



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

OC3-106E0

TB015

COMPACT EXCAVATOR

OPERATORS MANUAL

Serial No. 1154619~

TAKEUCHI MFG.CO.,LTD.

OPERATOR PRECAUTIONS

If this machine is used by an employee, it is the employer's responsibility to fully instruct each operator in the proper and safe operation of all operative equipment. Both employer and employee should thoroughly familiarize themselves with the following sections.

All operators must be instructed on the proper operation of the excavator before they operate the unit.

● Personnel Precautions

- Avoid loose fitting clothing, loose or uncovered long hair, jewelry and loose personal articles.
- Know and use the protective equipment that is to be worn when operating this machine. Hard hats, protective glasses, protective shoes, gloves, and ear protection are examples of types of equipment that may be required.
- Do not rush. Walk, do not run.
- Know and use the hand signals required for particular jobs and know who has the responsibility for signaling.

● Operator-General Precautions

- It is the responsibility of the operator to read and understand the Operators Manual and other information provided and use the correct operating procedure. Machines should be operated only by qualified operators.
- Wear the seat belt.
- Do not permit riders on the machine.
- Make sure all protective guards, canopies, doors, etc, are in place and secure.
- Remove all loose objects stored in the machine. Remove all objects which do not belong in or on the machine and its equipment.

● Mounting and Dismounting Precautions

- Use the recommended hand holds and steps with at least three points of support when getting on and off the machine. Keep steps and platform clean. Face the access system when climbing up and down.
- Do not jump off the machine.
- Do not dismount while the machine is in motion.

● **Starting and Stopping Precautions**

- Walk around the machine and warn all personnel who may be servicing the machine or are in the machine path prior to starting. Do not start until all personnel are clearly away from the machine.
- Check that the parking device is applied, place the travel levers in neutral before starting the machine.
- Adjust, secure and latch the seat and fasten the seat belt before starting the machine.
- Start and operate the machine only from the operator's station.
- Do not bypass the machine's neutral-start system. The neutral-start system must be repaired if it malfunctions.
- Use jumper cables only in the recommended manner. Improper use can result in battery explosion or unexpected machine motion.
- Do not operate the engine in an enclosed area without adequate ventilation.
- Park the machine on level ground whenever possible and apply the parking device. On grades, park the machine with the crawler belts securely blocked.
- Before leaving the operator's station, place the travel levers in the neutral position, lower the equipment to the ground or put in the locked position, set the parking device and shut off the engine.
- Remove the starter key or disconnect switch key when leaving the machine parked or unattended.

● **Operating Precautions**

- Check brakes, steering and other machine control devices prior to starting operation. Observe all gauges or warning instruments for proper operation. Operate all controls to insure proper operation. If any malfunctions are found, follow the shutdown procedure and report the malfunction for resolution.
- 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.
- Understand the machine limitations and keep the machine control.
- Operate the machine with care and at speeds compatible with conditions. Use extra caution when operating over rough ground, on slopes, and when turning the machine.
- 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.
- Carry loads in recommended positions for maximum stability.
- Never lift loads in excess of capacity.
- Use the recommended machine ballast and counterweighting.

- Know and understand the job site traffic flow patterns and obey flagmen, road signs and signals.
- Watch for bystanders and never allow anyone to be under or to reach through the machine and its equipment while operating.
- Select the 1st. speed (low gear) that will prevent excessive speed when going downhill.
- When roading a machine, know and use the signaling devices required on the machine. Provide an escort for roading when required.

● **Maintenance Precautions**

- Do not attempt repairs unless trained. Refer to manuals and experienced repair personnel for help.
- Wear protective glasses and other required safety equipment when servicing or repairing the machine.
- Wear gloves to protect hands when handling cable.
- Disconnect the battery before working on the electrical system.
- Avoid lubrication or mechanical adjustments with the machine in motion or the engine operating. If the engine must be in operation to make certain adjustments, place the travel levers in neutral, apply the parking device, place the equipment in a safe position, securely block the crawler belts and use extreme caution.
- Securely block the machine or any component that may fall before working on the machine or component.
- To prevent unexpected movement, securely block working elements when repairing or changing working tool parts such as cutting edges.
- Never make repairs on pressurized components, fluid, gas or mechanical until the pressure has been relieved.
- Use extreme caution when removing radiator caps, drain plugs, grease fitting or pressure taps. Park the machine and let it cool down before opening a pressurized compartment.
- Release all pressure before working on the hydraulic system. Use a piece of cardboard or wood to check for pressurized leaks to prevent fluid penetrating the skin.
- Observe proper maintenance procedures.
- Whenever servicing or replacing hardened pins, etc, use a brass drift or other suitable material between the hammer and pin.
- Keep the brakes and steering systems in good operating condition.
- Replace all missing, illegible or damaged safety signs. Keep all safety signs clean.

- **Fuel Handling Precautions**

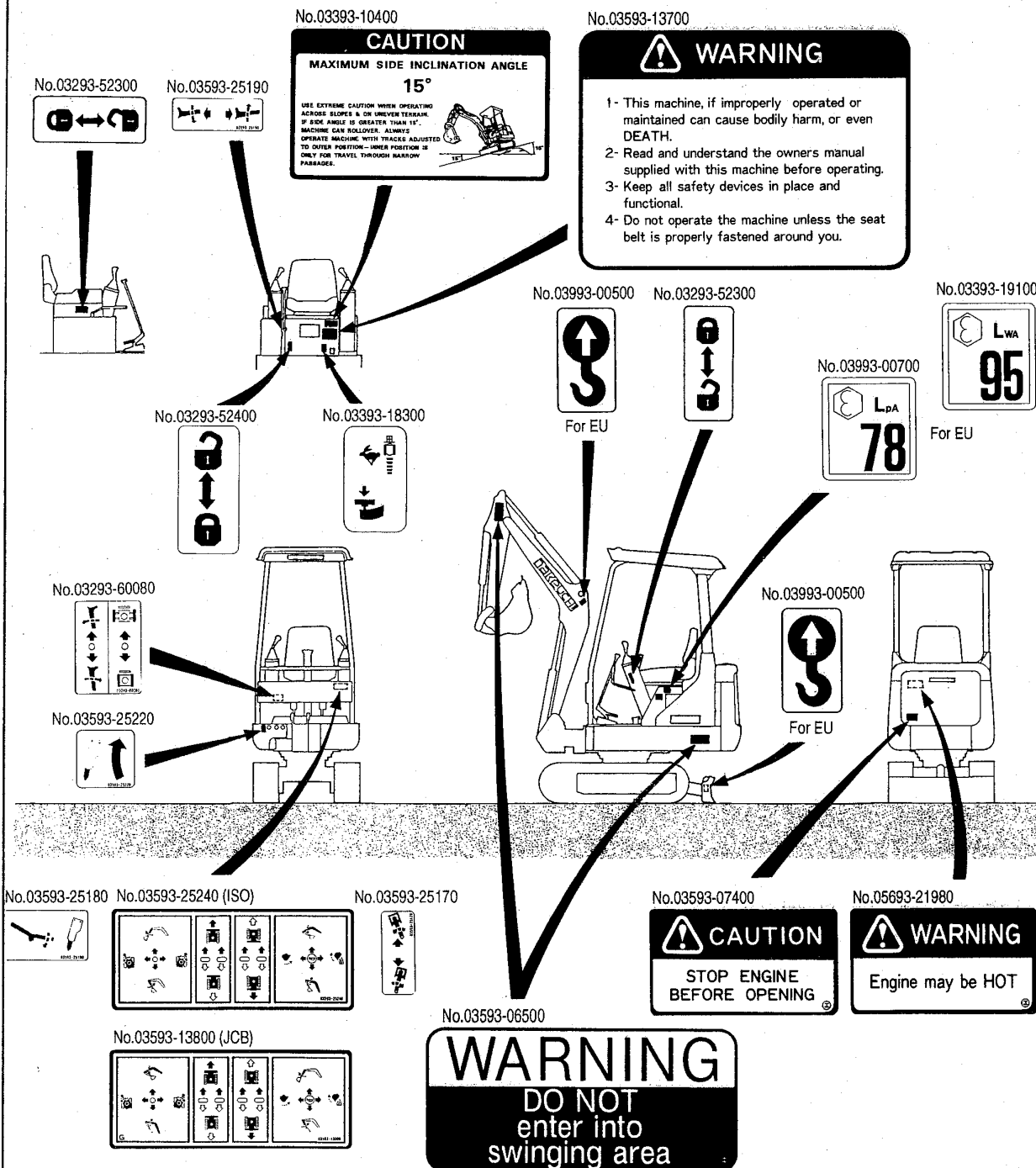
- Do not smoke or permit open flames while fueling or near fueling operations.
- Never remove the fuel cap or refuel with the engine running or hot. Never allow fuel to spill on hot machine components.
- Maintain control of the fuel filler nozzle when filling the tank.
- Do not fill the fuel tank to 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.

SAFETY SIGNS (Decals)

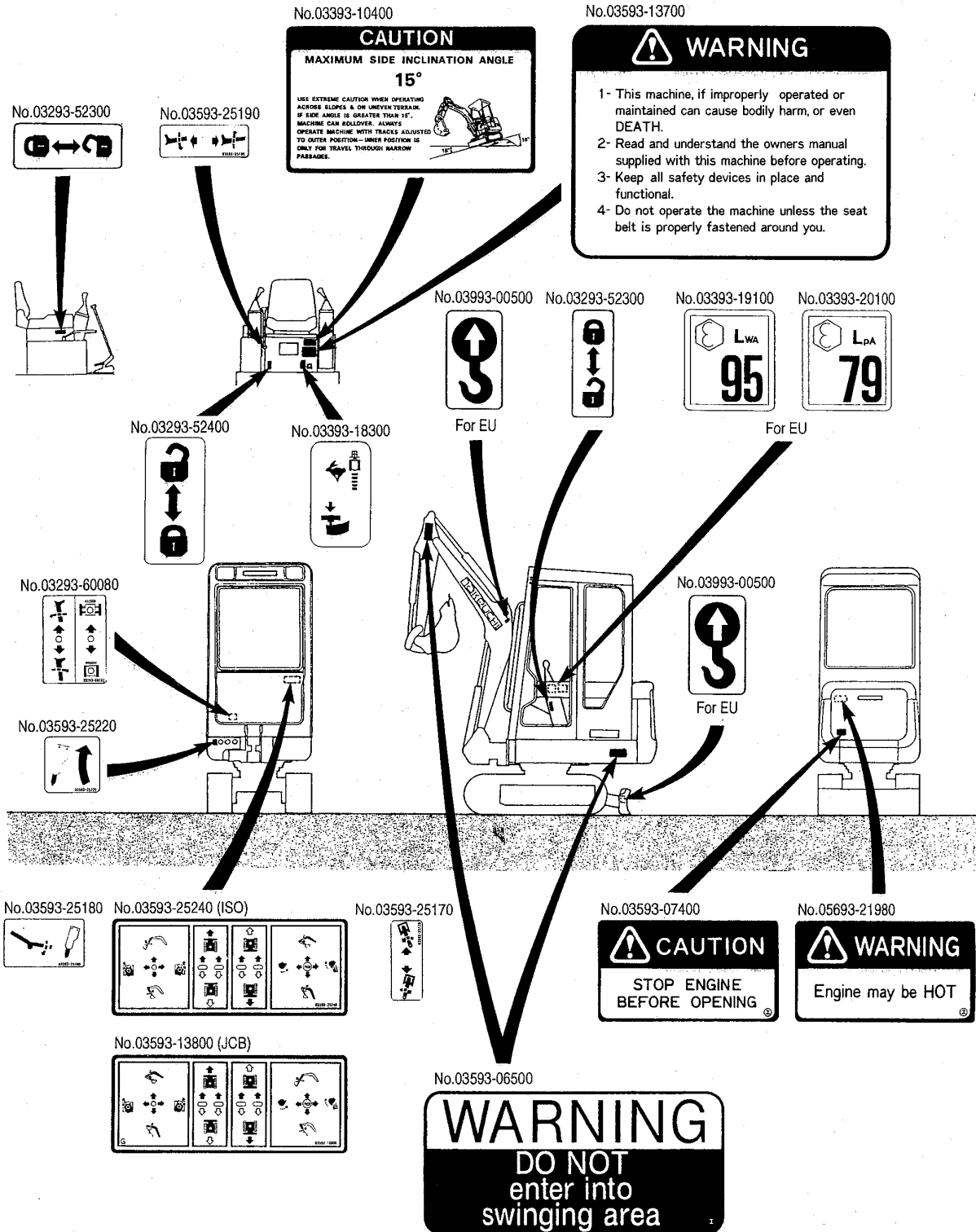
The following safety signs (decals) have been placed on your machine in the areas indicated. They are intended for the personal safety of you, and those working with you. Please take this manual, walk around your machine and note the content and location of these safety signs. Review these signs and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

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

Canopy



Cab



Introduction

Congratulations on your purchase of a Takeuchi construction machine. This manual explains operation and maintenance so that you can use your compact excavator efficiently and economically. Read this manual carefully, and operate and service your excavator accordingly. Please note that due to improvements, the explanations and diagrams in this manual may differ in some points from the actual excavator and the explanations in the engine's manual.



This mark indicates important information on safety. Be sure to follow the instructions indicated after this mark.



This mark indicates advice for the operator.

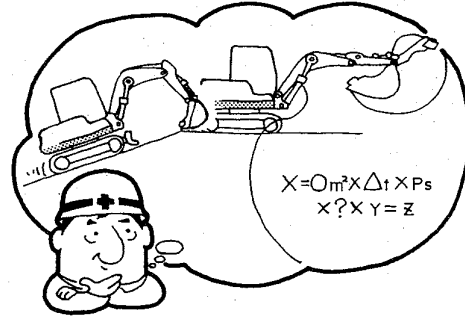
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< BEFORE OPERATION > SAFETY INSTRUCTIONS

▲ Know your excavator well.

- Make sure you know and understand the excavator's performance, working capacities, sizes, weights, etc.



00-005P

▲ Read this manual carefully and inspect and service the excavator accordingly.

- Proper handling of the excavator is the basis for safe operation. Read this manual and the stickers on the excavator carefully and make sure you understand them.
- Conduct pre-operation and daily inspections rigorously.



00-006P

▲ Wear the proper clothing.

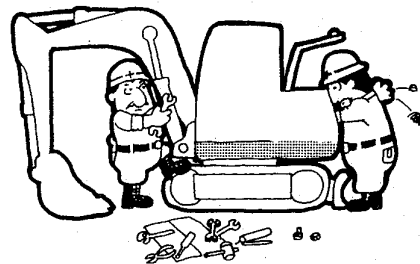
- Always use a helmet, work shoes, protective tools and work clothes.



00-007A

▲ Service and repair defects or problems carefully before operating the excavator.

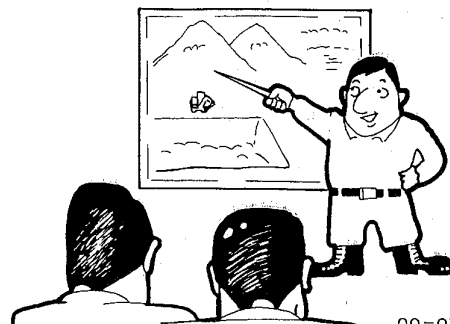
- Mark non-serviced excavators with the words "DO NOT OPERATE".
- Reinspect problem parts serviced or repaired the previous day before operating the excavator.



00-008P

▲ Perform operations systematically.

- Carefully discuss the work to be done for the day and the procedures.
- Survey the area on which the excavator is to be used, checking the ground, road shoulders, etc., for dangerous places, and prepare plans.

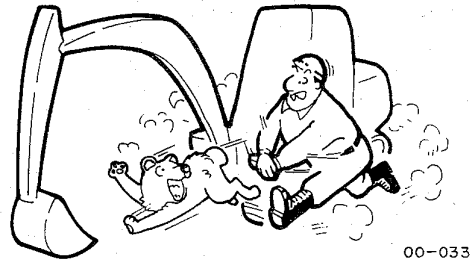


00-032

SAFETY INSTRUCTIONS <BEFORE OPERATION>

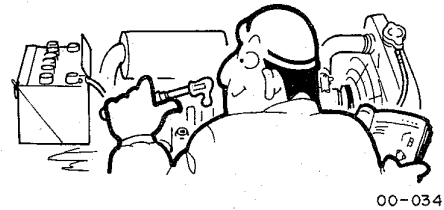
⚠ Check the area around the excavator before starting operations.

- Walk around the excavator once to check whether it is safe to move it. While doing so, check the outside of the excavator for scratches or damage.



⚠ Carefully perform the proper inspections before starting.

- Before starting, perform the inspections explained in the section "Before Starting". If you find any problems, adjust or repair them completely before starting.



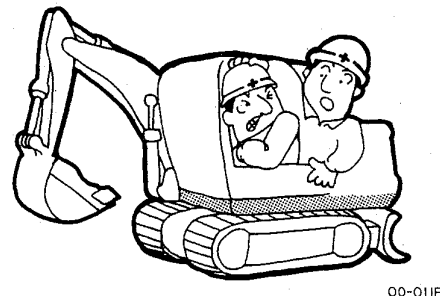
⚠ Do not jump onto or off of the excavator!

- Check that the engine is stopped and hold onto the handrail when climbing off.
- Do not grab operating levers when climbing in or out.
- Keep the floor and pedals clean, as dirt can make them slippery.



⚠ No passengers!

- No one but the operator should be in the excavator.



⚠ Be careful of noise.

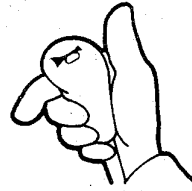
- Loud prolonged noise can cause hearing impairments, even the total loss of hearing. Use ear plugs or ear covers when operating the excavator.



< DURING OPERATION > SAFETY INSTRUCTIONS

▲ Honk the horn as a warning before starting the engine, starting up or slewing.

- To prevent accidents, signal others around the excavator before moving it by honking the horn or flashing the lights.



00-037

▲ Be careful of exhaust gases!

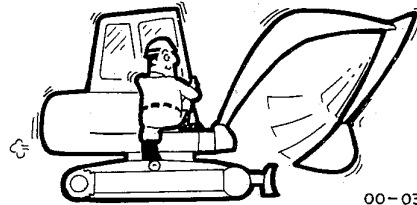
- The exhaust gases from the engine are extremely toxic. Take the following measures:
 - Ventilate thoroughly when working indoors.
 - Extend an exhaust pipe outdoors.



00-038P

▲ Always operate from the operator's seat.

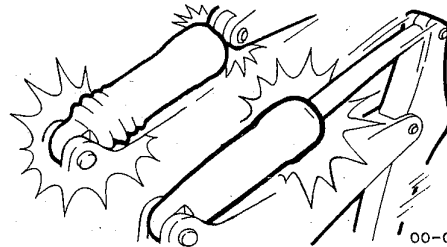
- Do not start the engine or operate the operating or travel levers except when in the operator's seat with the seat belt fastened. Doing so is extremely dangerous.



00-039

▲ Treat the hydraulic cylinders gently.

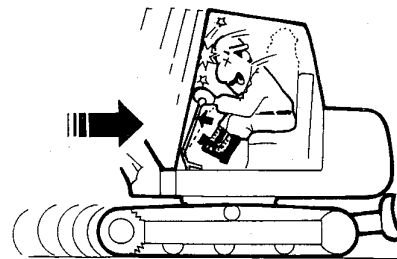
- Whenever possible, do not operate the hydraulic cylinders to the stroke ends. Leave a little leeway.



00-040P

▲ Check the position of the blade before starting to travel.

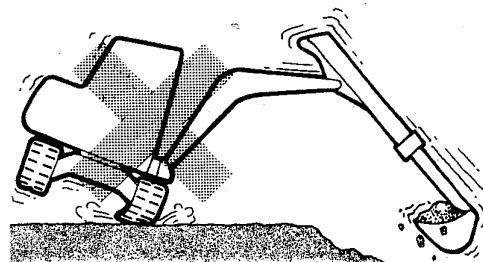
- The side on which the blade is located is the front of the travel frame. Lift the blade before travelling.
- Travelling long distances in reverse can damage the crawler belts.
- Remember that when the blade is to the rear of the operator's seat, the excavator will move backwards when the travel levers are pushed forwards.
- Be careful not to damage asphalt surfaces which are soft in the summer.



00-041

▲ Cautions on using the telescopic arm!

- When using the telescopic arm, stability decreases and the risk of tipping increases, so only operate in the following conditions:
 - Do not operate the telescopic arm in the slewing or swinging posture.
 - Operate with the spanner cylinder fully extended.
 - Set the boom swing directly to the front.
 - To dig, set the blade against the ground in the front.

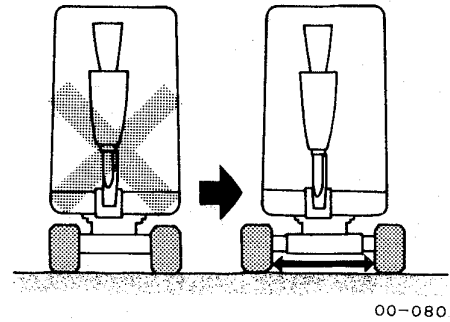


00-081P

SAFETY INSTRUCTIONS < DURING OPERATION >

▲ Operate with fully extended crawlers!

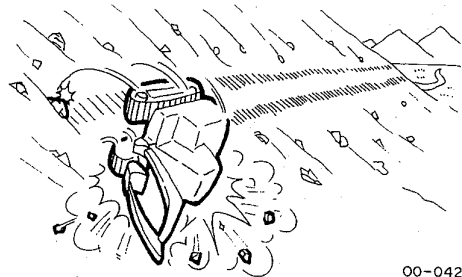
- When operate the machine, always extend the crawlers for greater stability. Operation with retracted crawlers the machine may be unstable and tip over.
- When travel with retracted crawlers, position the attachment facing straight forward.
- When operate the optional attachments such as Breaker, Tilt-Bucket, Cramshell, machine should be operated only in the extended width of 1300mm (51.2 in.).



00-080

▲ Never travel sideways or change directions on slopes!

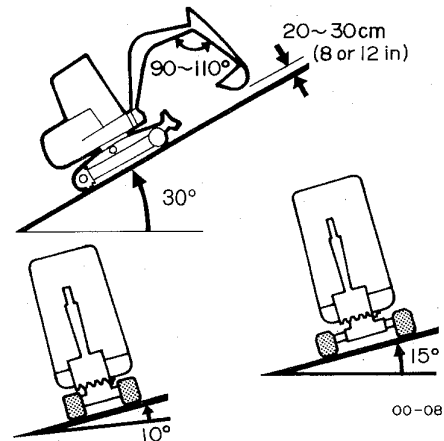
- Doing so is extremely dangerous. First move down the slope, then travel or change directions.
- When slewing on slopes, first pull the boom in as close as possible to the body and lower the bucket, then slew slowly.



00-042P

▲ Use within the maximum gradeability 30° and lateral tipping angle 15°. (10° when a retracted crawler width)

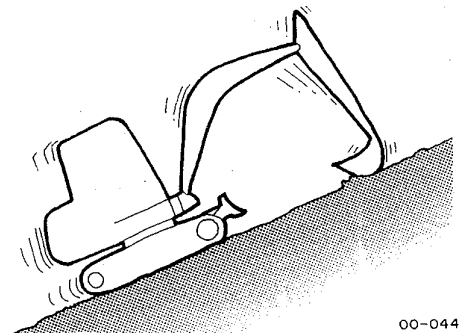
- Never use on slopes steeper than the excavator's specified maximum gradient.
- On slopes, set the bucket 20 or 30cm (8 or 12 in.) from the surface and use it for support in emergencies.
- When travelling down slopes, setting the travel levers to the neutral position provides automatic braking force.



00-081

▲ Cautions when climbing and descending slopes!

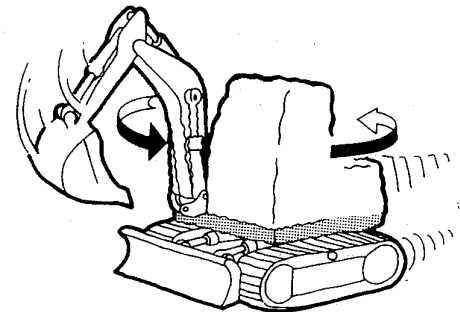
- If the crawlers slip and it is not possible to climb the slope, use the force of the arm pulling in to help.
- Travelling in high speed on slopes or non-leveled ground is dangerous as it could result in tipping or sliding. Always travel slowly in low speed.
- If the engine stops when climbing a slope, set the travel levers to the neutral position, lower the bucket to the ground and stop the excavator before starting the engine back up. Also, never slew when the engine is stopped. The excavator slews from its own weight.



00-044P

▲ Never slew while travelling!

- It is dangerous to slew while traveling, since it is not possible to pay attention to all factors. Also do not operate the hoe attachment while traveling.
- Do not drive the bucket's teeth into the ground while slewing, as this could damage the excavator.

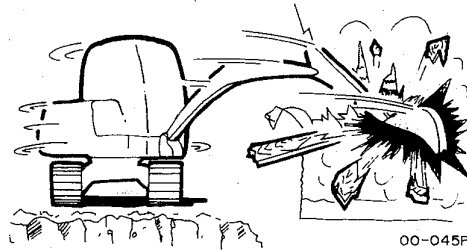


00-015P

< DURING OPERATION > SAFETY INSTRUCTIONS

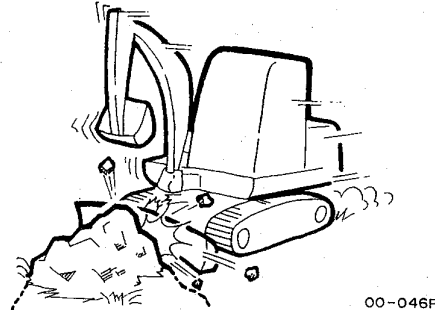
⚠ Watch for obstacles!

- Be very careful that the hoe attachment does not come into contact with obstacles while operating the excavator.



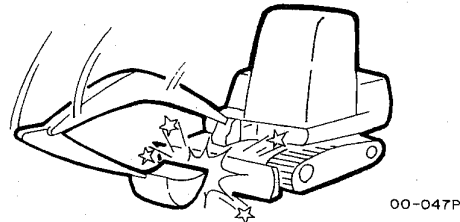
⚠ Be careful not to subject the blade to shocks!

- Hitting the blade against large rocks, etc., can damage the blade or blade cylinder.



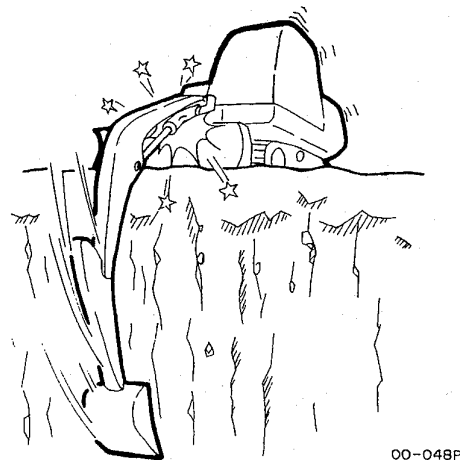
⚠ Be careful when folding the hoe attachment!

- When folding the hoe attachment, be careful that the bucket does not hit the blade.



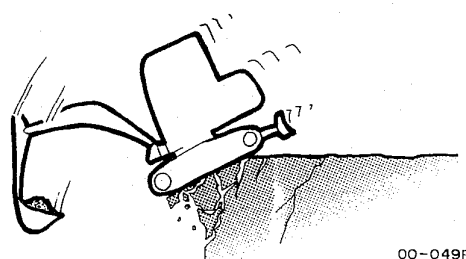
⚠ Be careful of the blade when digging!

- When digging deeply with the blade at the front, be careful that it does not hit the boom cylinder or bucket. Always operate with the blade at the back unless otherwise necessary.



⚠ Be careful when operating on the edges of cliffs or road shoulders!

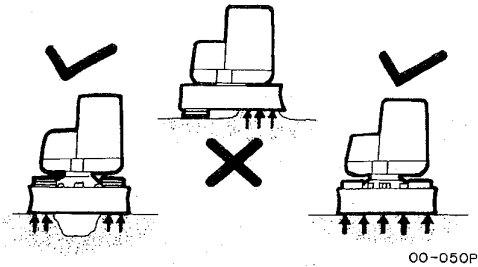
- To avoid unforeseeable situations, keep the crawlers at right angles to the cliff or road shoulder so that it can be moved back easily.
- Check the hardness of the ground beforehand for safety.
- Be careful not to dig the area directly in front of the excavator too deeply.



SAFETY INSTRUCTIONS < DURING OPERATION >

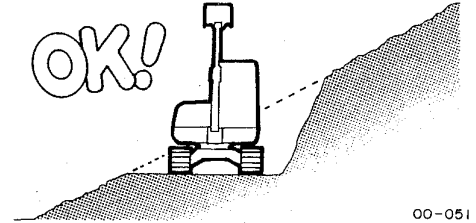
▲ Support the blade on both sides.

- When supporting the blade to stabilize the excavator while digging, do not support it on one side only.



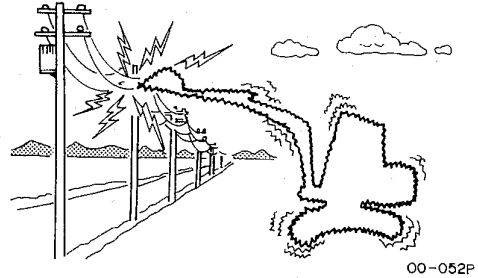
▲ Operating on slopes is dangerous!

- Level the ground on which the excavator is sitting before operating on slopes.



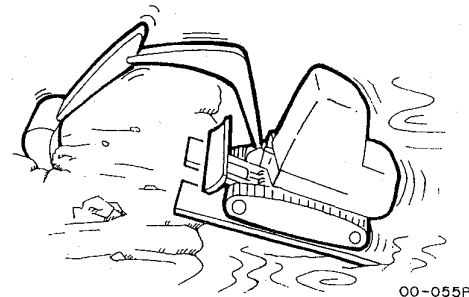
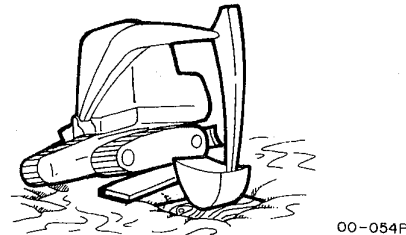
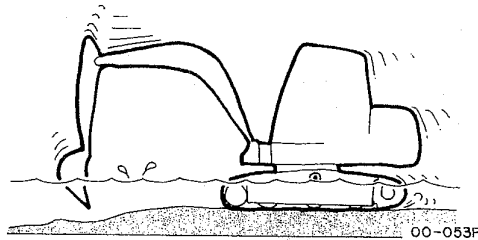
▲ Be careful of electric cables!

- Coming into contact with electric cables can result in shocks. Keep the hoe attachment and excavator body a sufficient distance from electric cables.
- If there are electric cables in the area in which you are to work, consult with the electric company so that work can be done safely.



▲ Cautions on using in water and on soft ground.

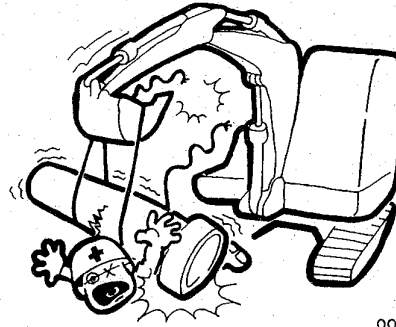
- The excavator can be used in water up to the middle of the carrier rollers. When operating in a river, check the depth of the river floor constantly with the bucket and operate carefully.
- For parts used over long periods of time under water, supply new grease until the old grease is expelled.
- Never let water or sand on the slew bearings or excavator body. If water or sand gets on these, have the excavator inspected at a service factory.
- When leaving water at a steep angle, be sufficiently careful that the back of the excavator does not get in the water, getting the radiator fin wet or damaging it.
- On soft ground, constantly observe the area around the excavator to make sure the excavator does not sink in.
- Getting out of mud
 - If only one side is stuck in mud, lift that side using the hoe attachment then place planks or boards underneath. When doing so, always push on the ground with the bottom of the bucket.
 - When both sides are stuck in the mud, set boards or planks underneath using the above procedure, dig the bucket into the ground in front, then pull the arm in and push the travel levers forward to get the excavator out.



< DURING OPERATION > SAFETY INSTRUCTIONS

⚠ Never use the excavator as a crane!

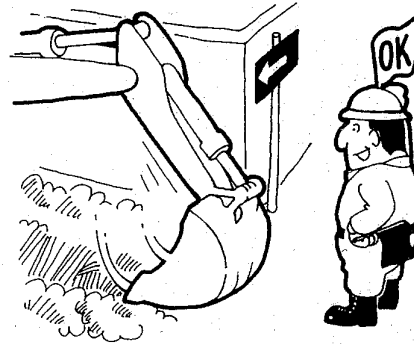
- Do not use the excavator as a crane. The excavator is not equipped for such operations.
- However, lifting operations within the specified limits are possible using the proper attachment.



00-030P

⚠ Use a guide in dangerous places or places where visibility is poor.

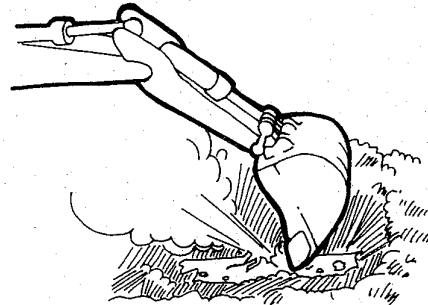
- Establish hand signals, etc., ahead of time.



00-009P

⚠ Watch for buried objects!

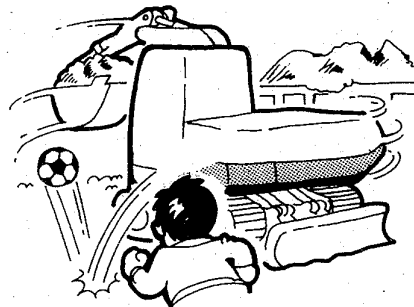
- Dig shallowly first to check for the presence or position of buried objects before starting actual operations.



00-010P

⚠ Do not let anyone within the slewing range!

- Blow the horn as a warning before slewing so that no one but the guide comes near the excavator.



00-012P

⚠ Only use the excavator for its designated purposes!

- Never let people ride in the bucket.

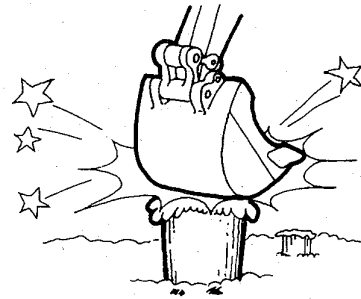


00-013P

SAFETY INSTRUCTIONS < DURING OPERATION >

⚠ Do not try to drive piles or clear away dirt by banging the bucket down!

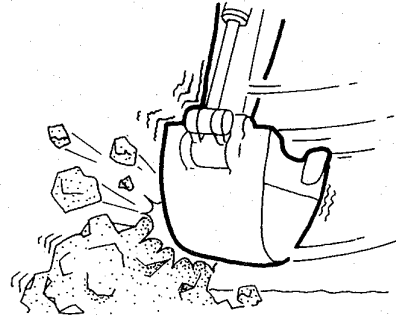
- This can shorten the service life of the hoe attachment parts. Always dig using the hydraulic force.



00-001P

⚠ Do not fill in holes or break earthen walls using the slewing or swinging force!

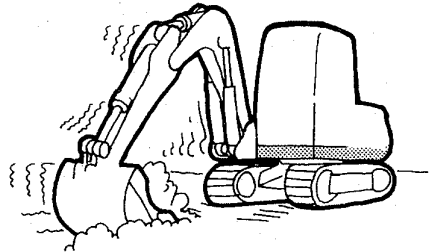
- Subjecting the swing bracket or slew mechanism to excessive force can result in damage.



00-004P

⚠ Do not try to dig while traveling!

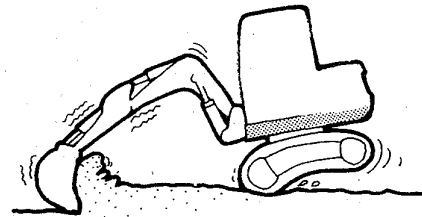
- Do not dig the bucket in first then try to pull it with the motion of the excavator.



00-003P

⚠ Do not try to use the weight of the excavator to add force when digging!

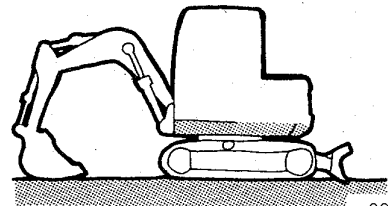
- Use the hydraulic force of the hoe attachment and always dig with shallow, long strokes.



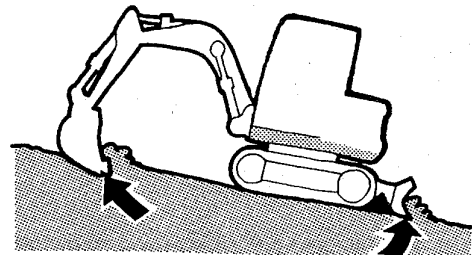
00-002P

⚠ Do the following before leaving the operator's seat:

- When parking or stopping on flat surfaces:
 - Set the bucket and blade against the ground.
 - Stop the engine and lock the operation levers.
 - Lock slewing and store the starter switch key away.
- When parking and stopping on slopes:
 - Do the above and also set stoppers against the crawler belts.



00-016P



00-017P

< DURING INSPECTION AND MAINTENANCE > SAFETY INSTRUCTIONS

Cautions on Inspection and Maintenance

▲ Inspection and maintenance schedule.

- Perform inspection and maintenance according to the time indicated on the hour meter.

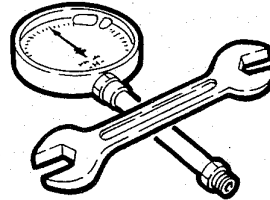
Check and add oil at regular intervals, determined in function of the type of operation, the load, the weather, etc., using as a basis that if the excavator is operated 8 hours a day, the oil should be checked and replenished after 1 week or 50 hours, 1 month or 250 hours, 6 months or 500 hours, 1 year or 1000 hours.



00-056

▲ Have a service factory perform major inspections and servicing.

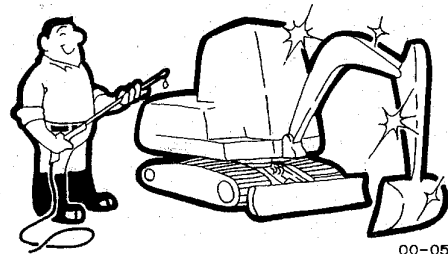
- Have a service factory perform any inspections, maintenance, and adjustments not explained in this manual. Also feel free to contact a service factory should you have any questions.
- If any of the situations for which this manual says to contact a service factory arise, do so as soon as possible.



00-057

▲ Wash the excavator methodically.

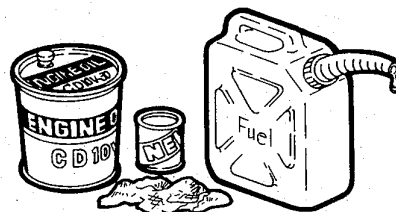
- Make it a habit to wash the excavator every day after using it. Dirt on the pedals can make them slippery, so clean it off carefully.
- When washing the excavator, cover electrical parts with vinyl to protect them from water. If they get wet, this could result in short circuits, malfunction or errors.



00-058P

▲ Handling fuel and oil.

- Fuel and oil are extremely inflammable, so handle them with sufficient care.
 - Replenish fuel outdoors with the engine stopped.
 - Carefully wipe off any fuel which may have spilled while fueling or servicing the excavator.
 - Store fuel and oil in places away from flames.
 - Cloths on which there is fuel or oil may ignite spontaneously, so dispose of them following the prescribed rules.



00-059

▲ Disposing of spent oil

- Place spent oil in oil barrels, etc. Do not pour the oil on the ground or into rivers or lakes, as this can damage the environment. Dispose of it following the prescribed rules for industrial wastes. Do the same for filters.



00-060

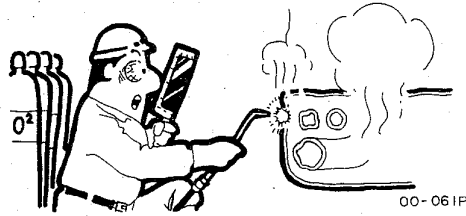
SAFETY INSTRUCTIONS < DURING INSPECTION AND MAINTENANCE >

⚠ Never try to modify the excavator!

- Never try to modify the excavator by yourself, as this could lead to reduced safety, function and service life.

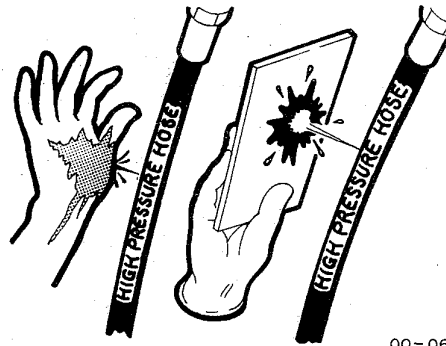
⚠ Have welding repairs done by a service factory.

- Heating hydraulic parts, pipes or nearby areas can generate combustible steam or gases which may explode, so have welding repairs done by a service factory.



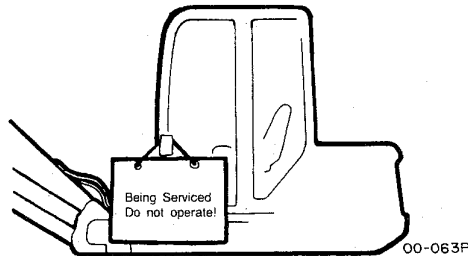
⚠ High pressure oil is dangerous!

- Do not let oil under high pressure spurt out onto the hands or body.
- If high pressure oil spurts out and gets into the skin, it can cause necrosis after several hours. If you should be exposed to high pressure oil, contact a physician immediately.
- Release the remaining oil pressure before removing hydraulic parts and pipes. Inversely, inspect the hoses and pipes carefully before pressurizing.
- Use boards to check for high pressure oil leaks.



⚠ Use signs during inspection.

- To prevent accidents, during inspecting and maintenance, place a sign on an easily visible part such as the door or operating levers saying "Being Serviced Do not operate!" so that others will not touch the excavator inadvertently.



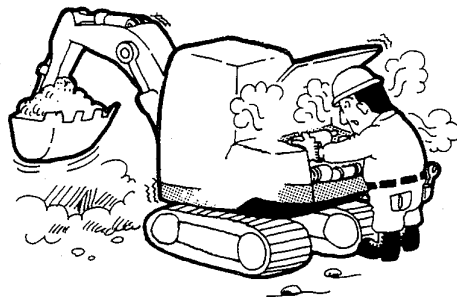
⚠ Cautions on handling the radiator!

- If the radiator cap is removed inadvertently when the engine is hot, hot water may spurt out, resulting in burns.
- Let the engine cool down, then slowly turn the cap to release the pressure.



⚠ Do not service while the excavator is operating!

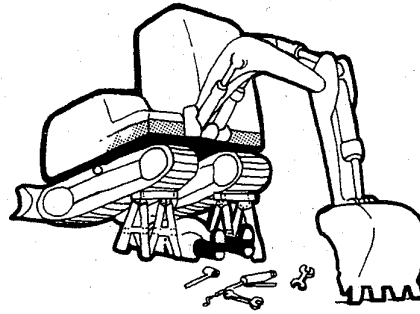
- Be sure to turn the engine off when inspecting or servicing.
- If a problem should arise with the excavator during operation, stop operating it immediately, inspect carefully and find the cause of the problem. Conduct repairs as soon as possible.



< DURING INSPECTION AND MAINTENANCE > SAFETY INSTRUCTIONS

▲Place safety blocks under the body!

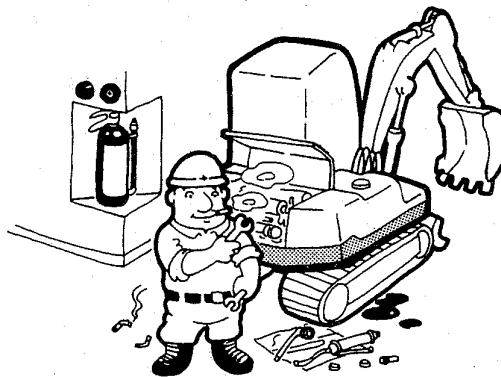
- Always set safety blocks under the body when inspecting or servicing underneath the excavator to prevent it from falling.



00-020P

▲Keep sources of fire away from the excavator!

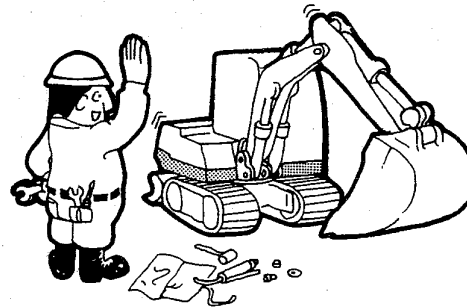
- Always be prepared – check the location and operation of the nearest fire extinguisher.
- Never smoke while inspecting the excavator, as this can cause fires.
- In particular, the battery can explode. Be careful of the following:
 - Inspect and service in a well ventilated place.
 - Keep sparks, cigarettes and other flames away from the battery.
 - Do not charge frozen batteries. Heat up the battery first to melt the battery fluid, and only charge the battery when the temperature is 15°C (59°F) or above.



00-021P

▲Use proper signals when inspecting and servicing!

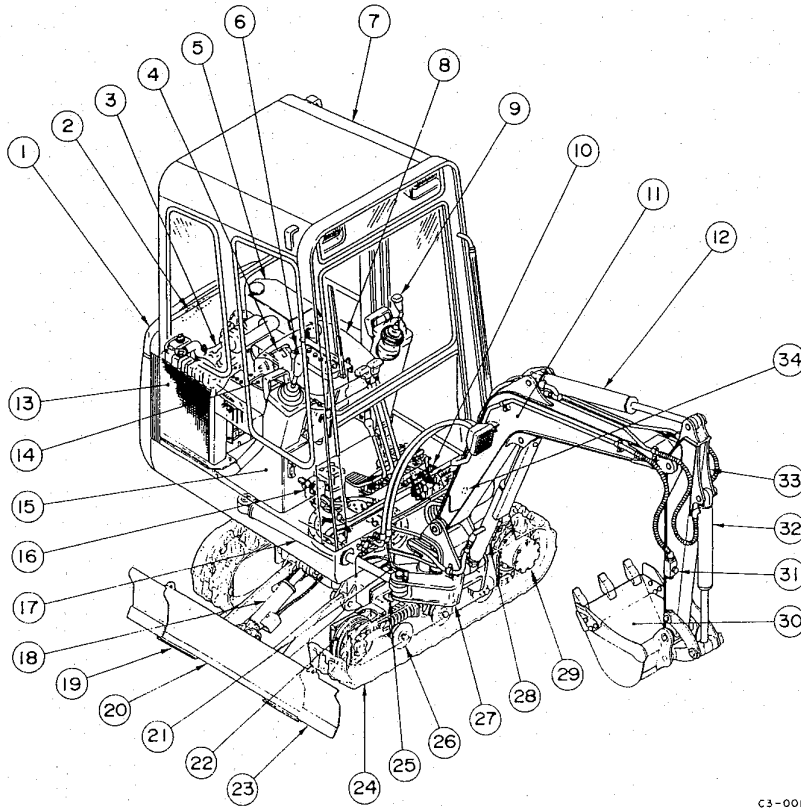
- Inspect and service on a flat, firm surface.



00-018P

PART NAMES AND FUNCTIONS

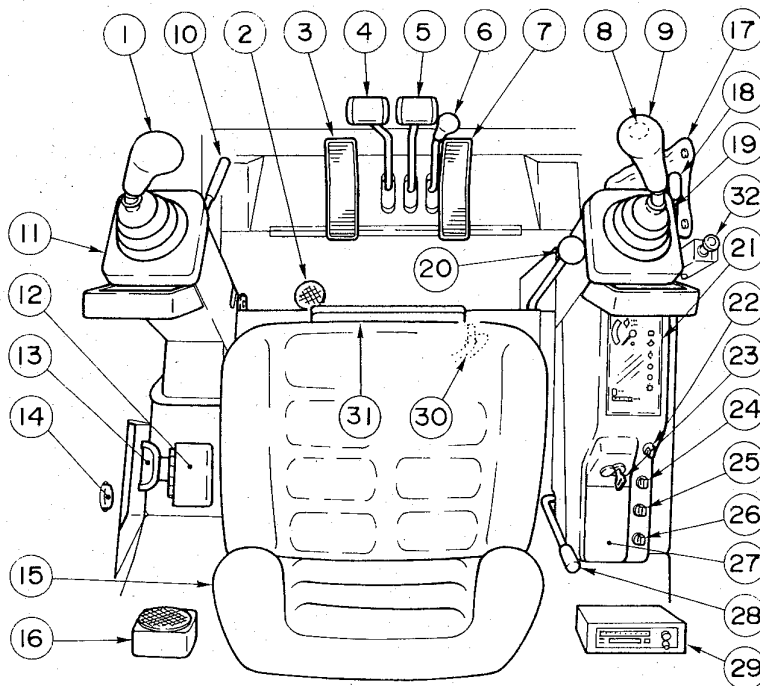
Part Names



C3-001A

1. Bonnet
2. Flasher lamp
3. Engine
4. Hydraulic pump
5. Fuel tank
6. Battery
7. Cab
8. Seat
9. Left operating lever
10. Control valve
11. Boom
12. Arm cylinder
13. Radiator
14. Monitor
15. Hydraulic oil tank
16. Slew motor
17. Swing cylinder
18. Blade cylinder
19. Road protector*
20. Blade
21. Spanner cylinder
22. Idler
23. Plate
24. Crawler belt
25. Slide
26. Track roller
27. Swing Bracket
28. Boom cylinder
29. Travel motor
30. Bucket
31. Auxiliary port
32. Bucket cylinder
33. Arm
34. Electric socket DC 12V (for EU)

Levers and Instruments



C3-011D

1. Left operating lever
2. Acceleration pedal
3. Auxiliary port pedal
4. Left travel lever
5. Right travel lever
6. Blade/spanner selector lever
7. Swing pedal
8. Horn switch
9. Right operating lever
10. Left operating lock lever
11. Left lever stand
12. Heater (Cab)
13. Air switching plate (Cab)
14. Releasing button (Cab door)
15. Seat
16. Speaker (Cab)
17. Washer fluid tank (Cab)
18. Right operating lock lever (Cano)
19. Right lever stand
20. Blade/spanner lever
21. Monitor
22. Flasher switch
23. Starter switch
24. Light switch
25. Wiper and washer switch (Cab)
26. Heater switch (Cab)
27. Fuse box
28. Throttle lever
29. Radio (Cab)
30. Slew lock lever
31. Operator's manual holder (Cano)
32. Cigarette lighter (Cab: for EU)

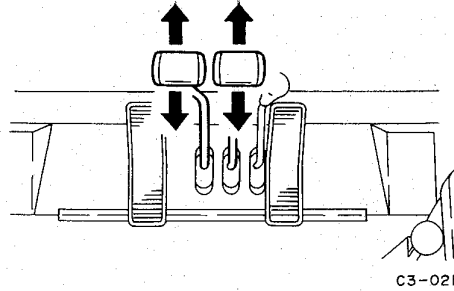
Parts marked "*" are optional.

PART NAMES AND FUNCTIONS

Left and Right Travel Levers

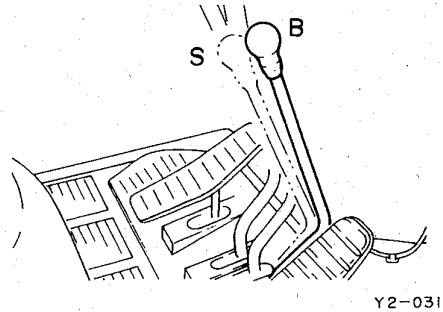
Use these to move the left and right crawlers forward and backward.

- The crawlers move forward when the levers are pushed forward, backward when the levers are pulled backward. (Refer to pages 27 and 28.)
- ☞ The side with the blade is the front. Remember that when the blade is to the rear of the operator's seat, the excavator will move backwards when the travel levers are pushed forwards.



Blade/spanner selector lever

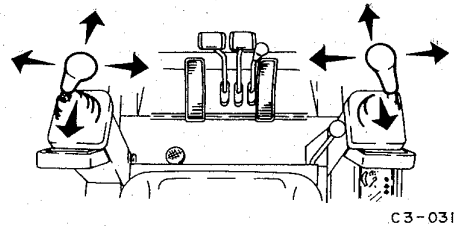
With this excavator, the crawler width can be changed. Usually leave this lever in the "B" position to use the blade. To change the crawler width, first set the lever to the "S" position, then operate the spanner cylinder with the blade/spanner lever to change the crawler width. (Refer to page 33 and below.)



Left and Right Operating Levers

These levers are for operating the attachment and slewing.

- The speed changes depending on how far the lever is operated. (Refer to pages 27 to 32.)



Blade/spanner lever

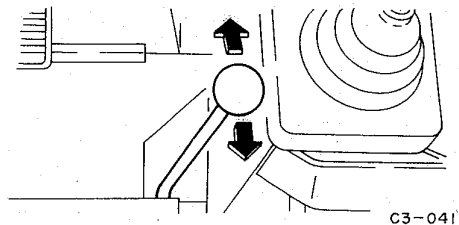
This lifts and lowers the blade, and or this lever is the crawler width can be extended and retracted.

The blade lowers when the lever is pushed forward, and lifts when the lever is pulled backward.

(Refer to pages 27 through 33.)

Also, when changing the crawler width, this lever is used as the blade/spanner selector lever.

- When lever is pushed away from you Extend
- When lever is pulled towards you Retract



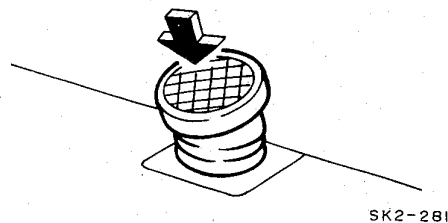
Acceleration Pedal

Use this to change the speed of travel.

- The travel speed increases when the pedal is pressed during travel. The speed decreases when the pedal is released.

⚠ **Never travel at high speeds on slopes and rough surfaces, as this is extremely dangerous.**

(Refer to pages 27 to 28.)



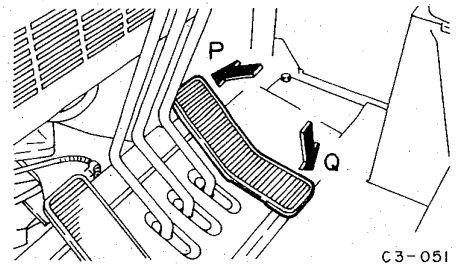
PART NAMES AND FUNCTIONS

Swing Pedal

Use this pedal to swing the hoe attachment left and right.

- Press on the heel side "Q" to swing to the right.
- Press on the toe side "P" to swing to the left.

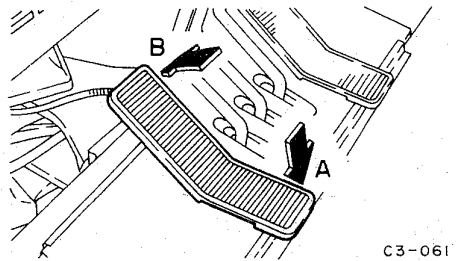
(Refer to page 27 and 30.)



Auxiliary port pedal

Use this pedal when an attachment other than the included one is connected to the auxiliary ports.

Hydraulic oil flows from port "a" when the heel side "A" is pressed, from port "b" when the toe side "B" is pressed. (See below.)



Auxiliary Ports

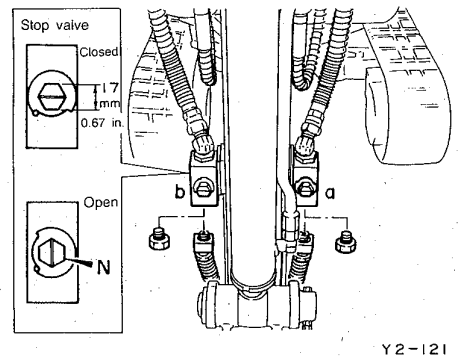
The auxiliary ports are used for replacing the bucket with a breaker, crusher, etc.

Connect the attachment's hoses to stop valves "a" and "b" on the tip of the auxiliary piping connected to the auxiliary ports and open the stop valves.

Operate with the auxiliary port pedal.

Refer to "Using the Auxiliary Ports" on page 34.

Keep the plugs securely attached to unconnected ports.



Stop Valve (for Auxiliary ports)

This valve is for switching between two-way flow and one-way flow when using attachments other than the included one.

• For two-way flow

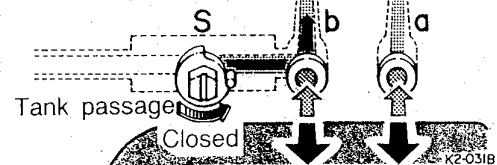
Turn stop valve "S" 90° counterclockwise to close the passage to the tank.

• For one-way flow

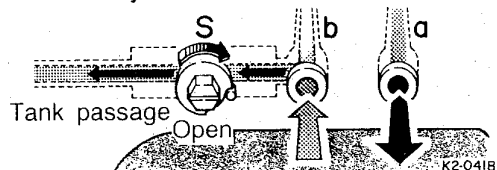
Turn stop valve "S" 90° clockwise to open the passage to the tank.

Connect the return side (OUT) of the new attachment to arm port "b", the supply side (IN) to arm port "a". Refer to "Using the Auxiliary Ports" on page 34.

< Two-way flow >



< One-way flow >



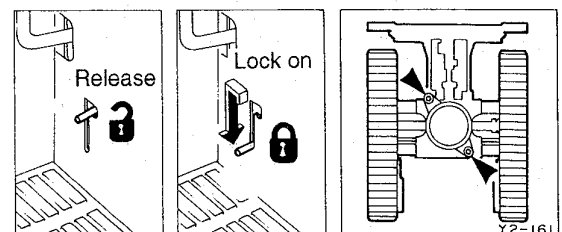
Slew Lock Lever

Use when fixing the turntable to the track frame in order to transport the machine. (Refer to pages 38 and 39)

When the turntable is facing straight forward or backward, the turntable can be locked in two locations (marked by black dots).

▲ Lowering the lock lever while the slew is in progress will damage the machine.

Wait until the slew is fully completed before locking.



PART NAMES AND FUNCTIONS

Lock levers

This locks the hoe attachment and slewing operation.

Lock levers are located on the outer sides of left and right lever stands "S", and are operated in the same way. Cab type is left lever lock only.

- The operating levers can be locked by locking only one of the lock levers.
- Both lock levers must be released to unlock the operating levers. (Canopy type)

Releasing

Lower lock lever "L" fully until the stand stops.

Locking

Lift lock lever "L". The lever stand rises automatically and is locked.

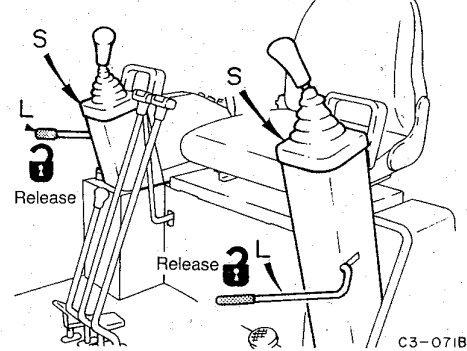
☞ This locking device is of the hydraulic type. The left and right operating levers will move when locked, but the hoe attachment and slew will not move.

⚠ **Always set the attachment against the ground and lock the operating levers when not performing work operations or when leaving the excavator.**

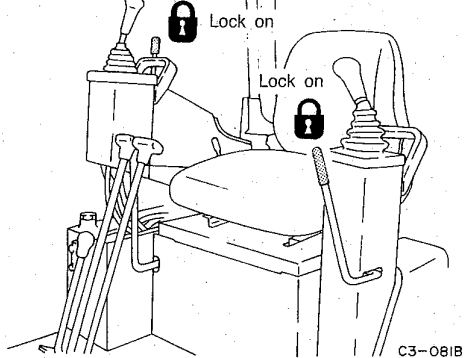
⚠ **The travel, boom swing and blade operations are not locked when the operating levers are locked.**

⚠ **When locking, be careful not to touch the operating levers. The hoe attachment and slew may move if the lock lever is not fully lifted.**

UNLOCKED



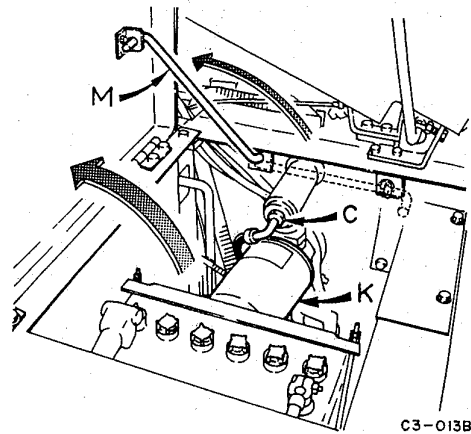
LOCKED



Seat Stay

⚠ **To check and service, turn the starter switch to the OFF position.**

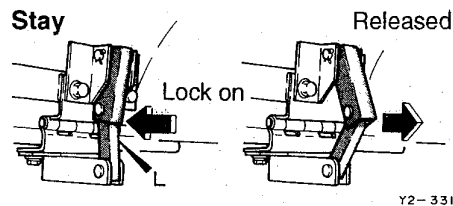
1. Gently push the seat forward and fasten it in place with the stay "M".



Bonnet Stay

⚠ **Be sure to press firmly against the joint to secure the stay "L" in place.**

1. Unlock with the starter switch key.
2. Fully open the bonnet and press the stay "L" into place. This will lock the bonnet into an open position.
3. To close the bonnet, support one side of the bonnet with your hand while pulling the stay "L" to release it from the locked position and close.

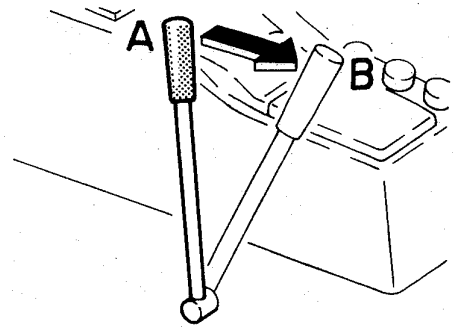


PART NAMES AND FUNCTIONS

Throttle Lever

This controls the engine speed.

- A Idling
- B Maximum speed

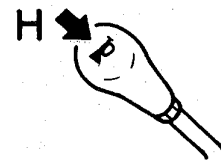


SK2-071A

Horn Switch

Press "H" on the right operating lever grip while the starter switch is ON to sound the horn.

- ☞ Make it a habit to sound the horn as a signal when starting to operate the excavator.

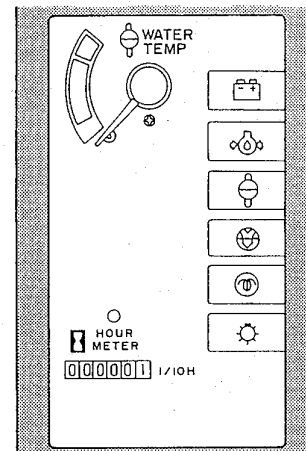


SK2-181

Monitor

The monitor displays information sent from sensors positioned at various places on the excavator, making it possible to monitor the excavator's operating status.

- When the starter switch is set to "ON", the battery charge and engine oil pressure lamps on the monitor light and the water temperature meter starts operating. In addition, the battery charge and engine oil pressure lamps light until the engine is started, and turn off once the engine is started.
- ☞ Always pay attention to the gauges and the lamps to prevent problems before they happen.

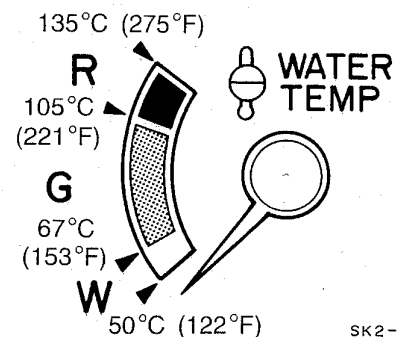


D3-081

WATER TEMP (water temperature meter)

This indicates the temperature of the engine cooling water. The temperature is normal in the green area (approx. 67 to 105°C or 153 to 221°F).

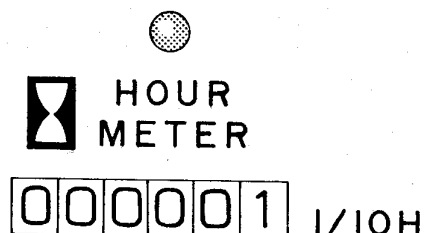
- If the needle rises to the red area, refer to the section on page 19 on the coolant temperature lamp.
- R = red, G = green, W = white



SK2-091

HOUR METER

This indicates the total time the engine has run. Even if the excavator is not moving, the meter continues to count as long as the engine is on.



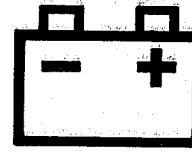
SK2-111

PART NAMES AND FUNCTIONS

Battery Charge Lamp

This lamp lights when a problem arises in the charging system.

☞ Have the excavator inspected at a service outlet.



ST2-016

Engine Oil Pressure Lamp

This lamp lights when a problem arises in the lubricant oil system.

- Stop the engine and check the quantity of engine oil. (Refer to page 24.)
- If the cause is elsewhere, have the excavator inspected at a service outlet.

⚠ **Continued operation of the excavator can cause the engine to burn.**



SF2-104

Coolant Temperature Lamp

This lamp lights when the coolant temperature rises abnormally (above 105°C or 221°F).

- The engine is overheating. Stop operation immediately and let the engine idle (refer to page 25) to let the coolant cool down.
- Once the coolant has cooled down, stop the engine.
- Once the engine has cooled down, inspect the amount of coolant, and check the fan belt for breaks or slack. (Refer to page 24.)
- The coolant temperature may rise abnormally if the engine is run with an excessive load.

☞ Let the coolant cool down as explained above, then start operating the excavator again, being careful not to overdo it.



SF2-103

Air Cleaner Lamp

This lamp lights when the air cleaner filter is clogged.

- Clean the dust cap and element. (Refer to page 49.)



SF2-102

Glow Lamp

This lamp lights when the starter switch is turned to the "GLOW" position, indicating that the power to the glow plug is on. The lamp turns off when the switch is turned to the "OFF" position. The glow lamp turns on. Wait for 3 seconds to heat the glow plug. (Refer to page 25 and 26.)

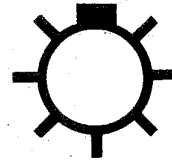


SZ3-091

PART NAMES AND FUNCTIONS

Flasher Lamp Monitor

This indicates whether the flasher lamp is on, making it possible to check whether or not the flasher lamp is on without looking back. (Refer to page 21.)



SK2-131

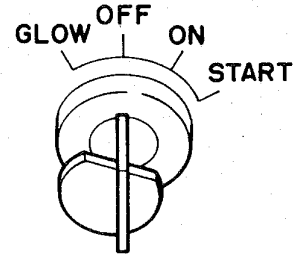
Starter Switch (refer to pages 25 and 26)

GLOW In this position, the air in the combustion chamber is heated, making it easier to start the engine. (The glow lamp lights.)

OFF In this position, the power circuit is interrupted. (Engine stop position)

ON In this position, the power circuit is connected. (Engine on position)

START In this position, the engine is started. (The switch automatically returns to the "ON" position when the hand is released.)



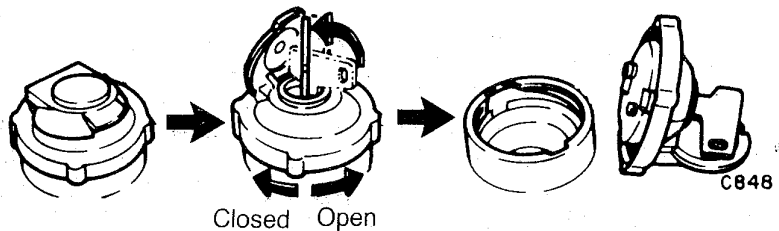
SZ2-041

- The key plate can be used for all the following places:
 - Starter switch
 - Operator's manual holder (Canopy)
 - Cab door
 - Bonnet

Fuel Supply Port

Opening the Fuel Supply Port

1. Open the lid, insert the key, and turn counterclockwise to unlock.
2. Turn the entire cap counterclockwise and remove it.
3. Follow the above procedure in reverse order to reinstall and lock the cap.



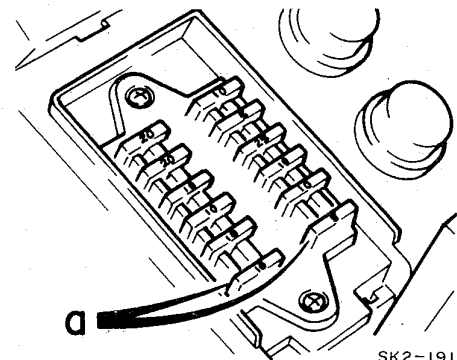
C848

Fuse Box

The fuses are lined up as shown on the table below. If a fuse should blow, turn the starter switch off and replace it with one of the spare fuses "a".

Serial No. 1153068 ~

Capacity	Circuit(s) protected	Capacity	Circuit(s) protected
30A		10A	Radio, room light, heater
30A	Stop solenoid	5A	Monitor
10A	Limit switch, feed pump solenoid valve (sub valve)	25A	Wiper, Windshield Washer Cigarette lighter (Cab: for EU)
10A	Head lights, boom light, monitor light	10A	Flasher lamp
10A	Charge indicator, current limiter	10A	Horn Electricsocket (for EU)
10A	Spare fuse "a"	5A	Spare fuse "a"



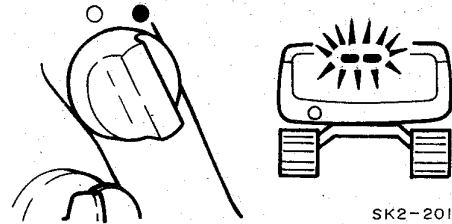
SK2-191

PART NAMES AND FUNCTIONS

Flasher Switch and Lamp

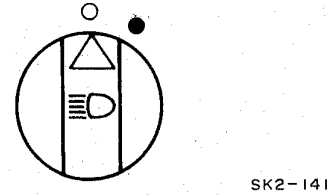
If this switch is turned when the starter switch is set to "ON", the flasher lamp at the rear of the bonnet begins flashing.

- position: Off
- position: Flasher lamp flashes.



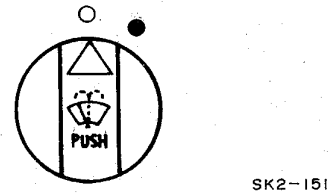
Light Switch

- position: Off
- position: Monitor lights, headlights, and boom light turn on.



Wiper and Washer Switch (Cab)

- position: Off
 - position: Wiper operates.
- PUSH: Washer fluid is squirted from the nozzle while pressed, and stops when released.

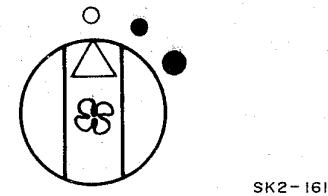


Heater Switch (Cab)

- position: Off
- position: Heater fan rotates at low speed.
- position: Heater fan rotates at high speed.

▲ **Ventilate well when using the heater.**

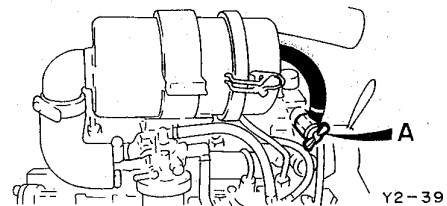
(Refer to page 23)



☞ Handle the heater carefully in warm seasons.

The coolant circulates in the heater even when the heater switch is off. When the external temperature becomes warm and the heater is no longer needed, close valve "A" so that the coolant no longer circulates in the heater.

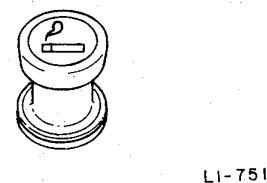
☞ When the external temperature gets cold, remember to open valve "A" before using the heater.



Cigarette Lighter (for EU)

- ▲ **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.**

1. Press in the lighter's knob.
2. Release the knob and wait for it to pop out automatically.
3. When the knob pops out, pull on it to pull out the lighter.



PART NAMES AND FUNCTIONS

Seat and seat belt

Weight adjustment

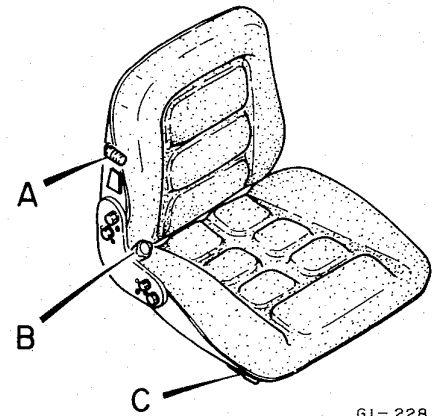
- By pulling lever "A" upwards or downwards, the seat can be adjusted according to driver's weight.
 - Lever position up Light driver
 - Lever position middle ... Medium weight driver
 - Lever position down Heavy driver

Backrest inclination adjustment

- Can be effected by turning handle "B".
 - Adjustment scope of backrest 5 deg. -20 deg.

Longitudinal adjustment

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



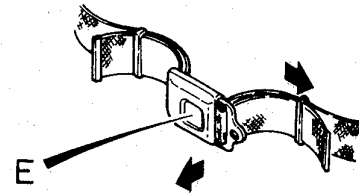
G1-228

Seat belt length adjustment

- Set the belt and buckle at right angles to each other.
- Then the length can be adjusted easily by pulling on the end of the belt.

Always make sure that the seat belt is buckled up tightly so it will not come loose. Release by pressing at "E" with a finger.

▲ Do not operate the excavator unless the seat belt is properly fastened around you.



LO-030

Radio (Serial No. 1153001~1157564)

The radio can be used when the starter switch is at the "ON" position.

Operation

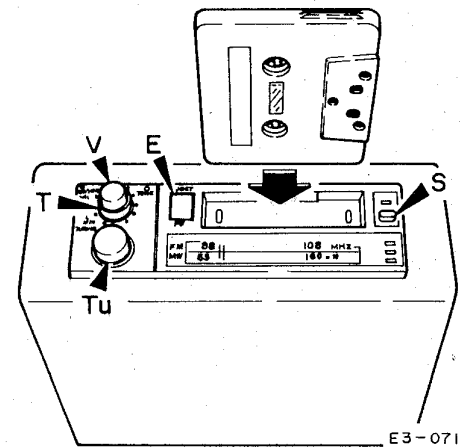
- Turn "V" clockwise to turn on the power.
- Turn "V" to adjust the volume.
- Turn "T" to adjust the tone.
- Turn "Tu" to tune.
- Press "E" to eject the cassette.
- Press "S" to select "TAPE", "FM" or "MW".

Listening to cassette tapes

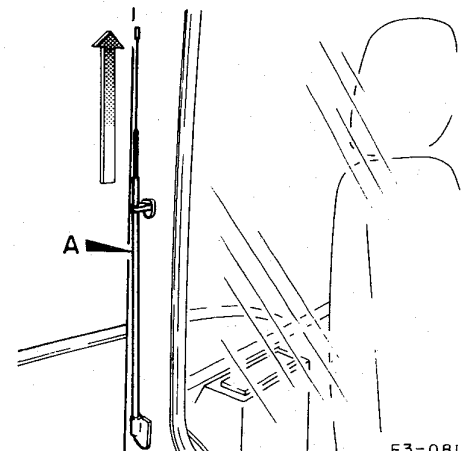
- Turn "V" to turn on the power.
- Insert the cassette tape as shown on the diagram at the right.
- Press "S" to switch to "TAPE".
- Turn "V" and "T" to adjust the volume and tone.

Listening to the radio

- Extend antenna "A".
- Turn "V" to turn on the power.
- Press "S" to select "FM" or "MW".
- Turn "Tu" to tune.
- Turn "V" and "T" to adjust the volume and tone.



E3-071



E3-081

Radio (Serial No. 1157565~)
(Refer to page 90.)

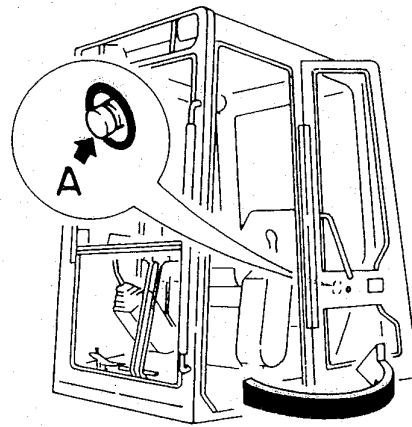
PART NAMES AND FUNCTIONS

Cab

⚠ Always keep the windows clean. Working with the windows dirty or foggy is dangerous as this limits visibility.

The door can be locked in the fully open position (turned 180°).

- To lock the door in the fully open position, press it against the cab until a click is heard.
- To close the door, press releasing button "A" inside the cab to unlock the door.

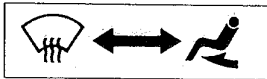


SK 2-221

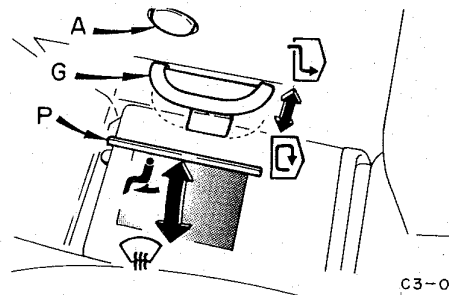
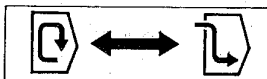
Adjusting the Air in the Cab

Use the gate "G" and plate "P" shown in the diagram at the right to adjust the air in the cab when using the heater.

- Air port switching



- Internal/external air switching



C3-091

⚠ Be sure to ventilate properly when using the heater.

Opening and Closing the Front Window

The front window can be opened and closed. When opened, the window is housed in the ceiling. Open and close the window with the excavator on a flat surface.

⚠ Note that the front window is heavy. When closing it, let it down slowly. Letting it down abruptly can cause it to break.

1. Pull the pins of left and right locks "B" to the inside then turn them to the locked position to unlock the front window. If the lock pins are partially sticking out they may cause damage. (Refer to Figure 1.)
2. Using the handle "C", lift the front window in the direction indicated by arrow "D" and slide it to the back. (Refer to Figure 2.)
3. Lock the window securely into the roof using lock "B". (Refer to Figure 3.)
4. Follow these steps in reverse order to close the window.

⚠ Always lock "B". If not, vibration may cause the front window to fall out.

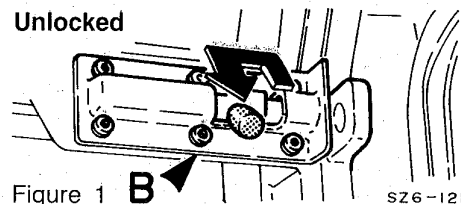


Figure 1 B SZ6-121A

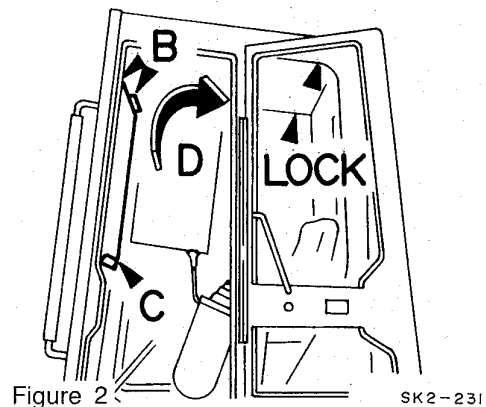


Figure 2 SK 2-231

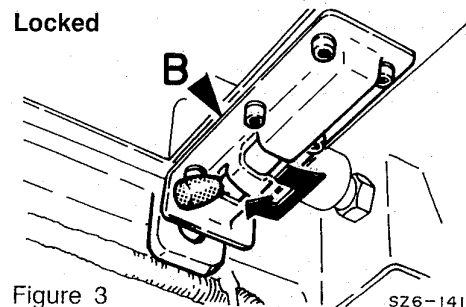


Figure 3 SZ6-141A

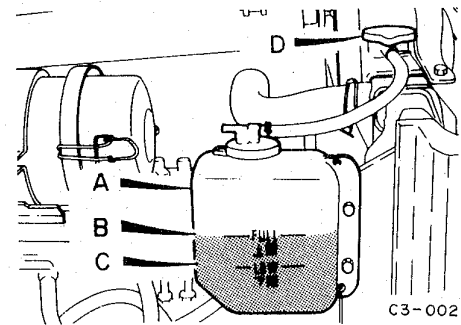
OPERATION

Before Starting Operation

Checking the Coolant

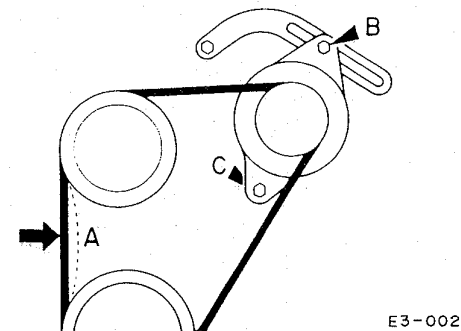
- Inspect this before starting the engine when the engine is cool.
- Check the amount of water in reserve tank "A". The water level should be between upper limit "B" and lower limit "C". If the level is near or below "C", add water up to "B". (Refer to pages 50 and 57.)

▲ **Normally, do not remove the radiator cap "D", especially directly after operating the excavator. Doing so is dangerous, as hot water may spurt out.**



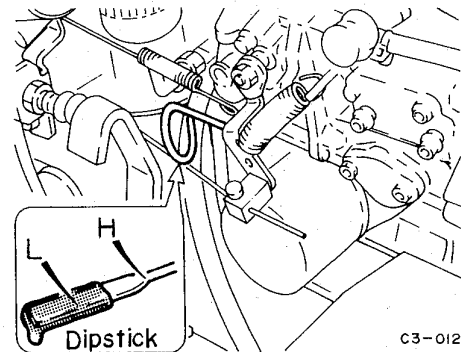
Checking the Fan Belt

- Press on the center of the belt span with a force of 10kg (22lb.). The tension is standard if the deflection "A" is approximately 10mm (0.4 in.).
- If not, loosen the alternator's tension pulley mounting bolt "B" and adjustment bolt "C" and adjust the tension. (Refer to page 51.)



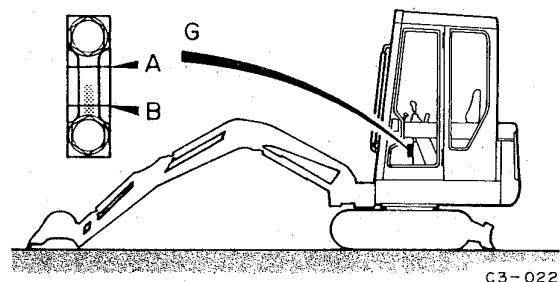
Checking the Engine Oil

- Check the engine oil on a flat surface before starting the engine.
- Use the dipstick. "H" is the upper limit, "L" the lower limit. The level is normal if it is between "H" and "L". If the oil level is near "L", supply oil up to "H". (Refer to page 49.)



Checking the Hydraulic Oil

- Select a flat place and set the excavator in the posture shown on the diagram at the right. The oil level differs according to the oil temperature, so use the following as basic criteria and check the level with the level gauge "G".
- Between upper limit "A" and lower limit "B" when the oil is at normal temperature (about 20°C or 68°F).
- Near upper limit "A" when the oil is at the normal operating temperature (about 60°C or 140°F). (Refer to page 45.)



Miscellaneous

Check all piping for oil leaks, and check to make sure there are no missing bolts, nuts, split pins, etc.

If you find that adjustments are necessary after the above checks, refer to the section entitled "Inspection and Maintenance".

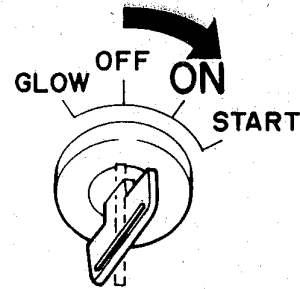
OPERATION

Starting the Engine

- ▲ **Set the operating levers and pedals to the locked or center positions.**

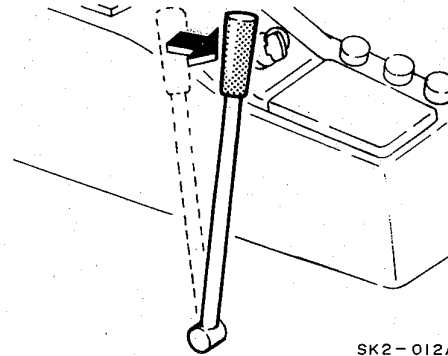
Use the following procedure to start the engine:

1. Turn the starter switch to the "ON" position. The engine oil pressure lamp and battery charge lamp will light and the meters will start operating. The engine oil lamp and battery charge lamp continue lighting until the engine is started.



SZ2-012

2. Pull the throttle lever to the center position.



SK2-012A

3. Turn the starter switch to the "START" position and start the engine. When released, the switch will automatically return to the "ON" position.

When the engine starts, the engine oil pressure lamp and battery charge lamp will turn off.

- ☞ If the lamps do not turn off within approximately 7 seconds after starting the engine, stop the engine and inspect for irregularities.

(Refer to pages 19 and 24)

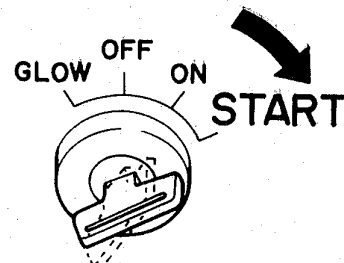
- ▲ **Do not run the starting motor for more than 15 consecutive seconds.**

- ▲ **If the engine does not start, wait for about 30 seconds to protect the battery then try again.**

- ▲ **Operate the starter switch slowly, waiting a little before turning it to the next position.**

In particular, the engine may stop or may not start if the switch is turned immediately from the "START" to the "OFF" position directly after starting the engine.

- ☞ Check the engine oil pressure and battery charge lamps to make sure there are no problems. (Refer to page 19.)



SZ2-022

4. Move the throttle lever back to the idling position, then let the engine warm up for about 5 minutes before operating the excavator.

- ▲ **Never race the engine directly after starting it.**

- ☞ Avoid running at speeds at which the engine resonates. Change the engine speed slightly to stop resonance.

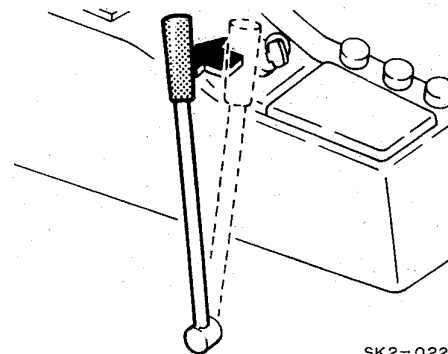
- ▲ **When using one-way flow attachments such as breakers, do not use with the throttle fully opened. Keep the engine speed at about 80%.**

- ☞ For new excavators, operate gently to break the excavator in. Handling the excavator roughly can shorten its service life or inversely affect performance.

- ☞ Break the excavator in for the first 50 hours.

- ☞ Let the engine warm up sufficiently.

- ☞ After letting the engine warm up, move the attachment with no load for approximately 5 minutes so that the hydraulic oil also warms up.



SK2-022A

OPERATION

Starting in Cold Weather

⚠ **Set the operating levers and pedals to the locked or center positions.**

1. Set the throttle lever to a maximum speed position.
2. Turn the starter switch to the "GLOW" position and hold it there for approximately 3 seconds.

The engine oil pressure lamp, battery charge lamp and glow lamp turn on.

⚠ **Operate the starter switch slowly, waiting a little before turning it to the next position. In particular, the engine may stop or may not start if the switch is turned immediately from the "START" to the "OFF" position directly after starting the engine, or immediately from the "GLOW" to the "START" position.**

3. After approximately 3 seconds, turn the starter switch to the "START" position and start the engine.
4. Move the throttle lever back to the idling position, when the engine speed become stabilized.
5. Let the engine warm up until the water temperature meter starts moving.

☞ Do not race the engine directly after it is started.

☞ Check for engine problems (color of exhaust, irregular noise or vibration, etc.).

☞ Do not warm up the engine for long periods of time (20 minutes or more).

☞ After letting the engine warm up, move the attachment with no load for approximately 5 minutes so that the hydraulic oil also warms up.

If this is not done, the attachment will not operate with maximum performance.

⚠ **If the engine fails to start, wait about 30 seconds before trying again to protect the battery.**

⚠ **Never use start assist fluids, etc.**

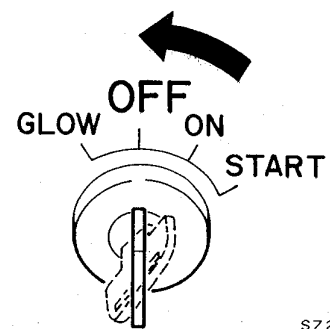
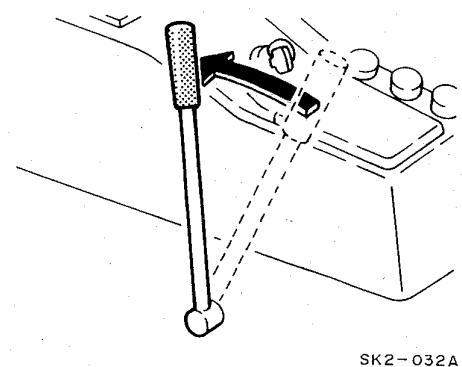
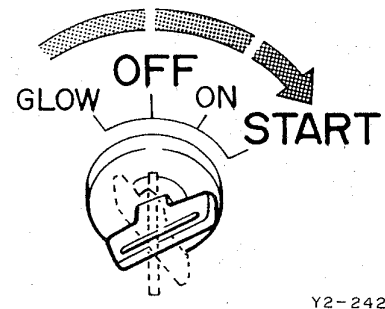
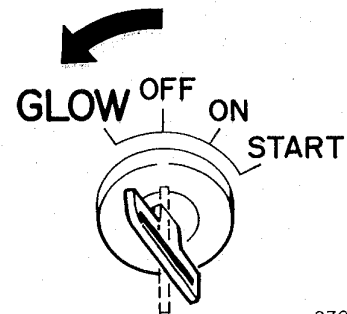
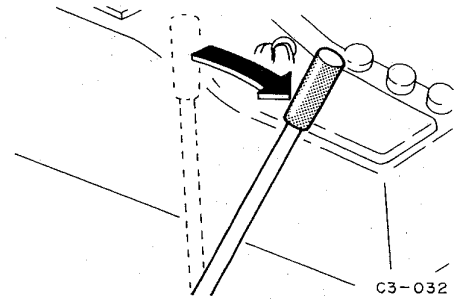
Stopping the Engine

1. Let the engine run at an idle for approximately 5 minutes to cool it down.

⚠ **Stopping the engine without first letting it cool down can shorten the engine's service life. Never stop it abruptly, except in emergencies.**

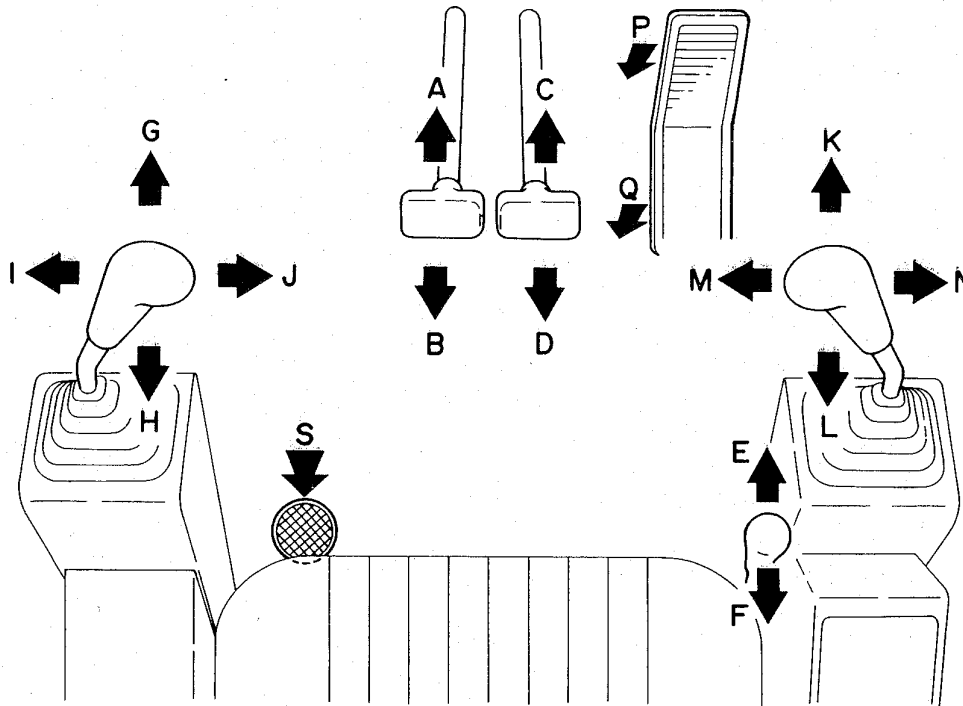
⚠ **If the engine is overheating, gradually return the throttle lever and let the engine cool before stopping it.**

2. Turn the starter switch to the "OFF" position to stop the engine.



OPERATION

Operating the Levers and Pedals



K2-042P

A	Left Crawler Forward	B	Left Crawler Reverse
C	Right Crawler Forward	D	Right Crawler Reverse
E	Blade Down Crawler Width Extend	F	Blade Up Crawler Width Retract
G	Arm Out (A type) Boom Down (G type)	H	Arm In (A type) Boom Up (G type)
I	Left Slew	J	Right Slew
K	Boom Down (A type) Arm Out (G type)	L	Boom Up (A type) Arm In (G type)
M	Bucket Load	N	Bucket Dump
P	Left Swing	Q	Right Swing
S	Accelerate Travel		

⚠ A type=ISO, G type=JCB

OPERATION

Operation: Travel

⚠ Check that the area around the excavator is safe, then blow the horn to signal that you are starting to operate the excavator.

☞ Normally operate the excavator with extended crawlers. If the crawlers are set to retracted, widen them for greater stability. (Refer to page 33.)

The blade is on the front side. Check the direction of the travel frame.

⚠ Remember that when the blade is to the rear of the operator's seat, the excavator will move backwards when the travel levers are pushed forwards.

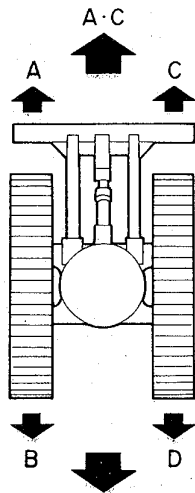
- Before driving, release the lock lever. Also, after driving, be sure to lift lock lever you to lock it. (Refer to page 17.)

Remove the key and be sure to lock all the parts.

- Operate the levers slowly when descending slopes. Move the levers back to the neutral position to brake the excavator.
- The acceleration pedal is always at the low speed position when the engine is started. When pressed during travel, the speed increases, and when released, the speed returns to low speed.

⚠ Never travel in high speed on slopes or rough terrains.

Travel Forward

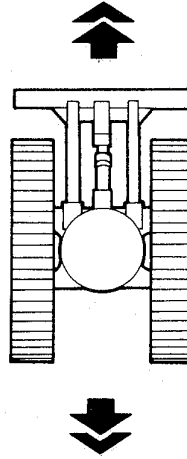


B2-048

Reverse

Acceleration

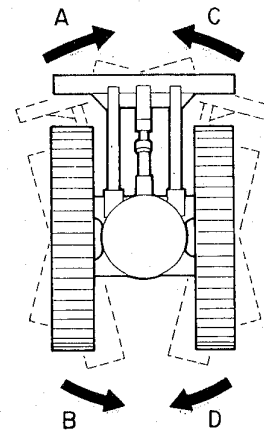
(A.C)+S



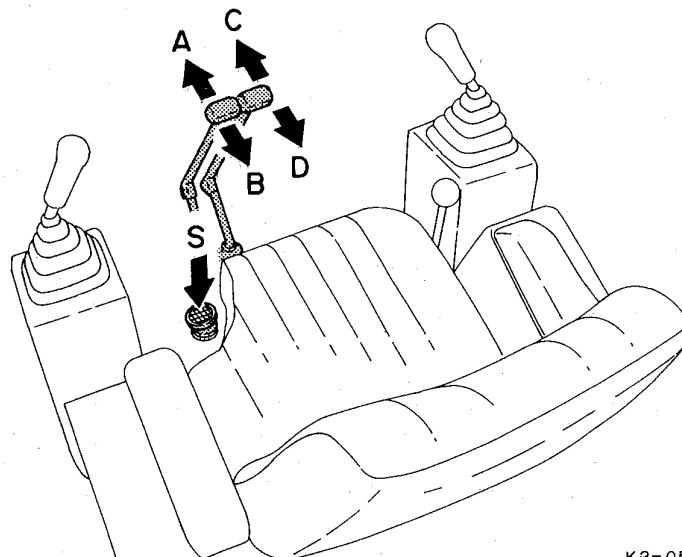
(B.D)+S

D1-229P

Turning



B2-049



K2-052A

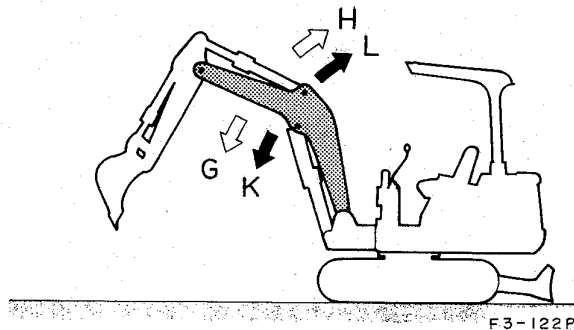
OPERATION

Operation: Hoe Attachment

Boom action

A type →

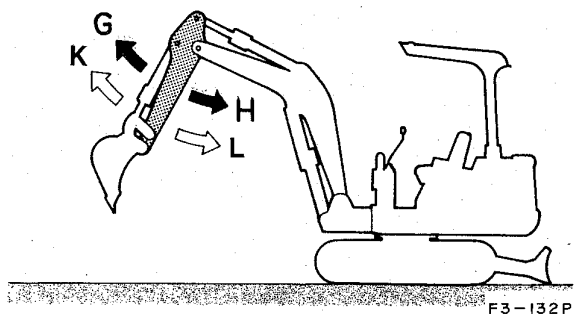
G type ⇨



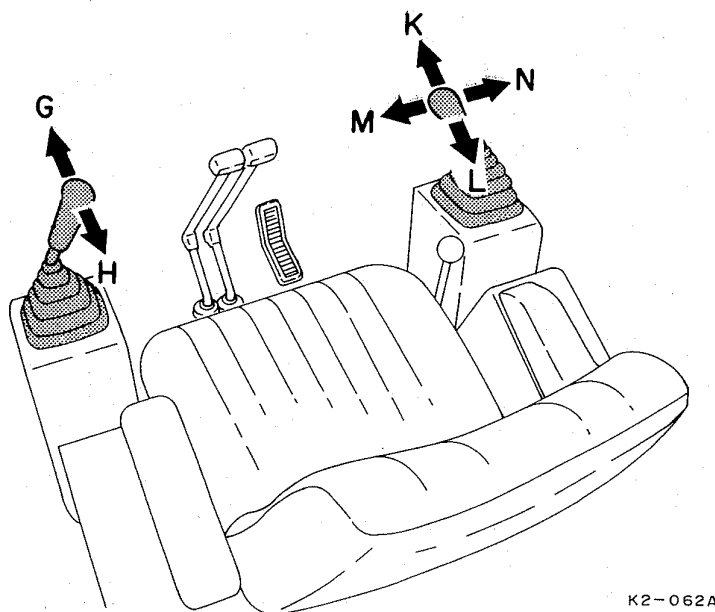
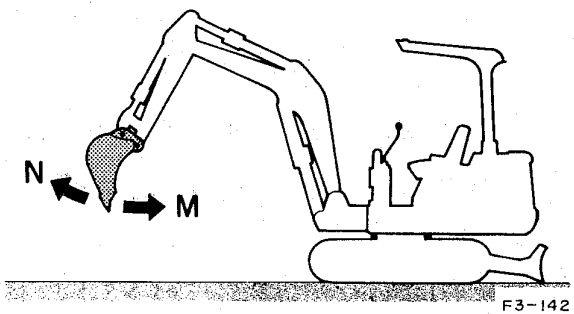
Arm action

A type →

G type ⇨

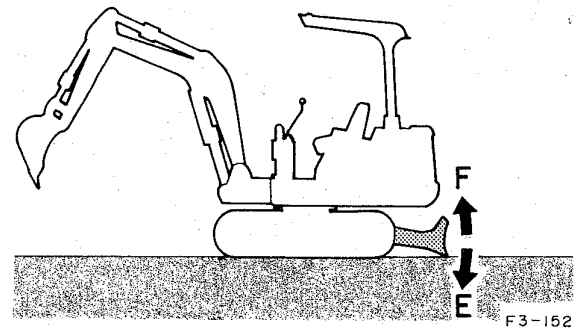


Bucket action

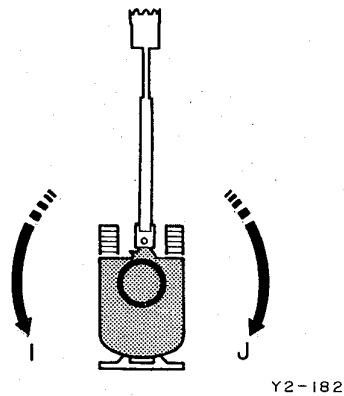


OPERATION

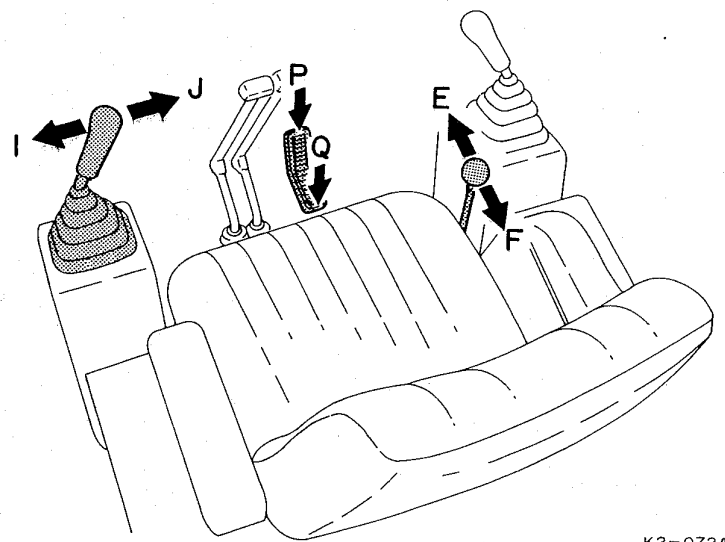
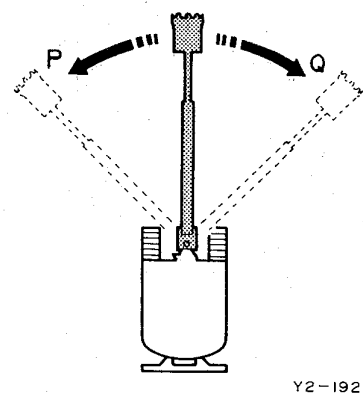
Blade action



Slew



Boom swing

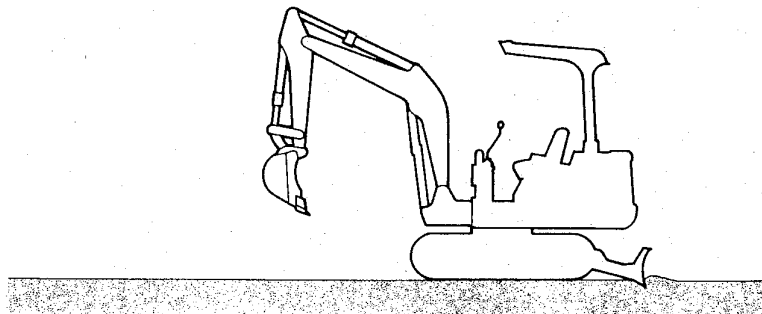


OPERATION

Work Operations

Point the blade in the direction opposite to where digging will be done and drive it slightly into the ground.

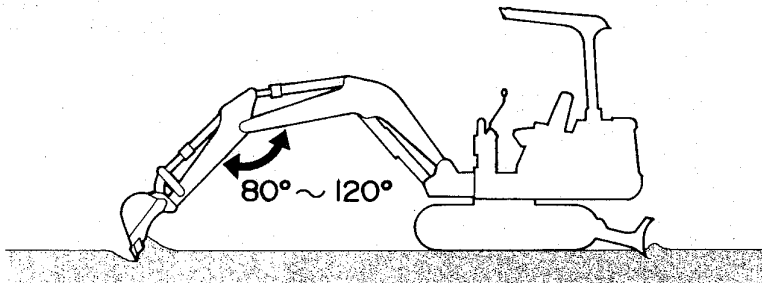
▲ **Operate with extended crawlers for greater stability.**



F3-162

Do not extend the hoe attachment out all the way when digging. An arm angle of between about 80° to 120° offers strong digging power.

☞ Trying to dig too deep reduces efficiency and puts a strain on the excavator.



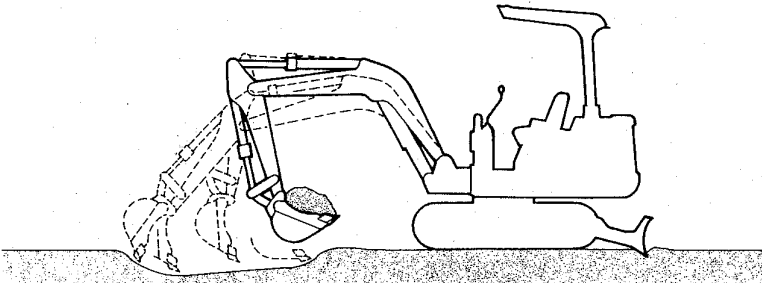
F3-172

Dig long and shallow.

Operate the boom smoothly. Stopping it abruptly subjects the body to a strong shock and can cause damage.

When dumping the dirt, move the bucket levers two or three times to shake the dirt out.

☞ Do not use the shock of the bucket end to get the dirt out.

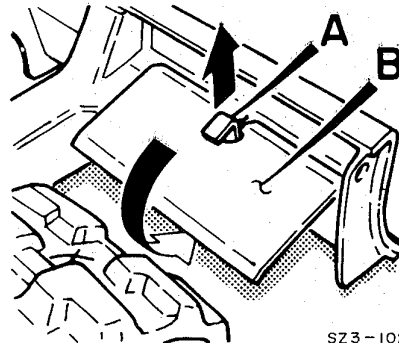


F3-182

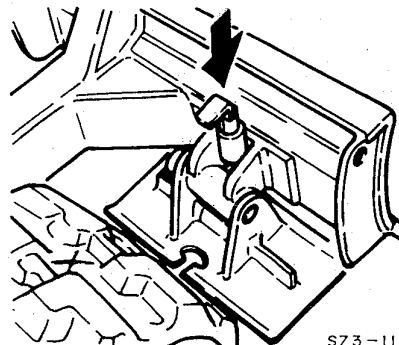
Operating the Road Protector (Option)

The road protector is installed so that the blade will not damage the road when working on paved surfaces, etc. Operate it as follows:

1. Clean the area around the road protector.
2. Lift the blade so it is about 5cm or 1.97 in. from the ground.
3. Disconnect stopper pin "A" and rotate road protector "B".
4. Lower the blade, and set the stopper pin back in its original position.
5. After using, set the road protector back as before.



SZ3-102A



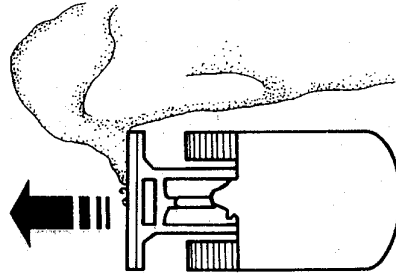
SZ3-112A

OPERATION

Blade Operation

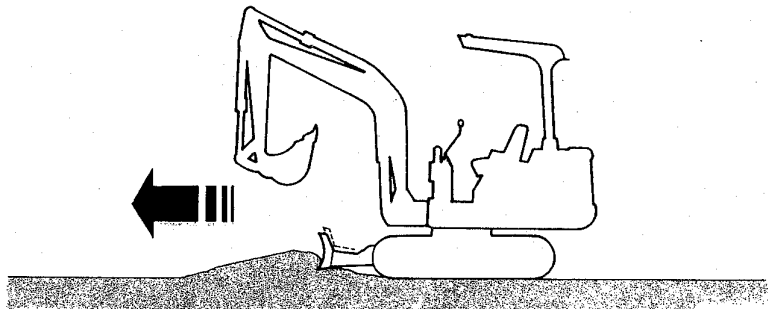
Fold the hoe attachment up against the main body before starting ground leveling work. If there is an excessive load on the excavator, adjust the blade up or down.

Remove dirt from the sides of dirt piles.



Y2-262

Remove dirt from the top of piles.

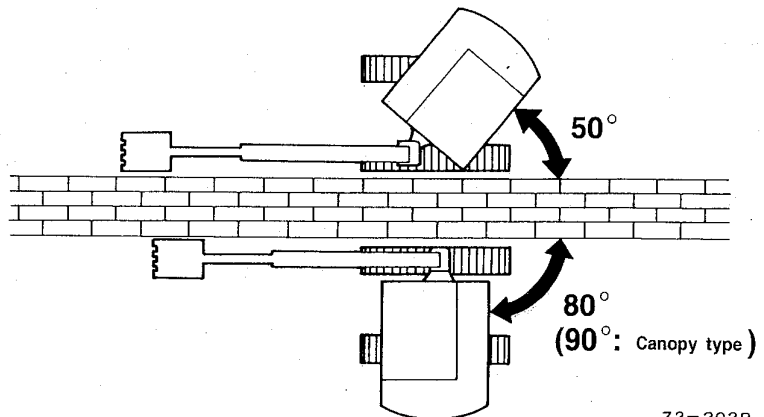


F3-192

Trenching alongside obstacles

The boom swings 50° to the right and 80° to the left of the excavator joint, permitting side trenching operations as shown in the diagram.

When stopping the slew, operate the lever a little ahead of time in consideration of the play after the lever is returned. Also, be sure you have an accurate sense of the slewing range.



Z2-202P

OPERATION

Changing the Crawler Width

With this excavator the crawler width can be changed. Normally use with extended crawlers for greater stability. Perform these operations on a flat, solid surface with no obstacles in the way.

1. Lift the machine body using the hoe attachment and blade.
 ⚠ Always lift the body before changing the crawler width. Failure to do so can result in damage to the travel frame and spanner cylinder.

Blade/spanner selector lever

Usually leave this lever in the "B" position to use the blade. Only move the lever to change the crawler width. The crawler width is changed by the spanner cylinder.

2. Set the blade/spanner selector lever to the "S" position.

Blade/Spanner lever

3. Push the blade/Spanner lever forward to extend crawler width.

- ➔ 1300mm (51.2 in.)

If necessary, also replace the blade's plate and use it with the extended width. (Refer to below)

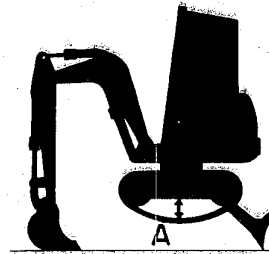
4. Pull the blade/spanner lever towards you to retract crawler width.

- ➔ 960mm (37.8 in.)

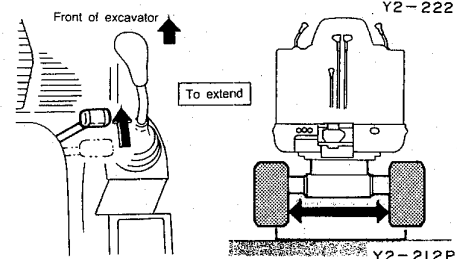
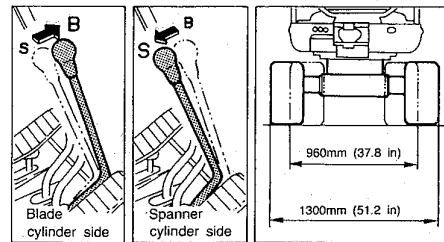
Changing the blade width

If necessary, also change the blade and use with a wider blade. Widen the blade using the procedure explained below. Follow the procedure in reverse order to make the blade narrower.

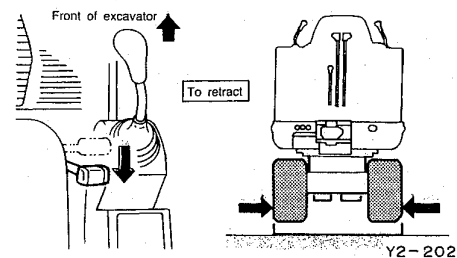
1. Loosen bolts "B" and remove plate "P".
2. Attach the right blade to the left, the left blade to the right.
3. Tighten the blade with bolts "B".



Z2-173A

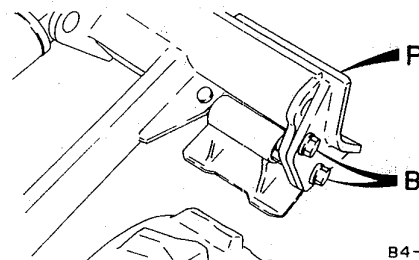


Y2-222

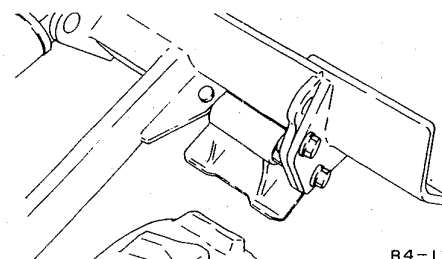


Y2-212P

Y2-202



B4-102P



B4-112P

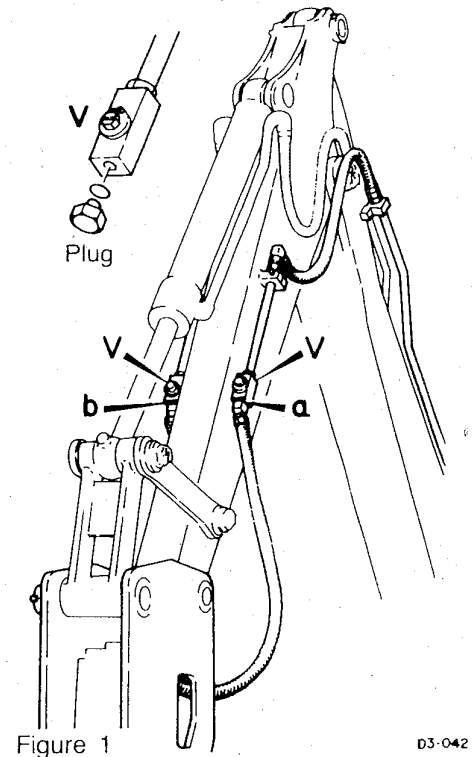
OPERATION

Using the Auxiliary Ports

These are auxiliary output ports allowing connection of attachments other than the included one.

They can be used in one of two ways, with a two-way flow or one-way flow, as described below.

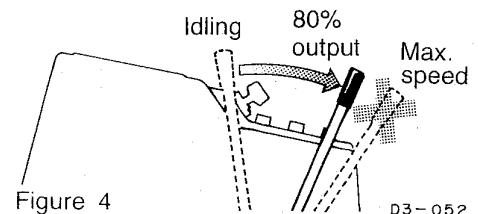
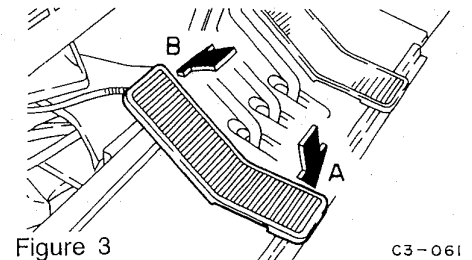
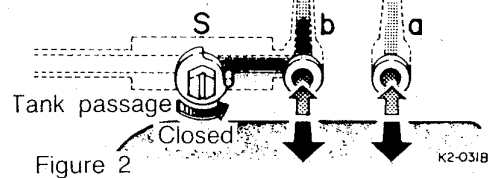
- **Using with a two-way flow** (crasher, grapple, etc.)
 1. Remove the bucket and install the new attachment. (Refer to "Replacing the Bucket" on page 55.)
 2. Remove the plug from stop valve "V" and connect the hoses of the new attachment to ports "a" and "b", (Refer to Figure 1.)
 3. Turn the stop valve "V" 90° clockwise to open the passage. (Refer to Figure 1.)
 4. Turn stop valve "S" on the excavator side 90° counterclockwise to close the passage to the tank. (Refer to Figure 2.)
 5. Operating the auxiliary pedal
 - When the heel side "A" is pressed, oil is discharged from port "a".
 - When the toe side "B" is pressed, oil is discharged from port "b".



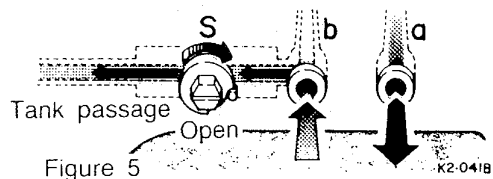
- **Using with a one-way flow** (breaker, etc.)
 1. Remove the bucket and install the new attachment. (Refer to "Replacing the Bucket" on page 55.)
 2. Remove the plug from stop valve "V" and connect the hoses of the new attachment as follows (refer to Figure 1):
 - Connect the hose for the supply (IN) side to port "a".
 - Connect the hose for the return (OUT) side to port "b".
 3. Turn the stop valve "V" 90° clockwise to open the passage. (Refer to Figure 1.)
 4. Turn stop valve "S" on the excavator side 90° clockwise to open the passage to the tank. (Refer to Figure 5.)
 5. After heating up the engine, set the throttle lever to about 80% open before operating. (Refer to Figure 4.)
 6. The new attachment operates when the heel side "A" of auxiliary port pedal is pressed.

- ☞ Clean the surrounding area before connecting and disconnecting hoses to prevent dirt from getting in.
- ☞ Refer to "Cautions on Handling a Hydraulic Breaker" to prevent accidents and problems. (Refer to pages 35 to 37.)

< Two-way flow >



< One-way flow >



OPERATION

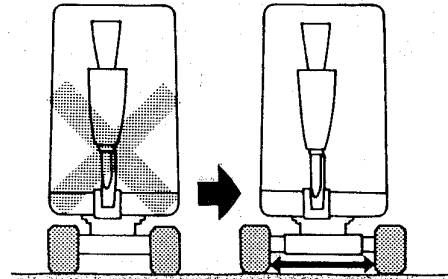
Cautions on Handling a Hydraulic Breaker

When attaching a breaker to the excavator, it is necessary to study what breaker is suited for the excavator. Consult a service factory. Also, read the breaker's operating instructions carefully before using it to be sure to take full advantage of its capabilities.

Using the breaker improperly is dangerous and can inversely affect not only the breaker but the hoe attachment and the excavator itself. To prevent accidents, never use the breaker as described below. Also refer to the directions on the installation port and operation on page 34.

⚠ Do not operate hammer with retracted crawler width!

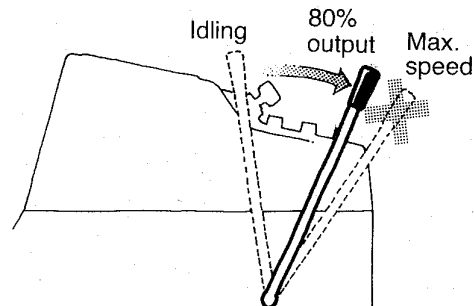
- When operate the machine, always extend the crawlers for greater stability. Operation with retracted crawlers the machine may be unstable and tip over.
- When travel with retracted crawlers, position the attachment facing straight forward.
- When operate the optional attachments such as Breaker, Tilt-Bucket, Cramshell, machine should be operated only in the extended width of 1300mm (51.2 in.).



00-080

⚠ Do not use at maximum engine speed!

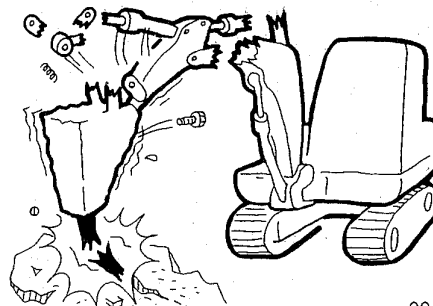
- If shocks are applied repeatedly with the engine at maximum speed, the hydraulic oil temperature may rise and the breaker not operate. Doing so can also cause wear or damage to the seals on the breaker and excavator.
- Set the engine speed to 80%.
- Slew occasionally to cool off the engine.



00-079

⚠ Never use levers!

- Do not use chisels as levers. Doing so can damage the breaker and hoe attachment.



00-023P

⚠ Never use with cylinders full extended or contracted!

- Never use (break) with the cylinders full extended or contracted. Doing so can bend or damage the cylinder rods. Leave some extra space on the cylinders' stroke ends when breaking.

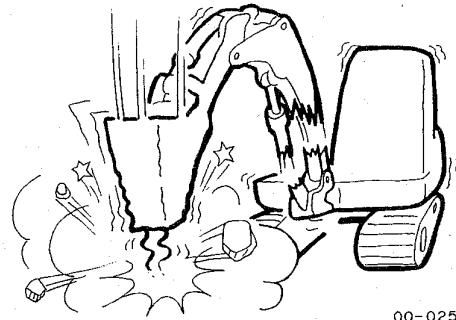


00-024P

OPERATION

⚠️ Avoid intense shocks!

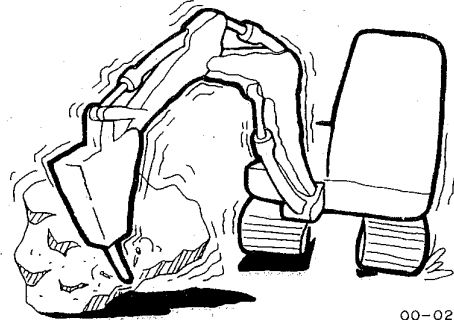
- The breaker is heavier than the bucket, so dropping it or hitting it very strongly can damage the front of the excavator and slew parts.
Hit the object slowly, without strong shocks.



00-025P

⚠️ Do not move objects with the breaker!

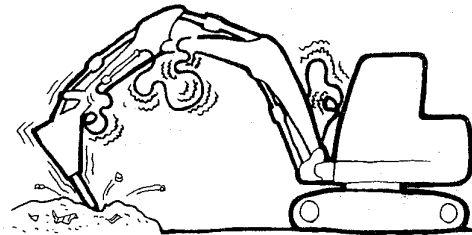
- Doing so causes excessive force on the swing bracket, slew parts, etc., and can damage them.



00-026P

⚠️ Stop immediately if hose shakes!

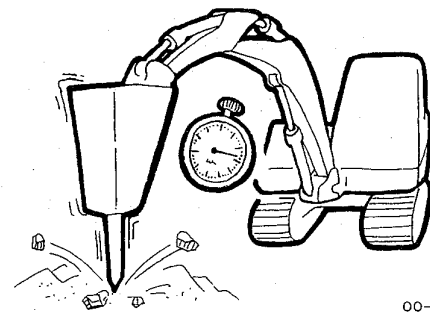
- If the breaker's hose shakes abnormally, stop operating immediately as the accumulator is damaged.
 - Continuing to operate as such will cause the shock to increase and can lead to loose bolts and otherwise affect the excavator.
- Stop operations and have the excavator inspected at a service outlet.



00-027P

⚠️ Do not apply shocks for over 30 seconds!

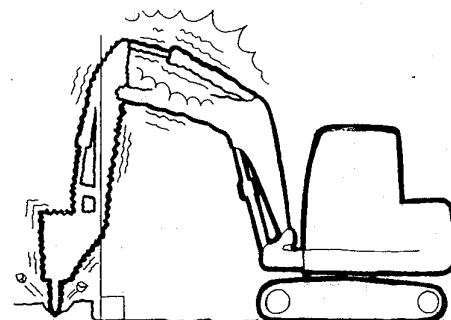
- If shocks are applied for over 30 seconds, the oil temperature may rise, damaging the accumulator or wearing out the cylinder seals.
 - If the object does not break when shocks are applied for 30 seconds in a certain position, wait 30 seconds, then change the position and apply more shocks.
- Slew occasionally to cool off the engine.



00-028P

⚠️ Do not use with the arm vertical!

- Do not use the breaker with the arm perpendicular to the ground, as the arm cylinder will swing.
 - Using the breaker with the arm in the vertical position can gouge the piston and lead to leaks.

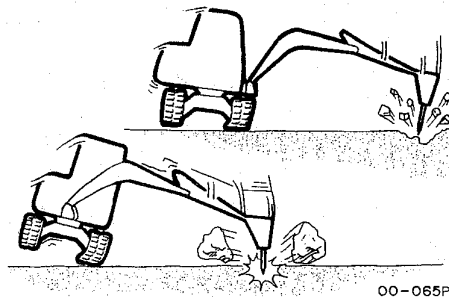


00-029P

OPERATION

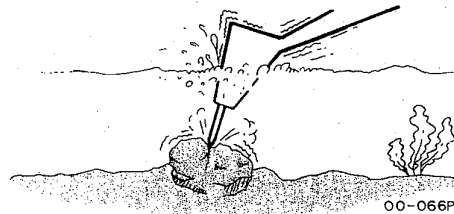
⚠ Do not operate the breaker in the slewing or swinging posture!

- In the slewing or swinging posture, the excavator is unstable and may tip over. Never use the breaker in this posture. Use it with the excavator facing directly forward or backward.



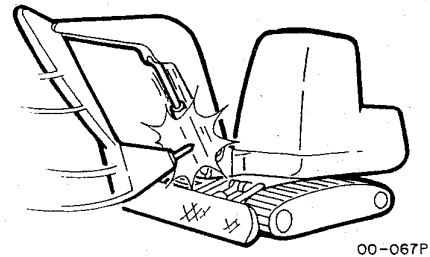
⚠ Never use in water!

- Using in water can cause the breaker to rust, and dirt can damage the breaker or excavator.



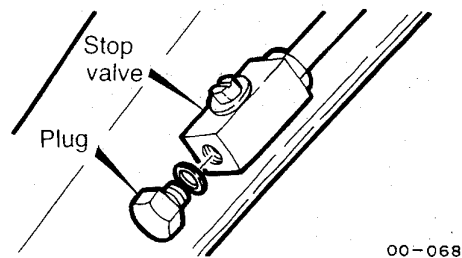
⚠ Be careful when chiseling

- Be careful not to let the breaker chisel come into contact with the hoe attachment or blade.



⚠ Cautions on handling auxiliary pipe

- Fully open the stop valves on the body and arm sides before using.
- When the attachment is not installed, securely close the stop valve with the included plug to prevent dirt from getting inside.
- Be especially careful not to let dirt into the stop valve when installing and removing the attachment.
- Check for looseness in pipe clamps and oil leaks from pipes before starting.



⚠ 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 filter element.
- Failure to replace these in time can lead to damage to the excavator and breaker's hydraulic systems. In order to improve the service life of the hydraulic systems, be sure to replace the hydraulic oil and filter element after the number of hours shown on the diagram at the right.
- Clean the suction filter when changing the element. (Refer "Changing the Hydraulic Oil" on page 45.)

Replacement	Interval Item	
	Hydraulic Oil	Filter Element
1st time	—	25
2nd time	—	100
Regularly	600	200

⚠ Follow the "Cautions on Handling a Hydraulic Breakers" even when using attachments other than hydraulic breakers.

OPERATION

Transporting the Excavator

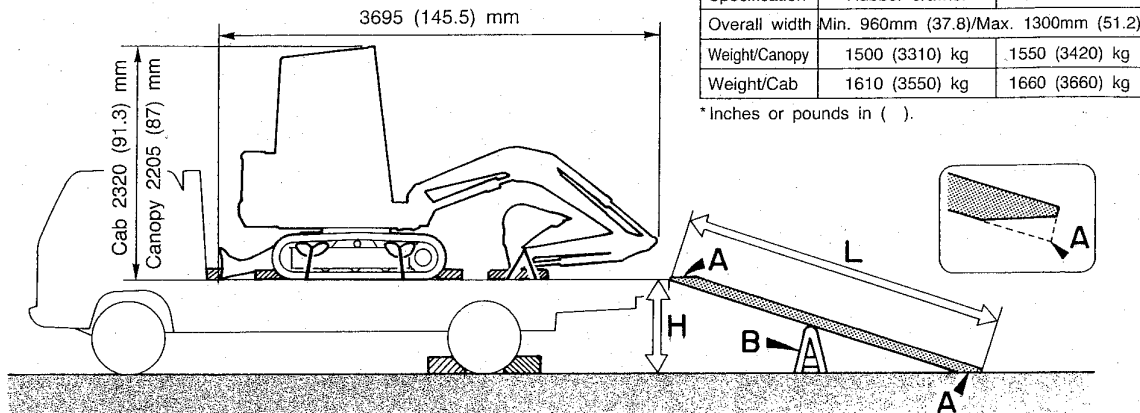


Figure 1

D3-012A

Ramps

- Choose a length that will keep the slope angle under 15° and a material that is sufficiently strong.
- The ramp width should be at least 1.2 times the crawler belt width.
- Bevel the end of the ramp as shown at point "A" on the diagram.
- Fasten the ramp securely to the truck with a metal fitting in such a way that the truck and excavator centers are matched.
- For better safety, insert a support "B" under the ramp in the middle.

Relationship of bed height "H" and ramp length "L"

H	L
750 (2-6)	2800 (9-2) or greater
930 (3-1)	3500 (11-6) or greater
1110 (3-8)	4200 (13-9) or greater
1300 (4-3)	4900 (16-1) or greater

Units : mm (ft. in.)

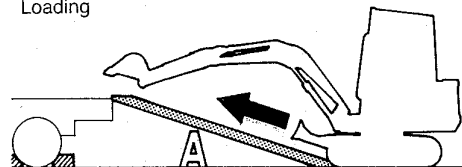
Loading and Unloading the Excavator

1. Clean the crawlers to prevent sideways slippage on the ramp.
2. When loading, extend the bucket before starting the excavator up the ramp so that it is directly over the bed, lift the blade, then climb up the ramp at slow speed.
3. Once on the bed, slowly lift the boom, slew, and set the excavator as shown in Figure 1.
4. When unloading, from the posture shown in Figure 1, lift the blade, extend the arm over the ramp, and climb down the ramp using the hoe attachment as you would a cane.

⚠ **Never change directions or slew while on the ramp, as this is extremely dangerous. Wait until the excavator is off the ramp to change directions.**

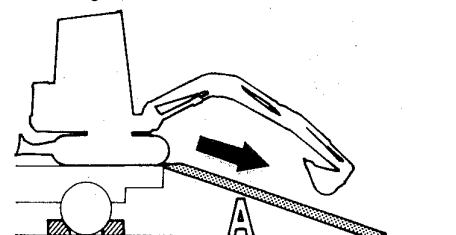
⚠ **The excavator should always be loaded and unloaded on firm, level ground. Set the truck's parking brake and set stoppers under the wheels.**

Loading



D3-022

Unloading



D3-032

Posture During Transportation (refer to Figure 1)

- Set down a wooden block as shown in Figure 1, and slowly lower the hoe attachment onto it. Also lower the blade.
- After stopping the engine, move the levers several times to release the pressure remaining in the hydraulic circuitry, then lock the levers.
- For units equipped with a slew lock lever, lock the slew.

Continues on next page

OPERATION

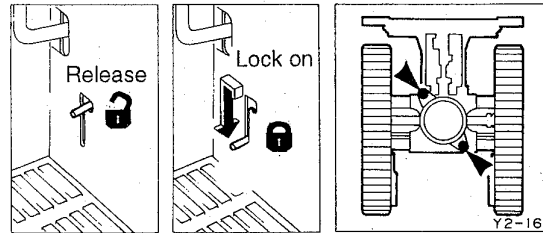
- Fasten the arm or bucket in place with wire rope to prevent the upper frame from slewing.
- Use wood blocks to brake the crawler belt. To prevent sideways slippage, fasten the lower frame securely with wire rope.
For iron crawlers: Fasten the lower frame by attaching the wire rope directly to the crawler belt.
For rubber crawlers: Do not attach the wire rope directly to the crawler belt. Attach it to the crawler frame to fasten the lower frame.
- Apply a covering to the crawler frame before attaching the wire rope so that the wire rope does not damage the crawler frame.

Locking Slewing

Use when fixing the turntable to the track frame in order to transport the machine.

When the turntable is facing straight forward or backward, the turntable can be locked in two locations (marked by black dots).

- ⚠ **Lowering the lock lever while the slew is in progress will damage the machine.**
Wait until the slew is fully completed before locking.



When Transporting

Carefully study the route beforehand, considering the road width, height restrictions and weight.

- ⚠ **When traveling on paved roads, use planking, etc., so as not to damage the road surface.**
Take special precautions on asphalt surfaces in the summer, as they become soft.

Peculiarities of Hydraulic Equipment

The following are peculiarities of hydraulic equipment. These are normal responses and sounds, and are not malfunctions.

- **Temporary stopping when arm is folding in**

The arm may stop temporarily when it is making the digging motion with no load. This is due to the fact that the speed at which the arm falls under its own weight is faster than the speed at which the cylinder is extended by the hydraulic pressure.

- **Sound of running hydraulic oil**

When the boom is lowered, etc., you may hear a continuous swishing noise. This is caused by the oil flowing in the valves.

- **Sound of relief valve**

A continuous swishing sound may also be heard when operating the hoe attachment or blade with an excessive load. This is the sound of the relief valve being activated to protect the hydraulic system.

- **Relief sound of brake valve**

Sounds may be produced from the slew and travel motors when slewing or travelling is started or stopped. This is the relief sound of the brake valve in the motor.

- **Blade movement when operating the spanner device**

If the spanner device is operated without lifting the excavator body, the blade moves as explained below. This is due to the structure of the hydraulic circuit.

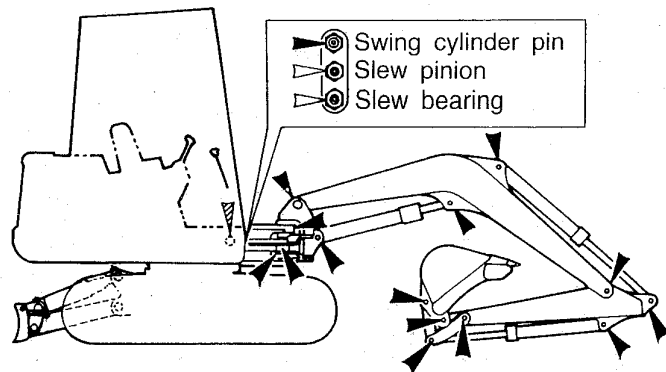
If the crawler width is extended, the blade lowers under its own weight. If the width is retracted the blade rises.

INSPECTION AND MAINTENANCE

Greasing

Apply grease as follows:

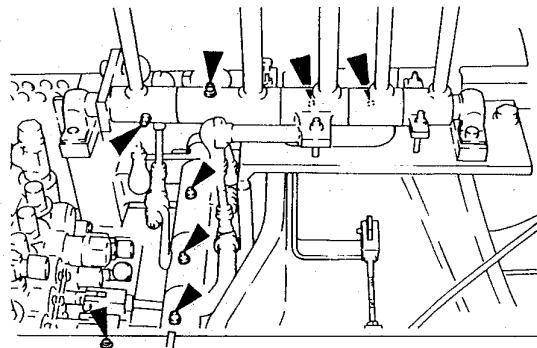
- ▶ : Every day or every 10 hours
- ▷ : Every 50 hours
- ▧ : If travel equipment does not work smoothly, remove floor cover and apply grease.



E3-103PI

Greasing the travel levers and pedals

- Supply a suitable amount of grease if the levers and pedals do not move smoothly.
- 1. Remove the floor plate.
- 2. Supply a suitable amount of grease to the grease nipples "▶" of the levers.
- 3. The old grease flows out. Wipe it off.
- 4. Install the floor plate.

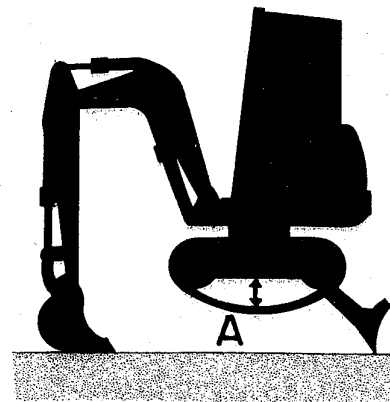


Y2-113B

- Apply grease a little more often when using the excavator under severe conditions.
- Type of grease: Multipurpose grease No. 2
- ▧ After greasing, wipe off the old grease carefully to prevent sand or dirt from getting stuck to it.

Adjusting the Crawler Belt Tension

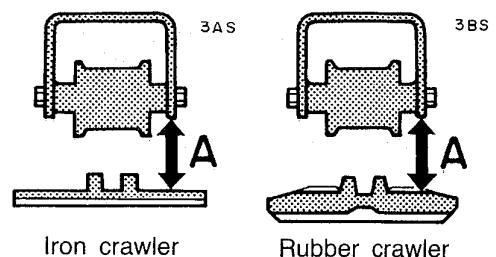
- Every 50 hours (after 30 hours first time for rubber crawlers)
- 1. Lift the main body using the hoe attachment and blade.
- 2. Check the gap "A" between the bottom surface of the frame and the top surface of the crawler belt at the center of the crawler frame.



SZ2-173P

- **Standard values for gap "A":**
 - 80 to 95mm (3.15 to 3.74 in.) for iron crawlers
 - 52 to 57mm (2.05 to 2.24 in.) for rubber crawlers

- ▧ Perform these operations on a flat, hard surface.
- ▧ Wash the crawlers before adjusting the tension.

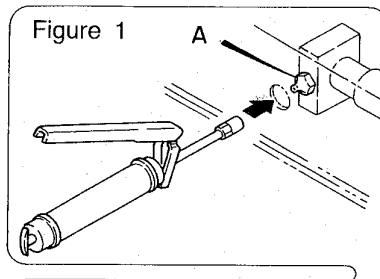


INSPECTION AND MAINTENANCE

Tightening the Crawler Belt

(Figure 1)

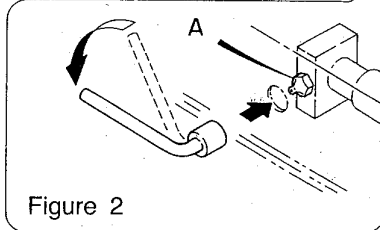
1. Apply grease to check valve "A" until the tension of the crawler belt is correct.



Loosening the Crawler Belt

(Figure 2)

1. Using an L wrench, gradually loosen check valve "A". Grease is expelled and the crawler belt loosens.
- Check valve "A" tightening torque: 59 N·m (43.4 ft.-lb.)



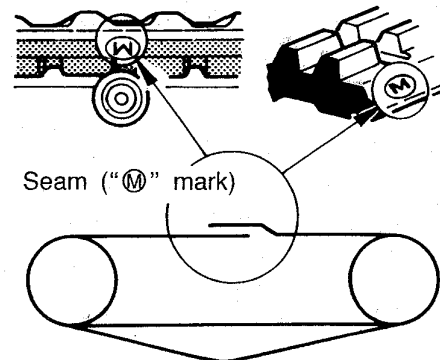
B2-069B

⚠ Do not loosen the check valve "A" more than one turn. If the grease is not expelled easily, move the crawler back and forth.

⚠ If no grease is expelled when check valve "A" is loosened, there is a problem. Contact your nearest service outlet for repairs. DO NOT disassemble, as this is very dangerous.

Cautions on Handling Rubber Crawlers

- ☞ Rubber crawlers include a seam ("M" mark). When adjusting the tension, set so that the seam is at the top center of the frame. If this is not done, the crawler belt will be too loose, and readjusting will be necessary.



SZ2-153A

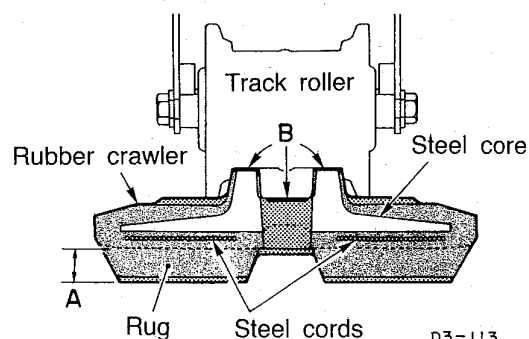
- ☞ Replace the rubber crawlers with new ones in the following cases:

- When the height of the rug "A" becomes 5mm (0.2 in) or less.
- When the rugs are worn and the steel cord inside the crawler is exposed in two places.
- When one of the steel cords is severed more than half way through.
- When one or more of the steel cores inside the crawler has come off.
- If the crawlers are too loose even after grease is injected.

- ☞ Consult a service outlet when deciding whether to repair scratches or replace parts.

- ☞ It is normal for the steel cores at surface of contact "B" to be exposed.

Cross Section of Rubber Crawler

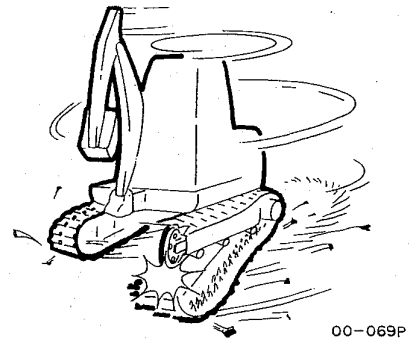


D3-113

INSPECTION AND MAINTENANCE

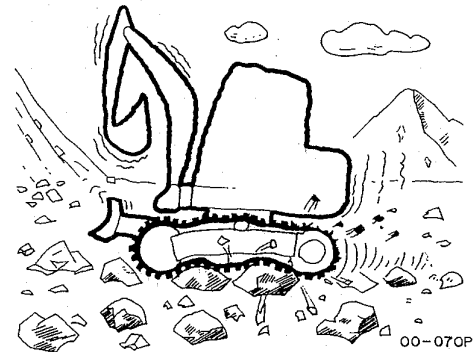
⚠ No pivot turns or spin turns on surfaces with a high coefficient of friction (concrete, etc.)!

- This can cause the rubber crawlers to break. Also be careful not to drive on sharp objects or rocks.
- Never drive on river beds, broken stone surfaces, iron reinforcing rods, or layers of iron sheets, as this can shorten the service life of the crawlers.



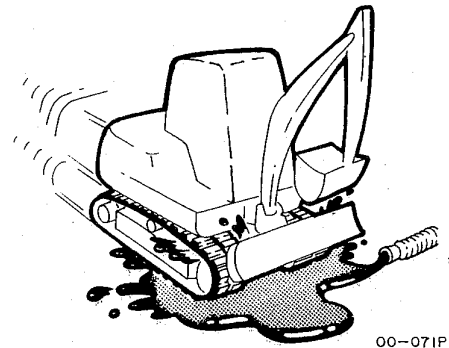
⚠ Be careful of the crawlers in rocky places!

- Rocks may get caught in the crawlers, damaging them or shortening their service life.
- If gravel or rocks get caught in the crawlers when turning and the relief valve is activated, drive straight backwards to remove the gravel then turn.



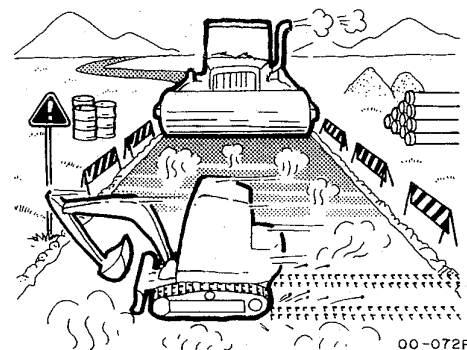
⚠ Do not let oil or solvents on the rubber crawlers!

- If oil or solvents get on the crawlers, wipe them off immediately with a cloth.
- Salt, potassium chloride, ammonium sulfate, potassium sulfate, and triple superphosphate of lime can damage the crawlers. If any of these substances should get on the crawlers, wash them off thoroughly with water.
- Soybeans, corn, rapeseed, etc., give off oils when crushed, so either do not drive on these or wash the crawlers off thoroughly with water afterwards.



⚠ Do not use on hot surfaces (50°C (122°F) or greater) or on the seashore!

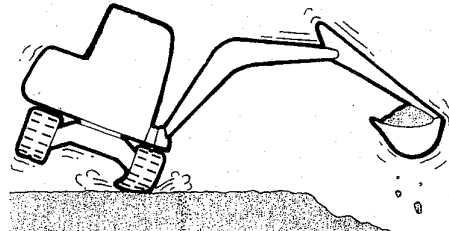
- Do not drive on hot surfaces, such as roads which have just been asphalted or places where fires have recently burned, as this could damage the crawlers and the surface.
- Also avoid using on the seashore, as the salt can seep into the metal core adhesive.
- Be especially careful in the winter on snowy or frozen surfaces as the crawlers tend to slip.
- Use rubber crawlers at temperatures between -25°C and +55°C (-14°F and 131°F).



INSPECTION AND MAINTENANCE

⚠ Be careful when operating sideways!

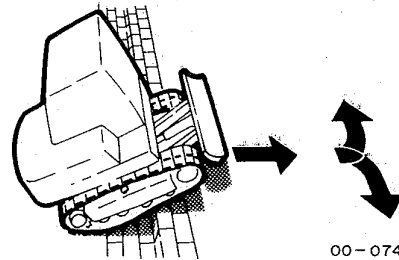
- Rubber crawlers are not as stable as iron crawlers since the entire rug is rubber. Be very careful when slewing and swinging sideways.



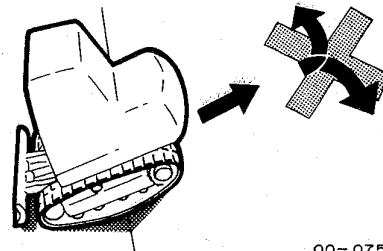
00-073P

⚠ Preventing the rubber crawlers from coming off.

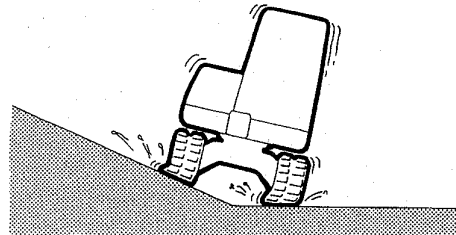
- Be careful of the following to prevent the rubber crawlers from coming off:
 - Always keep the crawlers at the proper tension.
 - Do not change directions on places where there are large level differences, such as on rocks, etc. Drive over level differences at right angles.
- When climbing slopes in reverse, travel straight over places where the level ground ends and the slope begins, without changing directions. Also, do not change directions on slopes.
- Do not travel on places where one side of the excavator is on flat ground and the other side is on a slope. Both sides should be on the same plane. Also, do not change directions on such places.



00-074

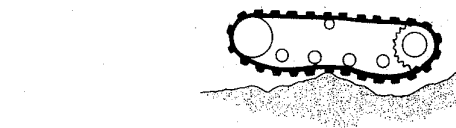


00-075



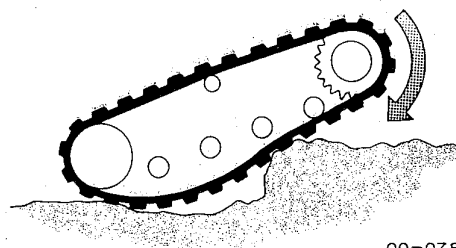
00-076P

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



00-077

- Gaps arise between the track rollers and idlers when driving over level differences in reverse. The rubber crawlers may come off in such cases.



00-078

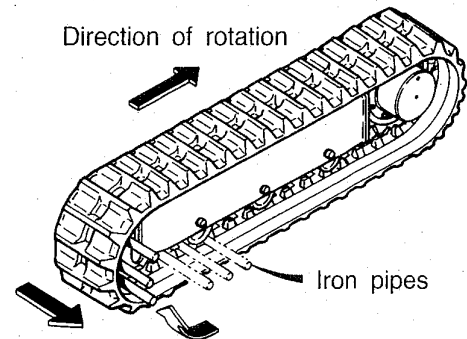
INSPECTION AND MAINTENANCE

Replacing Rubber Crawlers

Removal

1. Release the tension of the rubber crawler completely. (Refer to pages 40 and 41.)
2. Lift the excavator body using the hoe attachment and blade.
3. Place iron pipes in the crawler, and slowly turn the sprocket towards the back.
4. Stop the sprocket when the iron pipes reach the side of the idler and the crawler comes away from the idler.
5. Slide the crawler to the side and off the crawler frame.
6. Use the same procedure to remove the other crawler.

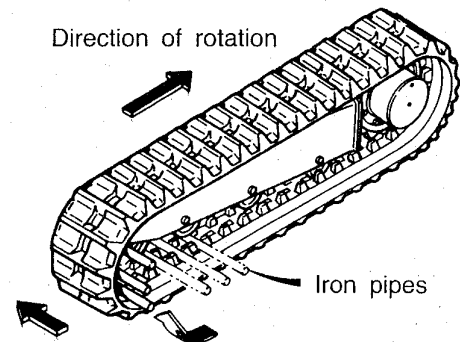
⚠ Check that the crawler tension is completely released before turning the sprocket.



Z3-333

Installation

1. Place the rubber crawler on the sprocket and set it on the crawler frame.
2. Place iron pipes in the crawler, and slowly turn the sprocket towards the back.
3. Stop the sprocket when the iron pipes reach the side of the idler and the crawler comes away from the idler.
4. Slide the crawler to a position at which it can be squarely set on the idler, then remove the iron pipes.
5. Check that the crawler is squarely on the sprocket and idler, then adjust the tension to the standard value. (Refer to pages 40 and 41.)
6. Check again, then lower the excavator body.
7. Use the same procedure to install the other crawler.



Z3-343

INSPECTION AND MAINTENANCE

Changing the Hydraulic Oil

- Replace the oil every 1000 hours of operation (or every 600 hours when using a breaker).
- Total qty. oil 30 liters (31.7 US.qt.)
- Tank level 21 liters (22.2 US.qt.)

Hydraulic oil inspection posture

On a flat surface, extend the hoe attachment fully, set the bucket and blade against the ground as shown in the diagram at the right, then stop the engine.

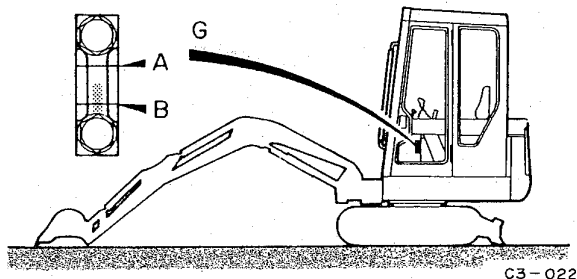


Figure 1 Hydraulic oil inspection posture

Procedure (Refer to Figures 1, 2 and 3)

1. Slew so that an oil pan can be placed under drain plug "B", then set the excavator in the inspection posture shown above.
2. Lock the operating lever and stop the engine.
3. Slowly loosen plug "A" to gradually release the pressure in the tank, then remove the plug.
4. Gently push the seat forward and fasten it in place with the stay "M".
5. Remove the hose plug "C".
6. Prepare the oil pan, then remove plug "B" and drain the hydraulic oil.
7. Remove the two bolts "D", then pull up stand "E". (Do not disconnect the hose.)
8. Loosen the four bolts "F", then remove cover "H".
9. Take out suction strainer "J" and clean it with cleaning solution.
10. Replace return filter "K". (See the following page.)
11. Clean the inside of the hydraulic tank.

Hydraulic oil viscosity

External temperature	Hydraulic oil
5°C to 55°C (41°F to 131°F)	ISO VG68
-5°C to 40°C (23°F to 104°F)	ISO VG46
-20°C to 30°C (-4°F to 86°F)	ISO VG32

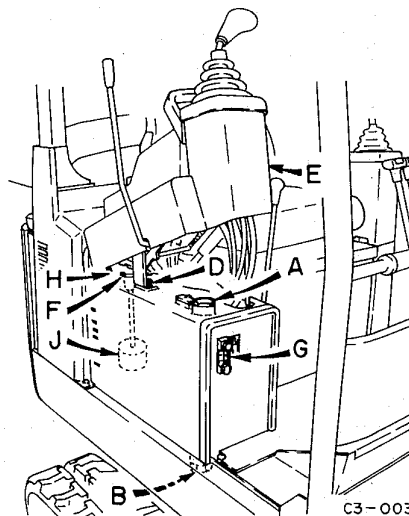


Figure 2

Supplying Hydraulic Oil (Refer to Figures 1, 2, 3 and 4)

1. After assembling the various parts, supply new hydraulic oil through the plug "A" hole up to the middle of level gauge "G".
2. Bleed the air out of the cylinders and pipes. (See the following page.)
3. Set the excavator to the hydraulic oil inspection posture.
4. Inspect level gauge "G" and add oil if necessary.
5. Pressurize the hydraulic tank. (See the following page.)
6. Finally, check for oil leaks.

⚠ The hydraulic pump will be damaged if the hydraulic tank is not pressurized. Be sure to do so. (Refer to page 46.)

⚠ Failure to bleed the air out of the cylinders and pipes may damage the piston packing, etc. Be sure to do so. (Refer to page 46.)

☞ Be sure that no dirt, water, sand, or other foreign substance gets into the tank when replacing the hydraulic oil.

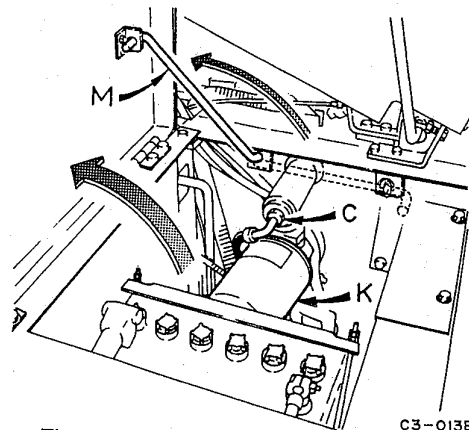


Figure 3

INSPECTION AND MAINTENANCE

Replacing the Return Filter

- First time After 50 hours (after 25 hours when using a breaker, after 100 hours the second time)
- Second time on Every 500 hours (every 200 hours when using a breaker)

Replacement Procedure (Refer to Figures 2 and 3)

1. Set the excavator in the hydraulic oil inspection posture.
2. Lock the operating lever and stop the engine.
3. Slowly loosen plug "A", letting the pressure out of the tank.
4. Gently push the seat forward and fasten it in place with the stay "M".
5. Remove the hose plug "C".
6. Remove return filter "K".
7. Apply oil thinly to the packing of the new filter and turn it by hand 3/4 of a turn.
8. Tighten the hose plug "C" and check the hydraulic oil quantity with level gauge "G". Add oil if necessary.
9. Pressurize the hydraulic tank. (See below.)
10. Finally, check for oil leaks from the filter connection.

⚠ **Draining the oil directly after stopping the engine is dangerous, as the oil is hot. Wait for the oil temperature to decrease.**

⚠ **If there is metallic dust on the old return filter, contact a service outlet for an inspection. (Refer to page 65.)**

☞ The hydraulic pump will be damaged if the hydraulic tank is not pressurized. Be sure to do so.

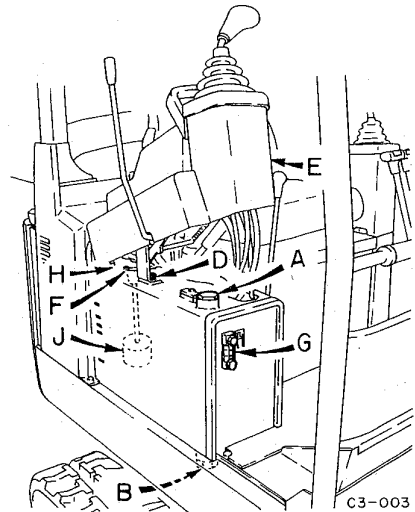


Figure 2

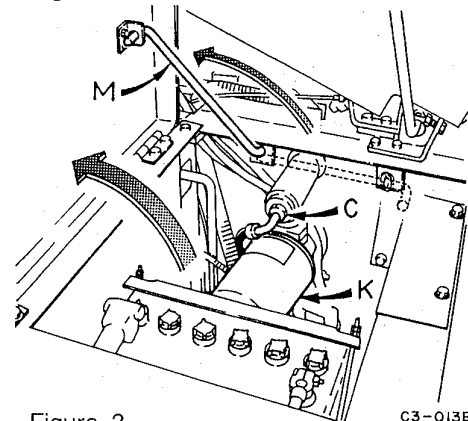


Figure 3

• Bleeding Air From the Cylinders and Pipes

1. Extend the cylinders to a point approximately 100mm (4 in.) before the stroke end, then contract. Repeat this about 5 times.
2. Next, extend the cylinders to the stroke end, then contract. Repeat this about 4 times.

☞ Set the engine to an idle (1000 rpm or less).

☞ The pistons and packings may be damaged by the air in the cylinders if the engine is run at high speed or if the cylinders are extended to the stroke ends at the beginning.

• Pressurizing the Hydraulic Tank (Refer to Figure 4)

1. Slowly extend all cylinders to the stroke end.
The excavator should be as shown in Figure 4 when pressurizing the hydraulic tank.
2. Finally, tighten plug "A". The tank is pressurized the next time the hoe attachment is moved.

☞ Set the engine to an idle (1000 rpm or less).

Hydraulic tank pressurization posture

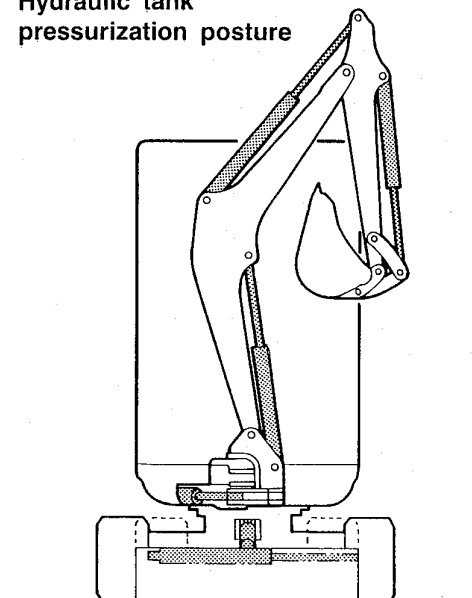


Figure 4

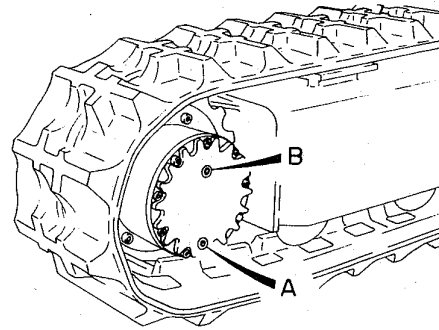
Y2-063P

INSPECTION AND MAINTENANCE

Changing the Gear Oil

Track Gearbox

- First time: After 500 hours
- Second time on: Every 1000 hours
- Type of oil: Gear oil
SAE: #90
API: GL-4 or GL-5
- Quantity: 400 cc/24.4 cu.in. per



Y2-083

Replacement Procedure

1. Drive the excavator some on a flat surface to heat up the track gearbox oil then stop the engine with drain port "A" at the very bottom.
 2. Remove the plugs from oil drain port "A" and inspection supply port "B" and drain out the oil into an oil pan.
 3. Wrap sealing tape around the oil port plugs.
 4. Tighten the plug to oil drain port "A".
 5. Pour oil inspection/supply port "B" until it overflows from port "B".
 6. Tighten the plug to port "B".
 7. Then operate the excavator lightly and check for oil leaks.
- ☞ Check for metallic dust in the drained oil. If metallic dust is present, contact a service outlet for an inspection.
- ☞ Drive the excavator for a while then check for oil leaks.

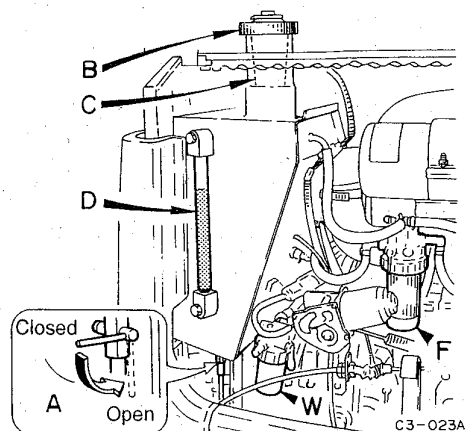
INSPECTION AND MAINTENANCE

Inspecting and Servicing the Fuel System

Draining the Fuel Tank

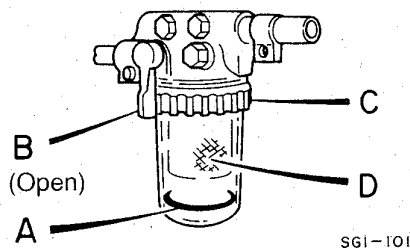
- Drain every 50 hours.
- Tank capacity: 23 liters (24.3 US.qt.)
- 1. Stop the engine and open the bonnet.
- 2. Drain water, dirt, etc., which has accumulated in the bottom of the tank from drain cock "A" on the bottom of the tank.
- 3. Remove the strainer "C" from the supply port and clean it with cleaning solution.
- 4. After draining, fill the tank with fuel through supply port "B", looking at level gauge "D".

⚠ Refer to the Engine Operation Manual for engine inspection and maintenance.



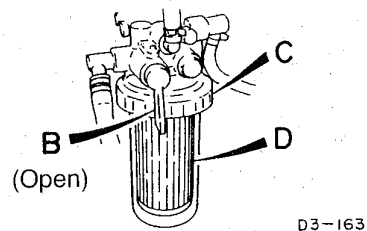
Draining and Cleaning the Water Separator "W"

- Drain and clean every 100 hours.
- Float "A" moves near element "D" when water accumulates in the separator body. Empty it out when necessary.
- 1. Close cock "B" and remove retainer ring "C".
- 2. Remove element "D" and clean with cleaning solution.
- 3. After setting the element back in place, open cock "B".
- 4. Be sure to bleed the air. (See below.)
- 5. Drive the excavator for a while then check for fuel leaks.



Cleaning and Replacing the Fuel Filter "F"

- Cleaning Every 100 hours.
- Replacement Every 500 hours.
- 1. Close cock "B" and remove retainer ring "C".
- 2. Remove element "D" and clean with cleaning solution.
- 3. After setting the element back in place, open cock "B" and bleed the air.
- 4. Drive the excavator for a while then check for fuel leaks. (Refer to page 65.)



Fuel System Air Bleeding

☞ If the engine does not start, wait for about 30 seconds to protect the battery then try again.

Bleed the air as follows.

1. Fill the fuel tank.
2. Open the water separator and fuel filter cocks "B".
3. Set the throttle lever to the maximum speed position then turn the starter motor. Repeat this several times to bleed the air.

⚠ To prevent fires, be sure to wipe up any diesel fuel which has spilled.

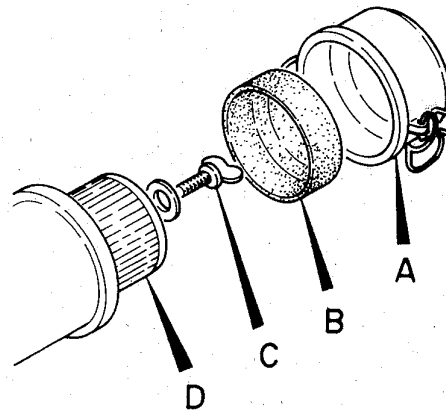
- Carefully wipe up any diesel fuel or old grease which may have spilled during operation.
- Supply fuel outdoors with the engine off.
- Store fuel and grease away from flames.
- Dispose of oily cloths according to the specified regulations. Remember that such cloths are subject to spontaneous combustion.

⚠ Never use fuels which are mixtures of such things as kerosene, gasoline and/or alcohol. Doing so may cause reduced performance, problems, explosions or fires.

INSPECTION AND MAINTENANCE

Cleaning and Replacing the Air Cleaner Element

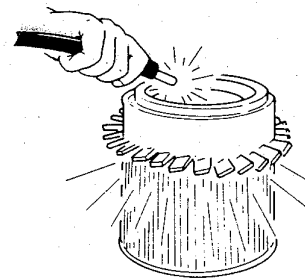
- Cleaning Every 250 hours
 - Replacement Every 1000 hours
1. Remove dust cup "A".
 2. Remove baffle "B" from the dust cup and throw out the accumulated dust.
 3. Remove butterfly bolt "C" and detach element "D".
- ☞ Remove the dust from the dust cup once every day, or more often if the dust is heavy.
- ☞ Replace the element if its packing is bent or scratched. (Refer to page 65.)
- ☞ Install the dust cup with the arrow pointing up.



SB2-076

Cleaning

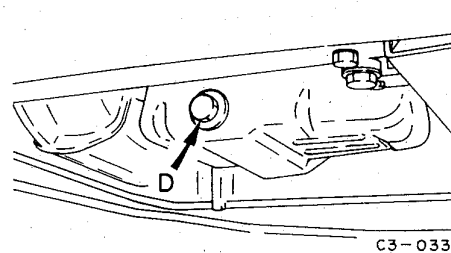
1. Spray clean, dry compressed air (at 686 kPa (99.5psi) or less) on the inside of the element, moving the nozzle up and down along the folds.
- ☞ Maintain an appropriate distance between the nozzle and the element.



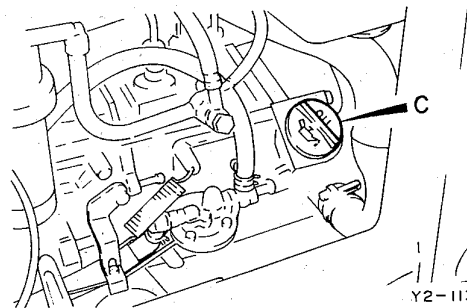
SL0-077

Changing the Engine Oil

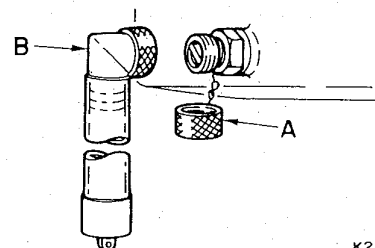
- First time After 50 hours
 - Second time After 100 hours
 - Third time on: Every 250 hours
 - Type of oil: Diesel engine oil
API Class CC or CD
 - Upper limit: 2.4 liter (2.54 US.qt.)
Lower limit: 1.4 liter (1.48 US.qt.)
1. Heat up the engine oil (to approximately 30°C or 86°F), and place an oil pan under drain plug "D".
 2. Turn supply port cap "C" counterclockwise and remove it.
- **When a drain valve is included**
3. Remove cap "A", install connector "B" and drain the oil. (The oil comes out when the screw is tightened.)
 4. Remove connector "B" and install cap "A".
- **When a drain plug is included**
3. Remove plug "D" and drain the oil.
 4. Tighten plug "D".
 5. Add new oil up to the upper limit "H" of the dipstick.
 6. After supplying the oil, tighten cap "C", then idle for several minutes so that the oil circulates.
 7. Stop the engine, wait approximately 30 minutes, then check the oil quantity again and add more oil if necessary.
- ☞ Be careful not to let any dirt or dust in through the cap or plug.
- ☞ Check the drained oil and make sure there are no large quantities of metallic dust or other foreign substances in it.



C3-033



Y2-113



K2-203

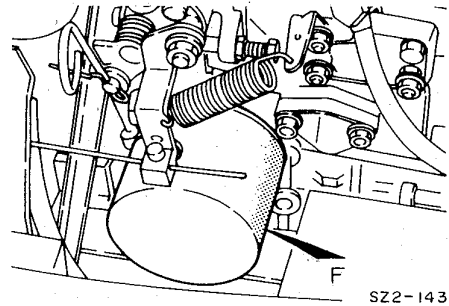
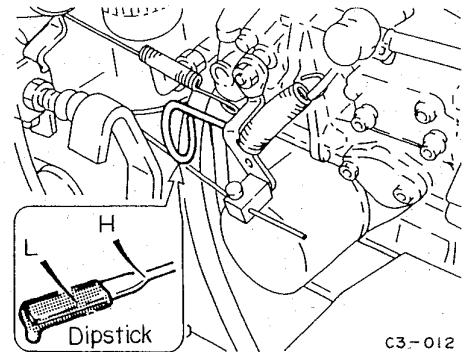
⚠ Draining the oil directly after operating the excavator is dangerous, as the oil is hot.

Wait for the temperature to decrease to an appropriate level before draining. Inversely, heat the oil a little if it is cold.

INSPECTION AND MAINTENANCE

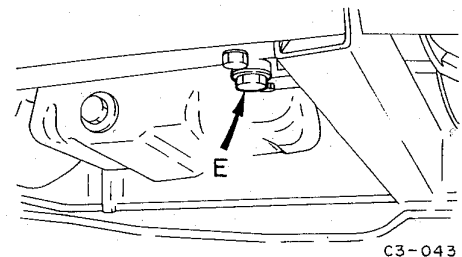
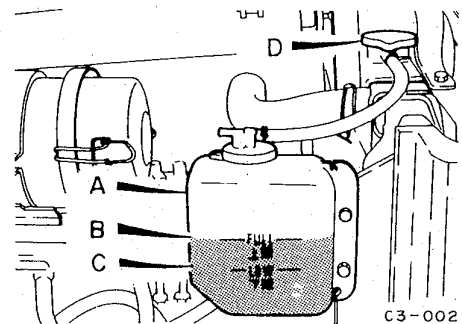
Replacing the Engine Oil Filter

- First time: After 50 hours
 - Second time on: Every 250 hours
1. Perform these operations on a flat, hard surface, with the engine stopped and open the bonnet.
 2. Using a filter wrench, turn filter "F" counterclockwise and remove it.
 3. Apply engine oil to the connection part of the new filter.
 4. Tighten the filter by turning it 3/4 to 1 full turn from the point where the connection part first makes contact.
 5. Idle the engine for several minutes, let sit for approximately 30 minutes, then check the oil level and check for oil leaks.
 6. Add oil up to upper limit "H" on the dipstick.
- ☞ If metallic dust is present on the old filter, contact a service outlet for an inspection. (Refer to page 65.)
- ☞ The oil filter element is of the cartridge type, so it cannot be reused.
- ☞ Replace at shorter intervals when using in dusty places.



Cleaning the Radiator and Replacing the Coolant

- Replace every 1000 hours
 - Total quantity: 3.5 liters (3.7 US.qt.)
1. After the engine has cooled down, slowly remove radiator cap "D", letting the pressure out gradually.
 2. Drain the water from drain plug "E" located on the side of the oil pan.
 3. After the water is drained, tighten drain plug, pour water into the radiator, and once it is full, let the engine run at a low idle.
 4. With the engine still idling slowly, remove drain plug and let the water flow for about 10 minutes to clean the radiator. During this operation, constantly adjust the quantity of water supplied and drained to keep the radiator always full.
 5. Once the draining water is clean, tighten drain plug and fill the radiator with tap water up to the brim of the radiator cap.
 6. To bleed the air from the radiator coolant, run the engine at a low idle for 5 minutes then at a high idle for another 5 minutes. Do this with the radiator cap off.
 7. Stop the engine, wait five minutes, then fill the radiator up to the brim and tighten the radiator cap.

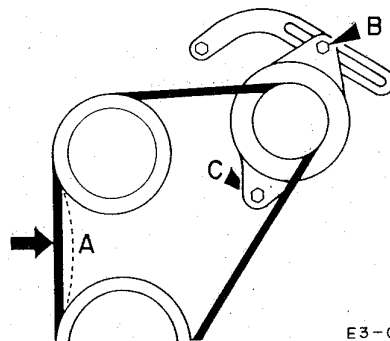


- ☞ During cold weather, use the coolant mixture shown on the table on page 57.
- ☞ Do not use hard water (well or sea water), as this reduces cooling efficiency and may result in overheating.

INSPECTION AND MAINTENANCE

Adjusting and Replacing the Fan Belt

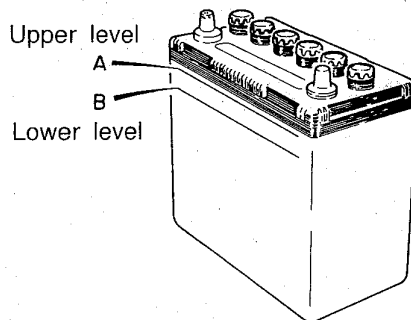
- Press strongly on the center of the fan belt with your finger (with a force of approximately 10kg (22lb.)). The tension is standard if the deflection "A" is approximately 10mm (0.4in.).
- If the tension is off, loosen the alternator's tension pulley bolt "B" and the adjustment bolt "C" to adjust the tension.
- Replace the belt in the following cases:
 1. If it stretches and the tension cannot be adjusted;
 2. If it is cut or cracked;
 3. If it is worn to the bottom of the V groove.



E3-002

Inspecting the Battery Fluid

- Always set the starter switch to the "OFF" position when inspecting and handling the battery, and do so in a well-ventilated place.
 - Gently push the seat forward and fasten it in place with the seat stay "M". (Refer to page 17)
 - The fluid level should be between the lines indicating the upper level "A" and lower level "B". If not, add distilled water up to line "A".
- ☞ Replenish the distilled water before starting to charge the battery to prevent freezing.

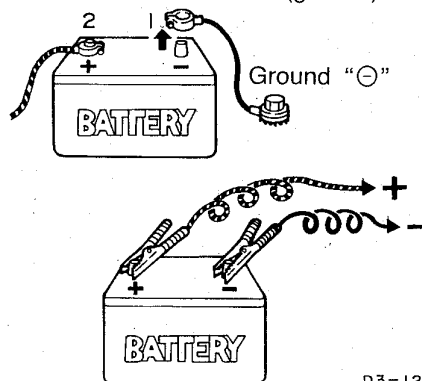


SL0-085

Charging the Battery (when the specific gravity of the electrolyte is 70% or less)

1. Gently push the seat forward and fasten it in place with the seat stay "M". (Refer to page 17)
 2. To protect the alternator, disconnect the minus side "⊖" (ground) first.
 3. After properly wiring the clips to the battery terminals ("⊕" to "⊕", "⊖" to "⊖"), turn on the power of the charger.
- ⚠ **Do not wire the battery terminals the opposite way ("⊕" to "⊖", "⊖" to "⊕"), as this could damage the alternator, etc.**
4. Remove all the plugs while charging to let the gases escape.

Disconnect the "⊖" side (ground) first.



D3-123

- ⚠ **These gases may explode. Charge the battery in a well-ventilated place, making sure there are no short-circuits, sparks, cigarettes, or other sources of flames in the vicinity. Also do not overheat (45°C (113°F) or above) the battery fluid during charging.**

5. Refer to the table at the right and measure the specific gravity of the electrolyte. Charge to as close as possible to 100% to prevent loss in battery capacity and freezing.
6. After charging, turn off the charger's power immediately then remove the clips. Overcharging can lead to problems with the battery.
7. Wire the battery starting from the "⊖" terminal, wiring the "⊕" terminal last. Be sure to wire properly.

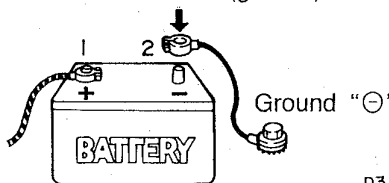
- ⚠ **If battery fluid should get in your eyes or on your skin, rinse immediately with large quantities of water. Particularly if it gets in your eyes, rinse well then consult a physician immediately.**

Specific gravity table

Electrolyte temperature	30°C	20°C	0°C	-10°C	-20°C
Charging rate	(86°F)	(68°F)	(32°F)	(14°F)	(-4°F)
100%	1.27	1.28	1.29	1.30	1.31
90%	1.25	1.26	1.27	1.28	1.29
80%	1.23	1.24	1.25	1.26	1.27
70%	1.22	1.23	1.24	1.25	1.26
60%	1.17	1.18	1.19	1.20	1.21

- The specific gravity changes according to the temperature of the electrolyte.

Wire the "⊖" side (ground) last.



D3-133

INSPECTION AND MAINTENANCE

Handling Booster Cables

When starting the engine using booster cables, connect and disconnect the booster cable as follows:

Connection

1. Gently push the seat forward and fasten it in place with the seat stay "M". (Refer to page 17)
2. Connect the clip of cable "R" to the "+" battery terminal of the excavator.
3. Connect the other clip of cable "R" to the "+" battery terminal of the good battery.
4. Connect the clip of cable "B" to the "-" battery terminal of the good battery.
5. Connect the other clip of cable "B" to the engine block of the excavator (as far as possible from the battery).

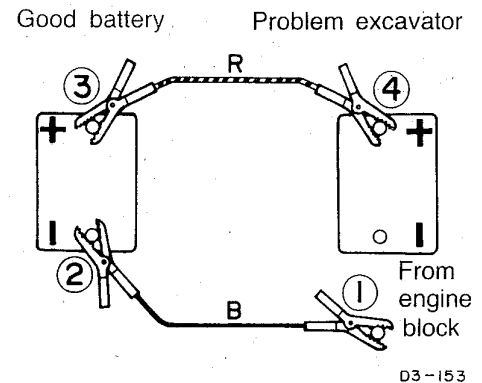
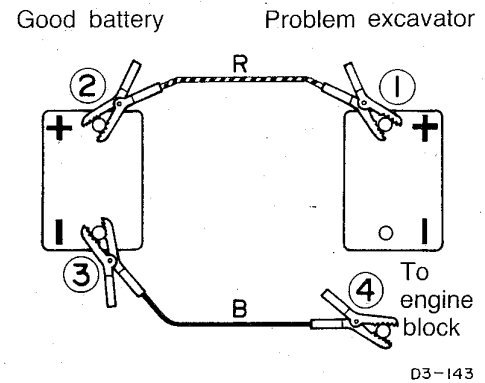
⚠ Be sure not to let the "+" and "-" terminals touch when connecting the cable clips.

⚠ Be sure to connect the cables properly.

Removal

1. Disconnect the clip of cable "B" which is connected to the engine block of the excavator.
2. Disconnect the other clip of cable "B" which is connected to the "-" battery terminal of the good battery.
3. Disconnect the clip of cable "R" which is connected to the "+" battery terminal of the good battery.
4. Disconnect the other clip of cable "R" which is connected to the "+" battery terminal of the excavator.

⚠ The gases which are generated may explode. Jump the excavator in a well-ventilated place, making sure there are no short-circuits, sparks, cigarettes, or other sources of flames in the vicinity.

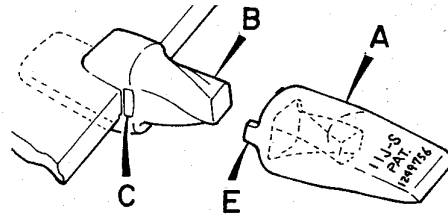


INSPECTION AND MAINTENANCE

Replacing the Bucket Teeth

Replace the teeth "A" as soon as possible when they start to wear. If there is even a small hole in a tooth, replace it immediately.

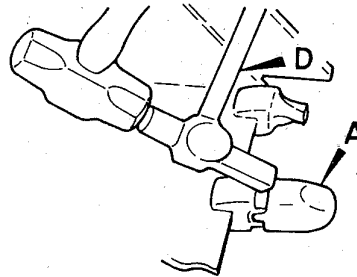
⚠ **Failure to replace the teeth in time can lead to damage of the bucket itself.**



Removing the Old Tooth

1. Set the bucket teeth level against the ground.
(Refer to "Replacing the Bucket" on page 55.)
2. Place jig "D" or something similar against the shoulder of tooth "A" and hit it with a hammer.

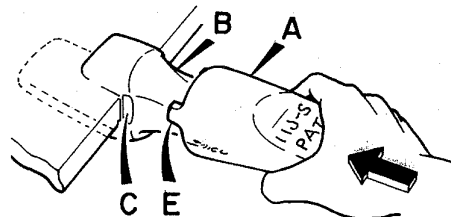
⚠ **When hit with the hammer, the tooth flies off suddenly. Make sure to remove the tooth safely, paying special attention to the area in front of the tooth.**



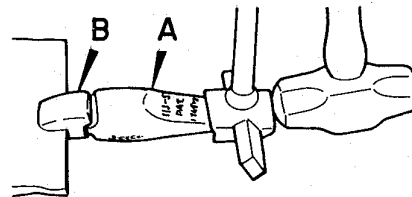
Installing New Teeth

1. Push tooth "A" in along nose "B" by hand as far as it will go.

⚠ **Tooth "A" must be installed in the proper up/down direction. Make sure the letters (11J-S PAT. No.) are facing the proper direction.**



2. Place the installation jig (or a piece of wood, etc.) against the tip of tooth "A" and hit it with a hammer. Hit until hook "E" on the tooth is completely inserted into groove "E" on the nose.

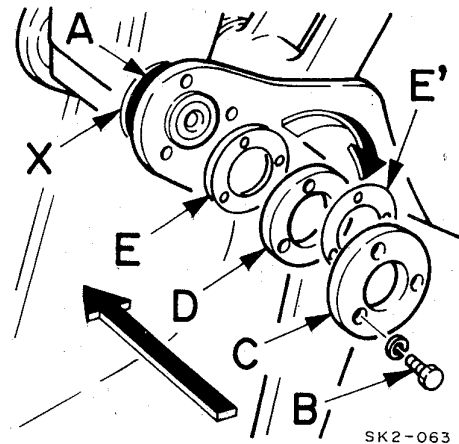
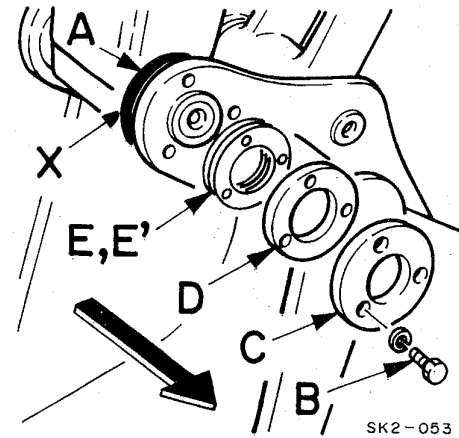


INSPECTION AND MAINTENANCE

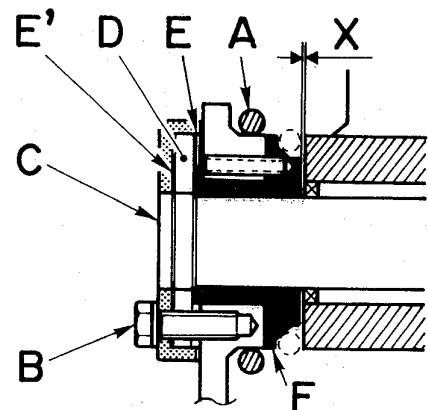
Adjusting the Bucket/Arm Gap

This excavator is equipped with a mechanism for adjusting the gap between the bucket bush and arm. Adjust the gap as follows:

1. Clean the area around where the bucket is connected.
 2. Set O-ring "A" so that gap "X" can be seen.
 3. Measure gap "X". The gap should be 0.5mm (0.02 in.) or less. (Note that there should be no gap in the opposite side.)
 4. Remove the three bolts "B" then remove end plate "C" and flange "D".
 5. Shims are now visible ("E" – 0.5mm (0.02 in.) thickness per shim). Remove the number of shims necessary to obtain the proper gap.
Ex.: If gap "X" is 2mm (0.08 in.)
 $2\text{mm (0.08 in.) (X)} - 0.5\text{mm (0.02 in.) (proper gap)} = 1.5\text{mm (0.06 in.)}$
Remove 3 shims.
 6. Insert the removed shim(s) "E'" between end plate "C" and flange "D" and tighten the three bolts "B" with the same force.
Bolt "B" tightening torque: 26 N·m (19.6 ft.-lb.)
 7. Set O-ring "A" back in place.
- ▲ Be sure to leave a gap "X" of 0.5mm (0.02 in.).



- Bush "F" is pressed by flange "D" by the thickness of the moved shim(s) "E'", thereby adjusting the gap.



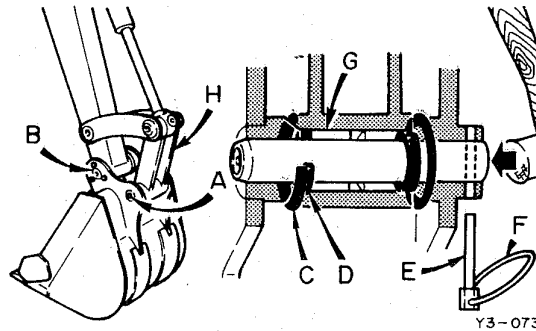
INSPECTION AND MAINTENANCE

Replacing the Bucket

Perform these operations on a flat, hard surface.

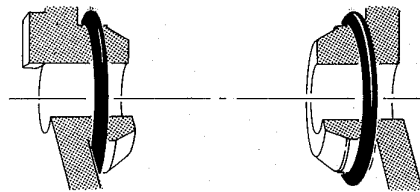
Removing the Old Bucket

1. Clean around the bucket pin.
2. Set the bucket on the ground as shown in the diagram.
3. Remove ring "F" from pin hole, then pull out lock pin "E".
4. Hammer out bucket pin "A".
The operation can be made easier by lifting the bucket slightly.
5. Also hammer out bucket pin "B".
6. Wipe carefully so that dirt will not get on the pin or into the pinhole.



Installing the New Bucket

1. Set O-ring "C" as shown in the diagram.
☞ Replace the O-ring if the rubber loses its elasticity or becomes cracked.



2. Apply grease to arm and link arm bushes "G".

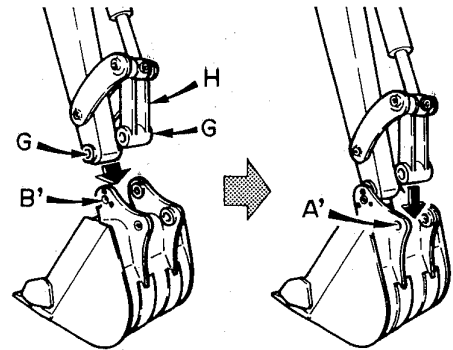
3. Fix in place at pinhole "B".
4. Operate the bucket cylinder to align pinhole "A" with its mating hole, then fix in place.

⚠ **Keep fingers away from the pinhole when aligning it. Align by sight, not by touch.**

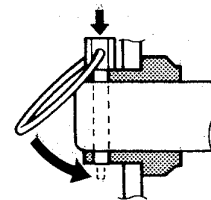
⚠ **The shims are also plastic. Attach one shim to each side when installing the attachment.**

☞ Pin seal "D" will break if the pinholes are not matched up correctly when the pins are installed.

☞ Also replace the pin seal if it is deformed or scratched. (Refer to page 56.)

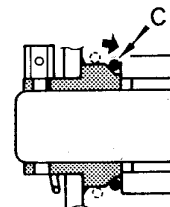


5. Insert the lock pin in the rotation stopper hole, hook the ring on the inside and fasten securely.
6. Adjust the bucket/arm gap. (Refer to page 54)



7. Slide an O-ring in and install as shown at "C" on the diagram.

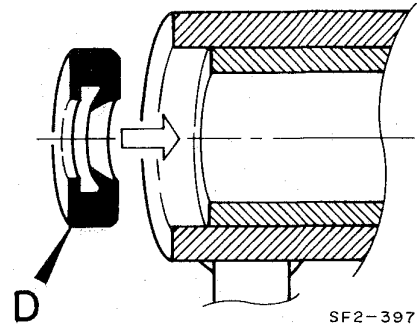
☞ Also be sure to adjust the gap between the bucket and arm. (Refer to page 54.)



INSPECTION AND MAINTENANCE

Replacing the Pin Seal "D"

1. Set the pin seal as shown in the diagram and pound it in a little at a time with a wooden hammer.
2. Be careful not to deform or scratch the pin seal.



Cautions on Handling the Stay Dampers (Lever stand stays)

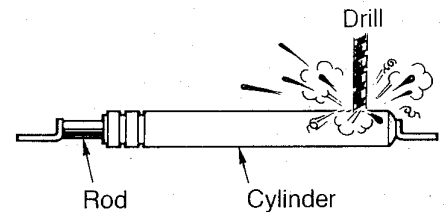
The stay dampers contain high pressure gases, so be sure to heed the following cautions:

- ⚠ **Never take the stay damper apart or dispose of it in flames.**
- ⚠ **Do not subject the stay damper to shocks in order to protect the rod and cylinder from scratches and bending.**
- ⚠ **Do not let paint, vinyl or other foreign substances on the rod.**
- ⚠ **If the stay damper should stop functioning, stop using immediately and contact a service outlet.**

Cautions on Disposing

- ⚠ **Using protective glasses and tools (as gas, oil and fragments are dispersed), open a hole in the bottom of the cylinder and let out the gas completely before disposing.**

When Disposing



03-103

INSPECTION AND MAINTENANCE

Handling in Cold Weather

Battery

- Check the amount of battery fluid and its specific gravity, and charge it quickly.
- ☞ To prevent the distilled water from freezing, fill the battery first thing in the morning, not after operations in the afternoon. Also, have qualified service personnel check and charge the battery.

Coolant

- Add coolant to the radiator when the temperature drops below 0°C (32°F).
- Water-coolant mixture (for total quantity of 3.5 liters (3.7 US. quarts))

Min. Temperature	°C (°F)	-2 (29)	-5 (23)	-9 (16)	-12 (11)	-20 (-4)	-26 (-14)	-33 (-27)	-40 (-40)
Coolant	lit. (US.qt.)	0.9 (1.0)	1.1 (1.2)	1.2 (1.3)	1.4 (1.5)	1.6 (1.7)	1.8 (1.9)	1.9 (2.0)	2.1 (2.2)
Water	lit. (US.qt.)	2.6 (2.7)	2.4 (2.5)	2.3 (2.4)	2.1 (2.2)	1.9 (2.0)	1.7 (1.8)	1.6 (1.7)	1.4 (1.5)

- ☞ Be sure to add coolant in the proper amount to achieve the proper mixing ratio as specified by the coolant maker.
- ☞ A concentration of 30% or greater is necessary to prevent rusting and corrosion.

Precautions after Operations

Clean off any mud or water adhering to the excavator body, park the excavator on a concrete surface or on dry ground, or lay timbers down to park it on, then cover it with a sheet or similar covering. Wipe off any water drops on the hydraulic cylinder piston rod completely. Frozen water droplets mixed with mud, etc. could get into the seal and damage it.

Care in Long-term Storage

Take the following measures when storing the excavator for extended periods of time.

- Store the excavator indoors in a dry place after cleaning and drying it thoroughly. Do not store it outdoors. If the excavator must be kept outdoors, select a level area and place it on top of a row of timbers. Cover the seat securely to protect it.
- Add oil, apply grease and change the oil regularly.
- Apply an adequate amount of grease to the piston rod of the hydraulic cylinder.
- Disconnect the cable from the ground terminal of the battery or remove it from the excavator and store it indoors.
- Add antifreeze to the coolant or drain all the coolant from the engine if the temperature drops below 0°C (32°F).

Following long term storage of the excavator, carry out the following measures before use.

- Wipe the grease off the hydraulic cylinder piston rod.
- Start the engine, drive and operate it under no load, letting the oil circulate completely.

- ☞ If the excavator is not operated for 1 month or longer, carry out the above procedure once a month.

INSPECTION AND MAINTENANCE CHART

Item	Every day	Every 50 hrs.	Every 100 hrs.	Every 250 hrs.	Every 500 hrs.	Every 1000 hrs.
Grease application	▲	▲				
Crawler belt tension		●				
Track gearbox gear oil					X (1st time)	X
Hydraulic oil	●					X
Return filter		X (1st time)			X	
Suction strainer					■	
Operating lever operation, looseness	●					
Travel lever operation, looseness	●					
Water separator	●		■			
Fuel filter			■		X	
Engine oil filter		X (1st time)		X		
Air cleaner	●			■		X
Coolant	●					X
Radiator fins					■	
Fan belt	●					
Engine oil	●	X (1st time)		X		
Fuel tank drainage		■				
Boom light, head lights, horn, flasher lamp	●					
Hour meter operation	●					
Operation of water temperature meter	●					
Monitor lamp operation	●					
Battery fluid		●			● (specific gravity)	
Retightening of screws	●		● Periodic inspections time			

●: Inspection ▲: Replenishment ■: Cleaning X: Replacement

TROUBLESHOOTING

Trouble	Main causes	Countermeasures
Operating levers stiff or do not return automatically	● Insufficient grease ● Defective control or pilot valve	● Grease. ● Contact service outlet for repairs.
No operations possible, or insufficient operating power	● Insufficient hydraulic oil ● Hydraulic oil not warmed ● Low engine power ● Defective pump or coupling ● Improper hydraulic oil ● Low relief valve pressure setting ● Defective control valve	● Replenish to specified level. ● Warm up excavator. ● Clean air cleaner and inspect fuel system. ● Contact service outlet for repairs. ● Replace with recommended hydraulic oil. ● Contact service outlet for repairs. ● Contact service outlet for repairs.
Turning or traveling problems	● Stone or foreign object stuck ● Defective pump ● Defective control valve ● Defective motor or gear ● Defective brake valve	● Remove foreign object. ● Contact service outlet for repairs. ● Contact service outlet for repairs. ● Contact service outlet for repairs. ● Contact service outlet for repairs.
Excavator does not travel straight	● Stone or foreign object stuck ● Poor adjustment of belt tension ● Defective pump ● Defective motor or brake valve ● Defective control valve	● Remove foreign object. ● Adjust left and right belts to standard values. ● Contact service outlet for repairs. ● Contact service outlet for repairs. ● Contact service outlet for repairs.
Slewing is impossible or not smooth	● Insufficient grease on slew bearing ● Defective brake or pilot valve ● Defective motor or gear	● Grease. ● Contact service outlet for repairs. ● Contact service outlet for repairs.
Insufficient digging power	● Insufficient hydraulic oil ● Hydraulic oil not warmed ● Hydraulic oil not appropriate ● Low engine power ● Defective pump ● Low relief valve setting ● Defective hydraulic cylinder ● Defective control or pilot valve	● Replenish to specified quantity. ● Warm up excavator. ● Replace with recommended hydraulic oil. ● Clean air cleaner and inspect fuel system. ● Contact service outlet for repairs. ● Contact service outlet for repairs. ● Contact service outlet for repairs. ● Contact service outlet for repairs.
Only the hoe attachment and slew cannot be operated.	● Forgot to release the lock levers. ● Control valve defective.	● Release the lock levers. ● Request repairs at the service station.

TIGHTENING TORQUES

Bolts and Nuts (For ISO Strength Category 10.9)

Tighten the various bolts and nuts to the torques shown on the table below.

When conducting periodic inspections and daily inspections prior to operation, check for looseness in the bolts and nuts and tighten as necessary. If any bolts and nuts are missing, replace them with the proper types.

Category	Size × Pitch	Torque			
		General Connection Points		Special Connection Points	
		N·m	ft·lb	N·m	ft·lb
Coarse	M 6 × 1.0	9.8 ^{±0.5}	7.3 ^{±0.3}	11.8 ^{±0.5}	8.7 ^{±0.3}
	M 8 × 1.25	22.5 ^{±1.1}	16.7 ^{±0.7}	26.5 ^{±1.3}	19.6 ^{±0.8}
	M10 × 1.5	47 ^{±2.3}	34.8 ^{±1.6}	55 ^{±2.7}	40.5 ^{±2.0}
	M12 × 1.5	87 ^{±4.3}	64.4 ^{±3.1}	102 ^{±5.1}	75.3 ^{±3.6}
	M12 × 1.75	83 ^{±4.1}	61.5 ^{±2.9}	97 ^{±4.8}	71.6 ^{±3.5}
	M14 × 2.0	134 ^{±6.6}	99.1 ^{±4.8}	156 ^{±7.7}	115.0 ^{±5.7}
	M16 × 2.0	208 ^{±10}	153.3 ^{±7.5}	241 ^{±12}	178.0 ^{±8.8}
	M20 × 2.5	411 ^{±20}	303.1 ^{±15.0}	475 ^{±23}	350.8 ^{±17.4}
Fine	M 6 ×	—	—	—	—
	M 8 × 1.0	24.5 ^{±1.1}	18.1 ^{±0.8}	28.4 ^{±1.3}	21.0 ^{±0.9}
	M10 × 1.25	50 ^{±2.4}	36.9 ^{±1.7}	59 ^{±2.9}	43.4 ^{±2.1}
	M12 × 1.25	91 ^{±4.5}	67.3 ^{±3.2}	106 ^{±5.3}	78.2 ^{±3.8}
	M14 × 1.5	135 ^{±6.7}	99.9 ^{±4.9}	158 ^{±7.8}	116.5 ^{±5.7}
	M16 × 1.5	220 ^{±11}	162.8 ^{±8.0}	256 ^{±12}	188.8 ^{±9.3}
	M20 × 1.5	452 ^{±22}	333.5 ^{±16.5}	524 ^{±26}	387.0 ^{±19.1}

Points where Thread Lock is Used (with Three Bond #1324 applied).

 Do not retighten these Bolts and Nuts.

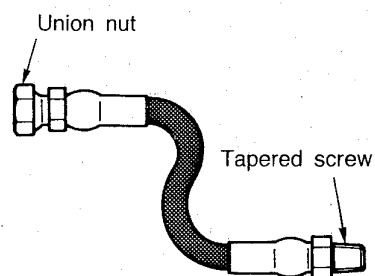
- Connections between the slew bearing and lower frame.
- Engine foot connections.
- Pump coupling connections.
 - Do not let any screw lock get on rubber parts.
- Rod end connections in the lever assembly.
- Travel motor connections.
- Drive sprocket connections.
- Track roller connections.
- Swivel joint connections.
- Slew motor and turntable connections.

- General Connection Point (Not lubricated).
 - Points other than special connection points.
- Special Connection Point (Apply grease with molybdenum disulfide added).
 - Points which are particularly important for function.
 - Connections between slew bearing and turntable.
 - Other areas deemed necessary in the design.
- If tightening torques are included in the text, use the specified tightening torques.
- Tighten the upper and lower, left and right bolts and nuts alternately so that tightening is uniform all around.

TIGHTENING TORQUES

Hydraulic hoses

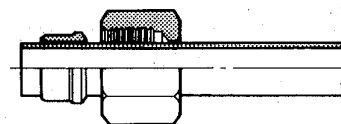
Hose fitting size	Torque			
	Union nut (PF)		Taper thread (PT)	
	N·m	ft·lb	N·m	ft·lb
1/8	9.8 ^{+4.9} ₋₀	7.3 ^{+3.5} ₀	11.8 ^{±1.1}	8.7 ^{±0.8}
1/4	24.5 ^{+4.9} ₋₀	18.1 ^{+3.5} ₀	29.4 ^{±2.9}	21.7 ^{±2.1}
3/8	49 ^{+4.9} ₋₀	36.2 ^{+3.5} ₀	54 ^{±5.3}	39.8 ^{±3.9}
1/2	59 ^{+4.9} ₋₀	43.4 ^{+3.5} ₀	88 ^{±8.8}	65.1 ^{±6.4}
3/4	117 ^{+4.9} ₋₀	86.8 ^{+3.5} ₀	147 ^{±14.7}	108.5 ^{±10.7}
1	137 ^{+4.9} ₋₀	101.3 ^{+3.5} ₀	196 ^{±19.6}	144.7 ^{±14.3}



Z2-0051

Bite type pipe fitting for steel pipe

Pipe outer diameter (mm)	Torque	
	N·m	ft·lb
8	34 ^{±4.9}	25.3 ^{±3.5}
10	41 ^{±2.4}	30.7 ^{±1.7}
12	59 ^{±4.9}	43.4 ^{±3.5}
15	88 ^{±4.9}	65.1 ^{±3.5}
16	93 ^{±4.9}	68.7 ^{±3.5}
18	132 ^{±4.9}	97.6 ^{±3.5}
22	206 ^{±9.8}	151.8 ^{±7.2}
27.2	245 ^{±9.8}	181.0 ^{±7.2}
28	314 ^{±19.6}	231.4 ^{±14.3}
32	314 ^{±19.6}	231.4 ^{±14.3}
35	412 ^{±19.6}	303.7 ^{±14.3}

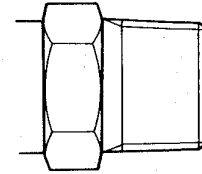


Z2-0061

TIGHTENING TORQUES

Joints for piping

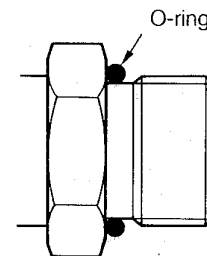
Nominal thread diameter (PT)	Torque			
	Steel		Cast steel	
	N·m	ft-lb	N·m	ft-lb
1/8	11.8 $\pm$ 1.1	8.7 $\pm$ 0.8	10.8 $\pm$ 1.0	8.0 $\pm$ 0.7
1/4	29.4 $\pm$ 2.9	21.7 $\pm$ 2.1	24.5 $\pm$ 2.4	18.1 $\pm$ 1.7
3/8	54 $\pm$ 5.3	39.8 $\pm$ 3.9	49 $\pm$ 4.9	36.2 $\pm$ 3.5
1/2	88 $\pm$ 8.8	65.1 $\pm$ 6.4	73 $\pm$ 7.3	54.3 $\pm$ 5.3
3/4	147 $\pm$ 14.7	108.5 $\pm$ 10.7	127 $\pm$ 12.7	94.1 $\pm$ 9.3
1	196 $\pm$ 19.6	144.7 $\pm$ 14.3	171 $\pm$ 17.1	126.6 $\pm$ 12.5



Z2-0071

Joints for piping (O-ring sealing type)

Nominal thread diameter (PT)	Torque	
	N·m	ft-lb
1/8	19.6 $\pm$ 1.9	14.5 $\pm$ 1.4
1/4	34 $\pm$ 4.9	25.3 $\pm$ 3.5
3/8	54 $\pm$ 4.9	39.8 $\pm$ 3.5
1/2	64 $\pm$ 4.9	47.0 $\pm$ 3.5
3/4	93 $\pm$ 4.9	68.7 $\pm$ 3.5
1	108 $\pm$ 9.8	79.5 $\pm$ 7.2
1-1/4	117 $\pm$ 9.8	86.8 $\pm$ 7.2
1-1/2	137 $\pm$ 9.8	101.2 $\pm$ 7.2



Z2-0081

Nominal thread diameter (UNF)	Torque	
	N·m	ft-lb
7/16 - 20	16.7 $\pm$ 1.9	12.3 $\pm$ 1.4
1/2 - 20	22.5 $\pm$ 1.9	16.6 $\pm$ 1.4
9/16 - 18	31 $\pm$ 2.9	23.1 $\pm$ 2.1
3/4 - 16	60 $\pm$ 4.9	44.1 $\pm$ 3.5
1-1/16 - 12	102 $\pm$ 5.9	75.2 $\pm$ 4.4
1-5/16 - 12	135 $\pm$ 7.8	99.8 $\pm$ 5.8
1-5/8 - 12	181 $\pm$ 9.8	133.8 $\pm$ 7.2

LUBRICANTS CHART

Lubricated Part	Hydraulic tank	Engine	Track gearbox	Grease fittings	
Capacities	Total system 30 lit. (31.7 U.S.qt.) Tank level 21 lit. (22.2 U.S.qt.)	8.0 lit. (2.1 US.gal.)	400cc (24.4 cu.in.)/per	As required	
Interval	Every 1,000 hours	First 50 hours Every 250 hours	First 500 hours each succeeding 1,000 hours.	Everyday or every 10 hours and every week or every 50 hours.	
Application					
Takeuchi specification	Antiwear hydraulic oil		Diesel engine oil API Classification Grade CC or CD	Gear oil API Classification Grade GL-4 or GL-5 SAE #90	EP-2 Lithium-base grease
	External temperature	Hydraulic oil			
	5 C to 55 C (41 F to 131 F)	ISO VG68			
	-5 C to 40 C (23 F to 104 F)	ISO VG46			
	-20 C to 30 C (-4 F to 86 F)	ISO VG32			

NOTES

1. Change the lubricant earlier than as shown in the above table if it is extremely dirty or its performance has deteriorated severely.
2. 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.

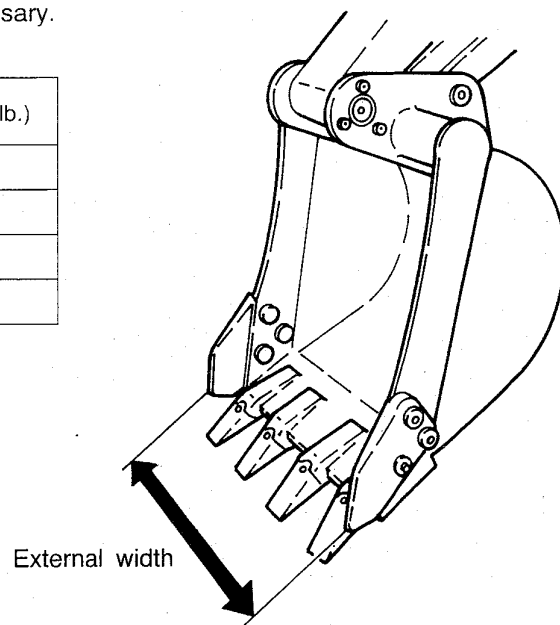
▲ Refer to the Engine Operation Manual for engine inspection and maintenance.

OPTIONS

The following options are available. Use them as necessary.

- Buckets

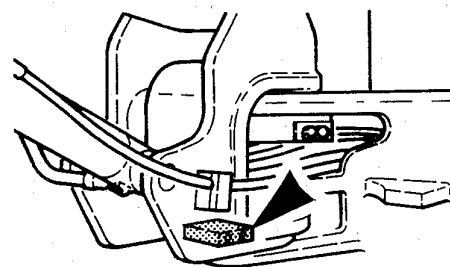
External width mm (inch)	Rated Capacity m ³ (cu.yd.)	Weight kg (lb.)
350 (13.8)	0.027 (0.035)	29 (64)
400 (15.8)	0.032 (0.042)	31 (68)
450 (STD) (17.7)	0.037 (0.048)	33 (73)
500 (19.7)	0.043 (0.056)	36 (79)



SZ6-007

▲ **Swing stopper** (standard): optional for canopy

The swing stopper is installed to prevent contact between the excavator and buckets exceeding the standard width, as well as for general safety. Do not remove it.



SZ6-017

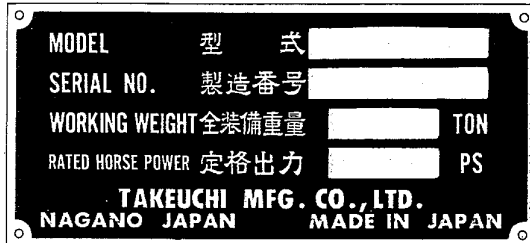
- Long arm (200mm (7.9 in.) longer than standard arm)
- Telescopic arm (manufactured on order)
- Breaker
- Road protector

ORDERING PARTS

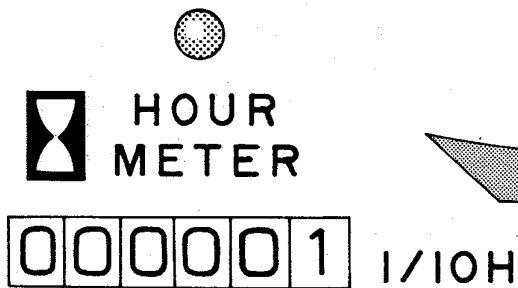
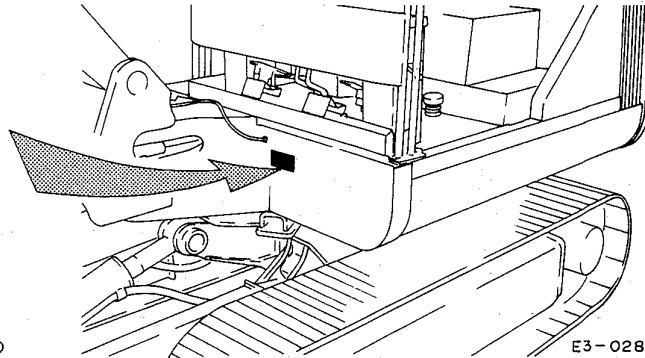
Ordering Parts and Notifying of Problems

When ordering parts or notifying of problems, be sure to indicate the model name serial number stamped on the nameplate, and the time for which the excavator has been operated, as indicated on the hour meter.

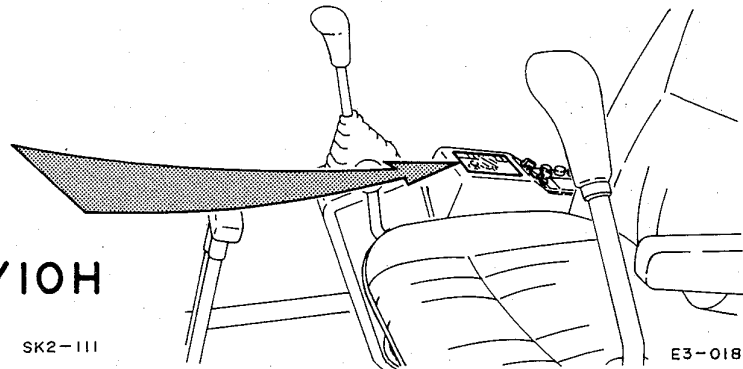
- Nameplate



T2-110



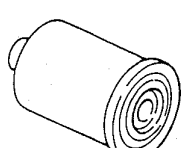
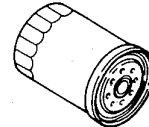
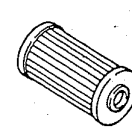
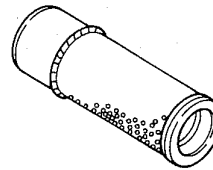
SK2-111



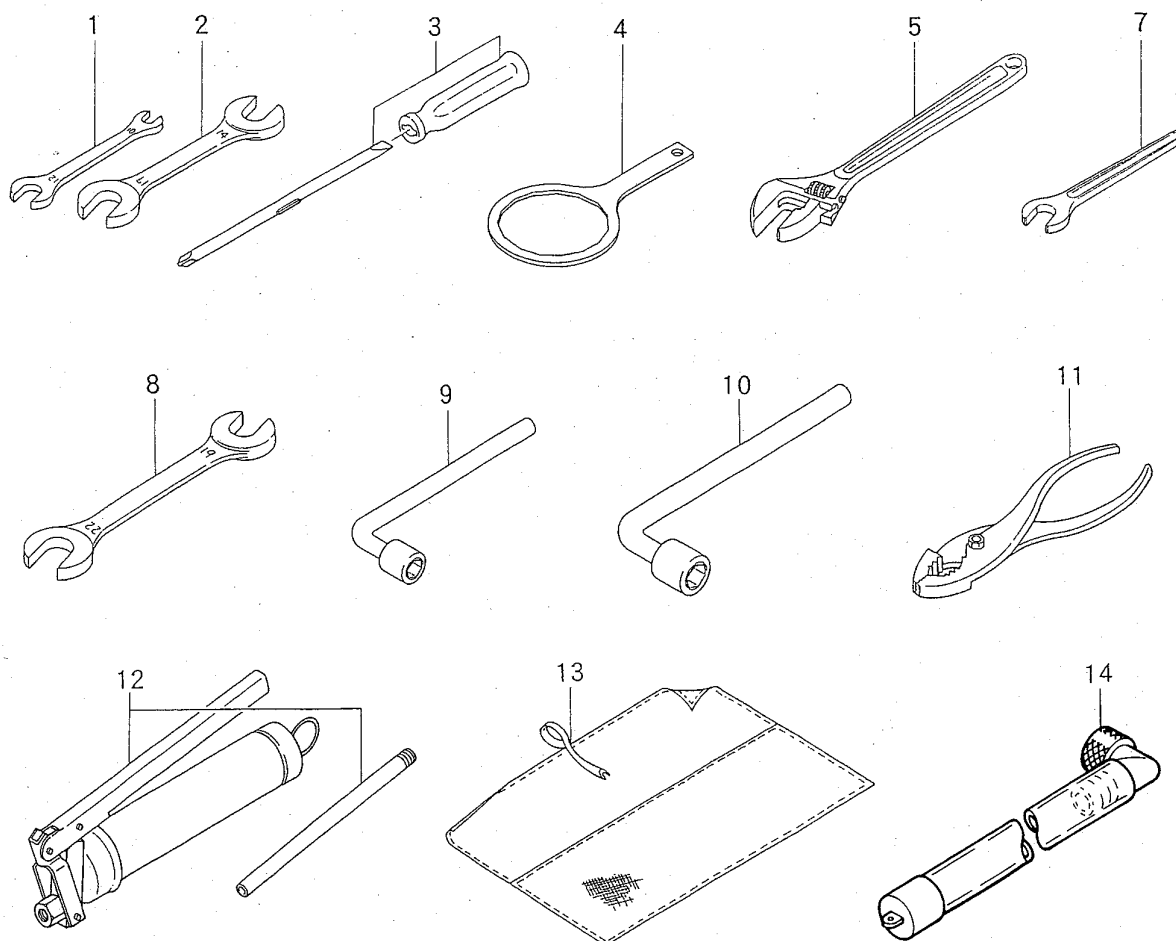
Expendables

Inspect and replace expendables such as the filter element periodically. Periodic replacement of expendables will prevent problems from occurring.

- Major Expendables (items to be replaced periodically)

Hydraulic tank return filter  Replace after 50 hours the first time, every 500 hours thereafter. (Refer to page 46.) When using a breaker: Replace after 25 hours the first time, after 100 hours the second time, and every 200 hours thereafter. (Refer to pages 34 to 37.) Part number: 15510-00320	Engine oil filter cartridge  Replace after 50 hours the first time, every 250 hours thereafter. (Refer to Page 50.) Part number: 119305-35150
Fuel filter element  Replace every 500 hours. (Refer to page 48.) Part number: 124550-55700	Air cleaner element  Replace every 1000 hours. (Refer to page 49.) Part number: 121465-12510

STANDARD ACCESSORIES



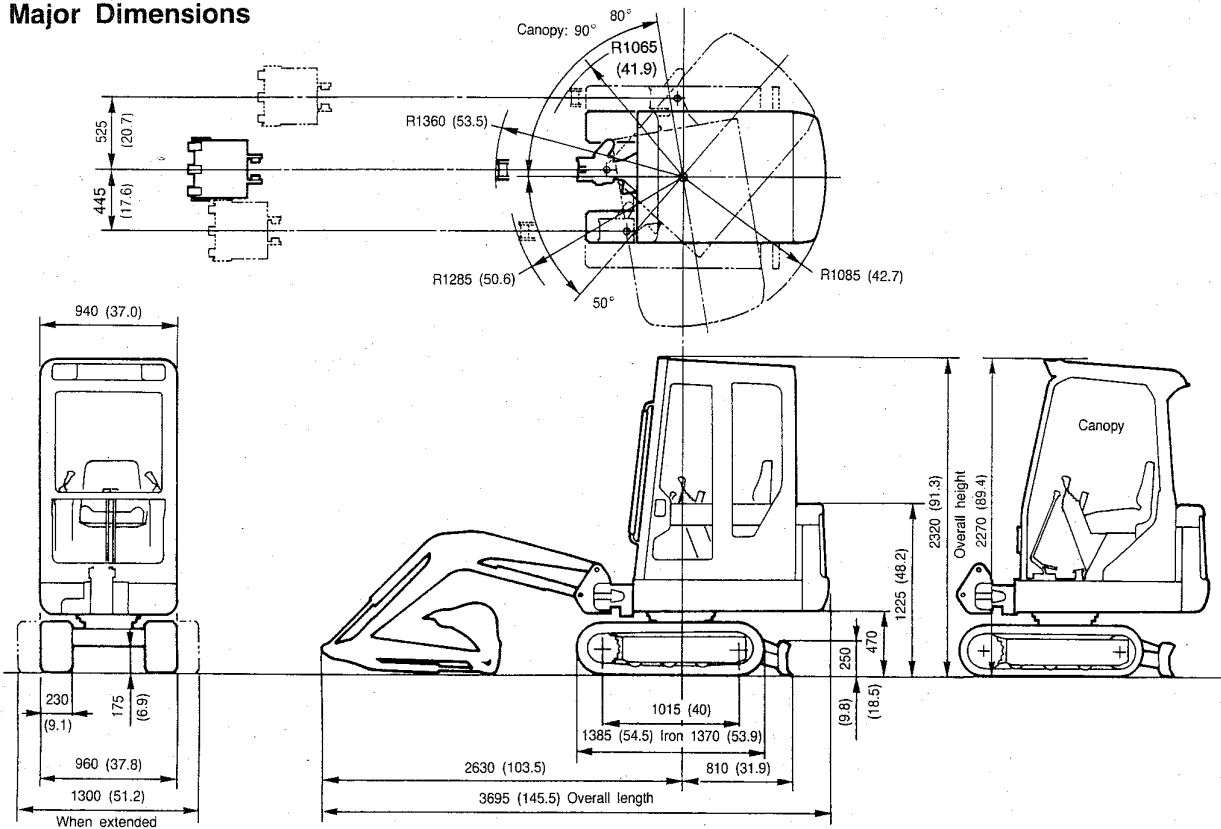
C3-44a-2-D

No.	Part name (number)	Specification	Qty.
1	Spanner (Y28110-100120)	10-12	1
2	Spanner (Y28110-140170)	14-17	1
3	Screwdriver (Y104200-92350)	⊕ ⊖ Interchangeable type	1
4	LO filter wrench (Y119640-92750)		1
5	Tool set (03392-90000)	6~13 Included	1
6	Monkey wrench (16904-00250)	250 mm	1
7	Spanner (16901-00013)	13	1

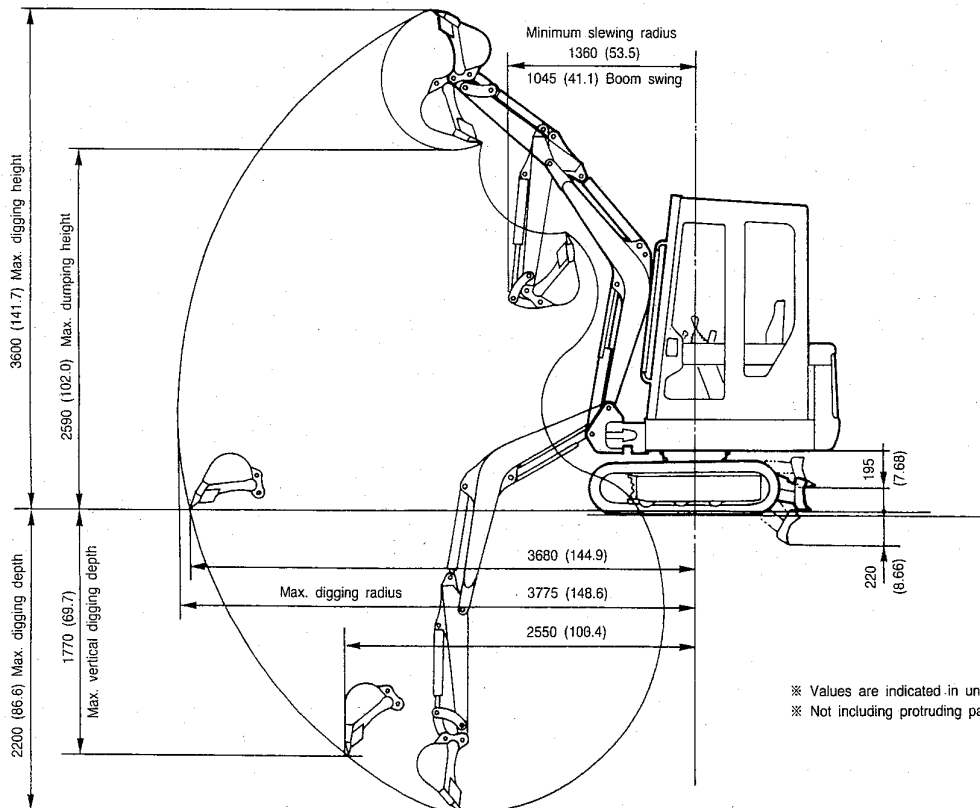
No.	Part name (number)	Specification	Qty.
8	Spanner (16900-01922)	19-22	1
9	L-type wrench (16908-30019)	19	1
10	L-type wrench (16908-30024)	24	1
11	Pliers (16905-00200)	200 mm	1
12	Grease gun assembly (16910-60600)	600 cc	1
13	Tool case (16914-00001)		1
14	Drain connector	for EU	1
15	Operator's manual		1
16	Engine operation manual		1

MAIN SPECIFICATIONS

Major Dimensions



Operating Ranges



※ Values are indicated in units of mm, inches in ().
 ※ Not including protruding part of shoe.

C3-000A

MAIN SPECIFICATIONS

Unit Performance

Slew speed:	8.8 min ⁻¹
Travel speed	Low – 2.2 km/h (1.37 mph), High – 4.2 km/h (2.61 mph)
Gradeability:	30 deg.

Side Ditch Digging Mechanism

Type:	Boom offset by hydraulic cylinder
Offset angle:	Right 50 deg., Left 80 deg. (Canopy: 90°)

Fuel, Lube Oil and Cooling Water

Fuel tank capacity:	19.5 liters (20.6 US.qt.)
Hydraulic oil:	Tank capacity – 21 liters (22.2 US.qt.) Total system capacity – 30 liters (31.7 US.qt.)
Engine oil	
Upper limit:	2.4 liters (2.54 US.qt.)
Lower limit:	1.4 liters (1.48 US.qt.)
Cooling water:	3.5 liters (3.70 US.qt.)

Engine

Model:	Yanmar 3TNA72L-UTBZ
Type:	4-cycle, water-cooled, 3-cylinder in-line diesel engine
Displacement:	879 cm ³ (53.6 cu.in.)
Rated output:	11.8 kW (15.8 hp) @2550 min ⁻¹
Max. torque:	51 N·m (37.6 ft.-lb.) @2000 min ⁻¹

Weight

During transport	Canopy	Cab
w/ rubber crawlers:	1500 kg (3310 lb.)	1610 kg (3550 lb.)
w/ iron crawlers:	1550 kg (3420 lb.)	1660 kg (3660 lb.)
Ground pressure		
w/ rubber crawlers:	28.4 kPa (4.12 psi)	31.4 kPa (4.55 psi)
w/ iron crawlers:	30.4 kPa (4.47 psi)	32.4 kPa (4.69 psi)

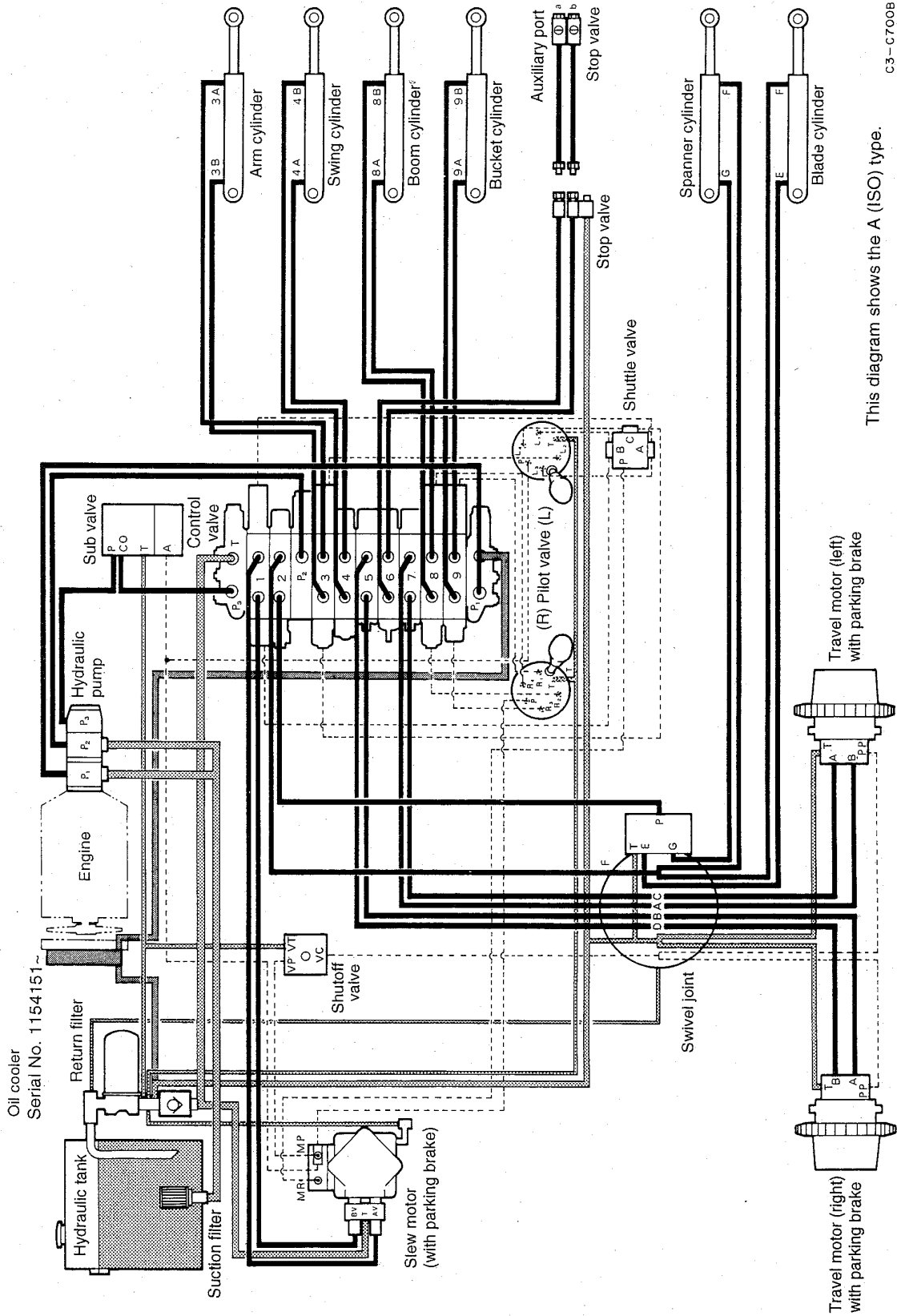
Standard Bucket

External width:	450 mm (17.7 in.)
Rated Capacity:	0.037m ³ (0.048 cu.yd.)
Struck Capacity:	0.035m ³ (0.046 cu.yd.)
Weight:	33 kg (73 lb.)

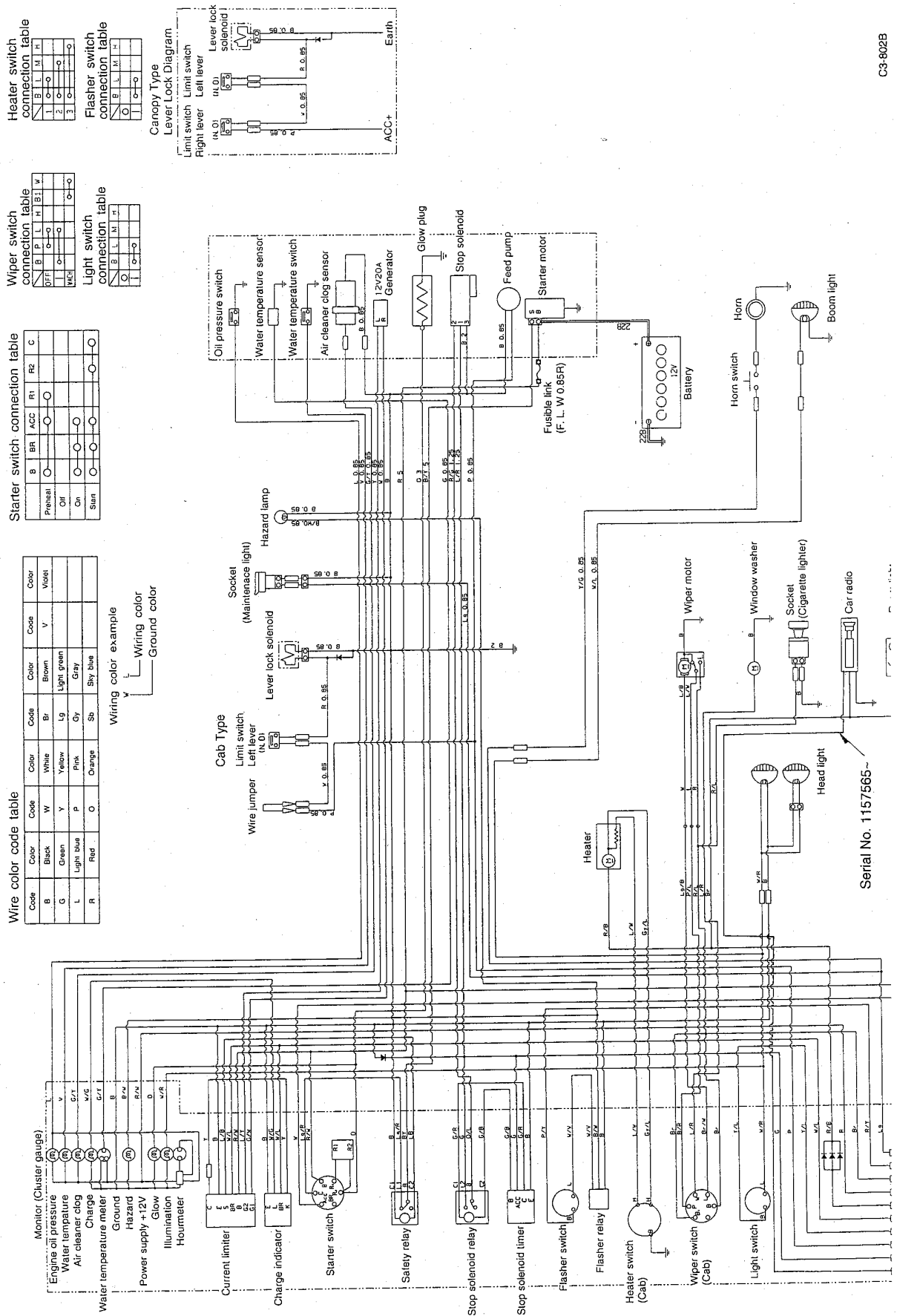
Noise Level

Sound-power level:	LWA 95 dB(A)
Sound-pressure level:	LpA 78 dB(A) [Canopy], 79 dB(A) [Cab]

HYDRAULIC SYSTEM DIAGRAM



ELECTRICAL SYSTEM DIAGRAM



C3-802B

LIFTING CAPACITIES

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.

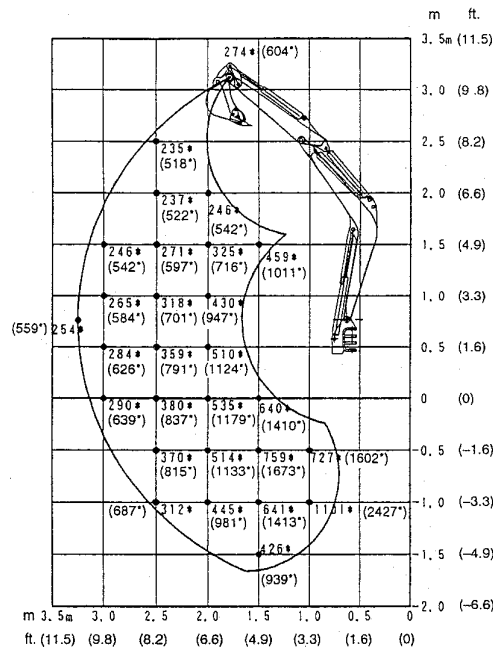
WARNING

- **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.**

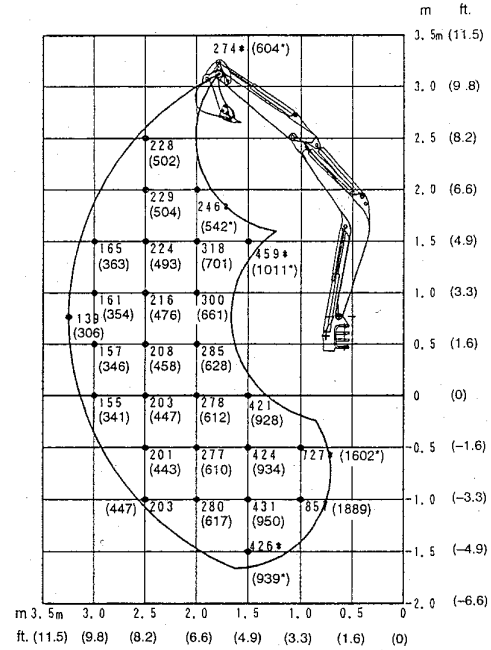
LIFTING CAPACITIES

Equipped with Canopy and Standard Arm

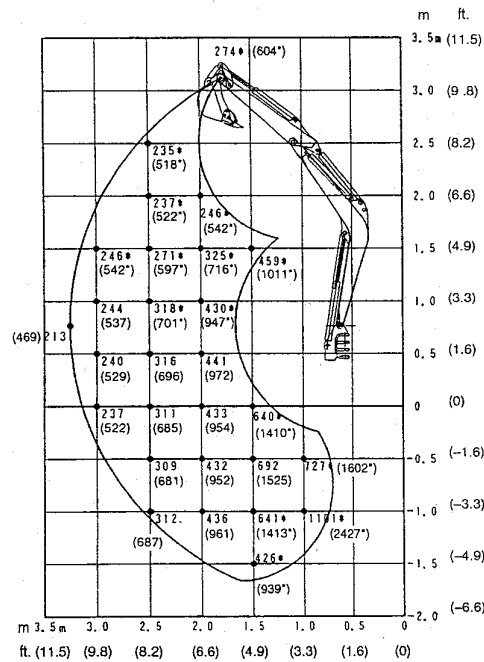
Over Front ; Dozer Blade Down



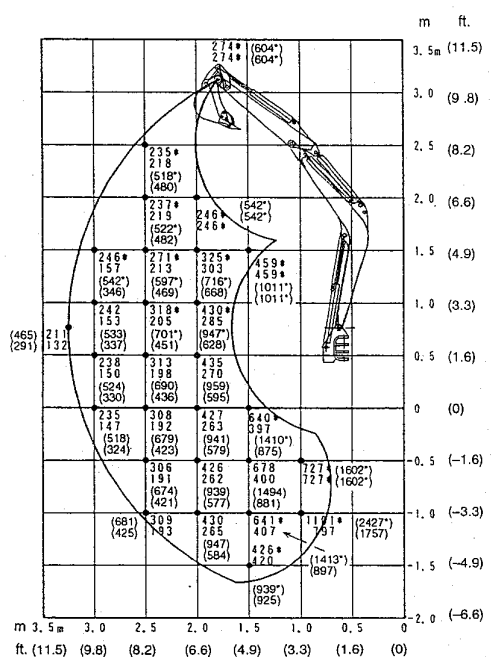
Over Front ; Dozer Blade Up



Over Rear



Over Side



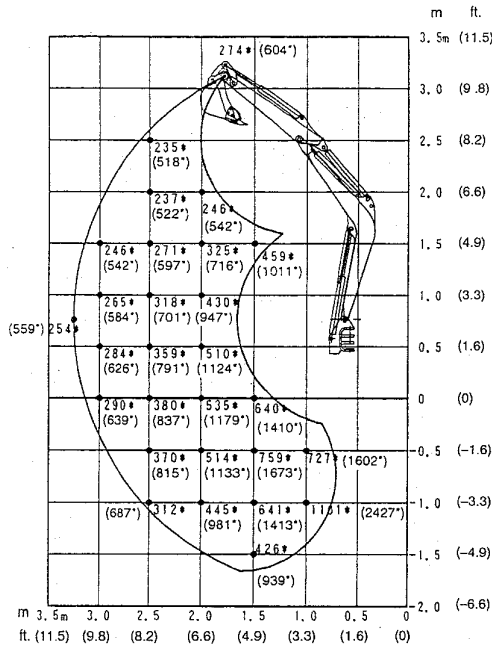
Upper: Crawler Width 1300mm
Lower: Crawler Width 960mm

C3-01C

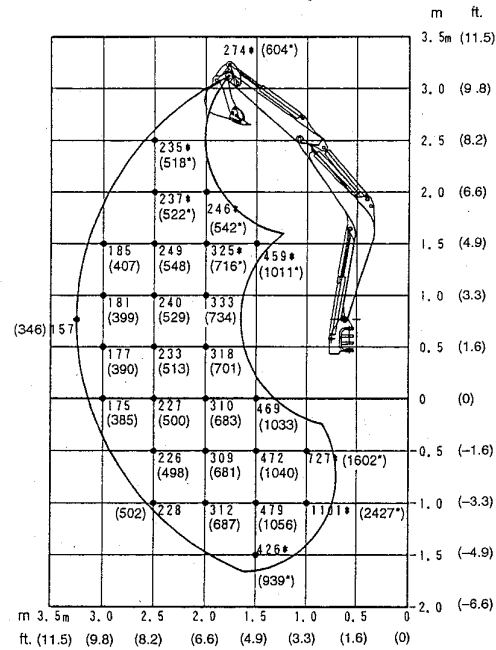
Equipped with Cab and Standard Arm

LIFTING CAPACITIES

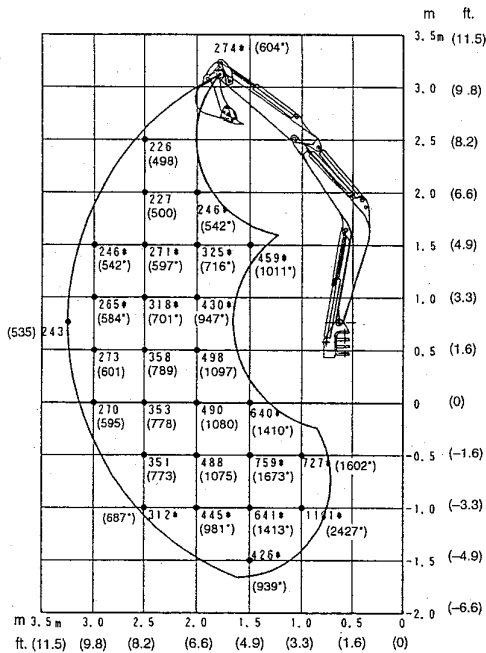
Over Front ; Dozer Blade Down



Over Front ; Dozer Blade Up

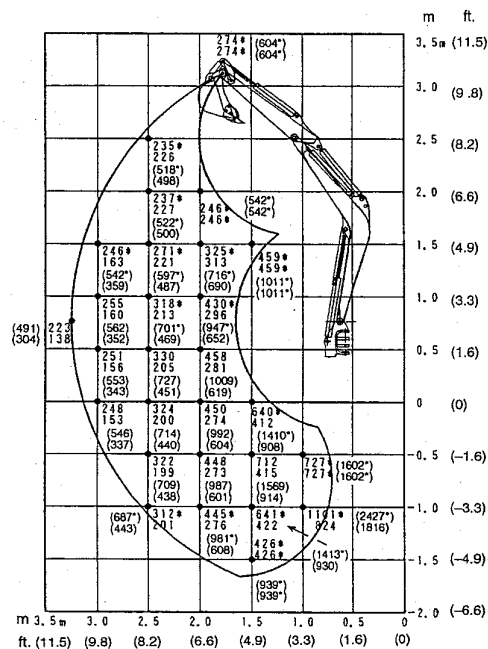


Over Rear



Over Side

Upper: Crawler Width 1300mm
Lower: Crawler Width 960mm



C3-020



HANDLING OF OPTIONS

GENERAL CAUTIONS

Cautions on Safety	76
Cautions on Installing Attachments	76
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Extending and Retracting the Arm	81
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3-HOLE BUCKET

Changing the Link Arm Installation Position	87
Replacing the Bucket Teeth	87

TRAVEL ALARM	89
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HANDLING OF OPTIONS GENERAL CAUTIONS

CAUTIONS ON SAFETY

- Consult with a Takeuchi dealer before installing optional attachments.
- Do not use attachments that have not been approved by Takeuchi or a Takeuchi dealer. 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.

WARNING

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

- 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 spilled 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 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.

CAUTIONS 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.



HANDLING OF OPTIONS GENERAL CAUTIONS

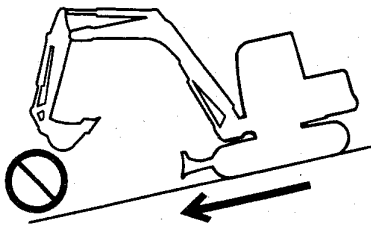
CAUTIONS ON OPERATING ATTACHMENTS

⚠ WARNING

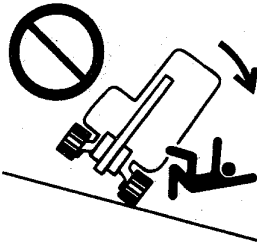
Long attachments reduce machine stability. When traveling down steep slopes or slewing on slopes, the machine may lose its balance and tip over.

The following operations are particularly dangerous. Do not perform them.

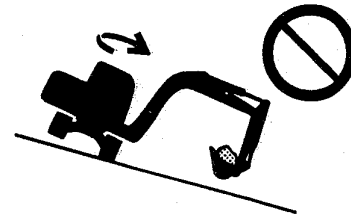
- Traveling down slopes with the attachment lifted
- Traveling across slopes
- Slewing on slopes



OE3A251



OE3A271



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.

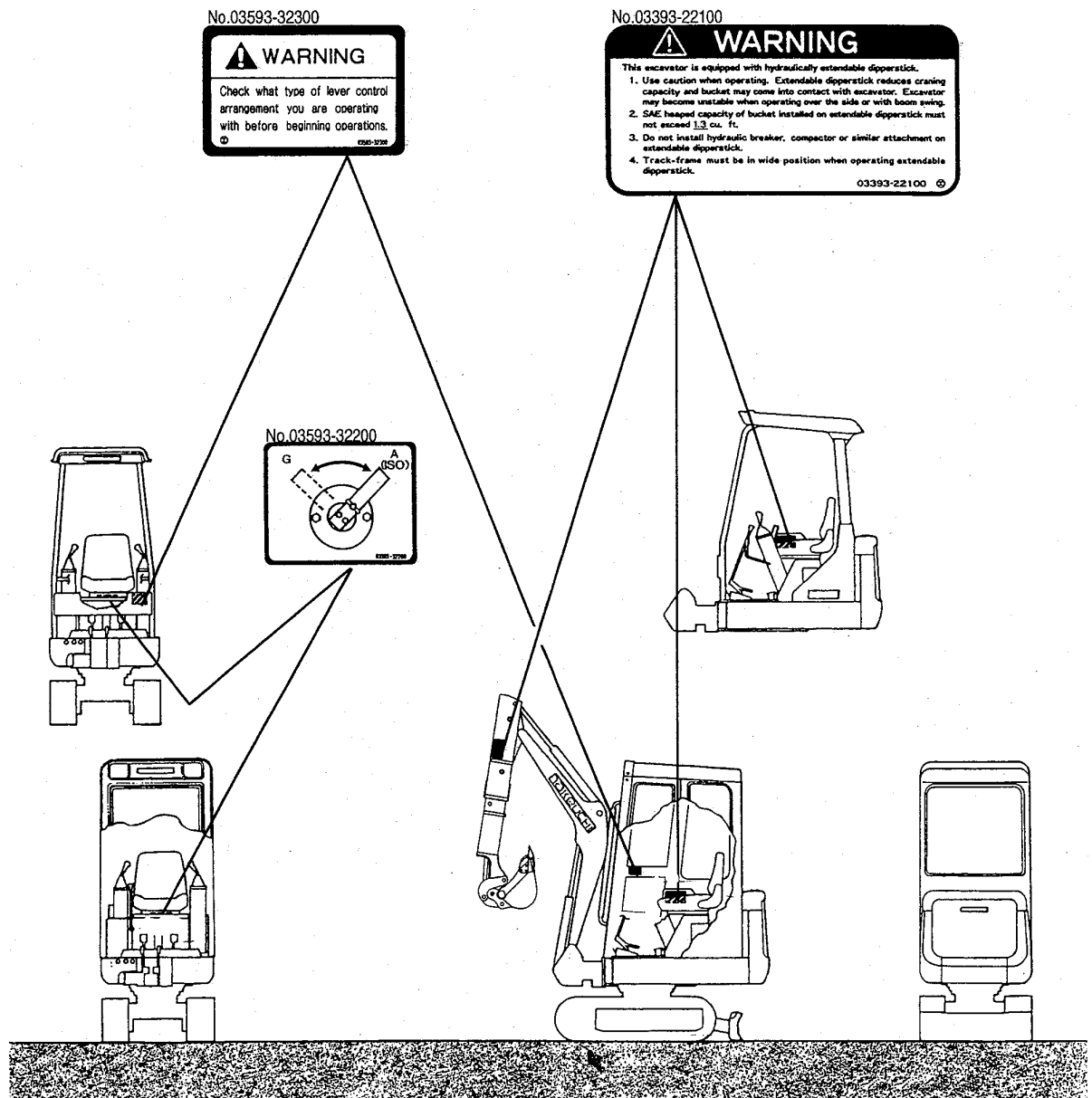
- The machine can tip over more easily in the lateral direction than in the longitudinal direction.
 - Do not slew (swing) sideways with excessive weight at the front. In particular do not slew sideways on slopes.
 - The front is heavier for machines equipped with breakers, crushers or telescopic arms 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.



HANDLING OF OPTIONS 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.





HANDLING OF OPTIONS SWITCHING THE OPERATION PATTERN

Machines equipped with a selector valve
(Serial No.1156460~)

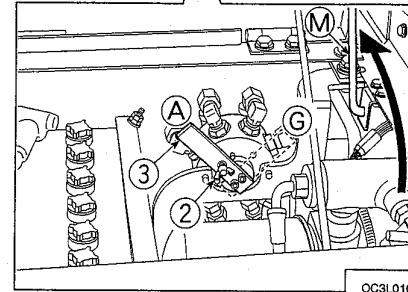
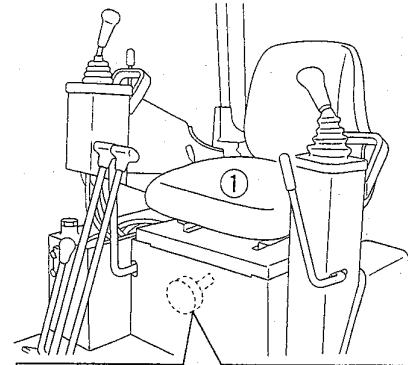
⚠ WARNING

- Check what type of lever control arrangement you are operating with before beginning operations.

- 1 Park the machine in a safe place and turn off the engine.
- 2 Gently push the seat ① forward and fasten it in place with the stay ④.
- 3 Loosen the wing bolt ②.
- 4 Turn the selector valve lever ③ and switch the pattern.
- 5 Tighten the wing bolt ② and fasten the lever ③ in place.
- 6 Set the seat ① back in its original position.
- 7 Check the lever pattern.

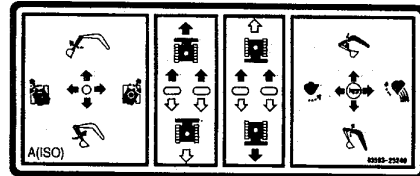
Ⓐ ISO type

Ⓒ JCB type



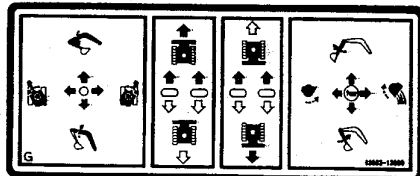
OC3L010

Ⓐ ISO type



03593-25240

Ⓒ JCB type



03593-13800



HANDLING OF OPTIONS

ATTACHMENT COMBINATION TABLE

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

⚠ WARNING

- 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)

Bucket	Rated Capacity m ³ (cu.yd.)	Bucket width mm (inch)	Standard Arm 0.93m (37 in.)	Long Arm 1.13m (69 in.)	Telescopic Arm 0.93 ~ 1.38m (37 ~ 54 in.)
350W	0.027 (0.035)	350 (13.8)	✓	✓	✓
400W	0.032 (0.042)	400 (15.8)	✓	✓	✓
450W (S.T.D.)	0.037 (0.048)	450 (17.7)	✓	✓	—
500W	0.043 (0.056)	500 (19.7)	✓	✓	—
3-hole Bucket	0.049 (0.064)	460 (18.1)	✓	✓	—
Total bucket weight = Within 98 kg (216 lb.)		Within 500 (19.7)	✓	✓	✓
Total bucket weight = Within 127 kg (280 lb.)		Within 500 (19.7)	✓	✓	—
Hydraulic Breaker (TKB -71)			✓	✓	—



HANDLING OF OPTIONS TELESCOPIC ARM

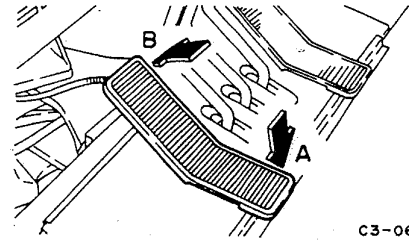
EXTENDING AND RETRACTING THE ARM

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

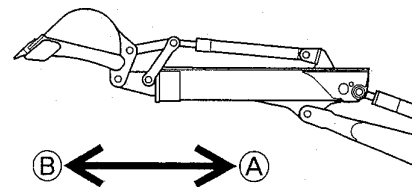
- Ⓐ Retract
- Ⓑ Extend

⚠ WARNING

1. Excavator must be equipped with boom swing stopper.
2. 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.
3. SAE heaped capacity of bucket installed on telescopic arm must not exceed 0.036 m³ (1.3 cu. ft.) .
4. Do not install hydraulic breaker, compactor or similar attachment on telescopic arm.
4. Track-frame must be in wide position when operating telescopic arm.



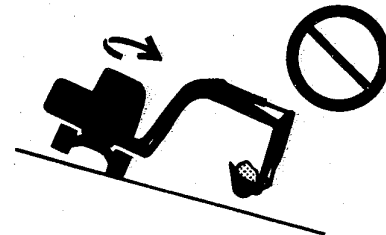
C3-061



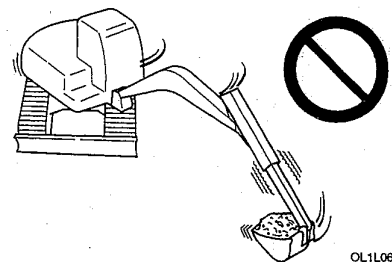
OC3L090

CAUTIONS ON USING THE ARM

- The machine may lose 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.



OE3A331

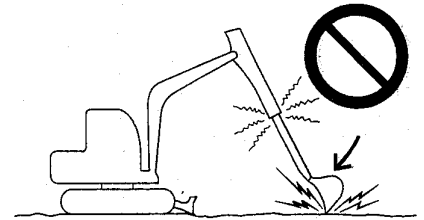


OL1L060



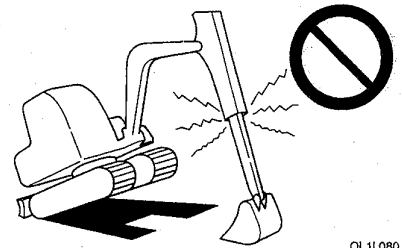
HANDLING OF OPTIONS TELESCOPIC ARM

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



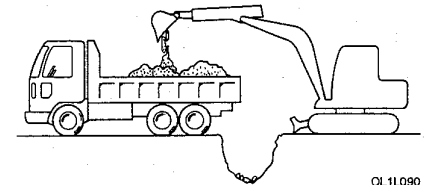
OL1L070

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



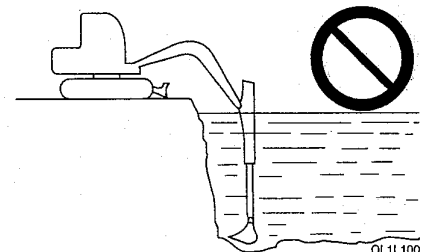
OL1L080

- 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.

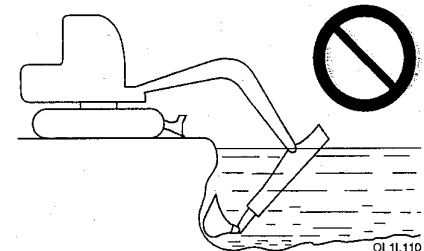


OL1L090

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

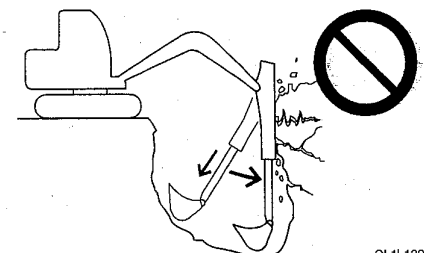


OL1L100



OL1L110

- 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.



OL1L120



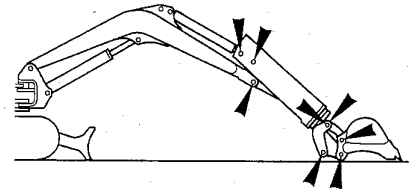
HANDLING OF OPTIONS TELESCOPIC ARM

INSPECTION AND MAINTENANCE

Greasing

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

- 1 Fully retract the bucket, arm and 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.



OC3L090

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.

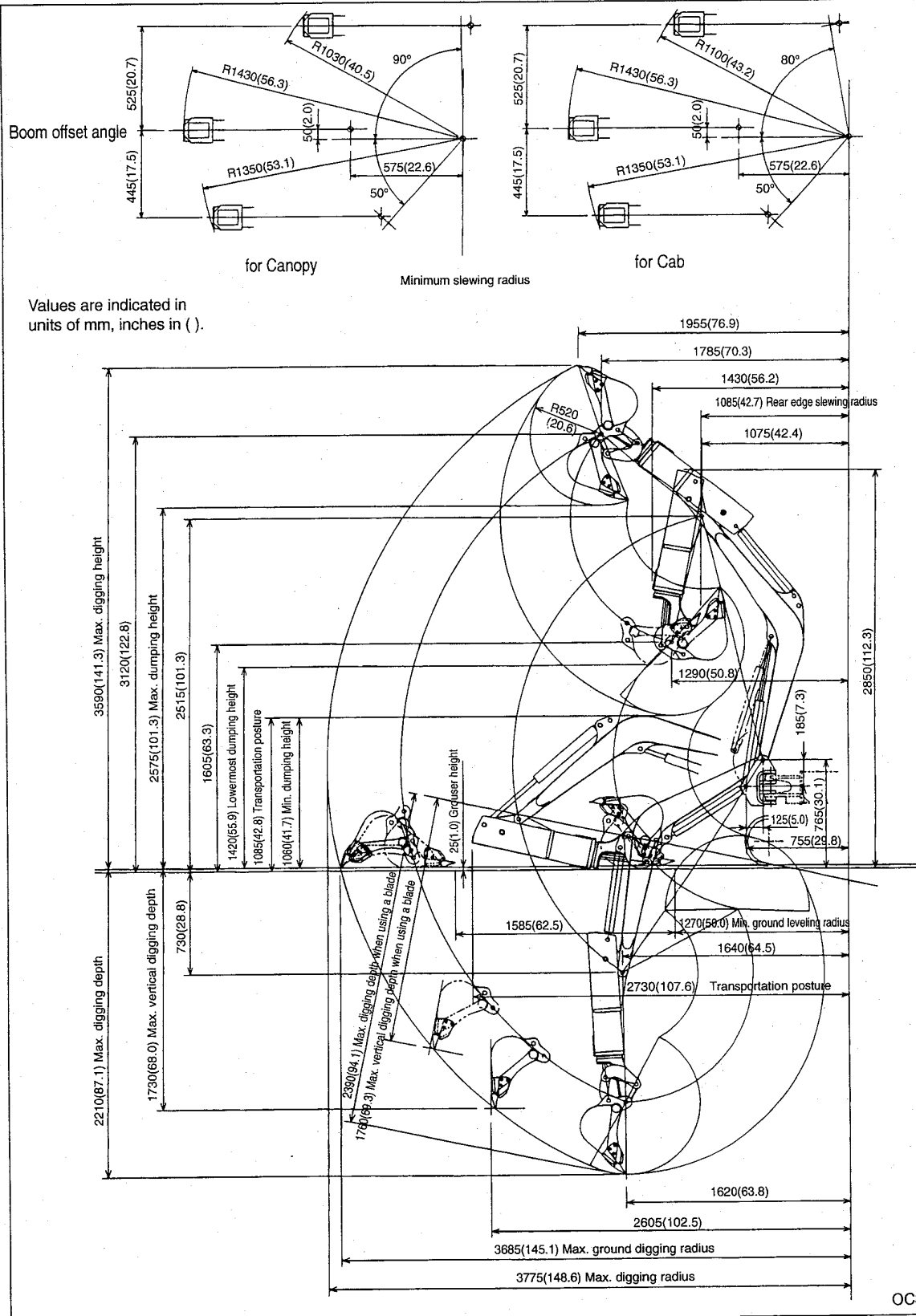
Other parts may be damaged if the telescopic arm is used with such looseness. Contact a Takeuchi dealer for maintenance.

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



HANDLING OF OPTIONS TELESCOPIC ARM

TRANSPORTATION POSTURE AND OPERATING RANGES (FULLY RETRACTED ARM)

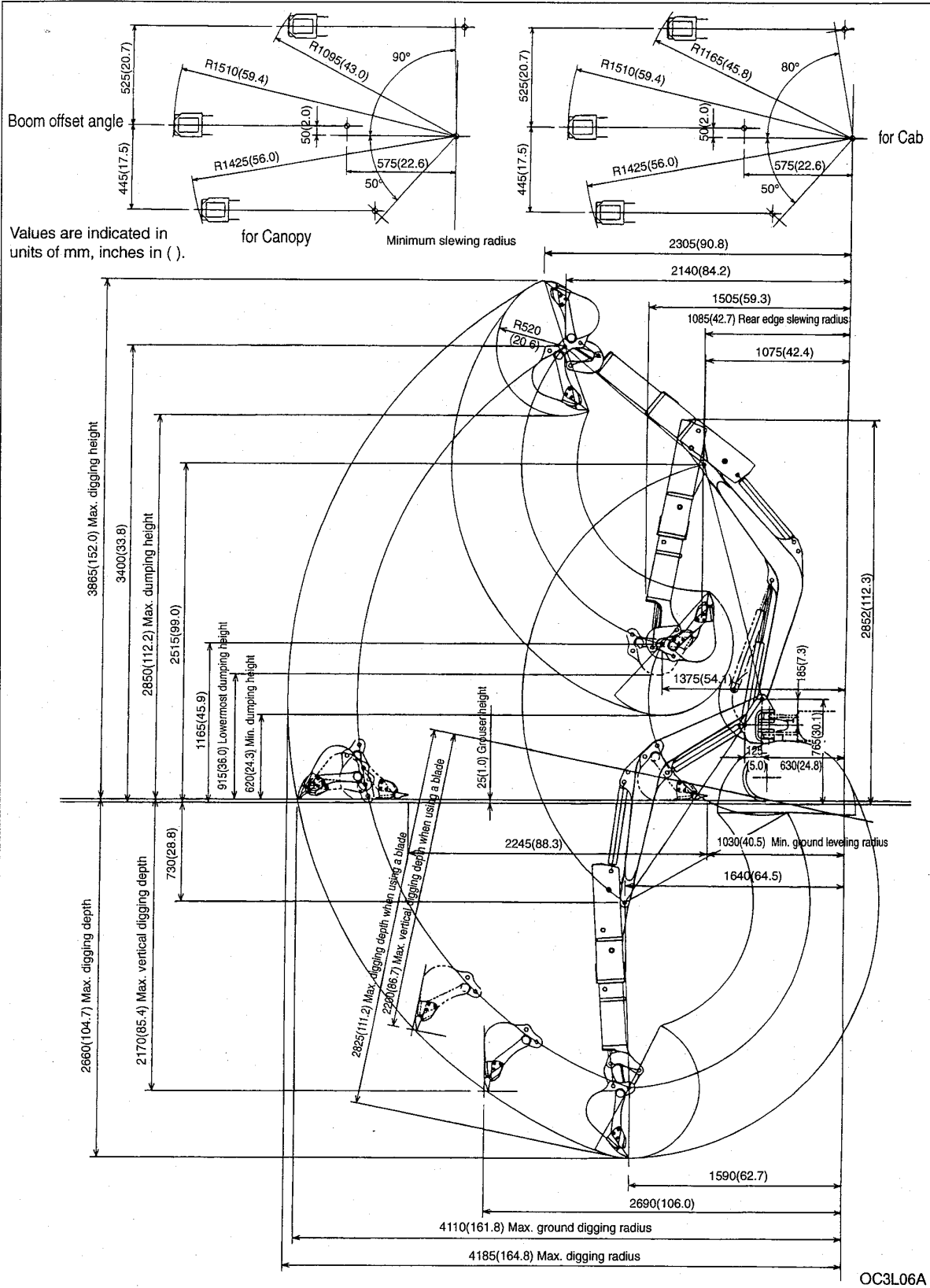


OC3L05A



HANDLING OF OPTIONS TELESCOPIC ARM

OPERATING RANGES (FULLY EXTENDED ARM)

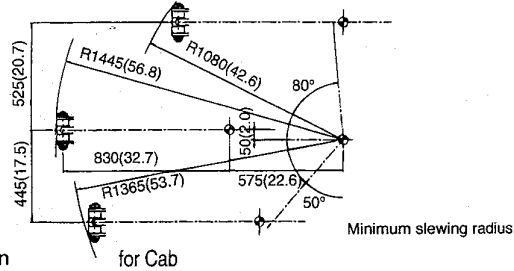




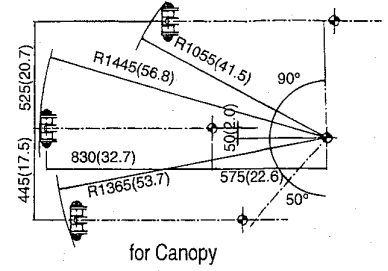
HANDLING OF OPTIONS LONG ARM

OPERATING RANGES

Boom offset angle

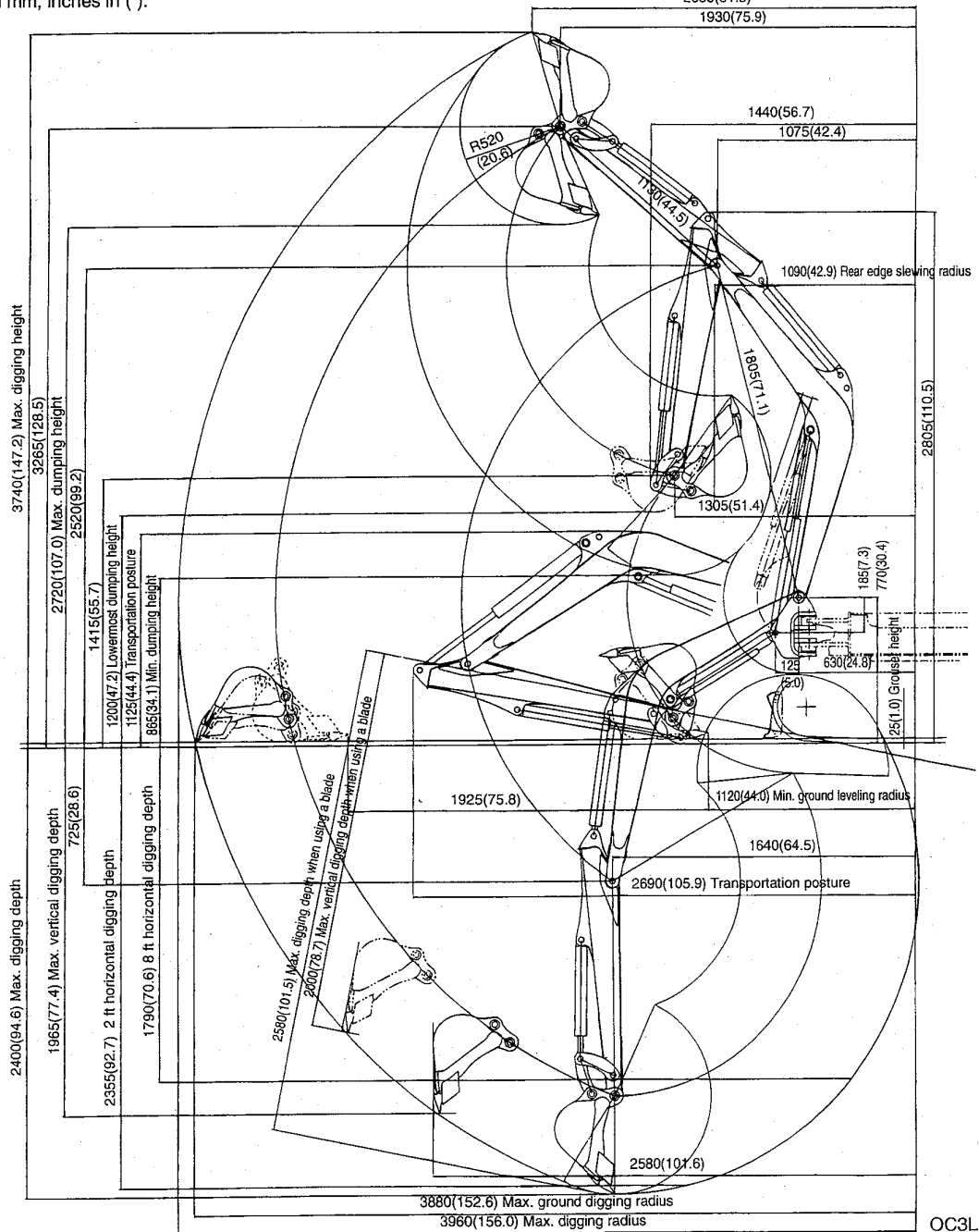


for Cab



for Canopy

Values are indicated in
units of mm, inches in ().



OC3L07A



HANDLING OF OPTIONS

3-HOLE BUCKET

Standard U.S. Version

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

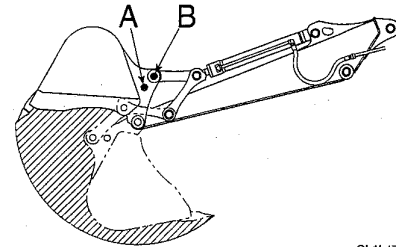
Struck capacity (SAE) 0.038 m³ (0.049 cu. yd.)

Rated capacity (SAE) 0.049 m³ (0.064 cu. yd.)

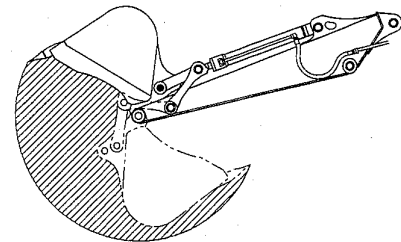
CHANGING THE LINK ARM INSTALLATION POSITION

Refer to "Replacing the Bucket" in the manual.

3-hole bucket have no clearance adjustment mechanism.



OL1L170



OL1L180

REPLACING THE BUCKET TEETH

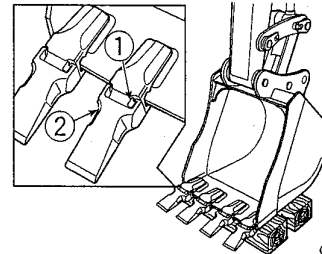
Replace the bucket teeth when the tooth points are worn, before the adapter is damaged.

⚠ WARNING

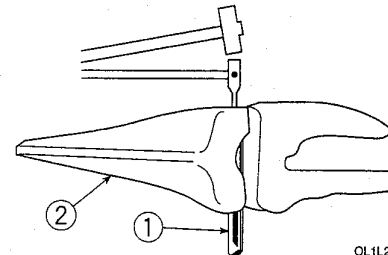
- Before performing maintenance or repairs under the machine, set all working equipment against the ground or in the lowermost position.
- To prevent unexpected movement, securely block the working elements when repairing or replacing the bucket teeth.
- Wear required appropriate equipment such as safety 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

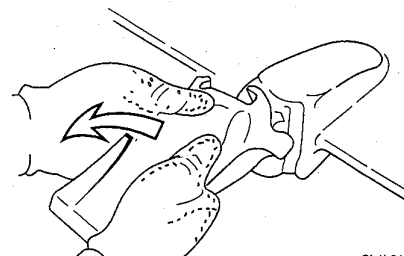
- 1 Clean the bucket and park the machine in a flat, safe place where the ground is hard.
- 2 Set the bottom surface of the bucket flat and lower it on a block so that the locking pin ① can be knocked out.
- 3 Remove the key, then check that the bucket is stable.
- 4 Place a rod against the locking pin 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.



OL1L190



OL1L200



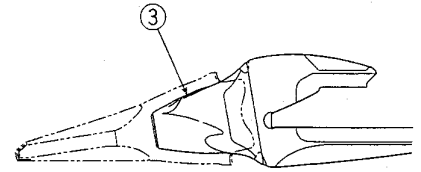
OL1L210



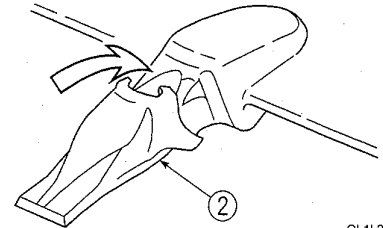
HANDLING OF OPTIONS 3-HOLE BUCKET

Installation

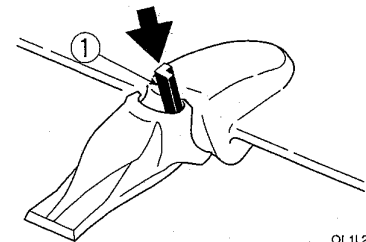
- 1 Clean the adapter nose ③.
If there is gravel or mud on the adapter nose, the tooth point will not go in all the way and the pin cannot be driven in.
- 2 Put the tooth point ② in the adapter nose ③.
Push in firmly until the tooth point ② touches the tip of the adapter nose ③.
Some tooth points ② are 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.



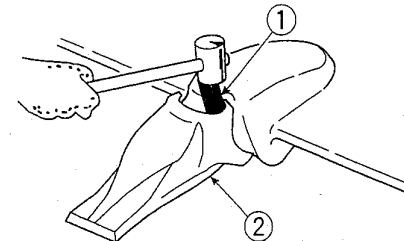
OL1L220



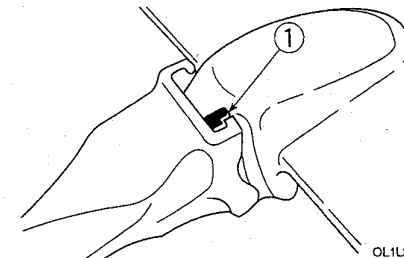
OL1L230



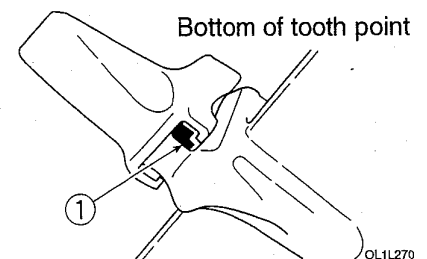
OL1L240



OL1L250



OL1L260



OL1L270



HANDLING OF OPTIONS TRAVEL ALARM

Australian Version

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

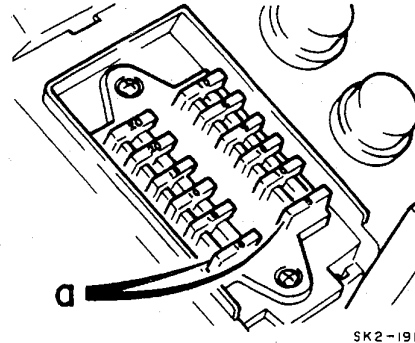
- If the a fuse which has just been replaced should blow again, there is a problem in the electrical system. This could cause fires. Contact a Takeuchi dealer.

- 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.

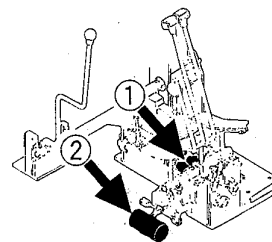
Capacity	Circuit(s) protected (left)	Capacity	Circuit(s) protected (right)
30A		10A	Radio, Room light, Heater
30A	Stop solenoid	5A	Monitor
10A	Limit switch, Feed pump, Solenoid valve (Sub valve)	25A	Wiper, Windshield washer, Cigarette lighter (Cab: for EU)
10A	Headlights, Boom light, Monitor light	10A	Flasher lamp
10A	Charge indicator, Current limiter	10A	Horn, Travel alarm , Electricsocket (for EU)
10A	Spare fuse "a"	5A	Spare fuse "a"

Position of installation of travel alarm limit switch ①

Position of installation of travel alarm buzzer ②



SK2-191



OC3L080

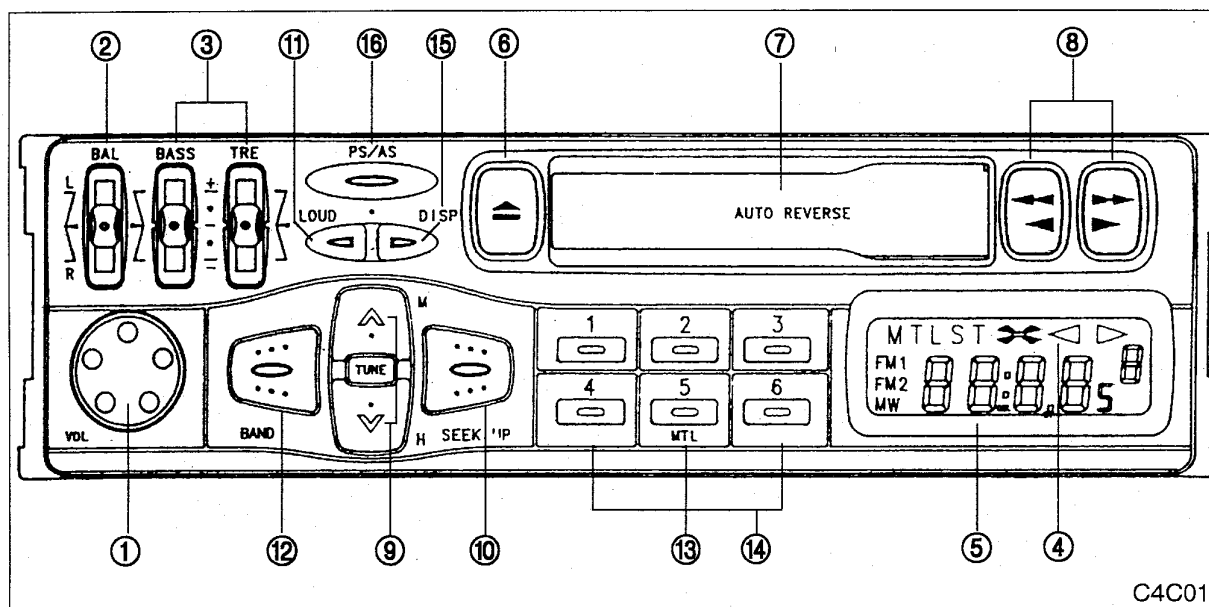


Car Stereo

Operating precautions

- To ensure safe operation of the machine, always be sure to keep the volume of the car stereo down to a level where you can easily hear sounds from outside the machine.
- Do not keep the car stereo 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 car stereo. Doing so may result in it being rendered inoperable.
- Be careful not to insert cassette tapes backward. Doing so may damage the cassette player. Insert tapes with the head of the tape facing to the right.
- Always remove the cassette from the player when not in use.

Names of components



C4C018

(1) Power switch/volume control knob

Turn this knob clockwise. The “click” sound indicates that the power supply is turned on. Further turning increases the speaker volume. If a tape is loaded in the car stereo, eject the tape to switch to the radio.

(2) Balance control slide-knob

Slide this knob to the “L” to enhance the left speaker volume and to the “R” to attenuate the right speaker volume.

(3) Tone control

- Bass control slide-knob
Slide this knob to the “+” to enhance the bass sound and to the “-” to attenuate the bass.
- Treble control slide-knob
Slide this knob to the “+” to enhance high frequency sound and to the “-” to attenuate high frequency sound.



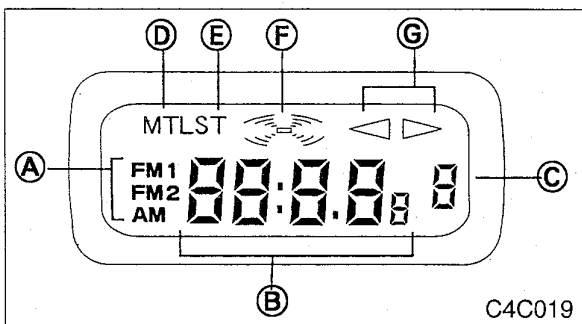
CONTROLS ACCESSORIES

<https://truckmanualshub.com/>

(4) Program indicators

Indicates tape direction. When ► lamp is on. Upper side of a tape is playback, ◀ indicates playback of lower side.

(5) Display



C4C019

- (A) Band
- (B) Time/Frequency
- (C) Memory channel(1-6)
- (D) Metal
- (E) FM Stereo
- (F) Loudness
- (G) Tape direction

(6) Eject button

Push this button to eject the cassette tape.

- To change over to radio while listening to a cassette tape, press the EJECT button to stop the tape and the system will automatically change over to radio.

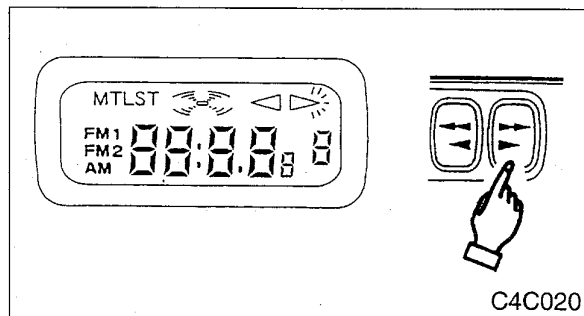
(7) Cassette door

Insert the cassette tape with the exposed magnetic tape side facing to the right.

- Simply insert a tape to change over to the cassette tape mode while listening to the radio.

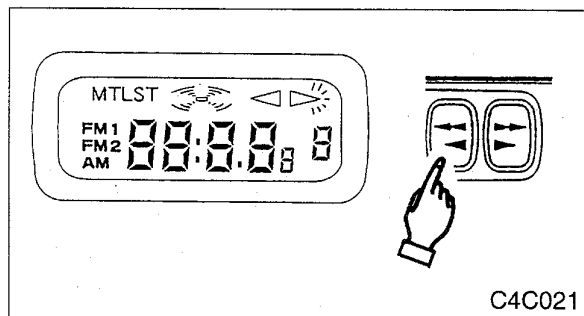
(8) Fast-forward/rewind/program changeover button

Fast-forward



C4C020

Fast-rewind/Stop

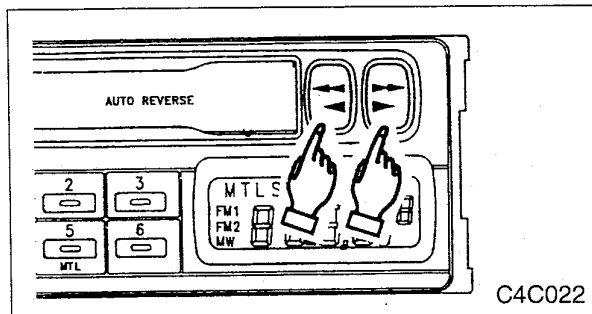


C4C021

To fast-forward the tape, push the button matching the direction of program indication and to rewind, push the other button. To stop fast-forwarding or rewinding, lightly press the button which is not locked to cancel the operation. The system will then start playing the tape again normally.



CONTROLS ACCESSORIES



To change the program, press the fast-forward and rewind buttons simultaneously. The direction of tape feed will reverse.

- When the tape ends in one direction, the system automatically reverses the tape and plays the other side.
- To stop fast-forwarding or rewinding, lightly touch the unlocked key. This frees the locked key and normal playing resumes.

(9) Tuner switch (Manual tuning)

Pressing the Δ shaped TUNER button raises the receiving frequency. Pressing the ∇ shaped TUNER button lowers the receiving frequency similarly. Pressing either of these buttons continuously shifts the receiving frequency continuously.

(10) SEEK switch

Pressing the "SEEK" button shifts the receiving frequency in the higher frequency direction before automatically stopping at a position where a station is picked up.

(11) LOUD switch

This button is used to operate the system at a lower sound volume but with enhanced bass and treble sound. ("  " indication appears on the display.)

(12) Band select switch

Pressing the "BAND" button change over between FM1, FM2 and AM (MW) bands. The display indicates the receiving band name and frequency.

(13) Metal switch

Press the "MTL" (5) button before playing a metal or CrO₂ tape. The "MTL" indication appears on the display.

(14) Preset switch keys

One station each in the FM1, FM2 and AM(MW) bands, respectively, can be preset for each of these preset keys. When listening to a preset station select either of the AM, FM1, FM2 bands using the band select switch then simply press the number key corresponding to the preset selected station.

The system can memorize 6 stations in AM band and 12 stations in FM bands (FM1: 6 stations and FM2: 6 stations).

Manual Memory

Use manual tuning button or seek tuning button to choose a radio station if a broadcasting station is wanted to be recorded. For 2 seconds press 1-preset key when the indication of frequency has already shown and the frequency is recorded. Flash stops and channel starts functioning.

- If the main power supply is interrupted such as when exchanging the battery, all presettings will be erased. Repeat the presetting procedure in such case.



(15) DISP(Time/Frequency) button

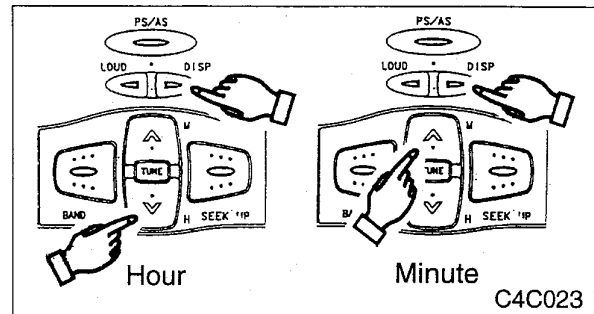
This system is equipped with a clock which can show the accurate time. Even if the radio is off, the clock still shows the time.

(16) PS/AS switch

Push this button 2 sec below will automatically operates to show the memorized station from 1 to 6. The signal scanning start by pushing this button momentarily. When a station is received the scanning automatically stops there for 5 seconds FLASHLY and then resumes scanning. As soos as the desired station is found, press the this button again.

If you will auto memory push this button over 5 sec so initiates a scan of the band. Station frequencies are either stored in order of low of frequency for FM, or in sequence for AM, starting from preset channel 1. If all of the preset channels have not been filled up after one scan, the remaining preset channels are left unchanged, and channel 1 is recalled. Channel 8 flashes during A.

● Set the time



After pressing DISP button, press tuner button ∇ or Δ to correct the time. Press tuner button ∇ to set the "hour" and tuner button Δ for setting the "minute". Set the time when the time is shown.

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.

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OPERATOR'S MANUAL

TB015 Compact Excavator

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