

⚠ Read this handbook thoroughly and understand the whole information contained before trying to operate, inspect and service your machine!

**OPERATING &
MAINTENANCE
INSTRUCTIONS**

**3-WHEEL
ROLLER**

MODEL

R2H-2

From 1R5 – 60101

SAKAI®

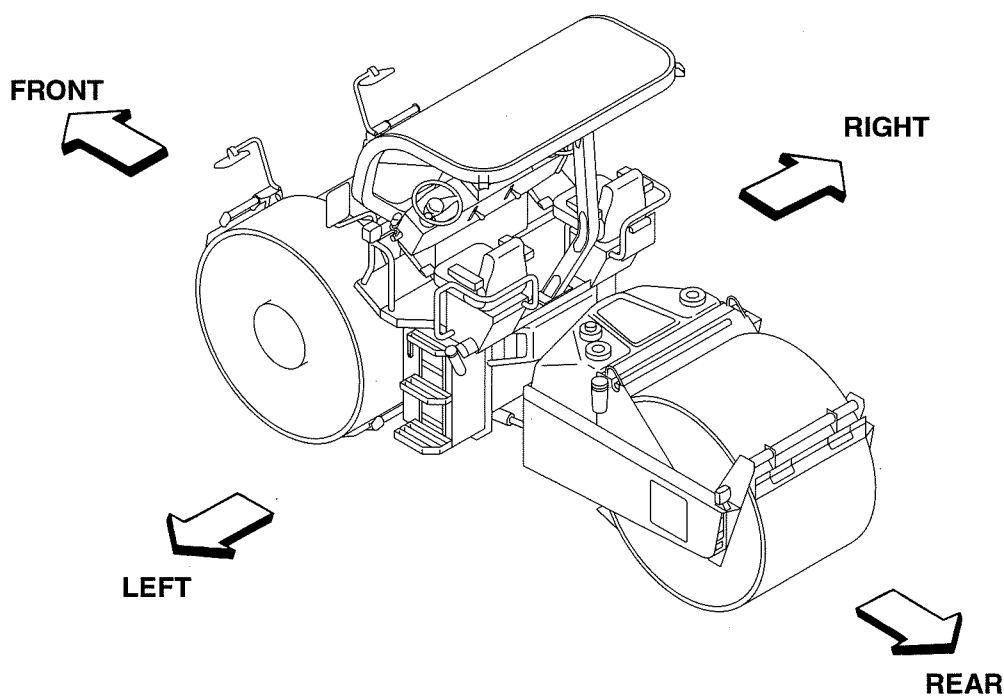
PREFACE

This operator's manual serves as a guide for the use of your Sakai R2H-2 3-wheel Roller for those who are new to the machine, and also for the people who have experience in using the Machine and want to refresh their knowledge for the machine.

Read this manual thoroughly and try to fully understand the information before operating your machine. Keep this handbook at hand whenever you do your work.

The main subjects of this manual are:

(1) Basic precautions for safety, (2) Operation, (3) Daily maintenance and (4) Specifications. For operation and maintenance of the engine, refer to the Engine Instruction Manual furnished separately. Descriptions in this manual can differ from the machine instructions of your machine due to the results of the investigation and improvement in its design. If you have any inquiry regarding your Machine or this manual, contact our distributors.



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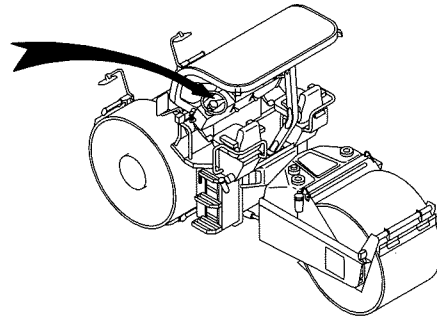
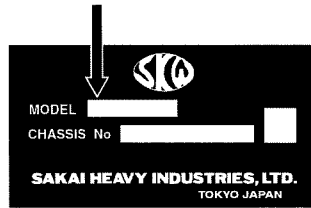
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MACHINE AND ENGINE IDENTIFICATION NUMBERS

When ordering parts or making inquiries about your machine, the following information is requested:

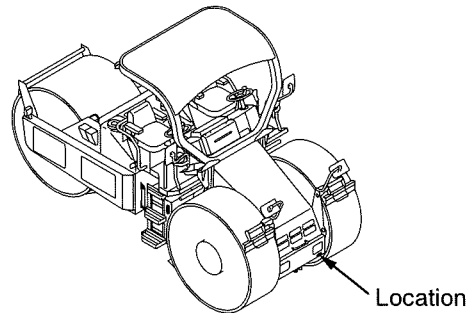
(1) Machine model

Indicated on the dashboard in the operator's station.

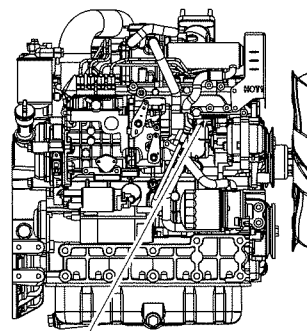


(2) Machine serial number

1R5- ○○○○○



(3) Engine serial number









SAFETY NOTICES

For the safe use of your machine, correct handling and periodical maintenance are of utmost importance. Thoroughly read the safety precautions described in this manual. Do not attempt to operate and maintain your machine until you gain a full understanding of these safety statements.

This manual covers the proper and safe method of driving and handling of this machine for its intended use. When this machine is used a manner, other than that covered in this manual, you must assume responsibility for your own personal safety.

In this manual and on the machine, you will find safety notices. Each safety notice starts with a signal word as shown below:

- | | |
|--|--|
|  DANGER | Denotes that there is an extreme hazard. If you fail to take proper precautions, it is highly likely that you could be killed or seriously injured (The color of the symbol  is red). |
|  WARNING | Denotes that there is a hazard. If you fail to take proper precautions, you could be killed or seriously injured (Symbol  is orange). |
|  CAUTION | Calls attention to safety practices. If you fail to take proper precautions, you could be injured or cause damage to the machine (Symbol  is yellow). |

It is almost impossible for the safety notices in this manual and or the machine to cover all the potential dangers. Keep alert to possible dangers not mentioned in this manual and on the decals.

 **WARNING**

Do not operate your machine before you read its operator's manual thoroughly.

Incorrect operation can kill or cause injury.

It is your responsibility to operate the machine safely.

- ☆ Non-approved modifications can pose safety-related problems. Before making any modifications, consult your distributor. For an injury or damage to the machine caused by non-approved modifications, Sakai accepts no responsibility.
- ☆ Basic precautions for safe operation of your machine are discussed beginning on page 4.
- ☆ To operate and work with your machine, you must be qualified.

1. BASIC PRECAUTIONS FOR SAFETY

1. BASIC PRECAUTIONS FOR SAFETY

1.1 General Precautions

■ **Read thoroughly the operator's manual.**

- Understand the functions of the controls and gauges. Familiarize yourself with their location and how to operate them. Understand the meaning of all the symbols.



■ **Obey the worksite rules.**

- Follow the worksite rules such as matters forbidden or to be attended to, and working procedures.

■ **Wear protective clothing to suit the work.**

- Wear clothing, safety shoes and hard hat to suit your work.
- Do not wear clothing and accessories that tend to get caught in the controls or protruded portions of the machine. Do not wear oily clothing.
- According to the type of jobs, wear safety goggles or mask.



■ **Know the work area in advance.**

- Know the terrain, geology and conditions of the road surface at the worksite. Start working after securing safety such as stationing a guardsman or putting up barriers where there is a risk of falling of the machine or collapse of shoulder.

■ **Provide against an accident.**

- Decide in advance the means of communication in an emergency. Know the location and use of an extinguisher and first-aid kit.

■ **Know the capability of the machine.**

- Thoroughly understand the performance of your machine and correctly operate the machine to meet the requirements of the job site. Operating the machine beyond its capabilities may lead to an accident. Use your machine within its capability.

▲ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

■ Do not use a machine which has not been serviced correctly at regular intervals.

- Before working, perform necessary inspections. Start operation only after making certain the machine is in good operating condition. If found to be abnormal, report to the responsible person and have the fault corrected. Operate the machine after making sure that it is safe to operate.

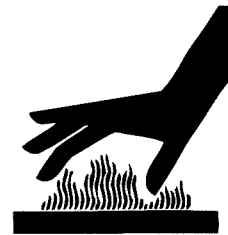
■ Do not allow anyone to enter the work area except for authorized personnel.

- Always conduct the work paying attention to the workers around the machine.



■ Be careful of hot parts.

- After your machine has operated for some time, the coolant, engine oil and hydraulic fluid will become hot and the pressure will build up. If, in this state, you try to remove the filler caps, drain the oil or replace the filters, you can get burned. Perform this work in accordance with the correct procedures with the machine cooled down.
- To remove the radiator cap, slowly loosen the cap to relieve the pressure with the engine shut down and the coolant cooled down. (For the radiator cap with a lever, lift the lever to release the trapped pressure.)
- When removing the filler cap on the hydraulic tank, release the trapped pressure by turning it out slowly to prevent the oil from gushing out.
- Do not touch the muffler while the engine is running or immediately after it has been shut down. You can get burned.



■ Be careful with fire.

- The fuel, oil, and anti-freeze will catch fire if open flames or ignition sources are used close to them. Particularly, the fuel is highly flammable.



- Do not smoke or use a match or cigarette lighter close to inflammables (combustibles).
- When refueling, stop the engine and do not smoke.
- The filler caps of the fuel and oil tanks must be kept tight.



1. BASIC PRECAUTIONS FOR SAFETY

■ **Mount on or dismount from your machine after it has come to a complete stop.**

- For getting on and off, face the machine and use the handrail and step.
- Do not jump on or off a machine, particularly when it is moving.

■ **To handle the hydraulic fluid.**

- Wear safety goggles to protect your eyes from contact with hydraulic fluid. It can irritate your eyes.
If the fluid contacts your eyes, flush with clean water for 15 minutes and get medical aid.
- The fluid can also irritate your skin. When handling it, wear rubber gloves to avoid contact with it. In case of skin contact, wash with soap and water.
- Be careful not to swallow the fluid. It can cause diarrhea and emesis.
If swallowed, do not try to vomit. Get medical help immediately.



1.2 Preparation for Safe Operation

■ **Clean the step, operator's station and floor board.**

- Do not place parts, tools or unnecessary articles on the step, operator's station and floor board.
- Keep the step, floor board, controls and handholds free from muds, oil, ice or water, as they can cause slippage. Repair them if found to be damaged. Tighten loose bolts.
- Keep your boot soles free of oil or muds. They can slip, leading to an accident.

■ **Inspect your machine before operation**

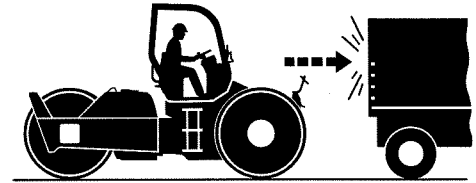
- Check your machine for damage such as cracks and deformation. If found to be abnormal, operate the machine after taking a proper measure to secure safety.
- Check the level of fluids (fuel, engine oil, coolant, anti-freeze and hydraulic oil). Add as necessary.
- Check the area where the machine has parked for signs of leakage of oil, fuel and water. If any leakage is noticeable, determine the cause and make corrections immediately.

▲ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

■ Know the stopping distance.

- When traveling on a road, bear in mind the stopping distance. Avoid excessive speed, and abrupt starting and stopping, and moving in a zigzag direction.



1.3 Before Starting the Engine

■ Adjust the operator's seat to your most effective operating position.

- Sit on the operator's seat. Adjust the seat so that your back will make contact with the seat back when the brake pedal is depressed to the full extent. Check to be sure that the brake pedal can be fully depressed without difficulty when you twist your body for reverse run.

■ Secure good visibility (with cabin : Option)

- Keep the windowpane clean.
- Lock the windows and doors no matter whether they are open or closed.
- Do not leave the doors half-closed.

■ Secure forward and backward visibilities.

- Adjust the rear view mirrors and under mirrors for good visibility. If dirty, clean them. If damaged, replace.

■ Check that the horn, lamps and gauges work correctly.

■ Before starting, make certain that each lever is in the neutral position and the parking brake is applied.

■ When starting, sound the horn.

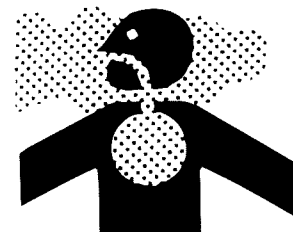
- Before starting the engine. Make sure there is no one in the immediate vicinity and there are no obstructions around the machine.



1. BASIC PRECAUTIONS FOR SAFETY

■ Pay attention to ventilation.

- Exhaust fumes are dangerous if breathed in. When starting the engine in an enclosed area, provide good ventilation with windows and doors opened.



■ Do not stand close to the exhaust gas pipe opening.

- Exhaust fumes are noxious if breathed in.

1.4 After Starting the Engine

■ Secure safety around the machine.

- Ensure that the area around the machine is clear of personnel and obstructions. Pay particular attention to dead spaces. Before starting, sound the horn.



■ Warm up the Engine

- Do not put your machine into motion immediately after the engine has started, let it idle for several minutes until it is at operating temperature.
- Check the area where the machine has parked for signs of leakage or oil, fuel and water. If any leakage is noticeable, determine the cause and make corrections immediately.

■ Have a trial run.

- Make a test run in a safe place to check that there are no abnormal signs. If found to be abnormal, rectify the fault before traveling again.
- Listen for unusual sounds, and check for abnormal temperature rise. If abnormal, park the machine in a safe location and find the source of trouble before operating.

1.5 During Operation

■ No other person but the operator

- This machine is a one-man roller. Do not allow anyone to get on. Only the operator is allowed on this machine while it is running or in operation. Radios are not permitted.

■ Before mounting, be sure areas around the machine are safe.

- Before getting on the machine, make certain that there are no obstacles around the machine and no workers under it. If some workers are present or close to the machine, tell them that the machine is about to move, warning them to stay away from it.

▲ **WARNING:** Negligence of these instructions can lead to accidents.

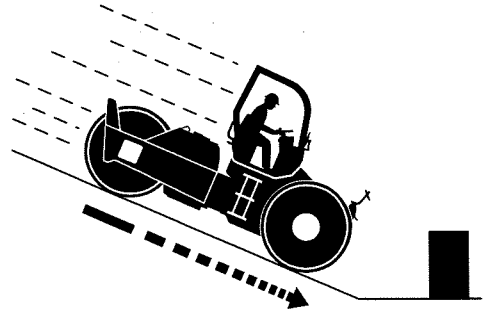
1. BASIC PRECAUTIONS FOR SAFETY

■ Do not try to get on or off a moving machine.

- Get on or off the machine after making sure it has come to a complete stop.

■ To go uphill or downhill, run at low speeds. Do not attempt to shift speeds while traveling on a grade.

- Shifting speeds on a slope can cause unexpected running down the slope.
- Going down hill at speeds other than low range can cause the machine to run down violently.



■ Refrain from inattentive driving.

- Inattentive driving or driving relying on guess work can cause an accident. Use extreme care for workers present in the path of the roller or around it. In case of danger, stop and sound the horn, and proceed when the area is clear of personnel or obstructions.

■ When changing the direction of travel, secure the safety on the path in the travel direction.

■ Keep everyone away from the pinch points.

- When making turns, do not allow anyone to come close to the pinch point.



■ At night, carefully drive the machine.

- Nighttime driving tends to frustrate the sense of distance. Carefully drive the machine at a speed suited to illumination. Keep the headlamps and flood lamps lighted. If necessary, provide extra lighting in the work area.

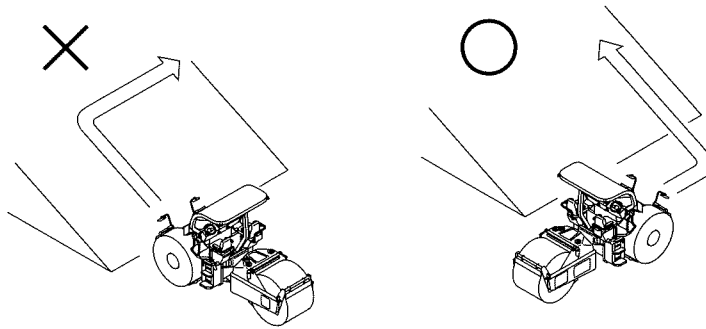
■ Repair as soon as possible if found to be defective.

- If the machine is found to be faulty, stop the machine and repair. Do not operate the machine until the problem is corrected. When any warning lamp indicates faulty operation, inspect the machine after moving it to the nearest safe location.

⚠ WARNING: Negligence of these instructions can lead to accidents.

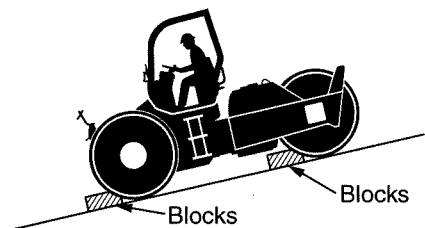
1. BASIC PRECAUTIONS FOR SAFETY

- Do not operate the machine except from the operator's seat. Do not drive in a standing posture.
- While making turns, do not run at abnormally high speed and do not turn the steering wheel abruptly and sharply.
- For the traveling on structures such as a bridge, make certain that they can support your machine. Before traveling on the structure, you must know the load capacity of the structure and the load weight of the machine you are operating to insure safe travel across the structure.
- Do not make turns on a slope and do not travel across sidehill. If necessary to do so, go down straight along the slope to the flat ground, move sideways and go up straight to the destination.



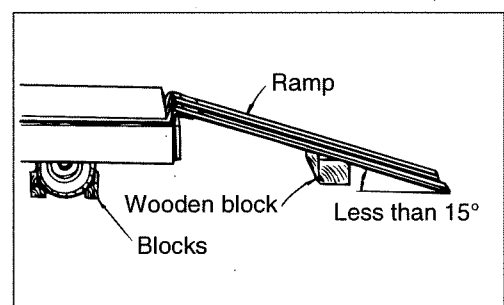
■ When parking.

- Select level and hard ground. If necessary to park on a slope, block the front of the drums on the downside of the slope.
- When required to park on the public road, provide necessary markings such as flag, barriers and illumination. However, be sure they do not obstruct traffic.
- When getting off the machine, stop the engine and remove the key from the ignition switch.



1.6 Loading and Unloading

- Loading and unloading can accompany any danger. Use extreme care.
- Select level and hard ground leaving a sufficient distance from the shoulder.
- Use sturdy ramps with proper width, length and thickness which allow safe loading and unloading. If they deflect considerably under load, apply wooden blocks to reinforce the ramps.



⚠ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

- To prevent your machine from crosswise slippage, keep the ramps free from oil, mud, debris, etc. The drum must also be free from extraneous matter that can cause slippage.
- Do not steer your machine on the ramps. If the machine is facing in the wrong direction, allow it to dismount from the ramps, correct the direction and try again.
- Do not use kinked, twisted or damaged wireropes for crane or winch operation. Use ones with ample strength.
- When loading is complete, fix the machine with wooden blocks placed under the drums and chains fastened to the machine.

1.7 Transportation

- Follow required regulations.
- Select a transporting route according to the overall width, overall height and gross weight of the trailer with the roller loaded.

1.8 Handling the Battery

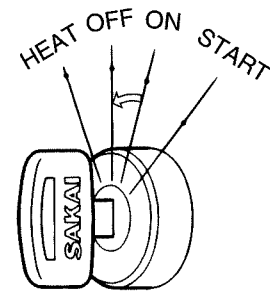
■ When handling the battery:

- Battery electrolyte contains sulphuric acid. It will destroy clothing and skin. If it touches your clothing or skin, flush with large quantities of water.
- In case of eye contact, flush with clean water and seek medical help.
- If swallowed, drink large amount of water, milk, beaten egg or vegetable oil, and get medical help.
- Wear safety goggles when handling the battery. Wear safety goggles, full face shield, rubber gloves and rubber apron when adding fluids to the battery.
- The battery generates flammable gases that can cause an explosion. Do not smoke close to the battery. Keep the battery away from flames, sparks and ignition sources.



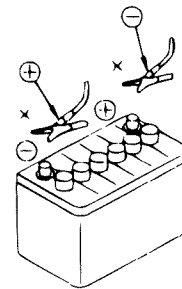
1. BASIC PRECAUTIONS FOR SAFETY

- Inspect or handle the battery with the engine shut down and the starter key in the OFF position.
- Keep metallic items such as tools away from the battery terminals.
- Loose terminals can cause sparks leading to an explosion. Secure the terminals tightly.



■ Jump-starting the engine.

- Wear safety goggles when jump-starting the machine.
- When starting from another machine, do not allow the two machines to make contact with each other.
- When connecting the battery cables, start with the positive terminal. For disconnection, start with the negative one.
- Do not allow a tool to bridge between the positive terminal and machine body. This can generate dangerous sparks.
- Do not connect the booster cable to wrong terminal. NEVER connect the positive terminal to the negative.
- Final connection to the engine block of the disabled machine can cause sparks. The connecting point should be as far as possible from the battery.



1.9 Towing

- To tow the machine, use wire ropes with ample strength.
- Do not perform towing on a slope.
- Do not use towing ropes twisted, kinked or damaged.
- Do not stride towing cables.
- Keep everyone away from the space between the machine and the towing vehicle when connecting the two.
- Align the connecting portions of the machine and towing vehicle straight when coupling the machine.

▲ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

1.10 Before Servicing

■ Attach warning tags when servicing the machine.

- Serious accidents can occur if the machine is unexpectedly started or controls carelessly touched by an unauthorized person.
- Attach a warning tag at a clearly visible location in the operator's station and insure the key has been removed from the ignition switch.



■ Use proper tools.

- It is very dangerous to use damaged or deteriorated tools or to use tools for other purposes than intended. Use correct tools for their intended use only.



■ Change safety-related parts at regular intervals.

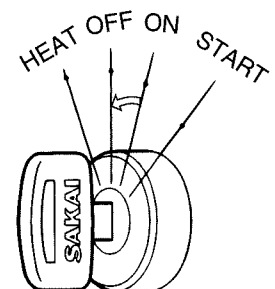
Replace fuel hose and high pressure hydraulic hoses regularly to prevent fire.

Replace high pressure hoses of the power steering system every two years.

- ☆ Even if these parts are normal, periodically replace them with new ones. They will deteriorate as time goes on.
- ☆ If they are abnormal, replace them with new ones even if the periodical replacement time is yet to come.

■ Inspect or service your machine with the engine stopped.

- If required to keep the engine running in such a case as radiator interior cleaning, perform the work with two persons. One of them should sit on the operator's seat getting ready for shutting down the engine. He must take care not to touch any of controls carelessly. Maintenance personnel must exercise extreme caution not to make contact with moving parts.



1. BASIC PRECAUTIONS FOR SAFETY

■ Supplying fuel and oils

- Spilled fuel or oil will be slippery. Wipe up immediately. Keep the filler caps tight. Do not use fuel for flushing oil. Handle fuel and oil in a well ventilated area.

■ Check the coolant level in the radiator.

- To check the coolant level, shut down the engine and allow the engine and radiator to cool down.

■ Illumination

- For inspecting the level of the fuel, oil, coolant and battery electrolyte, use burn-proof illuminations. Failure to use this type of illumination can result in an explosion.



1.11 During Servicing

■ Keep unauthorized persons away

- During service, do not allow persons not concerned to enter the work area, particularly when grinding or welding operation is performed or heavy hammers are being used.

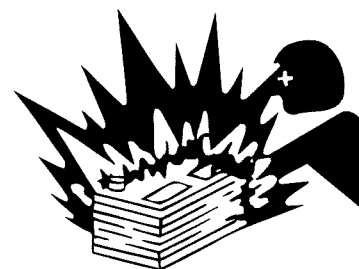


■ Keep your machine clean

- Spilled oil, grease or scattered debris are dangerous. Always keep your machine clean. Moisture that penetrates into the electrical system can cause malfunctions. Do not use water to clean sensors, connectors and the operator's station.

■ When repairing the electrical system

- For repairing the electrical system or for conducting welding, disconnect the negative cable from the battery to shut off the electricity.



■ Carefully handle high pressure hoses.

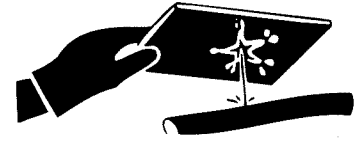
- Do not try to bend or hit hoses against a hard object. Do not use hoses or pipes that are bent or damaged. They will burst.
- Replace damaged fuel hose and hydraulic hoses. An oil or hydraulic fluid spill can cause a fire.

▲ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

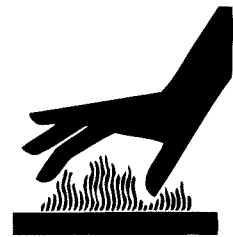
■ Be careful of high pressure hydraulic fluid.

- Bear in mind that the working equipment hydraulic systems are under internal spressure. Do not perform adding, draining, inspection or servicing of the hydraulic systems until the internal pressure has been relieved. Hydraulic fluid leaking through a fine hole at high pressure can penetrate your skin and eyes. Inspect leakage by holding a hard board close to suspected leaks wearing goggles. If affected by high pressure oil, get medical help immediately.



■ Be careful of hot parts

- After the machine has been operated for some time, the coolant, engine oil and hydraulic fluid will become hot.
- Removing the radiator cap or draining the coolant or oil can burn you. Perform this work in accordance with correct procedures after the systems have cooled down.



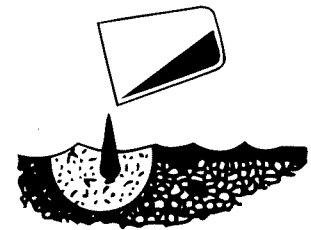
■ Use care when inspecting or servicing fan or belts in motion

- Secure loose clothing and keep articles away that could get caught in moving parts.
- Do not let your body or tools make contact with the fan blades or belts. They can be cut seriously.



■ Used oil disposal

- Do not throw used oil into a drain or waterway. Drain the oil from the machine into a proper container. Do not drain directly on the ground.
- Obey all local, state and federal environment regulations for the proper disposal of oil, fuel, coolant, battery electrolyte or any other fluids.



1. BASIC PRECAUTIONS FOR SAFETY

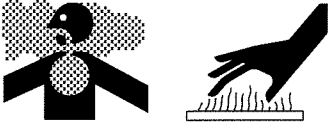
1.12 Safety Decals

Keep all decals clean. If lost, replace with new one. There are decals other than those shown below: Treat them in the same manner as the one shown here.

① 3998-16503-0

▲ WARNING
<p>1. When Handling the Machine:</p> <ul style="list-style-type: none"> Operate only while seated. Use the handrails and steps when boarding and getting off. Never carry passengers. Never attempt to board or get off the machine while it is moving. <p>2. Preparation for Safe Operation</p> <ul style="list-style-type: none"> Clean the steps, operator's station and floorboards. Obey the worksite rules. Sakai accepts no responsibility for any injury or damage to the machine caused by unapproved modification. Do not use a machine which needs repair or maintenance. Sound the horn immediately prior to starting the engine to warn people in the vicinity. <p>3. Starting the Engine</p> <ul style="list-style-type: none"> Check that all operating levers are in the neutral position. Idle the engine for about 5 minutes to warm it up prior to commencing work. <p>4. Parking Precautions</p> <ul style="list-style-type: none"> When parking the machine, park it on level ground, set the parking switch and set the roller chocks. Allow the engine to cool off by running it for about 5 minutes before stopping. When getting off the machine, remove the key from the ignition switch. <p>5. Precautions to Avoid the Machine Rolling Over</p> <ul style="list-style-type: none"> Do not work in the vicinity of overhanging banks, or on grades steep enough to cause the machine to slide or roll over. Reduce speed prior to asking a turn. Pay particular attention when operating on uneven surfaces, as the machine may become unstable.
<small>3998-16503-0</small>

⑤ 3998-16500-0

▲ WARNING

<ul style="list-style-type: none"> Avoid inhalation of exhaust gas. Avoid contact with exhaust pipe while engine is running and after it has been stopped. Contact with hot exhaust pipe will cause burns.
<small>3998-16500-0</small>

⑧ 3998-36002-0 (2 locations)



⑨ 3998-36003-0 (2 locations)



⑥ 3998-16499-0

▲ WARNING

<ul style="list-style-type: none"> Do not open the hood with the engine running. Contact with hot parts will cause burns. Contact with rotating parts will cause severe injury.
<small>3998-16499-0</small>




⑩ 3998-16507-1

▲ CAUTION
<p>Lubricate all grease fittings daily prior to commencing work.</p>
<small>3998-16507-1</small>

② 3998-16497-1

▲ WARNING
<ul style="list-style-type: none"> Thoroughly read the operator's manual before using the machine. Incorrect operation can cause severe injury or death. It is your responsibility to operate the machine safely.
<small>3998-16497-1</small>

⑦ 3998-16502-0

▲ DANGER	
	<ul style="list-style-type: none"> Do not approach, or allow objects to touch the rotating parts. Body parts make contact with rotating mechanism will be severed.
	<ul style="list-style-type: none"> Do not open the radiator cap when fluid is hot. Radiator fluid is flammable. Avoid exposure to flame when radiator cap has been removed.
	<ul style="list-style-type: none"> Avoid contact with machine parts in the vicinity of the engine while engine is running and after it has been stopped. Contact with hot part will cause burns.
<small>3998-16502-0</small>	



⑪ 3998-16205-0

<p>CAUTION</p> <p>TO PREVENT FREEZING, OPEN THE DRAINCOCK OF THE SPRINKLER PUMP AFTER OPERATION.</p>
<small>3998-16205-0</small>

③ 1634-19012-0

TOWING
<p>Before towing the machine, carry out following operation: start engine, turn UNLOADER valve to NEUTRAL, and release brake.</p> <p>When towing on a slope, be sure to drag rolls and carry out as described above.</p> <p>If engine can't be cranked and/or if brake can't be released because of some causes, release brake manually before operating UNLOADER valve.</p>

④ 3998-16501-0

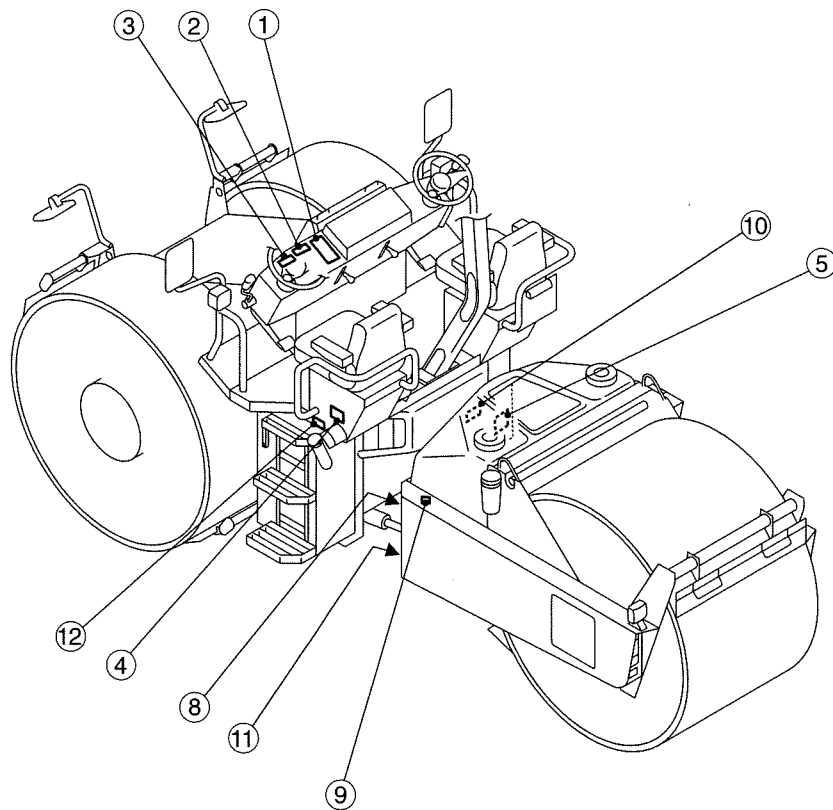
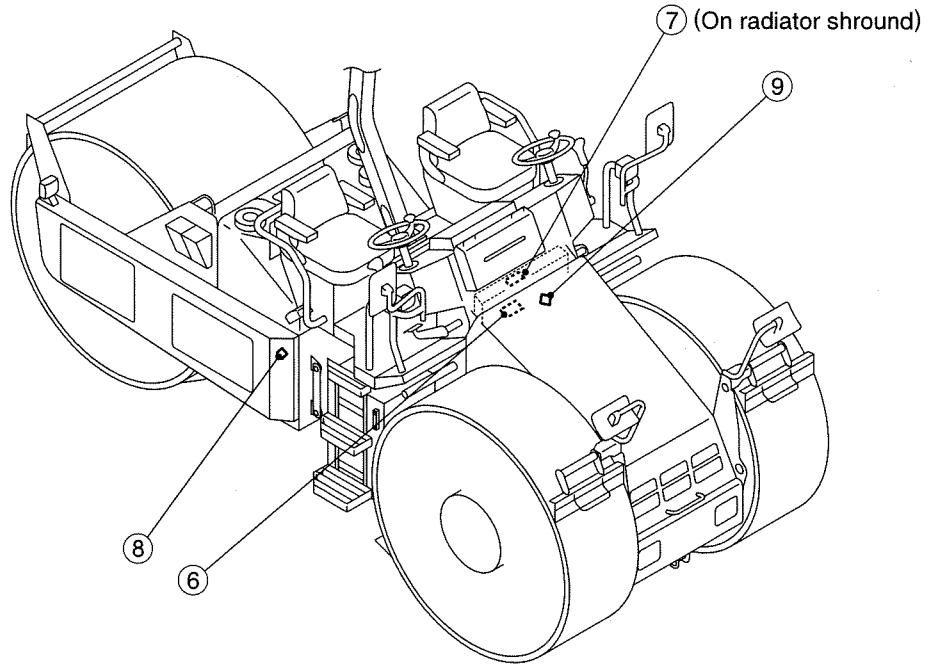
▲ DANGER
 
<p>Be Careful with Fire</p> <ul style="list-style-type: none"> When refueling, stop the engine and do not smoke. The filter cap of the fuel tank must be kept tight.
<small>3998-16501-0</small>

⑫ 2998-96001-1

▲ CAUTION
<p>USE SPECIFIED FUEL ONLY</p> <ul style="list-style-type: none"> Use of other than the specified fuel may result in damage to the engine. Please refer to the manual for details.
<small>2998-96001-1</small>

▲ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

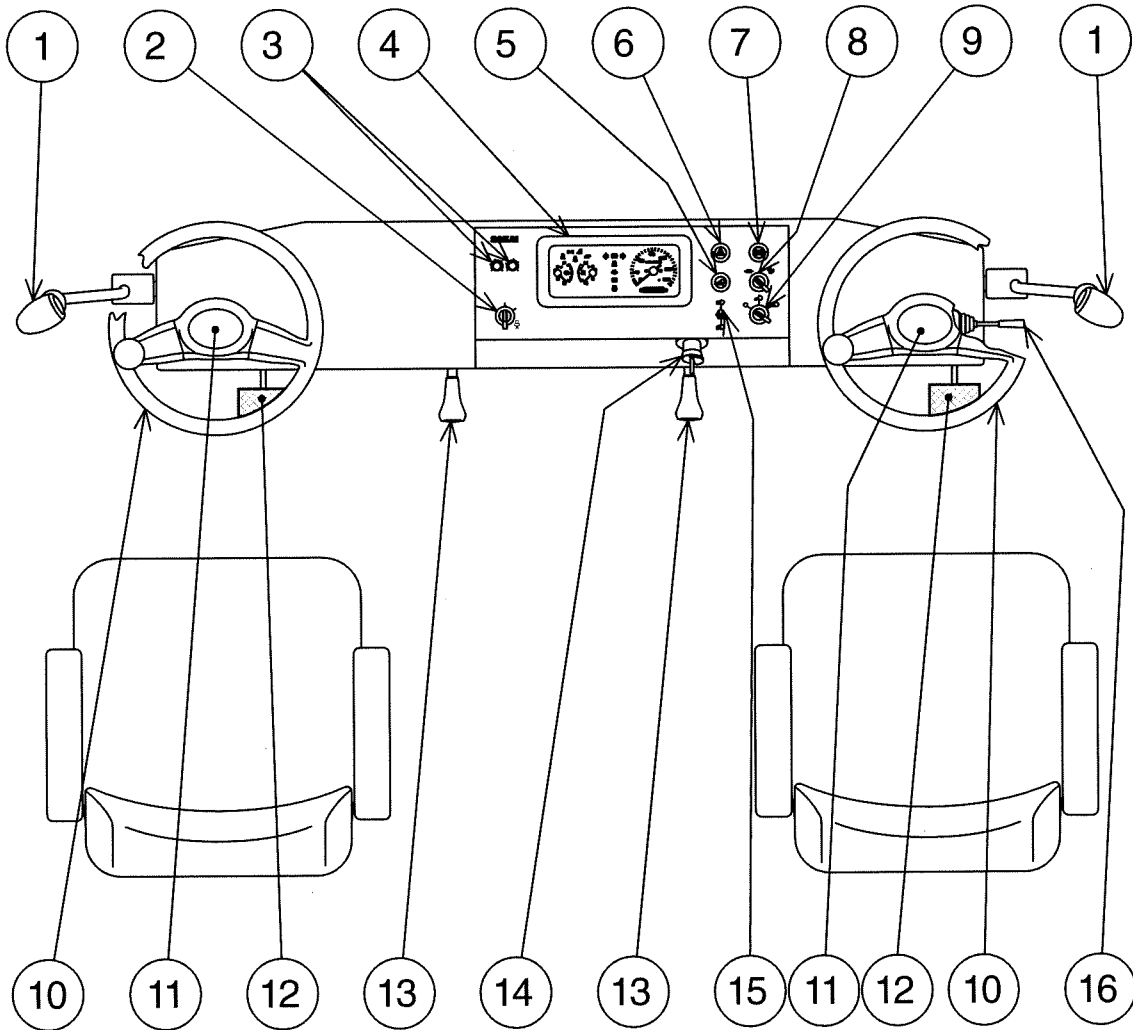


2. OPERATION

2. OPERATION

2.1 Instruments and Controls

2.1.1 Operator's station



- ① Forward-reverse (F-R) lever
- ② Sprinkler switch
- ③ Sprinkler timer
- ④ Combination meter
- ⑤ Flood lamp switch
- ⑥ Hazard switch

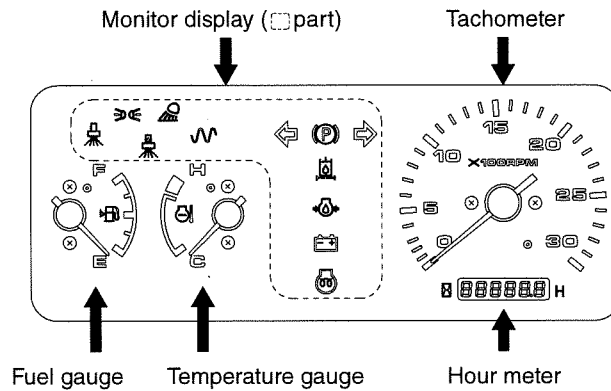
- ⑦ Parking brake switch
- ⑧ Speed shift switch
- ⑨ Lamp switch
- ⑩ Steering wheel
- ⑪ Horn switch button
- ⑫ Brake pedal

- ⑬ Throttle lever
- ⑭ Starter switch
- ⑮ Dimmer switch
- ⑯ Turn signal switch

2.1.2 Gauges, indicator lamps and warning lamps

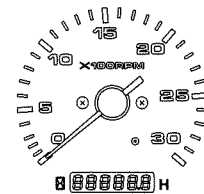
For safe execution of your job, fully understand the role and function of the systems involved.

Combination meter



Tachometer / Hour meter

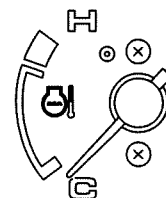
Indicates the engine RPM. The hour meter shows total operating hours. The service interval recommendation in this manual should be based upon the hour meter readings.



Tachometer / Hour meter

Temperature gauge

Indicates the coolant temperature. Zone close to symbol H indicates overheating. In case of overheating, run the engine at idling for about ten minutes before shutting it down. Then determine the cause.



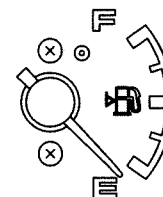
Temperature gauge

Fuel gauge

Indicates the fuel level in the tank.

- E: The tank is empty.
- F: The tank is full.

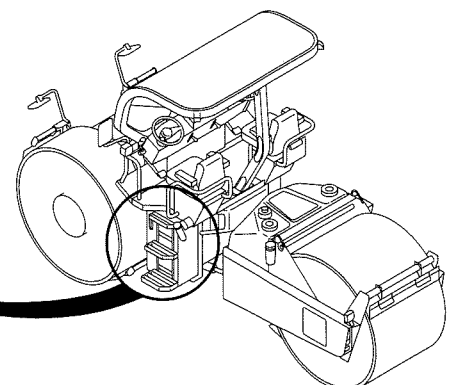
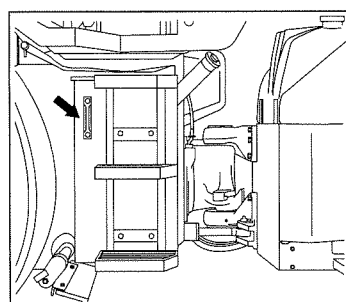
The fuel level can also be checked by looking in the sight glass as shown. Make a habit to refuel before the tank becomes empty.



Fuel gauge

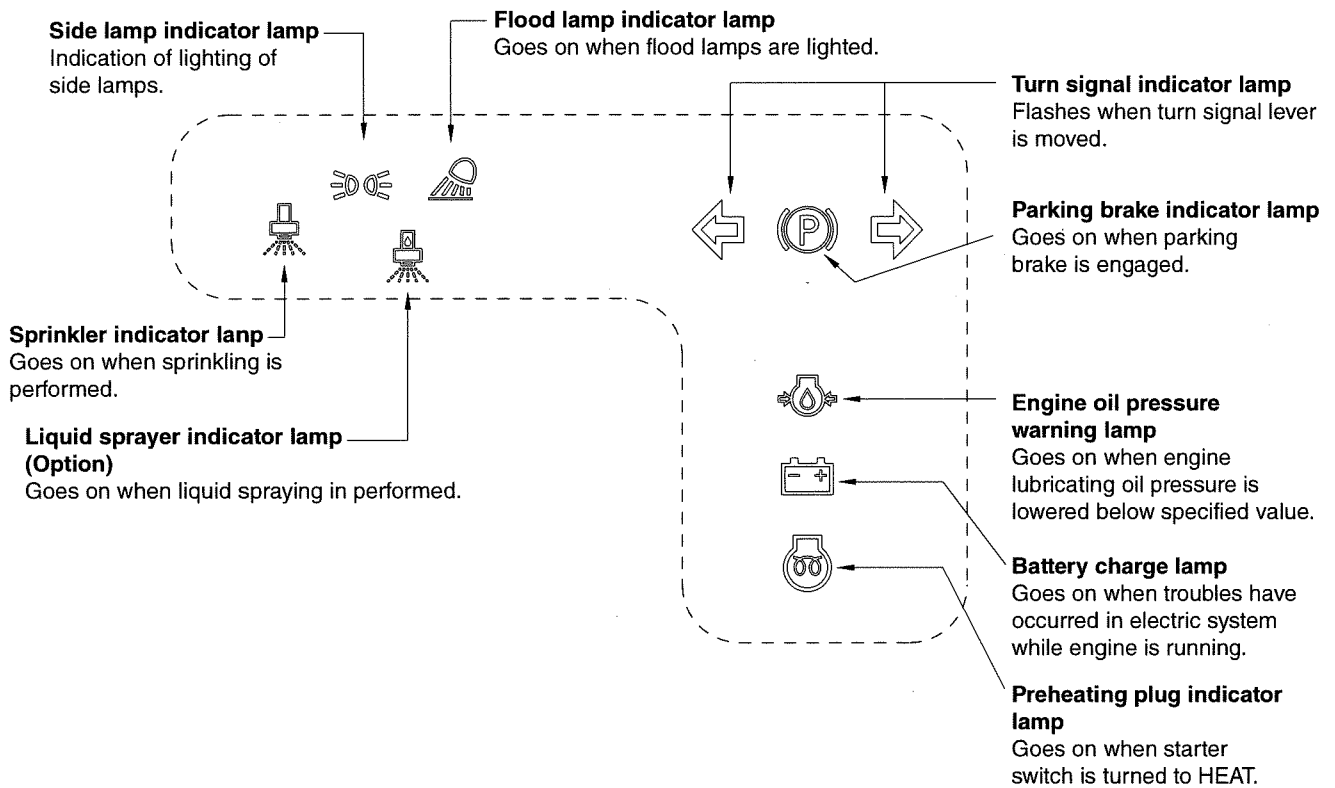
CAUTION

Be sure to use fuel recommended by SAKAI (refer to page 70)



2. OPERATION

Monitor display



★ Indicator lamps [   ]

Light up when corresponding systems have been operated.

★ Warning lamps [ ]

Go on when the starter switch is turned to the ON position and go off when the engine has started. If any of them lights up while the engine is running, this indicates a faulty condition. Stop the engine and trace the source of trouble.

= Checking for warning lamp and parking brake indicator lamp =

They should turn on light when the starter switch in ON position.

If not, there is some trouble.

Check and repair the combination meter or wirings harness.

=The window of the combination meter=

The window of the combination meter may become invisible because of aged deterioration caused by fine sand or dust or ultraviolet ray. When any flaw or mist is found on the window, contact our branch offices or designated factory.

2.1.3 Switches

Starter switch

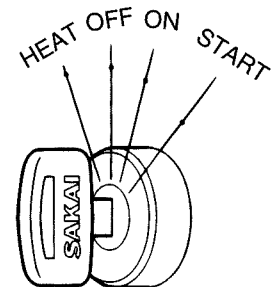
Starts and stops the engine.

HEAT: When the engine is cold, hold the starter switch in the heat position, the heater indicator lamp will go on. Stay in that position until the indicator lamp goes off. Release the switch key when the indicator lamp goes off. The key will automatically return to the OFF position. Turn the key to the START position to start the engine.

OFF: The key can be removed in this position. All the electric systems are switched off. To shut down the engine, move the key to this position.

ON: The charging circuit and lamp circuit are charged with electricity. Let the key stay in this position after the engine has started.

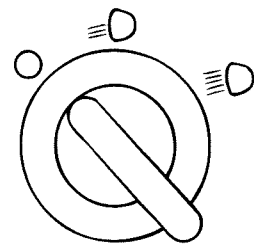
START: The engine is cranked and gets started. The moment the engine has started, release the key. It will automatically return to the ON position.



Lamp switch

Has three positions.

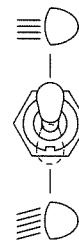
- : All lamps are switched off.
- ☉ : Side marker lamps and tail lamps illuminate.
- ☉☉ : In addition to the above-mentioned lamps, the headlamps become bright. For high beam, move the turn signal lever up. For low beam, move it down.



Dimmer switch

Turn on dimmer switch to switch over the upper beam and the lower beam of headlight.

- ☉☉ : The lower beam of headlight lights up.
- ☉☉☉ : The upper beam of headlight lights up.

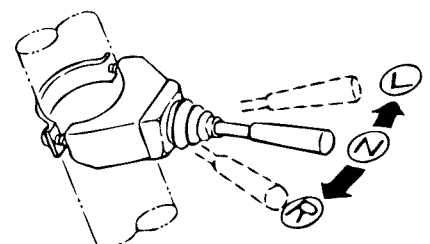


Turn signal lever

Turn signal lamp flashes when the turn signal lever is operated.



- Left turn : Move the lever forward.
- Right turn : Move the lever backward.

NOTE: The lever does not return to the OFF position even if the steering wheel is turned back.

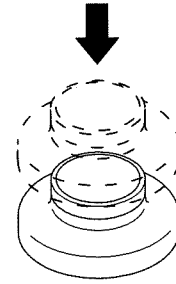


2. OPERATION



Flood lamp switch

Press the switch , and the working lamp at the back of the body will light up and the combination meter indication lamp  will light up.

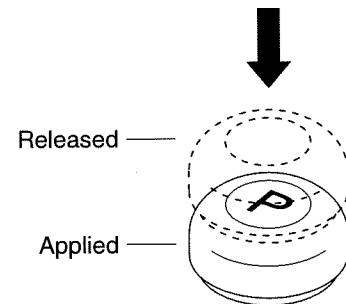
Press the switch again, and the working lamp will go out and the OK monitor indication lamp will go out as well.



Parking brake switch

If the switch  is pressed down, the parking brake applies with the indicator lamp  on the monitor display lighted up.

When pressed again, the brake is released and the indicator lamp goes off.



WARNING



- To disengage the brake, be sure to press the button again instead of pulling it.
- When dismounting from the machine, press the button to apply the brake without fail.

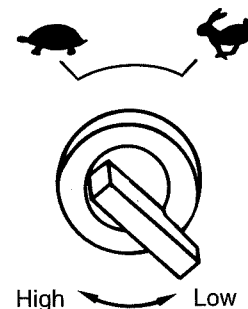
IMPORTANT

Never pull the switch up.

Speed shift switch

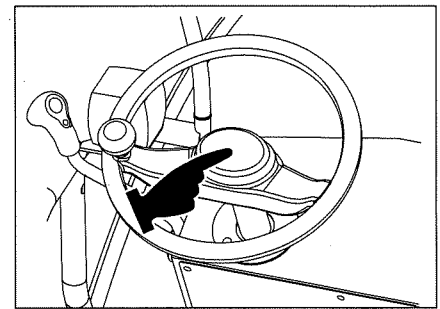
Selects two vehicle speed ranges.
Place the switch at the desired position.

LOW		0 ~ 8 km/h (0 ~ 5 mph)
HIGH		0 ~ 16 km/h (0 ~ 10 mph)



Horn switch

Pressing the button at the center of the steering wheel makes the horn sound.

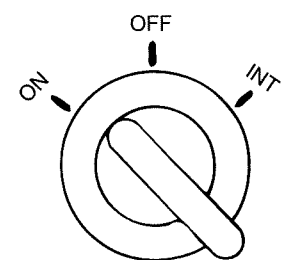


Sprinkler switch / Sprinkler timer

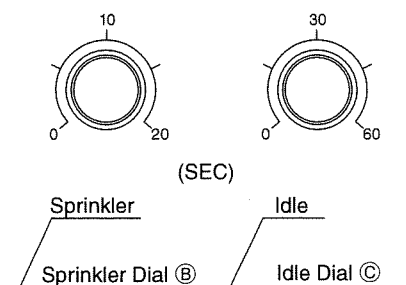
Switch (A) selects the sprinkler modes.
 ON : Continuous sprinkling is performed.
 OFF : Sprinkling is shut off.
 INT : Intermittent sprinkling takes place.

For the intermittent sprinkling, set the sprinkler timer at the desired sprinkling duration and idling duration (Sprinkling dial (B) , idling dial (C)). Then turn switch (A) to the INT position. Sprinkling will start.

Sprinkling duration can be adjusted within 0 ~ 20 seconds with dial (B) . Idling duration can be set within 0 ~ 60 seconds by turning dial (C) . Adjust the dials to meet job conditions.



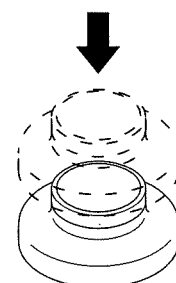
Sprinkler switch (A)



Hazard switch

Pressing the switch (triangle symbol) causes direction indicator and indicator lamp to flash simultaneously.

Pressing it again causes the indicator lamp to go off.

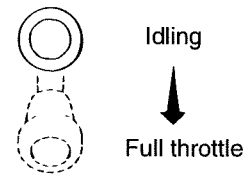


2. OPERATION

2.1.4 Operating levers and pedals

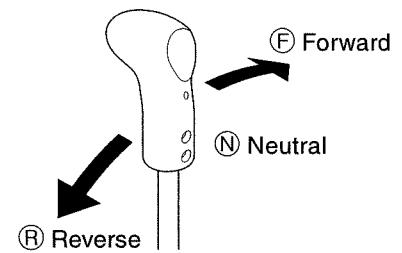
Throttle lever

Shift the engine RPM
The engine RPM increases when moved toward the operator.



Forward-reverse lever (F-R lever)

Moving the F-R lever forward or backward makes the machine travel forward or backward respectively. The neutral position brings the machine to a stop. The vehicle speed increases or decreases in proportion to the lever displacement.



IMPORTANT

- For normal braking, return the F-R lever back to neutral.
- In an emergency, depress the brake pedal. The F-R lever is simultaneously placed back to neutral along with the pedal movement. This combines the multi-disc static brake with the dynamic braking.

Unloader valve

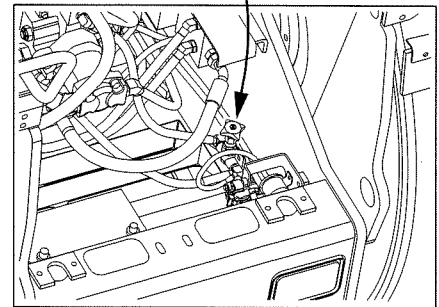
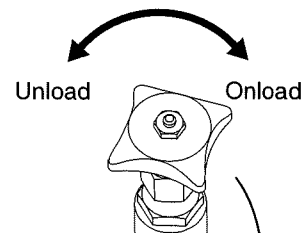
The unloader valve disengages the drive, playing a role like a clutch. Use this lever for towing the machine when the engine is disabled or when troubles have developed in the hydraulic drive.

☆ For towing (Unload):

- If engine can be started:
With the engine running, turn the unloader valve counterclockwise to open and turn OFF the parking brake switch.
- If engine does not start:
Disengage motor brake manually. (See “Disengaging the brake manually” on P30.)
Turn the unloader valve counterclockwise to open.

☆ For normal traveling:

- Turn the unloader valve clockwise to close.



⚠ WARNING

- On a slope, use extreme care when handling the unloader lever and towing the machine.
- Be sure to apply the parking brake when operating the unloader lever.

NOTE: With the lever in the UNLOAD position, the machine is not self-propelled. For normal travel, be sure to hold the valve in the ONLOAD position.

2. OPERATION

Brake pedal

In an emergency, push down on the pedal to the full extent, and the machine will come to a sudden stop.

IMPORTANT

Do not use the pedal wherever practicable except for an emergency. If used during the compacting operation of asphalt pavement, this can cause damage to its surface.

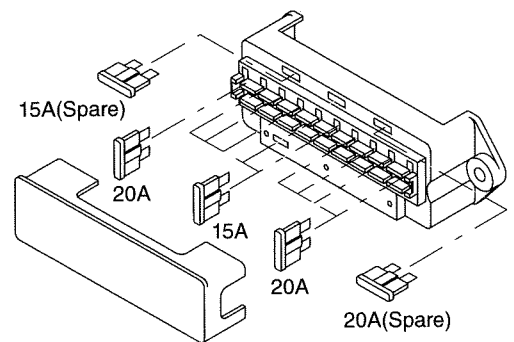
NOTE: Depressing the brake pedal brings the F-R lever into neutral (N).

2.1.5 Fuse box

⚠ WARNING

When changing a fuse, cut the power supply by turning the starter switch to the OFF position.

Fuses protect electrical components and wiring from burning. Change any fuse which has become powder-coated due to deterioration or which has a play between it and fuse holder. To replace fuses, take off the cover. Be sure to use fuses of correct capacity.

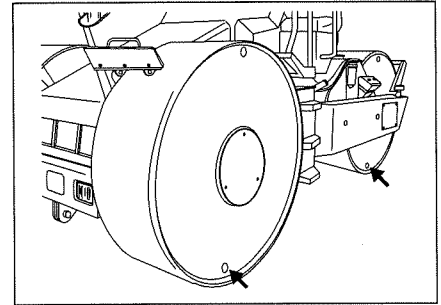


2.2 Handling and Adjustments

2.2.1 Ballast water

Each drum can be filled with ballast water.

- 1) Allow either of two plugs on the side of drum to come to the top.
- 2) Fill the drum from the top hole.
- 3) When filling is completed, replace and tighten the removed plug.



⚠ CAUTION

In cold weather, drain the drums by taking out the plugs to prevent freezing.

⚠ WARNING

Before filling the drums, be sure to engage the parking brake by pressing the parking brake button.

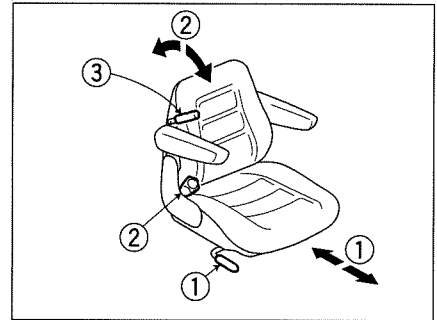
2. OPERATION

2.2.2 Seat adjustment

Adjust the seat for your best operating position. Move the lever as shown by arrow. With the lever held in that position, slide the seat forward or backward as desired. When properly adjusted, release the lever.

Adjust your seat position to suit you as follows:

- 1) Pull the lever ① and adjust seat position longitudinally.
- 2) Turn the backrest adjust dial ② for optimum angle.
- 3) Move the suspension lever ③ to select suitable suspension for your body weight.



⚠ WARNING

The adjustment will be necessary when operating the machine first or when operators are alternated.

2.2.3 Scraper adjustment and replacement

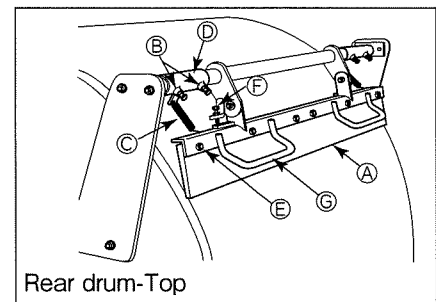
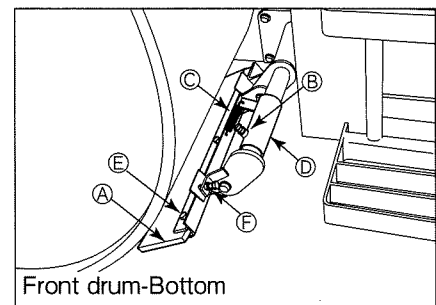
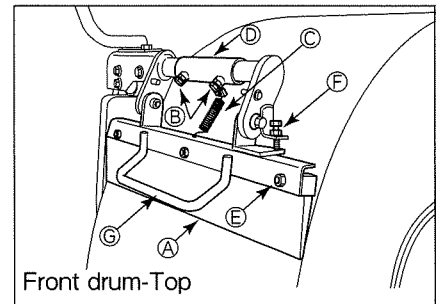
The procedures are the same for both the front and rear scrapers.

1) Pressure of scraper blade (A) on drum

- ① Loosen bolts (B) at two locations.
- ② With blade (A) and the drum in contact with each other, rotate set pipe (D) in the direction in which the spring (C) is extended. This increases the pressure on the drum.
- ③ If necessary to reduce the pressure, turn set pipe (D) in the direction in which the spring retracts.
- ④ Adjust bolt length (F) so that the blade stops where it comes in contact with roll.

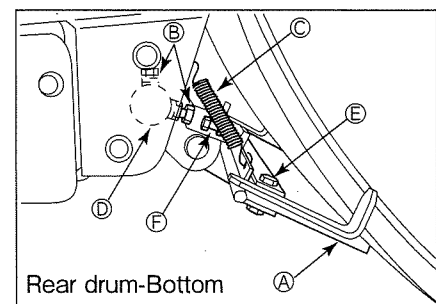
2) Scraper blade replacement

- ① Remove bolts (E) (3 locations on the front scraper and 6 locations on the rear one).
- ② Replace the blades.
- ③ Replace bolts (E) and tighten.



NOTE: The scraper blades can stay idle if held in the raised position as follows:

- ④ Grip the handle (G) and lift the blade. (Handles are provided at the front of front drum and rear of rear drum.)



⚠ WARNING

- When blade (A) is lifted to separate from the drum, raise it slowly by supporting it with both hands not to allow your hands to be pinched between the drum and blade.
- Exercise care so as not to have your hands caught between the roll and blade when returning the lifted blade (A) back to the original position.

2. OPERATION

2.2.4 Disengaging the brake when towing

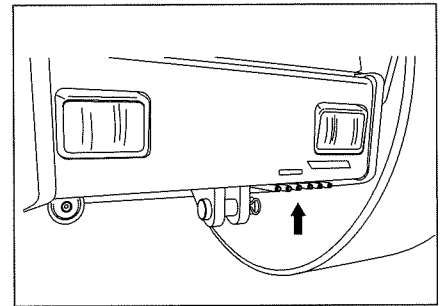
⚠ WARNING

- On a slope, chock the drums and prepare for towing before disengaging the brake.
- Start with the front drums, proceeding to the rear one.

For towing the machine when the engine is disabled or when troubles have developed in the hydraulic system for propulsion, disengage the brake as instructed below: The procedure is the same for both the front and rear brakes.

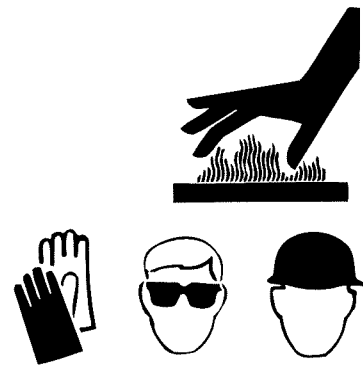
1) Front brake

- ① Remove the brake-disengaging bolts and washers from the machine frame.



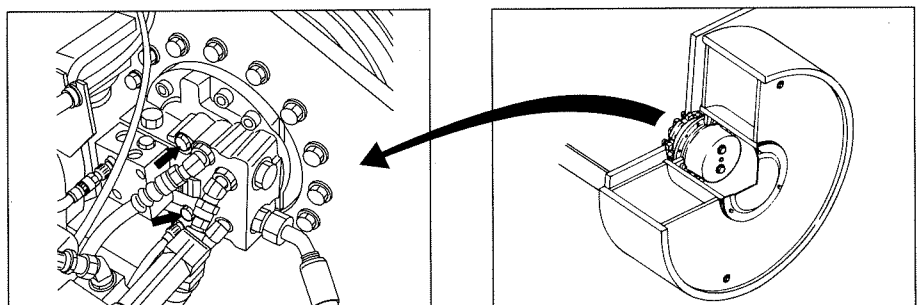
⚠ WARNING

- Do not try to release the brake immediately after a hot engine has been stopped. Let the oil cool down.
- For the brake disengagement, wear hard hat and safety goggles.



- ② Remove the motor plugs (2 locations) from under the front frame.

NOTE: Conduct the work rapidly, as the oil will gush out when the plugs are taken off.

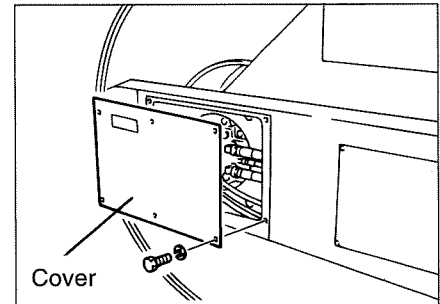


- ③ Screw in the removed bolts with the washers into the plug holes alternately. Screwing in them until they become a little tight will disengage the brake.

NOTE: Wash clean the brake release bolts and blank plugs before fitting to the motors.

2) Rear brake

- ① Loosen the cover securing bolts.
- ② Remove the bolts while pressing the cover on the frame.



⚠ WARNING

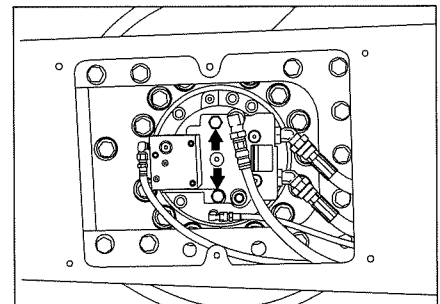
Hold the cover when removing the securing bolts, or else the cover will fall and cause injury.

- ③ Carefully lower the cover on the ground while supporting it by hands.

⚠ WARNING

When lowering the cover on the ground, hold it with both hands to prevent your feet from being caught between the cover and ground.

- ④ Remove the brake release bolts and washers from the machine frame.
- ⑤ Turn them into the plug holes alternately. When screwed in until they become a little tight, the brake will be disengaged.



NOTE: Perform the work rapidly, as the oil will gush out as the plugs are taken off.

- 3) When towing is complete, set the bolts and washers in the original position and fit the plugs in the motors securely.

2. OPERATION

2.3 Operation

⚠ WARNING

- Do not operate the machine from the left hand side seat except for work.
- This machine is a one-man roller.
- Operate the machine from the operator's seat.

2.3.1 Before-starting inspection

- 1) Check that the steering lock bar is in the carrying position.

⚠ WARNING

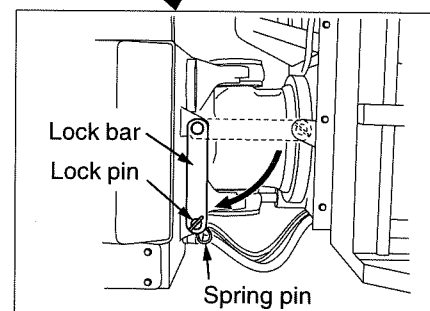
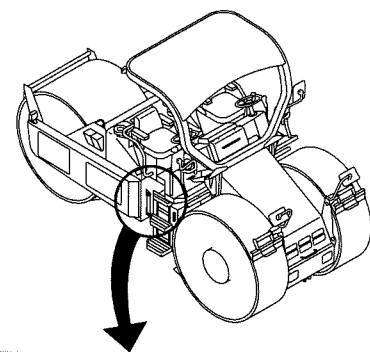
Make sure that the steering lock bar is connected in the carrying position before putting the machine in motion. Steering is impossible if the bar is in the steering lock position.

The bar is located at the right of the center of the machine.

To unlock the bar:

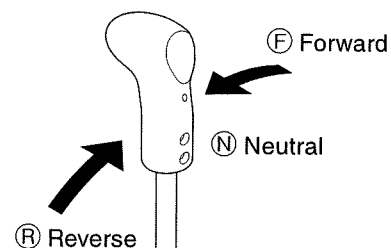
- ① Remove the spring pin.
- ② Pull out the lock pin.
- ③ Set the bar in the carrying position.

NOTE: Retain the lock bar in the locked position by inserting the lock pin into the lock holes. Fix the lock pin with the spring pin.



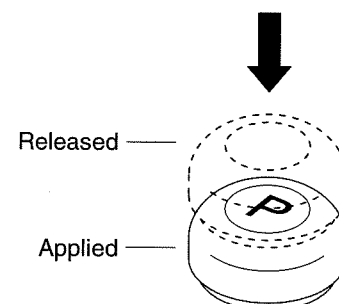
- 2) Check that the F-R lever is in the neutral position (N).

NOTE: The engine does not start if the F-R lever is not in the neutral position.



- 3) Check that the parking brake has been pressed.

NOTE: When the forward-backward lever is not at the neutral position or when the parking brake has been released, the interlock will be activated, preventing the engine from starting. Be sure to check that the forward-backward lever is at the neutral position and the parking brake has been pressed before starting the engine.

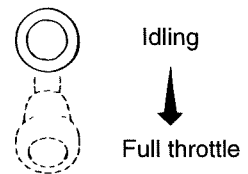


2.3.2 Starting the engine

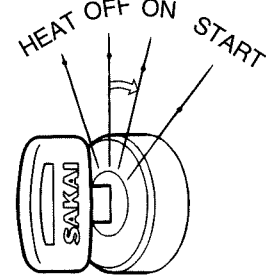
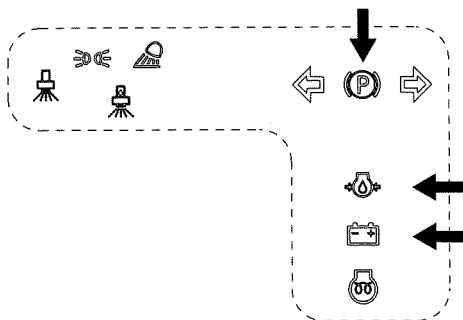
⚠ WARNING


After starting the engine, sound the horn and make sure that there are no personnel or obstructions close to the machine. Sound the horn when starting the engine after making certain that there are no one and no objects close to the machine.

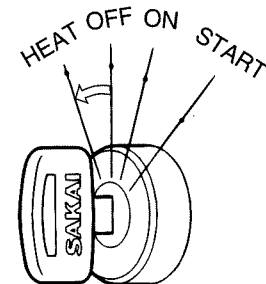
- 1) Set the throttle lever in a position slightly higher than IDLING.



- 2) Turn the starter switch to the ON position and check that the warning lamps and parking brake indicator lamp on the monitor display are on.

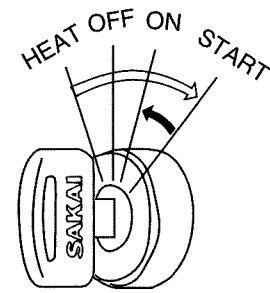


- 3) In cold weather, hold the starter switch in the HEAT position (for about 2 minutes), until the heater indicator lamp  goes on. Let the switch key to stay in this position till the indicator lamp goes off. Now the engine is ready to start.



2. OPERATION

- 4) Turning the key to the START position makes the engine start. Release the key the moment the engine has started. The key will automatically return to the ON position.



⚠ CAUTION

- Do not allow the starter key to stay in the START position for more than 15 seconds.
- When you fail in starting the engine, wait for more than one minute and then restart the engine.
- Check that the warning lamps on the monitor display go off immediately after the engine is started. If any of these warning lamps becomes bright while the engine is running, shut down the machine, determine the cause and rectify the fault.

2.3.3 After starting the engine

Try not to move to operation immediately after starting but observe the following:

IMPORTANT

Avoid increasing the engine speed abruptly before warming-up run is completed.

- 1) Run the engine at around 1,200 rpm for about 5 minutes to warm it up. Warming-up run allows the lubricating oil to reach the vital parts of the engine and hydraulic system, while gradually bringing up the engine oil and hydraulic oil to the working temperature.
- 2) After the warm-up operation, check that:
 - Temperature gaugePointer falls near the center zone.
 - Fuel gaugePointer falls between the E and F marks
 - Charge lamp.....Has gone off.
 - Engine oil pressure warning lamp.....Has gone off.
- 3) Check for the color of exhaust gas, listen for unusual sounds and vibration. If abnormal, determine the cause and correct the problem.

2.3.4 Traveling



⚠ CAUTION

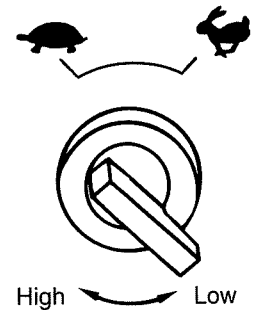
When travelling, do not turn the starter switch OFF.

⚠ WARNING

When starting, operate the horn after securing the safety around the machine.

- 1) Select HIGH or LOW speed by the operation of speed shift switch.

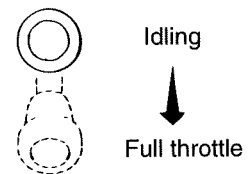
LOW		0 ~ 8 km/h (0 ~ 5 mph)
HIGH		0 ~ 16 km/h (0 ~ 10 mph)



⚠ WARNING

On a steep slope, run the machine at low speed.
Do not attempt to shift speed while travelling.

- 2) Speed up the engine by pulling the throttle lever towards you.



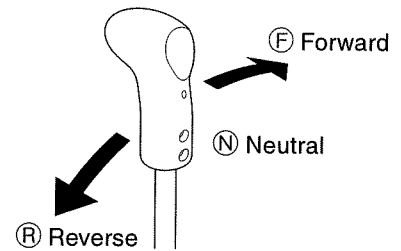
- 3) Press down parking brake switch button to release the brake.
Check that indicator lamp  goes off.

2. OPERATION

- 4) Move the F-R lever in the direction to travel, and the machine will begin traveling.

⚠ CAUTION
Avoid abrupt operation of the F-R lever.

NOTE: The travel speed can be controlled by the throttle lever and F-R lever.



⚠ WARNING

Pay extreme attention to the area behind the machine when backing, since the space just behind it tends to be a blind spot.

NOTE: If the engine speed drops frequently when the vehicle begins to move or while the vehicle is driving, increase the engine speed.

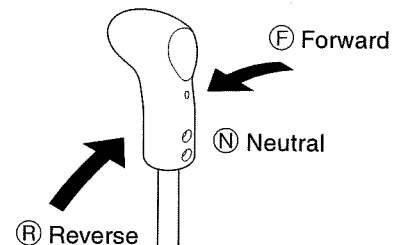
2.3.5 Stopping

⚠ WARNING

- Avoid abrupt braking. Try to leave enough time for braking.
- Avoid parking on a grade.
If necessary to park on a grade, block the wheel to prevent unexpected moving down the grade.

- 1) Bring the F-R lever to the neutral position (N), and the machine will come to a halt.

⚠ CAUTION
For normal braking, move the F-R lever back to the neutral position. In an emergency, depress the brake pedal. The F-R lever is placed back to neutral through a linkage. This combines the multi-disc static brake with the dynamic braking.



2) Press the parking switch button securely, and check that indicator lamp (P) illuminates.

2.3.6 Stopping the engine

1) Cool down the engine at idling for about 5 minutes with the throttle lever in the idling position.

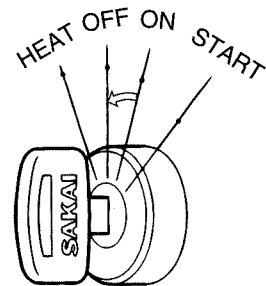
IMPORTANT

- Do not bring a hot engine to a sudden stop except for an emergency. This will shorten the life of its component parts.
- Do not also allow an overheated engine to come to a sudden stop, but run it at middle idling speed for gradual cooling down.

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

CAUTION

While travelling, do not turn the starter switch OFF.



3) Pull off the starter switch key.

WARNING

- When dismounting from the machine, apply the parking brake by actuating the parking brake switch. If necessary to park on a slope, chock the drums.
- Remove the starter switch key.

2. OPERATION

2.3.7 Check after stopping the engine

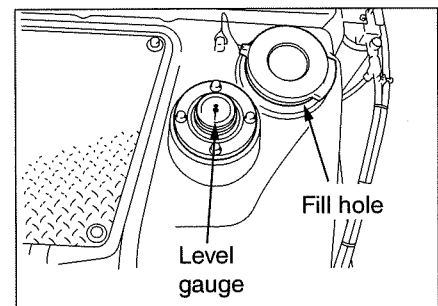
- 1) Perform the walk-around checks for oil and water leakage, abnormal signs around the drums.
- 2) Fill the fuel tank.
- 3) Remove waste paper if any from the engine compartment, as this will pose a possible fire hazard.
- 4) Scrape mud or other materials from and around the drums.

2.4 Sprinkler

Before sprinkling, check for the water level in the sprinkler tank on the gauge. Add water as necessary.

IMPORTANT

Use clean water wherever practicable.



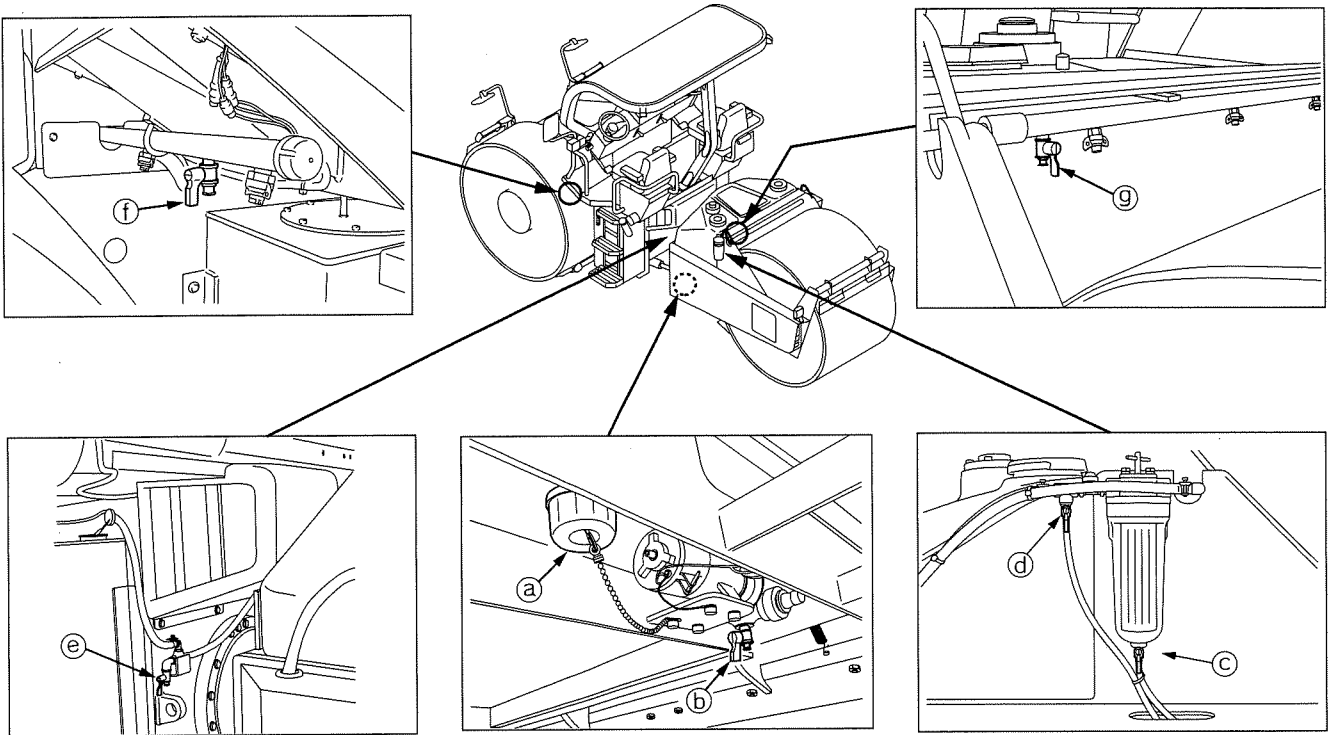
Two sprinkler modes are available continuous mode and intermittent (timer) one. Select depending upon job conditions. For use, see page 23.

IMPORTANT

When compacting asphalt mixes, select ON to fully wet the drum surface, then switch to "INT". Follow the same procedure for starting the work after a short break.

CAUTION

To avoid freezing, fully drain the sprinkler tank, pipes and filter in cold weather.



To drain water:

- ① Turn sprinkler tank drain cap (a) counter-clockwise and completely drain the tank.
- ② Open sprinkler pump drain (b) sprinkler filter drain valve (c) air bleeding valve (d) and drain valve (e) of the piping in the center pin part in order to completely remove water.
- ③ Drain the front and rear sprinkler pipes by opening valves (f) and (g).
- ④ In cold weather, also drain the hoses, pump and sprinkler nozzles.

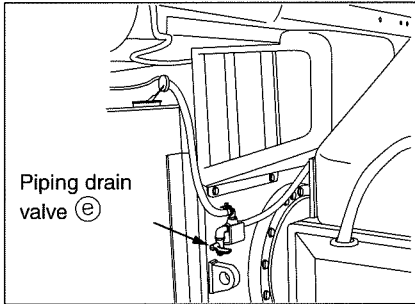
⚠ CAUTION

- Open the sprinkler tank cover when draining.
- “Open” the respective cocks when the weather is cold and after the operation is finished.

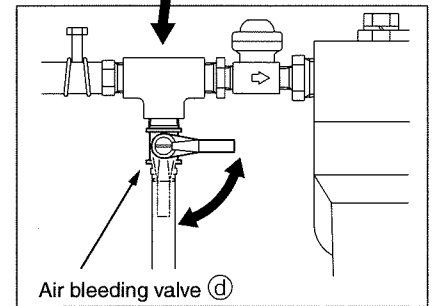
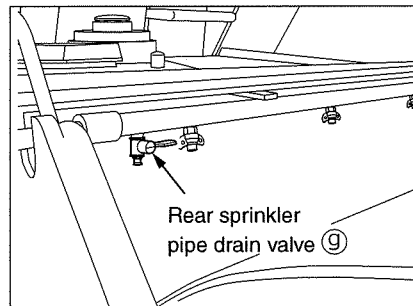
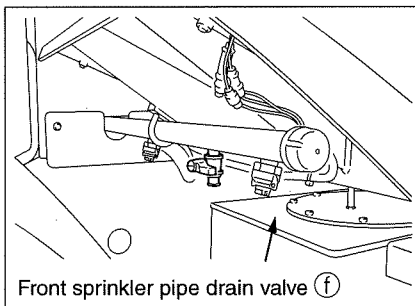
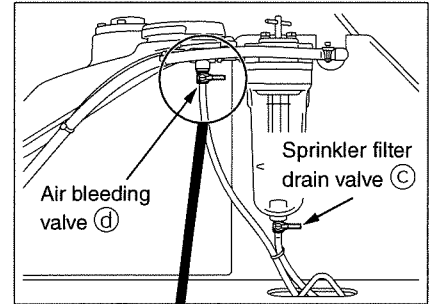
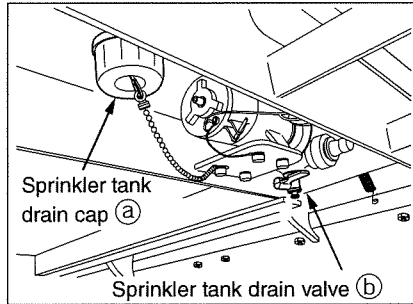
2. OPERATION

Water may not come out of the sprinkler nozzle when an attempt is made to spray water again after draining the water according to the procedure shown on P39. In that case, operate the machine according to the procedure shown below.

Front of vehicle



Rear of vehicle



Supplement to draining method

- ① Check that all the caps and valves (a)~(g) have been closed.
- ② Start the sprinkler pump.
- ③ Repeatedly open and close the air bleeding valve (d) to remove the air from the pipeline .
(Water will be discharged simultaneously.)
- ④ After confirming that the air has been removed completely, close the air bleeding valve (d) .

2.5 Precautions for Work

2.5.1 Compaction operation

■ Change the direction of travel gently.

- When changing the direction of travel during asphalt mix compaction, slowly shift the F-R lever.

2.5.2 When going downhill

■ Use the F-R lever.

- Run slowly by the operation of the F-R lever even if the travel distance is short.

■ Use the engine brake

- Go downhill by applying the engine brake along with the F-R lever operation.

⚠ WARNING

When going uphill, run at low speed. Do not attempt to shift speeds during travelling. The machine can slip down the slope.

2.5.3 On a slope

■ Working on a sidehill

- Work in an uphill/downhill direction, and avoid working on sidehill with the machine inclining sideways.

2. OPERATION

2.6 Applicable Jobs

The machines do a variety of jobs as listed below:

Work

- Asphalt road paving
- Dust removal treatment for road
- Road improvement
- Foundation building
- Construction of sidewalk, shoulder and gutter foundation
- Embankment construction
- Dam construction
- Railway construction
- Construction of forestry and farm roads

Material to be compacted

- Asphalt pavement
- Crusher run
- Cement concrete
- Sands
- Soils
- Slag
- Soft rock

Layers to be compacted

- Surface course, Binder course
- Base course
- Subgrade
- Embankment
- Shoulder
- Sidewalk

2.7 After Operation

Check for the coolant temperature, engine oil pressure and fuel level.

Follow the procedures below to prevent the machine from falling into an unworkable condition the following morning caused by muds and other extraneous matter on the drum, or frozen drums:

- 1) Remove muds and water from the machine. Muds can get into the seals together with water drops on the hydraulic cylinder piston rod. Damaged seals will result.
- 2) Park the machine on a hard and dry surface. If such a place is not available, cover the ground with hard plates.
- 3) Low temperatures, will cause a significant reduction of battery efficiency. Cover batteries or take them off from the machine and store in a warm place for the following day's operation.
- 4) To prevent the sprinkler water from freezing, observe the following (See page 39 for draining water):

IMPORTANT

- **Insufficient draining of water can cause troubles or damage to the system.**
- **Do not wash clean around the instrument panel and the reverse side of the dash board with high pressure water, as this can cause instrument failures.**

2.8 Loading and Unloading

⚠ WARNING

- **Use sturdy ramps with proper width, length and thickness which allow safe loading and unloading.**
- **If the ramps deflect considerably under load, apply wooden blocks to reinforce them.**
- **Loading should be conducted on a level and hard ground. Leave a sufficient distance between the machine and the shoulder.**
- **To prevent slippage on the ramps, keep the drums free from mud, oils, etc. The ramps must also be free of grease, oil and ice.**
- **Do not steer the machine on the ramps. If the machine is facing in the wrong direction, allow it to dismount from the ramps and correct the direction.**
- **Use only the properly rated capacity ramps for the machinery that is to be loaded/unloaded.**

For loading and unloading, use ramps or a proper loading stand.

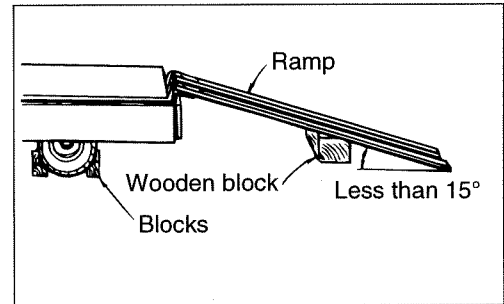
2. OPERATION

2.8.1 Use of a trailer equipped with a winch

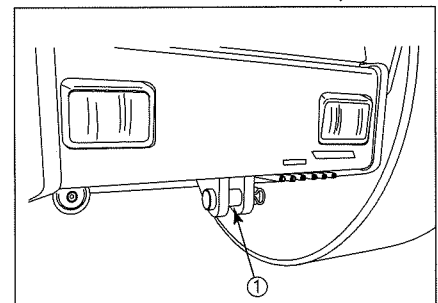
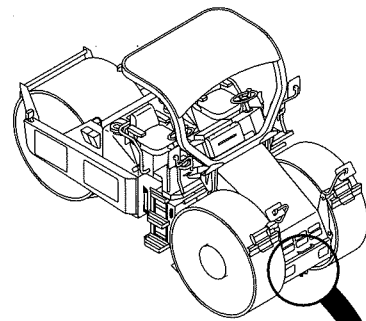
⚠ WARNING

Placing the unloader in UNLOAD position disrupts the power for traction. Do not enter the areas ahead of and behind the machine. It is very dangerous.

- 1) Engage the trailer brake and chock its wheels.
Fix the ramps so that the machine and trailer are completely aligned.
- ☆ The angle between the ramps and ground must be less than 15 degrees.
 - ☆ Leave a proper space between the ramps according to the width of the roller drum.



- 2) Decide the correct direction of run and make the machine run forward to the ramps.
- 3) Draw the wire rope from the trailer winch and put its hook on the hooking point ① of the roller.
- 4) Lift bonnet and place the unloader valve in unload position (See "Unloader valve" on page 25).
- 5) With the engine running at idle, perform loading by means of the trailer winch.
- 6) When the loading is completed, set the unloader valve back in the ONLOAD position.
- 7) Locate the machine correctly on the trailer.

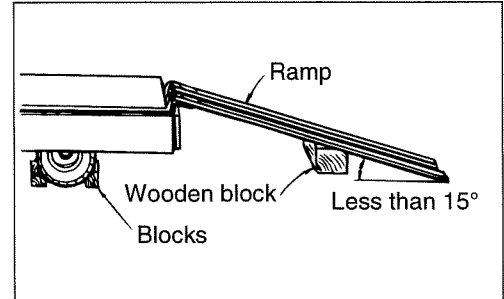


2.8.2 Self-propelling

1) Engage the trailer brake and chock its wheels. Fix the ramps so that the machine and trailer are completely aligned.

☆ The angle between the ramps and ground must be less than 15 degrees.

☆ Leave a proper space between the ramps according to the width of the roller drum.

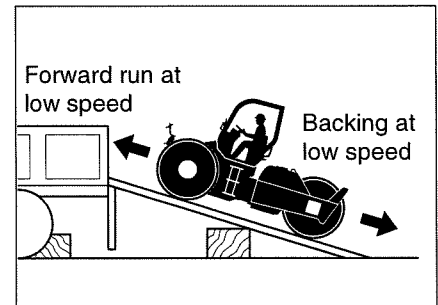


2) Decide the correct direction of run and conduct loading or unloading at low speed.

For loading, run forward at low speed.

For unloading, run backward at low speed.

3) Locate the machine correctly on the trailer.



2. OPERATION

2.9 After Loading the Machine

When the machine has been located properly on the trailer, tie it down as follows:

- 1) Press the parking switch button to apply the parking brake. Place wooden blocks under the drums to prevent movement.
- 2) Fix the machine with ropes tied at the front and rear towing hook holes. Particularly, pay attention to sidewise skidding.

2.10 Transportation

⚠ WARNING

To decide the transporting route, check the width of the road, height and weight (including the roller) of the trailer. Obey relevant regulations.

For transportation, obey traffic regulations.

2.11 Operation in Cold Weather

In cold weather, take the following measures to prevent troubles such as starting difficulty and coolant freeze-up.

2.11.1 Fuel oil and grease

Use fuel and oil with low viscosity. See "Rating" on page 70.

2.11.2 Coolant

⚠ WARNING

Do not bring an open flame to the anti-freeze or do not smoke when handling it. It is inflammable.

⚠ CAUTION

Never use methanol-, ethanol- and propanol-base antifreeze.

2. OPERATION

In freezing weather, add anti-freeze to the coolant referring to the table below. Select the most suitable mix ratio according the lowest temperature in the job location.

Ambient temperature	-33°C (-27.4°F)	-26°C (-14.8°F)	-20°C (-4°F)	-16°C (3.2°F)	-11°C (12.2°F)
Amount of anti-freeze	4.5ℓ (1.2gal)	4.1ℓ (1.1gal)	3.6ℓ (1.0gal)	3.2ℓ (0.9gal)	2.7ℓ (0.7gal)
Amount of water	4.5ℓ (1.2gal)	4.9ℓ (1.3gal)	5.4ℓ (1.4gal)	5.8ℓ (1.5gal)	6.3ℓ (1.7gal)
Ratio	50%	45%	40%	35%	30%

The rollers use a long-life coolant (non-amine type for general location: 35% in concentration ; for cold places:50%).Change the coolant at lease every two years.
Use non-amine type long-life coolant when changing coolant.

IMPORTANT

Use of a high consistency antifreeze coolant in summer time can cause the engine to overheat depending upon job conditions. Use a coolant with the water-antifreeze ratio of 70 to 30.

2.11.3 Battery

⚠ WARNING

- **Batteries generate explosive gases. Do not use an open flame close to batteries.**
- **The battery electrolyte is corrosion. Keep the electrolyte away from your eyes and skin. If you are affected by the electrolyte, flush with large quantities of water and get medical help.**

The battery capacity will drop when the temperature lowers, and the electrolyte may freeze. Keep the battery warm and in good condition to be ready for the operation on the next morning.

The condition of the battery can be confirmed by checking the indicator at the top of the battery. Check the condition of the battery. Charge or replace it with a new one as necessary.

- Blue Satisfactory (Good)
- White Charging is necessary (Charging necessary)
- Red Replacement is necessary (Electrolyte insufficient)

2. OPERATION

2.12 When the Cold Season is Over

When winter is over and the warm season has come, proceed as follows:

- 1) Change oil and fuel with those for use in warm season referring to "Rating" on page 70.
- 2) If AF-PT anti-freeze is in use drain, the coolant completely, wash clean inside the cooling system, and then fill with clean water, (city water).

2.13 For a Long Storage Period

For leaving the machine unused for longer than one month, proceed as follows:

- 1) Store the machine in a closed area after cleaning.
- 2) Conduct oiling, greasing and changing of oil.
- 3) Grease lubricate the exposed portion of hydraulic cylinder piston rods.
- 4) Cover the battery after disconnecting the negative cable or take off the battery from the machine and store in a safe place.
- 5) If the temperature is expected to go down below 0°C, add anti-freeze to the coolant.
- 6) Completely drain the sprinkler system.
- 7) Place the F-R lever in the neutral position (N), sprinkler switch in OFF, and apply the parking brake.
- 8) Chock the machine.
- 9) Remove the starter switch.

2.14 During the Storage Period

⚠ WARNING

If necessary to operate the machine for anti-corrosive purpose in closed area, ensure good ventilation keeping windows and doors open to prevent gas poisoning.

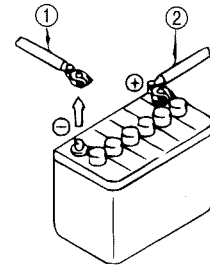
During storage, operate the machine at least once a month to prevent the oil films on the lubricated parts from deteriorating and to charge the batteries.

2.15 When the Battery Has Discharged

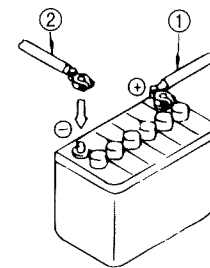
⚠ WARNING

- To check and handle the batteries, keep the engine stopped with the starter switch in the OFF position.
- The batteries give off explosive gases. Do not smoke close to the batteries. Keep flames and sparks away from the batteries.
- The electrolyte is very corrosive and will harm your clothing or skin. If the electrolyte has come into contact with your clothing or skin, flush with sufficient amount of water. In case the electrolyte has gotten into your eyes, flush with water and get medical help.
- To disconnect the battery cables, start with the negative terminal (earth). When connecting, start with the positive terminal. Do not allow a metallic item to bridge between the positive terminal and machine body. This can generate sparks, causing an explosion.
- Loose battery terminals can cause sparks. An explosion will result. When connecting the terminals, make certain that they are tight.

Disconnect with negative cable first



Connect with positive cable first

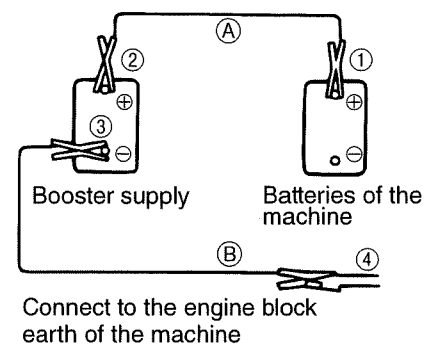


2.15.1 Connection and disconnection of booster cables

When jump-starting the engine, connect the booster cables as follows:

■ Connection of booster cables

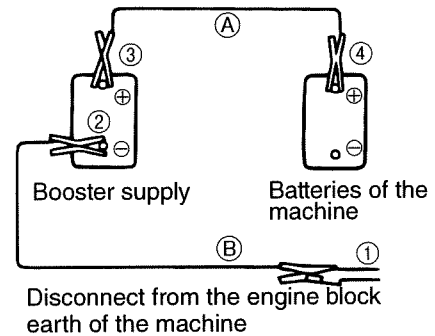
- 1) Connect one end of the positive booster cable (A) to the positive (+) terminal of the battery on the machine.
- 2) Connect the other end of the positive booster cable to the positive (+) terminal of the booster supply.
- 3) Connect the negative booster cable (B) to the negative (-) terminal of the booster supply.
- 4) Connect the other end of the negative booster cable to a good earth of the engine block of the machine.



2. OPERATION

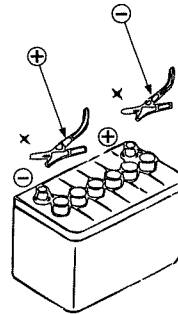
■ Disconnection of booster cables

- 1) Disconnect the negative booster cable (B) from the engine block earth.
- 2) Disconnect the negative booster cable (B) from the booster supply.
- 3) Disconnect the positive booster cable (A) from the booster supply.
- 4) Disconnect the positive booster cable (A) from the machine.



⚠ WARNING

- Do not allow the positive (+) terminal to make contact with the negative (-) terminal when connecting the booster cables.
- Wear safety goggles when jump-starting the engine.
- Do not allow the machine to make careless contact with the booster supply.
- Do not make wrong connections. Connect the negative (-) cable to the engine block earth far away from the battery, as sparks may occur when connecting.



⚠ CAUTION

- Use booster cables and end clips of proper size suited to the battery capacity.
- Use the batteries of the equal capacity for the machine and booster supply.
- Check booster cables and end clips for signs of damage and corrosion.
- Connect the clips positively.

3. PERIODICAL MAINTENANCE

3.1 Precautions

Whether or not the inspection service and lubrication are performed at the correct regular intervals exerts significant influence on the occurrence of trouble and service life of the machine. In this manual, typical intervals for inspection and service are given. However, flexibility should be introduced as to interval or type of services to enable your machine to always operate in the best condition.

General precautions:

- 1) Always use Sakai genuine parts for replacement.
- 2) Use lubricants recommended by Sakai. Avoid mixing different brand lubricants.
- 3) For hydraulic oil replenishment, changing, level checking, filter cleaning or replacement, oiling and greasing, use extreme care to prevent dust from entering.
- 4) For checking oil level or changing oil, park the machine on a level and hard surface.
- 5) Change oil while its temperature remains high after operation.
- 6) For a long-term storage, fill the fuel tank, lubricate necessary points and run the machine for more than 20 minutes once a month.
- 7) In freezing weather, add antifreeze to the coolant according to the ambient temperature.
- 8) For the hydraulic pump and motor, have them serviced at authorized service shops.
- 9) Turn the starter switch OFF when performing services such as repairing broken wires, short circuits and tightening loose terminals.

Periodical Replacement of Essential Maintenance Parts

In order secure safety for work and travel, conduct inspection and services. Further, for enhanced safety, following parts and components should be replaced periodically. These parts are prone to material deterioration due to aging or physical change due to wear, while it is difficult to determine their useful limit by regular inspection, which makes it necessary to replace with new ones after certain period of service to maintain their perfect function.

If any abnormality is detected such as crack, deformation, wear or oil leakage, go ahead and replace them even if it is within scheduled replacement time.

3. PERIODICAL MAINTENANCE

System or Mechanism	Part name	Periodical replacement maintenance part	Replacement period	Remarks
1.Brake system	Master cylinder	Seals (rubber parts)	2 years	
	Wheel cylinder	Seals (rubber parts)	2 years	
	Brake piping parts	Brake hose	2 years	
		Air hose	2 years	
Operating parts	Cable	4 years		
2. Steering system	Orbitrol	Seals (rubber parts)	2 years	
	Hydraulic piping parts	Hydraulic hose	2 years	
	Steering cylinder	Seals (rubber parts)	2 years	
	Hydraulic pump	Seals (rubber parts)	4 years	
3. Power transmission system (inclusive of axle)	Axle	Seals (rubber parts)	4 years	
	Travel pump	Seals (rubber parts)	4 years	
	Travel motor	Seals (rubber parts)	4 years	
	Hydraulic piping parts	Hydraulic hose	4 years	
	Isolation rubber	Isolation rubber itself	4 years	
4. Fuel system	Piping parts	Fuel hose	2 years	
5. Engine related	Engine mounting parts	Isolation rubber	4 years	
	Seals (rubber parts)	Packing and others	4 years	
	Drive parts	V-belt	2 years	or 500 hours
	Piping parts	Engine drain hose	4 years	
6. Cooling system	Piping parts	Radiator hose	2 years	
		Radiator drain hose	4 years	
7. Control related parts	Cable	Cable	4 years	
8.Intake system	Piping parts	Intake hose	2 years	
		CAC hose	2 years	
9.Flood system	Hydraulic piping parts	Fuel hose	4 years	

▲ CAUTION

- **With a new machine, drain water the fuel sedimenter (refer to page 59), change the engine oil and change the engine oil filter elements (refer to page 62) after 50 hours of operation for the first time only.**
- **When trouble occurs in the location indicated by the indicator lamp on the monitor display, sensor will work and corresponding lamp comes on. If this occurs, conduct necessary service regardless of the periodical service interval recommendation.**
- **Check the electric wiring at a regular interval not exceeding one month:
If there are some trouble on the electric wiring, replace them with new one.**
 - 1) **Damage to the wire harness and loose clamps**
 - 2) **Loose sockets**
 - 3) **Function of electrical systems**
- **For the parts other than listed above, if there are some trouble on the parts at periodical inspection or daily check, replace them as soon as possible.**

3.2 Walk-around Checking

For efficient operation, daily, before-operation checking is very important. Before starting, perform walk-around checking for loose bolts, nuts and signs of leakage in addition to items as shown below:

Hydraulic components and joints:

Oil leakage

Air cleaner:

Clogging

Fan belt:

Tension

Fuel tank:

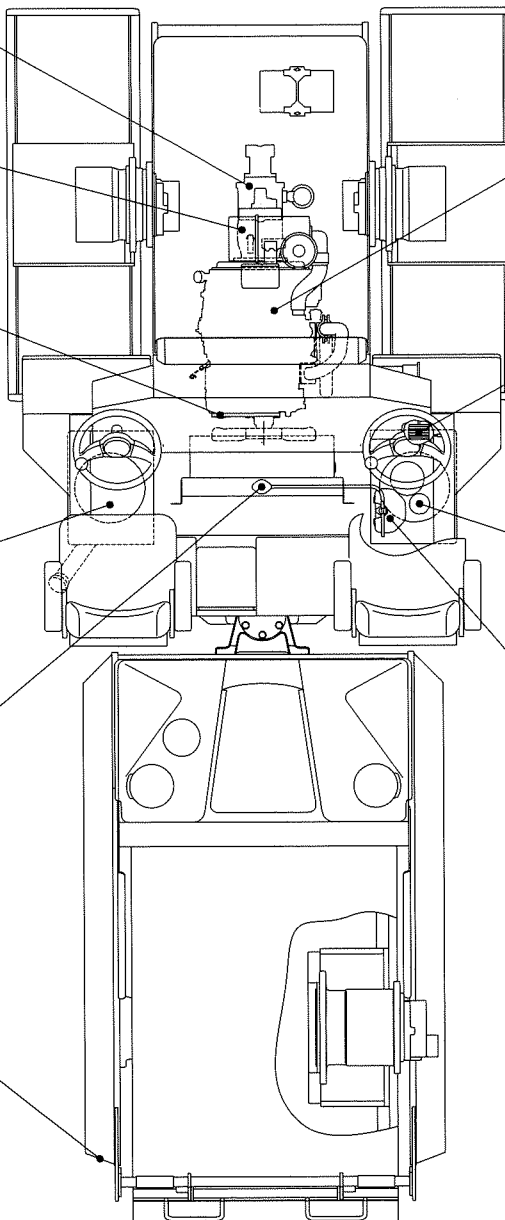
Fuel leakage
Fuel level

Radiator:

Coolant leakage
Fin cleanliness

Lamps:

Function



Engine:

Oil leakage
Fuel leakage
Oil level
Loose bolt

Brake pedal:

Proper function

Hydraulic oil tank:

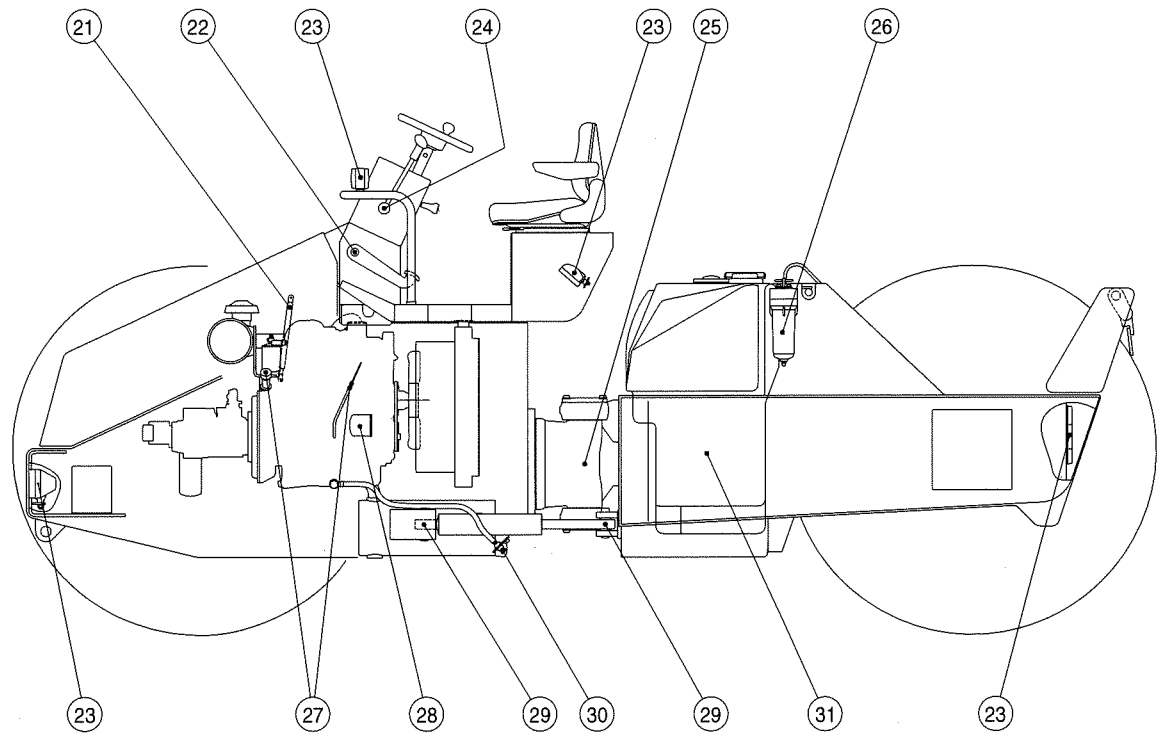
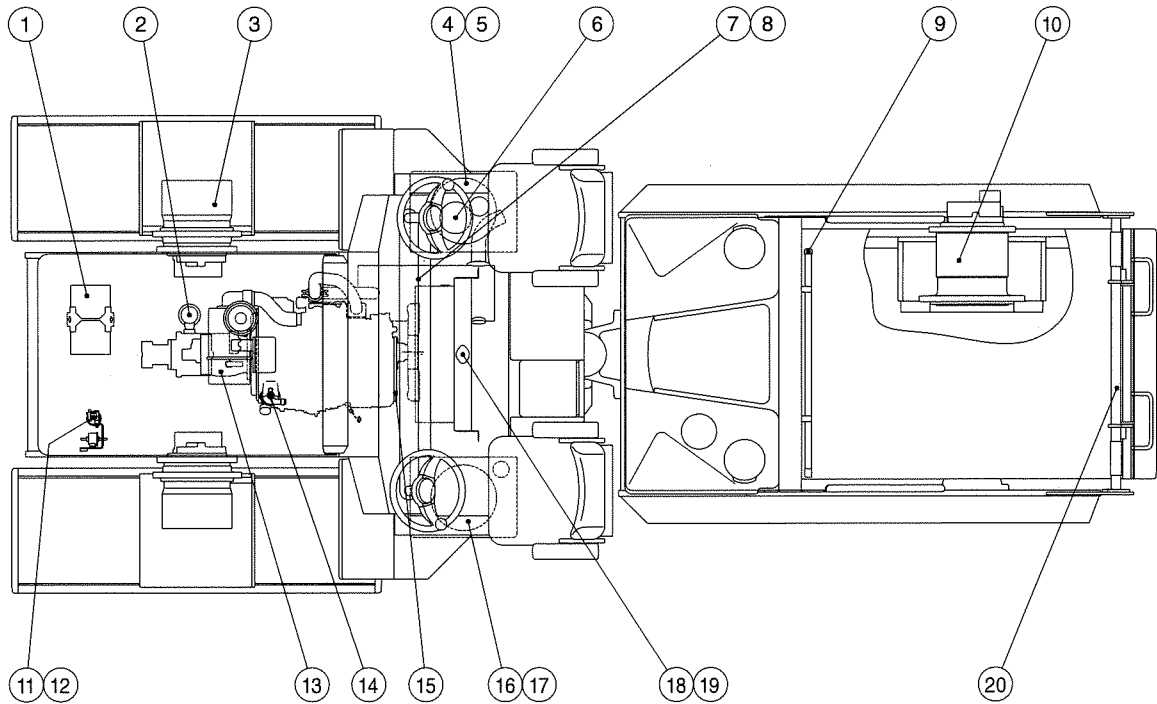
Oil leakage
Oil level

Coolant reservoir:

Coolant level

3. PERIODICAL MAINTENANCE

3.3 Periodical Maintenance Points



3. PERIODICAL MAINTENANCE

Interval	Sym-bol.	Location	Inspection and service	Lubricant	Q'ty
Every 10 hours or daily	⑮	Fan belt	Check and adjust tension		1
	⑯	Fuel tank	Check level and replenish	Diesel oil	1
	⑱	Radiator	Check coolant level and replenish	Coolant	1
	⑳	Engine oil pan	Check level and replenish	Engine oil	1
Every 50 hours	①	Battery	Check hydrometer		1
	④	Hydraulic oil tank	Check oil level and replenish	Hydraulic oil	1
	⑦	Steering chain	Apply gear oil	Gear oil	1
	㉒	Bake pedal	Apply grease	Grease	2
	㉔	F-R lever	Apply grease	Grease	2
	㉕	Center pin	Apply grease	Grease	4
Every 100 hours	㉙	Steering cylinder	Apply grease	Grease	2
	⑪	Fuel sedimenter	Check and remove water and sediment		1
Every 250 hours	⑧	Steering chain	Check and adjust tension		1
Every 500 hours	②	Line filte	Replace element		1
	⑫	Fuel sedimenter	Replace element		1
	⑭	Fuel filter	Replace element		1
	⑲	Radiator	Clean fins		1
	㉘	Engine oil filter	Replace element		1
	⑳	Engine oil pan	Change oil	Engine oil	1
Every 1000 hours	③	Gear case: Wheel motor	Inspection, maintenance or replacement	Gear oil	2
	⑤	Hydraulic oil tank	Clean internals and change oil	Hydraulic oil	1
	⑥	Suction filter	Clean or replace filter element		1
	⑩	Gear case: Wheel motor	Inspection, maintenance or replacement	Gear oil	1
As required	⑨	Sprinkler pipe and nozzle	Clean or change		-
	⑬	Air cleaner	Clean or replace element		1
	⑰	Fuel tank	Clean inside		1
	㉐	Scraper	Adjust or replace blade		-
	㉑	Gas damper	Check or change		1
	㉓	Bulbs	Blowout check		-
	㉖	Sprinkler filter	Clean or replace element		1
⑳	Sprinkler tank	Clean inside		1	

3. PERIODICAL MAINTENANCE

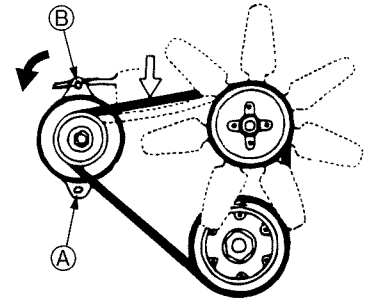
3.4 Maintenance Procedure

➔ For servicing the engine, see the separate engine manual.

(1) Every 10 hours or daily

⑮ Fan belts

- 1) Check the fan belt for wear and damage. Replace as necessary.
- 2) Depress each belt midway with a push of about 10 kg. The tension is appropriate if it sags 10 ~ 15 mm.
- 3) For adjustment, loosen alternator bracket bolt (A) and adjusting plate bolt (B), and slide the alternator. To tighten, move the alternator as shown by arrow.



⑯ Fuel tank

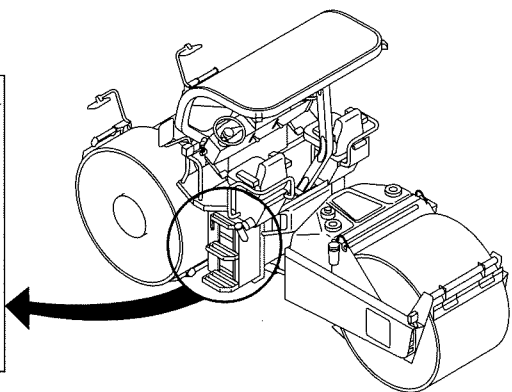
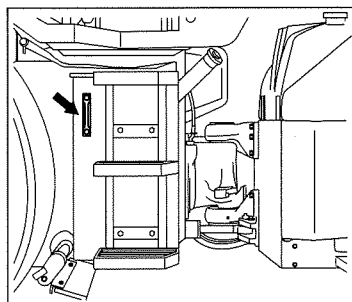
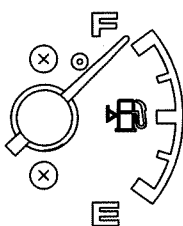
Check the fuel level with the fuel gauge or the level gauge. Add as necessary from fill hole. Fuel filler port cap can be opened with the starter key inserted.

IMPORTANT

Strainer should remain installed while refueling.

⚠ WARNING

For refueling, park the machine on a level and solid surface.



⚠ CAUTION

Be sure to use fuel recommended by SAKAI (refer to page 70).

⑱ Radiator

With the cap removed, check to see if the coolant level is near the port. Add as necessary.

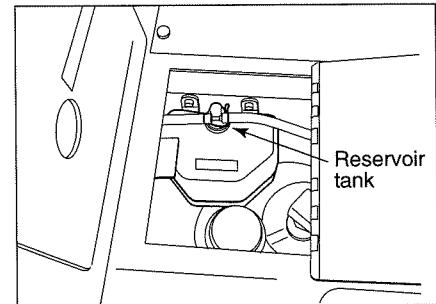
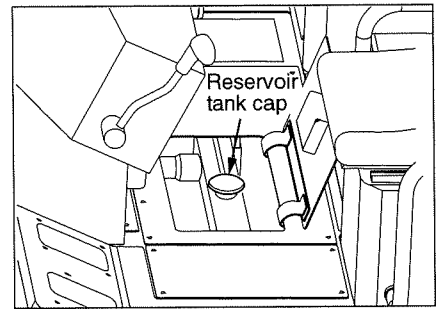
Further, run the engine at idling speed for a few more minutes and make sure that coolant level in reservoir tank is between L and H marks. If insufficient, replenish with the tank cap removed. Use soft water only.

IMPORTANT

Replace the coolant with new ones two years.

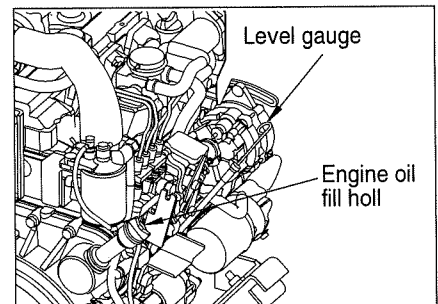
⚠ WARNING

Do not remove the radiator cap while the coolant is not.



⑳ Engine oil pan

Shutdown the engine and check the engine oil level. If it is not between MAX and MIN marks, add oil through the fill hole.

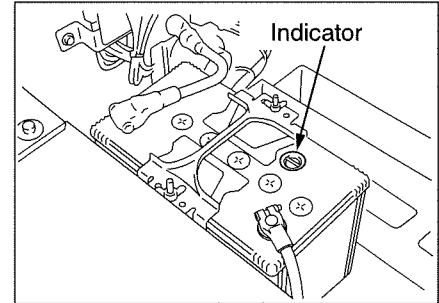


3. PERIODICAL MAINTENANCE

(2) Every 50 hours

① Battery

- 1) The condition of the battery can be confirmed by checking the indicator at the top of the battery. Check the condition of the battery. Charge or replace it with a new one as necessary.

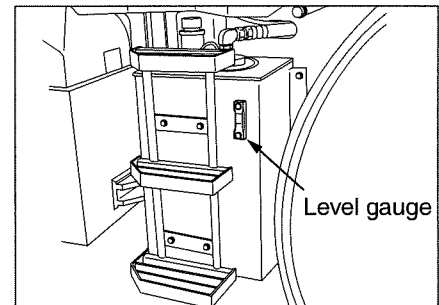


- Blue Satisfactory (Good)
- White Charging is necessary (Charging necessary)
- Red Replacement is necessary (Electrolyte insufficient)

- 2) Retighten any loose terminal. Apply grease or vaseline to the terminals to retard rusting.

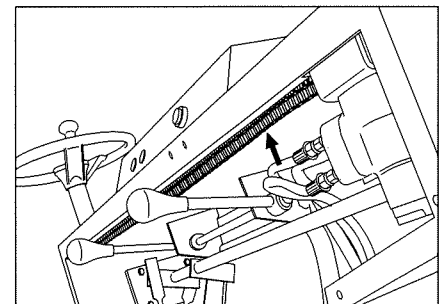
④ Hydraulic oil tank

- Check the oil level with the sight glass on the side of tank. The level is proper if it is between H and L marks. If necessary, add the hydraulic fluid from the fill port.



⑦ Steering chain

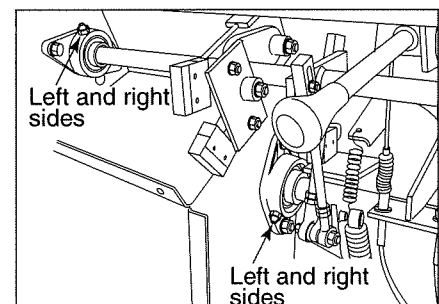
- Lubricate the chain with gear oil.



⑳ Brake pedal

㉔ F-R lever

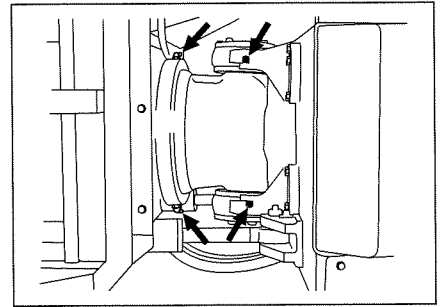
- Grease the bearing units.



3. PERIODICAL MAINTENANCE

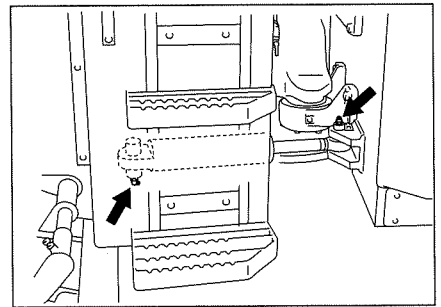
25 Center pin

Grease the bearing at four locations.



29 Steering cylinder

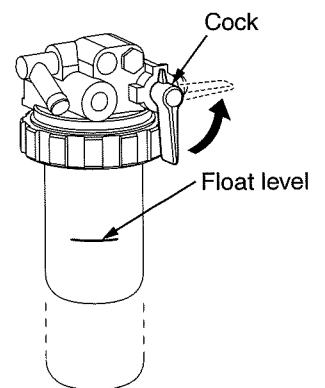
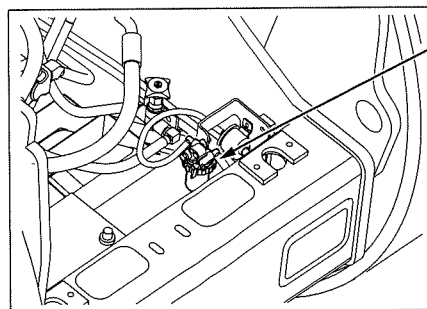
Grease the fitting at two locations.



(3) Every 100 hours

11 Fuel sedimenter

Check the float level. If it comes up to the warning mark, take off the plug at the bottom and drain water.



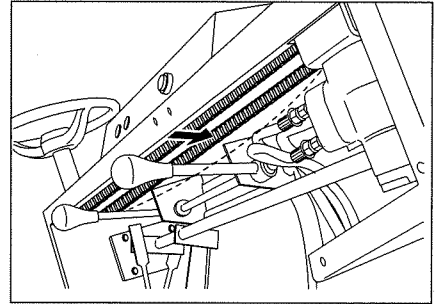
NOTE: After purchasing a new vehicle, drain water 50 hours after the initial operation

3. PERIODICAL MAINTENANCE

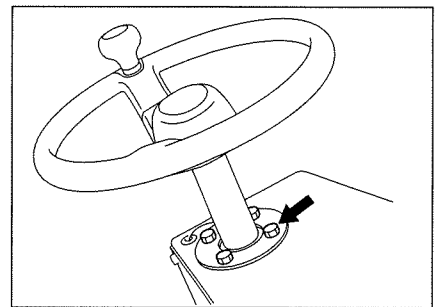
(4) Every 250 hours

⑧ Steering chain

- 1) Check the tension. A correctly adjusted chain sags 25 ~ 30 mm when pressed with a push of about 2 kg at midway of the chain in the back.



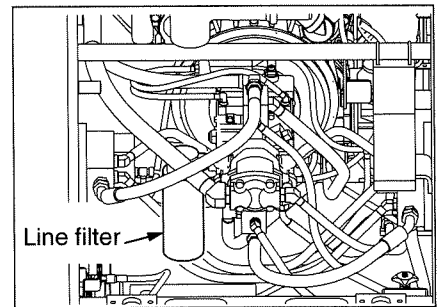
- 2) To adjust, loosen the four fixing bolts below the left hand side steering wheel and slide the steering column.



(5) Every 500 hours

② Line filter

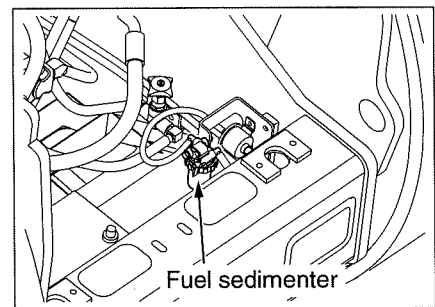
Change the element.



⑫ Fuel sedimenter

→ See the separate engine manual.

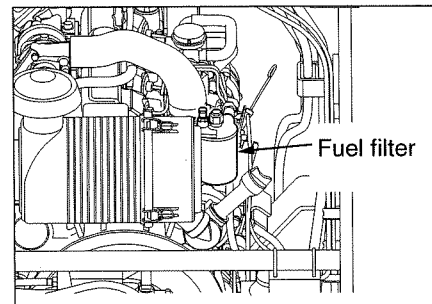
Change the element.



⑭ Fuel filter

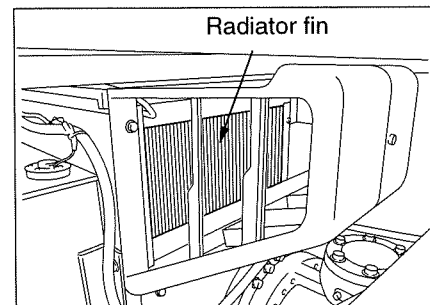
→ See the separate engine manual.

Change the element



⑲ Radiator

Clean the fin to remove the clogging matter.



3. PERIODICAL MAINTENANCE

28 Engine oil filter

30 Engine oil pan

→ See the separate engine manual.

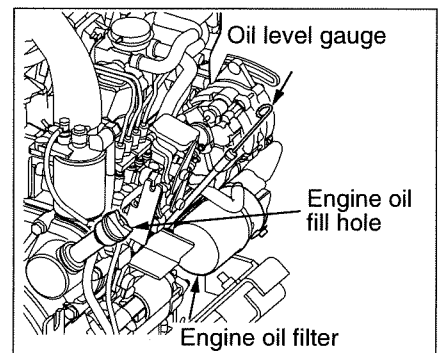
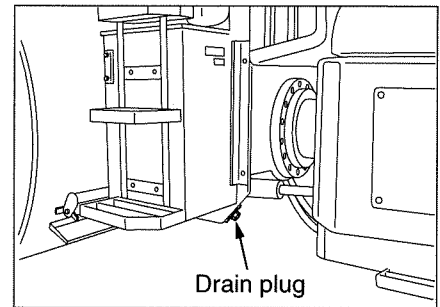
- 1) After completion of operation and while the oil is warm, drain the oil with the drain plug removed.

⚠ WARNING

When draining a hot oil, use care not to get burned.

- 2) Refit the drain plug and fill the crankcase with the engine oil from the fill hole on the cylinder head cover.
- 3) Change the oil filter element.

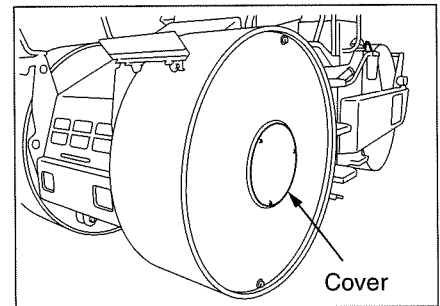
NOTE: After purchasing a new vehicle, change the oil and replace the oil filter element 50 hours after the initial operation



(6) Every 1000 hours

③ Gear case : Wheel motor

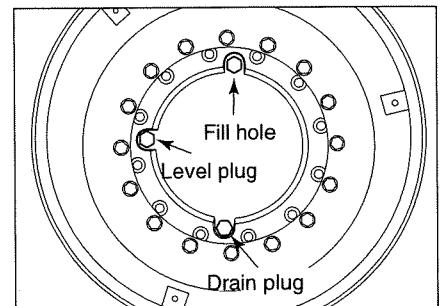
- 1) With the cover removed from the front drums, position the drums so that the drain plug comes to the bottom.
- 2) Remove the drain plugs and drain the oil while it is warm.



- 3) Refit the drain plugs and fill the oil through the fill holes until it overflows at the level holes.

⚠ WARNING

When draining a hot oil, be careful not to get burned.

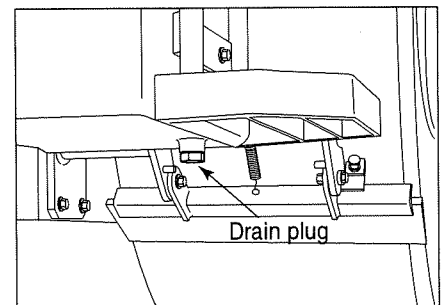


⑤ Hydraulic oil tank

- 1) Remove the drain plug and drain the oil while it is warm.
- 2) After cleaning the inside of the tank, fill the tank to the specified level with new hydraulic fluid.
- 3) Start and run the engine at idling for 2 ~ 5 minutes. When air bubbles have disappeared from the oil, stop the engine and check the oil level again.

⚠ WARNING

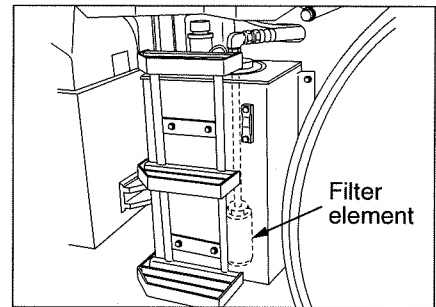
When draining a hot oil, be careful not to get burned.



3. PERIODICAL MAINTENANCE

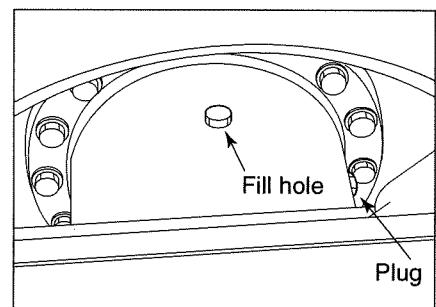
⑥ Suction filter

Turn the filter counter-clockwise viewed from the bottom, and change it.



⑩ Gear case : Wheel motor

- 1) Position the rear drum so that any one of the four plugs comes to bottom.
- 2) Remove the bottom plug and drain the oil while it is warm.
- 3) Refit the plug and fill oil from the top hole till it overflows through a side hole.

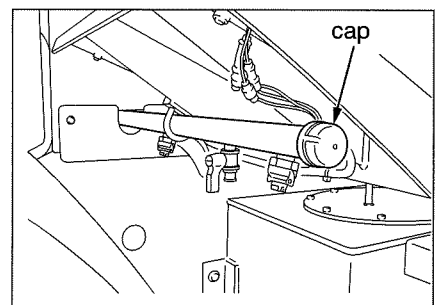


(7) As required

⑨ Sprinkler pipe / Nozzle

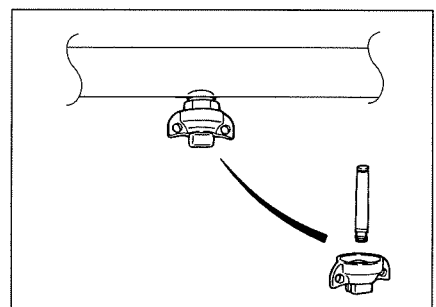
1) Pipe

Remove the cap from both ends of each sprinkler pipe. Operate the sprinkler pump to wash out dust from inside the pipe.



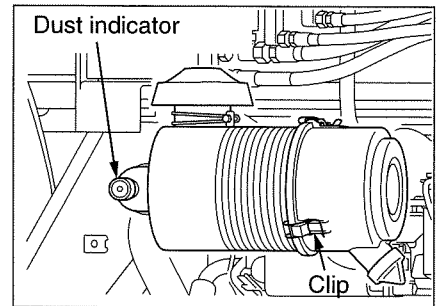
2) Nozzle

- Remove the nozzles from the sprinkler pipes and separate the filter from each nozzle.
- Clean the filters. Use a needle or the like to clean nozzle hole. Refit the filters to the nozzles.
- Fit the nozzles to the pipes so that the water is sprayed in the form of a hand fan in parallel with the pipe.



⑬ Air cleaner

When the red moving piece of the dust indicator reaches the service level (mark on the dust indicator), clean the outer element in the manner shown below.



- 1) Open the hood, remove the clip on the air cleaner case, and remove the cover.
- 2) Pull the outer element straight out of the element case so as not to damage the outer element.
- 3) Blow compressed air from the inside of the outer element for cleaning. The air pressure shall not exceed 686 kPa {7 kgf/cm²}. If the element has scratches, holes, or oil spots, replace it with a new one.

⚠ WARNING

- Stop the engine before inspection, cleaning, or maintenance, otherwise dust will enter the engine, causing the breakdown of the engine.
- Wear protective goggles, a dust respirator, and other protective gear before cleaning the air cleaner and outer element in order to prevent dust from entering your eyes or nose.

- 4) Attach the outer element and clamp it with a clip.

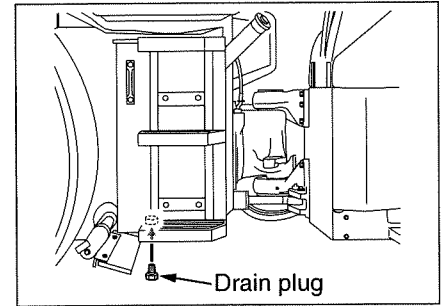
⚠ CAUTION

- Clean only the outer element. Do not remove the inner element.
- If the red moving piece of the dust indicator still reaches the service level after the outer element has been cleared, replace the outer element with a new one.
- Replace the outer element every year or after it is cleaned five times when the vehicle is operated under normal conditions. Be sure to replace the inner element together with the outer element.
- Shorten the outer element cleaning and replacing intervals as necessary when our vehicle is used under severe conditions.
- Be sure to use our genuine element.

3. PERIODICAL MAINTENANCE

⑰ Fuel tank

- 1) Remove the drain plug and drain water and sediment from the bottom of the tank.
- 2) If there is significant sediment, remove the drain plug and wash clean the inside of the tank.
- 3) When the necessary work and refueling are complete, tighten the filler cap positively.



NOTE: When the fuel tank is full, the fuel may gush out if the drain plug is loosened to excess.

⚠ WARNING

- The fuel will catch fire if open flames or ignition sources are used close to it.
- Do not smoke or use a match or cigarette lighter close to it.



⑳ Scraper

When the gap between the drum and blade has grown large, adjust the scraper properly. To clear muds accumulated between the roll and scraper blade, raise the blade

⚠ WARNING

Exercise care not to pinch your fingers between the drum and blade.

See page 29 for adjustment.

㉑ Gas damper

Raise the hood, and check to see if it is supported by the gas damper. When the hood is not supported by the gas damper, replace the gas damper with a new one.

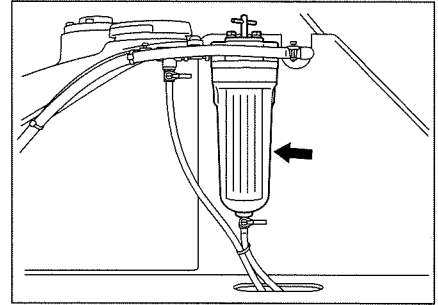
㉓ Bulbs

Operate the switches on control panel to confirm whether bulbs (turn signal lamps, head lamps, flood lamps, rear combination lamps) flash or light up. If any lamp does not flash or light up, the bulb has burnt out; replace it with a new one.

3. PERIODICAL MAINTENANCE

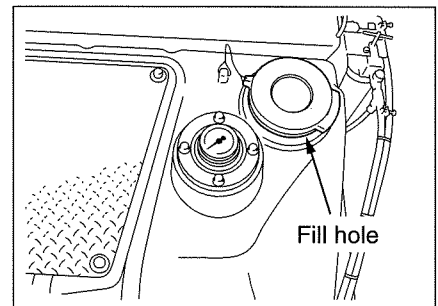
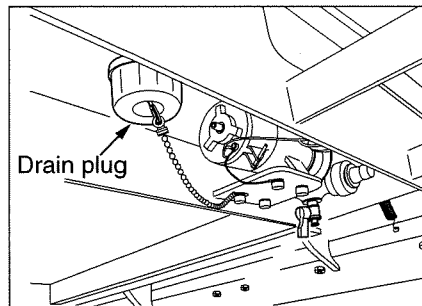
②⑥ Sprinkler filter

Turn the filter case counterclockwise and clean the element.



③① Sprinkler tank

Remove the drain cap, feed water through the fill hole to clean the inside of the tank.



3. PERIODICAL MAINTENANCE

3.5 Consumable Parts

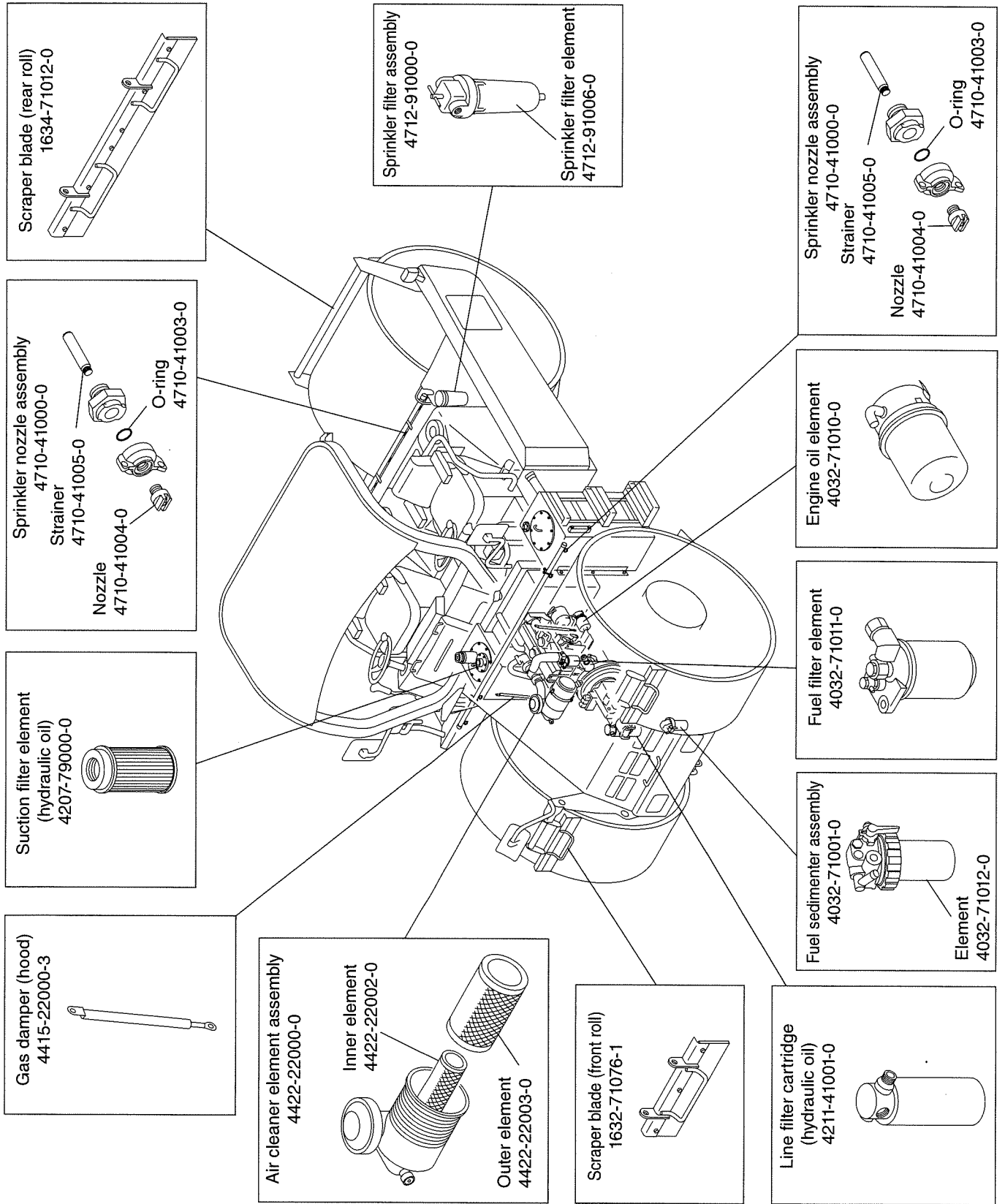
Replace consumable parts such as filter elements and air cleaner elements during periodical maintenance or before reaching the wear limit. Proper replacement of consumable parts will improve the overall life of the machine, resulting in cost-effective operations.

Use genuine SAKAI parts as replacement parts.

The part numbers are subject to change due to the improvements to the parts. When ordering parts, make sure to obtain the latest part numbers by checking with our distributorship or one of our certified service shops of the version, model name and model number of the vehicle in use.

Consumable Part	Part No.	Interval		Remark
		Annual replacement (year)	Replacement per operation (hours)	
Engine oil element	4032-71010-0		500	
Fuel sedimenter assembly	4032-71001-0		As required	
Element	4032-71012-0		As required	
Fuel filter element	4032-71011-0		500	
Air cleaner assembly	4422-22000-0		As required	
Inner element	4422-22002-0	1	Replacement simultaneously with the outer element	
Outer element	4422-22003-0	1	After cleaning five times	
Suction filter element (hydraulic oil)	4207-79000-0		1,000	Clean or replacement
Line filter cartridge (hydraulic oil)	4211-41001-0		500	
Sprinkler filter assembly	4712-91000-0		As required	
Sprinkler filter element	4712-91006-0		As required	
Sprinkler nozzle assembly	4710-41000-0		As required	
Nozzle	4710-41004-0		As required	
O-ring	4710-41003-0		As required	
Strainer	4710-41005-0		As required	Clean or replacement
Scraper blade (front roll)	1632-71076-1		As required	
Scraper blade (rear roll)	1634-71012-0		As required	
Gas damper (hood)	4415-22000-3	2		
Gas damper (canopy)	4415-22000-3	2		

3. PERIODICAL MAINTENANCE



3. PERIODICAL MAINTENANCE

3.6 Feeding Water and Lubricants

(1) General rules

- 1) Never feed water or lubricant with the strainer removed.
- 2) Use recommended lubricant and hydraulic fluid.
- 3) Do not use lubricants and hydraulic fluid of different brands.
- 4) When changing oil, drain it completely and clean the container with flushing oil before filling new oil.
- 5) Be sure to use fuels and greases designated/recommended by SAKAI. Faulty due to the use of those not designated/recommended by SAKAI is out of the scope of repair and guarantee.

(2) Capacity

Compartment		Type of fluid	Capacity in liters (gal.)
Fuel tank		Diesel oil	100 (26)
Engine oil pan		Engine oil	11.2 (3.2)
Hydraulic tank		Hydraulic oil	85 (22.5)
Radiator		Coolant	9 (2.4)
Sprinkler water tank		Water	680 (180)
Hydraulic motor	Front drum	Gear oil	3.2 x 2 (0.8 x 2)
	Rear drum		3.6 (1)

(3) Rating

Lubricant	Service classification	Ambient temp. and applicable viscosity rating			Applicable standards
		-15 ~ 30°C (5 ~ 86°F) Cold	0 ~ 40°C (32 ~ 104°F) Moderate	15 ~ 55°C (59 ~ 131°F) Tropical	
Engine oil	API grade "CF"	SAE 10W-30	SAE 30	SAE 40	MIL-L-2104D
Gear oil	API grade "GL4"	SAE 80W-90	SAE 90	SAE 140	MIL-L-2105
Hydraulic oil	Wear resisting	ISO-VG32 over VI 140	ISO-VG46 over VI 140	ISO-VG68 over VI 110	ISO-3448
Grease	Lithium type extreme-pressure grease				NLGI-2
Fuel	Diesel oil				ASTM-D975-2D

3. PERIODICAL MAINTENANCE

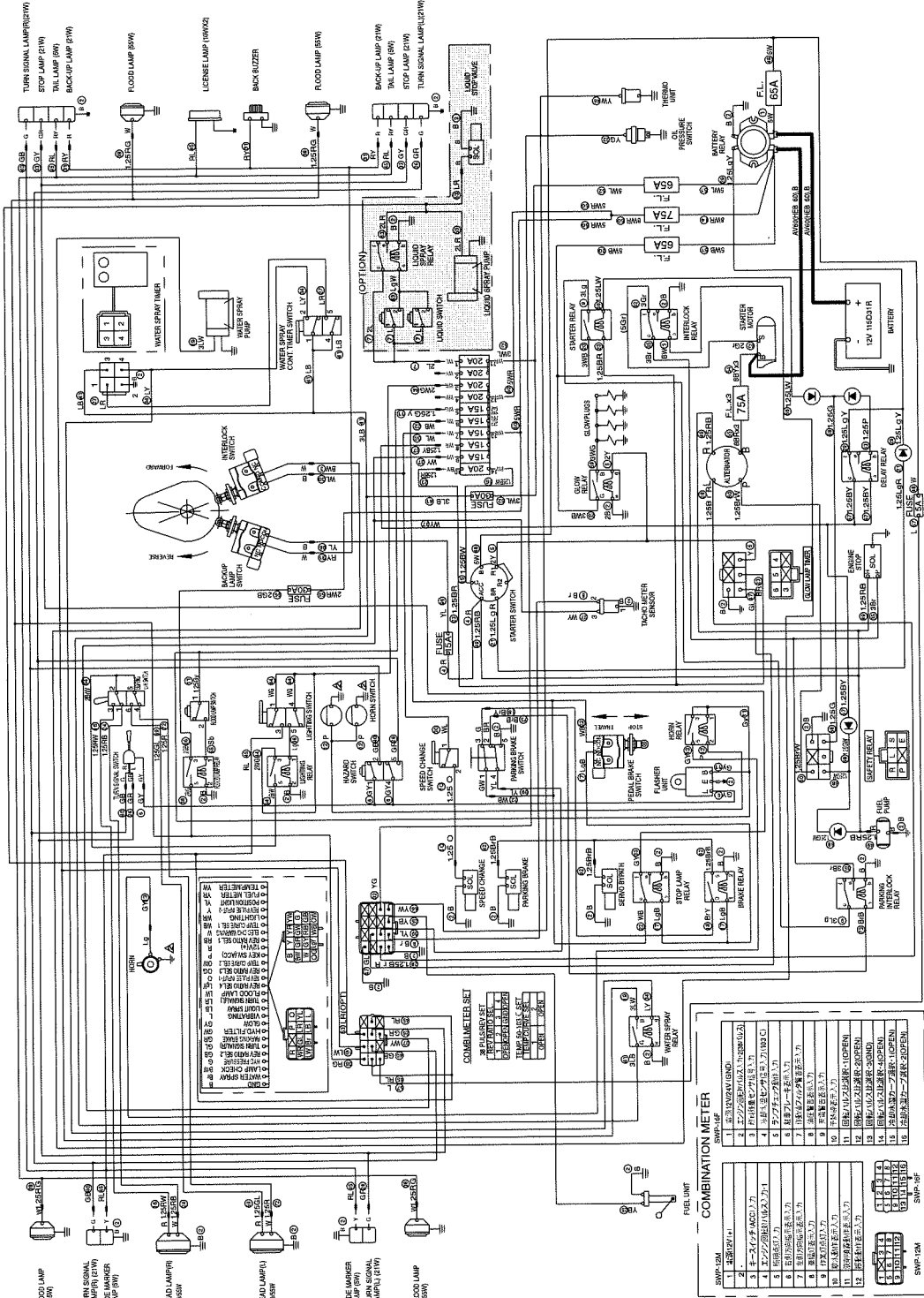
(4) Recommended lubricants

Oil company \ Lubricant	Engine oil API – CC	Gear oil API GL 4	Hydraulic oil VG 46	Grease (NLGI – II)
CALTEX	RPM DELO 300 oil	Universal Thuban 90	Rando Oil HD 46	Martifack EP 2
BP	BP Vanellus M30	BP Gear Oil EP 90	BP Energol HLP 46	BP Energrease LS – EP 2
ESSO	Esso Lube HDX 30	Esso Gear Oil GP 90	Nuto H 46	Beacon EP 2
MOBIL	Mobil Delvac 1230	Mobil Pegasus Gear Oil 90	Mobil DTE Oil 25	Mobil Lux EP 25
SHELL	Shell Rotella SX Oil 30	Shell Spirax 90 EP	Shell Tellus Oil 46	Shell Alvania EP Grease 2
CASTROL	Castrol CRB 30	Castrol Hypoy 90	Hyspin AWS 46	Spherrol ELP 2

- CAUTION:** 1) Fill the fluid reservoirs with the filters installed.
2) Use recommended fuels and lubricants only.

3. PERIODICAL MAINTENANCE

3.7 Electric Wiring Diagram



NOTE: Size of wire not indicated in the diagram is AV 0.85.

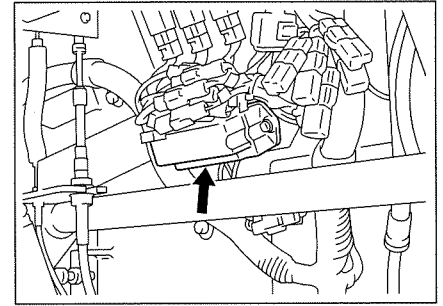
Identification	color of wire	B	Black/Red stripe	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe
Y	Yellow	WL	White/Blue stripe	WB	Green/Black stripe	Gr	Gray	Lg	Light green	WB	White/Black stripe	YL	Yellow/Blue stripe	Y	Yellow	WB	White/Black stripe	YL	Yellow/Blue stripe	Sb	Blue	YR	Yellow/Red stripe	YW	Yellow/White stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe																																																												
Y	Yellow	WL	White/Blue stripe	WB	Green/Black stripe	Gr	Gray	Lg	Light green	WB	White/Black stripe	YL	Yellow/Blue stripe	Y	Yellow	WB	White/Black stripe	YL	Yellow/Blue stripe	Sb	Blue	YR	Yellow/Red stripe	YW	Yellow/White stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe	B	Black	BR	Black/Red stripe	BRr	Brown/Red stripe	GR	Green/Red stripe	LR	Blue/Red stripe	P	Pink	RW	Red/White stripe	WR	White/Red stripe	YR	Yellow/Red stripe	Y	Yellow	YB	Yellow/Black stripe																																																												

Identification color of wire

Fuse box

The fuse box houses five 15A- and five 20A-fuses lined up with spares fitted separately. Use fuses of correct capacity. See page 26.

NOTE: When a fuse is burnt, determine the cause before replacing.



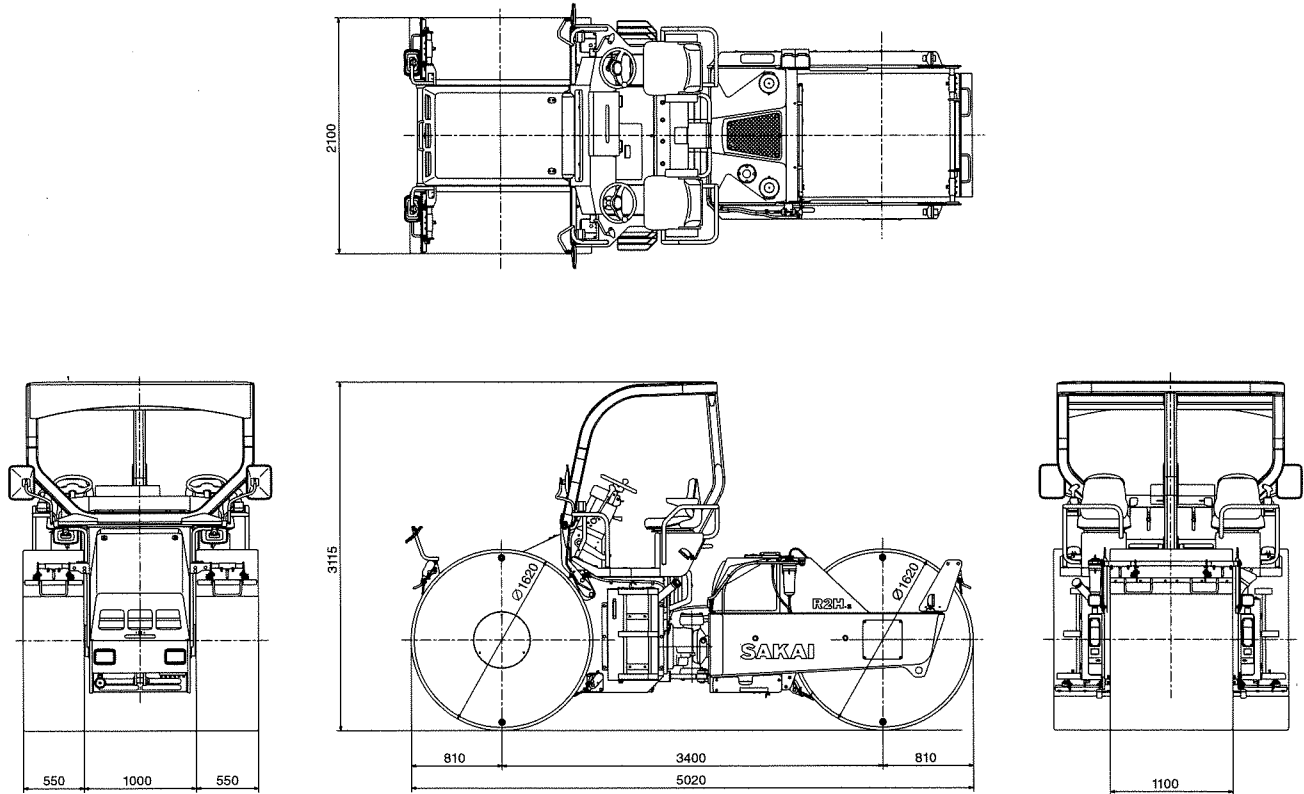
Battery

- ★ When the battery is left unused for a long time or the electricity is used too much, the pole palates will be damaged, shortening its service life extremely.
- ★ When the battery will not be used for a long time, charge it sufficiently, leave it in the shade in a cool, dry place, and check its condition every month.
- ★ Keep the battery in a satisfactory condition at all time.
- ★ The battery should be in a satisfactory condition when the engine is to be started on cold days. Avoid starting the engine with the battery in a poor condition at any time.

4. SPECIFICATIONS

4. SPECIFICATIONS

R2H-2



Model		R2H-2	
Weight:			
Gross weight		14,345 kg (31,625 lbs)	
Weight empty		10,485 kg (23,115 lbs)	
Dimension:			
Overall length		5,020 mm (198")	
Overall width		2,100 mm (83")	
Overall height		3,115 mm (123")	
Wheelbase		3,400 mm (134")	
Drum size (Dia. x Width)			
Front		1,620 mm x 550 mm (64" x 22")	
Rear		1,620 mm x 1,100 mm (64" x 43")	
Performance:			
Travel speed	Low	0 ~ 8.0 km/h (0 ~ 5 mile/h)	
	High	0 ~ 16.0 km/h (0 ~ 9.9 mile/h)	
Performance:			
Gradability			17 degrees
Rolling width			2,100 mm (83")
Minimum turning radius			6,300 mm (248")
Engine:			
Model		KUBOTA " V3307-DI-T-KDN "	
		Diesel Engine	
Total displacement		3.331 L (203 cu.in)	
Rated output		55.4 kW/2,200 min ⁻¹ (74 HP/2,200 rpm)	
Max. torque		265 N·m/1,500 min ⁻¹ (195 ft·lbs/ 1,500 rpm)	
Tank capacity:			
Fuel tank		100 liters (26 gal)	
Hydraulic tank		85 liters (22.5 gal)	
Sprinkler tank		680 liters (180 gal)	

NOTE: Gradability is the calculated value. It may vary with ground surface conditions.

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