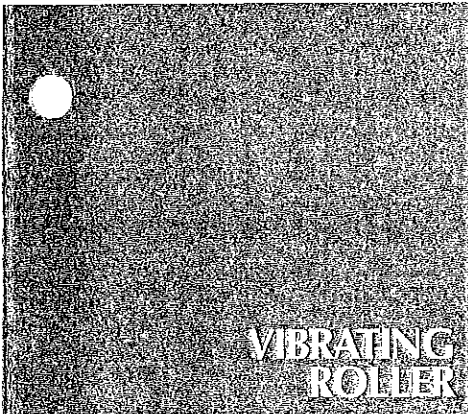


⚠ Read this handbook thoroughly and understand the whole information contained before trying to operate, inspect and service your machine!

**OPERATING &
MAINTENANCE
INSTRUCTIONS**



MODEL

SV400-I Series

SV400D-I

SV400T-I

SV400TB-I

SV400TF-I

SV400TFB-I

From SV400D-I → VSVD9 - 20153
SV400T-I → VSVT9 - 20162
SV400TF-I → VSVT9 - 20162
SV400TB-I → VSVT9 - 20162
SV400TFB-I → VSVT9 - 20162

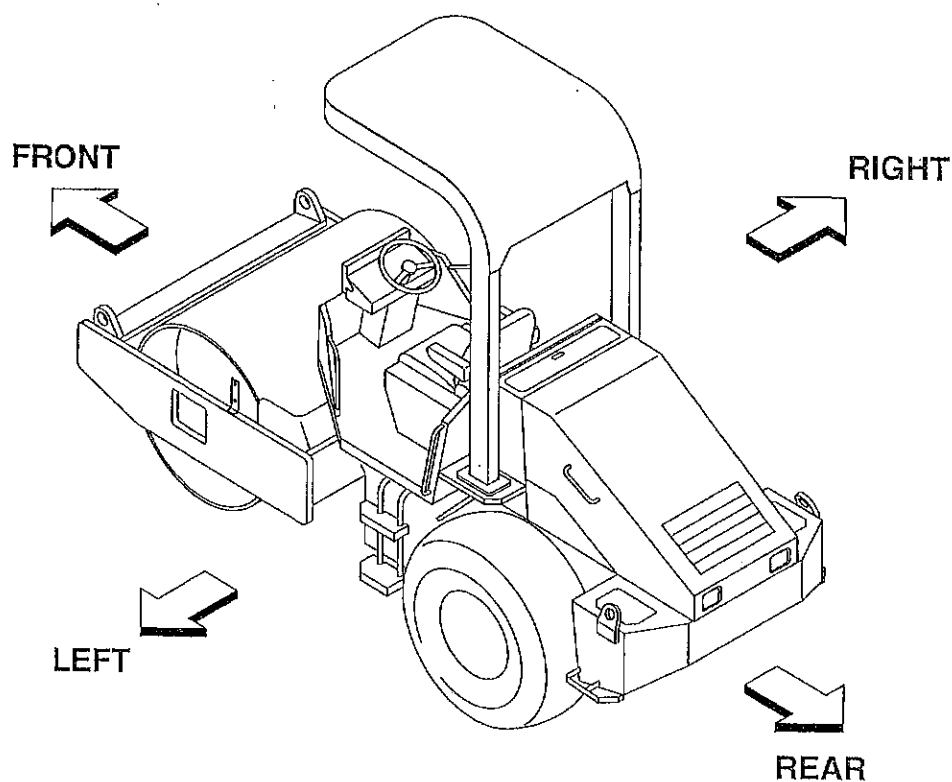
PREFACE

This operator's manual serves as a guide for the use of your Sakai SV400-1 Series Vibrating Roller for those who are new to the machine, and also for the people who have experience in using the Machine and want to refresh their knowledge for the machine.

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

The main subjects of this manual are:

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



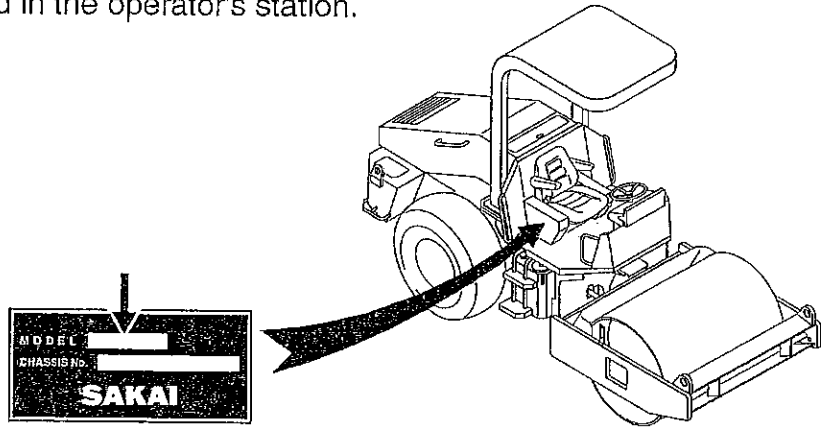
2.5	Precautions for Working.....	37
2.5.1	Compaction operation.....	37
2.5.2	When going downhill.....	37
2.5.3	On a slope.....	37
2.6	Applicable Jobs.....	37
2.7	After Operation.....	38
2.8	Loading and Unloading.....	39
2.8.1	Use of a trailer equipped with a winch.....	39
2.8.2	Self-propelling.....	40
2.9	After Loading the Machine.....	41
2.10	Transportation.....	41
2.11	Operation in Cold Weather.....	41
2.11.1	Fuel oil and grease.....	41
2.11.2	Coolant.....	41
2.11.3	Battery.....	42
2.12	When the Cold Season is Over.....	43
2.13	For a Long Storage Period.....	43
2.14	During the Storage Period.....	43
2.15	When the Battery Has Discharged.....	44
2.15.1	Connection and disconnection of booster cables.....	44
3.	PERIODICAL MAINTENANCE.....	46
3.1	Precautions.....	46
3.1.1	Lifting the machine on a hoist.....	48
3.2	Walk-around Checking.....	49
3.3	Periodical Maintenance Points.....	50
3.4	Maintenance Procedure.....	52
	(1) Every 10 hours or daily.....	52
	(2) Every 50 hours.....	53
	(3) Every 250 hours.....	55
	(4) Every 500 hours.....	58
	(5) Every 1000 hours.....	59
	(6) As required.....	61
3.5	Feeding Water and Lubricants.....	63
3.6	Electric Wiring Diagram.....	65
4.	SPECIFICATIONS.....	67

MACHINE AND ENGINE IDENTIFICATION NUMBERS

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

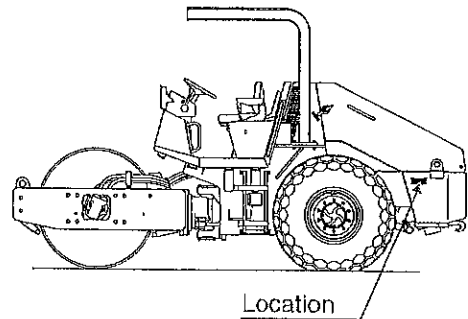
(1) Machine model

Indicated on the dashboard in the operator's station.

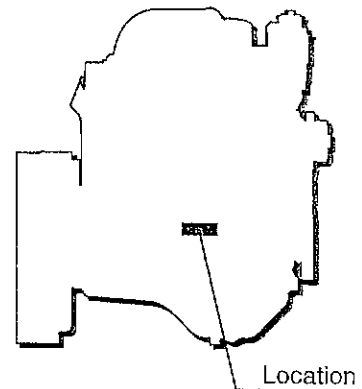


(2) Machine serial number

SV400D-1 ⇨ VSV9D- ○○○○○○
SV400T-1 ⇨ VSV9T- ○○○○○○
SV400TF-1 ⇨ VSV9T- ○○○○○○
SV400TB-1 ⇨ VSV9T- ○○○○○○
SV400TFB-1 ⇨ VSV9T- ○○○○○○



(3) Engine serial number



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

 **WARNING**

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

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

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

1. BASIC PRECAUTIONS FOR SAFETY

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

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

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

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



■ Be careful of hot parts.

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



■ Be careful with fire.

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



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

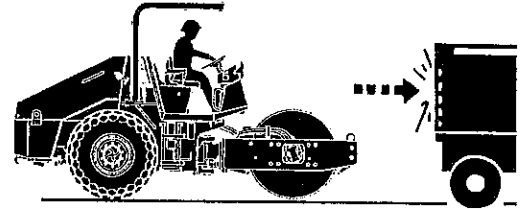


⚠ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

■ Know the stopping distance.

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



1.3 Before Starting the Engine

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

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

■ Secure good visibility (with cabin)

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

■ Secure forward and backward visibilities.

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

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

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

■ When starting, sound the horn.

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



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

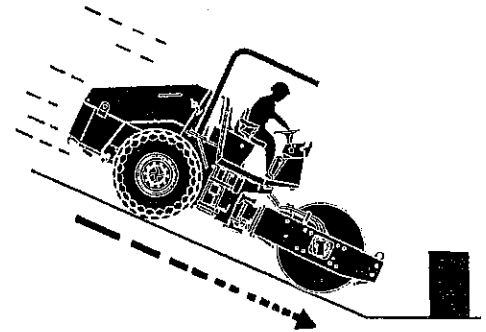
1. BASIC PRECAUTIONS FOR SAFETY

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

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

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

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



■ **Refrain from inattentive driving.**

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

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

■ **Keep everyone away from the pinch points.**

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



■ **At night, carefully drive the machine.**

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

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

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

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

1. BASIC PRECAUTIONS FOR SAFETY

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

1.7 Transportation

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

1.8 Handling the Battery

■ When handling the battery:

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



⚠ WARNING

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

Wash hand after handling.

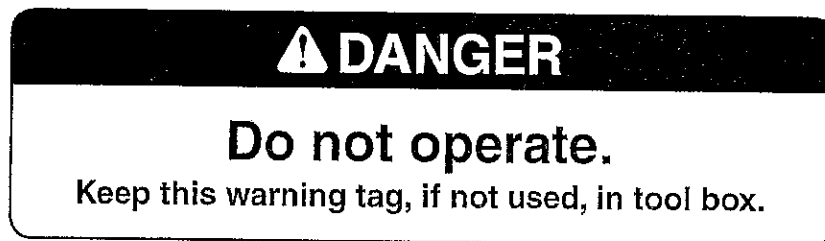
⚠ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

1.10 Before Servicing

■ Attach warning tags when servicing the machine.

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



■ Use proper tools.

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

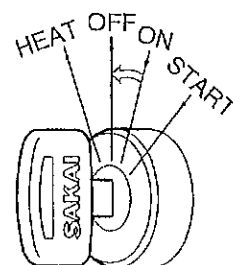


■ Change safety-related parts at regular intervals.

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

■ Inspect or service your machine with the engine stopped.

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

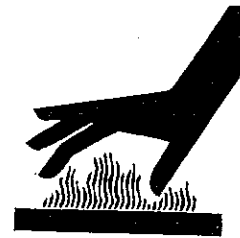
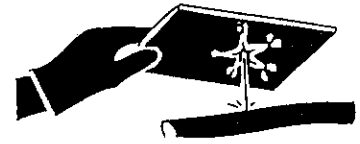


▲ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY

■ Be careful of high pressure hydraulic fluid.

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



■ Be careful of hot parts

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

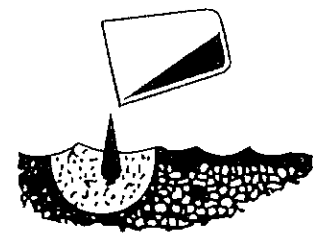
■ Use care when inspecting or servicing fan or belts in motion

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



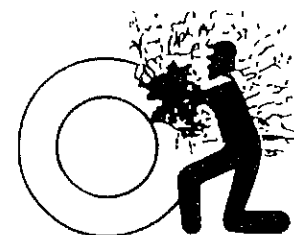
■ Used oil disposal

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



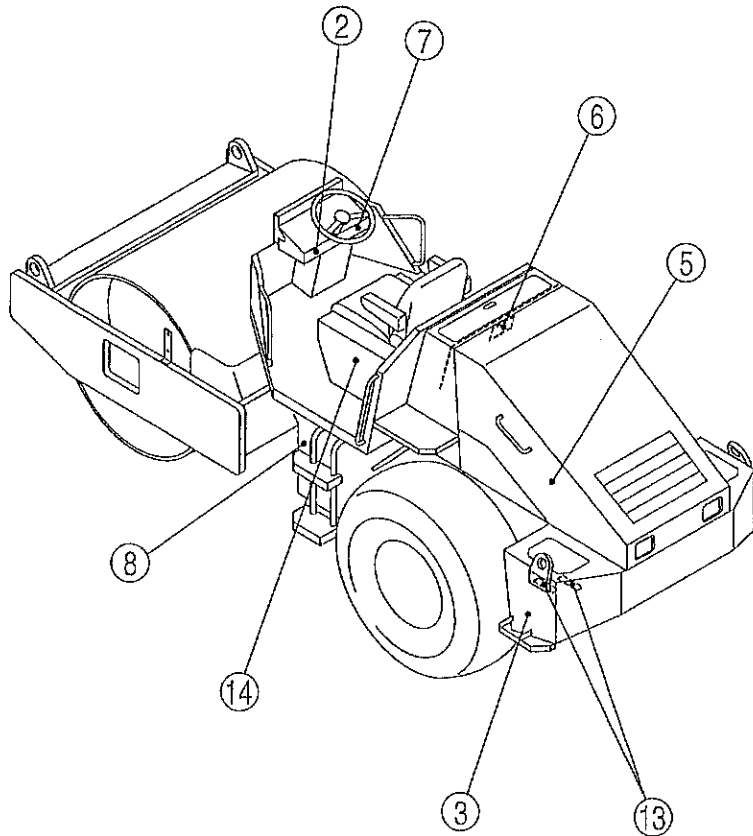
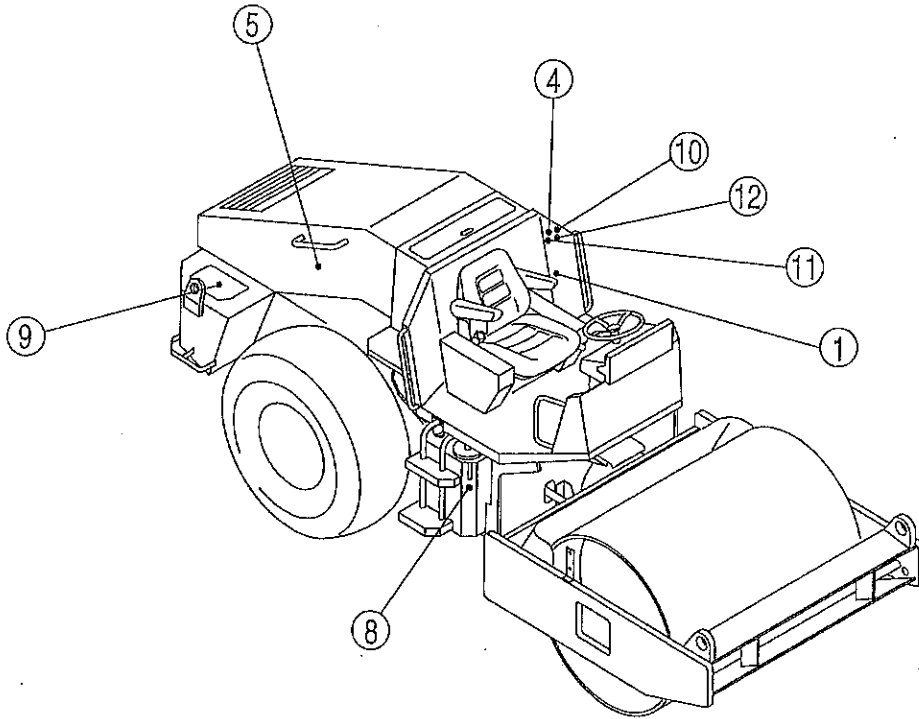
■ Exercise extreme care when replacing and repairing tires

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



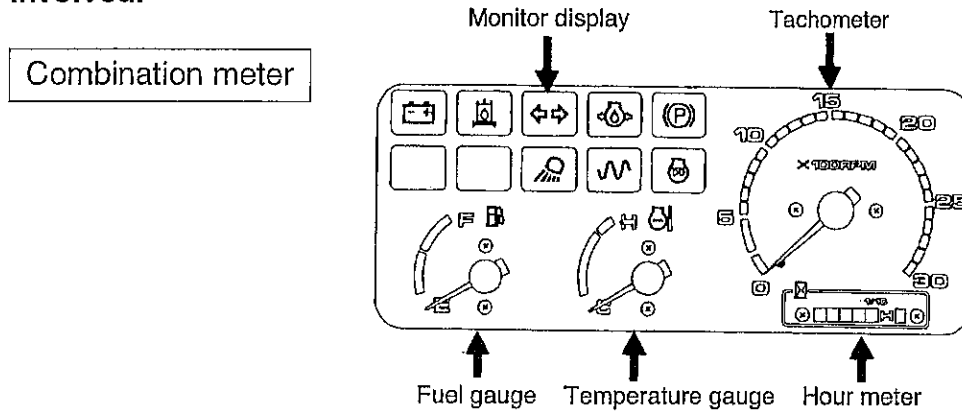
⚠ WARNING: Negligence of these instructions can lead to accidents.

1. BASIC PRECAUTIONS FOR SAFETY



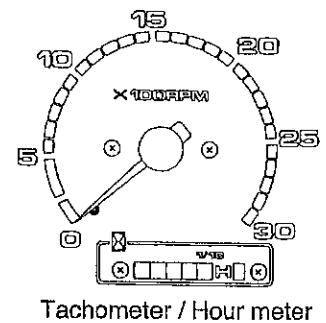
2.1.2 Gauges, indicator lamps and warning lamps

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



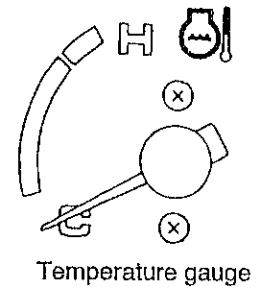
Tachometer

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.



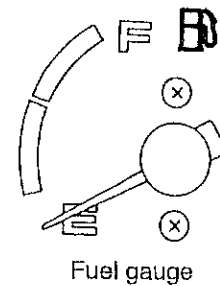
Temperature gauge

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.



Fuel gauge

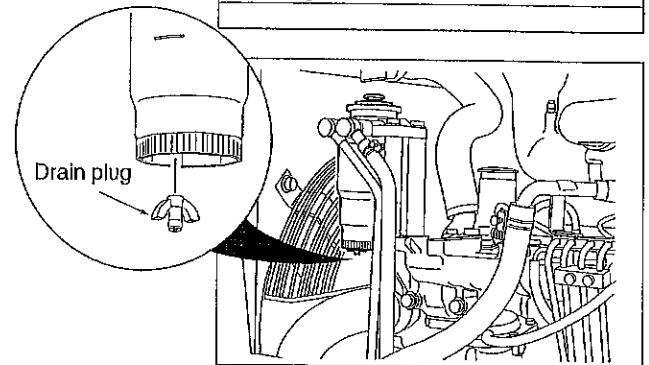
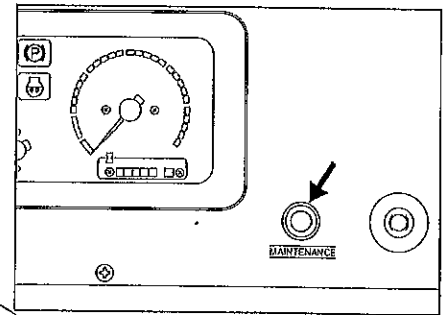
Indicates the fuel level in the tank.
 E: The tank is empty.
 F: The tank is full.



Maintenance Lamp

When the lamp comes on, drain off the water from the fuel filter. Check that the lamp has gone out after that.

(See page 54)



2.1.3 Switches

Starter switch

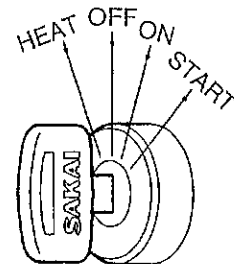
Starts and stops the engine.

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

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

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

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




Lamp switch (OPTION)

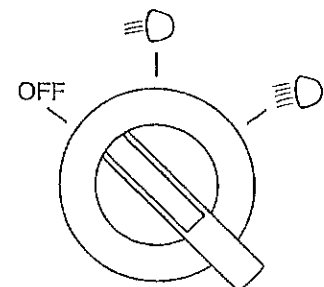
Has three positions.

OFF: All lamps are switched off.


☉: Each gauge lamp and the headlamps become bright.

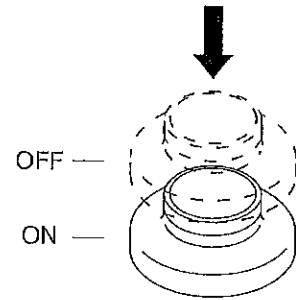
☉☉: In addition, the flood lamps become bright.

At this time, an icon  on monitor display will go on.



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.





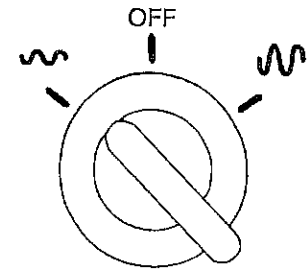
CAUTION

- Never pull the switch UP.

Vibrator switch

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

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






Vibrator switch

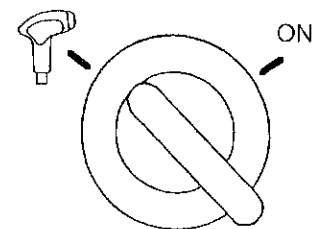
NOTE: For vibratory rolling, for vibratory rolling, run on full throttle.

Vibration Selector Switch

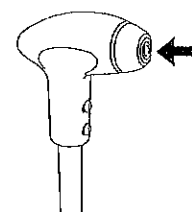
Selection can be mode between the vibrator switch installed to the forward-reverse lever and the other one located on the panel to the right of operator seat.

-  position: Vibration can be turned ON or OFF with the switch located on the forward-reverse 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: Have this switch placed at this position when vibration is not to be actuated.



Vibration selector switch



Vibration switch

NOTE: For vibratory rolling, for vibratory rolling, run on full throttle.

2. OPERATION

Leveling blade lift lever (SV400TB-1, SV400TFB-1)

The leveling blade is operated from a single control lever.

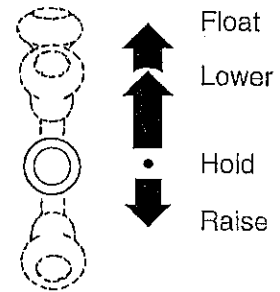
The lever has four positions; RAISE, HOLD, LOWER and FLOAT.

Raise : To raise the blade, pull the lever backward.
The lever automatically returns to the Hold position when released.

Hold : When this position is selected, the blade stays in any position.

Lower: To lower the blade, push the lever forward.
The lever automatically returns to the Hold position when released.

Float : Push the lever forward to its full extent.
In this position, the blade becomes free to ride up and down over the ground, following the ground configuration as the machine travels. The lever stays in the Float position even if it is released.



Brake pedal

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

IMPORTANT

Do not use the pedal wherever practicable except for an emergency.

2.1.5 Unloader valve

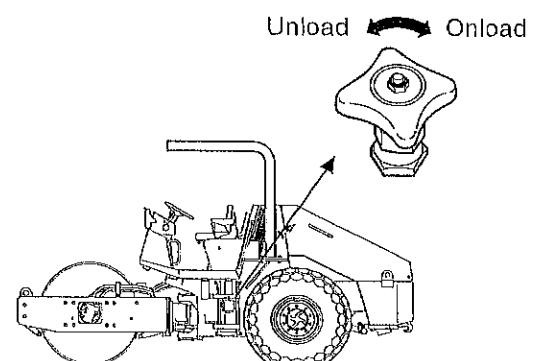
The unloader valve disengages the drive, playing a role like a clutch. Use this valve for towing the machine when the engine is disabled or when troubles have developed in the hydraulic drive.

For towing:

Turn the knob counter-clockwise (Unload).

For normal traveling:

Turn the knob clockwise (Onload).

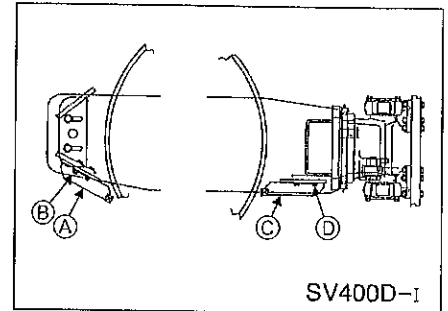


2.2.2 Scraper adjustment and replacement

SV400D-1

1) Clearance adjustment of scraper (A)

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



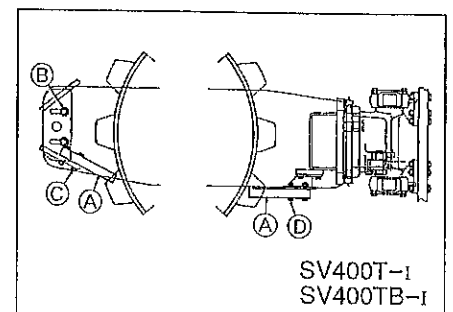
2) Clearance adjustment of scraper (C)

- ① Loosen bolts (D) at 8 locations.
- ② Provide a clearance of 20mm between scraper and the drum.
- ③ Retighten bolts (D) at 8 locations.

SV400T-1, SV400TB-1

1) Clearance adjustment of scrapers (A)

- ① Loosen bolts and nuts (B) (4 locations) and (D) (16 locations) at bottom.
- ② Provide a clearance of 20mm between scrapers (A) and the drum.
- ③ Retighten bolts and nuts (B) (4 locations) and (D) (16 locations) .



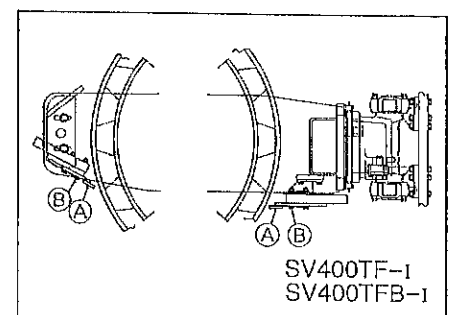
2) Replacement of scrapers (A) (9 pieces on top and 8 pieces at rear.)

- ① Remove bolts and nuts (C) and (D).
- ② Replace scrapers (A) with new ones.
- ③ Refit and retighten bolts and nuts (C) and (D).

SV400TF-1, SV400TFB-1

1) Clearance adjustment of scraper blades (A). (One at the right and one at the left)

- ① Loosen bolts and nuts (B) (8 locations respectively at front and rear)
- ② Provide a clearance of 20mm between scrapers (A) and the drum.
- ③ Retighten bolts and nuts (B) (8 locations respectively at front and rear)



2) Replacement of scraper blades (A)

- ① Remove bolts and nuts (B) (8 locations respectively at front and rear)
- ② Replace scraper blades (A) with new ones.
- ③ Refit and retighten bolts and nuts (B) (8 locations respectively at front and rear)

2.3 Operation

⚠ WARNING

- This machine is a one-man roller.
- Operate the machine from the operator's seat.

2.3.1 Before-starting inspection

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

⚠ WARNING

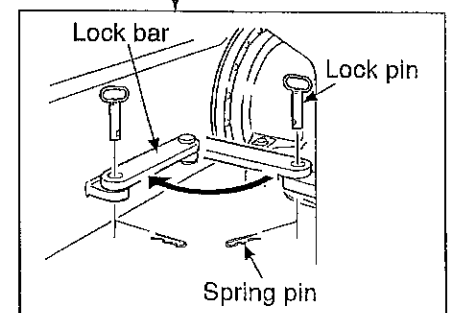
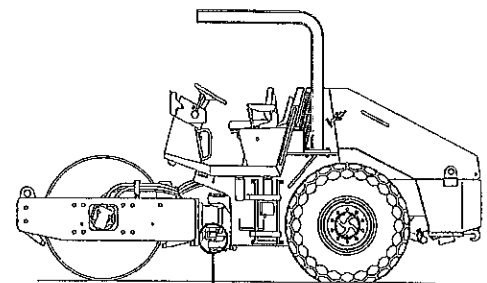
Make sure that the steering lock bar is connected in the carrying position before putting the machine in motion. Steering is impossible if the bar is in the steering lock position.

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

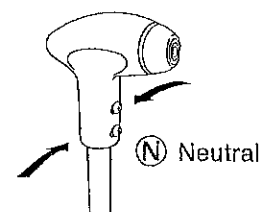
To unlock the bar:

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

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

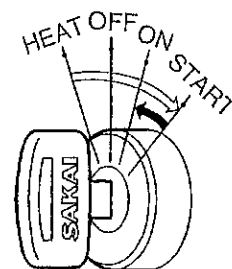


(2) Check that the F-R lever and is in the neutral position
 Ⓝ.



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

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



⚠ CAUTION

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

2.3.3 After starting the engine

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

IMPORTANT

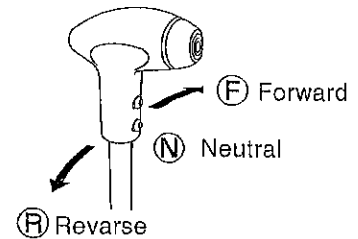
Avoid increasing the engine speed abruptly before warming-up run is completed.

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

2. OPERATION

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

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



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

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

2.3.5 Stopping / Parking

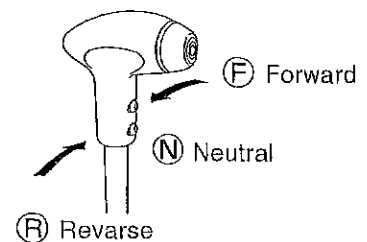
⚠ WARNING

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

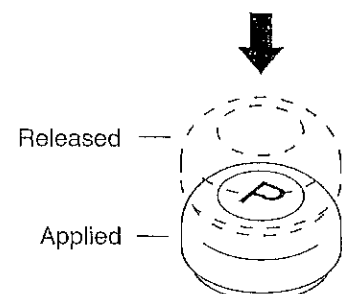
(1) Bring the F-R lever to the neutral position (N), and the machine will come to a halt.

⚠ CAUTION

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

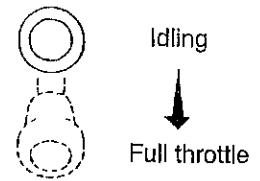


(2) Press the parking switch button securely, and check that indicator lamp (P) illuminates.




2.4 Vibratory Operation


(1) Run the engine on the full throttle by operating throttle lever or higher by operating the throttle lever.

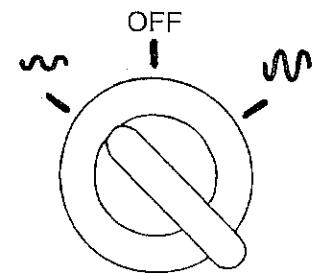


(2) Amplitude of vibration is selectable and turned on and off with the vibration switch (A) located on control panel to the right of operator seat.

 position: Turning the vibration switch clockwise causes the vibration to start with high amplitude.

OFF position: Vibration is shut down.

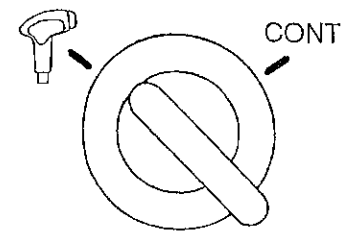
 position: Turning the vibration switch counter clockwise causes vibration to start with low amplitude.






Vibrator switch (A)

NOTE: For vibratory rolling, run the engine at 1,800 rpm or higher.

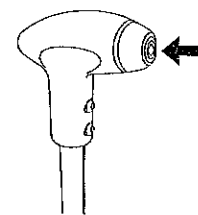
Also, by means of vibration selector switch (B), the selection can be made between the vibration switch (C) installed to the forward-reverse lever and the other one located on the panel to the right of operator seat.



Vibration selector switch (B)

 position: Vibration can be turned ON or OFF with the switch located on the forward-reverse lever. Pressing this switch causes the vibration to start and pressing it again to stop. This vibration switch on the lever should be used with the vibration switch on the panel placed at  or  position.

CONT position: Have this switch placed at this position when vibration is not to be actuated.



Vibration switch (C)

2.5 Precautions for Work

2.5.1 Compaction operation

■ Do not operate the vibrator on hard location

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

■ Change the direction of travel gently.

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

2.5.2 When going downhill

■ Use the F-R lever.

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

■ Use the engine brake

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

▲ WARNING

- When going uphill, run at low speed. Do not attempt to shift speeds during travelling. The machine can slip down the slope.
- When going downhill, adjust the travel speed not to allow the engine speed to exceed 2,500 rpm.

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

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 materials marked ☆ .

Work

- Asphalt road paving
- Dust removal treatment for road
- ☆ Road improvement

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

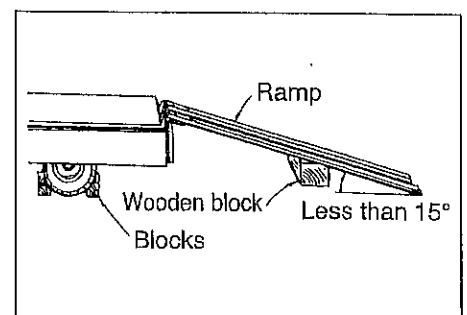
⚠ WARNING

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.



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, obey traffic regulations.

2.11 Operation in Cold Weather

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

2.11.1 Fuel oil and grease

Use fuel and oil with low viscosity. See "Rating" on page 63.

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 to the lowest temperature in the job location.

2.12 When the Cold Season is Over

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

- 1) Change oil and fuel with those for use in warm season referring to "Rating" on page 63.
- 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-R lever placed at neutral position (N) and vibrator switch at OFF position, have the parking brake engaged.
- 7) Chock the machine.
- 8) Remove the starter switch key.

2.14 During the Storage Period

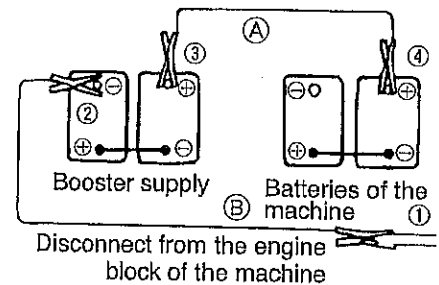
▲ WARNING

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.
- To prevent the brake linings from sticking to the brake drum, disengage the brake once a month. Exercise care not to allow the machine to move unexpectedly.

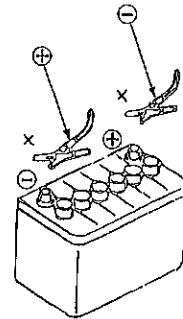
■ Disconnection of booster cables

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



⚠ WARNING

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



⚠ CAUTION

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

3. PERIODICAL MAINTENANCE

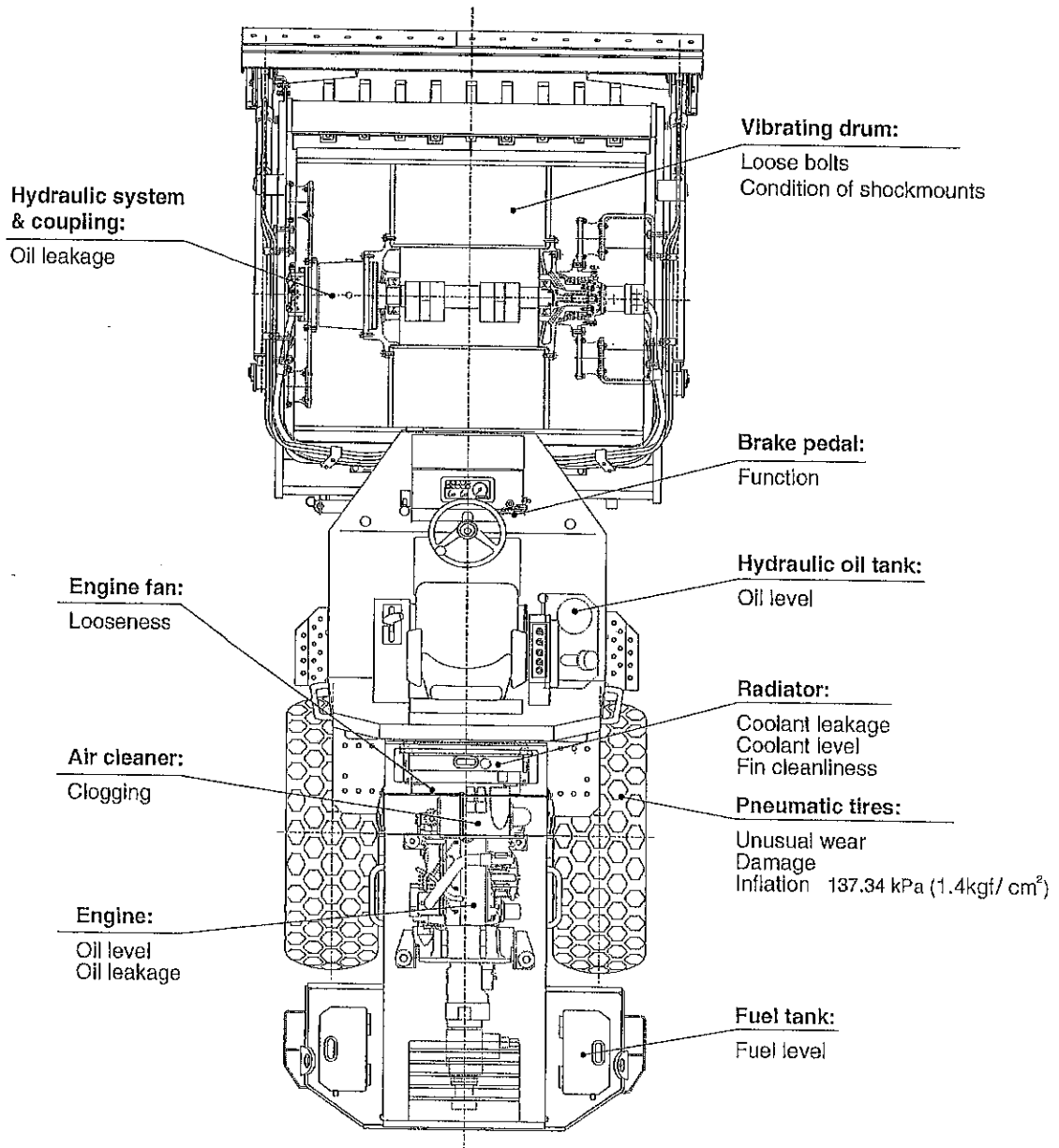
System or Mechanism	Part name	Periodical replacement maintenance parts	Replacement period	Remarks
1. Brake system	Master cylinder	Seals (rubber parts)	2 years	Adopted machines only
	Wheel cylinder	Seals (rubber parts)	2 years	//
	Brake piping parts	Brake hose	2 years	
		Air hose	2 years	Adopted machines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

⚠ CAUTION:

- With a new machine, change the engine oil and change the engine oil filter elements after 50 hours of operation for the first time only. (Refer to page 55)
- When trouble occurs in the location indicated by the indicator lamp on the monitor display, sensor will work and corresponding lamp comes on. If this occurs, conduct necessary service regardless of the periodical service interval recommendation.
 - 1) The hydraulic filter (line filter) warning lamp ⇨ Replace elements
- Check the electric wiring at a regular interval not exceeding one month:
 - 1) Damage to the wire harness and loose clamps
 - 2) Loose sockets
 - 3) Function of electrical systems

3.2 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. PERIODICAL MAINTENANCE

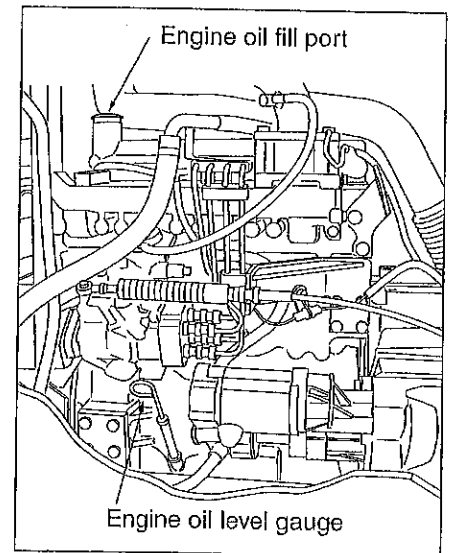
Interval	Ref. No.	Item	Service	Lubricant	Q'ty
Every 10 service hours or daily	⑯	Radiator	Check coolant level, add as necessary	Coolant	1
	⑰	Fan belt	Check tension and adjust		1
	⑱	Engine oil pan	Check oil level, add as necessary	Engine oil	1
Every 50 service hours	①	Hydraulic oil tank	Check oil level, add as necessary	Hydraulic oil	1
	④	Air cleaner	Check indicator		1
	⑧	Fuel sedimenter	Check and remove water and sediment		1
	⑪	Battery	Check fluid level, add as necessary	Battery fluid	2
	* ⑳	Cylinder head and anchor pins	Apply grease	Grease	4
	* ㉑	Push rod anchor pin	Apply grease	Grease	2
Every 250 service hours	⑤	Engine oil filter	Change element		1
	⑩	Tires	Check condition and air pressure		2
	⑫	Rubber dampers	Check for condition		—
	⑬	Vibrator	Check oil level, add as necessary	Gear oil	1
	⑭	Brake link	Apply grease	Grease	2
	⑲	Gear case : Wheel motor	Check oil level, add as necessary	Gear oil	1
	㉒	Center pin and tiltpin bearings	Apply grease	Grease	4
	㉓	Steering cylinder	Apply grease	Grease	4
	㉔	Differential and final drive	Check oil level, add as necessary	Gear oil	1
	㉕	Engine oil pan	Change oil	Engine oil	1
Every 500 service hours	⑥	Return filter	Change element		1
	⑦	Line filter	Change element		1
	⑨	Fuel filter	Change element		1
	⑮	Control link	Check looseness and adjust		1
Every 1000 service hours	②	Suction filter	Clean element		1
	③	Hydraulic oil tank	Change oil	Hydraulic oil	1
	⑬	Vibrator	Change oil	Gear oil	1
	⑲	Gear case : Wheel motor	Change oil	Gear oil	1
	㉔	Differential and final drive	Change oil	Gear oil	1
When required	④	Air cleaner	Clean or change element		1
	㉖	Fuel tank	Clean interior		1

* SV400TB-1, SV400TFB-1 only

3. PERIODICAL MAINTENANCE

⑱ Engine oil pan

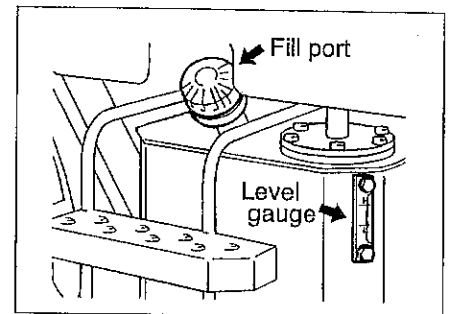
Shut down the engine and check the engine oil level. If it is not between MAX and MIN marks, add oil through the fill hole.



(2) Every 50 hours

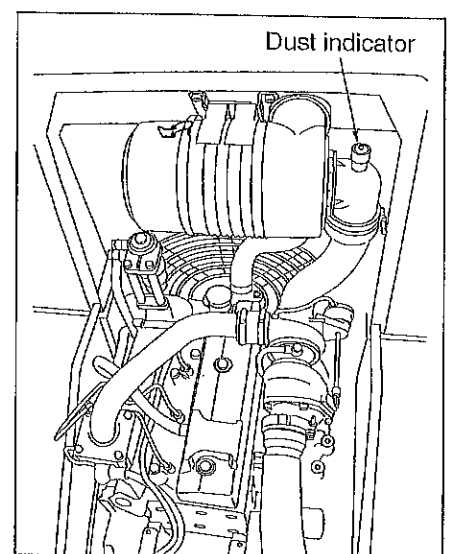
① Hydraulic oil tank

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



④ Air cleaner

When the red float of the dust indicator reaches the service level (a mark on the indicator), clean the element (see page 58).



(3) Every 250 hours

⑤ Engine oil filter

②③ 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 ① removed.

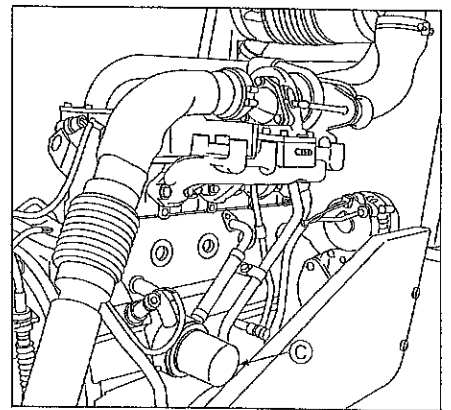
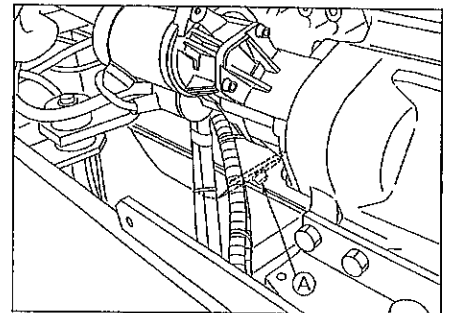
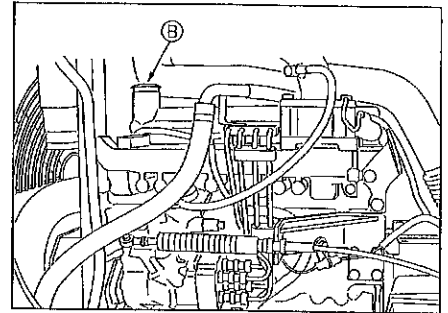
⚠ WARNING

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

(2) Refit the drain plug ① and fill the crankcase with the engine oil from the fill hole ②.

(3) Change the oil filter ③.

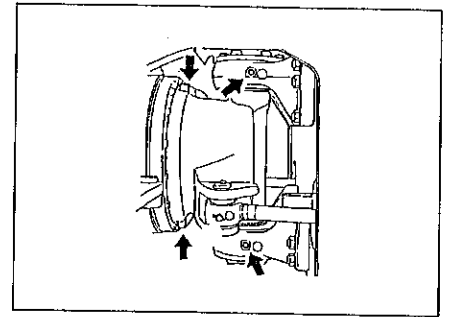
NOTE: For a new machine, change oil at 50 operating hours for the initial time only.



3. PERIODICAL MAINTENANCE

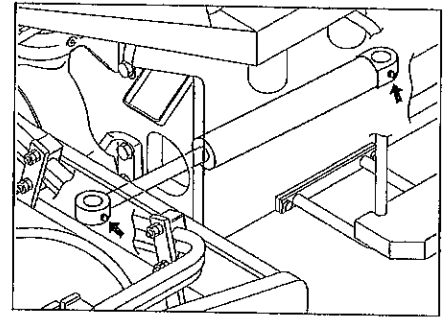
20 Center pin and tilt pin bearings

Apply grease at 4 locations.



21 Steering cylinder

Apply grease at 4 locations.

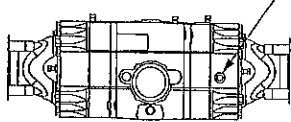


22 Differential and final drive

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

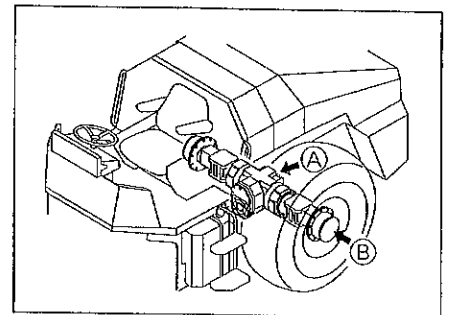
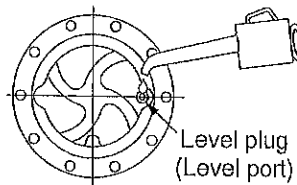
<Differential (A)>

Fill port plug and Level plug
(Fill port and Level port)



<Final drive (B)>

Level plug
(Level port)



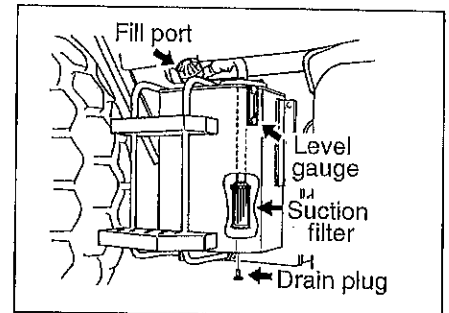
(5) Every 1,000 hours

② Suction filter

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

③ Hydraulic tank

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

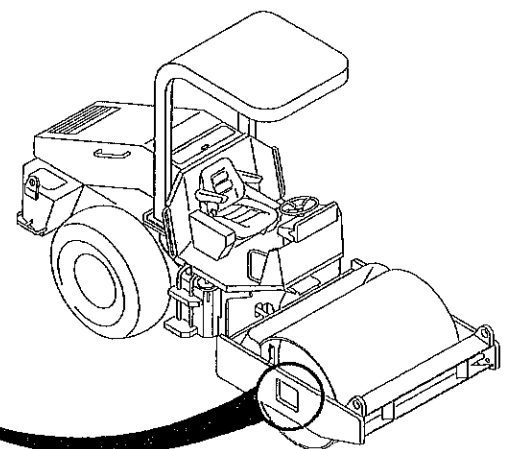
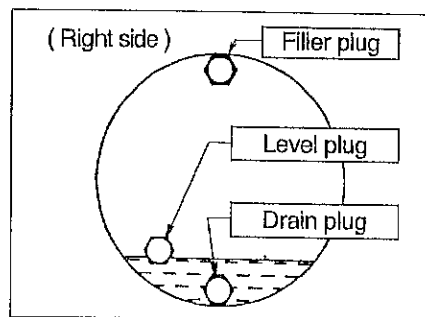


⚠ WARNING

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

⑬ 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

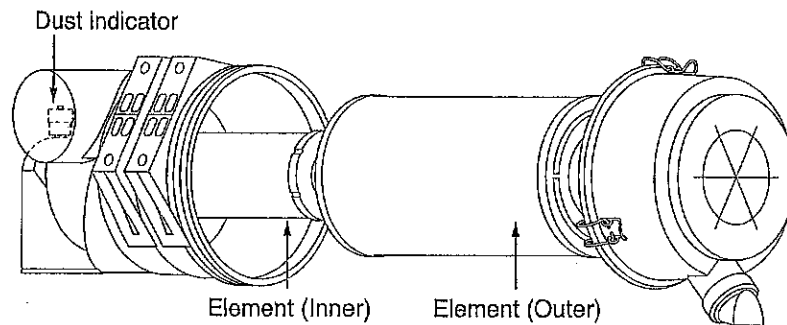
The oil capacity of the vibrator is 21 liters each. Do not fill more than 21 liters.

(6) As required

④ Air cleaner

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

- (1) Unclip and remove the cover. Withdraw the element.
- (2) Blow compressed air from inside of the element.



⚠ WARNING

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

- (3) Check the element for any damage and replace as necessary, before pushing the dust indicator reset button.
- (4) Reinstall the element and fix the cover with the clip.

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

⚠ CAUTION

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

3.5 Feeding Water and Lubricants

1. General rules

- 1) Never feed water or lubricant with the strainer removed.
- 2) Use recommended lubricant and hydraulic fluid.
- 3) Do not use lubricants and hydraulic fluid of different brands.
- 4) When replacing oil, drain it completely and clean the container with flushing oil before filling new oil.

2. Capacity

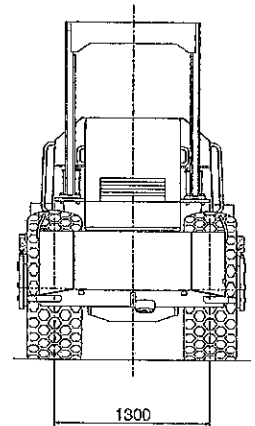
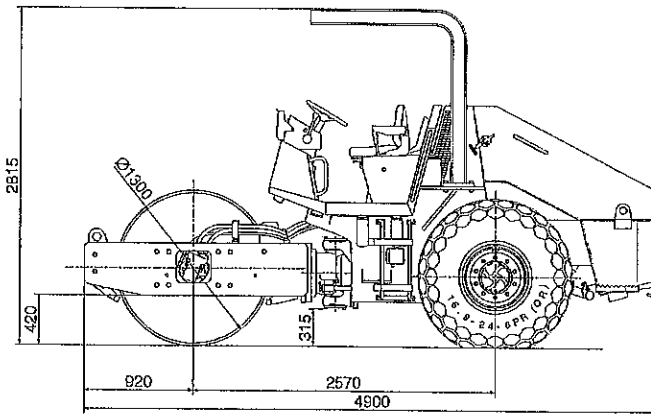
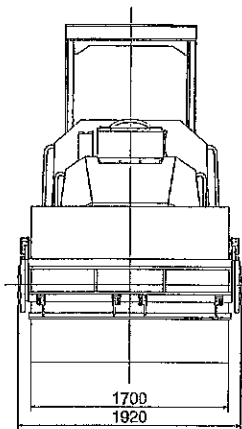
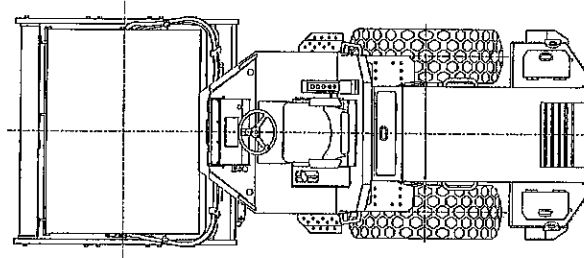
Compartment	Type of fluid	Capacity in liters(gal.)
Fuel tank	Diesel oil	180 (48.0)
Engine oil pan	Engine oil	8 (2.1)
Hydraulic oil tank	Hydraulic oil	50 (13.2)
Wheel motor	Gear oil	3.2 (0.8)
Radiator	Coolant	12 (3.2)
Vibrator	Gear oil	21 (5.5)
Differential	Gear oil	7.3 (1.9)
Final drives	Gear oil	1.25 x 2 (0.33 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 15W-40	SAE 40	SAE 40	MIL-L-2104B
Gear oil	API grade GL4	SAE 80W-90	SAE 90	SAE 140	MIL-L-2105
Hydraulic oil	Wear resistant	ISO-VG32 over VI 140	ISO-VG46 over VI 140	ISO-VG68 over VI 110	ISO-3448
Grease	Lithium type extreme pressure				NLGI-2
Fuel	Diesel oil				ASTM D975-2D

4. SPECIFICATIONS

(1) SV400D-I

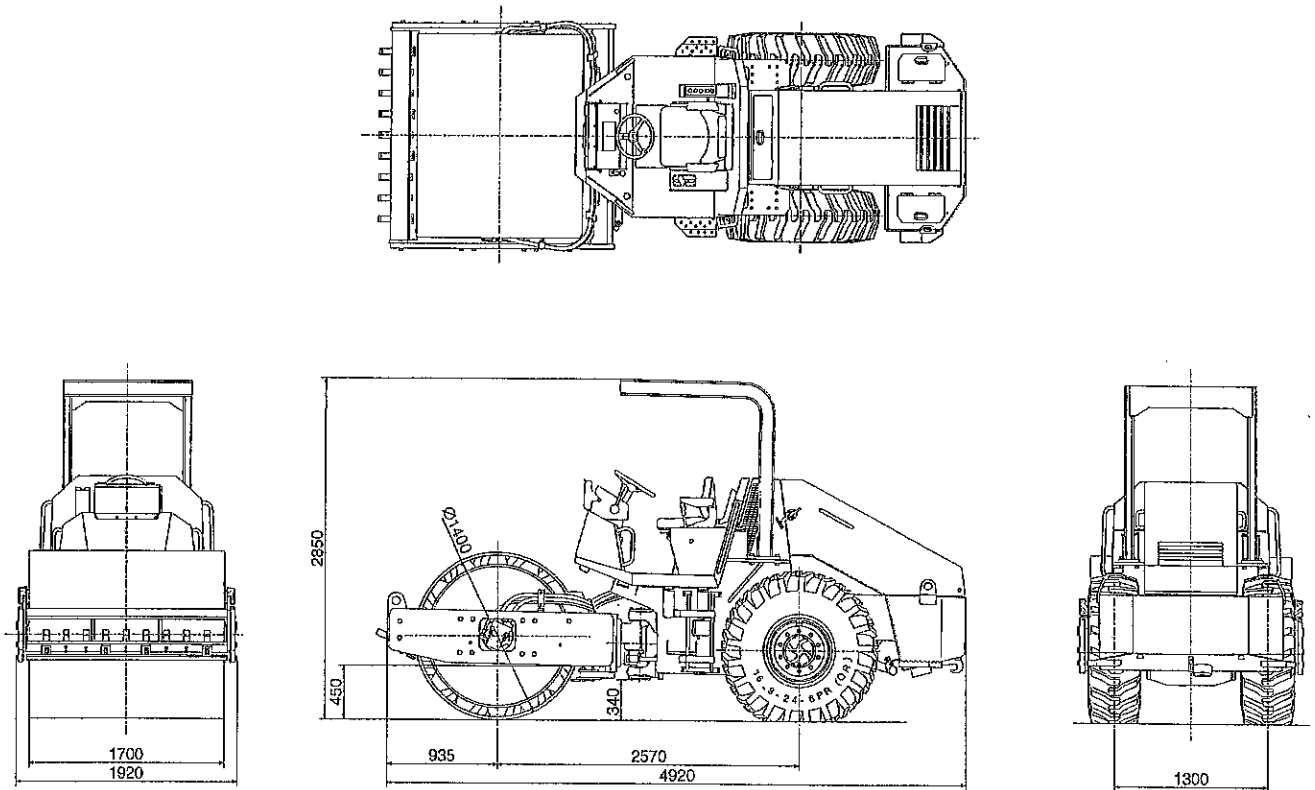


Model		SV400D-I	
Weight:			
Gross weight	7,350 kg (16,210 lbs)		
On front axle	3,500 kg (7,720 lbs)		
On rear axle	3,850 kg (8,490 lbs)		
Dimension:			
Overall length	4,900 mm (193")		
Overall width	1,920 mm (76")		
Overall height	2,815 mm (111")		
Wheelbase	2,570 mm (101")		
Wheel			
Front	Roll (dia. x width)		
	1,300 x 1,700 mm (51" x 67")		
Rear	Tire		
	16.9-24-6PR (OR)		
Performance:			
Travel speed			
	Low 0~ 6 km/h (0~ 3.7 mile/h)		
	High 0~ 10 km/h (0~ 6.2 mile/h)		
		Vibrating power:	
		Low	High
		Frequency	38 Hz {2,300 vpm} 30 Hz {1,800 vpm}
		Centrifugal force	93 kN(20,940 lbs) 118 kN(26,460 lbs) {9,500 kgf} {12,000 kgf}
		Gradability	62% (32°)
		Rolling width	1,700 mm (67")
		Minimum turning radius	4.7 m (185")
		Engine:	
		Model	CUMMINS "B3.3T" Diesel Engine with turbo charger
		Total displacement	3.260 litres (199 cu.in) {3,260 cc}
		Rated output	60kW {81 ps} /2,200 min ⁻¹ {rpm} (80 HP/2,200 rpm)
		Max. torque	292N·m {29.8 kgf·m} /1,600 min ⁻¹ {rpm} (216 ft-lbs/1,600 rpm)
		Tank capacity:	
		Fuel tank	180 litres (48 gal)
		Hydraulic oil tank	50 litres (13 gal)

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

4. SPECIFICATIONS

(3) SV400TF- I

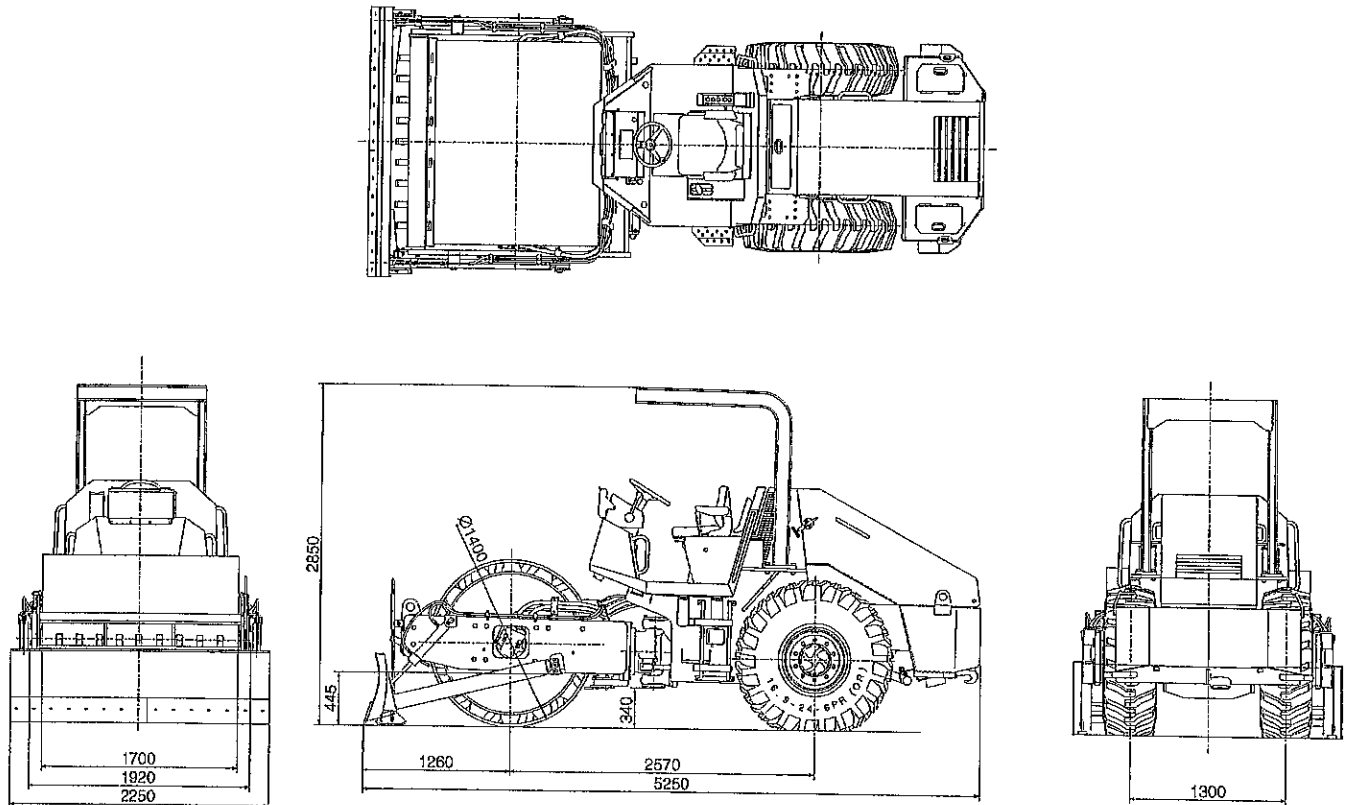


Model		SV400TF-I	
Weight:			
Gross weight	8,900 kg (19,620 lbs)		
On front axle	5,050 kg (11,130 lbs)		
On rear axle	3,850 kg (8,490 lbs)		
Dimension:			
Overall length	4,920 mm (194")		
Overall width	1,920 mm (76")		
Overall height	2,850 mm (112")		
Wheelbase	2,570 mm (101")		
Wheel			
Front	Roll (dia. x width)		
Smooth	1,400 x 1,700 mm (55" x 67")		
Pad	1,350 x 1,700 mm (53" x 67")		
Rear	Tire		
	16.9-24-6PR (OR)		
Performance:			
Travel speed			
	Low 0 ~ 6 km/h (0 ~ 3.7 mile/h)		
	High 0 ~ 10 km/h (0 ~ 6.2 mile/h)		
Vibrating power:		Low	High
Frequency		38 Hz {2,300 vpm}	30 Hz {1,800 vpm}
Centrifugal force		103 kN(23,150 lbs) {10,500 kgf}	127 kN(28,660 lbs) {13,000 kgf}
Gradability		62% (32°)	
Rolling width		1,700 mm (67")	
Minimum turning radius		4.7 m (185")	
Engine:			
Model		CUMINS "B3.3T" Diesel Engine with turbo charger	
Total displacement		3,260 litres (199 cu.in) {3,260 cc}	
Rated output		60kW {81 ps} /2,200 min ⁻¹ {rpm} (80 HP/2,200 rpm)	
Max. torque		292N·m {29.8 kgf·m} /1,600 min ⁻¹ {rpm} (216 ft·lbs/1,600 rpm)	
Tank capacity:			
Fuel tank		180 litres (48 gal)	
Hydraulic oil tank		50 litres (13 gal)	

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

4. SPECIFICATIONS

(5) SV400TFB- I



Model		SV400TFB-I	
Weight:			
Gross weight	9,500 kg (20,950 lbs)		
On front axle	5,750 kg (12,680 lbs)		
On rear axle	3,750 kg (8,270 lbs)		
Dimension:			
Overall length	5,250 mm (207")		
Overall width	2,250 mm (89")		
Overall height	2,850 mm (112")		
Wheelbase	2,570 mm (101")		
Wheel			
Front	Roll (dia. x width)		
Smooth	1,400 x 1,700 mm (55" x 67")		
Pad	1,350 x 1,700 mm (53" x 67")		
Rear	Tire		
	16.9-24-6PR (OR)		
Performance:			
Travel speed			
	Low 0~ 6 km/h (0~ 3.7 mile/h)		
	High 0~ 10 km/h (0~ 6.2 mile/h)		
Vibrating power:			
	Low	High	
Frequency	38 Hz {2,300 vpm}	30 Hz {1,800 vpm}	
Centrifugal force	103 kN(23,150 lbs) {10,500 kgf}	127 kN(28,660 lbs) {13,000 kgf}	
Gradability	62% (32°)		
Rolling width	1,700 mm (67")		
Minimum turning radius	4.7 m (185")		
Engine:			
Model	CUMMINS "B3.3T" Diesel Engine with turbo charger		
Total displacement	3.260 litres (199 cu.in) {3,260 cc}		
Rated output	60kW {81 ps}/2,200 min ⁻¹ {rpm} (80 HP/2,200 rpm)		
Max. torque	292N·m {29.8 kgf·m}/1,600 min ⁻¹ {rpm} (216 ft-lbs/1,600 rpm)		
Tank capacity:			
Fuel tank	180 litres (48 gal)		
Hydraulic oil tank	50 litres (13 gal)		

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

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