

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

**OPERATING &
MAINTENANCE
INSTRUCTIONS**

**VIBRATING
ROLLER**

MODEL

SW651 Series

SW651 SW651B

SW651ND

SAKAI®

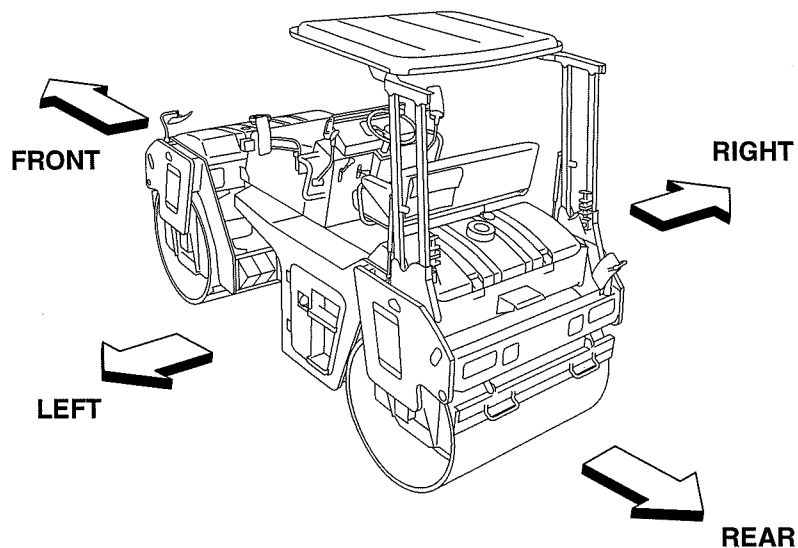
PREFACE

This operator's manual serves as a guide for the use of your Sakai SW651 Series Vibrating 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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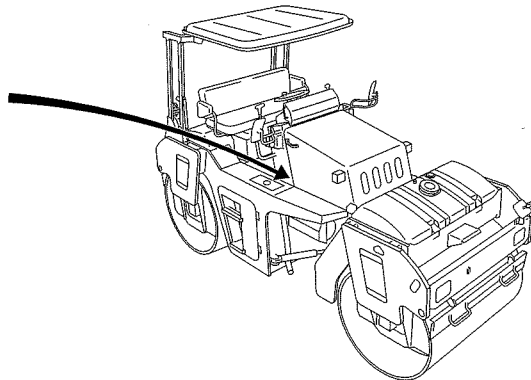
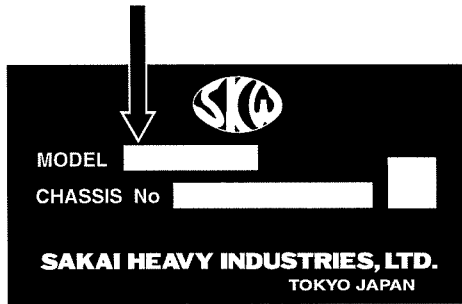
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MACHINE AND ENGINE IDENTIFICATION NUMBERS

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

(1) Machine model

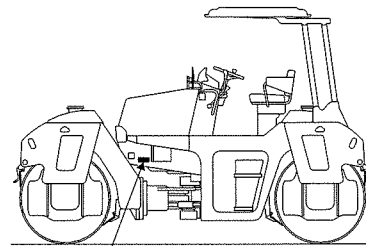
Indicated on the dashboard in the operator's station.



(2) Machine serial number

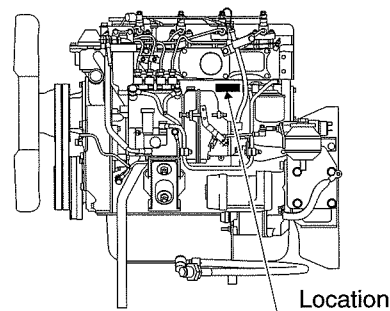
SW651
SW651B
SW651ND

} VSW28-○○○○○



Location

(3) Engine serial number









Location

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 decal.

 **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.

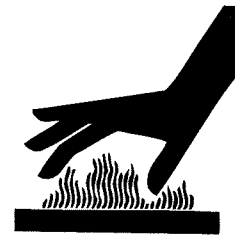
■ Do not allow anyone to enter the work area except for authorized personnel.

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



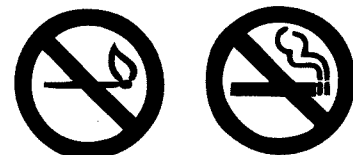
■ Be careful of hot parts.

- 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**

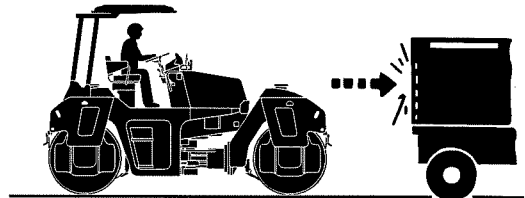
- Check your machine for damage such as cracks and deformation. If found to be abnormal, operate the machine after taking a proper measure to secure safety.
- Check the level of fluids (fuel, engine oil, coolant, anti-freeze and hydraulic oil). Add as necessary.
- Check the area where the machine has 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)

- 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.

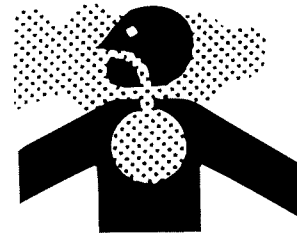
- Before starting the engine. Make sure there is no one in the immediate vicinity and there are no obstructions around the machine.



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.

■ Obey Traffic Regulations.

- When road-travelling, comply with relevant traffic rules.

■ 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.

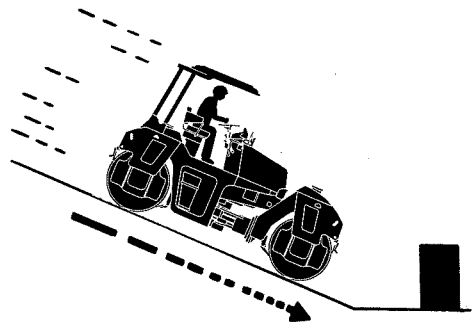
1. BASIC PRECAUTIONS FOR SAFETY

■ **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.



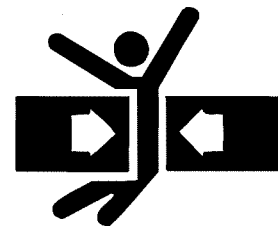
■ **Refrain from inattentive driving.**

- 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.**

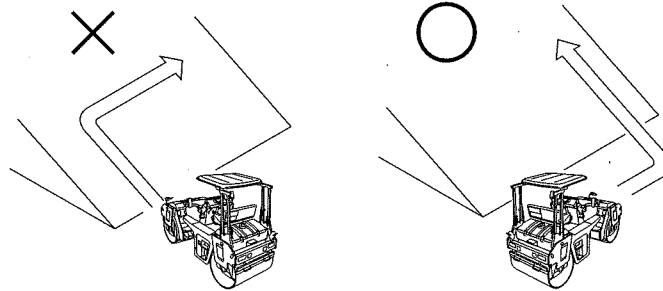
- Nighttime driving tends to frustrate the sense of distance. Carefully drive the machine at a speed suited to illumination. Keep the headlamps and flood lamps lighted. If necessary, provide extra lighting in the work area.

■ **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.

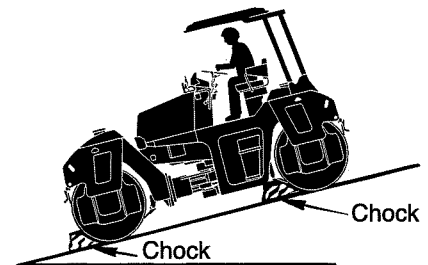
1. BASIC PRECAUTIONS FOR SAFETY

- **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.**



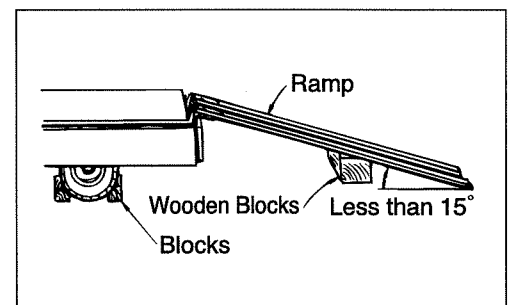
■ **When parking.**

- 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

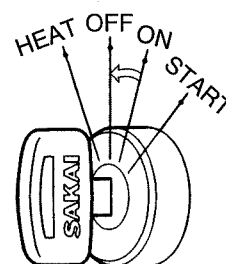
■ When handling the battery:

- 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.



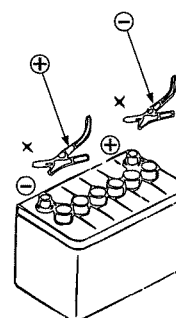
1. BASIC PRECAUTIONS FOR SAFETY

- 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.

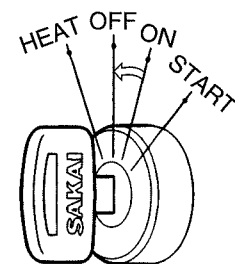


■ **Change safety-related parts at regular intervals.**

- Replace fuel hose and high pressure hydraulic hoses regularly to prevent fire. Replace high pressure hoses of the power steering system every two years.
 - ☆ Change these parts at regular intervals even if found to be normal. They will deteriorate as time goes on.
 - ☆ Change any hose found to be abnormal even if it is within its recommended service interval.

■ **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

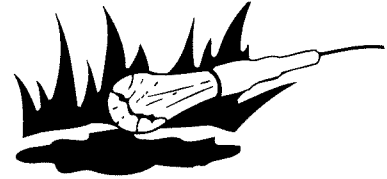
- Spilled fuel or oil will be slippery. Wipe up immediately. Keep the filler caps tight. Do not use fuel for flushing oil. Handle fuel and oil in a well ventilated area.

■ 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.

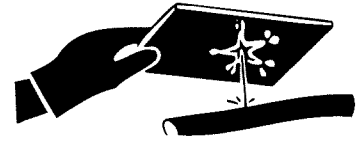
- Do not try to bend or hit hoses against a hard object. Do not use hoses or pipes that are bent or damaged. They will burst.
- Replace damaged fuel hose and hydraulic hoses. An oil or hydraulic fluid spill can cause a fire.

⚠ 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 pressure. 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.



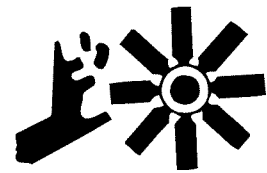
■ Be careful of hot parts

- 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.



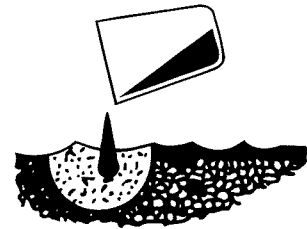
■ Use care when inspecting or servicing fan or belts in motion

- 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.



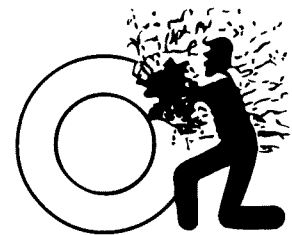
■ Used oil disposal

- 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.



■ Exercise extreme care when replacing and repairing tires

- Disassembly, repair and reassembly of tires require special facility and knowledge. Have them repaired at work shop specialized in handling tires.
- Improperly fitted rim can separate if the tire is inflated. When inflating tires, do not work in front of the rim. Use correct inflation pressure.
- When dismounting a tire, chock other tires for safety.
- When welding job is carried out near the tires, use extreme care, as this can cause an explosion of the tires.



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

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 3998-16504-0

⚠ 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.
<small>3998-16504-0</small>

④ 3998-16489-0

<p>CALIFORNIA Proposition 65 Warning</p> <p>Diesel engine and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.</p> <p style="text-align: right;"><small>3998-16489-0</small></p>

⑧ 3998-36002-0 (2 locations)



⑤ 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. <p style="text-align: right;"><small>3998-16497-1</small></p>

⑨ 3998-16501-0

⚠ DANGER
<p>Be Careful with Fire</p> <ul style="list-style-type: none"> • When refueling, stop the engine and do not • The filter cap of the fuel tank must be <p style="text-align: right;"><small>3998-16501-0</small></p>

② 3998-16499-0 (2 locations)

⚠ 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. <p style="text-align: right;"><small>3998-16499-0</small></p>

⑥ 3998-16502-0

⚠ DANGER
<ul style="list-style-type: none"> • Do not approach, or allow objects to touch the rotating parts. • Body parts which 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. <p style="text-align: right;"><small>3998-16502-0</small></p>

⑩ 3998-16510-0

⚠ CAUTION
<p>Refill the specified quantity of oil in the vibrator case when changing oil.</p> <p style="text-align: right;"><small>3998-16510-0</small></p>

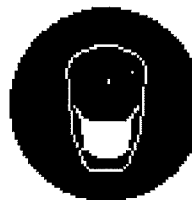
③ 3998-16500-0

⚠ 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. <p style="text-align: right;"><small>3998-16500-0</small></p>

⑦ 3998-16505-0

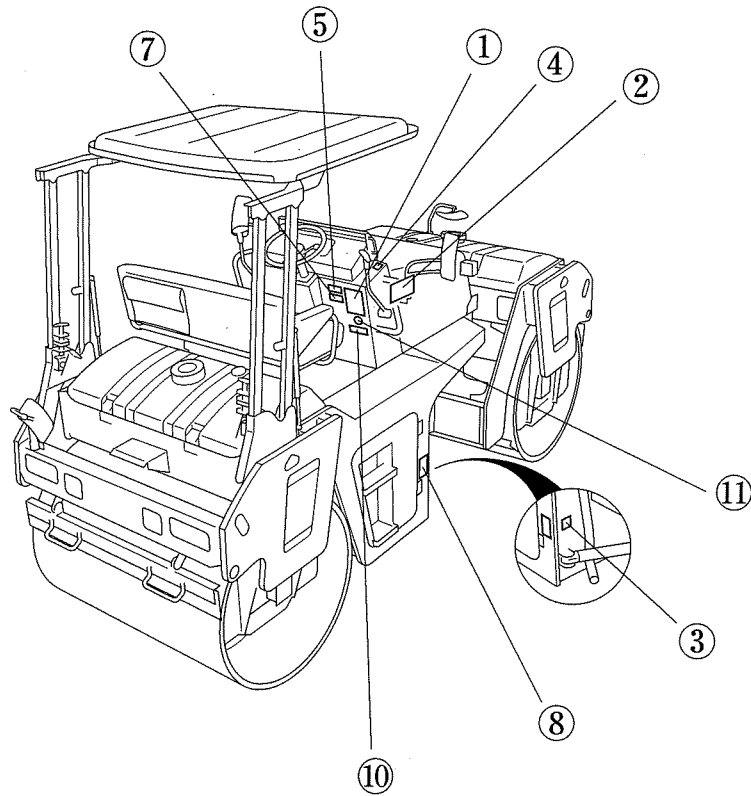
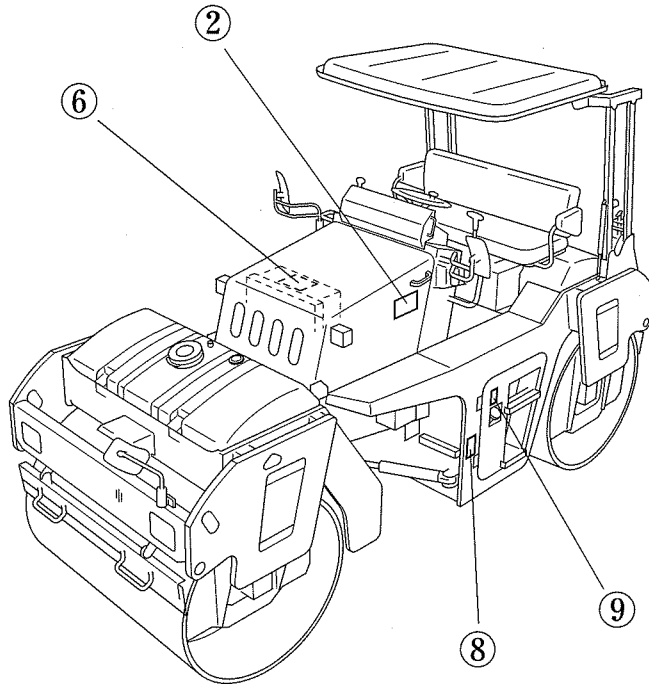
⚠ DANGER
<p>Roll Over Prevention</p> <ul style="list-style-type: none"> • Do not work in the vicinity of overhanging banks, or on grades steep enough to cause the machine to slide or roll over. • Reduce speed prior to making turns. • Pay particular attention when operating on uneven surfaces, as the machine may become unstable. <p style="text-align: right;"><small>3998-16505-0</small></p>

⑪ 3998-06139-0



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

1. BASIC PRECAUTIONS FOR SAFETY

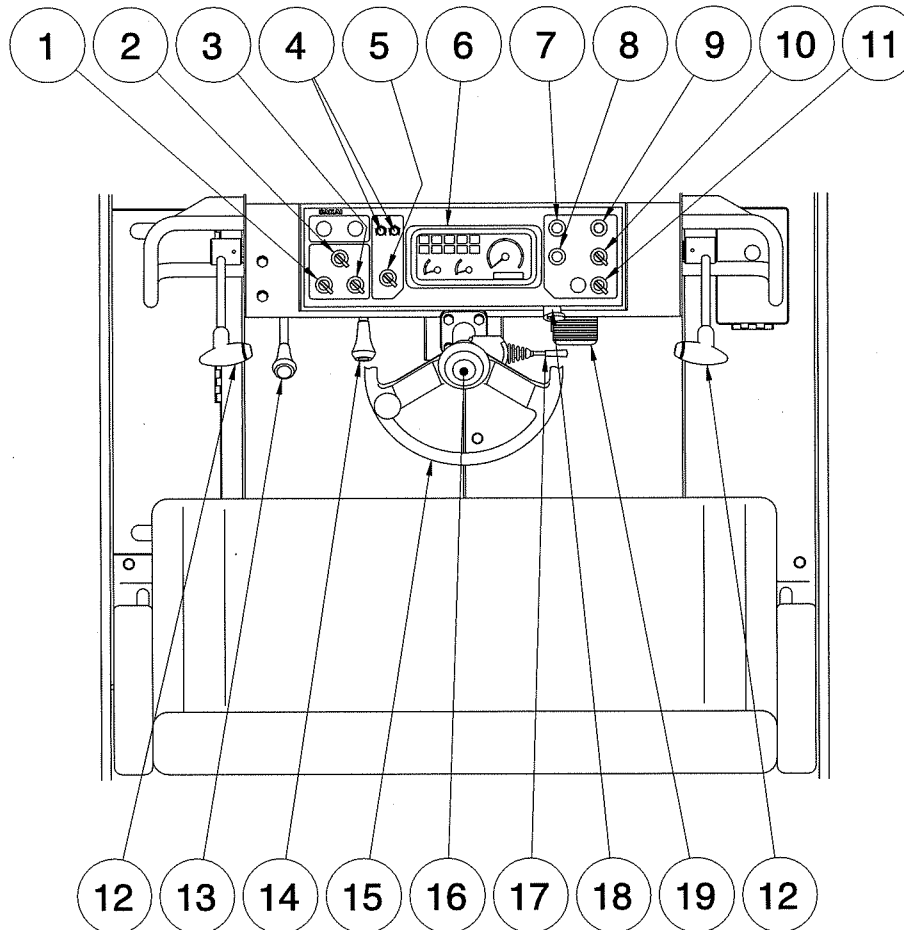


2. OPERATION

2. OPERATION

2.1 Instruments and Controls

2.1.1 Operator's station



① Vibration drum selector switch

② Vibration selector switch

③ Vibrator switch

④ Sprinkler timer

⑤ Sprinkler switch

⑥ Combination meter

⑦ Hazard switch

⑧ Flood lamp switch

⑨ Parking brake switch

⑩ Speed shift switch

⑪ Lamp switch

⑫ Forward-Reverse lever (F-R lever)
with vibrator switch

⑬ Throttle lever

⑭ Speed shift lever

⑮ Steering wheel

⑯ Horn switch

⑰ Turn signal lever

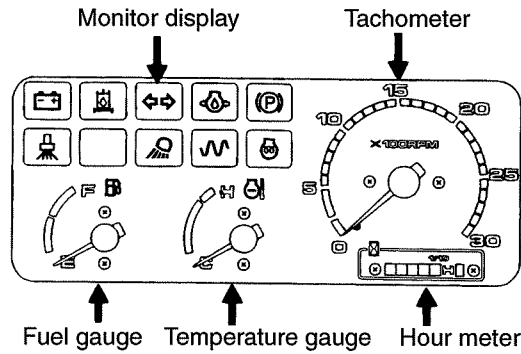
⑱ Starter switch

⑲ Brake pedal

2.1.2 Gauges, indicator lamps and warning lamps

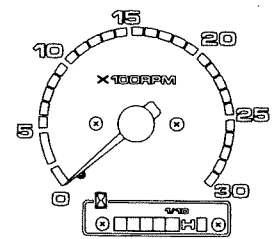
For safe execution of your job, fully understand the role and function of the systems involved.

Combination meter



Tachometer / Hour meter

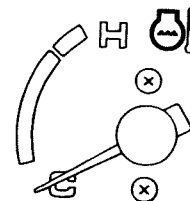
Indicates the engine RPM. The hour meter shows total operating hours. The service interval recommendation in this manual should be based upon the hour meter readings.



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.



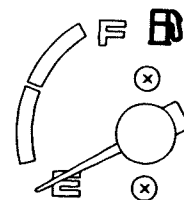
Temperature gauge

Fuel gauge

Indicates the fuel level in the tank.

E: The tank is empty.

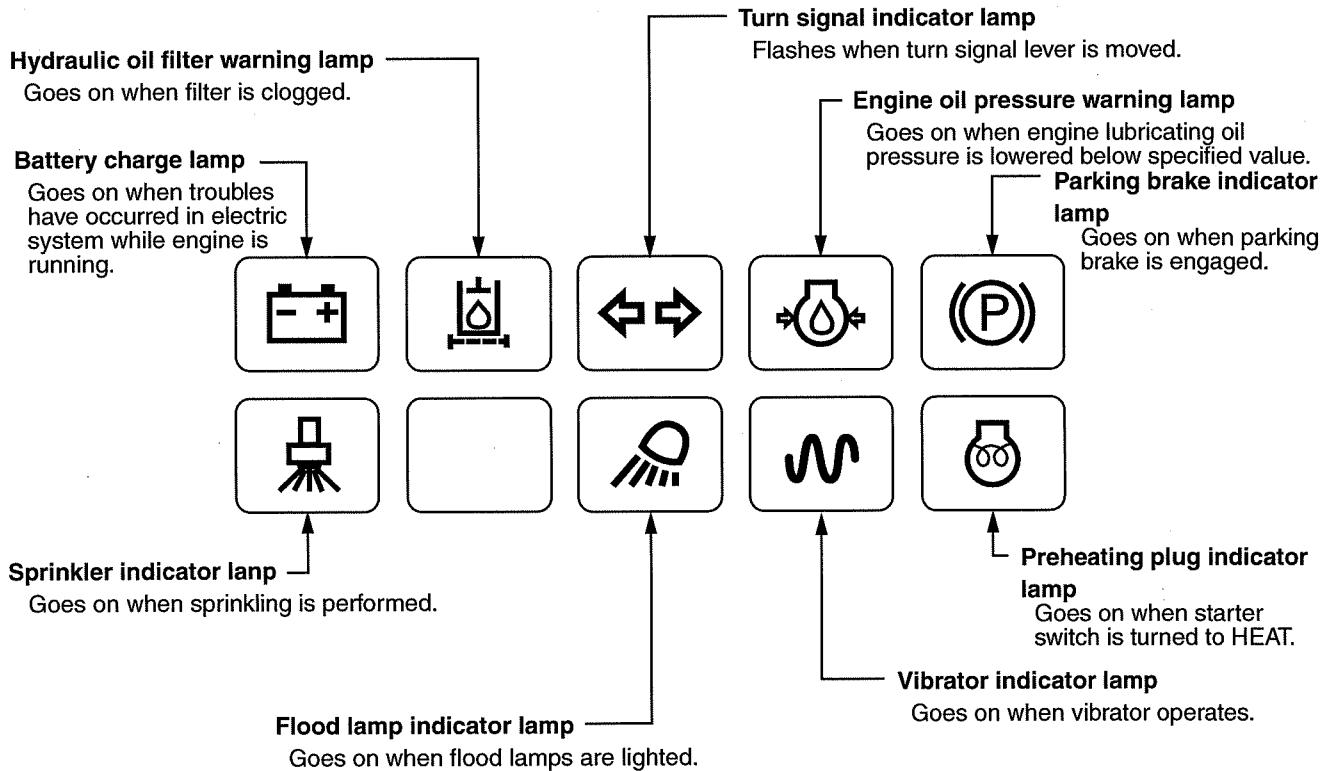
F: The tank is full.






Fuel gauge

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.

★ Bulb failure check
= Warning lamps and parking brake indicator lamp =
They should go on when the starter switch is turned to the ON position.
If not, corresponding bulb has burnt out.

CAUTION:

Hydraulic oil filter warning lamp may go on when the engine rpm is increased before the engine has been warmed up enough. Keep the engine idling until the lamp goes off, before starting your work.

2.1.3 Switches

Starter switch

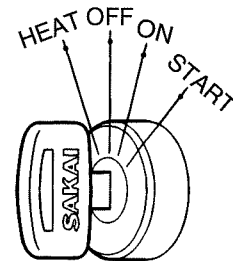
Starts and stops the engine.

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.



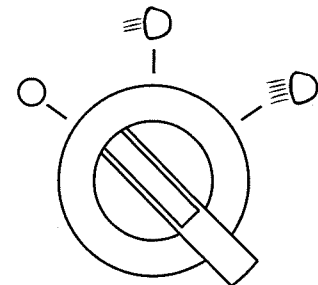
Lamp switch

Has three positions.

OFF: All lamps are switched off.

☉: Side marker lamps and tail lamps come on.

☉☉: 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.

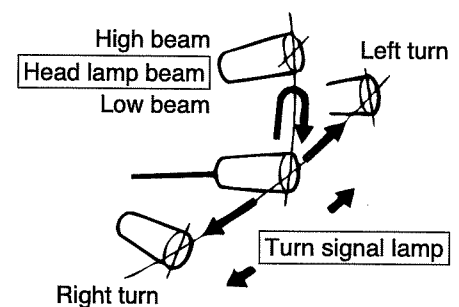


Turn signal lever

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

The flood lamps fitted at the rear of machine light up with the indicator lamp  on the monitor display coming on when switch  is pressed down. The lamps come off if the switch is pushed down again.

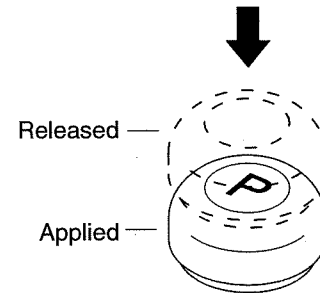
NOTE: Do not drive on the load with the flood lamp lighted up. You can obstruct traffic.



Parking brake switch

If 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.

⚠ CAUTION

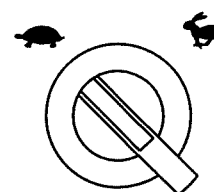
- Never pull the switch UP.

[IMPORTANT]

- In an emergency, press the parking brake switch.

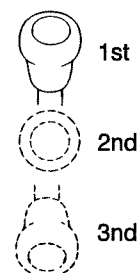
Speed shift switch / Speed shift lever

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



Speed shift switch

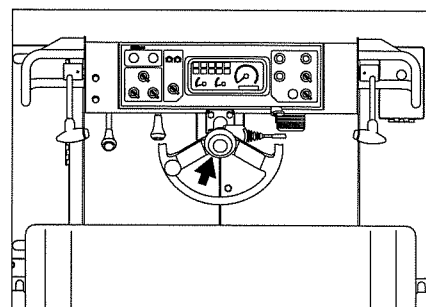
Speed shift switch \ Speed shift lever	1	2	3
LOW	0 ~ 2km/h (0~1.2mile/h)	0 ~ 4km/h (0~2.5mile/h)	0 ~ 6km/h (0~3.7mile/h)
HIGH	0 ~ 4km/h (0~2.5mile/h)	0 ~ 7km/h (0~4.5mile/h)	0 ~ 12km/h (0~7.5mile/h)



Speed shift lever

Horn switch

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





2. OPERATION


Vibrator switch

= SW651, SW651B =

Select low or high amplitude vibration and vibration ON or OFF.

 : The front and rear drums (both drums) vibrate.

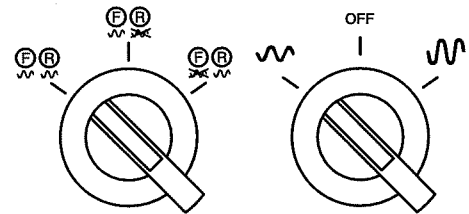
 : The front drum vibrates.

 : The rear drum vibrates.

 : High amplitude vibration

OFF : Vibration stop


 : Low amplitude vibration




Vibration drum selector switch Vibration switch

= SW651ND =

Selects horizontal or ordinary vibration and vibration ON or OFF.

 : The front and rear drums (both drums) vibrate.

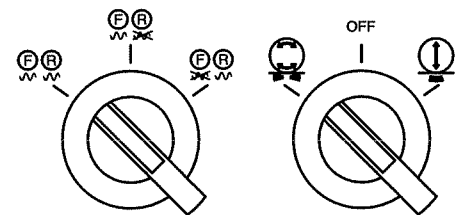
 : The front drum vibrates.

 : The rear drum vibrates.

 : Ordinary vibration

OFF : Vibration stop

 : Horizontal vibration



Vibration drum selector switch Vibration switch

NOTE:

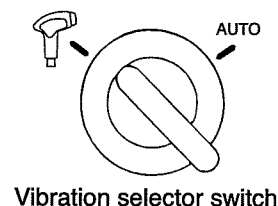
- The engine speed must exceed 1,800 rpm for vibration compaction.
- The optimum vibration compaction speed is 2~7km/h (1.2~4.5mile/h). However, select an appropriate speed according to the actual situation of the site.

IMPORTANT


- Do not operate the vibrator on a hard area such as cement concrete pavement surface or the ground covered by thick steel sheets.
- Keep the vibrator stopped when the machine is at rest.
- Shut off the vibrator immediately when the machine has been caught in the mud during vibratory operation.





Vibration selector switch





The switch permits selection of automatic or manual vibration operation. No matter what mode the machine is in, vibration will stop when the F-R lever is set in the neutral position.




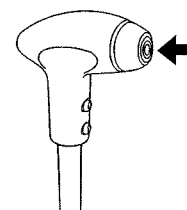
Vibration selector switch

 : The vibration switch attached to the F-R lever permits ON and OFF. Press the switch for vibration. Press the switch again to stop vibration.

Set the vibration switch attached to the panel in the “” or “” (“” or “” for SW651ND) position before operating the vibration switch on the F-R lever.

AUTO: The machine starts and vibrates simultaneously when the F-R lever is set in the F or R position while the vibration switch is in the “” or “” (“” or “” for SW651ND) position.

The vibrator switch mounted on the F-R lever also shuts off vibration. When using this switch, set the vibration selector switch to the “” position.



Vibrator switch

Sprinkler switch / Sprinkler timer

The sprinkler switch and sprinkler timer are both used for sprinkler operation.

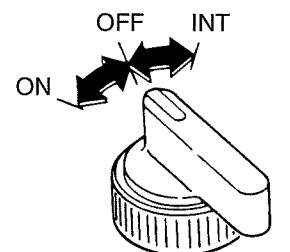
Sprinkler switch (A) selects continuous sprinkling, and intermittent sprinkling.

Switch selects the sprinkler modes.

ON : Continuous sprinkling is performed.

OFF : Sprinkling is shut off.

INT : Intermittent sprinkling takes places.

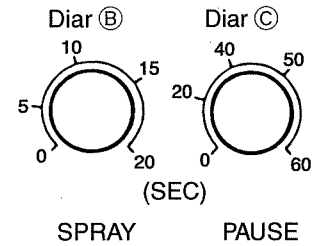


Sprinkler switch (A)

2. OPERATION

For the intermittent sprinkling, set the sprinkler timer at the desired sprinkling duration and idling duration (SPRAY dial ②, PAUSE dial ③). Then turn sprinkler switch ① to the INT position. Sprinkling will start.

Sprinkling duration can be adjusted within 0 ~ 20 seconds with dial ②. Idling duration can be set within 0 ~ 60 seconds by turning dial ③. Adjust the dials to meet job conditions.




The table below serves as a guide for sprinkling and idling durations.

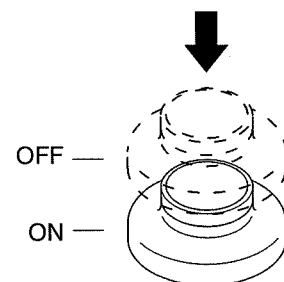
Vehicle speed (km/h)	Sprinkling duration (seconds)	Idling duration (seconds)
2 (1.2 mile/h)	7 ~ 8	35 ~ 40
3 (1.9 mile/h)	4 ~ 5	30 ~ 35
4 (2.5 mile/h)	3 ~ 4	25 ~ 30
5 (3.1 mile/h)	2.5 ~ 3.5	20 ~ 25

For normal operation (3 km/h, 1.9 mile/h), use the sprinkler with a sprinkling duration of 5 seconds and an idling duration of 30 seconds. Adjust according to job requirements.

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.

Hazard Switch

Pushing the switch  causes direction indicator lamp and indicator lamp Monitor display start to flash simultaneously. Pushing the switch again causes the lamps to go off.

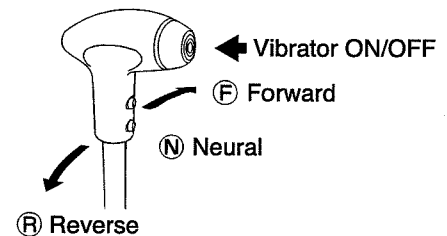


2.1.4 Operating levers and pedals

Forward-reverse lever (F-R lever) with vibrator switch

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.

The vibrator ON-OFF control is easily made by the F-R lever top vibrator switch (See page 25).



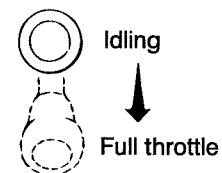
IMPORTANT

- For normal braking, return the F-R lever back to neutral.
- In an emergency, depress the brake pedal. More powerful braking will take place.

Throttle lever

Shifts the engine RPM.

The engine RPM increases when moved toward the operator.



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. OPERATION

Unloader valve

To gain access to the unload valve, open the cover at the left hand side of the operator's seat. The unloader valve disengages the drive, playing a role like a clutch. Use this valve for towing the machine when the engine is disabled or when troubles have developed in the hydraulic drive.

For towing:

Turn the knob counter-clockwise (Unload).

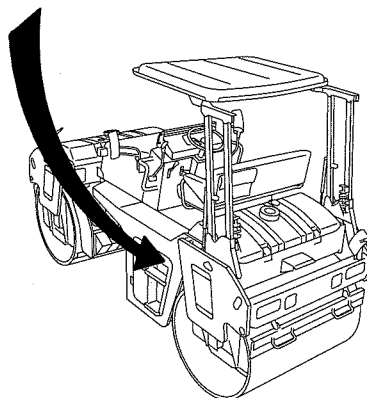
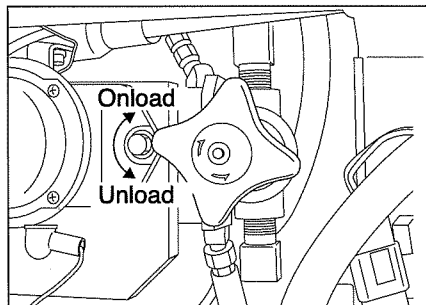
For normal traveling:

Turn the knob clockwise (Onload).

⚠ WARNING

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

NOTE: For normal travel, be sure to hold the valve in the ONLOAD position.

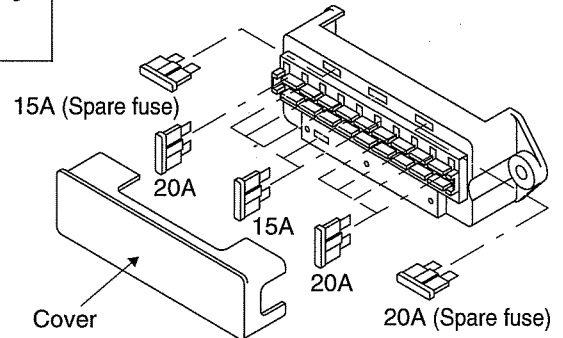


2.1.5 Fuse box

⚠ 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 Awning

1) To fold the awning:

- ① Remove the fixing bolts (two locations; right and left) by turning counter-clockwise.
- ② Lift the lock pins (two locations; right and left), rotate slightly clockwise or counter-clockwise to let them stay away from their lock hole.

⚠ WARNING

When handling the awning, keep your feet away from the folding columns.

NOTE: Pushing the support column backward will facilitate lifting of lock pin.

- ③ Fold the supporting columns slowly forward.

⚠ CAUTION

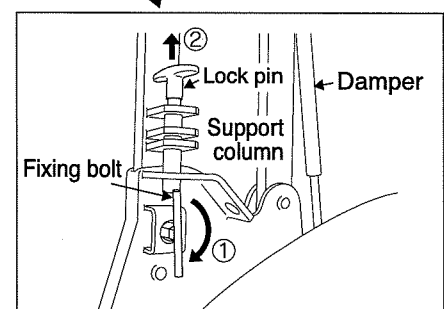
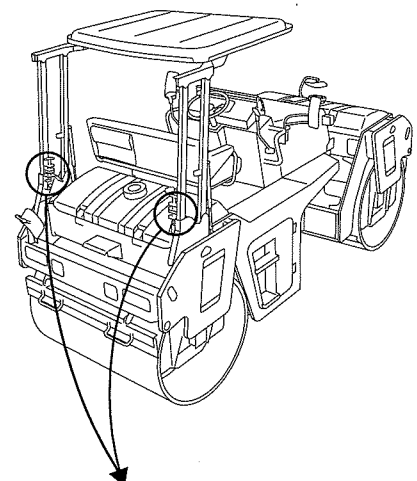
When folding down the awning, use care not to bump your head against it.



- ④ Lower and put the lock pin into its lock hole by turning slightly clockwise or counter-clockwise.
- ⑤ Make certain the lock pin is positively in the locking hole.

2) To set up the awning:

- ① Lift the lock pins (two locations; right and left), rotate slightly clockwise or counter-clockwise to let them stay away from their lock hole.
- ② Set the columns slowly.
- ③ Rotate the lock pins slightly clockwise or counter-clockwise to let them get into its lock hole.



2. OPERATION

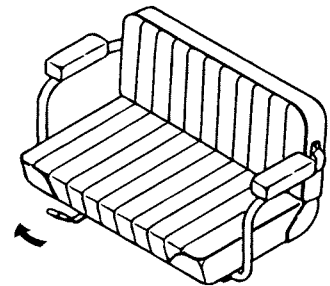
- ④ Screw in the fixing bolt until tight by turning clockwise to fix the columns.

⚠ WARNING

- When the awing is folded, loosen the fixing bolt, unlock the lock pin, then fold the supporting columns forward after making sure the damper to permit easy column lifting is functioning.
- If the damper is not working use care because the supporting columns can fold forward quickly.
- In case the damper fails to work, replace it with new one.

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.



⚠ WARNING

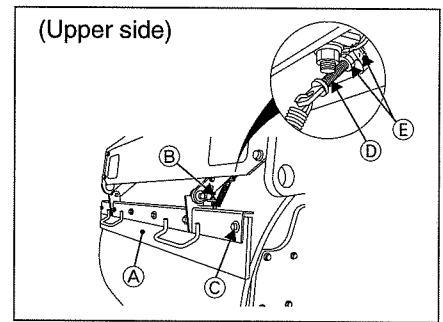
The adjustment will be necessary when operating the machine first or when operators are alternated.

2.2.3 Adjustment and replacement of scraper

The method of adjustment and replacement of scraper is the same both for front and rear drums.

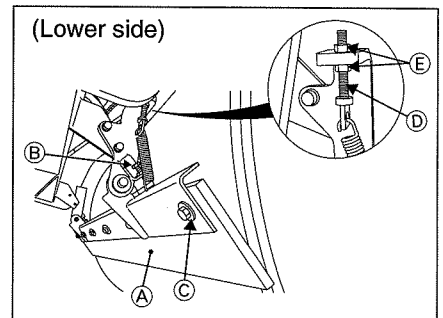
1) Adjustment of clearance between scraper blade (A) and roll

- (1) Loosen set bolts (B) (two locations).
- (2) Loosen bolts (C) (six locations). Slide blade (A) until it touches the roll.
- (3) When the blade touches the roll, tighten bolt (C).
- (4) Adjust the clearance between the roll and blade using set bolt (B).



2) Replacement of scraper blade

- (1) Remove bolts (C) (six locations).
- (2) Replace blade (A) with a new one.
- (3) Attach bolts (C) (six locations) and tighten them.



[Supplement] : The scraper can be raised so that it will not be in contact with the roll during operation.

: The force to press the scraper blade to the roll can be adjusted by bolts (D) (two locations) and nuts (E) (four locations).

⚠ WARNING

- Hold blade (A) and raise it slowly so that your hand will not be caught between the roll and blade.
- When returning raised blade (A) to the original position, exercise care so that your hand will not be caught between the roll and blade.

2. OPERATION

2.2.4 Disengaging the brake when towing

⚠ WARNING

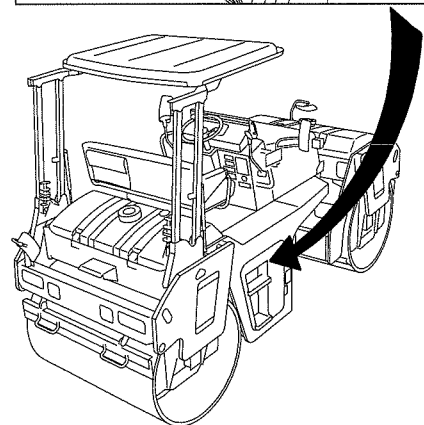
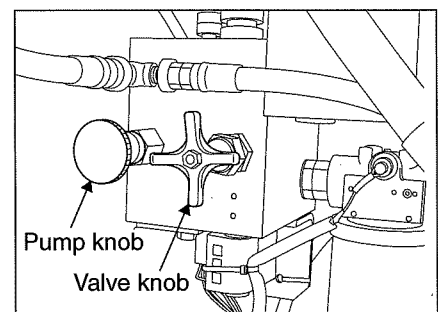
- On a slope, chock the drums and prepare for towing before disengaging the brake.
- Start with the rear wheels, proceeding to the front drum.

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:

- 1) Turn the valve knob clockwise until it stops.
- 2) Pull up the pump knob and push it. Push it about eight times, and the parking brake will be released.
- 3) After traction, be sure to turn the valve knob counterclockwise until it stops.

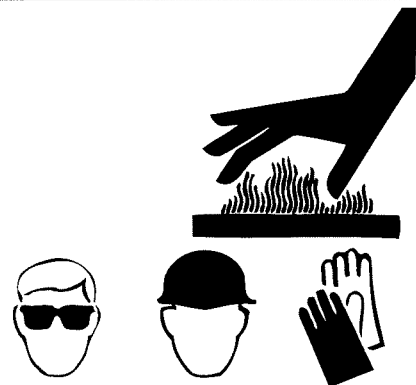
NOTE: The direction of rotation of the valve knob is shown below.

- Normal: Counterclockwise
- Only when releasing brake manually:
Clockwise



⚠ 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.



2.3 Operation

⚠ WARNING

- 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.

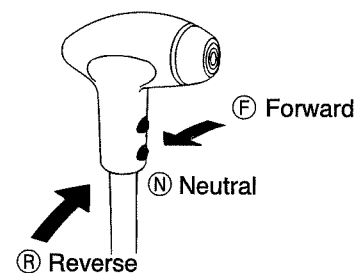
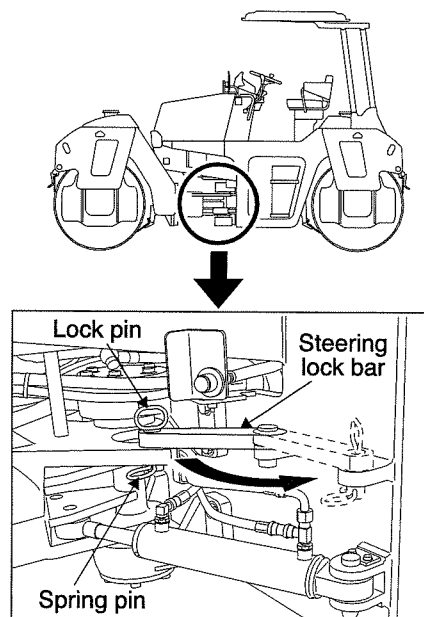
The bar is located at the left of the center of the machine.

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 (N).

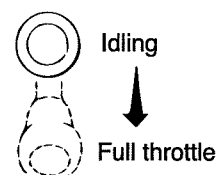
2. OPERATION

2.3.2 Starting the engine

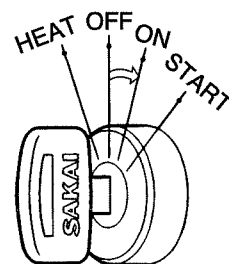
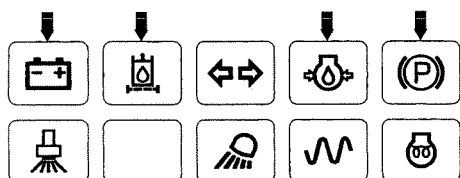
⚠ WARNING

Check that the F-R lever is in the neutral position, and sound the horn when starting the engine after making certain that there are no one and no objects close to the machine.

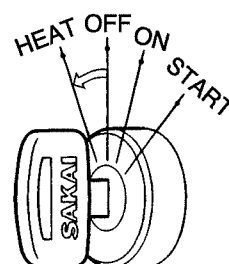
1) Set the throttle lever in a position slightly higher than IDLING.



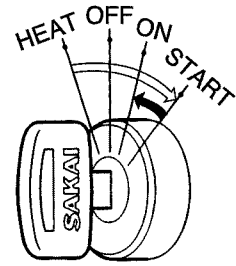
2) Turn the starter switch to the ON position and check that the warning lamps and parking brake indicator lamp on the monitor display are on.



3) In cold weather, hold the starter switch in the HEAT position, 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.



- 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.
- If the engine does not start, allow an interval before trying again.
- 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 gauge Pointer falls near the center zone.
 - Fuel gauge Pointer 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. OPERATION

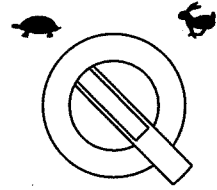
2.3.4 Traveling

⚠ CAUTION

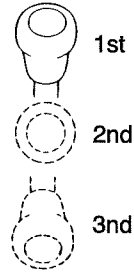
While travelling, do not turn the starter switch OFF.

⚠ WARNING

When starting, operate the horn after securing the safety around the machine. Clear away obstacles on the road.





Speed shift switch



Speed shift lever

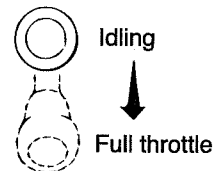
- 1) Select the desired speed by the operation of speed shift lever and speed shift switch.


Speed shift lever Speed shift switch		Speed shift lever		
		1	2	3
 LOW	0 ~ 2km/h (0~1.2mile/h)	0 ~ 4km/h (0~2.5mile/h)	0 ~ 6km/h (0~3.7mile/h)	
 HIGH	0 ~ 4km/h (0~2.5mile/h)	0 ~ 7km/h (0~4.5mile/h)	0 ~ 12km/h (0~7.5mile/h)	

⚠ WARNING

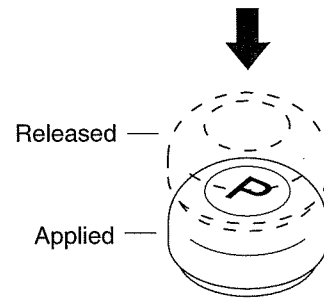
On a steep slope, run the machine at low speed. Do not attempt to shift speed while travelling.

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



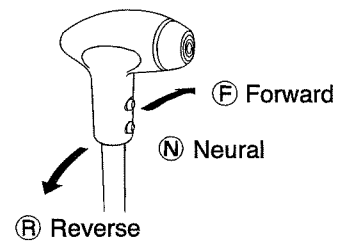
3) Press down parking brake switch button to release the brake. Check that indicator lamp  on the monitor display goes off.

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.

2. OPERATION

2.3.5 Stopping / Parking

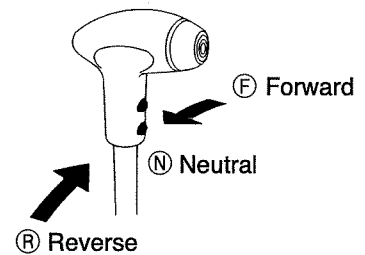
⚠ WARNING


- 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.

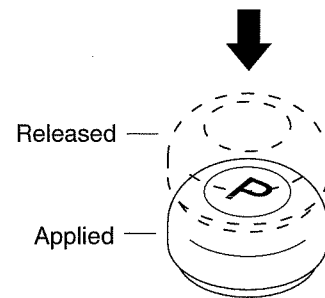
- 1) Bring the F-R lever to the neutral position (N), and the machine will come to a halt.

⚠ CAUTION

- For normal braking, move the F-R lever back to the neutral position. In an emergency, depress the brake pedal or press the parking brake switch. The F-R lever is brought back to the neutral position.



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



2.3.6 Stopping the engine

- 1) Gradually cool down the engine at low idling for about 5 minutes

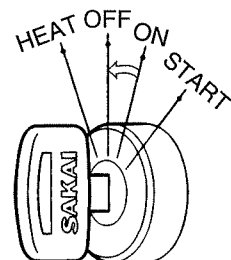
IMPORTANT

- 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.

2.3.7 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 Vibratory Operation

- 1) Operate the throttle lever to set the engine speed at more than 1,800 rpm.
- 2) Use vibration switch (A) to select low or high amplitude vibration (selection of horizontal or ordinary vibration for SW651ND) and select vibration ON or OFF.


= SW651, SW651B =

 : High amplitude vibration

OFF : Vibration stop

 : Low amplitude vibration


= SW651ND =


 : Ordinary vibration


OFF : Vibration stop

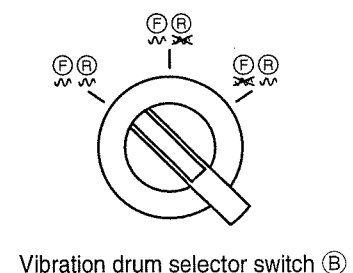
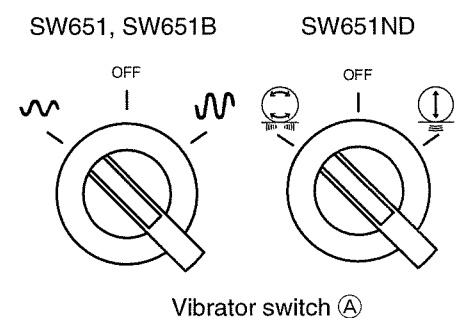
 : Horizontal vibration

- 3) Vibration drum selector switch (B) permits selection of front/rear drum vibration, front drum vibration, or rear drum vibration.

 : The front and rear drums (both drums) vibrate.


 : The front drum vibrates.





 : The rear drum vibrates.

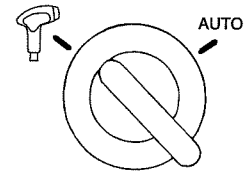


2. OPERATION





- 4) The switch permits selection of automatic or manual vibration selector switch. No matter what mode the machine is in, vibration will stop when the F-R lever is set in the neutral position.


 : The vibration switch attached to the F-R lever permits ON and OFF. Press the switch for vibration. Press the switch again to stop vibration.

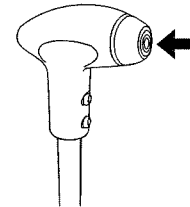
Set the vibration switch attached to the panel in the “” or “” (“” or “” for SW651ND) position before operating the vibration switch on the F-R lever.



Vibration selector switch

AUTO: The machine starts and vibrates simultaneously when the F-R lever is set in the Forward or Reverse position while the vibration switch is in the “” or “” (“” or “” for SW651ND) position.

The vibrator switch mounted on the F-R lever also shuts off vibration. When using this switch, set the vibration selector switch to the “” position.



Vibrator switch

- 5) Proper travel speed for vibratory compaction is 2~7km/h (1.2~4.5mile/h), however, select speeds depending upon job requirements.

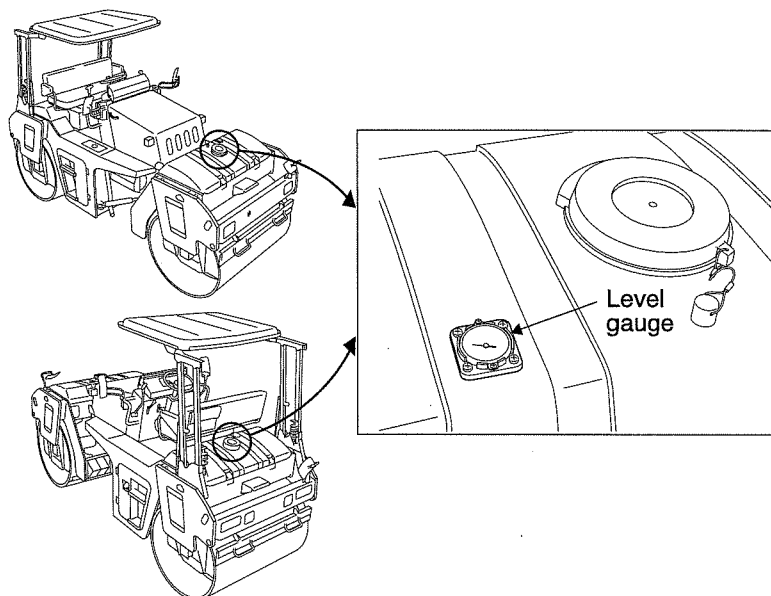
⚠ CAUTION

- **Keep the vibrator shut off when the machine is not rolling.**
- **Shut off the vibrator immediately when the machine has been caught in the mud during vibratory operation.**

2.5 Sprinkler

- 1) Before sprinkling, check for the water level in the sprinkler tank with the sight level gauge. Add water as necessary.

IMPORTANT
Use clean water wherever practicable.

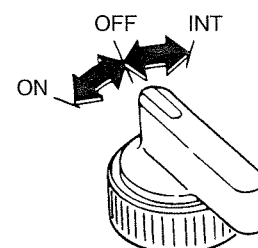


- 2) Sprinkler switch (A) selects sprinkler modes; continuous sprinkling mode and intermittent sprinkling mode.

“ ON ” : Continuous sprinkling

“ OFF ”: Sprinkling stop

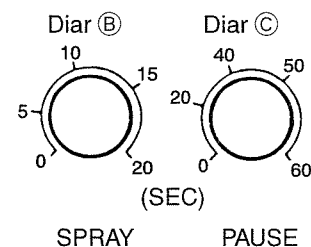
“ INT ”: Intermittent (timer) sprinkling



Sprinkler switch (A)

For intermittent spray, set the spray time in the following manner:

Spray time is adjustable between 0~20 seconds with Spray Dial (B) and so is pause time between 0~60 seconds with PAUSE Dial (C) respectively as desired. Adjust it according to the job requirement.



2. OPERATION

- The table below serves as a guide for sprinkling and idling durations.

Vehicle speed (km/h)	Sprinkling duration (seconds)	Idling duration (seconds)
2 (1.2 mile/h)	7 ~ 8	35 ~ 40
3 (1.9 mile/h)	4 ~ 5	30 ~ 35
4 (2.5 mile/h)	3 ~ 4	25 ~ 30
5 (3.1 mile/h)	2.5 ~ 3.5	20 ~ 25

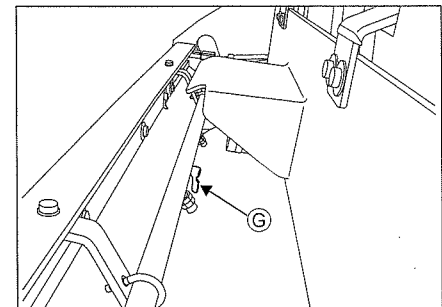
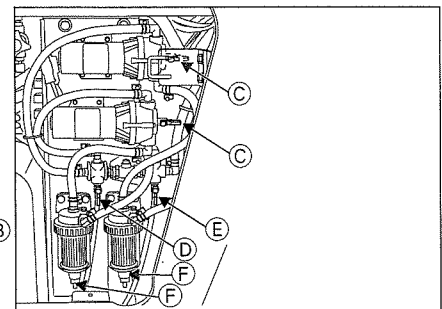
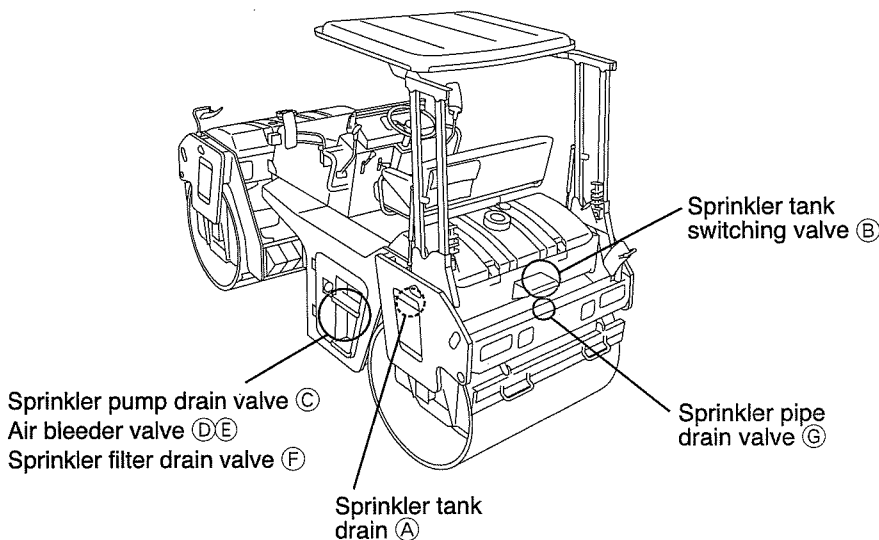
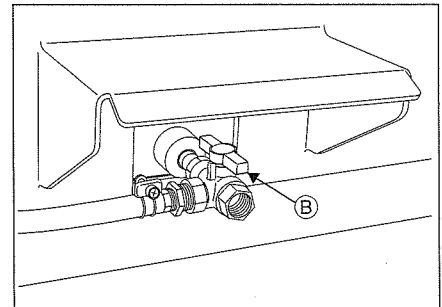
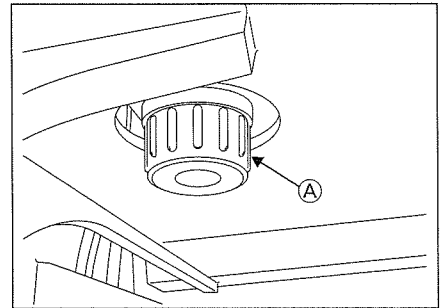
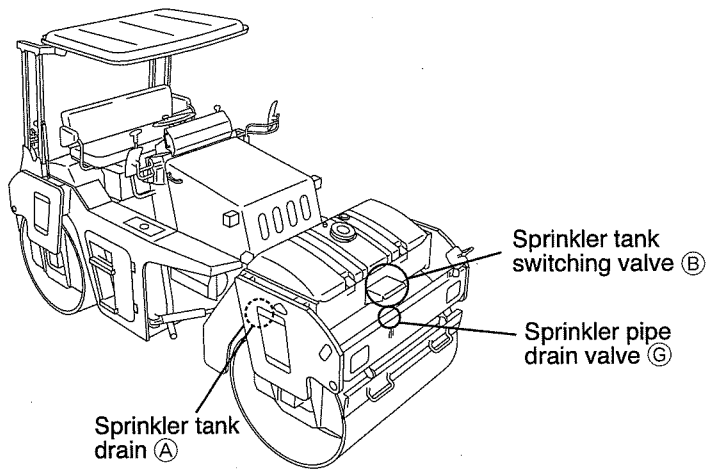
- For normal operation (3 km/h, 1.9 mile/h), use the sprinkler with a sprinkling duration of 5 seconds and an idling duration of 30 seconds. Adjust according to job requirements.

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

- Pay attention to level of water, because turning the pump with empty tank results in trouble.
- To avoid freezing, fully drain the sprinkler tank, pipes and filter in cold weather.



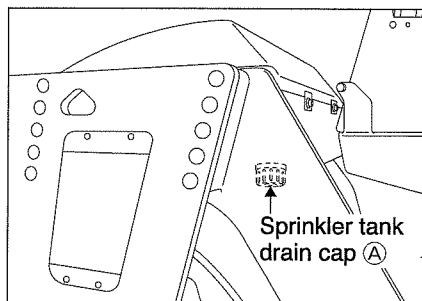
To drain water:

- ① Turn sprinkler tank drain cap (A) counter-clockwise and completely drain the tank.
- ② Fully open sprinkler tank switching valve (B), and then open sprinkler pump drain valve (C), air bleeder valves (D) and (E), and sprinkler filter drain valve (F) to remove water completely.
- ③ Drain the front and rear sprinkler pipes by opening value (E).
- ④ Idle the sprinkler pump, while sprinkler pump drain valve (C) is open, for about 30 seconds after confirmation of complete removal of water from the sprinkler filter in order to remove water from the pump completely.
- ④ Also drain the hoses, pump and sprinkler nozzles.

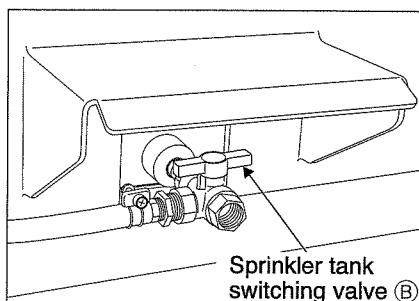
2. OPERATION

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 p.43. In that case, operate the machine according to the procedure shown below.

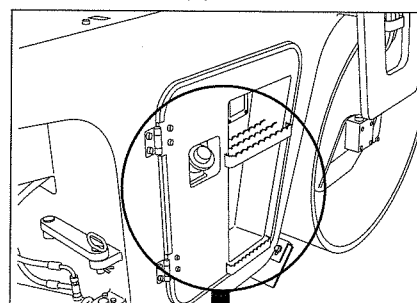
Front of vehicle



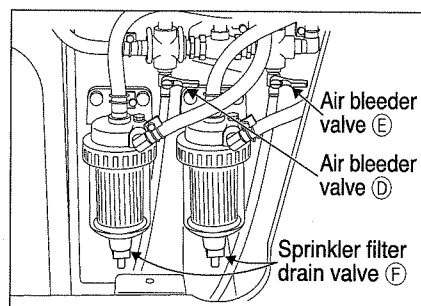
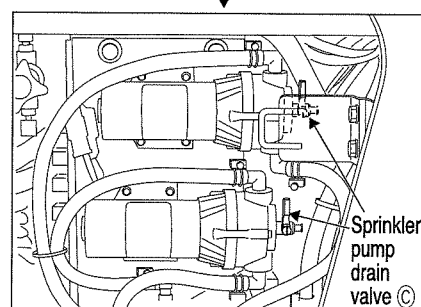
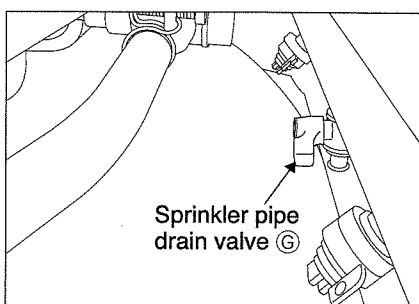
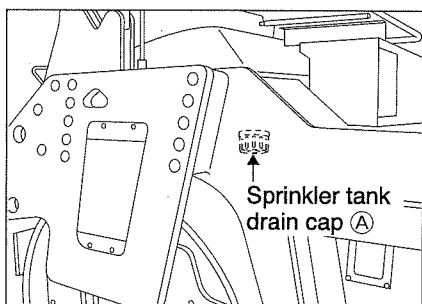
Front and rear of vehicle



Left side of vehicle



Rear of vehicle



= Supplementary explanation of draining method =

- (1) Check that all caps and valves (A)-(G) are closed.
- (2) Start the sprinkler pump.
- (3) Repeat open-close operation of air bleeder valve (D) to remove air from the pipeline.
(Water will be discharged simultaneously.)
- (4) After confirmation of complete removal of air, close air bleeder valve (D).

[Supplement] : Two pumps that back up each other are installed. When one pump fails, only the water in either front or rear sprinkler tank will be consumed.

2.6 Precautions for Work

2.6.1 Compaction operation

■ Do not operate the vibrator on hard location

- Do not work the vibrator on a hard surface such as concrete pavement, as this can cause the machine to jump and give abnormal shock load. Damage to shock isolators will result.

■ Change the direction of travel gently.

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

2.6.2 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.

2.6.3 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

2.7 Applicable Jobs

The machines do a variety of jobs as listed below:

Work

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

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

2.8 After Operation

Check for the coolant temperature, engine oil pressure fuel lever.

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 temperature 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 freezing, drain water from the sprinkler system (See page 43 and 44).

IMPORTANT

Insufficient draining of water can cause troubles or damage to the system.

2.9 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.

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

2.9.1 Use of a trailer equipped with a winch

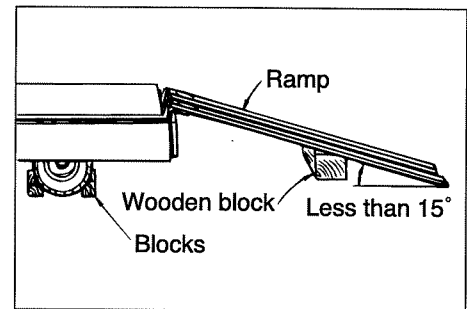
⚠ WARNING

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.

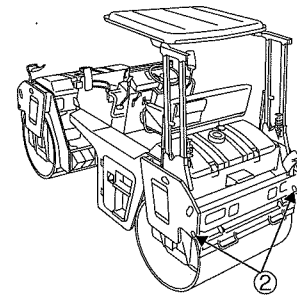
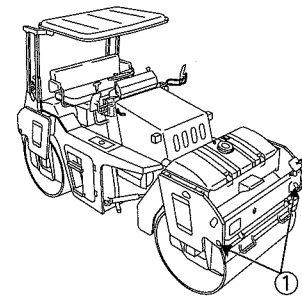
2. OPERATION

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.



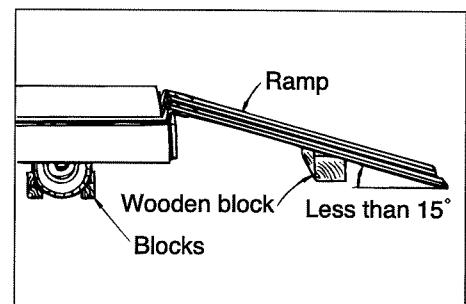
- 2) Decide the correct direction of run and make the machine run forward to the ramps.
- 3) Draw the wire rope from the trailer winch and put its hook on the hooking point ① or ② of the roller.
- 4) Place the unloader valve located at the operator's station to the UNLOAD position (See "Unloader valve" on page 28).
- 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.



2.9.2 Self-propelling

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

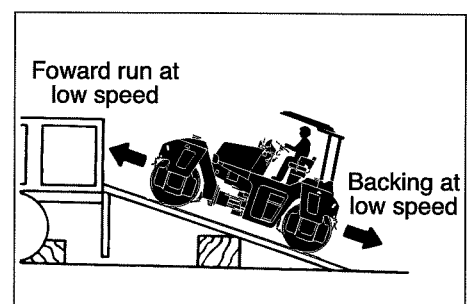
- ☆ The angle between the ramps and ground must be less than 15 degrees.
- ☆ Leave a proper space between the ramps according to the width of the roller drum.



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.



2.10 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.

2.11 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.

2.12 Operation in Cold Weather

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

2.12.1 Fuel oil and grease

Use fuel and oil with low viscosity. See "Rating" on page 71.

2.12.2 Coolant

⚠ WARNING

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

⚠ CAUTION

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

Use soft water for coolant.

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

2. OPERATION

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	7 l (1.8)	6 l (1.6)	5.5 l (1.5)	5 l (1.3)	4 l (1.1)
Amount of coolant	7 l (1.8)	8 l (2.1)	8.5 l (2.2)	9 l (2.4)	10 l (2.6)
Ratio	50%	45%	40%	35%	30%

Long Life Coolant is used in our roller. Useful life of this antifreeze coolant is 2years.

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 to30.**

2.12.3 Battery

⚠ WARNING

- **Batteries generate explosive gases. Do not use an open flame close to batteries.**
- **The battery electrolyte is corrosive. 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.**

At low temperature, batteries are less efficient. The level of charge is lowered and batteries will tend to freeze. Maintain batteries full charged wherever practicable, and give attention to heat insulation at night for the next day's operation.

Check the color of the hydrometer attached to the battery top to charge or replace the battery.

Green Good
Black Discharged too much
White Checking required

2.13 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 71.
- 2) If AF-PT antifreeze is in use, drain the coolant completely, wash clean inside the cooling system, and then fill with clean water (city water).

2.14 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 antifreeze to the coolant.
- 6) Completely drain the sprinkler system.
- 7) Place the F-R lever in the neutral position (N), turn the vibrator and sprinkler switches off and apply the parking brake.
- 8) Chock the machine.
- 9) Remove the starter switch key.

2.15 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.

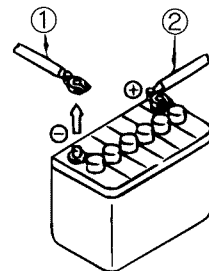
2. OPERATION

2.16 When the Battery Has Discharged

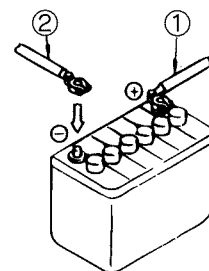
⚠ WARNING

- 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

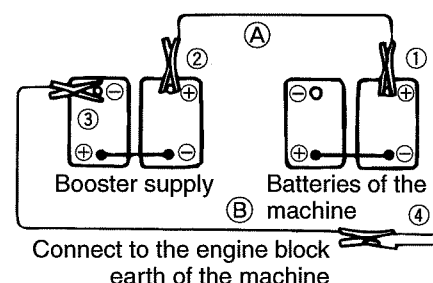


2.16.1 Connection and disconnection of booster cables

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

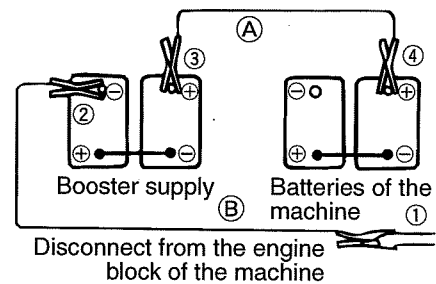
■ Connection of booster cables

- 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.



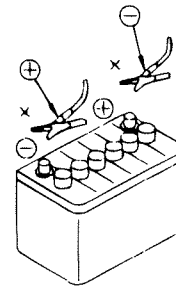
■ **Disconnection of booster cables**

- 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 friction, 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 or oil leakage, go ahead and replace them even if it is within scheduled replacement time.

System or Mechanism	Part name	Periodical replacement maintenance part	Replacement period	Remarks
1. Brake system	Master cylinder	Seals (rubber parts)	2 years	Adopted machines only
	Wheel cylinder	Seals (rubber parts)	2 years	“
	Brake piping parts	Brake hose	2 years	
		Air hose	2 years	Adopted machines only
	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	Adopted machines only
	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	4 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	
6. Cooling system	Piping parts	Radiator hose	2 years	
7. Control related parts	Cable	Cable	4 years	Adopted machines only

⚠ CAUTION:

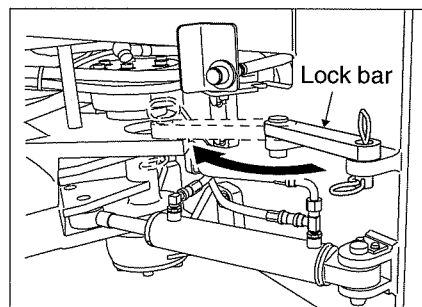
- **With a new machine, change the engine oil and change the engine oil filter element after 50 hours of operation for the first time only. (Refer to page 63)**
- **When trouble occurs in the location indicated by the indicator lamp on the monitor display, sensor will work and corresponding lamp comes on. If this occurs, conduct necessary service regardless of the periodical service interval recommendation.**
 - 1) **The hydraulic filter (line filter) warning lamp ⇨ Replace elements**
- **Check the electric wiring at a regular interval not exceeding one month:**
 - 1) **Damage to the wire harness and loose clamps**
 - 2) **Loose sockets**
 - 3) **Function of electrical systems**

3. PERIODICAL MAINTENANCE

3.1.1 Lifting the machine on a hoist

⚠ WARNING

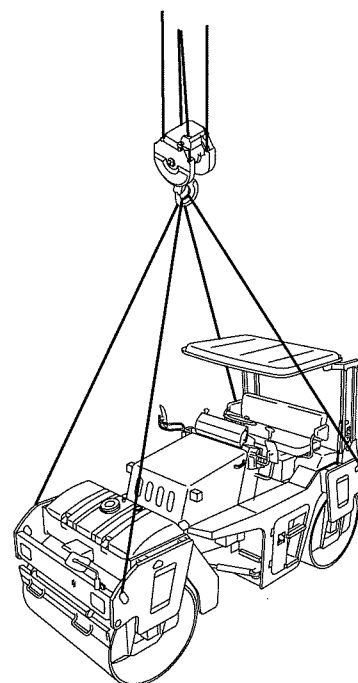
- Get a qualified personnel to lift and lower the machine on a hoist.
- Use sturdy wire ropes.
- Lock articulation by means of lock bar located at the center of machine.



⚠ CAUTION

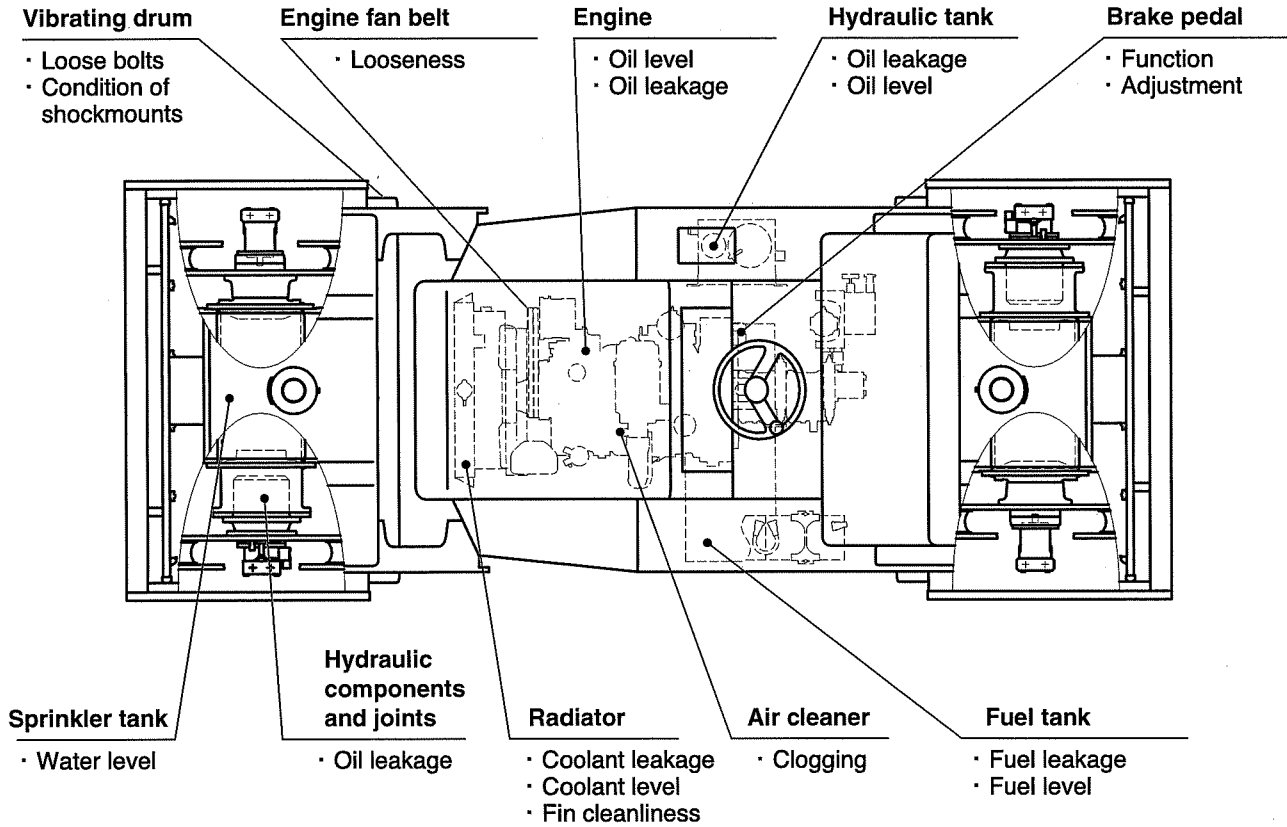
To do the lifting and lowering work, fold the awning.

- (1) Put wire ropes securely on the hook and lifting points as shown.
- (2) If wire ropes make contact with other parts of the machine, put pieces of cloth or wooden blocks at the contact points. Carefully perform lifting.
- (3) When lifting, keep the machine properly balanced.
- (4) Load the vehicle at the specified position on the truck correctly.

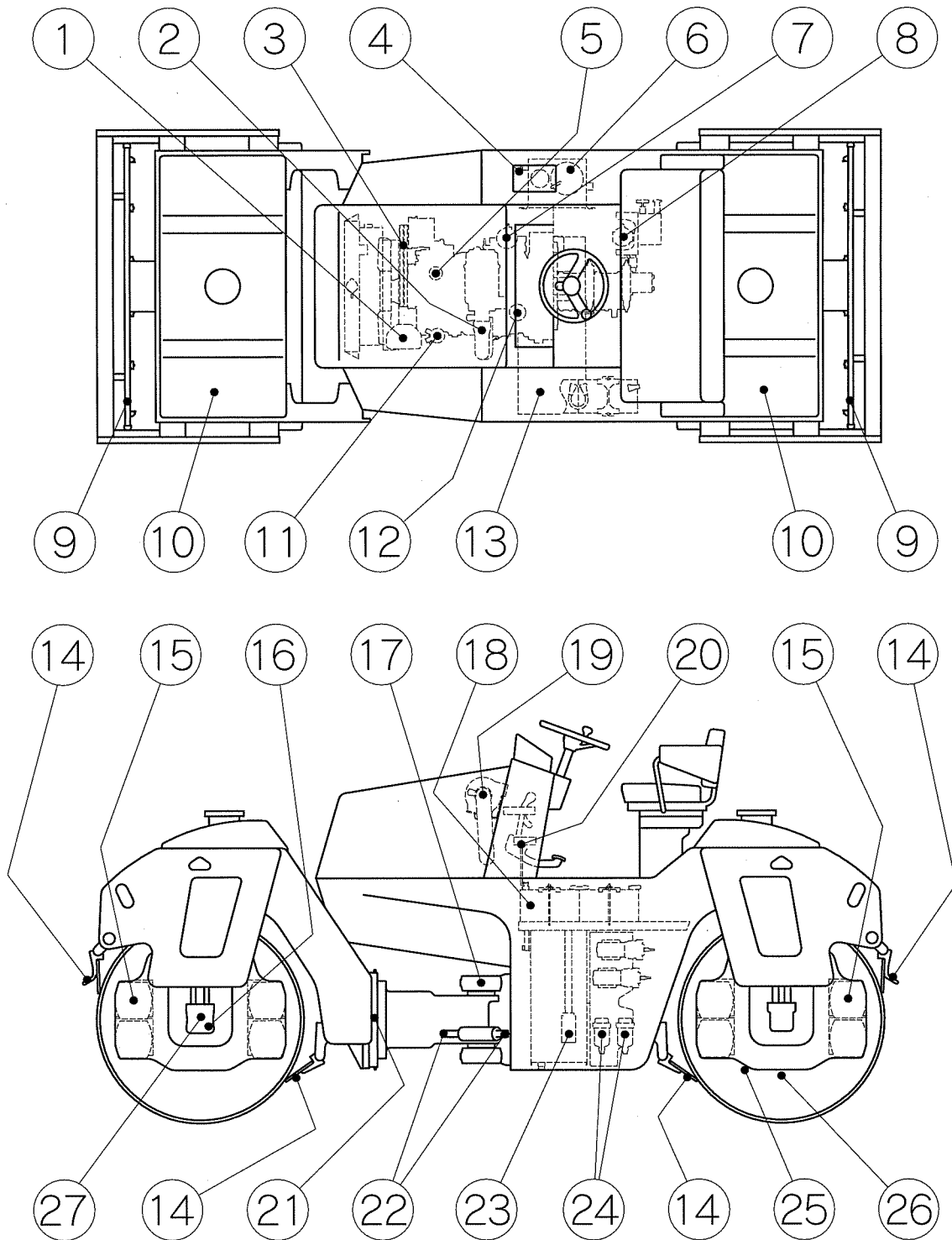


3.2 Walk-Around Checking

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:



3.3 Periodical Maintenance Points



3. PERIODICAL MAINTENANCE

Interval	Ref. No.	Item	Service	Lubricant	Q'ty
Every 10 hours or daily	①	Radiator	Check coolant level, add as necessary	Coolant	1
	②	Engine oil pan	Check oil level, add as necessary	Engine oil	1
	⑰	Center pin	Apply grease	Grease	2
	⑳	Tilt pin	Apply grease	Grease	4
Every 50 hours	④	Hydraulic tank	Check oil level, add as necessary	Hydraulic oil	1
	⑪	Fuel sedimenter	Check and drain water and sediment		1
	⑱	Battery	Check hydrometer		2
	㉔	Sprinkler filter	Clean element		2
Every 250 hours	③	Fan belt	Check looseness, adjust as necessary		1
	⑤	Engine oil pan	Change oil	Engine oil	1
	⑦	Engine oil filter	Change element		1
	⑨	Sprinkler pipe · nozzle	Clean		Pipe:2 Nozzle:12
	⑮	Rubber dampers	Check cracks		16
	㉒	Steering cylinder	Apply grease	Grease	4
	㉕	Vibrator	Check oil level	Gear oil	2
Every 500 hours	⑧	Line filter	Replace element		1
	⑫	Fuel filter	Replace element		1
	㉐	Control links	Check looseness and adjust		2
Every 1000 hours	⑥	Hydraulic tank	Change oil	Hydraulic oil	1
	⑯	Gear case : Whell motor	Change oil	Gear oil	2
	㉓	Suction filter	Clean element		1
	㉖	Vibrator	Change oil	Gear oil	2
	㉗	Brake	Check brake disk thickness or replace		2
As required	⑩	Sprinkler tank	Clean inside		2
	⑬	Fuel tank	Clean inside		1
	⑭	Scraper	Adjust or replace blade		4
	⑲	Air cleaner	Clean or replace element		1

3. PERIODICAL MAINTENANCE

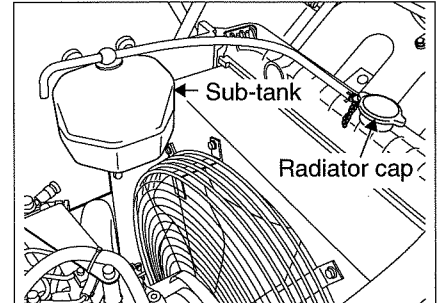
3.4 Maintenance Procedure

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

(1) Every 10 hours or daily

① Radiator

Check to see coolant in sub-tank is up to level mark and replenish with water. Use soft water only.

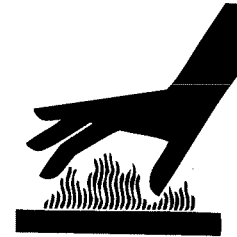


⚠ CAUTION

- With radiator cap removed, feed water nearly up to filler port, then replenish the sub-tank as well.
- If level is below LOW mark, remove sub-tank cover and replenish with fresh water up to FULL mark.

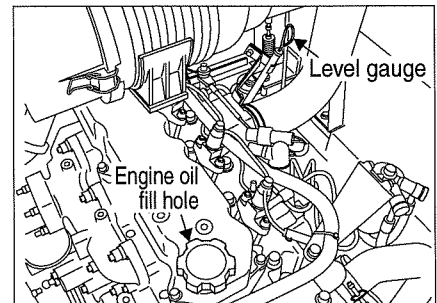
⚠ WARNING

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



② Engine oil pan

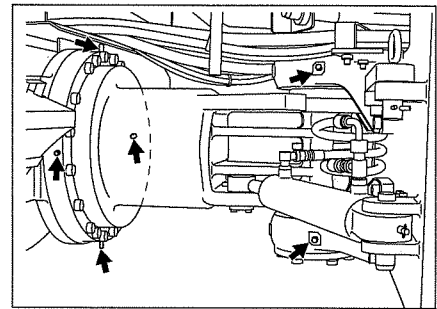
Shut down the engine and check the engine oil level. If it is not between MAX and MIN marks, add oil through the fill hole.



3. PERIODICAL MAINTENANCE

⑰ Center pin

Grease lubricate two locations.



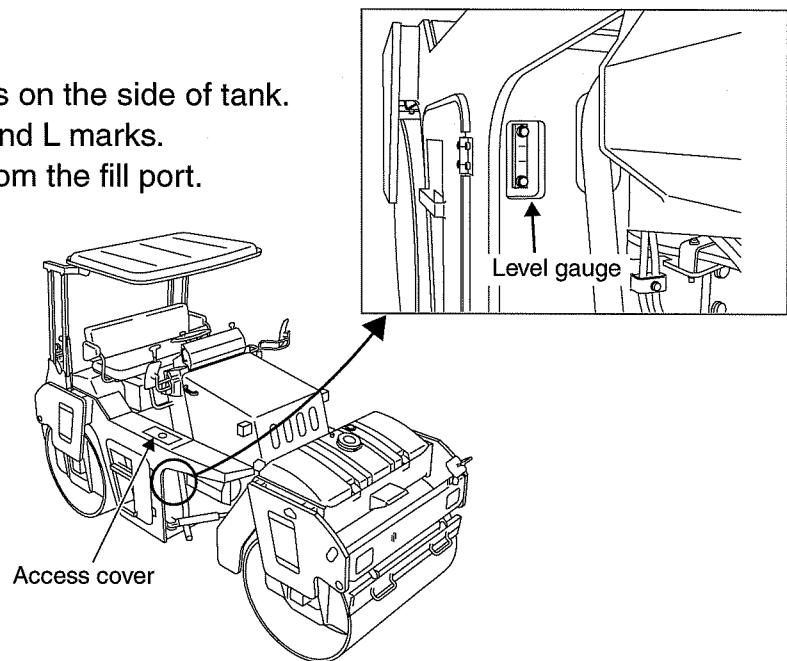
⑳ Tilt pin

Grease lubricate four locations.

(2) Every 50 hours

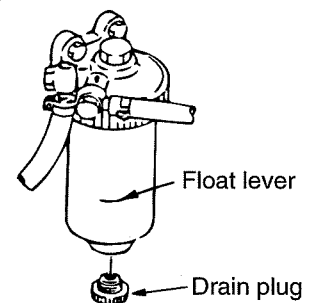
④ Hydraulic tank

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.



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.



3. PERIODICAL MAINTENANCE

18 Battery

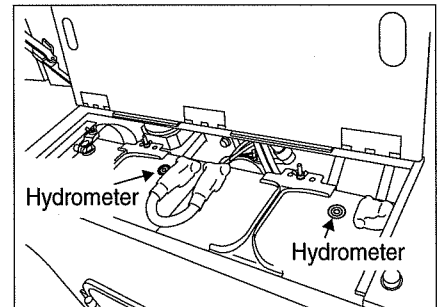
- 1) Check the color of the hydrometer attached to the battery top to charge or replace the battery.

Green ... Good

Black ... Discharged too much

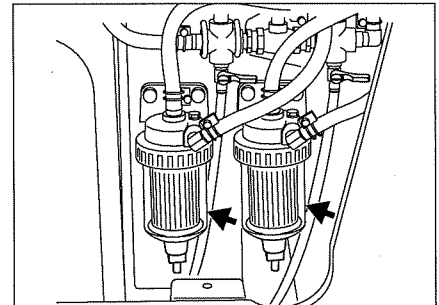
White ... Checking required

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



24 Sprinkler filter

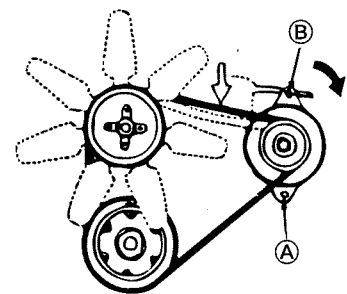
Take off the filter case by turning counter-clockwise as viewed from the bottom. Clean the element or change the element.



(3) Every 250 hours

3 Fan belt

- 1) Check the fan belt for wear and damage. Replace as necessary.
- 2) Check the tension. Depress the middle of the belt with a push of about 10kg. A properly adjusted belt deflects 10 to 15 mm.
- 3) To adjust, loosen alternator bracket bolt (A) and plate bolt (B), and slide the alternator.



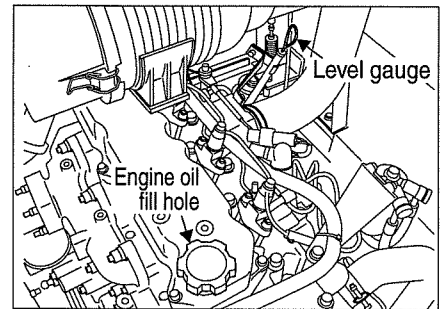
3. PERIODICAL MAINTENANCE

⑤ Engine oil pan

⑦ Engine oil filter

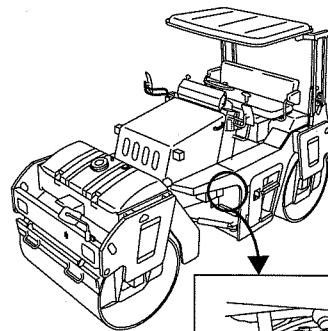
➔ See the separate engine manual.

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

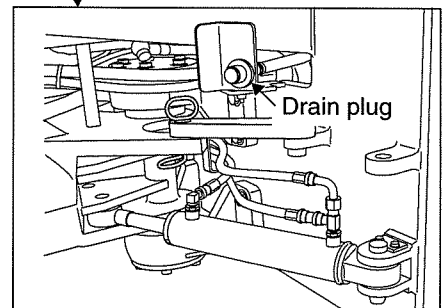


⚠ WARNING

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

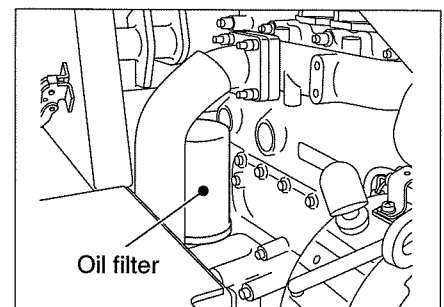


- 2) Refit the drain plug and fill the crankcase with the engine oil from the fill hole on the cylinder head cover.



- 3) Change the oil filter.

NOTE: For a new machine, change oil at 50 operating hours for the initial time only.

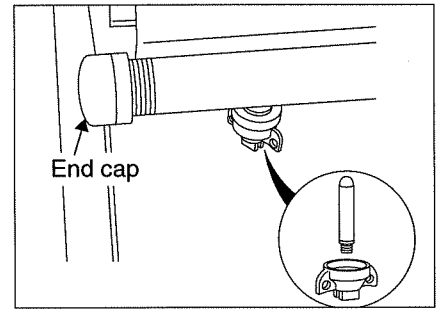


3. PERIODICAL MAINTENANCE

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.



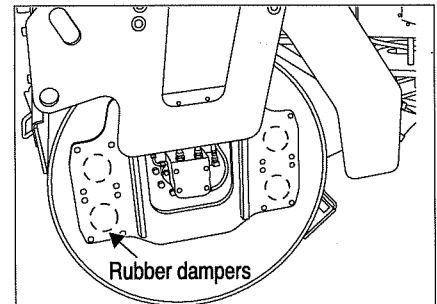
2) Nozzle

- 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.

NOTE: Clean the nozzle as necessary even before the next inspection time comes.

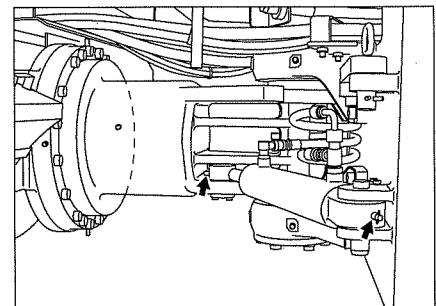
⑮ Rubber dampers

Check the rubber blocks for cracks, and their mounting bolts for looseness.



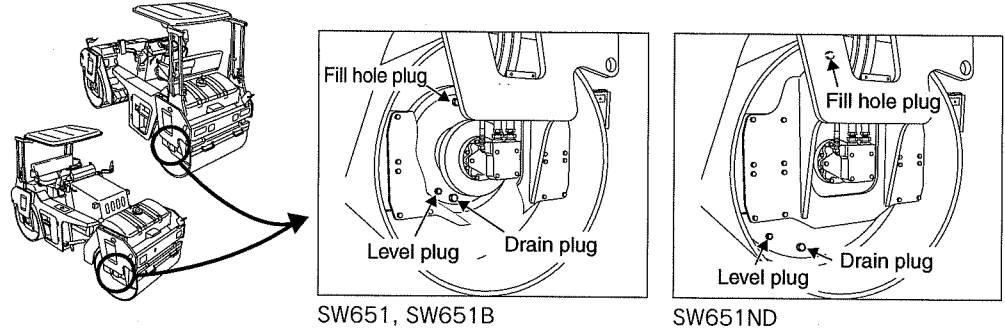
⑳ Steering cylinder

Apply grease to the four fittings.



25 **Vibrator**

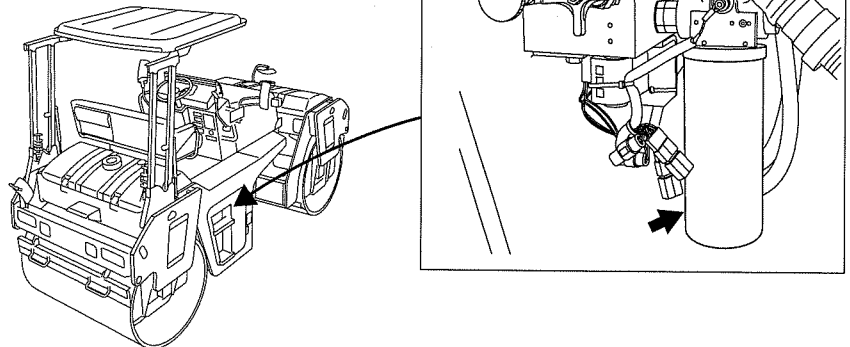
Check for the oil level and leakage.



(4) Every 500 hours

8 **Line filter**

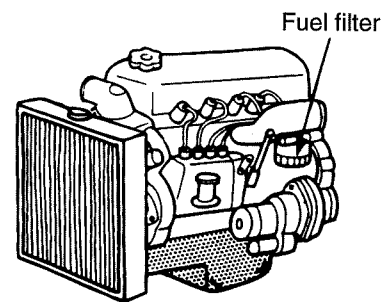
Change the elements.



12 **Fuel filter**

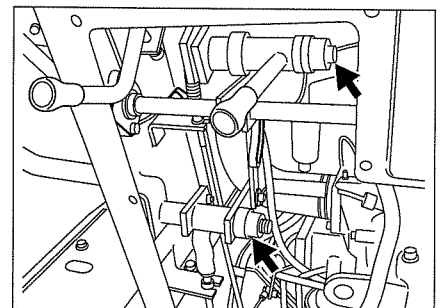
➔ See the separate engine manual.

Change the filter cartridge.



20 **Control links**

Remove the cover under the dashboard.
Check the bolts and nuts for looseness. Adjust the rod.

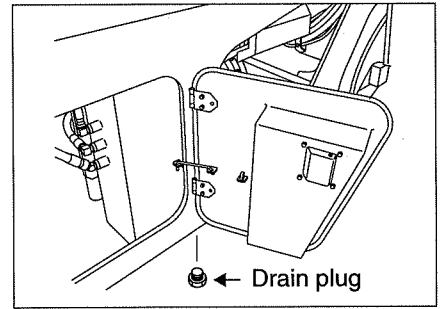


3. PERIODICAL MAINTENANCE

(5) Every 1000 hours

⑥ Hydraulic 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.

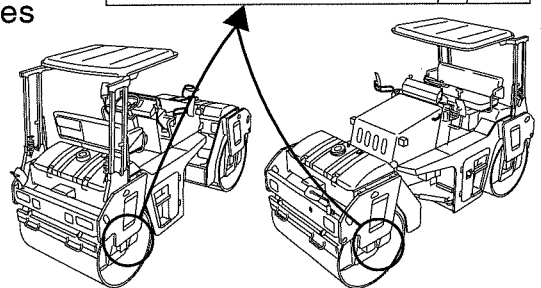
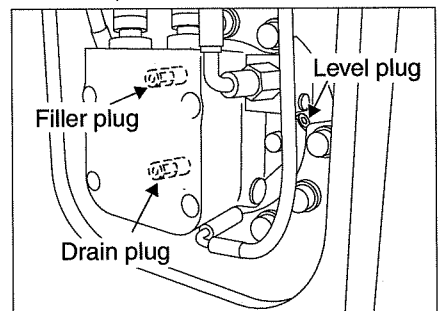


⚠ WARNING

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

①⑥ Gear case : Wheel motor

- 1) Remove the filler plug, level plug, and drain plug while the oil is still warm.
- 2) After draining oil from the gear case, attach the drain plug.
- 3) Supply oil through the filler port until the oil overflows the level port.
- 4) Attach the filler plug and level plug.
- 5) Run the vehicle once after oil is supplied. Check the quantity of oil again at the level port several minutes later.



⚠ WARNING

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

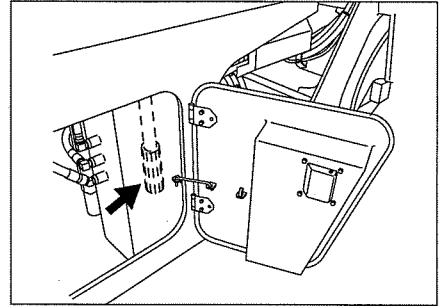
⚠ CAUTION

The quantity of oil in the gear case is 1.2~1.3 liters (0.3 gal.) .

3. PERIODICAL MAINTENANCE

23 Suction filter

Take off the hydraulic tank cover. Take out and clean the strainer, change the strainer if necessary.



26 Vibrator

- 1) Rotate the drum till the drain plug comes to bottom.
- 2) Remove the drain , level and fill hole plugs.
- 3) Drain the vibrator oil.
- 4) Wash clean the removed plugs, and refit the drain plug.
- 5) Fill oil through the fill port till it overflows from the fill port.
- 6) Refit the level plug and fill port plug.

⚠ WARNING

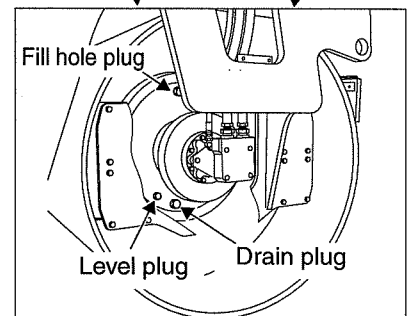
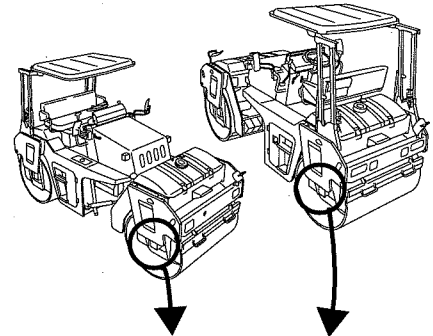
When draining a hot oil, use care not to get burned.

⚠ CAUTION

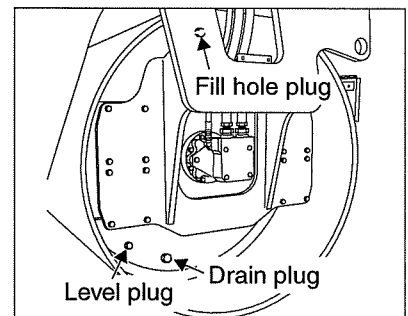
The oil quantity of the vibrator is 4.0 liters (1.1 gal.).
Never supply oil more than that.

*1 SW651B : 1.7 liters (0.4 gal.)

SW651ND : 10.4 liters (2.7 gal.)



SW651, SW651B



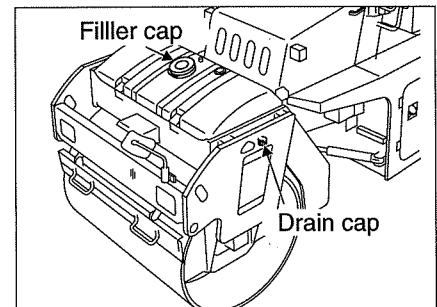
SW651ND

3. PERIODICAL MAINTENANCE

(6) As required

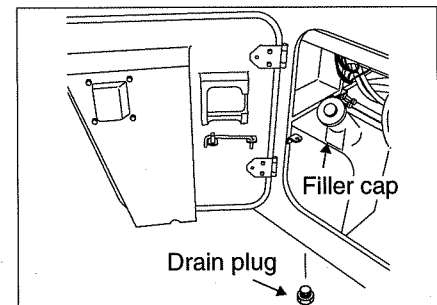
⑩ Sprinkler tank

- 1) Remove the drain cap under the sprinkling tank located at the machine front/rear and discharge dust and deposit in the tank.
- 2) Remove the filler cap and clean the interior of the tank.
- 3) When the necessary work is complete, refit the drain cap and filler cap.



⑬ Fuel tank

- 1) With the drain plug removed, remove the water and sediment from the bottom of the tank.
- 2) If sedimentation is substantial, remove the drain plug and clean the interior of the tank.
- 3) When the necessary work and refueling are complete, tighten the filler cap positively.



NOTE: When removing the water and sediment from the tank filled with the fuel, the fuel will gush out if the drain plug is screwed out completely.

⚠ 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.



27 Brake

Traveling motor disassembling procedure

- Traveling motor part No.4217-26000-0
- Before disassembly, carefully clean the circumference so that foreign matter will not enter the traveling motor.

1) Hydraulic hose

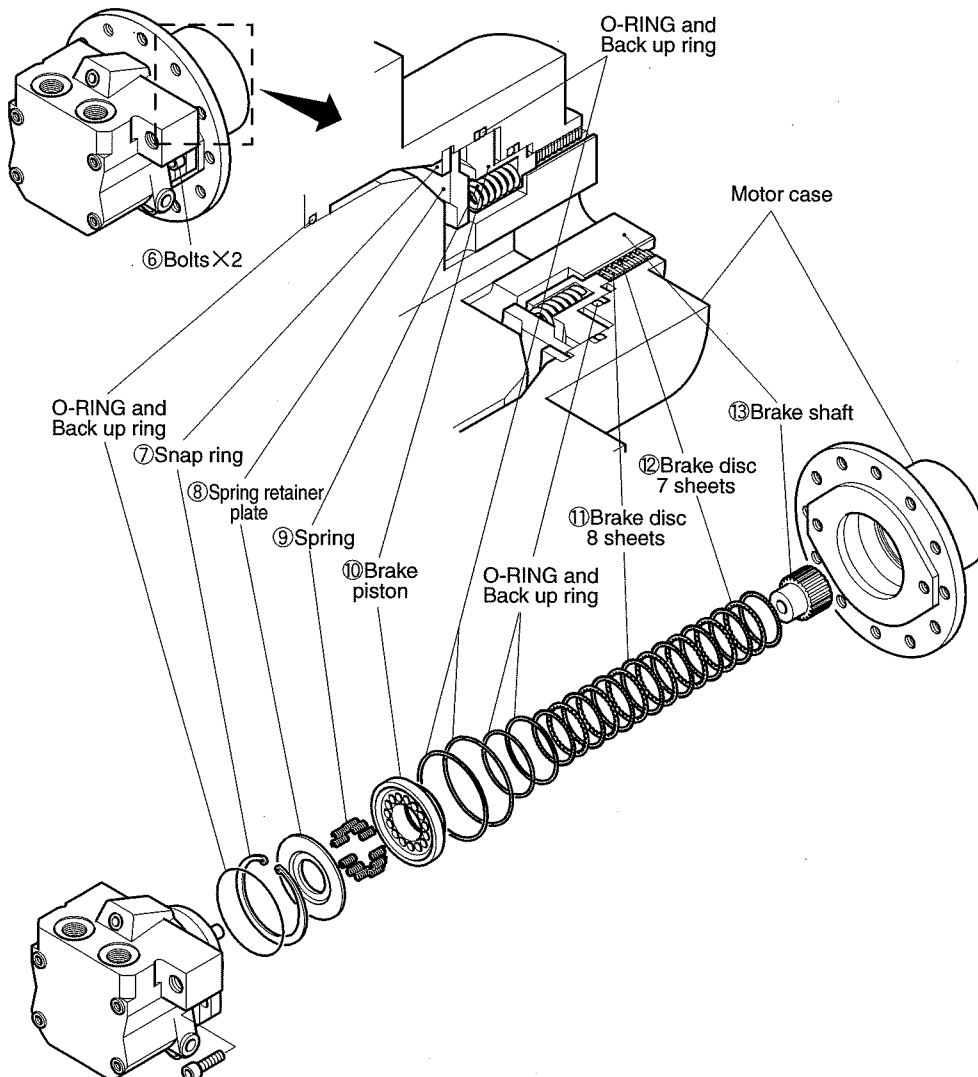
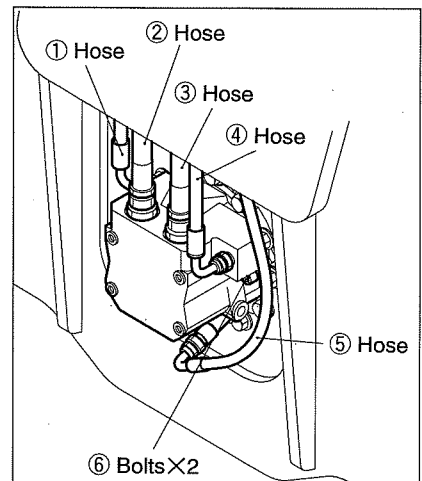
Separate hydraulic hoses ①, ②, ③, ④, and ⑤ from the motor.

- Attach a blind plug to thee hoses and motor-side adaptors respectively.

2) Removal of traveling motor

Remove two bolts ⑥, and then remove the traveling motor.

- A small quantity of gear oil will flow out of the motor.
- Exercise care.



3. PERIODICAL MAINTENANCE

3) Removal of brake disc

- (1) Remove snap ring ⑦ , and remove spring retainer plate ⑧ .
- (2) Remove spring ⑨ , and remove brake piston ⑩ .
 - Spring: 11 pcs
 - When the brake piston is difficult to remove, force-feed air from the brake port.
(Attach hydraulic hose ⑤ , turn clockwise the valve knob installed at the right inside the vehicle, and press the hand pump to force-feed air.)
 - After force feeding air, return the valve knob counterclockwise.
- (3) Remove brake discs ⑪ and ⑫ , as well as brake shaft ⑬ .
 - Disc ⑪ : 8 sheets; disc ⑫ : 7 sheets
 - Part No. Disc ⑪ : 4217-26002-0; disc ⑫ : 4217-26001-0

Traveling motor assembling procedure

★ Carefully clean attaching parts, and assemble the traveling motor in a manner to prevent entry of foreign matter into the motor.

1) Installation of brake disc

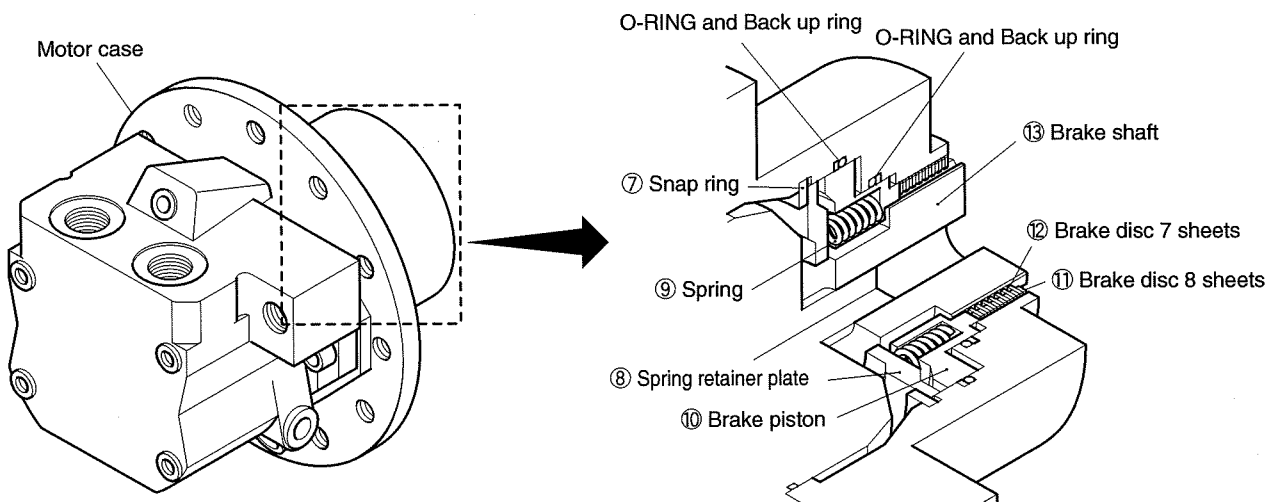
Install brake shaft ⑬ , and then install brake disc ⑪ and brake disc ⑫ in this order.

- Disc ⑪ : 8 sheets; disc ⑫ : 7 sheets

2) Installation of brake piston

(1) Install brake piston ⑩ .

- Check that the O-ring and backup ring have been attached to the attaching section on the motor side (2 places shown in the figure).

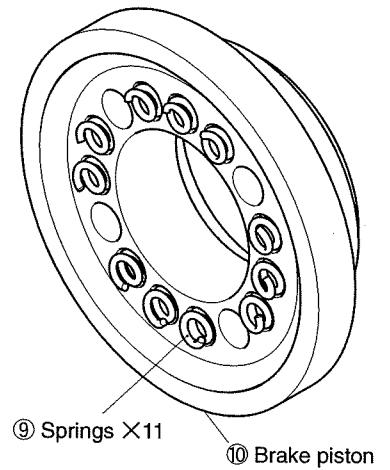


- Carefully install the brake piston so that the O-ring will not be clamped.

3. PERIODICAL MAINTENANCE

(2) Install spring ⑨ as shown in the figure.

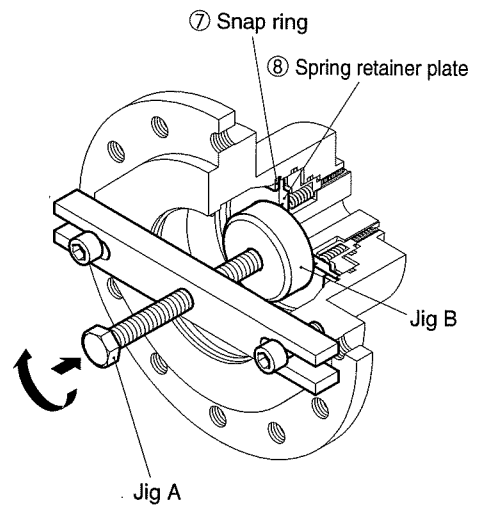
- Spring: 11 pcs



(3) Install spring retainer plate ⑧ .

3) Installation of snap ring

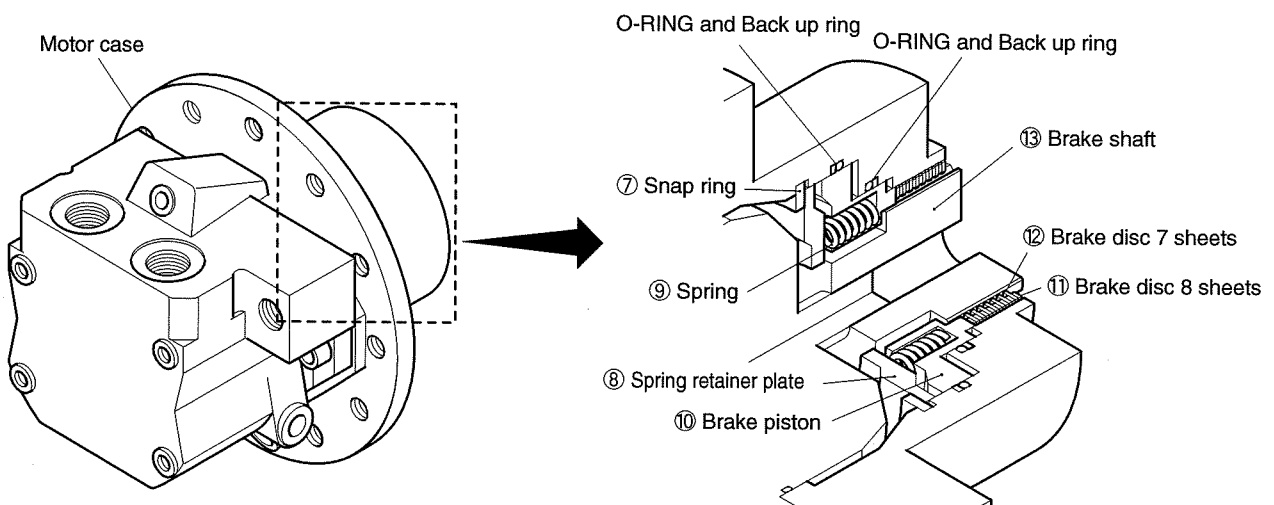
- (1) Push in spring retainer plate ⑧ with a jig until the snap ring installation groove is seen.
- (2) In the above state, install snap ring ⑦ .
- (3) Remove the jig.



4) Installation of traveling motor

Install the traveling motor, and secure it with two bolts ⑥ .

- Check that the O-ring is attached to the motor.



- Exercise care so that the O-ring will not be clamped.
- Bolt tightening torque: 86 [Nm]

3. PERIODICAL MAINTENANCE

5) Hydraulic hose

Attach hydraulic hoses ⑤ , ④ , ③ , ② , and ① to the motor.

6) Supply of gear oil and hydraulic oil

(1) Feed gear oil to the traveling motor up to the specified level.

★ Refer to " ⑩ Gear case: Wheel motor" in "3. PERIODICAL MAINTENANCE" on page 66.

(2) Feed oil to the hydraulic oil tank to make up for the spill.

★ Start the engine to circulate the oil through the piping, and then check the oil level again.

3. PERIODICAL MAINTENANCE

⑭ Scraper

When the blade is worn, adjust the scraper properly. See page 31 for adjustment. If the clearance is beyond the adjustable range, change the blade.

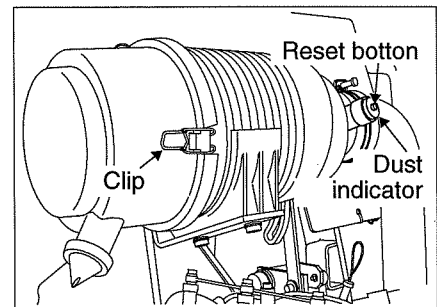
⚠ WARNING

Use care not to get your fingers caught between the scraper blade and drum.

⑰ Air cleaner

When the red float of the dust indicator reaches the service level (a mark on the indicator), clean the element as described below:

- 1) Remove the clip and pull out the element.
- 2) Blow compressed air from inside of the element to clean.



⚠ WARNING

Exercise caution not to get a speck of dust in your eye.

- 3) Check the element for damage. Change if found to be abnormal.
- 4) Refit the element and tighten the clip.

⚠ CAUTION

Replace the element when the red float reaches the service level even if it is cleaned.

NOTE: In normal use, change the outer element once in every six cleanings.

3. PERIODICAL MAINTENANCE

3.5 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 replacing oil, drain it completely and clean the container with flushing oil before filling new oil.

2. Capacity

Compartment	Type of fluid	Capacity in liters (gal.)		
		SW651	SW651B	SW651ND
Engine oil pan	Engie oil	8 (2.1)		
Front wheel motor	Gear oil	1.1 (0.3)		
Rear wheel motor	Gear oil	1.1 (0.3)		
Vibrator	Gear oil	4.0 (1.1) x 2	1.7 (0.4) x 2	10.4 (2.7) x 2
Hydraulic tank	Hydraulic oil	42 (11)		
Fuel tank	Diesel oil	120 (32)		
Radiator	Coolant	14 (3.7)		
Sprinkler tank	Water	300 (79) x 2		

3. PERIODICAL MAINTENANCE

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 CD	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 resistant	ISO-VG32 over VI 140	ISO-VG46 over VI 140	ISO-VG68 over VI 110	ISO-3448
Grease	Lithium type extreme pressure				NLGI-2
Fuel	Diesel oil				ASTM D975-2D

4. Recommended lubricants

Lubricant Oil company	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 C3-30	BP Gear Oil EP 90	BP Energol HLP 46	BP Energrease LS - EP 2
ESSO	Esso Lube D3-30	Esso Gear Oil GP 90	Nuto H 46	Beacon EP 2
MOBIL	Mobil Delvac 1330	Mobil Pegasus Gear Oil 90	Nuto Oil 25	Beacon EP 25
SHELL	Shell Rotella CT Oil 30	Shell Spirax 90 EP	Shell Tellus Oil 48	Shell Alvania EP Grease 2
CASTROL	Castrol CRD 30	Castrol Hypoy 90	Hyspin AWS 46	Spherrol ELP 2

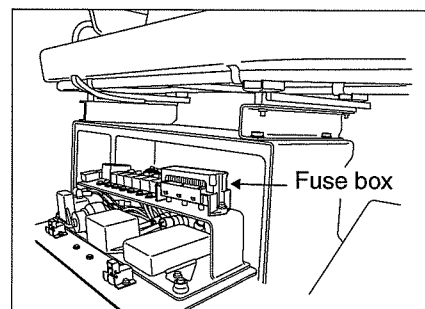
- CAUTION:** (1) Fill the fluid reservoirs with the filters installed.
(2) Use recommended fuels and lubricants only.

Fuse box

The fuse box houses five 15A- and five 20A- fuses lined up with spares fitted for 15A- and 20A- fuses.

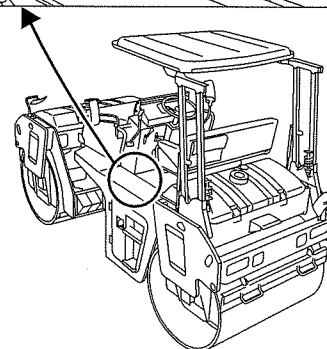
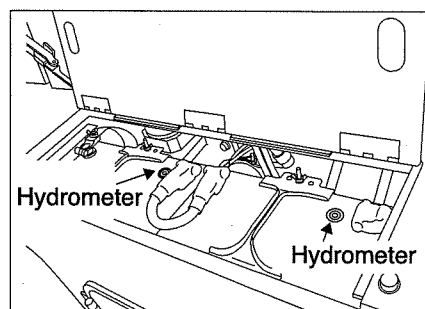
Use fuses of correct capacity. See page 29.

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



Battery

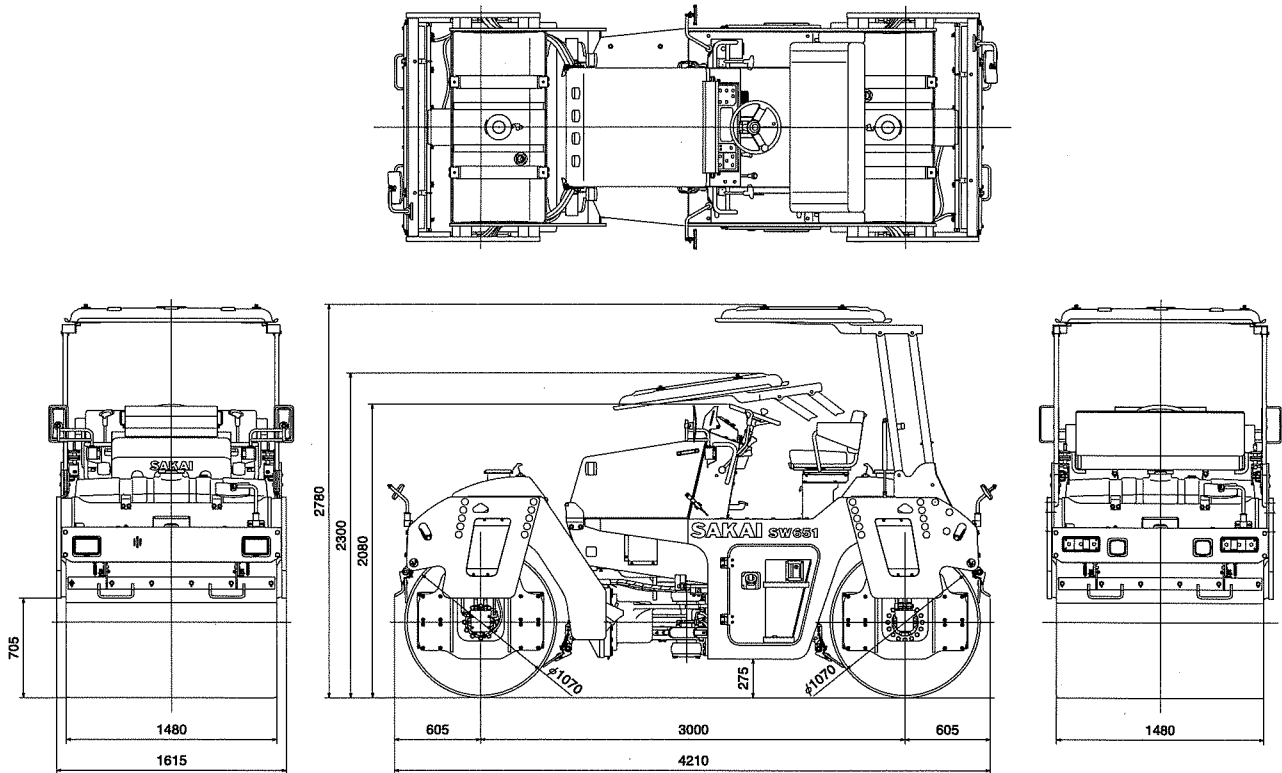
- ★ Leaving the battery unused for long without attention or its power excessively at a time can cause damage to the plates, leading to a shortened life.
- ★ For long-term storage, charge it fully, tighten the caps securely, store in a cool and dry place, and check the level of charge at least once a month.
- ★ Keep the battery in a satisfactory condition at all times.
- ★ 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

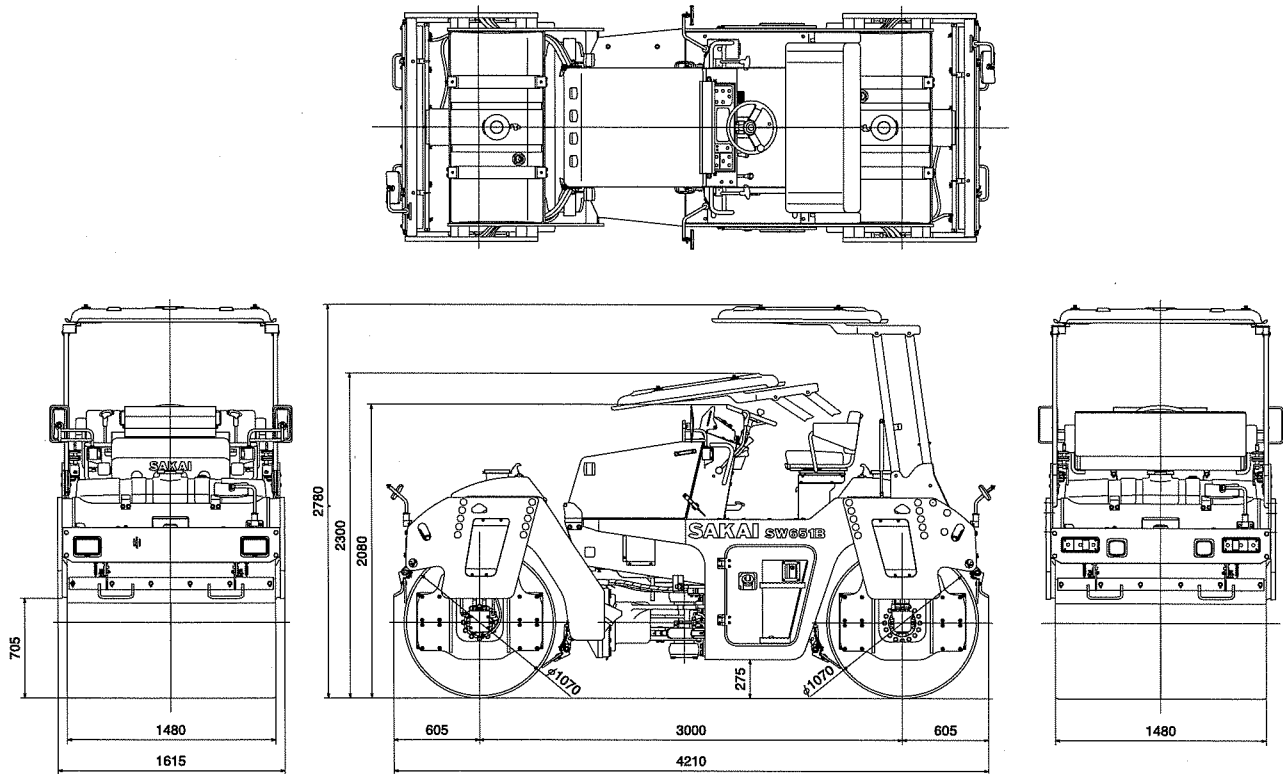
(1) SW651



Model	SW651		
Weight:			
Gross weight	7,100 kg (15,660 lbs)		
Empty weight	6,500 kg (14,330 lbs)		
Dimension:			
Overall length	4,210 mm (165")		
Overall width	1,615 mm (64")		
Overall height	2,780 mm (109")		
Wheelbase	3,000 mm (118")		
Wheel			
Front	Roll (dia. x width)		
	1,070 x 1,480 (740×2) mm (42" x 58")		
Rear	Roll (dia. x width)		
	1,070 x 1,480 (740×2) mm (42" x 58")		
Performance:			
Travel speed (forward/reverse)	0 ~ 12 km/h (0 ~ 7.5 mile/h)		
Vibrating power:		Low	High
Frequency		67 Hz {4,020 vpm}	50 Hz {3,000 vpm}
Centrifugal force		62 kN {6,300 kgf}	69 kN {7,000 kgf}
Gradability		19 degrees	
Rolling width		1,480 mm (58")	
Minimum turning radius		5.0 m (197")	
Engine:			
Model		HINO "W04D-H" Diesel Engine	
Total displacement		4.009L {4,009 cc} (245 cu.in)	
Rated output		56kW {76 PS}/2,050 min ⁻¹ {rpm} (75 HP/2,050 rpm)	
Max. torque		265N·m {27.0 kgf·m}/1,600 min ⁻¹ {rpm} (195 ft·lbs/1,600 rpm)	
Tank capacity:			
Fuel tank		120 litres (32 gal)	
Hydraulic tank		42 litres (11 gal)	
Sprinkler tank		300 litres x 2 (79 gal x 2)	

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

(2) SW651B

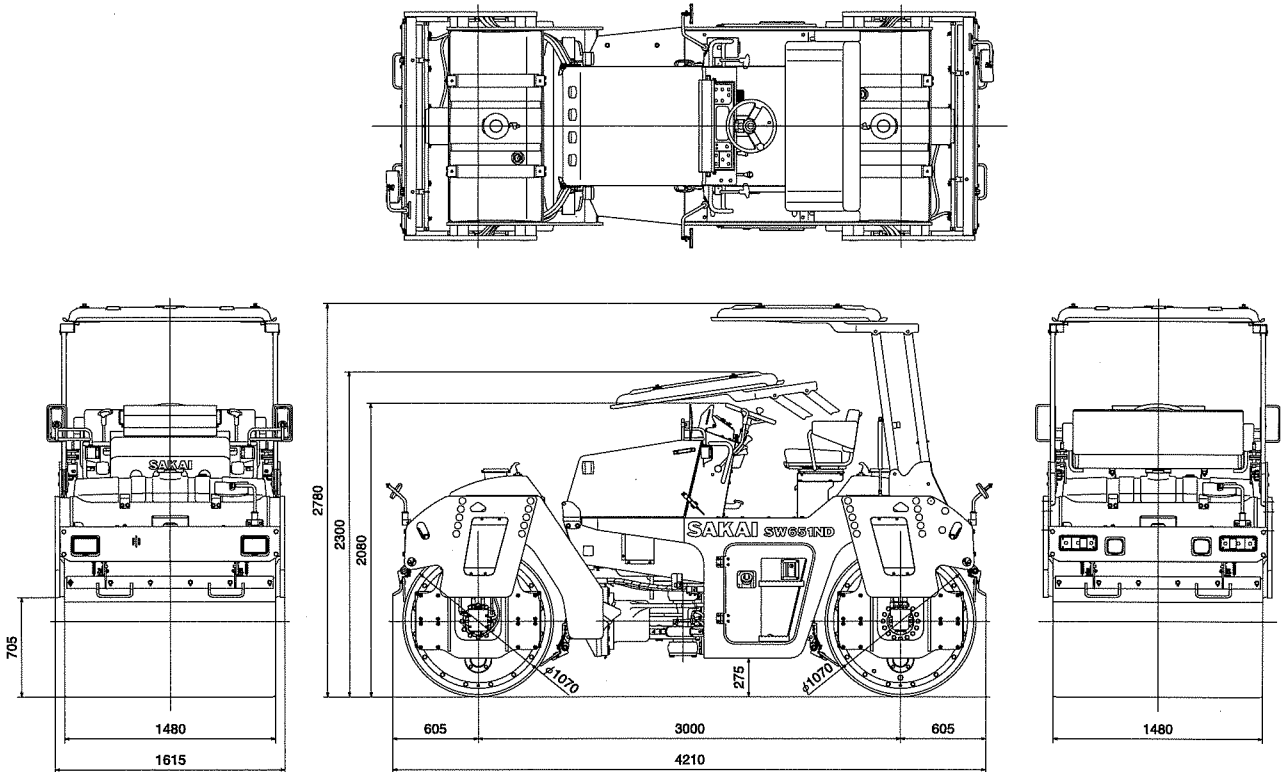


Model	SW651B		Vibrating power:	Low	High
Weight:			Frequency	67 Hz {4,020 vpm}	50 Hz {3,000 vpm}
Gross weight	8,000 kg (17,640 lbs)		Centrifugal force	61 kN {6,200 kgf}	67 kN {6,800 kgf}
Empty weight	7,400 kg (16,310 lbs)		Gradability	16 degrees	
Dimension:			Rolling width	1,480 mm (58")	
Overall length	4,210 mm (165")		Minimum turning radius	5.0 m (197")	
Overall width	1,615 mm (64")		Engine:		
Overall height	2,780 mm (109")		Model	HINO "W04D-H" Diesel Engine	
Wheelbase	3,000 mm (118")		Total displacement	4.009L {4,009 cc} (245 cu.in)	
Wheel			Rated output	56kW {76 PS}/2,050 min ⁻¹ {rpm} (75 HP/2,050 rpm)	
Front	Roll (dia. x width)		Max. torque	265N·m {27.0 kgf·m}/1,600 min ⁻¹ {rpm} (195 ft·lbs/1,600 rpm)	
	1,070 x 1,480 (740×2) mm (42" x 58")		Tank capacity:		
Rear	Roll (dia. x width)		Fuel tank	120 litres (32 gal)	
	1,070 x 1,480 (740×2) mm (42" x 58")		Hydraulic tank	42 litres (11 gal)	
Performance:			Sprinkler tank	300 litres x 2 (79 gal x 2)	
Travel speed (forward/reverse)	0 ~ 12 km/h (0 ~ 7.5 mile/h)				

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

4. SPECIFICATIONS

(3) SW651ND



Model	SW651ND		Vibrating power:	Ordinary	Horizontal
Weight:			Frequency	49 Hz {2,940 vpm}	49 Hz {2,940 vpm}
Gross weight	7,400 kg (16,310 lbs)		Centrifugal force	68 kN {6,900 kgf}	124 kN {12,600 kgf}
Empty weight	6,800 kg (14,990 lbs)		Gradability	18 degrees	
Dimension:			Rolling width	1,480 mm (58")	
Overall length	4,210 mm (165")		Minimum turning radius	5.0 m (197")	
Overall width	1,615 mm (64")		Engine:		
Overall height	2,780 mm (109")		Model	HINO "W04D-H" Diesel Engine	
Wheelbase	3,000 mm (118")		Total displacement	4.009L {4,009 cc} {245 cu.in}	
Wheel			Rated output	56kW {76 PS}/2,050 min ⁻¹ {rpm} (75 HP/2,050 rpm)	
Front	Roll (dia. x width) 1,070 x 1,480 (740×2) mm (42" x 58")		Max. torque	265N·m {27.0 kgf·m}/1,600 min ⁻¹ {rpm} (195 ft-lbs/1,600 rpm)	
Rear	Roll (dia. x width) 1,070 x 1,480 (740×2) mm (42" x 58")		Tank capacity:		
Performance:			Fuel tank	120 litres (32 gal)	
Travel speed (forward/reverse)	0 ~ 12 km/h (0 ~ 7.5 mile/h)		Hydraulic tank	42 litres (11 gal)	
			Sprinkler tank	300 litres x 2 (79 gal x 2)	

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

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