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 photographs and 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.

- 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.
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SAFETY HINTS • • • ▲

OPERATION

GENERAL

● 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.

● 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.

● Take care of your health. Do not operate when tired, or after drinking.

● 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.

● 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.

● 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

● 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.
• 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.

• When operating inside a building always be sure of the clearance of the ceiling, entrances, aisles, etc. and the load limit of the floor.

• Never allow other person than the operator to ride on the machine during operation.

BEFORE STARTING OPERATION

• 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.

• 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.

• When getting on or off the machine, use the handrail provided. Do not jump up or down from the machine.

• 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.

• Wipe off thoroughly any grease, oil or mud on the handrail, floor or control levers. Failure to do this may cause you to slip.

• 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.

• 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.
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.

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.

Before starting the engine, confirm that all control levers are in NEUTRAL.

**AFTER STARTING THE ENGINE**

- Confirm that all gauges and warning devices are functioning correctly, and that the gauge readings are within the prescribed range.
- Check the play and travel of each lever.
- Operate the work equipment to confirm that they are functioning normally.
- Before operating the forward-reverse lever, check whether the undercarriage is forward or backwards. If the undercarriage is facing backwards, operate the forward-reverse lever in the reverse manner to that when the undercarriage is facing forward.

- Move the machine slowly and listen carefully to the engine or gears to confirm that they are not making any unusual noises.
- Choosing a safe place, operate the machine to confirm that it is functioning normally.
- If these tests reveal anything wrong, however slight it may be, contact the man in charge of the machine and operate the machine only after obtaining his permission.
DURING OPERATION

- 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.
- Always operate slowly in crowded places. On haul roads or in narrow places, give way to loaded vehicles.
- Do not allow unauthorized persons into the work area.
- Before reversing or turning, ensure that there is nobody in the vicinity. Also, be careful of obstacles.
- 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.
- When operating the machine along a road, retract the work equipment to improve machine stability. As far as possible proceed along a flat road.
- 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
- 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.
- 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.
- 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.

- 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.

- 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.

- 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.

- 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.

- After earthquakes, confirm that the ground is still firm; after blasting, confirm that there are no unexploded charges remaining.

- 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.

- 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.
• Check the load limits of bridges before crossing.
• 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.
• 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 wheel rim).
• 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.
• 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.
• 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.
• Do not undercut the machine, unless absolutely necessary. If necessary, always take care to prevent the machine falling.

• 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.

• 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.

• Take care not to swing the bucket against the sides of trenches or dump trucks. Load the truck from the rear.

PARKING

• 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.
● 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.

● 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.
GENERAL LOCATIONS AND SPECIFICATIONS

1. Bucket
2. Bucket cylinder
3. Arm
4. Arm cylinder
5. Upper boom
6. Lower boom
7. Boom cylinder
8. Front wheel
9. Rear wheel
10. Outrigger

OPERATING WEIGHT

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15500 kg</td>
</tr>
</tbody>
</table>

PERFORMANCE

- Bucket capacity (SAE) 0.62 m³
- Bucket capacity (CECE) 0.55 m³
- Travel speed
  - Forward: Max. 20.0 km/h
  - Reverse: Max. 20.0 km/h
- Swing speed 11.0 rpm

ENGINE

- Model Komatsu 6D95L diesel engine
- Flywheel horsepower (at 2400 rpm): 87 HP

Note: Specifications are subject to change without notice.
INSTRUMENTS AND CONTROLS

MONITOR PANEL
This monitor system consists of meter group A, monitor group B and switch group C.

A: METER GROUP
This group includes the air pressure gauge, engine water temperature gauge, tachometer and pilot lamps.

B: MONITOR GROUP
This group includes the monitor lamps which light while the indicated items are working normally and monitor lamps which indicate abnormalities.

C: SWITCH GROUP
This group includes the lamp switch, windshield wiper switch and cab heater switch.
A: METER GROUP

1. TURN SIGNAL PILOT LAMP

This lamp flashes in synchronization with the turn signal lamp.
2. ENGINE WATER TEMPERATURE GAUGE

This gauge indicates a cooling water temperature. When indicator is in the green range during operation, water temperature is normal. If indicator moves from green into red range during operation, run the engine at low idling speed until temperature goes down.

3. AIR PRESSURE GAUGE

This gauge indicates a air pressure in the air tank. When indicator is in the green range during operation, the air pressure is normal. If the indicator stays below the green range during operation, it indicates the air tank pressure is low and the air tank pressure monitor lamp should come on and the warning buzzer should sounding. If this happens, stop the machine and increase engine speed until indicator moves into the green range.

4. TACHOMETER AND SERVICE METER

This meter has a tachometer to indicate engine revolutions per minute and a service meter. Refer to the section “SERVICE METER”.
B: MONITOR GROUP

1. HYDRAULIC TANK PRESSURE MONITOR

This monitor indicates an abnormality of air pressure in the hydraulic tank.

When the starting switch key is turned to ON position, the lamp lights. Then as the hydraulic tank pressure increases, the lamp goes out. After starting up, an engine should be run at low idling speed until the lamp goes out.
PRESSURE CONTROL

If the pressure is low, set the pressure to 0.6 kg/cm² by rotating the regulator handle above the air tank. If the pressure is too high, rotate the regulator handle in the "Pressure low" direction and bleed air from the hydraulic tank by loosening the cap.

Then, tighten the cap and make sure that the pressure is stable and the pressure gauge reading at the regulator is less than 0.6 kg/cm². Further, set the pressure to 0.6 kg/cm² again by rotating the regulator handle. In this case, the working equipment should be in the position shown below. Adjust the hydraulic oil temperature to approx. 50°C.

This monitor indicates a low engine oil pressure.

When the starting switch key is turned to ON position, the lamp lights.

Normally the lamp is out during operation. If it comes on during operation, the oil pressure has dropped. In such a case, immediately stop the engine and check the cause of the trouble.
3. AIR TANK PRESSURE MONITOR

This monitor indicates a low air pressure in the air tank. When the starting switch key is turned to ON position, the lamp lights. Normally the lamp is out during operation. After starting up, an engine should be run at low idling speed until the lamp goes out.
4. SWING MECHANICAL BRAKE PILOT LAMP

Swing brake releasing switch at AUTO position;
The pilot lamp will light when the swing mechanical brake is applied.
Swing brake releasing switch at RELEASE position;
The pilot lamp goes out.

5. WORKING LAMP MONITOR

This monitor lamp lights while the working lamp is lit with the starting switch key ON.

6. CHARGE MONITOR

This monitor indicates an abnormality in the charging system.
Normally the lamp comes on when the starting switch key is turned to ON position and gradually goes out as the engine speed increases.
7. FUEL MONITOR

This monitor indicates that there is less than 53 liters of fuel in the fuel tank. When this lamp lights, check the fuel level and fill the tank with fuel.
8. HAZARD LAMP MONITOR

This lamp lights when the hazard lamp is turned on.

9. PARKING BRAKE MONITOR

This lamp lights when the parking brake is applied with the starting switch key ON.

10. SUSPENSION LOCK MONITOR

This lamp lights when the suspension is locked.
C: SWITCH GROUP

1. WORKING LAMP/PARKING LAMP SWITCH

This switch is used to turn on the working lamp and parking lamp. The monitor lamps of these lamps also light.

WORKING:
Working lamp lights.

PARKING:
Parking lamp lights.

★ Turn off these lamps when traveling on public roads.
2. CAB HEATER SWITCH

This switch is used to heat the operator's compartment.
It can set the flow of warm air to two levels.
L: Low level
H: High level
★ Since the compartment is warmed by the engine cooling water, the heater can be used only while the cooling water is warm.

3. LAMP SWITCH

This switch is used to turn on the head lamps, side clearance lamps, tail lamps, license plate lamp, and instrument panel lamp.
Position I:
Side clearance lamps, tail lamps, license plate lamp, and instrument panel lamp light.
Position II:
All of the above lamps plus the head lamps light.

4. WINDSHIELD WIPER SWITCH

This switch is used to operate the front windshield wiper and to spray the detergent.
ON: Wiper operates.
W: Detergent liquid is sprayed.
5. ARM/OUTRIGGER SELECTOR SWITCH

This switch is used when operating the arm and outriggers.
ON: Outriggers can be operated.
OFF: Arm can be operated.
6. BUCKET SPEED SWITCH

This switch is used to change the speed of the bucket.
HIGH: Fast bucket speed
LOW: Normal bucket speed
★ Turn this switch to HIGH position for excavating work with bucket only.

7. 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.

8. HAZARD LAMP SWITCH

This switch is used in case of an emergency.
ON: Hazard lamps flash.
★ The left and right turn signal lamps at the front and rear of the machine flash.
1. HEATER SIGNAL

This signal is red-heated after the starting switch is turned to HEAT, thus indicating the electrical intake air heater is heated.
2. STARTING SWITCH

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.

3. ROOM LAMP SWITCH

When this switch is moved to on position, room lamp will light.
4. HORN SWITCHES

These switches, one located on the steering wheel and the other on the RH control lever of the working equipment, are used to sound the horn.

5. TURN SIGNAL LEVER

This lever is used to actuate the turn signal lamps.
When making a left turn:
Pull the lever.
When making a right turn:
Push the lever.
★ When the lever is operated, the turn signal pilot lamp also lights.
6. SWING MECHANICAL BRAKE
RELEASING SWITCH

Auto:
The swing mechanical brake will start working about 5 seconds after the swing control lever is shifted to neutral position.

Release:
Use this position when you want to release the swing mechanical brake in case of a trouble in the electrical system.
1. SUSPENSION LOCK LEVER

This lever is used to lock the suspension.

1 : Lock
2 : Free

★ When the machine is traveling normally, the suspension should be activated.
During work operations, the suspension should be locked.
★ When the suspension is locked, the suspension lock monitor lamp lights.
2. BRAKE LOCK LEVER

This lever is used to lock the wheels when digging.
① : Lock
② : Free
★ Set this lever to the free position while the machine is traveling.

Do not use the brake lock lever as a parking brake.

3. PARKING BRAKE LEVER

The lever is used to apply the parking brake.
① : Lock
② : Free

When leaving the machine after it is parked, be sure to apply the parking brake.

4. FUEL CONTROL LEVER

This lever is used to control the engine speed and output.

① Engine stop position:
   Push the lever fully.
② Low idling position:
   Pull the lever from engine stop position ① until you feel the operating force falls off.
③ High idling position:
   Pull the lever from low idling position ② fully.
5. FORWARD/REVERSE LEVER

This lever is used to set the machine into forward drive or backward drive.

1: Forward
2: Reverse

* To change the position of this lever from N to F or R, press it down.

⚠ Do not operate this lever while the machine is traveling.
6. LEFT WORKING EQUIPMENT CONTROL LEVER  
(arm/swing control lever)

N  (Neutral):  
When the lever in this position, the upper works, the arm and outrigger 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.
★ When operating the arm and swinging the upper works, turn off the Arm/Outrigger selector switch.

7. RIGHT WORKING EQUIPMENT LEVER  
(boom/bucket control lever)

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

Outrigger operation
A  Extending
B  Storing
★ When operating the outriggers, turn on the Arm/Outrigger selector switch.

Boom operation
① Boom raises.
② Boom lowers.

Bucket operation
③ Bucket dumps.
④ Bucket curls.
8. SAFETY LEVER
(for working equipment levers)

The safety lever is used to lock the working equipment levers.

⚠️ When stopping the machine or leaving the machine, be sure to lower the bucket to the ground, then operate the lever to lock the left and right working equipment levers.
9. SWING LOCK LEVER

When this lever is placed in the lock position, the upper work is locked. Swing lock lever must be in lock position during traveling of machine.

★ This lever must be in the lock position after the upper works is parallel with the track frame.

⚠️ Do not attempt to rotate the upper works when the swing lock lever is in the lock position.

10. PEDAL FOR TILTING BACK THE LEFT CONTROL BOX

Use this pedal to tilt back the LH control box. When this pedal is pressed, the control box can be tilted back towards the rear. When the control box is put back in its ordinary position, it will lock into the correct position, making it possible to control the work equipment.

⚠️ When operating this pedal, lock the safety lever for the LH working equipment.
11. TRAVELING PEDAL

When this pedal is depressed, the machine will start off.

⚠️ Before depressing the pedal, confirm whether the chassis is facing front or rear.

⚠️ Do not place your foot on this pedal unless necessary.
12. BRAKE PEDAL

This pedal applies the front and rear wheel brakes.

⚠️ Do not rest your foot on the pedal unless necessary.

13. HIGH/LOW SPEED LEVER

This lever is used to change the speed of the machine.

1: High speed (H)
2: Low speed (L)

★ Before changing the position of this lever, depress the brake pedal to stop the machine and set the Forward/Reverse lever to N (Neutral).
★ When towing the machine, set this lever to position N.
**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.

Dust indicator is on air cleaner bracket in engine hood.

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**DOOR LOCK**

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

The door will become fixed in place when it is pressed against catch (1).

To release the door, pull knob (2) on the left side of the operator's seat so as to remove the lock.

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

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**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.
FRONT WINDSHIELD

It is possible to pull up the front windshield flush with the ceiling of the cab.

* Before opening or closing the windshield, be sure to lower the working equipment with the machine on level ground, stop the engine and lock the left and right working equipment levers.

OPENING SEQUENCE

1. When lock pins (A) at the left and right of the top of the front windshield are pulled to the inside, the lock will be removed.
2. Disconnect the wiring of the wiper motor at socket (B).
3. Grip the lower handle with the left hand and the upper handle with the right hand from the inside of the operator’s cab, then pull up the windshield and push it firmly against catch (C).
4. Then, after checking that the windshield is properly locked, be sure to retain it with left and right lock pins (A).
CLOSING SEQUENCE

1. Free left and right lock pins (A).

2. To release the lock from catch (C), move release lever (D) in the direction of the arrow. (When releasing the lock, grasp the handle at the lower part of the front windshield with the left hand and the upper part of the windshield with the right hand, then carefully lower the front windshield.)

3. Be sure to retain the windshield with left and right lock pins (A).

4. Connect the wiring of the wiper motor at socket (B).
ENGINE HOOD LOCK

Pull the lever to release the lock and open the engine hood.
Push down the engine hood stably to be locked.

OVERLOAD WARNING LAMP

This lamp comes on when there is danger of a machine falling over because of a slung load.
If the lamp lights, immediately lower the load to the ground or bring the arm in towards the machine. At this time, make sure that the lamp goes out.
* See PRECAUTIONS FOR HANDLING THE OVERLOAD WARNING DEVICE.
OPERATING THE RADIO

TUNING KNOB
Tune this knob in to the desired station. Tune right in to the station. If the tuning is off center, the sound quality will be unnatural and sensitivity will be reduced.

TONE CONTROL
Use this knob to adjust the tone as desired. When it is turned to the right the high tones will be emphasized, and when it is turned to the left the high tones will be cut, resulting in a mellow tone.

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

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.
OPERATOR’S SEAT

Forward-backward adjustment
Move lever (1) to the left, move the seat to the best position and release the lever.
The seat can be moved forward or backward over 160 mm in 8 steps.

Seat cushion adjustment
Sit in the operator’s seat; turn knob (2) counterclockwise to increase the strength of suspension to match body weight, and vice versa.

Back-rest adjustment
Pull lever (4) in the direction of the arrow, move the back-rest to the desired position and release the lever.

Height adjustment
Turn knob (3) counterclockwise to lower the seat, and vice versa.
The seat can be adjusted within a range of 190 mm.
FUSE BOX

The fuses protect the electric devices and wiring from burning out. If any fuse is rusted or coated with white powder, replace it.

Fuse box (I)

To open fuse box cover (1), push in the direction of arrow A and pull out spare fuse box side (2) in the direction of arrow B.

Fuse box (II)

Loosen bolt (3) and remove cover (4).

★ Replace a fuse with another of the same capacity.

⚠️ Before replacing a fuse, be sure to turn off the starting switch.
### Fuse box (I)

<table>
<thead>
<tr>
<th>No.</th>
<th>Terminal mark</th>
<th>Fuse capacity</th>
<th>Circuit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T</td>
<td>30A</td>
<td>Bucket speed circuit, Outrigger select circuit, Head lamp, Side clearance lamp, Instrument lamp</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>L</td>
<td>40A</td>
<td>Cab heater, Radio, Cigarette lighter</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>R</td>
<td>20A</td>
<td>Horn, Wiper</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I</td>
<td>10A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>O</td>
<td>10A</td>
<td>Turn signal lamp, Control lamp, Back lamp, Forward-reverse selector, Back up buzzer</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>U</td>
<td>10A</td>
<td>Water temperature gauge, Monitor lamp buzzer</td>
<td></td>
</tr>
</tbody>
</table>

### Fuse box (II)

<table>
<thead>
<tr>
<th>No.</th>
<th>Terminal mark</th>
<th>Fuse capacity</th>
<th>Circuit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L</td>
<td>20A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>H</td>
<td>10A</td>
<td>Working lamp, Parking lamp</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>10A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>O</td>
<td>20A</td>
<td>Hazard lamp, Room lamp</td>
<td></td>
</tr>
</tbody>
</table>
LOCKING CAP

A locking cap is available as an optional radiator cap, fuel tank cap or hydraulic tank cap. Open and close locking caps as follows:

1. To open the cap
   1) Insert the key into the cap.
       * Insert the key as far as it will go. If the key is turned before it is inserted all the way, it may break.
   2) Turn the key counterclockwise and bring the rotor groove in line with the aligning mark on the cap. Turn the cap slowly until a "clicking" sound is made. This releases the lock and allows the cap to be opened.

2. To lock the cap
   1) Turn the cap into place.
   2) Turn the key clockwise and take the key out.

* When the cap is locked (against vandalism), it rotates freely.
PRECAUTIONS FOR HANDLING THE OVERLOAD WARNING DEVICE

* Excavators are provided with this device to prevent them from tipping over while lifting loads.

1. When lifting loads
   1) Remove bolt (1) fastening the lever of the pressure switch and put roller (2) of the lever against cam (3).
   2) Shift valve lever (4) to ON so that the hydraulic pressure of the bottom sides of the boom cylinders can be directed to the pressure switch.

2. When not lifting loads
   When the machine is performing any kind of operation other than lifting loads, shift valve lever (4) to OFF and fasten the pressure switch lever with the bolt to prolong the life at the pressure switch.

* Remove valve lever (4) and the bolt, and keep them in a safe place when they are not in use.
* When an adjustment is required, contact your Komatsu distributor and have him make the adjustment.
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 equipment 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 battery terminal.
3. Check radiator for water leak.
4. Check tightness of air cleaner mounting bolt.
5. Check around the engine for water and oil leaks.
6. Check tire for wear of damage.

b. CHECK AND REFILL COOLANT

1. Open the engine hood and check if the cooling water level in sub-tank (1) is within the range shown above.
2. Refill through filler (2) if level is too low.
   ★ If the volume of coolant added is more than usual, check for possible water leakage.

⚠️ When removing the cap, release radiator pressure little by little by loosening cap slowly, then remove cap.
c. CHECK OIL LEVEL IN ENGINE OIL PAN

1. Use the dipstick (G) to check the oil level.
2. 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.

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 from filler (F) until the fuel tank is full.

★ 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: 240 l
★ When adding fuel, never let the fuel overflow. This may cause a fire.
e. CHECK OIL LEVEL IN HYDRAULIC TANK

1. Run the engine at low speed, retract the arm and bucket cylinder, lower the boom until the tips of the teeth touch the ground and then stop the engine.
2. Move each operation lever (for working equipment and travel) to its full travel to release the internal pressure.
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 from 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:

i) 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.

ii) 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.
f. CHECK AND REFILL OF OIL IN BRAKE FLUID TANK

Check if the brake fluid surface is below the level line marked on the tank. Add brake fluid through filler (F), if necessary.

★ Use caution to prevent the mixing of the mineral oil with the brake fluid when refilling.
★ The special vessel must be used only for refilling the brake fluid.

g. DRAIN WATER FROM AIR TANK

Open the drain valve (1) on the air tank underside and drain water out of the tank.
★ In cold weather operation or when a machine is to be operated after long storage, the tank should be drained after starting up the engine.

h. DRAIN WATER FROM AIR FILTER

1. Open the engine hood.
2. Loosen the screw (1) on the underside of the filter and drain water from the filter.
i. CHECK DUST INDICATOR

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

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

After cleaning element, push button to return red piston.

j. CHECK TIRES FOR AIR PRESSURE AND DAMAGE

Check the air pressure before starting work, when they are cold.

★ Standard air pressure
  Front: 6.75 kg/cm²
  Rear: 6.75 kg/cm²

★ Inspect tire surfaces for cuts, hollows, sticking nails or pieces of metal that might lead to puncture.

k. CHECK WHEEL BRAKE

If it does not work well, adjust, referring to the ADJUSTMENT section.

l. CHECK ELECTRICAL WIRING

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.
m. CHECK PARKING BRAKE
   If it does not work well, adjust, referring to the ADJUSTMENT section.

n. CHECK THAT ALL LAMPS AND INSTRUMENTS WORK PROPERLY.
o. CHECK THAT REAR VIEW MIRRORS ARE WELL ADJUSTED.
p. CHECK HORN AND WIPER.
q. CHECK EXHAUST GAS COLOR AND EXHAUST SOUND.
r. CHECK DOOR LOCK.
s. CHECK PART WHICH WAS UNUSUAL ON THE PREVIOUS DAY.

t. LUBRICATE CLAMSHELL BUCKET

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

u. 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.
OPERATING YOUR MACHINE

BEFORE STARTING THE ENGINE

1. Carry out an initial inspection. (For details of the inspection see CHECK BEFORE STARTING.)
2. Put the forward-reverse lever (1) in N (neutral) position.
3. Put the left and right working equipment levers (2) in neutral and check that safety levers (3) are locked.

★ The engine will not start while the forward-reverse lever (1) is in any position other than N (neutral).
TO START THE ENGINE

1. Pull the fuel control lever (1) a little towards your from the low idling position.

2. Turn starting switch key (2) to START and start the engine.

3. Release starting switch key (2), and the key will return automatically to ON.
Special starting

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

Refer to FUEL FILTER in every 500 hours service.

★ Do not leave the key in START for more than 20 seconds.
★ If engine will not start, repeat the starting procedure after about 2 minutes.
★ To start engine in cold weather, refer to "COLD WEATHER OPERATION".

★ When the starting switch key is turned to ON, the air tank pressure warning buzzer will sound and the charge monitor lamp, air pressure monitor lamp, engine oil pressure monitor lamp and hydraulic tank pressure monitor lamp light.

Then, several seconds after the engine is started up, the buzzer will cease sounding and each monitor lamp will go out. While the buzzer is sounding or the monitor lamps are on, do not start off the machine.
CHECKS AFTER STARTING

After starting make the following checks.

2. Leaving the bucket control lever (2) in either pushing or pulling side, run the engine for about 5 minutes to warm up the hydraulic oil.

3. After warm-up run is completed, check gauges, warning lamps for proper operation.
   - Continue to run the engine at light load until the engine water temperature gauge indicator falls within the green range.

4. Check if the exhaust color is normal or whether there is any abnormal noise or vibration.
   - Avoid abruptly accelerating the engine until the completion of warm-up.
   - The hydraulic oil temperature should ideally lie within the range 50 to 80°C. If the machine is operated after raising the oil temperature to 20°C, the life to the machine will be extended.
   - 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 from time to time or raise the engine speed to a midrange speed.
TO MOVE THE MACHINE OFF

1. Put swing lock lever (1) in the lock position by pushing the lever down.

2. Put suspension lock lever (2) and brake lock lever (3) in each free position.
3. Pull fuel control lever (4) and raise the engine speed.

4. Free safety levers (6) of left and right working equipment lever (5), move the working equipment in and raise it to a height of about 40 to 50 cm.

5. Put the high-low lever (7) in H (high speed) position.

6. Move the forward-reverse lever (8) to F (forward) or R (reverse).

7. Put parking brake lever in free position and check that the parking brake monitor lamp (9) has gone out.

8. Depress the traveling pedal (10) and the machine will start off.
While the engine is running, if the air tank pressure warning buzzer sounds continuously, the air pressure monitor lamp lights, or the air pressure gauge indicator stays in the red range, the braking effect is worsened. Check and repair the air piping system.

Before changing the direction of travel, release the traveling pedal and depress the brake pedal to stop the machine.

When traveling the machine on a road, set the machine to traveling posture.

Before operating the Forward/Reverse lever and depressing the traveling pedal, check the direction of the chassis.

If the traveling pedal is depressed with the fuel control lever fully opened, the machine will start abruptly.

When traveling the machine on a road, raise the outriggers and insert the lock pins to prevent them from falling.

The machine can be turned by turning steering wheel (1) to the desired direction.

When operating the machine in a narrow place, its direction can be changed by raising and turning the body.

If the upper works are turned 180 degrees and the undercarriage is reversed, the machine is steered in the opposite direction of the steering wheel. Therefore, take care of the direction of the chassis.
SWINGING

1. Raise the swing lock lever (1) to unlock the upper works.
   * Before swinging the upper works, make sure that the working equipment levers have been unlocked.

2. To swing the upper works, move the left working equipment lever.
   * Do not push down the swing lock lever during swinging.

3. To lock the upper works, push down the swing lock lever (1) when the upper works and the chassis are parallel.
   * Do not move the swing lock lever if the upper works and the chassis are not parallel.
BEFORE OPERATION

1. Put the forward-reverse lever (1) in N (neutral) position.

2. Put the brake lock lever (2) in the lock position.

3. Put the suspension lock lever (3) in the lock position.
   * Check that suspension lock monitor lamp (4) has come on.

4. Operate the left and right work equipment control levers to carry out operations.
OPERATION OF THE WORKING EQUIPMENT

The working equipment is operated by means of the left and right working equipment levers. The left lever is used to operate the arm and swing the machine, and the right lever is used to operate the boom and the bucket.

The motion of the lever and working equipment is as shown in the diagrams.

★ Before swinging the upper works, make sure that the swing lock lever has been in free.
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
HOW TO STOP AND START ON A SLOPE

1. To start again immediately after stopping once
   Stopping
   • Release the traveling pedal and depress the brake pedal.
   Starting
   • While slowly releasing your left foot on the brake pedal, depress the traveling pedal with your right foot.

2. To start again after being stopped for a long time
   Do the following in addition to the operation in item 1.
   Stopping
   • Set the forward-reverse lever to N, then apply the parking brake.
   Starting
   • Put the parking brake lever in free position and start the machine.
TO STOP THE MACHINE

1. Release the traveling pedal (1) and depress the brake pedal (2) to stop the machine.

2. Put the forward-reverse lever (3) into N (neutral) position.

3. Lower the engine speed using the fuel control lever (4).
4. Lower the bucket horizontally until its underside touches the ground.
5. Lock safety levers (6) for the working equipment levers (5).

**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 wheels. As an additional safety measure, thrust the bucket into the ground.**

**TO STOP THE ENGINE**

3. Return starting switch key (2) to the OFF position and remove it.

1. Run the engine at low idling speed for about 5 minutes to allow it to gradually cool down.
2. Put fuel control lever (1) in the engine stop position and stop the engine.

★ 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.
PRECAUTIONS FOR OPERATION

- Be careful not to compact the soil or damage earth mounds as a result of the swinging force.
- When swinging, do not dig the bucket teeth into the soil.
- Do not move off and excavate with the bucket leaving dug into the ground.
- When working with the machine, do not move the cylinder to the end of its stroke but leave a small safety margin.
- Do not use the dropping force of the bucket as a pickaxe, breaker, or pile driver.
- Do not use the dropping force of the machine for digging.
- 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.

- If the machine is to travel with the suspension left locked, move the suspension lock lever to the lock position.

⚠️ Do not abruptly press the brake pedal while descending a steep slope. The tires may slip.

⚠️ Do not drive the machine on slopes steeper than 30 degrees. The machine may tip over.

⚠️ Before starting to travel downhill, apply the foot brake to check that it is working correctly.

⚠️ When continuously climbing or descending a steep slope of more than 7 degrees, place the high-low speed lever to low speed (Lo) position. When continuously climbing a steep slope with the high-low speed lever put in high speed position, the machine speed decreases and it causes overheat.

⚠️ When traveling down gradual slopes (less than 7°), apply the foot brake and keep the travel speed to around 20 km/h to ensure safety.

- When descending a steep slope of more than 7 degrees, reduce the engine speed, set the high-low speed lever to the low speed position, and adjust the travel speed with the foot brake. When descending a slope of more than 15 degrees, set the machine to the position shown in the figure and reduce the engine speed.
- When traveling on a slippery road or on a slope, keep the bucket near to the ground at the lowest possible speed. Brake or start off smoothly to prevent transmitting shock to this chassis.

- While going uphill, braking power is applied in correspondence to the force applied to the brake pedal.

- If the engine should stop while the machine is going up a slope, depress the brake pedal. Rest the bucket on the ground and stop the machine. Move the forward-reverse lever to N (neutral) position. Then, start up the engine.

- When going down a slope, observe the maximum speed at each speed position to prevent racing the travel motors.

<table>
<thead>
<tr>
<th>Speed position</th>
<th>( F_1 (R_1) )</th>
<th>( F_2 (R_2) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. speed (km/h)</td>
<td>8.0</td>
<td>20</td>
</tr>
</tbody>
</table>

- The following phenomena are not abnormal and do not require corrective action.
  1) When retracting the arm, the arm may stop momentarily it is nearly vertical.
  2) When dumping with the shovel reversed, the bucket may stop momentarily when it is nearly horizontal.
  3) The brake valve may make a noise at the beginning and end of a swing.
• 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 side of the machine is in the bog, push down the bucket on the same side against the ground to float the wheels. Then place logs or timber underneath the wheels to 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 the wheels of the both sides are in the bog and slip, place logs or timber under the wheels 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 forward-reverse lever into the forward position.

• The arm retracting force can be controlled by the operating force of the brake pedal.
EXCAVATOR'S WORK

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

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.

SHOVEL WORK

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.

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 facilitates loading and also enables a greater amount of material to be loaded as compared with loading from the side of the truck.
HANDLING THE BOOM

The boom can be adjusted for work in close quarters, excavating cliffs, and for the travel position.

- Set the mounting positions of the boom connecting pins based on the drawing of the working range in the section SPECIFICATIONS.

How to remove and install pins

1. Remove hose clamp (1) on the lower boom.

2. Support the upper boom and pull out pins (2) and (3).

3. Move the upper boom to the desired position and align the hole for the pin on the upper boom with that on the lower boom.
4. Insert pins (2) and (3).
   ★ Take care not to damage the hoses.

5. Install the hose clamp.
   ⚠ Depending on the mounting positions of the connecting pins, the hose may bend sharply. If so, the clamp is not necessary.

   ⚠ After reinstalling the pins, slowly move the boom cylinder to the stroke ends to confirm that no excessive force is applied to the hoses of the working equipment.

   ⚠ With the upper boom mounted in the shortest position and with the arm and bucket fully pulled in, if the boom is raised to the stroke end, the bucket teeth will contact the operator's compartment. Therefore, operate the boom slowly.

   ⚠ When the machine is set to the traveling posture, if the boom is raised to the stroke end, the upper boom will contact the outer components. Therefore, never raise the boom all the way.
HANDLING THE DOZER BLADE

OPERATION
1. Set the arm/blade selector switch on the panel to ON. (The same switch as arm/outrigger selector.)

2. Move the left working equipment lever to operate the dozer blade.

⚠️ When operating the arm, confirm that the selector switch is turned off.

⚠️ When moving the machine, confirm that the dozer blade is raised.

3. After finishing work with the dozer blade, turn off the arm/blade selector switch.
PRECAUTIONS FOR USING THE DOZER BLADE

1. When using the dozer blade as an outrigger
   Use the dozer blade in the same way as an outrigger. However, use it only on level ground so that uneven loads will not be applied to the blade.

2. Precautions for driving on public roads
   Secure the dozer blade with hook (1).

- Engage (or disengage) the hook to (from) the blade with the upper structure swung 90 degrees.

⚠️ When the hook is disengaged, keep it downward. If the hook is kept upward, it will interfere with the upper structure.
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.
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.
HANDLING THE CLAMSHELL BUCKET

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.
HANDLING THE TIRES

REMOVING TIRES
1. Move the forward-reverse lever to N (neutral) position and lock the lever.
2. Move the brake lock lever to the lock position to lock all wheels.
3. Raise the chassis with the boom so that the tires are raised above the ground. Then, place wood blocks below the front and rear axles.
4. Loosen wheel nuts with a wheel wrench. (Wheel nuts on either the L.H. and R.H. wheel tires all have R.H. thread).
   ★ Front and rear inner wheel tires should be removed after removing their outer wheel tires, in the same manner.

Standard tire pressure:
Front wheel: 6.75 kg/cm²
Rear wheel: 6.75 kg/cm²

INSTALLING TIRES
1. Coat wheel pins and thread areas of nuts with oil.
   ★ When replacing the outer rear wheel tires only, be sure to check the inner wheel tires for looseness.
2. In installing new tires, tighten lightly with the tires lifted and tighten the tires to the specified torque in the order shown in the photo, after placing the tires on the ground.
   Tightening torque:
   $58.5 \pm 6.5 \text{ kgm}$

★ Insert a pipe about 1 m long into a wheel wrench, and apply a force of 76 kg to the tip of the pipe to approximate standard tightening torque.
★ When installing the front and rear tires on wheels, the tires can be easily inflated, if the inner and outer air valves are shifted so they are not aligned with each other.
ROTATING TIRES

Tires wear differently depending on their positions. Consequently, tires should be rotated periodically as shown below.
HANDLING OF BATTERY

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.
5. If the electrolyte gets on your skin or clothes, immediately wash with plenty of clean water.
6. Do not mix up cables (positive (+) to negative (−) or negative (−) to positive (+)), as it will damage the alternator.
7. When inspecting or servicing a battery, be sure to stop the engine and turn the starting switch key to “OFF” position.
8. When performing any service to battery besides checking the electrolyte level or measuring the specific gravity, disconnect cables from the battery.
REMOVAL AND INSTALLATION OF BATTERY

- When removing 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 battery, the ground cable should be connected to the ground terminal as the last step.

STARTING ENGINE WITH A BOOSTER CABLE

When starting up 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 "OFF" position.
   5) The battery of the running engine must be the same capacity as that of 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 to 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.
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.
   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.

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.
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 beneath the tires to ensure that it does not move. Then fix the gangplank 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.
   ★ Lock the suspension using the suspension lock lever.
   ★ Lock the upper works using the swing lock lever.

2. Determine the direction of the gangplank, then slowly load or unload the machine.
   ★ Move the machine backward to get on the trailer.
   ★ Do not on any account change the direction of the machine while it is on the gangplank. To change the direction of the machine, first take it down from the gangplank.
   ★ Remove the mud from the undercarriage to prevent the machine from slipping to the side on slopes.

3. Correctly load the machine onto the specified part of 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.

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4. Apply the parking brake using the parking brake lever. When transporting the machine, place blocks underneath the front and rear wheels to prevent the machine from moving about. Also, hold it down with chains or wire ropes. Be particularly careful to ensure that the machine does not slip sideways.

5. Lock the swing lock lever and apply the lock to the work equipment lever.

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

When traveling on the road, the work equipment should be as follows.

1. The work equipment should be fixed as follows:
   1) Reinstall boom connecting pins, then set the boom to the traveling posture.
   2) Retract the arm all the way inside.
   3) Secure the bucket using the bucket fixing link.
   4) Rest the bucket on the bucket stand in front of the chassis.

2. Stop the engine and move the work equipment levers to all positions to make sure that the work equipment never drops under its own weight.

3. Lock the work equipment levers by moving the safety lock lever to lock position. Move the swing lock lever to lock position.

⚠️ Before starting to travel, be sure to pull in and lock the outriggers.

⚠️ After setting the machine to the traveling posture, confirm that its overall height is below 4000 mm and the distance between the steering wheel and the tip of the work equipment is less than 3500 mm.

⚠️ When the machine is set to the traveling posture, if the boom is raised to the stroke end, the upper boom will contact the outer components. Therefore, never raise the boom all the way.
If a machine equipped with the hook on the bucket
1. The working equipment should be fixed as follows:
   1) Relocate the pin on the boom to shift the boom toward the rearmost position. For details, see "HANDLING THE BOOM".

⚠️ When the machine is in the travel posture, do not raise the boom all the way. Otherwise the upper boom will interfere with the machine out fittings.

2) Determine the boom angle by operating the right hand working equipment lever until plate (1) on the boom is aligned with plate (2) on the machine body, then move valve lever (3) to the LOCK side.

- FREE: For working
- LOCK: For traveling
3) Take wire rope (4) from the accessory spare parts, hook it to hook (5) at the front of the machine, and wind it around pipe (6) one turn.

4) Operate the control lever to curl the bucket and to move the arm toward the machine, then hook the other end (7) of wire rope (4) to hook (8) on the bucket.

5) Operate the bucket and arm control levers in alternation to dump the bucket and to move the arm away from the machine so that the bottom face of the bucket will contact the pipe on the machine. Continue operating the levers until the wire rope is stretched without any sag.

* During this operation, operate the levers slowly and carefully.
2. Stop the engine and move the working equipment levers to all positions to make sure that the working equipment never drops under its own weight.

3. Lock the working equipment levers by moving the safety lock lever to lock position. Move the swing lock lever to lock position.

⚠️ After setting the machine to the traveling posture, confirm that its overall height is below 4000 mm and the distance between the steering wheel and the tip of the working equipment is less than 3500 mm.

⚠️ Before starting to travel, be sure to pull in and lock the outriggers.

⚠️ When the machine is set to the traveling posture, if the boom is raised to the stroke end, the upper boom will contact the outer components. Therefore, never raise the boom all the way.
To drive the machine at night, install marker lamps in the following manner.

1. Take the cable for marker lamps (10) from the accessory spare parts, remove wing nuts (9) at the left and right link, set the marker lamp ends of the cable on the links parallel to the links, and fasten under wing nuts (9).

2. Insert plugs (11) of the cable to receptacles (12) at the right rear of the machine.

3. Secure the cable using clip (13) on the machine body.
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 anti-freeze 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:

<table>
<thead>
<tr>
<th>Rate of charge</th>
<th>Temp. of fluid</th>
<th>20°C</th>
<th>0°C</th>
<th>-10°C</th>
<th>-20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td></td>
<td>1.28</td>
<td>1.29</td>
<td>1.30</td>
<td>1.31</td>
</tr>
<tr>
<td>90%</td>
<td></td>
<td>1.26</td>
<td>1.27</td>
<td>1.28</td>
<td>1.29</td>
</tr>
<tr>
<td>80%</td>
<td></td>
<td>1.24</td>
<td>1.25</td>
<td>1.26</td>
<td>1.27</td>
</tr>
<tr>
<td>75%</td>
<td></td>
<td>1.23</td>
<td>1.24</td>
<td>1.25</td>
<td>1.26</td>
</tr>
</tbody>
</table>

★ 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.
STARTING IN COLD WEATHER

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

1. Pull fuel control lever (1) a little toward you from low idling position.

2. Put the starting switch key (2) in the HEAT position to red-hot heater signal (3).
The preheating times are as shown below:

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Preheat time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 0°C</td>
<td>–</td>
</tr>
<tr>
<td>0°C to –10°C</td>
<td>20 seconds</td>
</tr>
<tr>
<td>–10°C to –20°C</td>
<td>30 seconds</td>
</tr>
</tbody>
</table>

3. When heater signal (3) becomes red, turn starting switch key (2) to START position to start engine.

4. When the engine starts, return the key of starting switch (2) to the ON position.
(The key will return automatically when released.)
CAUTIONS AFTER COMPLETION OF WORK

1. Mud and water on the machine body should be completely removed. Park the machine on concrete or hard ground. If this is impossible, park the machine on wooden boards. This will prevent the accessories from freezing or the undercarriage from freezing to the ground thereby preventing machine movement the next morning. Particular attention should be given to water drops collected on the surface of the hydraulic cylinder piston rods. Such droplets must be fully wiped off because if water is frozen to the rod when the cylinder is utilized, the cylinder oil seals may be damaged.

2. Drain water collected in fuel system so that such water may be frozen at night.

3. As battery capacity drops at low ambient temperature, cover the battery or remove it from the machine to be kept warm at night.
PREPARING THE CAB HEATER

If the ambient temperature drops, use the cab heater.
1. When using the cab heater, turn valves (1) on the water manifold counterclockwise to open them.
2. When leaving the cab heater unused for a long time, turn valves (1) clockwise to close them.

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 cannot 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.
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 FOR MAINTENANCE

SAFETY ................. ⚠

- Wear well-fitting helmet, safety shoes and working clothes. When drilling, grinding or hammering, always wear protective goggles.
- 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.
- Do not handle electrical equipment while wearing wet gloves, or in wet places, as this can cause electric shock.
- During maintenance do not allow any unauthorized person to stand near the machine.
- Exhaust gas is dangerous. When working inside, be particularly careful to have good ventilation.
- Unless you have special instructions to the contrary, maintenance should always be carried out with the engine stopped. Lock the swing lock lever 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.
- Do not go underneath the machine after raising it up using the boom and the arm.
- When working with others, choose a group leader and work according to his instructions. Do not perform any maintenance beyond the agreed work.
- When maintenance has to be carried out with the work equipment raised, they must be securely supported by blocks.
- 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.

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 control lever through their full stroke in each direction)
2) Gradually unscrew the cap of the hydraulic tank and leave it for a few minutes.

- 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.
- 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.
- 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.
- 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.
- 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.
- Use the tool which is suitable for the maintenance work.
- Remove the minus terminal from the battery in maintaining the electrical system.
- 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.
MISCELLANEOUS

- Thoroughly wash the machine, particularly the oiling and greasing parts and the vicinity, 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 30 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.
- 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.

● After replacing hydraulic oil and filter element, or replacing the hydraulic cylinder or the piping system for the machine, the air bleed operation is necessary. Low-idle the engine, and proceed as follows:
1. Extend and contract each cylinder 4 to 5 times, taking care not allowing it to reach its stroke end (i.e., allowing it to return from a point of about 100 mm before the stroke end.)
2. Then, extend and contract each cylinder 3 to 4 times up to the stroke full end.

★ Sudden running of the engine at a high speed and allowing of the cylinder to reach the stroke end cause damage to the piston packing, etc. due to the air trapped in the cylinder.
- When the hydraulic oil or the main pump is replaced, or when the suction pipe of the pump or gear pump is removed, bleed the air according to the following procedure. Remove drain hose (1) and (2), then fill the pump with oil through port (3) and (4).
- Refill capacity: Approx. 4 l

- Fix the adapter of the removed drain hose to a place which is higher than the oil level in the hydraulic tank.
- If the pump is not filled with oil and is driven, abnormal heat will occur and the pump will soon break down.
PERIODICAL REPLACEMENT OF SAFETY PARTS

The users of our machine should carry out periodical maintenance in order to ensure the working and operation safety. Those parts, as listed on the right, which are closely convected with safety, must be replaced periodi- cally so that the highest safety standard can be maintained.

These parts with the passage of time have a great tendency to deteriorate in quality, and to wear ratter deform. Furthermore, their defective condition is difficult to detect during periodical maintenance. These parts must, therefore, be replaced with new ones after a predetermined service period even though there is no apparent abnormality.

It goes without saying that if any abnormality should be found, these parts must be replaced or repaired even before the predetermined period expires.

The periodical replacement is completely different from the replacement due to the claim against the guarantee by the manufacturer. So they must be treated separately.

<table>
<thead>
<tr>
<th>No.</th>
<th>Unit composed of replacement parts</th>
<th>Interval</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake hose (Air and oil line)</td>
<td>Every 1 year</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Air master, disc brake piston seal, dust boot</td>
<td>Every 1 year</td>
<td>Replace as a repair kit</td>
</tr>
<tr>
<td>3</td>
<td>Brake booster apparatus</td>
<td>Every 1 year</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>Swivel joint for brake</td>
<td>Every 1 year</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>Brake fluid</td>
<td>Every 1 year</td>
<td>–</td>
</tr>
<tr>
<td>6</td>
<td>Air hose for brake</td>
<td>Every 2 years</td>
<td>–</td>
</tr>
<tr>
<td>7</td>
<td>Stop lamp switch</td>
<td>Every 2 years</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>Packing, seal and O-ring for steering cylinder</td>
<td>Every 2 years</td>
<td>–</td>
</tr>
<tr>
<td>9</td>
<td>Rubber hose for steering cylinder</td>
<td>Every 2 years</td>
<td>–</td>
</tr>
<tr>
<td>10</td>
<td>Hose for fuel</td>
<td>Every 2 years</td>
<td>–</td>
</tr>
</tbody>
</table>
# MAINTENANCE TABLE

## CHECK BEFORE STARTING

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Walk around check</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>b</td>
<td>Coolant</td>
<td>Check and supply</td>
<td>49</td>
</tr>
<tr>
<td>c</td>
<td>Engine oil pan</td>
<td>Check and supply</td>
<td>50</td>
</tr>
<tr>
<td>d</td>
<td>Fuel tank</td>
<td>Check and supply</td>
<td>50</td>
</tr>
<tr>
<td>e</td>
<td>Hydraulic tank</td>
<td>Check and supply</td>
<td>51</td>
</tr>
<tr>
<td>f</td>
<td>Brake fluid tank</td>
<td>Check and supply</td>
<td>52</td>
</tr>
<tr>
<td>g</td>
<td>Air tank</td>
<td>Drain water</td>
<td>52</td>
</tr>
<tr>
<td>h</td>
<td>Air filter</td>
<td>Drain water</td>
<td>52</td>
</tr>
<tr>
<td>i</td>
<td>Dust indicator</td>
<td>Check</td>
<td>53</td>
</tr>
<tr>
<td>j</td>
<td>Tires</td>
<td>Check air pressure and damage</td>
<td>53</td>
</tr>
<tr>
<td>k</td>
<td>Wheel brake</td>
<td>Check</td>
<td>53</td>
</tr>
<tr>
<td>l</td>
<td>Electrical wiring</td>
<td>Check</td>
<td>53</td>
</tr>
<tr>
<td>m</td>
<td>Parking brake</td>
<td>Check</td>
<td>54</td>
</tr>
<tr>
<td>n</td>
<td>Lamps and instruments</td>
<td>Check</td>
<td>54</td>
</tr>
</tbody>
</table>

## EVERY 50 HOURS SERVICE

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Fuel tank</td>
<td>Drain water and sediment</td>
<td>108</td>
</tr>
<tr>
<td>b</td>
<td>Lubricator</td>
<td>Check and supply</td>
<td>108</td>
</tr>
</tbody>
</table>

## EVERY 100 HOURS SERVICE

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Lubricating</td>
<td></td>
<td>109</td>
</tr>
<tr>
<td>-1</td>
<td>Boom cylinder foot pin</td>
<td>Lubricate 2 points</td>
<td>109</td>
</tr>
<tr>
<td>-2</td>
<td>Boom foot pin</td>
<td>Lubricate 2 points</td>
<td>109</td>
</tr>
<tr>
<td>-3</td>
<td>Boom cylinder rod end pin</td>
<td>Lubricate 2 points</td>
<td>110</td>
</tr>
<tr>
<td>No.</td>
<td>ITEM</td>
<td>SERVICE</td>
<td>PAGE</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------</td>
<td>--------------</td>
<td>------</td>
</tr>
<tr>
<td>-4</td>
<td>Arm cylinder foot pin</td>
<td>Lubricate 1 point</td>
<td>110</td>
</tr>
<tr>
<td>-5</td>
<td>Boom-Arm coupling pin</td>
<td>Lubricate 1 point</td>
<td>110</td>
</tr>
<tr>
<td>-6</td>
<td>Arm cylinder rod end pin</td>
<td>Lubricate 1 point</td>
<td>110</td>
</tr>
<tr>
<td>-7</td>
<td>Bucket cylinder foot pin</td>
<td>Lubricate 1 point</td>
<td>110</td>
</tr>
<tr>
<td>-8</td>
<td>Link coupling pin</td>
<td>Lubricate 2 points</td>
<td>110</td>
</tr>
<tr>
<td>-9</td>
<td>Bucket cylinder rod end pin</td>
<td>Lubricate 1 point</td>
<td>110</td>
</tr>
<tr>
<td>-10</td>
<td>Bucket-link coupling pin</td>
<td>Lubricate 2 points</td>
<td>110</td>
</tr>
<tr>
<td>-11</td>
<td>Arm-bucket coupling pin</td>
<td>Lubricate 1 point</td>
<td>110</td>
</tr>
<tr>
<td>-12</td>
<td>Arm-link coupling pin</td>
<td>Lubricate 1 point</td>
<td>111</td>
</tr>
<tr>
<td>-13</td>
<td>Blade</td>
<td>Lubricate 12 points</td>
<td>111</td>
</tr>
<tr>
<td>b</td>
<td>Swing machinery case</td>
<td>Check and supply</td>
<td>111</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Fuel filter</td>
<td>Replace cartridge</td>
<td>112</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* Fuel filter</td>
<td>Replace cartridge</td>
<td>112</td>
</tr>
<tr>
<td>-1</td>
<td>Front axle U-joint</td>
<td>Lubricate 2 points</td>
<td>112</td>
</tr>
<tr>
<td>-2</td>
<td>King pin</td>
<td>Lubricate 4 points</td>
<td>112</td>
</tr>
<tr>
<td>-3</td>
<td>Tie rod end pin</td>
<td>Lubricate 2 points</td>
<td>113</td>
</tr>
<tr>
<td>-4</td>
<td>Power steering cylinder foot</td>
<td>Lubricate 1 point</td>
<td>113</td>
</tr>
<tr>
<td>-5</td>
<td>Power steering cylinder rod end</td>
<td>Lubricate 1 point</td>
<td>113</td>
</tr>
<tr>
<td>-6</td>
<td>Drive shaft</td>
<td>Lubricate 6 points</td>
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<td>-7</td>
<td>Center pin</td>
<td>Lubricate 1 point</td>
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<td>Outrigger</td>
<td>Lubricate 8 points</td>
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<td>b</td>
<td>Transmission case</td>
<td>Check and supply</td>
<td>115</td>
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<td>c</td>
<td>Final drive case</td>
<td>Check and supply</td>
<td>115</td>
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### MAINTENANCE TABLE

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<td><strong>(EVERY 250 HOURS SERVICE)</strong></td>
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<td>d</td>
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<td>Check and supply</td>
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<td>e</td>
<td>Hydraulic filter</td>
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<td>116</td>
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### EVERY 500 HOURS SERVICE

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<td>a</td>
<td>Swing circle</td>
<td>Lubricate 4 points</td>
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<tr>
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<td>Swing circle pinion</td>
<td>Lubricate with grease</td>
<td>120</td>
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<td>121</td>
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<td>Change oil and replace cartridge</td>
<td>122</td>
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<td>Radiator fins</td>
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<td>123</td>
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<td>Brake fluid</td>
<td>Change oil</td>
<td>123</td>
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</table>

### EVERY 4000 HOURS SERVICE

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Air compressor</td>
<td>Check</td>
<td>131</td>
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### WHEN REQUIRED

<table>
<thead>
<tr>
<th>No.</th>
<th>ITEM</th>
<th>SERVICE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
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<td>Clean</td>
<td>135</td>
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<td>c</td>
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<td>Check</td>
<td>137</td>
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<td>d</td>
<td>Air filter</td>
<td>Check</td>
<td>138</td>
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<td>e</td>
<td>Bucket teeth</td>
<td>Replace</td>
<td>138</td>
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<td>141</td>
</tr>
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</table>
OIL FILLER AND LEVEL GAUGE POSITIONS

1. Hydraulic tank level gauge
2. Hydraulic tank oil filler
3. Swing machinery case level gauge
4. Swing machinery case drain plug
5. Transmission case oil filler
6. Transmission case drain plug
7. Rear differential gear case oil filler
8. Rear differential gear case drain plug
9. Cooling water inlet
10. Engine oil pan oil filler
11. Engine oil pan level gauge
12. Fuel tank oil filler
13. Fuel tank level gauge
14. Fuel tank drain valve
15. Hydraulic tank drain plug
16. Final drive case oil filler
17. Final drive case drain plug
18. Front differential gear case drain plug
19. Front differential gear case oil filler
20. Engine oil pan drain plug
21. Cooling water drain valve
EVERY 50 HOURS SERVICE

a. 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.

b. LUBRICATOR CASE

1. Open the engine hood.
2. Check the oil level with gauge (G).
3. If the oil is insufficient, replenish with engine oil from hole of plug (F).

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

★ Adjust the lubricator with knob (1) so that one drop of engine oil is obtained every 30 to 50 applications of the wheel brake. This adjustment should be made after the oil is warm.
EVERY 100 HOURS SERVICE

a. LUBRICATING

Apply grease to the grease fittings shown by arrows.

★ Maintenance for every 50 hours should be carried out at the same time.

1. Boom cylinder foot pin (2 points)

2. Boom foot pin (2 points)
3. Boom cylinder rod end pin (2 points)

4. Arm cylinder foot pin (1 point)

5. Boom — Arm coupling pin (1 point)

6. Arm cylinder rod end pin (1 point)

7. Bucket cylinder foot pin (1 point)

8. Link coupling pin (2 points)

9. Bucket cylinder rod end pin (1 point)

10. Bucket — Link coupling pin (2 points)

11. Arm — Bucket coupling pin (1 point)
12. Arm — Link coupling pin
   (1 point)

b. SWING MACHINERY CASE

13. Blade
    (12 points)

   Inspect the oil level using dipstick (G), and if insufficient pour in additional engine oil from gauge hole.
   ★ The type of lubricant used depends on the ambient temperature. Select according to the table “FUEL, COOLANT AND LUBRICANTS”.

   ★ Check that dipstick (G) is completely inserted in.
   ★ Before supplying oil, remove air vent plug (1).
   After refilling, tighten plug (1).
EVERY 250 HOURS SERVICE

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

- FUEL FILTER, REPLACE CARTRIDGE
- ENGINE OIL PAN AND FILTER, CHANGE OIL AND REPLACE CARTRIDGE
- SWING MACHINERY CASE, CHANGE OIL
- DIFFERENTIAL GEAR CASE, CHANGE OIL
- FINAL DRIVE CASE, CHANGE OIL
- TRANSMISSION CASE, CHANGE OIL
- ENGINE VALVE CLEARANCE, CHECK AND ADJUST

For details of the method of replacing or maintaining, see the section on EVERY 500 HOURS, 1000 HOURS AND 2000 HOURS SERVICE.

★ Maintenance for 50 hours should be carried out at the same time.

a. LUBRICATING
   Apply grease to the grease fittings shown by arrows.

1. Front axle U-joint (2 points)  2. King pin (4 points)
3. Tie rod end pin  (2 points)

4. Power steering cylinder foot  
   (1 point)

5. Power steering cylinder rod end  
   (1 point)

6. Drive shaft  
   (6 points)
   Front

   Rear
7. Center pin (1 point) 8. Outrigger (8 points)
b. TRANSMISSION CASE

Remove plug (G) and check the oil level is just below the hole. If it is insufficient, add the engine oil from the hole.

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

c. FINAL DRIVE CASE

1. Stop the machine with the oil level mark (1) in the horizontal position to the ground surface.
2. Remove plug (G) and check that the oil level is near the bottom of the plug hole.
If necessary, add gear oil through the plug hole.

★ The type of lubricant used depends on the ambient temperature. Select according to the table “FUEL, COOLANT AND LUBRICANTS”.
d. DIFFERENTIAL GEAR CASE

Front

Remove plug (G) and check the oil level is just below the plug. If it is insufficient, add the gear oil from the hole.

Rear

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

e. HYDRAULIC FILTER

1. Open drain valve (1) below the air tank.
2. Gradually loosen cap (F) of the oil filler and leave it for several minutes to sufficiently relieve the air pressure in the tank.

3. Remove cover (2), (3), spring (4) and valve (5) to remove element (6). Clean the parts and the inside of the case, then replace it with a new one.

★ Be sure to use a genuine Komatsu element.

⚠️ When remove cover (3), undo the bolts gradually to prevent the cover flying off under the force of spring (4).

⚠️ When removing the cap, turn it slowly to relieve inner pressure.
f. FAN BELT

The belt tension should normally deflect by about 8 mm when pressed with the finger at a point midway between the alternator and the fan pulley (approx. 6 kg).

To adjust the belt tension, loosen nut and bolt (1) and (2) and shift alternator (3) slightly.

☆ Inspect each pulley for possible damage and wear of the V-groove, and also check the belt for wear. In particular, check to see if the V-belt is touching the bottom of the groove.
☆ If the belt stretches to such an extent that adjustment is no longer possible or if there is slashed or cracked, replace both belts together.
☆ When adjusting the V-belt tension, do not push the starter core of alternator (3) directly with a bar, etc. Place a piece of wood between the alternator and the bar.
g. 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).

★ Never use metal funnel for electrolyte supply.

⚠ 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.
EVERY 500 HOURS SERVICE

a. SWING CIRCLE

Lubricate the 4 grease fittings shown by arrows.

b. SWING CIRCLE PINION

1. Remove bolts (1) (2 bolts) on the top of the revolving frame and remove cover (2).
2. Check with scale that grease depth is above 18 mm. If there is insufficient grease, replenish it.

* If the grease is particularly milky due to ingress of water, etc., then remove cover (3) and remove the grease. Replace all of the grease with new grease. The total amount of grease is $\frac{8}{35}$ [7.2 kg].

* Maintenance for every 50, 100 and 250 hours should be carried out at the same time.
c. FUEL FILTER

1. Using a filter wrench, remove cartridge (1) by turning it counterclockwise.
2. Fill the new cartridge with fuel and refit it after applying a dab of oil to the gasket face.
   ★ To refit the cartridge, place the gasket face in contact with the seal face of the filter stand, then screw up the cartridge about 2/3 of a turn (be careful not to tighten it up excessively).
3. After replacing cartridge (1), loosen air vent plug (2).
4. Loosen feed pump knob (3) and move the pump up and down to draw off fuel until air ceases to come out of plug (2).
5. Tighten up air vent plug (2).
6. Hold the fuel injection pump sleeve (5) and loosen air vent plug (4). Bleed air from the fuel injection pump using the same procedure as described for the fuel filter.
7. After air bleeding, tighten plug (4) with holding sleeve (5). Push in feed pump knob (3) and tighten it.
   ★ After replacing the cartridge, start up the engine and check the filter seal face for possible oil leakage.
   ★ Be sure to use a genuine Komatsu cartridge.
d. ENGINE OIL PAN AND FILTER

1. Remove drain plug (P) to drain oil. After draining, tighten the drain plug.
2. Using a filter wrench, remove cartridge (1) of the engine oil filter by turning it counterclockwise.
3. Clean the filter base and refit the new cartridge after applying a dab of oil to the gasket face.
   ★ To refit the cartridge, place the gasket face in contact with the seal face of the filter base, then screw up the cartridge further 1/2 turn (be careful not to tighten it up excessively).
4. After replacing the cartridge, pour in the specified quantity of engine oil from oil filler (F).
5. Idle the engine for a while and stop the engine. Check the oil level. For details, refer to the section "CHECK BEFORE STARTING."

★ Refill capacity: 10.5 l
★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
e. RADIATOR FINS

- Be sure to fit a genuine Komatsu cartridge.
- Replace once every 6 months, regardless of the number of hours operated.
- 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.
- 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 (250 hours).

f. BRAKE FLUID

Please contact with your Komatsu distributor for changing the brake fluid.

Clean the radiator 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.
EVERY 1000 HOURS SERVICE

a. SWING MACHINERY CASE

Drain the oil from plug (P) on the lower body, then retighten it. Refill the engine oil from the oil filler (G).
★ The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
★ Refill capacity: 5 ℓ

★ For details of the method of refilling the oil, refer to the section EVERY 100 HOURS SERVICE.
★ Before supplying oil, remove air vent plug (1).
 After refilling, tighten plug (1).
b. CORROSION RESISTOR

1. After screwing in valve (1) on the corrosion resistor (2) remove the cartridge by turning it counterclockwise and replace it with a new one.
2. Turn the cartridge in until its sealing surface comes into contact with the head. Then, retighten the cartridge about 2/3 of a turn.
3. After replacement, open valve (1).

★ It is recommended genuine Komatsu cartridge are used.
★ Be careful not to screw in more than required.
★ When installing a new cartridge, coat the sealing surface with lubricating oil.
EVERY 2000 HOURS SERVICE

a. DIFFERENTIAL GEAR CASE

Front

Rear

Drain the oil from plug (P) on the lower body, then retighten it. Refill the gear oil from the oil filler (G).

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

★ Refill capacity: 11.5 ℓ (Front)
  14.5 ℓ (Rear)

★ For details of the method of refilling the oil, refer to the section EVERY 250 HOURS SERVICE.

★ Maintenance for every 50, 100, 250, 500 and 1000 hours should be carried out at the same time.
b. FINAL DRIVE CASE

1. Stop the machine with the oil level mark (1) in the horizontal position to the ground surface.
2. Drain the oil from drain plug (P), then tighten the plug.
3. Refill the gear oil from oil filler (G).

- The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
- Refill capacity: 2.5 l (Front and rear on each side)
- For details of the method of refilling the oil, refer to the section EVERY 250 HOURS SERVICE.

c. TRANSMISSION CASE

Drain the oil from plug (P) on the lower body, then retighten it. Refill the engine oil from oil filler (G).

- The type of lubricant used depends on the ambient temperature. Select according to the table "FUEL, COOLANT AND LUBRICANTS".
- Refill capacity: 8 l
- For details of the method of refilling the oil, refer to the section EVERY 250 HOURS SERVICE.
d. HYDRAULIC TANK

1. Retract the arm and bucket cylinder, then lower the boom and put the tips of the teeth in contact with the ground.

2. Gradually unscrew the cap of oil filler (F) and leave it for several minutes to relieve the air pressure in the tank.

3. Then remove the cap and unscrew drain plug (P) to drain off the oil. After draining off the oil, tighten up drain plug (P).

4. Pour in the specified amount of engine oil from oil filler (F).

5. For the method of checking the oil level, see the CHECK BEFORE STARTING.

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

★ After changing oil, put the control levers in neutral position and run the engine at low idling speed for a few minutes before operation of working equipment.

★ Refill capacity: 190 ℓ

⚠️ When removing filler cap (F), turn it slowly to relieve inner pressure.
When the hydraulic oil or the main pump is replaced, or when the suction pipe of the pump or gear pump is removed, bleed the air according to the following procedure.

- Remove drain hose (1) and (2), then fill the pump with oil through port (3) and (4).
- Refill capacity: Approx. 4 l

- Fix the adapter of the removed drain hose to a place which is higher than the oil level in the hydraulic tank.
- If the pump is not filled with oil and is driven, abnormal heat will occur and the pump will soon break down.

1. Open drain valve (1) below the air tank.
2. Gradually loosen cap (F) of the oil filler and leave it for several minutes to sufficiently relieve the air pressure in the tank.

3. Remove cover (2), (3) at the top of the hydraulic tank and lift up the top of rod (5). Remove spring (4) and strainer (6) and wash them. If strainer (6) is damaged, replace it with a new one. Refit strainer (6) by inserting it into tank projecting part (7).

⚠️ When remove cover (3), undo the bolts gradually to prevent the cover flying off under the force of spring (4).

⚠️ When removing the cap, turn it slowly to relieve inner pressure.
f. ALTERNATOR AND STARTING MOTOR
   Around this time, the brush will become worn and the bearing will run out of grease, so please ask your Komatsu distributor to carry out inspection and repair.
   ★ If the engine is started frequently, carry out inspection every 1000 hours.

g. ENGINE VALVE CLEARANCE
   As special tool is required for removing and adjusting the parts, you shall request Komatsu distributor for service.

h. HUB BEARING
   Ask your Komatsu distributor to lubricate the hub bearing (4 points) because special tools should be used.

EVERY 4000 HOURS SERVICE

a. AIR COMPRESSOR
   Ask your Komatsu distributor for service.

★ Maintenance for every 50, 100, 250, 500, 1000 and 2000 hours should be carried out at the same time.
WHEN REQUIRED

a. CHECK, CLEAN AND REPLACE AIR CLEANER ELEMENT

Checking

Cleaning or replacing outer element

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

1. Loosen clamp (2) and remove dust cup (3), wing nut, and the outer element.
2. Clean the air cleaner body interior and the removed cover.
3. Clean and inspect the element. (See the item “Cleaning outer element” for cleaning procedure.) Install the cleaned element.
4. Push the dust indicator reset button to return the red piston to the original position.

★ When inspecting or cleaning the air cleaner, remove evacuator valve (4) and clean with compressed air.
★ 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 seal washer (6) or wing nut (5) if they are broken.
Replacing inner element

1. First remove the cover and the outer element, and then remove the inner element.
2. Place the cover over the air intake port to prevent dust entering.
3. Fit a new inner element and tighten it with nuts.
4. Install the outer element and the cover. Push the dust indicator reset button.

NOTE: Do not attempt to reinstall a cleaned inner element.

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

With compressed air
Direct dry compressed air (less than 7 kg/cm²) to element from inside along its folds, then direct it from outside along its folds and again from inside, and check 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/cm²) on 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/cm²) 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 element when it is checked with an electric bulb after cleaning and drying, replace the element.

★ If element is usable, wrap it and store it in dry place.

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

★ When cleaning element, do not hit it or beat it against something.
b. CLEAN INSIDE OF COOLING SYSTEM

Clean the inside of the cooling system, change the coolant, and replace the corrosion resistor, 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.

- 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

<table>
<thead>
<tr>
<th>Min. atmospheric temperature (°C)</th>
<th>-5</th>
<th>-10</th>
<th>-15</th>
<th>-20</th>
<th>-25</th>
<th>-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of antifreeze (l)</td>
<td>5.0</td>
<td>6.3</td>
<td>7.6</td>
<td>8.6</td>
<td>9.7</td>
<td>10.5</td>
</tr>
<tr>
<td>Amount of water (l)</td>
<td>16.0</td>
<td>14.7</td>
<td>13.4</td>
<td>12.4</td>
<td>11.3</td>
<td>10.5</td>
</tr>
</tbody>
</table>

★ We recommend use of an antifreeze density gauge to control the mixing proportions.
1. Stop the engine, close corrosion resistor valve (1).
2. Turn radiator cap (2) slowly until it comes off.

**If the water temperature is high, do not remove the cap. This is because of the possibility of scalding water spurting out.**

When removing cap, turn cap slowly to allow pressure to be relieved.

3. Loosen drain valve (3) at the bottom of radiator and drain plugs (4), (5) at the side of cylinder block and drain off the cooling water.

4. Close up drain valve (3) and plugs (4), (5) and pour in clean 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 the drain valve (3) and plugs (4), (5) then pass water through the cooling system until clean water comes out from the drain valve and plugs for 10 minutes.

★ When flushing, adjust the flow so that water is added at the same rate as the water is drained to keep the radiator always full.

6. After washing the cooling system, stop the engine. Open drain valve (3) and plugs (4), (5) to drain water and close drain valve (3) and plugs (4), (5).

7. After draining off the cooling water, wash out the cooling system using commercially available detergent. Follow the instructions on the detergent container.

8. After washing the cooling system, drain off all the water, then close up drain valve and plugs, and pour in clean water (ex. city water) slowly up to the vicinity of the water filler.
Drain plug (cylinder block)

9. When the water reaches the vicinity of the water filler, put the engine at low idling, open the drain valve and plugs, then pass water through the cooling system until clean water comes out from the drain valve and plugs.

☆ When flushing, adjust the flow so that water is added at the same rate as the water is drained to keep the radiator always full.

10. When the water becomes completely clean, stop the engine and close the all drain valve and plugs.
11. Replace the corrosion resistor cartridge and open valve (1).

☆ For details of replacement of the corrosion resistor, see EVERY 1000 HOURS SERVICE.
12. Supply water until it overflows from water filler.
13. Run the engine 5 minutes at low idling and then for another 5 minutes at high idling to eliminate air trapped in the cooling system (leave radiator cap off during the operation).
14. Stop the engine and wait for about 3 minutes. Supply cooling water up to the specified level. Tighten the cap.

C. CHECK ELECTRICAL INTAKE AIR HEATER

Check electrical intake air heater (1) once a year before commencing work in the cold season.

Remove electrical intake air heater (1) from the engine intake connection, and check it for possible open-circuits and dirt.

When inspecting and replacing electrical intake air heater (1), replace the gasket with new one.
d. CHECK AND CLEAN AIR FILTER

As element (1) is clogged by dirt or dust, check and clean it every three months to half a year.

e. REPLACE BUCKET TEETH

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.

The lock pin is too short.

- A lock pin which is too short.
A rubber pin lock, the rubber of which is broken and whose steel balls come out easily.

- 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.
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 above 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.

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 fuel line when drain the water, be sure to bleed air in the same manner as for the fuel filter.
(See Fuel Filter Cartridge in EVERY 500 HOURS SERVICE section.)
WHEEL BRAKES

CHECK DISC BRAKE FOR WEAR

1. Insert a rod of a diameter of less than Ø5 (mini screwdriver, etc.) perpendicularly into wear inspection hole (1) of the calipers to inspect.
2. If the insertion depth when the rod contacts the pad is 35 mm, the wear limit (pad thickness: approx. 2 mm) has been reached, so replace the pad.

⚠️ If the pads are used beyond max. wear limit, poor braking will be caused which is very dangerous. As pads reaches to wear limit, more frequent checks may be required.

* Check all pads for wear because wear of pads is different each other. If any one pad is worn to the limit, replace all the pads on the machine or the four on the front wheels or the four on the rear wheels.
* For such machines operating in muddy water, washing caliper and disc is recommended after each day’s work to prevent pads from premature wear.
* You shall request Komatsu distributor for replacement of the pad.
AIR BLEEDING OF THE BRAKE FLUID SYSTEM

Air master

1. Fill the brake fluid tank to the specified level. Add the fluid during the air bleeding if the surface is lower than the specified level.

2. Air bleeding of the air master cylinder.

1) Remove cap (1) of the air bleeder of the air master, connect a vinyl pipe to the end of the bleeder, and place the other end of the pipe in a container which contains the brake fluid.

2) After depressing the brake pedal repeatedly, keep it depressed fully or leave the parking brake lever in BRAKE LOCK position. Loosen the vent screw 1/2 rotation to check the flow of the brake fluid. Then, tighten the vent screw quickly.

3. Perform air bleeding in (2), (3) and (1) (5 places: front and rear wheel cylinders and the air master), beginning at the furthest place from the air master.
ADJUSTMENT OF PARKING BRAKE

When the parking brake becomes ineffective, adjust the brake as follows.

Adjustment

1. Move the machine a short distance. Turn the drive shaft to align four adjusting holes on drum periphery (1) and the adjuster wheel on the opposite side of the lever.

2. Insert a straight screwdriver in each adjusting hole (1) and rotate the adjuster wheel toward the center until it cannot be rotated. Then, rotate the wheel in the opposite direction approximately 12 clicks.
TROUBLE SHOOTING GUIDE

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

ELECTRICAL SYSTEM

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

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.
• Inspect and repair wiring.

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

Starting motor does not turn when starting switch is turned on.
• Inspect and repair the wiring.
• Charge the battery.

The pinion of the starting motor keeps going in and out.
• Charge the battery.

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.

The heater signal does not glow red.
• Check and repair wiring.
• Replace the heater relay.

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

Outside the electrical intake air heater is not warm when touched with the hand.
• Check and repair wiring.
• Replace the electrical intake air heater.
• Check and repair the heater switch.
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 oil element.
- 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 pointer of the water temperature gauge is in red range on right hand side of the gauge.
- Supply the coolig 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 gasket of it.
- Replace the water temperature gauge.

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 occasionally turns black.
- Clean or replace the air cleaner element.
- Replace the nozzle.
- Check engine compression pressure.

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 the belt tension of fan.
- Add oil to specified level.

Unusual noise emitted from transmission
- Add oil to specified level.

Unusual noise emitted from front or rear axle
- Add oil to specified level.

High-low gear is difficult to shift.
- Check the air leakage.

Unusual noise is emitted from drive shaft.
- Add oil.

Steering wheels drag
- Repair the steering pump.
- Repair the steering valve.
- Repair the steering cylinder.

Steering wheel pulls to one side.
- Adjust the brake shoe.
- Adjust the air pressure of tire.

Braking effect is poor
- Brake acts for only one side.
- Adjust the brake.
- Bleed air from the brake piping.
- Add oil.
- Replace the brake pads.
- Check and repair the brake piping.
- Check and repair the air master.
Rise of air pressure is not quick.

Maximum air pressure is too low.
- Check and replace the air compressor.
- Adjust and replace the safety valve.
- Adjust and replace the governor.
- Adjust and replace the air pressure gauge.
- Check the air leakage from the pipe and repair it.

Air pressure gauge indicates high position.
- Adjust and replace the air pressure gauge.
- Adjust and replace the governor.

Forward-reverse lever does not shift
Acceleration or deceleration is impossible.
- Check the air leakage.
- Check and replace the forward-reverse lever valve.
- Check and replace the selector valve.
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 shall be housed in a dry building. Never leave it outdoors.
- In case it is indispensable 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 fuel tank, lubricate and change oil before storage.
- Apply a thin coat of grease to metal surface (hydraulic piston rods and front idler adjusting rods).
- As to 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.
- The fuel control lever shall be set to STOP position.
  Each control lever shall be set to neutral position and locked.

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

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

AFTER STORAGE
After storage, you shall apply the following treatment before operation.

- Completely fill fuel tank and lubricate before operation.
- Wipe off the grease on the hydraulic piston rod.
- If the machine to be used when the monthly rust prevention operation has not been carried out, contact your Komatsu distributor.
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.
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 photos below.

- Location of the machine serial number mark

This is seen on the bottom left of the cab.

- Location of engine serial number mark

This is seen on the upper right of the cylinder block, when seen from the fan side.
## FUEL, COOLANT AND LUBRICANTS

### PROPER SELECTION OF FUEL, COOLANT AND LUBRICANTS

<table>
<thead>
<tr>
<th>RESERVOIR</th>
<th>KIND OF FLUID</th>
<th>AMBIENT TEMPERATURE</th>
<th>CAPACITY (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>14 32 50 68 86°C</td>
<td>Specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refill</td>
</tr>
<tr>
<td>Engine oil pan</td>
<td>SAE 30</td>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>SAE 10W</td>
<td></td>
<td>10.5</td>
</tr>
<tr>
<td></td>
<td>SAE 10W-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAE 15W-40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swing machinery case</td>
<td>Engine oil</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Transmission case</td>
<td>SAE 30</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>SAE 10W</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>SAE 10W-30</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>SAE 15W-40</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Hydraulic system</td>
<td>SAE 10W</td>
<td></td>
<td>260</td>
</tr>
<tr>
<td></td>
<td>SAE 10W-30</td>
<td></td>
<td>190</td>
</tr>
<tr>
<td>Lubricator</td>
<td>SAE 10W</td>
<td></td>
<td>0.135</td>
</tr>
<tr>
<td>Differential gear case</td>
<td>Gear oil</td>
<td></td>
<td>11.6</td>
</tr>
<tr>
<td>(Front) (Rear)</td>
<td>SAE 90</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Final drive case</td>
<td>SAE 90</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>(Front and rear on each side)</td>
<td>SAE 90</td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>SAE 90</td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td>Brake</td>
<td>Brake fluid</td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>SAE J-1703F</td>
<td></td>
<td>1.4</td>
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<tr>
<td>Air master</td>
<td>Vacuum cylinder oil</td>
<td></td>
<td>0.03</td>
</tr>
<tr>
<td>Fuel tank</td>
<td>Diesel fuel</td>
<td></td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>ASTM D975 No. 2</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>Cooling system</td>
<td>Water</td>
<td></td>
<td>Add antifreeze</td>
</tr>
</tbody>
</table>
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%.

<table>
<thead>
<tr>
<th>Fuel sulphur content</th>
<th>Change interval of oil in engine oil pan</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 to 1.0%</td>
<td>1/2 of regular interval</td>
</tr>
<tr>
<td>Above 1.0%</td>
<td>1/4 of regular interval</td>
</tr>
</tbody>
</table>

(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.
<table>
<thead>
<tr>
<th>No.</th>
<th>Supplier</th>
<th>Engine Oil [CD or CE]</th>
<th>Grease [Lithium-Base] NLGI No. 2</th>
<th>Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KOMATSU</td>
<td>EO10-CD EO30-CD EO10-30CD EO15-40CD</td>
<td>G2-LI G2-LI-S</td>
<td>AF-ACL AF-PTL AF-PT (Winter, one season type)</td>
</tr>
<tr>
<td>2</td>
<td>AGIP</td>
<td>Diesel sigma S Super dieselmultigrade * Sigma turbo</td>
<td>GR MU/EP</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>AMOCO</td>
<td>* Amoco 300</td>
<td>RYKON premium grease</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>ARCO</td>
<td>* Arco fleet S3 plus</td>
<td>Litholine HEP 2 Arco EP moly D</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>BP</td>
<td>Vanelius C3</td>
<td>Energrease LS-EP2</td>
<td>Antifreeze</td>
</tr>
<tr>
<td>6</td>
<td>CALTEX</td>
<td>* RPM delo 400 RPM delo 450</td>
<td>Marfak all purpose 2 Ultra-duty grease 2</td>
<td>AF engine coolant</td>
</tr>
<tr>
<td>7</td>
<td>CASTROL</td>
<td>* Turbomax * RX super CRD</td>
<td>MS3 Spheerol EPL2</td>
<td>Anti-freeze</td>
</tr>
<tr>
<td>8</td>
<td>CHEVRON</td>
<td>* Delo 400</td>
<td>Ultra-duty grease 2</td>
<td>-</td>
</tr>
<tr>
<td>No.</td>
<td>Supplier</td>
<td>Engine Oil (CD or CE) SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)</td>
<td>Grease [Lithium-Base] NLGI No. 2</td>
<td>Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type</td>
</tr>
<tr>
<td>-----</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>9</td>
<td>CONOCO</td>
<td>* Fleet motor oil</td>
<td>Super-sta grease</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>ELF</td>
<td>Multiperformance 3C Performance 3C</td>
<td>Tranself EP</td>
<td>Giacelf</td>
</tr>
<tr>
<td>11</td>
<td>EXXON (ESSO)</td>
<td>Essolube D3  * Essolube XD-3  * Essolube XD-3 Extra  * Esso heavy duty Exxon heavy duty</td>
<td>Beacon EP2</td>
<td>All season coolant</td>
</tr>
<tr>
<td>12</td>
<td>GULF</td>
<td>Super duty motor oil  * Super duty plus</td>
<td>Gulfcrown EP2</td>
<td>Antifreeze and coolant</td>
</tr>
<tr>
<td>13</td>
<td>MOBIL</td>
<td>Delvac 1300  * Delvac super 10W-30, 15W-40</td>
<td>Mobilux EP2</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Supplier</td>
<td>Engine Oil [CD or CE]</td>
<td>Grease [Lithium-Base] NLGI No. 2</td>
<td>Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type</td>
</tr>
<tr>
<td>-----</td>
<td>----------</td>
<td>-----------------------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>14</td>
<td>PENNZOIL</td>
<td>* Supreme duty fleet motor oil</td>
<td>Multi-purpose white grease 705 707L White Bearing grease</td>
<td>Anti-freeze and summer coolant</td>
</tr>
<tr>
<td>15</td>
<td>PETROFINA</td>
<td>FINA kappa TD</td>
<td>FINA marson EPL2</td>
<td>FINA tamidor</td>
</tr>
<tr>
<td>16</td>
<td>SHELL</td>
<td>Rimula X</td>
<td>Alvania EP grease</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>SUN</td>
<td>-</td>
<td>Sunoco ultra prestige 2EP Sun prestige 742</td>
<td>Sunoco antifreeze and summer coolant</td>
</tr>
<tr>
<td>18</td>
<td>TEXACO</td>
<td>* Ursa super plus Ursa premium</td>
<td>Multifak EP2 Starplex 2</td>
<td>Code 2055 startex antifreeze coolant</td>
</tr>
<tr>
<td>19</td>
<td>TOTAL</td>
<td>Rubia S * Rubia X</td>
<td>Multis EP2</td>
<td>Antigel/antifreeze</td>
</tr>
<tr>
<td>20</td>
<td>UNION</td>
<td>* Guardol</td>
<td>Unoba EP</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>VEEGOL</td>
<td>* Turbostar * Diesel star MDC</td>
<td>-</td>
<td>Antifreeze</td>
</tr>
</tbody>
</table>
MACHINES READY FOR ATTACHMENTS

The following pages describe the sections of the machines which are ready to be mounted with attachments and which are different from the standard machines.
1. STOP VALVE

This valve stops the flow of hydraulic oil.

1. Free: The hydraulic oil flows.
2. Lock: The hydraulic oil is stopped.

* Before installing or removing an attachment, turn this valve to LOCK.

2. SELECTOR VALVE

This valve changes the direction flow of the hydraulic oil.

1. When a breaker is used.
2. When ordinary attachments (such as a tilt bucket) are used.

3. CONTROL PEDAL

This pedal is used to control the attachments.
HYDRAULIC CIRCUIT

CONNECTION OF HYDRAULIC CIRCUIT

When connecting an attachment, connect the hydraulic circuit according to the following procedure.

1. Confirm that the stop valve is set to the lock position. Then remove the blind plug and O-ring.

2. Install the elbow for the attachments in place of the plug which was removed in step 1.

* The dimensions of the stop valve side of the elbow are shown above.

* Determine the dimensions of the opposite side by consulting with the attachment manufacturer.
OIL PASSAGES

The operating direction of the pedal and the oil passages are related as shown below.

3. Shorten the bucket cylinder to its stroke end and confirm that there is a clearance between the link and the hose for attachments.
OPERATION

Operate the attachments according to the following procedure.

BREAKER
Depress the pedal in the direction of the arrow to start the breaker.

OPERATING PRECAUTIONS
- Confirm that the stop valve is set to the free position.

- Confirm that the selector valve is set to the position for the breaker.

PEDAL STOPPER
The pedal stopper is installed to prevent the reverse operation of the control pedal.
1. Set the pedal to the neutral position.
2. Lengthen adjustment bolt (1) until it contacts stopper (2), then tighten lock nut (3).

Adjustment

- Connect the LH pipe to IN of the breaker. If it is connected in the reverse manner, the breaker may be damaged.

- For the oil passage, see the section on Hydraulic circuits on the previous page.

- For other handling precautions for the breaker, see the Instruction Manual issued by the manufacturer.
THE TILT BUCKET AND OTHER COMMON ATTACHMENTS
When the pedal is depressed the attachments start operating.

OPERATING PRECAUTIONS
- Confirm that the stop valve is set to the free position.
- For details on the oil passages, see the section on Hydraulic circuit.
- For other handling precautions for the attachments, see the Instruction Manuals issued by the manufacturers.

ADJUSTMENT OF PEDAL
Adjust the pedal according to the following procedure.
1. Loosen lock nut (1) and tighten adjustment bolt (2).

2. Depress pedal (3) to its stroke end, turn the adjustment bolt until its head contacts the stopper, then tighten the lock nut.

* Adjust the stopper on the opposite side in the same way.
STORAGE

If the parts for attachments are not going to be used for a long time, adjust them as follows.

- Turn the stop valve to the Lock position.
- Install a blind plug and O-ring to the stop valve.
- Turn the selector valve to the position for common attachments such as the tilt bucket.
- Lock the pedal with the adjustment bolt.

★ If the pedal is operated while the breaker or other attachment is not installed, the engine may overheat.

SPECIFICATIONS

Specification of hydraulic system
1. Flow rate 126 l/min.
2. Set pressure 290 kg/cm²
3. Set pressure of safety valve 305 kg/cm²
   (For low pressure: 175 kg/cm²)
HYDRAULIC BREAKER

MAIN APPLICATION
- Stone crushing
- Demolition
- Road repair

Can be widely used for the demolition of buildings, crushing of pavement, building of tunnels, and crushing of slag, stone and rock from quarries.

- Strike the chisel while pressing it at a right angle against the surface of the object.

- Before starting to strike the chisel, raise the front of the machine about 5 cm off the ground with the chisel pressed down against the object.

- Operate the bucket cylinder so that the chisel always penetrates into the object in line with the C.L. of the breaker.

- If the chisel fails to crush or penetrate the object after a continued striking operation of one minute, move the striking position closer to the edge.

- Take care to keep the chisel properly pressed against the object to ensure that the chisel does not strike without hitting the object.
OPERATIONS TO BE AVOIDED

To ensure safety and long machine service life, do not operate the machine in the manners shown below.

Sweeping-and-gathering rocks with the mount portion

Moving the chisel while striking

Prying the chisel while it is penetrated into the ground

Doing work while swinging

Striking in a horizontal or vertical direction

Picking operation
Raising the machine off the ground with the breaker, while the bucket cylinder is operated close to its stroke end.