Operator Manual

GSV2000

HATSUTA

2019.JAN

Introduction

Thank you for purchasing the GSV2000 Hatsuta Top dresser.

This instruction manual describes the correct handling and easy care of the Top dresser so that you will be able to fully demonstrate its performance. In order to ensure safe and comfortable operation, please read this manual in its entirety before use to fully understand the machine, practice operating the machine, and become proficient in its operation before operating it correctly. Please operate, adjust, or maintain the machine with a full understanding of this instruction manual. Failure to follow this manual may result in death or serious injury.

Even a minor malfunction should be repaired as soon as possible to prevent a major malfunction. If the machine is not working properly, do not force it, and feel free to contact the Hatsuta dealer where you purchased the machine. All Hatsuta distributors are familiar with the latest service methods and are equipped with the necessary facilities to provide proper and prompt service. Hatsuta distributors are fully stocked with Hatsuta service parts or can order them quickly from the factory. Use of parts other than genuine HATSUTA parts or parts specifically set by HATSUTA will void the warranty.

Please read the enclosed instruction manuals for the engine, battery, etc., and use the machine correctly. After reading the manual, be sure to keep it in a safe place so that you can check its contents at any time, and take it out and read it again when you have any questions. If you cannot read the manual due to damage or loss, please purchase a new manual from the dealer and keep it in a safe place for future reference.

※ **When ordering parts, please provide the model and fuselage number of the main unit in addition to the name and quantity of parts required. The aircraft number is located on the nameplate on the right side of the frame of the main unit. We recommend that you record the number below so that you can refer to it at any time.**

Model GSV2000　　Serial No. _____

Some of the figures shown in the instruction manual are shown with the cover and safety guard removed for clarity. However, under no circumstances should these safety devices be removed from the machine. Always operate the machine with the safety devices securely installed in place.

Please note that machine specifications are subject to change without notice due to improvements in quality and performance or other circumstances.

Safety Precautions

⚠ Attention

1. Always keep this instruction manual in a readily accessible place where it can be read at any time without fear of loss or defacement.
2. If this instruction manual becomes unreadable due to damage or is lost, please purchase a new one from the dealer and keep it in a safe place for constant reference.
3. The person operating the machine must read and understand the instruction manual carefully before operating the machine.
4. If the label is damaged or peeled off and no longer legible, purchase a new label from the retailer and replace it.

⚠ Attention

For safe Top dressing work

- **Please dress appropriately so that no part of your clothing, hair, hand towels, etc. will get caught in the machine.**
- **The engine and other parts of the machine are extremely hot during operation. Do not touch the hot parts of the machine to avoid burns.**
- **The rotating parts of the machine are the most dangerous parts. Do not touch it during operation. Also, keep other people away from the rotating parts.**
- **When inspecting or cleaning the machine, be sure to stop the engine, stop the rotating parts, and allow all parts of the machine to reach room temperature.**

The following persons should not engage in the work

① **Persons under the influence of alcohol**

② **Persons who are unable to work normally due to fatigue, illness, drug influence or other reasons.**

③ **Pregnant**

④ **Persons under 18 years of age**

⑤ **People who are susceptible to the effects of pesticides, such as injured persons and menstruating women.**

1. Read this instruction manual carefully to familiarize yourself with the machine. Operating an unfamiliar machine may result in an accident.
2. The terms "right" and "left" and "front" and "rear" of the machine in the instruction manual mean the direction in which the operator sits in the operator's seat and moves forward.
3. Wear work-appropriate clothing and helmets so that no part of your clothing, hair, hand towels,

etc. will get caught in the machine.

4. Operation should be limited to daytime or when there is adequate lighting.
5. Do not allow children to operate machinery. Even adults should not be allowed to operate the machine without proper training.
   Be sure to have a person with a driver's license drive the vehicle.
6. When operating the machine, do not carry people on the working parts.
7. This machine cannot be driven on public roads.

⚠ **Warning**
Safety Measure
◎ **All covers must be installed in their proper position.** ◎ **Before leaving the driver's seat, be sure to do the following** A) **When parking, please choose a flat area. The golf course has many ups and downs, so please avoid parking on slopes.** B) **Parking brake or wheel stopper.** C) **Turn off the engine of the work equipment.** D) **Remove the engine key of the work equipment.** ◎ **Check the safety around the machine.** ◎ **Be sure to clean all parts of the machine of turf debris, fallen leaves, etc. Especially, clean the engine and muffler parts even during operation. In particular, clean the engine and muffler parts even during operation. Please inspect and maintain the machine in accordance with the periodic inspection list in this instruction manual.** ◎ **◎Beginning and ending inspections must be performed daily.**

1. Always turn off all drive systems and apply the parking brake before starting the engine.
2. The engine must be started with the operator seated in the driver's seat, and the engine must not be started at any time with the operator standing nearby without the operator in the vehicle.
3. Before starting the engine, read the engine manual carefully to familiarize yourself with the engine.
4. When starting the engine, always apply the parking brake and start the engine while stepping on the foot brake and taking your foot off the traveling pedal.
5. Make sure that the operation switch is set to "OFF" before starting the engine.
6. When starting the vehicle, do not start suddenly.
   Start slowly, making sure there are no hazards in front, behind, to the left or right.
   When stopping, assume a stopping position and slowly ease your foot off the pedal and step on

the foot brake to come to a stop. Use the throttle lever to lower the engine speed and apply the parking brake.

** Never make a sudden start or stop.

7. When backing up a machine, check what is behind it first.
8. Do not turn, start or stop suddenly on a slope. Turning on a slope may result in tipping over or loss of control.
9. Do not park on slopes. Park on a flat surface.
10. When traveling down a hill, the throttle lever should be set to the "low" position to reduce engine speed. Start slowly and use the engine brake and foot brake to avoid increasing speed and to drive carefully down the slope.
11. Handle fuel with care because it is highly flammable.
    a) Use only new, clean, designated fuel.
    b) Do not refuel the tank while the engine is running or hot.
    c) If fuel is spilled, wipe it up clean.
    d) Do not smoke when handling fuel. Fires are strictly prohibited.
    e) Never use naked lighting.
    f) Do not store fuel containers in the presence of open flames or near equipment that generates sparks.
    g) Do not use fuel for cleaning.
12. Do not store the machine with fuel left in the tank. If the machine is to be stored for an extended period of time, the fuel tank must be drained and emptied.
13. When storing the machine indoors, wait until the engine has cooled down. Be sure to remove the engine key.
14. When starting the engine indoors, open doors and windows to provide adequate ventilation. Exhaust carbon monoxide is poisonous.
15. When inspecting and servicing the machine, remove the engine key and allow the engine to cool down sufficiently.
16. Keep the machine and attachments in good working order. Do not remove safety devices. If the machine strikes a foreign object, stop the machine and check for damage. If any damage is found, do not use the machine until it is repaired.
17. Especially in winter, warm-up operation should be performed until the hydraulic oil temperature rises.
18. Have a fully qualified service person inspect the machine at least once a year.
19. Be sure to clean turf debris and fallen leaves from all parts of the machine. In particular, the engine and muffler parts must be inspected and cleaned even during operation.
20. When loading and unloading trucks, etc., stop the truck on a flat surface, apply the parking brake and park the truck. The bridge must have a marked load capacity of 1,000 tons or more and a slope of 18° or less.

※ **When ordering parts, please provide the model and fuselage number of the main unit in addition to the name and quantity of parts required. The aircraft number is located on the nameplate on the right side of the frame of the main unit. We recommend that you record the number below so that you can refer to it at any time.**

Model GSV2000 Aircraft No. _____

Some of the figures shown in the instruction manual are shown with the cover and safety guard removed for clarity. However, under no circumstances should these safety devices be removed from the machine. Always operate the machine with the safety devices securely installed in place.

Please note that machine specifications are subject to change without notice due to improvements in quality and performance or other circumstances.

Safety and Instructional Decals

The machine is equipped with labels for the operating system, etc. and warning labels for "⚠DANGER", "⚠CAUTION", and "⚠WARNING". Before using the machine, check the position of each label, fully understand the meaning of each label, and be sure to follow the instructions. If any of the labels on the machine are damaged or become unreadable due to paint or peeling off, purchase new labels from the dealer and affix the warning labels in the locations indicated in the "Warning Label Locations" section. Please refer to the photos in each section for the other labels and keep the labels legible at all times. When ordering labels, please indicate the label number.

◎ **When replacing parts with labels, be sure to replace the new labels together.**

Display	Importance
⚠ **Danger**	**Indicates a warning that, if not heeded, could result in death or serious injury.**
⚠ **Warning.**	**Indicates a risk of death or serious injury if the warning is not followed.**
⚠ **Attention**	**Indicates a potential risk of injury if the warning is not followed.**

⚠ **Warning**

◎ Do not operate the machine with the safety cover removed.
◎ Always stop the engine before refueling and adjusting.
◎ If the machine becomes clogged or other problems occur, turn off the power and stop the engine before cleaning.
◎ Keep hands, feet, and clothing away from any parts powered by the engine while it is running.
◎ The machine must be operated with the operator seated in the driver's seat. Do not allow passengers to ride in the machine unless there is a seat for them.
◎ Read and understand the manual carefully before operating the machine.
◎ If turf debris accumulates on the muffler, muffler joint pipe, or muffler cover, a fire may occur.
◎ The equipment shall be inspected and cleaned by a qualified person.
◎ Be careful not to get caught in the wheel.
◎ The belt cover must be in place.

This product is marked with 11 different labels and aircraft numbers, which indicate important handling information. These labels are very important for the safe operation of the top dresser and must be observed.

No.1

No.5

No.6

No.7

No.8

No.2

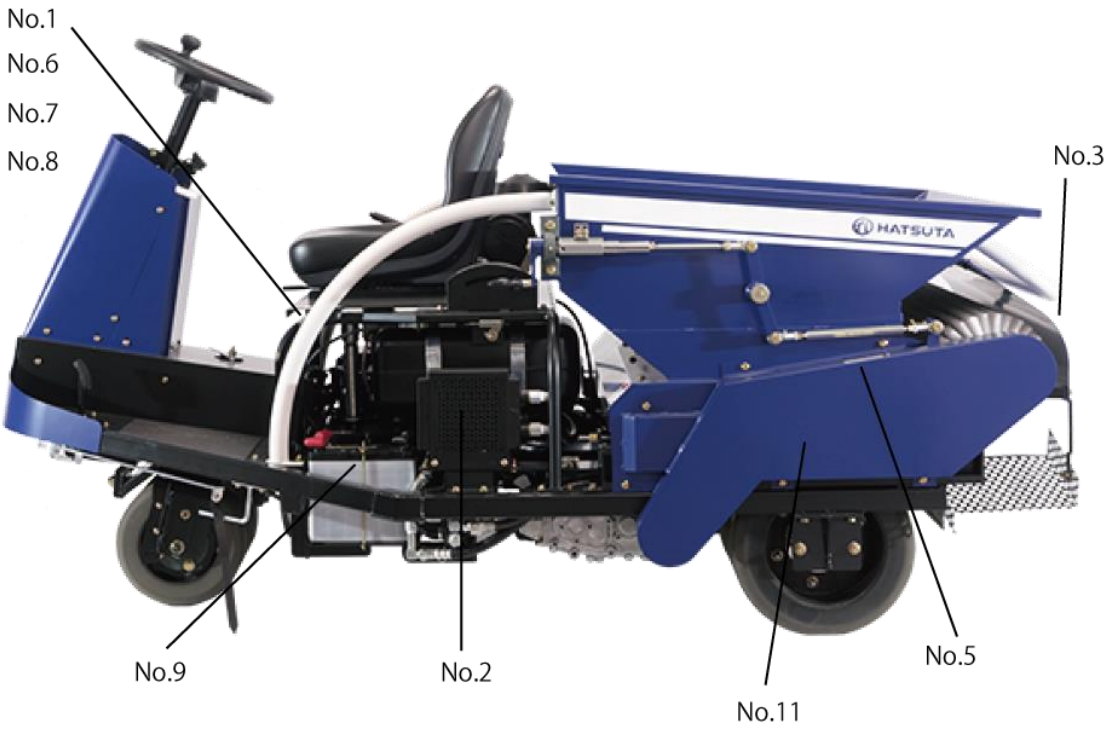
No.9

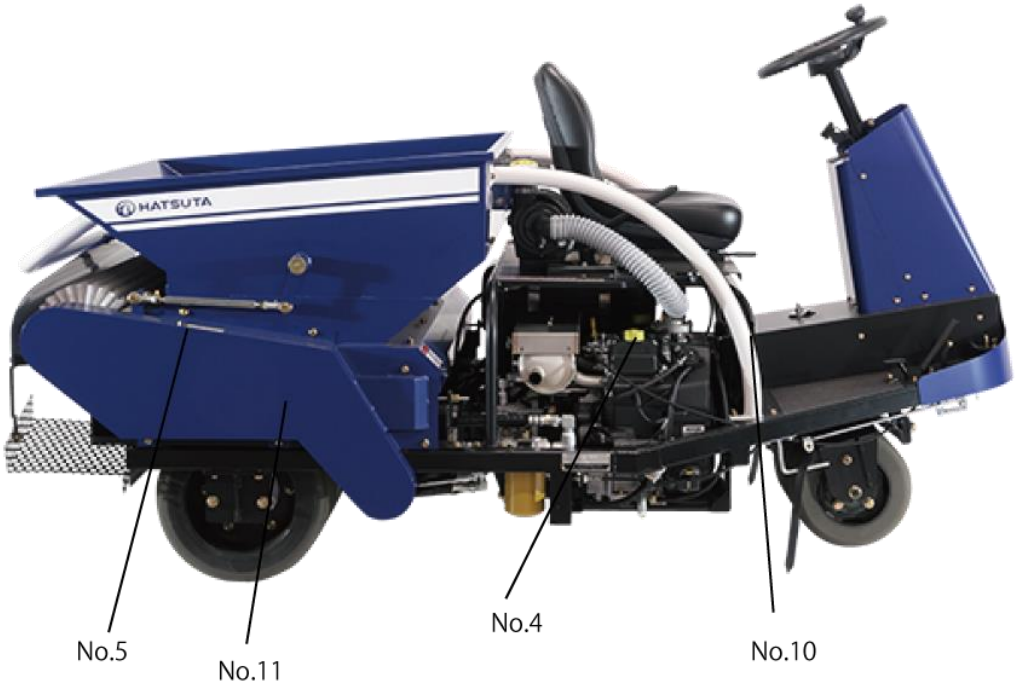
No.3

No.10

No.4

No.11

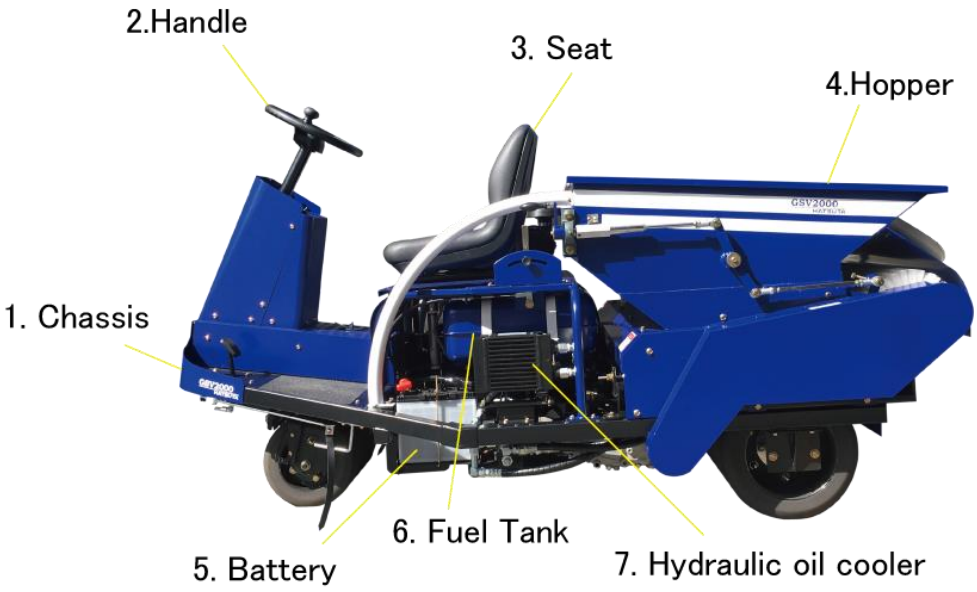

No.1
No.6
No.7
No.8
No.3
No.9
No.2
No.11
No.5

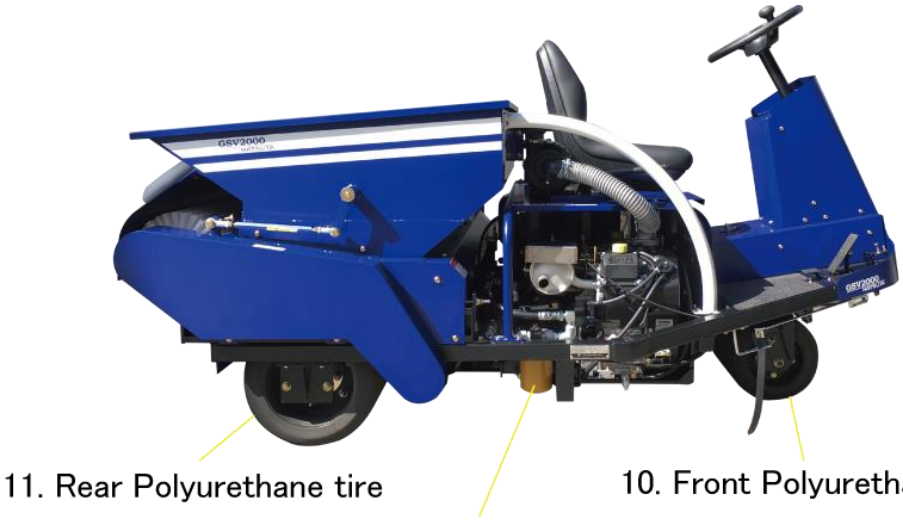

No.5
No.11
No.4
No.10

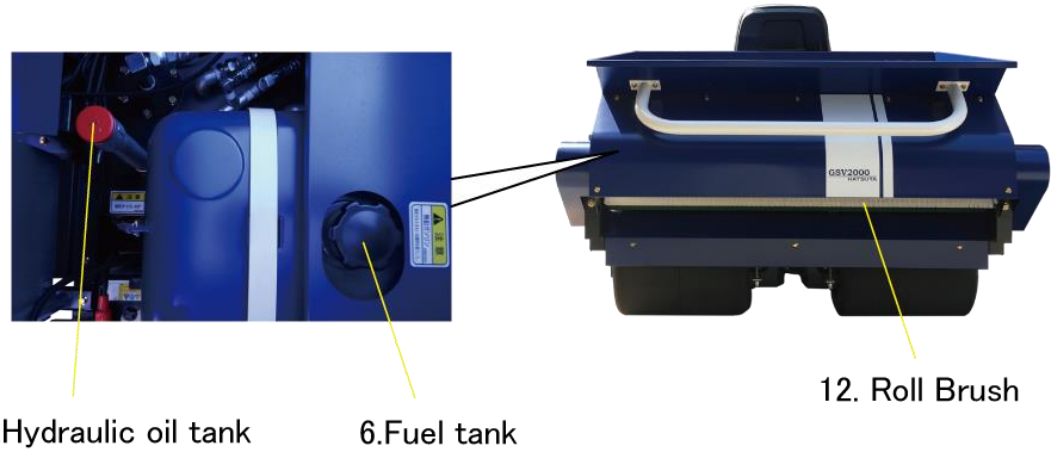
1.SPECIFICATION

	Type	GSV2000
Dimensions	Length	2380mm
	Width	1540mm
	Height	1360mm
	Dry weight	840 kg
	Hopper capacity	0.41m^3
Traveling	Tire size (front)	ϕ300×150×3 Urethane tires
	Tire size (rear wheel)	Φ400×220×4 Urethane tires
	wheelbase	1470mm
	Rear wheel tread	845mm
Engine	Model	KOHLER PA-CH680
	type	Air-cooled 4-stroke OHV gasoline
	number of cylinders	2
	Total line capacity	674cc
	Maximum output	17.2kW (23HP)
	Fuel	Gasoline
	Starting method	starter
Hydraulic	Pump	DAIKIN SAUER DANFOSS PV16
	Motor	DAIKIN SAUER DANFOSS OMSW 200
	Relief pressure	20.6 MPa
	Hydraulic oil filters	TAISEI SFT-06 Spion filter
	Hydraulic Oil	Mobil DTE25 (ISO VG46#)
Operatio	Sand Feeder	Conveyor rough-top, Shutter type, Roll Brush
	Spread Width	1200mm
	Fuel Tank	24L
	Engine Oil	1.9L (including oil filter)
	Hydraulic Oil	28L
Electri city	Ground	Minus (-)
	battery	65B24R 12V

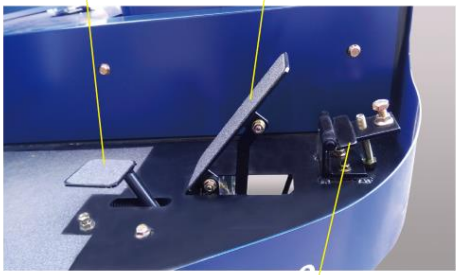
These specifications are subject to change without notice.

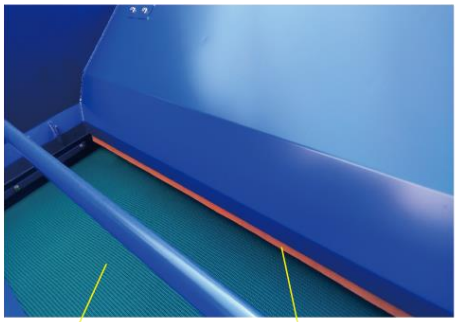

2.Handle
3. Seat
4.Hopper
1. Chassis
6. Fuel Tank
5. Battery
7. Hydraulic oil cooler


11. Rear Polyurethane tire
10. Front Polyurethane tire
8. Hydraulic oil filter


12. Roll Brush
9.Hydraulic oil tank
6.Fuel tank

※ Remove the handle so that this manual can be seen better.





2. Parts Names and Functions

1. Chassis

The chassis is a cart composed mainly of square pipes to which the engine, wheels, hopper, etc. are attached. This chassis is prone to accumulation of turf debris, fallen leaves, and other debris, which may cause corrosion and damage over the years.

2. Handle

When the steering wheel is turned to the right, the steering gear box turns the front tires to the right. Also, the steering wheel can be operated with light operating force because of the steering gearbox.

3. Seat

There is an adjustment lever under the seat, so adjust it to the optimum position for driving.

4. Hopper

Hoppers are used to hold sand, etc.

The hopper capacity of this machine is 0.41 m^3. Do not add more than that. Overfilling the hopper with sand will increase the load and cause damage to the drive unit gears, etc., or cause the conveyor belt to meander or spin. Add sand according to the type of work to be performed.

When adding the joint sand, make sure that there are no stones, trees, or other foreign objects in the sand.

Please be very careful not to let any foreign objects in the shutter or conveyor belt, as they may cause damage to the shutter and conveyor belt.

Always choose a flat area when adding sand.

5. Battery

The battery is a 65B24R. The battery contains sulfuric acid, which produces an explosive mixture of hydrogen and oxygen gas. Please handle with care. Also, to prevent explosion, keep fire away from the product.

6. Fuel tank

Fill with unleaded gasoline in a 24L capacity. Handle with care when refueling, as the fuel is highly flammable. Fire is strictly prohibited.

7. Hydraulic Oil Cooler

Cools hydraulic oil.

8. Hydraulic Oil Filter

Filter hydraulic oil to remove debris.

9. Hydraulic Oil Tank

Use ISO VG46# hydraulic oil with a capacity of 28 liters. Always check for insufficient oil, deterioration and cloudiness, and leakage.

For stable use of this product, hydraulic oil should be changed once every 12 months.

10.11. Front and Rear urethane tires

Equipped with front and rear urethane tires that reduce ground pressure and damage to the turf.

Also, by eliminating the tire gap between the front and rear wheels, tire marks that remain after the work is completed are eliminated.

12. Roll Brush

This brush is used to spread the sand evenly. As the brush wears out, it will no longer hit the conveyor belt and will not spread the sand evenly. Before use, adjust the brush so that it lightly touches the conveyor belt.

13. Key Switch

This switch starts and stops the engine. By turning the key to the right in steps, it switches between "OFF," "ON," and "START" in that order. In the start position, the cell motor rotates to start the engine. After starting, promptly release your hand and return to the "ON" position. Excessive turning of the cell motor or operation of the cell motor while the engine is starting may result in damage.

14. Choke wire

This device improves the starting performance of carbureted engines when cold, by reducing the amount of intake air in the carburetor and supplying a relatively rich fuel mixture.

15. Gas Pedal Lever

This lever is used to switch between high and low work equipment engine speeds.

16. Speedometer

Displays the running speed of the work equipment. See "How to Adjust the Speed Meter" below for instructions on replacing batteries and adjusting the speed meter.

17. Engine Tachometer

This indicates the speed of the work equipment engine. The engine speed of this machine is minimum 1300-1400 rpm maximum 3400 rpm. The tachometer position is set at P21:42, so do not touch the MODE and SET keys of the tachometer.

18. Operation switch (Spreading)

The conveyor belt rotates by turning the operation switch ON and OFF.

When turning on the operation switch, be sure to check that no one is near the roll brush, as it is dangerous.

19, 20 Pedals for driving

Depressing the traveling pedal forward moves the vehicle forward, and depressing it backward moves it backward. A hydraulic HST circuit is used to drive the vehicle, so the more the pedal is depressed, the faster the speed increases. The body stops when the driver takes his/her foot off the pedal. Never attempt to start or stop the machine suddenly, especially on uneven terrain, as it may cause the machine to fall over.

21. Pedal Stopper

It maintains a constant speed during operation.

22. Air Cleaner

Joint Sand work is not a good working environment.

It is important to clean the air element frequently to remove dust and other debris, as it can easily absorb sand and dust.

23. Parking lever

Pulling up the parking lever applies the parking brake. Always pull the parking lever when parking the machine. Also, park on a flat surface.

24. Conveyor speed control lever

Adjusts the conveyor belt rotation speed.

25. Shutter handle

Adjusts shutter belt opening and closing.

26. Conveyor belt

This belt is used to convey the grit to the rear of the machine. If the conveyor belt is damaged, uniform sand application will not be possible. Before use, check the belt for twisting or slack. Also, be careful not to lean the belt too far back or tension it too much when adjusting it.

27. Shutter belt

The sprayer opens and closes to prevent sand from spilling out of the spreader opening.

3. Safety Points Before Working

Before operating the machine, the operator must fully understand the structure and functions of the top dresser and be completely familiar with the correct operation of the machine.

◎Start-Up Inspection

The first time is the most important for everything. To prevent breakdowns in daily operation, it is necessary to know the condition of the machine at all times. For this purpose, it is necessary for the operator to inspect and maintain the machine once a month before work (start-up inspection).

⚠ Attention

To prevent injury and fuel ignition, the following must be strictly observed before starting the first inspection.

- **◎ Make sure the unit is on a level surface and its surroundings are not Danger.**
- **◎ This machine must be securely parked. In some cases, the unit should be secured by a vehicle stopper or other means.**
- **◎ Turn all switches to the OFF position and remove the key switch before proceeding.**
- **◎ Do not smoke or use naked lighting when handling fuel, such as transporting or refueling.**
- **◎ Do not lubricate, oil, or perform inspection and maintenance while the engine is running or while the engine is hot.**

Engine oil

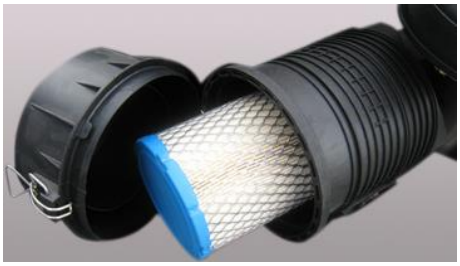
- Engine oil SAE 10W-30 is recommended. For cold climates, use 5W-20. The amount of engine oil should be filled to the "FULL" mark on the dipstick. Do not overfill.
- To check the oil level, start the engine and stop it after about 30 seconds, remove the oil dipstick, wipe it with a clean cloth, insert it into the tube, and screw the cap on securely. Pull the stick out again and check the oil level. Add more if necessary. The capacity of the oil with oil filter is approximately 1.9 liters. After the oil check is complete, screw the dipstick back on securely.
- Change the engine oil at 8 hours the first time, 50 hours the second time, and every 100 hours thereafter. Apply clean oil to the gasket of the new oil filter and install it. After replacing the oil filter, run the engine at idle to check for oil leaks, check the oil level again, and refill if necessary.

2. Fuel

Use clean, fresh, unleaded gasoline for fuel. Do not burn when refueling. Do not overfill the

tank.

3. Air filter



The working environment is not very good for the engine in this product's grading operation.

The air element must be cleaned before operation.

Failure to clean will shorten the life of the product.

*Refer to the engine manual for details.

4. Battery

1. Read and fully understand the battery manufacturer's instruction manual before performing inspection and maintenance.
2. Battery maintenance and battery maintenance work should be performed after the engine is stopped and the ignition key is removed.
3. Battery: 65B24R.
4. When installing or removing the battery, make sure that the positive and negative terminals do not come into contact with metal parts of the machine at the same time. Simultaneous contact may cause a short circuit, resulting in serious damage. Whenever performing battery maintenance, the "ground" (-) should be connected last and disconnected first.
5. Keep battery connections clean and tight. Loose cables can cause battery failure. The terminal covers should be in the correct position.
6. Clean the battery with soap and water as needed. However, be careful not to get soap and water into the battery.
7. Polish the surface of the terminal connection with steel wool.
8. Apply a thin coat of silicon dielectric grease to the terminals and cable ends to prevent corrosion.
9. Tighten the cable securely to the battery terminal.
10. If the battery electrolyte solution is insufficient, replenish purified water to the UPPER line.

5. Tire

Front and rear urethane tires. Check tires closely for cracks, damage, or abnormal wear, and check and retighten wheels and nuts every 20 hours after use.

7. Hydraulic oil

Tank capacity is 28L. Use hydraulic oil equivalent to ISO VG46#. Check the gauge to make sure that the amount of hydraulic oil is not insufficient. If the oil emulsifies or becomes slightly less clear, replace the oil immediately.

8. Hydraulic Pump

Hydraulic pumps, motors, solenoid valves, etc. are highly precise and particularly sensitive to contamination (sludge, iron powder, rust, sandpaper, and other dust). Therefore, suitable filters must be installed to remove contamination. The filter should be changed every 200 hours after the first 50 hours. Always use clean hydraulic oil to ensure that the pump motor and other equipment will perform well for many years to come.

9. Hydraulic Hoses

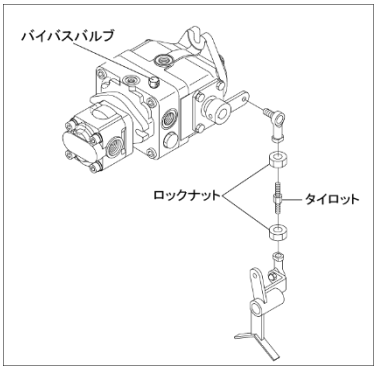
Some hydraulic hoses are subject to high pressure (21 MPa), so check the hoses for external damage and for oil leaks at the connections. Hydraulic oil can damage the turf, so wipe up any spills and do not drop the oil. If hydraulic oil spills from a hose wound, keep your hands away from the hot, pressurized oil and stop the engine immediately.

10. Hydraulic system

A Piston pump / Neutral Position

Check to see if forward and backward neutrals are out.

1. Jack up the main unit, place it on a stable stand, and lift one side of the rear wheel.
2. Release the parking brake
3. Start the engine and raise the throttle lever slightly to increase the engine speed.
4. If the wheel rotates in this state, the neutral position is set as follows.



◎Tighten the lock nut on the tie-lot next to the pump, adjusting the length and tightening it until the rear wheel stops.

***Transfer of vehicles in case of breakdown**

In the unlikely event that the vehicle is unable to travel, the bypass valve (hexagonal bolt) on the top of the hydraulic pump can be loosened to open the hydraulic closed circuit and allow the vehicle to be towed.

Loosening this bypass valve one to one and a half turns to the left will open the hydraulic circuit. Never loosen more than 2 turns at this time.

Tighten this valve when putting it back together. The tightening torque is 11±1 N-m.

⚠ Attention
When loosening the bypass valve to the left, donot turn it more than 2 turns.

B Hydraulic oil tank

Capacity is 28 liters. Use Mobil DTE25 (ISO VG46# equivalent) hydraulic oil.

Check the gauge to see if the amount of hydraulic oil is insufficient.
If the oil emulsifies or becomes slightly less clear, replace it immediately.

C Spin-on filter

Piston pumps are highly accurate and are particularly sensitive to contamination (sludge, iron, rust, sandpaper, and other dust). For this reason, suitable filters must be installed to remove contamination.
The filter should be replaced at the first 100 hours and every 12 months thereafter.
Always use clean hydraulic oil to ensure that the piston pump will perform well for a long time.

D Hydraulic hose

Some hydraulic hoses are subject to high pressure (20.6 MPa), so check for external damage to the hoses and for oil leaks at the connections.
Hydraulic oil can damage the turf, so be careful not to wipe up any spills. If hydraulic oil spills from a hose wound, keep your hands away from the hot, pressurized oil and stop the engine immediately for repair.

Precautions for hydraulic oil

⚠ Contact with eyes may cause irritation. When handling, use protective glasses, etc. to avoid contact with the eyes.
⚠ Contact with skin may cause irritation. When handling, use protective gloves, etc. to avoid skin contact.
⚠ Do not drink. (Swallowing can cause diarrhea and vomiting.)

Emergency measure

◎ If contact with eyes, rinse with clean water for 15 minutes and seek medical attention.
◎ If in contact with skin, wash thoroughly with water and soap.
◎ If swallowed, do not force vomiting, but seek medical advice immediately.

Treatment of waste oil and waste containers

◎ Disposal methods are required by law. Please dispose of properly in accordance with laws and regulations.
◎ Do not dispose of in the vicinity of oceans, rivers, lakes, or other areas or in drains.
Not only is this a fire hazard, but it also leads to environmental pollution.
◎ If you are unsure, please consult the place of purchase before processing.

11. Shutter adjustment handle

Check the shutter belt for opening and closing operation and for damage.
If there is damage, adjust or replace.

12. Conveyor belt

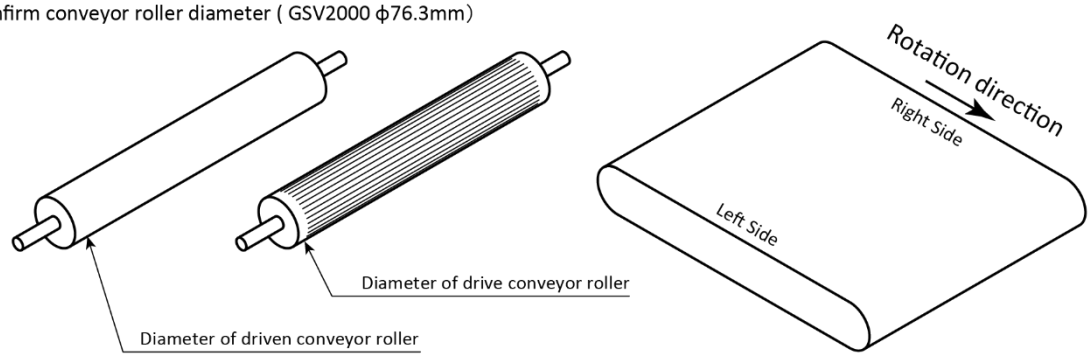
Inspection of conveyor belt (meander adjustment method)
However, when the hopper is filled with soil (loaded), the conveyor belt may stretch initially and may meander depending on the working conditions. If the belt snakes, adjust it as follows.

How to Adjust Conveyor Belt

Confirm Conveyor belt inspection table completed dimensions (Inner circumference length / Pitch circumference length)

**Note: the lengths of the left and right sides may differ.

Confirm conveyor roller diameter (GSV2000 ϕ76.3mm）



☆ Calculation of distance between starting shafts and amount of tension when assembling conveyor belts

Distance between start shafts =

(inner circumference length - (driven roller diameter x π/2 + driven roller diameter x π/2))/2

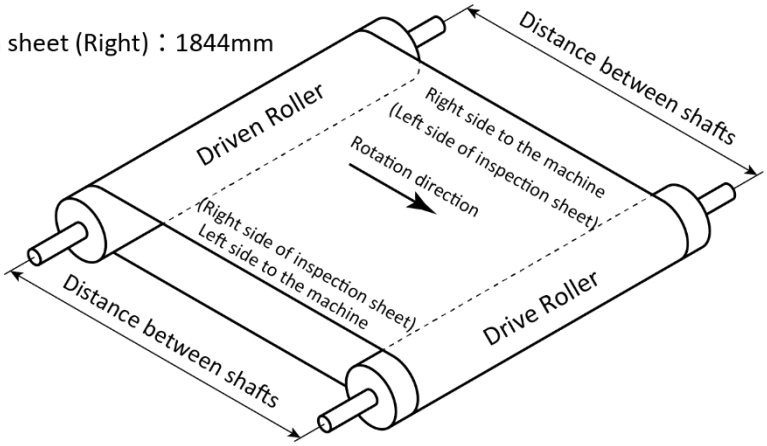
Conveyor tension = 0.6% of distance between start shafts

Ex.

Inner circumference length of inspection sheet (Right)：1844mm

Driven Roller ：ϕ100mm

Drive Roller ：ϕ100mm



<Distance between starting shafts>

＝(1844 -（100π/2+(100π/2))/2

＝(1844 - 157 + 157）/2

＝765mm

<Maximum Tension>

＝765mm×0.6%(0.006)

≒4.6mm

<Distance between shafts after conveyor tension adjustment>

＝765mm + 4.6mm

＝769.6mm

- Temporarily assemble the conveyor belt at the distance between the starting shafts.
  In this state, drive the conveyor rollers to confirm that there is no meandering.
- The guideline for conveyor tension is 0.6%.
  Tension the conveyor from the distance between the starting shafts to the value obtained by multiplying the distance between the starting shafts by 1.006.
  (Do not stretch only one side, but stretch both sides equally and a little at a time.)
- Drive the conveyor for about 20 minutes and check for meandering.
  (If you see meandering, start over from the beginning.)
- If there is no meandering, the initial elongation from the trial run is increased.
  Fix the conveyor after one turn of the pull or push bolt.

※ Slip may occur due to the load applied to the conveyor during operation.
In such cases, try to tension the conveyor a little on both sides equally.

⚠ Caution

If the tension exceeds the specified limit, the conveyor belt or rollers may be damaged.

4.Periodic Inspection List

Engine

- **Starting and Noise**
  Before Every Use
- **Low/High throttle conditions**
  Before Every Use
- **Exhaust conditions**
  Before Every Use
- **Oil Leak and Stain**
  Before Every Use
- **Amounts of Oil**
  Before Every Use / 1month or 50h/ 3month or 100h
- **Oil Change**
  3month or 100h/ ** First time: 8h
- **Oil Filter Change**
  6month or 200h/** First time: 50h

Fuel

- **Fuel Leak**
  Before Every Use
- **Condition of Fuel Filter**
  Before Every Use
- **Change Fuel Filter**
  12month or 500h
- **Amounts of Fuel**
  Before Every Use
- **Change Fuel hose**
  24 month or 800h
- **Cramp of fuel hose**
  12month or 500h

Air Cleaner

- **Clean Air filter**
  Before Every Use
- **Change Air Filter**
  12month or 500h

Battery

- **Amounts of battery fluid**
  Before Every Use

- **Battery Cramp**
  3 month or 100h
- **Change Battery**
  Refer to battery manual.
- **Wiring connection**
  3 month or 100h

Hydraulic

- **Hydraulic Oil leak and stain**
  Before Every Use
- **Amounts of Hydraulic Oil**
  Before Every Use
- **Change Hydraulic Oil**
  12month or 500h
- **Change Hydraulic Oil Filter**
  12month or 500h
- **Hydraulic Hose Inspection**
  Before Every Use
- **Change Hydraulic Hose**
  24month or 800h
- **Hydraulic Pump Inspection**
  Before Every Use
- **Hydraulic Motor Inspection**
  Before Every Use

Traveling

- **Traveling Pedal Inspection**
  Before Every Use
- **Tire**
  Before Every Use

Work

- **Roll Brush Inspection**
  Before Every Use
- **Shutter Belt Inspection**
  Before Every Use
- **Conveyor Inspection**
  Before Every Use
- **Electromagnetic Clutch Inspection**
  Before Every Use
- **V-Belt Inspection**

Before Every Use

- **Areas where errors were found in the previous operation.**
  Before Every Use
- **Loose screws/ Bolts in each part**
  Before Every Use
- **Grease Point of each part**
  50h or 100h

⚠ Attention
Driving conditions are different from general driving conditions, so please refer to the list above. Perform inspection and maintenance.

4-3 Inspection and maintenance chart by period and time of use

After completion of the maintenance, enter the date of implementation and the total hours of implementation and mark "○" or "レ".

We recommend replacement every usage time and period, whichever comes first.

Inspection/replacement	Date	/	/	/	/
	Usage Time	h	h	h	h
Engine oil change	8h at first 2nd 50H After the 3rd 100H				
Oil Element Replacement	200H or 6 months				
Air cleaner element replacement	100H or 12 months				
Fuel filter replacement	800H or 24 months				
Fuel hose replacement	800H or 24 months				
Hydraulic oil change	500H or 12 months				
Hydraulic filter replacement	500H or 12 months				
Hydraulic hose replacement	800H or 24 months				

4-4 Periodic Inspection and Maintenance Record Book

1. Monthly inspection and maintenance

   Circle "○" the inspection period of periodic inspections and maintenance to be performed.

2. fuselage number

Please fill out the form by looking at the fuselage markings on the fuselage.

3. Summary of Inspection Results and Maintenance

（1）If the results of the inspection show no abnormalities, enter a "□" in the check box (□) for that inspection item.

(2) If any abnormality is found as a result of the inspection and necessary maintenance is performed, enter it in the check column using the "check symbol" according to the maintenance work classification in the table below. If maintenance work was performed in duplicate, the one with the highest entry order in the table should be listed.

(3) Circle the "check mark" when inspection or maintenance is performed with disassembly.

4. Name of the person who performed the inspection or maintenance

Enter the name of the person who performed the inspection or maintenance.

If the person who performed the inspection and maintenance is different, enter both.

5. Date of inspection and date maintenance was completed

Enter the date of inspection and the date maintenance was completed, respectively.

6. Articles (main replacement parts, measurement results, etc.)

Enter the main parts replaced during maintenance and the results of measurements, if necessary.

Meaning of check symbols and order of entry

	Task	sign	Meaning
	Inspection	✓	Inspection results showed no abnormalities.
1	Exchange	×	As a result of inspection, replaced. (Parts, oil and grease)
2	Repair	△	Repaired as a result of inspection. (Wear and tear)
3	Adjustment	A	Adjusted as a result of inspection. (to maintain functionality).
4	Fastening	T	Tightened as a result of inspection. (Increased tightening of loose parts)
5	Cleaning	C	As a result of inspection, cleaned. (dust, oil, and other contaminants)
6	Oiling	L	As a result of inspection, oil was supplied. (Fueled with oil and fluids)

Maintenance Record Book

Inspection	ㄴ	Replace	×	Tighten	T
		Repair	△	Cleaning	C
Disassembly	o	Ajustment	A	Refuel	L

Model :

Serial No :

1.3.6.12- month Periodic Inspection and maint

Results of Inspection or Maintenance

Engine

- ☐ Engine starts and noise
- ☐ Throttle Slow and High conditions
- ☐ Exhaust condition
- ☐ Air Filter Contamination
- ☐ Fuel Leak
- ☐ Clogged Fuel Filter
- ☐ Choke Conditions
- ☐ Engine oil leak, stain, amount

Traveling

- ☐ Travel pedal condition
- ☐ Travel pedal Neutral
- ☐ Tire Wear, Cracks, and Damage
- ☐ Loose Wheel Nuts

Electrical Equipment

- ☐ Spark plug condition
- ☐ Ignition Timing
- ☐ Condition of the transistor magnet
- ☐ Specific Gravity and Fluid Content of Battery
- ☐ Loose or damaged electrical wiring connections

Hydraulic

- ☐ Oil Leak in Hydraulic Pump
- ☐ Oil Leak in Hydraulic Motor
- ☐ Oil leakage or damage to Hydraulic hoses
- ☐ Oil Contamination / Amount
- ☐ Oil leak in each pipe

Other

- ☐ Damage to each connecting hose
- ☐ Grease
- ☐ Bolt / Nut Tightening of each part
- ☐ other

NOTE

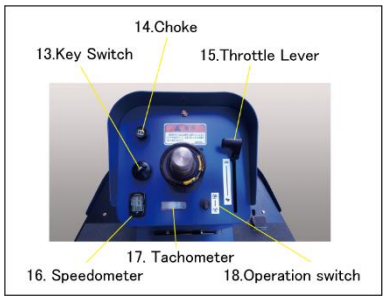
Name	Date	Completion Date	Accumulated time for inspection
			〔h〕

Consumable parts list

Part Number	name of product	quantity	Parts List identification number	remarks
ET2508301S	air element	1		tubular
ET2508304S	Air Element 2	1		cylinder
ET1205001S	oil element	1		
ET2405013S	fuel filter	1		
K30450401	Hydraulic spin filter cartridges	1		
K31566100	Hydraulic oil strainer SFT-06	1		
KH9046020	Hydraulic oil (20L can)	2		Hydraulic tank capacity 28L
K31516701A	gas pedal wire	1		
K22503400	Travel wire	1		forward and backward
K22503400	Conveyor speed adjustment wire	1		
K22511600	chokewire	1		
K22508800	Foot brake wire	1		
K22503501	Parking brake wire	1		
K01073800	V-belt SA-38	1		
K22500600	conveyor belt	1		
K21801401	roll brush	1		

5.Operation Procedure

A. Engine start



1) Check to see if the parking brake is applied.

2) Check that the operation switch is in the "OFF" position and the operation lever is in the upper position.

3) Insert the ignition key and turn the fuel cock to the "open" position.

4) Turn the throttle lever slightly to the "high speed" position.

5) Place the choke knob in the "closed" position. (Pull it out)

6) Turn the key switch to the right to the "ON" position. Turn it further to the right to the "START" position to start the engine. After starting, release the key (key is in the "ON" position).

⚠ **Continuously turning the starter motor may damage it. If the engine does not start, turn the key back and wait a moment before starting the engine again. Do not run the starter motor for more than 10 seconds to prevent the battery from running down.**

7) When the engine starts, gradually return the choke knob to the "open" position. (Push it in).

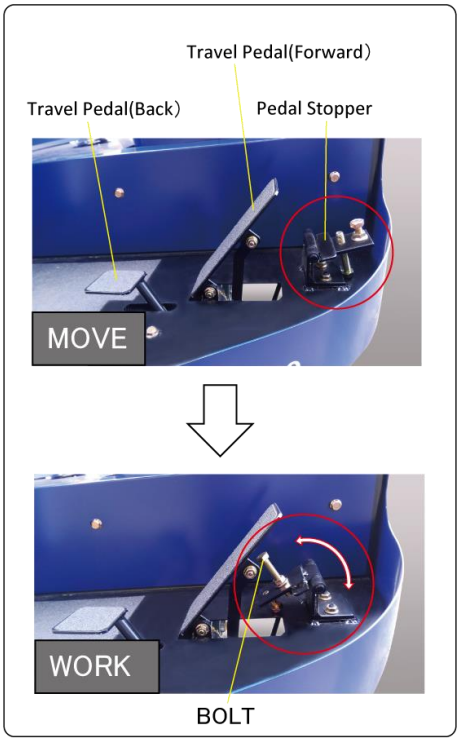
8) Warm up the engine for a while without applying load after starting the engine.

⚠ **Warm-up operation must be performed not only during the winter season. Do not leave the engine running for long periods of time in a poorly ventilated area such as a hangar or other enclosed area. Exhaust fumes may contaminate the air and cause gas poisoning.**

⚠ **Attention**
The choke knob should be in the "closed" position when it is cold or the engine is cold. When the engine is warm or when restarting immediately after stopping operation, set the choke knob in the "open" position. If the engine does not start after three or more attempts, starting the engine several times in succession will result in excessive fuel intake, making it difficult to start the engine. In this case, set the choke knob to the "open" position and the throttle lever to the "middle" position before restarting.

B. Driving

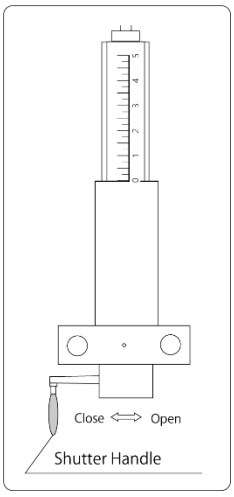
1) Use the gas pedal lever to raise the engine speed to about 1500 rpm. (Check with an engine tachometer.)
(2) Release the side brake lever and set the pedal stopper for travel. Then, slowly depress the forward travel pedal to move forward.
3) To stop the machine, return the traveling pedal slowly and pull the side brake lever after stopping.
4) The speed is adjusted by the gas pedal lever and pedal operation. The maximum speed on a flat surface is about 16 km/h.



⚠ This top dresser is a three-wheeled type, so be careful of your surroundings on slopes and when turning. Do not start and stop the machine suddenly. Check ahead and to the left and right, and do not look to the side when driving. Failure to do so may cause an accident.

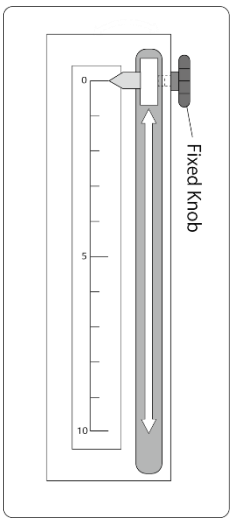
C. Place the grit in the hopper.

1) Park the unit on a flat surface.
2) Check that the shutter scale is set to "0".
   Scale "0" Shutter belt is closed.
   Scale "3.5" Shutter belt is open.
3) Add the gravel. When adding grit, make sure that there are no stones, trees, or other foreign objects in the grit. Foreign objects may cause damage to the shutter. The hopper capacity is 0.41 m3. Do not fill the hopper more than that. Overfilling may put a strain on the drive unit and cause it to malfunction. Add grit according to the type of work to be performed.



E. Spreading sand

1) Before starting spraying, check the work area and confirm that there are no Danger areas such as slopes or gouges in the vicinity. If there are Danger areas, mark the boundaries and work within the safe area, and be careful not to fall or run off the ground.
2) Turn the shutter handle to the right to open the shutter according to the soil spreading operation.
3) Loosen the fixed knob on the conveyor speed adjustment lever, determine the speed according to the soil application work, and then tighten the fixed knob.



4) Start the engine and drive the machine slowly to the spraying operation.
5) Before starting spraying, make sure that no one is within the area where the grit will be dispersed.
6) Turn on the work switch (spraying); when turned on, the conveyor belt and roll brush rotate to start spraying.
7) When interrupting work, turn off the work switch (spraying).

※ **Please finish after all the eye sand is removed as much as possible.**

6.Cleaning after work

After spreading soil, be sure to remove any sand adhering to the machine.

Stop the engine of the top dresser and stay away from the machine until it stops rotating.
It may be caught in the rotating parts or come in contact with them, resulting in injury or accident.

Clean sand that has entered the inside of the conveyor belt with compressor air.

⚠ **Attention**
Failure to clean the inside of the conveyor belt can cause sand to stick to the conveyor belt, causing the conveyor belt to be stretched more than necessary and significantly Durability will be reduced and the product will be damaged.

How to adjust the speedometer (Model HA548B)

The speedometer of the product displays the running speed by detecting the number of rotations of the front tire with a speed sensor.

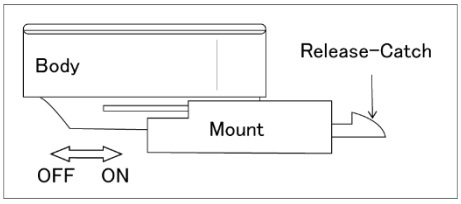
Insert the main unit of the computer into the mounting shoe in the "ON" position until it clicks into place.

⚠ Caution

If not installed properly, the computer may come off the mounting shoe during use.

If the contact surface between the computer and the mounting shoe becomes dirty, the speed may not be displayed. Occasionally clean the contact surface with a dry rag.

To remove the computer body, push the release catch downward while pulling the computer body out in the "OFF" direction.



Enter wheel size

Please input the following values.

GSV2000: 915mm

Input Method

1. First, press and hold both left and right buttons simultaneously for 3 seconds.
2. Enter the wheel size.
   The display will show "2060" and the "0" in the right "first digit" will blink.
3. Press the right button to increase the number. Set to "5".
4. Press the left button. Press the left button to move to the second digit on the left side.
   Press the right button to set to "1" and press the left button to move to the left side "3rd digit.
   Repeat this operation to enter "0915".
5. Press the left button continuously. Select the distance unit. The display will show "KM (kilometer)" / "M (mile)". Press the right button to select "KM (kilometer).
6. Press the left button to continue. Select the maintenance alert notification distance.
   Press the right button to display "200," "400," "600," and "800" in that order.
   Select "400" and press the left button to confirm. *The factory default is "400.
   After driving 400Km, the maintenance alert " " will be displayed.
   To reset the maintenance alert, press and hold the right button for 3 seconds.

   *The recommended time for oil change is set at 400KM. You may enter any value you like.

Time setting

1. Press the right button several times to enter clock mode (no red frame shown in the right figure).
2. Press and hold the left button for 3 seconds to enter "12/24Hr" selection mode.
3. Press the left button to select "12Hr"/"24Hr". 3. Press the right button to confirm. Factory default is "24Hr".
4. The number indicating the time will blink.
5. Press the left button to enter "Hr".
6. Press the right button when you have finished entering the "hour.
   The minute digit will begin flashing. Press the left button to enter the minute.
7. When you have finished entering the minute, press the right button.
8. The display switches to ODO mode and the setting is complete.

Is it malfunctioning? If you think

If the displayed value is not correct, remove the battery. 10 seconds later, insert the battery again.

If the display becomes dim, replace the battery "AG13 or LR44".

If the display becomes hot due to direct sunlight, a black screen with no display may appear, but this will be resolved after a cool down.

Reset

For products using urethane front tires, if the tire diameter becomes smaller due to wear, there will be an error between the actual speed and the speedometer display. Periodically measure the tire circumference and reset the rotation circumference.

Functions

SPD Current speed / ODO Odometer (0.001-99999kmlm) / DST Distance traveled / MXS Maximum speed

AVS Average speed / TM Elapsed time / CLK Clock (12H/24H) / SCAN Scan / "-" "+" comparator

SETTING SPEED SCALE Speed scale setting (km/h, m/h)

SETTING TIRE CIRCUMFERENCE Tire circumference setting (Omm~9999mm)

SETTIN THE LAST VALUE OF ODOMETER/ODOMAINTENANCE ALERT

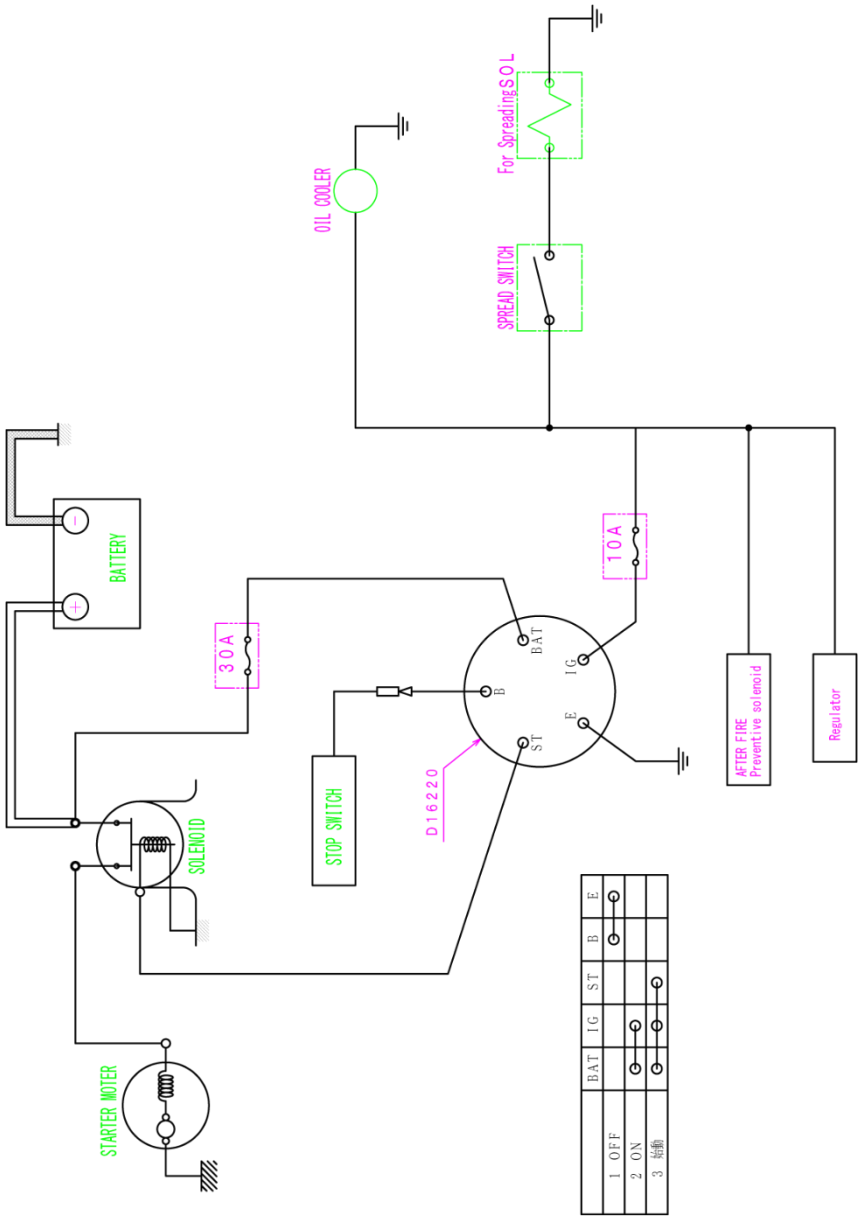
SETTIN THE LAST VALUE OF ODOMETER/ODOMAINTENANCE ALERT

FREEZE FRAME MEMORY Freeze frame memory

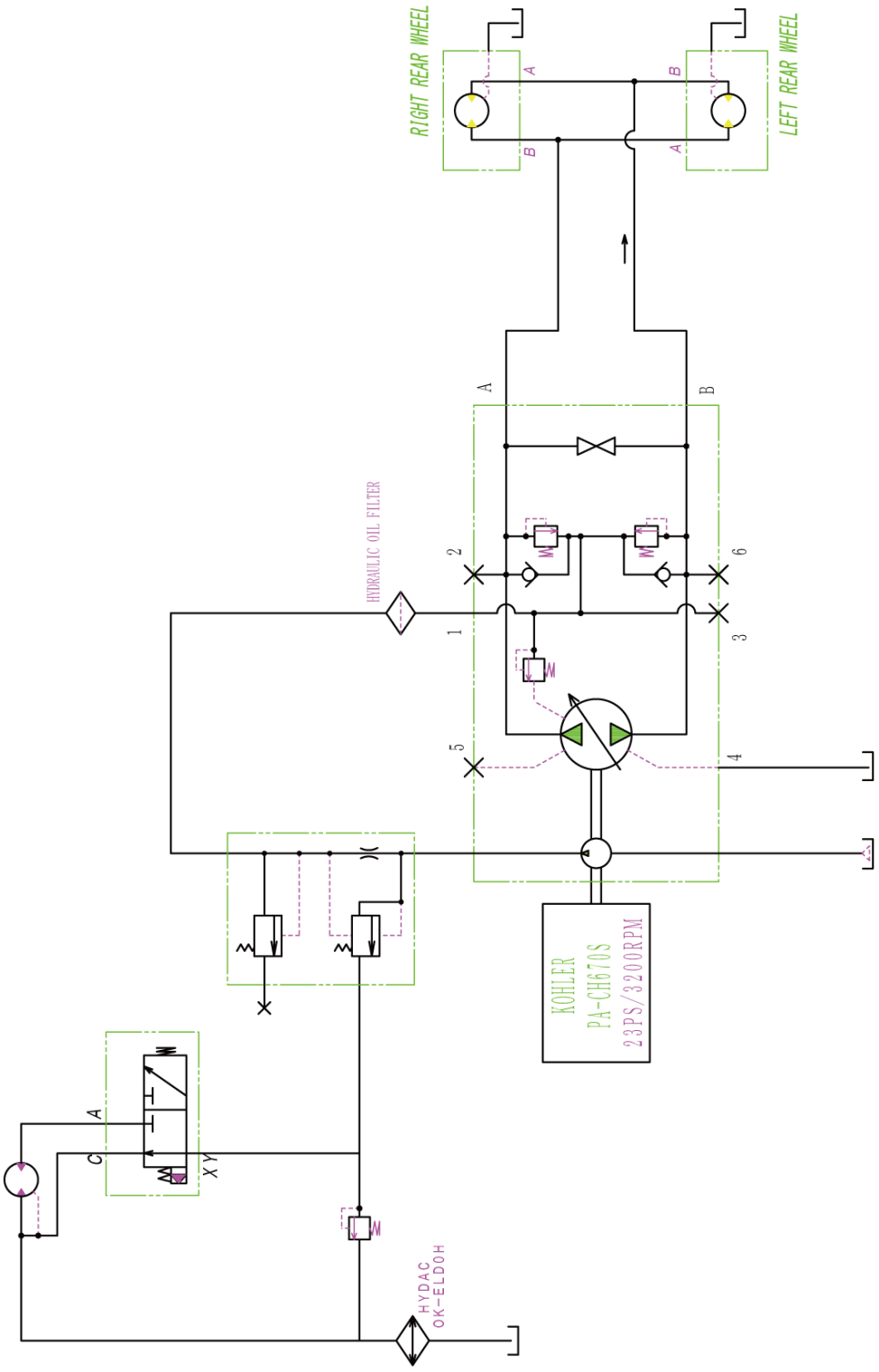
AUTO ON/OFF Auto on/off

BATTERY **"AG13 or LR44"** Battery

7.Wiring Diagram



8.Hydraulic Diagram



9.Troubleshooting

Hydraulic Equipment

Problem	Possible Cause	Corrective Action
Pump does not discharge oil. Or, low discharge rate.	Pump shaft does not rotate.	Inspect and repair pump shaft for damage.
	Clogged suction strainer	Inspection and replacement
	Pump draws in air	1） Inspect and tighten intake pipe Replace pipe and hose if necessary 2） Inspect and replenish the tank for proper oil quantity
Pump noise has increased. (Assuming actuator is working properly)	Cavitation and air inhalation due to poor suction	Inspect and replace suction strainer for clogging.
	External interference with pump or piping	Remove interfering parts and repair piping clamps
	Hydraulic fluid viscosity is too high.	Replace with low viscosity hydraulic oil.
Pressure rise failure	Pump discharge rate drops	Pump does not discharge Refer to the item, check and repair.
	Leakage in part of the circuit	1） Inspect and repair for correct circuitry 2） Inspect and repair piping for oil leaks. Inspect and adjust discharge pressure and rotation speed

Problem	Possible Cause	Corrective Action
Motor does not rotate	overload	Reduce load.
	Pressure does not increase, oil does not flow	Examine the entire hydraulic circuit, including valves and pumps.
	Degradation of dust and hydraulic oil. Seizure galling of internal parts or damage to bearings due to cavitation.	Pull out the drain plug and check for the presence of metal powder. If metal powder is present, there is a possibility of seizure or bearing damage.
RPM is abnormally low	Insufficient oil inflow	Check the discharge rate of the pump, the speed of the prime mover, oil leaks from valves, etc.
	Low viscosity and frequent oil leakage due to oil temperature or other causes.	Operate at the appropriate viscosity or temperature.
	Abnormal wear of internal parts	Check the amount of drainage in the motor, and if it is abnormally large compared to the catalog value, replace parts. Please contact us.
oil leak	Scratched or worn oil seals	Replace the oil seal. Correct any scratches on the contact surface of the output shaft seal.
	Leakage or damage from gasket section due to loosened bolts	Tighten the bolts to the correct tightening torque.
	Leakage due to O-ring damage	O-ring replacement

The above is a list of various accident phenomena, their causes, and countermeasures. Since the majority of accidents are caused by dust contamination, please take the utmost care to prevent dust from entering.

10.Storage

General

When the machine will not be used for a while, store it in a dry, covered area. Exposure to wind and rain will not only damage the appearance but also shorten the life of the machine.

1. Start the engine and completely exhaust the fuel.
2. Drain the fuel from the fuel tank. After draining the fuel from the tank, back-flow the fuel in the piping to clean the fuel filter.
3. While the engine is still warm, drain the oil from the crankcase and add fresh oil. (See engine manual).
4. Clean the outside of the engine and repair any peeling paint with paint or apply rust-preventive oil. Use oil that meets SAE30MIL-L21260 standards.

Battery

Refer to the manufacturer's manual for specific instructions. Also refer to the maintenance section of this manual. Remove and clean the battery according to the maintenance section. Batteries should be stored in a cool, dark place in an upright position.26 Storage at temperatures above -7°C (-4°F) will greatly increase discharge. Storing discharged batteries at temperatures below -7°C will cause the electrolyte to freeze.

Important

Batteries in storage should be inspected at 60- to 90-day intervals and recharged if necessary.

Starting the engine after storage

1. Check and recharge the battery according to the instructions in the battery manual.
2. Clean the fuel filter and drain water from the fuel tank.
3. Clean the air cleaner.
4. Check the oil level in the engine crankcase and hydraulic system.
5. Fill the fuel tank with fresh fuel.
6. Before starting the engine, take the machine outside. 6. Before starting the engine, take the machine outside, or open doors and windows to provide sufficient ventilation to prevent the risk of carbon monoxide in the exhaust. Do not start the engine at high speed immediately after starting. Wait until the engine is sufficiently warm and lubricated.


HATSUTA