

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

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**OPERATING &  
MAINTENANCE  
INSTRUCTIONS**

**SAKAI HEAVY INDUSTRIES, LTD.**

VIBRATING  
ROLLER

MODEL  
**SW884**  
**SW884ND**  
**SW994**

From	SW884	→ 3SW79 – 40101
		→ 1SW82 – 40101
SW884ND		→ 3SW79 – 40101
		→ 1SW82 – 40101
SW994		→ 3SW80 – 40101
		→ 1SW83 – 40101

**SAKAI®**

## PREFACE

This operator's manual serves as a guide for the use of your SAKAI SW884, SW884ND, SW994 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.

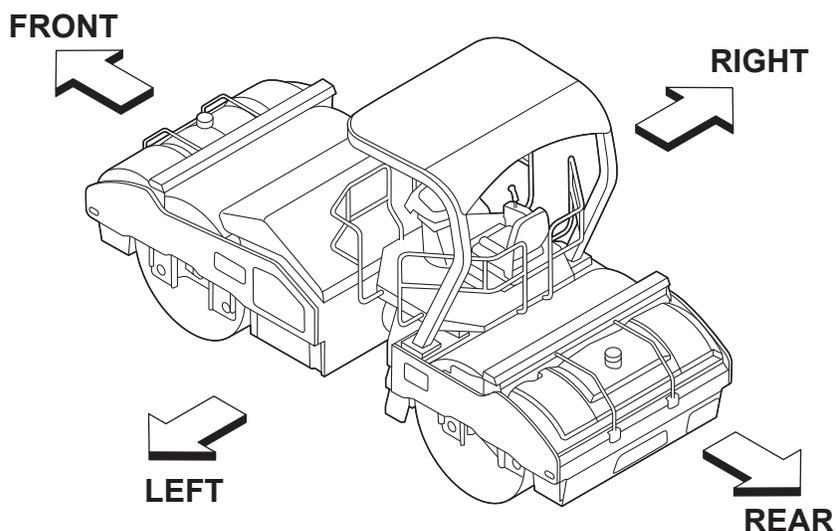
Read this manual thoroughly and try to fully understand the information before operating your machine. Keep this handbook at hand whenever you do your work.

When an instruction manual is lost or is damaged and is not legible, replace it immediately.

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.



SW884, SW884ND, SW994

### **CALIFORNIA**

#### **Proposition 65 Warning**

**Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.**

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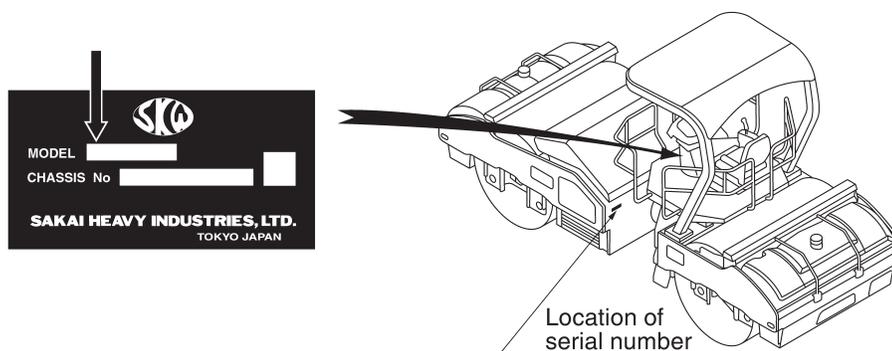
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## MACHINE AND ENGINE IDENTIFICATION NUMBERS

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

### (1) Machine model

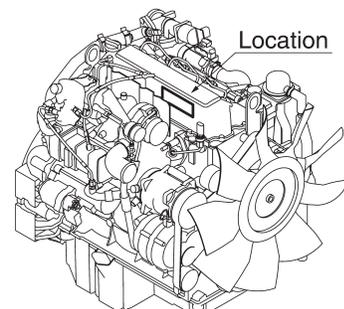
Indicated on the nameplate of the dashboard in the operator's station.



### (2) Machine serial number

SW884	→	3SW79	-	○	○	○	○	○
		1SW82	-	○	○	○	○	○
SW884ND	→	3SW79	-	○	○	○	○	○
		1SW82	-	○	○	○	○	○
SW994	→	3SW80	-	○	○	○	○	○
		1SW83	-	○	○	○	○	○

### (3) Engine serial number



## **SAFETY NOTICES**

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

This manual covers the proper and safe method of driving and handling of this machine for its intended use. When this machine is used in a manner other than those 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:

- |  |   |
|--|---|
|  <b>DANGER</b>    | <b>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).</b> |
|  <b>WARNING</b>  | <b>Denotes that there is a hazard. If you fail to take proper precautions, you could be killed or seriously injured (Symbol  is orange).</b>   |
|  <b>CAUTION</b> | <b>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).</b>                               |

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

 **WARNING**

**Do not operate your machine before you read its operator's manual thoroughly.  
Incorrect operation can kill or cause injury.  
It is your responsibility to operate the machine safely.**

☆ Making alterations to the machine.

Please do not make alterations to the machine without permission for safety reasons.  
We shall not be held responsible for injuries, death or breakdowns caused by alterations.

☆ Basic precautions for safe operation of your machine are described beginning on page 4.

☆ To operate and work with your machine, you must be qualified.

## 1 BASIC PRECAUTIONS FOR SAFETY

### 1.1 General Precautions

#### ■ Ensure proper management of health

- People under the influence of alcohol, drugs, lack of sleep or health problems must avoid driving or repairing the machine at all times, as it may lead to serious accidents.

#### ■ Turn off cell phones

- Turn off cell phones while driving or repairing the machine. Never drive while talking on a cell phone, as it may lead to serious accidents.

#### ■ Read the operator's manual thoroughly

- 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.



#### ■ When an instruction manual is lost or is damaged and is not legible, replace it immediately

#### ■ Understanding the uses for the machine

- This machine was developed and manufactured mainly for the purpose of rolling compaction in engineering works. Do not use it for any other purpose. Vibration rolling compaction under conditions of excessive compaction, or using it to crush rocks can damage the machine.

#### ■ Obey the worksite rules

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

■ **Wear protective clothing appropriate to 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.
- Depending on the type of job, wear gloves, earplugs safety goggles or a 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.

■ **The operator must make prior checks when moving the machine to a hazardous area under unusual conditions**

■ **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.

■ **Realize 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.

■ **The machines not equipped with ROPS must not be operated on the slope or unsafe ground**

■ **The machines not equipped with CABIN must not be operated in the bad weather or a harmful contaminated zone**

## 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.



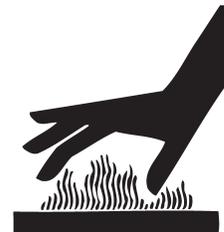
### ■ Beware when operating moving parts

- When operating moving parts such as covers, be sure to understand the way they move and take care not to get the hands and feet caught.

### ■ Operator must sit in the seat when operating 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 stopped 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 (For the cap with a lever, lift the lever to release the trapped pressure).
- While the engine is running or immediately after it has been stopped, do not touch the engine, muffler, exhaust pipes, oil hydraulic pumps, oil hydraulic motors, lights, etc., as they will be hot.
- Resin and metallic parts may become hot under direct sunlight on a hot day. Direct contact with such parts may cause burns, so be sure to wear clothing and protective equipment appropriate for the job.



**■ 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.

**■ Ensuring safety in a fire**

- Machine fires may cause serious injuries or death, so stop the engine by turning the starter switch to the  $\bigcirc$  position, then move away from the machine as quickly as possible.

**■ While the engine is running or immediately after it has been turned off, do not touch the muffler, exhaust pipe or DPF**

- While the engine is running or immediately after it has been turned off, do not touch the muffler, exhaust pipe or DPF, as they will be hot.

**■ 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.
- Watch your step when getting on or off the machine.
- Do not jump on or off a machine, particularly when it is moving.
- When getting on and off an articulated machine, straighten it out before stopping the machine. In the turned state, there is danger that personnel gets caught because the getting on and off space narrows.

**■ Be careful not to fall**

- Falling off the machine may cause serious injuries or death, so do not place your feet anywhere other than on the steps, and in the driver's seat.

**■ Do not lock out yourself when leaving the machines**

- Always bring the key with you by pulling it out from the starting switch when leaving the machine.

## 1 BASIC PRECAUTIONS FOR SAFETY

### ■ 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.



### ■ Do not use worn tires (Tire installed)

- Tires may be damaged when they are scratched on curb stones, when the machine runs over irregular surfaces of roads or projections on roads, and when the machine is operated suddenly.
- Continued use of damaged tires will cause them to blow out. Replace them with new ones.

## 1.2 Preparation for Safe Operation

### ■ Clean the step, operator's station and floor board and brake pedal

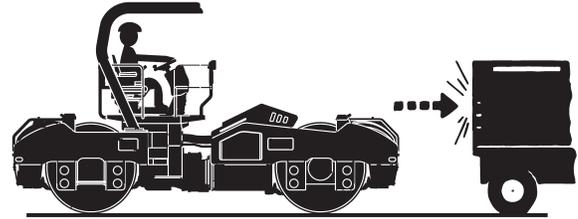
- Do not place parts, tools or unnecessary articles on the step, operator's station and floor board.
- Keep the step, floor board, brake pedal, controls and handholds free from muds, oil, ice or water, as they can cause slippage. Repair them if found to be damaged. Tighten loose bolts.
- Keep your boot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

**■ Watch your 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.

**■ Understand ROPS functions (with ROPS)**

- Ensure that there is no loose bolt, crack nor rust on the bodies and the attaching portions, of ROPS.
- Tighten bolts with the specified torques after ROPS are removed.  
Tightening torque : **883 N·m**
- Do not weld nor drill holes to the ROPS parts without the permissions from SAKAI, because it may decrease strengths of the ROPS.
- Be sure to wear the seatbelt during operation.

**1.3 Before Starting the Engine****■ It is confirmed that hood and door is closed**

- Please confirm hood and door has put it away in the confirmation before it gets on.

**■ 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 pressed down to the full extent. Check to be sure that the brake pedal can be fully pressed down without difficulty when you twist your body for reverse run.
- Adjust the seat to allow proper operation of the steering wheel, levers, switches, etc.

**■ Secure good visibility (with CABIN)**

- Keep the windowpanel 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.

## 1 BASIC PRECAUTIONS FOR SAFETY

### ■ 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.

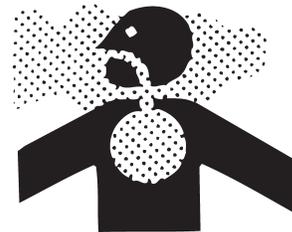


### ■ Sit in the driver's seat and turn on the engine

- Do not start the engine anywhere other than from the driver's seat as there is the danger of operational mistakes.

### ■ 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

- The exhaust gas from the engine is dangerous.
- Exhaust fumes are harmful 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. Moreover, honk the horn, indicate your intention to move, and wait a while before moving off.



### ■ 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, correct the fault before traveling again.
- Listen for unusual sounds, and check for abnormal temperature rise. If abnormal, park the machine in a safe place and find the source of trouble before operating.

## 1.5 During Operation

### ■ Strictly observe the traffic regulations

- Follow all the traffic regulations when driving on a public road.

### ■ Sit in the driver's seat before starting operation

- Sit in the driver's seat before starting operation. Be sure to wear the seat belt when provided.

### ■ Seat belt (with seat belt)

- Be sure to wear the seat belt 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.

### ■ 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.

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

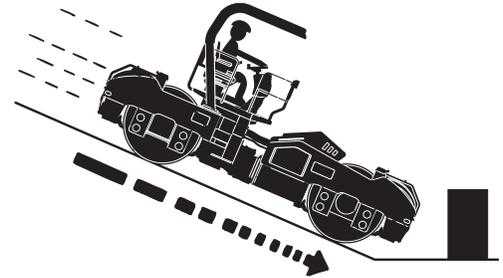
- Get on or off the machine after making sure it has come to a complete stop and the parking brake is applied.

■ **Do not let anyone enter the work area**

- There is the danger of being run over causing serious injuries or death.
- If the driver does not have a clear field of vision, assign a conductor ensure peripheral safety.

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

- 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.



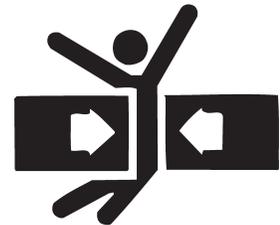
■ **Refrain from inattentive driving**

- Inattentive driving or driving relying on guess work can cause an accident. Use extreme care for workers present in the path of the machine 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.



## 1 BASIC PRECAUTIONS FOR SAFETY

### ■ 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.

### ■ Avoid long hours of continual operation

- Avoid long hours of continual operation as it may lead to loss of health.

### ■ 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.

### ■ The machines not equipped with ROPS must not be operated on the slopes or unsafe ground

### ■ The machines not equipped with CABIN must not be operated in the bad weather or a harmful contaminated

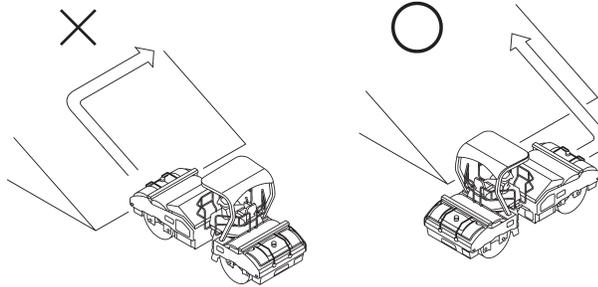
### ■ Do not operate the machine except from the operator's seat. Do not drive in a standing posture

- Do not throw your legs out or lean forward. Be sure to sit in the proper position while driving the machine.

### ■ While making turns, do not run at abnormally high speed and do not turn the steering wheel abruptly and sharply. High speed turns, especially on soft or uneven ground, could result in a rollover

### ■ 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

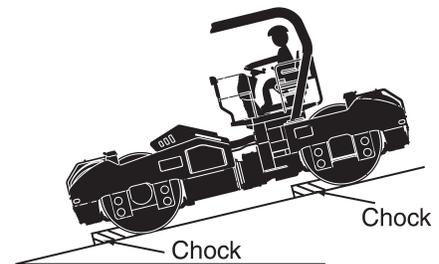
- Do not make turns on a slope and do not travel across sidehill. If necessary to do so, go down straight along the slope to the flat ground, move sideways and go up straight to the destination



- On a step slope, run the machine at low speed

■ When parking

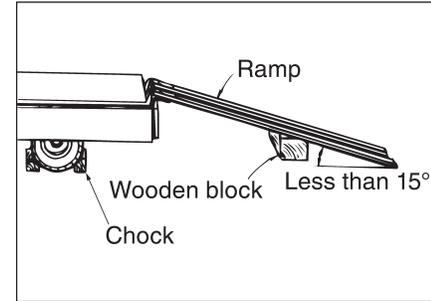
- Select level and hard ground. If necessary to park on a slope, chock the front of the drum and tire on the downside of the slope.
- When required to park on the public road, provide necessary markings such as flag, barriers and illumination. However, be sure they do not obstruct traffic.
- Stop the engine when getting off the machine. Remove the key from the starter switch, and make sure it is stored appropriately.
- Be sure not to get your hands caught in the chocks when handling them.



## 1 BASIC PRECAUTIONS FOR SAFETY

### 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 of a road or bank.
- 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.
- 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, go back off the ramp, 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 machine loaded.
- Know the maximum height clearance of the machine loaded on the transport trailer before hauling under bridges and other structures.

## 1.8 Handling the Battery

### ■ When handling the battery

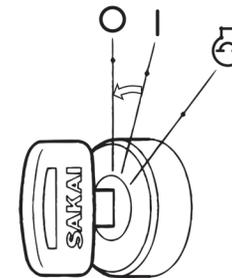
- Battery electrolyte contains sulphuric acid. It will destroy clothing and skin. If it touches your clothing or skin, flush with large quantities of water.
- In case of eye contact, flush with clean water and get medical help.
- If swallowed, drink large amount of water, milk, beaten egg or vegetable 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.
- Keep cigarettes and flames away, and avoid recharging the battery in poorly ventilated places when there is a danger or generating sparks.



### ⚠ WARNING

**Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hand after handling.**

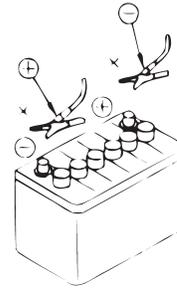
- Inspect or handle the battery with the engine stopped and the starter switch in the  $\bigcirc$  position.
- Keep metallic items such as tools away from the battery terminals.
- Tangled terminals may generate sparks due to improper connections, resulting in the danger of explosions. Make sure terminals are connected firmly.
- The battery is for starting the engine and operating electrical equipment on the machine. Do not use it for any other purpose.
- Do not charge battery when the top surfaces of the liquids are at the LOWER level (the minimum liquid level) or below. Not only the internal parts of the battery are degraded and the battery lifetime are shortened but also it can cause explosions if you continue on using the battery when the top surfaces of the liquids are at the LOWER level or below. Immediately supply water until the water level is between the UPPER and LOWER levels.



## 1 BASIC PRECAUTIONS FOR SAFETY

### ■ 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 the terminal. Never connect the positive terminal to the negative terminal or the body of the machine.
- 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

- Towing should only be carried out in emergencies and over short distances. A trailer should be used for long distance transport.
- The machine should not be operated while being towed.
- Follow the instructions in this manual to enable towing.
- Do not tow if the braking system has broken down, as it is dangerous.
- To tow the machine, use cables with ample strength.
- Do not perform towing on a slope.
- Be sure to attach a wire rope firmly to the towing hook.
- Do not use twisted, kinked or damaged cables when towing.
- Do not step over the wire rope.
- Keep everyone away from the space between the machine and the towing machine when connecting the two.
- Align the connection points of the disabled machine and the towing machine in a straight line when connecting the machines.

## 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 starter switch.



### ■ Setting the chocks

- Set chocks in front of and behind the roller drum (wheels) to prevent the machine from moving before beginning inspections or maintenance work.

### ■ 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

- Change any seatbelt found to be abnormal even if it is within its recommended service interval.
- Change any ROPS found to be abnormal even if it is within its recommended service interval.
- Replace fuel hose, high pressure hydraulic hoses and liquid hoses regularly to prevent fire. Replace high pressure hoses of the power steering system every two years.

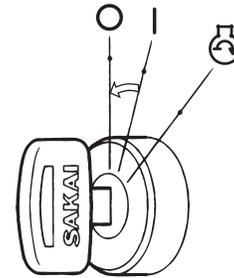
☆ Change these parts at regular intervals even if found to be normal. They will deteriorate as time goes on.

☆ Change any hose found to be abnormal even if it is within its recommended service interval.

## 1 BASIC PRECAUTIONS FOR SAFETY

### ■ 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.



### ■ Supplying fuel, oils and grease

- Do not cover the filler port when refueling. Feeding fuel in an airtight tank might damage the fuel tank.
- 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, stop the engine and allow the engine and radiator to cool down before removing the radiator cap. Remove the cap by covering it with a rag before removing to prevent any fluid that could spray under pressure from causing a burn.

### ■ Illumination

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



### ■ Make sure the gas dampers are properly maintained

- Before inspecting the engine room, make sure the gas dampers holding up the hood are firmly engaged. Furthermore, in machines with stays to prevent the hood from closing, make sure they are firmly in place.

### ■ Points to beware of when filling the sprinkler tank with water (on machines equipped with a sprinkler tank)

- Do not fill the tank with the water inlet blocked. It may damage the sprinkler tank.

## 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.



### ■ Assume an appropriate posture while working

- An unnatural posture during maintenance work may cause injuries. Assume a posture that is appropriate for the work being carried out.

### ■ 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.

### ■ Take care not to get caught or crushed

- Be sure to fix the hood and other covers after opening them to prevent closing and avoid getting caught in them.
- If there is a need to crawl under the machine after it has been lifted, be sure to support it from underneath with a solid prop or block.

### ■ When repairing the electrical system

- Read the warnings in this manual regarding the handling of batteries, and make sure to have a thorough understanding in order to handle them appropriately and safely.
- When repairing the electrical system or welding, disconnect the negative cable from the battery to shut off the electricity. Carrying out work while the cables are connected to the negative terminal may cause electrocution or explosions.



## 1 BASIC PRECAUTIONS FOR SAFETY

### ■ 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, hydraulic hoses and liquid hoses.  
An oil, hydraulic and liquid fluid spill can cause a fire.

### ■ 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.



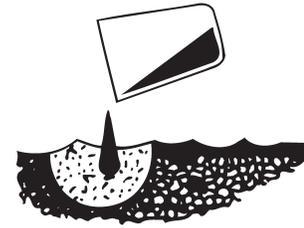
### ■ Use care when inspecting or servicing fan or belts in motion

- Do not wear clothing and accessories that tend to 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.

**■ Take care in handling the gas damper**

- Never dismantle it.
- Do not throw it into a fire.
- Do not damage the rod.
- Do not bend the tube or rod, or use it as a handle.
- When disposing of it, be sure to fix the gas damper, and drill a hole around 2 to 3 mm in diameter, about 20 to 30 mm from the edge on the tube bracket side. Dispose of it after releasing the gas pressure. When doing this, be sure to wear protective goggles because of the danger of oil inside or swarfs getting sprayed everywhere by the compressed gas inside.

**■ Exercise extreme care when replacing and repairing tires (Tire installed)**

- Disassembly, repair and reassembly of tires require special facility and knowledge. Have them repaired at work shop specialized in handling tires.
- An improperly fitted tire can separate from the rim when inflating.
- 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.



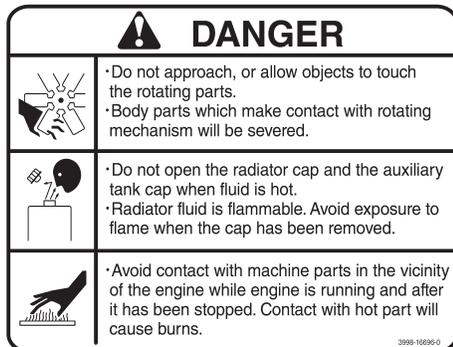
**⚠ WARNING: Negligence of these instructions can lead to accidents.**

**1 BASIC PRECAUTIONS FOR SAFETY**

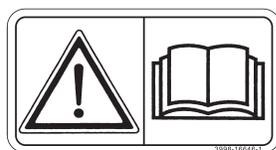
**1.12 Safety Decals**

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.

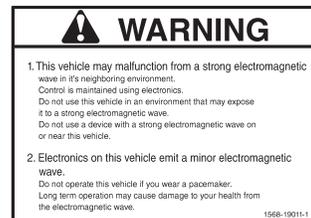
① 3998-16696-0



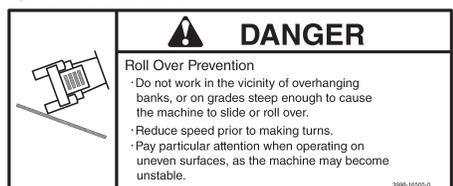
⑦ 3998-16646-1



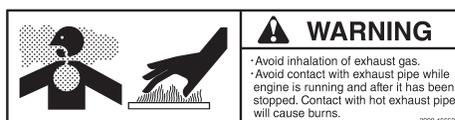
⑫ 1568-19011-1



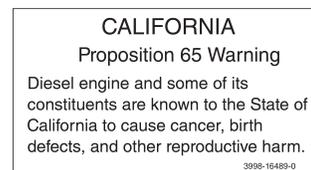
② 3998-16505-0



⑧ 3998-16652-0



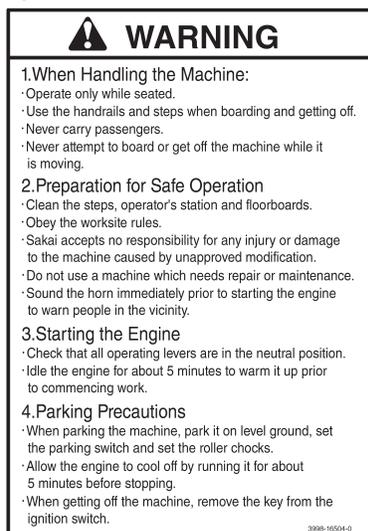
⑬ 3998-16489-0



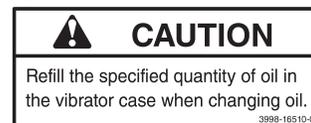
③ 3998-16501-0



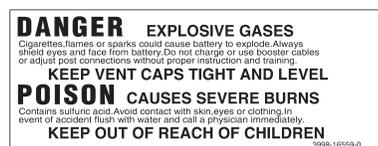
⑨ 3998-16504-0



⑭ 3998-16510-0



④ 3998-16559-0



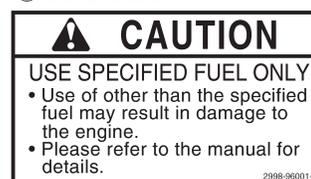
⑮ 3998-16507-1



⑩ 3998-16499-0



⑯ 2998-96001-1



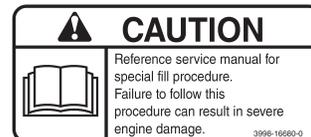
⑤ 3998-19678-0



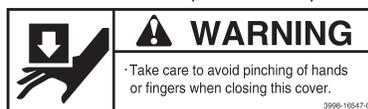
⑥ 3998-06139-0



⑰ 3998-16680-0



⑪ 3998-16547-0 (4 locations)



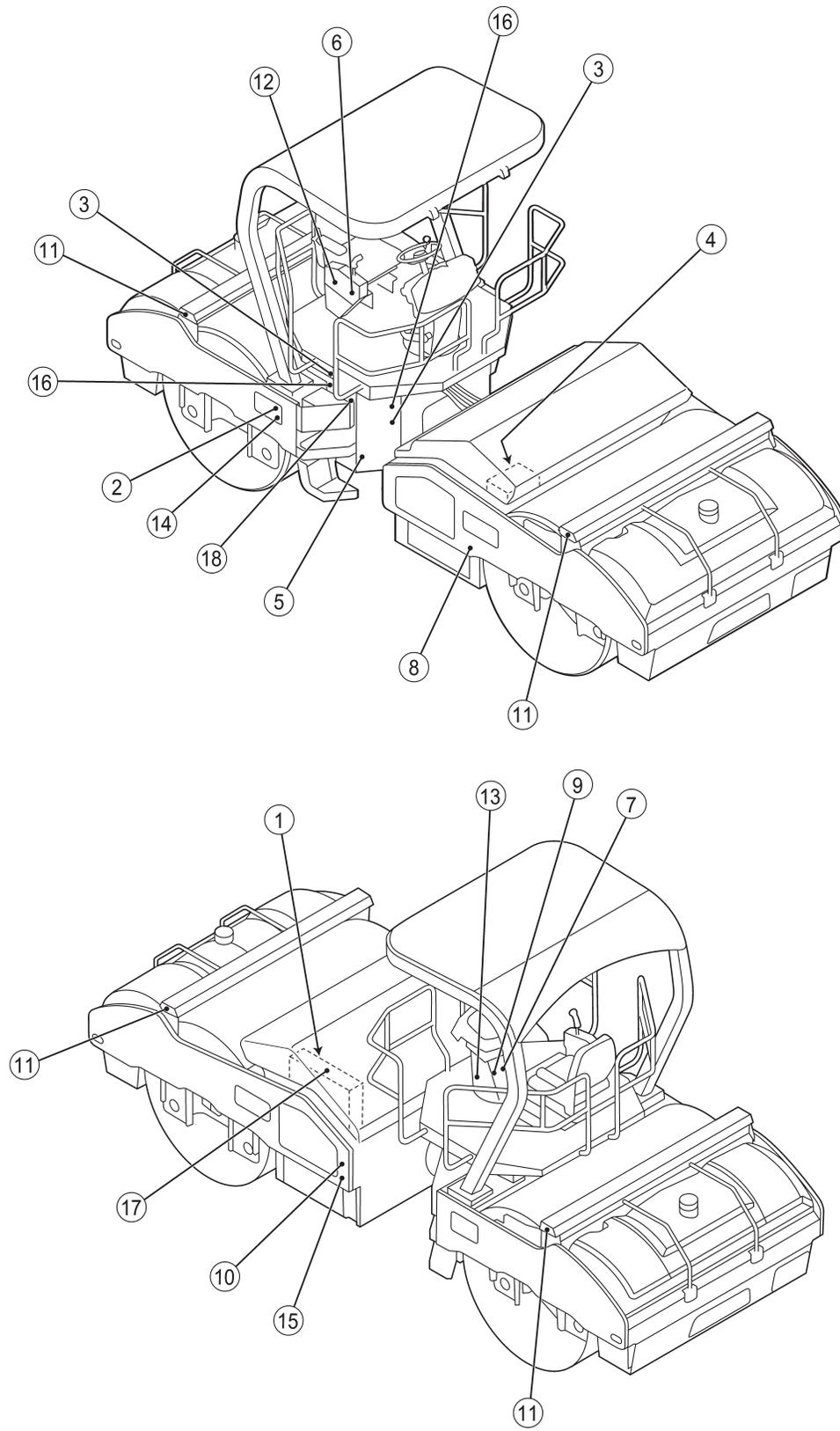
⑱ 1418-19109-0



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

**1 BASIC PRECAUTIONS FOR SAFETY**

SW884, SW884ND, SW994



## 2. OPERATION

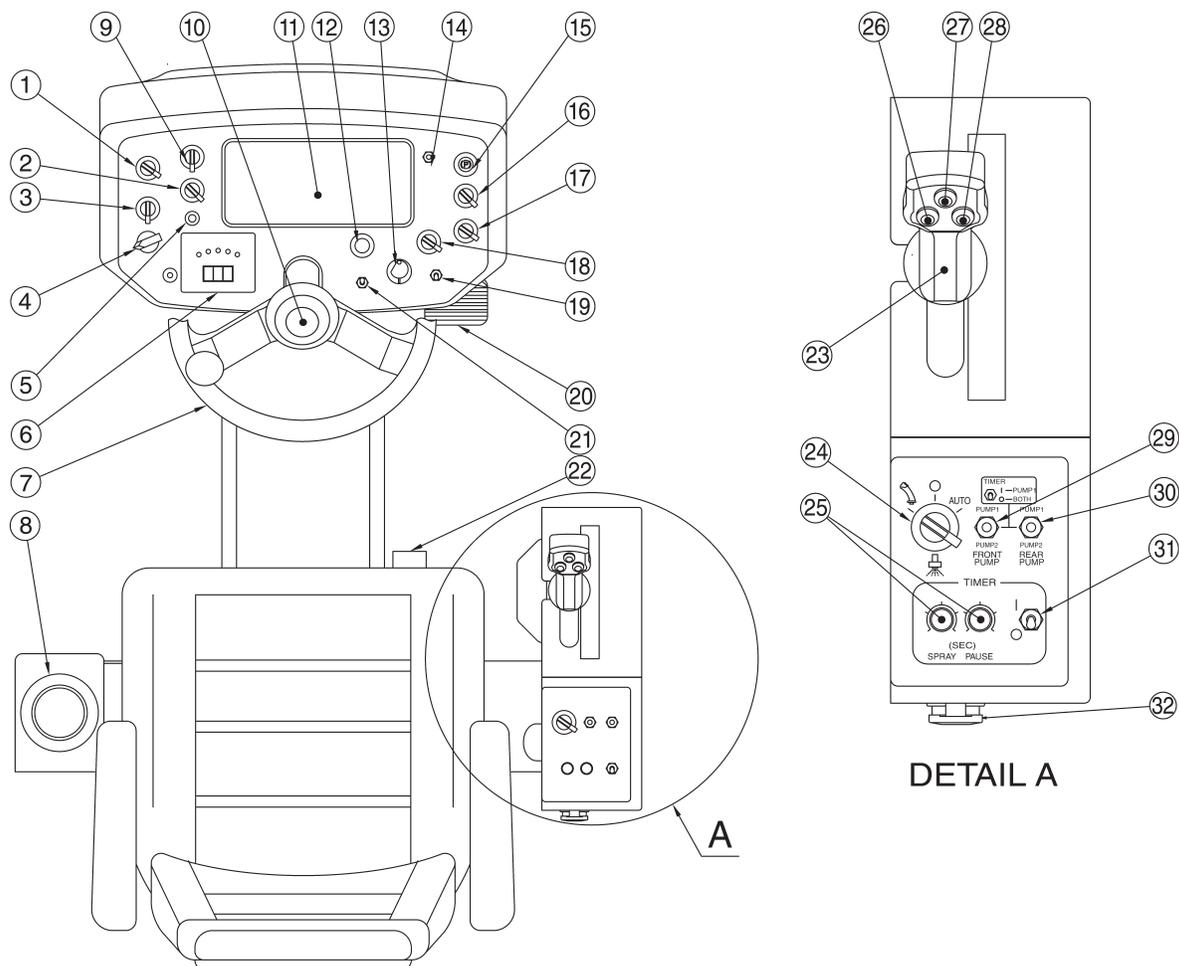
### 2 OPERATION

#### 2.1 Instruments and Controls

##### 2.1.1 Operator's station

**NOTE:**

\*marked switches are responded only when the F-N-R lever is in the neutral position.

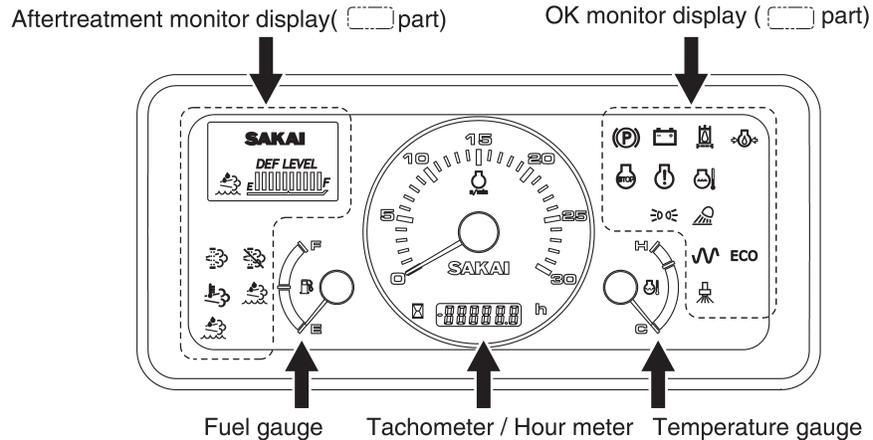


- |   |   |
|---|---|
| ① Vibration drum selector switch                          | ⑩ Travel mode selector switch                         |
| ② Vibration amplitude selector switch (SW884, SW994)      | ⑪ Engine speed selector switch                        |
| ③ Vibration type selector switch (SW884ND)                | ⑫ Lamp switch   |
| ④ IPF selector switch                                     | ⑬ Engine diagnostic switch                            |
| ⑤ Auto speed lamp   | ⑭ Brake pedal   |
| ⑥ Exact compact meter                                     | ⑮ Disable regeneration switch                         |
| ⑦ Steering wheel  | ⑯ Swivel release pedal                                |
| ⑧ Drink holder  | ⑰ Forward-Neutral-Reverse lever(F-N-R lever)          |
| ⑨ Vibration type selector switch (Manual or Auto control) | ⑱ Spray mode selector switch (Manual or Auto control) |
| ⑩ Horn switch button                                      | ⑲ Spray timer dial                                    |
| ⑪ Combination meter                                       | ⑳ Vibration switch                                    |
| ⑫ Manual regeneration switch                              | ㉑ Auto speed set switch                               |
| ⑬ Starter switch  | ㉒ Spray switch  |
| ⑭ Emergency propel switch                                 | ㉓ Front spray pump selector switch                    |
| ⑮ Parking brake switch                                    | ㉔ Rear spray pump selector switch                     |
|   | ㉕ Spray timer switch                                  |
|   | ㉖ Accessory socket                                    |

### 2.1.2 Gauges, indicator lamps and warning lamps

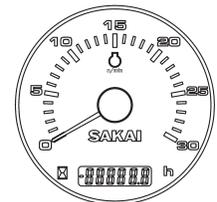
For safe execution of your job, fully understand the role and function of the systems involved.

#### Combination meter



#### Tachometer / Hour meter

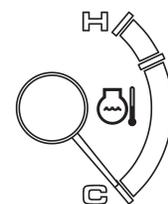
Indicates the engine RPM. The hour meter shows total operating hours. The service interval recommendation in this manual should be based upon the hour meter readings.



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

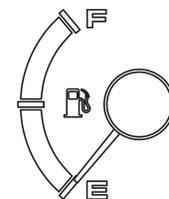
#### Fuel gauge

Indicates the fuel level in the tank.

E: The tank is empty.

F: The tank is full.

Replenish fuel appropriately before the fuel runs down.



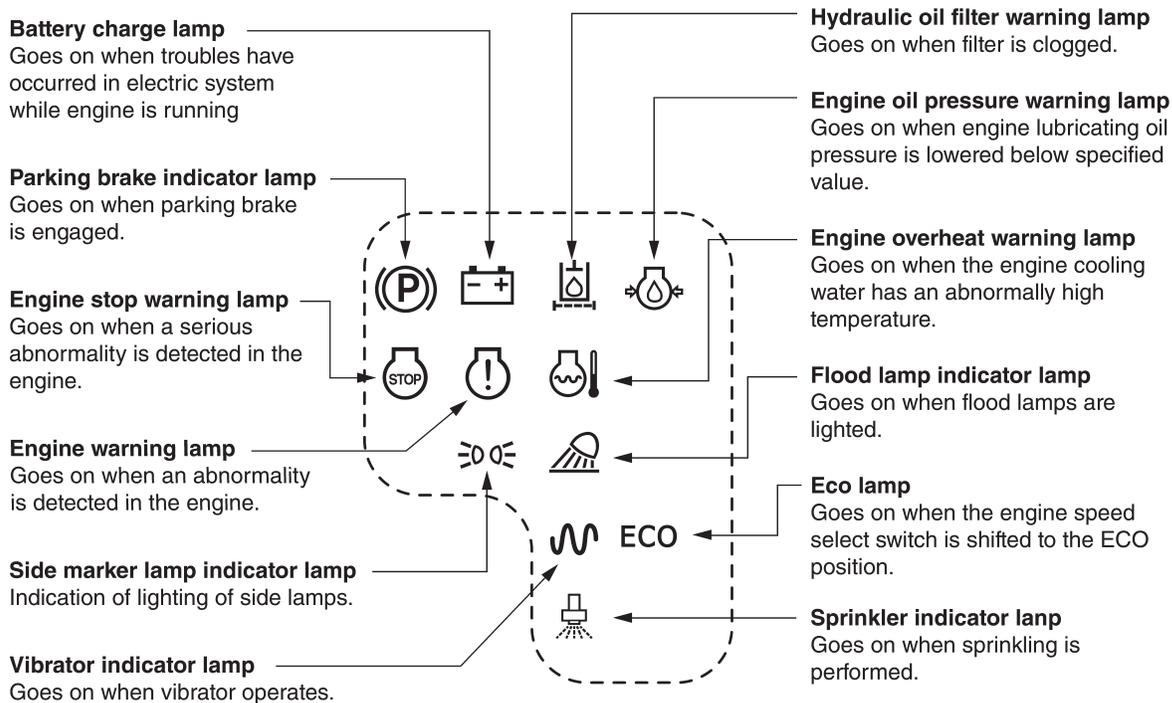
Fuel gauge

#### ⚠ CAUTION

Be sure to use fuel recommended by SAKAI (refer to page 112).

## 2. OPERATION

### Monitor display



- ★ Indicator lamps [     ]  
Light up when corresponding systems have been operated.
- ★ Parking brake indicator lamp [  ]  
It will flash once when the starter switch is turned to the  position.  
After that it will remain on while the parking brake is engaged, and turn off when it is released.
- ★ Hydraulic oil filter warning lamp [  ]  
It will flash once when the starter switch is turned to the  position.  
After that it will turn on when the hydraulic oil filter becomes clogged. Stop the machine and carry out an inspection.
- ★ Engine oil pressure warning lamp [  ]  
It will turn on when the starter switch is turned to the  position, and turn off when the engine starts running.  
It will turn on while the engine is running if the engine oil pressure drops below the specified value. Stop the machine and carry out an inspection.
- ★ Battery charge lamp [  ]  
It will turn on when the starter switch is turned to the  position, and turn off when the engine starts running.  
It will turn on while the engine is running when a problem arises with the electric system. Stop the machine and carry out an inspection.

★ Engine overheat warning lamp [  ]

It will turn on when the starter switch is turned to the | position, and turn off when the engine starts running.

When the Engine overheat warning lamp lights, there is a possibility of overheating.

Stop the machine and cool the engine by set the engine speed select switch in the IDLE position.

If the lamp does not go out, the engine may be abnormal. Receive proper checking / maintenance or repairing.

★ Engine stop warning lamp [  ]

It will turn on when the starter switch is turned to the | position, and turn off when the engine starts running.

When the Engine stop lamp lights, it means a serious abnormality occurs with the engine.

Stop the machine and the engine, and receive proper checking / maintenance or repairing.

★ Engine warning lamp [  ]

It will turn on when the starter switch is turned to the | position, and turn off when the engine starts running.

When the Engine warning lamp lights, water may be accumulated in the fuel pre-filter.

Drain the fuel pre-filter (refer to page 92).

If the lamp lights just because the water is accumulated in the pre-filter, it will go out after draining.

If the lamp does not go out, the engine may be abnormal. Receive proper checking / maintenance or repairing before a serious failure occurs.

### IMPORTANT

- **Hydraulic oil filter warning lamp**

**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. In that case, warm up the engine sufficiently, and operate the machine after the warning light has gone out. When the warning light will not go out, the filter may be clogging up. Check the filter.**

- **Checking for warning lamp and parking brake indicator lamp**

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

**If not, there is some trouble.**

**Check and repair the combination meter or wirings harness.**

- **The window of the combination meter**

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

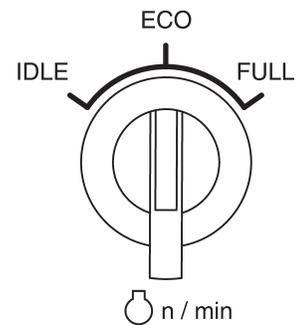
## 2 OPERATION

### Eco lamp

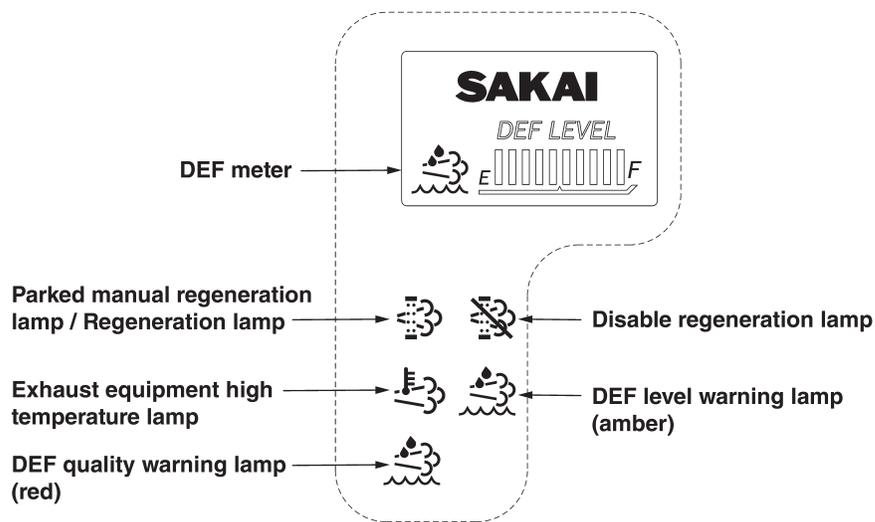
ECO lamp is turned on if the Engine speed select switch is shifted to ECO position. It runs under the fuel-efficient mode when the ECO lamp is turned on.

Normal vibrator speed occurs in ECO mode.

**ECO**  
Eco lamp



### Post-processing equipment display monitor



### ★ DEF meter

Indicates DEF level in DEF tank

E: Indicates there is no DEF left

F: Indicates tank is full

Do not use DEF until tank is empty, but fill it up regularly.

Refer to Operating the DEF SCR System for more details.



### ⚠ CAUTION

- Using the machine when the DEF level is low, the warning lamp will turn on or flash. A limit will also be placed on the engine output, not allowing the machine to perform to its full potential. Never use the machine in such a state.
- Use AUS32 for the DEF, or an ISO 22241-1 certified DEF.  
Do not use anything else. If any kind of additive or water is mixed into the DEF, the machine will not be able to function properly, and it will not satisfy exhaust gas emissions standards. It will also damage the engine system.  
If the tank is filled with any fluid other than DEF, contact one of our sales offices for advice.

- ★ Parked manual regeneration lamp / Regeneration lamp  
Turns on and flashes during regeneration of the SCR or when parked manual regeneration is needed.



- ★ Disable regeneration lamp  
Turns on while SCR automatic regeneration is disabled.



- ★ Exhaust equipment high temperature lamp  
Turns on when exhaust equipment is hot during, e.g., SCR regeneration.



- ★ DEF level warning lamp (amber)  
Turns on or flashes when the DEF level in the tank falls below the standard level.



- ★ DEF quality warning lamp (red)  
Turns on or flashes when the DEF concentration is below the minimum required value, or something other than DEF is detected.  
It may also turn on when the DEF concentration approaches the minimum required value.



#### ★ WAIT TO START

When the wait to start is lit on the monitor display, it means self-diagnosis of the engine, and the engine should not be started.

Must wait to start the engine. The most common reason for this is to wait for the intake air heaters to complete a pre-heat cycle during cold ambient conditions.

Wait to start

## 2 OPERATION

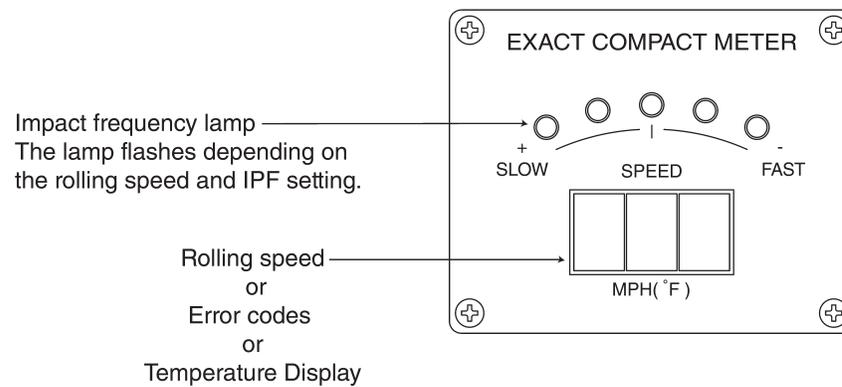
### Auto Speed lamp

- Steady light : Goes on when the AUTO SPEED is selected by pressing the AUTO SPEED button.
- Slow flicker : Goes on when the AUTO SPEED is cancelled by pressing the AUTO SPEED button.
- Fast flicker : Goes on when the either of IPF / Propel speed / Vibration frequency / Vibration amplitude / Engine speed position is changed while in the AUTO SPEED mode.s



AUTO SPEED

### Exact compact meter



### 2.1.3 Switches

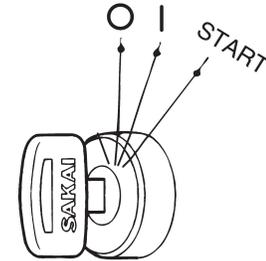
#### Starter switch

Starts and stops the engine.

○ position : 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.

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

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



#### ⚠ CAUTION

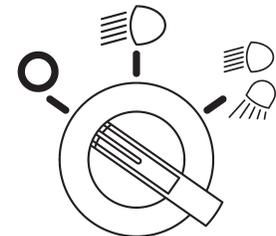
**Set the Forward-Neutral-Reverse (F-N-R) lever in the neutral position and press down the parking brake switch before starting the engine. Unless these conditions are met, the engine will not start.**

#### Lamp switch

○ position : All lamps are switched off.

☞ position : Illuminates the dash panel and front lamps go on.

☞☞ position : All lamps are switched on.

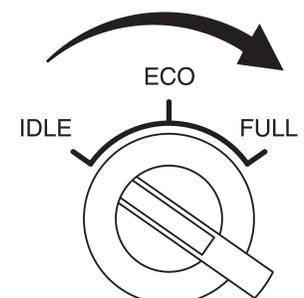


#### Engine speed selector switch

Shifts the engine RPM.

(± 50 min<sup>-1</sup>)

Engine speed	IDLE	ECO	FULL
	900 min <sup>-1</sup>	1850 min <sup>-1</sup>	2200 min <sup>-1</sup>



n / min

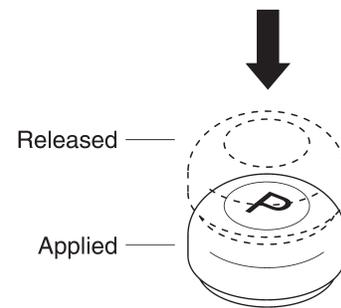
Engine speed select switch

## 2 OPERATION

### Parking brake switch

If switch (P) is pressed down, the parking brake will be applied with the indicator lamp (P) on the dash board lit up.

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



**NOTE:** When pressing the parking brake switch during machine running, the brake is activated. When starting the engine again, shift the F-N-R lever back to the neutral position, set engine speed to idle, activate the parking brake switch, and then start the engine.

### ⚠ WARNING

- To disengage the brake, be sure to press the button again instead of pulling it.
- Always press the button to apply the parking brake before dismounting from the machine.

### ⚠ CAUTION

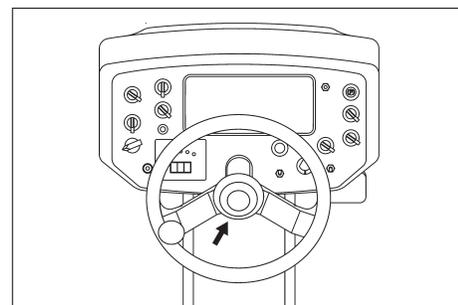
Never pull the switch up.

### IMPORTANT

In an emergency, depress the brake pedal.

### Horn switch button

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



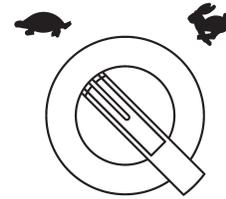
## Travel mode selector switch

Select mode according to propel condition.



position : Work condition

- The Auto speed function can be controlled with this mode (refer to page 53).
- Maximum speed is regulated by each vibration frequency in the case of SW884 and SW994.



Frequency (vpm)	Propel speed mile/h (km/h)
2,500	0-2.8 (0-4.5)
3,000	0-3.4 (0-5.5)
4,000	0-4.5 (0-7.2)

- Maximum speed is regulated by each vibration type in the case of SW884ND.

Vibration type	Propel speed mile/h (km/h)
Ordinary Vibration	0-3.4 (0-5.5)
Oscillational Vibration	0-4.0 (0-6.4)



position : Traveling 0-6.8mile/h (0-11km/h)

**IMPORTANT**

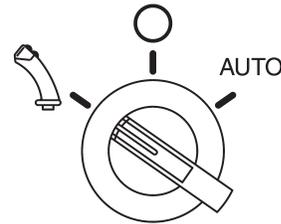
**Be sure to shift gears while the machine is being stopped. Do not shift gears during running.**

- NOTE:**
- Machine speed can be operated under at ECO or FULL position of Engine speed selector switch.  
Maximum speed is reference value.
  - Selection is applied only when the F-N-R lever is in the neutral position.

## 2 OPERATION

### Vibration mode selector switch

-  position: Vibration can be controlled by the vibration switch on the F-N-R lever
  -  position: Vibration is shut off
- AUTO position: Vibration automatically engages when the F-N-R lever is moved into the forward or reverse



**NOTE:** For vibratory compaction, the Engine speed selection switch must be in the ECO or FULL position.

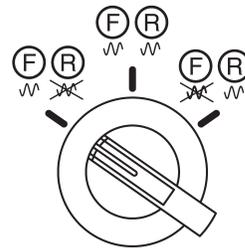
The vibrator indicator lamp stays lit at all times when the machine is running in vibratory mode.

### IMPORTANT

- **Do not operate the vibrator on a hard area such as cement concrete pavement surface or the ground covered by thick steel sheets.**
- **Turn the vibrator off when the machine is at rest.**
- **Shut off the vibrator immediately if the machine gets stuck in the mud during vibratory operation.**

### Vibration drum selector switch

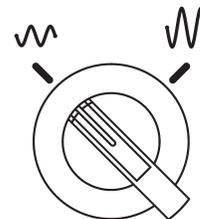
-  position : Only the front drum will vibrate
-  position : Both drums will vibrate
-  position : Only the rear drum will vibrate



### Vibration amplitude selector switch (For SW884, SW994)

-  position : Low amplitude vibration
-  position : High amplitude vibration

**NOTE:** Selection is applied only when the F-N-R lever is in the neutral position.

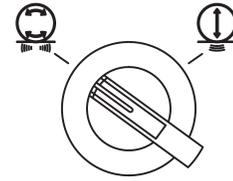


### Vibration type selector switch (For SW884ND)

Select ordinary or oscillational vibration.

 : Ordinary vibration

 : Oscillational vibration



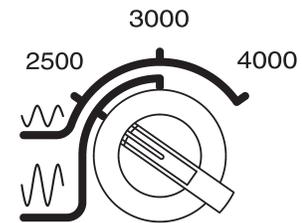
### Vibration frequency selector switch (For SW884, SW994)

2,500 position : Vibration can be set at 2,500 vpm in the low or high amplitude position.

3,000 position : Vibration can be set at 3,000 vpm in the low or high amplitude position.

4,000 position : Vibration can be set at 4,000 vpm in the low amplitude position only.

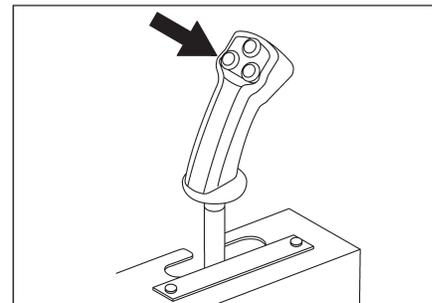
Vibration will automatically be limited to 3,000 vpm when high amplitude is selected, regardless of the frequency selection. This machine can not operate at 4,000 vpm in high amplitude.



**NOTE:** Selection is applied only when the F-N-R lever is in the neutral position.

### Vibration switch

The vibration switch is integrated on the F-N-R lever. The green button toggles vibration ON and OFF. When the green button is depressed the first time, vibration will turn on. When the green button is depressed a second time, vibration will shut off. The button must be depressed and held for one second in order to engage. It works only when  is selected on the Vibration mode selector switch.



**NOTE:** For vibratory compaction, the Engine speed selection switch must be in the ECO or FULL position.

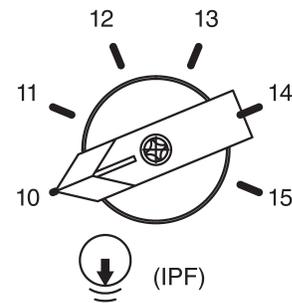
The vibrator indicator lamp stays lit at all times when the machine is running in vibratory mode.

## 2 OPERATION

### IPF selector switch

The Number of Impacts Per Foot (IPF) can be selected for when using the EXACT COMPACT METER. Refer to 2.7 Exact Compact Operation Page 71 IPF number can be set at 10, 11, 12, 13, 14, 15.

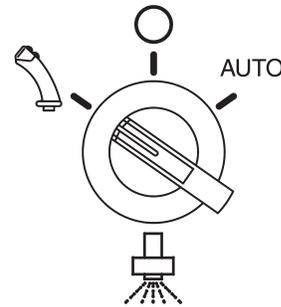
**NOTE:** Selection is applied only when the F-N-R lever is in the neutral position.  
Selection is applied in the case of the SW884, ordinary vibration of the SW884ND, and the SW994.



### Spray mode selector switch / Spray switch / Spray timer switch / Spray timer dial

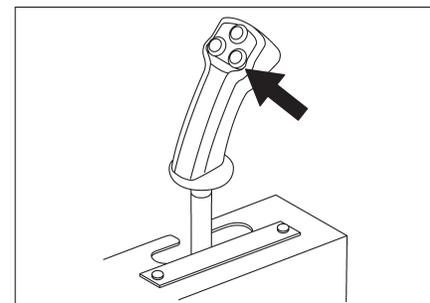
#### Spray mode selector switch

 position : Spray system can be controlled by the blue button switch on the F-N-R lever.  
position : Spray system is shut off.  
AUTO position: Spray system is actuated when the F-N-R lever is in the forward or reverse position and deactivated when the F-N-R lever is moved to the Neutral position.



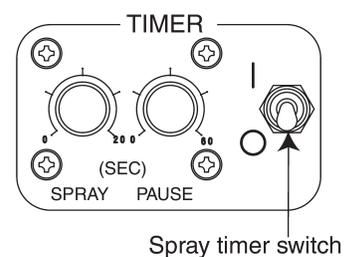
#### Spray switch

The spray sprinkler switch is integrated on the F-N-R lever. The blue button toggles the spray system on and off. Spray pumps will turn on when the blue button is depressed once and then turn off when the blue button is depressed a second time. Be sure to hold the button for at least one full second in order for it to engage. It works only when the Spray mode selector switch is set in the  position.



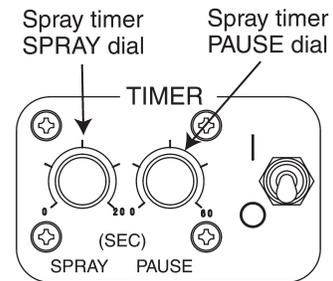
#### Spray timer switch

I position : Spray timer is activated  
O position : Spray timer is shut off



Spray timer SPRAY dial

Spray time can be set from 0–20 seconds by turning this dial.



Spray timer PAUSE dial

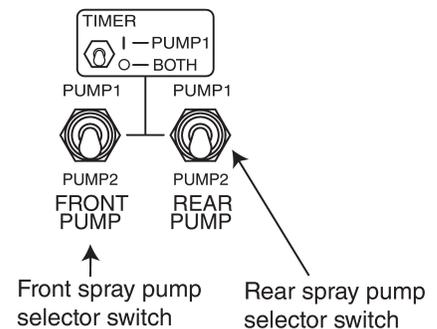
Sprinkling pause interval can be set from 0–60 seconds by turning this dial.

**NOTE:** The spray indicator lamp stays illuminated whenever water is spraying. In timer mode, the lamp will turn on (indicating spray) and off (indicating pause).

Front spray pump selector switch

Rear spray pump selector switch

There is a total of four spray bars on the SW Series rollers. Two spray bars on the front drum and two spray bars on the rear drum. Each spray bar has one water pump dedicated to it, for a total of four water pumps, one for each spray bar. When pump 1 is selected for either the front or rear drum, one spray bar is operational. When pump 2 is selected for either the front or rear drum, the second spray bar is operational. When BOTH is selected for either the front or rear drum, both spray bars operate, providing double the volume of water going to wet the drum. In most cases, only pump 1 or pump 2 is selected. In a few situations, where a heavy application of water is required on the drum, such as in very windy and/or dry desert conditions, both pumps are used simultaneously.



When only one pump is required, it is recommended to alternate pumps so that they both wear evenly. Alternating pump use also helps to keep them in better operating condition by running water through them to keep the inside of the pump wet. For example, on a multi-day project, it is recommended to use pump 1 on the first day, pump 2 on the second day, and alternate each day.

PUMP1 position : Actuate pump 1

Center position : Pump 1 when select intermittent spray

Pump 1 and pump 2 when deselect intermittent spray

PUMP2 position : Actuate pump 2

## 2 OPERATION

### Engine diagnostic switch

Engine troubleshooting can be conducted using the trouble code selector switch.

During normal operation, do not operate switches.

Set switch as shown in O position during the normal operation.

Refer to 2.2.8 Engine troubleshooting page 48 for detail.



- I position : Engine diagnostic is activated
- O position : Engine diagnostic is shut off

### IMPORTANT

**When operating the trouble code selector switch, see the engine manual.**

### Emergency propel switch

Propel the machine with this switch if the machine can't be propelled with F-N-R lever.

Sometimes called a limp home switch, this function will only work after MANUALLY plugging in the appropriate wire harness connection.

Refer to 2.3.4 Traveling page 53 for the detailed procedure on how to plug in the wire harness.



### AUTO SPEED set switch

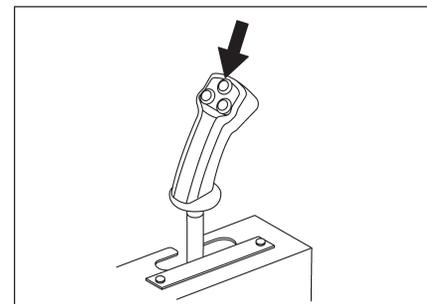
The AUTO SPEED set switch is the top button on the F-N-R lever.

The speed that the roller is traveling at when the button is depressed will be recorded into memory. The Button must be depressed and held for at least one second.

When auto speed is set, the machine will run at the preset speed when the F-N-R lever is moved to the full forward or full reverse position.

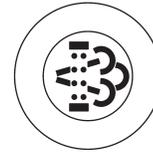
The auto speed memory is cancelled when the button is pushed a second time and held for one second or longer.

Refer to 2.3.6 AUTO SPEED page 57 for full operational instructions.



**Manual regeneration switch**

Press the  switch to start parked manual regeneration.  
Press the switch again to stop parked manual regeneration.



**MANUAL  
REGEN.**

**Disable regeneration switch**

Use to disable/enable regeneration.

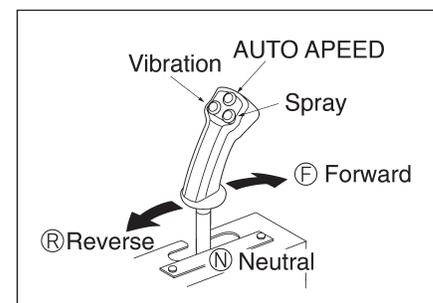
- (OFF) position : Enables regeneration, and the disable regeneration lamp turns off.
- ⊏ (ON) position : Disables regeneration, and the disable regeneration lamp turns on.



**DISABLE  
REGEN.**

**2.1.4 Operating levers / pedals****Forward-Neutral-Reverse lever (F-N-R lever) with AUTO SPEED / Vibration / Spray switch**

Moving the F-N-R lever forward or backward makes the machine travel forward or backward respectively.  
The neutral position brings the machine to a stop.  
The machine speed increases or decreases in proportion to the lever displacement.  
AUTO SPEED / Vibration / Spray switches are integrated on this lever.

**IMPORTANT**

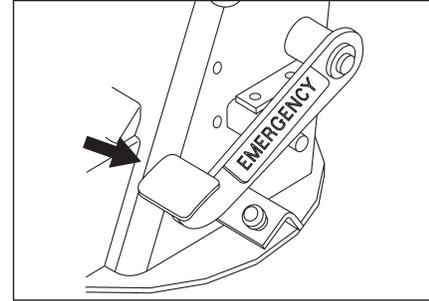
- **For normal braking, return the F-N-R lever back to neutral.**
- **In an emergency, depress the brake pedal.**

## 2 OPERATION

### Brake pedal

In an emergency, push down on the pedal to the full extent, then the machine will stop suddenly together with its engine.

**NOTE:** The F-N-R lever must be in the neutral position to release the brake for the travel again.



### IMPORTANT

**Do not use the brake pedal for normal machine operation. Use only in an emergency. Use the F-N-R lever to stop the machine under normal operating conditions. Continuous use of the emergency brake pedal will damage the brake.**

### Unloader valve

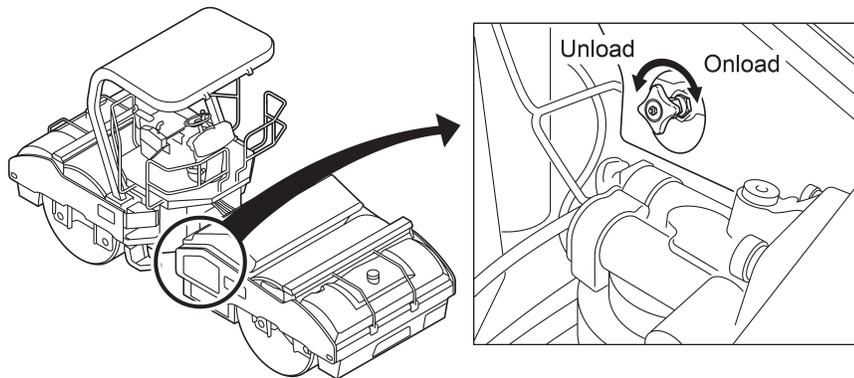
The unloader valve disengages the drive, similar to a clutch. Use this valve for towing the machine when the engine is disabled or when trouble has developed in the hydraulic drive.

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 using the unloader valve and towing the machine.**
- **Be sure to apply the parking brake when operating the unloader valve.**
- **Unloading the unload valve will disengage the engine, so never get in front of or behind the machine.**

**NOTE:** For normal travel, be sure that the unloader valve is in the ONLOAD position.

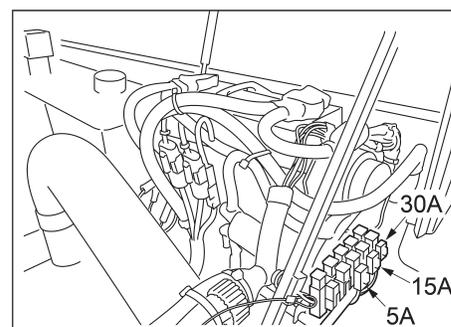
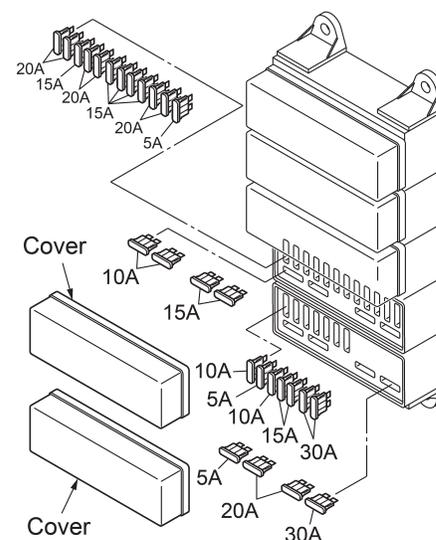
### 2.1.5 Fuse box and line fuse

#### **⚠ WARNING**

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

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

Using improperly rated fuses may result in poor machine performance, damage to the electrical system, or safety problems, such as an electrical fire (refer to page 117).



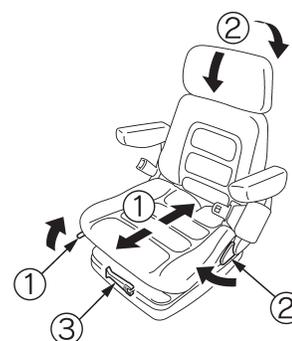
## 2.2 Handling and Adjustments

### 2.2.1 Seat adjustment

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

Adjust your seat position to suit you as follows:

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



## 2 OPERATION

### **⚠ WARNING**

- The seat shall be adjusted before starting any works or when the driver is switched over the other person while the machine is completely stopped.
- Do not adjust the seat while the machine is in motion.
- Some unexpected troubles may be accidentally caused if moving the machine without completely fixing the seat such as while sliding the seat. Before moving the machine, make certain that the seat is completely fixed after making proper adjustments.
- Do not pinch your fingers, hands or legs while adjusting the seat.
- Adjust seat only when one person rides on the machine.
- Adjust seat only when the machine stays on the flat ground.
- Adjust the seat so that your back is in close contact with the back of the seat while seated and when stepping on the brake pedal down to the floor. Adjust the seat so as to be able to certainly step on the brake pedal when twisting your body around to look back in order to move the machine backwards.

### **IMPORTANT**

Be sure to wear the seatbelt during operation.

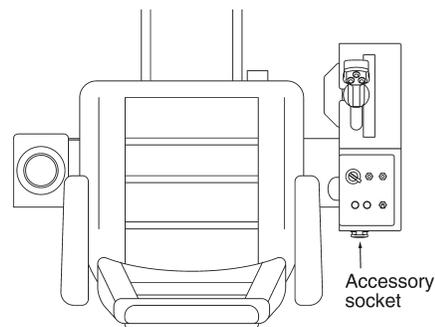
### 2.2.2 Accessory socket

The accessory socket may be used when the starter switch is turned to the **I** position.

Open the cover, and a 12 V DC can be drawn from the socket for powering electronic equipment.

### **⚠ WARNING**

When connecting electronic equipment to the accessory socket, make sure it does not obstruct the raising and lowering of the F-N-R lever.



### **⚠ CAUTION**

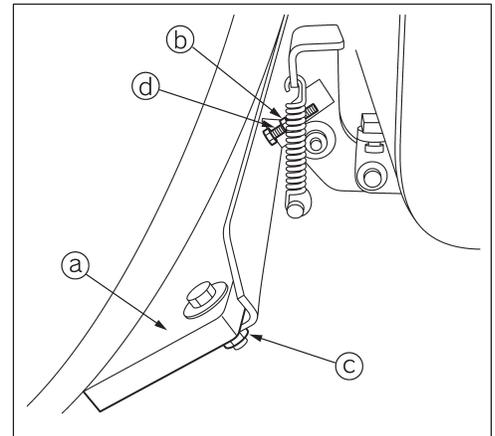
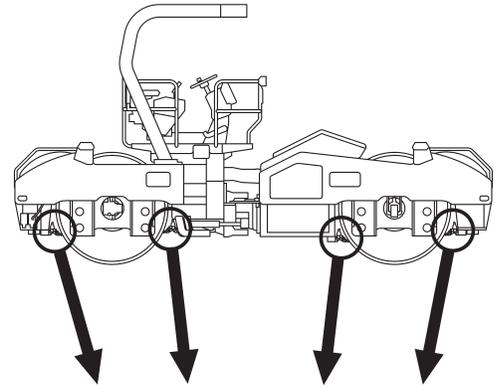
- Use electronic equipment that consumes no more than 120 W (12 V, 10 A).
- Keep the cover closed when not in use to prevent foreign matter from getting inside.
- There is a possibility of the battery running flat when the accessory socket is used for a long time to power electronic equipment with the engine turned off or idling.

### 2.2.3 Scraper adjustment and replacement

#### Scraper

Adjusting the gap between scraper blade (a) and drum.

- 1) Loosen lock nuts (b) at 2 locations and nuts (c) at 7 locations.
- 2) Adjust scraper blade (a) to eliminate the clearance between scraper blade (a) and drum.
- 3) Tighten nuts (c).
- 4) Make fine adjustment of the gap between scraper blade (a) and drum by set bolt (d).
- 5) Tighten lock nuts (b).



#### Replacing the scraper blade

- 1) Remove bolts and nuts (c) at 7 locations.
- 2) Replace scraper blade (a) with new one.
- 3) Reinstall and tighten the bolts and nuts (c).

## 2 OPERATION

### 2.2.4 Disengaging the brake when towing

#### **⚠ WARNING**

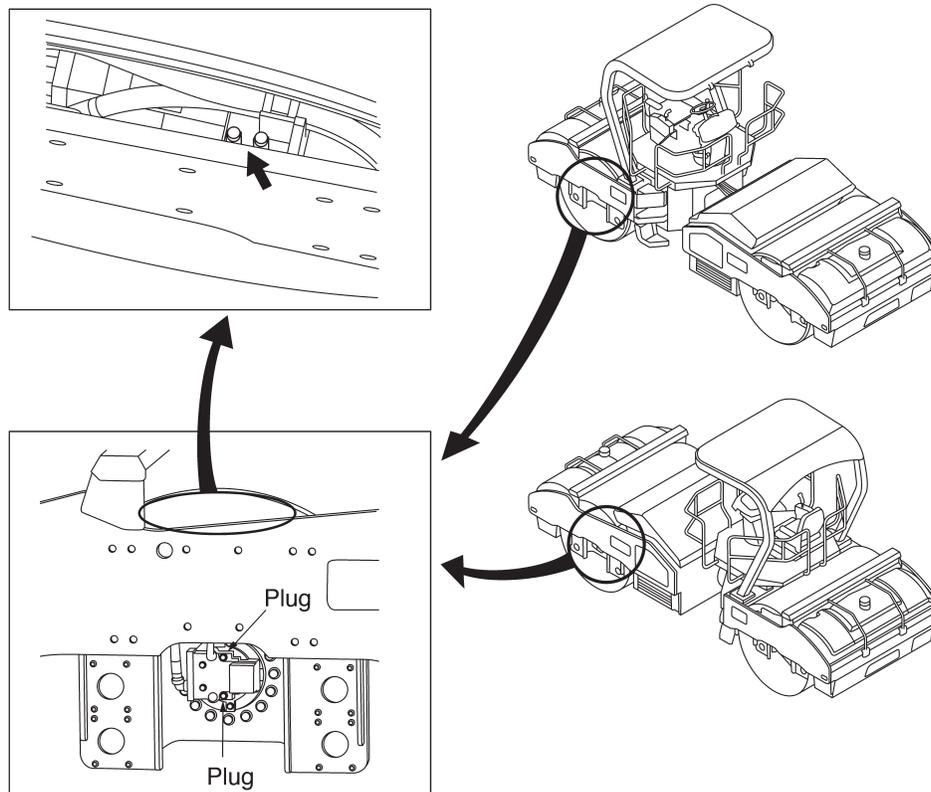
**On a slope, chock the drums and prepare for towing before disengaging the brake.**

For towing the machine when the engine is disabled or when trouble has developed in the hydraulic propulsion system, disengage the brake as instructed below:

Use the same procedure for both front and rear drums.

- 1) Remove the brake-disengaging bolts and washers (two each) from the machine frame.

Brake-disengaging bolts and washers (red)



#### **⚠ 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 and protector glove.



2) Remove the plugs (2 locations) from the motor.

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

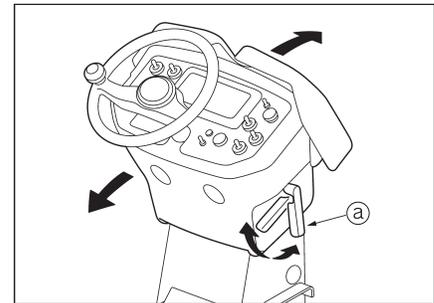
3) Screw in the removed bolts with the washers into the plug holes. Screwing in them until they become a little tight will disengage the brake.

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

4) After towing, replace the bolt and washer to original position and tighten the plug securely to the motor.

### 2.2.5 Steering wheel position adjustment

- 1) Pull the lever (a) upward. Doing so disengages the lock off the wheel.
- 2) Position the wheel for your operating comfort.
- 3) Lower the lever (a) to lock the wheel in place.

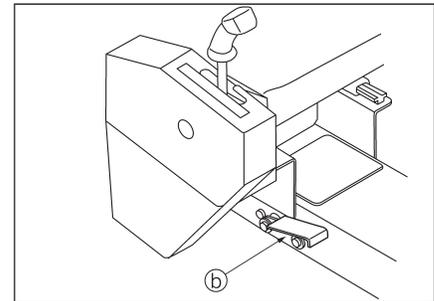


### 2.2.6 Operator's platform position adjustment

Operator's platform rotates by 60 and 90 degrees, clockwise or counterclock – wise.

Set it at the desired angle to allow you to easily see the drum edge during work.

- 1) While depressing the swivel pedal (b), rotate the operator's platform by pushing or pulling with your other foot.
- 2) As soon as it starts rotating, release the swivel pedal (b) and continue to push the operator's platform at 60 degrees, it will automatically lock into position.
- 3) Continuing the same action while depressing the swivel lever (b) will allow the operator's platform to lock automatically at 90 degrees.



#### ⚠ WARNING

**Make sure the operator's platform is completely locked in place before continuing to operate the machine. If the operator's platform is not locked in place, it could unexpectedly rotate during operation and cause the operator to lose control of the machine and result in an accident with the potential for injury or death.**

#### ⚠ CAUTION

**Sit down on the seat during this operation for your safety.**

## 2 OPERATION

### 2.2.7 Step for maintenance of engine room

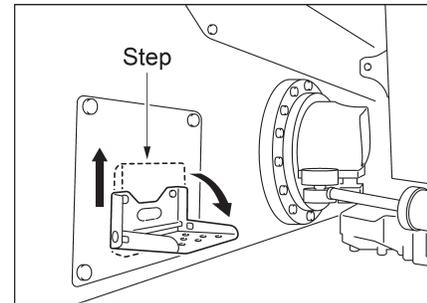
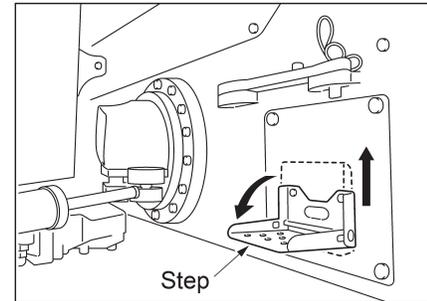
Pull the step up, then fold down.

#### **⚠ WARNING**

**Withstand load 130 kg (286 lbs).**

#### **⚠ CAUTION**

**Keep closed to the step when during the operation.**



### 2.2.8 Engine troubleshooting

Engine troubleshooting can be conducted using the engine diagnostic switch.

During normal operation, do not operate switches.

Set switch as shown in ○ position during the normal operation.

- ┆ position : Engine diagnostic is activated
- position : Engine diagnostic is shut off



DIAG.

#### **IMPORTANT**

- **When operating the engine diagnostic switch, see the engine manual.**
- **When the engine malfunctions or fails, contact your SAKAI Dealer immediately for appropriate inspection, maintenance, or repair.**

## 2.3 Operation

### ⚠ WARNING

- This machine is a one-man roller.
- Operate the machine from the operator's seat.
- Be sure to wear the seatbelt during operation.

### 2.3.1 Before-starting inspection

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

### ⚠ WARNING

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

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

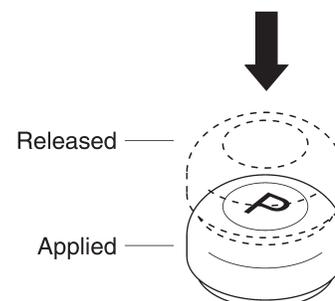
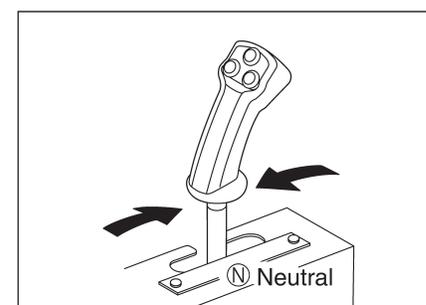
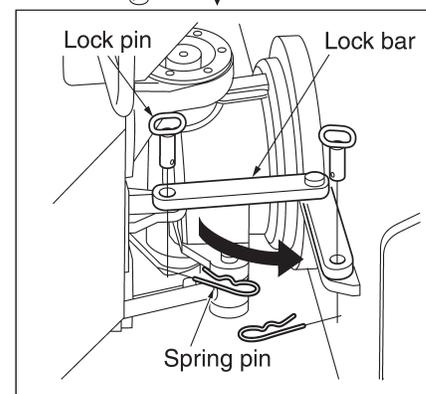
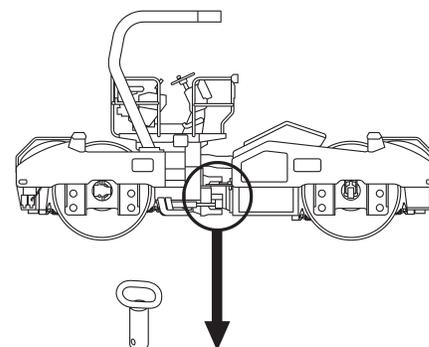
To unlock the bar

- ① Remove the spring pin.
- ② Pull out the lock pin.
- ③ Set the bar in the carrying position.
- ④ Retain the lock bar in the locked position by inserting the lock pin into the lock holes.
- ⑤ Secure the lock pin with the spring pin.

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

- 3) Confirm that the parking brake is engaged.

**NOTE:** When the F-N-R lever is not in the neutral (middle) position, or the parking brake has been released, the interlocking system goes into operation and the engine will not turn on. Be sure to confirm that the F-N-R lever is in the neutral (middle) position, and that the parking brake is engaged before starting the engine.



## 2 OPERATION

### 2.3.2 Starting the engine

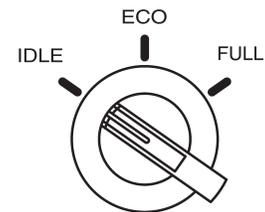
#### ⚠ WARNING

- Check that there are no people or obstacles around the machine and beep the horn before starting the engine.
- Set the Forward-Neutral-Reverse (F-N-R) lever in the neutral position and press down the parking brake switch before starting the engine.  
Unless these conditions are met, the engine will not start.

1) Set the engine speed select switch in the IDLE position.

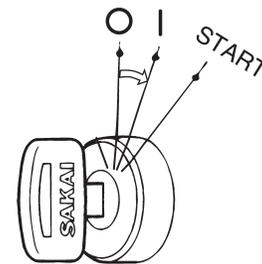
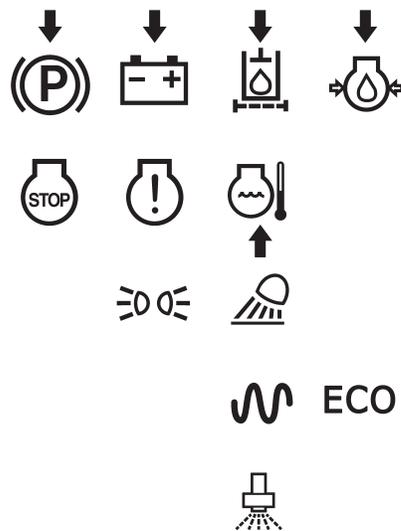
Engine speed	IDLE	ECO	FULL
		900 min <sup>-1</sup>	1850 min <sup>-1</sup>

(± 50 min<sup>-1</sup>)

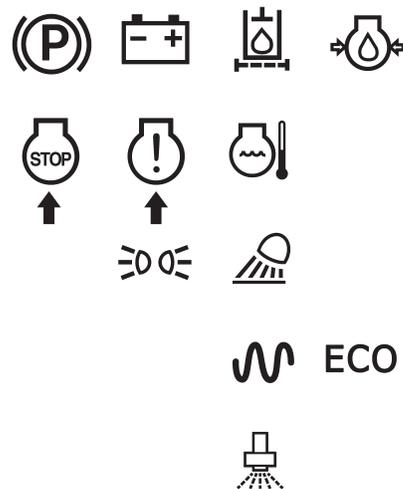


Engine speed selector switch

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



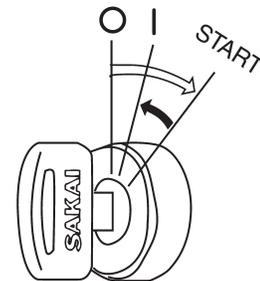
3) Start the engine after the engine check lamp lights up and goes out.



Wait to start

LCD monitor display

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 I position.



#### ⚠ CAUTION

- Do not allow the starter key to stay in the START position for more than 15 seconds.
- When the engine fails to start, or you want to restart the engine immediately after turning it off, wait around 30 seconds before restarting it.
- 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 stay on while the engine is running, shut down the machine, determine the cause and rectify the fault.

## 2 OPERATION

### 2.3.3 After starting the engine

Try not to move the machine immediately after starting but practice the following:

#### **IMPORTANT**

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

- 1) Run the engine at idling 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, gradually warm the engine, engine oil and hydraulic oil to prepare the machine for driving.
- 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
  - Engine check 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.

#### **⚠ WARNING**

**Keep staying at the driver's seat while starting the engine.**

### 2.3.4 Traveling

#### **⚠ WARNING**

- **When starting, operate the horn after securing the safety around the machine.**
- **Be sure to wear the seatbelt during operation.**

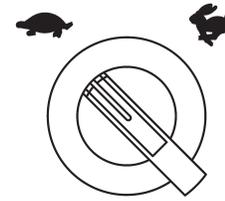
#### **⚠ CAUTION**

**While travelling, do not turn the starter switch ○ .**

1) Select mode according to propel condition.

 position : Work condition

- The AUTO SPEED function can be controlled with this mode (refer to page 57).
- Maximum speed is regulated by each vibration frequency in the case of SW884 and SW994.



Frequency (vpm)	Propel speed mile/h (km/h)
2,500	0–2.8 (0–4.5)
3,000	0–3.4 (0–5.5)
4,000	0–4.5 (0–7.2)

- Maximum speed is regulated by each vibration type in the case of SW884ND.

Vibration type	Propel speed mile/h (km/h)
Ordinary Vibration	0-3.4 (0-5.5)
Oscillational Vibration	0-4.0 (0-6.4)

ECO or FULL position of Engine speed selector switch.

 position : Traveling condition 0–6.8 mile/h (0–11 km/h).

**NOTE:** Selection is applied only when the F-N-R lever is in the neutral position.

#### WARNING

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

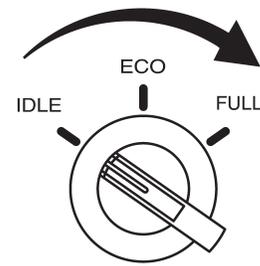
#### IMPORTANT

**Be sure to shift gears while the machine is stopped. Can not shift gear during running.**

## 2 OPERATION

- 2) Select ECO or FULL position of Engine speed selector switch.

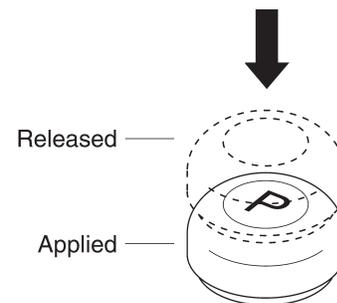
**NOTE:** Machine speed can be operated under at FULL position of Engine speed selector switch. Maximum speed is reference value.



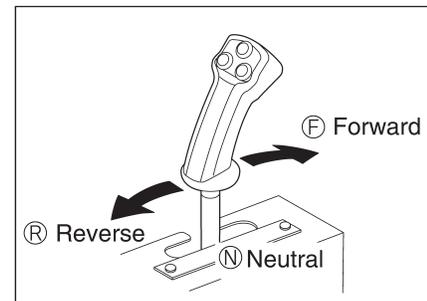
Engine speed selector switch

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

**CAUTION**  
Never pull the switch.



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



**NOTE:** The travel speed can be controlled by the engine speed select switch and F-N-R lever.

### **WARNING**

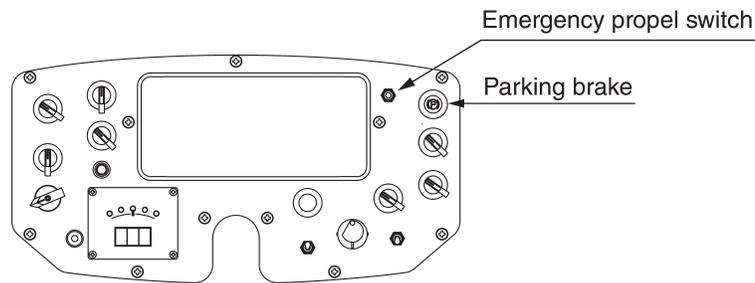
- Pay extreme attention to the area behind the machine when backing, since the space just behind it tends to be a blind spot.
- Pay careful attention to your surroundings and maintain control of the machine when changing switch positions. Whenever possible, stop the machine to change switch settings before continuing operation.

**CAUTION**  
Avoid abrupt operation of the F-N-R lever.

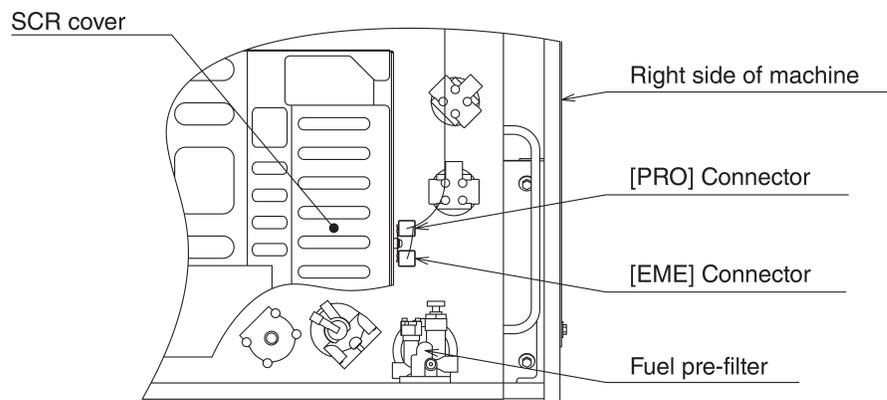
## Emergency traveling

If the machine doesn't move when you operate the forward and reverse control lever while the engine is running, there maybe a problem with the control system. In this case, you may bypass the controller to temporarily drive the machine by following the procedure below.

- 1) Push on the parking brake. Shut off the engine and make sure the emergency propel switch is in the neutral position.



- 2) Identify the connectors PRO & EME on the SCR cover on right side of the machine.
- 3) Remove the plugs from connector PRO then exchange connectors PRO and EME.



- 4) Make sure the connectors are properly connected, close the hood but do not start the engine until you have checked the surrounding area for obstacles. Also make sure that the emergency switch and traveling direction of the machine are the same. Now it will be safe to move the machine to a safe area.

## 2 OPERATION

If the machine will not move at this point there are other problems. You will have to tow the machine to safe area.

When you exchange connectors again, follow the procedure below.

- Push on the parking brake.
- Shut off the engine.
- Be sure the F-N-R lever is in neutral.
- Contact your servicing dealer.

### IMPORTANT

**Contact your Sakai Dealer to service the machine, after the machine is transported to a safe place.**

### 2.3.5 Stopping and parking

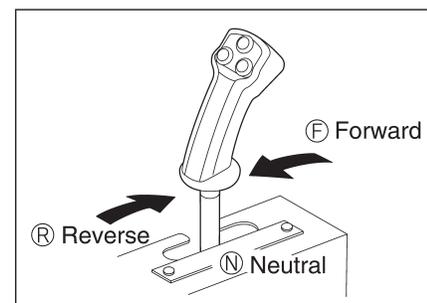
#### ⚠ WARNING

- **Avoid abrupt braking. Leave enough space for braking safety.**
- **Avoid parking on a grade.**
- **If necessary to park on a grade, chock the drums to prevent unexpected moving down the grade.**

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

#### ⚠ CAUTION

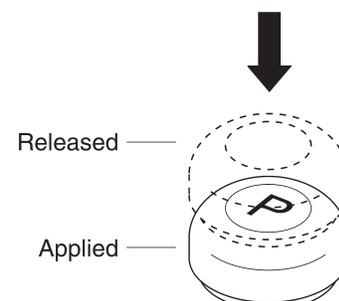
- **For normal braking, move the F-N-R lever back to the neutral position.**
- **In an emergency, depress the brake pedal.**



### IMPORTANT

**When pressing the brake pedal, the brake is activated and the engine is stopped at the same time. After depressing the brake pedal, return F-N-R lever to the neutral position, and press the parking switch button, otherwise the machine will not start.**

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



## 2.3.6 AUTO SPEED

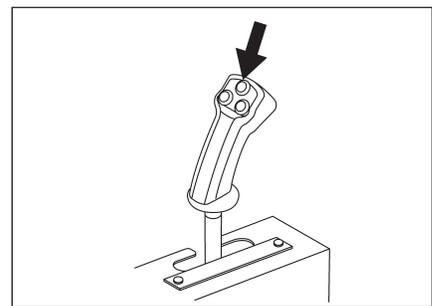
### 2.3.6.1 Setting

The machine propel speed can be memorized by the machine controller and the speed is controlled automatically. It will help to easily control your speed to a preset value when a certain speed is required on the work site.

**NOTE:** The AUTO SPEED function only operates when the Engine speed selection switch is set to ECO or FULL and the Propel speed selection is in the  position.

**NOTE:** The minimum allowable AUTO SPEED setting is 1.5 miles per hour.

- 1) With the machine in moving at the desired AUTO SPEED setting, press the TOP button on the F-N-R lever and hold for at least one second to set the AUTO SPEED equal to the current machine speed.

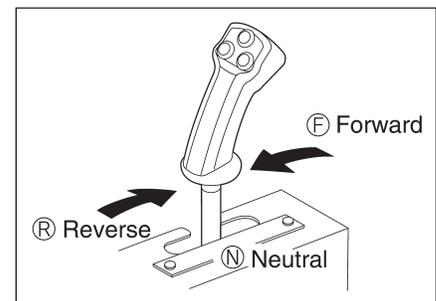


- 2) Check the AUTO SPEED lamp  
If the AUTO SPEED is successfully set up in Step 1, the AUTO SPEED lamp will remain lit. If the lamp is not illuminated, repeat Step 1.



AUTO SPEED

- 3) After setting the AUTO SPEED in Step 1, move the F-N-R lever to the neutral position (N).  
The AUTO SPEED feature is now set so that the machine will travel at the preset speed when the F-N-R lever is in the full forward or full reverse position.



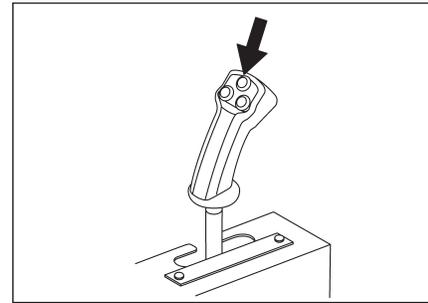
### **CAUTION**

**Do not change the IPF / Vibration Frequency / Vibration Amplitude / Propel Speed / Engine Speed switch setting after setting the AUTO SPEED without first canceling the AUTO SPEED. Doing this will cause the AUTO SPEED lamp flicker until the IPF / Vibration Frequency / Vibration Amplitude / Propel Speed / Engine Speed switch is set back to the position it was in when AUTO SPEED was set.**

## 2 OPERATION

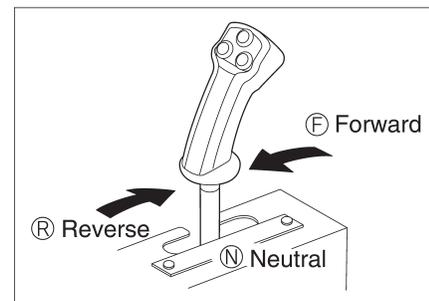
### 2.3.6.2 Canceling AUTO SPEED

- 1) Press and hold the Top button on the F-N-R lever for at least one second when the AUTO SPEED lamp is lighted on.
- 2) Check the AUTO SPEED lamp.  
It is ready to cancel the AUTO SPEED, the lamp will flicker. If the lamp is not flickering, press the Top button again and hold for at least one second.
- 3) Move back the F-N-R lever to neutral position (N).  
AUTO SPEED is cancelled after the machine stops.



AUTO SPEED

- 4) Check the AUTO SPEED lamp.  
When the AUTO SPEED is cancelled completely, the lamp goes off.

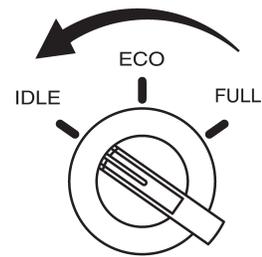


#### **⚠ CAUTION**

**Move the F-N-R lever slowly at first after the AUTO SPEED feature has been canceled because the machine response will be faster now.**

### 2.3.7 Stopping the engine

- 1) Set the Engine speed select switch at the IDLE position, wait for about 5 minutes with the engine idling to gradually cool the engine.



Engine speed selector switch

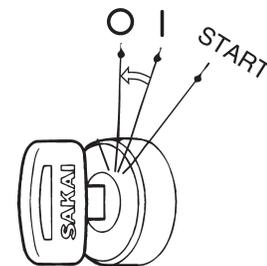
#### IMPORTANT

- 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 switch key to the ○ position to stop the engine.

#### CAUTION

Do not turn the starter switch ○ while the machine is in motion.



- 3) Remove the starter switch key.

#### WARNING

- When dismantling from the machine, apply the brake by pressing the parking switch button. If necessary to park on a grade, chock the wheels to prevent unexpected moving down the grade.
- Never fail to remove the starter key.

### 2.3.8 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.
- 5) When transporting the machines, please ensure safety by strictly complying with the applicable laws and regulations.

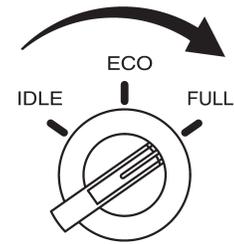
## 2.4 Vibratory Operation

- 1) Turn the Engine speed select switch clockwise to set the engine RPM to FULL or ECO.

**NOTE:** It is possible to conduct the rolling compactations as much as the vibration specifications when setting the engine speed select switch to FULL and ECO. MID is fuel-efficient position called the ECO MODE.

The ECO MODE is recommended when working on flat road surfaces as the maximum speeds and the hill-climbing performances are degraded.

Please conduct the rolling compactations by setting to the FULL position when working on soft, steep sloped and rugged road surfaces.

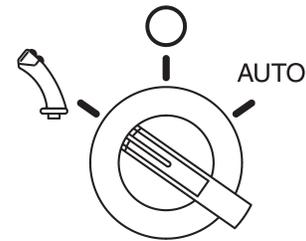


Engine speed selector switch

- 2) Select  or AUTO position of Vibration mode selector switch.

 position : Vibration can be controlled by the vibration switch on the F-N-R lever

AUTO position : Vibration is automatically engaged when the F-N-R lever is moved into the forward or reverse positions



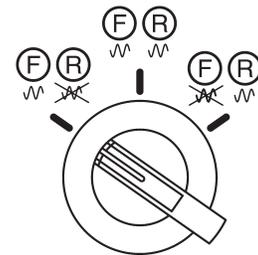
**NOTE:** For vibratory rolling, run the engine at FULL. or ECO.

- 3) Select Vibration drum of Vibration drum selector switch.

 position : Only the front drum will vibrate

 position : Both drums will vibrate

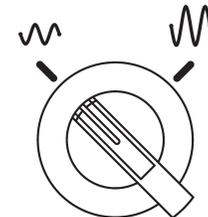
 position : Only the rear drum will vibrate



- 4) Select Vibration amplitude ( For SW884, SW994 )

 position : Low amplitude vibration

 position : High amplitude vibration

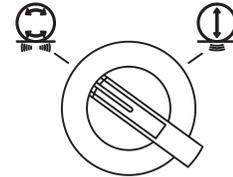


## 5) Select Vibration type (For SW884ND)

Select ordinary or oscillational vibration.

 : Ordinary vibration

 : Oscillational vibration



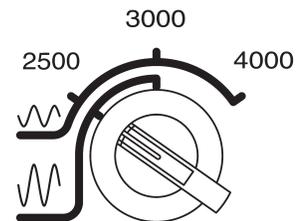
**NOTE:** Selection is applied only when the F-N-R lever is in the neutral position.

## 6) Select Vibration frequency (For SW884,SW994).

2,500 position : Vibration can be generated at 2,500 vpm at low or high amplitude.

3,000 position : Vibration can be generated at 3,000 vpm at low or high amplitude.

4,000 position : Vibration can be generated at 4,000 vpm only in the low amplitude setting.



**NOTE:**

- If 4,000 vpm is selected and the machine is set on the high amplitude, it will default to operating in high amplitude at a frequency of 3,000 vpm.
- Selection is applied only when the F-N-R lever is in the neutral position.

## 7) Select Impacts per Foot using the IPF selector switch.

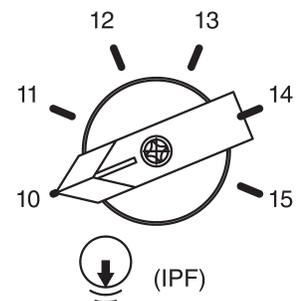
Number of Impacts Per Foot is selected as an input value for the EXACT COMPACT METER.

Refer to 2.7 EXACT COMPACT Operation page 71

IPF number can be selected from 10, 11, 12, 13, 14, 15

The green lights on the EXACT COMPACT METER will light up when the machine speed matches the desired IPF number.

Refer to 2.7 EXACT COMPACT Operation page 71 for more details.



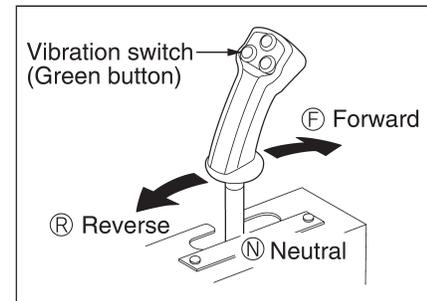
**NOTE:**

- Selection is applied only when the F-N-R lever is in the neutral position.
- Selection is applied in the case of the SW884, ordinary vibration of the SW884ND, and the SW994.

## 2 OPERATION

### 8) To generate vibration.

When the AUTO mode is enabled as described in Step 2 above, placing the F-N-R lever in the Forward or Reverse positions will cause the vibration to engage automatically when the machine starts in motion.



**NOTE:** Vibration can not be controlled by the vibration switch on the F-N-R lever in Auto speed mode.

When  position is selected in Step 2, press and hold the vibration switch (green button) for at least one second to start vibration. The vibration indicator lamp on the F-N-R lever will illuminate.

To shut off vibration, press and hold the vibration switch (green button) on the F-N-R lever for at least one second. The vibration indicator lamp will shut off when no vibration is occurring.

### WARNING

**Pay careful attention to your surroundings and maintain control of the machine when changing switch positions. Whenever possible, stop the machine to change switch settings before continuing operation.**

### CAUTION

- **Keep the vibrator shut off when the machine is not rolling.**
- **Stop vibration if the machine has encountered a running difficulty, for example, when it gets stuck in the mud.**

## 2.5 Operating the DEF SCR System

### 1) About the DEF SCR (Selective Catalytic Reduction) system

The DEF SCR system breaks down toxic nitrogen oxides (NO<sub>x</sub>) contained in the exhaust gas into harmless nitrogen and water. DEF is sprayed into the exhaust gas, and the ammonia generated by the urea reacts with the nitrogen oxides breaking them down into nitrogen and water.

Depending on the operating conditions, when the DEF SCR system's cleaning function deteriorates, regeneration is carried out to protect the system.

#### **⚠ CAUTION**

- **Keep the DEF tank topped up by refilling it at the right time.**
- **Always use the DEF designated by our company.**

### 2) Regeneration

Regeneration is carried out in the following ways.

- Automatic regeneration

The exhaust equipment high temperature lamp  will turn on.

**NOTE:** The machine may be driven or operated as usual during automatic regeneration.

- Parked manual regeneration request

Parked manual regeneration lamp / Regeneration lamp  will turn on.

Press the Parked manual regeneration switch  in accordance with the prescribed procedures.

The exhaust equipment high temperature lamp  will turn on when regeneration begins, and the parked manual regeneration lamp / regeneration lamp  will flash.

- Parked manual regeneration request emergency lamp  will flash.

Parked manual regeneration lamp / Regeneration lamp  will turn on.

Press the Parked manual regeneration switch  in accordance with the prescribed procedures.

The exhaust equipment high temperature lamp  will turn on when regeneration begins, and the parked manual regeneration lamp / regeneration lamp  will flash.

**NOTE:** The engine sound, exhaust gas smell, etc., may change during regeneration.

#### **⚠ WARNING**

- **Do not carry out cleaning in enclosed spaces with poor ventilation, such as inside a garage or a room. There is the danger of carbon monoxide poisoning.**
- **Check to make sure there are no flammables near the mouth of the exhaust pipe to prevent fires.**
- **Do not touch or let people go near the exhaust pipe or muffler, which will be hot during cleaning, and for a while after cleaning.**

## 2 OPERATION

### 3) Procedures for parked manual regeneration

- ① Turn off the vibrator.
- ② Move the machine to a safe place.  
(The exhaust gas temperature will rise during parked manual regeneration, so beware of burns, trees lining streets, fires, ventilation, etc.)
- ③ Move all F-R levers to the neutral position.
- ④ Press the parking brake switch.
- ⑤ Let the engine idle.
- ⑥ Check to make sure that the disable regeneration lamp is turned off.
- ⑦ Press the parked manual regeneration switch.  
(Regeneration is complete when all the indicator lamps turn off. Be sure to let the engine idle for 5 minutes after completion of regeneration)  
\*If the thermometer is in the position (C) before carrying out parked manual regeneration, let the engine warm up.

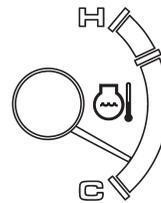
#### **⚠ CAUTION**

- **The exhaust gas temperature will rise during regeneration, so beware of burns, fires, etc.**
- **The SCR must never be modified. The machine will not be able to function properly, and it will not satisfy exhaust gas emissions standards.**
- **Do not turn the engine off immediately after regeneration. Put the throttle lever in the idling position, and let the engine idle to gradually cool it for around 5 minutes.**
- **Stopping the engine suddenly without letting it cool may shorten the life span of engine parts.**
- **Continuing to use the machine without carrying out regeneration when the parked manual regeneration lamp / regeneration lamp is flashing may, in the worst case scenario, result in a limit being placed on the engine output. Promptly carry out parked manual regeneration.**
- **Parked manual regeneration can be carried out any time, but limit it to once daily except when the parked manual regeneration lamp / regeneration lamp flashes.**
- **Operating the parking brake switch or accelerator lever during parked manual regeneration will automatically stop regeneration. Restart parked manual regeneration in accordance with the prescribed procedures.**

### 4) Carrying out regeneration on cold days.

Be sure to let the engine warm up adequately on cold days before carrying out regeneration.

As a rough guide, let the engine warm up until the thermometer indicates the position shown in the illustration on the right.



Temperature gauge

## 5) Disable regeneration

To prevent fires and burns from high temperature exhaust gas during regeneration, disable regeneration by pressing the disable regeneration switch if there is a danger of the gas coming into contact with nearby flammable materials.

When safety has been secured, promptly turn  $\bigcirc$  position the disable regeneration switch.

Pressing the disable regeneration switch will turn  $\text{I}$  position the disable regeneration lamp  and stop regeneration.

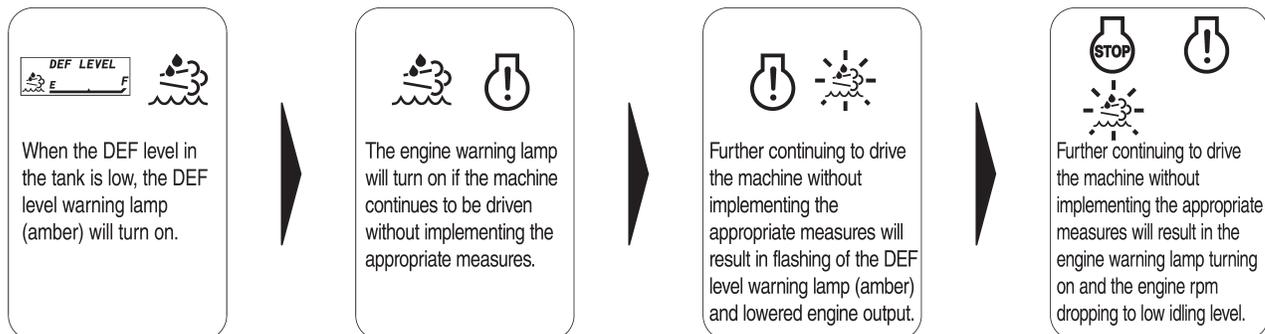
Pressing the switch again will turn off the lamp , and enable regeneration.

**⚠ WARNING**

**When there are flammable materials (paper, dead leaves, etc.) or people nearby, disable regeneration to prevent fires and burns from high temperature exhaust gas.**

## 6) Implement the following procedures when there is an abnormality in the DEF SCR system.

## • When the DEF level is low

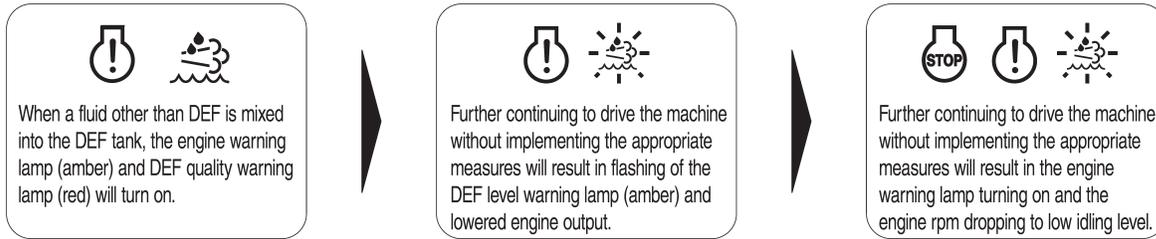


**Countermeasure:** When the above warning is displayed, fill the tank immediately with DEF designated by our company.

If the warning lamp does not turn off even after filling the tank with DEF, stop the engine, make sure the system busy lamp turns off, then turn the starter switch from the  $\text{I}$  position to the  $\bigcirc$  position twice before restarting the engine.

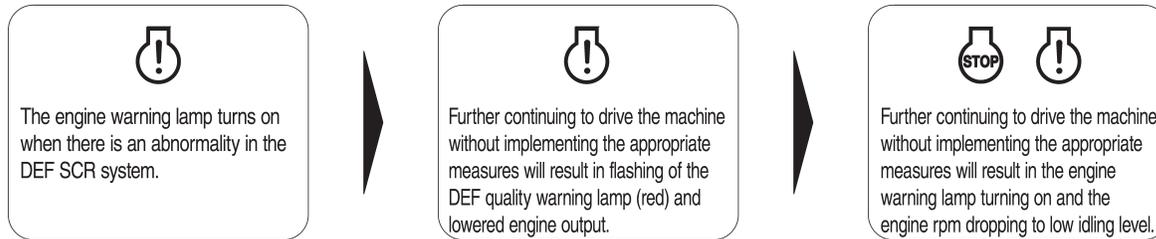
## 2 OPERATION

### • When there is an abnormality in the DEF quality



**Countermeasure:** When the above warning is displayed, completely drain the fluid from the DEF tank, and change it to the DEF designated by our company. If the warning does not turn off even after changing the DEF, stop the engine, turn the starter switch from the **I** position to the **O** position twice, then restart the engine.

### • Abnormality in the DEF SCR system



**Countermeasure:** When the above warning is displayed, contact one of our sales offices or a factory designated by our company for advice.

**⚠ WARNING**

- DEF on the skin may cause inflammation in some people, so contaminated clothes, shoes, etc., should be taken off and washed in cold or warm water. If there are any changes in appearance or pain, promptly seek medical help.
- If the DEF is accidentally swallowed, rinse out your mouth well with water, and promptly seek medical help.
- If the DEF gets in your eyes, rinse it out immediately in clean water for several minutes, then promptly seek medical help.
- Wear protective glasses when there is a danger of the DEF splattering. Wear rubber gloves if work requires you to come into contact with the DEF.
- Do not put anything other than DEF into the DEF tank. Diesel, gasoline, etc., in particular may cause fires. Moreover, putting additives in the tank may lead to generation of toxic gases.
- Opening the DEF tank cap may release toxic ammonia gas. When opening the cap or filling the tank, keep your face away from the filler port.
- If the DEF is spilled, promptly wipe it clean and wash with water. Neglecting to do so may lead to toxic gases or corrosive substances being given off.

**⚠ CAUTION**

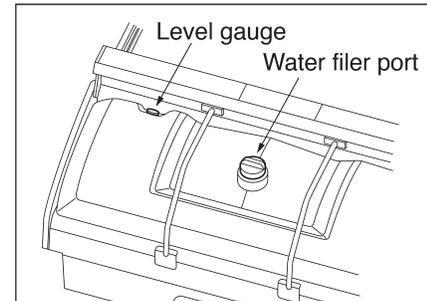
- Put AUS32 or ISO (International Organization for Standardization) ISO22241-1 certified DEF in the DEF tank.  
Using anything else may cause breakdowns in the DEF SCR system.
- Never modify the DEF SCR system.
- The machine will not be able to function properly, and it will not satisfy exhaust gas emissions standards. It may also damage the machine.
- The machine will continue running for several minutes after the engine starter switch has been turned off, but this is to pump the DEF left in the pipes, injector, and supply pump back into the DEF tank, and it is not abnormal.  
Moreover, do not pull out the battery cord while the system is still running.
- Keep the DEF tank topped up by refilling it at the right time.
- When storing the machine for a month or more, change the DEF pump filter and fill up the DEF tank before starting the engine.
- If the machine is not used for two months or more, change the DEF pump filter and fill up the DEF tank before starting the engine.
- Check the DEF SCR system to make sure there are no abnormalities after starting the engine.  
If there is something wrong with the DEF SCR system, stop the engine and restart it.

## 2 OPERATION

### 2.6 Water Spray System

- 1) Before turning the spray system on, check level in the water tank with the sight gauge. Add water as necessary.

**IMPORTANT**  
**Use clean water wherever practicable.**

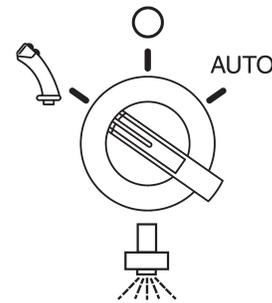


- 2) Select  or AUTO position of Spray mode selector switch.

 position : Spray system can be controlled by the blue button switch on the F-N-R lever

 position : Spray system is shut off

AUTO position : Spray system is actuated when the F-N-R lever is in the forward or reverse position and deactivated when the F-N-R lever is moved to the Neutral position



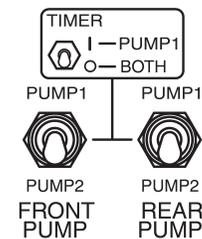
- 3) Select water pumps for front and rear drums.

Two each of same water pumps are installed to front drum and rear drum spray system. There are three positions at each switch.

PUMP1 position : Actuate pump 1

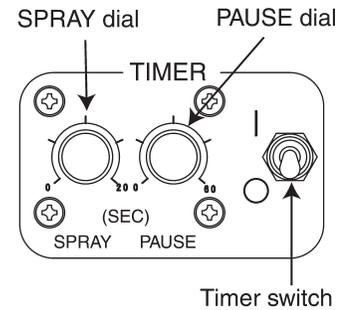
Center position : Pump 1 when select intermittent spray (see 4)  
Pump 1 and Pump 2 when deselect intermittent spray (see 4)

PUMP2 position : Actuate pump 2



4) Select I position of timer switch for intermittent spray.

- I position : Spray timer is activated
- O position : Spray timer is shut off

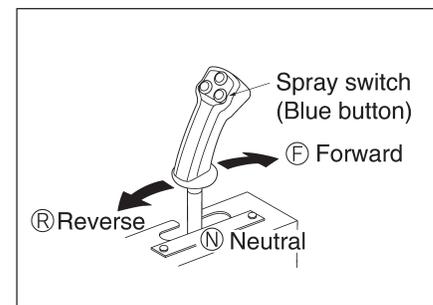


5) Adjust spray time and pause time.

Spray time is adjustable between 0–20 seconds using the SPRAY Dial and pause time is adjustable between 0–60 seconds with PAUSE Dial as desired. Adjust according to the job site conditions.

6) To start spraying.

When AUTO position is selected, placing the F-N-R lever in the Forward or Reverse position causes travel and sprinkling to start simultaneously.



**NOTE:** The water can not be controlled by the spray switch.

When  position is selected, press the spray switch (blue button) and hold for at least one second and the system will start spraying. The spray lamp will illuminate.

Pressing and holding the spray switch (blue button) for at least one second while the system is spraying will cause the sprinkling to stop. The spray indicator lamp will turn off.

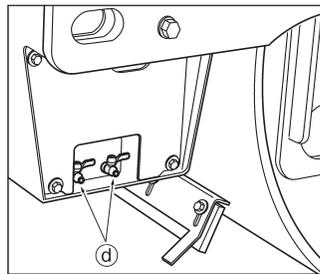
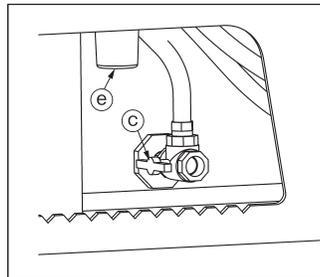
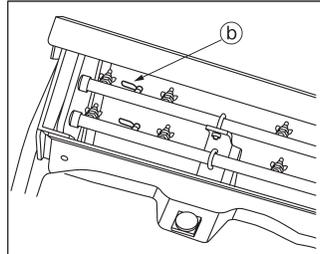
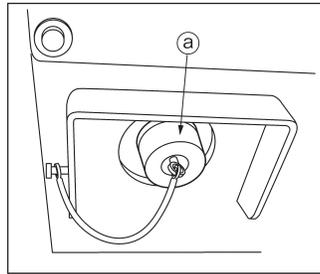
**WARNING**

**Pay careful attention to your surroundings and maintain control of the machine when changing switch positions. Whenever possible, stop the machine to change switch settings before continuing operation.**

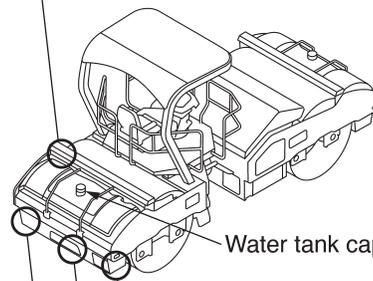
**IMPORTANT**

**When starting asphalt compaction, place the spray switch in the  position and moisten the drum surface completely before selecting TIMER spray. For resuming work after a short break, follow the same procedure.**

## 2 OPERATION



Spray bars and drain cocks (b)



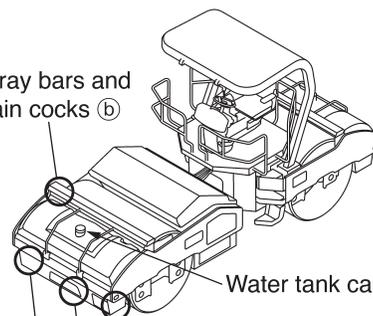
Water tank cap

Water pump drain cocks (d)

Water tank selector valve (c) / Water filter (e)

Water tank drain cap (a)

Spray bars and drain cocks (b)



Water tank cap

Water pump drain cocks (d)

Water tank selector valve (c) / Water filter (e)

Water tank drain cap (a)

### To drain water

- 1) Take off the caps of water tanks.
- 2) Take off the drain caps (a) of water tanks and drain water from the tanks completely.
- 3) Open drain cocks (b) of spray bars at front and rear, to drain water completely.
- 4) Turn the lever of water tank selector valve (c) clockwise, open the drain cocks (d) of water pumps.

Take off the bowl (e) from water filters then throw away water in the bowl then put the bowl back on the water filters.

- 5) Run the water pumps approximately 30 seconds with the drain cocks open.
- 6) Make sure water is completely drained from all hoses, water pumps and spray nozzles.

### ⚠ CAUTION

- To avoid freezing, fully drain the water tank, pipes and filters in cold weather.
- Pay attention to the water level because turning the pump with an empty water tank will damage the pumps.

## 2.7 EXACT COMPACT Operation (Impact Space Indicator & Speed Meter)

### 2.7.1 Function

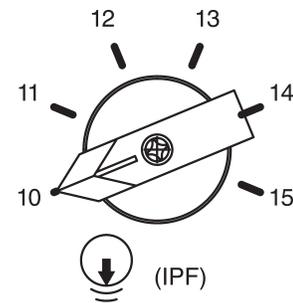
- 1) Indicates if the roller is achieving the desired number of impacts per foot based on the inputs of rolling speed and the operating frequency of the roller. The information is visually displayed by yellow, green, and red LED lights.
- 2) Indicates the rolling speed.
- 3) Indicates the error codes of the machine controller.
- 4) Indicates the rolling surface temperature (OPTION).

### 2.7.2 Operating instruction

#### IPF selector switch

The desired number of Impacts Per Foot can be selected as an input for the EXACT COMPACT METER.

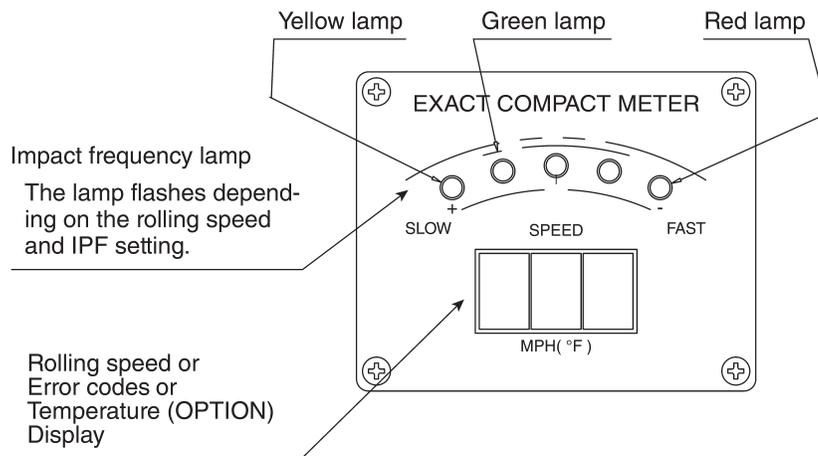
IPF number can be selected from 10, 11, 12, 13, 14, 15.



- NOTE:**
- Selection is applied only when the F-N-R lever is in the neutral position.
  - Selection is applied in the case of the SW884, ordinary vibration of the SW884ND, and the SW994.

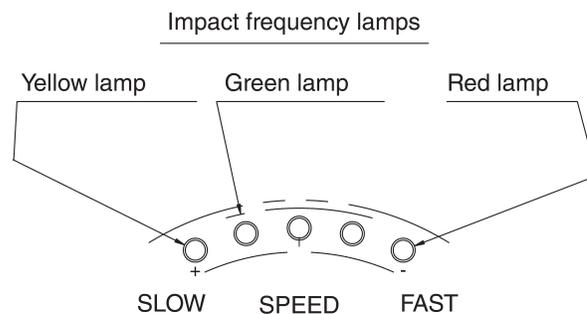
## 2 OPERATION

### Display



#### 1) Impact frequency lamp

The position where the impact frequency lamp flashes, indicates whether actual impact frequency is greater or fewer than the preset IPF.



- Yellow light :  $+3 <$  Difference comparing to IPF numbers
- Left green light :  $+1 <$  Difference comparing to IPF numbers  $\leq +3$
- Center green light :  $-1 \leq$  Difference comparing to IPF numbers  $\leq +1$
- Right green light :  $-3 \leq$  Difference comparing to IPF numbers  $< -1$
- Red light : Difference comparing to IPF numbers  $< -3$

#### 2) Rolling speed / Error codes / Temperature display

When the starter switch key is turned to the starter switch | position, PON shows up for approximate 2 seconds.

After that, the rolling speed is displayed. If there is an error in the system, the error code is displayed.

Temperature is displayed when the Temperature / Machines speed selector switch is selected to F position.

**NOTE:** Temperature display function is OPTIONAL.

### 2.7.3 Operation

- 1) When the ignition is turned to the I position, the rolling speed display shows [0.0] after approximate 2 seconds. If the display shows any other message, there may be problems. Refer to page 74 for detail.
- 2) Select the desired frequency from 2,500 vpm, 3,000 vpm, or 4,000 vpm by means of Vibration frequency selector switch.
- 3) Select the desired impacts per foot from 10, 11, 12, 13, 14, 15 IPF by means of the IPF selector switch.
- 4) When the machine travels with vibration on, the illuminated color of the impact frequency lamp moves in accordance with the rolling speed and the impacts per foot selection.
- 5) In order to execute compaction work at the desired vibration frequency and IPF setting, the work should be performed at the rolling speed where the center green light stays illuminated.
- 6) Using the AUTO SPEED function (refer to page 58) will assist compaction work. Following table shows reference with Frequency / I.P.F./ Propel speed.

Frequency (vpm)	I.P.F. (MPH)					
	10	11	12	13	14	15
2,500	2.8	2.6	2.4	2.2	2.0	1.9
3,000	3.4	3.1	2.8	2.6	2.4	2.3
4,000	4.5	4.1	3.8	3.5	3.2	3.0

**NOTE:** Increase the rolling speed when Yellow light is illuminated.  
Reduce the rolling speed when the Red light is illuminated.  
Selection is applied in the case of the SW884, ordinary vibration of the SW884ND, and the SW994.

#### **⚠ CAUTION**

- When using the Exact Compact meter in vibratory mode, be sure to run the engine at ECO or FULL engine speed.
- If the engine is not running at the ECO or FULL speed position, the Exact Compact meter may display inaccurate results.

## 2.8 Machine Controller Diagnoses

If error code like as E XX is displayed on the EXACT COMPACT METER, some kind of error has been detected.

#### **⚠ CAUTION**

**When an error is detected, the engine may stop to urgently stop the machine.**

## 2 OPERATION

Error code	Function / Component	Error	Engine stop
E01	Potential meter	Output voltage to machine controller is grounded	Yes
E02	Potential meter	Output voltage to machine controller is power supply voltage	Yes
E03	Forward switch / F-N-R lever	Short circuit to machine controller	Yes
E04	Forward switch / F-N-R lever	Broken wire	Yes
E05	Reverse switch / F-N-R lever	Short circuit to machine controller	Yes
E06	Reverse switch / F-N-R lever	Broken wire	Yes
E11	Speed sensor	Broken wire	Yes(*)
E15(Lo)	Rolling surface temperature sensor (OPT)	Broken wire or low temperature	No
E21	Vibration selector switch	Broken wire / Short circuit to machine controller	No
E22	IPF selector switch	Broken wire / Short circuit to machine controller	No
E31	Current control / Propel pump solenoid for forward	Current outside the nominal range	Yes
E32	Current control / Propel pump solenoid for reverse	Current outside the nominal range	Yes
E33	Current control / Vibration pump solenoid for left	Current outside the nominal range	No
E34	Current control / Vibration pump solenoid for right	Current outside the nominal range	No
E41	CAN BUS / ECU	Signal defect to machine controller	Yes(*)
E42	Traveling controller	Signal defect to machine controller	Yes
E43	Exact meter	Signal defect to exact meter	Yes
E44	Working controller	Signal defect to machine controller	Yes
E45	Working controller	Parameter error	Yes

### IMPORTANT

**When the machine controller malfunctions or fails, contact your SAKAI Dealer immediately for appropriate inspection, maintenance, or repair.**

**NOTE:** Refer to Emergency traveling on page 55 when it is necessary to move the machine urgently.

\* Only AUTO SPEED mode (refer to 2. 3. 6 AUTO SPEED on page 57).

## 2.9 Precautions for Work

### 2.9.1 Compaction operation

#### ■ Do not operate the vibrator on a 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-N-R lever.

#### ■ Drive at a speed appropriate for the road surface conditions

- Drive slowly on uneven surfaces.

### 2.9.2 When going downhill

#### ■ Use the F-N-R lever

- Run slowly going downhill. Do not use excessive speed. Avoid changing speed if possible when going downhill. Start slowly and end slowly on steep downgrades.

#### ■ Use the engine brake

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

### 2.9.3 On a slope

#### ■ Working on a sidehill

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

## 2.10 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

## 2 OPERATION

### Material to be compacted

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

### Layers to be compacted

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

## 2.11 After Operation

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

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

- 1) Check to see if the engine coolant temperature is too high and the engine oil pressure is not normal. Also check the fuel level.
- 2) 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.
- 3) Park the machine on a hard and dry surface. If such a place is not available, cover the ground with hard plates.
- 4) Low temperature will cause a significant reduction of battery efficiency. Cover batteries or take them off the machine and store in a warm place for the following day's operation. There is a danger of battery fluid leaking when removing the battery from the machine, so take care not to tilt the battery when doing so.
- 5) To prevent freezing, drain water from the spray system (refer to water spray system on page 70).

### IMPORTANT

- **Insufficient draining of water can cause damage to the machine.**
- **Do not wash clean with high pressure water around the instrument panel or reverse side of the dash board. This can cause instrument failures.**

## 2.12 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.

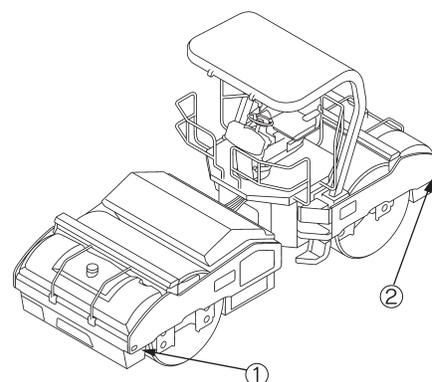
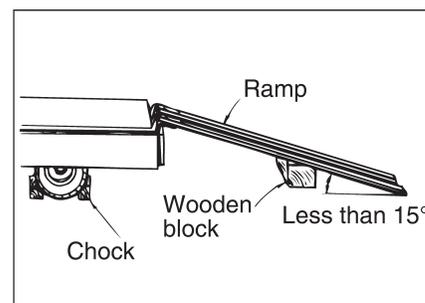
For loading and unloading, use ramps or a proper loading stand.

### 2.12.1 Use of a trailer equipped with a winch

### ⚠ WARNING

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

- 1) Engage the trailer brake and chock its wheels. Fix the ramps so that the machine and trailer are completely aligned.
  - ☆ The angle between the ramps and ground must be less than 15 degrees.
  - ☆ Leave a proper space between the ramps according to the width of the roller drum.
- 2) Decide the correct direction of run and make the machine run forward to the ramps.
- 3) Draw the wire rope from the trailer winch and put its hook on the hooking point ① or ② (One each on right and left) of the roller.
- 4) Place the unloader valve located at the engine room to the UNLOAD position. (refer to Unloader valve on page 42)



## 2 OPERATION

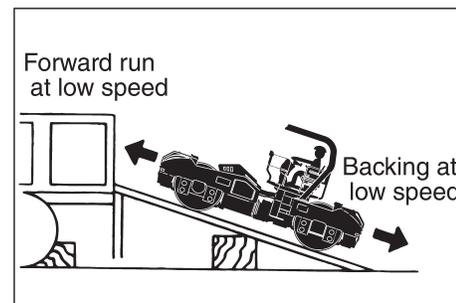
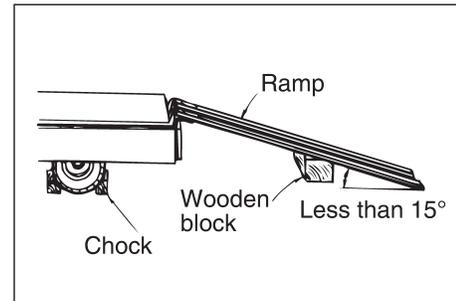
- 5) With the engine running at idle, perform loading by means of the trailer winch.
- 6) When the loading is completed, set the unloader valve back in the ONLOAD position.
- 7) Locate the machine correctly on the trailer.

### 2.12.2 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.



### 2.13 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 chock 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.

## 2.14 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.

## 2.15 Operation in Cold Weather

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

### 2.15.1 Fuel oil and grease

Use fuel and oil with low viscosity (refer to page 112).

### 2.15.2 Coolant

#### **⚠ WARNING**

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

#### **⚠ CAUTION**

**Use ethylene glycol-base antifreeze.**

For the cooling water, mix the antifreeze in water.  
Use softened water as the water to be mixed.  
Please refer to the following table for the mixing ratio.

Ambient temperature	Always
Amount of anti-freeze	11 L (2.9 gal)
Amount of water	11 L (2.9 gal)
Ratio	50 %

Our machines are filled with a long-life coolant.  
The life of the antifreeze is for two years.  
Use non-amine type long-life coolant when changing coolant.

## 2 OPERATION

### ⚠ WARNING

- Do not remove the radiator cap while the coolant is hot.
- Hot water may be spouted out that can cause scald. Relieve pressure by slowly turning the cap after the water temperature is dropped, then remove the cap.



### ⚠ CAUTION

Failure to follow this procedure can result in severe engine damage.

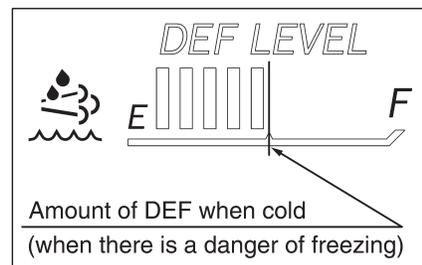
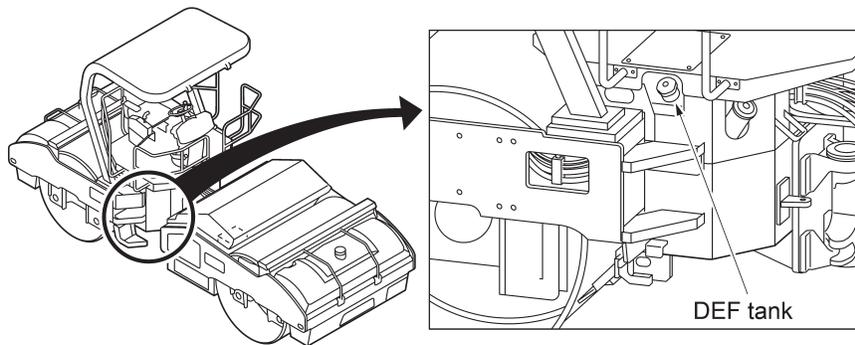
- Fill :
- 1) Fill coolant at 3 gallons per minute (12 liters per minute) until coolant reaches the bottom of the fill neck. Wait for 1 minute, then top up coolant to the bottom of the fill neck if needed.
  - 2) Start engine and run at ECO speed for 1 minute or until engine warning lamp comes on.
  - 3) Turn off engine and top up coolant to bottom of fill neck if needed.
  - 4) Replace coolant cap.

### 2.15.3 DEF

When the DEF inside the tank freezes, it may expand damaging equipment inside the tank or parts.

Fill the tank with the prescribed amount of DEF while it is cold (less than half if there is a danger of freezing).

The DEF freezes at  $-11^{\circ}\text{C}$ .



## 2.15.4 Battery

**⚠ WARNING**

- The battery contains diluted sulfuric acid, which will dissolve clothes and skin. Should you get battery fluid on your clothes or skin, wash it off immediately with copious quantities of clean water.
- If you get it in your eyes, rinse them straight away with clean water and immediately seek the help of a doctor.
- If you accidentally ingest it, drink copious quantities of water and immediately seek the help of a doctor.
- Always wear safety glasses when handling the battery.
- The battery generates hydrogen gas, so there is a danger of explosions. Avoid recharging the battery, keep cigarettes and flames away, etc., in poorly ventilated places when there is a danger of generating sparks.
- The inspection and handling of batteries should be carried out with the engine turned off and the starter switch in the  $\bigcirc$  position.
- Be careful not to accidentally connect the two battery terminals with tools or other metallic objects.
- Tangled terminals may generate sparks due to improper connections, resulting in the danger of explosions. Make sure terminals are connected firmly.
- The battery is for starting the engine and operating electrical equipment on the machine. Do not use it for any other purpose.

When the temperature decreases, the battery capacity will lower, possibly freezing the electrolyte.

The battery should be maintained in a good state at all times, with care taken to keep it warm in preparation for use the next morning.

**⚠ CAUTION**

**The power-supply voltage of this machine is 12V.**

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

For the level of charge, check the specific gravity of electrolyte and use the following table of conversion.

Temperature Level of charge (%)	20°C (68°F)	0°C (32°F)	-10°C (14°F)	-20°C (-4°F)
100		1.29	1.30	1.31
90	1.26	1.27	1.28	1.29
80	1.24	1.25	1.26	1.27
75	1.23	1.24	1.25	1.26

## 2.16 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 (rafer to page 112).
- 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).
- 3) Check to make sure there is no damage to parts inside the DEF tank. Carry out repairs if there is any damage.

## 2.17 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 ) Fill up the DEF tank. However, fill the tank with DEF to less than half full if there is a danger of freezing.
- 4 ) Grease lubricate the exposed portion of hydraulic cylinder piston rods.
- 5 ) Cover the battery after disconnecting the negative cable or take off the battery from the machine and store in a safe place.
- 6 ) If the temperature is expected to go down below 0°C, add antifreeze to the coolant.
- 7 ) Completely drain the spray system.
- 8 ) With F-N-R lever placed at neutral position (N) and vibration mode selector switch at O position, have the parking brake engaged.
- 9 ) Chock the machine.
- 10) Remove the starter switch key.

## 2.18 During the Storage Period

### **⚠ WARNING**

**If necessary to operate the machine in indoor storage space, 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.
- To prevent the brake linings from sticking to the brake drum, disengage the brake once a month. Exercise care not to allow the machine to move unexpectedly.

### **⚠ CAUTION**

**Follow the procedures below if the machine is not used for two months or more after storage.**

- **Change the DEF pump filter and fill up the DEF tank before starting the engine.**
  - **Check the SCR system to make sure there are no abnormalities after starting the engine.**
  - **If there is something wrong with the SCR system, stop the engine and restart it. If there is an abnormality in the SCR system even after restarting the engine, contact one of our sales offices or a factory designated by our company.**
  - **If a year or more has passed since refilling the DEF tank, contact one of our sales offices or a factory designated by our company to change the DEF.**
  - **Dispose of the drained DEF in accordance with the local environmental laws, rules and regulations.**
- Old DEF may give off an ammonium smell. Change the DEF in a well-ventilated place.**

## 2.19 When the Battery has Discharged

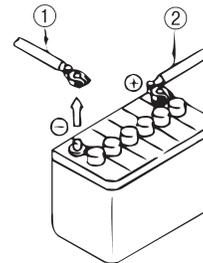
### ⚠ WARNING

- To check and handle the batteries, keep the engine stopped with the starter switch in the  $\circ$  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.

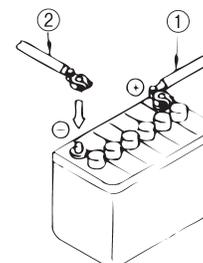
### ⚠ CAUTION

The power-supply voltage of this machine is 12V.

Disconnect with negative cable first



Connect with positive cable first

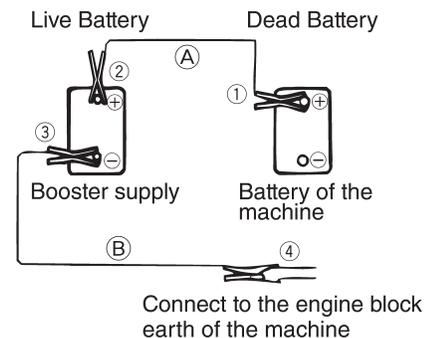


### 2.19.1 Connection and disconnection of booster cables

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

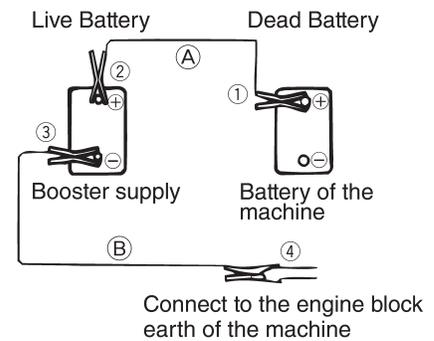
#### ■ Connection of booster cables

- 1) Connect one end of the positive booster cable (A) to the positive  $\oplus$  terminal of the dead battery on the machine.
- 2) Connect the other end of the positive booster cable to the positive  $\oplus$  terminal of the live power supply.
- 3) Connect the negative booster cable (B) to the negative  $\ominus$  terminal of the booster supply.
- 4) Connect the other end of the negative booster cable to a good earth ground on 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  $\oplus$  terminal to make contact with the negative  $\ominus$  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  $\ominus$  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.
- Securely connect the clips.
- The power-supply voltage of this machine is 12V.

## 3 PERIODIC 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 problems and service life of the machine. In this manual, typical intervals for inspection and service are given. However, flexibility should be exercised as to interval or type of services to enable your machine to always operate in the best condition.

#### **⚠ WARNING**

**Be sure to take adequate care not to burn yourself when replacing filters, elements, oil, etc.**

#### **IMPORTANT**

- **After maintenance and inspection record the result of inspection. Remember that replacement of filter elements, replenishment and change of oil and grease, and cleaning the radiator fins are important.**  
**When draining a hot oil, use care not to get burned.**
- **Waste oil, waste coolant, waste DEF, and used filters, elements, etc., should be handled by specialized disposal companies.**

#### **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 warm.
- 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. Completely fill the DEF tank except during cold times.
- 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) Contact one of our sales offices or a factory designated by our company to change DEF hoses and clean the DEF tank.
- 10) Turn the starter switch OFF when performing services such as repairing broken wires, short circuits and tightening loose terminals.

#### **Periodic 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 ensure they function as intended.

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

### 3 PERIODIC MAINTENANCE

System or Mechanism	Part name	Periodical replacement maintenance part	Replacement period	Remarks
1 Brake system	Master cylinder	Seals (rubber parts)	2 years	
	Wheel cylinder	Seals (rubber parts)	2 years	
	Brake piping parts	Brake hose	2 years	
		Air hose	2 years	
Operating parts	Cable	4 years		
2 Steering system	Orbitrol	Seals (rubber parts)	2 years	
	Hydraulic piping parts	Hydraulic hose	2 years	
	Steering cylinder	Seals (rubber parts)	2 years	
	Hydraulic pump	Seals (rubber parts)	4 years	
3 Power transmission system (inclusive of axle)	Axle	Seals (rubber parts)	4 years	
	Travel pump	Seals (rubber parts)	4 years	
	Travel motor	Seals (rubber parts)	4 years	
	Hydraulic piping parts	Hydraulic hose	4 years	
	Isolation rubber	Isolation rubber itself	4 years	
4 Fuel system	Piping parts	Fuel hose	2 years	
5 Engine related	Engine mounting parts	Isolation rubber	4 years	
	Seals (rubber parts)	Packing and others	4 years	
	Drive parts	V-belt	2 years	or 500 hours
	Piping parts	Engine drain hose	4 years	
6 Cooling system	Piping parts	Radiator hose	2 years	
		Radiator drain hose	4 years	
7 Control related parts	Cable	Cable	4 years	
8 Intake system	Piping parts	Intake hose	2 years	
		CAC hose	2 years	
9 Hydraulic system	Hydraulic piping parts	Hydraulic hose	4 years	
10 Urea system	Piping parts	Coolant hose for urea system	2 years	
		Urea hose	9,000 hours	

#### ⚠ 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 95).**
- **When trouble occurs in the location indicated by the indicator lamp on the dashboard 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, when there is abnormality, replace it.**

**If there are some trouble on the electric wiring, replace them with new one.**

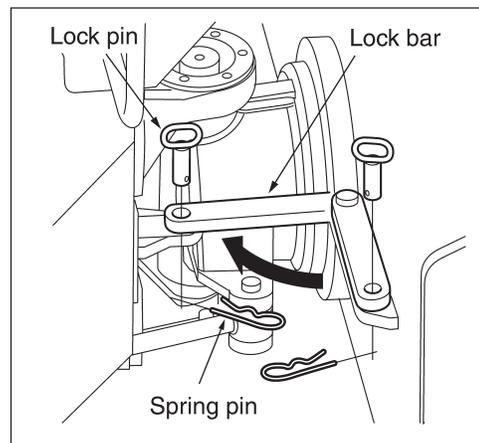
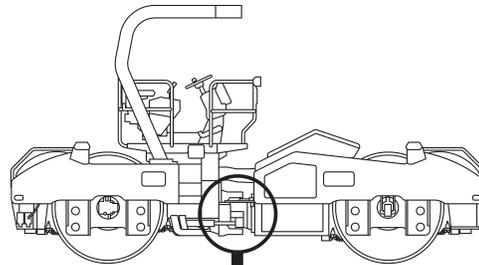
  - 1) **Damage to the wire harness and loose clamps**
  - 2) **Loose sockets**
  - 3) **Function of electrical systems**
- **For the parts other than listed above, if there are some trouble on the parts at periodical inspection or daily check, replace them as soon as possible.**

### 3 PERIODIC MAINTENANCE

#### 3.1.1 Lifting the machine by hoist

##### **⚠ WARNING**

- Get 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.



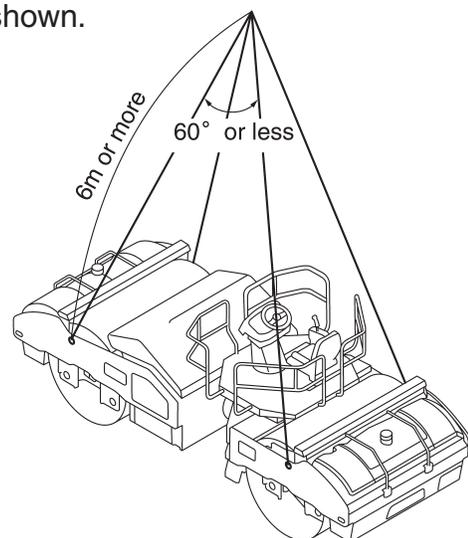
##### **⚠ CAUTION**

**Remove ROPS before starting lifting work.**

- 1) Put wire ropes securely on the hook and lifting points as shown.

**NOTE:** Use appropriate wire rope size.

- 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.

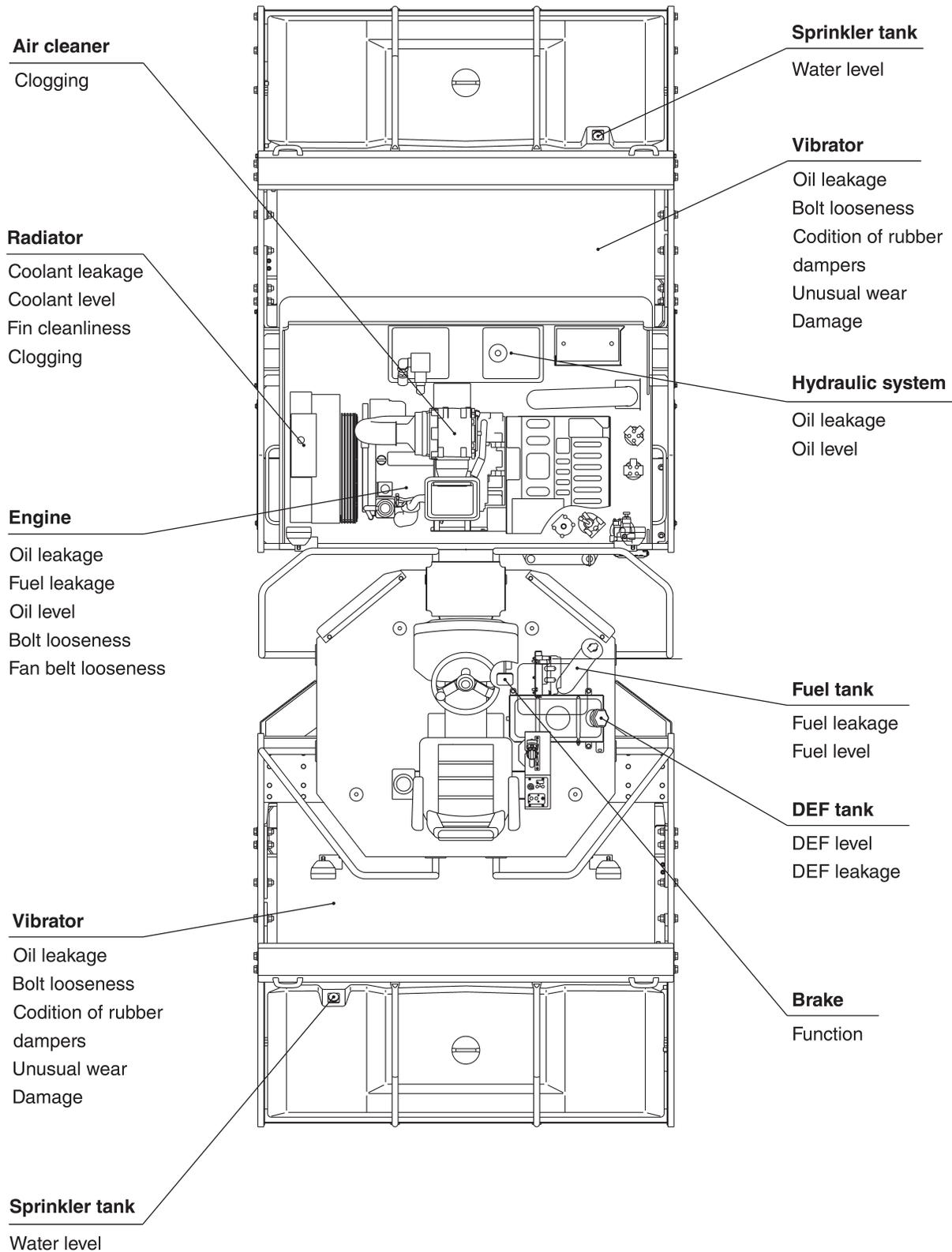


##### **⚠ WARNING**

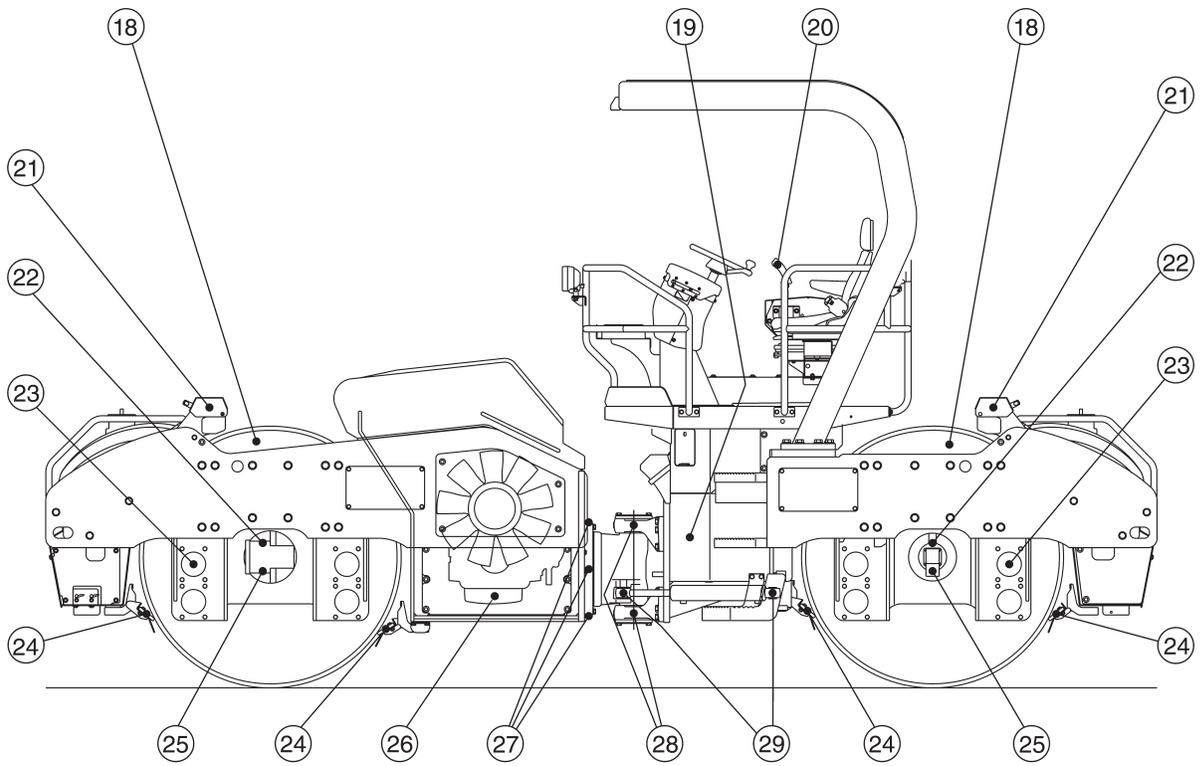
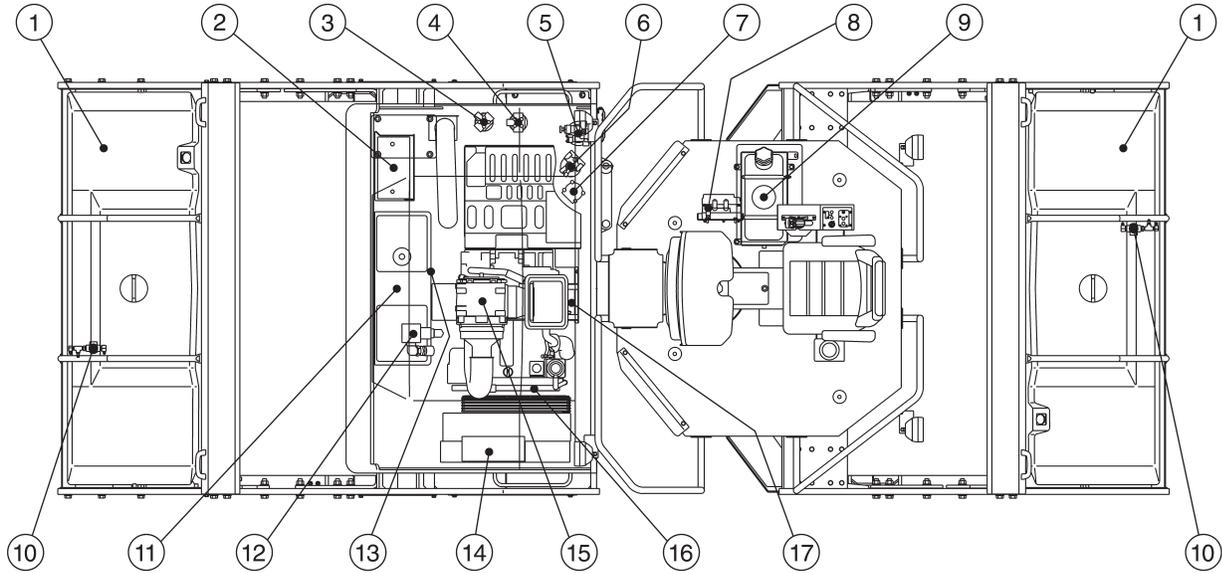
**Make sure wire ropes are not damaged.**

### 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 Periodic Maintenance Points



### 3 PERIODIC MAINTENANCE

Interval	No	Item	Service	Lubricant	Q'fy
Every 10 service hours or daily	⑤	Fuel pre-filter	Check drain water and dirt		1
	⑭	Auxiliary tank	Check coolant level	Coolant	1
	⑮	Air cleaner	Check indicator		1
	⑯	Fan belt	Check tension and unusual wear		1
	⑰	Engine oil level gauge	Check oil level	Engine oil	1
Every 50 service hours	②	Battery	Check looseness of terminal and appearance	Battery fluid	1
	⑩	Sprinkler filter	Clean filter element		2
	⑬	Hydraulic oil level gauge	Check oil level	Hydraulic oil	1
Every 250 service hours	⑦	Engine oil filter	Change filter element		1
	⑱	Vibrator	Check oil level	Gear oil	2
	⑳	Sprinkler pipe	Clean inside pipe		4
	㉓	Rubber dampers	Check for cracks		24
	㉖	Engine oil pan	Change engine oil	Engine oil	1
Every 500 service hours	③	Hydraulic oil pump filter	Change filter element		1
	④	Hydraulic oil line filter	Change filter element		1
	㉒	Control links	Check looseness and adjust		1
	㉗	Tilt pin bearing	Grease 4 fittings	Grease	4
	㉘	Center pin bearing	Grease 2 fittings	Grease	2
	㉙	Cylinder head and anchor pins	Grease 4 fittings	Grease	4
Every 1000 service hours	⑤	Fuel pre-filter	Change filter element		1
	⑥	Fuel filter	Change filter element		1
	⑪	Hydraulic oil tank	Change hydraulic oil	Hydraulic oil	1
	⑫	Hydraulic oil suction filter	Clean filter element		1
	⑱	Vibrator	Change gear oil	Gear oil	2
	㉒	Gear case (Wheel Motor)	Change gear oil	Gear oil	2
	㉕	Brake	Check brake disk thickness		-
Every 4000 service hours	⑧	DEF pump filter	Change filter element		1
As needed	①	Water tank	Clean inside tank		2
	⑨	DEF tank	Check DEF level, add as necessary	DEF	1
	⑮	Air cleaner	Change element		1
	⑰	Fuel tank	Drain water and dirt		1
	㉔	Scrapers	Adjust and clean		4

#### IMPORTANT

- Ensure that the 10 hour maintenance is carried out and that there are no loose bolts, nuts or oil leaks before starting.
- No.3, 4 : Carry out servicing when the monitor lamp lights up, besides following the instructions shown above.

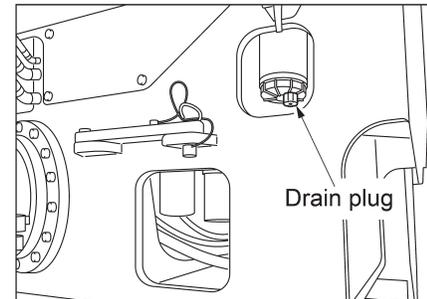
### 3.4 Maintenance Procedure

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

#### (1) Every 10 service hours or daily

##### ⑤ Fuel pre-filter

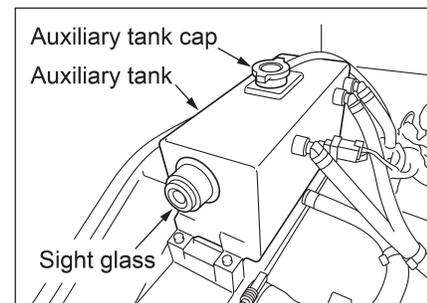
Please check if it is filled with water at the lower part of the filter. If it is filled with water, remove the plug at the bottom to drain water.



##### ⑭ Auxiliary tank

Check to see coolant level in the sight glass, if coolant can not be seen, replenish with the Auxiliary tank cap removed.

Use soft water only.



#### ⚠ WARNING

- Do not remove the radiator cap while the coolant is hot.
  - Hot water may be spouted out that can cause scald.
- Relieve pressure by slowly turning the cap after the water temperature is dropped, then remove the cap.



#### ⚠ CAUTION

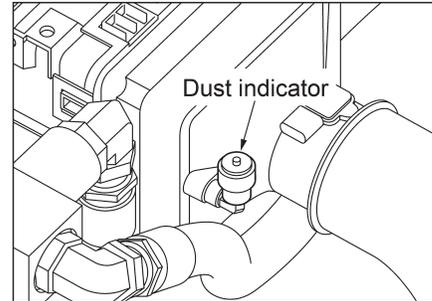
Failure to follow this procedure can result in severe engine damage.

- Fill :
- 1) Fill coolant at 3 gallons per minute (12 liters per minute) until coolant reaches the bottom of the fill neck. Wait for 1 minute, then top up coolant to the bottom of the fill neck if needed.
  - 2) Start engine and run at ECO speed for 1 minute or until engine warning lamp comes on.
  - 3) Turn off engine and top up coolant to bottom of fill neck if needed.
  - 4) Replace coolant cap.

**NOTE:** Replace long-life coolant every two years. Replace the other types every year.

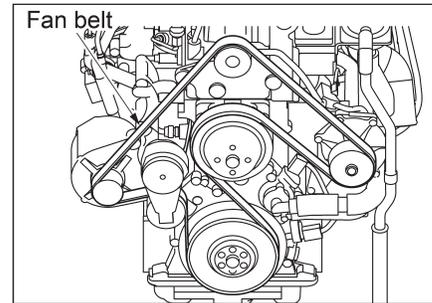
### 15 Air Cleaner

When the red float of the dust indicator reaches the service level (a mark on the indicator), clean the element (refer to page 106).



### 16 Fan belt

Check the fan belt for wear and damage. Replace as necessary.



#### ⚠ WARNING

**Make certain that the engine is completely stopped to avoid any risks when checking looseness, tensions and damages for the fan belts. Also make certain that the key is removed from the key cylinder.**

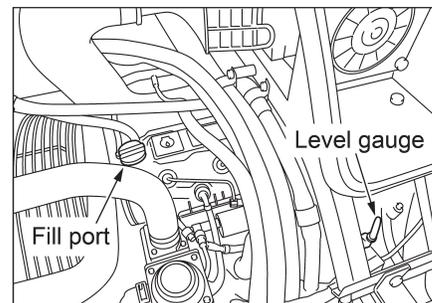
#### IMPORTANT

**Please see the separate engine manual for engine for more details on fan belts.**

### 17 Engine oil level gauge

➔ **See the separate engine manual.**

Check the amount of engine oil after the engine is completely stopped. Pull out the oil level gauge and wipe off oils by waste clothes. Re-insert the oil level gauge into the full length of the oil dip pipe and pull it out. Check that the oil level is between MAX and MIN. In case of shortage, feed oils through the engine oil fill port.



**NOTE:** When checking the amount of oils after running the engine, please check at least 15 minutes after the engine is stopped. If the machine is inclined, please move it to the flat ground before start checking it.

#### ⚠ WARNING

**It may cause scald immediately after that the engine is stopped because the temperature of the parts and the oils may be raised. Please start checking it by waiting until the temperature is dropped.**

### 3 PERIODIC MAINTENANCE

#### (2) Every 50 service hours

##### ② Battery

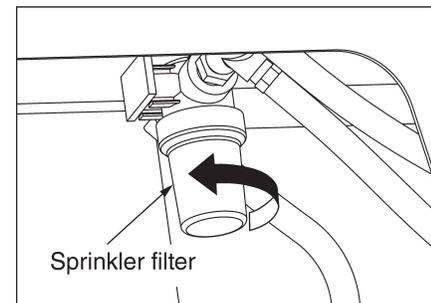
- 1) When the terminal is loose, tighten it up and thinly apply vaseline or grease for rust prevention.
- 2) Check that there is no abnormality on the surface.
- 3) Be sure to tighten the battery holder if it is loose.

##### ⚠ CAUTION

The power-supply voltage of this machine is 12V.

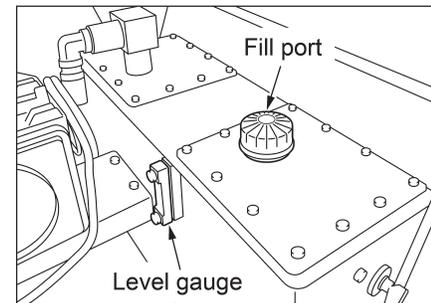
##### ⑩ Sprinkler filter

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



##### ⑬ Hydraulic oil level gauge

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. Of necessary, add the hydraulic oil from the fill port.



##### ⚠ WARNING

Be sure to use hydraulic oil recommended by SAKAI (refer to page 112).

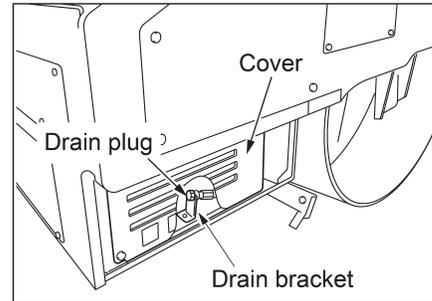
**(3) Every 250 service hours**

⑦ **Engine oil filter**

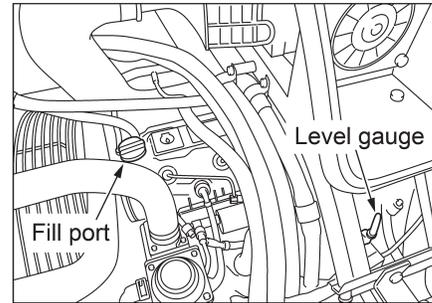
⑳ **Engine oil pan**

➔ See the separate engine manual.

- 1) Remove the cover. Remove the drain plug from the drain bracket.
- 2) After completion of operation and while the oil is warm, drain the oil with the drain plug removed.

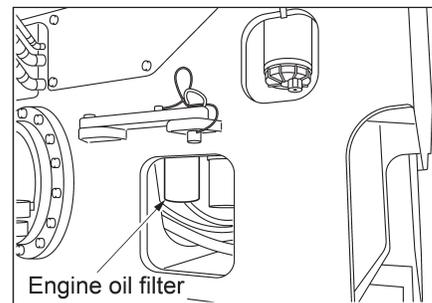


**⚠ WARNING**  
When draining a hot oil, use care not to get burned.



- 3) Refit the drain plug and fill the crankcase with the engine oil from the fill port.
- 4) Change the engine oil filter element.

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

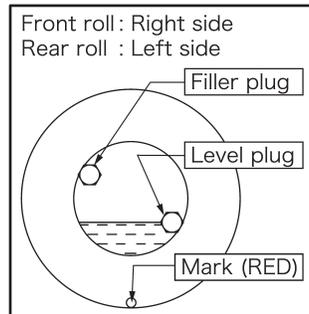


**⚠ CAUTION**  
Be sure to use engine oil recommended by SAKAI (refer to page 112).

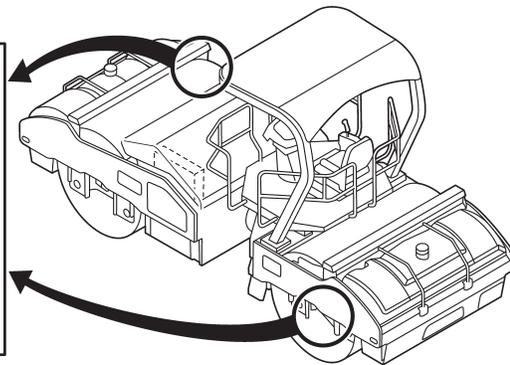
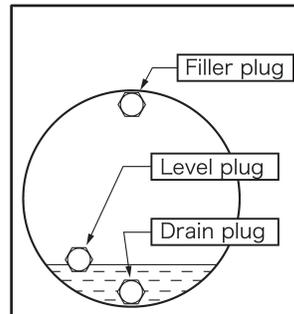
⑱ **Vibrator**

Check for the oil level and leakage.

SW884,SW994



SW884ND



**⚠ CAUTION**  
Be sure to use gear oil recommended by SAKAI (refer to page 112).

### 3 PERIODIC MAINTENANCE

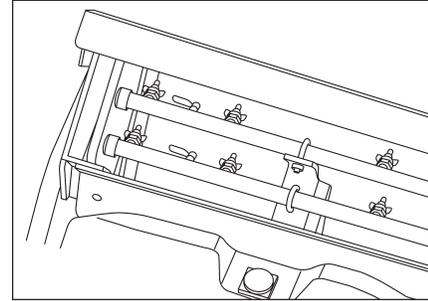
#### ②① Sprinkler pipe

##### 1) Spray pipe

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

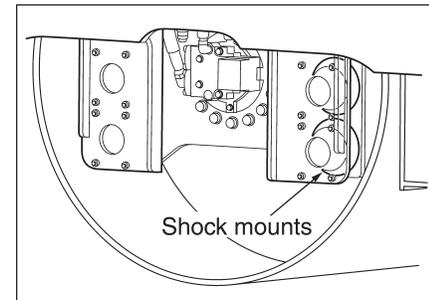
##### 2) Nozzle

- Remove the nozzles from the spray pipe 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.



#### ②③ Rubber dampers

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

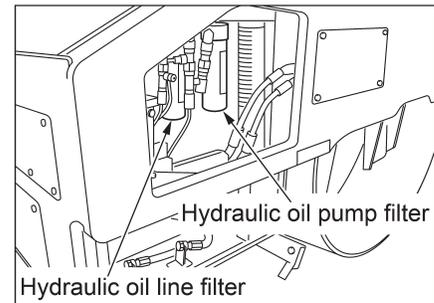


**(4) Every 500 service hours**

③ **Hydraulic oil pump filter**

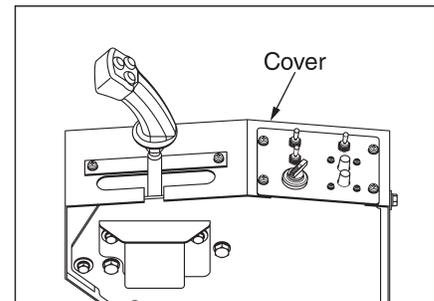
④ **Hydraulic oil line filter**

Change the filter elements.



⑳ **Control links**

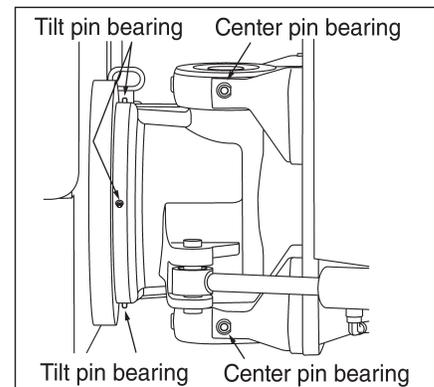
Remove the cover.  
Check the bolts and nuts for looseness.



㉑ **Tilt pin bearing**

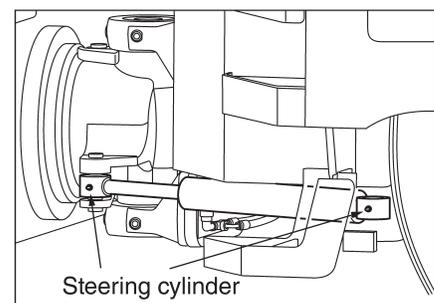
㉒ **Center pin bearing**

Apply grease at 6 locations.



㉓ **Cylinder head and anchor pins**

Apply grease at 4 locations.  
The steering cylinder is provided on both sides of the machine.



### 3 PERIODIC MAINTENANCE

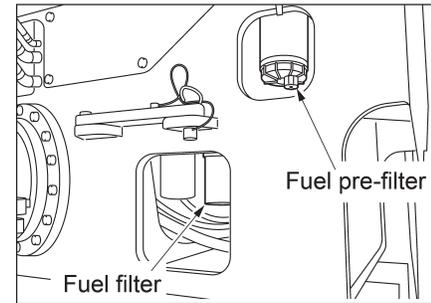
#### (5) Every 1,000 service hours

##### ⑤ Fuel prefilter

➔ See the separate engine manual.

Change the fuel filter element and the fuel pre-filter element.

##### ⑥ Fuel filter



##### ⑪ Hydraulic oil tank

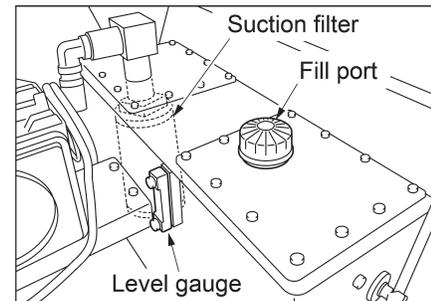
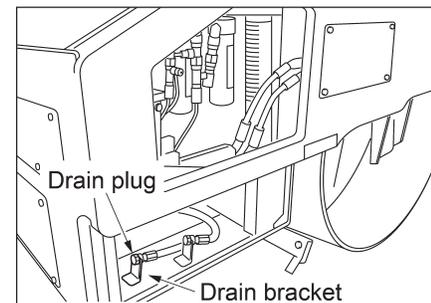
- 1) Remove the drain plug, and drain oil while it is warm.
- 2) Clean inside of the tank, and fill fresh oil to the specified level.
- 3) Start and run the engine at idling for 2 to 5 minutes. When the hydraulic oil has become free from air bubbles, stop the engine and recheck the oil level.

#### ⚠ WARNING

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

#### ⚠ CAUTION

Be sure to use hydraulic oil recommended by SAKAI (refer to page 112) .

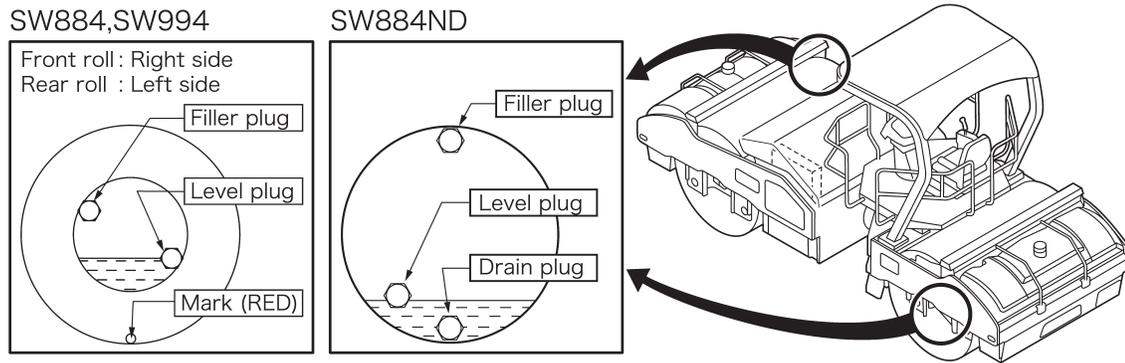


##### ⑫ Hydraulic oil suction filter

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

##### ⑱ Vibrator

- 1) Rotate the drum till the level plug comes to bottom.
- 2) Remove the fill oil plug and level plug.
- 3) Drain oil from vibrator.
- 4) Rotate the roll until the mark on its inside comes to the bottom.
- 5) Feed oil at filler port until oil flows out of level gauge hole.
- 6) Reinstall the level gauge plug as well as filler oil plug after cleaning them.



**⚠ WARNING**

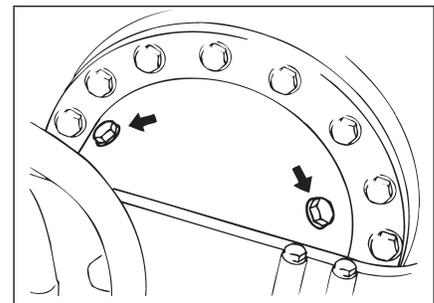
When draining a hot oil, use care not to get burned.

**⚠ CAUTION**

- The oil capacity of the vibrator is 22 liters for the SW884 and SW994, and 75 liters for the SW884ND. Never fill it with more than the designated amount of oil.
- Be sure to use gear oil recommended by SAKAI (refer to page 112) .

② **Gear case (Wheel motor)**

- 1) Position it so that drain plug comes to the bottom.
- 2) While oil is warm, drain it with drain plug and level plug removed.
- 3) Rotate the roll so that drain port comes to top (or side) and level plug to side (or top). Feed oil until it overflows from the level port.
- 4) Replace the drain plug and level plug to original positions.



**⚠ WARNING**

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

**⚠ CAUTION**

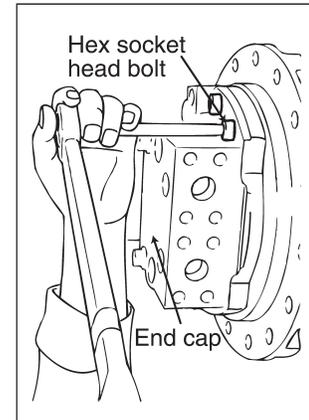
Be sure to use gear oil recommended by SAKAI (refer to page 112) .

### 3 PERIODIC MAINTENANCE

#### 25 Brake

- 1) Loosen hex socket bolts (6 bolts) which have been fixing end cap.  
Loosen them uniformly because the brake spring tends to push up the end cap.

Bold size	M16 x 50 L
Hex socket head across flats	14

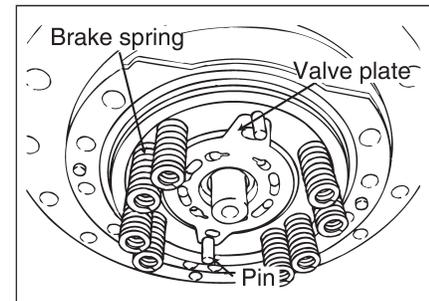


#### ⚠ CAUTION

Mating surfaces of end cap, valve plate and cylinder block having been lapped, care should be taken not to damage them.

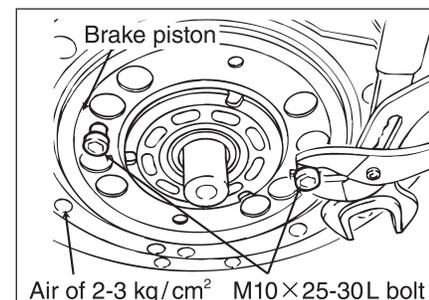
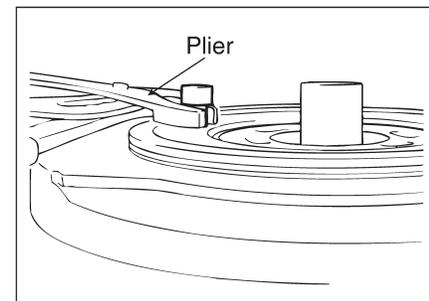
- 2) Remove following parts which will be exposed after removing the end cap.

Item	Quantity
Valve plate	1
Brake spring	8
Pin	2
O-Ring (large)	1
O-Ring (Small)	1



It is recommended that O-Rings are replaced with new ones.

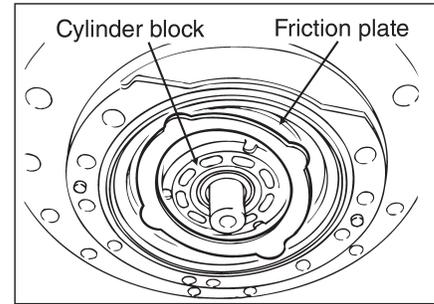
- 3) Blowing compressed air of 2–3 kg/cm<sup>2</sup> into hole shown in sketch, brake piston will come up. (Have the opposite side hole plugged.)  
Or, with M10 x 25–30L bolt turned into tapped hole at 2 locations of brake piston, lift it alternately using a wrench or the like as fulcrum point.



### 3 PERIODIC MAINTENANCE

- 4) Take out separate and friction plates. Using a wire with its end bent, will allow you to take them out more easily.

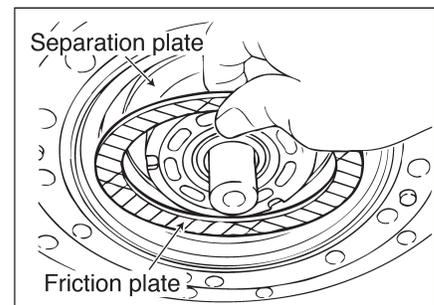
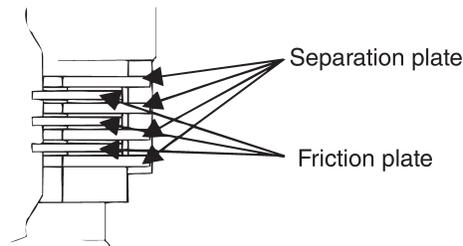
Item	Quantity
Separate sheet	4
Friction plate	3



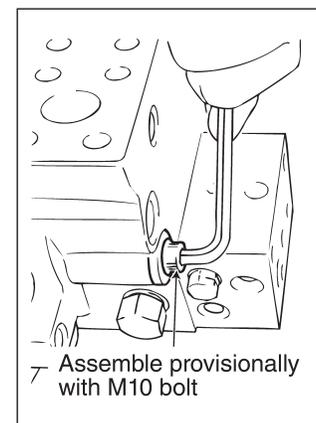
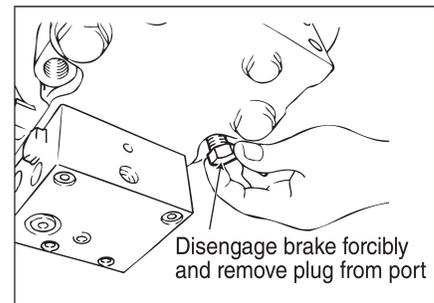
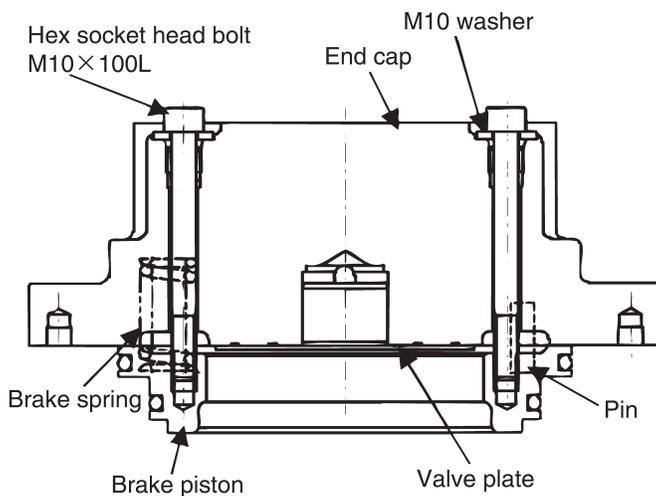
**⚠ CAUTION**

**Do not pull out the cylinder block. Pulling it out at this stage makes it impossible to reassemble.**

- 5) Install separate plate and friction plate alternately. Be careful to install them in the correct quantity and order.



- 6) Remove brake releasing port plug (19 across flats) from end cap. Sub-assemble, with M10 bolt, the brake spring, valve plate and pin so that they are held between the end cap and brake piston (provisional assembling).

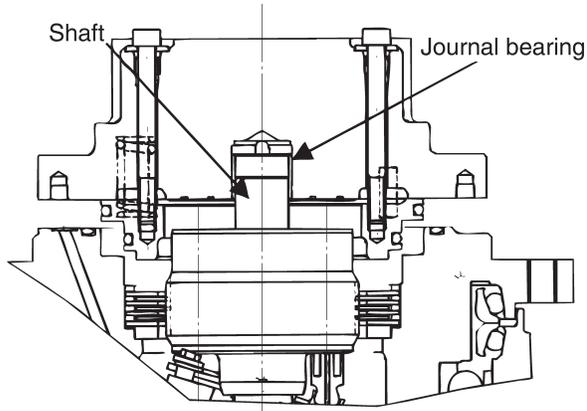


### 3 PERIODIC MAINTENANCE

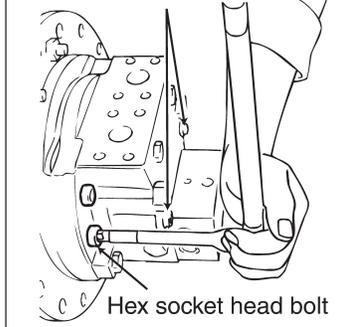
7) Tighten this sub-assembled end cap to the housing with hex socket head bolt.

**⚠ CAUTION**

**Install as straightly as possible so that the shaft end does not damage journal bearing which has been press-fit to end cap.**



Remove M10 bolt for provisional assembly and install formal plug



< Tightening torque for the hex socket head bolt >

Bolt size	M16 x 50 L
Tightening torque	340-425 ft lb

< Tightening torque for the hex socket head bolt >

Plug size	9 / 16-18 UNF
Tightening torque	40-70 ft lb

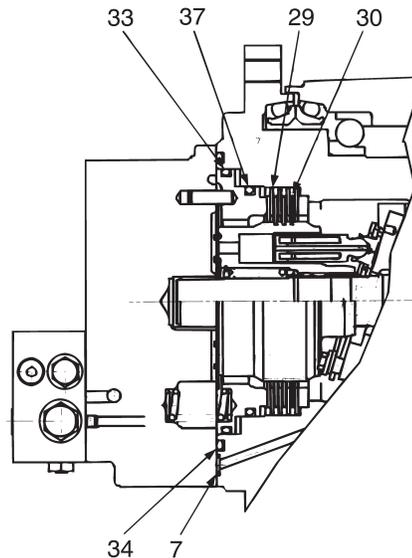
**List of replacement parts**

It is recommendable that, in addition to friction and separate plates, relevant O-Ring are replaced with new ones as well.

No.	Item	Quantity	Drawing # (DAIKIN Dwg.# (Standard JIS Nominal)
			BMV75, BM75
7	O-Ring	4 (2)	KP1B010A / 1BP10A
29	Separate plate	4	1731874
30	Friction plate	3	SP1051
33	O-Ring	1	KG1B185 / 1BG185
34	O-Ring	1	SP1092 / WG45
37	O-Ring	1	KG1B160 / 1BG160

**NOTE:** Quantity for No.7 O-ring : 4 for BMV75 and 2 for BM75.

For BMV series, as the seal for the second speed selection passage, 2 more are in use than for BM series.



If it falls in any of the following cases, without waiting for 1,000 operating hours, replace the friction and separate plates altogether.

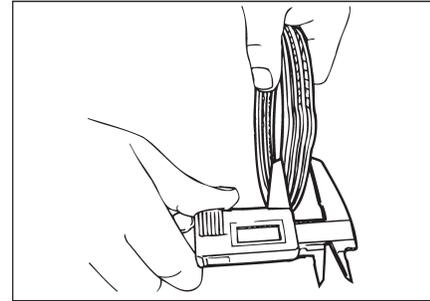
- 1) When the braking force becomes weaker than driving force of hydraulic motor. (Despite that the brake is being actuated, hydraulic motor rotates when HST drive is engaged)  
Checking procedure: While depressing the parking brake switch, open the throttle fully and engage the reversible travel lever. If traveling starts, replace the plates.
- 2) When total thickness of friction and separate plate falls short of the value in the chart below.

### 3 PERIODIC MAINTENANCE

Standard dimensions		
Separate plate	4 plates:	2.3 (per plate)
Friction plate	3 plates:	3.3 (per plate)
Total thickness		19.1
Standard total thickness for replacement		18.5

Thickness of separate and friction plates for SW884, SW884ND and SW994 are the same.

→ Checking procedure: Disassemble and measure the plate thickness in every 500 hours of operation in accordance with the instruction given earlier.



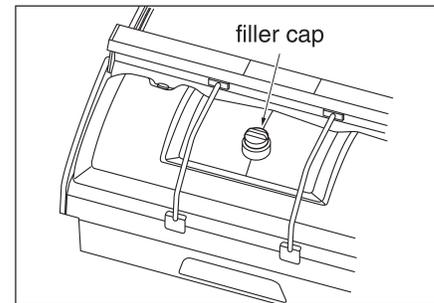
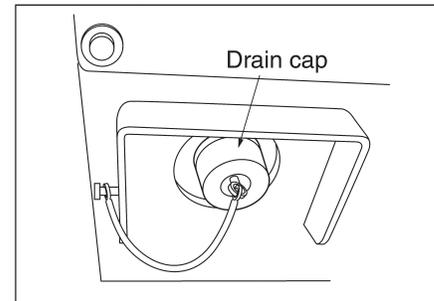
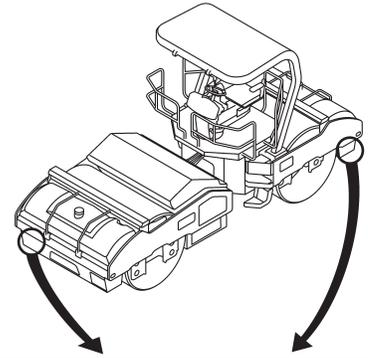
#### (6) Every 4,000 service hours

##### ⑧ DEF pump filter

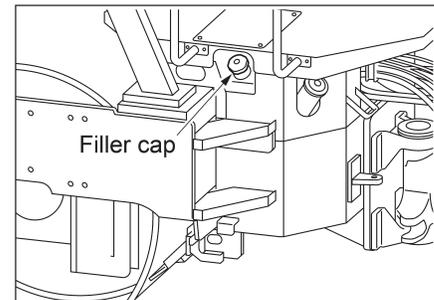
➔ Refer to 3.5.1 Changing the DEF pump filter (refer to page 110).  
Change the DEF pump filter element.

**(7) As needed****① Water tank**

- 1) With the drain cap 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 is complete, refit the drain cap and filler cap.

**⑨ DEF tank**

Check the DEF level  
If it is inadequate, remove the filler cap and fill the tank through the filler port.

**⚠ CAUTION**

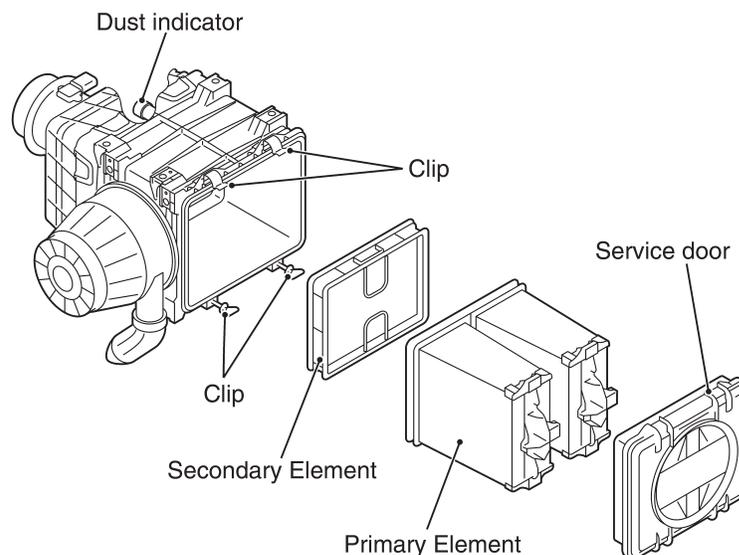
**Be sure to use the DEF recommended by SAKAI (refer to page 112).**

### 3 PERIODIC MAINTENANCE

#### 15 Air cleaner

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

- 1) Release the service door clips to remove the primary element from the main filter housing.
- 2) Primary element  
Grasp the handle in the center of the element and pull the filter element outward.  
Clean the inside of the housing with a damp rag to remove all loose dirt and dust.



- 3) Secondary element

#### **⚠ WARNING**

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

#### **⚠ CAUTION**

- Take caution when removing the secondary element. Any loose debris can fall into the air intake plumbing leading directly to the engine. Clean the area around the secondary filter element and replace the secondary promptly to avoid engine contamination ingestion.
- Do not attempt to clean the filter element. Cleaning filter elements by impact or compressed air voids the warranty and can degrade or damage the filter media leading to malfunction.

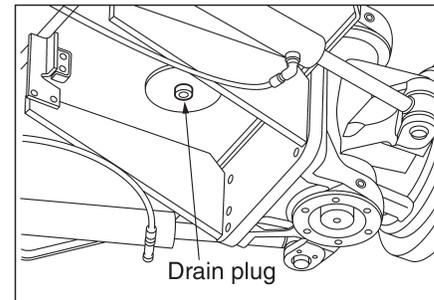
**NOTE:** The secondary element should be changed every third time that the primary element is changed. If the primary element has been breached then an inspection of the secondary filter must be performed and changed if necessary.

The secondary element is removed by pulling on the plastic ring tabs on the inside face of the filter element.

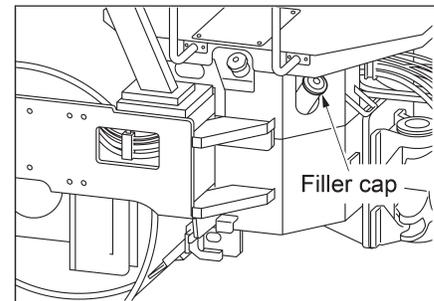
4) Attach the element and service door it with a clips.

### 19 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.



### 24 Scrapers

When the blade is worn, adjust the scraper properly.

Refer to page 45 for adjustment. If the clearance is beyond the adjustable range, change the blade.

### ⚠ WARNING

**Be careful not to pinch your fingers between the drum and blade.**

### 3 PERIODIC MAINTENANCE

#### 3.5 Consumable Parts

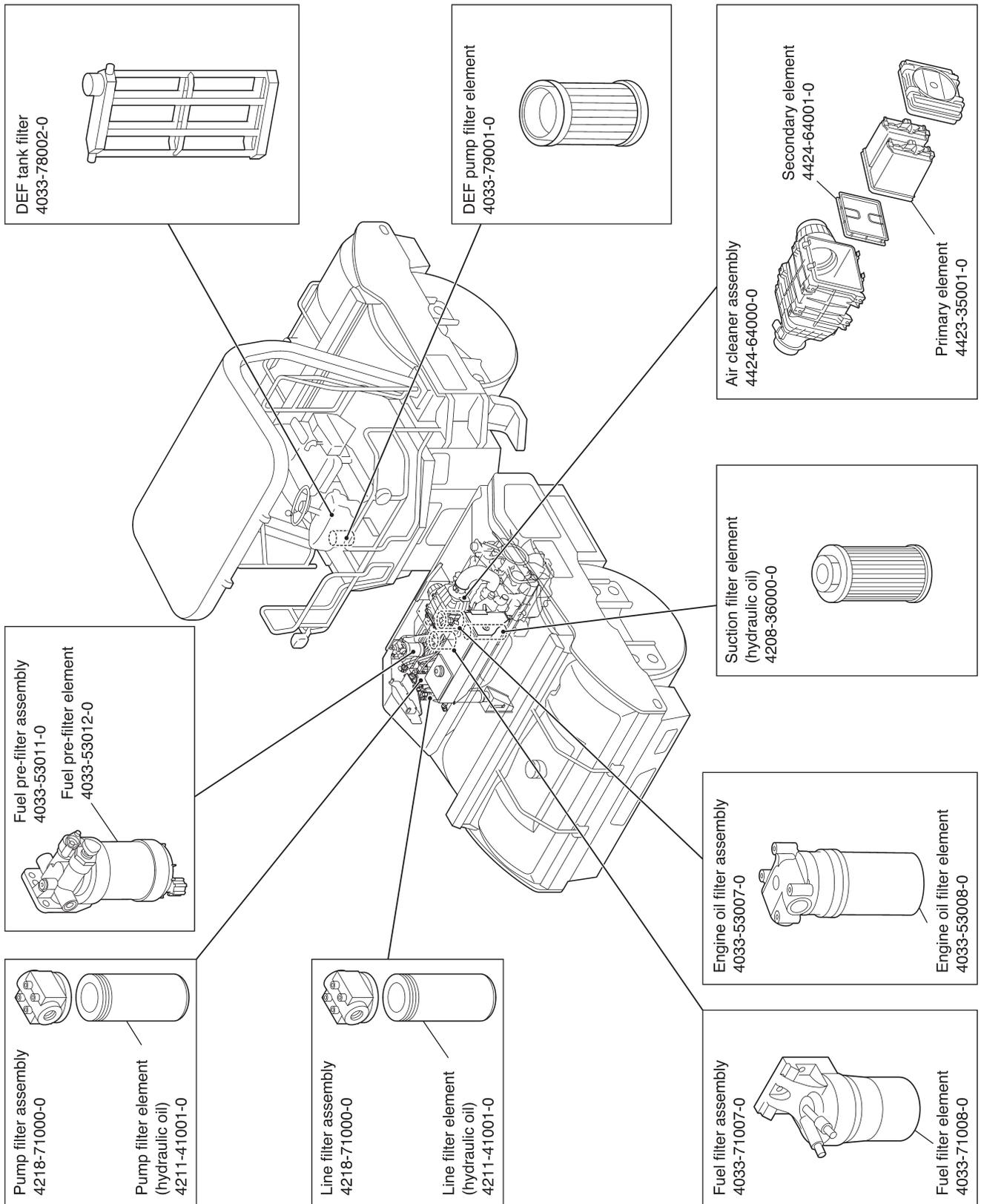
Replace consumable parts such as filter elements and air cleaner elements during periodical maintenance or before reaching the wear limit. Proper replacement of consumable parts will improve the overall life of the machine, resulting in cost-effective operations.

Use genuine SAKAI parts as replacement parts.

The part numbers are subject to change due to the improvements to the parts.

When ordering parts, make sure to obtain the latest part numbers by checking with our distributorship or one of our certified service shops of the version, model name and model number of the machine in use.

Consumable Part	Part No.	Interval		Remark
		Annual replacement (year)	Replacement per operation (hours)	
Engine oil filter element	4033-53008-0	0.25	250	
Line filter assembly	4218-71000-0		As need	
Line filter element (hydraulic oil)	4211-41001-0		500	
Pump filter assembly	4218-71000-0		As need	
Pump filter element (hydraulic oil)	4211-41001-0		500	
Fuel pre-filter assembly	4033-53011-0		As need	
Fuel pre-filter element	4033-53012-0	1.0	1,000	
Fuel filter assembly	4033-71007-0		As need	
Fuel filter element	4033-71008-0	1.0	1,000	
Suction filter element (hydraulic oil)	4208-36000-0		1,000	
DEF pump filter element	4033-79001-0		4,000	
DEF tank filter	4033-78002-0		As need	
Air cleaner assembly	4424-64000-0		As need	
Primary element	4423-35001-0		As need	
Secondary element	4424-64001-0		As need	They should be replaced with new ones once in every three times of Primary elements' replacement.



### 3 PERIODIC MAINTENANCE

#### 3.5.1 Changing the DEF pump filter

##### **⚠ WARNING**

The filter cannot be changed immediately after turning off the engine, because the outside will be hot. Change it after everything has cooled down.

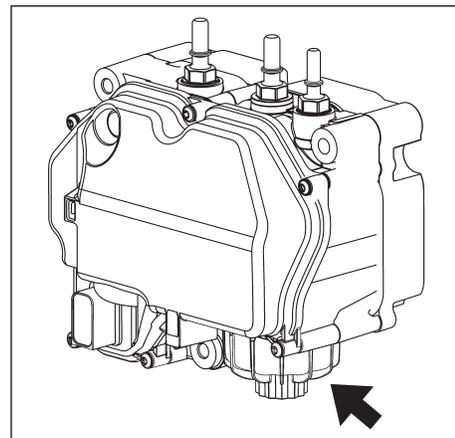
##### **IMPORTANT**

- Use genuine SAKAI products for replacement parts.
- Driving the machine without a DEF filter, or using non-genuine SAKAI filters may lead to breakdowns due to contaminants entering the DEF pump or DEF injector. Never drive the machine without a DEF pump filter, or a non-genuine SAKAI filter.
- The DEF pump filter cannot be washed. Washing it will lower its performance, causing breakdowns in the DEF pump and DEF injector. The element must never be reused.
- If the DEF pump filter is not assembled properly, it may cause the DEF to leak. Follow the correct procedures when changing the DEF pump filter.
- The DEF freezes at  $-11^{\circ}\text{C}$ . Freezing makes changing the filter difficult. Change the filter when the surrounding temperature exceeds  $-11^{\circ}\text{C}$ , so that the DEF will not freeze.

To prevent freezing of the DEF and malfunctions caused by precipitation of urea after the engine is turned off, the DEF machine system automatically sucks out the DEF remaining inside the DEF injector and DEF pump, and returns it to the tank.

The machine continues running for several minutes after the engine is turned off, so clean the area around the DEF pump after the DEF system has stopped running, before changing the filter.

The DEF pump filter is located at the bottom of the DEF pump.



### 3.6 Fluid and Lubricant Capacities

#### (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.
- 5) When fueling SAKAI machines, be sure to use the fuel that we specify or recommend. Nonconformance resulting from use of fuel and lube oil other than those specified or recommended by SAKAI is not covered by our warranty and repair service.

#### (2) Capacity

Compartment	Type of fluid	Capacity in liters (gal.)
Fuel tank	Diesel oil	292 (77.1)
Engine oil pan	Engine oil	11 (2.9)
Radiator	Coolant	22 (5.8)
Hydraulic oil tank	Hydraulic oil	65 (17.2)
Gear case (Wheel motor)	Gear oil	3.6 (0.95) × 2
Vibrator (SW884,SW994)	Gear oil	22 (5.8) × 2
Vibrator (SW884ND)	Gear oil	75 (19.8) × 2
Water tank	Water	600 (158.5) × 2
DEF tank	DEF	19 (5.0)

#### ⚠ WARNING

- **DEF on the skin may cause inflammation in some people, so contaminated clothes, shoes, etc., should be taken off and washed in cold or warm water. If there are any changes in appearance or pain, promptly seek medical help.**
- **If the DEF is accidentally swallowed, rinse out your mouth well with water, and promptly seek medical help.**
- **If the DEF gets in your eyes, rinse it out immediately in clean water for several minutes, then promptly seek medical help.**
- **Wear protective glasses when there is a danger of the DEF splattering. Wear rubber gloves if work requires you to come into contact with the DEF.**
- **Do not put anything other than DEF into the DEF tank. Diesel, gasoline, etc., in particular may cause fires. Moreover, putting additives in the tank may lead to generation of toxic gases.**
- **Opening the DEF tank cap may release toxic ammonia gas. When opening the cap or filling the tank, keep your face away from the filler port.**
- **If the DEF is spilled, promptly wipe it clean and wash with water. Neglecting to do so may lead to toxic gases or corrosive substances being given off.**

### 3 PERIODIC MAINTENANCE

#### **⚠ CAUTION**

- Put AUS32 or ISO22241-1 certified DEF in the DEF tank.  
Using anything else may cause breakdowns in the DEF SCR system.
- Keep the DEF tank topped up by refilling it at the right time.
- Keep the area around the DEF tank cap clean at all times, and take care not to allow contaminants to enter the DEF tank when opening the cap.
- When storing the machine for a month or more, fill up the DEF tank.
- On cold days, fill the tank to the designated level.

### (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 CJ-4	SAE 5W-40	SAE 5W-40	SAE 5W-40	MIL-L-2104B
Gear oil	API grade GL5	SAE 80W-90	SAE 90	SAE 140	MIL-L-2105
Hydraulic oil	Anti wear	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
DEF	ISO22241-1 or AUS32				

**(4) Storing the DEF**

- Keep DEF containers airtight, and store them indoors in a well ventilated place avoiding direct sunlight.
- Use the container that the DEF was bought in to store it. Never store it in other containers as it will lead to loss of quality.
- Commission the disposing of the DEF to an industrial waste treatment company to make sure it is handled appropriately. Moreover, DEF containers are to be treated as industrial waste, so they too, must be disposed of in the same way.
- The temperature requirements and storage period for DEF are as shown below:

Temperature during storage	Storage period
Below 10°C	Up to 36 months
Below 25°C	Up to 18 months
Below 30°C	Up to 12 months
Below 35°C	Up to 6 months

**(5) Recommended lubricants**

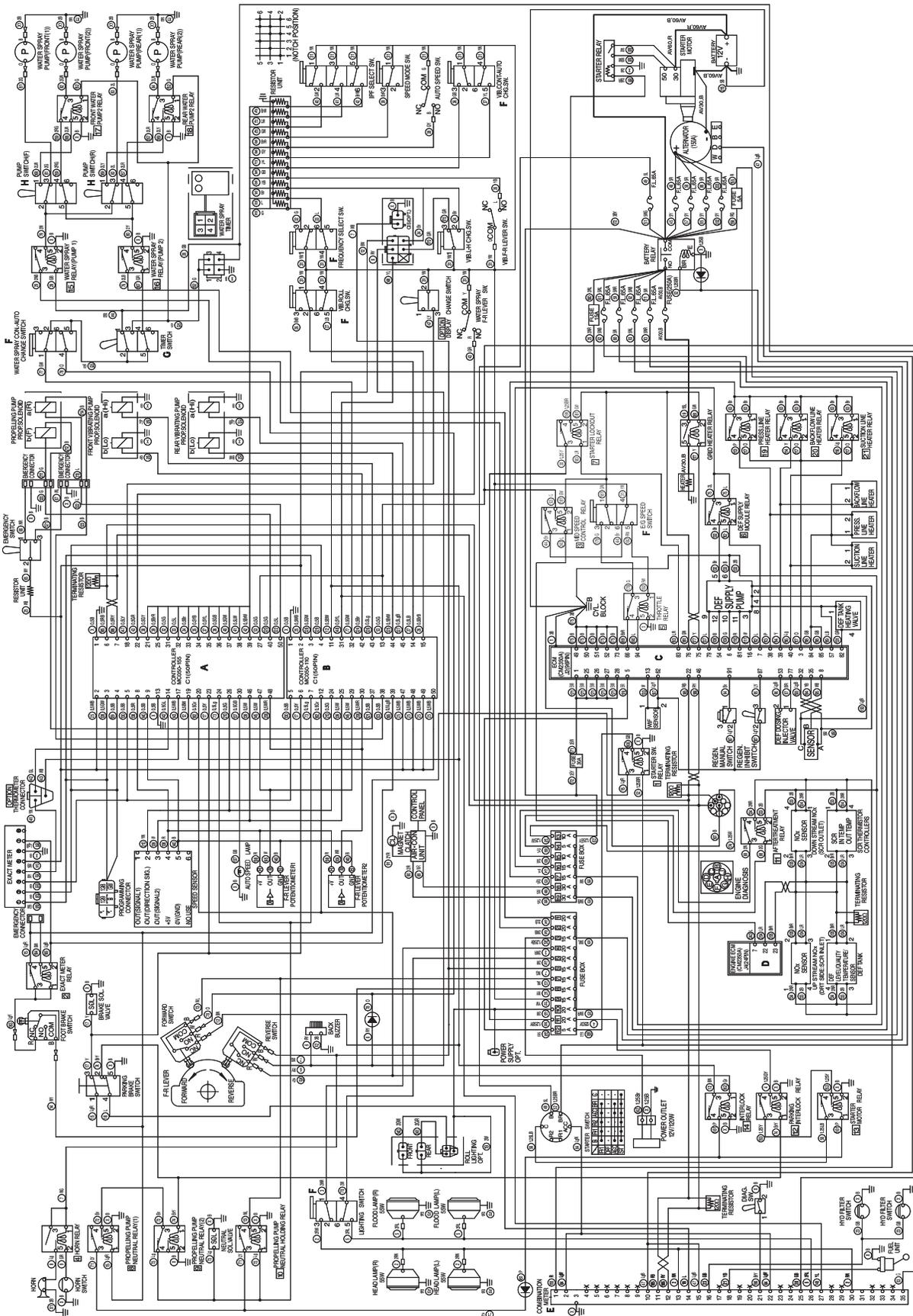
Lubricant Oil company	Engine oil API – CJ4	Gear oil API GL 5	Hydraulic oil ISO-VG 46	Grease (NLGI – 2)
CHEVRON	DELO 400 LE	RPM Universal Gear Lubricants	Rando HDZ 46	Martifak EP 2
BP	–	BP Energear HYPO-U	Bartran HV 46	BP Energrease LS – EP 2
CASTROL	Tection Extra	EXP Gear OILS	Castrol Hyspin AWH 46	Castrol Spheerol ELP 2
EXXON MOBIL	Mobil Delvac 1 ESP	Mobilube HD	Mobil DTE 10 Excel 46	Mobilux EP 2
SHELL	Shell Rimula R4 L	Shell Spirax S2 A90	Shell Tellus S2V 46	Shell Alvania Greases EP2

**⚠ CAUTION**

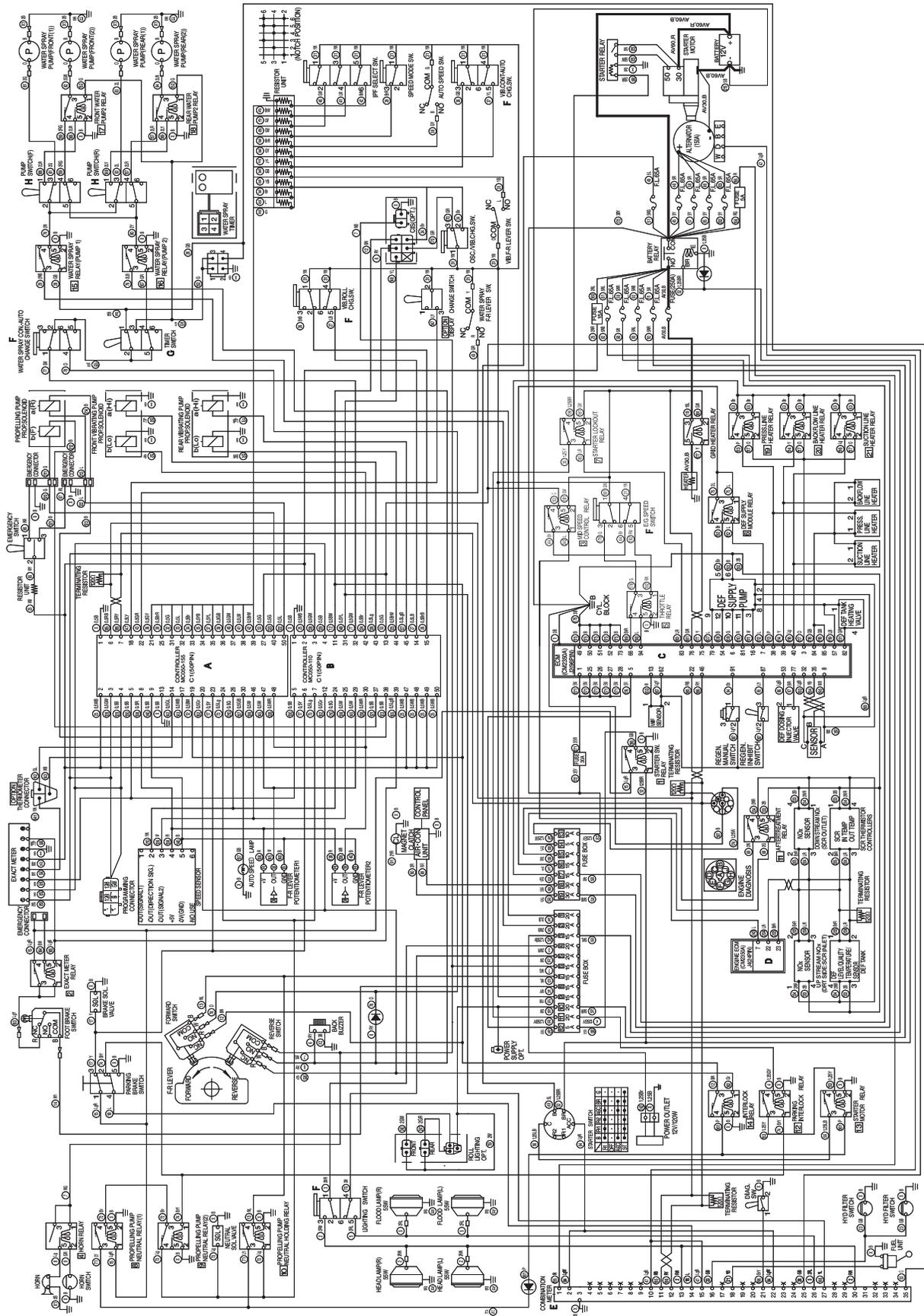
- **Fill the fluid reservoirs with the filters installed.**
- **Use recommended fuels and lubricants only.**
- **Use the hydraulic oils which specifications are as clean as ISO4406 18 / 13 or above.**

### 3 PERIODIC MAINTENANCE

## 3.7 Electric Wiring Diagram SW884, SW994



SW884ND



CONTROLLER MC050-155  
C1(50PIN)

1	GND(-)
2	POWER(+)
3	CAN0+
4	CAN0-
5	AIN/CAN0 SHIELD
6	CAN1+
7	CAN1-
8	3.3/5VDC SENSOR POWER(+)
9	SENSOR GND(-)
10	1.66VDC SENSOR POWER(+)
11	CAN2+
12	CAN2-
13	AIN/CAN1 SHIELD
14	AIN/CAN2 SHIELD
15	DIN/AIN
16	DIN/AIN
17	DIN/AIN
18	DIN/AIN
19	DIN/AIN
20	DIN/AIN
21	DIN/AIN
22	DIN/AIN
23	DIN/AIN
24	DIN/AIN
25	DIN/AIN
26	DIN/AIN
27	DIN/AIN
28	DIN/AIN
29	DIN/AIN
30	DOUT
31	DIN/AIN
32	DIN/AIN
33	DIN/AIN
34	DIN/AIN
35	DIN/AIN
36	DIN/AIN
37	DIN/AIN
38	DIN/AIN
39	DIN/AIN
40	PWMOUT/DOUT/PVGOUT
41	DIN/AIN
42	DIN/AIN
43	DIN/AIN
44	DIN/AIN
45	DIN/AIN
46	DIN/AIN/FREQIN
47	DIN/AIN/FREQIN
48	DIN/AIN/FREQIN
49	DIN/AIN/FREQIN
50	PWMOUT/DOUT/PVGOUT

**DETAIL A**

CONTROLLER MC050-110  
C1(50PIN)

1	GND(-)
2	POWER(+)
3	CAN0+
4	CAN0-
5	AIN/CAN0 SHIELD
6	DIN
7	DIN
8	5VDC SENSOR POWER(+)
9	SENSOR GND(-)
10	DIN
11	DIN
12	DIN
13	DIN
14	DIN/AIN
15	DIN/AIN
16	DIN/AIN
17	DIN/AIN
18	DIN/AIN/FREQIN
19	DIN/AIN/FREQIN
20	CAN1+
21	CAN1-
22	AIN/CAN1 SHIELD
23	DIN/AIN/FREQIN
24	DIN/AIN/FREQIN
25	DIN/AIN/FREQIN
26	DIN/AIN/FREQIN
27	AIN/TEMP/RHEO
28	AIN/TEMP/RHEO
29	AIN/TEMP/RHEO
30	AIN/TEMP/RHEO
31	DOUT
32	DOUT
33	DOUT
34	DOUT/PVG POWER
35	DOUT/PVG POWER
36	DOUT/PVG POWER
37	PWMOUT/DOUT/PVGOUT
38	PWMOUT/DOUT/PVGOUT
39	PWMOUT/DOUT/PVGOUT
40	PWMOUT/DOUT/PVGOUT
41	PWMOUT/DOUT/PVGOUT
42	PWMOUT/DOUT/PVGOUT
43	PWMOUT/DOUT/PVGOUT
44	PWMOUT/DOUT/PVGOUT
45	PWMOUT/DOUT/PVGOUT
46	PWMOUT/DOUT/PVGOUT
47	POWER(+)
48	POWER(+)
49	POWER(+)
50	POWER(+)

**DETAIL B**

ECM (CM2350A)  
J2(96PIN)

1	BATTERY(+)
3	DEF LINE HEATERS RELAY CONTROL
5	KEY SWITCH
6	DEF SUPPLY MODULE PUMP
7	DEF SUPPLY MODULE HEATER RELAY
8	OEM SENSOR SUPPLY
13	WATER IN FUEL SENSOR
16	DEF PRESS.SENSOR
22	J1939(+)-DATALINK 1
25	BATTERY(+)
26	BATTERY(+)
27	BATTERY(+)
28	BATTERY(+)
32	OEM SENSOR RETURN
35	COOLANT LEVEL
38	DEF HEATER1:PRESSURE LINE
39	DEF HEATER2:BACKFLOW LINE
40	DEF HEATER3:SUCTION LINE
46	J1939(-) DATALINK 1
49	BATTERY RETURN(-)
50	BATTERY RETURN(-)
51	BATTERY RETURN(-)
52	BATTERY RETURN(-)
53	DEF DOSING INJECTOR VALVE LOW(-)
54	DEF PUMP MOTOR RETURN
57	TANK HEATER RELAY/DEF REVERTING VALVE
62	OEM SWITCH/OEM SENSOR(RETURN)
66	ISC 2 SWITCH(MID)
73	BATTERY RETURN(-)
75	INTAKE AIR HEATER(+)
76	IAT/ASO/SLO/BRAKE LAMP RETURN
77	DEF DOSING INJECTOR VALVE HIGH(+)
79	DEF PUMP MOTOR SUPPLY
81	DEF REVERTING VALVE
82	DEF TANK HEATING RELAY/VALVE
83	STARTER LOCKOUT RELAY
84	LINE HEATER RETURNS
85	LINE HEATER RETURNS
87	EXHAUST SYSTEM CLEANING (REGEN) INHIBIT SWITCH
91	DIAGNOSTIC SWITCH/EXHAUST SYSTEM CLEANING(REGEN) INITIATE SWITCH
94	ISC 1 SWITCH(FULL)

**DETAIL C**

ENGINE ECM(CM2350)  
J4(24PIN)

7	DUAL OUTPUTB
22	J1939(+)-DATA LINK 2
23	J1939(-)-DATA LINK 2

**DETAIL D**

COMBINATION METER

1	POWER SUPPLY(+)
2	KEY SWITCH INPUT(IGN)
3	POWER SUPPLY(-)
4	TURN SIGNAL INPUT(RIGHT)
5	ENGINE RED STOP WARNING LAMP
6	OVER HEAT LAMP
7	FUNCTION SELECT-1
8	FUNCTION SELECT-3
9	BUZZER OUTPUT
10	LAMP CHECK INPUT
11	CAN(+)
12	CAN(-)
13	HEADLIGHT LAMP(MARKER LAMP)
14	PARKING BRAKE LAMP
15	CHARGE WARNING LAMP
16	HYDRAULIC OIL FILTER WARNING LAMP
17	ENGINE MALFUNCTION LAMP
18	FUEL GAUGE INPUT
21	DTC DISPLAY INPUT
22	HOUR METER INPUT
23	TURN SIGNAL INPUT(LEFT)
24	PREHEATING LAMP
25	WATER SPRAY LAMP
26	WORKING LAMP(FLOOD LAMP)
27	VIBRATION ACTUATION LAMP
28	LIQUID SPRAY LAMP
29	HIGH BEAM LAMP
30	BACKLIGHT
31	EXHAUST SYSTEM HIGH TEMPERATURE LAMP
32	DEF(AD BLUE)LOW LEVEL LAMP (AMBER)
33	MANUAL REGENERATION(AMBER)
34	LYS PIN
35	ECO MODE LAMP

REV RATIO SEL.  
127 PUL-SE/REV SET(NO.7)  
TEMP.CURVE SEL.  
TEMP. 50-103℃ SET(NO.0)

**DETAIL E**

### 3.8 Fuse Box and Line Fuse

#### Fuse Box

The fuse box houses two 30A-, six 20A-, seven 15A-, two 10A-, fuses lined up with spares fitted for one 30A-, two 20A-, two 15A-, one 5A-, two 10A-, two 15A-, two 10A- fuses (refer to page 43).

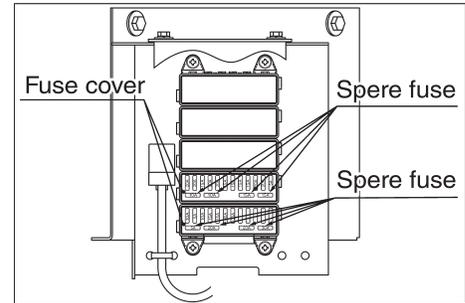
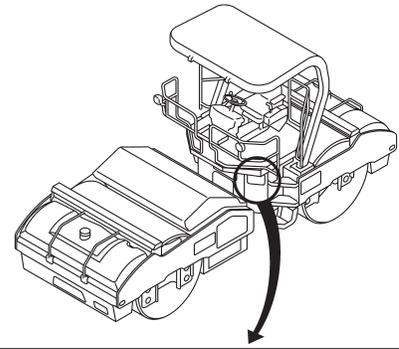
#### Line Fuse

The line fuse holders 30A-, 15A-, 5A- fuse are located on the side of the battery (refer to page 43).

#### ⚠ CAUTION

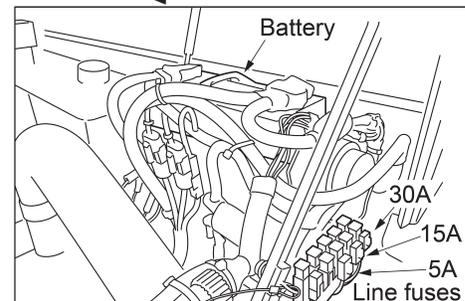
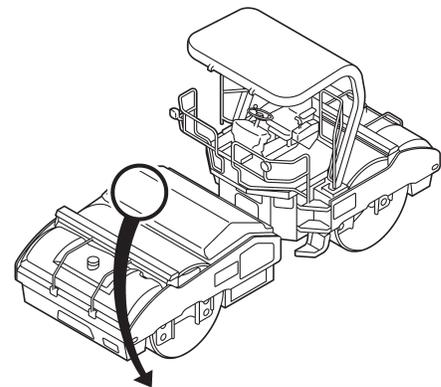
Use fuses of correct capacity.

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



### 3.9 Battery

- 1) Leaving the battery unused for long without attention or using its power excessively at a time can cause damage to the plates, leading to a shortened life.
- 2) For long-term storage, charge it fully, store in a cool and dry place, and check the level of charge at least once a month.
- 3) Maintain the level of charge above 75%.
- 4) In cold weather, it is desirable to start the engine with the battery charged 100%. Do not try to start the engine with less than 75%.



### 3 PERIODIC MAINTENANCE

#### **⚠ WARNING**

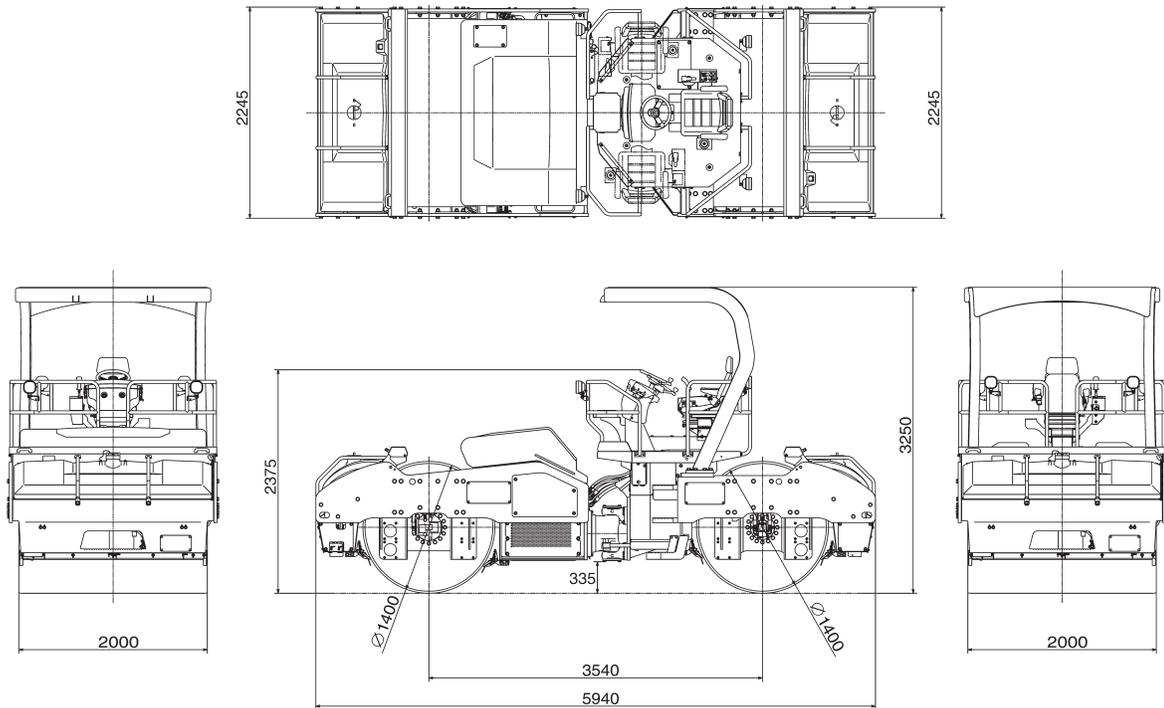
- The battery contains diluted sulfuric acid, which will dissolve clothes and skin. Should you get battery fluid on your clothes or skin, wash it off immediately with copious quantities of clean water.
- If you get it in your eyes, rinse them straight away with clean water and immediately seek the help of a doctor.
- If you accidentally ingest it, drink copious quantities of water and immediately seek the help of a doctor.
- Always wear safety glasses when handling the battery.
- The battery generates hydrogen gas, so there is a danger of explosions. Avoid recharging the battery, keep cigarettes and flames away, etc., in poorly ventilated places when there is a danger of generating sparks.
- The inspection and handling of batteries should be carried out with the engine turned off and the starter switch in the OFF position.
- Be careful not to accidentally connect the two battery terminals with tools or other metallic objects.
- Tangled terminals may generate sparks due to improper connections, resulting in the danger of explosions. Make sure terminals are connected firmly.
- The battery is for starting the engine and operating electrical equipment on the machine. Do not use it for any other purpose.

#### **⚠ CAUTION**

The power-supply voltage of this machine is 12V.

## 4 SPECIFICATIONS

### (1) SW884



<b>Model</b>	<b>SW884</b>		
<b>Operating Weight</b>			
Operating weight	12,890 kg (28,415 lbs)		
On front axle	6,350 kg (14,000 lbs)		
On rear axle	6,540 kg (14,420 lbs)		
<b>Dimension</b>			
Overall length	5,940 mm (234")		
Overall width	2,245 mm ( 88")		
Overall height	3,250 mm (128")		
Wheelbase	3,540 mm (139")		
Wheel			
Front	Roll (dia. x width) 1,400 x 2,000 mm (55" x 79")		
Rear	Roll (dia. x width) 1,400 x 2,000 mm (55" x 79")		
<b>Performance</b>			
Travel speed	1st 2,500 vpm 0 – 4.5 km/h (0 – 2.8 mile/h) 3,000 vpm 0 – 5.5 km/h (0 – 3.4 mile/h) 4,000 vpm 0 – 7.2 km/h (0 – 4.5 mile/h) 2nd 0 – 11 km/h (0 – 6.8 mile/h)		
<b>Vibrating power</b>			
Gradability	29 % (16° )		
Rolling width	2,000 mm (79")		
Minimum turning radius	6.4 m (252")		
<b>Vibrating power</b>			
Low amplitude			
Frequency	66.7 Hz {4,000 vpm}	50.0 Hz {3,000 vpm}	41.7 Hz {2,500 vpm}
Centrifugal force	160 kN (35,970 lbs)	90 kN (20,230 lbs)	63 kN (14,160 lbs)
High amplitude			
Frequency	50.0 Hz {3,000 vpm}	41.7 Hz {2,500 vpm}	
Centrifugal force	177 kN (39,790 lbs)	123 kN (27,650 lbs)	
<b>Engine</b>			
Model	CUMMINS "QSF3.8" Diesel Engine with turbo charger		
Total displacement	3.800 litres (229 cu.in)		
Rated output	97kW {130HP} / 2,200min <sup>-1</sup>		
Max. torque	488 N·m / 1,600 min <sup>-1</sup>		
<b>Tank capacity</b>			
Fuel tank	292 liters (77.1 gal)		
Hydraulic tank	65 liters (17.2 gal)		
Sprinkler tank	600 liters (158.5 gal ) x 2		

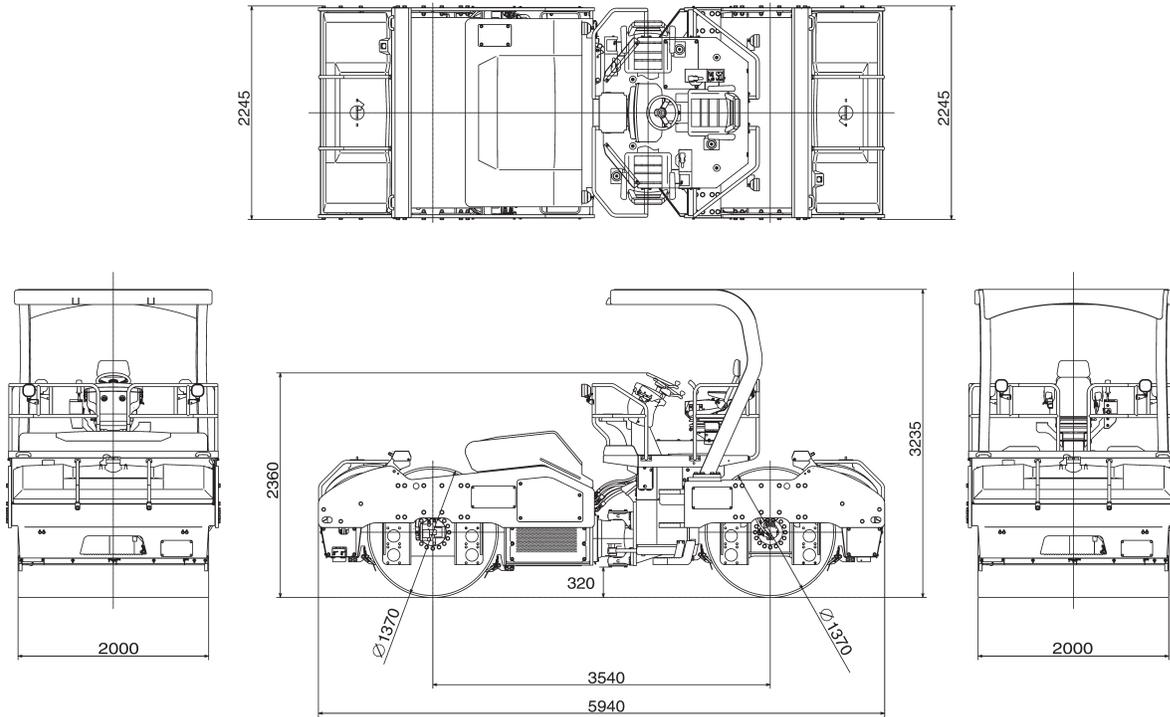
**NOTE:** 1) Gradability is the calculated value. It may vary with ground surface conditions.

2) According to European Standards (EN500-1, ISO 6165, etc.), the mass are defined as follows.

Operating mass : Fuel=50%, Water=50%, Operator=75kg.

## 4 SPECIFICATIONS

### (2) SW884ND



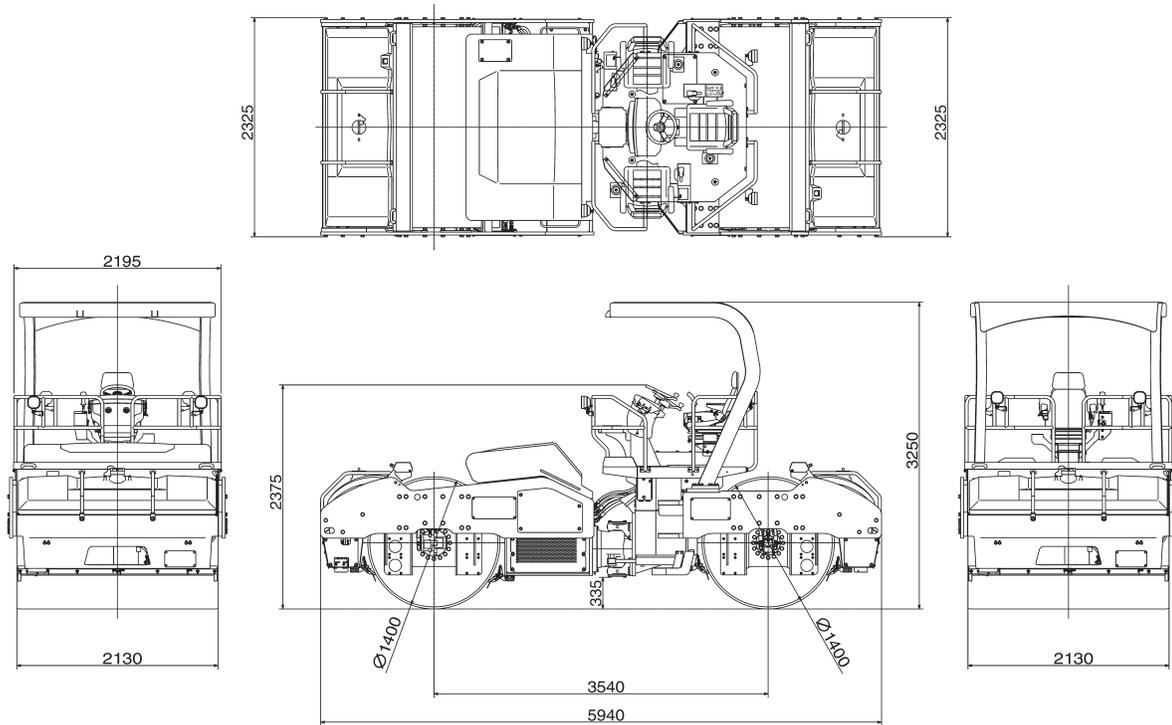
Model		SW884ND	
<b>Operating Weight</b>			
Operating weight		13,230 kg (29,165 lbs)	
On front axle		6,520 kg (14,375 lbs)	
On rear axle		6,710 kg (14,795 lbs)	
<b>Dimension</b>			
Overall length		5,940 mm (234")	
Overall width		2,245 mm ( 88")	
Overall height		3,235 mm (127")	
Wheelbase		3,540 mm (139")	
Wheel			
Front		Roll (dia. x width)	
		1,370 x 2,000 mm (54" x 79")	
Rear		Roll (dia. x width)	
		1,370 x 2,000 mm (54" x 79")	
<b>Performance</b>			
Travel speed	1st Oscillation	0 – 6.4 km/h (0 – 4.0 mile/h)	
	Vibration	0 – 5.5 km/h (0 – 3.4 mile/h)	
	2nd	0 – 11 km/h (0 – 6.8 mile/h)	
<b>Vibrating power</b>			
Gradability		28 % (15°)	
Rolling width		2,000 mm (79")	
Minimum turning radius		6.4 m (252")	
<b>Vibrating power</b>			
Oscillation			
Frequency		46.7 Hz	
		{2,800 vpm}	
Centrifugal force			
		172 kN	
		(38,600 lbs)	
Vibration			
Frequency		50.0 Hz	
		{3,000 vpm}	
Centrifugal force			
		158 kN	
		(35,585 lbs)	
<b>Engine</b>			
Model		CUMMINS "QSF3.8" Diesel Engine with turbo charger	
Total displacement		3.800 litres (229 cu.in)	
Rated output		97kW {130HP} / 2,200min <sup>-1</sup>	
Max. torque		488 N·m / 1,600 min <sup>-1</sup>	
<b>Tank capacity</b>			
Fuel tank		292 liters (77.1 gal)	
Hydraulic tank		65 liters (17.2 gal)	
Sprinkler tank		600 liters (158.5 gal) x 2	

**NOTE:** 1) Gradability is the calculated value. It may vary with ground surface conditions.

2) According to European Standards (EN500-1, ISO 6165, etc.), the mass are defined as follows.

Operating mass : Fuel=50%, Water=50%, Operator=75kg.

(3) SW994



<b>Model</b>	<b>SW994</b>
<b>Operating Weight</b>	
Operating weight	13,270 kg (29,255 lbs)
On front axle	6,530 kg (14,395 lbs)
On rear axle	6,740 kg (14,860 lbs)
<b>Dimension</b>	
Overall length	5,940 mm (234")
Overall width	2,325 mm (92")
Overall height	3,250 mm (128")
Wheelbase	3,540 mm (139")
Wheel	
Front	Roll (dia. x width) 1,400 x 2,130 mm (55" x 84")
Rear	Roll (dia. x width) 1,400 x 2,130 mm (55" x 84")
<b>Performance</b>	
Travel speed	1st 2,500 vpm 0 – 4.5 km/h (0 – 2.8 mile/h) 3,000 vpm 0 – 5.5 km/h (0 – 3.4 mile/h) 4,000 vpm 0 – 7.2 km/h (0 – 4.5 mile/h) 2nd 0 – 11 km/h (0 – 6.8 mile/h)
<b>Vibrating power</b>	
Gradability	28 % (15°)
Rolling width	2,130 mm (84")
Minimum turning radius	6.5 m (256")

<b>Vibrating power</b>			
Low amplitude			
Frequency	66.7 Hz {4,000 vpm}	50.0 Hz {3,000 vpm}	41.7 Hz {2,500 vpm}
Centrifugal force	173 kN (38,890 lbs)	98 kN (22,030 lbs)	68 kN (15,285 lbs)
High amplitude			
Frequency	50.0 Hz {3,000 vpm}		41.7 Hz {2,500 vpm}
Centrifugal force	185 kN (41,590 lbs)		128 kN (28,775 lbs)
<b>Engine</b>			
Model	CUMMINS "QSF3.8" Diesel Engine with turbo charger		
Total displacement	3.800 litres (229 cu.in)		
Rated output	97kW {130HP} / 2,200min <sup>-1</sup>		
Max. torque	488 N·m / 1,600 min <sup>-1</sup>		
<b>Tank capacity</b>			
Fuel tank	292 liters (77.1 gal)		
Hydraulic tank	65 liters (17.2 gal)		
Sprinkler tank	600 liters (158.5 gal ) x 2		

**NOTE:** 1) Gradability is the calculated value. It may vary with ground surface conditions.

2) According to European Standards (EN500-1, ISO 6165, etc.), the mass are defined as follows.

Operating mass : Fuel=50%, Water=50%, Operator=75kg.



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