CEAM207074
REPLACES SEAMA2070503 & CEAM207073

OPERATION & MAINTENANCE MANUAL

KOMATSU

PC300-5
PC300LC-5
PC300LC-5K
PC300-5 MIGHTY
PC300LC-5 MIGHTY
PC300HD-5

HYDRAULIC EXCAVATOR

SERIAL NUMBERS	PC300-5	21401	and up
	PC300LC-5	21401	
	PC300LC-5	A70501	
	PC300LC-5K	K20001	
	PC300-5 MIGHTY	21401	
	PC300LC-5 MIGHTY	21401	
	PC300HD-5	21401	

DEC 94

⚠ WARNING

Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who come in contact with it.

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.

FOREWORD

This manual describes procedures for operation, handling, lubrication, maintenance, checking, and adjustment. It will help the operator or anyone realize peak performance through effective, economical and safe machine operation and maintenance.

- Please read this manual carefully BEFORE operating the machine.
- Please continue studying this manual until proper operation is completely reinforced into personal habit.
- This manual describes the basic techniques. Skill is performed as the operator or anyone get the correct knowledge and performance of the machine.
- Operation, inspection, and maintenance should be carefully carried out, and the safety must be given the first priority. Safety precautions are indicated with ⚠ marks and technical precautions with ★ marks in this manual. The safety information contained in this manual is intended only to supplement safety codes, insurance requirements, local laws, rules and regulations.
- Some illustration pictures are different from your machine as technical improvement is continuously reflected on it. Revision to up-to-date manual's content is performed in later editions.
- This operation & maintenance manual may contain attachments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require.
  Materials and specifications are subject to change without notice.

BREAKING IN YOUR NEW MACHINE

Each machine is carefully adjusted and tested before shipment. However, a new machine requires careful operation during the first 100 hours to break in the various parts.

If a machine is subjected to unreasonably hard use at the initial operation stage, the potential of performance will prematurely deteriorate and the service life will be reduced. A new machine must be operated with care, particularly with regard to the following items.

- After starting, let the engine idle for 5 minutes to allow proper engine warm-up prior to actual operation.
- Avoid operation with heavy loads or at high speeds.
- Sudden starting or acceleration, unnecessarily abrupt braking and sharp turning should be avoided.
- During the initial 100 hours, the work equipment fixing pins are to be greased before each operation. Greasing is to be repeated after operation of the boom, arm and bucket is conducted several times.
- If the machine is delivered without any cooling water in the radiator, flush the cooling system with ample clean water to clean the system, then fill the radiator with cooling water.

★ When replacing oil filter elements (cartridges), check their interiors for dirt and dust. If heavily collected, check for possible cause before starting operation.

★ Hours of operation are indicated by the service meter.

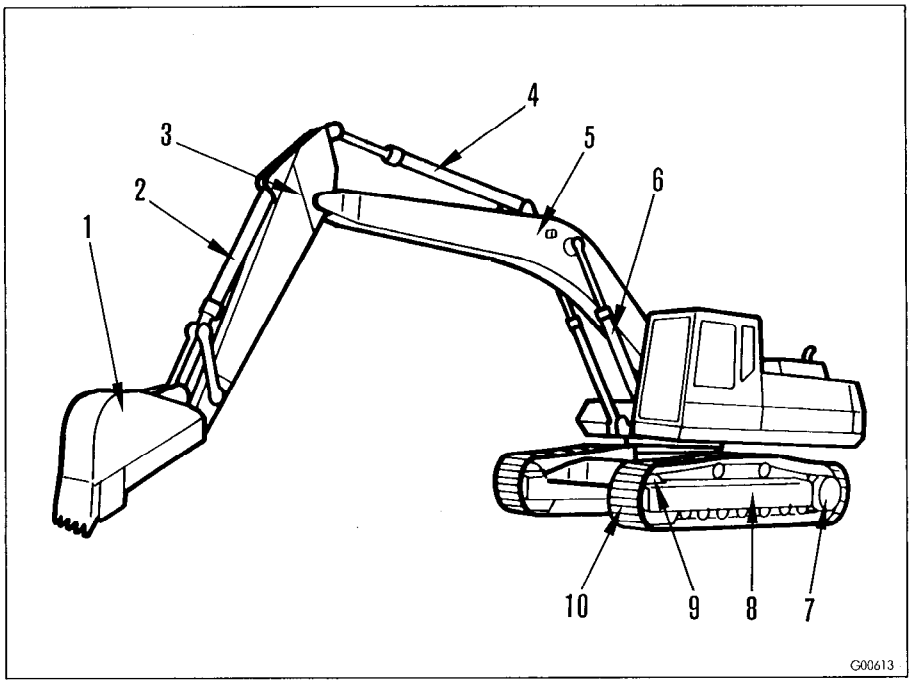
CONTENTS

GENERAL LOCATIONS AND SPECIFICATIONS

1. Bucket
2. Bucket cylinder
3. Arm
4. Arm cylinder
5. Boom
6. Boom cylinder
7. Sprocket
8. Track frame
9. Idler
10. Track shoe

MACHINE MODEL		PC300 -5	PC300LC-5 & PC300LC-5K	PC300-5 MIGHTY	PC300LC-5 MIGHTY	PC300HD -5
PERFORMANCE Bucket capacity (m^3)	[SAE]	1.32	1.32	1.32	1.32	1.32
	[CECE]	1.2	1.2	1.2	1.2	1.2
Travel speed (km/h)	Hi	5.5	5.5	5.5	5.5	4.4
	Lo	3.4	3.4	3.4	3.4	2.5
Swing speed (rpm)		10	10	10	10	10
OPERATING WEIGHT (kg)		29800	31000	30400	31200	36000
ENGINE Model		Komatsu SA6D108 Diesel Engine				
Flywheel horsepower (HP) [Rated rpm]		207 [1950]	207 [1950]	207 [1950]	207 [1950]	207 [1950]

NOTE: Specifications are subject to change without notice.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G00613

INSTRUMENTS AND CONTROLS

ELECTRONIC MONITOR & CONTROL CONSOLE (EMACC)

This monitor system consists of monitor lamp groups (Ⓐ, Ⓑ, Ⓒ), meter group Ⓓ and switch group Ⓔ.

ⒶCHECK MONITOR GROUP (Check items before starting)

If there is any abnormality, the appropriate monitor lamp will flash.
Check the location where the monitor is flashing, and carry out the Checks before starting.

★ When the engine is started, these monitor lamps will go off even if there are abnormalities.

ⒷCAUTION MONITOR GROUP (Caution items)

If any abnormality occurs while the engine is running, the appropriate monitor lamp will flash to indicate the abnormality.

★ Even if any monitor lamp flashes, the machine can operate, but it should be repaired as soon as possible.

ⒸCAUTION MONITOR GROUP (Emergency caution items)

If any abnormality occurs while the engine is running, the appropriate monitor lamp will flash and the alarm buzzer will sound intermittently at the same time.

★ If any monitor lamp flashes, stop the work, and repair it immediately.

ⒹMETER GROUP

This group consists of engine water temperature gauge, fuel gauge, engine pre-heating monitor lamp and swing lock lamp.

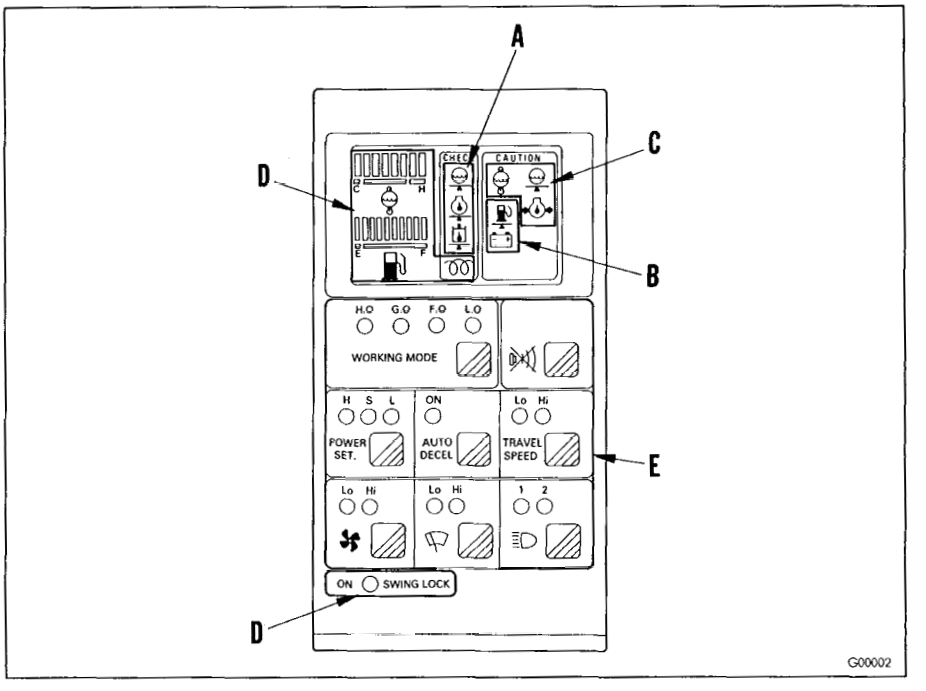
ⒺSWITCH GROUP

This consists of the lamps, car heater, mode selector switches, wiper switch, alarm buzzer stop switch and travel speed switches.

Functional check of the machine monitor system

When the starting switch is turned ON before starting the engine, all the monitor lamps and the gauges light up and the alarm buzzer sounds for about 3 seconds. If any monitor lamp does not light up, there is probably a broken bulb or disconnection in the monitor, so ask your Komatsu distributor to inspect it.

★ Park the machine on level ground and check the monitor lamps.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CHECK
CAUTION
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WORKING MODE
H S L
POWER SET.
ON
AUTO DECEL
Lo Hi
TRAVEL SPEED
Lo Hi
Lo Hi
1 2
ON
SWING LOCK
G00002

A: CHECK MONITOR GROUP (Check items before starting)

★ Do not rely on the "CHECK MONITOR GROUP (Check before starting)" only for the check before starting. Always make the check by referring to the section on CHECK BEFORE STARTING.

1. RADIATOR COOLANT LEVEL MONITOR

This warns of any drop in the radiator cooling water level.

If it flashes, check the cooling water level in the radiator and sub-tank, and add water.

2. ENGINE OIL LEVEL MONITOR

This monitor indicates a low oil level in the engine oil pan.

If the monitor lamp flashes, check the oil level in the engine oil pan and add oil as required.

3. HYDRAULIC OIL LEVEL MONITOR

This monitor indicates a low oil level in the hydraulic tank. If the monitor lamp flashes, check the oil level in the hydraulic tank and add oil as required.

B: CAUTION MONITOR GROUP (Caution items)

★ If the warning monitor flashes, carry out the necessary action as soon as possible.

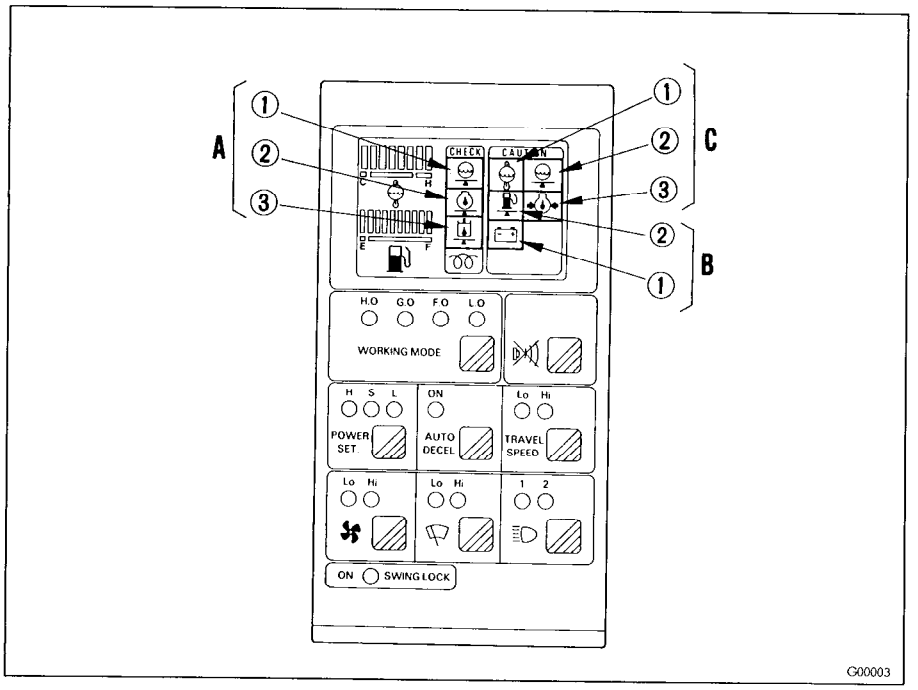
★ Park the machine on level ground and check the monitor lamps.

1. CHARGE MONITOR

This monitor indicates an abnormality in the charging system while the engine is running.

If the monitor lamp flashes, check the charging circuit.

★ This monitor lamp lights when the starting switch is turned to ON immediately after the engine is started. It does not indicate an abnormality.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WORKING MODE
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AUTO DECEL
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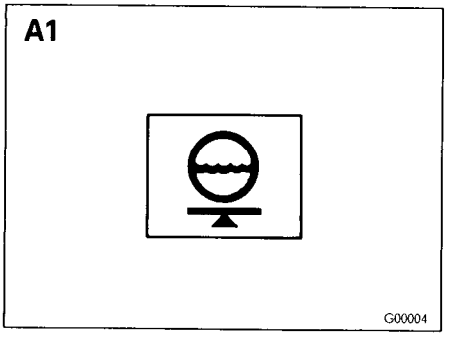
1 2
ON SWING LOCK
G00003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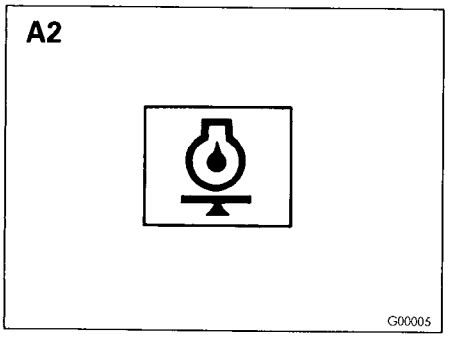
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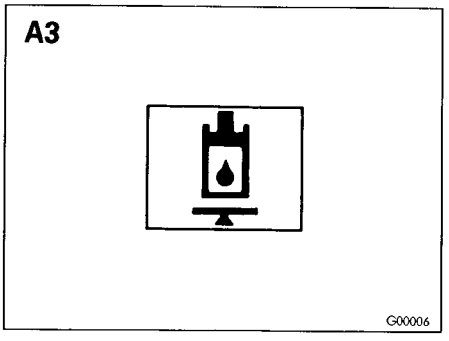
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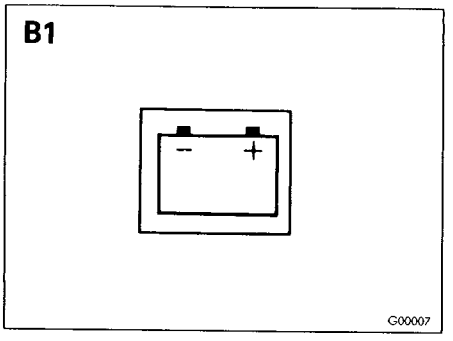

B1
G00007

2. FUEL LEVEL

This warns that the fuel level is low.

If it flashes, stop the engine, then check the fuel level and add fuel.

C: CAUTION MONITOR GROUP (Emergency caution items)

★ If the monitor flashes, stop the engine immediately or run it at low idling, then take the appropriate action.

★ Park the machine on level ground and check the monitor lamps.

1. ENGINE COOLING WATER TEMPERATURE MONITOR

This warns of any rise in the engine cooling water temperature.

If it flashes, the engine overheat prevention system is automatically actuated to run the engine at low idling until the engine water temperature gauge enters the green range.

2. RADIATOR COOLANT LEVEL MONITOR

This monitor indicates a low radiator coolant level.

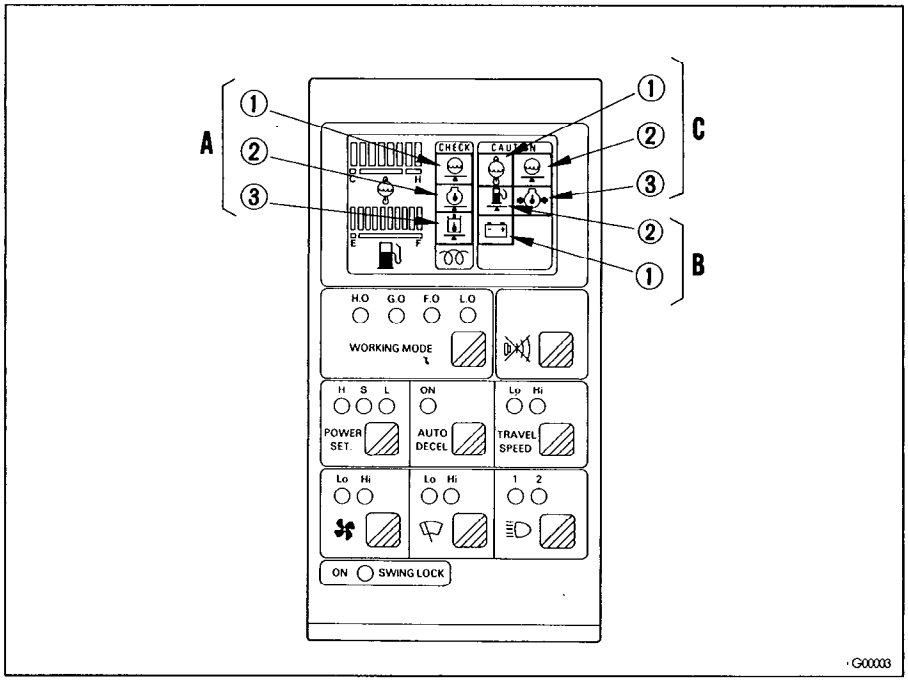
Check the coolant level when the alarm buzzer sounds and this monitor lamp flashes, stop engine and add water as required.

3. ENGINE OIL PRESSURE MONITOR

This monitor indicates a low engine oil pressure.

If the alarm buzzer sounds and this lamp flashes, the engine oil pressure is below the lower limit. Immediately stop the engine.

★ This monitor lamp lights and the alarm buzzer sounds, when the starting switch is turned to ON immediately after the engine is started. It does not indicate an abnormality.



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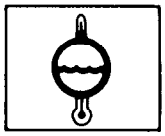

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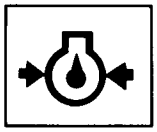
C3



G00012

D: METER GROUP

★ Confirm that gauges (1), (2) and monitor lamp (3) will light, when the starting switch is turned to **ON** before starting the engine. If any gauge or monitor lamp does not light, ask your Komatsu distributor to inspect that monitor lamp or gauge.

1. ENGINE COOLING WATER TEMPERATURE GAUGE

This gauge indicates the temperature of the cooling water. If the temperature is normal during operation, the green range will light. If the red range lights up during operation, the engine overheat prevention system is actuated.

★ The engine overheat prevention system acts as follows.
Red range (1) lights up:
The power mode is switched to L mode for each working mode and the caution lamp flashes.
Red range (2) lights up:
The engine speed is reduced to low idling, the caution lamp flashes and the alarm buzzer sounds at the same time.

★ The engine overheat prevention system is actuated until the temperature returns to the green ragne.

★ If red range (2) lights up, after the engine water temperature is lowered, turn the fuel control dial to low idling (MIN) to cancel the display.

(a): White
(b): Green
(c): Red

2. FUEL GAUGE

This gauge indicates the amount of fuel in the fuel tank. If there is enough fuel in the tank while the engine is running, the green range lights. If the red range lights, there is less than 55 liters of fuel in the tank.

When the red range lights, add fuel.

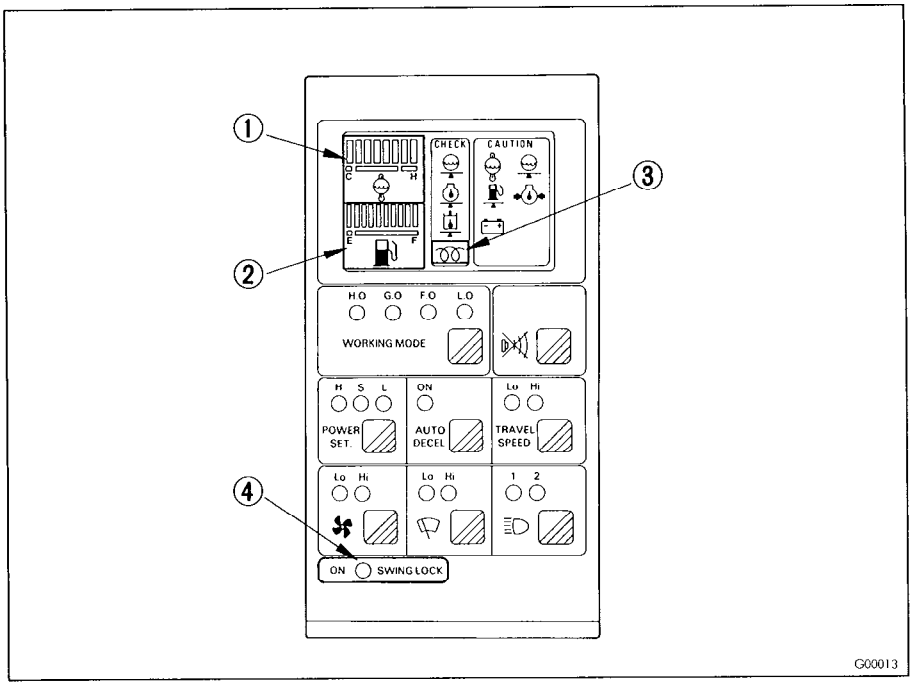
★ After the starting switch is turned ON, the correct level may not be displayed for a moment, but this does not indicate any abnormality.

(a): Red
(b): Green

3. ENGINE PRE-HEATING MONITOR LAMP

This shows the preheating time when starting the engine at temperatures below 0°C.

It lights up when the starting switch is turned to the HEAT position, and if it is kept in that position, the lamp flashes after approx. 30 seconds to inform that preheating is completed. (After flashing for approx. 10 seconds it goes out.)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AUTO DECEL
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TRAVEL SPEED
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Lo Hi
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SWING LOCK
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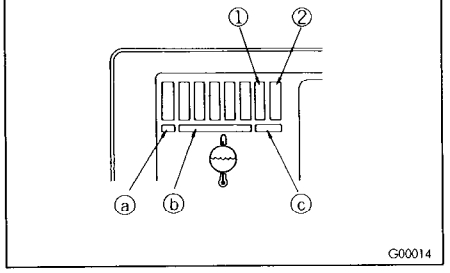
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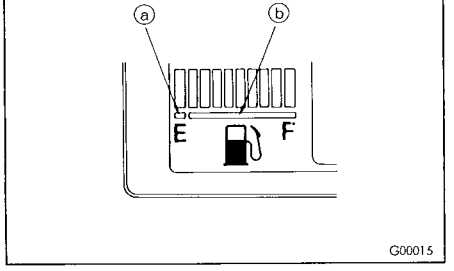
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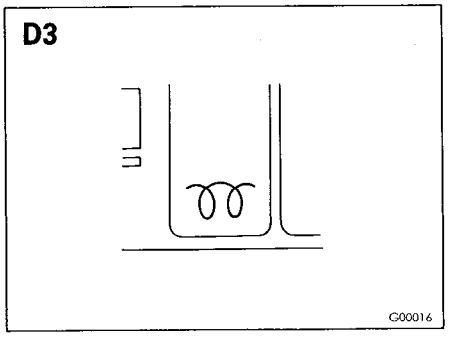
D3

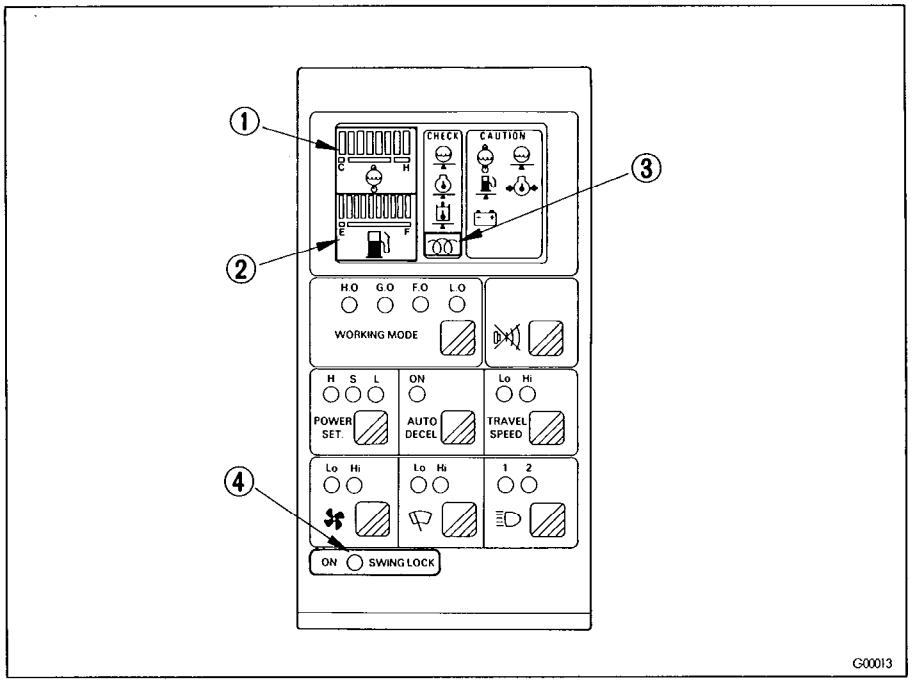

G00016

4. SWING LOCK LAMP

This informs the operator that the swing lock is being actuated.

Actuated: Lights up

★ When the swing lock switch is turned ON (ACTUATED), the lamp lights up.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CHECK
CAUTION
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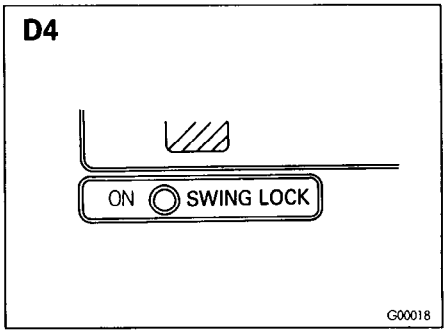
H.O G.O F.O L.O
WORKING MODE
H S L
POWER SET
ON
AUTO DECEL
Lo Hi
TRAVEL SPEED
Lo Hi
Lo Hi
1 2
ON SWING LOCK
G00013


D4
ON SWING LOCK
G00018

E: SWITCHES

1. WORKING MODE SELECTOR SWITCH (BASIC MODE)

This switch is used to set the movement or power for the work equipment to match the content or purpose of the operation.

H.O (heavy-duty operation mode) lights up:

This is used for heavy-duty work.

G.O (general operation mode) lights up:

This is used for ordinary work.

F.O (finishing operation mode) lights up:

This is used for leveling or grading work.

L.O (lifting operation mode) lights up:

This is used for fine control operations.

★ When starting the engine, the general operation mode (S mode) is automatically selected.

2. POWER MODE SWITCH (SELECTED MODE)

This switch is used to set output force for the work equipment to match the content or soil quality for the operation.

H lights up:

This is used for high productivity loading operations.

S lights up:

This is used for normal operations.

L lights up:

This is used for grading or other light-duty operations.

3. AUTO-DECELERATION SWITCH (SELECTED MODE)

This switch is used to actuate the auto-deceleration system so that the engine speed is lowered when all the control levers are at neutral.

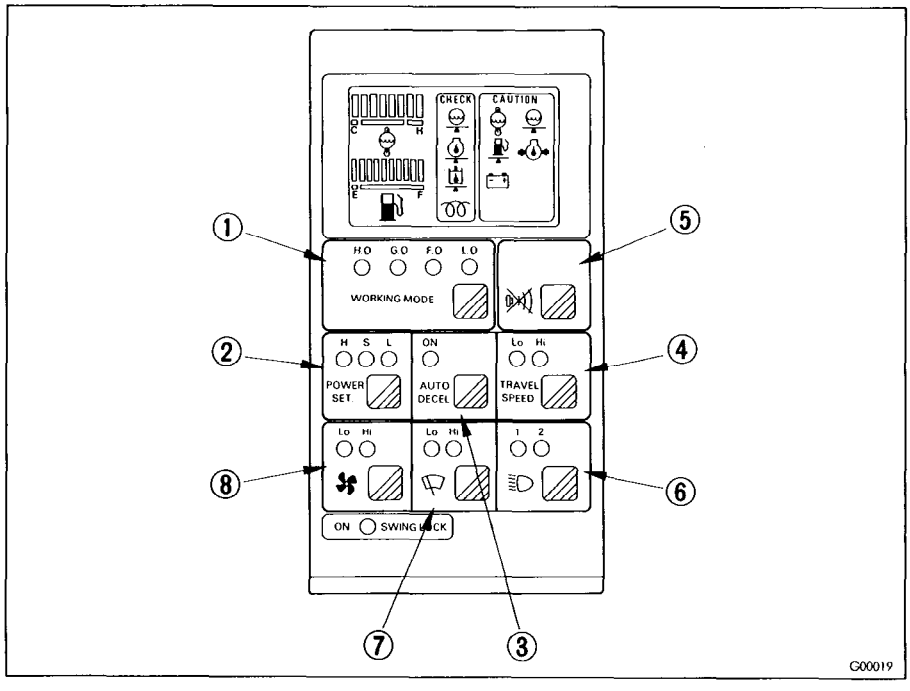
ON lights up:

Auto-deceleration is actuated

OFF lights up:

Auto-deceleration is canceled

★ For the use of switches 1, 2, and 3, see METHOD OF USING MODE SELECTOR SWITCHES.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WORKING MODE
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AUTO DECEL
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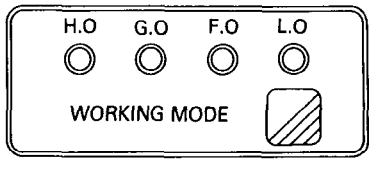
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WORKING MODE
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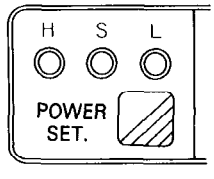
E2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POWER SET.
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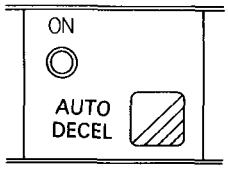
E3


ON
AUTO DECEL
G00022

4. TRAVEL SPEED SWITCH

This is used to select the two travel speeds.

Lo lights up:
Low speed travel
Hi lights up:
High speed travel

★ When traveling in Hi, the travel speed is automatically switched to low speed travel (Lo) to match the travel surface on soft ground or when traveling uphill, so there is no need to operate this switch.

★ If this switch is operated when the machine is traveling, it may cause deviation, so always stop the machine before operating the switch.

5. ALARM BUZZER STOP SWITCH

This switch is used to stop the alarm buzzer when it has sounded to warn of some abnormality while the engine is running.

6. LAMP SWITCH

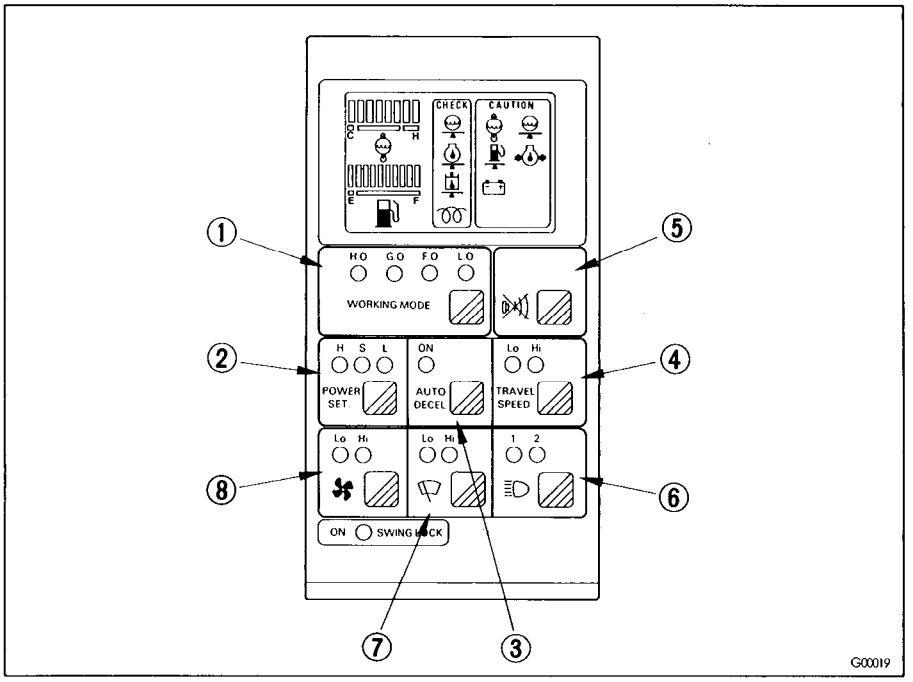
This lights up the head lamps and panel lamps.

Position 1:
Panel lamps light up
Position 2:
Panel lamps and head lamps light up
OFF: Panel lamps and head lamps are OFF

7. WIPER SWITCH

This operates the wipers for the front window.

Lo lights up:
Intermittent wiper operation
Hi lights up:
Continuous wiper operation
OFF: Wipers stopped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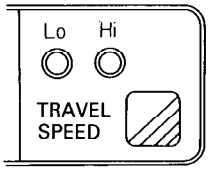
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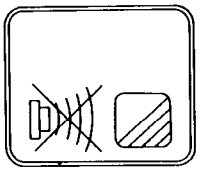
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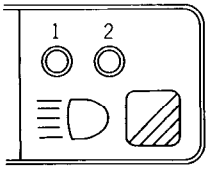
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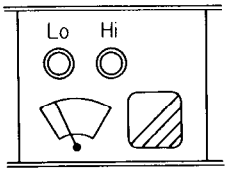
Lo Hi
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8. CAB HEATER SWITCH

This switch is used to heat the operator's compartment. The flow rate of the hot air can be set to two levels.

Lo lights up:
Low wind speed
Hi lights up:
High wind speed
OFF: Cab heater stopped

★ The cab is heated by means of warm water from the engine.
Accordingly, heating can not take place while the engine cooling water is warming up.

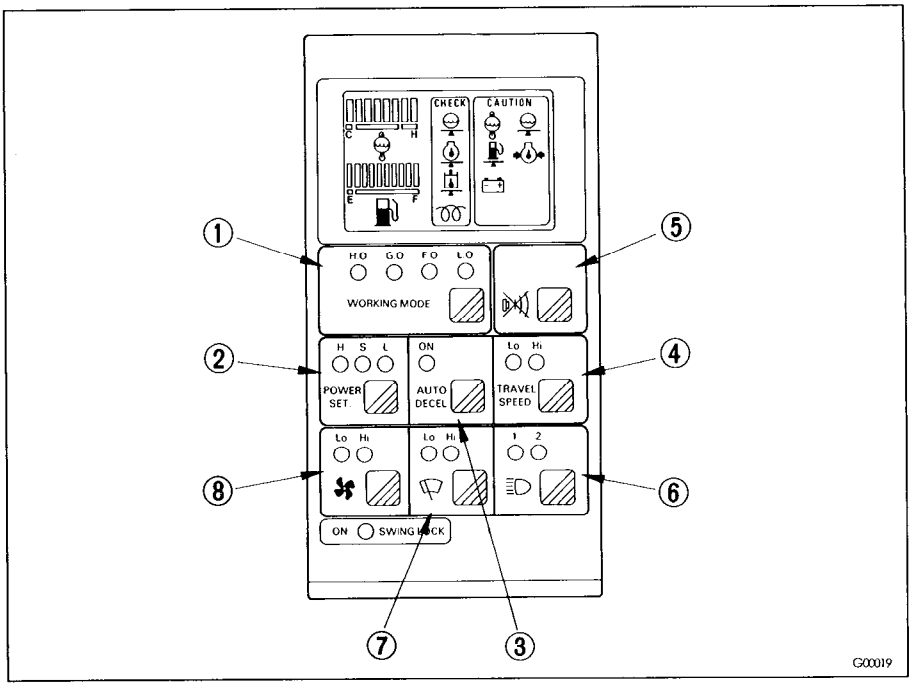
METERS

1. SERVICE METER

This meter shows the total operation hours of the machine. The service meter advances while the engine is running - even if the machine is not traveling.

Refer to the section "SERVICE METER".

★ While the engine is running, the indicator of the meter will rotate to indicate that the meter is turning over.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WORKING MODE
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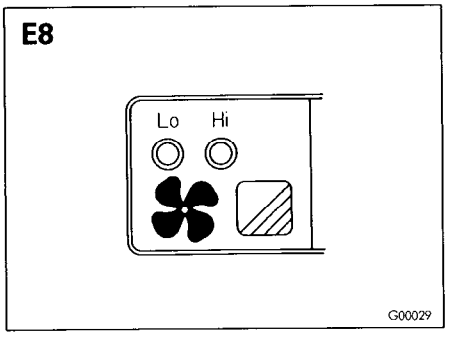
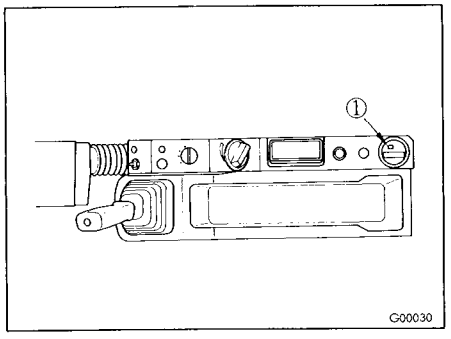

E8
Lo Hi
G00029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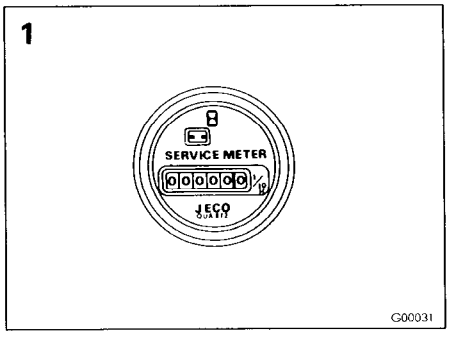

1
SERVICE METER
G00031

SWITCHES

1. STARTING SWITCH

This switch is used to start or stop the engine.

OFF

Key insertion-withdrawal position. None of electrical circuits activate.

ON

Charging and lamp circuits activate. Keep key at ON after starting.

START

At this key position, the starting motor will crank the engine. Release key immediately after starting.

HEAT

Use this position when starting in cold weather.

Release the key to allow it to return automatically to OFF and then, without delay, turn it to START.

★ When starting, be sure to use the starting key.

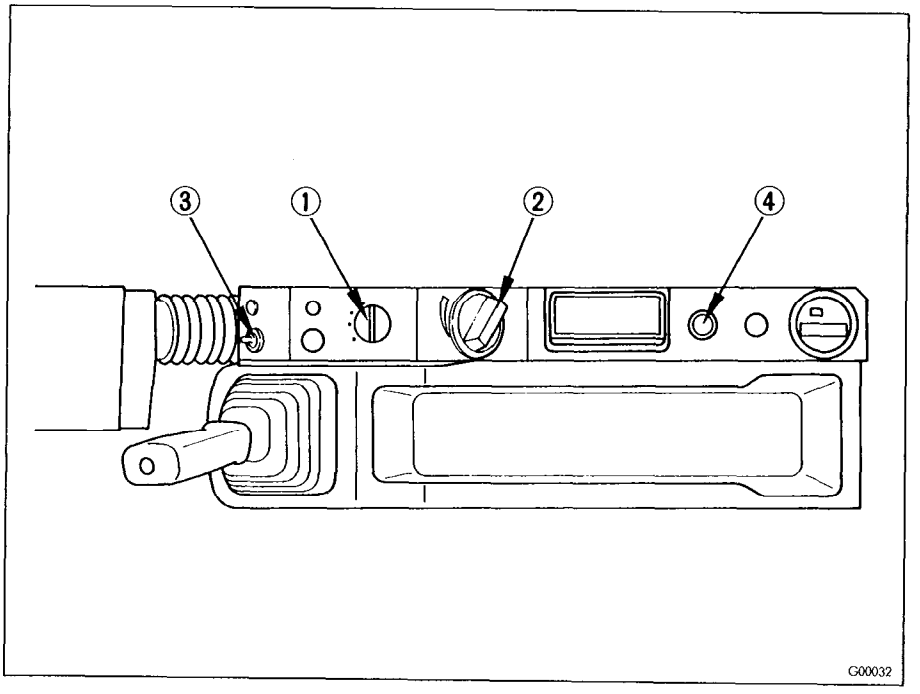
2. FUEL CONTROL DIAL (WITH AUTO-DECELERATION MECHANISM)

This adjusts the engine speed and output.

(1): Low idling (MIN)
Turned fully to the left

(2): Full speed (MAX)
Turned fully to the right

★ To stop the engine, turn the starting switch to the OFF position.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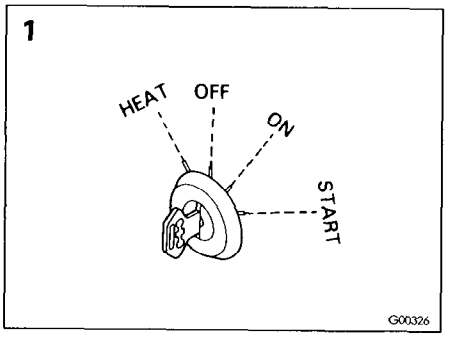
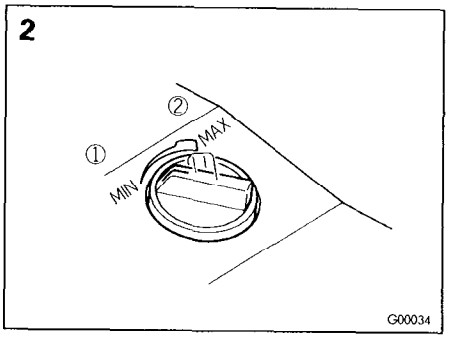

1
HEAT
OFF
ON
START
G00326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MAX
MIN
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3. SWING LOCK SWITCH

This actuates the swing lock.

(a): ON position (actuated)

The swing lock is always applied, and the upper structure will not swing even if the swing is operated. In this condition, the swing lock lamp lights up.

(b): OFF position (canceled)

The swing lock is actuated only when the work equipment and swing control levers are at neutral; it is canceled when the work equipment or swing is operated.

★ At the OFF position, the swing lock is actuated approx. 4 seconds after the work equipment and swing control levers are returned to neutral, and it locks the upper structure in position.

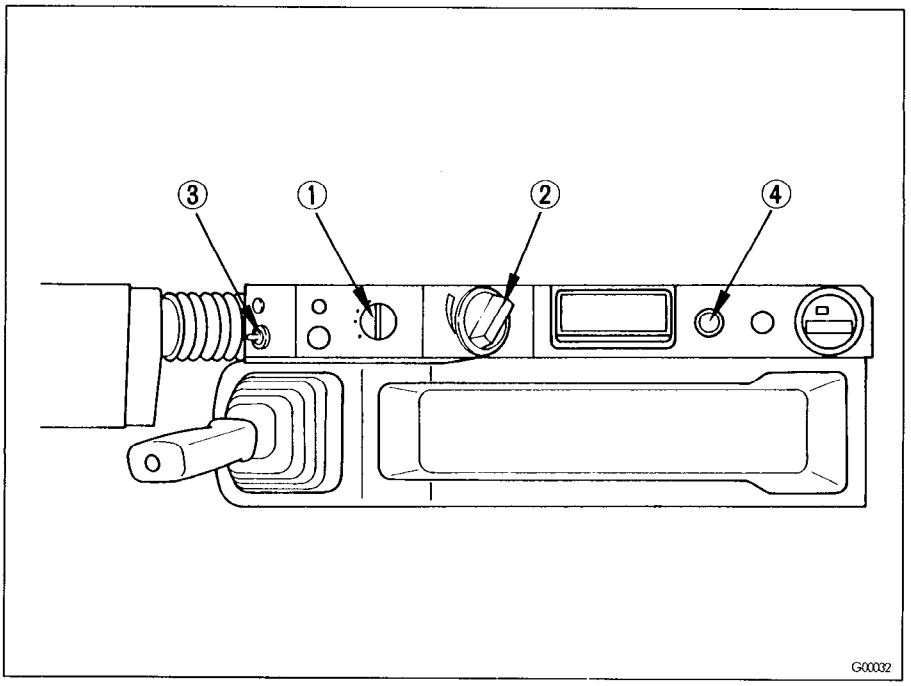
⚠ **When the machine is traveling under its own power, or when the swing is not being operated, always set the switch to the ON (ACTUATED) position.**

(c): Front of machine

4. CIGARETTE LIGHTER

This is used to light cigarettes. To use, push the lighter in. After a few seconds it will spring back.

At that time, remove the lighter and light your cigarette.



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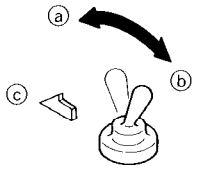

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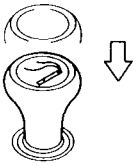


5. POWER MAX. BUTTON

When the button in the center of the knob of the left work equipment control lever is being pressed (max.: approx. 8 sec), the maximum power is increased.

6. HORN BUTTON

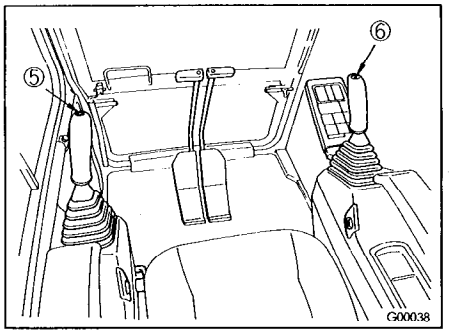
When this button is pressed, the horn will sound.

7. ROOM LAMP SWITCH

When this switch is moved to ON position, room lamp will light.

(a): Press to switch on.

(b): Press to switch off.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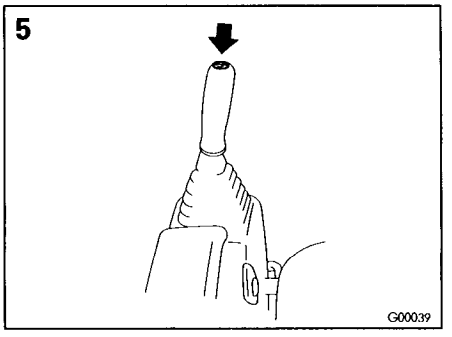
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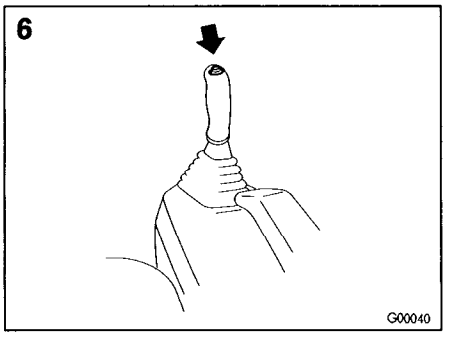
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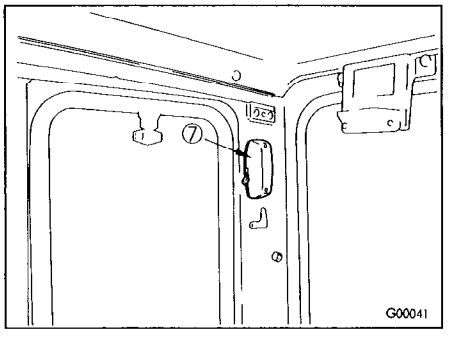
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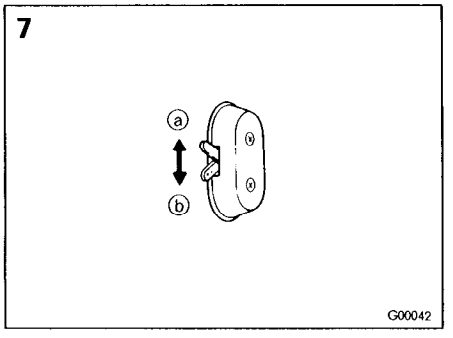
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G00042

LEVERS

1. LOCK LEVER

This locks the work equipment, travel, and swing. Lower the lever to apply the lock.

⚠ **When parking the machine or leaving the machine, always lower the bucket to the ground, and apply this lever to lock the control levers.**

★ This lock lever is a hydraulic lock, so even if it is in the lock position, the work equipment control lever and travel lever will move, but the work equipment, travel motor, and swing motor will not work.

(a): Free
(b): Lock

2. TRAVEL LEVERS (WITH PEDAL, AUTO-DECELERATION MECHANISM)

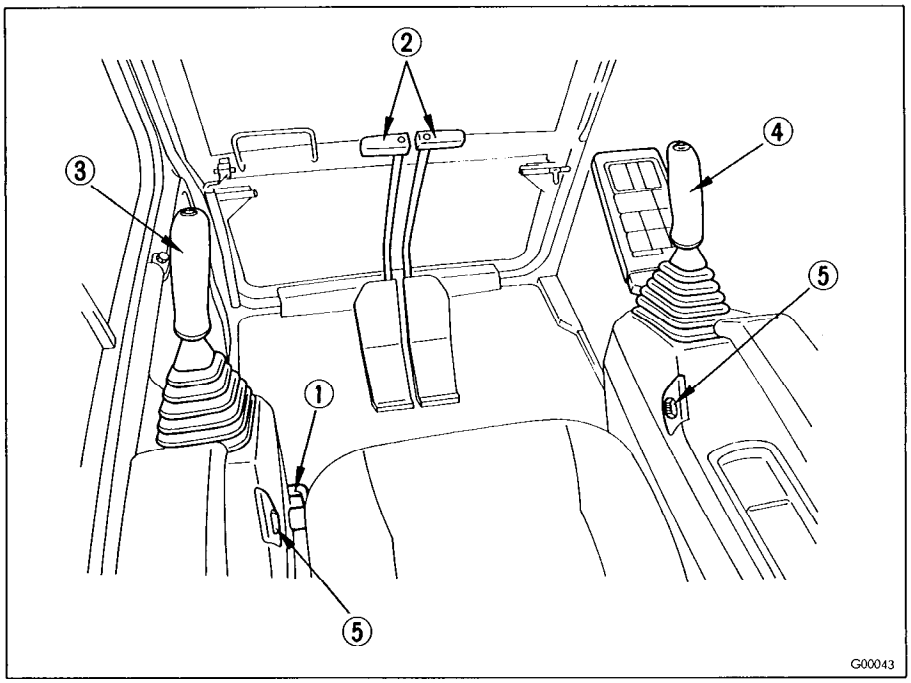
(1) FORWARD:
The lever is pushed forward
(The pedal is angled forward)
(2) REVERSE:
The lever is pulled back
(The pedal is angled back)
N (Neutral): The machine stops
★ ( ): This indicates operatin of the pedal.

⚠ **Do not put your foot on the pedal unless you are using it.**

3. LEFT WORK EQUIPMENT LEVER (arm/swing control lever) (with auto-deceleration device)

(N) Neutral:
When the lever in this position, the upper works and the arm will be retained in the position in which they stop.

Arm operation
(A)Arm moves out.
(B)Arm moves in.
Swing operation
(C)Upper works swings to the right.
(D)Upper works swings to the left.



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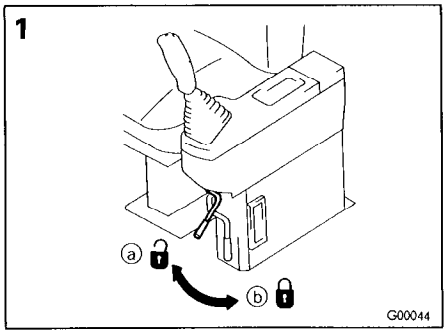

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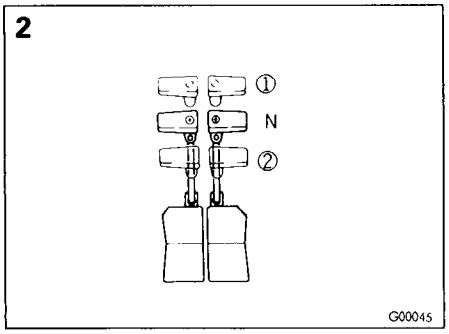

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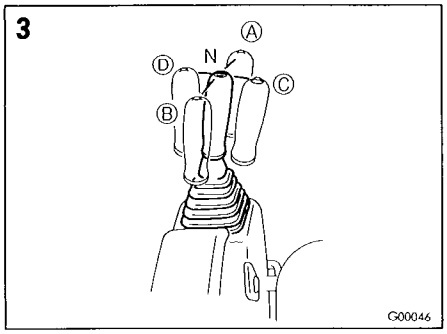


4. RIGHT WORK EQUIPMENT LEVER (boom/bucket control lever) (with auto-deceleration device)

(N)Neutral:

When the lever in this position, the boom and the bucket will be retained in the position in which they stop.

Boom operation

(1)Boom raises.

(2)Boom lowers.

Bucket operation

(3)Bucket dumps.

(4)Bucket curls.

★ For levers 2, 3, and 4, the engine speed changes as follows because of the auto-deceleration mechanism.

- When the travel lever and work equipment control levers are at neutral, even if the fuel control dial is above the mid-range position, the engine speed will drop to a mid-range speed.
  If any of the levers are operated, the engine speed will rise to the speed set by the fuel control dial.
- If all control levers are set to neutral, the engine speed will drop by approx. 100 rpm, and after approx. 4 seconds, the engine speed will drop to the deceleration speed (approx. 1400 rpm).

⚠ **If any lever is operated when in the deceleration range, the engine speed will suddenly increase, so be careful when operating the levers.**

5. FORWARD ADJUSTMENT BUTTON FOR WORK EQUIPMENT CONTROL LEVER

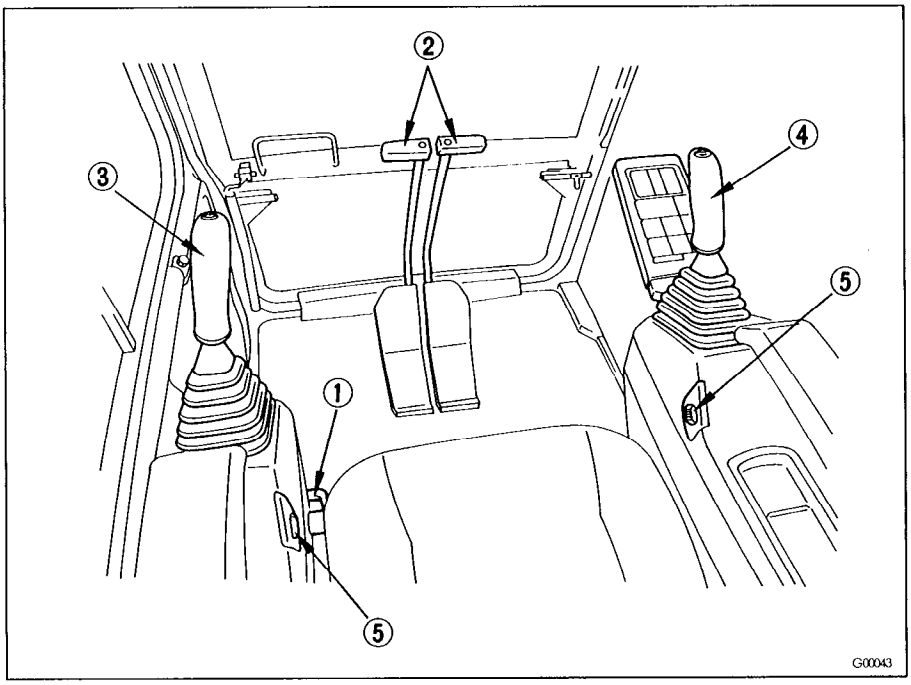
If the button at the side of the left and right console boxes is pressed, it is possible to move the console box forward in two stages.

N: Neutral position

F1: Middle position

F2: Deep excavation position

★ The left console box only can also be adjusted back from the N position. Use this position when getting on or off the machine.



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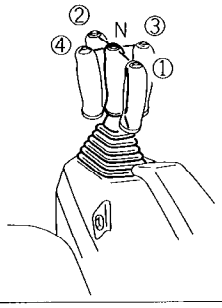

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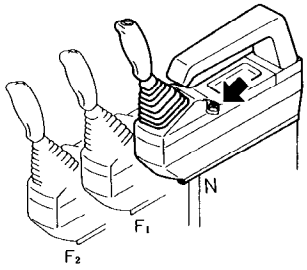


DUST INDICATOR

This device indicates clogging of the air cleaner element. When red piston (1) appears in the transparent part of this indicator, the element is clogged. Immediately clean element.

After cleaning, push indicator button (2) to return red piston to original position.

This is behind the air cleaner inside the engine hood.

DOOR LOCK

Use the door lock to fix the door in position after opening it.

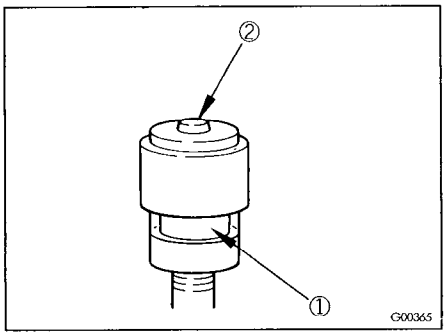
1. The door will become fixed in place when it is pressed against magnetic catch (1).
2. To release the lock, press knob (2) down at the left side of the operator's seat to release the catch.

★ When fixing the door, fix it firmly to the magnetic catch.

CEILING WINDOW

Ceiling window is opened by releasing the lock in the direction of the arrow and pushing the handle.

★ When opening or closing the ceiling window, grasp the handle.
Do not push in grasping staydumper (A).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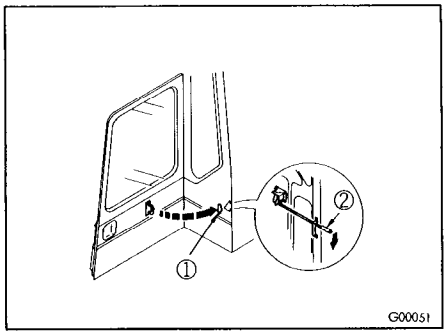
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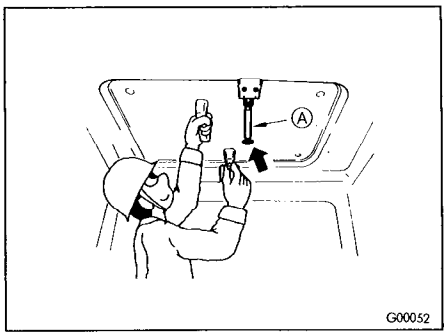
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FRONT WINDSHIELD

It is possible to store (pull up) the front window (top) in the roof of the operator's compartment.

When opening

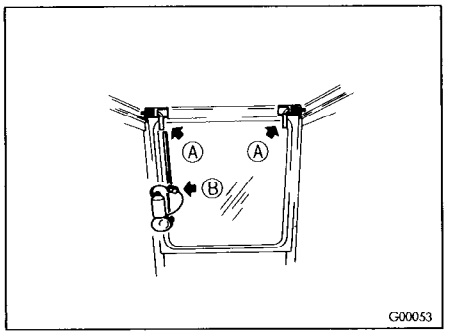
1. Stop the machine on flat ground, lower the work equipment to the ground, and stop the engine.
2. Lock the left and right work equipment control levers and travel levers.
3. Disconnect the wiring for the wiper motor from socket (B).
4. Pull lock pins (A) at the top left and right sides of the front window to the inside to release the lock.
5. From the inside of the operator's cab, hold the bottom grip with the left hand and the top grip with the right hand, pull up the window, and push it in fully until it is locked by catch (C).
6. Lock with lock pins (A) on the left and right sides.

When closing

1. Stop the machine on flat ground, lower the work equipment to the ground, and stop the engine.
2. Lock the left and right work equipment control levers and travel levers.
3. Release lock pins (A).
4. Hold the grip at the bottom of the front window with your left hand and the grip at the top with your right hand, release the lock of catch (C) with your right thumb, then pull the top grip slowly and lower the front window. When releasing the lock of catch (C), push release lever (D) in the direction of the arrow to release the lock.
5. Lock securely with lock pins (A) at the left and right sides.
6. Connect the wiper motor wiring to socket (B).

Removing front window (bottom)

With the front window open, remove lock pin (E), and the bottom part of the front window can be removed. Store the removed bottom part of the front window at the rear of the operator's cab.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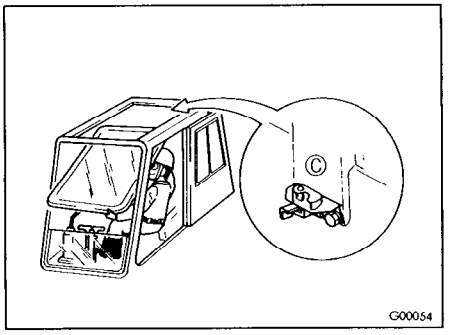
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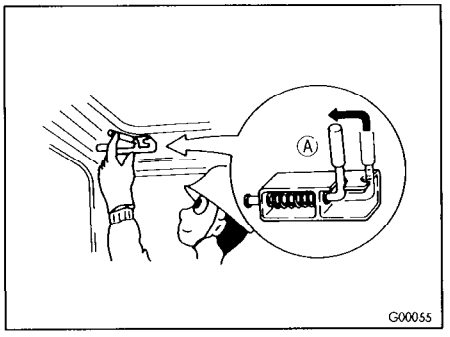
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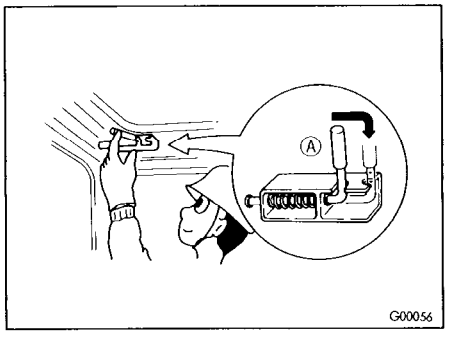
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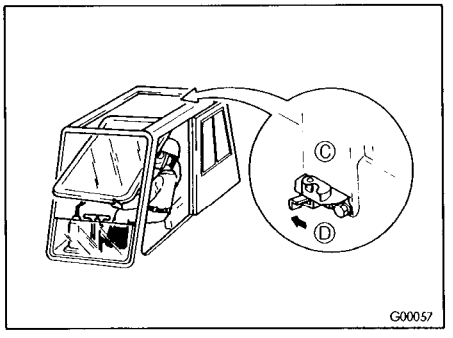
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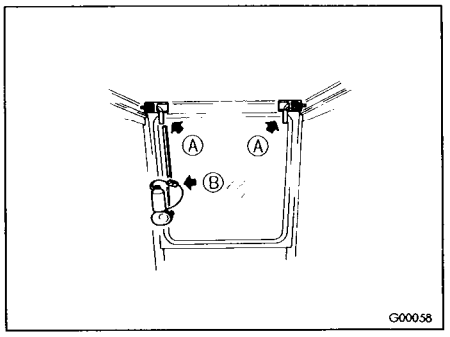
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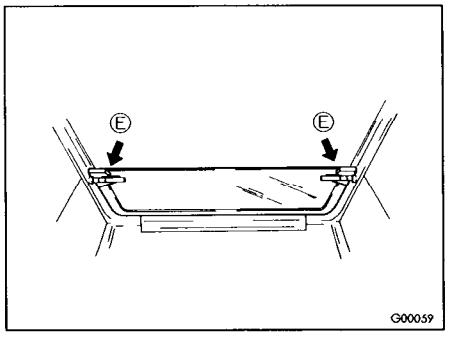
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OPERATOR'S SEAT

The seat adjustment should be checked at the beginning of each shift and when operators change.

Ⓐ Forward-backward adjustment

Move lever (1) to the right, move the seat to the best position and release the lever. The seat can be moved forward or backward over 160 mm in nine stages.

Ⓑ Backrest adjustment

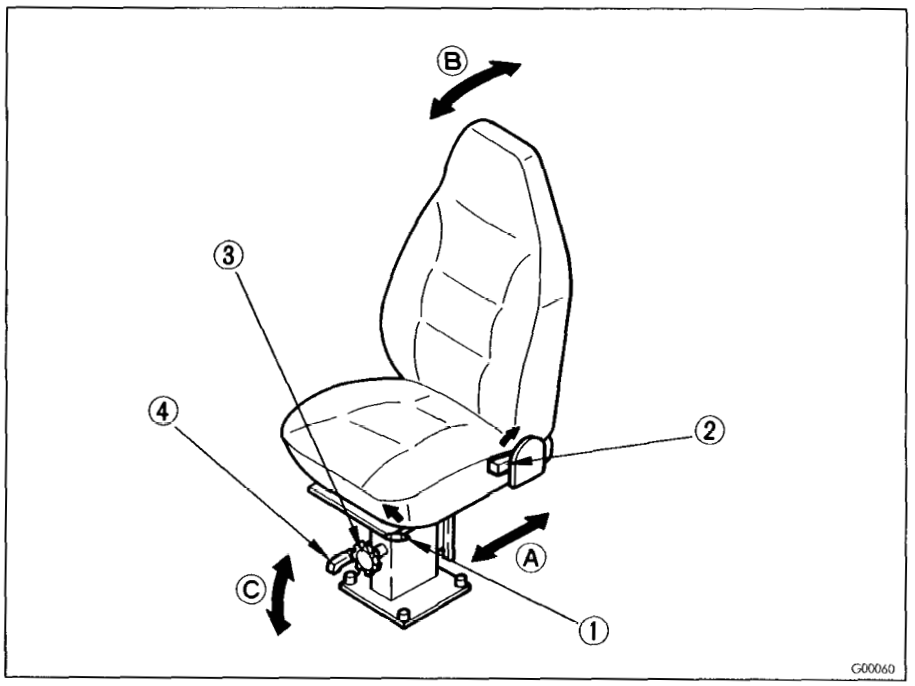
Pull lever (2) in the direction of arrow, move the back-rest to the desired position and release the lever.

Ⓒ Up-down adjustment of seat

When carrying out the adjustment, stop the engine and lock the left and right work equipment control levers with the lock lever.

Up-down adjustment range: 110 mm (5 stages)

1. Turn knob (3) to the left to loosen it, then pull up lever (4).
2. Align the pin hole in the mount base with the seat bracket pin hole at the desired height, then return lever (4) and insert pin (5).
   Turn knob (3) to the right to fix the seat in position.



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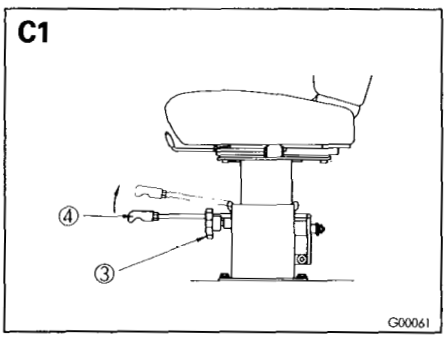

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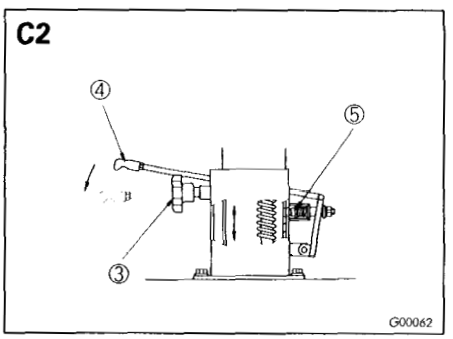


FUSE BOX

The fuses protect the electrical equipment and wiring from burning out.

If the fuse becomes corroded, or white powder can be seen, or the fuse is loose in the fuse holder, replace the fuse.

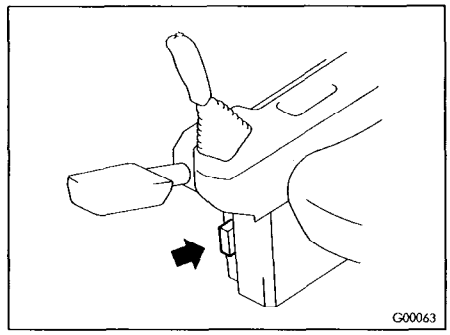
★ Replace a fuse with another of the same capacity.

⚠ **Before replacing a fuse, be sure to turn off the starting switch.**

Fuse arrangement and circuit

★ Spare fuses (two of 10A, one of 15A) are kept in the spare fuse box.

No.	Fuse capacity	Circuit	Remark
①	10A	Pump controller, solenoid	—
②	10A	Engine governor controller	—
③	10A	Monitor, buzzer	—
④	15A	Heater (air conditioner, cooler)	—
⑤	10A	Right head lamp, working lamp	—
⑥	10A	Room lamp, radio	—
⑦	10A	Wiper motor, horn (window washer)	—
⑧	10A	Cigarette lighter	—
⑨	10A	Battery relay, glow plug, start signal	—
⑩	10A	Spare (swing flasher)	—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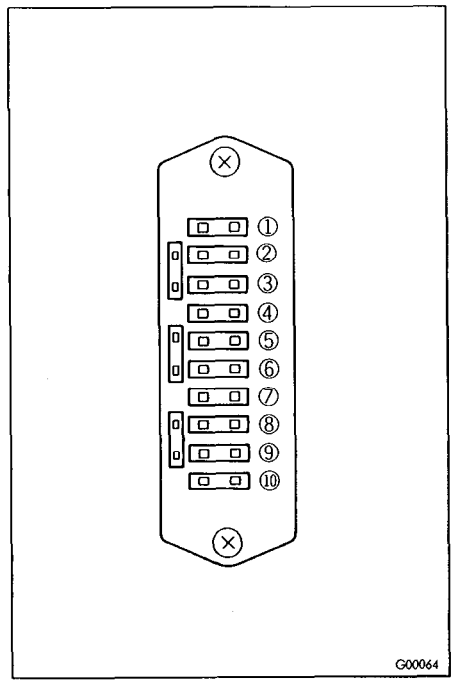
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FUSIBLE LINK

If the starting motor does not turn even when the starting switch is turned to START position, a possible cause is a disconnection in the wire-shaped fusible link (1), so check and replace if necessary.

ELECTRONIC MONITOR AND CONTROL CONSOLE (EMACC)

The angle of the monitor panel can be changed to make it easier to see.

When changing the angle, use both hands, and always stop the monitor panel at a position where it is held in the notch.

★ Range of adjustment: 30° (3 stages)

CONTROLLERS

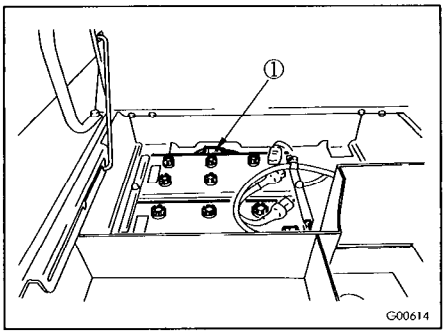
PUMP CONTROLLER

This informs of the location of any abnormality in the electronic control system of the pump.

A 2-digit display (01 — 29) indicates the location of the abnormality.

When the electronic control system is normal, the display in the table is shown.

★ If a display is given to show an abnormality, see TROUBLE SHOOTING GUIDE.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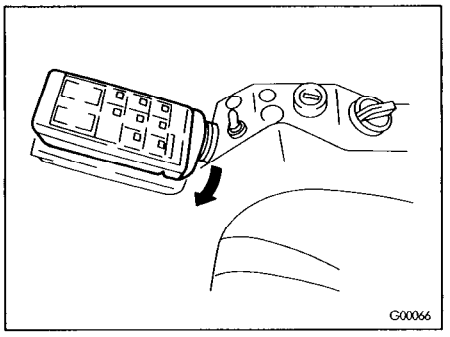
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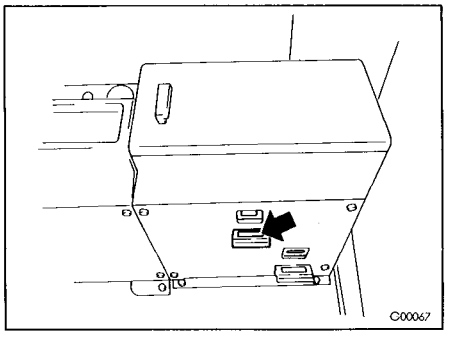

G00067

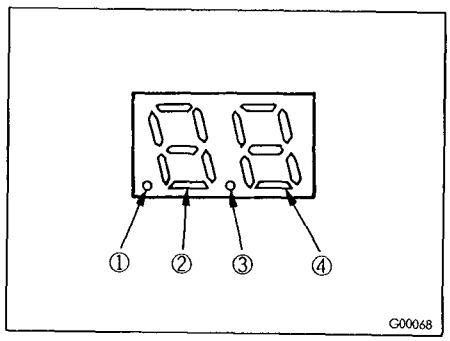
When normal

No.	Input mode and condition		Display
①	Power source monitor (with starting switch ON		Lights up
②	Power mode	H mode	H
		S mode	S
		L mode	L
③	Engine speed signal monitor (when engine is running)		Flashes
④	Working mode	Heavy-duty operation mode	1
		General operation mode	2
		Finishing operation mode	3
		Lifting operation mode	4

★ The combinations given in the table above are displayed according to the input mode and machine condition.
★ Engine speed signal monitor (3) flashes according to the engine speed. (At 2000 rpm, it flashes approx. 20 times/10 sec)
★ When switching the input, the following display is given.

When switching input		Display
When electric power is switched on (0.5 sec)		. 6
Switching travel speed	Hi	.H. 1
	Lo	.L.0
Auto-deceleration switch		.A.d
Swing lock switch		.b.S
Work equipment, Swing control lever		.P.2
Service control lever		.P.4
Travel lever		.P.6
Power max. button		.U.P

The display is given for 0.5 — 1.5 sec after the input is switched.


①
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③
④
G00068

ENGINE THROTTLE CONTROLLER

This informs of the location of any abnormality in the control system for the electrically controlled throttle. Green and red LEDs (Light Emitting diodes) are installed, and these go out or light up to give a combination that shows the location of the abnormality.

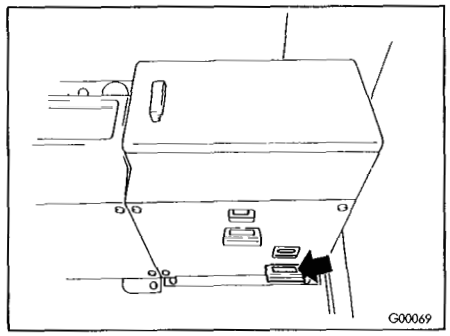
When the electrically controlled throttle is normal, the display is as given in the table.

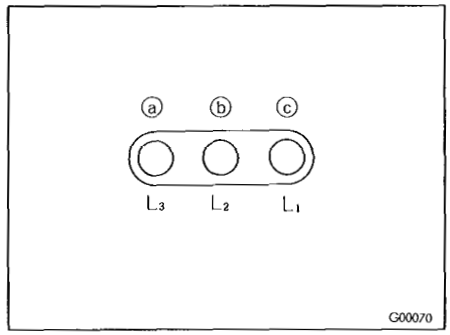
★ If the LEDs light up to show an abnormality, see Causes of TROUBLE SHOOTING GUIDE.

When normal

(a): Red
(b): Green
(c): Red

LED display			Condition of machine
L_3 Red	L_2 Green	L_1 Red	
OFF	OFF	ON	For 5 seconds after power is switched on
OFF	ON	OFF	5 seconds after power is switched on


G00069


ⓐ
ⓑ
ⓒ
L3
L2
L1
G00070

METHOD OF USING MODE SELECTOR SWITCHES

The mode selector switches can be used to switch the mode to match the conditions and purpose of work, thereby enabling efficient operations.

Use the following procedures to make effective use of each mode.

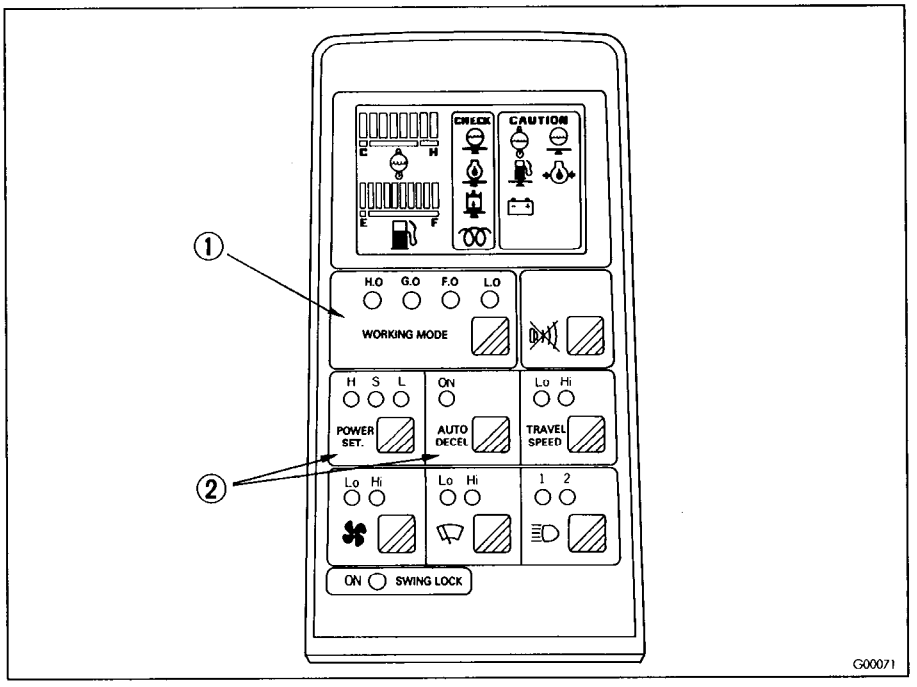
PROCEDURE FOR SETTING MODE SELECTOR SWITCH

SETTING BASIC MODES

When the starting switch is turned ON, the working mode is set to general operation mode, so normal work can be carried out without any need to set the mode. The most effective mode for the type of work is set with the basic mode (1) (working mode switch).

★ The table below shows the condition of the power mode and auto-deceleration, and the most suitable type of work for each setting.

Basic mode	Selected mode		Applicable work
Working mode	Power mode	auto-deceleration	
Heavy-duty control operation mode	H mode	ON	Large digging and loading production in a short time
General operation mode	S mode	ON	Normal digging and loading operations, crushing (breaker) operations
Finishing operation mode	S mode	OFF	Finishing and leveling operations, general hauling operations
Lifting operation mode	L mode	OFF	Positioning, etc.


①
②
CHECK
CAUTION
E
H
E
F
H.O
G.O
F.O
L.O
WORKING MODE
H S L
POWER SET.
ON
AUTO DECEL
Lo Hi
TRAVEL SPEED
Lo Hi
Lo Hi
1 2
ON
SWING LOCK
G00071

SETTING OF SELECTED MODES

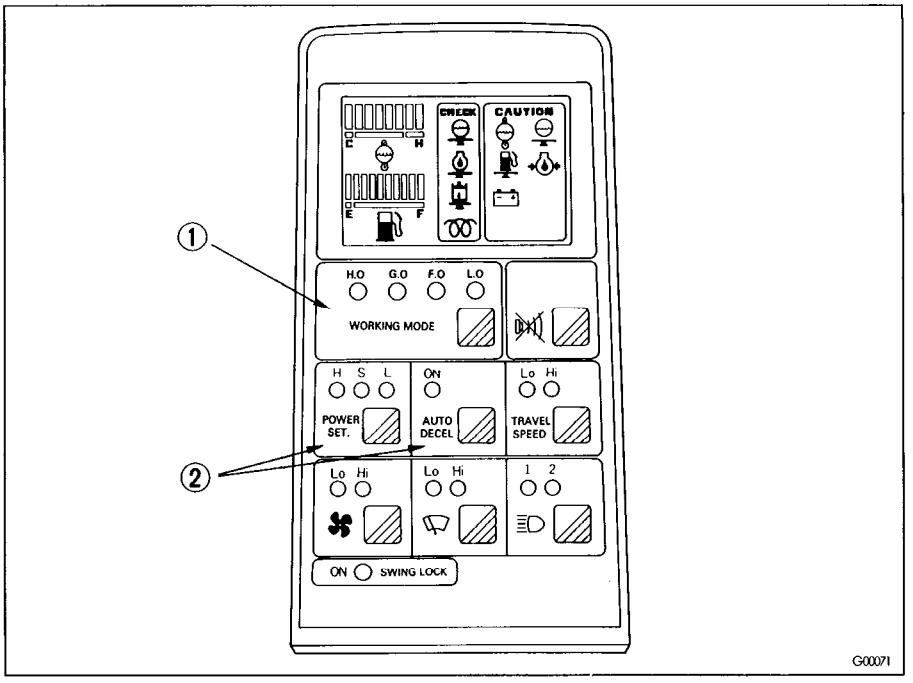
The selected modes are automatically set by setting the basic mode, but after the basic mode is selected, it is possible to change the selected mode (2) as desired.

Power mode

Working mode	Selection of power mode	Effect
Heavy-duty operation mode	H → S	Reduction in fuel consumption
General, finishing operation mode	H ← S	Increase in speed
	S → L	Reduction in fuel consumption
Lifting operation mode	S ← L	Increase in speed

Auto-deceleration

If the auto-deceleration is always actuated, it improves fuel consumption, so we recommend that it always be used. However, if the control levers are operated in small movements, the engine speed changes greatly, so it is better to carry out such operations with the auto-deceleration canceled.


CHECK
CAUTION
H.O
G.O
F.O
L.O
WORKING MODE
H S L
POWER SET.
ON
AUTO DECEL
Lo Hi
TRAVEL SPEED
Lo Hi
Lo Hi
1 2
ON SWING LOCK
1
2
G00071

CHECK BEFORE STARTING

Pre-operation checks forestall machine trouble. Never neglect them.

a. WALK-AROUND CHECK

Look around the machine and under the machine to check for loose nut or bolts, collection of dirt, or leakage of oil, fuel, or coolant, and check the condition of the work equiment and hydraulic system. Check also for loose wiring, play, and collection of dust at places which reach high temperatures.

1. Check for oil leak at high pressure hose, high pressure hose joints and hydraulic cylinder seal.
2. Check tightness of idler mounting bolt.
3. Check tightness of battery terminal.
4. Check radiator for water leaks.
5. Check around the engine for water and oil leaks.
6. Check final drive case for oil leaks and check tightness of sprocket mounting bolt.
7. Check tightness of air cleaner mounting bolt.

b. CHECK AND REFILL COOLANT

Open the cover at the rear of the machine and check that the cooling water is inside the correct range (shown in the diagram on the right) for sub-tank (1). If the water level is low, add water through water filler (2).

(3): FULL

(4): LOW

★ If the volume of coolant added is more than usual, check for possible water leakage.

⚠ **Do not remove the cap while cooling water is hot. Hot water may spout out.**

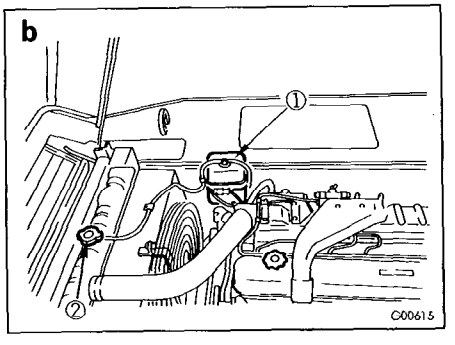
When removing the cap, wait until the water temperature goes down and release radiator pressure little by little by loosening the cap slowly, then remove the cap.

c. CHECK OIL LEVEL IN ENGINE OIL PAN

1. Open the cover at the rear of the machine.
2. Use the dipstick (G) to check the oil level.
3. The oil level should be between mark L and H, if necessary, add oil at the oil filler (F).

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

★ When checking the oil level, park the machine on a level surface, stop the engine and wait for 15 minutes before checking.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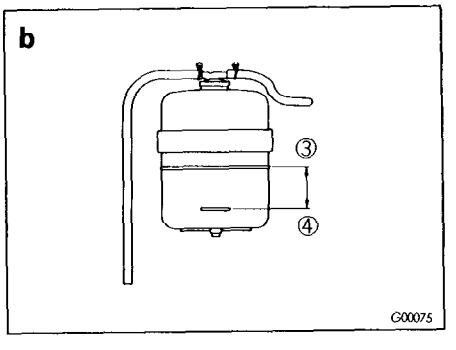
b
③
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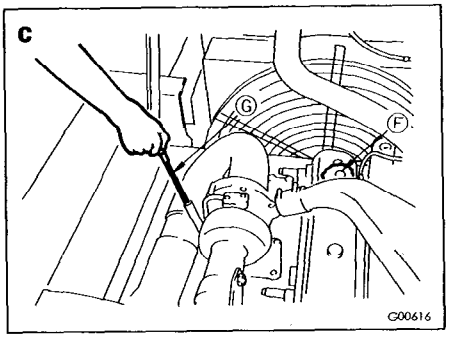
G00075


c
Ⓖ
Ⓕ
G00616

d. CHECK FUEL LEVEL

1. Check the fuel level using sight gauge (G) on the side face of the tank.
2. Upon completion of work, pour in additional fuel through filler (F) until the fuel tank is full.

★ When adding fuel, never let the fuel overflow. This may cause a fire.
★ If breather hole (1) in the cap is blocked up, fuel flow to the engine may stop. Accordingly, clean it from time to time.
★ Fuel capacity: 510 ℓ

e. CHECK OIL LEVEL IN HYDRAULIC TANK

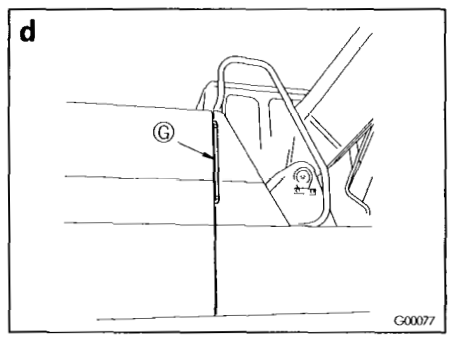
1. Run the engine at low speed, retract the arm and bucket cylinders, then lower the boom, set the bucket teeth in contact with the ground, and stop the engine.
2. Operate all the control levers (work equipment and travel) in all directions to the end of their stroke to release the internal pressure.

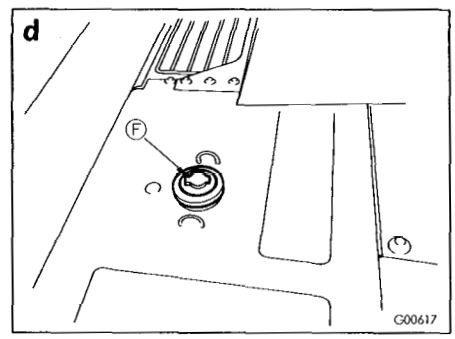
★ Carry out this operation within 15 seconds of stopping the engine.

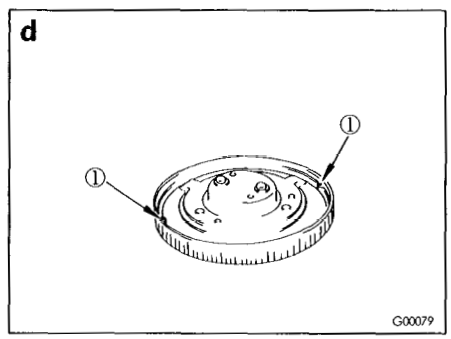
3. If the level of hydraulic oil is not between top H and bottom L lines of sight gauge (G), pour in additional engine oil through filler (F).

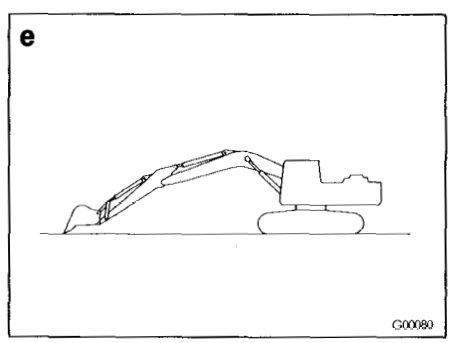
★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
★ Do not pour in additional oil if the level is above the top line H of the sight gauge.
★ The oil level will vary depending upon the oil temperature.
Accordingly, use the following as a guide:

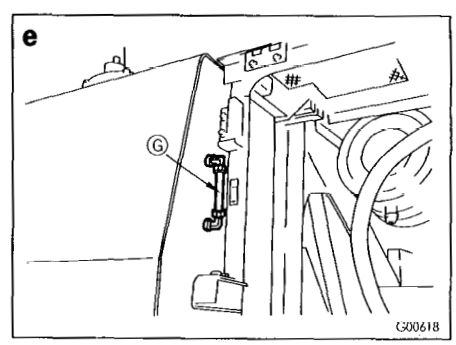
- When the oil temperature is close to the ambient temperature (10 to 30°C), the level will be close to bottom line L on the sight gauge.
- When the oil temperature is the normal operating temperature (50 to 80°C), the level will be close to top line H on the sight gauge.

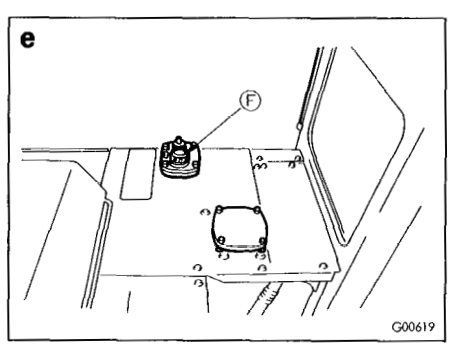

d
G
G00077


d
F
G00617


d
1
1
G00079


e
G00080


e
G
G00618


e
F
G00619

f. CHECK DUST INDICATOR

When the air cleaner element is clogged, the red piston of dust indicator (1) reaches the service level and gets locked.

In that case, clean the element, referring to the section "WHEN REQUIRED".

After cleaning the element, push the button to return the red piston.

g. CHECK ELECTRIC WIRINGS

Check for damage of the fuse and any sign of disconnection or short circuit in the electric wiring. Check also for loose terminals and tighten any loose parts.

Check the following points carefully.

- Battery
- Starting motor
- Alternator

⚠ **If the fuse is damaged or there is any sign of shortcircuiting in the electric wiring, always investigate the cause and correct it.**

★ Please contact your Komatsu distributor for investigation and correction of the cause.

⚠ **Accumulation of flammable material (dead leaves, twigs, grass, etc.) around the battery may cause fire, so always check and remove such material.**

When carrying out walk-around checks or checks before starting, always check if there is any accumulation of flammable material around the battery, and remove such flammable material.

h. LUBRICATE CLAMSHELL BUCKET (except PC300, 300LC-5 MIGHTY)

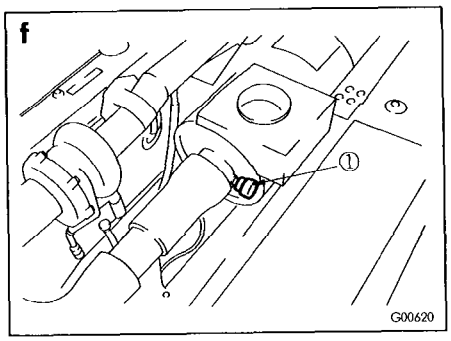
Apply grease to the grease fitting shown by the arrows. (12 points)

i. CHECK FOR SEDIMENT AND WATER IN THE WATER SEPARATOR

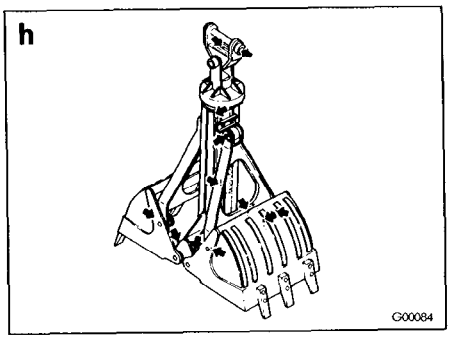
The water separator separates water mixed in the fuel. If float (2) is at or above red line (1), drain the water. For the draining procedure, see section "WHEN REQUIRED".

★ Even if a water separator is installed, be sure to check the fuel tank to remove water and sediment in the fuel.

f



h



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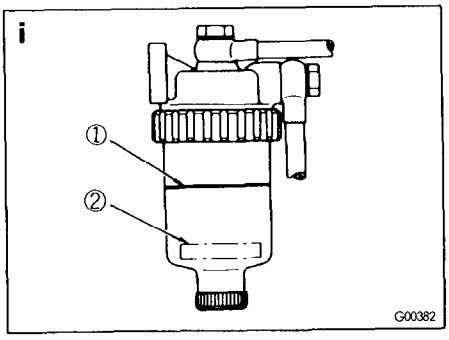


OPERATING YOUR MACHINE

AUTOMATIC WARMING-UP SYSTEM

When the engine is started with the engine coolant temperature below 30°C, even if the fuel control dial is at the low idling position, the engine speed is automatically set for the engine to run at a midrange speed to carry out automatic warming up.

The automatic warming-up is canceled when the engine coolant temperature is above 30°C, or when 10 minutes have passed since starting.

★ Canceling automatic warming-up operation.
It is becomes necessary in an emergency to lower the engine speed to low idling, cancel the automatic warming-up operation as follows.

1. Set the power mode to S mode or H mode.
2. Turn the fuel control dial to the full speed (MAX) position and hold it for 3 seconds.
3. When the fuel control dial is returned to the low idling (MIN) position, the engine speed will drop.

A: BEFORE STARTING THE ENGINE

⚠ **If the control levers are touched by accident, the work equipment may move suddenly. When leaving the operator's compartment, always set the lock lever securely to the LOCK position.**

⚠ **Before starting the engine, use a damp cloth to wipe off the dust accumulated on the top surface of the battery or on the starting motor and the alternator.**

Before starting the engine, check the positions of all levers.

1. Carry out an initial inspection. (For details of the inspection, see CHECK BEFORE STARTING.)
2. Is lock lever (1) in the LOCK position?

(a): Free
(b): Lock

B: TO START THE ENGINE

Before starting the engine, check that the surrounding area is safe.

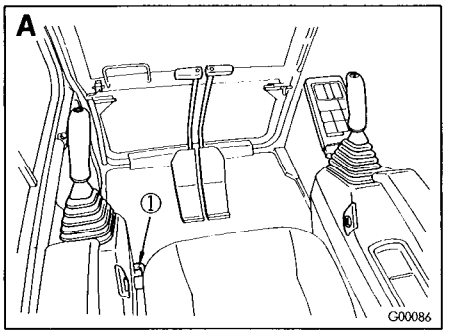
1. Set fuel control dial (1) at the low idling (MIN) position.

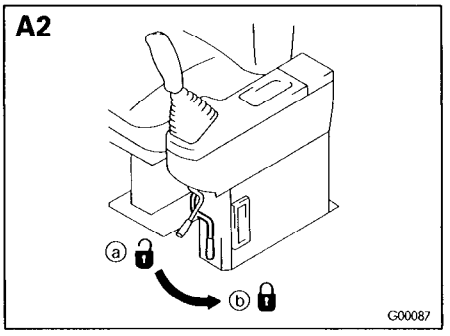
(a): Low idling.

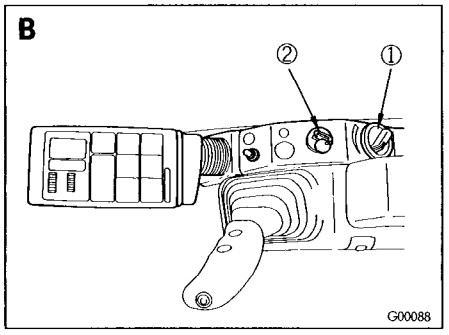
2. Turn the key of starting switch (2) to the START position.
3. When the engine starts, return the key of starting switch (2) to the ON position.
(The key will return automatically when released).

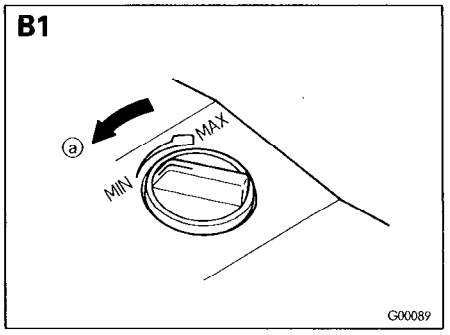
★ If engine will not start, repeat the starting procedure after about 2 minutes.

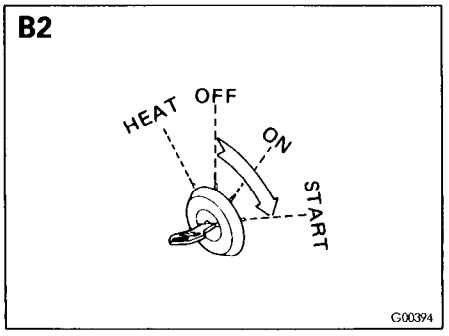
★ Do not leave the key in START for more than 20 seconds.

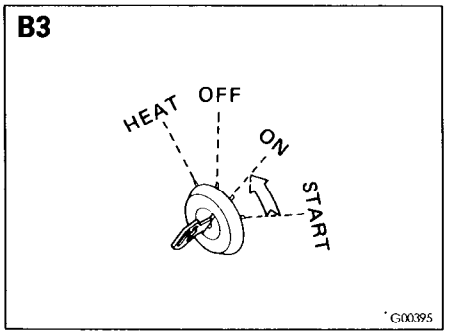

A
①
G00086


A2
ⓐ
ⓑ
G00087


B
②
①
G00088


B1
ⓐ
MIN
MAX
G00089


B2
HEAT
OFF
ON
START
G00394


B3
HEAT
OFF
ON
START
G00395

★ Do not put the key in OFF position while the engine is running.
★ To start engine in cold weather, refer to COLD WEATHER OPERATION.
★ When using low cetane fuel, starting ability at normal temperatures will be reduced. In such cases, starting will be facilitated by adopting the procedure for low-temperature starting.

Special starting

When starting after running out of fuel, fill with fuel, then fill the fuel filter cartridge with clean fuel and bleed the air from the fuel system before starting.

★ For details of bleeding the air, see the section on replacement of the FUEL FILTER.

Starting machine after long period out of use

When starting the machine after a long period out of use, first cancel the automatic-up warming function as follows.

1. Turn the starting switch key to the ON position.
2. Turn the fuel control dial from the low idling (MIN) to the full (MAX) position, hold it in position for at least 3 seconds, then return it to the low idling (MIN) position and start the engine.

C: CHECKS AFTER STARTING

After starting the engine, do not immediately start operations. First, carry out the following operations and checks.

1. Turn fuel control dial (1) to run the engine at a midrange speed, and run under no load for approx. 5 minutes.

(a): Midrange speed

2. Push working mode switch (2) on the monitor panel to select H.O (heavy-duty operation) mode.
   (The H.O lamp above the working mode switch lights up)
3. Operate bucket control lever (3) and arm control lever (4) slowly to move the bucket cylinder and arm cylinder to the end of their stroke.

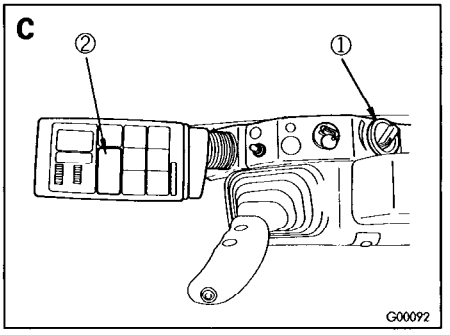
(a): In
(b): Out
(c): Curl
(d): Dump

4. Operate the bucket for 30 seconds and the arm for 30 seconds in turn fully for 5 minutes.

★ When pulling in the work equipment, be careful not to hit the chassis or ground.
★ Turn the swing lock switch ON (ACTUATED) and operate the lever to make the oil temperature rise more quickly.

5. After the warming-up operation, check that all gauges and caution lamps are normal.

★ Run under light load until the engine water temperature gauge enters the green range.


C
②
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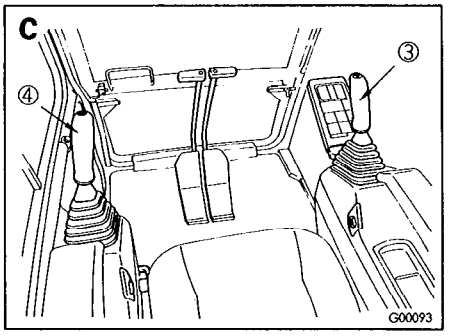
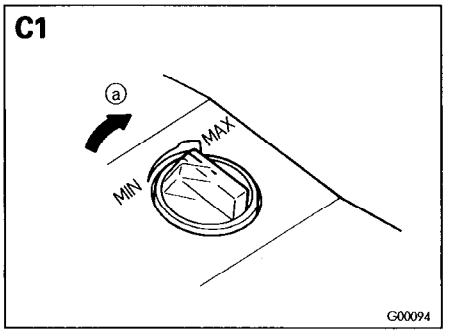
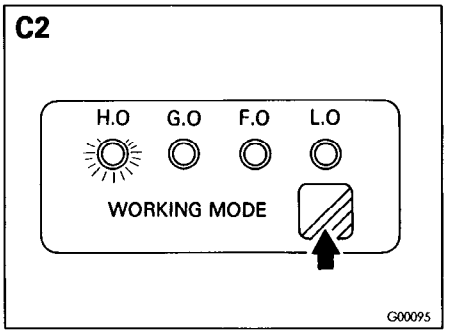
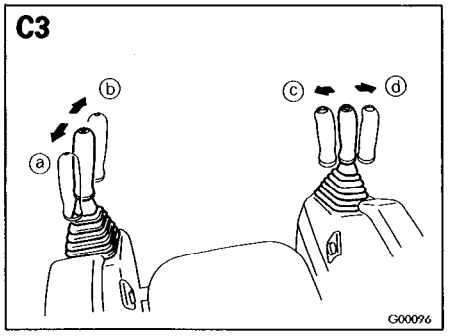
G00092


C
③
④
G00093


C1
ⓐ
MAX
MIN
G00094


C2
H.O
G.O
F.O
L.O
WORKING MODE
G00095


C3
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ⓐ
G00096

6. Check that there is no abnormal exhaust gas color, noise, or vibration.

★ Do not suddenly accelerate the engine before the completion of the warming-up operation.

★ The most suitable temperature for the hydraulic oil is 50 — 80°C, but in order to extend the life of the machine, the temperature must be raised to at least 20°C before starting work.

★ Do not suddenly operate the levers when the hydraulic oil temperature is below 20°C.

★ Do not run the engine at low idling or high idling for more than 20 minutes.
If it is necessary to run the engine at idling, apply a load or run at a mid-range speed from time to time.

D: TO MOVE THE MACHINE OFF

Before starting the machine, confirm the safety around the machine, and make a signal.

1. Turn swing lock switch (1) ON (ACTUATED) and check that swing lock lamp (2) lights up.

(a): ON (actuated)
(b): OFF (canceled)
(c): Front of machine

2. Turn fuel control dial (3) and increase the engine speed.

(a): Full speed

3. Set lock lever (4) in the FREE position, fold the work equipment, and raise it 40 — 50 cm from the ground.

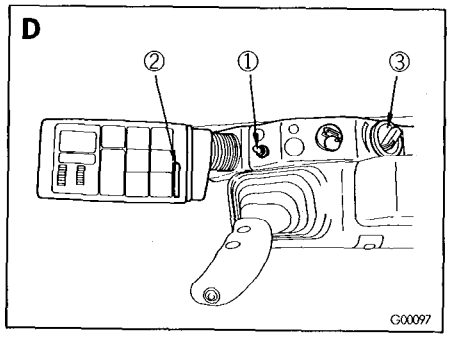
(a): Free
(b): Lock

4. Slowly incline left and right traveling and steering levers (5) in the forward (a: forward moving off) or reverse (b: reverse moving off) direction, and move off.

⚠ Check whether the track frame is facing forward or backward before operating the traveling and steering levers.

⚠ Avoid abruptly operating the traveling and steering levers with the fuel control dial fully open, as this will cause the machine to move off suddenly.

⚠ For machine with auto-deceleration device, if the lever is operated inside the deceleration range, the engine speed will rise suddenly.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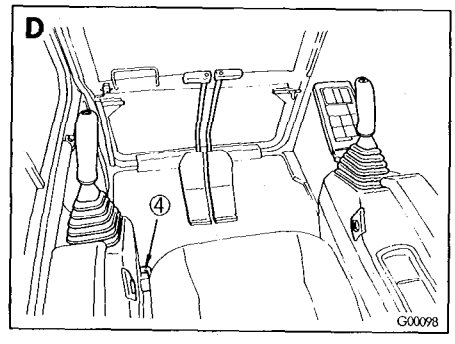
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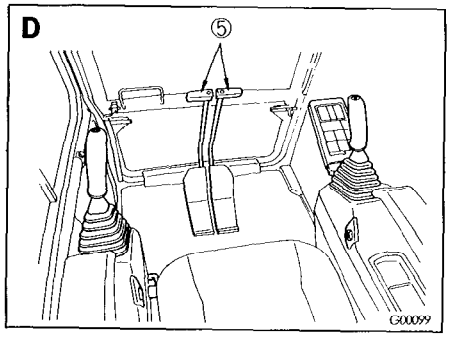
G00098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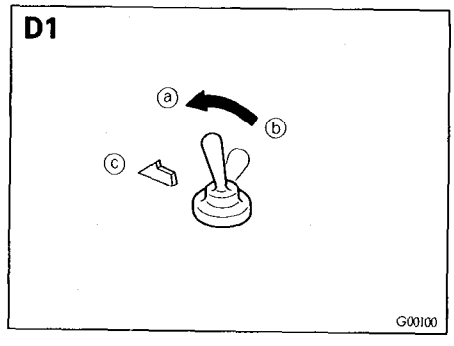
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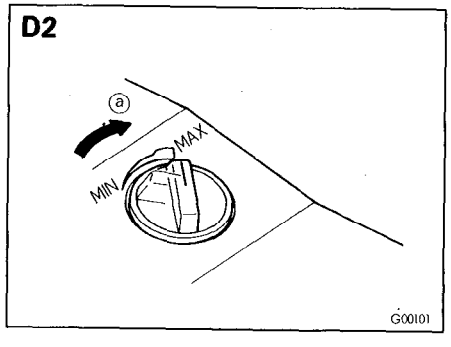
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MAX
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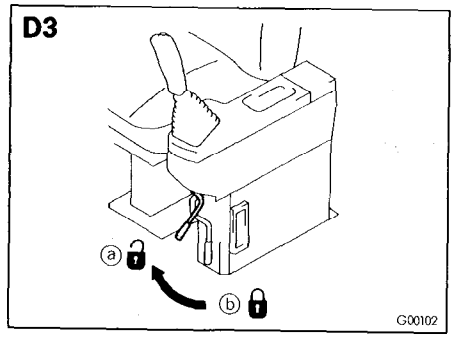
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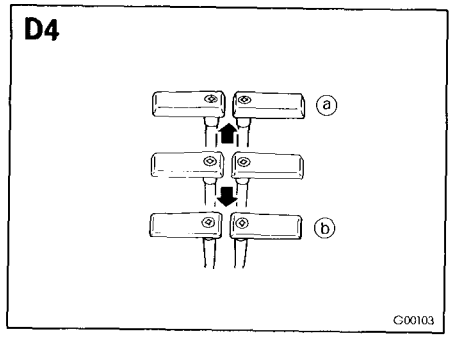
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G00103

E: STEERING (CHANGING DIRECTION)

Use the travel levers to change direction.

Operate the two travel levers (1) as follows.

★ When the sprocket is at the front, the travel levers turn the machine in the opposite direction, so before operating the travel levers, check the position of the sprocket.

★ Avoid sudden changes of direction as far as possible. In particular, when carrying out counter-rotation (spin turn), stop the machine first before turning.

1. Changing direction of machine when stopped

(a): Turning left when traveling forward

(b): Turning left when traveling in reverse

When turning to the left:

Push the right travel lever forward to travel left when traveling forward; and pull it back to turn left when traveling in reverse.

★ When turning to the right, operate the left travel lever in the same way.

2. Steering when traveling (left and right travel levers both operated in same direction

(a): Turning left when traveling forward

(b): Turning left when traveling in reverse

When turning to the left:

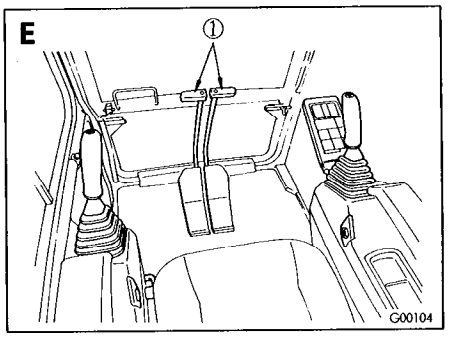
If the left travel lever is returned to the neutral position, the machine will turn to the left.

★ When turning to the right, operate the right travel lever in the same way.

3. When making counter-rotation turn (spin turn)

When turning left using counter-rotation, pull the left travel lever back and push the right travel lever forward.

★ When turning to the right using counter-rotation, pull the right travel lever back and push the left travel lever forward.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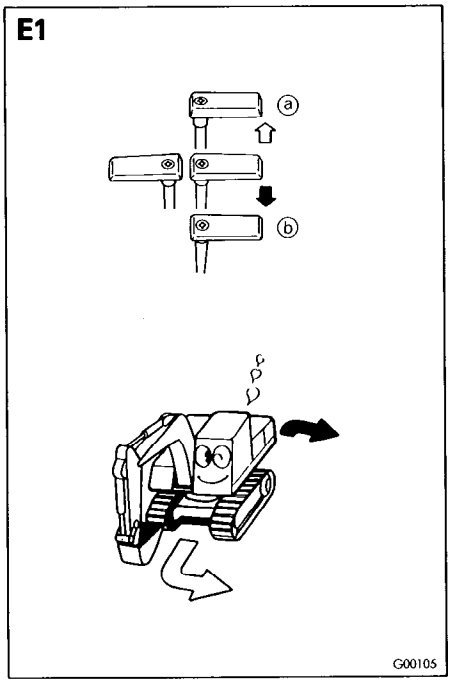
E1
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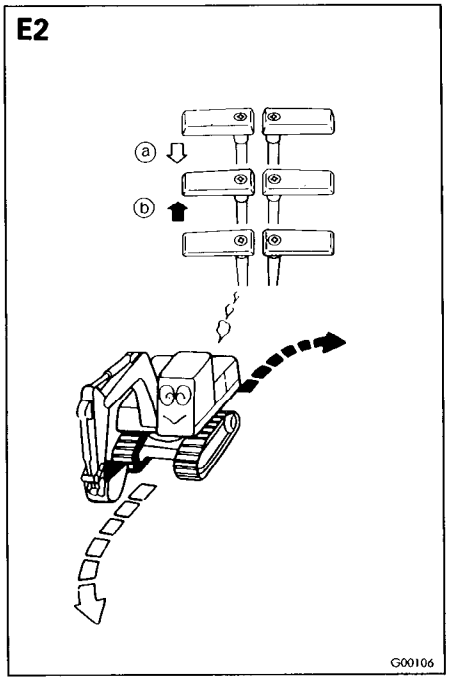
E2
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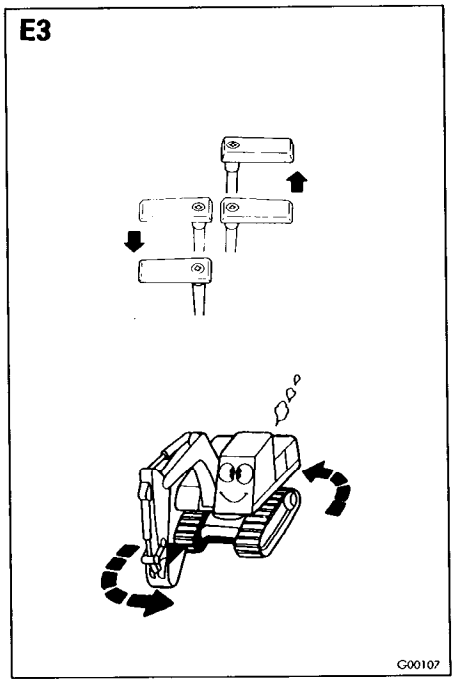

E3
G00107

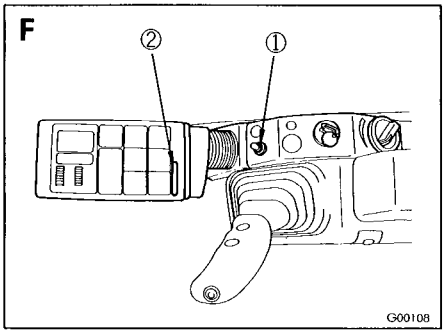
F: SWINGING

When operating the swing, check that the area around the machine is safe.

1. Before operating the swing, turn swing lock switch (1) OFF (CANCELED).

★ Check that swing lock lamp (2) goes out at the same time.

2. Operate the left work equipment control lever to swing the upper structure.
3. When not operating the siwng, turn the swing lock switch ON (ACTUATED).


F
②
①
G00108

G: OPERATION OF THE WORKING EQUIPMENT

The work equipment is operated by the left and right work equipment control levers. The left work equipment control lever operates the arm and swing, and the right work equipment control lever operates the boom and bucket.

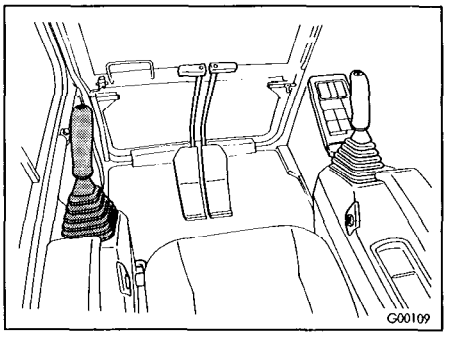
The movements of the lever and work equipment are as shown in the diagrams on the right. When the levers are released, they automatically return to the HOLD position and the work equipment is held in place.

- If the work equipment control lever is returned to HOLD when the machine is stopped, even if the fuel control dial is set to FULL, the auto-deceleration mechanism will act to reduce the engine speed to a mid-range speed.

⚠ **If any lever is operated when in the deceleration range, the engine speed will suddenly increase, so be careful when operating the levers.**

★ If the levers are operated within 15 seconds after stopping the engine, it is possible to lower the work equipment to the ground.
In addition, the levers can also be operated to release any remaining pressure inside the hydraulic cylinder circuit and to lower the boom after loading the machine on a trailer.

LEFT WORK EQUIPMENT LEVER
N. Neutral
1. Arm out
2. Arm out and swing right
3. Swing right
4. Arm in and swing right
5. Arm in
6. Arm in and swing left
7. Swing left
8. Arm out and swing left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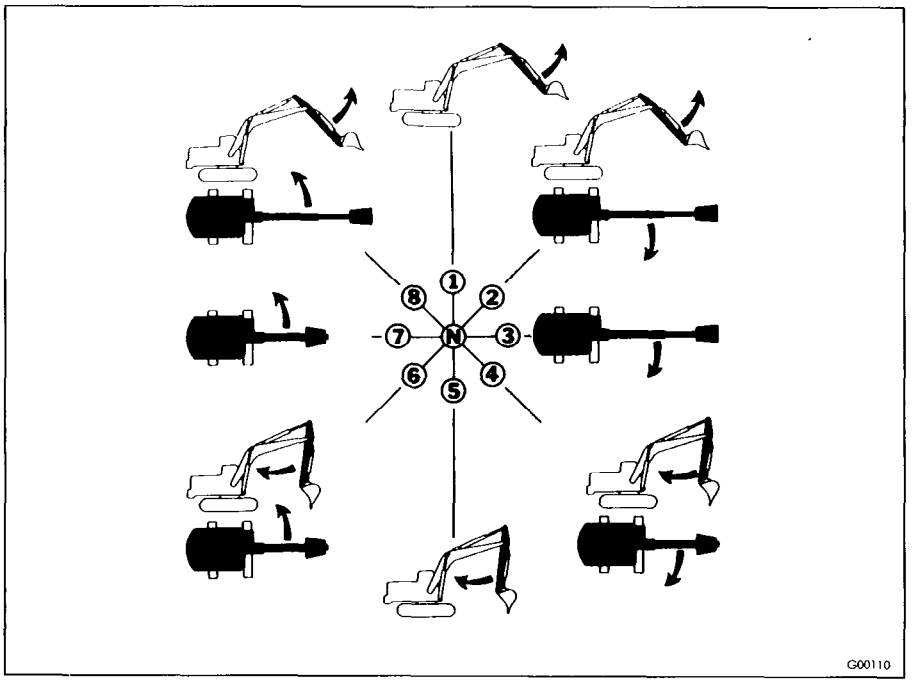
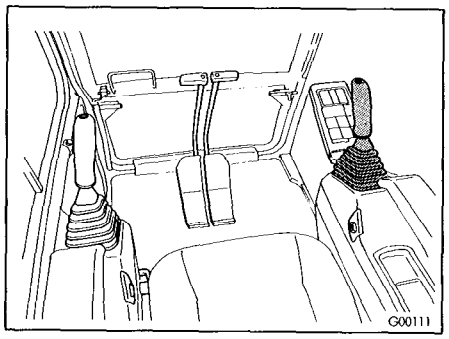

1
2
3
4
5
6
7
8
N
G00110

RIGHT WORK EQUIPMENT LEVER

N. Neutral

1. **Boom lower**
2. **Boom lower and bucket dump**
3. **Bucket dump**
4. **Boom raise and bucket dump**
5. **Boom raise**
6. **Boom raise and bucket curl**
7. **Bucket curl**
8. **Boom lower and bucket curl**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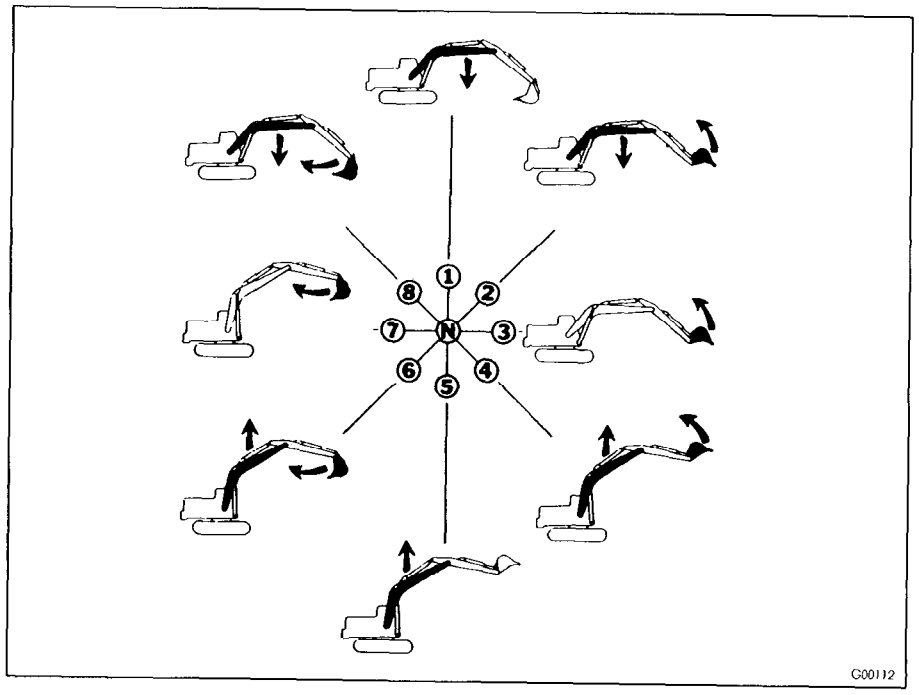
1
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8
N
G00112

H: TO STOP THE MACHINE

Avoid stopping suddenly. Give yourself ample room when stopping.

1. Put the left and right traveling and steering levers (1) in the neutral position.

(a): Neutral

2. Turn fuel control dial (2) to lower the engine speed.

(a): Low idling

3. Lower the bucket horizontally until its underside touches the ground.
4. Set lock lever (3) in the LOCK position.

(a): Free

(b): Lock

⚠ **When stopping the machine, select flat hard ground and avoid dangerous places. If it is unavoidably necessary to park the machine on a slope, insert blocks underneath the track shoes. As an additional safety measure, thrust the bucket into the ground.**

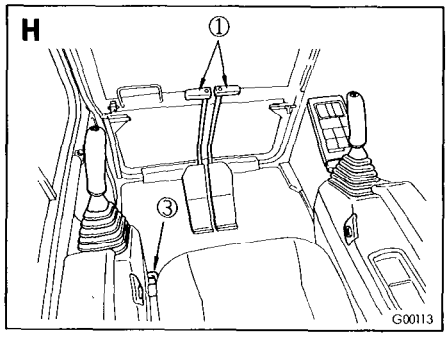
I: TO STOP THE ENGINE

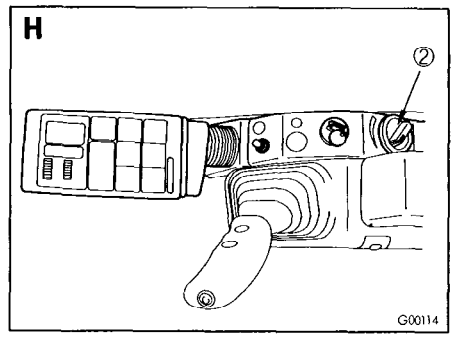
Cool the engine gradually before stopping the engine.

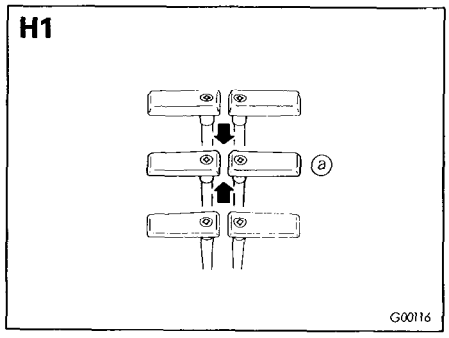
1. Run the engine at low idling speed for about 5 minutes to allow it to gradually cool down.
2. Return the key of starting switch (1) to the OFF position and remove the key.

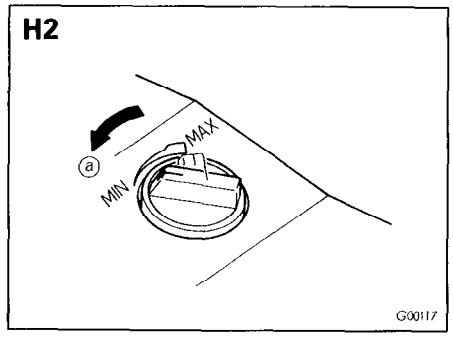
★ If the engine is abruptly stopped before it has cooled down, engine life may be greatly shortened. Consequently, do not abruptly stop the engine apart from an emergency.

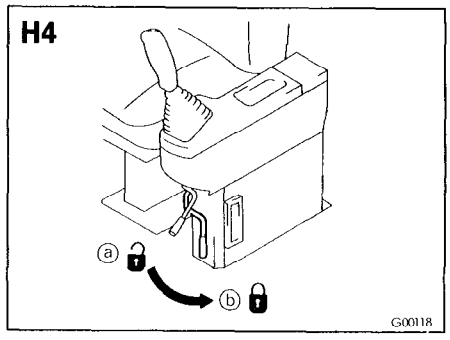
★ In particular, if the engine has overheated, do not abruptly stop it but run it at medium speed to allow it to cool gradually, then stop it.


H
①
③
G00113


H
②
G00114


H1
ⓐ
G00116


H2
ⓐ
MIN
MAX
G00117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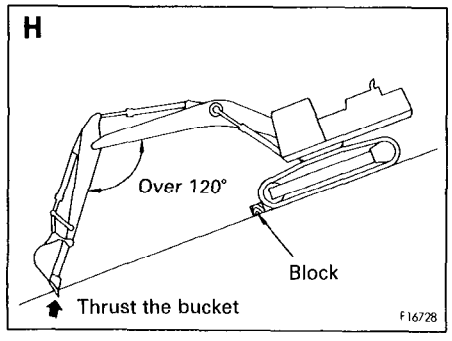
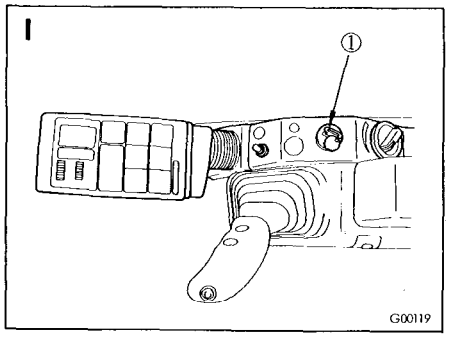
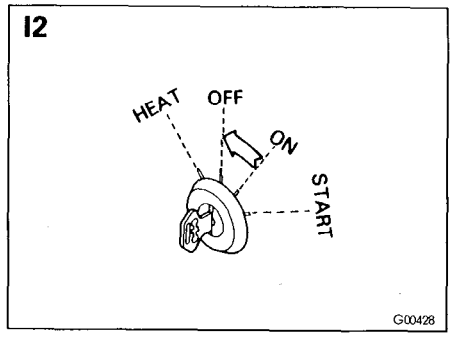
ⓐ
ⓑ
G00118


H
Over 120°
Block
Thrust the bucket
F16728


I
①
G00119


I2
HEAT
OFF
ON
START
G00428

J: PRECAUTIONS FOR OPERATION

1. Be careful not to compact the soil or damage earth mounds as a result of the swinging force.
2. When swinging, do not dig the bucket teeth into the soil.
3. Do not move off and excavate with the bucket leaving dug into the ground.
4. When working with the machine, do not move the cylinder to the end of its stroke but leave a small safety margin.
5. Do not use the dropping force of the bucket as a pickaxe, breaker, or pile driver.
6. Do not use the dropping force of the machine for digging.
7. It is better to excavate hard rocky ground after breaking it up by some other means. This will not only reduce damage to the machine but make for better economy.
8. Note that the following phenomena are not faults:

a) When the arm is pulled back, it will sometimes stop when becomes more or less vertical.
b) The arm may sometimes stop when the bucket teeth become more or less horizontal.
c) At the beginning and end of a swinging, a noise may sometimes be emitted from the brake valve.
d) When descending a steep slope at low speed, a noise may sometimes be emitted from the travel motor.

⚠ **If it is necessary to operate the work equipment lever when the machine is traveling, stop the machine before operating the work equipment lever.**

⚠ **For machine with autodeceleration device, if the lever is operated inside the deceleration range, the engine speed will rise suddenly.**

K: PRECAUTIONS WHEN TRAVELING

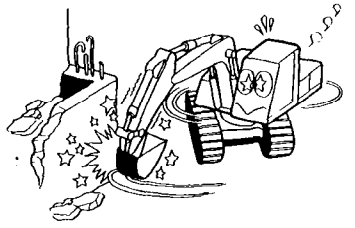
1. When traveling over obstacles such as boulders or tree stumps, the machine (in particular, the undercarriage) is subjected to a large shock, so reduce the travel speed and travel over the obstacle at the center of the tracks.

Special tracks (except PC300, 300LC-5 MIGHTY)

Wide triple shoes (700, 750, 800, 850 mm) are used as special shoes for soft ground. Therefore, do not use them when traveling over rocky ground, sandy gravel, rough ground with cobbles, and even on soft ground where there are boulders or tree roots.

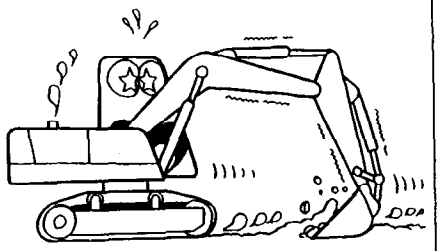
★ When selecting the track, see "SELECTION OF TRACK SHOES".

J1



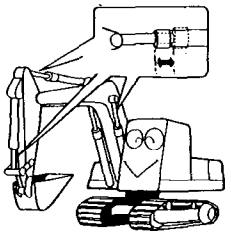
G00121

J3



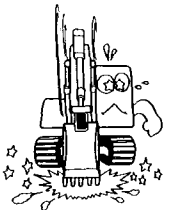
G00122

J4



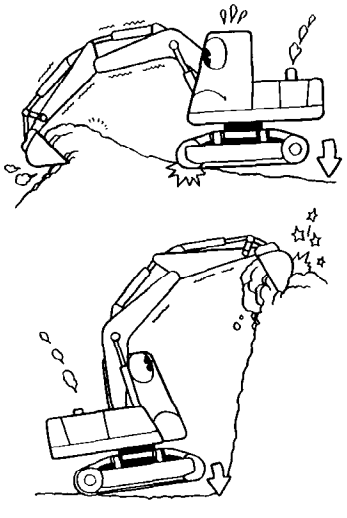
G00123

J5



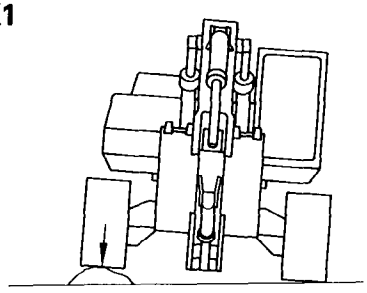
G00124

J6



G00125

K1



G00621

L: PERMISSIBLE WATER

1. Do not immerse the machine in water by more than the permissible depth (under center of carrier roller (1)). In addition, properly grease parts which have been immersed in water for a long time, until the old grease comes out from the bearings (vicinity of bucket pins).
2. When driving the machine out of water, if the angle of the machine exceeds 15°, the rear of the upper structure will go under water, and water will be thrown up by the radiator fan. This may cause the fan to break.
   Be extremely careful when driving the machine out of water.

M: PRECAUTIONS WHEN TRAVELING UP OR DOWN HILLS

1. **When traveling on a steep downhill grade.**
   When traveling down a hill, adjust the speed with the travel lever and fuel control dial.
   If the grade exceeds 15°, set the machine in the posture shown in the diagram, and reduce the engine speed.

a. ⚠ **Do not travel on slopes of over 30° as there is danger that the machine may overturn.**

b. ⚠ **When traveling, raise the bucket approx. 20 - 30 cm from the ground.**

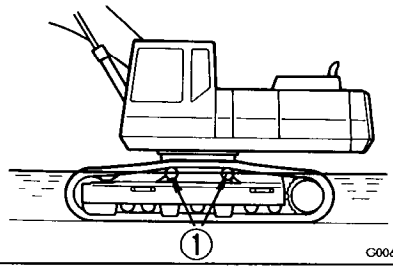
c. ⚠ **When traveling over ridges or other obstacles, keep the work equipment close to the ground and travel slowly.**

d. ⚠ **It is dangerous to turn on slopes or to travel across slopes. Always go down to a flat place to perform these operations. It may be longer, but it will ensure safety.**

e. ⚠ **If the machine starts to slide or loses stability, lower the bucket immediately and brake the machine.**

f. ⚠ **Turning or operating the work equipment when working on slopes may cause the machine to lose its balance and turn over, so avoid such operations. It is particularly dangerous to swing downhill when the bucket is loaded.**
   If such operations have to be carried out, pile soil to make platform (A) on the slope so that the machine can be kept horizontal when operating.

L1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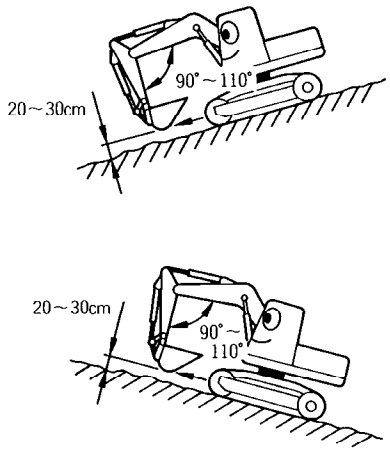
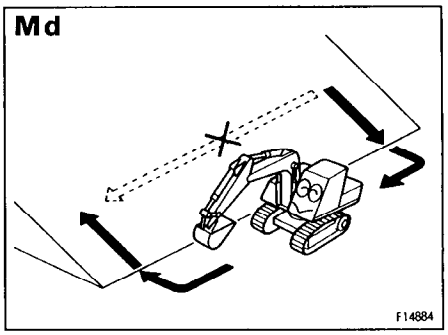
M1


90°~110°
20~30cm
20~30cm
90°~
110°
F14883

Md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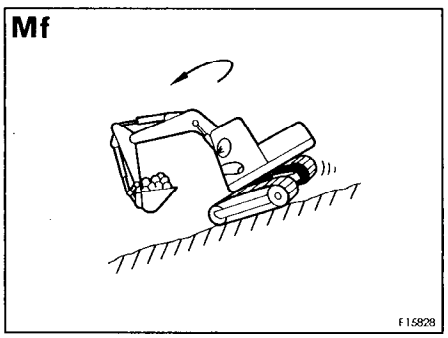
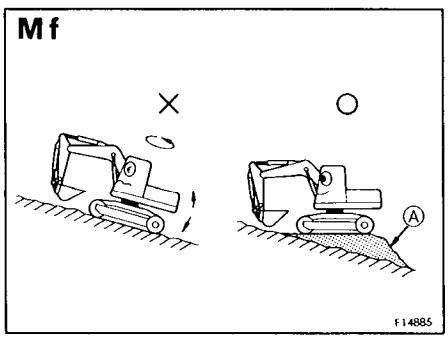
Mf


F15828

Mf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○
Ⓐ
F14885

2. **Braking when traveling downhill**
   To brake the machine during downhill runs, put the traveling and steering lever in the neutral position. This will cause the brake to be automatically applied.
3. **If shoes slip**
   When climbing a hill, if the shoes slip or the travel motor relieves, preventing the machine from climbing by means of the tracks alone, it is possible to use the force of the arm as an aid.
4. **If engine stops**
   When the engine stops on a slope, move the traveling and steering levers to neutral position and lower the bucket. Thereafter, turn starting key to START.

N: MATTERS FOR ATTENTION AT SPECIAL WORK SITES

a) If operation is executed in water, if the work equipment fixing pins come in contact with water, greasing is to be performed after every underwater operation.
b) Greasing of the work equipment fixing pins is to be performed every time before heavy digging or deep digging.
★ After greasing is done, the boom, arm and bucket are to be operated several times. This should be followed by re-greasing.

O: PROTECTION OF CONTROLLER

Always keep cover (1) of the display panel closed unless necessary. If rain or dust gets in, it may cause a failure in the controller.

P: HOW TO ESCAPE FROM MUD

- Always operate carefully to avoid getting stuck in mud. If the machine does get stuck in mud, use the following procedures to get the machine out.

1. When one side is stuck.

When only one side is stuck in mud, use the bucket to raise the track, then lay boards or logs and drive the machine out. If necessary, put a board under the bucket also.

★ When using the boom or arm to raise the machine, always have the bottom of the bucket in contact with the ground. (Never push with the teeth.) The angle between the boom and arm should be 90° to 110°.
The same applies when using the inverting bucket.

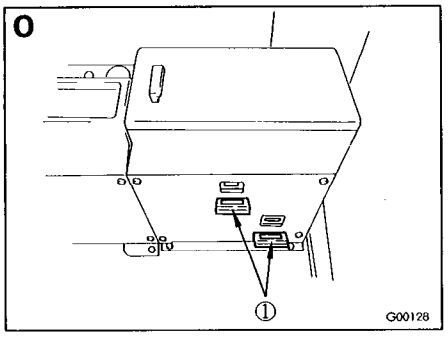
2. When both sides are stuck.

When the tracks on both sides are stuck in mud and the machine will not move, lay boards as explained in the diagram, and dig the bucket into the ground in front. Then pull in the arm as in normal digging operations and put the travel levers in the FORWARD position to pull the machine out.

3 Method of towing machine

If the machine sinks in mud and cannot get out under its own power, or if the drawbar pull of the excavator is being used to tow a heavy object, use a wire rope (a) as shown in the diagram on the right.

★ Do not use the hole for the towing hook.


O
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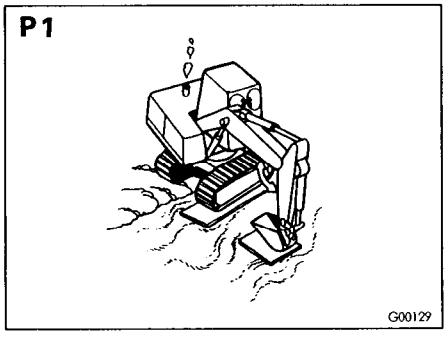
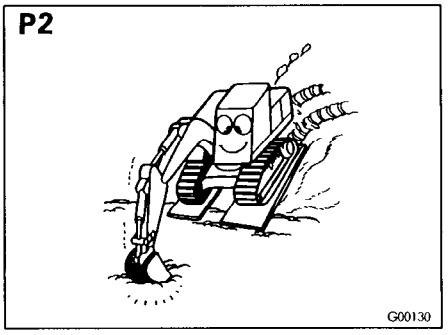
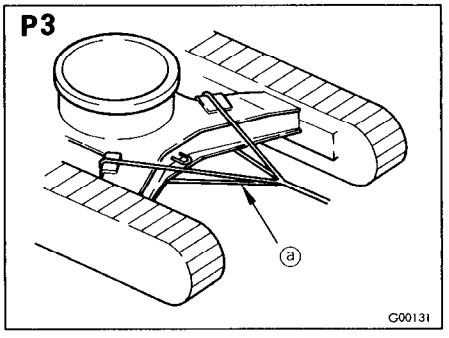

P1
G00129

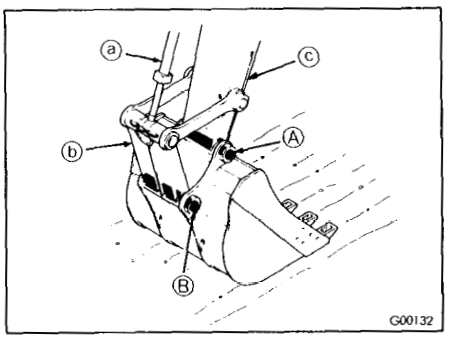

P2
G00130

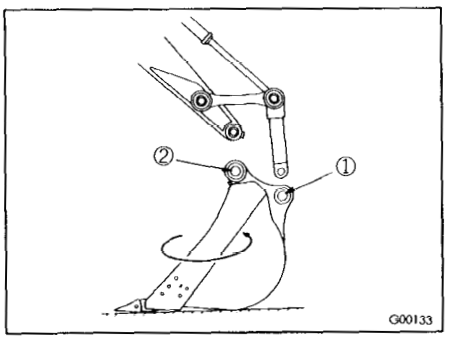

P3
ⓐ
G00131

INVERSION AND REPLACEMENT OF BUCKET

Stop the machine on a firm, flat surface. When performing joint work, make clear signals to each other and work carefully for safety's sake.

1. Select a flat surface and stabilize the bucket.
(a): Bucket cylinder
(b): Link
(c): Arm
2. After removing the stop bolt and nut for each pin, extract pins A and B.
★ After removing the pins, make sure that they do not become contaminated with sand or mud and that the seals of bushing on both sides do not become damaged.
3. Reverse the bucket.
★ After reversing the bucket, correct the direction and inclination of mounting pin holes (1) and (2) then firmly stabilize the bucket so that it does not shake about.
4. Couple the arm to hole (1), then connect the link to hole (2).
5. After mounting the stop bolt and nut for each pin, apply grease to each pin.
★ When replacing bucket, adjust bucket clearance. (Refer to ADJUSTMENT)
★ The bucket on the PC300, 300LC-5 MIGHTY cannot be reversed.


a
c
b
A
B
G00132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1
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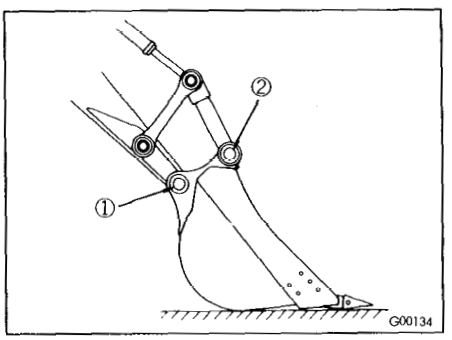

2
1
G00134

HANDLING THE TRAPEZOIDAL BUCKET (EXCEPT PC300, 300LC-5 MIGHTY)

This bucket is used in sloped ditch digging work in the farm.

1. **How to perform excavation**
   Operate the boom, the arm and the bucket to make the line A of the side-plate of the bucket vertical.
   The guide plate B to check this position is installed beside the bucket pins. Accordingly, hold this plate horizontal when digging.
2. **Shape of ditch**
   When the trapezoidal bucket is used, the shape of the ditch is as shown in the diagram.

HANDLING THE CLAMSHELL BUCKET (EXCEPT PC300, 300LC-5 MIGHTY)

This bucket is used for digging and loading in side-ditches or the confined spaces.

How to perform excavation

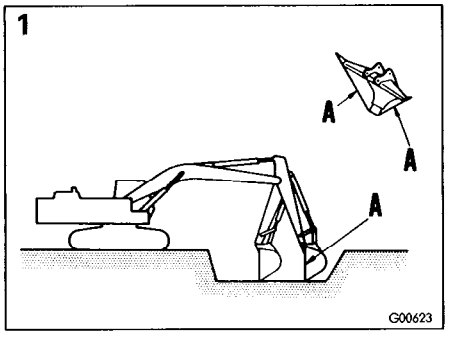
Carry out digging work by lowering the boom keeping the clamshell opened.

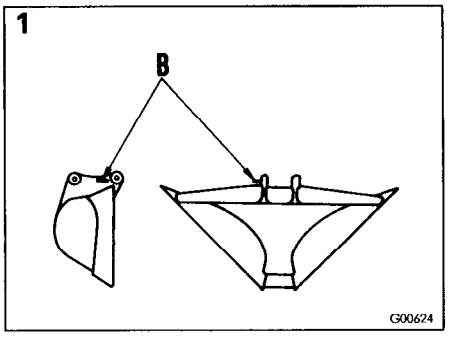
Close the bucket while raising the boom gradually.

When you begin to dig and find the bucket rotating, do as follows.

Extend the bucket cylinder fully and hold, the bucket will soon stop rotating.

★ Make the teeth of the bucket vertical in digging.
★ For safety, always avoid abrupt traveling, swing and stopping.
★ Do not swing the bucket to crush the rock or to cut through soil.
★ Do not use the bucket for hammering or pulling out piles etc.
★ Before leaving the machine, open the bucket and lower it to the ground.
★ Remove the bucket from the arm when transporting the machine.


1
A
A
A
G00623


1
B
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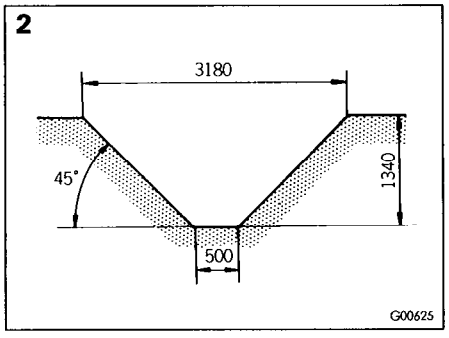

2
3180
45°
1340
500
G00625

SELECTION OF TRACK SHOES (EXCEPT PC300, 300LC-5 MIGHTY)

Choose suitable track shoes to match the ground conditions.

METHOD OF SELECTING SHOES

Confirm the category from the list of uses in Table 1, then use Table 2 to select the shoe.

★ Categories B and C are wide shoes, so there are limitations on their use. When using these shoes, check the precautions, then investigate and study fully the conditions of use to confirm that these shoes are suitable.

★ When selecting the shoe width, select the narrowest shoe possible that will give the required flotation and ground pressure. If a wider shoe than necessary is used, the load on the track will increase, and this will cause the shoes to bend, links to crack, pins to break, shoe bolts to come loose, and various other problems.

Table 1

Category	Use	Precautions when using
A	Rocky ground, riverbeds, normal soil	• On rough ground with large obstacles such as boulders or fallen trees, travel at low speed.
B	Normal soil, soft ground	• These shoes cannot be used on rough ground where there are large obstacles such as boulders or fallen trees. • Travel at Hi speed only on flat ground, and if it is impossible to avoid going over obstacles, shift down and travel at half speed in Lo.
C	Extremely soft ground (swampy ground)	• Use the shoes only in places where the machine sinks and it is impossible to use A or B shoes. • These shoes cannot be used on rough ground where there are large obstacles such as boulders or fallen trees. • Travel at Hi speed only on flat ground, and if it is impossible to avoid going over obstacles, shift down and travel at half speed in Lo.

Table 2

PC300-5		PC300LC-5	
Specifications	Category	Specifications	Category
600 triple grouser	A	700 triple grouser	B
500 triple grouser	A	600 triple grouser	A
700 triple grouser	B	750 triple grouser	B
750 triple grouser	B	800 triple grouser	C
800 triple grouser	C	850 triple grouser	C
850 triple grouser	C	—	—

PC300HD-5	
Specifications	Category
700 triple grouser	B
600 triple grouser	A
750 triple grouser	B
800 triple grouser	C
900 triple grouser	C

SELECTION OF BUCKET TEETH

Select suitable bucket teeth to match the operating conditions.

METHOD OF SELECTING TEETH

The standard teeth can be used over a wide range, but according to the operating conditions, we recommend the following teeth.

Long-Life teeth

- Jobsites where wear life is demanded, such as when loading hard rocks.
- Jobsites where no penetration is needed, such as when working with crushed rock after blasting or ripping.
- Jobsites where heavy-duty operations are carried out, such as hitting or pulling up rocks with the tips of the teeth.

Self-sharpening teeth

- Jobsites demanding penetration such as digging and loading sandy or clayey soil.

MEMO

TRANSPORTATION

When transporting the machine, observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc. It is a good idea to obtain a special platform for loading and unloading the machine. When it is unavoidably necessary to use a gangplank, however, at the very least observe the following for the sake of safety.

1. Properly apply the brakes on the trailer and insert blocks (a) beneath the tires to ensure that it does not move. Then fix gangplank (b) in line with the centers of the trailer and the machine.

★ Make sure the gangplank has sufficient width, length and thickness to enable the machine to be safely loaded and unloaded.
If the gangplank sags appreciably, reinforce it with blocks, etc.

★ Make angle (c) of the ganplank a maximum of 15°.

★ Set distance (d) between the gangplanks to match the center of the tracks.

⚠ **Remove the mud from the undercarriage to prevent the machine from slipping to the side on slopes.**

2. Set the travel speed switch to the Lo position.
3. Turn the AUTO-DECEL switch OFF and return the fuel control dial to reduce the engine speed.
4. Turn the swing lock switch ON to apply the swing lock.
5. Set in the direction of the gangplank, lower the work equipment as far as possible without letting it hit the trailer, then travel slowly to load or unload the machine.

★ When on the gangplank, do not operate any lever other than the travel lever.

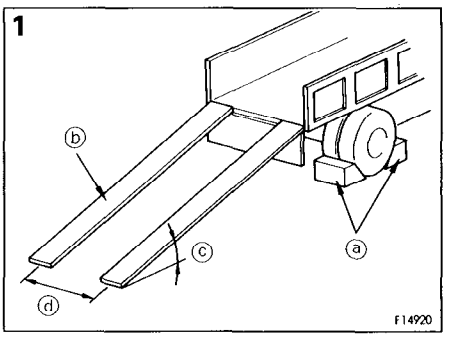
★ When the work equipment is installed, load the machine from the front; when the work equipment is not installed, load the machine from the rear.

⚠ **Never change the direction of travel when on the gangplank. If it is necessary to change direction, drive off the gangplank and correct the direction, then drive on to the gangplank again.**

6. Load the machine correctly in the specified position on the trailer.
After loading the machine, fully extend the bucket and arm cylinders, then slowly lower the boom.

★ When transporting the machine, place rectangular timber under one end of the bucket cylinder to prevent it touching the ground, thereby saving it from possible damage.

7. Lock all the control levers securely with the lock lever.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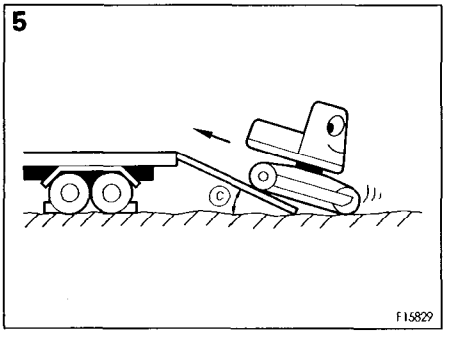
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8. When transporting the machine, place rectangular timber underneath the front and rear track shoes to prevent the machine from moving about. Also, hold it down with chains or rope. Be particularly careful to ensure that the machine does not slip sideways.

⚠ **When loading the machine, park the trailer on a flat firm roadbed. Keep a fairly long distance between the road shoulder and the machine.**

★ Determine the route for transporting the machine by taking into account the width, height and weight of the machine.

DIVIDING THE MACHINE

To simplify transportation, the machine can be divided into the body, attachments, and counterweight. Before transporting a machine, consult your Komatsu distributor.

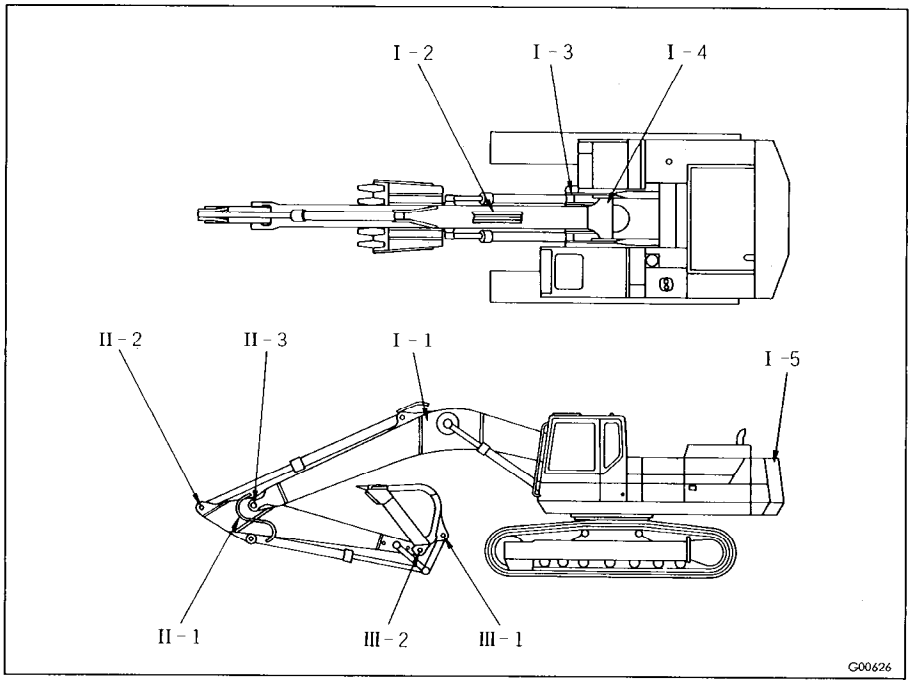
The following points when dividing a machine.

★ When disassembling the attachments, take care not to let dust get into the joints of the piping. After removing the attachment, plug or tape the joints.
★ After packing, check for water leakage and oil leakage. Refill if necessary.
★ Fix each section securely to protect cylinders and other parts.
★ Reinstall the pins and bolts which were removed for disassembly.

⚠ **The lifting hooks on the counterweight should only be used when raising the counterweight.**
Never use the lifting hooks on the counterweight to raise the machine itself.

● **Detachment sites:**

I-1 Boom lamp and associated wiring.
I-2 Cylinders and associated piping.
I-3 Boom cylinder foot
I-4 Boom foot
I-5 Counterweight
II-1 Bucket cylinder piping
II-2 Arm cylinder rod end
II-3 Boom-arm junction
III-1 Link-bucket junction
III-2 Arm-bucket junction


I - 2
I - 3
I - 4
II - 2
II - 3
I - 1
I -5
II - 1
III - 2
III - 1
G00626

PC300, 300LC, 300HD-5

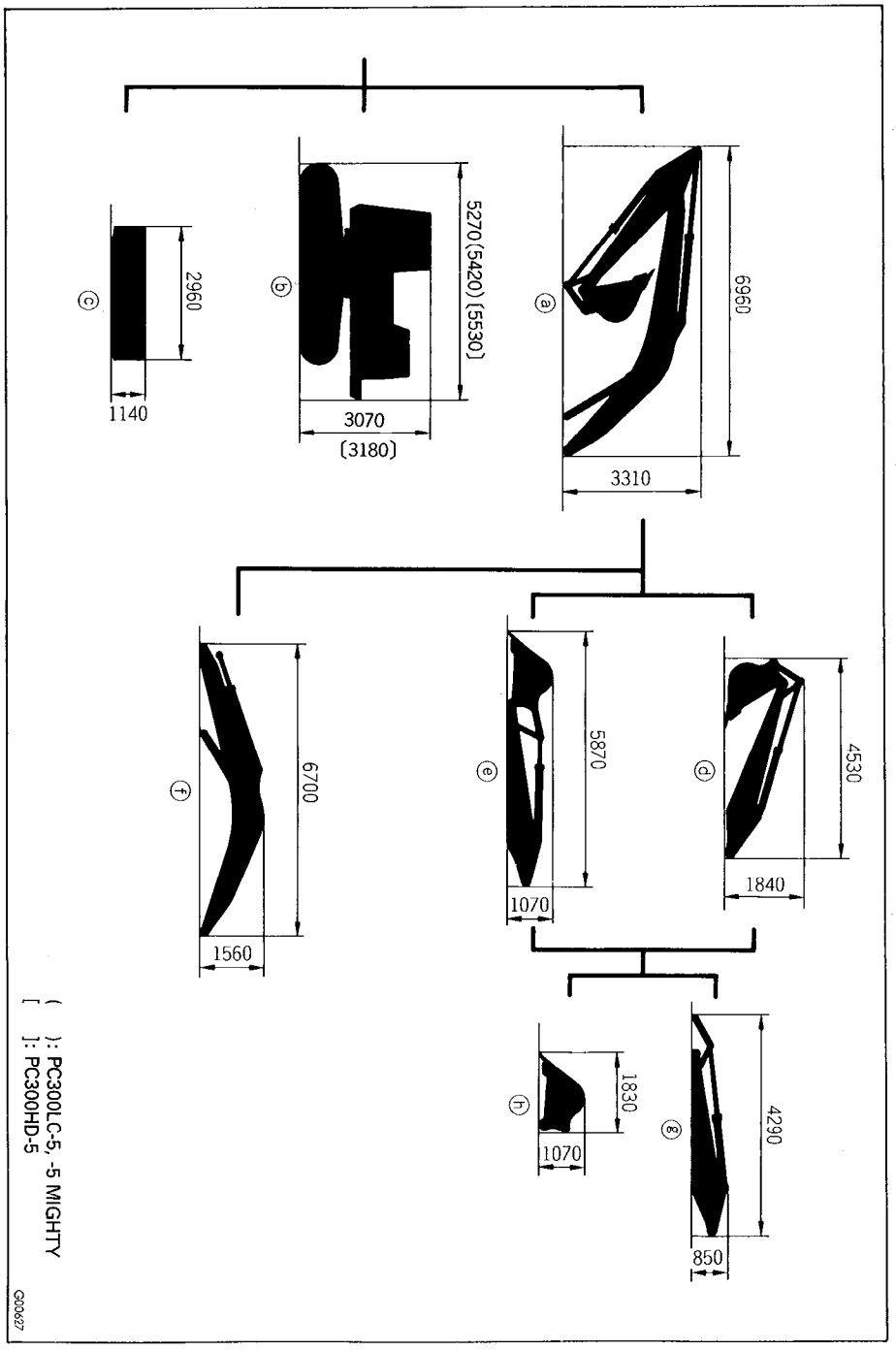
(a): weight : 6.1 ton
capacity : 6.96 x 3.31 x 1.47 = 33.8 m^3
(b): weight : 18.3 ton (19.5 ton) [24.3 ton]
capacity : 5.27 x 3.07 x 3.19 = 52.1 m^3
(5.42 x 3.07 x 3.29 = 54.7 m^3)
[5.53 x 3.18 x 3.08 = 54.2 m^3]
(c): weight : 5.4 ton
capacity : 2.96 x 1.14 x 0.59 = 2.0 m^3
(d): weight : 2.5 ton
capacity : 4.53 x 1.84 x 1.42 = 11.8 m^3
(e): weight : 2.5 ton
capacity : 5.87 x 1.07 x 1.49 = 9.3 m^3
(f): weight : 3.4 ton
capacity : 6.7 x 1.56 x 0.94 = 9.8 m^3
(g): weight : 1.5 ton
capacity : 4.29 x 0.85 x 0.52 = 1.9 m^3
(h): weight : 1.0 ton
capacity : 1.83 x 1.07 x 1.49 = 2.9 m^3

( ): PC300LC-5
[ ]: PC300HD-5

PC300, 300LC-5 MIGHTY

(a): weight : 6.5 ton
capacity : 6.96 x 3.31 x 1.47 = 33.8 m^3
(b): weight : 18.5 ton (19.3 ton)
capacity : 5.27 x 3.07 x 3.19 = 52.1 m^3
(5.42 x 3.07 x 3.19 = 53.1 m^3)
(c): weight : 6.0 ton
capacity : 2.96 x 1.14 x 0.59 = 2.0 m^3
(d): weight : 2.8 ton
capacity : 4.53 x 1.84 x 1.42 = 11.8 m^3
(e): weight : 2.8 ton
capacity : 5.87 x 1.07 x 1.49 = 9.3 m^3
(f): weight : 3.7 ton
capacity : 6.7 x 1.56 x 0.94 = 9.8 m^3
(g): weight : 1.5 ton
capacity : 4.29 x 0.85 x 0.52 = 1.9 m^3
(h): weight : 1.3 ton
capacity : 1.83 x 1.07 x 1.49 = 2.9 m^3

( ): PC300LC-5 MIGHTY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(3180)
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2960
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4530
1840
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5870
1070
ⓕ
6700
1560
ⓖ
4290
850
ⓗ
1830
1070
( ): PC300LC-5, -5 MIGHTY
[ ]: PC300HD-5
GD0427

PROCEDURE FOR INCREASING OR REDUCING TRACK FRAME GAUGE (PC300HD only)

REDUCING TRACK GAUGE

1. Remove center frame mounting bolts (1). (one side, front + rear: 18 bolts).

(a): Center frame
(b): Track frame

2. Swing the upper structure and set at a right angle to the track frame on side (A) which is to be retracted, then use the work equipment to jack up the track frame.
3. Fit block (C) (wooden block approx. 20 — 30 cm square) in the outside of track frame (A), then lower the body a little at a time with the boom cylinder. The track frame will slide and will stop when it contacts the stopper.
4. Lower the machine carefully and install bolts (2). (one side, front + rear: 8 bolts out of bolts (1))
   ★ Tightening torque: 175 ± 20 kgm
5. Remove steps (3) (front + rear: 2 places) on the side of the track frame.
6. Follow the same procedure to retract the track frame on the other side.

⚠ **Never use the machine for operations with the track frame retracted.**

INCREASING TRACK GAUGE

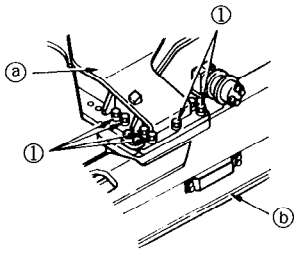
1. Remove center frame mounting bolts (2) (one side, front + rear: 8) from the front and rear of the track frame on the side to be extended.
2. Install steps (3) (front + rear: 2 places) on the side of the track frame.
   ★ Tightening torque: 28.25 ± 3.25 kgm
3. Swing the upper structure to the side opposite track frame (A) to be extended until the upper structure is at a right angle to the tracks.

★ Do not raise the track frame higher than 50 mm.
If it is raised too high, the stopper bolt will be twisted and will bend.

4. Pull the machine forward with the arm, and the track frame will slide sideways.
5. Extend the track frame until it comes into contact with the stopper, then lower the machine slowly to the ground. Install bolts (1) (one side, front + rear: 18) and tighten to specified torque:
   ★ Tightening torque 175 ± 20 kgm
6. Follow the same procedure to extend the track frame on the other side.

★ The track gauge should be changed on level, hard ground.
★ When changing the track gauge, it is dangerous to operate any cylinder suddenly. Always operate the control levers slowly.

1



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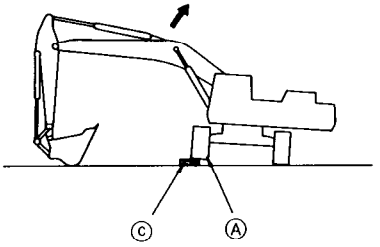

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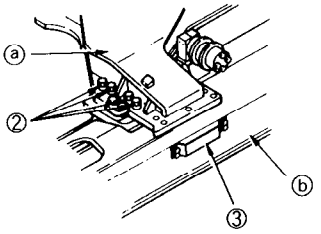

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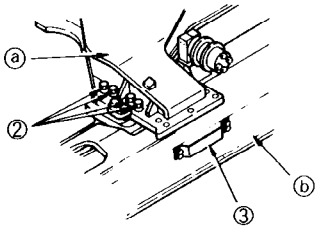

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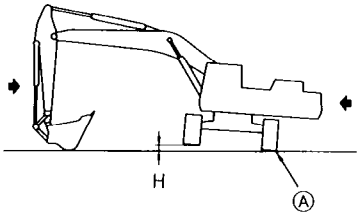

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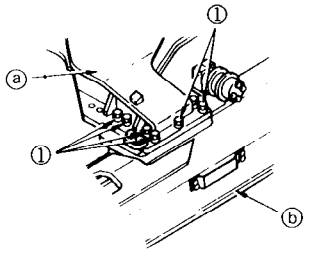
5



F05703

INSTALLATION OF OPTIONAL ELECTRICAL EQUIPMENT

A: Power source when installing optional electrical equipment.

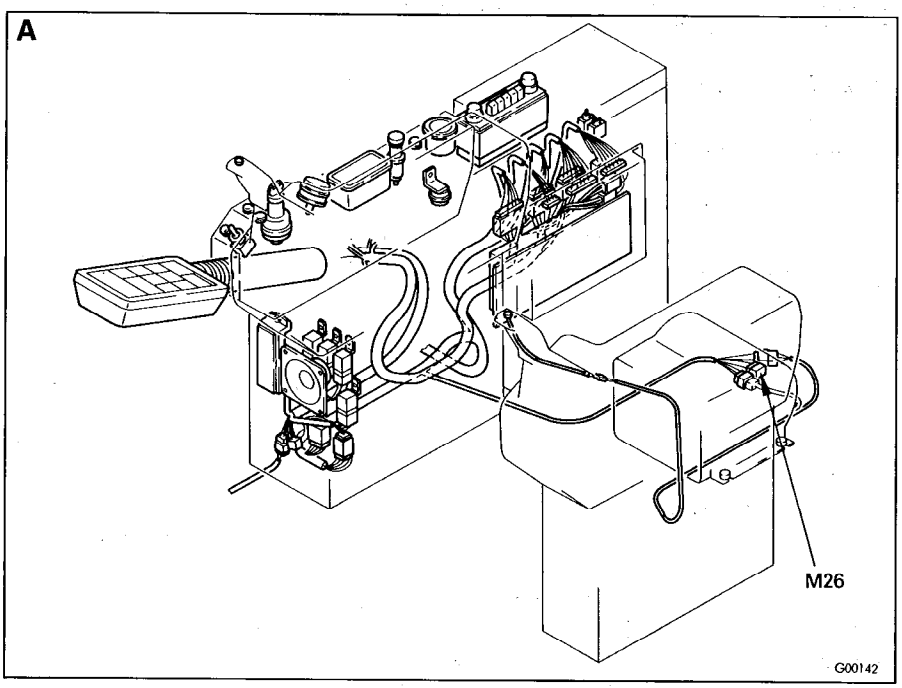
1. When installing extra electrical equipment, always take the power from connector No. M26 provided inside the panel (within 15A).
2. Never take the power from the following terminals.
   It will cause the fuse to blow or will have adverse effect on the mechatronics equipment.
   - Fuse No. 9
   - Starting swtich terminal B, BR and ACC
   - Battery relay terminal BR
3. Use a male connector (4 pin) to connect to the power source pick-up.

B: Connections when adding extra lamps

When adding lamps, use the connection method shown in the diagram.

★ When the present lamp relay is turned ON, the standard lamps light up. At the same time, power flows to the additional relay, so the additional relay is switched on and the extra lamps light up.

(a): Fuse box
(b): Monitor panel
(c): Lamp switch
(d): Two direct relays cannot be used
(e): Lamp relay
(f): Additional relay
(g): Standard lamps
(h): Additional lamps
——— Dashed line: Additional wiring harness


A
M26
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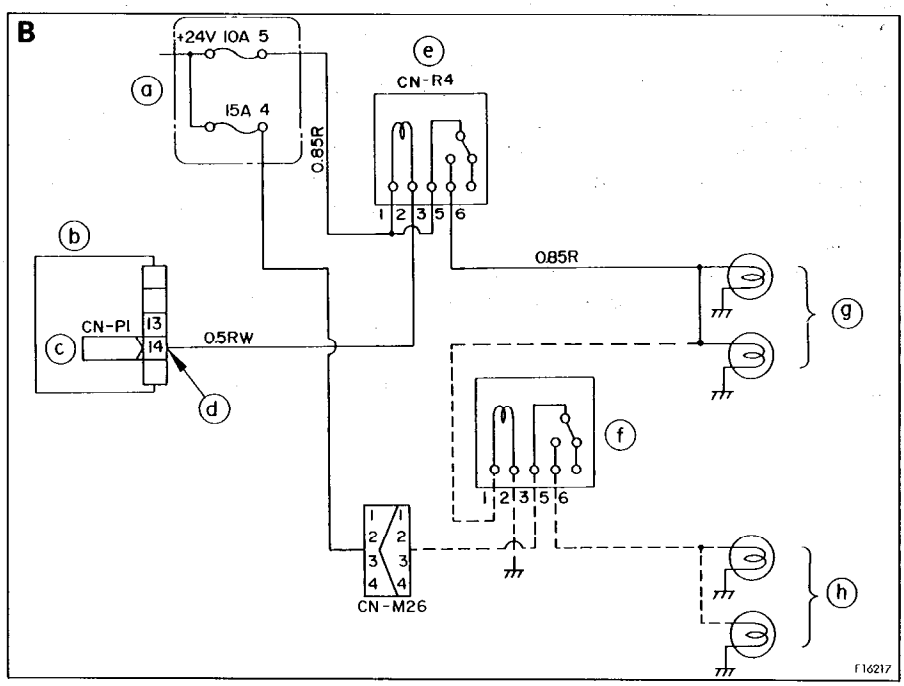

B
+24V 10A 5
a
15A 4
0.85R
e
CN-R4
1 2 3 5 6
b
CN-P1
13
14
c
0.5RW
d
085R
g
f
1 2 3 5 6
1 2 3 4
1 2 3 4
CN-M26
h
F16217

COLD WEATHER OPERATION

PREPARATION FOR LOW TEMPERATURE

If the temperature becomes low, it becomes difficult to start the engine, and the coolant may freeze, so do as follows.

FUEL AND LUBRICANTS

Change to fuel and oil with low viscosity for all components.
For details of the specified viscosity, see the TABLE OF FUEL, COOLANT AND LUBRICANTS.

COOLANT

After cleaning inside of the cooling system, add antifreeze to the coolant to prevent the coolant from freezing when the machine is not being used.

★ For details of the antifreeze mixture when changing the coolant, see WHEN REQUIRED.

Care in using Antifreeze

Use a Permanent Antifreeze (ethylene glycol mixed with corrosion inhibitor, antifoam agent, etc.) meeting the standard requirements as shown below. With permanent antifreeze, no change of coolant is required for a year. If it is doubtful that an available antifreeze meets the standard requirements, ask the supplier of that antifreeze for information.

Standard requirements for permanent antifreeze

- SAE J1034
- FEDERAL STANDARD O-A-548D

★ Never use methanol, ethanol or propanol based antifreeze.

★ Where no permanent antifreeze is available, an ethylene glycol antifreeze without corrosion inhibitor may be used only for the cold season. In this case, clean the cooling system twice a year (in spring and autumn). When refilling the cooling system, add antifreeze in autumn, but do not add any in spring.

★ Absolutely avoid using any water leak preventing agent irrespective of whether it is used independently or mixed with an antifreeze.

★ Do not mix one antifreeze with a different brand.

⚠ **Antifreeze is flammable, so keep it away from any flame.**

BATTERY

As ambient temperature drops, battery capacity will drop, and electrolyte may sometimes freeze if battery charge is low. Maintain battery at a charge level of approx. 100% and insulate it against cold temperature so that machine can be readily started the next morning.

★ Measure specific gravity of fluid and obtain rate of charge from the following conversion table:

Rate of charge \ Temp. of fluid	20°C	0°C	—10°C	—20°C
100%	1.28	1.29	1.30	1.31
90%	1.26	1.27	1.28	1.29
80%	1.24	1.25	1.26	1.27
75%	1.23	1.24	1.25	1.26

★ When electrolyte level is low, add distilled water in the morning before work instead of after the day's work. This is to prevent fluid from freezing at night.

⚠ **To avoid gas explosions, do not bring fire or sparks near the battery.**

⚠ **If the electrolyte gets on your skin or clothes, immediately wash with plenty of clean water.**

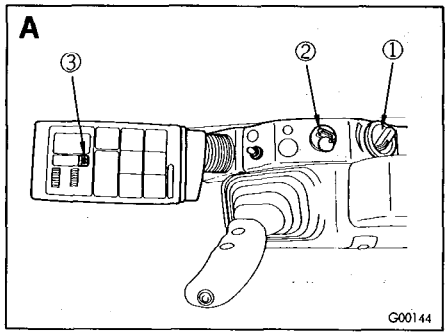
A: STARTING IN COLD WEATHER

For the pre- and post-starting inspection, refer to the section OPERATING YOUR MACHINE.

1. Set fuel control dial (1) at the low idling (MIN) position.
   (a): Low idling
2. Turn the key of starting switch (2) to HEAT, and confirm that engine preheating monitor lamp (3) comes on. After about 30 seconds, preheating monitor lamp (3) will flash for about 10 seconds to indicate that preheating is finished.
3. After preheating monitor lamp (3) starts to flash, turn the key of starting switch (2) to START and start the engine.
4. When the engine starts, return the key of starting switch (2) to the ON position.
   (The key will return automatically when released.)

★ If the engine does not start up under the above procedure, repeat steps 2 and 3 after waiting for about 2 minutes.

⚠ **Never use starting aid fluids as they may cause explosions.**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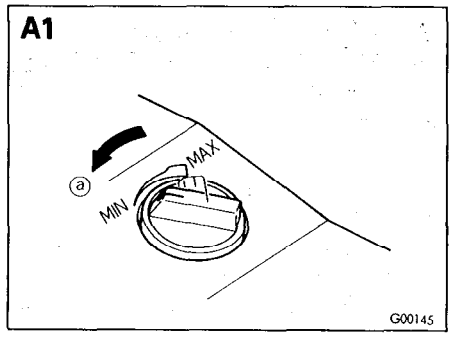
A1
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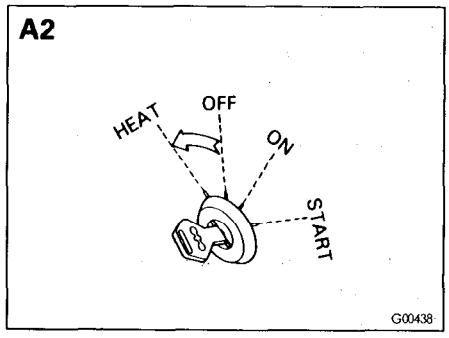
A2
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ON
START
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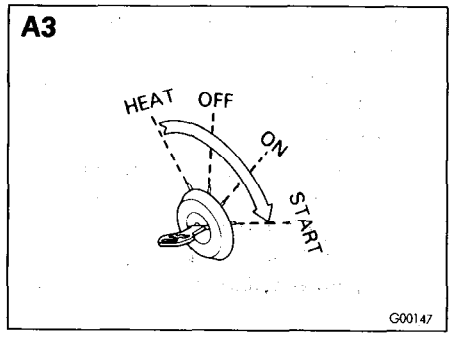
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HEAT
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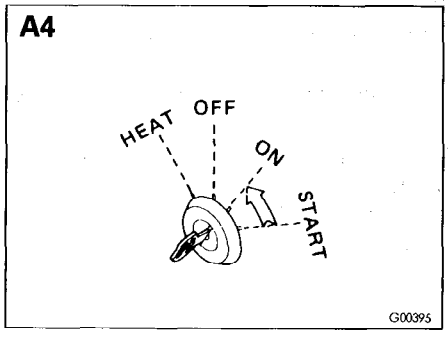
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B: AUTOMATIC WARMING-UP OPERATION (STARTING IN COLD AREAS)

After starting the engine in cold areas, carry out automatic warming-up operation.

1. Set fuel control dial (1) to the low idling (MIN) position.
   (a): Low idling (MIN) speed

★ After starting the engine, if the engine water temperature is low (below 30°C), warming-up operation will be carried out automatically.

★ The automatic warming-up operation is canceled when the engine water temperature reaches the specified temperature (30°C) or after warming-up operation has been continued for 10 minutes, so if the engine water temperature and hydraulic oil temperature are still low after the automatic warming-up operation, warm up the engine as follows.

2. Leave fuel control dial (1) at the low idling (MIN) position and run for approx. 5 minutes under no load.
3. Press working mode switch (2) on the monitor panel to set to H.O (heavy-duty operation) mode.
4. Turn fuel control dial (1) to the mid-range speed position.

(a): Mid-range speed

5. Operate bucket control lever (3) and arm control lever (4) slowly to move the bucket cylinder and arm cylinder to the end of their stroke.

(a): In (c): Curl
(b): Out (d): Dump

6. Operate the bucket for 30 seconds and the arm for 30 seconds in turn fully for 5 minutes.

★ When pulling in the work equipment, be careful not to hit the chassis or ground.

★ Turn the swing lock switch ON (ACTUATED) and operate the lever to make the oil temperature rise more quickly.

7. Turn fuel control dial (1) to the full speed (MAX) position and carry out the operation in Step 6 for 3 — 5 minutes.

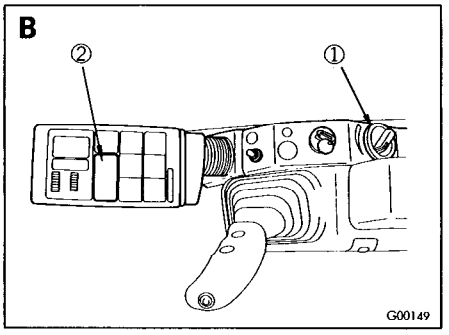
(a): Full speed

8. Repeat the following operation 3 — 5 times and operate slowly.

- Boom operation RAISE ↔ LOWER
- Arm control operation IN ↔ OUT
- Bucket control operation CURL ↔ DUMP
- Swing operation LEFT ↔ RIGHT
- Travel (Lo) operation FORWARD ↔ REVERSE

★ If the above operation is not carried out, there may be a delay in response when starting or stopping each actuator.

9. Use working mode switch (2) on the monitor panel to select the operation mode.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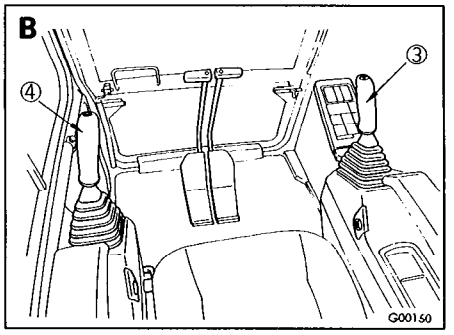
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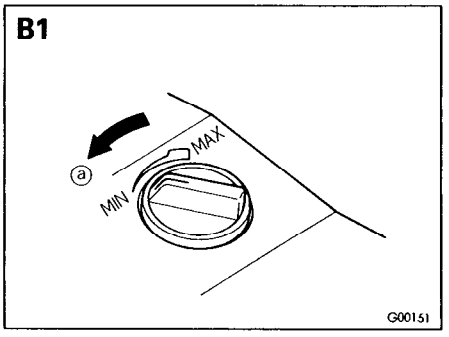
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MIN
MAX
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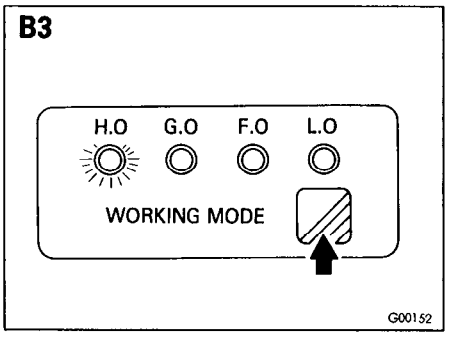
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H.O
G.O
F.O
L.O
WORKING MODE
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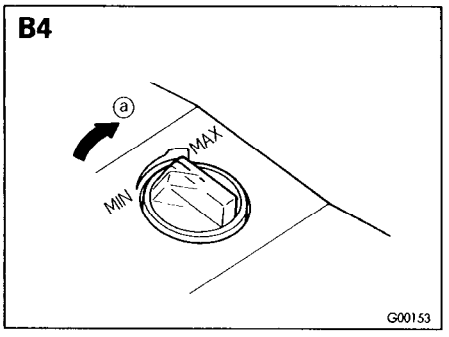
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MAX
MIN
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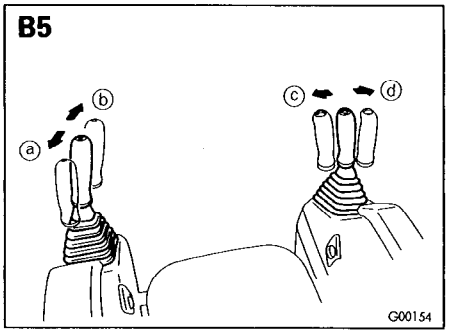
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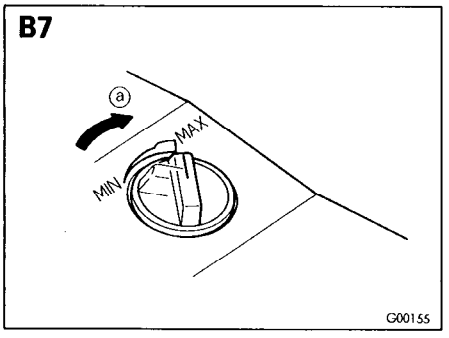
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MAX
MIN
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CAUTIONS AFTER COMPLETION OF WORK

To prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move on the following morning, always observe the following precautions.

- Mud and water on the machine body should be completely removed.
  This is to prevent damage to the seal caused by mud or dirt getting inside the seal with frozen drops of water.
- Park the machine on concrete or hard ground. If this is impossible, park the machine on wooden boards.
- Drain water collected in fuel system so that such water may be frozen at night.
- As battery capacity drops at low ambient temperature, cover the battery or remove it from the machine to be kept warm at night.

AFTER COLD WEATHER

When weather becomes warm, perform the following without fail:

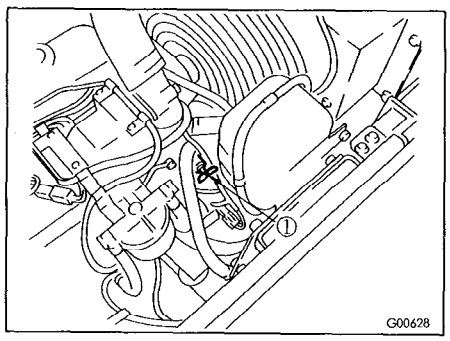
- Replace lubricating oils for various units with the ones specified for warm-weather use.
- If for any reason permanent antifreeze connot be used, and an ethyl glycol base antifreeze (winter, one season type) is used instead, or if no antifreeze is used, drain the cooling system completely, then clean out the inside of the cooling system thoroughly, and fill with fresh water.

PREPARING THE CAB HEATER

If the ambient temperature drops, use the cab heater.

When using the cab heater, turn valve (1) on the water manifold counterclockwise to open it.

★ When leaving the cab heater unused for a long time, turn valve (1) clockwise to close it.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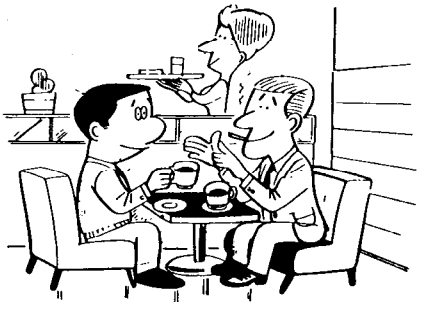


PERIODIC MAINTENANCE

Proper lubrication and maintenance assure trouble-free operation and long machine life. Time and money spent for scheduled periodic maintenance will be amply compensated by prolonged machine operation and reduced operating cost.

All hourly figures given in the following descriptions are based on service meter readings. In practice, however, it is recommended to rearrange all of them into units of days, weeks and months to make the maintenance schedule more convenient. Under rough job site or operating conditions, it is necessary to somewhat shorten the maintenance intervals stated in this manual.

PRECAUTIONS WHEN DISASSEMBLING MACHINE

When disassembling the machine or removing piping for inspection or maintenance, always release the remaining pressure as follows.

A. RELEASING PRESSURE IN WORK EQUIPMENT CIRCUIT, SWING CIRCUIT, TRAVEL CIRCUIT

1. Lower the work equipment to the ground on a firm, flat surface as shown in the diagram, then stop the engine.

★ Set the lock lever to the FREE position.

2. Operate all the work equipment levers to the end of their travel within 5 — 6 seconds of stopping the engine.
3. Remove the cap from the hydraulic tank.
4. Start the engine, run for approx. 10 seconds, then stop the engine.

★ Do not run the engine at above 1000 rpm.

★ Place the work equipment levers at neutral.

5. Operate all the work equipment levers to the end of their travel within 5 — 6 seconds of stopping the engine.

★ Repeat Steps 4 — 5 three times.

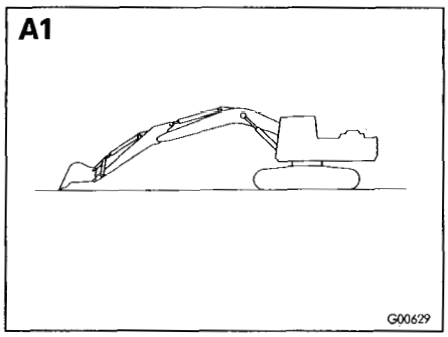
⚠ **When removing the oil filler cap from the hydraulic tank, turn it slowly to release the internal pressure, and remove it carefully.**

B. RELEASING PRESSURE FROM ACCUMULATOR CIRCUIT

- **Pilot circuit**

  After stopping the engine, place lock lever (1) in the FREE position, operate all the work equipment levers 3 — 4 times to the end of their travel, then wait for at least 1 minute for the pressure to be released.

★ Do not loosen any piping for at least 1 minute after releasing the pressure.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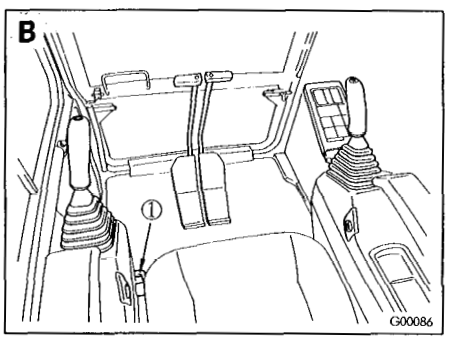
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BLEEDING AIR FROM CIRCUIT

When replacing or cleaning the hydraulic oil, filter element, or strainer, or when replacing or cleaning the line filter element, or when repairing or replacing hydraulic equipment, or after removing the hydraulic piping, bleed the air from the circuit.

PROCEDURE FOR BLEEDING AIR

Air bleeding item / Nature of work	Air bleeding procedure					
	1	2	3	4	5	6
	Bleed air from pump	Start engine	Bleed air from cylinder	Bleed air from swing motor	Bleed air from travel motor	Start operations
· Change hydraulic oil · Clean strainer	o →	o →	o →	o *1 →	o *1 →	o
· Replace return filter element		o →	→	→	→	o
· Replace, repair pump · Replace, clean line filter element · Remove suction piping	o →	o →	o →	→	→	o
· Replace, repair control valve		o →	o →	o →	o →	o
· Replace cylinder · Remove cylinder piping		o →	o →	→	→	o
· Replace swing motor · Remove swing motor piping		o →	→	o →	→	o
· Replace travel motor, swivel · Remove travel motor, swivel piping		o →	→	→	o →	o

*1 . . . Bleed the air from the swing motor and travel motor only when the oil inside the motor case has been drained.

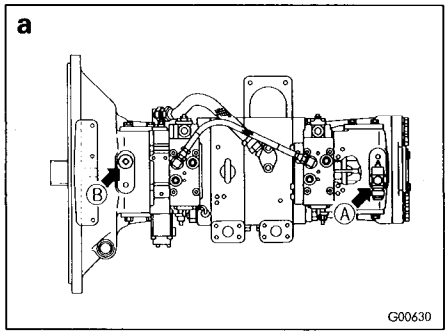
a. Bleeding air from pump

1. Loosen the bleeder at portion (A), remove plug (B), then add oil through filler (B) to fill the pump with oil.
2. After completion of bleeding the air, install plug (B) first, then tighten the bleeder.

★ If the bleeder is tightened first, oil will spurt out from hole (B).

★ If the pump is operated without the pump case being filled with hydraulic oil, abnormal heat will be generated, and this may lead to premature damage to the pump.

★ Tightening torque
Bleeder (A): 0.9 ± 0.1 kgm
Plug (B): 7.0 ± 1.0 kgm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b. Start engine

Start the engine (see OPERATING YOUR MACHINE) and run at low idling for 10 minutes, before going on to the next operation.

c. Bleeding air from cylinders

1. Run the engine at low idling, and extend and retract each cylinder 4 — 5 times without operating it to the end of its stroke. (Stop approx. 100 mm before the end of the stroke)
2. Next, operate each cylinder to the end of its stroke 3 — 4 times.
3. After this, operate each cylinder 4 — 5 times to the end of its stroke to completely bleed the air.

★ If, at first, the engine is run at high speed or the cylinder is operated to the end of its stroke, the air inside the cylinder may cause damage to the piston packing or other parts.

d. Bleeding air from swing motor

1. Run the engine at low idling, loosen air bleed plug (1), and when no more cloudy white oil flows out from air bleed plug (1), tighten the plug.

★ Tightening torque: 7.0 ± 1.0 kgm

★ When doing this, do not operate the swing.

2. Run the engine at low idling, and swing 2 or more times slowly and uniformly to the left and right.

★ If the air is not bled from the swing motor, the bearings of the motor may be damaged.

e. Bleeding air from travel motor

1. Run the engine at low idling, loosen air bleed plug (1), and when no more cloudy white oil flows out, tighten the plug.

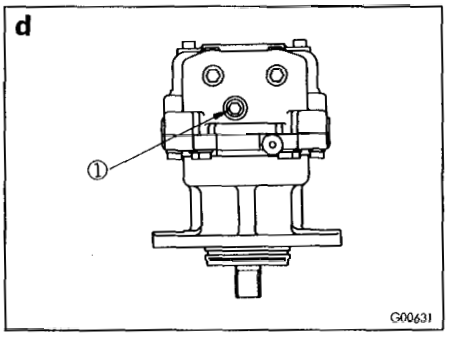
★ Tightening torque: 0.9 ± 0.1 kgm

2. Keep the engine running at low idling, and swing the work equipment 90° to bring it to the side of the track.
3. Jack up the machine until the track is raised slightly from the ground. Rotate the track under no load for 2 minutes. Repeat this procedure on both the left and right sides, and rotate the track equally both forward and in reverse.

f. Start operations

After completion of bleeding the air, stop the engine, and wait for at least 5 minutes before starting operations. In this way, the air bubbles are removed from the oil inside the hydraulic tank.

★ Check for any leakage of oil, and wipe off any oil that has been spilled.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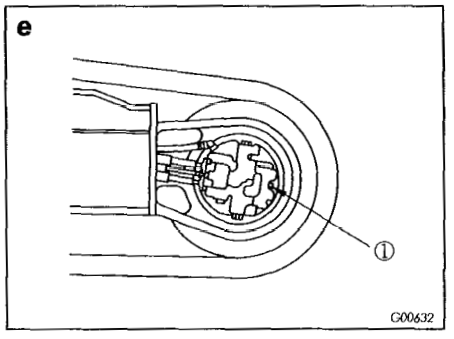
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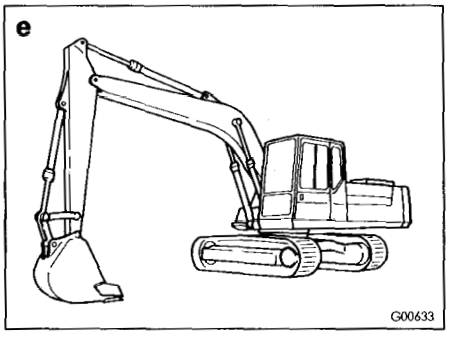
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PERIODICAL REPLACEMENT OF SAFETY PARTS

To ensure safety at all times when operating or driving the machine, the user of the machine must always carry out periodic maintenance. In addition, to further improve safety, the user should also carry out periodic replacement of the parts given in the table on the next page. These parts are particularly closely connected to safety and fire prevention.
With these parts, the material changes as time passed, or they easily wear or deteriorate. However, it is difficult to judge the condition of the parts simply by periodic maintenance, so they should always be replaced after a fixed time has passed, regardless of their condition. This is necessary to ensure that they always maintain their function compeletly.

However, if these parts show any abnormality before the replacement interval has passed, they should be repaired or replaced immediately.
If the hose clamps show any deterioration, such as deformation or cracking, replace the clamps at the same as the hoses.

Carry out the following inspection for hydraulic hoses in addition to the periodic replacement parts listed on the next page. If any abnormality is found, tighten, replace, or take any other necessary action.

Category of inspection	Inspection item
Check before starting	Leakage from joints or caulked portion of fuel or hydraulic hoses
Periodic inspection (monthly inspection)	Leakage from joints or caulked portion of fuel or hydraulic hoses Damage (cracks, wear and tear) of fuel or hydraulic hoses
Periodic inspection (yearly inspection)	Leakage from joints or caulked portion of fuel or hydraulic hoses Interference, deterioration, twisting, damage (cracks, wear and tear, crushed parts) of fuel or hydraulic hoses

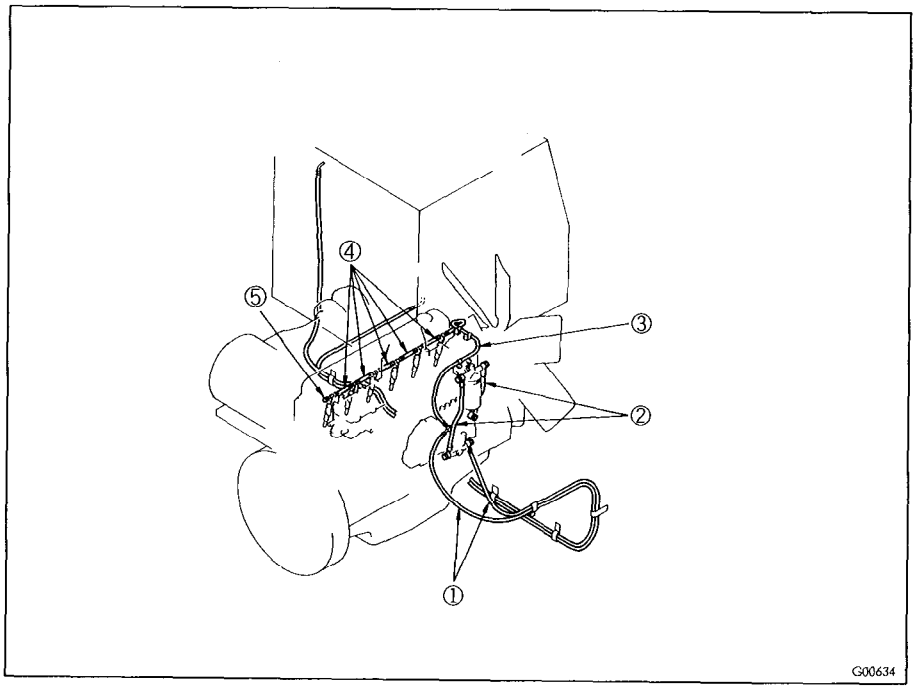
Fuel system parts

No.	Safety parts for periodical replacement	Q'ty	Replacement interval
1	Fuel hose (fuel tank – engine)	2	Every 2 years or 4000 hours, whichever comes sooner
2	Fuel hose (fuel filter – injection pump)	2	
3	Spill hose (nozzle – injection pump)	1	
4	Spill hose (between nozzles)	5	
5	Fuel tube cap	1	

Hydraulic system parts

No.	Safety parts for periodical replacement	Q'ty	Replacement interval
6	Front pump hose (front pump – line filter)	1	Every 2 years or 4000 hours, whichever comes sooner
7	Front pump hose (line filter – control valve)	1	
8	Rear pump hose (rear pump – line filter)	1	
9	Rear pump hose (line filter – control valve)	1	
10	Front and rear pump branch hoses	2	

★ When replacing the hoses, always replace the O-rings, gaskets, and other such parts at the same time.
★ Ask your Komatsu distributor to replace the safety parts.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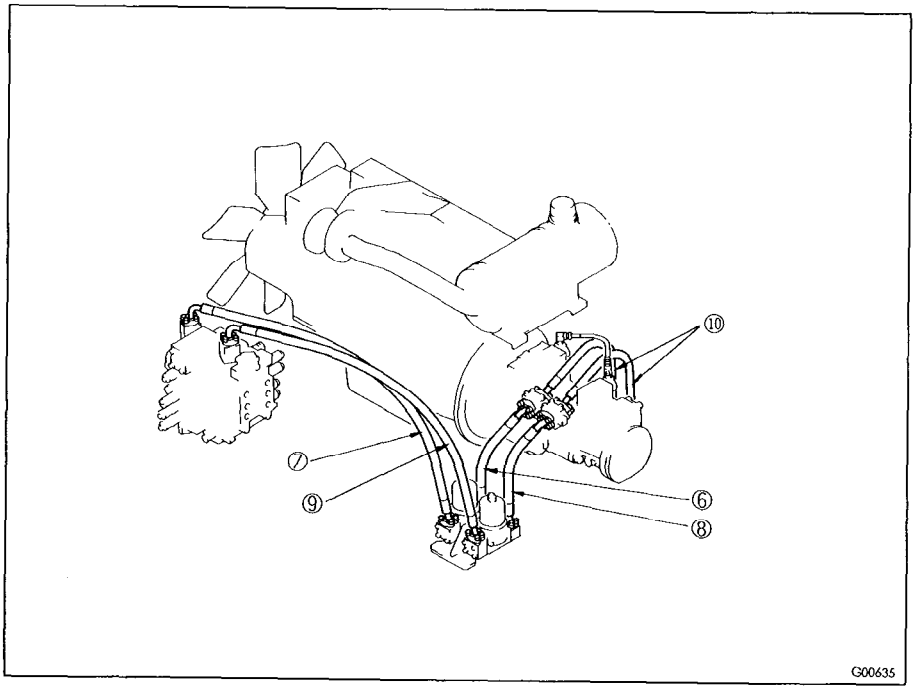
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MAINTENANCE TABLE

No.	ITEM	SERVICE	PAGE
	CHECK BEFORE STARTING		
a	Walk-around check		50
b	Coolant	Check and supply	50
c	Engine oil pan	Check and supply	50
d	Fuel	Check and supply	52
e	Hydraulic tank	Check and supply	52
f	Dust indicator	Check	54
g	Electric wirings	Check	54
h	Clamshell bucket (except PC300, 300LC-5 MIGHTY)	Lubricate 12 points	54
i	Water separator	Inspect float position	54
	EVERY 100 HOURS SERVICE		
a	Swing machinery case	Check and supply	126
b	Fuel tank	Drain water and sediment	126
c	Lubricating		128
-1	Boom cylinder foot pin	Lubricate 2 points	128
-2	Boom foot pin	Lubricate 2 points	128
-3	Boom cylinder rod end	Lubricate 2 points	128
-4	Arm cylinder foot pin	Lubricate 1 point	128
-5	Arm cylinder rod end	Lubricate 1 point	128
-6	Boom-Arm coupling pin	Lubricate 1 point	128
-7	Bucket cylinder foot pin	Lubricate 1 point	130
-8	Arm-Link coupling pin	Lubricate 1 point	130
-9	Arm-Bucket coupling pin	Lubricate 1 point	130
-10	Link coupling pin	Lubricate 2 points	130
-11	Bucket cylinder rod end	Lubricate 1 point	130

No.	ITEM	SERVICE	PAGE
-12	Bucket-Link coupling pin	Lubricate 1 point	130

EVERY 250 HOURS SERVICE

(The items marked * are carried out after the first 250 hours only for new machines.)

*	Fuel filter	Replace cartridge	132
*	Engine valve clearance	Check and adjust	132
a	Final drive case	Check and supply	132
b	Engine oil pan and filter	Change oil and replace cartridge	132
c	Fan belt	Check tension	134
d	Hydraulic filter	Replace element	134
e	Swing circle	Lubricate 3 points	136
f	Battery electrolyte	Check fluid level	136
g	Water pump belt	Check and adjust	136
h	Fuel filter	Drain water and sediment	138
i	Hydraulic tank breather	Replace element	138

EVERY 500 HOURS SERVICE

a	Swing circle pinion	Lubricate with grease	140
b	Radiator fins and oil cooler fins	Clean	140
c	Fuel filter	Replace cartridge	142

EVERY 1000 HOURS SERVICE

a	Swing machinery case	Change oil	144
b	Damper case	Check and supply	144
c	Turbocharger clamping joint	Check and retighten	144

No.	ITEM	SERVICE	PAGE
	(EVERY 1000 HOURS SERVICE)		
d	Turbocharger rotor	Check play	144
e	Corrosion resistor	Replace cartridge	146
	EVERY 2000 HOURS SERVICE		
a	Hydraulic tank	Change oil	148
b	Hydraulic tank strainer	Clean	150
c	Final drive case	Change oil	150
d	Engine breather	Clean	150
e	Turbocharger	Clean blower impeller	152
f	Alternator and starting motor	Check	152
g	Vibration damper	Check	152
h	Engine valve clearance	Check and adjust	152
	EVERY 4000 HOURS SERVICE		
a	Water pump	Check	153
	WHEN REQUIRED		
a	Cooling system	Clean	154
b	Air cleaner element	Check, clean or replace when required	158
c	Track	Check and adjust tension	162
d	Glow plug	Check once a year	164
e	Track shoe bolts	Check and retighten	164
f	Bucket teeth (Vertical pin type) (except PC300, 300LC-5 MIGHTY)	Replace	166
g	Bucket teeth (Horizontal pin type)	Replace	168
h	Clean line filter	Clean	170
i	Drain water from water separator	Drain water	170

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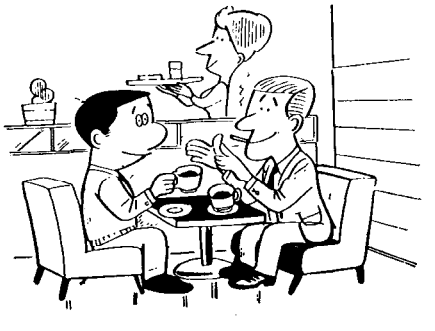
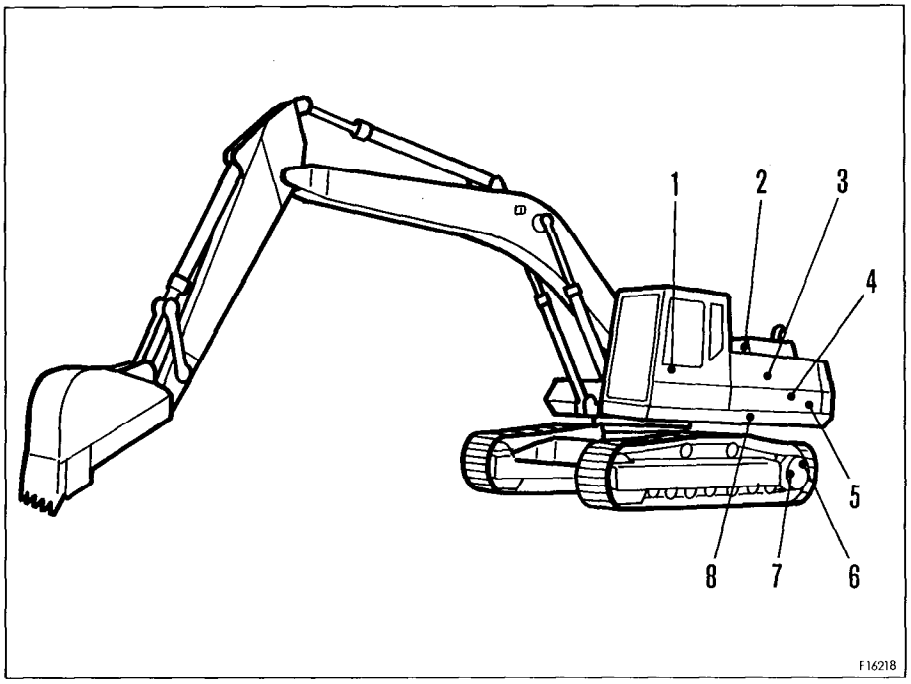


OIL FILLER AND LEVEL GAUGE POSITIONS

1. Swing machinery case oil filler and level gauge
2. Hydraulic tank oil filler
3. Hydraulic tank sight gauge
4. Damper case oil filler
5. Damper case level plug
6. Final drive case oil filler and level gauge
7. Final drive case drain plug
8. Hydraulic tank drain plug
9. Engine oil pan level gauge
10. Engine oil pan oil filler
11. Cooling water inlet
12. Fuel tank oil filler
13. Fuel tank sight gauge
14. Fuel tank drain valve
15. Swing machinery case drain plug
16. Cooling water drain valve
17. Engine oil pan drain valve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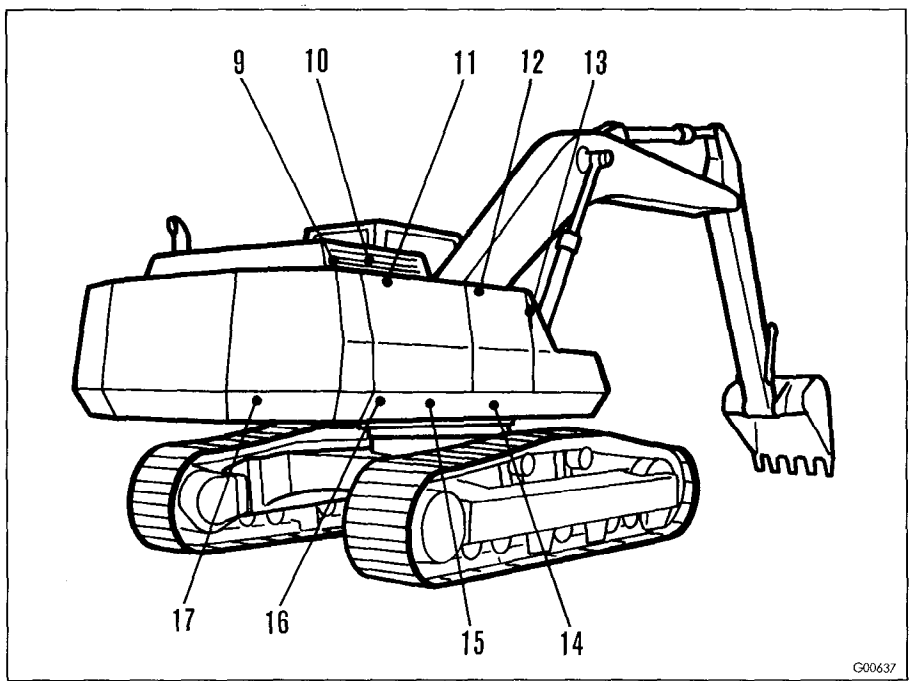
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CHECK BEFORE STARTING

See the section on CHECK BEFORE STARTING aforementioned.

EVERY 100 HOURS SERVICE

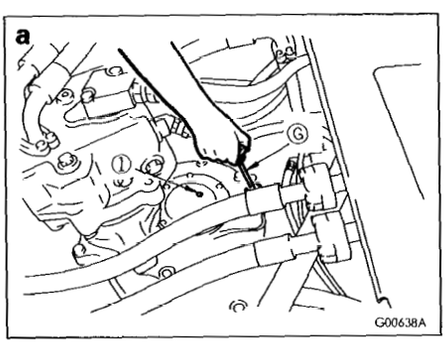
a. SWING MACHINERY CASE

Inspect the oil level using dipstick (G), and if insufficient pour in additional engine oil through the dipstick guide hole.

★ Insert dipstick (G) fully into the guide when checking the oil level.
★ Before supplying oil, remove air bleeding plug (1). After refilling, tighten plug (1).
★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

b. FUEL TANK

Loosen valve (1) on the bottom of the tank so that the precipitation and mixed water will be drained in accompaniment with fuel.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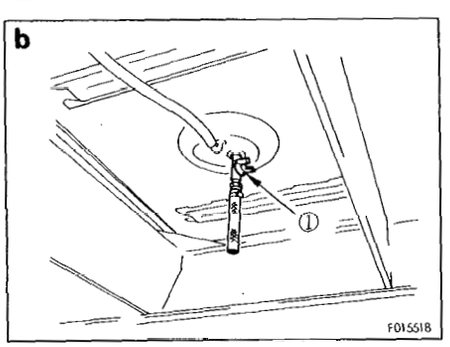
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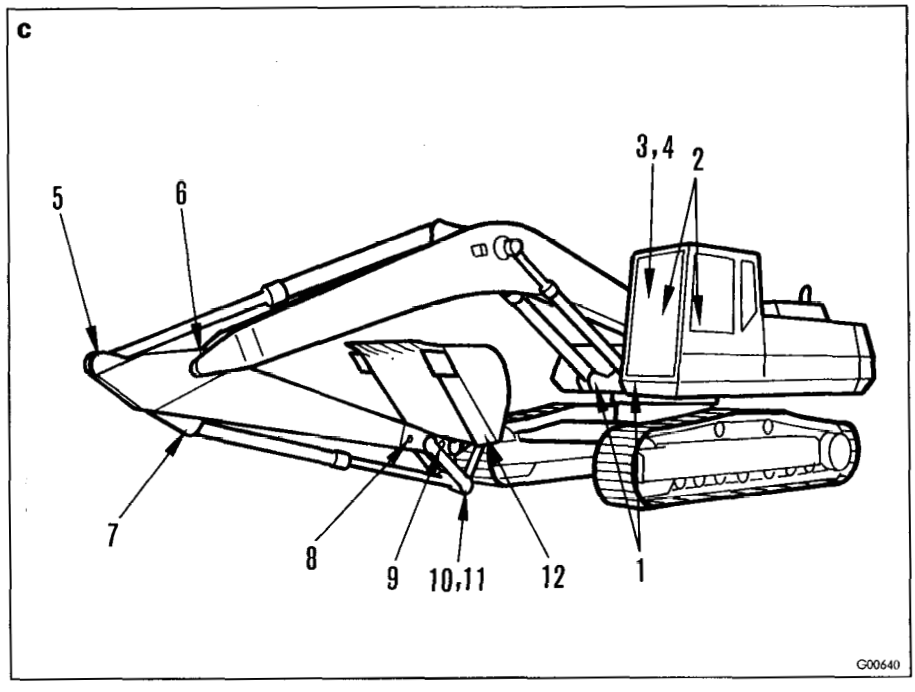
c. LUBRICATING

Apply grease to the grease fittings shown by arrows.

★ If any abnormal noise is heard from any greasing point, add grease regardless of the service interval.

★ For the first 100 hours of operation of new machines, grease the boom cylinder foot pin and boom foot pin every 10 hours.

1. Boom cylinder foot pin	(2 points)
2. Boom foot pin	(2 points)
3. Boom cylinder rod end	(2 points)
4. Arm cylinder foot pin	(1 point)
5. Arm cylinder rod end	(1 point)
6. Boom — Arm coupling pin	(1 point)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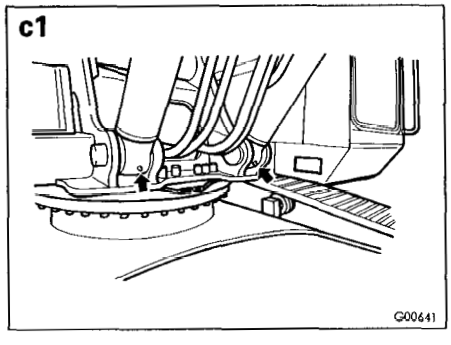
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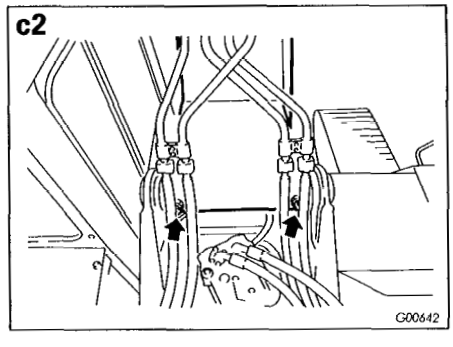
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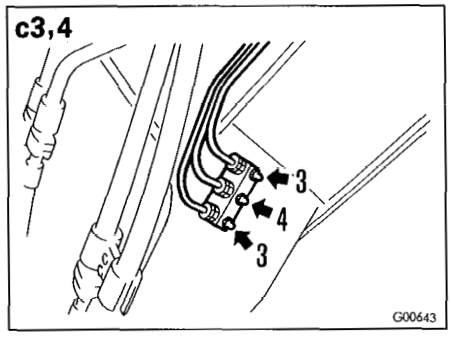
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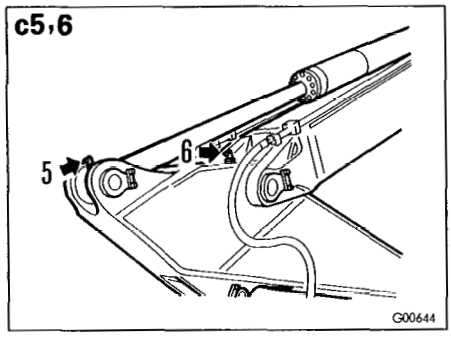
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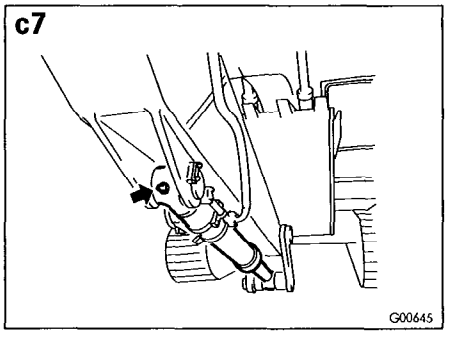
7.	Bucket cylinder foot pin	(1 point)
8.	Arm — Link coupling pin	(1 point)
9.	Arm — Bucket coupling pin	(1 point)
10.	Link coupling pin	(2 points)
11.	Bucket cylinder rod end	(1 point)
12.	Bucket — Link coupling pin	(1 point)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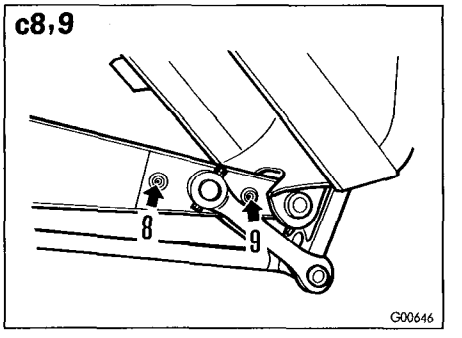
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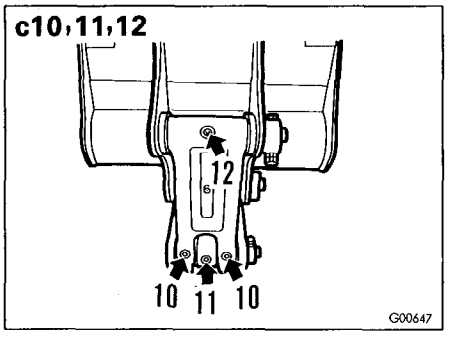
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EVERY 250 HOURS SERVICE

Carry out the following maintenance only after the first 250 hours.

- **FUEL FILTER, REPLACE CARTRIDGE**
- **ENGINE VALVE CLEARANCE, CHECK AND ADJUST**

For details of the method of replacing or maintaining, see the section on EVERY 500 HOURS AND 2000 HOURS SERVICE.

a. FINAL DRIVE CASE

1. Set with the UP mark at the top, and with the line connecting the UP mark and plug (P) perpendicular to the ground surface.
2. Remove plug (F), and if the oil is not within 10 mm below the bottom of the plug hole, install plug (F), rotate the sprocket one turn, then check again. If the oil is still not within 10 mm below the bottom of the plug hole, add engine oil through the plug hole.

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

b. ENGINE OIL PAN AND FILTER

1. Pull down the lever on drain valve (P) under the chassis to drain the oil. After draining the oil, push up the lever and close the valve.
2. Using a filter wrench, remove cartridge (1) of the engine oil filter by turning it counterclockwise.
3. Clean the filter holder, coat the packing surface and thread of a new filter cartridge with clean engine oil (or coat it thinly with clean grease), then install.

★ When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten 3/4 to 1 of a turn.

4. After replacing the cartridge, pour in the specified quantity of engine oil through oil filler (F).
5. Run the engine at idling for a short time, then stop the engine and check that the oil level is correct. For details, see CHECK BEFORE STARTING.

★ Refill capacity: 25 ℓ

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

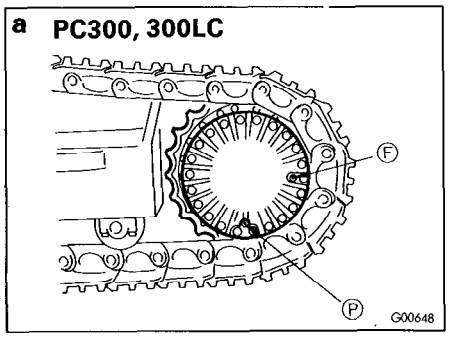
★ Be sure to fit a genuine Komatsu cartridge.

★ Even if the machine has not been operated for 250 hours, the oil and filter cartridge must be replaced when the machine has been operated for 6 months.

In the same way, even if the machine has not been operated for 6 months, the oil and filter cartridge must be replaced when the machine has been operated for 250 hours.

★ When supplying oil, be careful not to get oil on the alternator.

★ If filter cartridge (1) is removed immediately after stopping the engine, oil will spill. Wait at least 10 minutes after stopping the engine before replacing the filter cartridge.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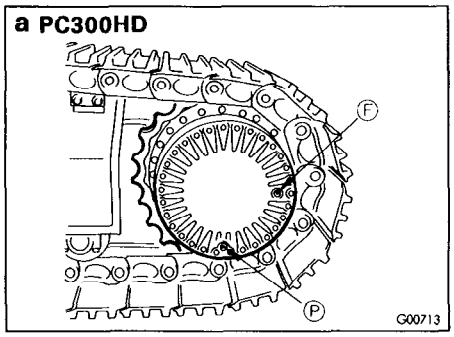
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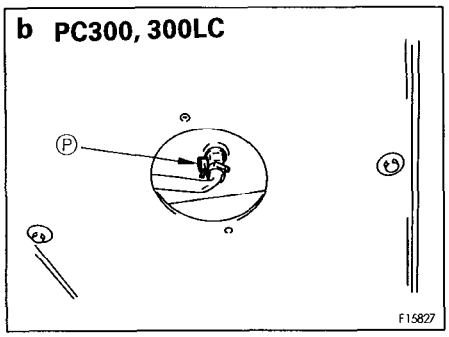
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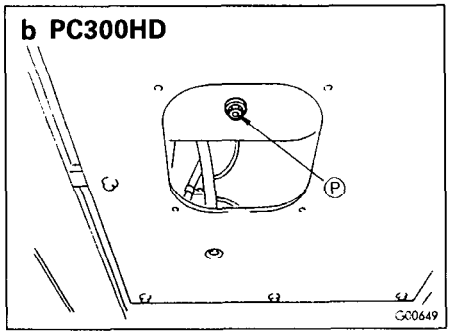
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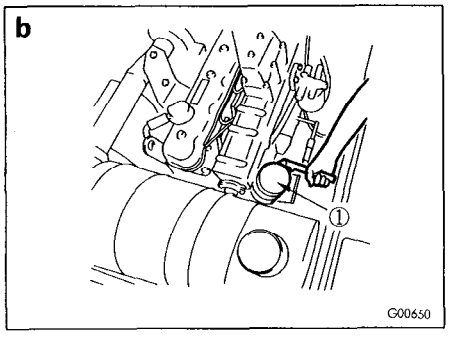
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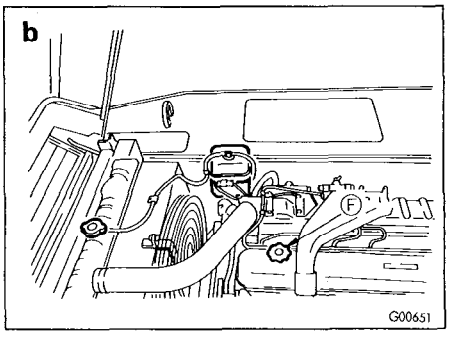
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★ Use API category CD class oil. If CC class oil must be used, change the oil and replace the oil filter at half the usual interval.

c. FAN BELT

1. The belt tension should normally deflect by 3 mm (a) when pressed with the finger at a point midway between alternator pulley (b) and fan pulley (c) (approx. 6 kg).
   (d): Crankshaft pulley
2. To adjust the belt tension, loosen bolts and nut (1), (2), (3) and shift alternator (4) slightly.
3. After adjusting, tighten bolts and nut (1), (2), and (3) to the specified torque.

★ Tightening torque
Bolt (1), (2): 6.75 ± 0.75 kgm
Bolt (3) : 11.75 ± 1.75 kgm

★ When adjusting the V-belt, do not attempt to push alternator (4) directly with a bar or the like, but use a wood pad to prevent damage to the core.

★ Check each pulley for damage, and V-grooves and V-belt for wear. Particularly, check whether V-belt is in contact with bottom of V-groove through wear.

★ Replace belt if it has stretched, leaving no allowance for adjustment, or if there is a cut or crack on belt.

d. HYDRAULIC FILTER

1. Remove the cap from oil filler (F).
2. Remove cover (1), then remove spring (2) and valve (3), and take out element (4).
3. Clean the parts after taking them out, then install a new element.

⚠ **When removing the cap, turn it slowly to relieve inner pressure.**

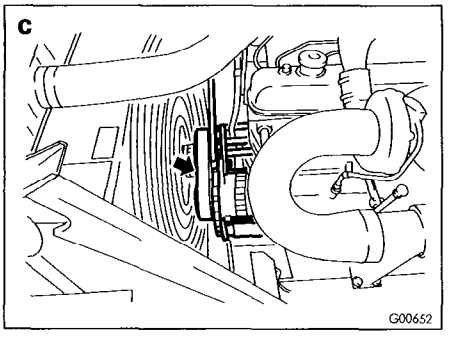
⚠ **When removing the cover (1), undo the bolts (4 bolts) gradually to prevent the cover flying off under the force of the spring (2).**

★ When a hydraulic breaker is installed, the hydraulic oil deteriorates faster than for the normal bucket excavation work, so always install the extra filter specified by Komatsu.

★ For installation of extra filters, please contact your Komatsu distributor.

★ Replace the extra filters on new machines after the first 250 hours, and following this, replace at the intervals shown in the table below.

(a): Replacement interval (h)
(b): Breaker operation rate (%)
(c): Replacement interval for main filter
(d): Replacement interval for extra filter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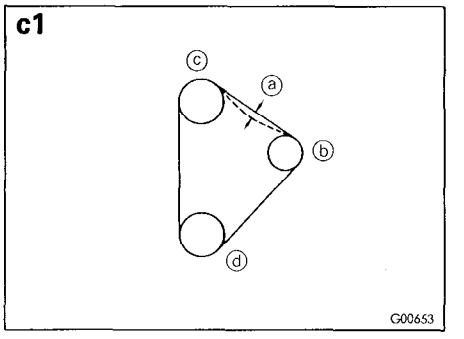
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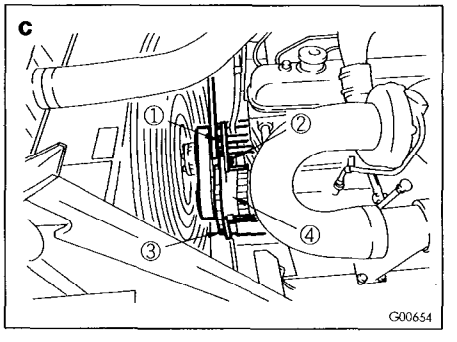
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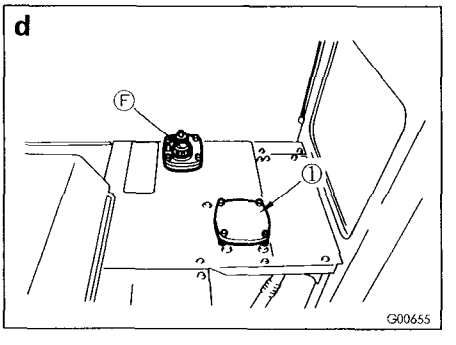
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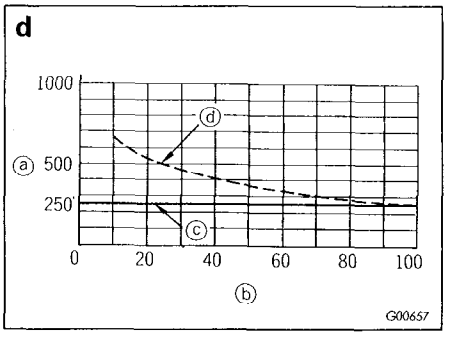
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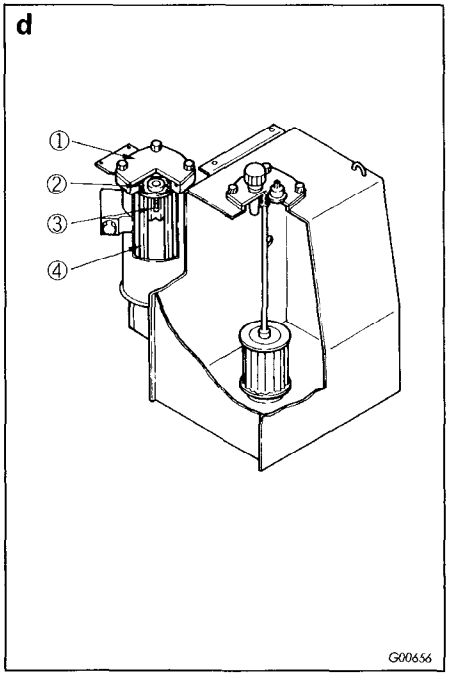
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e. SWING CIRCLE

Lubricate to the 3 grease fittings shown by an arrow.

f. BATTERY ELECTROLYTE

If the electrolyte level is lower than the prescribed level (10 to 12 mm above the plate), supply distilled water.

★ Should any of the acid be spilt, have it replenished by the nearest battery shop with acid of the correct specific gravity.

★ When inspecting electrolyte level, clean the air hole of the battery cap (1).

⚠ **If the electrolyte gets on your skin or clothes, immediately wash with plenty of clean water.**

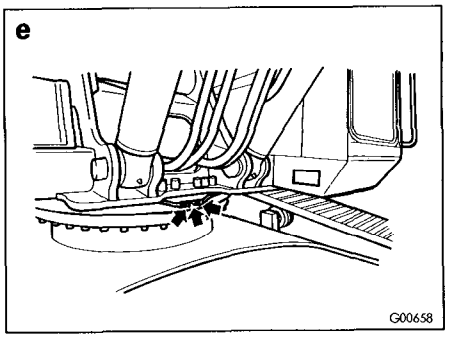
⚠ **To avoid gas explosions, do not bring fire or sparks near the battery.**

g. WATER PUMP BELT

1. The deflection (a) should be 6 mm when pushed with a thumb pressure of approx. 6 kg. midway between water pump pulley (b) and fan pulley (c).
   (d): Crankshaft pulley
2. Loosen locknut (1), and bolts (2) and (3), then adjust the belt tension with adjustment bolt (4).
3. After adjusting, tighten bolts (2) and (3), turn back adjustment bolt (4) 1/2 turns, then tighten locknut (1).

★ Tightening torque
Locknut (1): 3.15 ± 0.35 kgm
Bolt (2), (3): 6.75 ± 0.75 kgm

e



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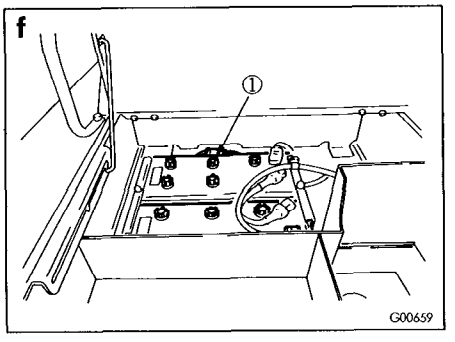

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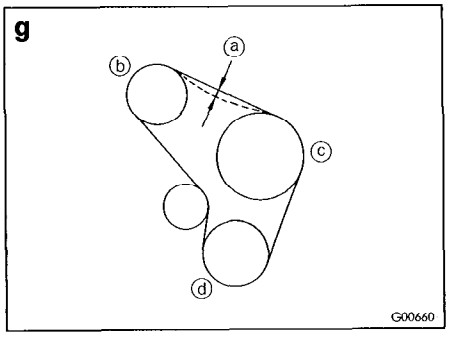

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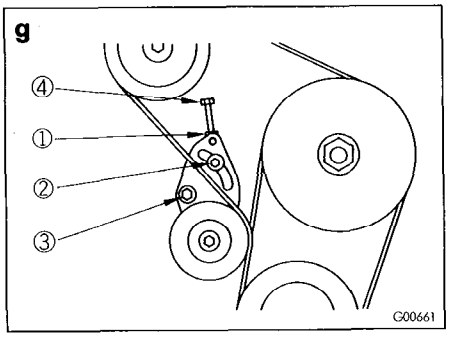


h. FUEL FILTER

Loosen the drain plug at the bottom of the fuel filter, and drain the water and sediment collected at the bottom together with fuel.

★ If air has been sucked in by mistake, bleed the air. For details, see REPLACING FUEL FILTER CARTRIDGE.

i. HYDRAULIC TANK BREATHER

⚠ **When replacing the breather, turn oil filler (F) slowly to release the internal pressure first.**

- **Replacement of filter element of breather (1)**

1. Remove cap nut (2), nut (3), seal washer (4), and cover (5).
2. Replace filter element (6) with a new element, then install cover (5), seal washer (4), nut (3), and cap nut (2) in order.

★ Install the filter element with the sponge packing at the top.

★ Align the notched portions of body (7) and cover (5), then install and lock in position.

(a): Notch

★ Tightening torque
Cap nut (2), nut (3): 1.2 ± 0.2 kgm

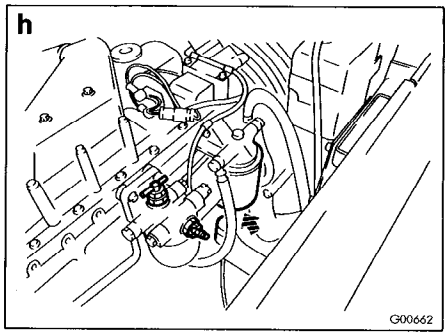
- **Replacement of element of cap (F)**

1. Remove bolt (8) and cover (9).
2. Replace filter element (10) with a new element, then install cover (9) and bolt (8).

★ When installing cover (9), check that the male and female portions inside are aligned.

★ Tightening torque of bolt (8): 0.8 ± 0.1 kgm

h



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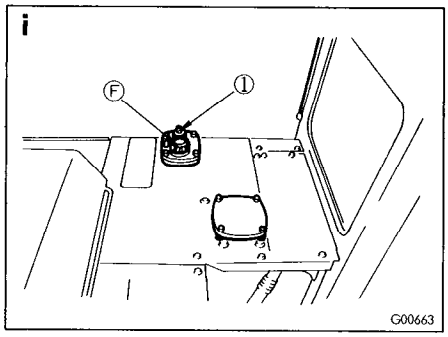

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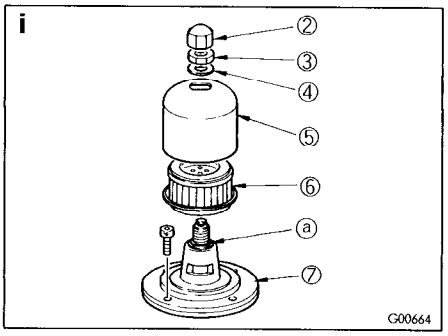

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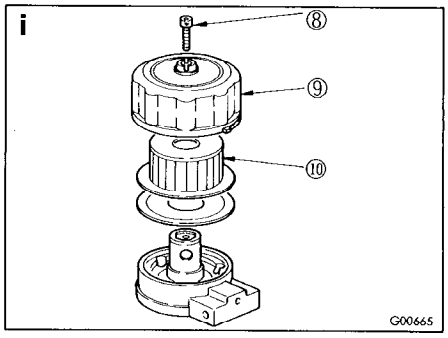


EVERY 500 HOURS SERVICE

★ **Maintenance for every 100 and 250 hours should be carried out at the same time.**

a. SWING CIRCLE PINION

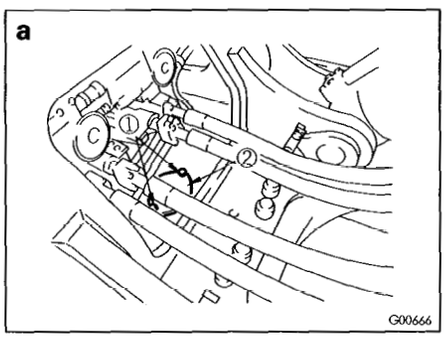
1. Remove bolts (1) (2 bolts) on the top of the revolving frame and remove cover (2).
2. Insert a scale into the grease and check that the height of the grease in the portion where the pinion passes is at least 28 mm. Add more grease if necessary.

★ If the grease is particularly milky due to ingress of water, etc., then remove cover (3) from the bottom of the track frame and remove the grease. Replace all of the grease with new grease.
★ The total amount of grease is 33 ℓ [29.7 kg].
★ When changing the grease, contact your Komatsu distributor.

b. RADIATOR FINS AND OIL COOLER FINS

Clean the radiator fins and oil cooler fins clogged with mud, dust and leaves with compressed air. Steam or water may be used instead of compressed air.

★ The rubber hose should be checked at the same time. If the hose is found to have cracks or to be hardened by ageing, such hose should be replaced by new one. Further, loosened hose clamp should also be checked.
★ When cleaning, clean the net at the front of the oil cooler also.
★ On dusty jobsites, carry out this inspection every day regardless of the maintenance interval.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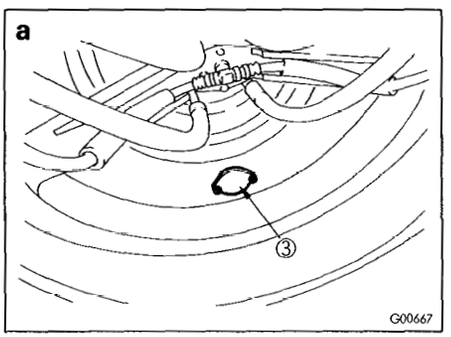
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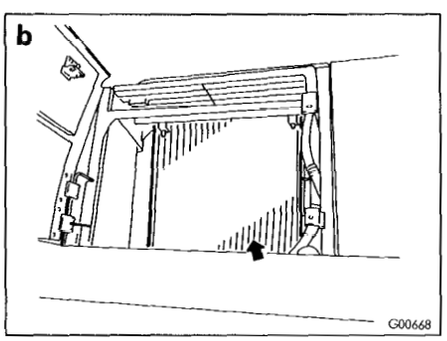
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c. FUEL FILTER

1. Using a filter wrench, remove cartridge (1) by turning it counterclockwise.
2. Clean the filter holder, fill a new cartridge with clean fuel and refit it after applying a dab of clean engine oil to the packing face and thread.

★ To refit the cartridge, place the packing face in contact with the seal face of the filter holder, then screw up the cartridge 2/3 of a turn.

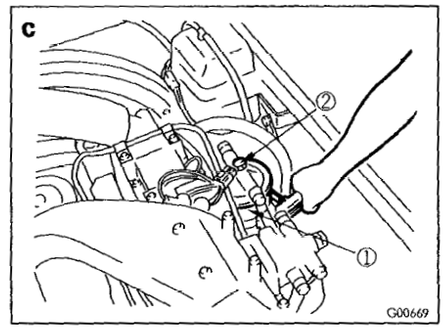
3. After replacing filter cartridge (1), loosen air bleed plug (2).
4. Loosen the knob of feed pump (3), then pump it up and down, and continue until no more bubbles come out with the fuel from air bleed plug (2).
5. Tighten air bleed plug (2).

★ Always use genuine Komatsu filter cartridges.

★ After replacing the filter cartridge, start the engine, and check that there is no leakage of oil from the filter seal surface.

When starting the engine after it has run out of fuel, if the engine misfires, or black smoke comes out, bleed the air from the line as follows.

6. Loosen the connection of the fuel discharge port of the injection pump, and bleed the air in the same way as for the fuel filter.
7. After bleeding the air, tighten the fuel discharge port, then push in the knob of the feed pump and tighten it.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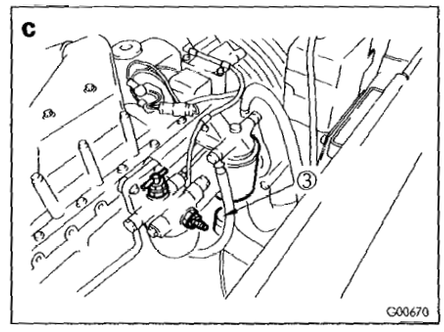
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EVERY 1000 HOURS SERVICE

★ **Maintenance for every 100, 250 and 500 hours should be carried out at the same time.**

a. SWING MACHINERY CASE

1. Drain off oil from drain valve (P) at the bottom of the machine.
   After draining, tighten drain valve (P).
2. Pour in the specified amount of engine oil through gauge hole (G).
   (Refer to EVERY 100 HOURS SERVICE.)

★ Before supplying oil, remove air bleeding plug (1). After refilling, tighten plug (1).
★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
★ Refill capacity: 22.5 ℓ

b. DAMPER CASE

Remove plug (G) and check that the oil is near the bottom edge of the plug hole. If the oil level is low, add engine oil through oil filler (F).

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

c. TURBOCHARGER CLAMPING JOINT

Contact your Komatsu distributor for checking, or proceed as follows:
Periodically inspect all joints for looseness. Tighten when necessary.

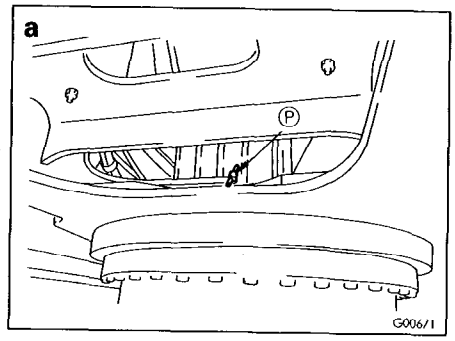
- Tightening torque for bolts on turbine housing side: 1.8 — 2.2 kgm
- Tightening torque for clamp bolts on compressor housing side: 1.15 — 1.50 kgm
- Tightening torque for turbocharger mounting nuts: 3.0 — 4.5 kgm
- Tightening torque for turbocharger oil pipe (inlet): 1.4 — 2.4 kgm
- Tightening torque for turbocharger oil pipe (outlet): 3.5 — 4.7 kgm

d. TURBOCHARGER ROTOR PLAY

Contact your Komatsu distributor for checking, or proceed as follows:
Remove air intake and exhaust pipes from turbocharger.

1. Axial play
   Check axial play by moving rotor in axial direction.
   Play:
   Standard 0.025 to 0.076 mm
2. Radial play
   Measure radial play by moving rotor holding both ends by hands in radial direction in parallel.
   Play:
   Standard 0.076 to 0.150 mm

★ If the play is over the limit, consult your Komatsu distributor.
★ If the rotor is excessively soiled with dust or carbon or if any oil leakage caused by turbocharger trouble is noted, have the turbocharger repaired by your Komatsu distributor.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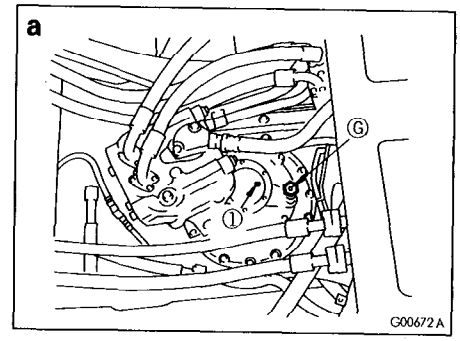
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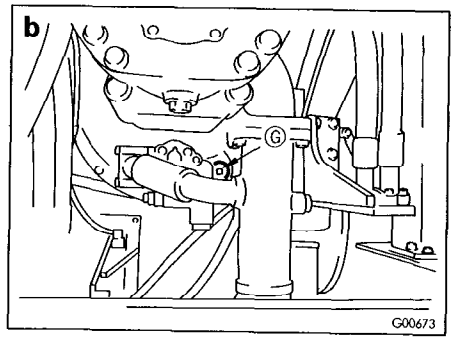
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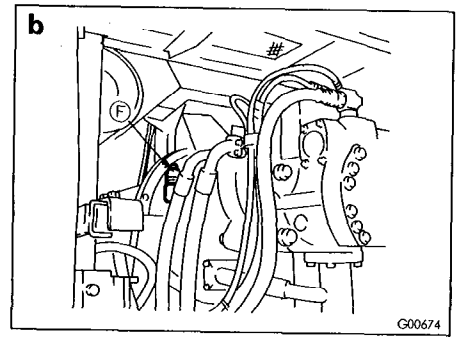
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e. CORROSION RESISTOR

1. Screw in valve (1) at the top of the corrosion resistor.
2. Using a filter wrench, turn cartridge (2) to the left and remove it.
3. Coat the packing surface and thread of a new cartridge with clean engine oil.

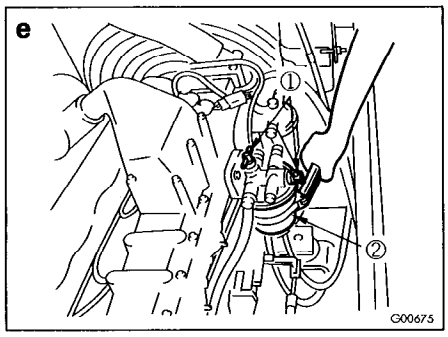
★ When installing, bring the packing surface into contact with the seal surface of the filter holder, then tighten about 2/3 of a turn.

4. Open valve (1).

★ Use a genuine Komatsu cartridge.

5. Start the engine and check that there is no leakage of water from the seal surface.

e



EVERY 2000 HOURS SERVICE

★ **Maintenance for every 100, 250, 500 and 1000 hours should be carried out at the same time.**

a. HYDRAULIC TANK

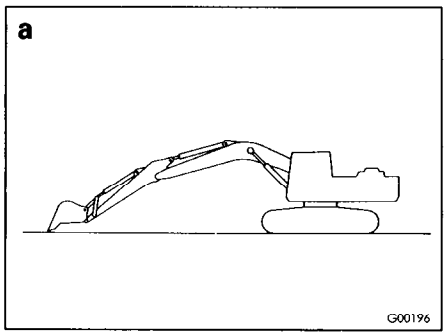
1. Retract the arm and bucket cylinder to the stroke end, then lower the boom and put the tip of the teeth in contact with the ground.
2. Remove the cap of oil filler (F).

⚠ **When removing the cap, turn it slowly to relieve inner pressure.**

3. Remove drain plug (P) at the bottom of the machine to drain off the oil. After draining off the oil, tighten up drain plug (P).
4. Pour in the specified amount of engine oil through oil filler (F).
5. After adding oil, check that the oil is at the specified level. For details, see CHECK BEFORE STARTING.

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
★ Refill capacity: 195 ℓ
★ When changing the oil in the hydraulic tank or replacing the main pump, or when removing the pump suction piping, bleed the air from the circuit before starting the engine. For details, see BLEEDING AIR FROM CIRCUIT.
★ If the pump is operated without filling the pump case with hydraulic oil, abnormal heat will be generated and this may lead to premature damage of the pump.
★ When a hydraulic breaker is installed, the hydraulic oil deteriorates much more rapidly than when carrying out ordinary digging operations with a bucket. Therefore, change the oil according to the table.

(a): Change interval (Hours)
(b): (When not using breaker)
(c): Breaker operation rate (%)
(d): (Using only breaker)
(e): Hydraulic oil change interval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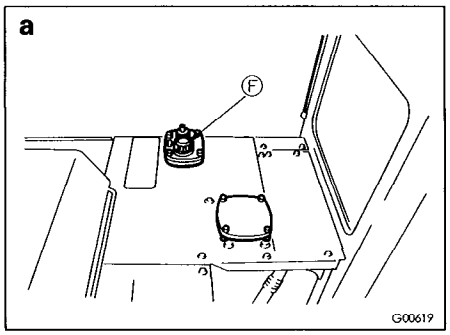
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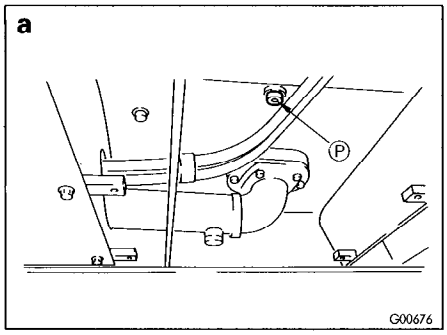
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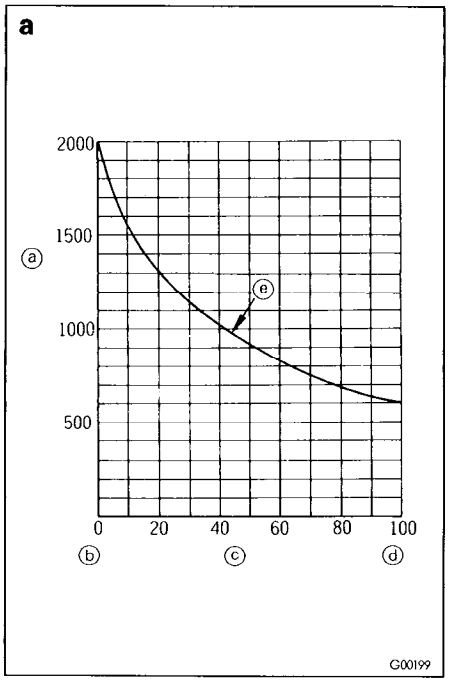
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b. HYDRAULIC TANK STRAINER

1. Remove the cap of oil filler (F).
2. Remove cover (1) and lift up the top of rod (3) from above to take out spring (2) and strainer (4).
3. Wash the strainer with fuel oil. If strainer (4) is damaged, replace it with a new one.
4. Refit strainer (4) by inserting it into tank projecting part (5).

⚠ **When removing the cap, turn it slowly to relieve inner pressure.**

⚠ **When removing cover (1), undo the bolts (4 bolts) gradually to prevent the cover flying off under the force of spring (2).**

c. FINAL DRIVE CASE

1. Set with the UP mark at the top, and with the line connecting the UP mark and plug (P) perpendicular to the ground surface.
2. Drain the oil from drain plugs (P) on both sides of the machine. After draining, tighten the drain plugs.
3. Then, supply new engine oil through oil filler (F) respectively to the specified level. (Refer to EVERY 250 HOURS SERVICE.)

★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".

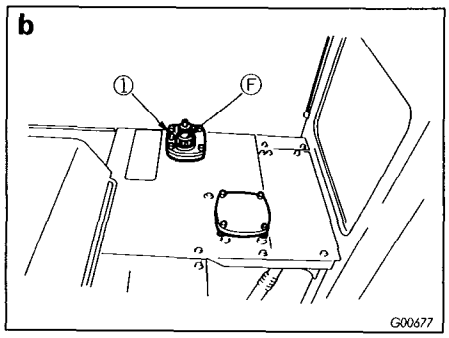
★ Refill capacity
PC300, 300LC: 7.4 ℓ (each)
PC300HD : 11 ℓ (each)

d. ENGINE BREATHER

1. Loosen the clamp, and remove the hose, then remove breather (1) from the cylinder head cover.
2. Wash the breather unit in diesel oil or flushing oil, dry with compressed air, then install it again.
3. Check the breather hose, and if any deteriorated oil (sludge) is stuck to the inside, replace it with a new hose.

★ Before removing the breather, remove all the dust from around the breather.

★ Replace the breather o-ring with a new part, coat with engine oil, then install.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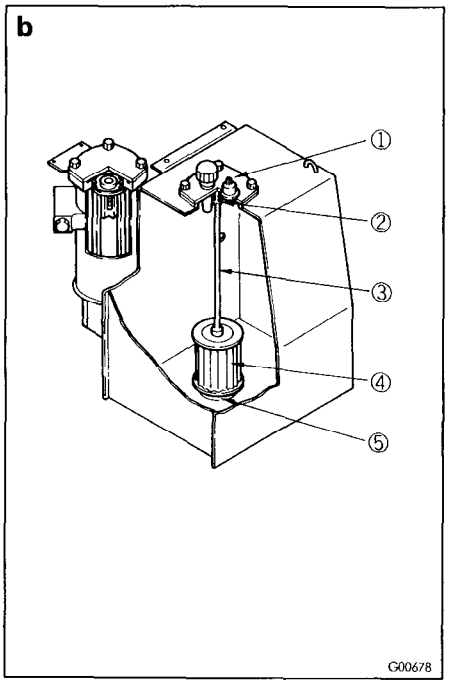
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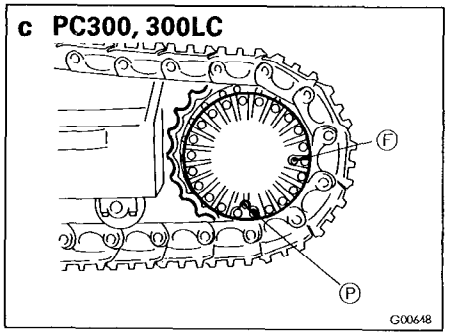
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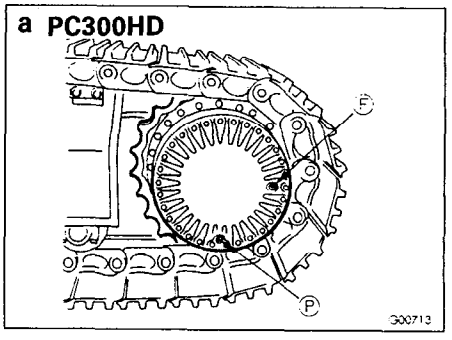
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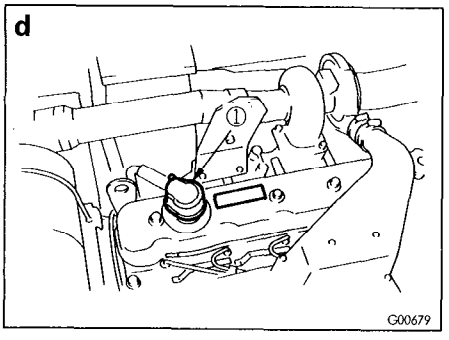
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e. TURBOCHARGER

Excessive carbon or oil sludge adhering to the turbocharger blower impeller may deteriorate normal performance of the turbocharger and may sometimes damage it.

Contact your Komatsu distributor.

1. Remove the turbocharger oil supply tube and the drain tube. Then, remove the connection area of the intake manifold and the blower housing so that the blower impeller can be seen.
2. Using light oil, wash the impeller to eliminate carbon adhered on the surface.

★ Do not use wire brushes or the like to prevent damage to the impeller surface.

3. Pour light oil through the turbocharger oil filler. Turn the blower impeller several turns so that foreign materials such as sludge can be washed away.
4. Using your fingers, turn the impeller vigorously for one revolution or more. If there is no sigh of interference or catching, the impeller is normal.

★ If the impeller seems to turn heavily, contact your Komatsu distributor to ask for repair or replacement.

5. If the impeller is found normal after this check, supply engine oil to the turbocharger.

f. ALTERNATOR AND STARTING MOTOR

The brush may be worn, or the bearing may have run out of grease, so please contact your Komatsu distributor for inspection or repair.

★ If the engine is started frequently, carry out inspection every 1000 hours.

g. VIBRATION DAMPER

Check the vibration damper for cracks or separation on rubber surface.

If there are cracks or separation, contact your Komatsu distributor for replacement.

h. ENGINE VALVE CLEARANCE

Ask Komatsu distributor to check engine valve clearance because special tools should be used.

EVERY 4000 HOURS SERVICE

★ **Maintenance for every 100, 250, 500, 1000 and 2000 hours should be carried out at the same time.**

a. WATER PUMP

Check that there is no play in the pulley, oil leakage, water leakage, or clogging of the drain hole. If any abnormality is found, please contact your Komatsu distributor for disassembly and repair or replacement.

WHEN REQUIRED

a. CLEAN INSIDE OF COOLING SYSTEM

Clean the inside of the cooling system, change the coolant, and replace the corrosion resistor cartridge, according to the table.

★ Stop the machine on level ground when cleaning or changing the coolant.

★ Use a permanent type of antifreeze.
If, for some reason, it is impossible to use permanent type antifreeze, use an antifreeze containing ethylene glycol.

★ Be sure to replace the corrosion resistor cartridge.

★ Use city water for the cooling water.
If river water, well water or other such water supply must be used, contact your Komatsu distributor.

⚠ Antifreeze is flammable, so keep it away from any flame.

Kind of coolant	Cleaning inside of cooling system and changing coolant	Replacing corrosion resistor
Permanent type antifreeze (All season type)	Every year (autumn) or every 2000 hours whichever comes first	Every 1000 hours and when cleaning the inside of the cooling system and when changing coolant
Non permanent type antifreeze containing ethylene glycol (Winter, one season type)	Every 6 months (spring, autumn) (Drain antifreeze in spring, add antifreeze in autumn)	
When not using antifreeze	Every 6 months or every 1000 hours whichever comes first	

- Add antifreeze in the cooling water
  When deciding the ratio of antifreeze to water, check the lowest temperature in the past, and decide from the mixing rate table given below.
  It is actually better to estimate a temperature about 10°C lower when deciding the mixing rate.

Mixing rate of water and antifreeze

Min. atmospheric temperature (°C)	—5	—10	—15	—20	—25	—30
Amount of antifreeze (ℓ)	6.9	9	10.8	12.3	13.8	15
Amount of water (ℓ)	23.1	21	19.2	17.7	16.2	15

★ We recommend use of an antifreeze density gauge to control the mixing proportions.

1. Stop the engine, close corrosion resistor valves (1).
2. Turn cap (2) slowly until it comes off.

(2): Water filler

⚠ **Do not remove the cap while cooling water is hot. Hot water may spout out.**
When removing the cap, wait until the water temperature goes down and release radiator pressure little by little by loosening the cap slowly, then remove the cap.

3. Open drain valve (3) at the bottom of the radiator and plug (4) on the side of cylinder block to drain off the cooling water.

(3): Drain valve (bottom of radiator)
(4): Drain plug (cylinder block)

4. After draining the cooling water, close up drain valve (3), plug (4), and pour in soft water (ex; city water) up to the vicinity of the water filler.
5. When the water reaches the vicinity of the water filler, put the engine at low idling, open drain valve (3), plug (4), then pass water for 10 minutes through the cooling system.

★ When doing this, adjust the speed of filling and draining the water so that the radiator is always full.

6. When the water becomes completely clean, stop the engine, draining off the cooling water, and close drain valve (3), plug (4).
7. After draining the water, clean with a cleaning agent.

★ We recommend use of a Komatsu genuine cleaning agent. For details of the cleaning method, see the instructions given with the cleaning agent.

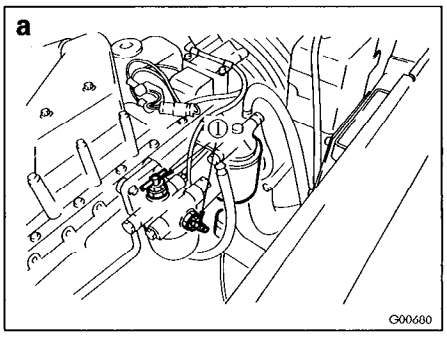
8. After cleaning, drain all the cooling water, then close the drain valve (3), plug (4) and fill slowly with clean water.
9. When the cooling water comes up to near the radiator water filler port, start the engine, and run at low idling. Add clean water, open drain valve (3), plug (4) and continue to run water until clean colorless water comes out from the drain valve (3) and plug (4).

★ When doing this, adjust the speed of filling and draining the water so that the radiator is always full.

10. When the water is completely clean, stop the engine and close drain valve (3), plug (4).
11. Replace the corrosion resistor cartridge and open valves (1).

★ For details of replacement of the corrosion resistor, see EVERY 1000 HOURS SERVICE.

12. Add cooling water until it overflows from the water filler.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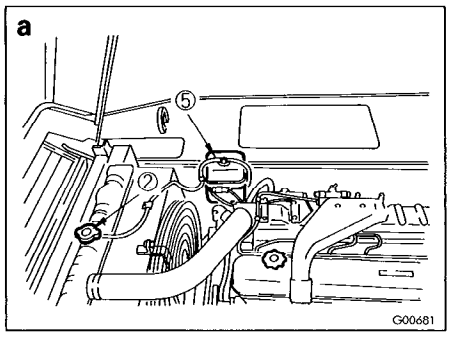
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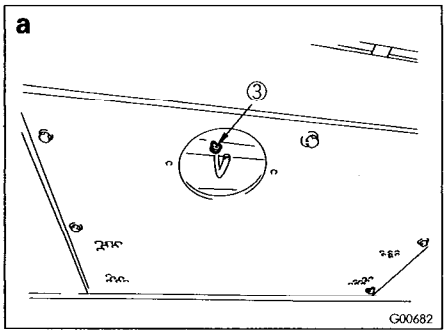
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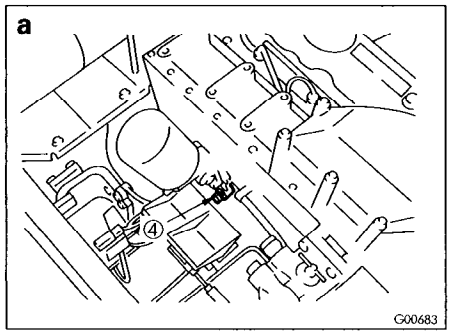
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13. To remove the air in the cooling water, run for five minutes at low idling, then for another five minutes at high idling.
    When doing this, leave radiator cap (2) off.
14. After draining off the cooling water of sub-tank (5), clean sub-tank and refill the water between H and L level.

(5): Sub-tank

15. Stop the engine, wait for about three minutes, add cooling water to the specified level, then tighten cap (2).

b. CHECK, CLEAN AND REPLACE AIR CLEANER ELEMENT

Checking

Whenever the red piston in dust indicator (1) appears, clean the air cleaner outer element. Stop the engine when cleaning the element.

Cleaning or replacing outer element

1. Remove wing nut (2), then remove cover (3), and take out the outer element.
2. Clean the air cleaner body interior and the removed cover.
3. Clean and inspect the outer element. (See the item "Cleaning outer element" for cleaning procedure.)
4. Install the cleaned outer element.
5. Push the dust indicator reset button to return the red piston to the original positon.

★ Replace the outer element which has been cleaned 6 times repeatedly or used throughout a year.
  Replace the inner element at the same time.

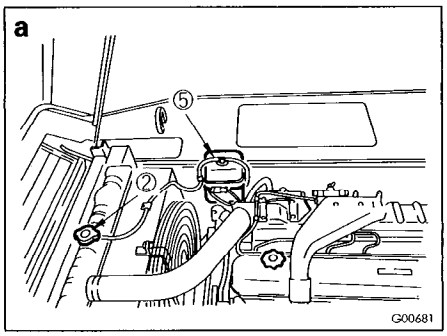
★ Replace both inner and outer element when the dust indicator red piston appears soon after installing the cleaned element even though it has not been cleaned 6 times.

★ Remove one seal from the outer element. The number of times the outer element has been cleaned can be seen by the number of removed seals.

★ Check inner element mounting nuts for looseness and, if necessary, retighten.

★ When inspecting or cleaning the air cleaner, remove evacuator valve (5) and clean with compressed air.

★ Replace seal washer (4) or wing nut (2) if they are broken.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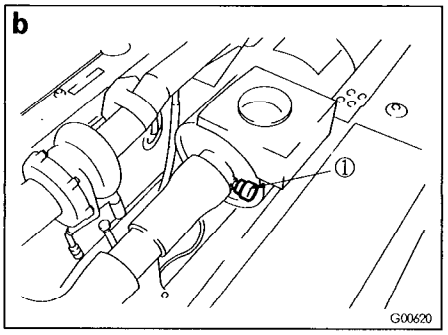
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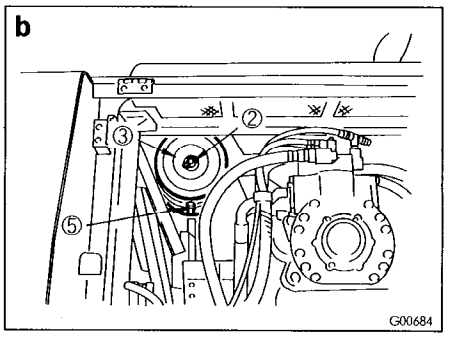
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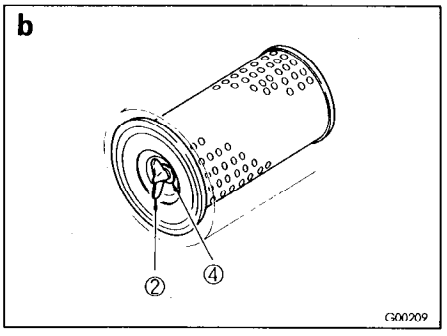
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Replacing inner element

1. Remove the outer element, and then remove the inner element.
2. Cover the air connector with a clean cloth or tape.
3. Clean inside the body, then remove the cover fitted in Step 2.
4. Install the new inner element.
5. After installing the new outer element, return the red piston in the dust indicator to its original position.

★ Do not attempt to reinstall a cleaned inner element.

⚠ **Do not clean or replace the air cleaner element with the engine running.**

Cleaning the outer element

With compressed air

Direct dry compressed air (less than 7 kg/cm^2) to the element from inside along its folds, then direct it from outside along its folds and again from inside, and check the element.

⚠ **When using compressed air, wear safety glasses and other things required to maintain safety.**

The following methods require spare parts.

With water

Dash city water (less than 3 kg/cm^2) on the element from inside along folds, then from outside and again from inside. Dry and check it.

With cleaning agent

For removing oils and fats as well as carbon, etc., attached on the element, the element may be cleaned in lukewarm solution of mild detergent, then rinsed in clean water and left to drip dry.

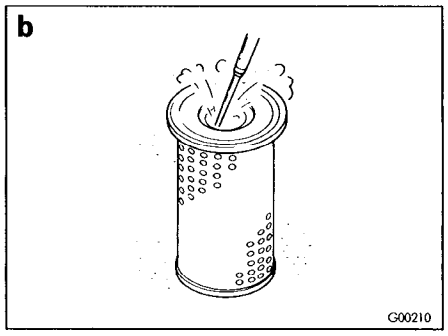
★ Drying can be speeded up by blowing dried compressed air (less than 7 kg/cm^2) from the inside to the outside of the element.
Never attempt to heat the element.

★ Using warm water (about 40°C) instead of soapy water may also be effective.

★ If small holes or thinner parts are found on the element when it is checked with an electric bulb after cleaning and drying, replace the element.

★ Do not use an element whose folds or gasket or seal are damaged.

★ When cleaning the element, do not hit it or beat it against something.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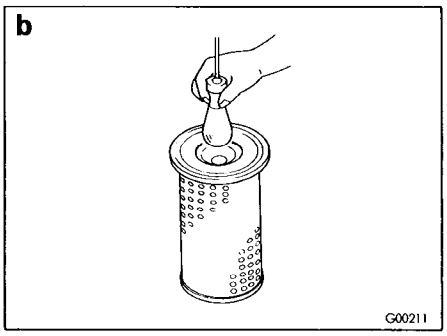
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c. CHECK TRACK TENSION

The wear of pins and bushings on the undercarriage will vary with the working conditions and soil properties. It is thus necessary to continually inspect the track tension so as to maintain the standard tension on it.

If the track tension is not at the standard value, adjust it in the following manner:

Inspection

1. Raise the chassis with the boom and arm.
2. The standard clearance between the bottom of the track frame and the top surface of the track shoe is 331 ± 20 mm (PC300HD: 358 ± 20 mm).

(a): Track frame
(b): Track shoe
★ Places to measure
PC300-5, 5 MIGHTY, 300HD: 4th track roller from sprocket
PC300LC-5, 5 MIGHTY: Between 4th and 5th track roller from sprocket

Adjustment

If the tension is not the standard value, adjust as follows.

1. To increase the tension, pump in grease through grease fitting (1); to reduce the tension, loosen plug (2) a little at a time, and release the grease.

⚠ **Plug (2) is under high pressure from the grease inside, and may fly out, so do not loosen it more than one turn.**
When doing this, do not loosen any part other than plug (2). If the grease does not come out properly, move the machine backwards and forwards slightly.

2. When pumping in the grease, make S 0 mm. If the tension is still loose, it means that there is excessive wear of the pin and bushing, so it is necessary to turn or replace the pin and bushing. Please contact your Komatsu distributor for repairs.

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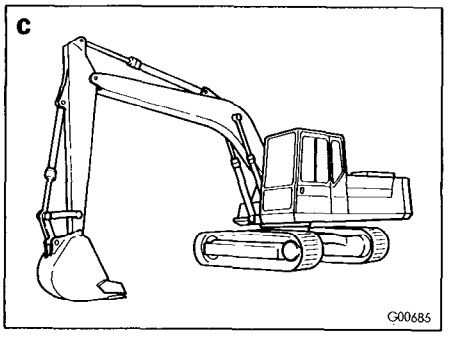

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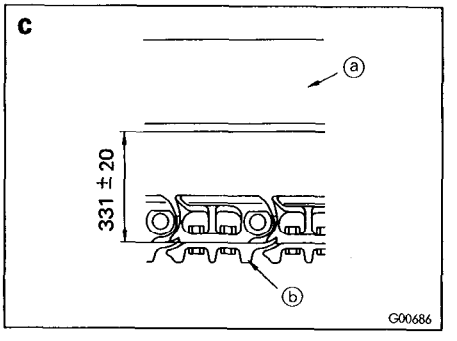

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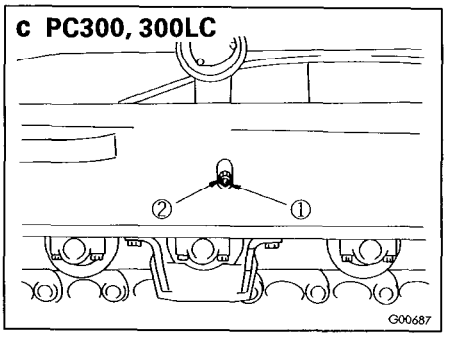

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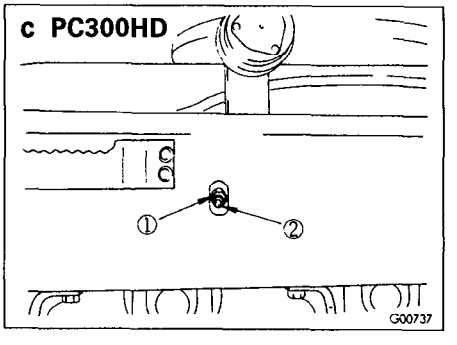

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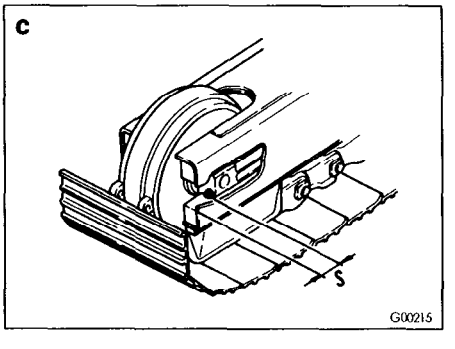

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d. CHECK ELECTRICAL INTAKE AIR HEATER

Check electrical intake air heater once a year before commencing work in the cold season.

Remove 6 glow plugs (1) from the engine cylinder head, and check that there are no disconnections or dirt stuck to the plugs.

e. TRACK SHOE BOLTS

If the machine is used with track shoe bolts (1) loose, they will break, so tighten any loose bolts immediately.

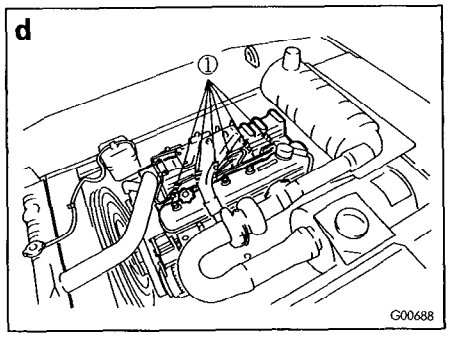
Method of tightening

1. Tighten first to a tightening torque of 20 ± 2 kgm (PC300HD: 40 ± 4 kgm), then check that the nut and shoe are in close contact with the link mating surface.
2. After checking, tighten a further 120° ± 10°.

Order for tightening

Tighten the bolts in the order shown in the diagram. After tightening, check that the nut and shoe are in close contact with the link mating surface.

d



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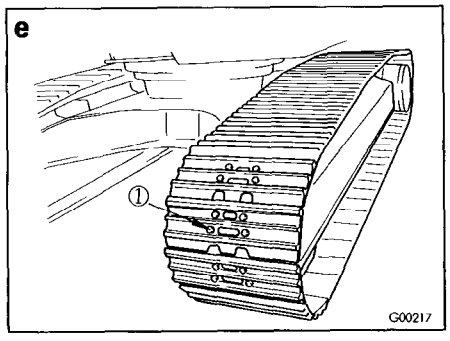

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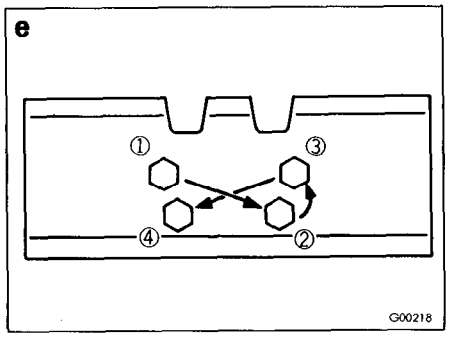


f. REPLACE BUCKET TEETH (VERTICAL PIN TYPE)
(except PC300, 300LC-5 MIGHTY)
Replace the point before the adapter starts to wear.

★ Set the bucket so that its bottom is horizontal.

1. Use a hammer and drift to drive out lock pin (2), which is fixing point (1) to the bucket. (If the drift is struck while facing rubber pin lock (3), the rubber pin lock may break. Direct the drift to the back of the pin.)
2. Check lock pin (2) and rubber pin lock (3) which were removed.

★ If the lock pins and rubber pin locks with the following defects are used, the point may come off the bucket. Replace them with new ones.

(a): A lock pin which is too short. (When aligning with bottom face (c), clearance (b) becomes more than 1/3A.)
(d): A rubber pin lock, the rubber of which is broken and whose steel balls come out easily.
(e): A rubber pin lock, the steel balls of which can be buried by being pressed with a finger.

3. Clean the surface of adapter (4) and remove the soil from it with a knife.
4. Use your hand or a hammer to drive rubber pin lock (3) into the hole of the adapter. Take care that the rubber pin lock does not project out of the adapter.
5. Clean the inside of point (1) and install it to adapter (4). If it is stained with soil or has projections, it will not fit to the adapter.

(f): Sticky material

6. Fit point (1) to adapter (4), and confirm that when the pointer is pressed strongly, the rear face of the hole for the pin of the point is at the same level as the rear face of the hole for the pin of the adapter.

★ If the rear face of the hole for the pin of point (1) is projecting from that of adapter (4), do not drive in the pin. Instead, find out what substance is preventing point (1) from fitting to adapter (4), and remove it. Then fit point (1) to adapter (4) and drive in lock pin (2).

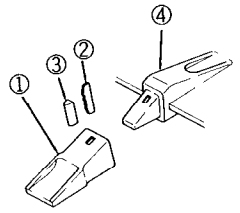
7. Insert lock pin (2) in the hole of the point and hit it until its top is the same level as the surface of point (1).
8. After replacing a bucket tooth, confirm that it is installed securely by doing the following:

1) Confirm that the surface of the lock pin is secured against the point.
2) Lightly hit lock pin (2) in the reverse direction from which it was hit in.
3) Lightly hit the tip of the point from above and below, and hit its sides from right and left.
4) Confirm that rubber pin lock (3) and lock pin (2) are set as shown in the figure.

★ The life of the point can be lengthened and the frequency of its replacement can be reduced by turning it upside down so that it will wear evenly.

★ When replacing the point, replace the rubber pin and lock pin with new ones. This will prevent the point from falling.

f



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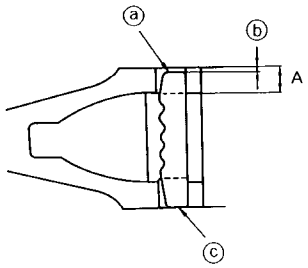

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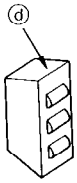

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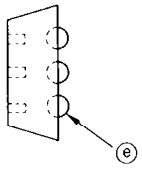

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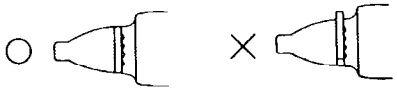

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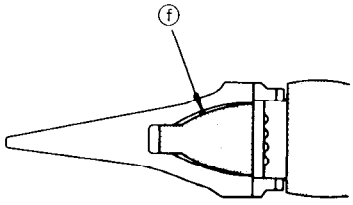

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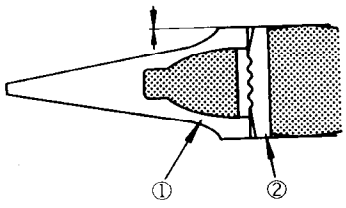

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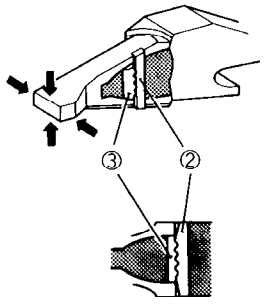


G00226

g. REPLACE BUCKET TEETH (HORIZONTAL PIN TYPE)

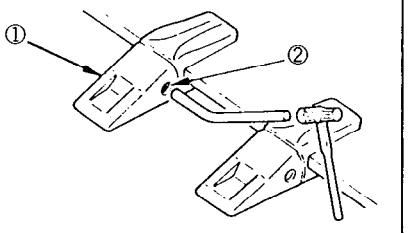
Replace the teeth before the wear reaches the adapter.

1. Remove pin (2) mounting the bucket, then remove tooth (1).

★ When removing pin (2), use a bar that is slightly thinner than the pin, then tap and remove from the opposite side.

2. Fit new tooth (1) in the adapter, push in pin (2) partially by hand, then knock in with a hammer.

g1



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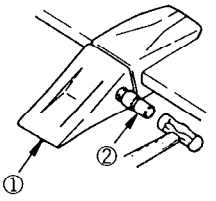

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h. CLEAN LINE FILTER

If there is any abnormality in the pump or other hydraulic equipment, remove the dirt from inside the line filter as follows.

★ Before removing the line filter, release the pressure inside the hydraulic circuit. For details, see PRECAUTIONS WHEN DISASSEMBLING MACHINE.

1. Remove case (1), then remove element (2) and clean it.

★ Some of the oil inside the piping will come out, so prepare a container to catch it.

★ Remove the dirt stuck inside the case.

2. Install element (2), then screw in case (1) to install it.

★ Replace o-ring (3) and backup ring (4) as a set when reassembling.

★ Tightening torque
Case (1): 4.5 ± 0.5 kgm

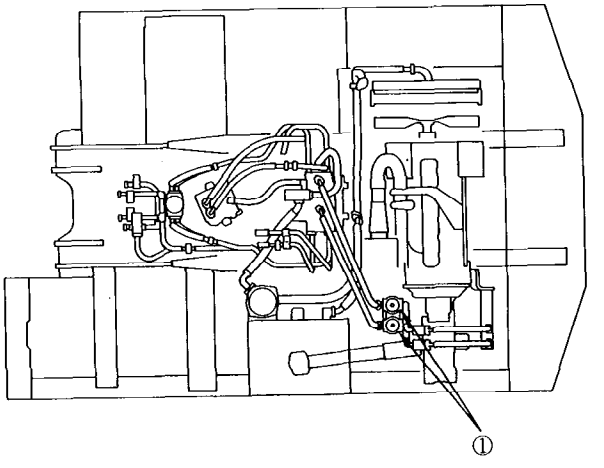
★ After reassembling the line filter, bleed the air from the circuit. For details, see BLEEDING AIR FROM CIRCUIT.

i. DRAIN WATER FROM WATER SEPARATOR

When float (2) is at or above red line (1), drain the water according to the following procedure:

1. Loosen drain plug (3) and drain the accumulated water until the float reaches the bottom.
2. Tighten drain plug (3).
3. If the air is sucked into the fuel line when draining the water, be sure to bleed the air in the same manner as for the fuel filter.
(See Fuel Filter Cartridge in EVERY 500 HOURS SERVICE section.)

h



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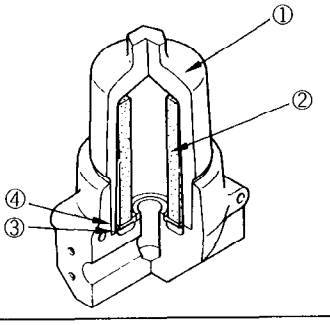

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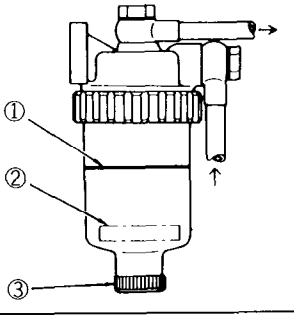

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ADJUSTMENT

ADJUSTMENT OF BUCKET CLEARANCE

If there is excessive free play on the coupling section of the bucket and arm, adjust the bucket clearance in the following manner.

★ When adjusting, set the work equipment in the posture shown in the diagram below.

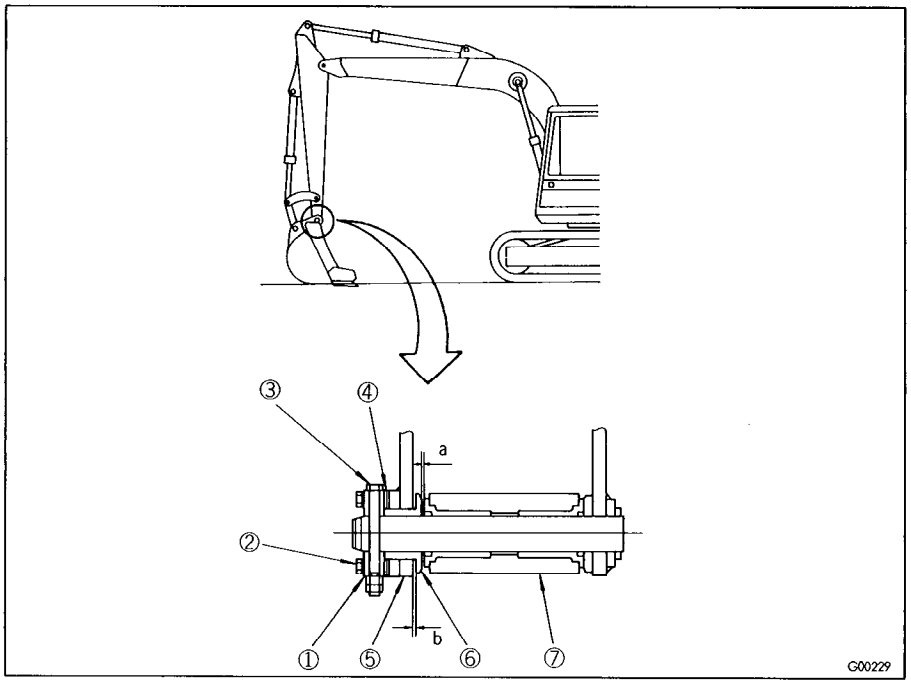
1. Loosen 4 bolts (2), bolt (3) and plate (1).
2. Take out shims (4) equivalent in size to free play "a".

★ The thickness of shim (4) is 0.5 mm or 1 mm each.

★ When free play "a" is less than 0.5 mm, do not compress the shims by tightening bolt (2).

3. Tighten 4 bolts (2) and bolt (3).
   Then, clearance "b" becomes larger and free play "a" is removed.

(5): Bucket
(6): Bush
(7): Arm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a
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b
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G00229

TROUBLE SHOOTING GUIDE

This guide is not intended to cover every conditions, however many of the more common possibilities are listed.

ELECTRICAL SYSTEM

Lamp does not glow brightly even when engine runs at high speed.
Lamp flickers while engine runs.
- Check for loose terminals and open-circuit wiring.
- Adjust belt tension.

Charge monitor does not go out even when engine runs at high speed.
- Replace the alternator.
- Check and repair wiring.

Unusual noise is emitted from the alternator.
- Replace the alternator.

Starting motor does not turn when starting switch is turned on.
- Check and repair the wiring.
- Charge the battery.
- Replace the starting motor.
- Replace the safety relay.

The pinion of the starting motor keeps going in and out.
- Charge the battery.
- Replace the safety relay.

Starting motor turns the engine sluggishly.
- Charge the battery.
- Replace the starting motor.

The starting motor disengages before the engine starts up.
- Check and repair the wiring.
- Charge the battery.
- Replace the glow plug.

The engine pre-heating monitor does not flash.
- Check and repair wiring.
- Replace the monitor.

The engine oil pressure monitor does not light up when engine is stationary (when the starting switch is in ON position.)
- Replace the monitor.
- Replace the caution lamp switch.

Charge monitor does not light up when the engine is stationary. (When the starting switch is in ON position.)
- Replace the monitor.
- Check and repair the wiring.

ENGINE

The engine oil pressure monitor flashes when engine speed is raised after completion of warm-up.
- Add the oil to the specified level.
- Replace the filter cartridge.
- Check oil leakage from the pipe or the joint.
- Replace the monitor.

Steam is emitted from the top part of the radiator (the pressure valve).
The radiator cooling water level monitor flashes.
- Supply the cooling water and check leakage.
- Adjust fan belt tension.
- Wash out inside of cooling system.
- Clean or repair the radiator fin.
- Replace the thermostat.
- Tighten the radiator cap firmly or replace the packing of it.
- Replace the monitor.

The engine does not start when the starting motor is turned over.
- Add fuel.
- Repair where air is leaking into fuel system.
- Replace the injection pump or the nozzle.
- Check the valve clearance.
- Check engine compression pressure.
- Refer to the section of electrical system.

Exhaust gas is white or blue.
- Adjust to specified oil quantity.
- Replace with specified fuel.

Exhaust gas occasionaly turns black.
- Clean or replace the air cleaner element.
- Replace the nozzle.
- Check engine compression pressure.
- Clean or replace the turbocharger.

Combustion noise occasionally changes to breathing sound.
- Replace the nozzle.

Unusual combustion noise or mechanical noise.
- Replace with specified fuel.
- Check over-heating.
- Replace the muffler.
- Adjust valve clearance.

CHASSIS

Slow speed of travel, swing, boom, arm and bucket
- Add oil to specified level.

Unusual noise emitted from pump
- Clean the hydraulic tank strainer.

Excessive oil temperature rise of hydraulic oil
- Clean the oil cooler.
- Adjust fan belt tension.
- Add oil to specified level.

Track slip out of place
Excessive wear of the sprocket
- Adjust tension of track.

Bucket either rises slowly or not at all
- Add oil to specified level.

MECHATRONICS RELATED PARTS

1. PUMP CONTROLLER

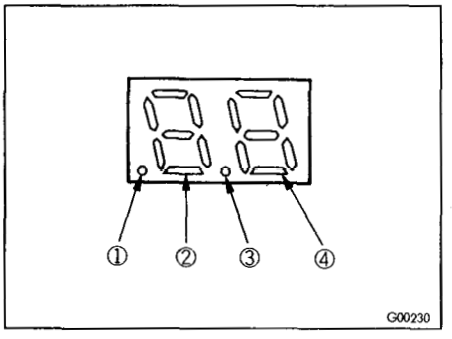
When normal

No.	Input mode and condition		Display
①	Power source monitor (with starting switch ON)		Lights up
②	Power mode	H mode	H
		S mode	S
		L mode	L
③	Engine speed signal monitor (when engine is running)		Flashes
④	Working mode	Heavy-duty operation mode	1
		General operation mode	2
		Finishing operation mode	3
		Lifting operation mode	4

★ The combinations given in the table above are displayed according to the input mode and machine condition.
★ Engine speed signal monitor (3) flashes according to the engine speed. (At 2000 rpm, it flashes approx. 20 times/10 sec)
★ When switching the input, the following display is given.

When switching input		Display
When electric power is switched on (0.5 sec)		. 6
Switching travel speed	Hi	.H. 1
	Lo	.L.0
Auto-deceleration switch		.A.d
Swing lock switch		.b.S
Work equipment Swing control lever		.P.2
Service control lever		.P.4
Travel lever		.P.6
Power max. button		.U.P

● The display is given for 0.5 — 1.5 sec after the imput is switched.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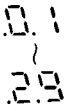
When abnormal

Display	condition of machine
	Abnormality in electrical system
Only power source monitor lights up	Abnormality in electrical system
All lamps OFF	Abnormality in electrical system

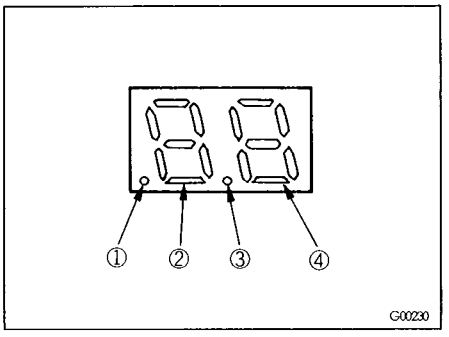
★ If any abnormality occurs, lower the work equipment to the ground, check the display on the controller, then contact your Komatsu distributor for repairs.
★ If it is thought that there is any abnormality or cause not listed above, please contact your Komatsu distributor for repairs.
★ If there is more than one failure, the abnormality display shows each abnormality in turn, so check all of the abnoramlity codes.
★ When any abnormality occurs, always check the abnormality display of the controller before turning the starting switch to the OFF position.

2. ENGINE THROTTLE CONTROLLER

When normal

(a): Red
(b): Green
(c): Red

LED display			Condition of machine
L_3 Red	L_2 Green	L_1 Red	
OFF	OFF	ON	For 5 seconds after power is switched on
OFF	ON	OFF	5 seconds after power is switched on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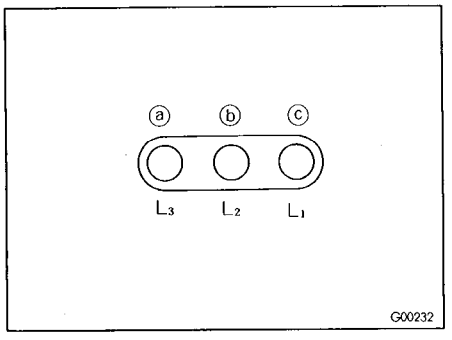
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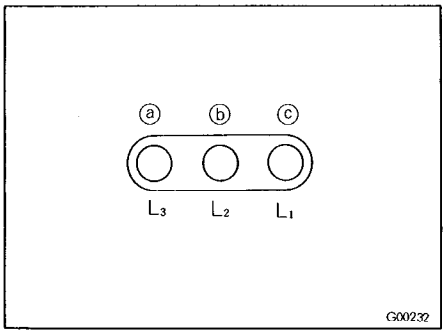
When abnormal

LED display			Condition of machine
L_3 Red	L_2 Green	L_1 Red	
OFF	OFF	OFF	
OFF	OFF	ON	
ON	OFF	OFF	
OFF	ON	ON	Abnormality in electrical system.
ON	OFF	ON	
ON	ON	OFF	
ON	ON	ON	

★ If any abnormality occurs, lower the work equipment to the ground, check the display on the controller, then contact your Komatsu distributor for repairs.
★ If it is thought that there is any abnormality or cause not listed above, please contact your Komatsu distributor for repairs.
★ When any abnormality occurs, always check the abnormality display of the controller before turning the starting switch to the OFF position.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L2
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SERVICE METER

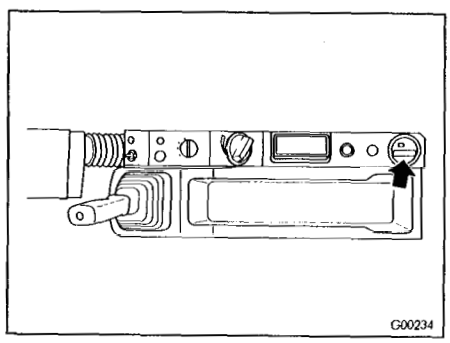
This meter indicates the integrated work hours. So, use it according to the following instructions.

- Record the readings at the start and the end of work, this is the work record of the machine.
- This record will indicate, when periodical maintenance is due.
- It also indicates the integrated working hours when machine problems are encountered.

★ **How the meter progresses**

The service meter progresses by 1 when the engine is operated for one hour, regardless of the engine speed.

Consequently, if the engine is running, the service meter will advance even if the machine does not move.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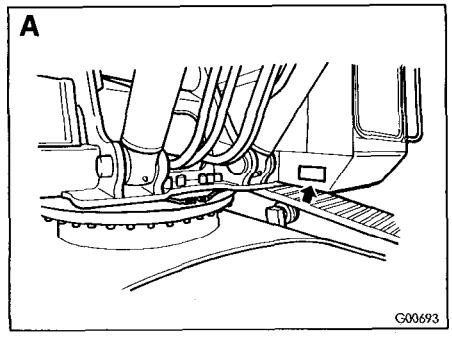
MACHINE AND ENGINE SERIAL NUMBERS

When calling for a service of mechanic or when making replacement-parts order, be sure to give Komatsu distributor the machine and engine serial numbers as well as the service meter reading before mentioned. These numbers are founds on the plates shown in the figure.

A. Location of the machine serial number mark.
This is seen on the bottom right of the cab.

B. Location of the engine serial number mark.
This is seen on the upper side of the cylinder head cover.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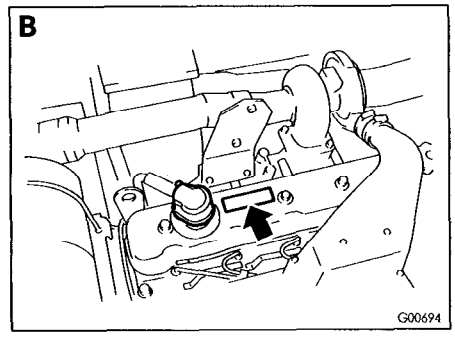
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FUEL, COOLANT AND LUBRICANTS

PROPER SELECTION OF FUEL, COOLANT AND LUBRICANTS

RESERVOIR	KIND OF FLUID	AMBIENT TEMPERATURE	CAPACITY (ℓ)	
		−22 −4 14 32 50 68 86 104 122°F −30 −20 −10 0 10 20 30 40 50°C	Specified	Refill
Engine oil pan	Engine oil	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40	28	25
Swing machinery case Final drive case (each)	Engine oil	SAE 30	23 PC300, 300LC 8.0 (each) PC300HD 11.5 (each)	22.5 PC300, 300LC 7.4 (each) PC300HD 11.0 (each)
Damper case			1.24	–
Hydraulic system	Engine oil	SAE 10W SAE 10W-30 SAE 15W-40	370	195
Fuel tank	Diesel fuel	ASTM D975 No.2 ※	510	–
Cooling system	Water	Add antifreeze	30	–

※ ASTM D975 No.1

NOTE:

(1) When fuel sulphur content is less than 0.5%, change oil in the oil pan every periodic maintenance hours described in this manual.
Change oil according to the following table if fuel sulphur content is above 0.5%.

Fuel sulphur content	Change interval of oil in engine oil pan
0.5 to 1.0 %	1/2 of regular interval
Above 1.0 %	1/4 of regular interval

(2) When starting the engine in an atmospheric temperature of lower than 0°C, be sure to use engine oil of SAE10W, SAE10W-30 and SAE15W-40, even though an atmospheric temperature goes up to 10°C more or less in the day time.

(3) Use API classification CD as engine oil and if API classification CC, reduce the engine oil change interval to half.

(4) There is no problem if single grade oil is mixed with multigrade oil (SAE10W-30, 15W-40), but be sure to add single grade oil that matches the temperature in the table on the left.

(5) We recommend Komatsu genuine oil which has been specifically formulated and approved for use in engine and hydraulic work equipment applications.

ASTM: American Society of Testing and Material
SAE: Society of Automotive Engineers
API: American Petroleum Institute

Specified capacity: Total amount of oil including oil for components and oil in piping.
Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

SAFETY AND OPERATION

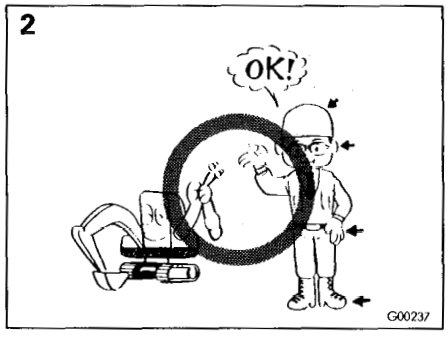
CONTENTS

SAFETY HINTS · · · ⚠

OPERATION

GENERAL

1. Wear proper clothes
   Loose clothes, ornaments or other things that may possibly contact the control lever or other machine parts must not be worn. Do not let you clothes get caught on protruding parts of the machine. Do not wear oily clothes since they may catch fire.
2. Wear well-fitting helmet, safety shoes and working clothes. If the nature of the work requires safety, wear protective goggles or mask, thick gloves, ear plugs or other protection.
3. Accidents or injuries are liable to occur when the operator is careless or slack. It is most important to bear safe operation in mind at all times.
4. Take care of your health. Do not operate when tired, or after drinking.
5. Learn the prohibitions, cautions and rules about work procedures in the work site.
   When there is a leader, fix standard signals and always follow these signals when operating.
6. If there should be an accident or fire or any other such unexpected mishap, deal with it quickly, using the nearest apparatus.
   Learn beforehand the locations of the first aid boxes and fire extinguishers and how to use them. It is also important to know the emergency contact system.
7. Learn about the safety devices on your own machine and about how to use them. Confirm that they are correctly attached in the prescribed position. Such safety devices include:
   ★ Protective-Devices
   ★ Seat Belts
8. Exhaust gas is dangerous. When running the engine for long periods in a poorly ventilated area, there is a danger of gas poisoning, so open the windows or doors to ensure a good supply of fresh air.
9. Read the Operation and Maintenance Manual carefully. Learn how to use the control devices, gauges and warning devices. Be sure you understand the meaning of the caution plates. Remember the check points and checking method for engine oil, fuel, cooling water and hydraulic oil levels.
10. When operating inside a building always be sure of the clearance of the ceiling, entrances, aisles, etc. and the load limit of the floor.
11. Never allow other person than the operator to ride on the machine during operation.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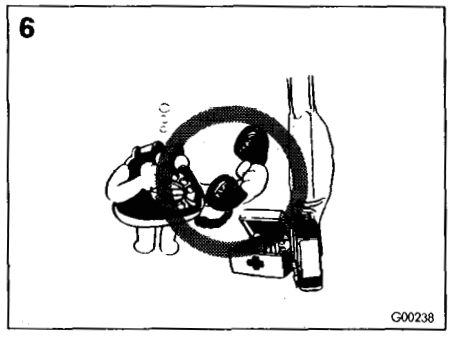
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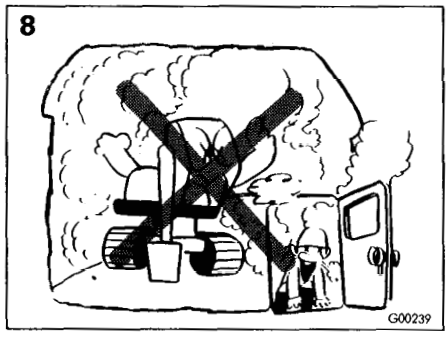
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BEFORE STARTING OPERATION

1. Examine the lay of the land and the kind of soil at the work site to determine the dangerous points and the best method of operation.
   Proceed with the work only after making safety arrangements about the dangerous points.
2. Inspect leakages from the fuel, lubricating and hydraulic systems. Repair any fuel or oil leakage, and wipe off all dirty oil. Check that the shoe bolts are not loose, and that no other parts are damaged or missing. Machines having such failures should not be operated.
3. When getting on or off the machine, use the handrail provided. Do not jump up or down from the machine.
4. Do not leave parts or tools lying around in the vicinity of or on the floor of the operator's cab. Keep everything in its proper place.
5. Wipe off thoroughly any grease, oil or mud on the handrail, floor or control levers. Failure to do this may cause you to slip.
6. Check the level of the fuel, lubricants and cooling water. Extinguish cigarettes before checking or replenishing. Check that the radiator cap and each oil filler caps or plugs are firmly tightened.
7. Adjust the operator's seat until it is in the most comfortable position for operating. Always sit in the seat while operating. Do not operate the machine from any other position.
8. To ensure the safety of workers near the machine, always sound the horn to warn them before starting the engine and moving the machine. Be particularly careful to check that the rear is clear before backing the machine.
9. Combustible objects such as pieces of wood, dead leaves, and pieces of paper may cause fire, so inspect the inside of the engine room and remove them.
10. Before starting the engine, confirm that all control levers are in NEUTRAL.

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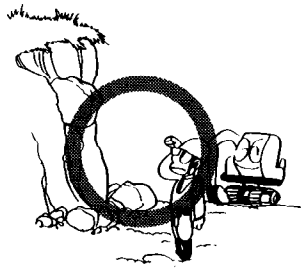

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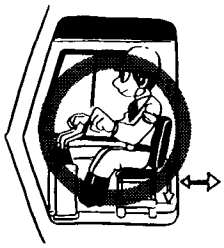

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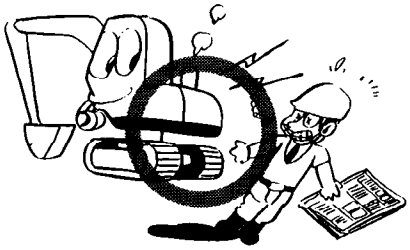

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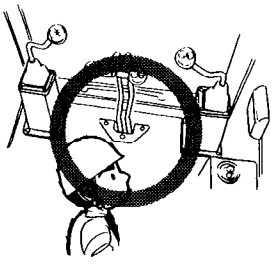

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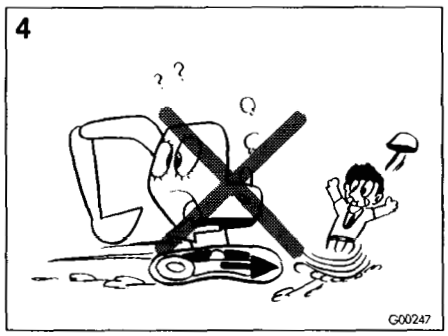
AFTER STARTING THE ENGINE

1. Confirm that all gauges and warning devices are functioning correctly, and that the gauge readings are within the prescribed range.
2. Check the play and travel of each lever.
3. Operate the work equipment to confirm that they are functioning normally.
4. Before operating the traveling and steering levers, check whether the track frame is forward or backwards. If the track frame is facing backwards, operate the traveling and steering levers in the reverse manner to that when the track frame is facing forward.
5. Move the machine slowly and listen carefully to the engine or gears to confirm that they are not making any unusual noises.
6. Choosing a safe place, turn the machine to the left and right to confirm that the traveling and steering levers are functioning normally.
7. If these tests reveal anything wrong, however slight is may be, contact the man in charge of the machine and operate the machine only after obtaining his permission.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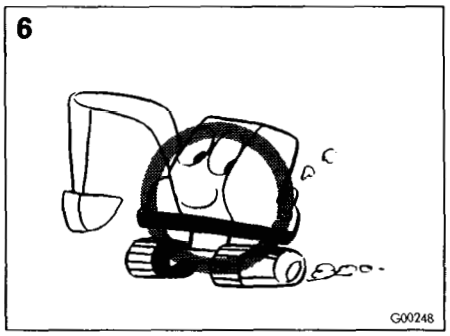
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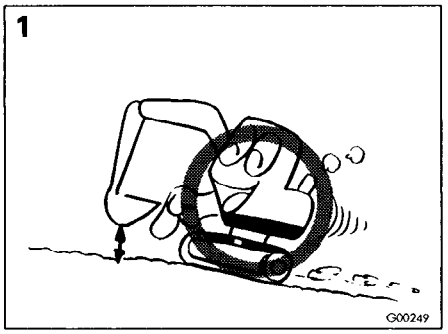
DURING OPERATION

1. Maintain the bucket at a height of 40 to 50 cm above the ground so that it can be quickly lowered to the ground and the machine stopped in an emergency.
2. As far as possible, operate the machine so that it does not tilt. (Do not tilt it by more than 35° in either the forward, rear, left or right directions, even under static conditions.)
3. Always operate slowly in crowded places. On haul roads or in narrow places, give way to loaded vehicles.
4. Do not allow unauthorized persons into the work area.
5. Before reversing or turning, ensure that there is nobody in the vicinity. Also, be careful of obstacles.
6. When operating on slopes, as far as possible, avoid turning the machine on a slope. It may cause the machine to roll over or slip sideways.
7. When operating the machine along a road, retract the work equipment to improve machine stability. As far as possible proceed along a flat road.
8. The machine should always be operated at a speed where it can be correctly controlled. Never do the following:
   1) Speeding
   2) Sudden starting, sudden braking, sudden turning.
   3) Snaking
   4) Coasting
9. When operating on uneven ground or in places where there are obstacles, remember the following points:
   ★ Operate at as low a speed as possible and avoid sudden changes in direction.
   ★ Wherever possible, avoid traveling over large rocks, fallen trees, tree stumps and other such obstacles. Either use the work equipment to remove them, or travel round them.
   When it is impossible to avoid traveling over them, reduce speed and mount over the obstacle. Just before the front of the machine tips down, reduce speed even more to make the shock of hitting ground as small as possible.
   ★ Never mount over an obstacle at an angle; never disengage one traveling and steering lever to travel over an obstacle.
10. The machine condition can be judged from many factors. Changes in the gauges, sound, vibration, exhaust gas color or response of the control levers can indicate the occurrence of some disorder. If any disorder occurs, park the machine immediately in a safe place and take appropriate action. Be especially careful in the case of a fuel leak as there is danger of fire.
11. The work area should be made as flat as possible. If the work area is flat, operation is made much easier and this reduces operator fatigue.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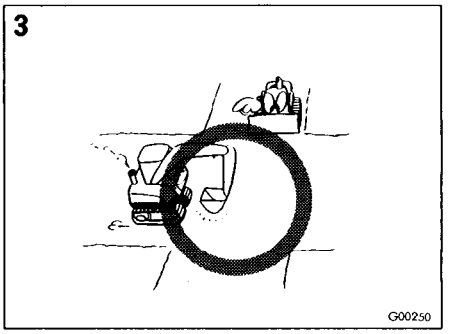
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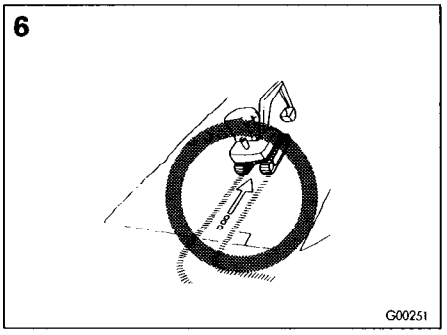
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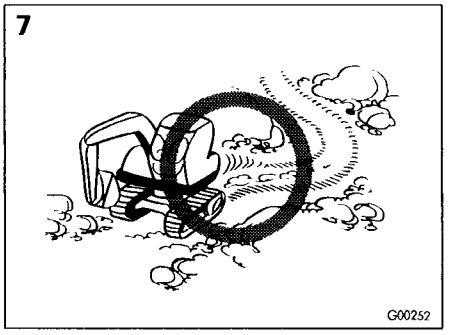
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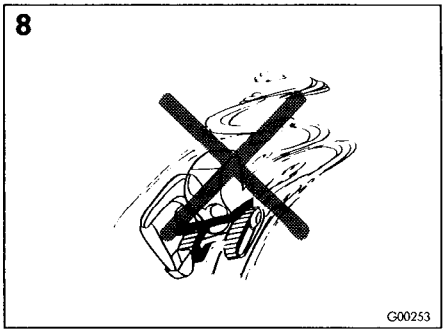
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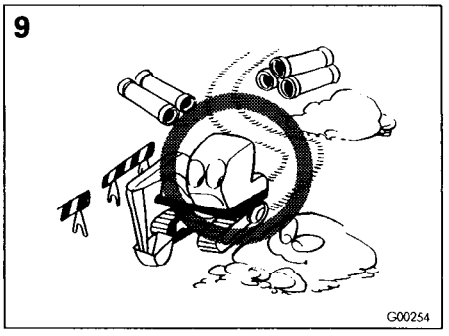
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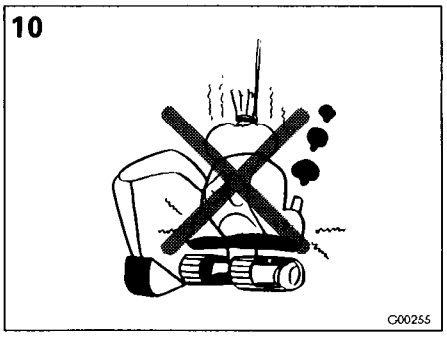
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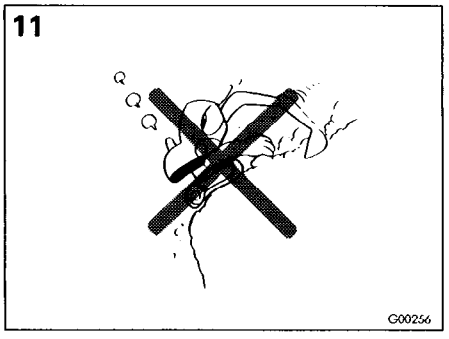
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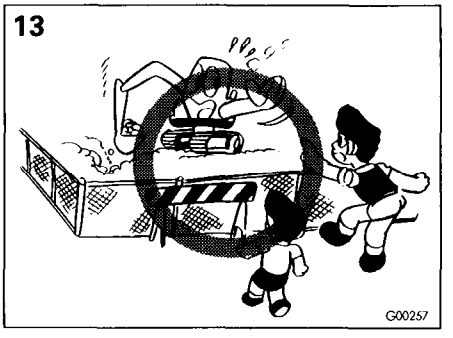
12. Always concentrate. It is extremely dangerous to allow yourself to be distracted or to think of other things when operating a machine. In dangerous places, or where there is restricted visibility, it is important to get down from the machine and confirm whether it is safe before continuing work.
13. Be careful of those around you, and always confirm that there is no person or obstacle in the way before moving or turning the machine.
14. When using the work equipment, be sure to keep your eyes on it all the time. Failure to do this may result in an accident.
15. When passing through a narrow space, be careful of the side and overhead clearances. Take special care not to touch any obstacles on either side or overhead. If necessary, have someone outside the machine call out instructions.
16. Be careful not to operate the machine into a bog. In the event that the machine goes into a bog, extract it in the following manner;
    1) If only one track of the machine is in the bog, push the bucket down against the ground on the side of the machine which is stuck so as to float the track. Then place logs or timber underneath the track and free the machine.
    ★ When raising the undercarriage by means of the boom or arm, push the bottom of the bucket against the ground (on no account use the teeth) until the angle between the boom and the arm is 90° to 110°.
    2) If both tracks of the machine are in the bog and slip, preventing the machine from getting in, place logs or timber under the tracks in the manner described in 1), then thrust the bucket into the soil in front of the machine and drag it out by bending the arm in the same manner as when excavating and putting the traveling and steering lever into the forward position.
17. After earthquakes, confirm that the ground is still firm; after blasting, confirm that there are no unexploded charges remaining.
18. When working on river embankments or other places made of piled soil, there is the danger that the weight of vibration of the machine may cause the machine to sink into the piled soil, so be extremely careful when operating in such places.
19. When continuing operations after rain, remember that conditions will have changed from those before the rain started, so proceed with caution.
    Be particularly careful when approaching the shoulder of the road of cliffs, as they may have been loosened by the rain.
20. Check the load limits of bridges before crossing.
21. When working in water or marshy ground, be careful of the following:
    ★ When working on soft ground, place thick boards on the ground to prevent the machine sinking. Place the boards horizontally and arrange them as neatly as possible.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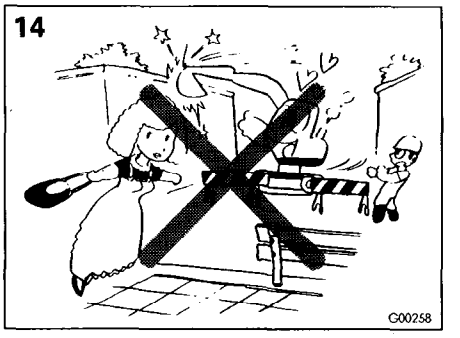
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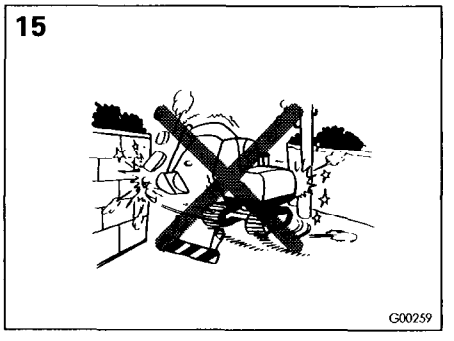
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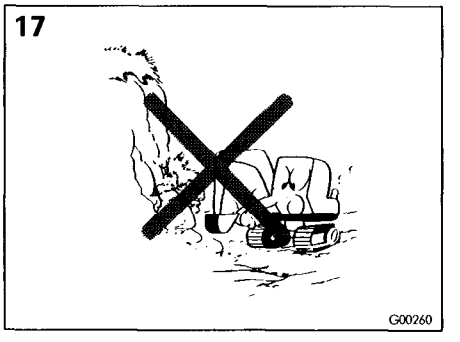
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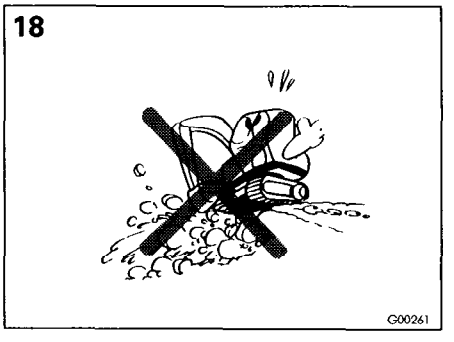
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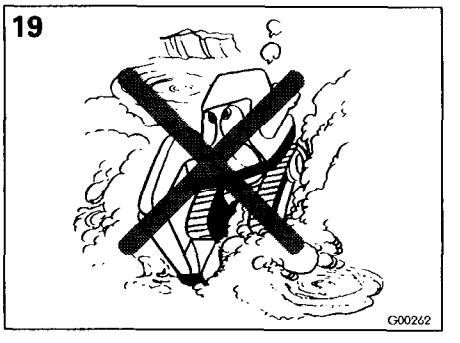
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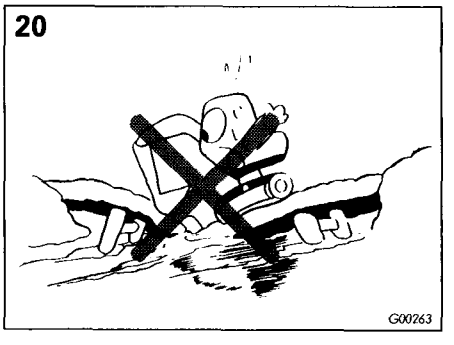
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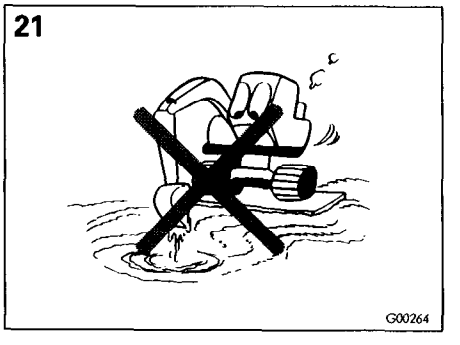
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22. When operating in water or when crossing shallows, first check the bed soil condition and the depth and flow speed of water, then proceed, taking care not to go beyond the permitted depth.
    ★ First check the water depth, the firmness of the ground and the strength of the current. Do not enter if the water exceeds the permissible depth (up to the bottom of the swing circle).
23. When operating in fog, mist or smoke, where visibility is bad, be especially careful to confirm first whether operation is safe.
    When visibility drops below safety level, stop work and wait for the visibility to improve.
24. When operating at night, remember the following points:
    ★ Be sure to arrange an adequate lighting system.
    ★ At night it is very easy to make mistakes in assuming the distance and height of objects and land.
25. Be very careful not to touch electric wires, always bearing in mind that there is a possibility of receiving an electric shock.
    ★ Wear rubber or leather soled shoes.
    ★ Position a full-time watcher at the site to ensure that operator is not exposed to the risk of electric shock.

★ Depending upon the supply voltage it is conceivable that an electric shock may be received by merely coming into the vicinity of an electric feeder wire. Accordingly, observe the minimum distances given in the table below, taking into account the inertia of the boom when in motion.

Supply voltage (number of insulators)	Minimum safe separation
6.6 kv (distribution line)	3 m
33.0 (1 to 3 insulators)	4 m
66.0 (5 to 8 insulators)	5 m
154.0 (10 to 18 insulators)	8 m
275.0 (16 to 30 insulators)	10 m

★ Become familiar with the necessary measures to be taken in the event that a operator receives an electric shock.

26. Do not perform excavation at the bottom of a precipice as it is dangerous practice.
27. If it is unavoidably necessary to operate the work equipment lever when traveling the machine in the vicinity of a precipice, road shoulders, on sloping ground or through a confined space, stop the machine momentarily before operating the work equipment lever in order to minimize danger.
28. When working on loose, crumbly soil, do not dig deeply and back the machine off smartly. If the ground crumbles, preventing the machine from getting away in time, do not panic and raise the work equipment. It is often better in the interests of stability to leave it down.

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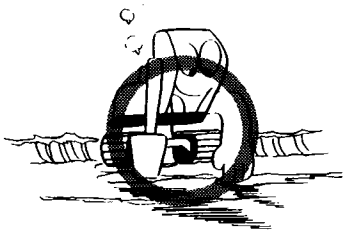

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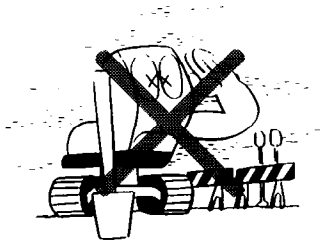

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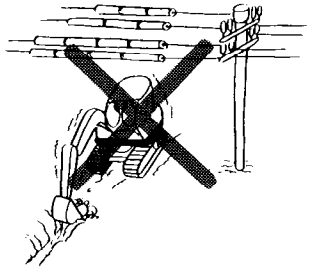

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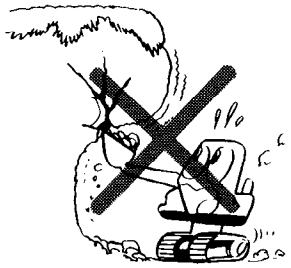

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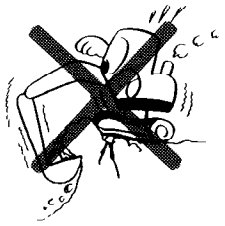

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29. Do not undercut the machine, unless absolutely necessary.
    If necessary, always take care to prevent the machine falling.
30. When operating at the edge of a cliff or on the shoulder of a road, remember the following points:

★ When operating in a place where there is danger of the machine falling over the side, be doubly careful. Do not approach the edge of the cliff or road shoulder by mistake.

31. If you suspect that there are buried facilities (water or gas pipes, etc.) at the work site, check with the companies responsible for looking after such facilities and also try a different method of excavation. Then, after confirming the existence and location of such facilities, carefully carry out excavation work.
32. Take care not to swing the bucket against the sides of trenches or dump trucks. Load the truck from the rear.

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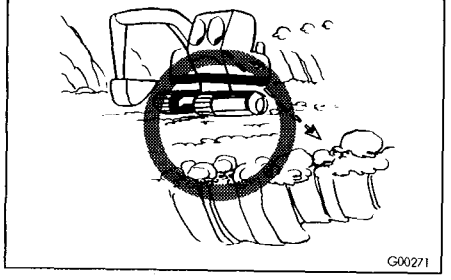

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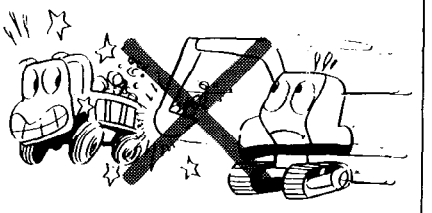

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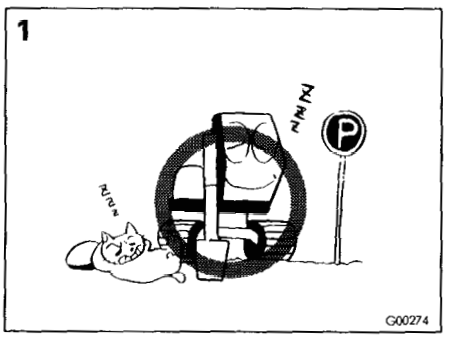
PARKING

1. When parking the machine, park it in a safe place outside the working area, or in the specified place. The following factors should be considered when choosing a parking place: it should be on flat, firm ground where there is no danger of rockfalls, landslides or floods. If the machine has to be parked on a slope, it should be parked facing directly up or down the slope, and chocks should be placed under the tracks. When the machine is facing downhill, lower the bucket so that it cuts slightly into the ground to further increase the safety.
2. If it is absolutely necessary to park the machine on a slope, park it facing downhill and put chocks against the tracks. If the ground is soft enough, dig the bucket into the ground for added safety.
3. When parking the machine, return the work equipment levers to neutral, apply the brake lock, lower the bucket to the ground, and put all safety levers in the lock position. Switch off the engine and remove the key.
4. Before leaving the machine, carry out the following:
   - ★ Apply the swing lock.
   - ★ Lower the bucket to the ground.
   - ★ Put the work equipment lever in neutral and lock it.
   - ★ Stop the engine and remove the key to prevent other people using the machine.
   - ★ Lock the cab.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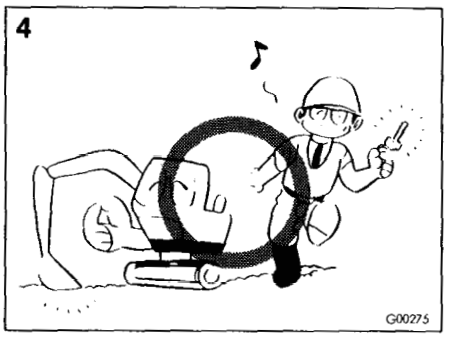
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RADIO

A: TUNING KNOB

Turn this knob in to the desired station.

Turn right in to the station. If the tuning is off center, the sound quality will be unnatural and sensitivity will be reduced.

B: TONE CONTROL

Use this konb to adjust the tone as desired.

When it is turned to the right the high tones will be emphasized, and when it turned to the left the high tones will be cut, resulting in a mellow tone.

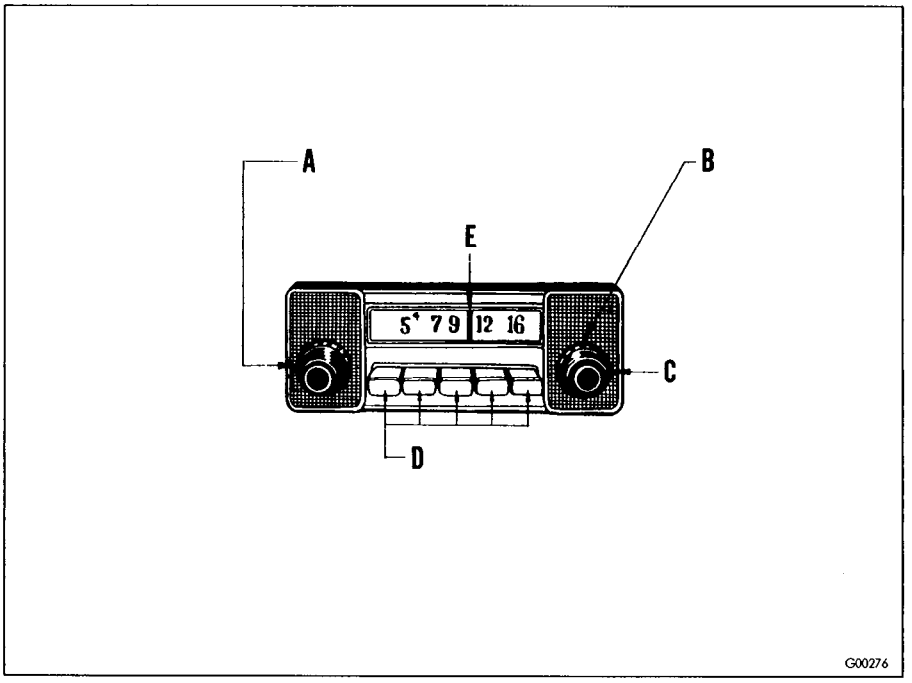
C: POWER SWITCH/VOLUME CONTROL

Press the knob to turn on (or off) the radio. When it is turned to the right, the sound level will increase, and vice-versa.

D: STATION SELECTOR BUTTONS (5 buttons)

By pressing these buttons it is possible to tune in to preset stations.

E: POINTER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B
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How to set station selector buttons

Set the station selector buttons to the desired stations as shown in the following figure.

1. Pull back the button corresponding to the station to be preselected.
2. Turn the station selector knob until the pointer is in front of the desired station. (Carefully tune in so that noise disappears and the broadcast is heard plainly.)
3. Carefully push back the button with the fingertip until it clicks into place.

★ When setting the turning selector to a strong station, shorten the antenna to reduce the input as far as possible before carrying out alignment.

Precautions when using radio

- To prevent possible breakdown, keep water well away from the speaker case and interior of the radio. In particular, close the window during rain or when washing the machine.
- Do not wipe the dial plate or knobs with benzine or paint thinners, etc. Always use a dry, soft cloth (if the radio is particularly dirty, soak the cloth in alcohol).
- Do not disassemble the radio.

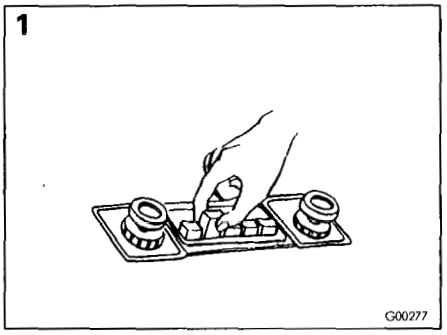
Trouble shooting guide

No sound

- Turn the SW/VOL knob to the right and press it two or three times.

Sound quality is poor.
Reception is noisy.

- Return using the station selector knob. If the problem disappears, reset the tuning button.
- Try lengthening the antenna to its fullest extent.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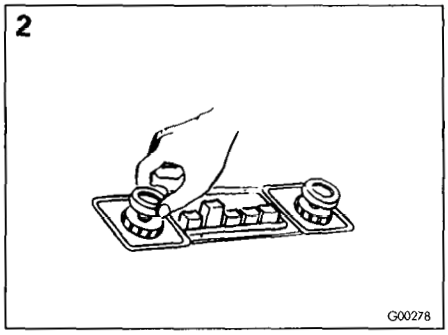
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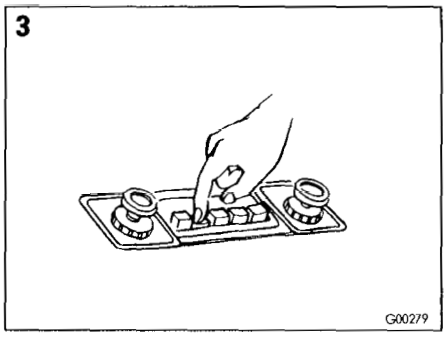
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G00279

LOCKING CAP

Locks are installed to the fuel tank filler cap, hydraulic tank filler cap, operator's cab, left side door (rear), and engine hood.

★ Use the starting key to open and close the cap.

A. METHOD OF OPENING AND CLOSING FUEL TANK FILLER CAP

● To open the cap

1. Insert the key into the cap.

(a): OPEN

(b): LOCK

2. Turn the key clockwise, align the match mark on the cap with the rotor groove, then remove the cap.

● To lock the cap

1. Turn the cap into place.
2. Turn the key counterclockwise and take the key out.

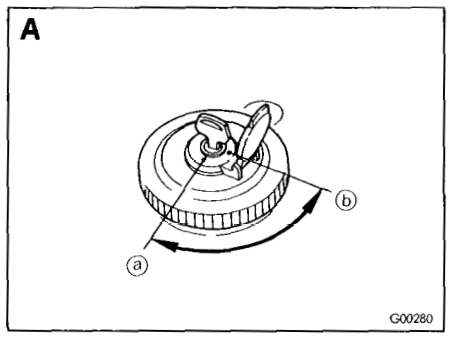
★ Insert the key as far as it will go. If the key is turned before it is inserted all the way, it may break.

(c): Shoulder

B. METHOD OF OPENING AND CLOSING HYDRAULIC TANK FILLER CAP

1. Insert hexagon wrench (1) (4 mm) into the hole at the side of the side block.
2. With the wrench turned to the outside, turn the cap counterclockwise approx. 30°. Stop here to release the pressure, then turn fully and remove the cap.
3. When closing the cap, align the cap with protrusion (2) on the case, then screw in the cap clockwise until it locks.

⚠ **When removing the cap, always use a hexagon wrench to release the lock before opening it.**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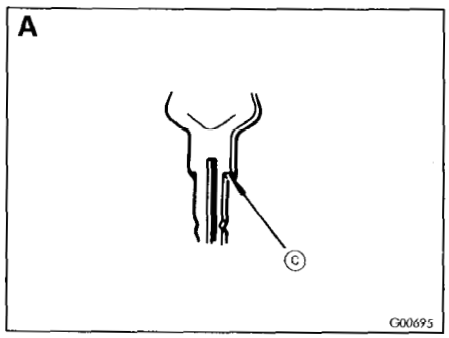
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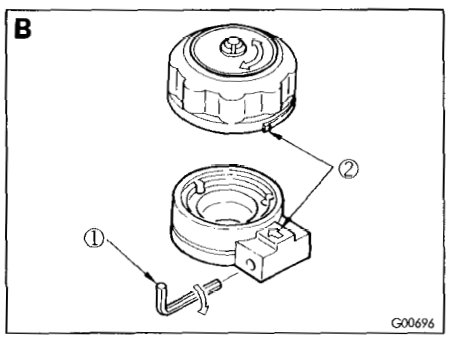
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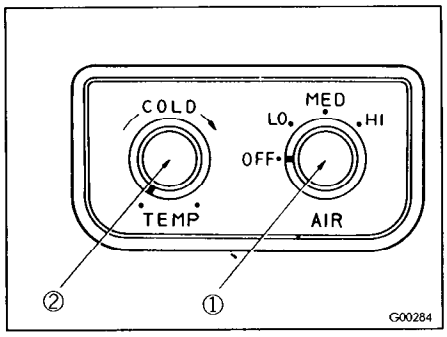
OPERATING THE CAR COOLER

CONTROL PANEL

① **Air flow control knob**
Turn from LO to MED or HI to increase the air flow.
② **Temperature control knob**
Turn the knob clockwise to give a lower room temperature.

For efficient use

★ If the inside of the operator's cab is hot after the machine has been parked for a long time in the sun, open the windows and doors fully to cool the operator's cab before switching on the cooler.
★ When using the cooler, make sure that the windows and doors are properly shut.
★ If there is dirt or mud on the condenser, the cooler will not cool properly. When washing or checking the machine, always remove all dirt and mud from the condenser, to ensure a good flow of air.
★ For reasons of health, the temperature inside the cab should not be adjusted too low. As a general rule, the temperature should be kept at a maximum of 5 to 6°C below the outside temperature, enough to feel cool when entering the cab.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CHECKING AND MAINTAINING CAR COOLER

a. Checking coolant level

If the cooling effect is poor, check the side glass (liquid eye) of the receiver drier. If there are many bubbles, the coolant level is too low. Check whether there is any coolant, and have the cooler serviced.

b. Clogging of condenser

If there is any dirt or mud stuck to the condenser, there will be a big reduction in the cooling efficiency of the condenser. That will mean a reduction in the cooling capacity, so clean the dirt and mud off and correct any bent fins with a screw-driver.

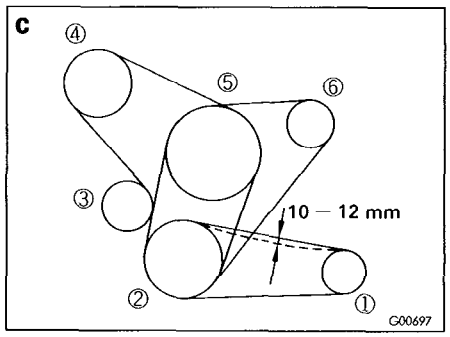
c. Checking and adjusting V-belt tension

The slack should be 10 to 12 mm when pushed with a finger force of about 6 kg midway between the compressor pulley (1) and the crankshaft pulley (2).

(3): Tension pulley
(4): Water pump pulley
(5): Fan pulley
(6): Alternator pulley

1. Loosen bolts (7) and (8), and move compressor (9) to adjust.
2. After adjusting, tighten 2 bolts (7) and bolt (8) securely.

★ When adjusting the V-belt, do not attempt to push compressor (9) directly with a bar or the like, but use a wood pad to prevent damage to the core.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10 – 12 mm
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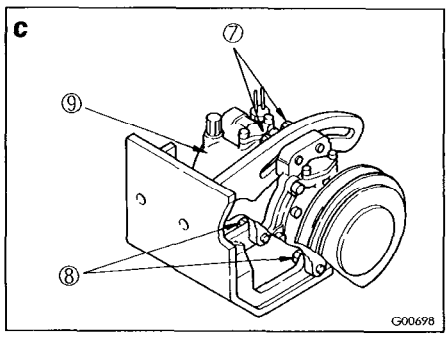
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OPERATING THE AIR CONDITIONER (EXCEPT PC300, 300LC-5 MIGHTY)

CONTROL PANEL

① **Outlet change-over knob**

- Switches over air outlets

Konb position	Air outlet	Purpose
FOOT 	Floor	Heating Dehumidity
FACE 	Rear	Cooling

② Heater temperature knob

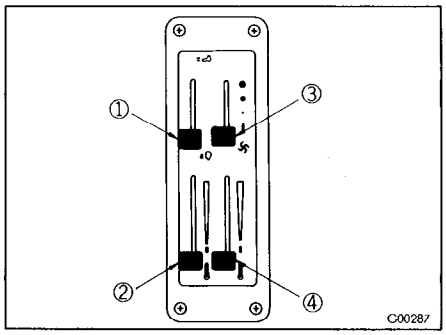
- Controls heating temperature
- The nearer to WARM MAX. the knob goes, the higher heater outlet air temperature will be.
- At OFF position, water valve will be closed and heating function will stop.

③ Blower switch

- Used for both controlling the air flow in cooling and heating and as the main switch.
- Changeable at three steps; low, medium and high.
- Placing knob in OFF cuts off the power supply and stops the air conditioner.

④ Cooler temperature knob

- The temperature is controlled with this knob for cooling.
  It is also the cooler switch.
- Move the knob towards LOW to decrease the output air temperature.
- When the knob is moved to OFF, the cooler switch is turned off and the cooling stops.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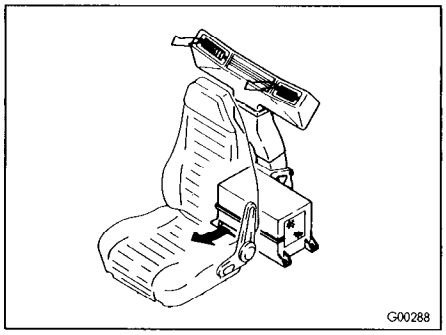

G00288

OPERATION

A. Cooling

Set the knobs to the following positions and a cool breeze will be flowed in from the rear vents.

- Outlet change-over knob (1): FACE
- Heater temperature knob (2): OFF
- Blower switch (3): See table below.
- Cooler temperature knob (4): See table below.

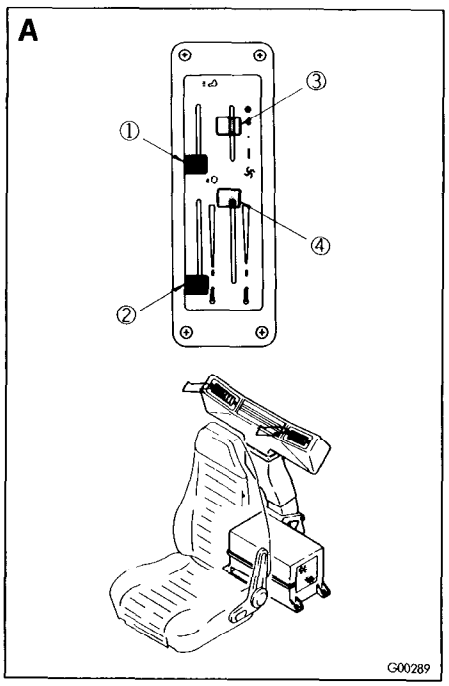
Control knob / Purpose	Blower switch (3)	Cooler temp. knob (4)
Quick cooling	HIGH	HIGH
Normal cooling	MEDIUM-LOW	MEDIUM
Gradual cooling	LOW	LOW

B: Heating

Set the knobs to the following positions, then warm breeze will be flowed in to the feet.

- Outlet change-over knob (1): FOOT
- Heater temperature knob (2): See table below.
- Blower switch (3): See table below.
- Cooler temperature knob (4): OFF

Control knob / Purpose	Heater temp. knob (2)	Blower switch (3)
Quick heating	HIGH	HIGH
Normal heating	MEDIUM	MEDIUM or LOW
Mild heating	LOW	LOW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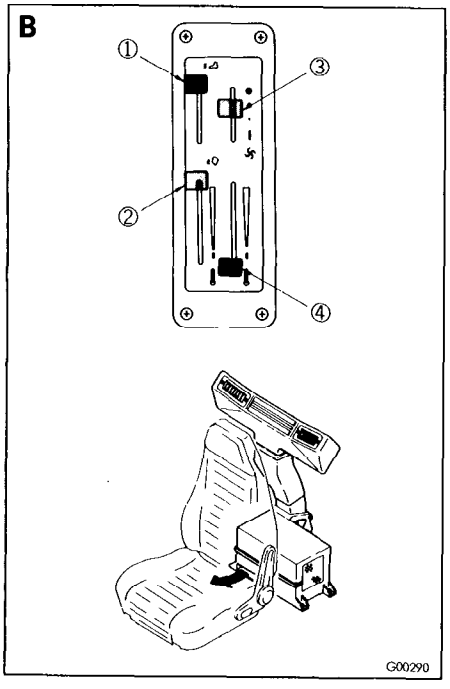
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C. Dehumidity and heating

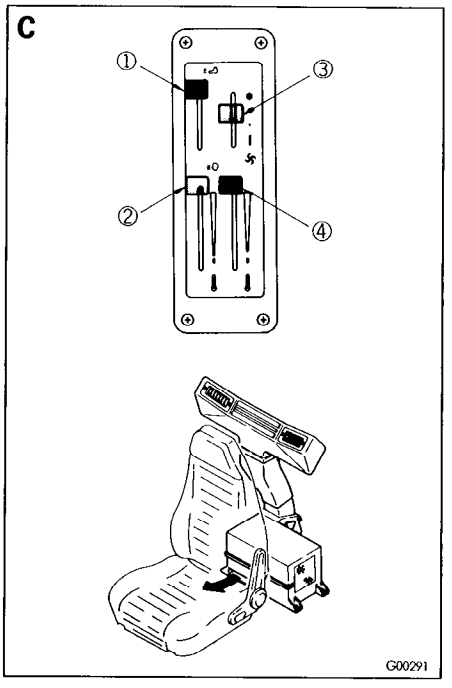
Set the knobs to the following positions and a dry, fresh, warm breeze will be flowed from the vents at operator's feet.

- Outlet change-over knob (1): FOOT
- Heater temperature knob (2): See table below.
- Blower switch (3): See table below.
- Cooler temperature knob (4): HIGH

Purpose	Control knob	Heater temp. knob (2)	Blower switch (3)
Dehumidifying and heating	Winter	HIGH	HIGH
	Spring and Autumn	MEDIUM or LOW	MEDIUM or LOW

★ If very damp air is used for heating, only hot, humid air will be sent to the cab, producing an unpleasant atmosphere. This air conditioner first cools the air to dehumidify it, and then reheats it to produce the optimum heating conditions. In addition, there is no problem with the windows misting up. This setting is particularly useful in spring, autumn or on rainy days when the air is very damp.

★ When the outside temperature is from 2°C to 6.5°C, a low pressure cut switch functions to automatically and switch the compressor off.
In this situation it is impossible to use the combination of dehumidifying and heating.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Precautions for using air coditioner

- When cooling, change the air occasionally.
- Smoking in the air-conditioned cab will cause your eyes to get sore. While smoking, open the window to let the smoke out of the cab.
- While using the air conditioner, open the window once every hour.
- When using the cooler, make sure the hot water circuit is completely stopped.
- If hot water is circulating in the heater, it is like having a hot heater, it is like having a hot water bottle in the cab. Always make sure the heater temperature knob is at the OFF position.
- When not using the heater for a long period, fully close the hot water outlet and inlet valves under the engine water manifold and radiator.
- Be careful not to overcool the cab.
  The cab should feel cool when entering there from outside (5°C or 6°C lower than the outside temperature). It is unhealthy to have the temperature in the cab too low. Always give careful consideration to temperature regulation.

INSPECTION AND MAINTENANCE

A. Clean air filter

If the air filter inlets is clogged, the heating or cooling capacity will drop.

Clean the air filter with compressed air once a week.

B. Check tension of compressor belt.

If the belt is loose, it will slip and the air conditioner will not be able to cool properly.

Periodically press the mid-point of the belt with the finger and check that the deflection is 10 to 12 mm.

When the belt is new, it is particularly liable to stretch, so always adjust it after 2 to 3 days.

(a): Compressor pulley
(b): Drive pulley

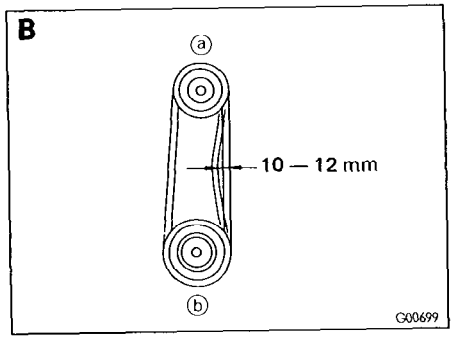
C. Check volume of refrigerant (gas)

If there is a lack of refrigerant, the cooling performance will be poor.

When operating the cooler at high speed, there should be no bubbles in the sight glass (inspection window) mounted on the condenser unit receiver.

If there are any bubbles, there is a lack of gas, so have to add refrigerant at a shop.

(a): Sight glass
(b): No refrigerant
(c): Lack of refrigerant
(d): Correct amount of refrigerant


B
a
10 — 12 mm
b
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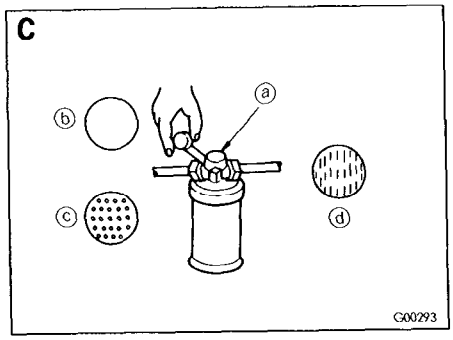
C
b
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⚠ **The refrigerant used in the cooler is colorless and odorless, and is harmless when released into the atmosphere. However if it gets in the eyes or on the hands, it will be cause of burn or loss of sight, so never loosen any part of the refrigerant circuit.**

D: Check during off-season

When the air conditioner is not being used, run the compressor at low speed for a few minutes every week to avoid loss of oil. (Run the engine at low speed with the cooler temperature regulator knob at LOW COOL.)

★ In cold weather, do not run the compressor suddenly at high speed. This may cause failure in the compressor. When the temperature is below 2 to 6.5°C, the low pressure cut-off switch functions to stop the compressor from running even when the air conditioner switch is pressed.

MEMO

EXCAVATOR'S WORK

In addition to the following, it is possible to further increase the range of applications by using various attachments.

A. BACK HOE WORK

A back hoe is suitable for excavation at a position lower than the machine. It is possible to effectively move the arm through 30° in the direction towards the machine and 45° in the direction away from the machine, making for efficient work.

B. SHOVEL WORK (except PC300, 300LC-5 MIGHTY)

A shovel is suitable for excavating at a position higher than the machine. Shovel work is performed by attaching the bucket in the reverse direction.

C. LOADING WORK

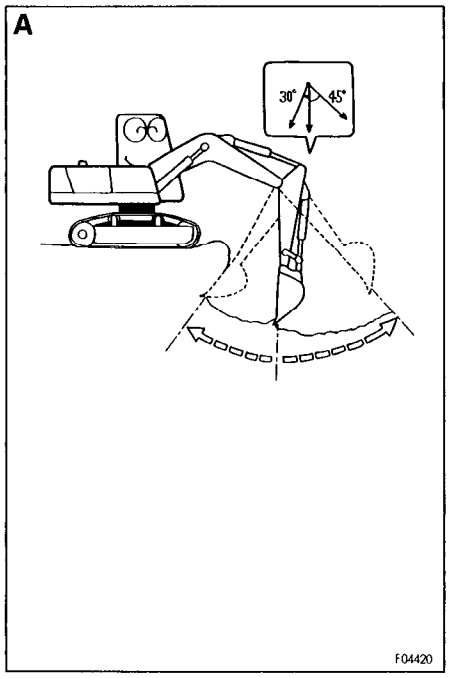
About half of the time spent during excavating and loading work is taken up swinging. Maximum work efficiency can be attained by carrying out work in such a way that the swinging angle is kept as small as possible in accordance with the terrain.

When loading, it is better to fit the machine in the longitudinal direction of the dump truck and to load from the front of the dump truck body. This both faciliates loading and also enables a greater amount of material to be loaded as compared with loading from the side of the truck.

D. DITCH DIGGING WORK

Ditch digging work can be performed efficiently by attaching a bucket to match the width of the ditch and then setting the tracks parallel to the line of the ditch to be excavated.

To excavate a wide ditch, first dig out both sides and then finally remove the center portion.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30°
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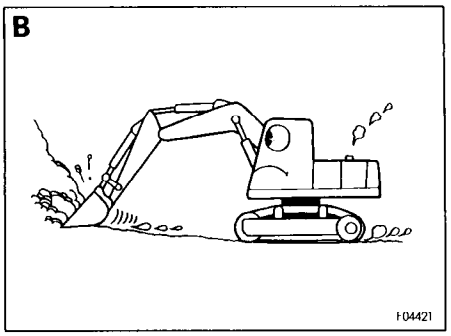
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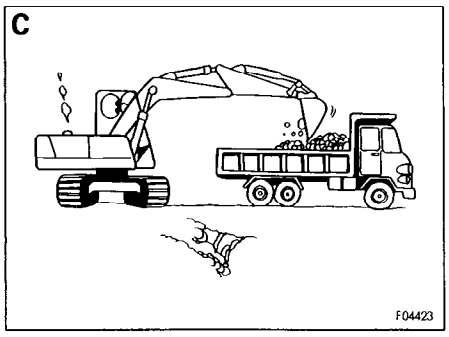
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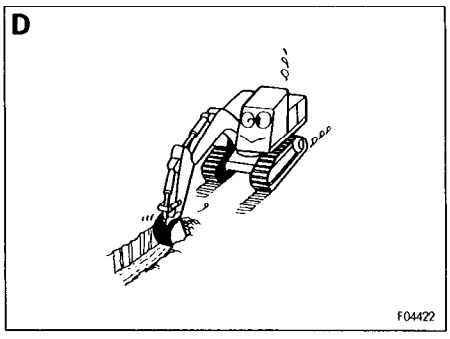
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HANDLING OF BATTERY

⚠ **Before starting the engine, use a damp cloth to wipe off the dust accumulated on the top surface of the battery or on the starting motor and the alternator.**

A. PRECAUTIONS FOR CHARGING BATTERY

1. Before charging, disconnect the cable from the negative (—) terminal of the battery. Otherwise, an unusually high voltage will damage the alternator.
2. While charging the battery, remove all battery plugs for satisfactory ventilation.

⚠ **To avoid gas explosions, do not bring fire or sparks near the battery.**

3. If the electrolyte temperature exceeds 45°C, stop charging for a while.
4. Turn off the charger as soon as the battery is charged.
   Overcharging the battery may cause followings:
   1) Overheating the battery
   2) Decreasing the quantity of electrolyte
   3) Damaging the electrode plate

⚠ **If the electrolyte gets on your skin or clothes, immediately wash with plenty of clean water.**

5. Do not mix up cables (positive (+) to negative (—) or negative (—) to positive (+)), as it will damage the alternator.
6. When inspecting or servicing a battery, be sure to stop the engine and turn the starting switch key to "OFF" position.
7. When performing any service to battery besides checking the electrolyte level or measuring the specific gravity, disconnect cables from the battery.

B. REMOVAL AND INSTALLATION OF BATTERY

- When removing the battery, first disconnect the cable from the ground (normally, from the negative (—) terminal). If a tool touches a cable connecting the positive terminal and the chassis, there is danger of sparks being emitted.
- When installing the battery, the ground cable should be connected to the ground terminal as the last step.

C. STARTING ENGINE WITH A BOOSTER CABLE

When starting the engine with a booster cable, do as follows:

1. Before connecting the booster cable
   1) Size of booster cable and clip should be suitable for the battery size.
   2) Check cables and clips for breaks, corroded surfaces, etc.
   3) Make sure cables and clips are firmly secured.
   4) Keep the starting switch in the "OFF" position.
   5) The battery of the running engine must be the same capacity as that of the engine to be started.

2. Connect the booster cables in the following manner.
   1) Connect one clip of booster cable (A) to the positive (+) terminal of the engine to be started.
   2) Connect the other clip to the positive (+) terminal of the engine which is running.
   3) Connect one clip of booster cable (B) to the negative (—) terminal of the engine which is running.
   4) Connect the other clip to the engine block to be started.

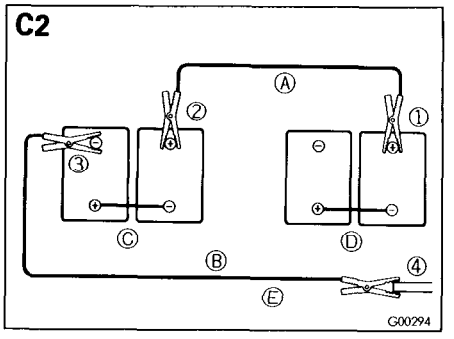
★ Make sure the clips are firmly connected to battery terminals. Then, start the engine.

(C): Battery for running engine
(D): Battery for engine to be started
(E): Engine block to be started

⚠ **When connecting the cables, never contact the positive (+) and negative (—) terminals.**

⚠ **Make sure that the booster cable connections are correct. Connect the booster cable to the engine block as far as possible from the battery.**

3. Starting engine
   1) Turn the starting switch to START position and start up the engine.
   2) If the engine doesn't start at first, try again after 2 minutes or so.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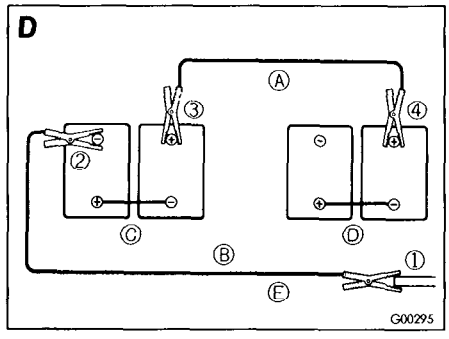
D. After the engine has started, the booster cables should be disconnected in the reverse order in which they were connected.

1. Disconnecting the booster cables
   1) Disconnect the clip of booster cable (B) from the engine block which was started.
   2) Disconnect the other clip from the negative (—) terminal of the running engine.
   3) Disconnect the clip of booster cable (A) from the positive (+) terminal of the running engine.
   4) Disconnect the other clip from the positive (+) terminal of the engine which was started.

(C): Battery for running engine
(D): Battery for engine which was started
(E): Engine block which was started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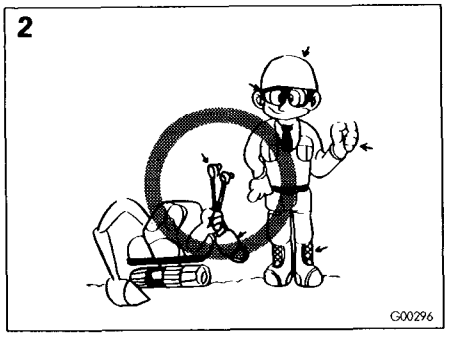
PRECAUTIONS FOR MAINTENANCE

SAFETY ····⚠

1. Wear proper clothes
   Loose clothes, ornaments or other things that may possibly contact the control lever or other machine parts must not be worn. Do not let you clothes get caught on protruding parts of the machine. Do not wear oily clothes since they may catch fire.
2. Wear well-fitting helmet, safety shoes and working clothes. When drilling, grinding or hammering, always wear protective goggles.
3. Fuel or oil are dangerous substances.
   Never handle fuel, oil, grease or oily clothes in places where there is any fire or flame.
   As preparation in case of fire, always know the location and directions for use of fire extinguishers and other fire-fighting equipment.
4. Do not handle electrical equipment while wearing wet gloves, or in wet places, as this can cause electric shock.
5. During maintenance do not allow any unauthorized person to stand near the machine.
6. Exhaust gas is dangerous. When working inside, be particularly careful to have good ventilation.
7. Unless you have special instructions to the contrary, maintenance should always be carried out with the engine stopped. Apply the swing lock and also all of the safety levers. If maintenance is carried out with the engine running, there must be two men present: one sitting in the operator's seat and the other one performing the maintenance. In such a case, never touch any moving part.
8. When working underneath the machine, place a sign to that effect on the operator's seat and, if necessary, put a similar signs in the vicinity as well.
9. Do not go underneath the machine after raising it up using the boom and the arm.
10. When working with others, choose a group leader and work according to his instructions. Do not perform any maintenance beyond the agreed work.
11. When maintenance has to be carried out with the work equipment raised, they must be securely supported by blocks.
12. Always remember that the hydraulic oil circuit is under pressure. When feeding or draining the oil or carrying out inspection and maintenance, release the pressure first.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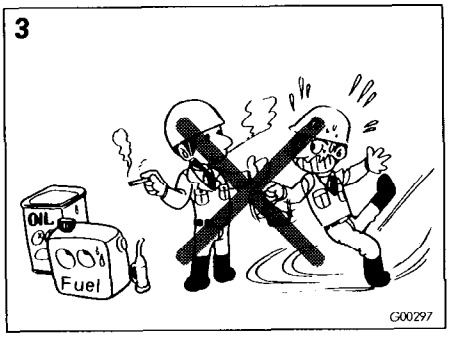
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OIL
Fuel
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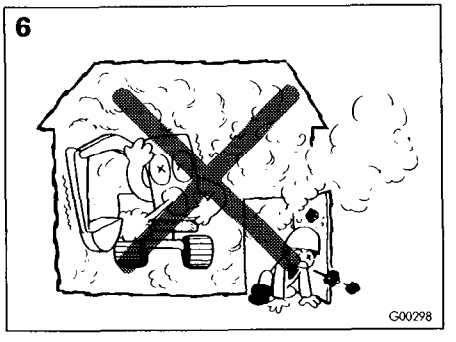
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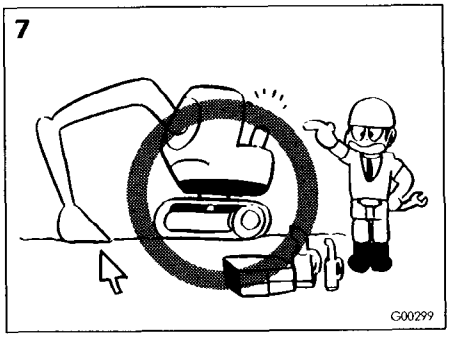
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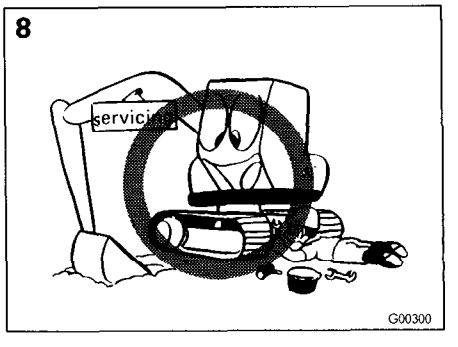
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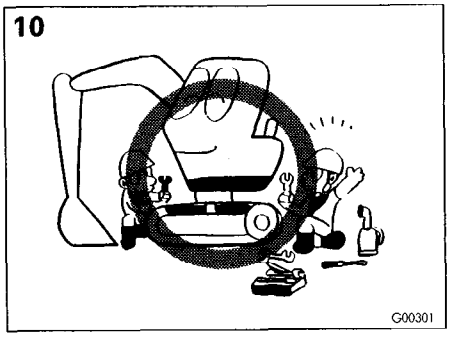
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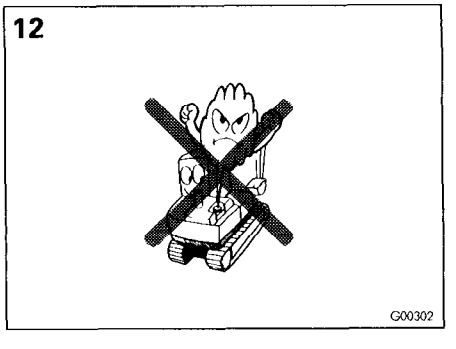
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G00302

Method of relieving pressure

1) Lower the work equipment to the ground and stop the engine after idling it for two or three minutes. Then operate the various operation levers. (work equipment, traveling and steering lever through their full stroke in each direction)
   When removing air instruments or pipings, open the drain valve under the air reservoir to relieve air pressure.
2) Gradually unscrew the cap of the hydraulic tank and leave it for a few minutes.

13. Flames should never be used instead of lamps. Never use a naked flame to check leaks or the level of oil, fuel, antifreeze or electrolyte.
14. Immediately remove any oil or grease on the floor of the operator's compartment, or on the handrail. It is very dangerous if someone slips while on the machine.
15. Be particularly careful when removing the radiator cap. If this is done immediately after using the machine, there is a danger that boiling water may spurt out.
16. Do not check the fan belt tension while the engine is running. Be sure to turn off the engine before inspecting other rotating parts and the vicinity thereof.
17. Do not allow anybody other than the necessary workers to go near the machine while it is being inspected or maintained. Also, be careful of people in the vicinity. It is necessary to exercise particular care when performing grinding or welding, or when swinging a large hammer.
18. Use the tool which is suitable for the maintenance work.
19. Remove the minus terminal from the battery in maintaining the electrical system.
20. When the tracks are removed, never put your fingers between the shoes.
21. When carrying out other difficult maintenance works, carrying them out carelessly can cause unexpected accidents. If you consider the maintenance is too difficult, always request Komatsu distributor to carry out it.

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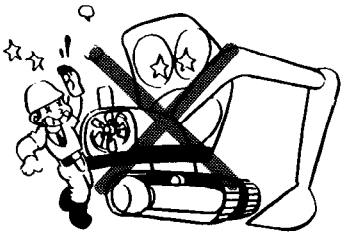

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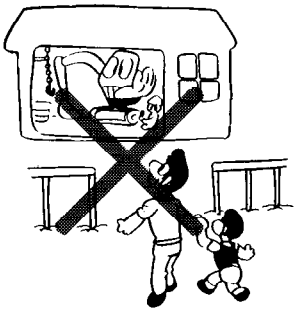

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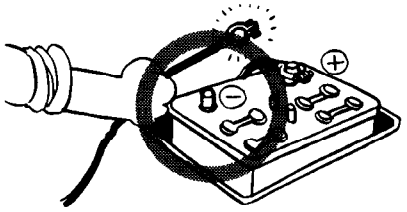


G00307

MISCELLANEOUS

- Thoroughly wash the machine, particularly the oiling and greasing parts and the vicinity, thereof, in order to prevent the ingress of dust.
- Use genuine Komatsu replacement parts specified in the parts list.
- Use Komatsu specified oil and grease. Use oil and grease having the recommended viscosity for the particular ambient temperature.
- Use clean oil and grease and keep them in clean containers to avoid the ingress of dust.
- Inspect or replace oil in a dust-free location to prevent the ingress of dirt.
- Drain off used oil after heating it to a suitable temperature (about 20 to 40°C).
- After replacing oil, filter element or strainer, bleed the air from the circuit.
- When the strainer is located in the oil filler, the strainer must not be removed while adding oil.
- When adding oil or checking the oil level, check that the oil is at the correct level.
  When adding oil or fuel, do not let the oil or fuel overflow.
  If oil or water are spilled, always wipe it up. Spilled oil or water may cause people to slip; spilled oil may cause fire.
  If soil is piled on top of a place where fuel has been spilled, remove the soil.
- After greasing up, always wipe off the old grease that was forced out.
- When changing the oil or filter, check the drained oil and filter for any signs of excessive metal particles or other foreign materials.
- When removing parts containing O-rings, gaskets or seals, clean the mounting surface and replace with new sealing parts.
- When washing the machine, ensure that water does not get onto the alternator.
- Special measuring apparatus is needed for testing hydraulic pressure.
- Thoroughly wash the machine. In particular, be careful to clean the filler caps, grease fittings and the area around the dipsticks. Be careful not to let any dirt or dust into the system.
- When check an open cover there is a risk of dropping things in. Before removing the covers to inspect cover, empty everything from your pockets. Be particularly careful to remove wrenches and nuts.
- When working on the sea shore, check that the various plugs and valves, etc., are tightened up properly. After the completion of work, thoroughly wash the machine and carefully clean all electrical equipment to ensure that is does not corrode.
- Before working in muddy water, rain or snow, check that the various plugs, valves, are properly screwed up. Upon completion of work, wash the machine, then check the various parts of the machine for cracking, scratching, loose or missing nuts and bolts. Also, oil and grease the various parts of the machine.

- When working in a dusty location, be careful of the following:

1) Inspect the dust indicator to see whether the air cleaner is blocked up. Clean the air cleaner as soon as it becomes dirty.
2) Clean the radiator core so that it does not become blocked up.
3) Clean or replace the fuel filter as soon as it becomes dirty.
4) Clean the electrical equipment, particularly the starting motor and alternator, to prevent accumulation of dust.

- When working on rocky ground, be careful of damage to the undercarriage, loose nuts and bolts, cracks, wear and other damage. Also, adjust the track tension so that it is a little slacker than usual.
- When installing car radio and a walkie-talkie or citizen band, contact your Komatsu distributor.
- Do not direct the steam jet directly at any mechatronic parts or connectors.
- Do not get any water on the controllers or monitors inside the operator's cab.
- Do not direct a high-pressure jet directly at the radiator.
- After disconnecting the connector, cover it with a vinyl bag to prevent oil or dust from sticking to its contact section.
- When welding, be careful of the following:

1) Turn OFF the power (starting switch).
2) Do not continuously apply more than 200 V.
3) Install the ground cable at least 1 m from the range to be welded.
4) Do not insert any seal or bearing between the weld and ground.
5) When repairing the controller mount, remove the controller connectors and carry out the welding.

Precautions when power source for options

When installing electrical components such as a car cooler, connect to the special power source connector.

The power source for options must never be connected to the fuse, starting switch, or battery relay.

STORAGE

BEFORE STORAGE

To place the machine in storage for an extended period of time, the following measures must be taken to insure that it can be returned to operation with minimum of service.

- After every part is washed and dried, the machine should be housed in a dry building. Never leave it outdoors.
  In case it is unavoidable to leave it outdoors, lay wood plates on the ground, and park the machine on the wood plates and cover it with canvas, etc.
- Completely fill the fuel tank, lubricate and change the oil before storage.

★ To protect the cylinder rod when the machine is not being used, set the work equipment in the posture shown in the diagram.
(This prevents rusting of the cylinder rod)

- Apply a thin coat of grease to metal surfaces (hydraulic piston rods and front idler adjusting rods).
- As for the batteries, remove the terminals and cover them, or remove them from the machine and store separately.
- When the ambient temperature is anticipated to drop below 0°C, always add antifreeze in the cooling water.
- Lock all the control levers securely with the lock lever.

DURING STORAGE

- Operate the engine and move the machine for a short distance once a month so that a new film of oil will be coated over movable parts and component surfaces.
- Before operating the working equipment, wipe off the grease on the hydraulic piston rod.

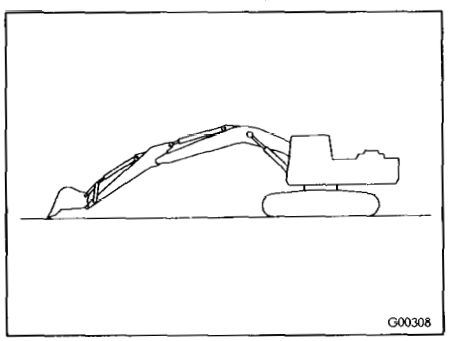
⚠ **If it is unavoidably necessary to carry out the rust-preventive operation while the machine is indoors, open the doors and windows to improve vetilation and prevent gas poisoning.**

AFTER STORAGE

Carry out the following procedure when taking the machine out of long-term storage.

- Wipe off the grease on the hydraulic piston rod.
- Completely fill fuel tank, lubricate and add oil.

★ If the machine is stored without carrying out the monthly rust prevention operation, request your Komatsu distributor for service.


G00308

COOLANT AND LUBRICANTS

No.	Supplier	**Engine Oil [CD or CE]** SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)	**Grease [Lithium-Base]** NLGI No. 2	**Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type**
1	KOMATSU	EO10-CD EO30-CD EO10-30CD EO15-40CD	G2-LI G2-LI-S	AF-ACL AF-PTL AF-PT (Winter, one season type)
2	AGIP	Diesel sigma S Super dieselmultigrade *Sigma turbo	GR MU/EP	–
3	AMOCO	*Amoco 300	RYKON prenium grease	–
4	ARCO	*Arcofleet S3 plus	Litholine HEP 2 Arco EP moly D	–
5	BP	Vanellus C3	Energrease LS-EP2	Antifreeze
6	CALTEX	*RPM delo 400 RPM delo 450	Marfak all purpose 2 Ultra-duty grease 2	AF engine coolant
7	CASTROL	*Turbomax *RX super CRD	MS3 Spheerol EPL2	Anti-freeze
8	CHEVRON	*Delo 400	Ultra-duty grease 2	–
9	CONOCO	*Fleet motor oil	Super-sta grease	–
10	ELF	Multiperformance 3C Performance 3C	Tranself EP Tranself EP type 2	Glacelf
11	EXXON (ESSO)	Essolube D3 *Essolube XD-3 *Essolube XD-3 Extra *Esso heavy duty Exxon heavy duty	Beacon EP2	All season coolant
12	GULF	Super duty motor oil *Super duty plus	Gulfcrown EP2 Gulfcrown EP special	Antifreeze and coolant
13	MOBIL	Delvac 1300 *Delvac super 10W-30, 15W-40	Mobilux EP2 Mobilgrease 77 Mobilgrease special	–
14	PENNZOIL	*Supreme duty fleet motor oil	Multi-purpose white grease 705 707L White – bearing grease	Anti-freeze and summer coolant

No.	Supplier	**Engine Oil [CD or CE]** SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)	**Grease [Lithium-Base]** NLGI No. 2	**Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type**
15	PETROFINA	FINA kappa TD	FINA marson EPL2	FINA tamidor
16	SHELL	Rimula X	Alvania EP grease	–
17	SUN	–	Sunoco ultra prestige 2EP Sun prestige 742	Sunoco antifreeze and summer coolant
18	TEXACO	*Ursa super plus Ursa premium	Multifak EP2 Starplex 2	Code 2055 startex antifreeze coolant
19	TOTAL	Rubia S *Rubia X	Multis EP2	Antigel/antifreeze
20	UNION	*Guardol	Unoba EP	–
21	VEEDOL	*Turbostar *Diesel star MDC	–	Antifreeze