SH80-3B

HYDRAULIC EXCAVATOR

OPERATOR'S MANUAL

CE

Please keep this manual inside the machine using a manual holder cable to refer to whenever needed. (See the back cover for how to attach the manual to the manual holder cable.)

SUMITOMO

Serial No.
080X3-7101~

WDL0830-0T

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⑯Part number: KHP1326

This decal warns that the radiator must never be touched and that the radiator cap must never be removed while the cooling system is still hot. See “Cooling system” in the “Inspections and Maintenance” Section.

0-0064E

⑰Part number: KHP1337

This decal warns that the fan and the fan belt must never be touched while the engine is running. Stop the engine before performing any operation.

0-0065E

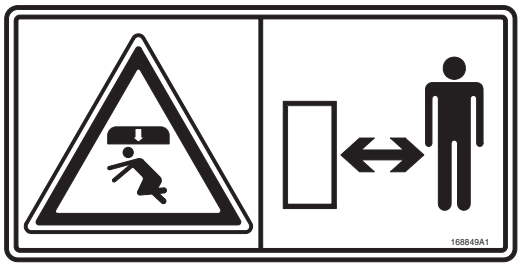
⑱Part number: KHP1338

This decal warns that the exhaust system must never be touched while the engine is running or immediately after the engine has stopped.

0-0066E

⑲Part number: KHP1388

This decal reminds the operator not to allow anyone to stand within the working range of the attachment while the engine is running.

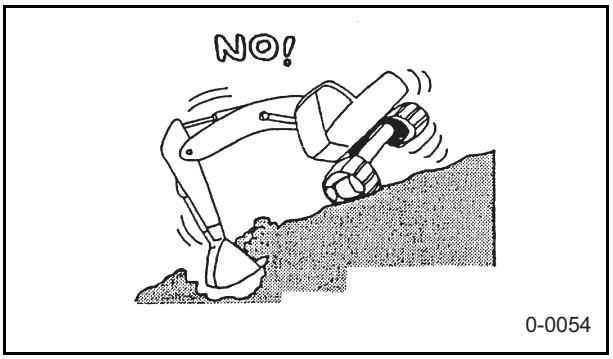


0-0067E

Working on slopes

Special attention should be paid when operating the machine on slopes because the machine's stability is significantly influenced.

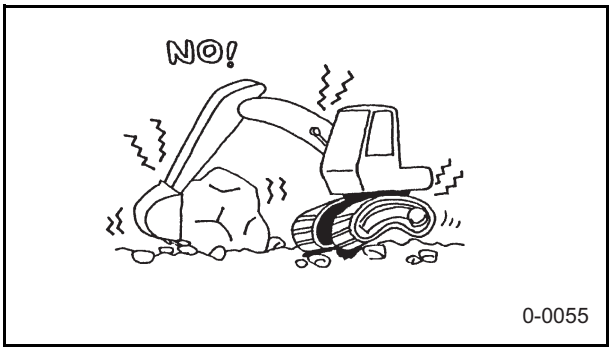
- Do not turn the bucket downward more than necessary.
- When operating on a slope, keep the footing level.



0-0054

Do not attempt operations beyond the machine capability

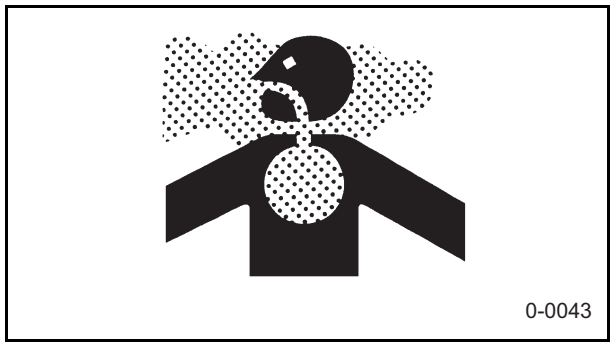
- Operations beyond the range of performances may cause damage to the machine or expose operators or workers to a risk of life.
- Perform operations within the range of machine's performances.



0-0055

Ventilation

- Engine exhaust fumes are dangerous.
- Take ventilation measures to prevent gas poisoning when starting the engine in the locations where ventilation is poor such as indoors, in tunnels, or underground.

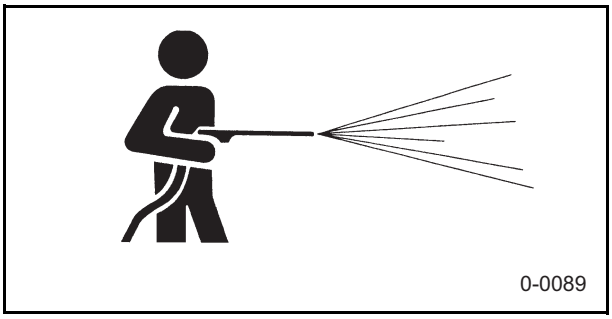

0-0043

Make sure the ground is safe

- Be sure that the ground or passage is strong enough and there is no risk of collapsing from the machine's weight and vibrations.
- Be careful of operating during the snow seasons since the ground is covered and not visible.
- Just after a rain fall, cliffs, grooves and road shoulders are dangerous since they tend to be softened. Keep away from them as much as possible. Landslides may occur due to the machine's vibration or weight.
- If there are rises and falls in the ground, the machine's operating conditions become unstable. Try to travel the machine on flat places if possible.

First clean the machine, then check and repair it

Cleaning machines makes it easy to detect failures and faults.
Keep the oil filler and oil level gauge clean and avoid dust and dirt entry.

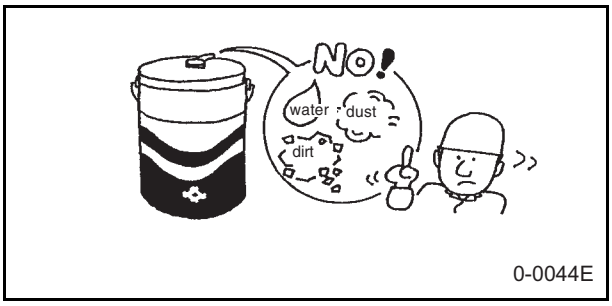

0-0089

Washing vehicles

1. When washing the machine, be careful not to splash the electrical equipment.
   - Monitors and electrical equipment in the operator cabin.
   - Do not apply steam directly to battery, connectors and other electrical equipment.
2. Do not apply high pressure washing steam directly to the radiators.
   Wash the radiator carefully and gently.

Keep fluids free of water and dirt

When adding fuel/hydraulic oil/engine oil, keep them free of water, dust and other contaminants.
Do not adding fuel or oil with the strainer removed from the filler port.

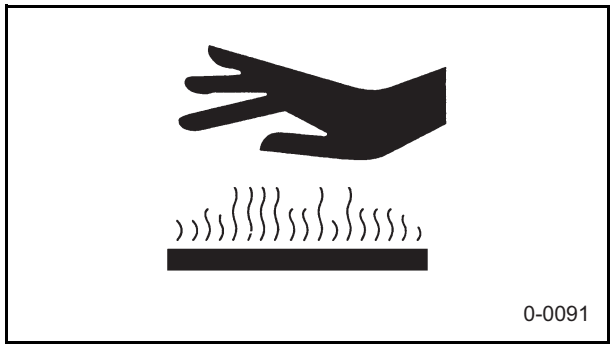


0-0044E

Draining oil and changing filters

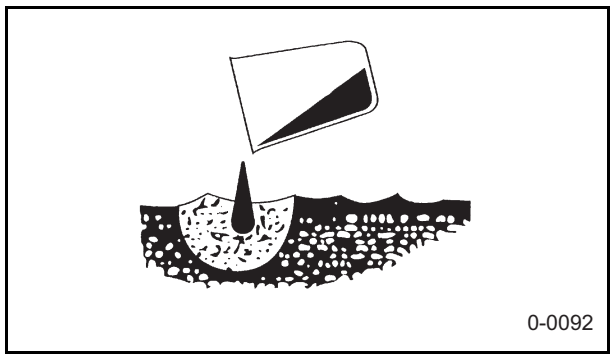
- It is dangerous to drain water or oil and replace filters just after the engine stops. Carry out the work after each part has cooled down (approximately 68 - 104°F (20 - 40°C)).
- When changing oil or changing filters, inspect the drained oil and old filters and check for metal debris or foreign substances.

If a large amount of metal debris is detected, contact our Service Shops for repairs.


0-0091

Disposal of waste fluids

- Do not pour waste fluids onto ground, rivers, lakes and marshes. It can harm the environment.
- When disposing of oil, fuel, cooling water, solutions, filters and other harmful substances, follow the local rules and regulations.


0-0092

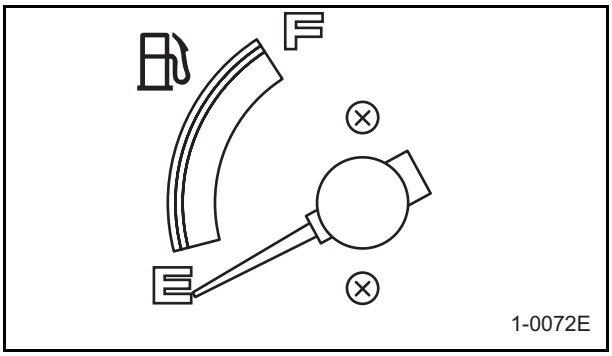
Use clean oil

- Use clean oil and grease to avoid introducing dirt.
  - Use clean oil and grease.
  - Also use clean containers.
- After filling grease, wipe any spilled grease or oil.
  - Extra grease on operating/rotating parts.

⚠ WARNING

- **The monitor is intended to indicate the machine's condition and to quickly alert the operator of any abnormalities by means of messages or buzzers. It is not intended to be used for inspection or maintenance.**
- **Follow the start of work inspection described in the "Inspection and Maintenance" Section.**
- **The monitor can be damaged by water. Take care that it does not get wet.**

Fuel Meter



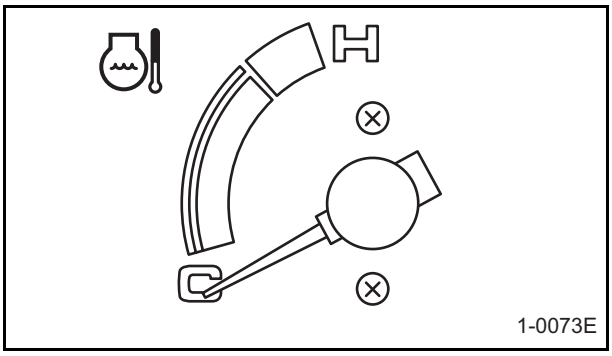
Indicates the amount of fuel in the tank.

F Fuel Level High

E Fuel Level Low

If the fuel meter indicates E, there is very little fuel left in the tank. Refill the machine with fuel.

Coolant Water Thermometer

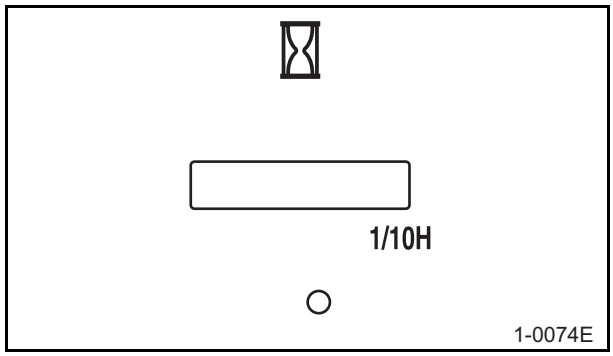


Indicates the engine coolant water temperature.

C: Low temperature H: High temperature

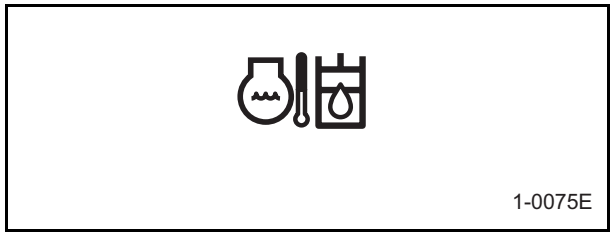
If the indication is below C position, carry out engine warming-up. When the indication is in H position, reduce the load to prevent overheating.

Hour Meter



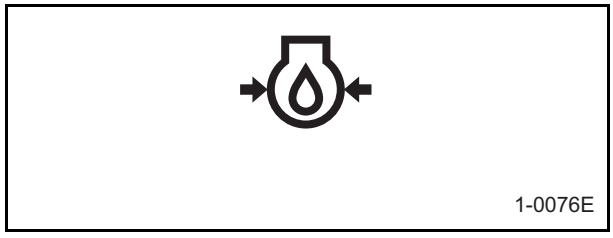
- Indicates the operation time of the machine. The last digit corresponds to 1/10th of an hour (6 min.).
- When the engine is running, the green lamp blinks to indicate that the meter is advancing.
- The indicated time is used for the reference time of inspection and maintenance.

Over Heat



(The warning buzzer sounds)
Indicates the engine coolant temperature or hydraulic oil temperature abnormally rises. Put the engine r.p.m. at low idling to reduce water or oil temperatures.

Engine Oil Pressure Problem



(The warning buzzer sounds)
The engine oil pressure is abnormally low or the engine oil filter is blocked.
Stop the engine, check engine oil level and add oil if the lever is too low. When the oil level is normal but the indication is turnd ON, change the engine oil and filter.

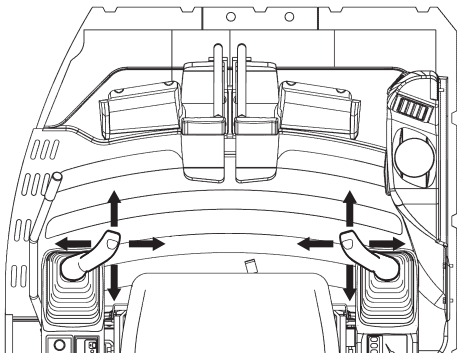
IMPORTANT

While the alarm lamp is being lit, the engine is to run at an idling speed automatically.

Operation Levers

⚠ WARNING

- **Even if the lever is put into neutral, the swing may continue briefly due to inertia. Therefore, keep enough distance not to hit anything during swing operations.**
- **The operation method of levers varies according to the machine specification. Verify the operation procedure nameplate attached inside the cab. Master and be familiar with the operation levers before operating the machine.**
- **The operation of the excavator attachment is the reverse of that of the bucket. Caution should be taken when performing this operation.**

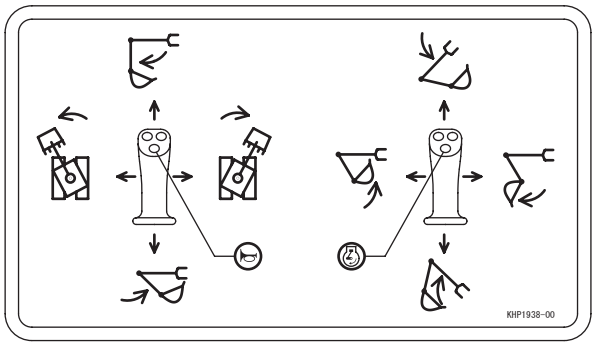


1-0103E

Boom, arm, bucket and swing operations can be controlled individually or simultaneously. The operation speed varies according to the operation lever stroke. When the hand is released from the operation lever, the lever automatically returns to neutral.

This machine adopts ISO (JIS) operation method.

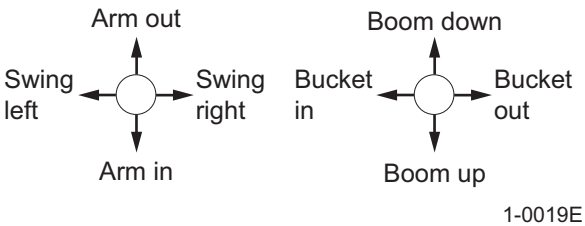
Operation Name Plate



1-0153E

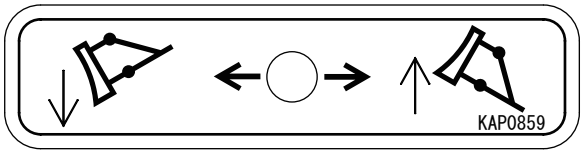
⚠ DANGER

- **Before beginning operations, verify that the operation method described in the operation nameplate is the same as the actual movements of the machine.**
- **When verifying each operation, perform it slowly.**
- **The operation method may different depending on the specifications.**
- **When the operation method on the nameplate and the actual movements do not match, either change the pipeline connections so that the movements match the nameplate or change the nameplate to match the machine movements.**



1-0019E

Operation Name Plate



1-0107E

Operating Instructions

This OPERATING INSTRUCTIONS section describes the proper operation of the machine.
All operators should always operate the machine carefully and safely to prevent personal injuries and damage to the machine.

Contents

- Operation of New Machine
- Daily Inspections
- Starting and Stopping the Engine
- Warm-up Operation
- Operations (Traveling)
- Operations (Swing)
- Operations (Attachment)
- Operations
- Special Attachments
- Operating Instructions (Cautions)
- Operating Instructions (Procedures)
- Bucket: Turning Over and Replacement
- On Completion of Daily Operations
- Operating in Cold Climates
- Operating under Extreme Conditions
- Transportation
- Storing

* For operations of the instruments and controls, refer to the INSTRUMENTS AND CONTROLS section.

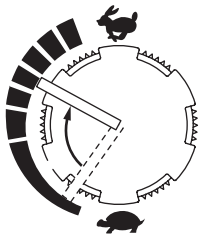
⚠ WARNING

- **If any problem is found, immediately correct the problem. Do not run or operate any machine which is not properly maintained.**
- **Before starting operations, check the job site conditions and take the necessary measures to ensure safe operations.**
- **Use extreme care in dangerous places.**
- **Make sure that unauthorized people can not enter the job site.**

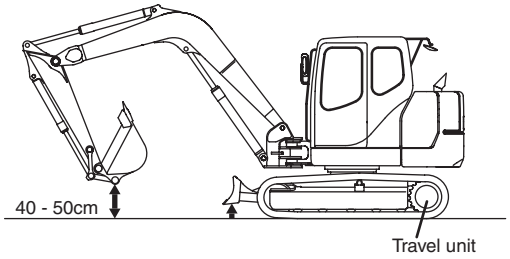
This section explains the starting and stopping procedures of the machine.

How to start

1. Turn the throttle volume and increase the speed of the engine.


2-0062E

2. Fold the attachment so that it is 16-20 inches (40-50 cm) above the ground.



2-0110E

3. Raise the blade.
4. Check the direction of the crawler.

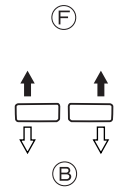
⚠ CAUTION

When the travel unit is in the rear and the travel lever is pushed forward, the machine moves forward. When the travel lever is pulled towards you, the machine moves backward.

5. Check the safety of the machine surroundings and sound the horn (give a signal), push the left and right travel levers slowly forward (travel forward) or pull them towards you (travel backward) to travel the machine.

⚠ WARNING

If the throttle volume is turned to high speed and the travel levers are operated rapidly, the machine will start rapidly.
Use extreme care when starting to more.



2-0064E

Ⓕ Forward
Ⓑ Backward

Operations (Attachment)

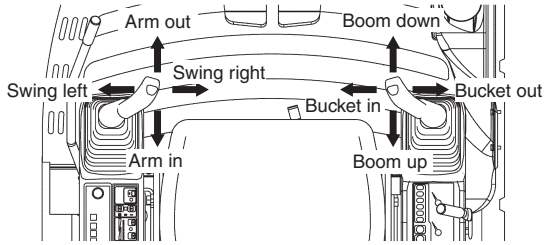
⚠ WARNING

Always verify the operation methods.

The machine is operated by the right and left operation levers.
ISO (JIS) Operation Method

Right Operation Lever...
Boom and bucket operation
Left Operation Lever...
Arm and swing operation

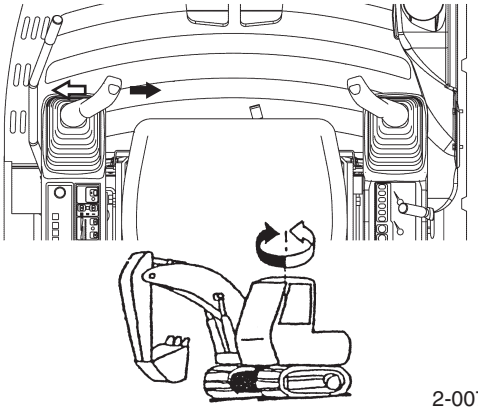
When you release your hand from the lever, it returns to the neutral position and the machine maintains that position.



ISO (JIS) Standard Operation Method

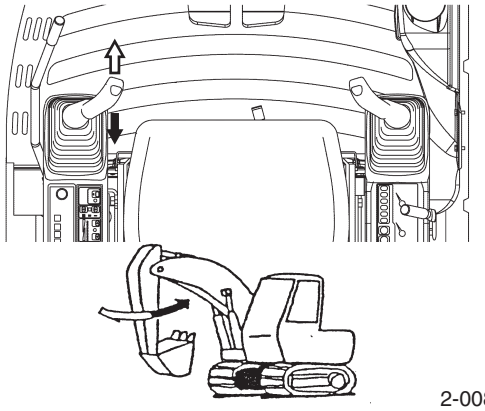
2-0078E

Swing Operation



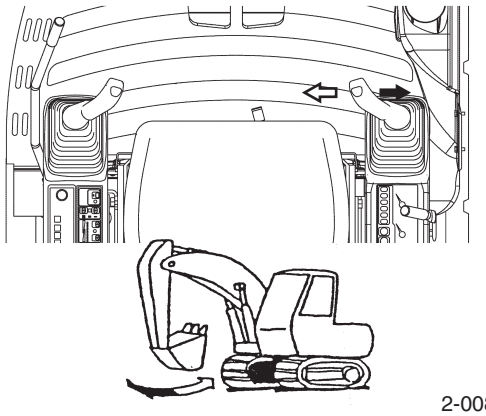
2-0079E

Arm Operation



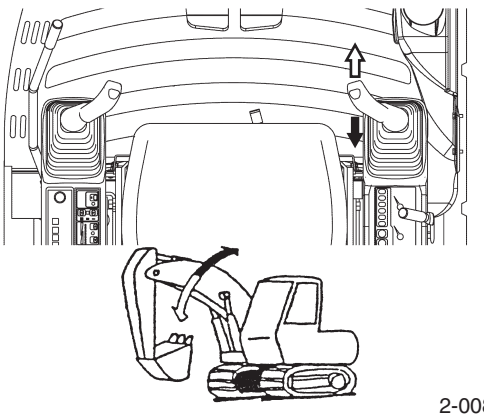
2-0080E

Bucket Operation



2-0081E

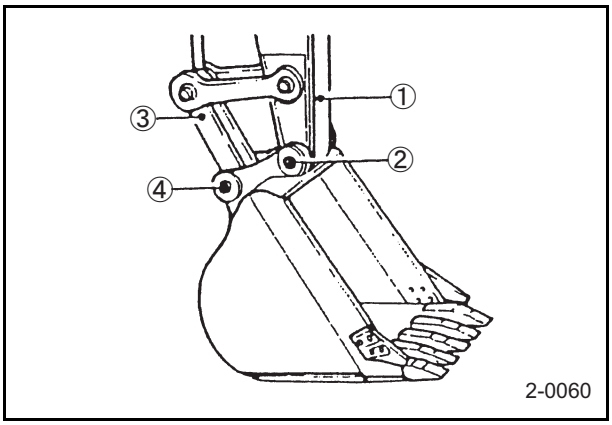
Boom Operation



2-0082E

Installing the bucket

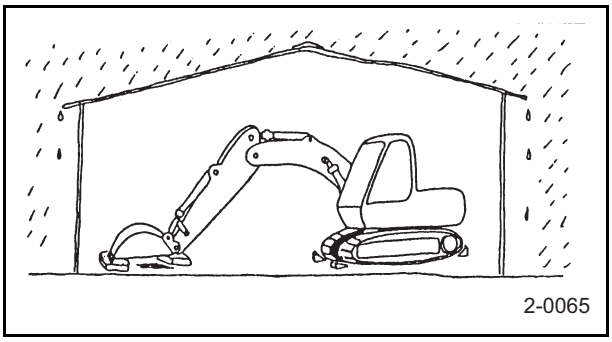
1. Clean the pin and pin hole of each area and grease them well.
2. Replace the O-rings and dust seals.
3. Align the bucket with the hole on the arm side ① and insert the pin ②.
4. Align the bucket with the hole on the bucket link side ③ and insert the pin ④.
5. Install the lock pins and grease the pins.
   (EM system type should be greased also.)



If the machine will be stored for a month or longer, make sure the followings to prevent decrease in machine performance for the next time it is operated.

Before Storing

1. Wash off the machine, especially the crawler.
2. Lubricate each part.
   - Grease the attachment and turntable bearing.
3. Check the lubricant amount and cleanliness.
   - Add if low.
   - Replace when excessively dirty.
4. Refer to the storage instructions in the operator's manual for the engine. If the temperature is low with the possibility that the coolant may freeze, mix it with anti-freeze or drain it completely.
5. After cleaning and washing, store the machine in a dry, indoor site. If it must be stored outdoors, lay timber on the ground under the machine and protect the machine with covers.


2-0065

(Outdoor storage)

a) Select a well drained, ventilated area.
b) The floor should be of level concrete, broken rocks or gravel or place a suitable wooden block under the tracks to prevent the machine from being in direct contact with the ground.
c) After following steps 6-9 below, cover the machine to prevent rain from entering the house to prevent rust.

6. Lower the bucket to the ground and block the tracks.
7. Coat the exposed area of the piston rod of all hydraulic cylinders with anti-rust coating.
8. Put all the operation levers into neutral.
9. Remove the battery, completely charge it and store it or remove one terminal ((-) terminal).

During Storage

If the machine is stored for a month or longer, check the operation of each function and drive rust prevention every month. This will prevent rust in the engine, deterioration at the seals and rusting in hydraulic parts. Check if there is any coolant.

- Before operating the machine, wipe off the anti-rust oil from the hydraulic cylinder rods.
- Carry out the operation of attachment, swinging, and traveling slowly with the engine running at a low speed.

⚠ WARNING

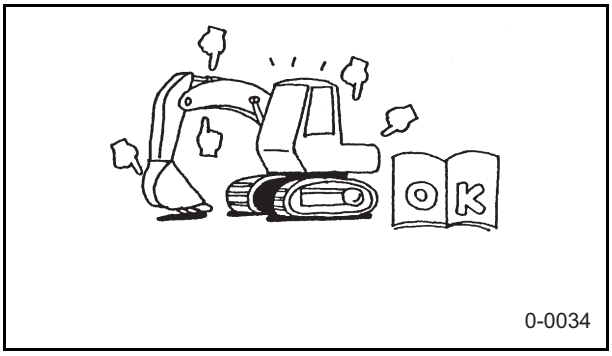
If the rust-prevention operation must be performed indoors, open the windows and doors for ventilation to prevent gas poisoning.

Inspections Prior to Operation

Walk-through checks

Check prior to starting the engine.
Visually check the areas around and under the machine, and

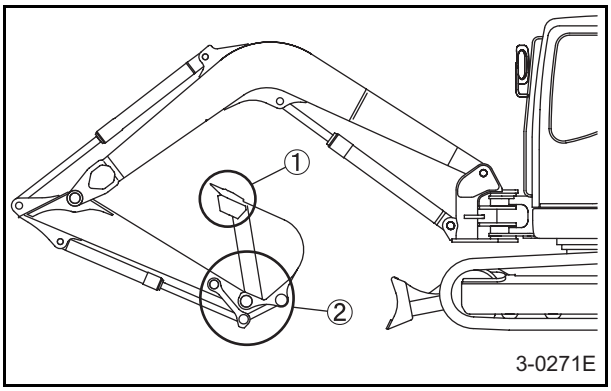
1. Check to see if there is any leakage of oil / fuel / coolant from any component.
2. Check and ensure all nuts & bolts are secure.
3. Check if there is any wire breakage or short circuit in electrical wiring. Ensure battery terminals are secure.
4. Check if oil / grease is clean in related components.
5. Eliminate accumulated dust and clean the area.



0-0034

Attachments (work unit)

1. Check oil leakage on high-pressure hoses and at linkage, and on hydraulic cylinders.
2. Around bucket
   ① Check to see if bucket teeth and side cutter are loose, worn, or missing.
   ② Check condition of grease on and around linkage. Check if bucket play is appropriate. (Refer to the section on bucket for specific instructions for adjusting play.)



3-0271E

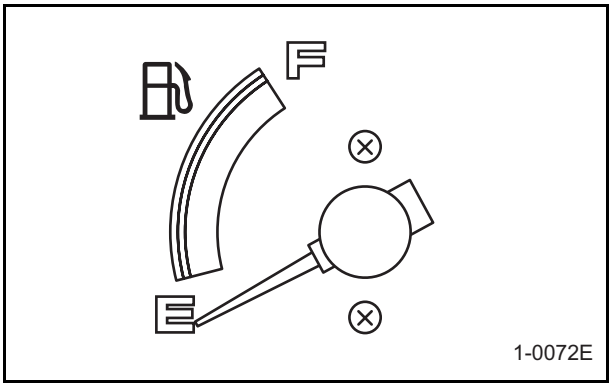
Fuel Refilling and Fuel Level Checking

⚠ WARNING

Do not overfill the fuel tank (never to the top of fuel tank).

Check the fuel level on the display gauge. If low, refuel from the fuel filler port ② of the fuel tank.

Refill the tank at the end of each work day, and make this a habit.



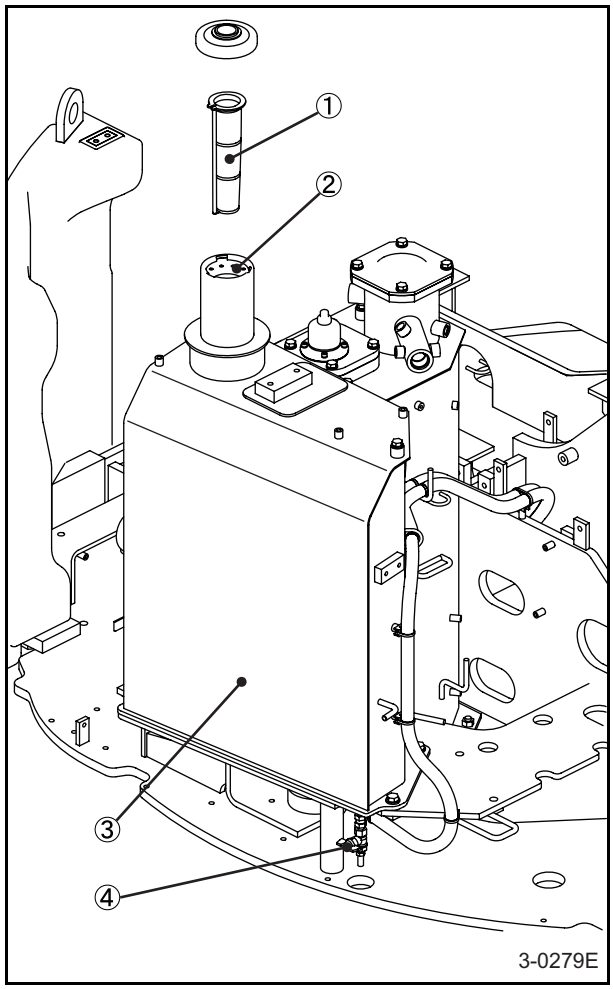
1-0072E

Drainage of Water and Sediments in the Fuel Tank • Maintenance: every 10 hours

1. Obtain a container to collect the drained contaminants.
   (Performing drainage before starting the engine in the morning is the most effective method.)
2. Loosen the drain valve ④ located at the bottom of the tank and drain the accumulated sediment and water.
3. After draining, tighten the drain valve.

IMPORTANT

Remove the fuel strainer ① from the fuel filler port ② for cleaning.



3-0279E

① Strainer
② Fuel filler port
③ Fuel tank
④ Drain valve

Bolt and Nut Torque
• After the first 50 hours/Maintenance: every 250 hours

Tighten the bolts and nuts according to the table. After daily work, check the bolts and nuts for looseness and for any missing. Tighten if loose and replace if missing.
Tighten the bolts and nuts after the first 50 hours of operation and every 250 hours thereafter.

Tightening Torque Table

No.	Tightening Point	Bolt Diameter	Wrench	Tightening Torque
				[N•m]
①	Travel Motor	M16	24mm	267-312
②	Drive Sprocket	M14	22mm	173-202
③	Take-up Roller	M10	17mm	63-73
④	Upper (Carrier) Roller	M16	24mm	267-312
⑤	Lower (Track) Roller	M20	30mm	521-608
6	Shoe Bolt	M14	22mm	245±25
7	Counterweight	M24	46mm	850-992
8	Turntable Bearing (Lower Frame)	M16	24mm	252-283
9	Turntable Bearing (Swing Frame)	M16	24mm	252-283
⑩	Swing Equipment	M16	24mm	272-317
⑪	Engine (Engine Mount)	M16	24mm	265-313
⑫	Engine Bracket	M10	17mm	64-74
13	Radiator	M12	19mm	64-74
⑭ ⑮	Hydraulic Pump	M10 M12	17mm Hex. Socket	64-73 109-126
⑯	Hydraulic Oil Tank	M12	19mm	67-78
⑰	Fuel Tank	M12	19mm	98-108
⑱	Control Valve	M12	19mm	59
⑲	Rotating Joint	M12	19mm	88-107
⑳	Rotating Joint	M12	19mm	109-127

Note: Use Loctite No. 262 (adhesive) equivalent on those marked with ○ and tighten to the torque listed in the above table.
Tightening torque is N•m ÷ 9.8=kgf•m

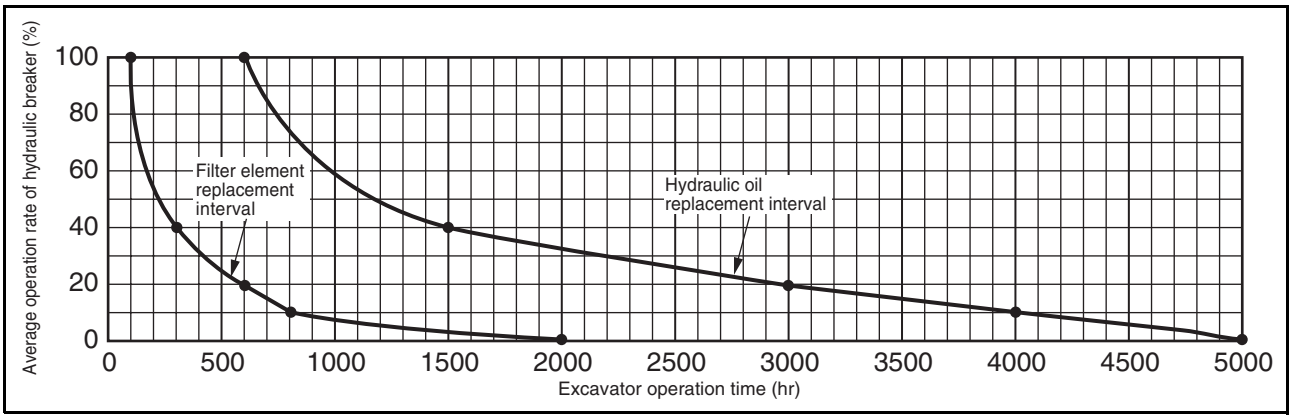
The tightening torque for the bolts and nuts not listed above are as follows:

Bolt Diameter (size)			M6	M8	M10	M12	M14	M16	M18	M20
Hex. Bolt	Wrench	[mm]	10	13	17	19	22	24	27	30
	Tightening Torque	[N·m]	6.9	19.6	39.2	58.8	98.1	157.0	196.0	274.0
Hex. Socket Head Bolt	Wrench	[mm]	5	6	8	10	12	14	14	17
	Tightening Torque	[N·m]	8.8	21.6	42.1	78.4	117.6	176.4	245.0	343.03

Replacement Intervals for Hydraulic Oil and Filters when Using Breaker

IMPORTANT

- When using the hydraulic breaker, the deterioration and/or contamination of hydraulic oil progresses faster compared to ordinary digging work. Be sure to carry out the maintenance more often. In addition, when replacing the hydraulic filters, also measure the cleanliness and deterioration of the oil.
- Replace the hydraulic oil and filter element, using the graph as a guideline, depending on the operation frequency of the breaker.
- If the breaker work continues during a short period of time and the hour meter exceeds 100 hours during the period, replace the element every 100 hours.
- Replace the return filter for the breaker at the same interval as the element. Additionally, if using a filter with indicator, change the filter according to the indicator's indication.



Checking Hoses and Lines
• Daily inspections
• Maintenance: every 50 hours

Check the hydraulic system hoses, pipes, plugs, connectors and fittings for oil leakage and the mounting bolts and nuts for looseness. If any faults are found, rectify them by repairing, replacing and additional tightening as required.

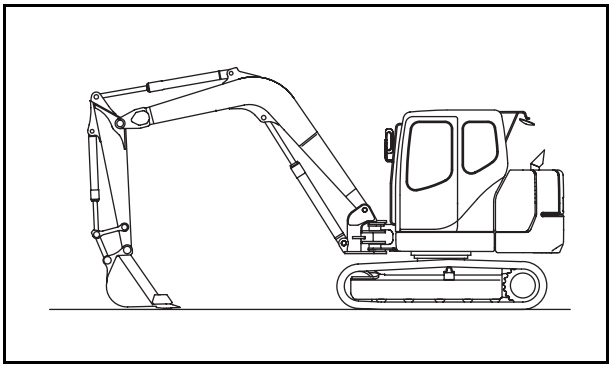
Adjustment of Bucket Backlash • As necessary

⚠ WARNING

Stop the engine before adjusting the bucket backlash.

Bucket Backlash Adjustment

The machine is provided with a bucket adjustment mechanism which eliminates the backlash of the bucket-to-arm joining area caused by wear.
Due to this mechanism, the sealing condition of the O-rings is kept stable and the wear is delayed. The service life of the bushings and pins thereby increases.



IMPORTANT

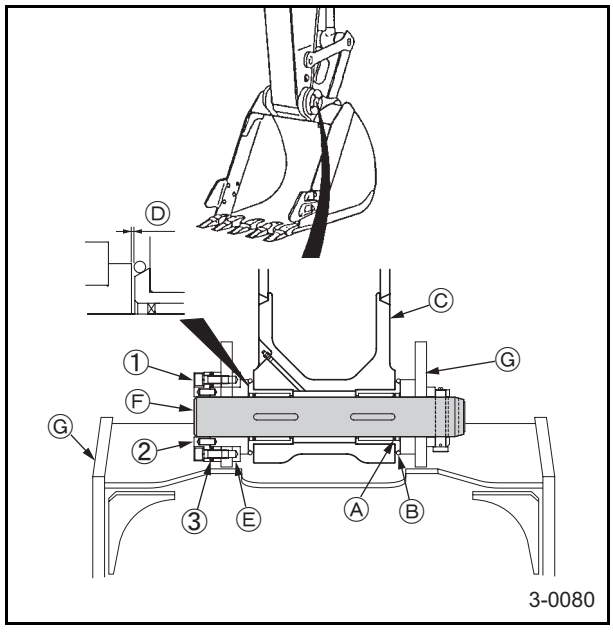
If the bucket backlash adjustment is not carried out properly, scuffing, unusual noise and backlash will occur, which causes damage to the O-rings.

Adjustment

1. Set the hydraulic bucket as shown in the above figure and have it lightly touch the ground.
2. Turn it slightly to the left and position it so the arm end is pressed to the side which is not to be adjusted. (When the bucket is turned over, turn it to the right.)
3. Stop the engine.
4. Measure the clearance between the bucket and the arm joining portion.
5. If the clearance is more than 0.08 in (2 mm), remove the shim plate and adjust as follows.
6. Adjusting Method
   a) Loosen the hexagonal socket head bolt ① to remove the plate ②.
   b) Remove the shim plates ③ (as required) the amount corresponding to the backlash amount of the joining area (wear amount).
   c) Install the plate ② and tighten the hexagonal head socket bolt ①.
   d) As the hexagonal socket bolt ① is tightened, the plate ② will be pressed against the steel bushing to reduce the clearance.
   Clearance amount of about 0.05 in (1.2 mm) is preferable.
7. Apply grease as necessary.

IMPORTANT

Too small amount of clearance may cause scuffing or seizure. Always check the clearance.



①Hexagonal socket head bolt
②Plate
③Shim plate
ⒶDust seal
ⒷO-ring
ⒸArm
ⒹClearance
ⒺSteel bushing
ⒻAttachment pin
ⒼBucket

Swing

Problem	Cause	Remedy
Insufficient swing force	Low performance of swing motor Thermal seizure of swing shaft	Replace swing motor* Supply grease or replace the swing shaft*
During braking, swing does not stop	Low setting of brake valve Clogged valve Low performance of swing motor Internal oil leakage of control valve	Adjust pressure* Clean valve* Replace swing motor* Repair or replace valve assembly*
During stopping, swing slips	Low setting of port relief valve or break valve pressure Clogged valve Low performance of swing motor Internal oil leakage of control valve	Adjust the pressure* Clean the valve* Replace swing motor* Repair or replace valve assembly*
Unusual noise during swing	Air in swing motor Insufficient lubrication of swing bearing	Grease Grease

* For items marked with *, contact our Service Shop.

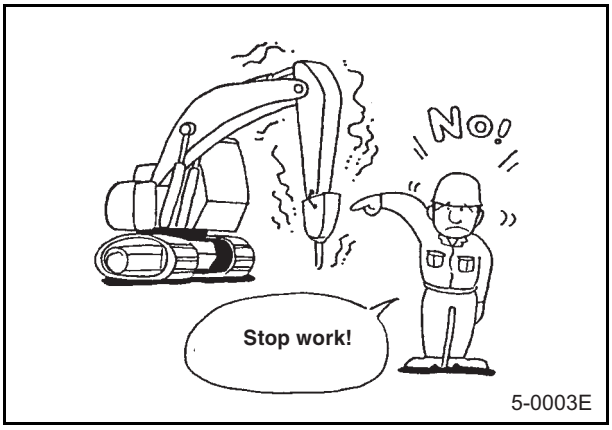
Hydraulic Cylinder

Problem	Cause	Remedy
Insufficient hydraulic cylinder power	Low setting of relief valve pressure Oil leakage inside hydraulic cylinder Damaged hydraulic cylinder piston or rod Oil leakage inside control valve	Adjust pressure* Replace cylinder packing* Replace hydraulic cylinder piston or rod* Repair or replace valve assembly*
Oil leakage outside hydraulic cylinders	Damaged hydraulic cylinder packing Damaged cylinder rod	Replace hydraulic cylinder packing* Replace cylinder rod*

* For items marked with *, contact our Service Shop.

Stop work if the hydraulic hoses vibrate abnormally

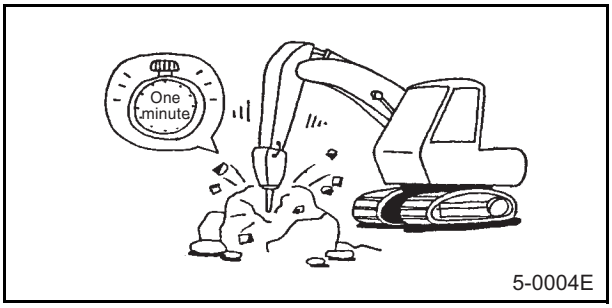
If used in such a condition, the shocks become stronger and lead to an accident.



When Using a Hydraulic Breaker

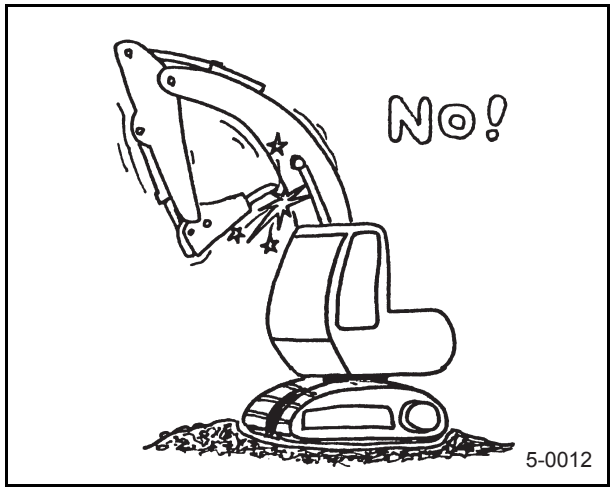
Finish continuous stroking within one minute!

If one place cannot be fragmented within one minute of continuous stroking, change the stroking surface. Care should be taken to avoid injury by flying fragments during breaker operations. Attach guards as necessary.



Be careful that the chisel does not interfere with the boom

Be especially careful when transporting the machine with the chisel in the folded position.



Underwater work

Underwater work with a standard type hydraulic breaker can lead damage to hydraulic devices of the machine. Do not do such work.