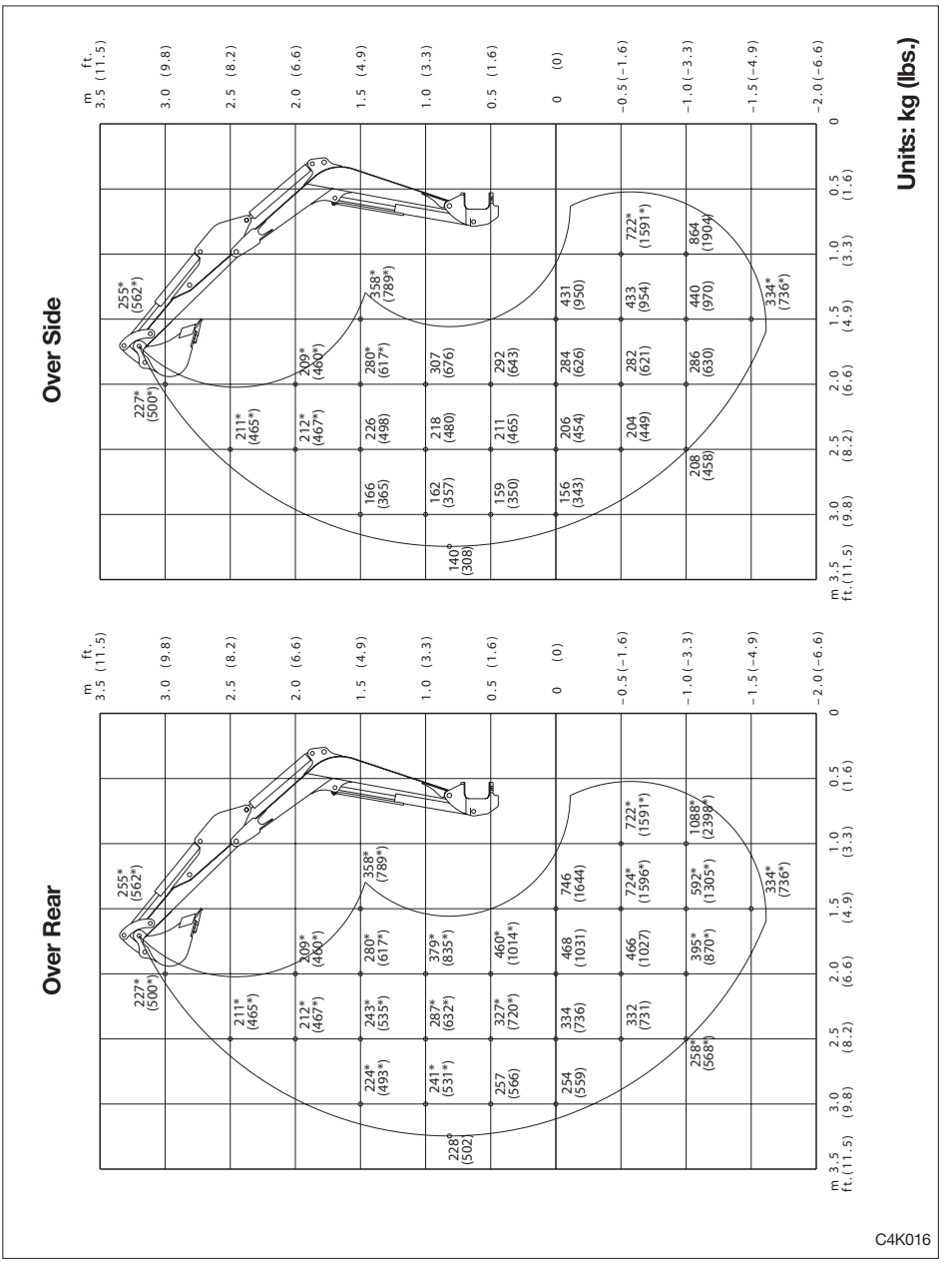
TB016 Equipped with 930 mm (37 in.) Arm



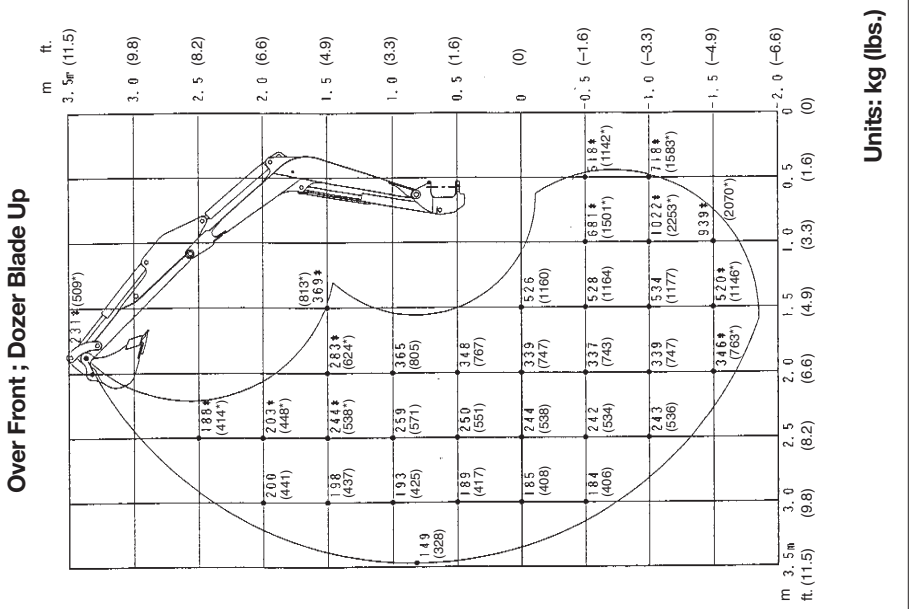
TB014 Equipped with 1040 mm (41 in.) Arm



TB014 Equipped with 1040 mm (41 in.) Arm

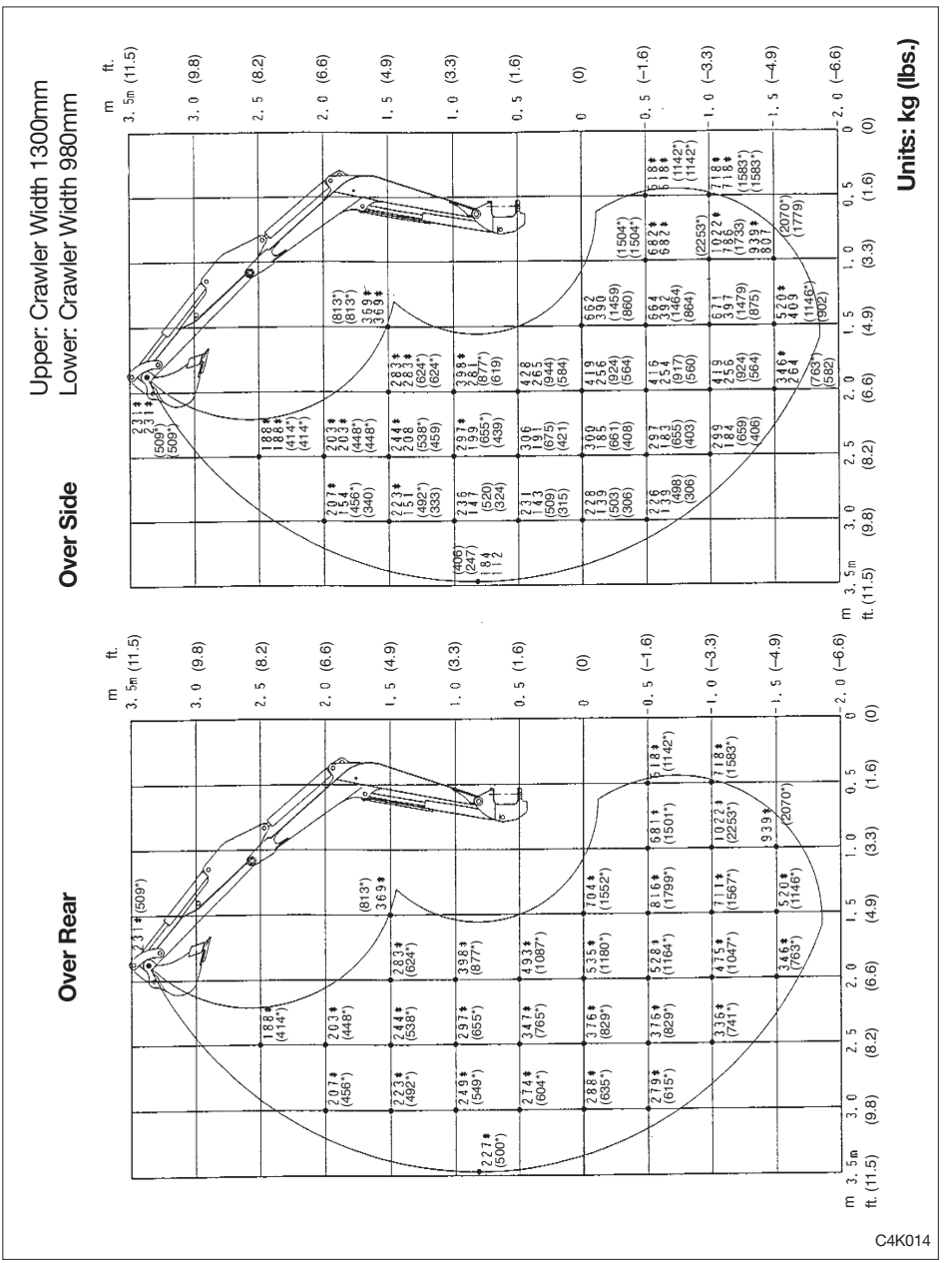


TB016 Equipped with 1130 mm (44 in.) Arm

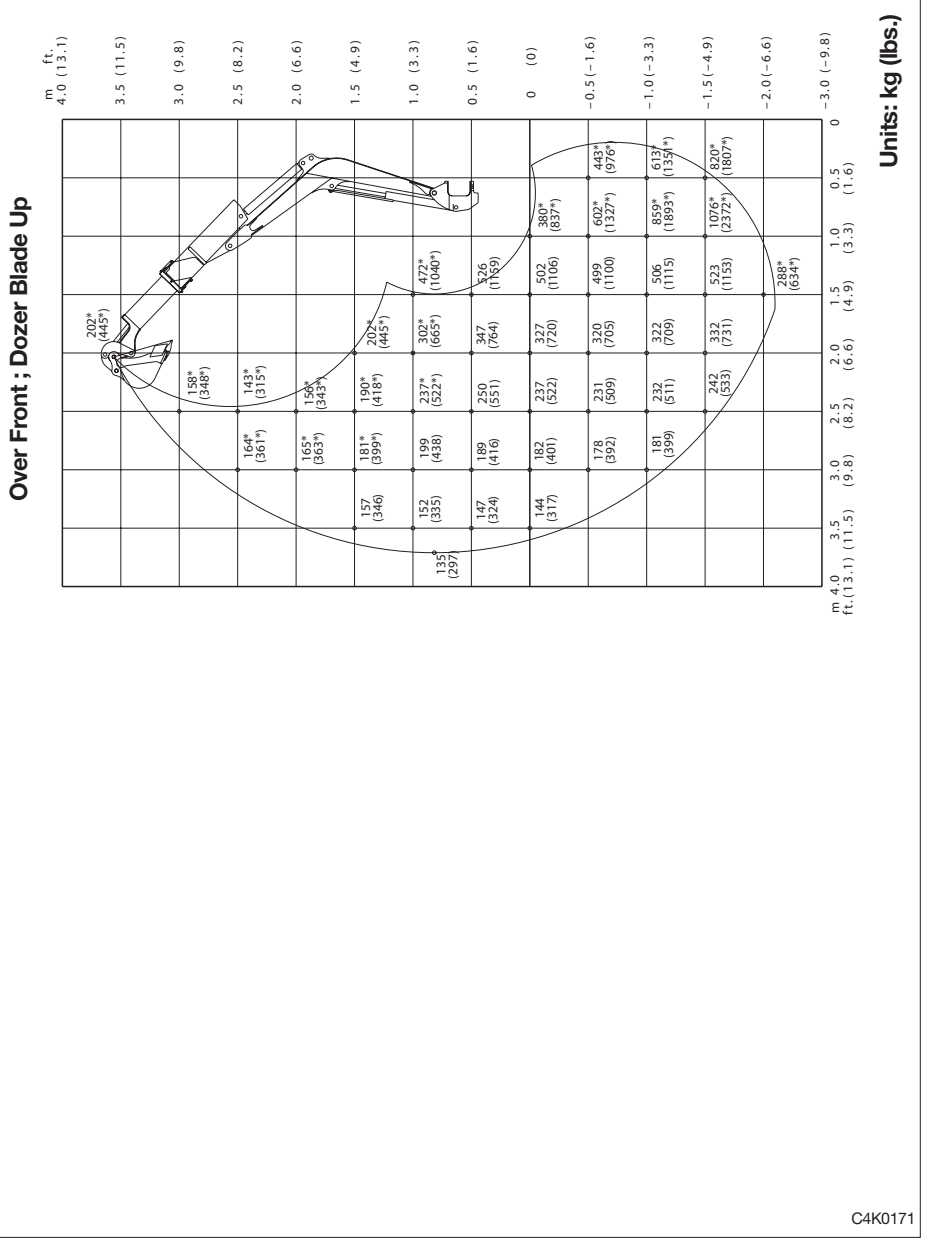


C4K0131

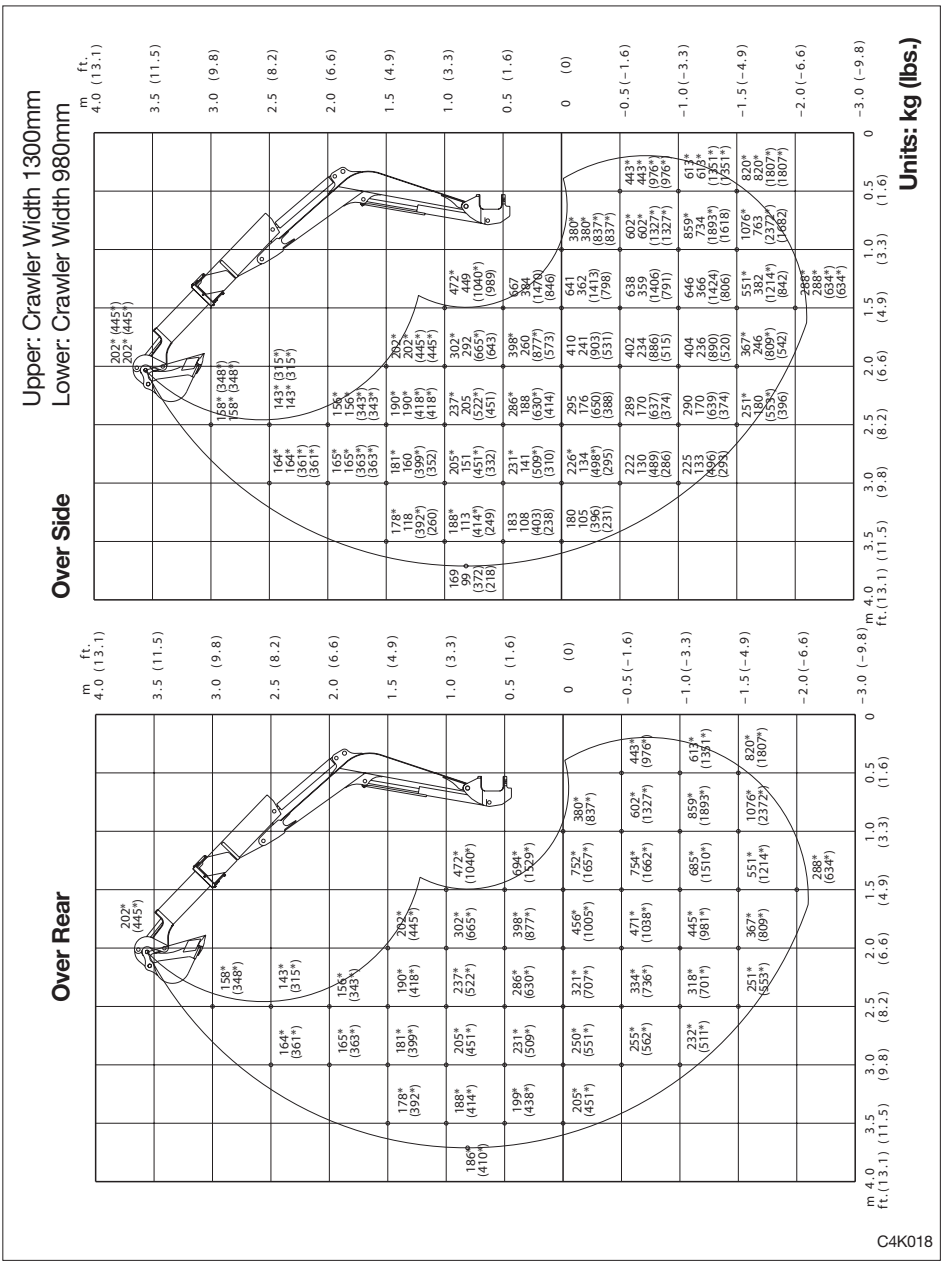
TB016 Equipped with 1130 mm (44 in.) Arm



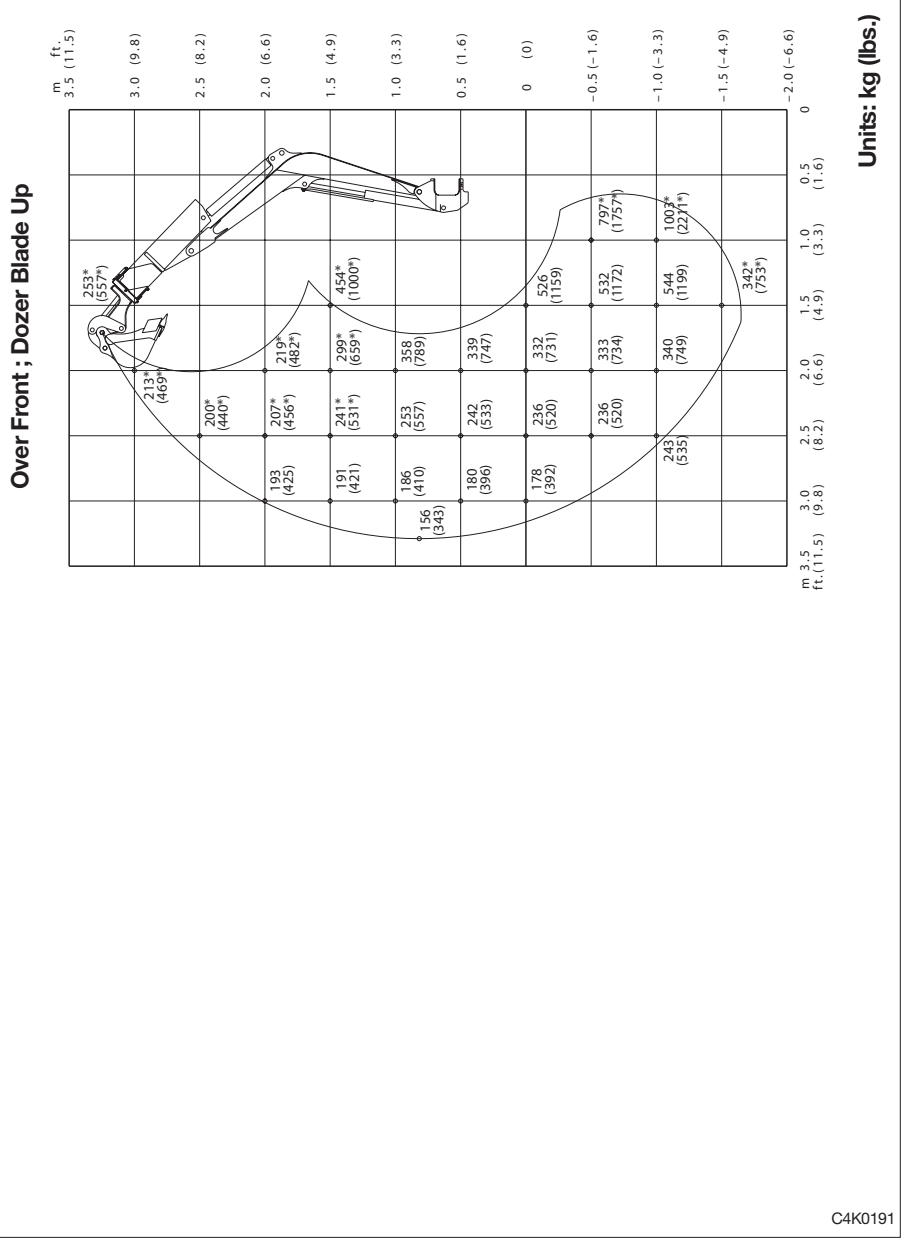
TB016 Equipped with Telescopic Arm (Fully Extended Arm)



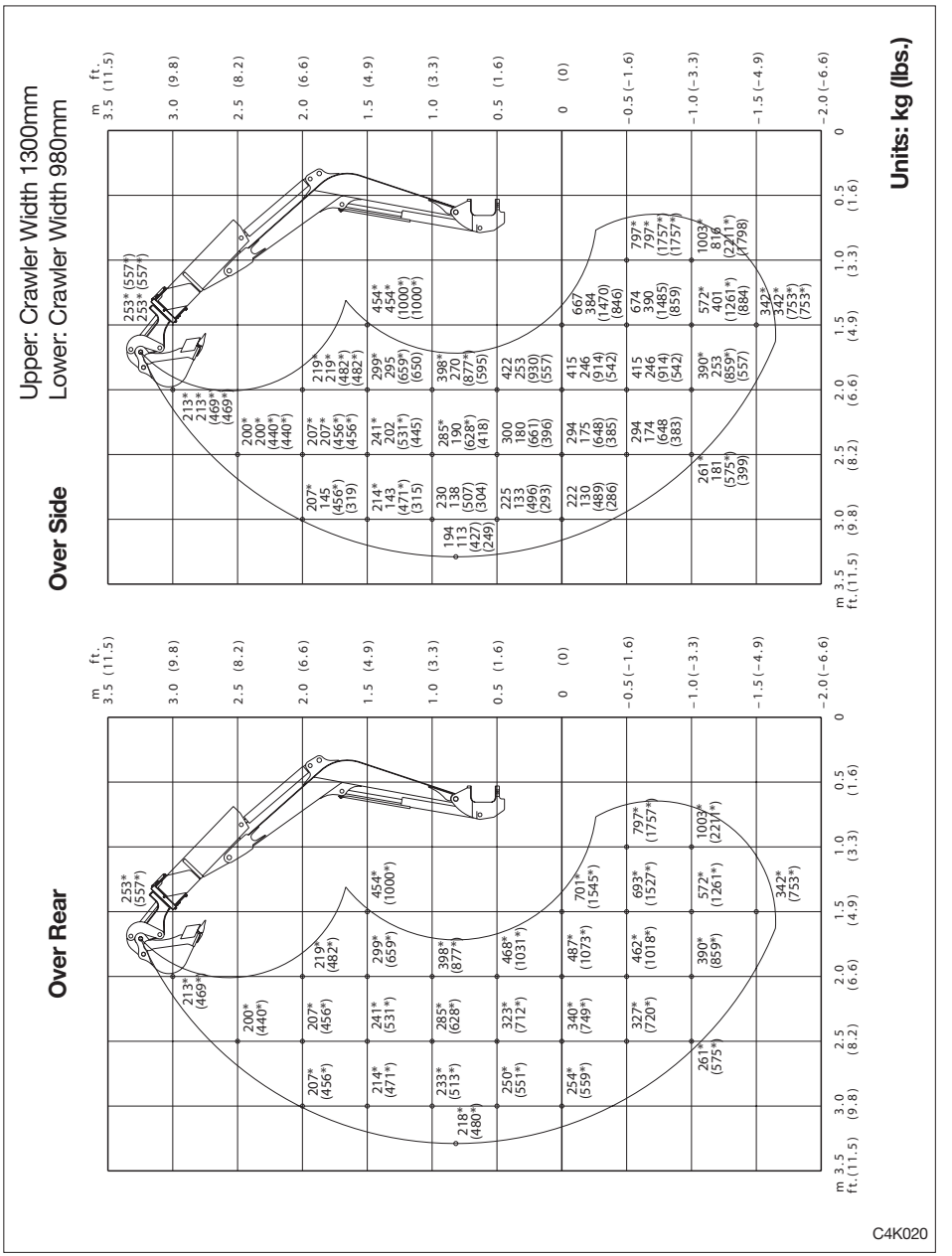
TB016 Equipped with Telescopic Arm (Fully Extended Arm)



TB016 Equipped with Telescopic Arm (Fully Retracted Arm)



TB016 Equipped with Telescopic Arm (Fully Retracted Arm)



OPTIONS

Precautions on Safety

⚠ WARNING

Heed the following when removing or installing an attachment or option:

- **Consult with a Takeuchi before installing optional attachments.**
- **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 products caused by the use of a non-approved attachment.**
- **Choose a flat, hard surface to perform the operations. Also make sure there is enough light and good ventilation.**
- **Clean the area, remove any articles that may get in the way or be dangerous, and remove any spilt oil or grease.**
- **When performing lifting operations, determine a person to lead the operations and always follow that person's instructions.**
  - **Follow the leader's instructions on operating methods and procedures.**
  - **Determine a signal leader and heed this person's signals.**
- **When removing or installing the hoe attachment, place it in a stable position so that it does not tip over.**
- **Due to the risk of loads falling and/or hitting people, do not allow unauthorized personnel in the work area.**
- **Use the crane to carry heavy objects (25 kg (55 lb.) or greater).**
- **When removing heavy parts, be sure to prop them up before removing them. When lifting them with a crane, be careful to balance them properly.**
- **Operating with loads suspended with the crane is dangerous. Place loads on a stand and check for safety.**
- **When attaching the boom or arm, failure to follow proper procedures could result in serious damage. Consult with a Takeuchi dealer beforehand.**

Precautions on Installing Attachments

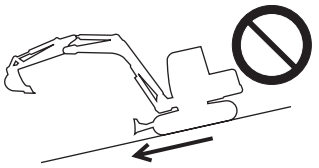
After replacing optional attachments or other special attachments, test-run them, then inspect the hydraulic oil level and add oil if necessary.
In addition, consult with a Takeuchi dealer for details of removal and installation procedures.

Precautions on Operating Attachments

⚠ WARNING

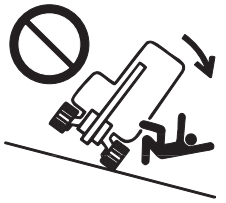
Long attachments reduce machine stability. When traveling down steep slopes or slewing on slopes, the machine may loose its balance and tip over.
The following operations are particularly dangerous. Do not perform them.

- **Traveling down slopes with the attachment lifted**



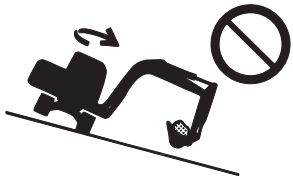
OE3A2531

- **Traveling across slopes**



OE3A271

- **Slewing on slopes**

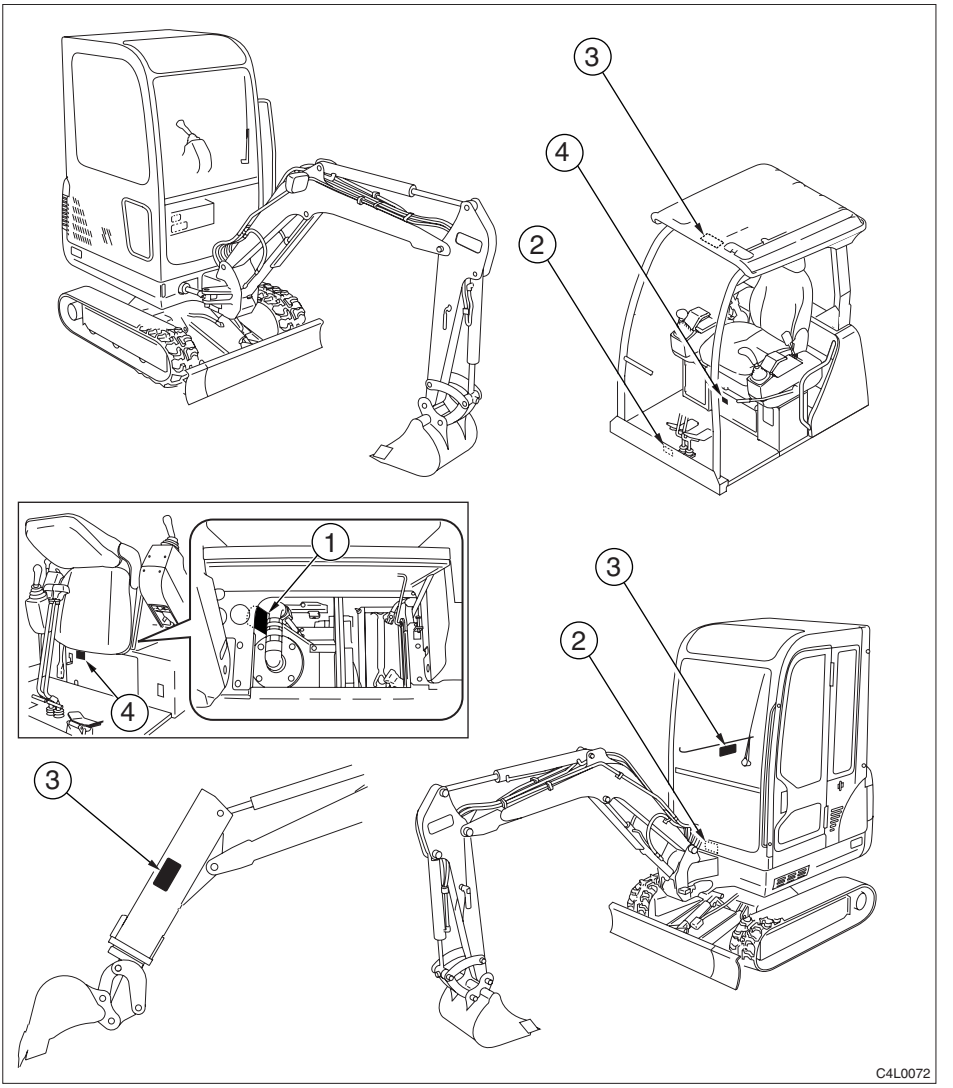


OE3A331

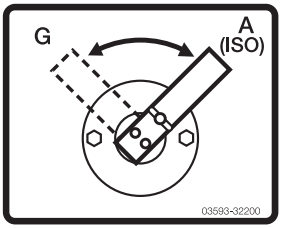
- **When heavy attachments are installed, the overslew (the distance from where the operation to stop slewing is performed until slewing stops completely) increases and mistakes in judgment may result in the attachment hitting surrounding objects. Allow for plenty of room between the attachment and obstacles.**
  In addition, the natural drop (the gradual dropping of the attachment under its own weight when it is stopped in midair) also increases when heavy attachments are installed.
- **The machine can tip over more easily in the lateral direction than in the longitudinal direction.**
  - **Do not slew (swing) sideways with excessive weight at the front. In particular do not slew sideways on slopes.**
  - **The front is heavier for machines equipped with breakers, crushers or telescopic arms than for machines equipped with the standard bucket. Do not operate such machines sideways, especially with the digging arm (boom) downhill.**
- **When a long arm or a telescopic arm is installed, the operating range suddenly increases and mistakes in judgment may result in the attachment hitting surrounding objects. Allow for plenty of room between the attachment and obstacles.**
- **Add an extra weight when using a long arm or a telescopic arm.**
- **Install a swing stopper when a bucket wider than the standard bucket, long arm and telescopic arm is installed and when using a cab version.**

Safety Signs (Decals)

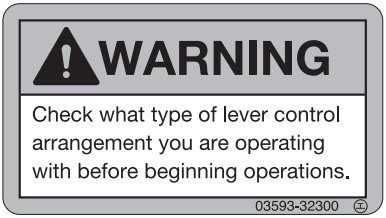
Keep all safety signs clean and legible.
Replace all missing, illegible or damaged safety and warning signs.
There are other safety signs in addition to the ones listed here. Treat them in the same way.



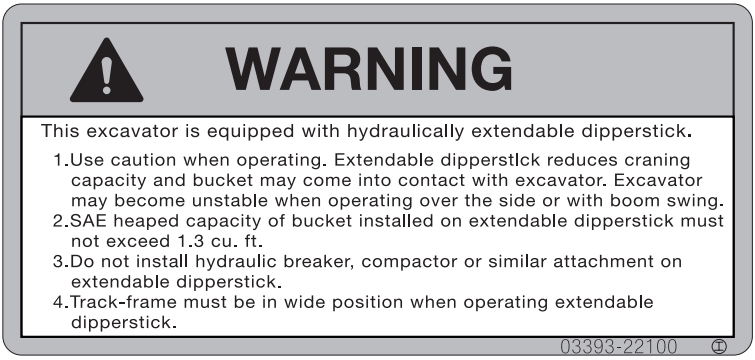
1. No.03593-32200



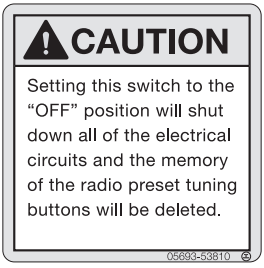
2. No.03593-32300



3. No.03393-22100 <TB016>



4. No.05693-53810



C4L022E

Biodegradable oil

Biodegradable oil is a new type of hydraulic oil that is decomposed into carbon dioxide and water by microorganisms in the soil and water. It is highly safe for living organisms and offers advantages in terms of environmental protection.

- Recommended biodegradable oil: Mobile EAL Envirosyn 46H (an ester synthetic oil).
  When replacing the hydraulic oil with biodegradable oil, use the above or an equivalent oil. Note that other oils, even other brands of ester synthetic oils, may damage O-rings, packings and seals. Takeuchi products shipped with the optional biodegradable oil are shipped with the above brand of oil.
- When switching from a mineral oil to a biodegradable oil, the parking brake torque decreases by about 30%.

Replacing the hydraulic oil with biodegradable oil

Mixing mineral oil with biodegradable oil will result in a decrease of the hydraulic oil's performance as well as a decrease in biodegradability and safety. The hydraulic oil system must be flushed as described below before supplying the biodegradable oil. This operation is dangerous and requires experience. Have it performed by a Takeuchi sales or service outlet.

Flushing

To be performed by a Takeuchi sales or service outlet

1. Drain the hydraulic oil (mineral oil) from the hydraulic tank and Clean the inside of the tank and suction strainer.
   Refer to page 127 "Replacing the Hydraulic Oil and Cleaning the Suction Strainer".
2. Remove the cylinder hoses and drain the hydraulic oil (mineral oil) from inside the cylinders.
   Hydraulic tank: Approx. 23 liters (24.3 US.qt.)
   Total of cylinders: Approx. 2 liters (2.1 US.qt.)
   Total amount of oil: Approx. 25 liters (26.4 US.qt.)
3. Supply new biodegradable oil to the hydraulic tank.
4. Bleed the air from the pump and cylinders and pressurize the hydraulic tank.
5. Operate the hydraulic devices for 30 minutes.
6. Drain the biodegradable oil from the tank and cylinders.
7. Replace the hydraulic oil return filter with a new filter.
8. Repeat steps 3 and 4.
9. Operate the hydraulic devices for 30 minutes.
10. Drain the biodegradable oil from the tank and cylinders.
11. Repeat steps 3 and 4.
12. Operate the hydraulic devices for 1 hour.
13. Drain the biodegradable oil from the tank and cylinders.
14. Replace the return filter with a new filter.
15. Repeat steps 3 and 4.
16. Operate the hydraulic devices, then check for oil leakage.

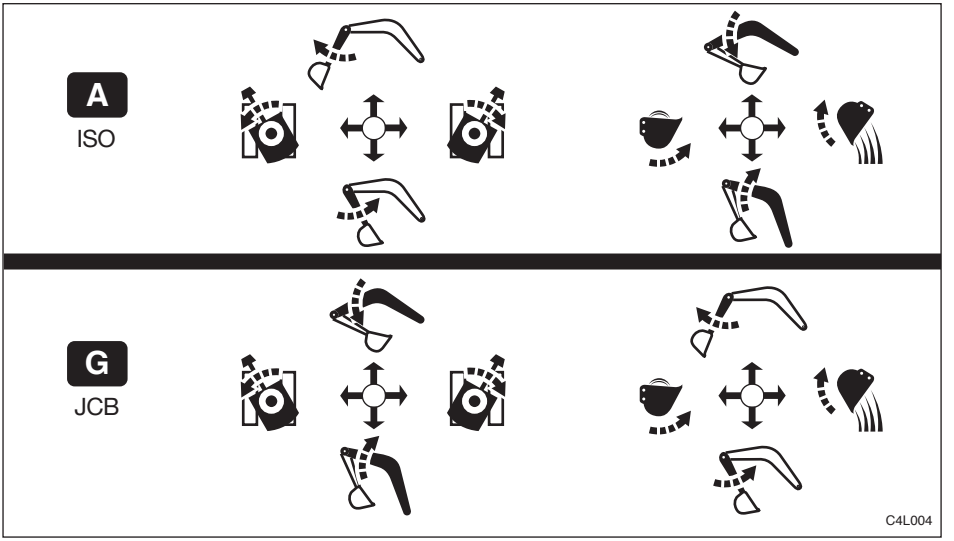
There is no need to flush the hydraulic oil system when switching from biodegradable to mineral hydraulic oil.

Switching the Lever Pattern

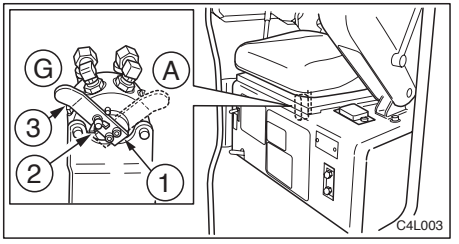
The operating pattern of the left and right operating levers can be changed.

⚠ WARNING

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



Switching the Lever Pattern



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

1. Open the maintenance cover.
2. Loosen the wing bolt (2) from selector valve (1).
3. Turn the lever (3) to switch the pattern.
4. Tighten the wing bolt (2) and fasten the lever (3) in place.
5. Close the maintenance cover and check the lever pattern.

Below is the bucket combination table for when arms and telescopic arms are installed. Heed this table.

⚠ WARNING

- **Consult with a Takeuchi before installing optional attachments.**
- **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 products caused by the use of a non-approved attachment.**
- **Add an extra weight when using a long arm or a telescopic arm.**
- **Install a swing stopper when a bucket wider than the standard bucket, long arm and telescopic arm is installed and when using a cab version.**

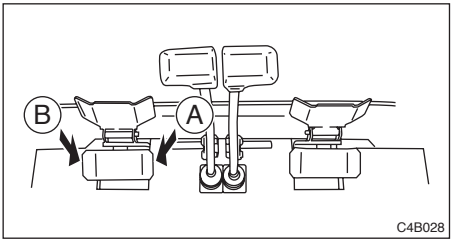
✔ : Usable
Δ : Usable for light operations (digging and loading operations with dry, loose sand or mud)
— : Not usable

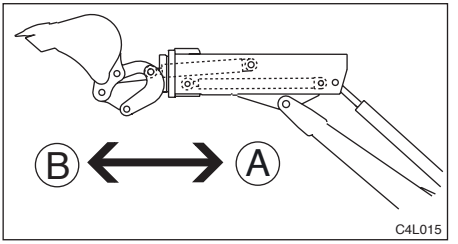
Total bucket weight = Weight of bucket + Weight of full bucket load (specific gravity : 1.8)

TB014 / **TB016**	**Rated Capacity m^3 (cu.yd.)**	**Bucket cutting width mm (inch)**	**830 mm (33 in.) Arm** / **930 mm (37 in.) Arm**	**1040 mm (41 in.) Arm** / **1130 mm (44 in.) Arm**	——— / **Telescopic Arm 930 to 1380 mm (37 to 54 in.)**
260W Bucket	0.020 (0.026)	265 (10.4)	✔	✔	✔
300W Bucket	0.023 (0.030)	300 (11.8)	✔	✔	✔
350W Bucket	0.027 (0.035)	335 (13.2)	✔	✔	✔
450W (S.T.D.) Bucket	0.038 (0.049)	435 (17.1)	✔	✔	—
500W Bucket	0.043 (0.056)	485 (19.1)	✔	✔	—
Three-Hole Bucket	0.049 (0.064)	457 (18.0)	✔	✔	—
Total bucket weight = Within 98 kg (216 lb.) for Telescopic Arm		Within 485 (19.1)	✔	✔	✔
Total bucket weight = Within 127 kg (280 lb.)		Within 485 (19.1)	✔	✔	—
Hydraulic Breaker (TKB-71)			✔	✔	—

Extending and Retracting the Arm

Use the auxiliary pedal to extend and retract the telescopic arm.



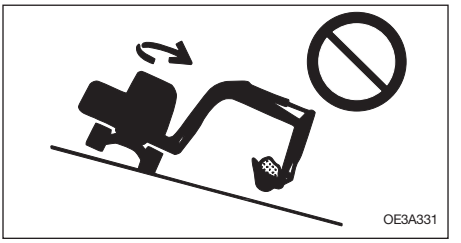


(A) Retract
(B) Extend

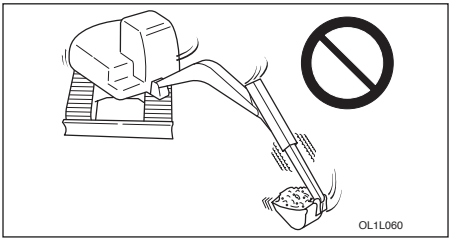
⚠ WARNING

- **Excavator must be equipped with boom swing stopper.**
- **Use caution when operating. Telescopic arm reduces craning capacity and bucket may come into contact with excavator. Excavator may become unstable when operating over the side or with boom swing.**
- **SAE heaped capacity of bucket installed on telescopic arm must not exceed 0.036 m^3 (1.3 cu. ft.) .**
- **Do not install hydraulic breaker, compactor or similar attachment on telescopic arm.**
- **Track-frame must be in wide position when operating telescopic arm.**

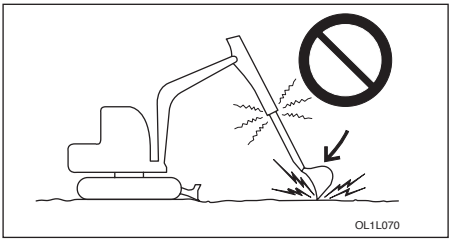
Caution on Using the Arm



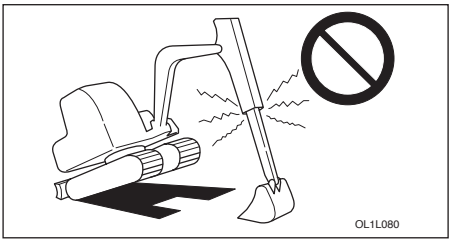
- The machine may loose balance and tip over when slewing or operating the attachment on slopes. It is particularly dangerous to slew with the arm extended on the bucket full. Never do so.



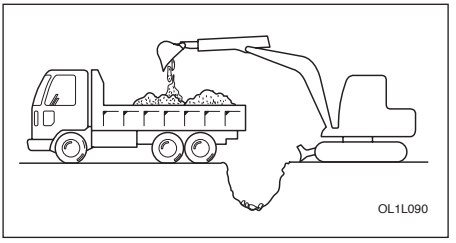
- NEVER slew suddenly or stop slewing suddenly with the arm extended. Doing so may damage the arm.



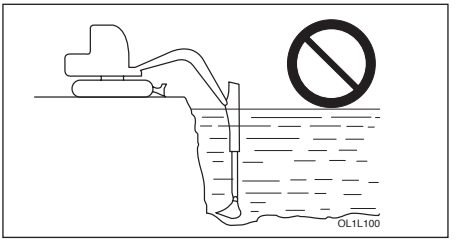
- Do not operate on base rock or hard soils, as doing so may shorten the arm's service life.

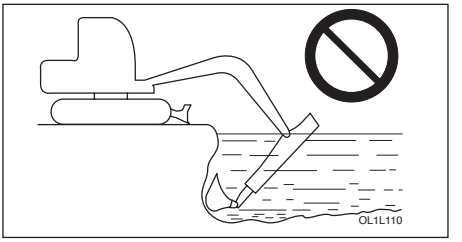


- Do not change directions with machine lifted by pressing the bucket pressed against the ground. Doing so may damage the arm.

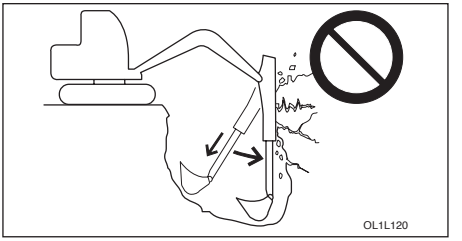


- When dumping soil from the bucket or shaking the bucket to remove the remaining soil, do so with the arm retracted to protect the arm extension/retraction section.





- Do not put the arm under water. Also avoid moisture when storing.

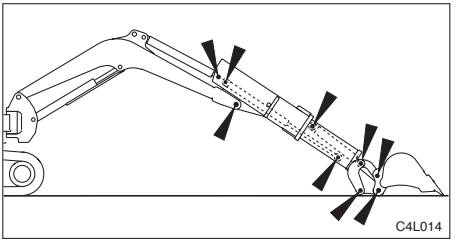


- The arm pressing speed is slow when pressing the arm while simultaneously extending it, but the arm pressing speed suddenly comes faster when the arm extending operation is stopped or the cylinder end is reached. Be careful not to hit surrounding objects.

Inspection and Maintenance

Greasing

- Every day or every 10 hours
- Type of grease.....Lithium-based multi-purpose grease No. 2
- Greasing points



1. Fully retract the bucket, arm and extend the telescopic cylinders, lower the boom and ground the bucket.
2. Lower the blade and stop the engine.
3. Clean the grease nipple.
4. Add grease to the grease nipple using a grease gun.
5. Wipe off the grease that has been squeezed out and any extra grease.

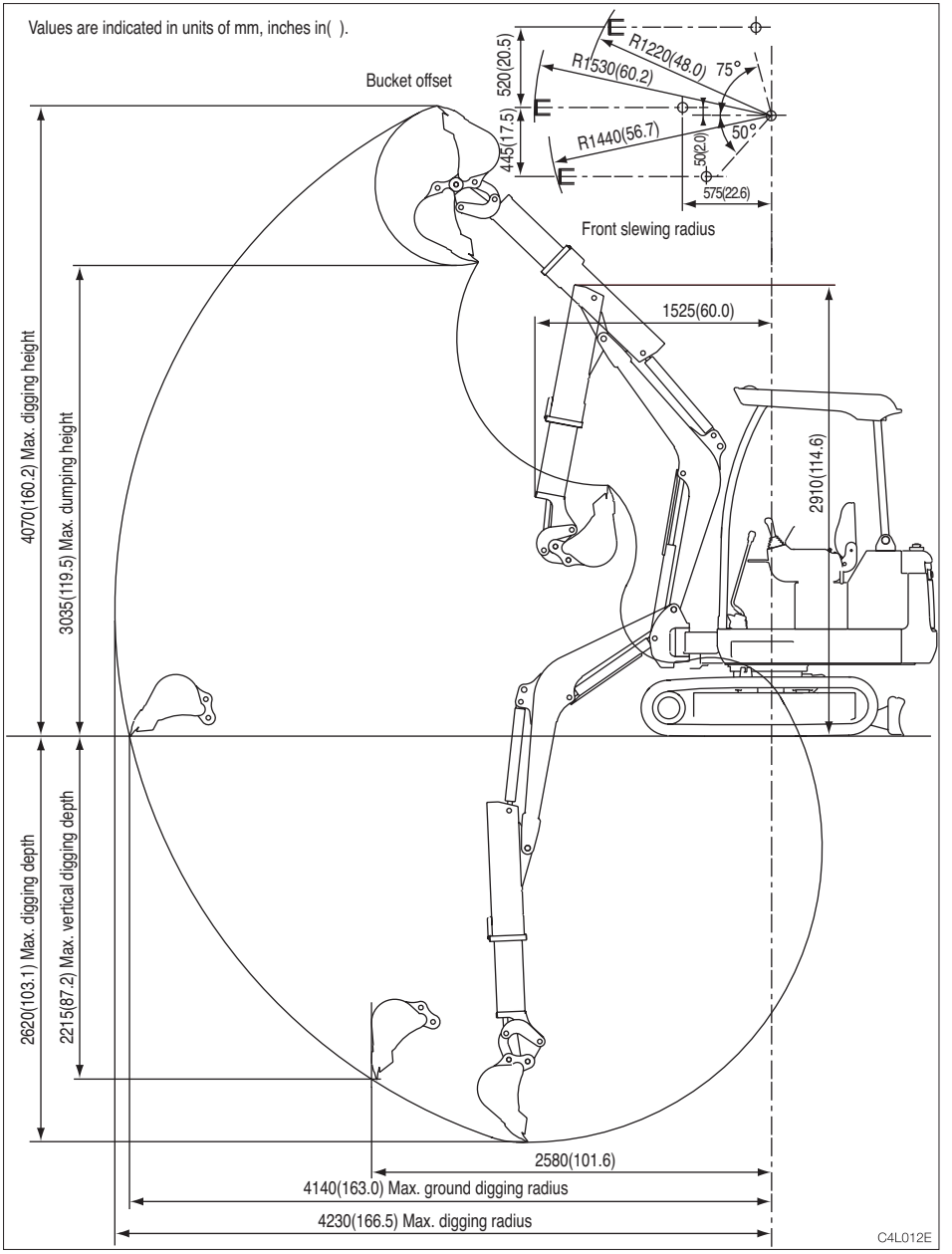
Looseness in the telescopic arm

When the telescopic arm is used for long periods of time, wear of the sliding parts may cause the gap between the outside arm and inside arm to increase to above the set value, resulting in looseness.

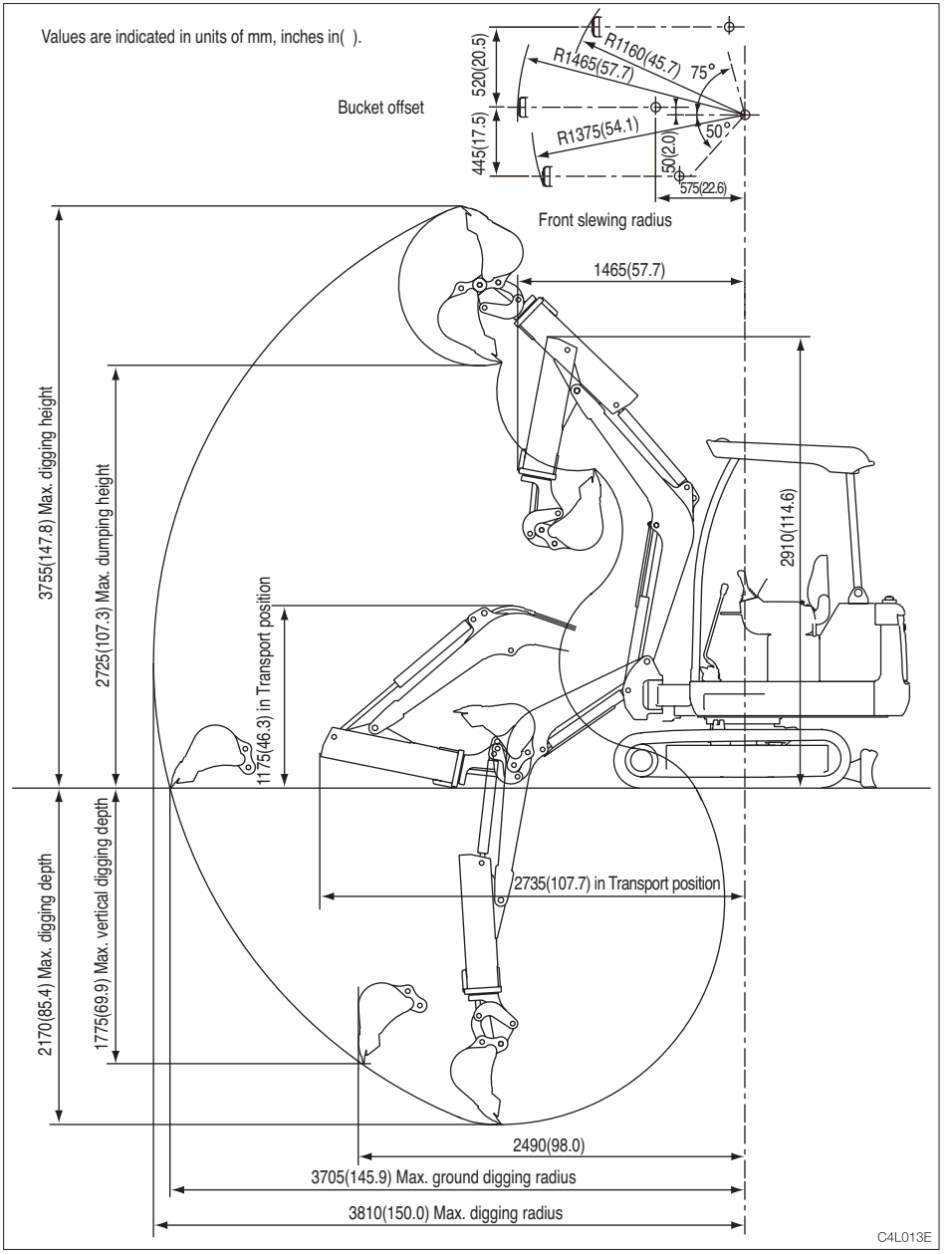
Other parts may be damaged if the telescopic arm is used with such looseness. Contact a Takeuchi dealer for maintenance.

Note that no maintenance is necessary other than the greasing described above.

Operating Ranges TB016 Canopy (Fully Extended Arm)



Operating Ranges TB016 Canopy (Fully Retracted Arm)

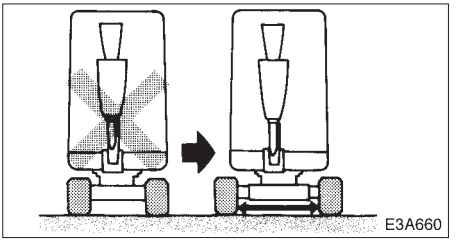


For handling of the breaker, read the hydraulic breaker's manual, provided separately.

< TB016 >
Do not use a breaker with the crawler width narrowed!

⚠ WARNING

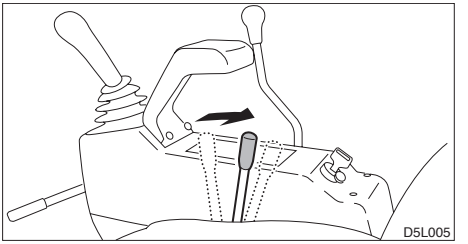
- **When operating the machine, always set the crawler width to 1300 mm (51 in.) for a more stable posture. Operating with the crawler width narrowed (980 mm (39 in.)) makes the machine unstable and may cause it to tip over.**
- **If you must operate with the crawler width narrowed (980 mm), fold in the hoe attachment, and lower the boom to lower the center of gravity, and set the machine facing directly forward before traveling.**



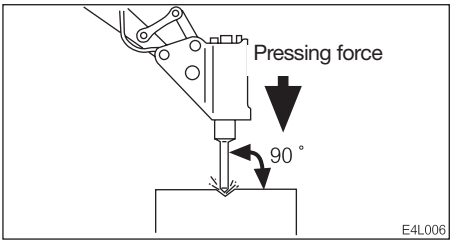
When operating such optional attachments as a breaker, tilted bucket or clamshell, always set the crawler width to 1300 mm (51 in.) before operating.

IMPORTANT: When mounting devices, select devices suited for this machine. For advice on selecting device, contact a Takeuchi sales or service outlet.

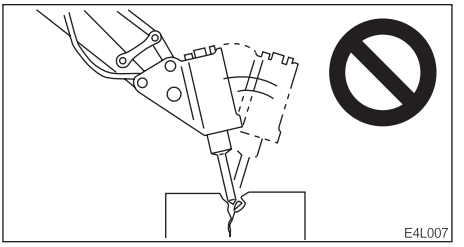
Precautions on Operating



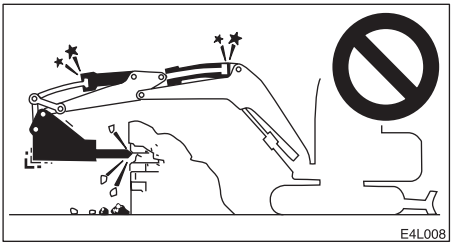
- Run the engine with 75% the maximum speed.



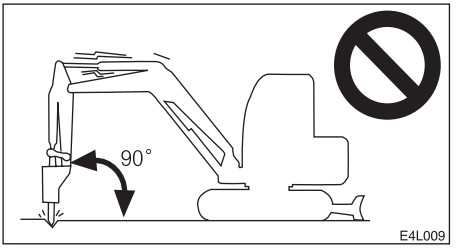
- Pound with the chisel perpendicular to the surface you are pounding.
- When pounding, press the chisel properly against the object to be broken so as to avoid pounding the air.



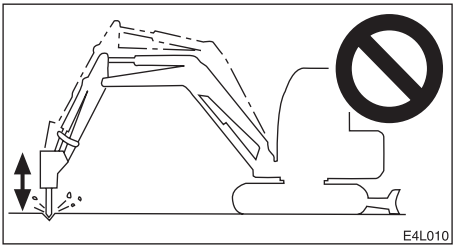
- Do not pry with the chisel, and do not pry while pounding.
- Do not move the chisel while pounding.
- Do not pound continuously for over 30 seconds on the same surface.



- Do not pound with the cylinder fully extended or contracted (at the stroke end). Leave a margin of at least 5 cm.



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



- Do not drop the breaker itself on the object to be broken in order to break it.
- Do not move objects to be broken or rocks with the breaker itself.
- Slew occasionally to cool the engine.
- If a hydraulic hose is vibrating abnormally, nitrogen gas may be leaking from the accumulator. Have an inspection as soon as possible.

Replace the hydraulic oil regularly!

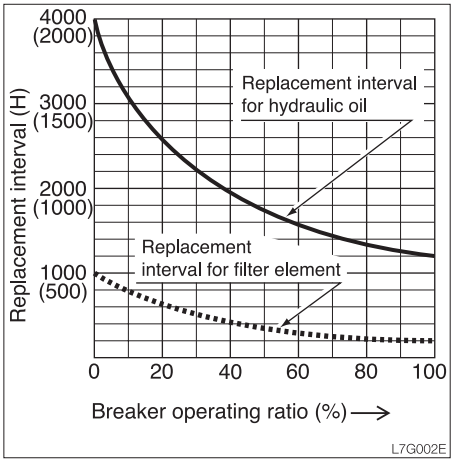
When using a hydraulic breaker, the oil deteriorates quicker than during normal digging. Be sure to replace the hydraulic oil and return filter element.

- Failure to replace these in time can lead to damage to the machine and breaker's hydraulic systems. In order to improve the service life of the hydraulic systems, be sure to replace the hydraulic oil and return filter element according to the following chart of the replacement interval.
- Clean the suction strainer when changing the return filter element.

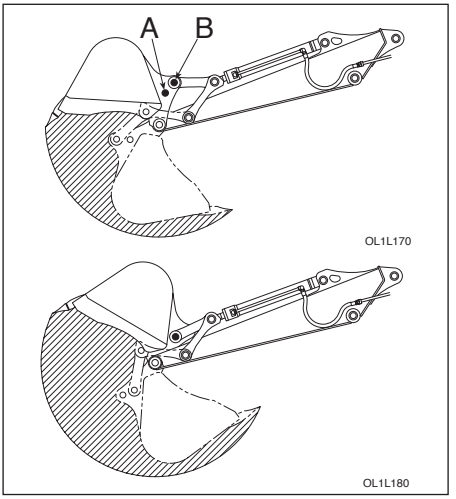
Replacement interval (hours)

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.



The digging capacity increases when the bucket's link arm installation position is switched from (A) to (B). However, this shortens the bucket stroke.

- Struck capacity (SAE): 0.038 m^3 (0.049 cu. yd.)
- Rated capacity (SAE): 0.049 m^3 (0.064 cu. yd.)

Changing the Link Arm Installation Position

Refer to "Replacing the Bucket" in the manual.

Replacing the Bucket Teeth

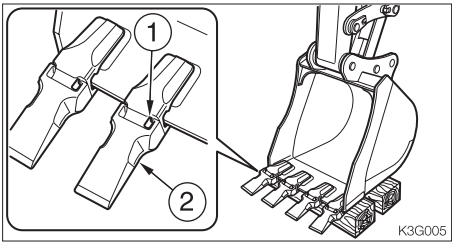
Replace the bucket teeth when the tooth points are worn, before the adapter is damaged.

⚠ WARNING

- **Before performing maintenance or repairs under the machine, set all working equipment against the ground or in the lowermost position.**
- **To prevent unexpected movement, securely block the working elements when repairing or replacing the bucket teeth.**
- **Wear required appropriate equipment such as safety glasses when using hammers, as metal fragments or other objects can fly and cause serious personal injury.**
- **Do not allow unauthorized personnel in the work area.**

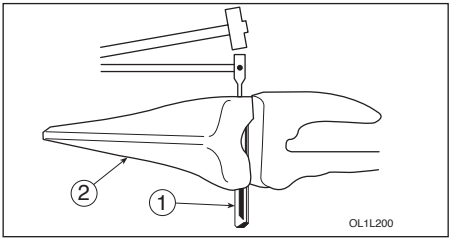
Removal

1. Clean the bucket and park the machine in a flat, safe place where the ground is hard.

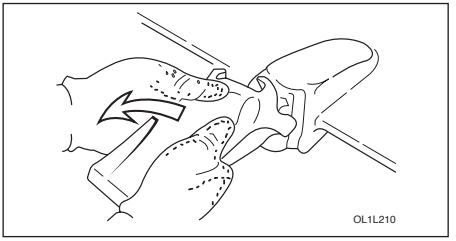


2. Set the bottom surface of the bucket flat and lower it on a block so that the locking pin (1) can be knocked out.

3. Remove the key, then check that the bucket is stable.

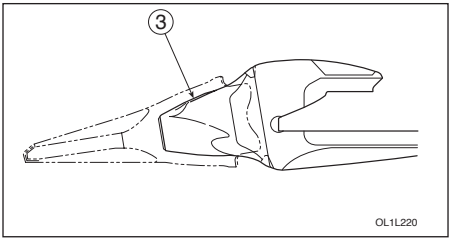


4. Place a rod against the locking pin (1) and knock the locking pin out by hammering against the rod.
   The rod should be round and thinner than the locking pin.

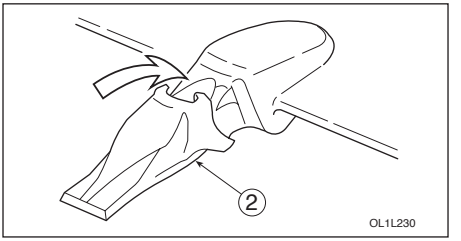


5. Remove the tooth point (2).
   Some tooth points (2) are of the type that are removed by turning (twisting) them counterclockwise.
   The same procedure can be used to remove the other tooth points.

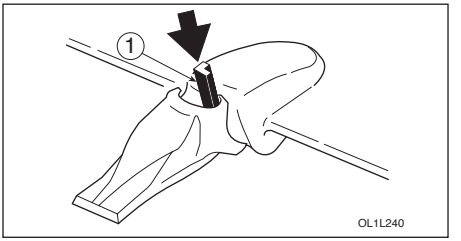
Installation



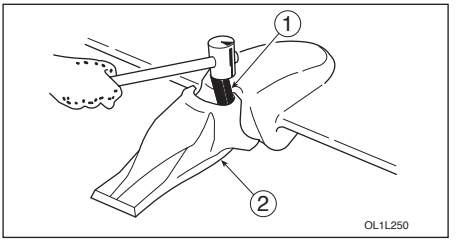
1. Clean the adapter nose (3).
   If there is gravel or mud on the adapter nose, the tooth point will not go in all the way and the pin cannot be driven in.



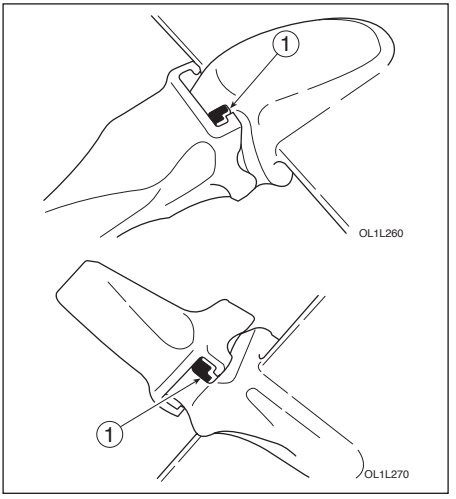
2. Put the tooth point (2) in the adapter nose (3).
   Push in firmly until the tooth point (2) touches the tip of the adapter nose (3).
   Some tooth points (2) are of the type that are installed by turning (twisting) them clockwise.



3. Insert the locking pin (1), making sure it is in the right direction.



4. Drive in the locking pin (1) with a hammer until it is flush with the tip of the tooth point (2) ear.

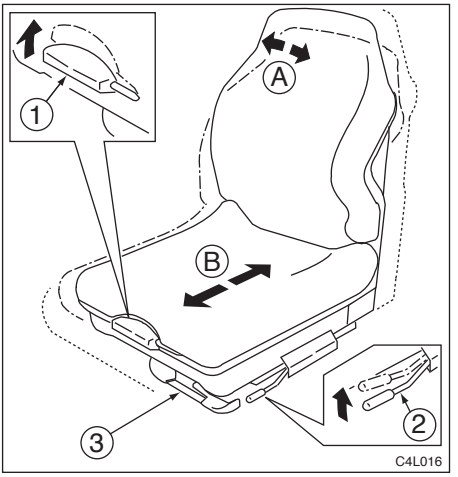


5. The locking pin (1) is now driven in.
   The same procedure can be used to install the other tooth points.

Seat

⚠ WARNING

Adjust, secure and latch the operator's seat.

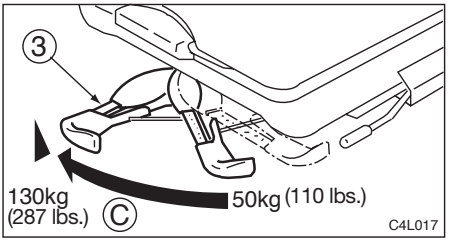


(A) Back angle adjustment

1. Raising your torso, sitting down firmly in the seat.
2. Pulling lever (1) allows you to use the pressure of the springs in the seat pressing against your back to adjust the reclining angle of the seat back. Release the lever (1) at the desired angle and the seat back will be locked in that position.

(B) Fore-and-aft adjustment

1. Pull on lever (2) and slide the seat backward or forward to bring it to the optimum position for operating the machine.
2. Release the lever (2) at the desired position and the seat will be locked there.
   Adjustment stroke: 10 steps,
   150 mm (5.9 in.)



(C) Weight adjustment

1. Turn handle (3) to the front side and set it to indicate the weight of the person to operate the machine.
   May be set to any value from 10 kg (22 lbs.) steps, 50 to 130 kg (110 to 287 lbs.).
2. When adjusting for a weight lower than the currently set weight, first turn handle (3) as far as it goes to cancel the setting, then readjust.

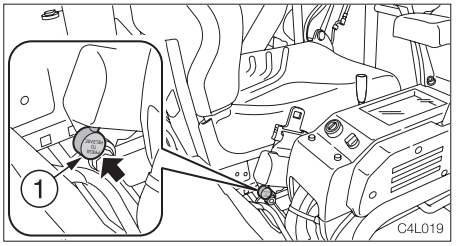
Seat Belt

⚠ CAUTION

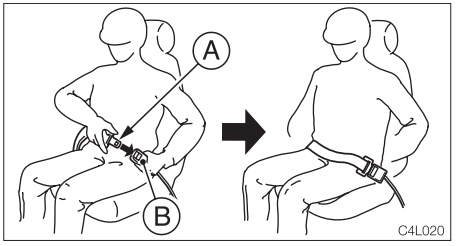
Always fasten the seat belt securely before starting the engine.

Fastening the seat belt

1. Adjust the seat to the optimum position for operating, raise your torso, and sit back firmly into the seat.

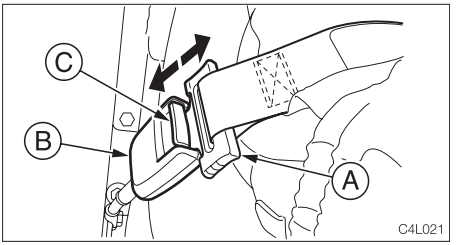


2. Press the button (1) to release the seat belt and pull the seat belt to the desired length.



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.

Releasing the seat belt

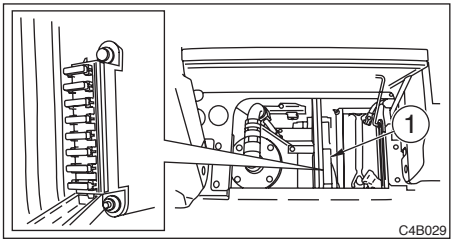


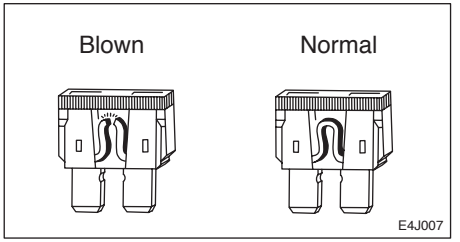
1. To remove the seat belt, simply press the red button (C) located on the buckle(B).
2. Hold the tongue plate (A) and press the button (1).
   The seat belt is automatically stowed away.

An alarm is sounded when the machine travels and stops when traveling is stopped. If the alarm does not sound when the machine travels, the fuse may be blown. Inspect the fuse.

⚠ WARNING

If the fuse which has just been replaced should blow again, there is a problem in the electrical system. This could cause fires. Contact a Takeuchi dealer.



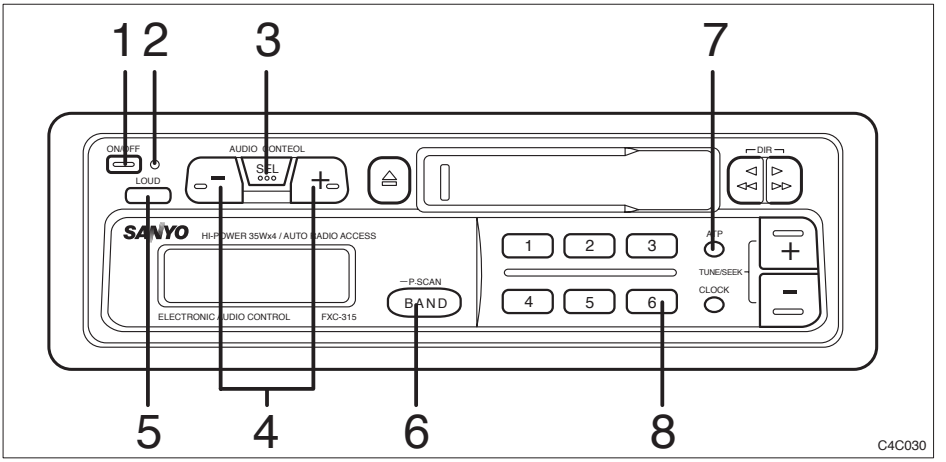


1. Park the machine in a safe place.
2. Set the starter switch to “OFF”.
3. Open the fuse holder and inspect for blown fuses.
4. If a fuse is blown, replace it with a spare fuse of the same capacity.

Fuse Layout and Circuits Protected

Capacity	Protected circuit
30A	Stop solenoid
10A	Lever lock
10A	Second travel speed
20A	Lights, Tail lamp
15A	Heater, Radio
10A	Feed pump, Instrument panel
25A	External power socket, Cigarette lighter, Wiper (cab), **Travel alarm**
10A	Horn, Clock(radio), Interior light

General operation



Turning the power on
Press the ON/OFF button ①.

Turning the power off 1, 2
Press the ON/OFF button ① to stop current operation.
The LED ② lights when the ACC is on.

Electronic controls.....3, 4
Press the SEL button ③ to select the audio functions as shown in the table below.
To adjust the volume, press the AUDIO CONTROL button ④ while in the volume mode.
To adjust the bass, treble, balance or fader, press the SEL button to select the desired operation, then press the ⊖ or ⊕ side of the AUDIO CONTROL button.
Supplement: While no other mode is displayed, the AUDIO CONTROL button functions as a volume control.

MODE	⊖ (Min)		⊕ (Max)	
VOL → BAS → TRE → BAL → FAD → VOL	Down	0	Up	50
	Down	-5	Up	+5
	Down	-5	Up	+5
	Left	L9	Right	R9
	Front	F9	Rear	R9

Loudness (LOUD) button 5
Press the LOUD button ⑤ to enhance the low-frequency sound at all volume levels. When the LOUDNESS is on, on is displayed for 3 seconds. Press the LOUD button again to turn the LOUDNESS off and oFF is displayed for 3 seconds.

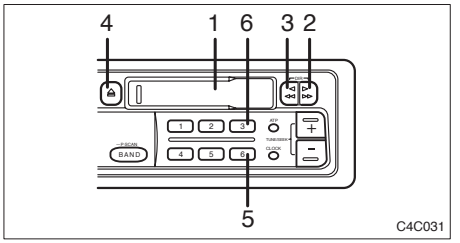
Radio selection button (BAND).....6
Each time the button is pressed, the function changes as shown below.

FM1 → FM2 → MW

To cancel the beep tones.....1, 7, 8
The unit emits a beep tone to confirm that a function button has been pressed. To cancel the function, follow the procedures below.

1 Turn off the power by depressing the ON/OFF button ①.
2 With ACC on, press the ATP button ⑦ and the preset button 6 ⑧ simultaneously until the display lights. The beep tones are cancelled and *boF F* is displayed.
3 To turn the beep tones on again, repeat steps 1 and 2 and *b-on* is displayed.

Tape operation



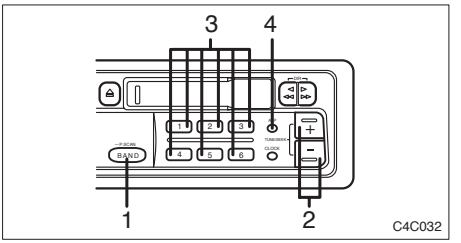
Selecting tape mode
Insert a cassette into the tape slot ① and the tape player will start.

Switching the tape direction 2, 3
Press BUTTONS ② and ③ simultaneously.
- When the tape reaches the end of one side, the unit will automatically switch to the opposite side of the tape.

Fast forward and rewind.....2, 3
Press button ② to fast-forward; press button ③ to rewind the tape. To stop fast forwarding or rewinding, lightly press the opposite button ② or ③ to return to the play mode.
During fast forward and rewind, the radio monitor is activated. The unit receives the station selected last.

Ejecting the tape 4
Press the EJECT button ④ to eject a tape.
The system will return to the audio source selected last.

Radio operation



Selecting radio mode
Each time the BAND button is pressed, the selected band changes as shown below.

→ FM1 → FM2 → MW →

Radio tuning.....2
- Automatic tuning
  Press the TUNE/SEEK ⊕ or ⊖ button ② for more than 2 seconds.
  When the button is released, the system will start automatic tuning and stop at the next receivable station.

- Manual tuning
  To select higher frequency stations, press the ⊕ button for less than 0.5 seconds.
  To select lower frequency stations, press the ⊖ button for less than 0.5 seconds.
  To quickly scan up or down in frequency, press and hold the ⊕ or ⊖ button. Release the button when the display approaches the desired frequency, then press and release the button repeatedly until the desired frequency is displayed.
  A flashing decimal point in the frequency display indicates that the system is receiving a station 50 kHz higher than the displayed frequency.

Storing preset stations.....3
The preset buttons ③ can be used to store 6 stations in each band (FM1, FM2, and MW) for convenient access to your favorite stations.

- Programming stations
  1. Select the desired band, then tune in the station you want to store in memory.
  2. Press and hold one of the preset buttons for more than 2 seconds.
     Repeat steps 1 and 2 to program additional stations.
- Quick tuning
  Select the desired band, then press one of the six preset buttons.

ATP (Auto Travel Preset) operation 4
The Auto Travel Preset function searches for and memorizes the 6 strongest stations in one of the two bands (FM, MW) in order of signal strength.
This feature is useful when you are driving in an unfamiliar location and want to memorize local stations without changing the standard preset stations.
A total of 12 stations (6 FM and 6 MW) can be programmed.

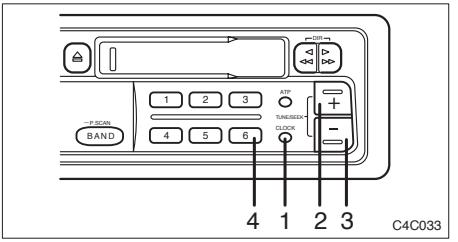
- To set the stations
  1. Select the desired band.
  2. Press and hold the ATP button ④ for more than 2 seconds, "ATP" appears in the display.
     When the stations have been memorized, scanning stops and the strongest station is selected.
- Quick Tuning of ATP Stations
  - Select the desired band.
  - Press the ATP button if the "ATP" indicator dose not appear in the display.
  - Press the ATP button for less than 1 second to select the ATP presets in sequence. If a total of six stations cannot be preset "- - -" will be displayed for the empty channels.
- To scan programmed stations
  See "Preset-Scan-Button operation".

Supplement: If no station can be received, "- - -" appears in the display.
If fewer than 6 stations can be received, the system will memorize as many stations as possible, then select the one memorized first.

Preset-Scan-Button operation.....1, 4
This function scans each of the preset stations stored in the selected band (both manual preset and auto travel presets).

1. Select the desired band or ATP mode.
   Press the BAND/P.SCAN button ① for FM1, FM2 or MW, or press the ATP button ④ for less than 0.5 seconds to select the ATP mode.
2. Press the BAND/P.SCAN button ① for more than 2 seconds. The system will select and receive each preset station for 5 seconds.
3. To stop scanning and retain the station currently selected, press the BAND/P.SCAN button ① again during this five-second period.

Clock



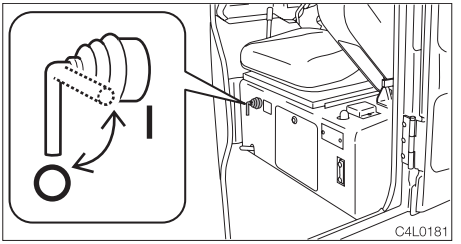
Display mode change.....1
The display on the unit can be changed by pushing the button ①. Pushing button ① alternates the display between time and radio/tape. Press the CLOCK button ① to switch between the clock and audio display. When a radio or tape function is performed while the time display is selected, the audio display will appear for 10 seconds, then the display will return to the time mode.

Adjusting the time.....1, 2, 3
To adjust the time, press the TUNE/SEEK ⊕ ② or ⊖ ③ button while pressing the CLOCK button ①.
To adjust the hour, press the ⊕ button.
To adjust the minutes, press the ⊖ button.
To advance the time rapidly, hold the ⊖ or ⊕ button continuously.

Clock reset.....1, 4
Press preset button 6 ④ while holding the CLOCK button to skip to the nearest half-hour as follows:
Example: 3:00 ~ 3:29 → 3:00
3:30 ~ 3:59 → 4:00

Supplement: This unit uses a 12-hour clock.
The clock function and radio presets are retained in memory when the audio is switched off.

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



OFF (O)..... Switches 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.

Supplement: 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.

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First Published May 1998
Thirtieth Published January 2012 OE-TB014-I

No. 33546

OPERATOR'S MANUAL

TB014
TB016 Compact 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.

EC-CONFORMITY CERTIFICATE

We herewith declare that following named machine, based on its conception and design and in the form brought into service is in accordance with the relevant, basic safety and health requirements of the following EC directives. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Compact Excavator	
Manufacturer	TAKEUCHI MFG. CO., LTD	
	205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan	
Model	TB014	TB016
Engine type	D782-E2B-BHTU-1	3TNV70-STB
Engine power	9.3 kW @ 2200rpm	10.3 kW @ 2200rpm

The machine is in accordance with the requirements of EC regulations:

1) Machine directive 2006/42/EC and appendix
2) Electromagnetic compatibility-regulation 2004/108/EC and appendix
3) Noise directive 2000/14/EC (Evaluation procedure according to appendix VI), 2005/88/EC and appendices.
4) Regulations on engine emissions: 2004/26/EC and appendices.

Harmonized norms: EN474-1:2006+A1:2009, EN474-5:2006+A1:2009.

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Issued in Sakaki, Japan

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