No. 3498-36660-1

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

OPERATING & MAINTENANCE INSTRUCTIONS

VIBRATING ROLLER

MODEL

SV521 Series

SV521D SV521DF
SV521T SV521TF
SV521DH SV521TH

From

SV521D	→	2SV66	– 10103
SV521T	→	2SV66	– 10103
SV521TF	→	2SV66	– 10103
SV521DF	→	2SV66	– 10103
SV521DH	→	2SV66	– 10103
SV521TH	→	2SV66	– 10103

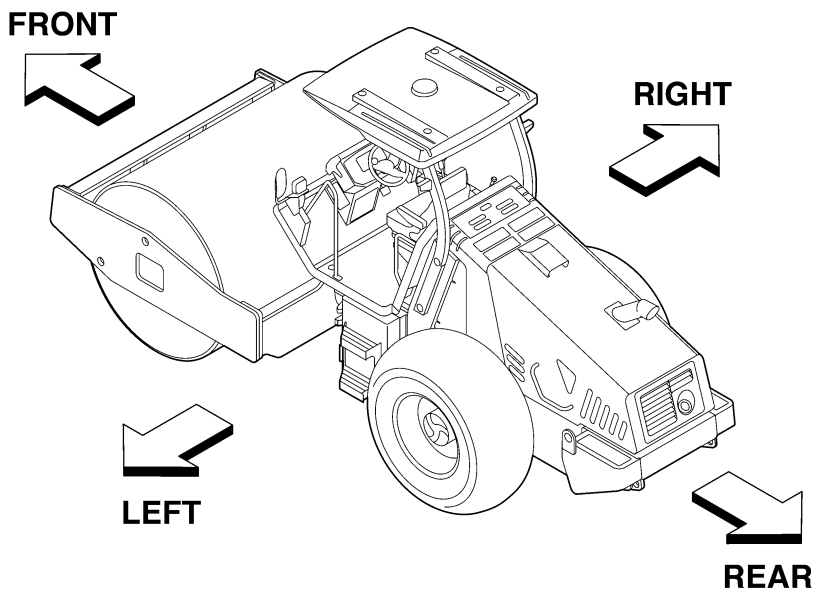
SAKAI®

PREFACE

This operator's manual serves as a guide for the use of your SAKAI SV521 Series Vibrating Roller for those who are new to the machine, and also for the people who have experience in using the machine and want to refresh their knowledge for the machine.

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



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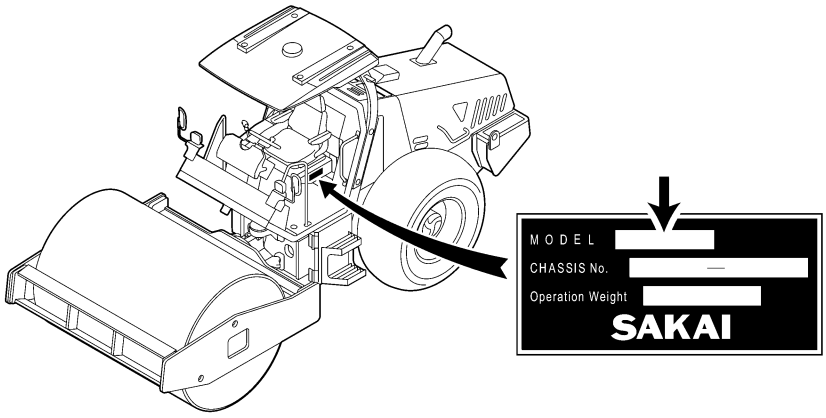
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MACHINE AND ENGINE IDENTIFICATION NUMBERS

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

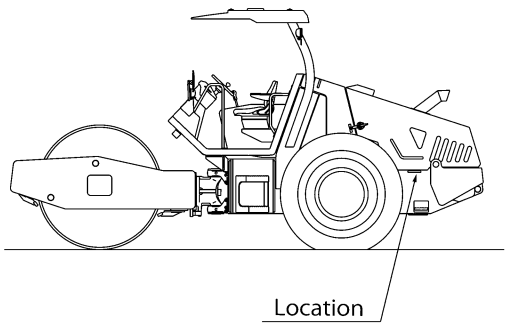
(1) Machine model

Indicated on the nameplate of the left side of the operator's seat.

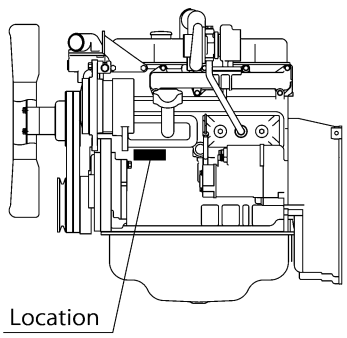


(2) Machine serial number

SV521D	→	2SV66 – ○○○○○
SV521T	→	2SV66 – ○○○○○
SV521TF	→	2SV66 – ○○○○○
SV521DF	→	2SV66 – ○○○○○
SV521DH	→	2SV66 – ○○○○○
SV521TH	→	2SV66 – ○○○○○



(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:

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

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

⚠ 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 reaseons.
We shall not be held responsible for injures, 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

■ 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.



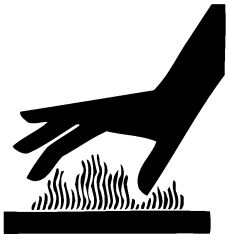
■ Beware when operating moving parts

- 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 OFF 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.

■ 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

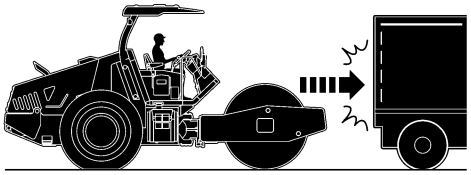
- Do not place parts, tools or unnecessary articles on the step, operator's station and floor board.
- Keep the step, floor board, brake pedal, controls and handholds free from muds, oil, ice or water, as they can cause slippage. Repair them if found to be damaged. Tighten loose bolts.
- Keep your boot 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** (When a tightening torque is M24)
- 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.

■ 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.

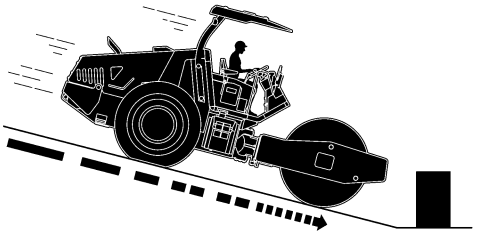
■ No other person but the operator
- This machine is a one-man roller. Do not allow anyone to get on. Only the operator is allowed on this machine while it is running or in operation.

■ 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.

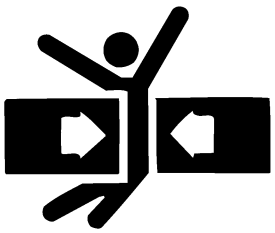
■ Refrain from inattentive driving

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



■ 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 zone

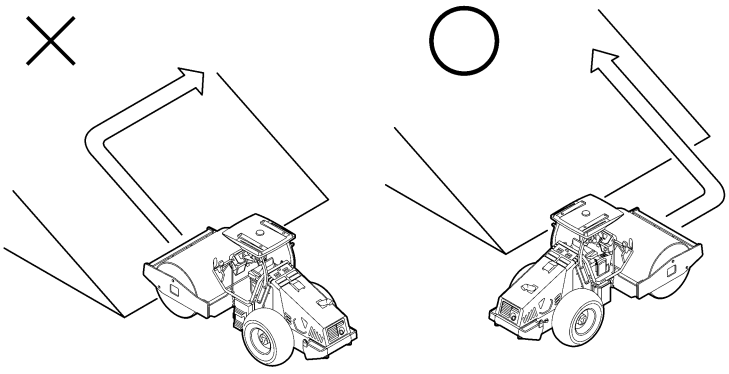
■ Do not operate the machine except from the operator's seat. Do not drive in a standing posture

- 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

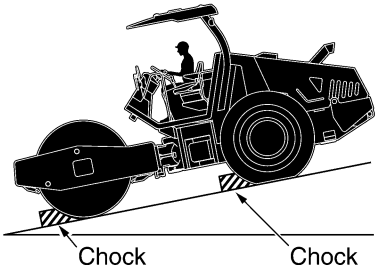
■ Do not make turns on a slope and do not travel across sidehill. If necessary to do so, go down straight along the slope to the flat ground, move sideways and go up straight to the destination



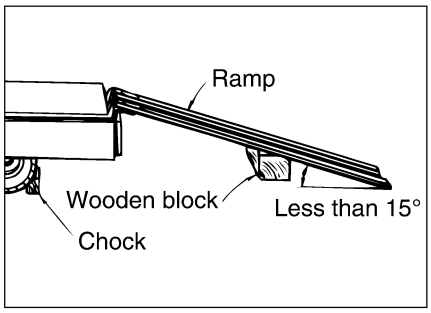
■ On a step slope, run the machine at low speed

■ 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.



1.6 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.





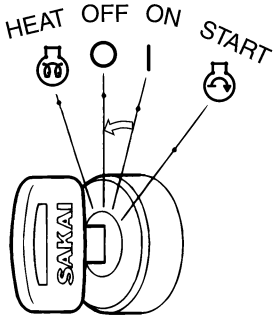






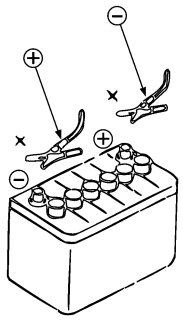
⚠ WARNING

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 handing.



- Inspect or handle the battery with the engine stopped and the starter switch in the OFF 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.

■ 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.

⚠ DANGER

Do not operate.

Keep this warning tag, if not used, in tool box.

■ 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.



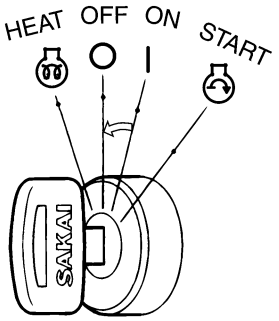
■ Change safety-related parts at regular intervals

- 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.

■ 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 machine 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



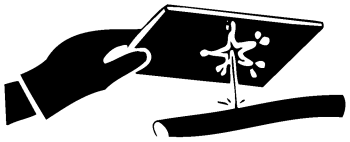
- Read the warnings in this manual regarding the handling of batteries, and make sure to have a thorough understanding in order to handle them appropriately and safely.
- When repairing the electrical system or welding, disconnect the negative cable from the battery to shut off the electricity. Carrying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

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





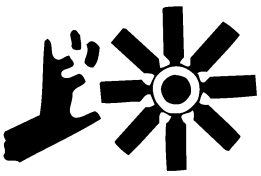
■ Be careful of hot parts

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



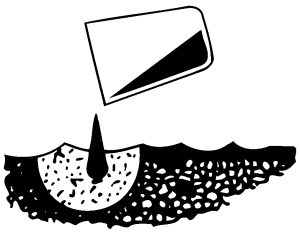
■ Use care when inspecting or servicing fan or belts in motion

- 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)

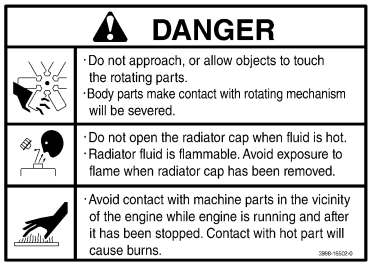
- Disassembly, repair and reassembly of tires require special facility and knowledge. Have them repaired at work shop specialized in handling tires.
- An improperly fitted tire can separate from the rim when inflating.
- When dismounting a tire, chock other tires for safety.
- When welding job is carried out near the tires, use extreme care, as this can cause an explosion of the tires.



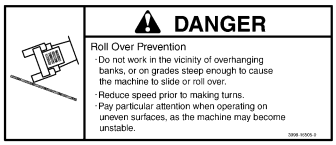
1.12 Safety Decals

Safety decals attached on the machine are very important parts for safety, operation, inspection, and maintenance. Keep the labels clean and legible.
If they are damaged or lost, replace them with new one.

① 3998-16502-0



② 3998-16505-0



③ 3998-16501-0



④ 3998-16724-0



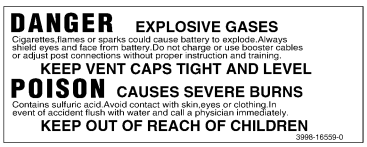
⑤ 3998-16701-0 (3 locations)



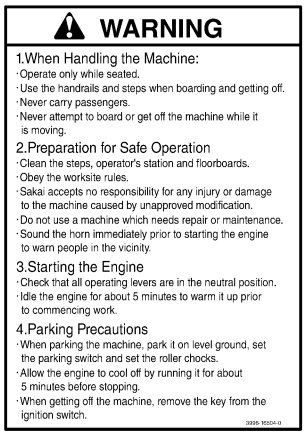
⑥ 3998-19678-0 (2 locations)



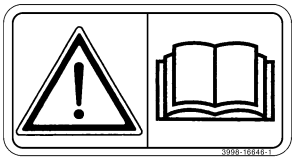
⑦ 3998-16559-0



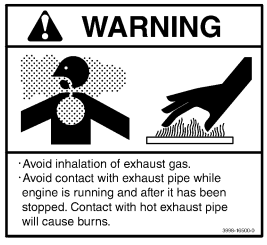
⑧ 3998-16504-0



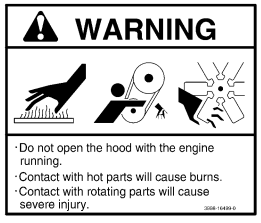
⑨ 3998-16646-1



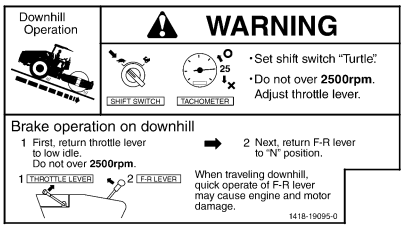
⑩ 3998-16500-0



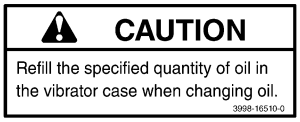
⑪ 3998-16499-0 (2 locations)



⑫ 1418-19095-0



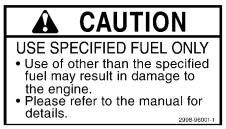
⑬ 3998-16510-0



⑭ 3998-16468-1



⑮ 2998-96001-1

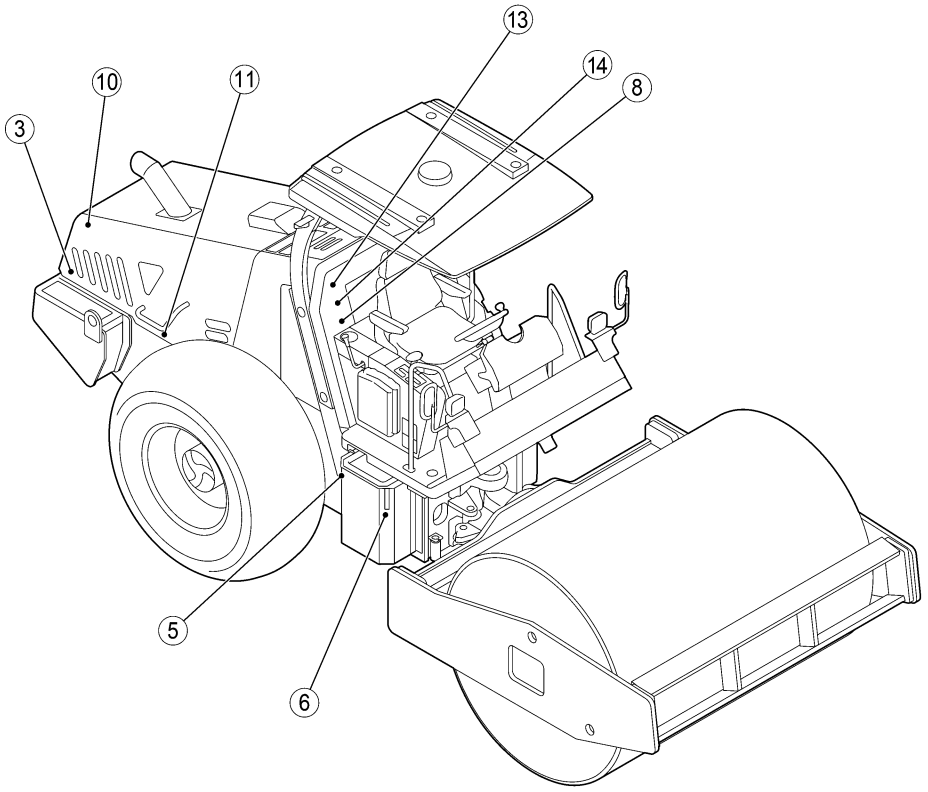


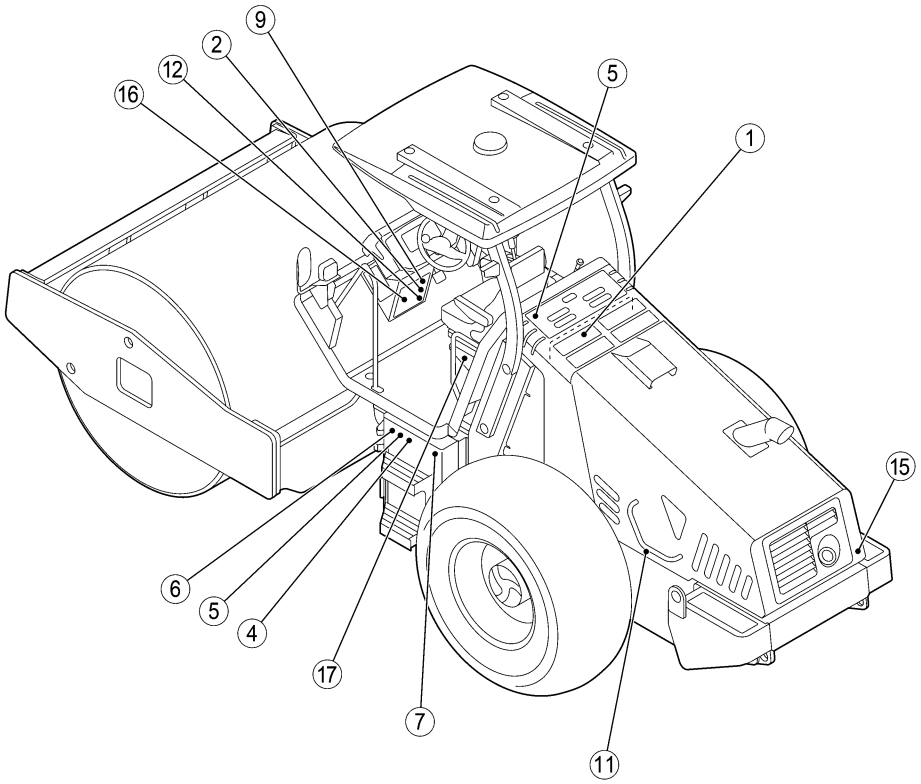
⑯ 1418-19035-1



⑰ 3998-06139-0



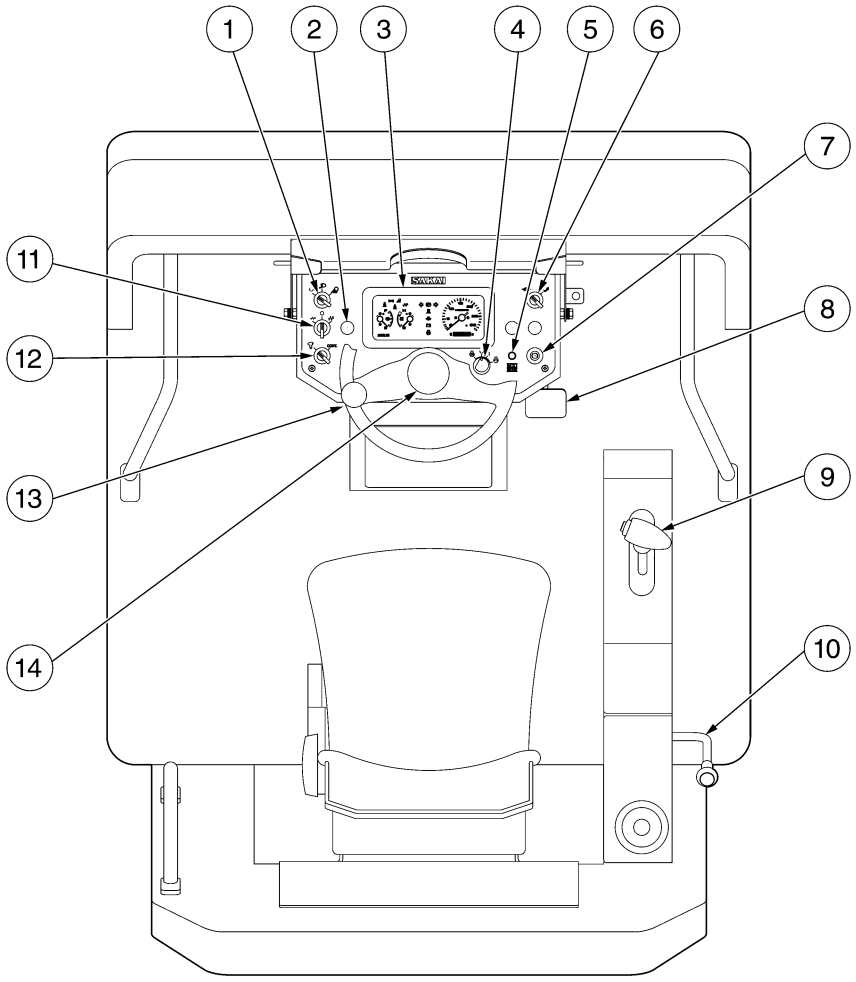

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2 OPERATION

2.1 Instruments and Controls

2.1.1 Operator's station

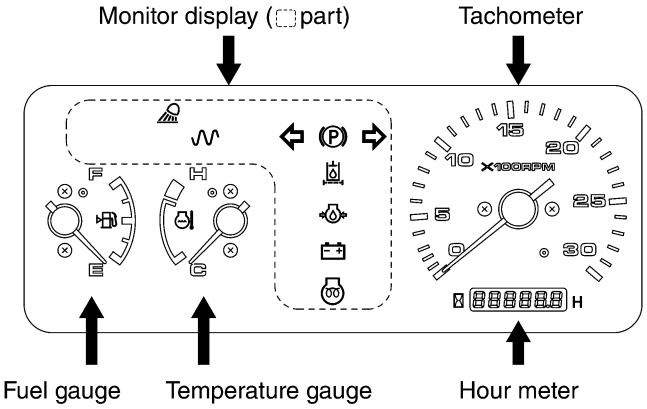


① Lamp switch
② Rotary lamp switch (Option)
③ Combination meter
④ Starter switch
⑤ Eco lamp
⑥ Speed change switch
⑦ Parking brake switch
⑧ Brake pedal
⑨ Forward-Neutral-Reverse (F-N-R) lever (For vibrator switch)
⑩ Throttle lever
⑪ Vibrator switch
⑫ Vibration selector switch
⑬ Steering wheel
⑭ Horn switch button

2.1.2 Gauges, indicator lamps and warning lamps

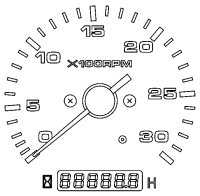
For safe execution of your job, fully understand the role and function of the systems involved.

Combination meter



Tachometer / Hour meter

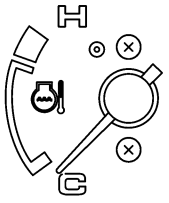
Indicates the engine RPM. The hour meter shows total operating hours. The service interval recommendation in this manual should be based upon the hour meter readings.



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

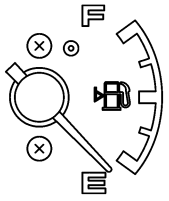
Fuel gauge

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.

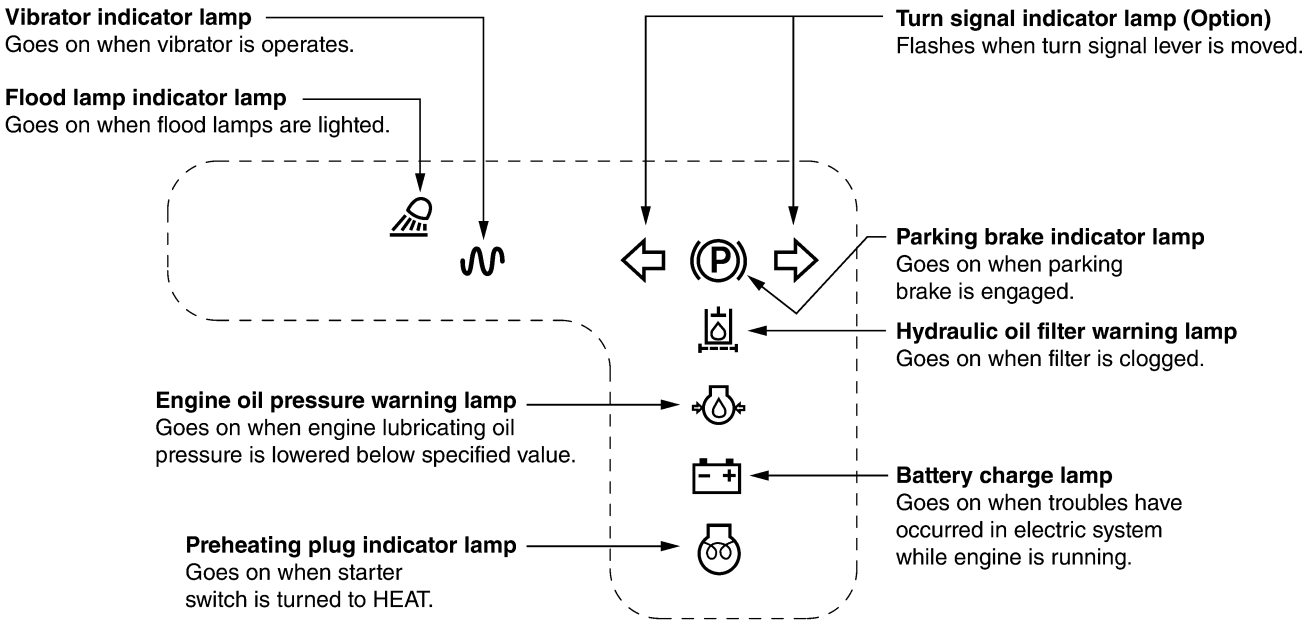


Fuel gauge

⚠ CAUTION

Be sure to use fuel recommended by SAKAI (refer to page 78).

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 "I" 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 "I" 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 flash once when the starter switch is turned to the "I" position.
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.

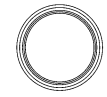
★ Battery charge lamp [ ]
It will turn on when the starter switch is turned to the "I" position, and turn off when the engine starts running.
It will turn on while the engine is running when a problem arises with the electric system. Stop the machine and carry out an inspection.

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 "I" 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 coused by fine sand or dust or ultraviolet. When any flaw or mist is found on the window,contact our branch offices or designated factory.

Eco lamp

ECO lamp is turned on if the throttle lever is shifted to ECO MODE position. It runs under the fuel-efficient mode when the ECO lamp is turned on.

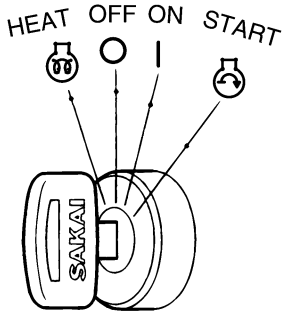


ECO
MODE

2.1.3 Switches

Starter switch

Starts and stops the engine.



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

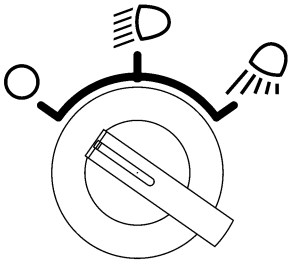
I position : The charging circuit and lamp circuit are charged with electricity. Let the key stay in this position after the engine has started.

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

- **When starting the engine, engage the parking brake and set the F-N-R lever in neutral.**
- **Be sure to engage the parking brake, remove the key from the ignition and carry it with you at all times when leaving the machine.**

Lamp switch (The right-most working lamp is an option)



Has three positions.

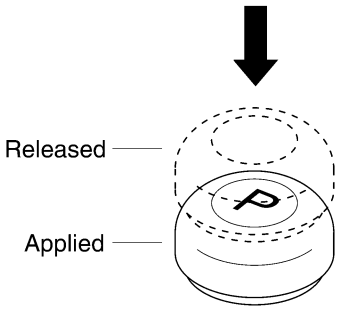
○ position : All lamps are switched off.

position : Each gauge lamp and the headlamps become bright.

position : In addition, the flood lamps become bright. At this time, an icon on monitor display will go on.

Parking brake switch

Use it as a parking brake.
Do not use while the machine is moving.
If switch is Ⓟ pressed down, the parking brake applies with the indicator lamp (Ⓟ) on the monitor display lighted up.
When pressed again, the parking brake is released and the indicator lamp goes off.



⚠ WARNING

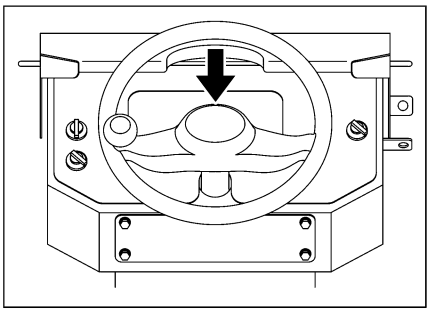
- **To disengage the brake, be sure to press the switch again instead of pulling it.**
- **When dismounting from the machine, press the switch to apply the brake without fail.**

⚠ CAUTION

- **Never pull the switch up.**
- **If the engine is shut down with the parking brake switch pushed down, the parking brake remains applied.**

Horn switch button

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

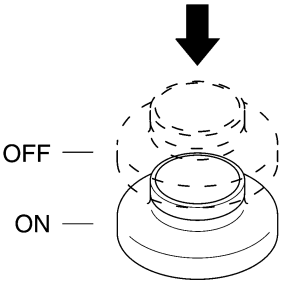


Rotary lamp switch (Option)

Press switch to operate the rotary lamp mounted on top of the canopy. To turn off the rotary lamp, press the switch again.

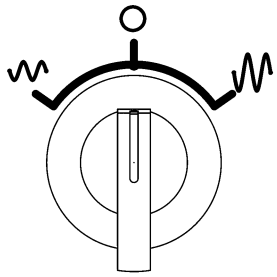
⚠ CAUTION

Never pull the switch up.



Vibrator switch

By means of vibrator switch located on the panel, selection of vibration amplitude and On-Off is mode.



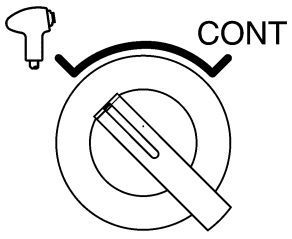
Vibrator swich

- position : Turning the vibrator switch clockwis causes the vibration to start with high amplitude.
- position : Vibration is shut down.
- position : Turning the vibrator switch counter clockwise causes vibration to start with low amplitude.

NOTE: Vibratory rolling compactions shall be conducted by shifting the throttle lever to the FULL or the ECO positions. The specified vibration performances shall be delivered when the throttle lever is shifted to the FULL or the ECO positions.

Vibration selector switch

Selection can be mode between the vibrator switch installed to the F-N-R lever and the other one located on the panel.

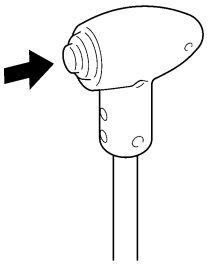


Vibration serector swich

- position : Vibration can be turned ON or OFF with the switch located on the F-N-R lever. Pressing this switch causes the vibration to start and pressing it again to stop.

  This vibrator switch on the lever should be used with the vibrator switch on the panel placed at or position.

CONT position : Turn it to this position when the vibrator switch on the F-N-R lever is not used. Use the vibrator switch on the panel then to turn it ON or OFF.



Vibration swich

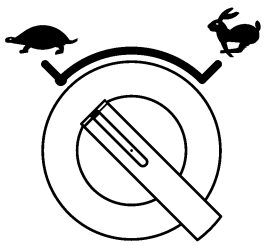
NOTE: Vibratory rolling compactions shall be conducted by shifting the throttle lever to FULL or ECO positions.

IMPORTANT

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

Speed change switch

Selects two machine speed ranges.



km / h (mile / h)

	(Low)	(High)
Speed	0 – 6 (0 – 3.7)	0 – 10 (0 – 6.2)

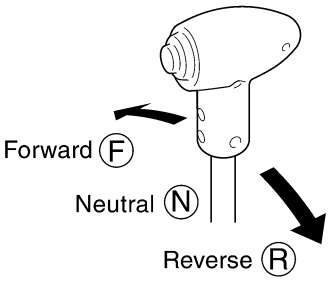
IMPORTANT

Change speed when the machine is completely stopped. Do not change speed while the machine is running.

2.1.4 Operating levers and pedals

Forward-Neutral-Reverse lever (F-N-R lever) with vibrator 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.

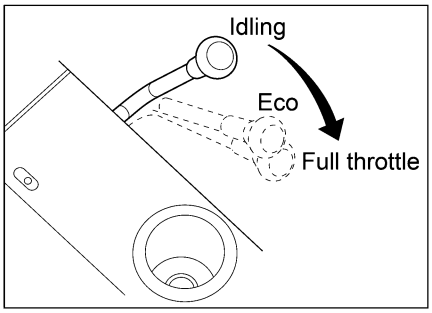


Provided at the knob of the lever is the vibrator switch for turning on or off the vibration.

IMPORTANT

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

Throttle lever



Shifts the engine RPM.
The engine RPM increases when the throttle lever is moved towards the rear side.

Brake pedal

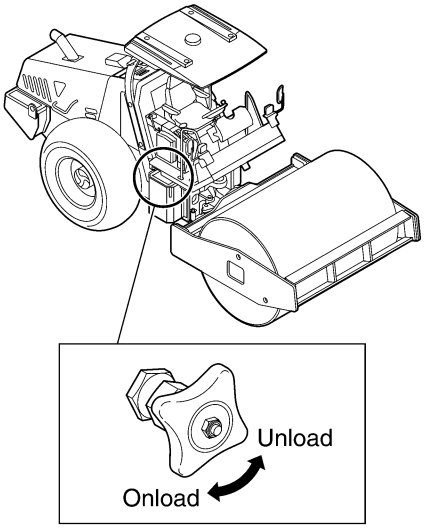
Use it in emergencies. Carry out inspections in accordance with “3.3 Periodical Maintenance Points” (refer to page 60) after each use.
In an emergency, push down on the pedal to the full extent, and the machine will come to a sudden stop.

IMPORTANT

- **Do not use the pedal wherever practicable except for an emergency.**
- **The normal operation can be performed by using the F-N-R lever.**

NOTE: When pressing the brake pedal, the brake is activated and the engine is stopped at the same time. When starting the engine again, shift the F-N-R lever back to the neutral position, activate the parking brake switch, and then start the engine.

2.1.5 Unloader valve



The unloader valve disengages the drive, playing a role like a clutch. Use this valve for towing the machine when the engine is disabled or when troubles have developed in the hydraulic drive.
When the engine is stopped, tow the machine after releasing the brakes. Please refer to the section “Manual Release of Brakes” on p.37 for more details on the operations to release the brakes.

Towing Speed : At of less than 0.5 km / h
Towing Distances : Within 100 m

For towing:
Turn the knob counter-clockwise (Unload).
For normal traveling:
Turn the knob clockwise (Onload).

⚠ WARNING

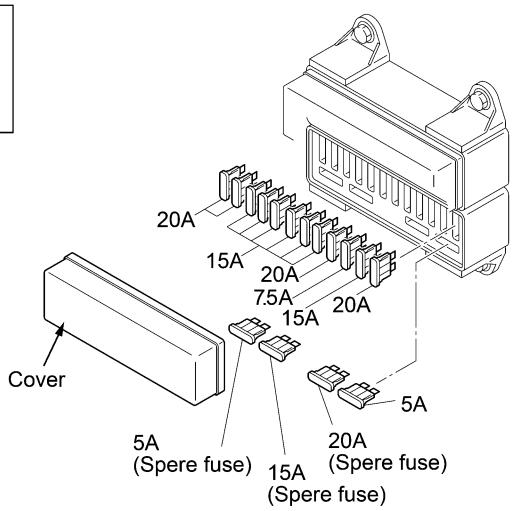
- **On a slope, chock the wheels and use extreme care when handling the unloader valve and towing the machine.**
- **Be sure to apply the parking brake when operating the unloader valve.**
- **Do not tow machine over long distances.**
- **Unloading the unload valve will disengage the engine, so never get in front of or behind the machine.**

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

2.1.6 Fuse box

⚠ WARNING

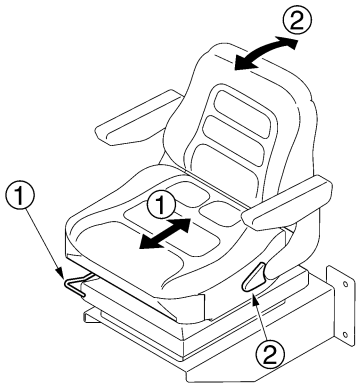
When changing a fuse, cut the power supply by turning the starter switch to the ○ position.



The fuse box is located at the rightside of the driver's seat.
Turn the stud of the F/R unit cover counter clockwise 90 degrees.
Fuses protect electrical components and wiring from burning. Change any fuse which has become powder-coated due to deterioration or which has a play between it and fuse holder. To replace fuses, take off the cover. Be sure to use fuses of correct capacity.

2.2 Handling and Adjustments

2.2.1 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, releasse 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.

⚠ 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.**

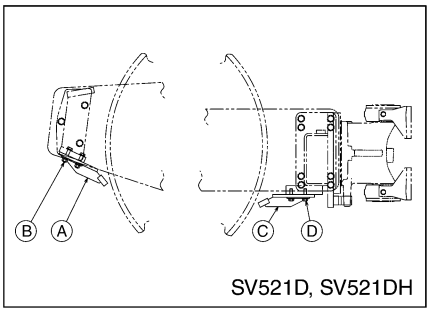
2.2.2 Scraper replacement and adjustment

SV521D, SV521TF, SV521DH

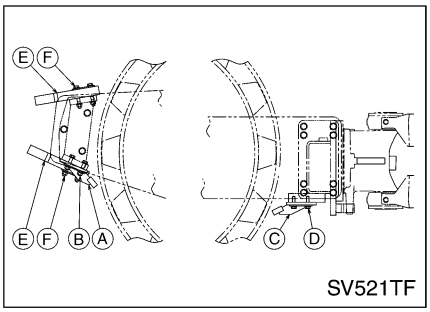
1) Clearance adjustment of scraper Ⓐ
   ① Loosen bolts and nuts Ⓑ at 8 locations.
   ② Provide a clearance of 20 mm between scraper blades Ⓐ and the drum.
   ③ Retighten bolts and nuts Ⓑ at 8 locations.

2) Clearance adjustment of scraper Ⓒ
   ① Loosen bolts Ⓓ at 8 locations.
   ② Provide a clearance of 20 mm between scraper blades Ⓒ and the drum.
   ③ Retighten bolts Ⓓ at 8 locations.

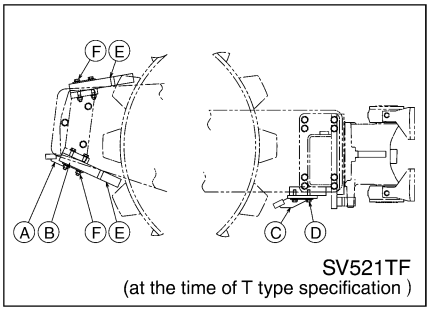
3) Change from TF to T types
   ① Loosen bolts and nuts Ⓑ at 8 locations.
   ② Adjust the scraper blade Ⓐ by changing its direction so that it does not interfere the pads.
   ③ Retighten bolts and nuts Ⓑ at 8 locations.
   ④ Loosen bolts Ⓓ at 8 locations.
   ⑤ Adjust the scraper blade Ⓒ so that it does not interfere the pads.
   ⑥ Loosen bolts Ⓓ at 8 locations.
   ⑦ Loosen bolts and nuts Ⓕ at 18 locations.
   ⑧ Adjust the scraper blade Ⓔ by changing provide a clearance of 20 mm between scraper Ⓔ and the drum.
   ⑨ Retighten bolts and nuts Ⓕ at 18 locations.



SV521D, SV521DH



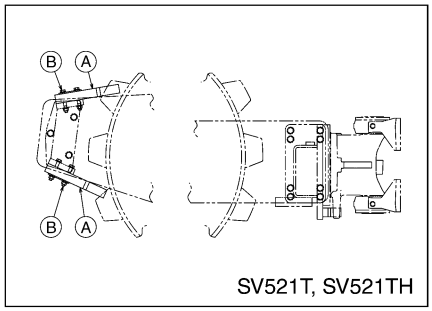
SV521TF



SV521TF
(at the time of T type specification)

SV521T, SV521DF, SV521TH

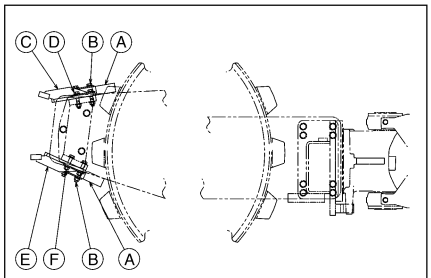
1) Clearance adjustment of scraper Ⓐ
(Nine pieces are mounted on both the top surface and the undersurface for each in front of the machine).
① Loosen bolts and nuts Ⓑ at 18 locations.
② Provide a clearance of 20 mm between scraper Ⓐ and the drum.
③ Retighten bolts and nuts Ⓑ at 18 locations.



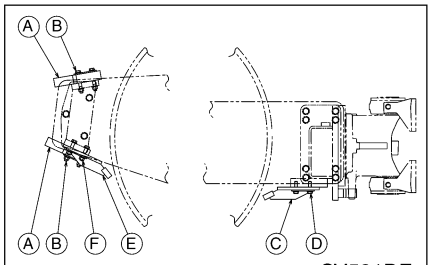
SV521T, SV521TH

2) Replacement of scraper Ⓐ
(Nine pieces are mounted on both the top surface and the undersurface for each in front of the machine).
① Remove bolts and nuts Ⓑ.
② Replace scraper Ⓐ with new ones.

3) Change from DF to D types
① Loosen bolts and nuts Ⓑ at 18 locations.
② Adjust the scraper blade Ⓐ by changing its direction so that it does not interfere the pads.
③ Retighten bolts and nuts Ⓑ at 18 locations.
④ Loosen bolts and nuts Ⓓ at 8 locations.
⑤ Move the scraper blade Ⓒ to the undersurface at the rear of the frame such that there is a gap by 20 mm between the scraper blade Ⓒ and the drum.
⑥ Retighten bolts Ⓓ at 8 locations.
⑦ Loosen bolts and nuts Ⓕ at 8 locations.
⑧ Adjust the scraper blade Ⓔ by changing provide a clearance of 20mm between scraper Ⓔ and the drum.
⑨ Retighten bolts and nuts Ⓕ at 8 locations.



SV521DF



SV521DF
(at the time of D type specification)

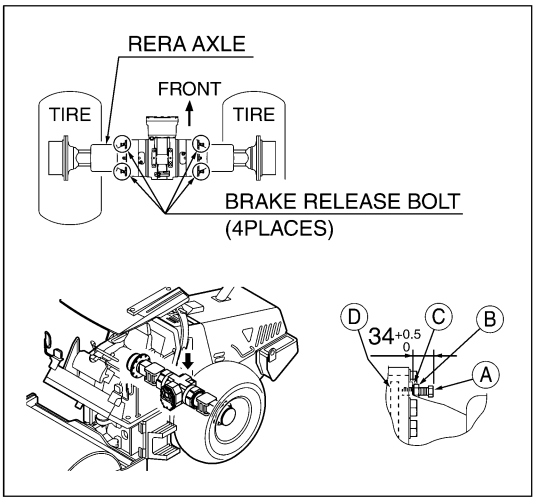
2.2.3 Disengaging the brake when towing

⚠ WARNING

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

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

1) Rear brake
   ① Loosen the lock nuts Ⓑ .Tighten bolts Ⓐ so as to fasten them onto the pressure plate Ⓓ .
   ② Using a wrench,tighten the bolts Ⓐ in an alternate sequence by 1/4 turn at a time so as to compress the Belleville washers and disengage the braking disks.



IMPORTANT

Tighten max. by one turn.

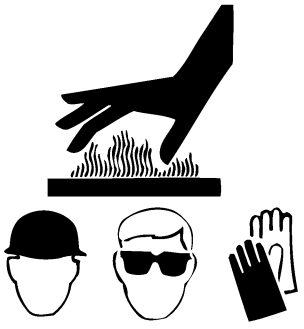
   ③ After towing is completed, remove bolts Ⓐ completely with nuts Ⓑ and seals Ⓒ . Then,replace seals Ⓒ , apply silicone-based Tecno Lupu/101 grease to the bolts Ⓐ and install all parts again.
   ④ Adjust bolts Ⓐ to obtain a jut of 34 $^{+0.5}_{0}$ mm. then, lock into position with nuts Ⓑ .

2) Turn the unload valve in a counterclockwise and open it. Please refer to the section “Unloader valves” on p.33 for more details on the operations of the unload valves.

⚠ 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, safety goggles and safety gloves.**



2.3 Operation

⚠ WARNING

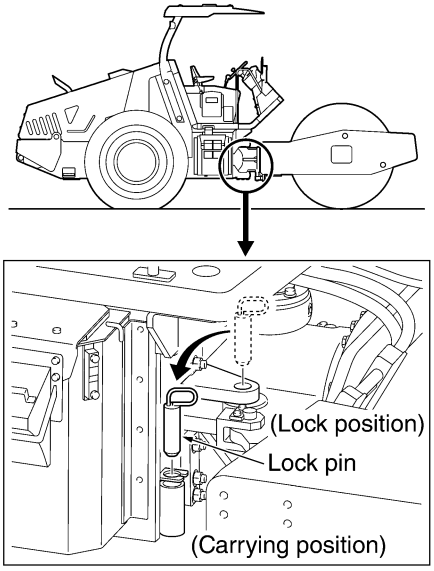
- **This machine is a one-man roller.**
- **Operate the machine from the operator's seat.**
- **Be sure to wear the seatbelt during operation.**

2.3.1 Before-starting inspection

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

⚠ WARNING

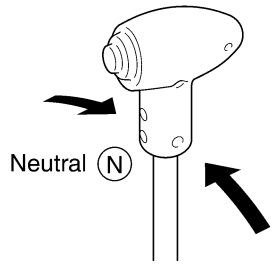
Make sure that the steering lock pin is in the carrying position before putting the machine in motion. Steering is impossible if the pin is in the steering lock position.



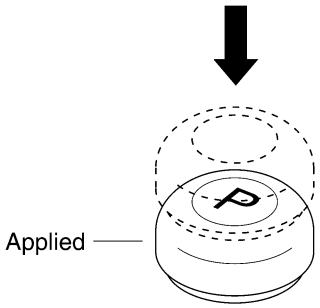
The pin is located at the right of the center of the machine.
To unlock the pin.
① Pull out the lock pin.
② Set the pin in the carrying position.

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

3) Check that the parking brake has been pressed.



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

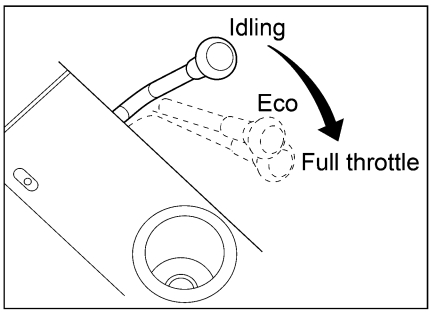


2.3.2 Starting the engine

⚠ WARNING

- **Sound the horn when starting the engine after making certain that there are no one and no objects close to the machine.**
- **After making certain that the parking brake is effectively pushed, and shifting the F-N-R lever to the neutral position, then start the engine.**

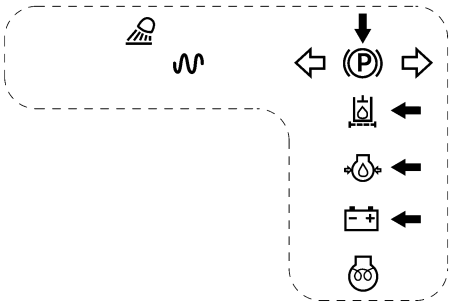
1) Set the throttle lever in a position slightly higher than IDLING.

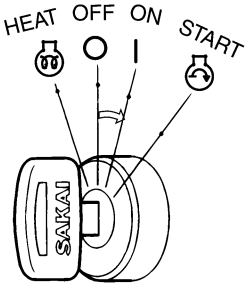


(± 25min^{-1}{rpm})

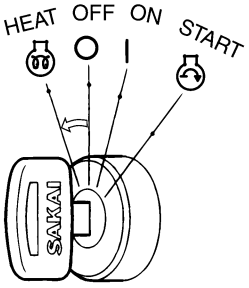
Engine RPM	IDLE	ECO MODE	FULL
	950min^{-1}{rpm}	1900min^{-1}{rpm}	2300min^{-1}{rpm}

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.

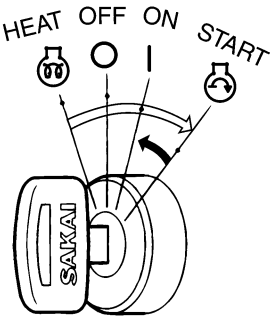




3) For cold weather staring, turn the starter switch to the position to let the glow indicator become bright. Stay in this position till the glow indicator goes off.
Then turn the switch to the position.



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



⚠ CAUTION

- **Do not allow the starter key to stay in the position for more than 15 seconds.**
- **When you fail to start the engine, restart it after waiting for about 30 seconds.**
- **If the engine does not start, allow an interval before trying again.**
- **Check that the warning lamps on the monitor display go off immediately after the engine is started. If any of these warning lamps becomes bright while the engine is running, shut down the machine, determine the cause and rectify the fault.**

2.3.3 After starting the engine

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

IMPORTANT

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

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

⚠ WARNING

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

2.3.4 Traveling

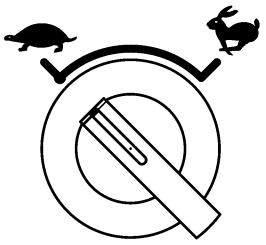
⚠ WARNING

- **When starting, operate the horn after securing the safety around the machine.**
- **On a slope, run the machine at low speed.**
- **Clear away obstacles on the road.**
- **Be sure to wear the seatbelt during operation.**

⚠ CAUTION

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

1) Select the desired speed by the speed change switch.



km / h (mile / h)

	(Low)	(High)
Speed	0 – 6 (0 – 3.7)	0 – 10 (0 – 6.2)

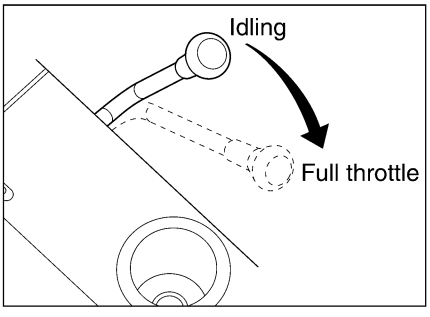
⚠ WARNING

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

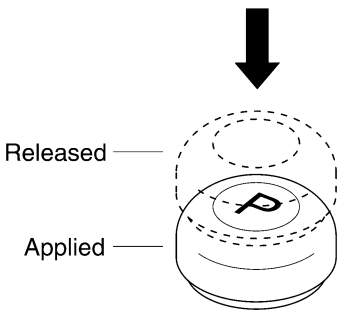
IMPORTANT

Change speed when the machine is completely stopped. Do not change speed while the machine is running.

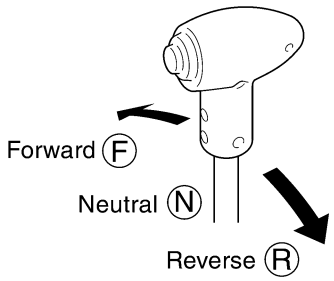
2) Speed up the engine by moving the throttle lever towards the rear side.



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



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



⚠ CAUTION

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

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

⚠ WARNING

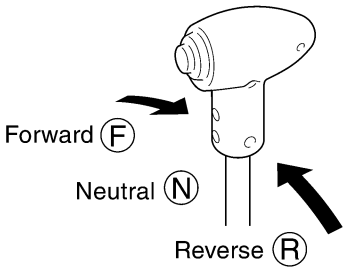
Pay extreme attention to the area behind the machine when backing, since the space just behind it tends to be a blind spot.

2.3.5 Stopping / Parking

⚠ WARNING

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

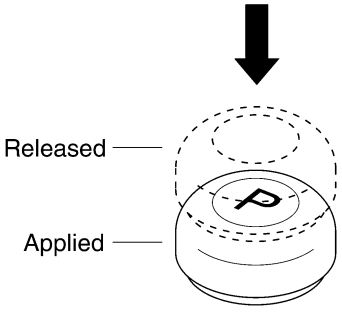
1) Bring the F-N-R lever to the neutral position Ⓝ , and the machine will come to a halt.



⚠ CAUTION

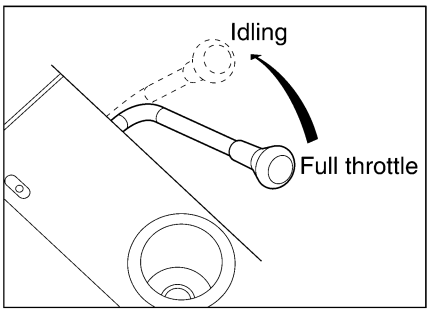
For normal braking, move the F-N-R lever back to the neutral position. In an emergency, depress the brake pedal.

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



2.3.6 Stopping the engine

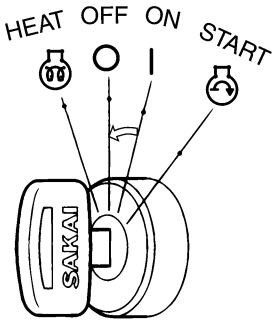
1) Gradually cool down the engine at low idling for about 5 minutes.



IMPORTANT

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

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



⚠ CAUTION

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

3) Remove the starter key.

⚠ WARNING

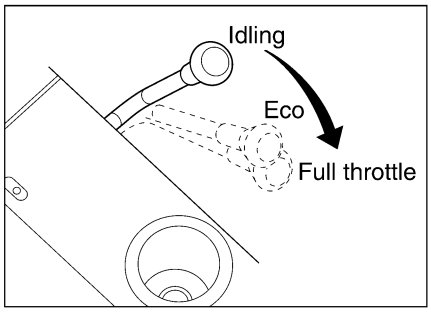
- **When dismounting from the machine, apply the brake by pressing the parking switch button. If necessary to park on a grade, block the wheels to prevent unexpected moving down the grade.**
- **Never fail to remove the starter key.**

2.3.7 Check after stopping the engine

1) Perform the walk-around checks for oil and water leakage, abnormal signs around the drums.
2) Fill the fuel tank.
3) Remove waste paper if any from the engine compartment, as this will pose a possible fire hazard.
4) Scrape mud or other materials from and around the drums.
5) When transporting the machines, please ensure safety by strictly complying with the applicable laws and regulations.

2.4 Vibratory Operation

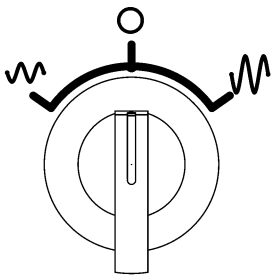
1) Run the engine on the full throttle or an eco by operating throttle lever.



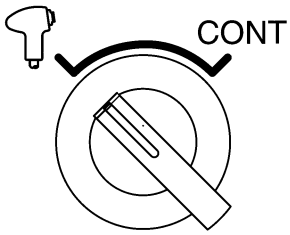
NOTE: It is possible to conduct the rolling compactions as much as the vibration specifications when setting the rotating speed of the engine to FULL while saving fuels, if conducting vibratory rolling compactions by setting the throttle to the ECO position (ECO MODE).
The ECO MODE is recommended when working on flat road surfaces as the maximum speeds and the hill-climbing performances are degraded for this mode. Please conduct the rolling compactions by setting the throttle lever to the FULL position when working on soft, steep sloped and rugged road surfaces.

2) Amplitude of vibration is selectable and turned on and off with the vibrator switch Ⓐ located on control panel.

- position : Turning the vibrator switch clockwis causes the vibration to start with high amplitude.
- ○ position : Vibration is shut down.
- position : Turning the vibrator switch counter clockwise causes vibration to start with low amplitude.


Vibrator swich Ⓐ

NOTE: Vibratory rolling compactions shall be conducted by shifting the throttle lever to the FULL or the ECO positions. The specified vibration performances shall be delivered when the throttle lever is shifted to the FULL or the ECO positions. Also, by means of vibration selector switch Ⓑ , the selection can be made between the vibration switch Ⓒ installed to the F-N-R lever and the other one located on the panel.

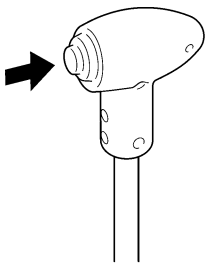


Vibration serector swich Ⓑ

position : Vibration can be turned ON or OFF with the switch located on the F-N-R lever. Pressing this switch causes the vibration to start and pressing it again to stop.

This vibrator switch on the lever should be used with the vibration switch on the panel placed at or position.

CONT position : Turn it to this position when the vibrator switch on the F-N-R lever is not used. Use the vibrator switch on the panel then to turn it ON or OFF.



Vibrator swich Ⓒ

3) Proper travel speed for vibratory compaction is 2 – 5 km / h, however, select speeds depending upon job requirements.

IMPORTANT

- **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.**
- **Set the speed change switch in the LOW position during vibratory rolling compaction. Use the HIGH position only for driving on flat straight roads.**

2.5 Precautions for Work

2.5.1 Compaction operation

■ Understand the intended purposes of the roller

- This roller is developed and manufactured mainly for rolling compactions of road constructions and repairing. Working with vibrations under excessive rolling compactions and/or using for crushing operations may cause damages to this machine. Do not use for any other purposes than rolling compactions in civil engineering works.

■ Do not operate the vibrator on hard location

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

■ Change the direction of travel gently

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

■ Drive at a speed appropriate for the road surface conditions

- Drive slowly on uneven surfaces.

2.5.2 When going downhill

■ Use the F-N-R lever

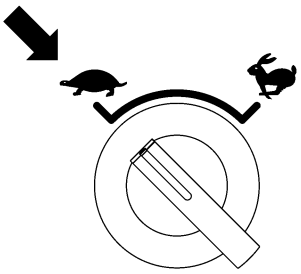
- Run slowly by the operation of the F-N-R lever even if the travel distance is short.

■ Use the engine brake

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

⚠ WARNING

- **When going uphill, run at low speed. Do not attempt to shift speeds during travelling. The machine can slip down the slope.**
- **When going downhill, set the shift switch to mode, adjust the F-N-R lever, and drive slowly. Furthermore, make sure the rate of revolution does not exceed 2,500 rpm while driving. Do not attempt to shift speeds during travelling. Driving downhill while the shift switch is in mode may cause the machine to move too fast due to insufficient engine braking, damaging the engine.**



2.5.3 On a slope

■ Working on a sidehill

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

2.6 Applicable Jobs

The machines do a variety of jobs as listed below.

1) This machine is mainly used for:
   - Static compacting work
   - Vibratory compacting work

2) Road rollers do a variety of jobs as listed below.
   This machine most effectively handles works or materals marked ☆ .

Work

- Asphalt road paving
- Dust removal treatment for road

☆ Road improvement

☆ Embankment construction

☆ Dam construction

- Construction of forestry and farm roads

- Foundation building
- Construction of sidewalk, shoulder and gutter foundation

Material to be compacted
- Asphalt pavement

☆ Crusher run
☆ Cement concrete
☆ Sands
☆ Soils
☆ Slag
☆ Soft rock

Layers to be compacted
- Surface course, Binder course

☆ Base course
☆ Subgrade
☆ Embankment

- Shoulder
- Sidewalk

2.7 After Operation

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

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

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

IMPORTANT

Do not wash clean with high pressure water around the instrument panel or reverse side of the dash board. This can cause instrument failures.

2.8 Loading and Unloading

⚠ WARNING

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

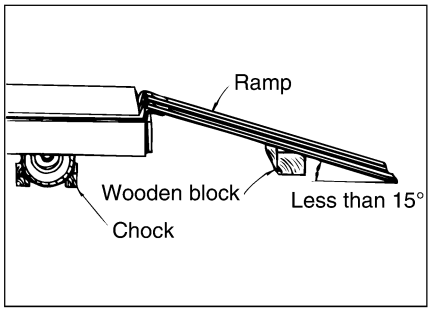
For loading and unloading, use ramps or a proper loading stand.

2.8.1 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.

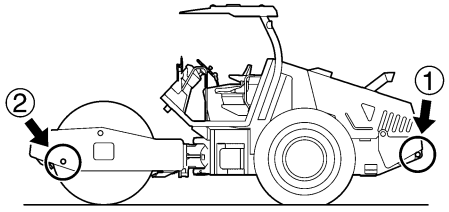
1) Engage the trailer brake and chock its wheels. Fix the ramps so that the machine and trailer are completely aligned.



☆ 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 operator's station to the UNLOAD position (refer to page 33).

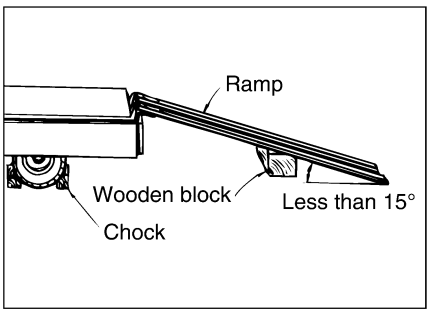
5) With the engine running at idle, perform loading by means of the trailer winch.

6) When the loading is completed, set the unloader valve back in the ONLOAD position.

7) Locate the machine correctly on the trailer.

2.8.2 Self-propelling

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

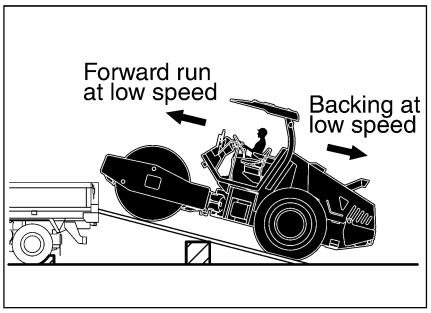


☆ The angle between the ramps and ground must be less than 15 degrees.

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

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

   For loading, run forward at low speed.
   For unloading, run backward at low speed.



3) Locate the machine correctly on the trailer.

2.9 After Loading the Machine

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

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

2.10 Transportation

⚠ WARNING

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

For transportation,odey traffic regulations.

2.11 Operation in Cold Weather

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

2.11.1 Fuel oil and grease

Use fuel and oil with low viscosity (refer to page 78).

2.11.2 Coolant

⚠ WARNING

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

⚠ CAUTION

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

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

Ambient temperature	−33°C (−27.4°F)	−26°C (−14.8°F)	−20°C (−4°F)	−16°C (3.2°F)	−11°C (12.2°F)
Amount of anti-freeze	9 L (2.4gal)	8 L (2.1gal)	7 L (1.8gal)	6 L (1.6gal)	5.5 L (1.5gal)
Amount of coolant	9 L (2.4gal)	10 L (2.6gal)	11 L (2.9gal)	12 L (3.2gal)	12.5 L (3.3gal)
Ratio	50%	45%	40%	35%	30%

IMPORTANT

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

2.11.3 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 safely 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 ○ 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 24V.

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

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	1.28	1.29	1.30	1.31
90	1.26	1.27	1.28	1.29
80	1.24	1.25	1.26	1.27
75	1.23	1.24	1.25	1.26

2.12 When the Cold Season is Over

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

1) Change oil and fuel with those for use in warm season (refer to page 78).
2) If AF-PT antifreeze is in use, drain the coolant completely, wash clean inside the cooling system, and then fill with clean water (city water).

2.13 For a Long Storage Period

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

1) Store the machine in a closed area after cleaning.
2) Conduct oiling, greasing and changing of oil.
3) Grease lubricate the exposed portion of hydraulic cylinder piston rods.
4) Cover the battery after disconnecting the negative cable or take off the battery from the machine and store in a safe place.
5) If the temperature is expected to go down below 0°C, add antifreeze to the coolant.
6) With F-N-R lever placed at neutral position Ⓝ and vibrator switch at ○ position, have the parking brake engaged.
7) Chock the machine.
8) Remove the starter switch key.

2.14 During the Storage Period

⚠ WARNING

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



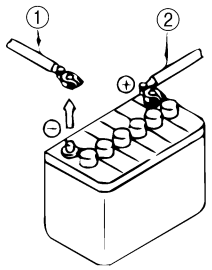
- During storage, operate the machine at least once a month to prevent the oil films on the lubricated parts from deteriorating and to charge the batteries.
- Disengage the brake at least once a month to prevent the brake lining from sticking to the brake drum, and travel the machine forward and backward. Then, engage brake again.

2.15 When the Battery has Discharged

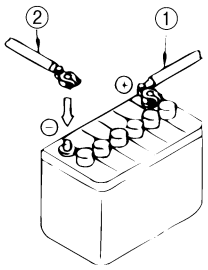
⚠ WARNING

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

Disconnect with negative cable first



Connect with positive cable first



⚠ CAUTION

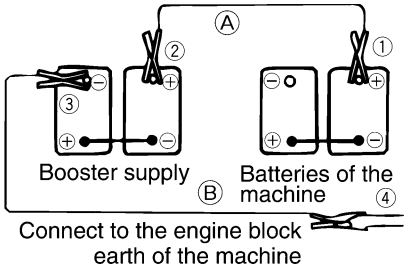
The power-supply voltage of this machine is 24V.

2.15.1 Connection and disconnection of booster cables

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

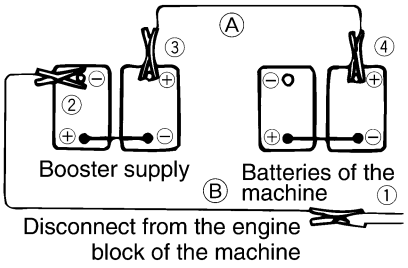
■ Connection of booster cables

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



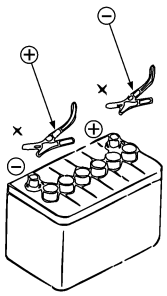
■ Disconnection of booster cables

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



⚠ WARNING

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



⚠ CAUTION

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

3 PERIODICAL MAINTENANCE

3.1 Precautions

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

⚠ 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 fines are important.**
  When draining a hot oil, use care not to get burned.
- **The disposal of waste oil and coolant, 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 its temperature remains high after operation.
6) For a long-term storage, fill the fuel tank, lubricate necessary points and run the machine for more than 20 minutes once a month.
7) In freezing weather, add antifreeze to the coolant according to the ambient temperature.
8) For the hydraulic pump and motor, have them serviced at authorized service shops.
9) Turn the starter switch ○ when performing services such as repairing broken wires, short circuits and tightening loose terminals.

Periodical replacement of essential maintenance parts

In order secure safety for work and travel, conduct inspection and services.
Further, for enhanced safety, following parts and components should be replaced periodically.
These parts are prone to material deterioration due to aging or physical change due to friction, while it is difficult to determine their useful limit by regular inspection, which makes it necessary to replace with new ones after certain period of service to maintain their perfect function.
If any abnormality is detected such as crack, deformation or oil leakage, go ahead and replace them even if it is within scheduled replacement time.

System or Mechanism	Part name	Periodical replacement maintenance part	Replacement period	Remarks
1 Brake system	Master cylinder	Seals (rubber parts)	2 years	
	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 parts	Cable	4 years	
8 Intake system	Piping parts	Intake hose	2 years	
		CAC hose	2 years	
9 Flood system	Hydraulic piping parts	Hydraulic hose	4 years	

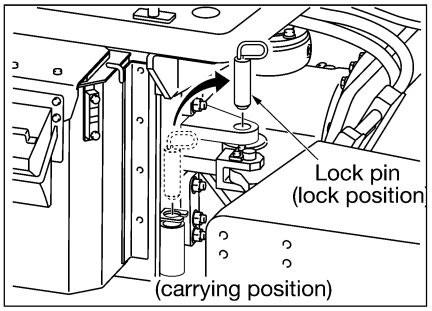
⚠ CAUTION

- **With a new machine, change the engine oil and change the engine oil filter elements after 50 hours of operation for the first time only (refer to page 65, 66).**
- **When trouble occurs in the location indicated by the indicator lamp on the monitor display, sensor will work and corresponding lamp comes on. If this occurs, conduct necessary service regardless of the periodical service interval recommendation.**
  1) The hydraulic filter (line filter) warning lamp ⇨ Replace elements
- **Check the electric wiring at a regular interval not exceeding one month, 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.**

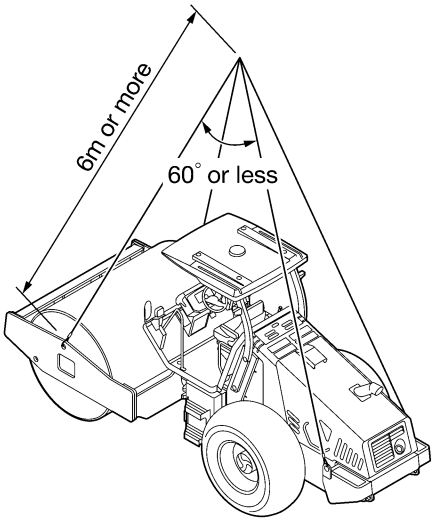
3.1.1 Lifting the machine on a hoist

⚠ WARNING

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

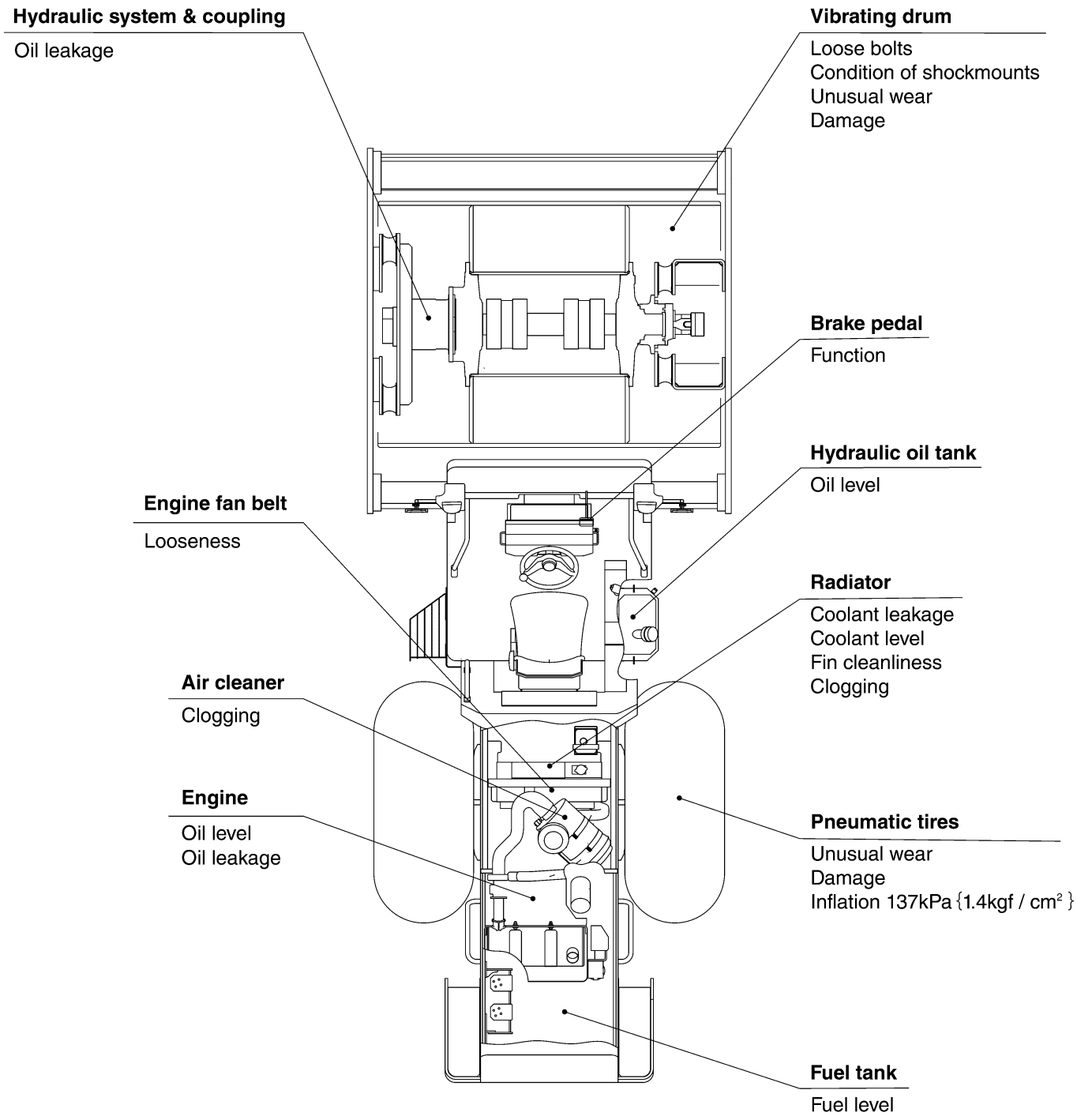


1) Put wire ropes securely on the hook and lifting points as shown.
2) If wire ropes make contact with other parts of the machine, put pieces of cloth or wooden blocks at the contact points. Carefully perform lifting.
3) When lifting, keep the machine properly ballanced.

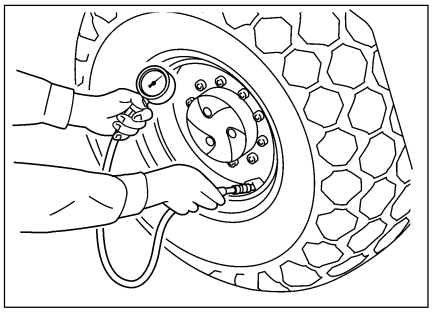


3.2 Walk-around Checking

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:



3.2.1 Tire inflation pressure check



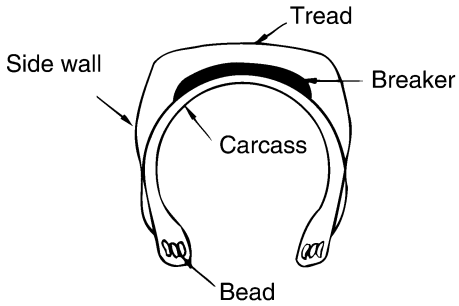
Inflation pressure

Check that the inflation pressure of a tire is 137 kPa (1.4 kgf/cm^2) with a pressure gauge when the tire has cooled down. If the pressure reading exceeds the above range, adjust the pressure accordingly.

⚠ WARNING

Improper handling of a tire is dangerous and may cause flat tire and a rim to come off.
Do not work on a tire facing the rim, but from behind the tread of the tire while checking the inflation pressure or replenishing air into a tire.

3.2.2 Checking for external injury to a tire



Check any external injury to a tire, its size and its depth (whether it has reached the carcass or not), etc.

1) Check for any cuts on the tread.
2) Check for any cracks on a rim or deformation of rim flanges.

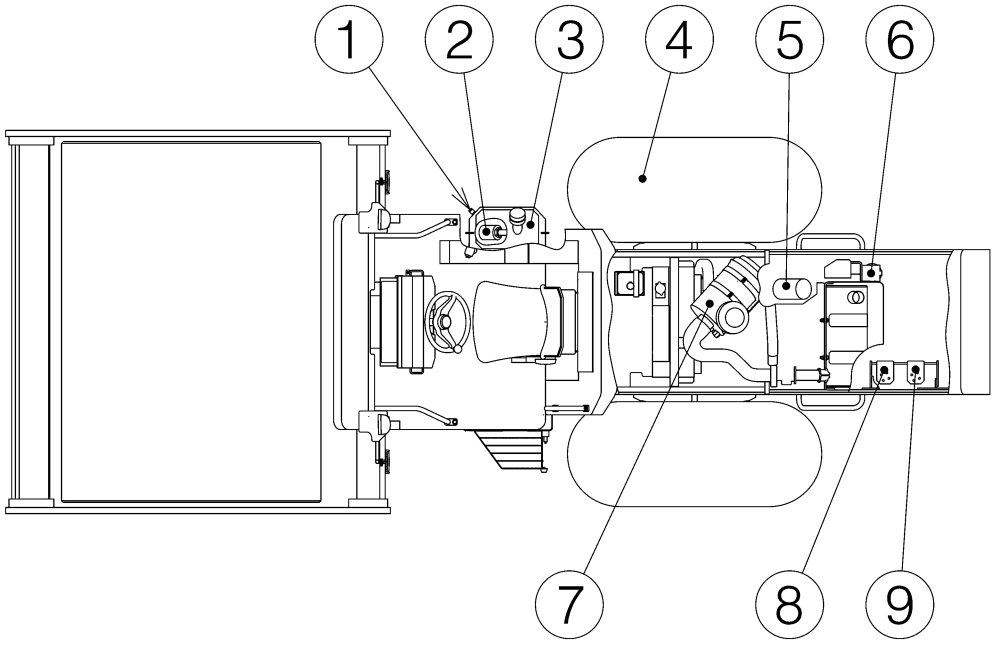
When a tire shows one or more of the following conditions, regard it as defective, and replace the tire with a new one for safety.

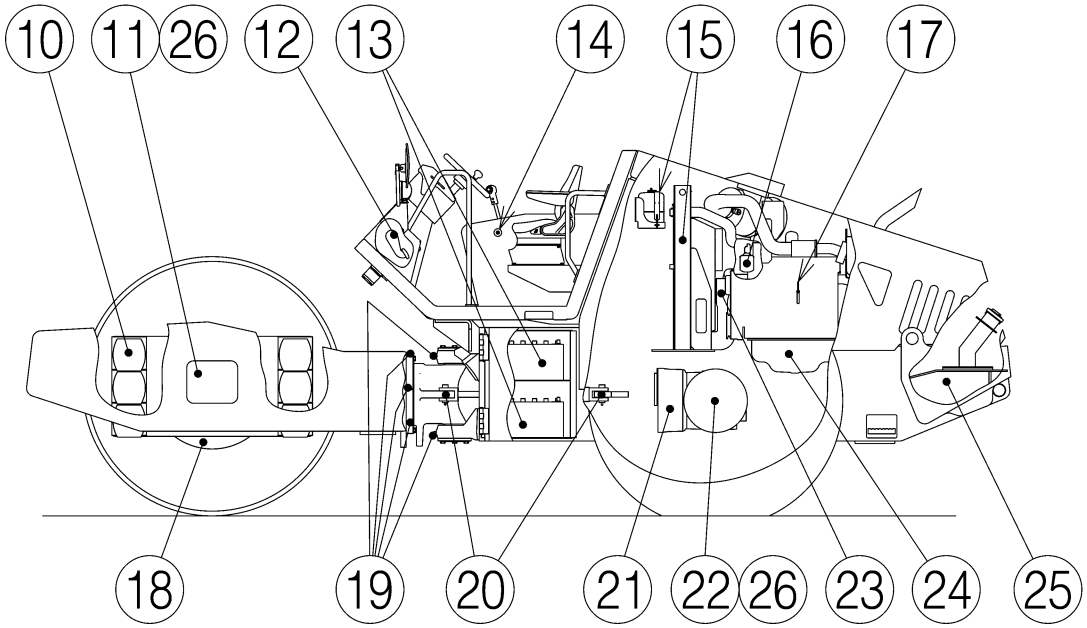
1) When the bead wire is cut, bent or significantly deformed.
2) When the carcass ply is showing due to excessive wear.
3) When damaged portion of the carcass exceeds one thirds of the tire width.
4) When a tire has ply separation (peeling).
5) When radial cracks reach the carcass.
6) When the tire is not regarded as durable due to abrasion, deformation, or abnormal flaw growth.

Please consult with an agency for maintenance in the following cases.

- When injury is found on the surface of a tire.
- When the degree of wear on the front, rear, right and left sides of a tire are extremely different.
- When a bent rim is found.

3.3 Periodical Maintenance Points





Interval	Symbol	Location	Inspection and service	Lubricant	Q'ty
Every 10 hours or daily	⑥	Fuel sedimenter	Check water level and dirt		1
	⑮	Radiator and reservoir	Check water level ,add as necessary	Coolant	1
	⑰	Engine oil level gauge	Check oil level, add as necessary	Engine oil	1
	㉓	Fan belt	Check tension and unusual wear and adjust		1
Every 50 hours	①	Hydraulic oil level gauge	Check oil level, add as necessary	Hydraulic oil	1
	⑦	Air cleaner	Check indicator		1
	⑫	Brake	Check function and adjust		1
	⑬	Battery	Check electrolyte level and looseness of terminal and appearance, add as necessary Clean the terminal and apply grease	Battery fluid Grease	2
Every 250 hours	⑤	Engine oil filter	Change filter		1
	⑩	Rubber dampers	Check for cracks		10
	⑱	Vibrator	Check oil level	Gear oil	1
	⑲	Center pin and tilt pin bearings	Grease 4 places	Grease	4
	⑳	Cylinder head and anchor pins	Grease 4 places	Grease	4
	㉑	Transmission	Check oil level, add as necessary	Gear oil	1
	㉔	Engine oil pan	Change engine oil	Engine oil	1
Every 500 hours	⑧	Hydraulic oil line filter	Change filter		1
	⑨	Hydraulic oil return filter	Change filter		1
	⑯	Fuel filter	Change filter		1
	⑭	Control links	Check for loose bolts and nuts Grease 1 place	Grease	1
	㉑	Transmission	Change gear oil	Gear oil	1
	㉒	Differential and final drive	Change gear oil	Gear oil	3
Every 500 hours or 3 months, or each time after brake pedal is used	㉖	Parking brake	Check function		2
Every 1000 hours	②	Hydraulic oil suction filter	Clean filter		1
	③	Hydraulic oil tank	Change hydraulic oil	Hydraulic oil	1
	⑪	Gear case : Wheel motor	Change gear oil	Gear oil	1
	⑱	Vibrator	Change gear oil	Gear oil	1
As required	④	Tires : Wheel hub nut	Check inflation and unusual wear, looseness of hub nut		2
	⑦	Air cleaner	Clean element		1
	⑮	Radiator	Clean fin		–
	㉕	Fuel tank	Drain water and dirt		1

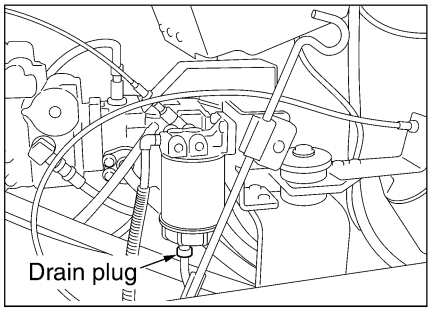
3.4 Maintenance Procedure

➡ **For servicing the engine, see the separate engine manual.**

(1) Every 10 hours or daily

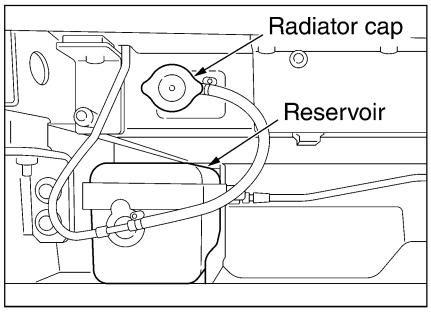
⑥	**Fuel sedimenter**

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.



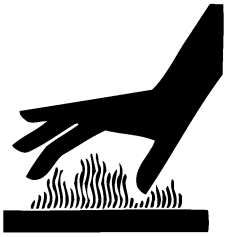
⑮	**Radiator and reservoir**

A reserve tank for coolant is placed at the top of the radiator. Check that the top surface of the coolant is between FULL and LOW In case of shortage, feed waters from the feed-water inlet by removing the reserve tank cap. In case that it is empty in the reserve tank, check the water leakage first. Then check the water level by removing the radiator cap. In case of shortage, feed water to the radiator first and then feed water to the reserve tank. 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.**

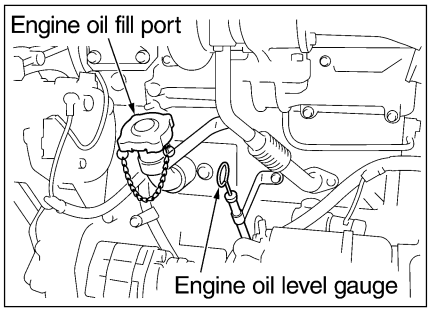


⚠ CAUTION

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

NOTE: Replace LLC every two years. Replace the other types every year.

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.

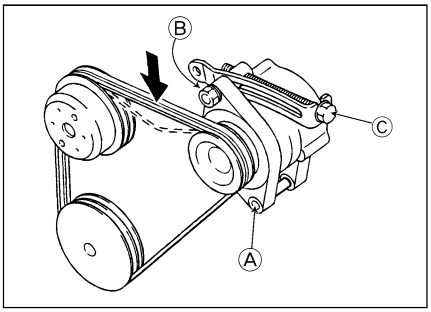
⚠ WARNING

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.

⚠ CAUTION

Be sure to use engine oil recommended by SAKAI (refer to page78).

㉓ Fan belt



1) Check the fan belt for wear and damage. Replace as necessary.
2) Check the tension. Depress the middle of belt with a push of about 10kg. A properly adjusted belt deflects 10 – 15mm.
3) Fan belt tension should be adjusted by turning the tension adjust bolt Ⓒ , with alternator bracket bolt Ⓐ as well as adjust plate bolt / nut Ⓑ loosened first.
   The tension will increase by turning the tension adjust bolt Ⓒ clockwise and vice versa.

⚠ WARNING

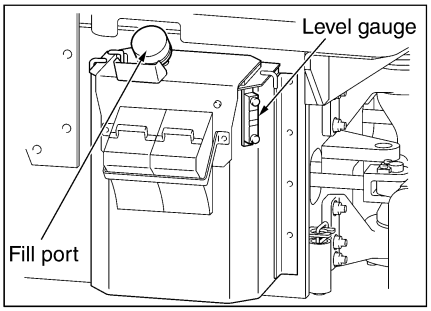
Make certain that the engine is completely stopped to avoid any risks when checking looseness, tensions and damages for the fan belts.
Also make certain that the key is removed from the key cylinder.

IMPORTANT

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

(2) Every 50 hours

① 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 fluid from the fill port.

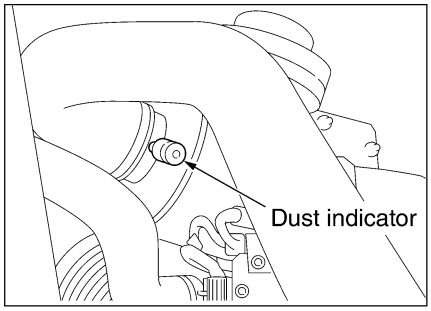
⚠ WARNING

When feeding the hydraulic oil, please use the designated hydraulic oils by SAKAI.

⚠ CAUTION

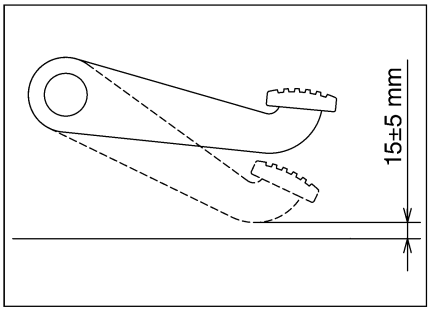
Be sure to use hydraulic oil recommended by SAKAI (refer to page78).

⑦ Air cleaner



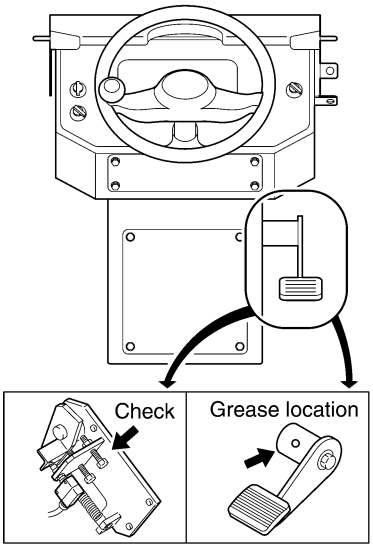
When the red float of the dust indicator reaches the service level (a mark on the indicator), clean the element (refer to page 73).

⑫ Brake



When the engine is completely stopped, step on the brake pedal by two or three times. After this, while forcefully keep stepping on the brake pedal for more than five seconds, check the gap between the brake pedal and the floor panel by rulers. It is appropriate if the gap between the brake pedal and floor panel is 15 mm ±5 mm.

Also check that each bolt is not loose, the motion of the brake pedal is smooth, and the brake pedal is properly resilient when stepping it on.



Apply grease to the brake pedal shaft.

⚠ CAUTION

Be sure to use grease recommended by SAKAI (refer to page78).

⑬ Battery

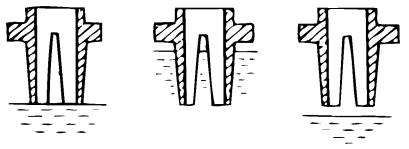
Maintenance-free batteries are installed at the time of delivery.

Inspection and maintenance methods for installed batteries.

1) Check the color of the hydrometer attached to the battery top to charge or replace the battery.
   Green … Satisfactory
   Black … Charging is necessary
   Semitransparent … Replacement is necessary
2) Retighten any loose terminal. Apply grease or vaseline to the terminals to retard rusting.
3) Be sure to tighten the battery holder if it is loose.

Inspection and maintenance methods for non-maintenance-free batteries.

1) With the caps removed, check to see if the electrolyte level is above the plates.
2) Add distilled water or battery fluid commercially available if the level is too low.
3) Retighten any loose terminal. Apply grease or vaseline to the terminals to retard rusting.
4) Be sure to tighten the battery holder if it is loose.



Proper Excessive Insufficient

⚠ 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 safely 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

- **Use only batteries recommended by SAKAI (refer to page 76).**
- **The power-supply voltage of this machine is 24V.**

(3) Every 250 hours

⑤ Engine oil filter

Change the elements.

㉔ Engine oil pan

➡ **See the separate engine manual.**

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

⚠ WARNING

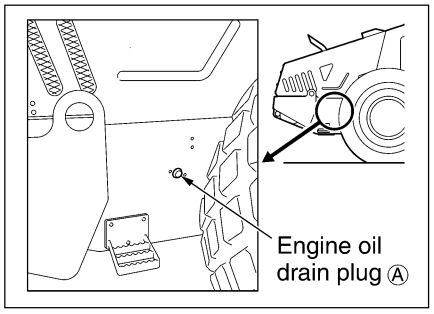
When draining a hot oil, use care not to get burned.

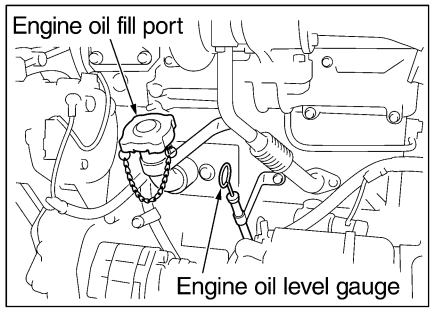
2) Put the shield tape on it, refit the drain plug Ⓐ and fill the crankcase with the engine oil from the fill hole Ⓑ .
3) Change the oil filter Ⓒ .

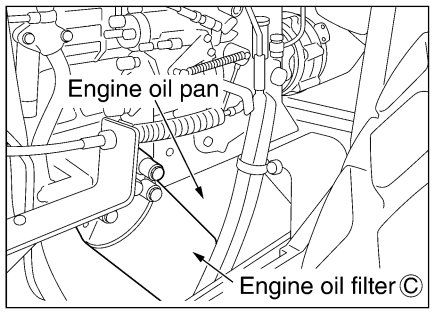
⚠ CAUTION

Be sure to use engine oil recommended by SAKAI (refer to page78).

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

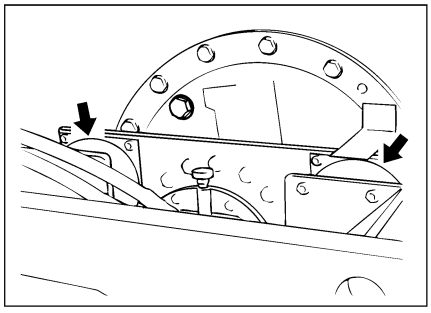






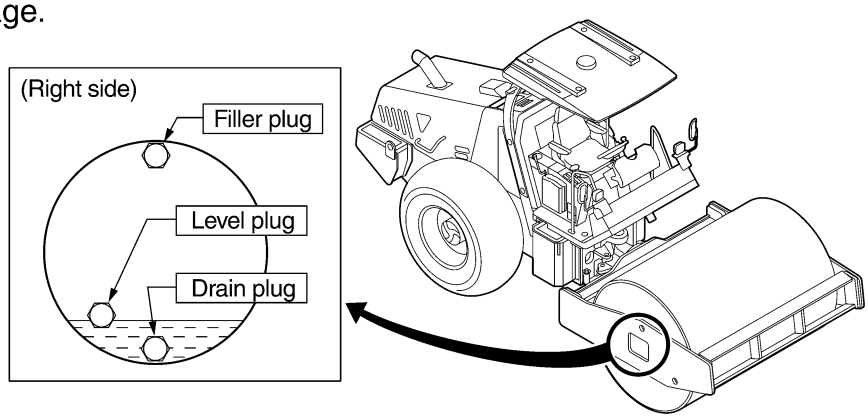
⑩ Rubber dampers

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



⑱ Vibrator

Check for the oil level and leakage.

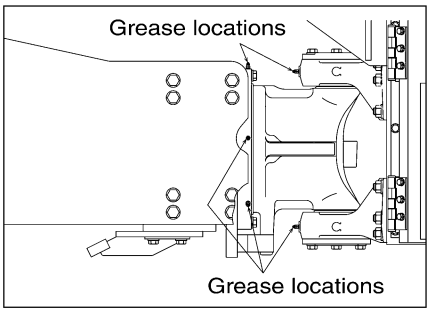


⚠ CAUTION

Be sure to use gear oil recommended by SAKAI (refer to page78).

⑲ Center pin and tilt pin bearings

Apply grease at 6 locations.

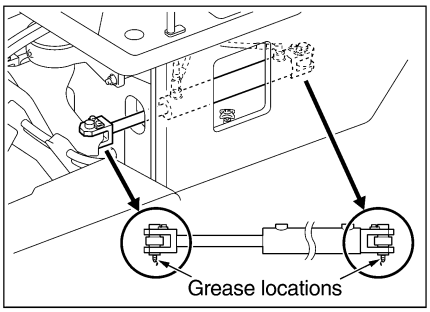


⚠ CAUTION

Be sure to use grease recommended by SAKAI (refer to page78).

⑳ Cylinder head and anchor pins

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



⚠ CAUTION

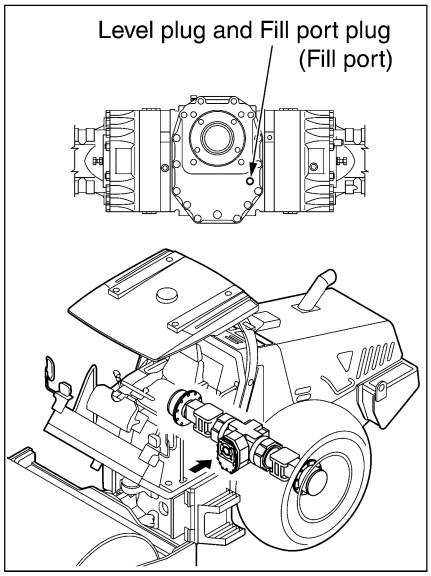
Be sure to use grease recommended by SAKAI (refer to page78).

㉑ Transmission

Check for oil level, and add oil through the fill port as necessary.

⚠ CAUTION

Be sure to use gear oil recommended by SAKAI (refer to page78).

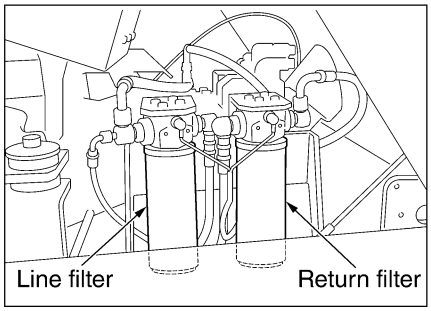


(4) Every 500 hours

⑧ Hydraulic oil line filter

⑨ Hydraulic oil return filter

Change the elements.

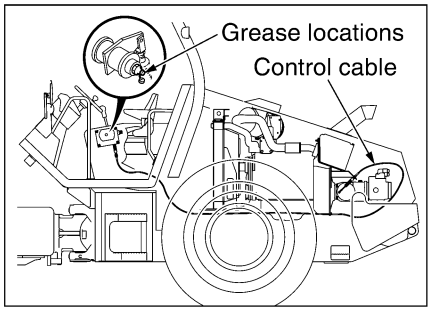


⑭ Control links

1) Check the nuts for looseness. Adjust the rod.
2) Apply grease to F-N-R lever shaft.

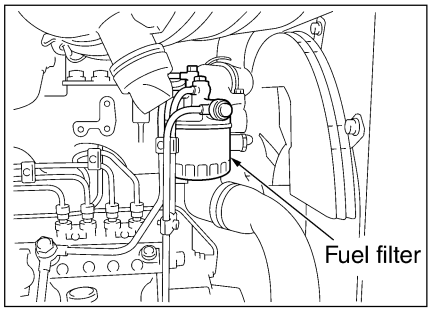
⚠ CAUTION

Be sure to use grease recommended by SAKAI (refer to page78).

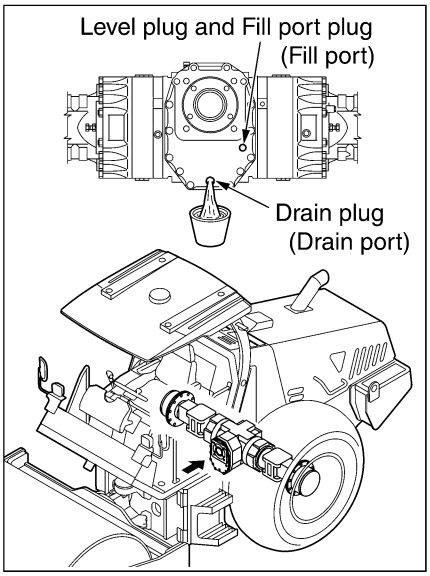


⑯ Fuel filter

➡ See the separate engine manual.
Change the filter cartridge.



㉑ Transmission

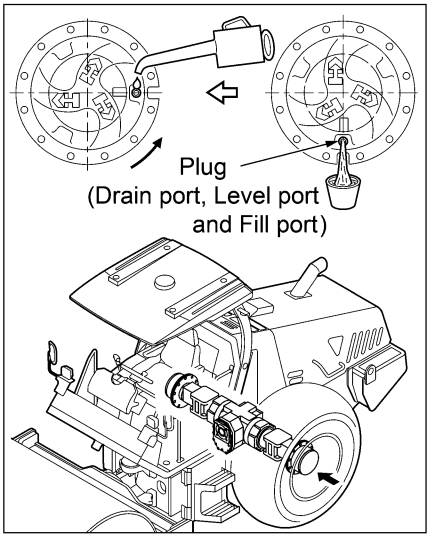


1) Drain the gear reducer oil by removing the drain plug.
2) Refit the drain plug.
3) Take off the level plug and fill port plug.
4) Fill oil through the fill port until oil starts overflowing from the level port.
5) Refit the level plug and fill port plug.

⚠ CAUTION

Be sure to use gear oil recommended by SAKAI (refer to page78).

㉒ Final drive

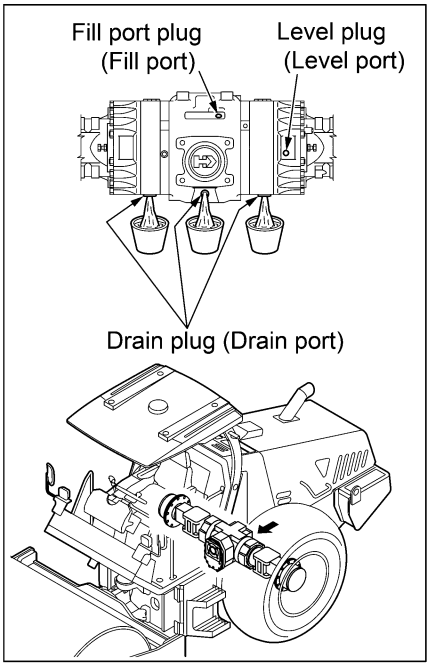


1) Rotate the wheel till the drain port is located at the lowest position. Remove plug to drain oil.
2) At the final drive, adjust the position of plug until it is parallel to the ground.
3) Fill oil through the fill port till oil overflows from the level port.
4) When the final drive case is filled to the specified level, refit the removed plugs.

⚠ CAUTION

Be sure to use gear oil recommended by SAKAI (refer to page78).

㉒ Differential case



1) Drain oil by removing the drain plug, fill port plug and level plug.
2) Refit the drain plug.
3) Fill oil through the fill port till it overflows from the level port.
4) Refit the removed plugs.

⚠ CAUTION

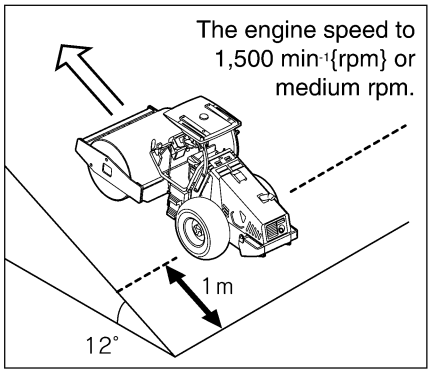
Be sure to use gear oil recommended by SAKAI (refer to page78).

(5) Every 500 hours or 3 months, or each time after brake pedal is used

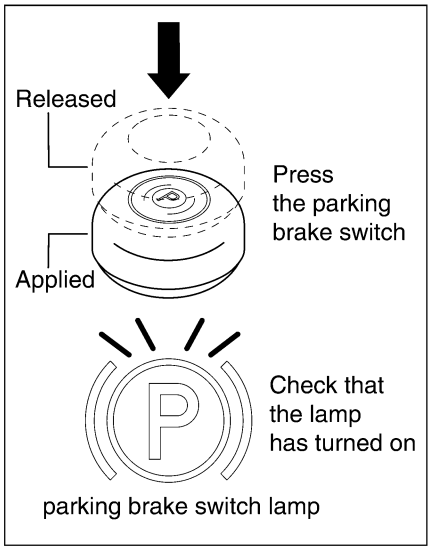
㉖ Parking brake

⚠ WARNING

- **Ensure safety by checking to make sure there is no one and no obstacles near the machine.**
- **Keep your hands on the forward-reverse lever and steering wheel during inspections. The machine may move in unexpected ways during inspections, leading to accidents.**

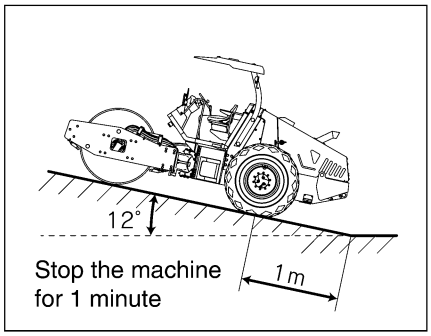


1) Adjust the engine speed to 1,500 min^{-1} {rpm} or medium rpm.
2) Be sure to move the machine onto asphalt pavement or an other hard surface with an upward inclination of 12° (20 %) with the engine left on.
3) Press the parking brake switch Ⓟ to engage the parking brake. Check that the OK monitor lamp (Ⓟ) has turned on.
   If the lamp (Ⓟ) does not turn on, contact one of our sales offices or a factory designated by our company for advice.
4) Remain seated on the machine to make sure it remains completely still for 1 minute.If it moves, move it immediately to flat ground, stop using it, contact one of our sales offices or a factory designated by our company, and have it repaired.



⚠ WARNING

- **This inspection must be carried out after each use of the brake pedal.**
  If the inspection is not carried out, the parking brake may malfunction when you try to use it next time causing a serious accident.
- **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 injures, death or breakdowns caused by alterations.

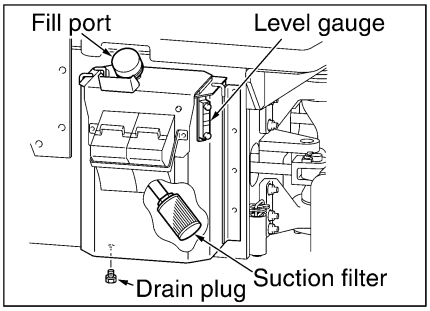


(6) Every 1,000 hours

② Hydraulic oil suction filter

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

③ 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 engien and recheck the oil level.

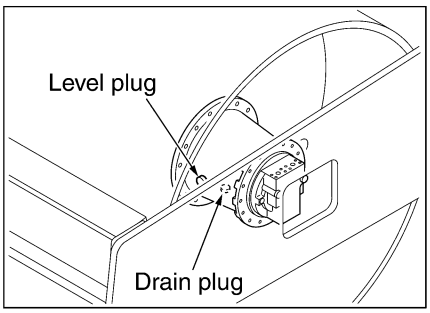
⚠ WARNING

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

⚠ CAUTION

Be sure to use hydraulic oil recommended by SAKAI (refer to page78).

⑪ Gear case / Wheel motor



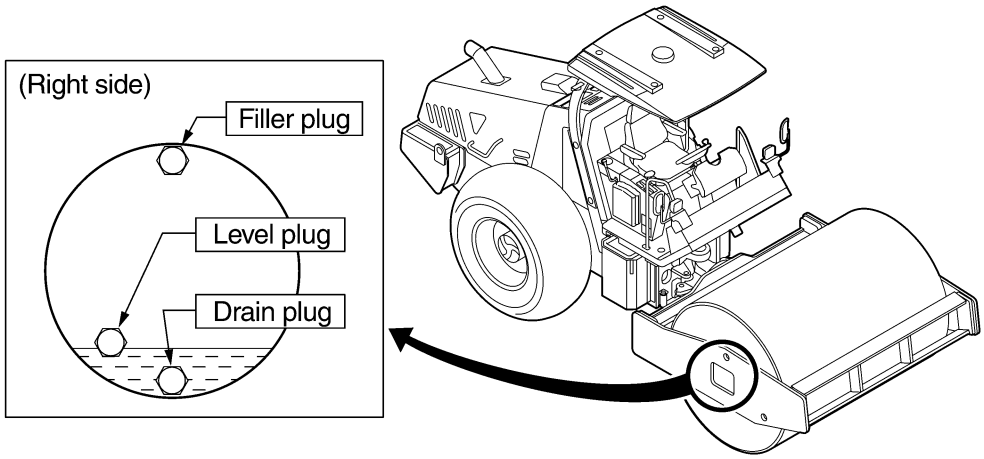
1) Position the drum so that the drain plug comes to the bottom.
2) Remove the drain plug and drain the oil while it is warm.
3) Rotate the drum so that a drain hole may come to top. Refit the drain plug and fill the oil through the fill hole until it overflows at the level hole.
4) Refit the level plug and drain plug.

⚠ CAUTION

Be sure to use gear oil recommended by SAKAI (refer to page78).

⑱ Vibrator

1) Rotate the drum till the drain plug comes to bottom.
2) Remove drain plug, level gauge plug and filler plug.
3) Drain oil from vibrator.
4) Clean the vibrator before reinstalling it.
5) Feed oil at filler port until oil flows out of level gauge hole.
6) Reinstall the level gauge plug as well as filler plug after cleaning them.



⚠ WARNING

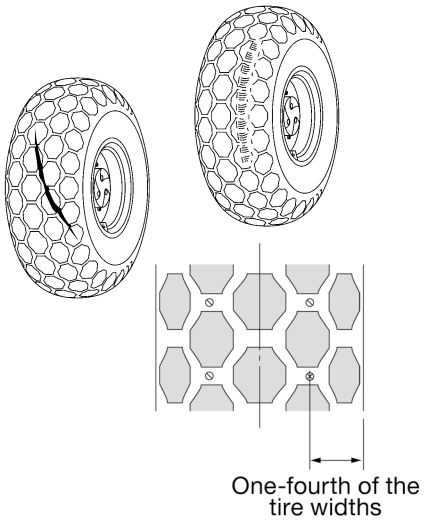
When draining a hot oil, use care not to get burned.

⚠ CAUTION

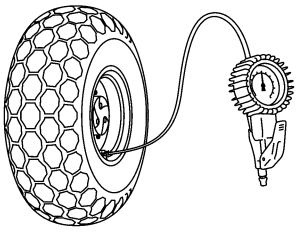
- **The oil capacity of the vibrator is 34 liters. Do not fill more than 34 liters.**
- **Be sure to use gear oil recommended by SAKAI (refer to page78).**

(7) As required

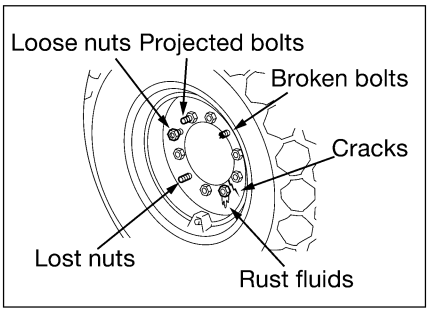
④	Tires : Wheel hub nut



1) Check if there are wears and flaws.
   Please check if there are any cracks and damages such as wears on one side, partial wares, step-shaped wares, nails and stones stuck or cut into the tires on the contacting surfaces with the grounds, both side surfaces and all around of the tires. If you find any abnormal conditions, replace tires. Check if the tire thread depths on the contacting surface with the grounds are 4 mm or more. Measure the tire thread depths at the areas indicated in the figure. When the depths become equal to or less than 4 mm, replace tires.
2) Check air pressures.Check air pressures with tire gauges when tires are cool enough, and make certain that they are at 137 kPa {1.4 kfg / cm^2}. Adjust air pressures of the tires if they are NOT appropriate.
3) Check whether or not the wheel nuts are loose. Check if the wheel hub nuts are loose or fallen off or if wheel hub bolts are broken. Also check if there are any rust fluids and/or whether or NOT the lengths of all the wheel hub bolts projected out of the wheel hub nuts are the same.



Check the wheel hub nut for looseness. If it is loose, tighte'n it. Be sure to torque it to the specified value.
Tightening torque: **630 N•m**



⚠ CAUTION

- **Turn the wheel hub nut in the tightening direction during inspection.**
- **Excessive tightening of the wheel hub nut will lead to breakage of bolts or cracks in the disc wheel. Be sure to observe the specified torque.**

NOTE: Tighten the wheel hub nut 50 hours after purchase of a new machine or replacement of tires.

Roll

The roll may be worn deeply and broken depending on the operation method and the condition of the site. Check the roll occasionally in the same way as tires.

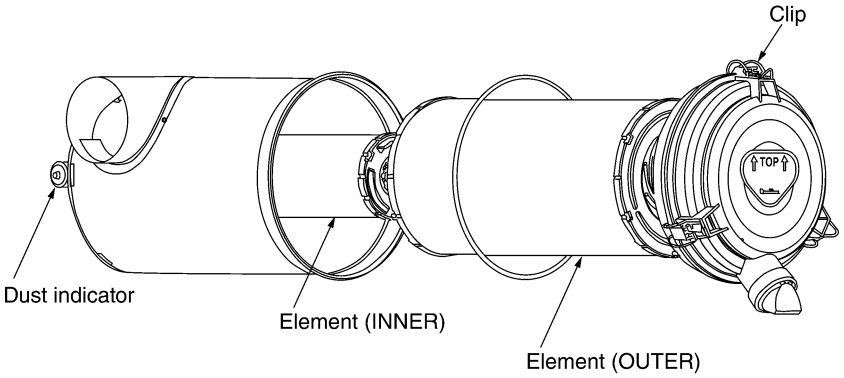
⑦	**Air cleaner**

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

1) The air cleaner is located at the front portion in the engine room. Open the bonnet hood, release the clip of the air cleaner case and remove the cover.
2) Pull the outer element straight out of the element case so as not to damage the outer element.
3) Blow compressed air from the inside of the outer element for cleaning. The air pressure shall not exceed 686 kPa {7 kgf / cm^2}. If the element has scratches, holes, or oil spots, replace it with a new one.

⚠ WARNING

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



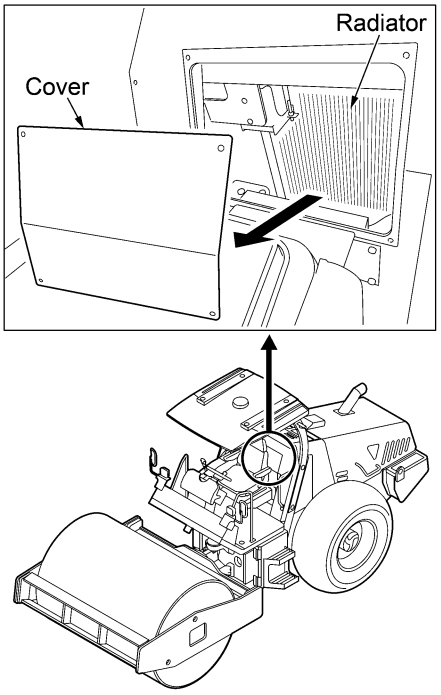
4) Attach the outer element and clamp it with a clip.

⚠ CAUTION

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

⑮ Radiator

Carry out appropriate inspections of the radiator fins to make sure there is no dust or dirt on them.
Dirty radiator fins may cause overheating.
Clean dirty radiator fins with an air blower or wash them with water.
To clean the fins, remove four bolts to take off the cover.
Be sure to reattach the cover after cleaning.



⚠ WARNING

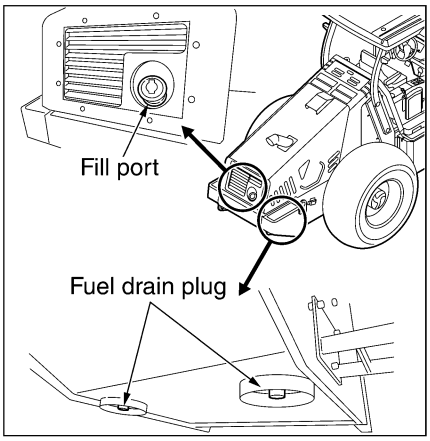
Be sure to wear protective glasses, a dust mask, and other protective equipment when cleaning the cooling fins to prevent particles from entering the body through the eyes, nose, etc.

IMPORTANT

- **Using an air blower or high-pressure cleaner at close distances may damage the fins on the radiator and oil cooler. Keep the nozzle at least 500 mm away from the surface of the core during cleaning.**
- **Avoid using any kind of screwdriver, metal scraper, paddle, etc. Cleaning the fins with such tools will damage the tube.**

㉕ Fuel tank

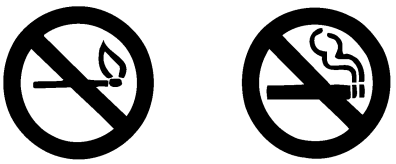
1) With the drain plug removed, remove the water and sediment from the bottom of the tank.
2) If sedimentation is substantial, remove the drain plug and clean the interior of the tank.
3) When the necessary work and refueling are complete, tighten the filler cap positively.



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.**



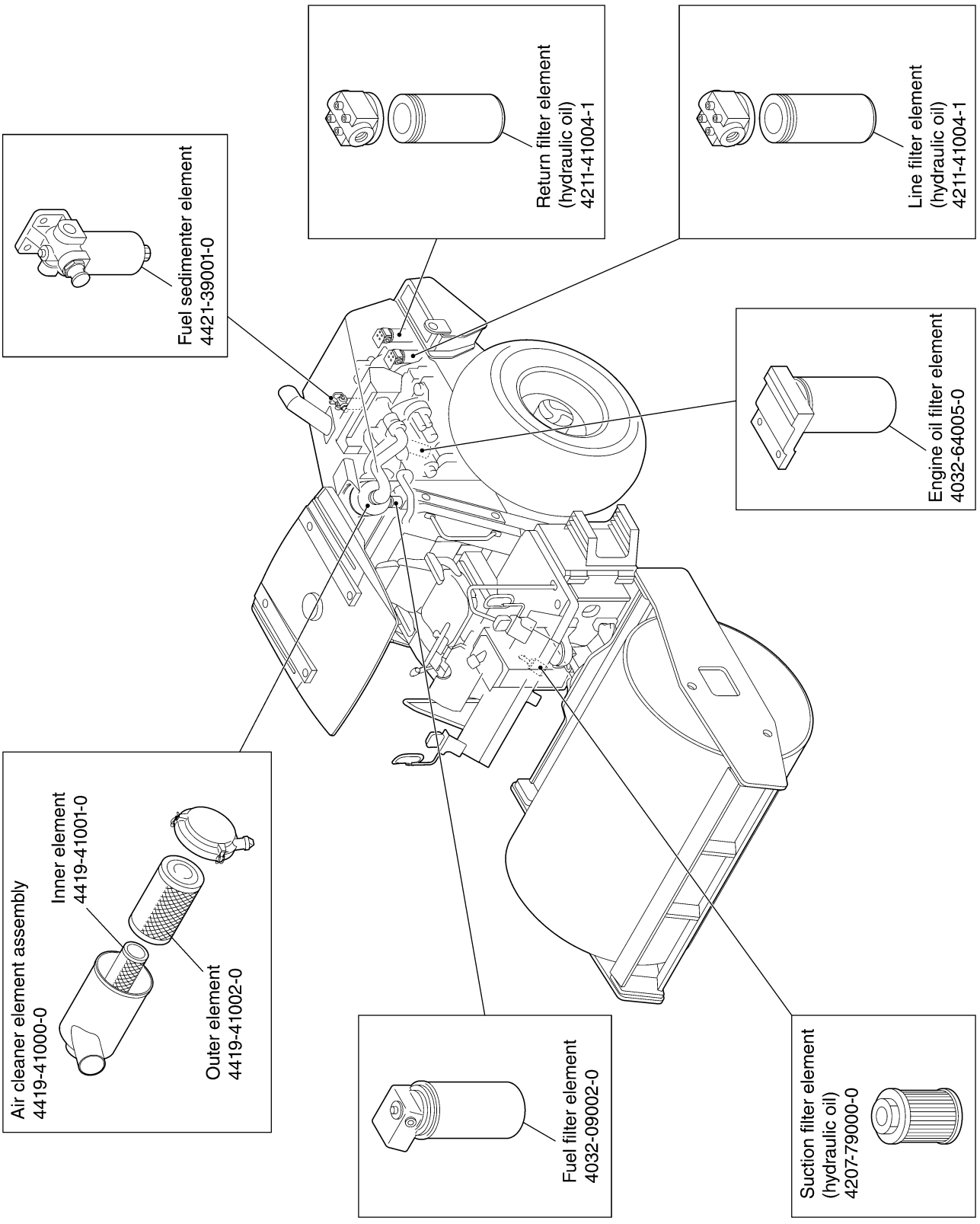
⚠ CAUTION

Be sure to use fuel recommended by SAKAI (refer to page78).

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)	
Return filter element (hydraulic oil)	4211-41004-1		500	
Line filter element (hydraulic oil)	4211-41004-1		500	
Fuel sedimenter element	4421-39001-0		500	
Fuel filter element	4032-09002-0		500	
Engine oil filter element	4032-64005-0		250	
Suction filter element (hydraulic oil)	4207-79000-0		1000	
Air cleaner element assembly	4419-41000-0		As required	
Inner element	4419-41001-0	1		Replacement simultaneously with the outer element
Outer element	4419-41002-0	1		After cleaning five times
Battery	4920-06000-0		As required	105D31R


Fuel sedimenter element
4421-39001-0
Return filter element
(hydraulic oil)
4211-41004-1
Line filter element
(hydraulic oil)
4211-41004-1
Engine oil filter element
4032-64005-0
Air cleaner element assembly
4419-41000-0
Inner element
4419-41001-0
Outer element
4419-41002-0
Fuel filter element
4032-09002-0
Suction filter element
(hydraulic oil)
4207-79000-0

3.6 Feeding Water and Lubricants

(1) General rules

1) Never feed water or lubricant with the strainer removed.
2) Use recommended lubricant and hydraulic fluid.
3) Do not use lubricants and hydraulic fluid of different brands.
4) When 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 our company is not covered by our warranty and repair service.

(2) Capacity

Compartment	Type of fluid	Capacity in liters (gal.)
Fuel tank	Diesel oil	215 (56.8)
Engine oil pan	Engine oil	13 (3.4)
Hydraulic oil tank	Hydraulic oil	50 (13.2)
Wheel motor	Gear oil	3.6 (0.95)
Radiator	Coolant	18 (4.8)
Vibrator	Gear oil	34 (9.0)
Transmission	Gear oil	2.0 (0.53)
Differential	Gear oil	11 (2.9)
Final drives	Gear oil	1.8 x 2 (0.46 x 2)

(3) Rating

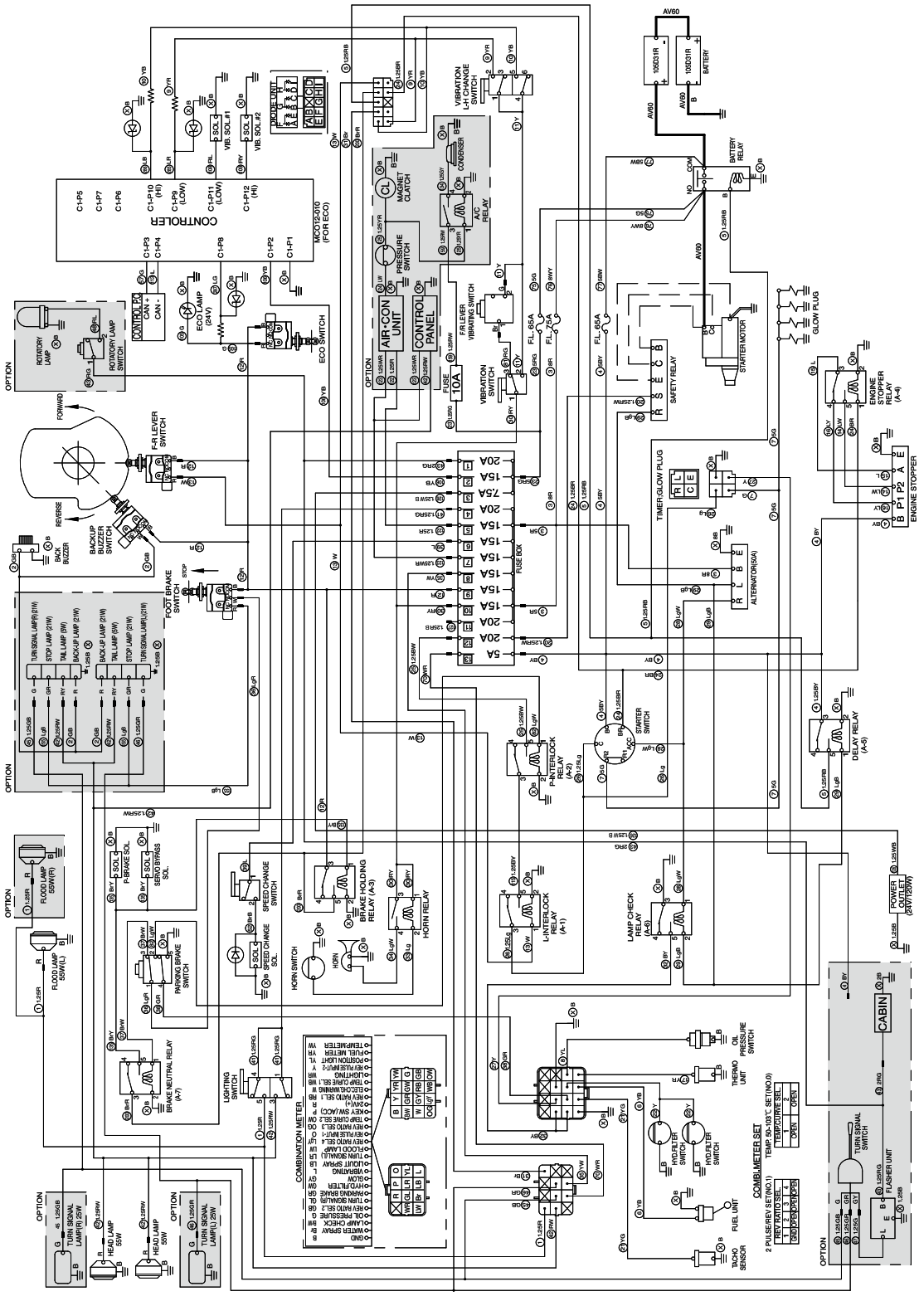
Lubricant	Service classification	Ambient temp. and applicable viscosity rating			Applicable standards
		-15 – 30°C (5 – 86°F) Cold	0 – 40°C (32 – 104°F) Moderate	15 – 55°C (59 – 131°F) Tropical	
Engine oil	API grade CF-4	SAE 10W-30	SAE 30	SAE 40	MIL-L-2104B
Gear oil	API grade GL4	SAE 80W-90	SAE 90	SAE 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

(4) Recommended lubricants

Lubricant / Oil company	Engine oil API CF – 4	Gear oil API GL 4	Hydraulic oil VG 46	Grease NLGI 2
Chevron	DELO 400 MULTIGRADE	RPM UNIVERSAL GEAR LUBRICANTS	RANDO HDZ	MULTIFAK EP
BP	Vanellus C	Energear HYPO − U	Bartran HV	Energrease LS − EP
Castrol	Diesel X	EPX GEAR OILS	Castrol Hyspin AWH	Castrol Spheerol EPL
Shell	Shell Rimula Super	Shell Spirax S2 A 90	Shell Tellus S2 V	Shell Alvania Greases EP
Exxon Mobile	Mobil Delvac Super 1300	Mobilube HD	Mobil DTE 10 Excel	Mobilux EP

CAUTION: 1) Fill the fluid reservoirs with the filters installed.
2) Use recommended fuels and lubricants only.
3) Use the hydraulic oils which specifications are as clean as ISO4406 18/13 or above.

3.7 Electric Wiring Diagram



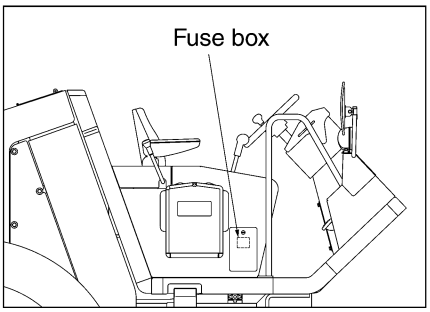
OPTION

Color of wire

B	Black	BrR	Brown/ Red stripe	GR	Green/ Red stripe	LR	Blue/ Red stripe	P	Pink	RW	Red/ White stripe	WR	White/ Red stripe	YR	Yellow/ Red stripe	LB	Blue/ Black stripe
BR	Black/ Red stripe	BrW	Brown/ White stripe	GW	Green/ White stripe	LW	Blue/ White stripe	R	Red	RY	Red/ Yellow stripe	Y	Yellow	YW	Yellow/ White stripe	WG	White/ Green stripe
BW	Black/ White stripe	G	Green	GY	Green/ Yellow stripe	LY	Blue/ Yellow stripe	RB	Red/ Black stripe	W	White	YB	Yellow/ Black stripe	BrY	Brown/ Yellow stripe		
BY	Black/ Yellow stripe	GB	Green/ Black stripe	Gr	Gray	Lg	Light green	RG	Red/ Green strope	WB	White/ Black stripe	YG	Yellow/ Green stripe	Sb	Blue		
Br	Brown	GL	Green/ Blue strope	L	Blue	O	Orange	RL	Red/ Blue stripe	WL	White/ Blue stripe	YL	Yellow/ Blue stripe	BG	Black/ Green stripe		

Fuse box

The fuse box houses one 7.5A-fuse, seven 15A-fuses, four 20A-fuses and one 5A-fuse lined up with spares fitted for 15A-fuses, 20A-fuses and 5A-fuses. Use fuses of correct capacity (refer to page 34).

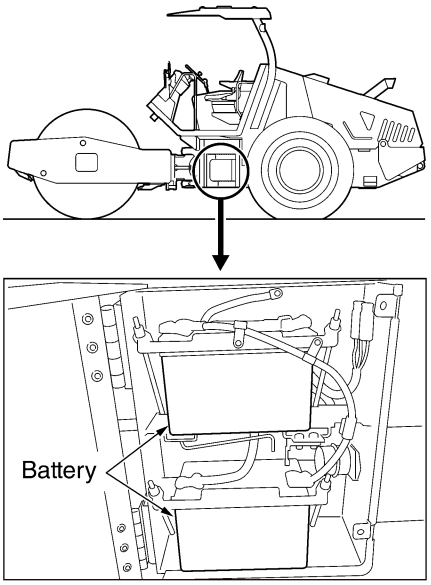


NOTE: When a fuse is burned, determine the cause before replacing.

Battery

IMPORTANT

When this machine is shipped, maintenance free battery is installed.



★ 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.

★ For long-term storage, charge it fully, tighten the caps securely, store in a cool and dry place, and check the level of charge at least once a month.

★ Maintain the level of charge above 75%.

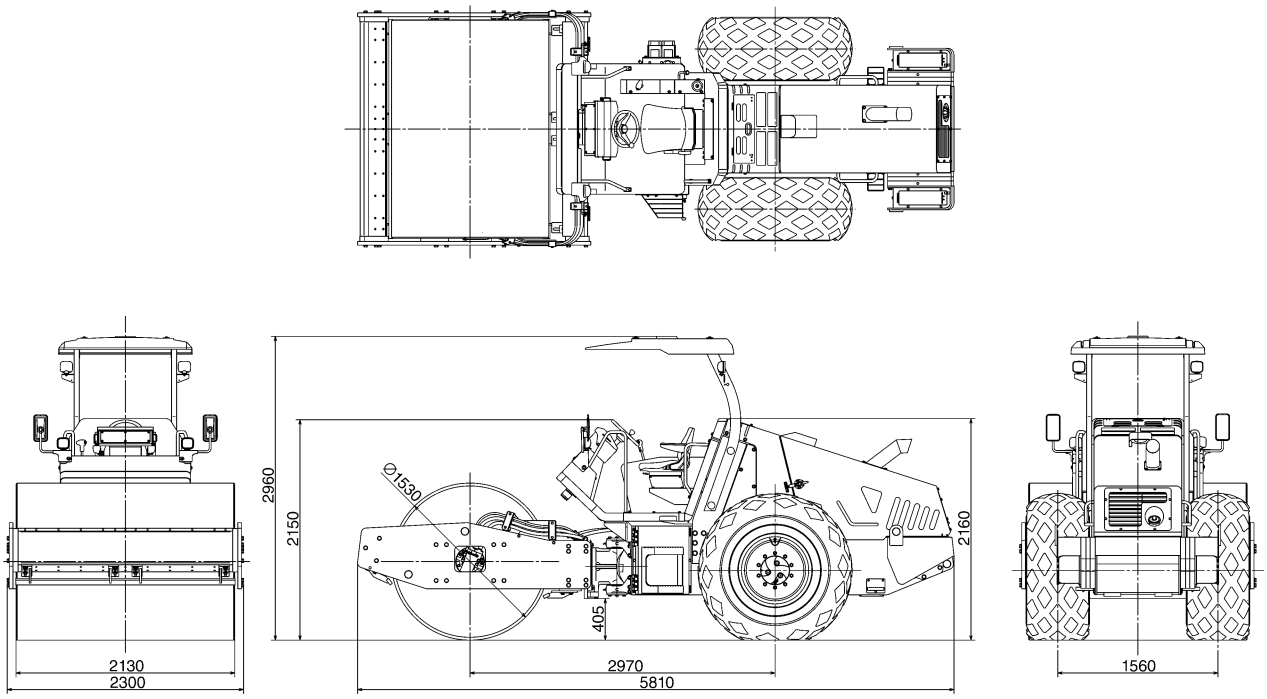
★ In cold weather, it is desirable to start the engine with the battery charged 100%. Do not try to start the engine with less than 75%.

⚠ CAUTION

The power-supply voltage of this machine is 24V.

4 SPECIFICATIONS

(1) SV521D

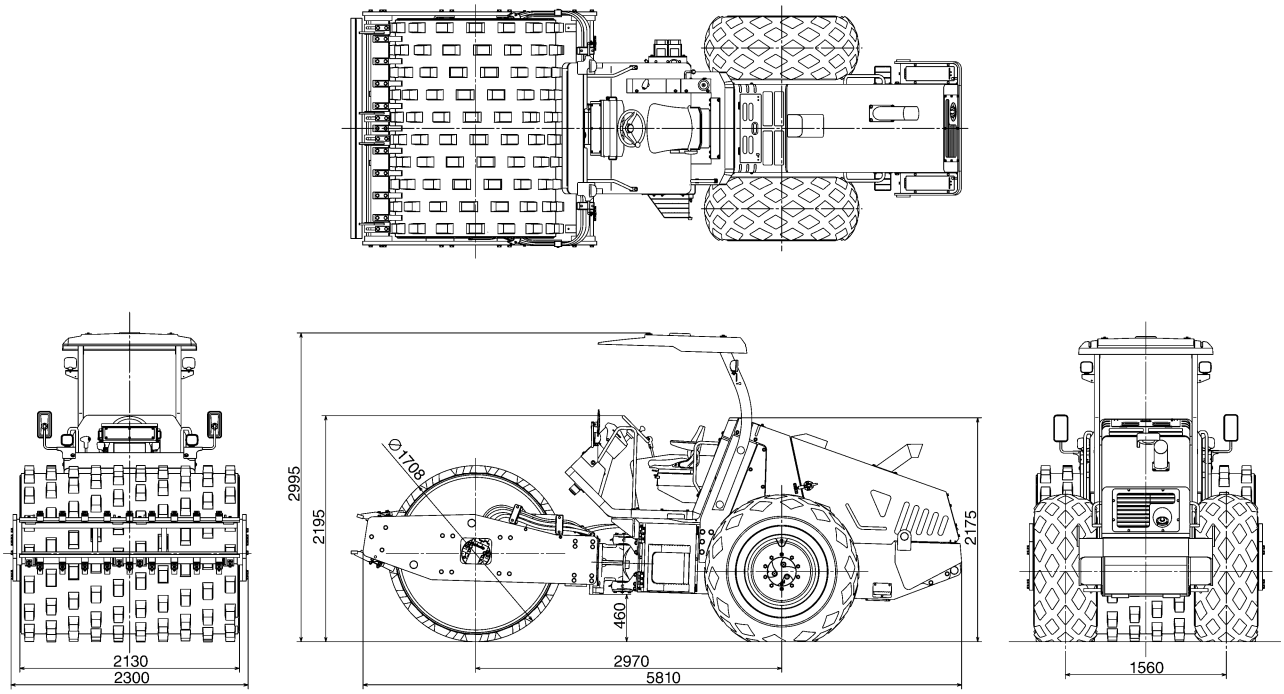


Model	SV521D
Mass:	
Operating mass	10,235 kg
On front axle	5,800 kg
On rear axle	4,435 kg
Dimension:	
Overall length	5,810 mm
Overall width	2,300 mm
Overall height	2,960 mm
Wheelbase	2,970 mm
Wheel	
Front	Roll (dia. x width)
Smooth	1,530 x 2,130 mm (60” x 84”)
Rear	Tire
	23.1– 26 – 8 PR (OR)
Performance:	
Travel speed	1st 0– 6 km / h (0– 3.7 mile / h)
	2nd 0–10 km / h (0– 6.2 mile / h)

Vibrating power:	Low	High
Frequency	33.3 Hz {2,000 vpm}	28.8 Hz {1,730 vpm}
Centrifugal force	150 kN (33,720 lbs) {15,300kgf}	255 kN (57,325 lbs) {26,000kgf}
Gradeability	63% (32°)	
Rolling width	2,130 mm (84”)	
Minimum turning radius	5.6 m (221”)	
Engine:		
Model	ISUZU “4BG1T” Diesel Engine with turbo charger	
Total displacement	4.329 litres (264.2 cu.in) {4,329 cc}	
Rated output	83.3kW {113ps} / 2,100min^{-1} {rpm} (111.7HP/2,100 rpm)	
Max. torque	387 N･m/2,000 min^{-1} {rpm} (285 ft-lb/2,000 rpm)	
Tank capacity:		
Fuel tank	215 litres (56.8 gal)	
Hydraulic oil tank	50 litres (13.2 gal)	

NOTE: 1) Gradeability 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.

(2) SV521DF

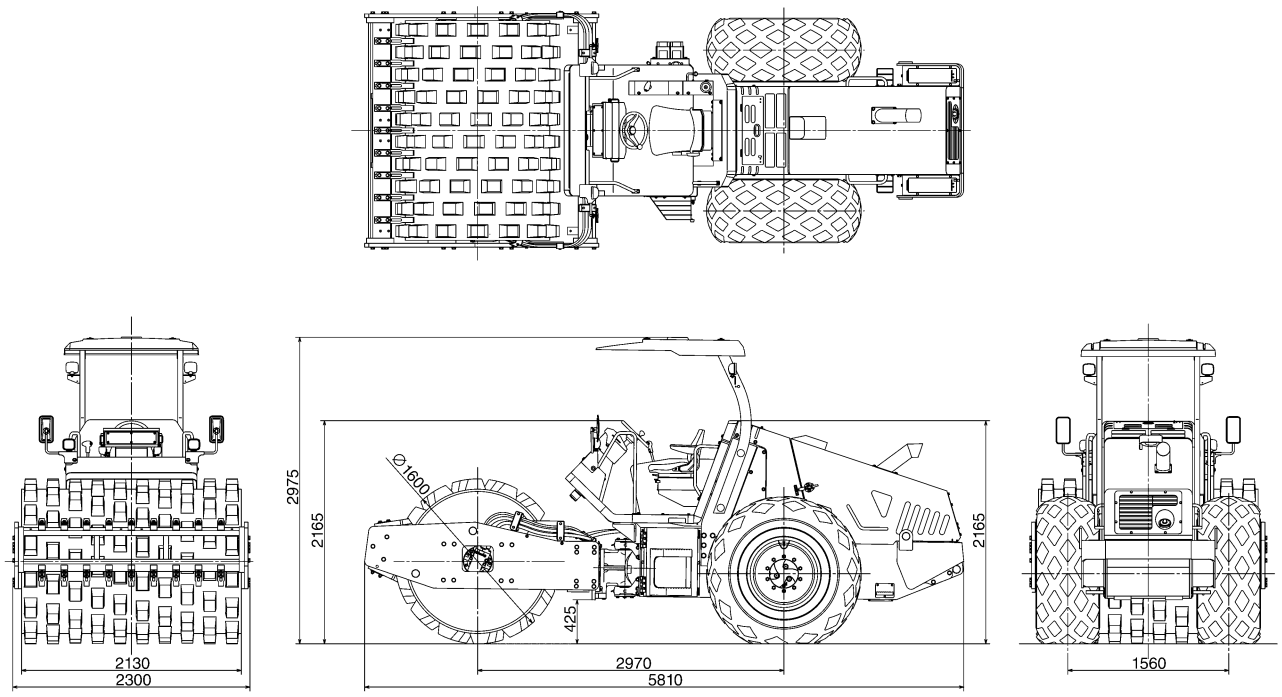


Model	SV521DF
Mass:	
Operating mass	11,875 kg
On front axle	7,505 kg
On rear axle	4,370 kg
Dimension:	
Overall length	5,810 mm
Overall width	2,300 mm
Overall height	2,995 mm
Wheelbase	2,970 mm
Wheel	
Front	Roll (dia. x width)
Smooth	1,530 x 2,130 mm (60" x 84")
Pad	1,708 x 2,130 mm (67" x 84")
Rear	Tire
	23.1– 26 – 8 PR (OR)
Performance:	
Travel speed	1st 0– 6 km / h (0– 3.7 mile / h)
	2nd 0–10 km / h (0– 6.2 mile / h)

Vibrating power:	Low	High
Frequency	33.3 Hz{2,000 vpm}	28.8 Hz{1,730 vpm}
Centrifugal force	150 kN(33,720 lbs) {15,300kgf}	255 kN(57,325 lbs) {26,000kgf}
Gradeability	56% (29°)	
Rolling width	2,130 mm (84")	
Minimum turning radius	5.6 m (221")	
Engine:		
Model	ISUZU "4BG1T" Diesel Engine with turbo charger	
Total displacement	4.329 litres (264.2 cu.in) {4,329 cc}	
Rated output	83.3kW {113ps} / 2,100min^{-1} {rpm} (111.7HP/2,100 rpm)	
Max. torque	387 N·m/2,000 min^{-1} {rpm} (285 ft-lb/2,000 rpm)	
Tank capacity:		
Fuel tank	215 litres (56.8 gal)	
Hydraulic oil tank	50 litres (13.2 gal)	

NOTE: 1) Gradeability 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) SV521T

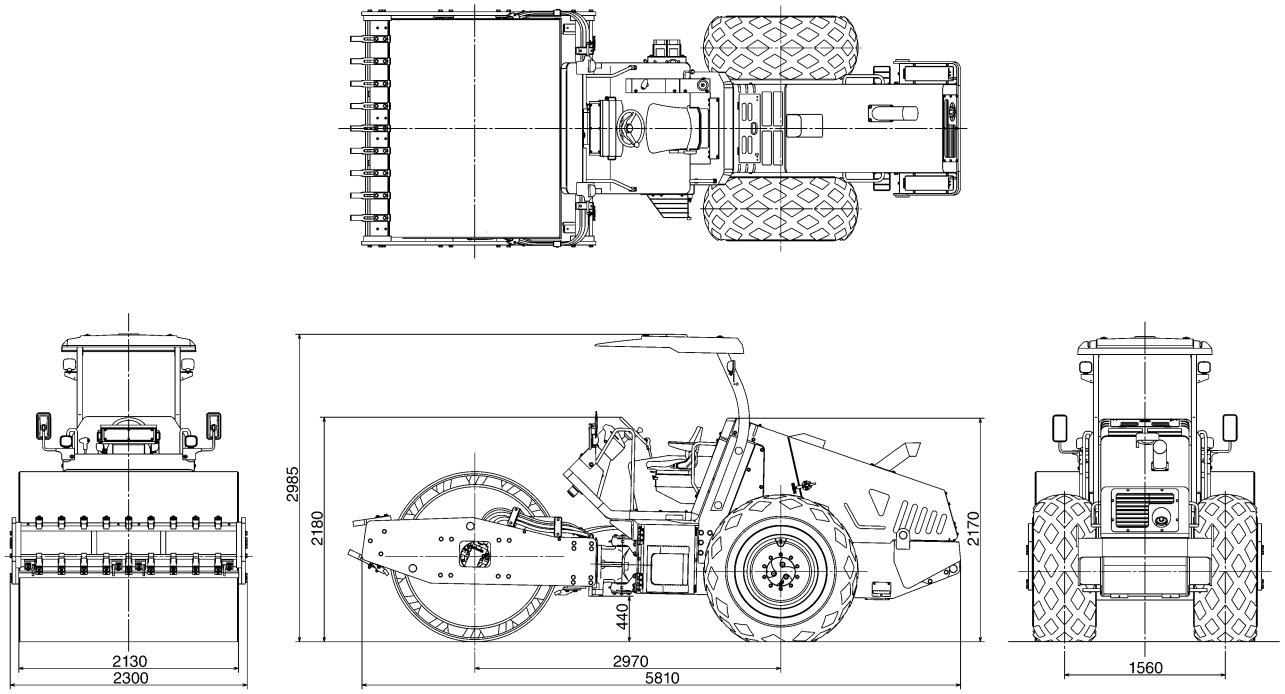


Model	SV521T
Mass:	
Operating mass	10,575 kg
On front axle	6,180 kg
On rear axle	4,395 kg
Dimension:	
Overall length	5,810 mm
Overall width	2,300 mm
Overall height	2,975 mm
Wheelbase	2,970 mm
Wheel	
Front	Roll (dia. x width)
Pad	1,600 x 2,130 mm (63" x 84")
Rear	Tire
	23.1– 26 – 8 PR (OR)
Performance:	
Travel speed	1st 0– 6 km / h (0– 3.7 mile / h)
	2nd 0–10 km / h (0– 6.2 mile / h)

Vibrating power:	Low	High
Frequency	33.3 Hz{2,000 vpm}	28.8 Hz{1,730 vpm}
Centrifugal force	150 kN(33,720 lbs) {15,300kgf}	255 kN(57,325 lbs) {26,000kgf}
Gradeability	63% (32°)	
Rolling width	2,130 mm (84")	
Minimum turning radius	5.6 m (221")	
Engine:		
Model	ISUZU "4BG1T" Diesel Engine with turbo charger	
Total displacement	4.329 litres (264.2 cu.in) {4,329 cc}	
Rated output	83.3kW {113ps} / 2,100min^{-1} {rpm} (111.7HP/2,100 rpm)	
Max. torque	387 N·m/2,000 min^{-1} {rpm} (285 ft-lb/2,000 rpm)	
Tank capacity:		
Fuel tank	215 litres (56.8 gal)	
Hydraulic oil tank	50 litres (13.2 gal)	

NOTE: 1) Gradeability 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) SV521TF

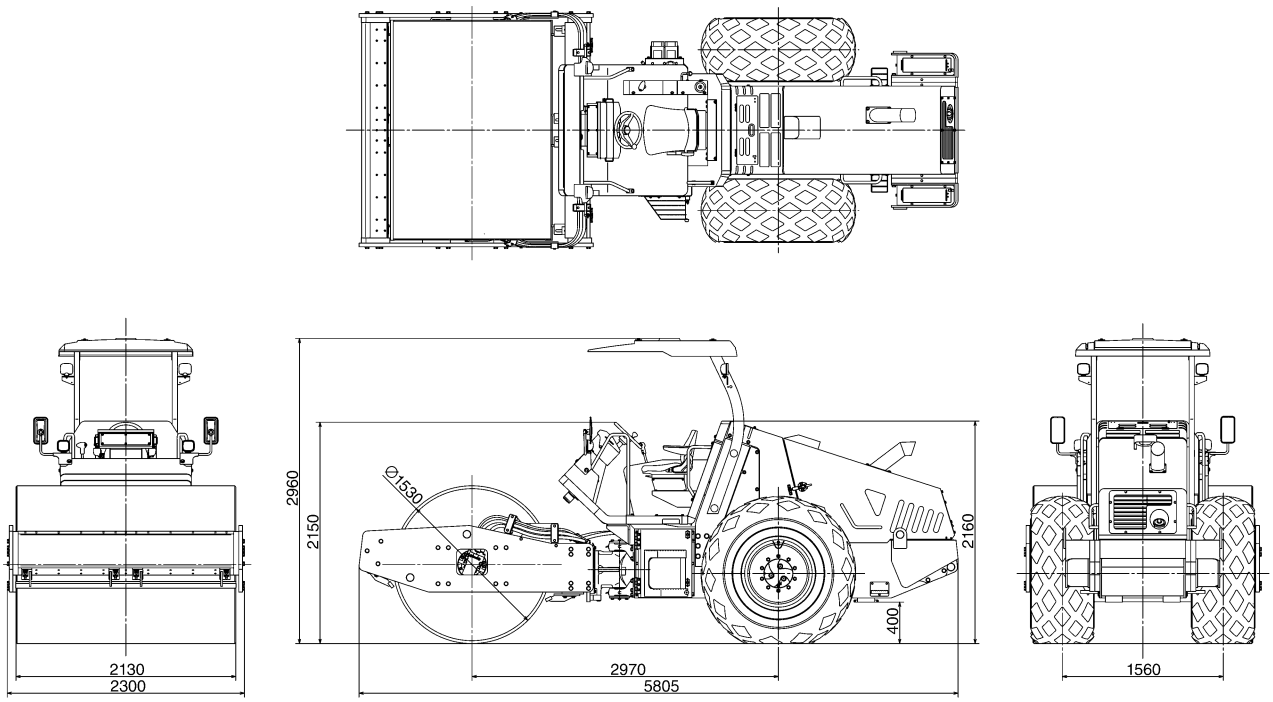


Model	SV521TF
Mass:	
Operating mass	12,845 kg
On front axle	8,440 kg
On rear axle	4,405 kg
Dimension:	
Overall length	5,810 mm
Overall width	2,300 mm
Overall height	2,985 mm
Wheelbase	2,970 mm
Wheel	
Front	Roll (dia. x width)
Smooth	1,650 x 2,130 mm (65” x 84”)
Pad	1,600 x 2,130 mm (63” x 84”)
Rear	Tire
	23.1– 26 – 8 PR (OR)
Performance:	
Travel speed	1st 0– 6 km / h (0– 3.7 mile / h)
	2nd 0–10 km / h (0– 6.2 mile / h)

Vibrating power:	Low	High
Frequency	33.3 Hz{2,000 vpm}	28.8 Hz{1,730 vpm}
Centrifugal force	150 kN(33,720 lbs) {15,300kgf}	255 kN(57,325 lbs) {26,000kgf}
Gradeability	49% (26°)	
Rolling width	2,130 mm (84”)	
Minimum turning radius	5.6 m (221”)	
Engine:		
Model	ISUZU “4BG1T” Diesel Engine with turbo charger	
Total displacement	4.329 litres (264.2 cu.in) {4,329 cc}	
Rated output	83.3kW {113ps} / 2,100min^{-1} {rpm} (111.7HP/2,100 rpm)	
Max. torque	387 N・m/2,000 min^{-1} {rpm} (285 ft-lb/2,000 rpm)	
Tank capacity:		
Fuel tank	215 litres (56.8 gal)	
Hydraulic oil tank	50 litres (13.2 gal)	

NOTE: 1) Gradeability 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.

(5) SV521DH

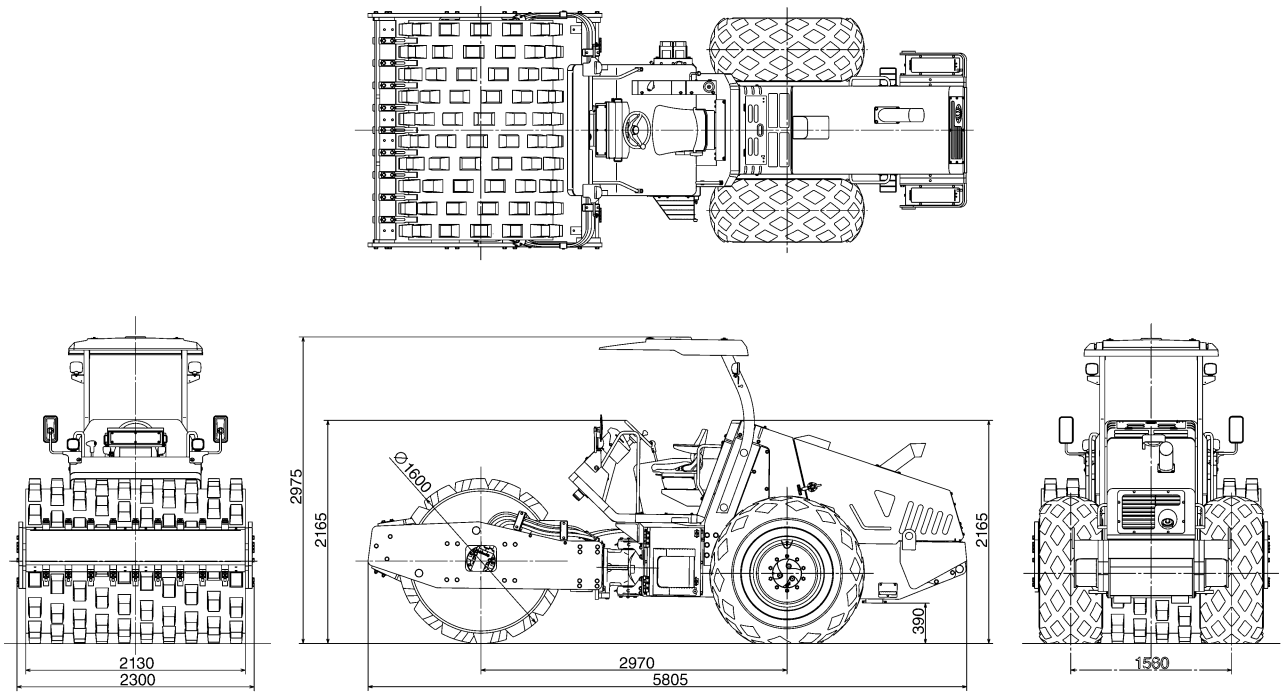


Model	SV521DH
Mass:	
Operating mass	11,130 kg
On front axle	6,320 kg
On rear axle	4,810 kg
Dimension:	
Overall length	5,810 mm
Overall width	2,300 mm
Overall height	2,960 mm
Wheelbase	2,970 mm
Wheel	
Front	Roll (dia. x width)
Smooth	1,530 x 2,130 mm (60" x 84")
Rear	Tire
	23.1– 26 – 8 PR (OR)
Performance:	
Travel speed	1st 0– 6 km / h (0– 3.7 mile / h)
	2nd 0–10 km / h (0– 6.2 mile / h)

Vibrating power:	Low	High
Frequency	33.3 Hz {2,000 vpm}	28.8 Hz {1,730 vpm}
Centrifugal force	150 kN (33,720 lbs) {15,300kgf}	255 kN (57,325 lbs) {26,000kgf}
Gradeability	61% (31°)	
Rolling width	2,130 mm (84")	
Minimum turning radius	5.6 m (221")	
Engine:		
Model	ISUZU "4BG1T" Diesel Engine with turbo charger	
Total displacement	4.329 litres (264.2 cu.in) {4,329 cc}	
Rated output	83.3kW {113ps} / 2,100min^{-1} {rpm} (111.7HP/2,100 rpm)	
Max. torque	387 N·m/2,000 min^{-1} {rpm} (285 ft-lb/2,000 rpm)	
Tank capacity:		
Fuel tank	215 litres (56.8 gal)	
Hydraulic oil tank	50 litres (13.2 gal)	

NOTE: 1) Gradeability 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.

(6) SV521TH



Model	SV521TH
Mass:	
Operating mass	11,470 kg
On front axle	6,700 kg
On rear axle	4,770 kg
Dimension:	
Overall length	5,810 mm
Overall width	2,300 mm
Overall height	2,975 mm
Wheelbase	2,970 mm
Wheel	
Front	Roll (dia. x width)
Pad	1,600 x 2,130 mm (63" x 84")
Rear	Tire
	23.1– 26 – 8 PR (OR)
Performance:	
Travel speed	1st 0– 6 km / h (0– 3.7 mile / h)
	2nd 0–10 km / h (0– 6.2 mile / h)

Vibrating power:	Low	High
Frequency	33.3 Hz{2,000 vpm}	28.8 Hz{1,730 vpm}
Centrifugal force	150 kN(33,720 lbs) {15,300kgf}	255 kN(57,325 lbs) {26,000kgf}
Gradeability	59% (30°)	
Rolling width	2,130 mm (84")	
Minimum turning radius	5.6 m (221")	
Engine:		
Model	ISUZU "4BG1T" Diesel Engine with turbo charger	
Total displacement	4.329 litres (264.2 cu.in) {4,329 cc}	
Rated output	83.3kW {113ps} / 2,100min^{-1} {rpm} (111.7HP/2,100 rpm)	
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