

# Instruction manual

Ride on Mower      Rabbit Mower

**RM983**

**RM983X**



0342-75200



- Please read carefully and fully understand the important dangerous parts that appear in the text of the instruction manual before using the product.
- When purchasing this product, please receive an explanation from the retailer about how to use it for safety.
- Please keep the instruction manual in a safe place so that you can read it at any time.
- To maintain safety, perform annual inspections according to the regular inspection table on this paper.
- Be sure to use the manufacturer's genuine product for maintenance of this product.

**//// OREC**

# INDEX

## Item ..... page

《Introduction》 .....	1
《Definitions and Symbol marks》 .....	1
《Regulations for this product》 .....	1
《Important Notices》 .....	2
《Warranty / Contract / Disclaimer》 ..	2

### 1. Before use <Be sure to read for safe use>

1.1 Before operation.....	3
1.2 Before working.....	3
1.2.1 Precautions before work .....	3
1.2.2 Inspection before work .....	4
1.2.3 No fire · Fuel refueling .....	5
1.3 Working .....	5
1.3.1 Precautions during work .....	5
1.3.2 Precautions for operation ....	6
1.3.3 Inspection during work · Stop · Cleaning	7
1.4 Precautions for loading and unloading and transportation .....	7
1.5 Inspection · Maintenance.....	8
1.6 At the time of storage .....	9
1.7 Warning display mark.....	9

### 2. Names and functions of each part

2.1 Name of each part .....	11
2.2 Functions of each part .....	12
① Engine switch.....	12
② Throttle lever .....	12
③ Choke lever.....	12
④ Light switch for movement .....	12
⑤ Cutting height adjustment lever.....	12
⑥ Blade clutch lever .....	13
⑦ Change pedal · Shift lever .....	13
⑧ Sub Change lever .....	13
⑨ Diff-Lock lever .....	14
⑩ Parking brake pedal .....	14
⑪ Knife cover .....	14
⑫ Seat (with seat slide and seat suspension function) .....	15
⑬ Handle tilt lock lever .....	15
⑭ Fuse BOX .....	16
⑮ 12V power socket.....	16
⑯ Engine oil warning light (Red) ...	16
⑰ Pilot lamp (green).....	16
⑱ Hour counter meter .....	16
⑲ Deck cleaning pipe.....	16
2.3 Machine direction.....	17

### 3. Inspection before work

3.1 Checking the Engine oil .....	18
3.2 Fuel inspection and refueling .....	19

### 4. How to operate and work

4.1 How to start / stop the engine... 21
--

4.1.1 How to start the engine .....	21
4.1.2 How to stop the engine .....	23
4.2 How to drive. Speed shift.	
Turn. Stop .....	23
4.2.1 How to Drive.....	23
4.2.2 How to stop (park) .....	24
4.2.3 How to operate the diff-lock .	25
4.2.4 How to move when you cannot drive	25
4.3 Loading and unloading .....	26
4.3.1 How to load and unload .....	27
4.4 How to make good mowing work.....	27
4.5 Adjusting the handle / seat position according to work and physique ..	31
4.6 How to use the moving light .....	31

### 5. Inspection / maintenance / adjustment

5.1 Oil inspection / replacement / lubrication.	32
5.1.1 Inspection and replacement of mission oil	32
5.1.2 Engine oil inspection / replacement .	33
5.1.3 Oil filter replacement .....	34
5.1.4 Oil filter replacement .....	34
5.1.5 Lubricate to each part.....	36
5.2 Engine Cleaning / Inspection / Adjustment ....	37
5.2.1 Air cleaner Cleaning.....	37
5.2.2 Inspection and adjustment of spark plugs	38
5.2.3 Inspection of fuel hose.....	38
5.2.4 Checking the fuel filter .....	39
5.2.5 Clean the engine cooling system	39
5.2.6 Clean the engine exhaust system ...	40
5.3 Product Inspection / adjustment..	40
5.3.1 Wire / Belt adjustment.....	41
① Driving belt adjustment .....	41
② Knife belt adjustment .....	42
③ Belt retainer adjustment.....	42
④ Knife brake adjustment.....	43
⑤ Parking brake adjustment .....	43
⑥ Speed change lever adjustment ....	44
⑦ Knife clutch wire adjustment ....	45
⑧ Diff-lock wire adjustment .....	45
⑨ Safety switch adjustment.....	45
5.3.2 Tire air pressure .....	46
5.3.3 Inspection of front tires.....	46
5.4 Knife inspection / replacement / installation.....	47
5.4.1 Open. Close the knife cover ...	49
5.4.2 Inspection. replacement of knives ....	49
5.4.3 How to replace the knife .....	50
5.5 How to store for a long time .....	51
5.5.1 Preparation .....	51
5.5.2 Precautions for next use.....	53

# I N D E X

**Item .....page**

## 6. Note

- 6.1 Specifications ..... 54
- 6.2 Tool bag details ..... 55
- 6.3 Consumables details ..... 55
- 6.4 Electrical schematic ..... 57

## 7.点検表

- 7.1 Periodic checklist
- 7.2 Engine malfunction and how to handle it
- 7.3 Self-diagnosis table
- 7.4 Battery maintenance / inspection
  - 7.4.1 How to refill the battery fluid
  - 7.4.2 How to supplement charge
  - 7.4.3 Battery life
  - 7.4.4 Battery failure and how to handle it
  - 7.4.5 How to deal with accidents  
caused by electrolyte
  - 7.4.6 Estimated battery charge time

## ■ About this instruction manual

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- Please read this instruction manual carefully before using this machine.
- When renting or hand overing this machine, be sure to hand it with this machine.
- If the product is lost or damaged, please place an order directly with the retailer.

### 《Introduction》




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- Thank you for purchasing this product.
- This instruction manual explains the correct handling method and simple maintenance method to keep this product in the best condition and to work safely.
- Please be sure to read this instruction manual carefully before use to fully understand safe driving work and correct handling method, and use it for safe and efficient work.
- After reading the product, take it out and keep it in a safe place for viewing. If it is lost or damaged, purchase it from the store or download it from the manufacturer's website.

### 《Definitions and Symbol marks》

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In this Manual, the following definitions and symbol marks are used according to the degree of risk (or the magnitude of the accident). Please fully understand the meaning of the following symbol marks and follow their contents.

Symbol marks	Definition
 Danger <sup>←</sup>	Indicates anything that could result in death or serious injury if the warning text is not followed.
 Warning <sup>←</sup>	Indicates a risk of death or serious injury if the warning is not followed.
 Caution <sup>←</sup>	Indicates a risk of injury if you do not follow the warning. It also indicates anything that could damage the product itself if not adhered to or corrected.
<b>Reference</b>	Shows items related to product performance and error-prone operations that are good to know in operation and maintenance.

### 《Regulations for this product》

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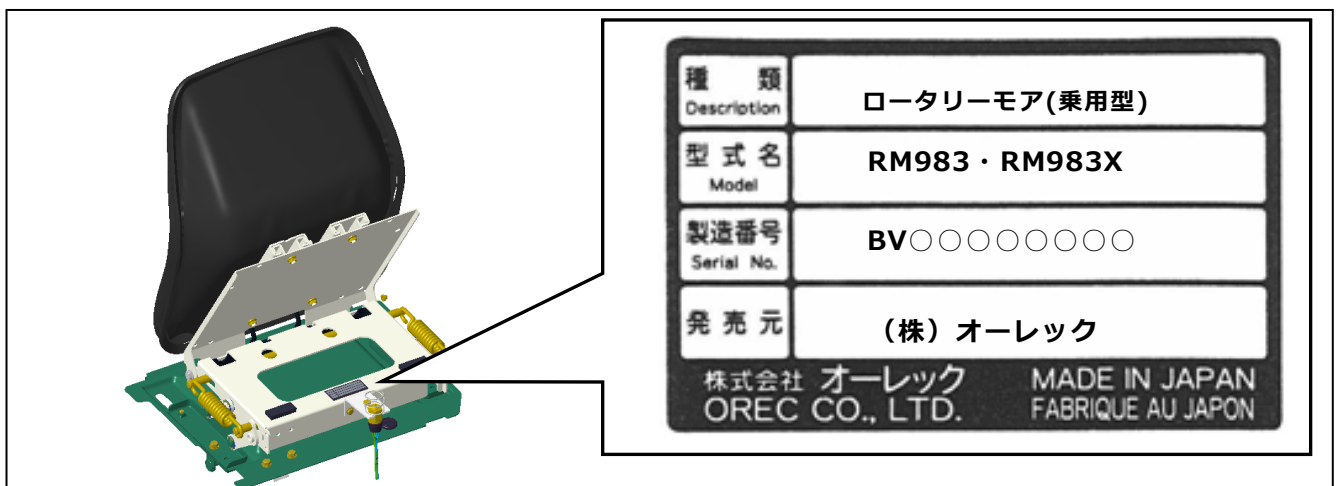
- 1) This product has been developed as a dedicated machine for agricultural workers, so please do not use it for any other purpose (usage that the worker cannot be identified by rental etc.). May not be covered by warranty.
- 2) This machine has a seating capacity of 1 person. In addition, you cannot drive on roads and places that are used for general traffic (agricultural roads, forest roads, public plazas, etc.). Even if you get a vehicle number, you cannot drive on public roads.
- 3) This product was developed and manufactured for use in Japan Market.

## 《Important Notices》

- 1) Please note that the product specifications at hand may not match the contents of this manual due to changes in parts, etc. due to improvements in performance and durability and other changes in specifications.
- 2) Please note that copying part or all of the contents of this document without permission is a copyright infringement, except as required by law.
- 3) In this manual, photographs and illustrations are used so that the explanation parts can be understood concretely, but the parts other than the explanation parts may be omitted. ..

## 《Warranty / Contract / Disclaimer》

- 1) The warranty period of this product is one year from the purchase of a new product, or 50 hours in total (6 months for contract work, or 50 hours in total), whichever comes first.
- 2) It is impossible to predict all the precautions. When using the product, the worker must also consider safety.
- 3) If you do not understand even after reading this manual, do not perform any operation and be sure to contact the store where you purchased the product .
- 4) Regular inspections and maintenance are indispensable for the safe and efficient use of the product. Be sure to request the dealer to perform the regular inspections and maintenance described in the "Regular inspection table" and "Annual inspection table" at least once a year.
- 5) The supply period for repair parts for this product is 9 years after the production is discontinued. However, even if it is within the supply period, we may consult with you regarding the delivery date for special parts.
- 6) If you have any questions or have any questions regarding services, please contact your dealer. In that case, please refer to the following points and check the "Product model and serial number / Model name of the installed engine (engraved or affixed to the engine body)" and contact us at the same time.



# 1. Before use <Be sure to read for safe use>

## 1.1 Before operation



- 1) Do not use if you do not understand the contents of this manual. In addition, this product is a single-seater. Do not carry people or animals other than workers.
- 2) In principle, no one other than the owner should use it. If you have to lend the machine to another person, explain how to handle it, read the "Instruction Manual" for this machine and the engine carefully, and fully understand the handling method and safety points before starting work.
- 3) Do not work when normal driving operation is not possible due to overwork, illness, drugs, or other effects.
- 4) Do not allow drunk people, pregnant women, children, or unskilled people to work.
- 5) To avoid getting caught in the rotating parts of the machine, wear long-sleeved jackets and long trousers with squeezed hem, and wear appropriate clothes. In addition, cigarettes and rolled (waist) towels are strictly prohibited.
- 6) Depending on the product, use appropriate equipment such as safety shoes (boots) with anti-slip (spike), helmet (hat), protective glasses, gloves, and sneakers.
- 7) This product has not been type-approved by the Road Transport Vehicle Law, so never drive on public roads. We are not responsible for accidents and violations caused by driving on the road.

## 1.2 Before working

### 1.2.1 Precautions before work



Exhaust gas may cause gas poisoning. Do not drive or work in places with insufficient ventilation such as indoors.



- 1) Never modify the machine to interfere with safe work.  
(Cutting the cover, installing non-genuine parts, using unspecified belt oil, removing safety devices, etc.)  
**We are not responsible for any accidents or malfunctions caused by these modifications.**
- 2) Make sure that there are no people, animals, vehicles, equipment, buildings, or other tangible assets around you. Also, check the safety of the surrounding area, and keep away from dangerous places such as obstacles, gutters, and soft shoulders in the field or places that require caution.



- 3) Remove stones and other foreign substances in advance, and if there are obstacles that cannot be removed, install a caution sign or a safety fence indicating the work prohibition range before starting work. Also, for safety, work at a higher mowing than usual in such fields.
- 4) Remove objects such as rocks and metal that may cause sparks due to contact with the blade in advance. If it cannot be removed, make a prominent mark to keep it away.
- 5) When mowing dead grass, clean the engine and the area around the exhaust pipe, which become hot, once an hour to check for the accumulation of grass debris.
- 6) Dead grass may catch fire due to spontaneous combustion or external fire. When cutting dead grass, have a work manager other than the worker and always monitor it.
- 7) Take especially careful when mowing during a dryness warning is issued, and do not mow in some cases.
- 8) To prevent falls, when driving on rivers, cliffs or steps (shoulders), consider the risk of road shoulder collapses and falls, and drive on sufficiently safe flat terrain.
- 9) It is dangerous to use it in the dark or when visibility is poor. Do not use it when you cannot fully understand the surrounding conditions. The light attached to this unit is for moving. Never use it for night work.



- 1) Avoid using the product under conditions such as rainy weather or puddles where the unit is exposed to a large amount of water.
- 2) Please decide on work implementation while paying attention to other weather conditions.

### 1.2.2 Inspection / confirmation before work



- 1) Never start the work until the repair is completed for the parts requiring repair, etc. that were confirmed after the previous work was completed.
- 2) It is extremely dangerous to operate with the standard safety device and related parts removed, as well as the safety covers. Check the normal condition before starting work.
- 3) When the work clutch (knife clutch, etc.) is in the "off" position, check that the V-belt is securely stopped, and if it is moving even a little, stop the engine, adjust the belt stopper and the wire.
- 4) It is dangerous for the Blade to fall off. Tighten the set bolts and nuts of the Blade. Also, replace the old one with a new one.
- 5) If there is an open / close cover for replacing the Blades, it is dangerous to use it while it is open. Be sure to use it in the closed state.

- 6) Be sure to check the effectiveness of the parking brake every time. Misalignment of the brakes can lead to serious accidents. Check with one or more of the following.
- ① At the traveling clutch lever "OFF" position (Sub-change shift lever neutral "N" position), the parking brake is applied and it does not move even if two adults push it.
  - ② The tires lock when you drive and apply a sudden brake.
  - ③ Apply the parking brake on the slope on the truck bed and do not move.
- 7) Carefully remove the air intake for cooling air, grass clogging near the cylinder, and especially grass debris accumulated around the exhaust pipe, which becomes hot. It may cause engine seizure or fire. Also, clean not only the outside but also the inside diligently. Also, clean the inside of the air cleaner and the grass debris accumulated on the HST fan cover (applicable product) at the same time.

### 1.2.3 No fire · Fuel refueling



- 1) **No fire is allowed around the machine, not only during work and refueling.** There is a risk of ignition and burns. In addition, never use open flames such as cigarettes, bonfires, etc. near the machine.
- 2) Refuel after the engine is stopped and the temperature of the muffler has dropped sufficiently.
- 3) For refueling, if there is a Fuel level upper limit mark, make it below the mark. If you put too much, pull it out until it is below the mark. Also, be sure to wipe off any spilled fuel.
- 4) Do not refueling when your body is charged with static electricity. Vaporized gasoline may catch fire, resulting in burns or fire.

## 1.3 Working

### 1.3.1 Precautions during work



- 1) For your safety, drive with a margin and do not start, stop or turn suddenly.
- 2) Do not work in an unreasonable posture, and take a rest in about 1 to 2 hours according to your physical condition.
- 3) To prevent people (especially children) and pets from entering the work area (within a radius of 15 m), put up a sign indicating that the mowing work is in progress, a guard rope, and a net to prevent scattering, and do not bring it closer to within a radius of 15 m. Immediately stop work and stop the engine when a person or child approaches.

- 4) Do not place flammable or dangerous materials around you while running. Also, the exhaust muffler gets hot. If you touch the machine when operating it or immediately after finishing work, you may get burned.
- 5) When working on a slope, use it with a slope of 10 ° or less. Make sure to do it in the horizontal direction (contour line direction) rather than in the vertical direction. If the machine is used at a slope of 10 ° or more, the machine may roll over and become an underlay of the machine.
- 6) Please be careful about the slip. do not work in slippery areas.
- 7) It is very dangerous to remove stones and other foreign substances around the machine while mowing. Be sure to remove stones and other foreign objects before mowing.

### 1.3.2 Precautions for operation



- 1) Be sure to sit on the seat, set the cutting height adjustment lever to the "move" position, and depress (or lock) the parking brake pedal to start.
- 2) Be careful when turning on slopes. You may lose your balance and fall and get injured.
- 3) For safety reasons, do not operate unnecessary operations on the shifting lever and clutch lever on slopes. There is a risk of slipping, falling, slipping, etc.
- 4) When moving backward, make sure that there is no person (especially children), animals, or obstacles, and be careful not to get caught between the machine or fall from a cliff or step.
- 5) When changing the mowing direction, check the safety in the front-back direction before turning.
- 6) Before operating the working (Blade) clutch, make sure that there are no person (including children) or animals, and pay sufficient attention to safety.
- 7) The cut grass is discharged from the right side of the machine to the rear, so always place this product on the right side of the grass to be cut. (In the case of counterclockwise mowing, always mow counterclockwise.)

### 1.3.3 Inspection during work · Stop · Cleaning



Warning

Carefully remove any grass debris that has accumulated around the exhaust pipe, which becomes hot. It may cause engine seizure or fire such as cooling air suction port or grass clogging near the cylinder. Also, clean the inside of the air cleaner and the grass debris accumulated on the HST fan cover at the same time.



Caution

- 1) When inspecting during work, be sure to stop the engine, wait for each part to cool down, and then wear protective equipment such as gloves and protective goggles.
- 2) Be sure to stop the engine when moving away from the machine. Also, make sure to stop on a stable flat ground.
- 3) When stopping the engine, do the following.
  - ① Apply the brake. ② Remove the key. ③ Close the fuel cock.
- 4) Abnormal noise, odor, and heat generation during operation may cause a fire, so stop the engine immediately and inspect and repair it.
- 5) If you collide with a foreign object during work, stop the work immediately and stop the engine. Be sure to check for knives, knife stays, Blades and covers that are missing or bent, and correct or replace them if necessary.
- 6) If you feel any abnormality during other work, be sure to stop the engine before doing the inspection.

### 1.4 Precautions for loading and unloading and transportation



Danger

When transporting this machine, be sure to stop the engine and put the fuel cock in the "closed" state. Fuel leaks can ignite spilled fuel. Also, do not tilt the unit more than necessary. Fuel may leak



Warning

- 1) Use a suitable vehicle for transportation according to the product specifications.
- 2) Choose the place of flat and safe place for loading the machine, stop the engine, pull the side brake, and chock the wheels so that it will not start moving when loading.
- 3) Adjust the height so that the knife / Blade does not contact with the slope. and doing following operations.
  - ① Set the Blade clutch to the "off" position. ② Set the diff-Lock to the "on" position.

- 4) Using to hang a strong Slope that meets the standard on a gentle slope (15 degrees or less), reduce the engine speed, load "forward", and unload "backward" slowly at low speed.
- 5) When transporting, secure it with a strong rope. Also, please try to drive safely.

## 1.5 Inspection • Maintenance

◎ **Regular inspections are essential to maintain quality and performance.**

**⟨Please note that we are not responsible for any accidents or malfunctions caused by neglecting regular inspections.⟩**



**Lack of follow the instructions below may result in burns, injury or mechanical failure.**

- 1) Before and after use, perform daily inspections and maintenance, as well as regular inspections and maintenance to always keep the product safe and comfortable.
- 2) For inspection, adjustment, and maintenance, stop the engine, and after the muffler and other overheated parts of the mission case have completely cooled, then wear protective gear such as leather gloves and protective goggles, and using appropriate tools.
- 3) Perform the inspections, adjustments, and maintenance on a flat, hard, wide and bright place, always pay attention to the balance of the Machine, and be careful not to tip it over.
- 4) Be sure to prevent the machine from falling when you lift it for inspection.
- 5) When replacing or attaching / detaching the working part (Blade) or driving part (Tire / Crawler), make sure that it is securely attached to the specified location and that it is firmly tightened.
- 6) When replacing the working part (Blade) or driving part (Tire / Crawler) to a new one, replace the setting bolts with a new one for safety.
- 7) It is dangerous to damage the safety cover of the Belt and Blade, and the shatterproof cover. Do not leave the part where you feel an abnormality during the work, but be sure to interrupt the work and inspect it, and after the work is completed, inspect it again and make necessary repairs.
- 8) Install the removed cover correctly in its original position.
- 9) Never attach or modify any attachments other than those specified.
- 10) If the fuel hose becomes old, it may cause fuel leakage and is dangerous.  
Replace it with a new one every 3 years or when it is damaged with a tightening band.



**Failure to follow the instructions below may cause a machine failure.**

- 1) When washing the machine, do not splash water on the engine (electrical parts, near the air cleaner, fuel cap, etc.) and the place where the warning label is affixed.
- 2) Check and adjust the clutches, throttles, gear changes, etc. sufficiently.
- 3) When applying the seat, wait "about 5 minutes or more" after stopping the engine and check the cooling condition of the muffler and the engine body to prevent burns and fire.

## 1.6 At the time of storage

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- 1) For safety, be sure to close the fuel cock.
- 2) When storing this machine for a long time, store it indoors.
- 3) Remove dust, deposits and foreign matter from the main body and working parts.

## 1.7 Warning display mark

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- 1) Be sure to read the warning display mark before use, fully understand it, and be sure to follow it.
- 2) If the warning display mark becomes difficult to see, replace it so that it can always be clearly identified.

警告表示マーク貼付箇所



0214-72100



0294-72910



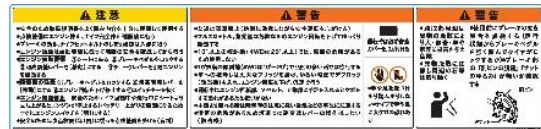
0244-81710



0334-80910



0262-81210



0308-75310



0329-76200



0215-83100



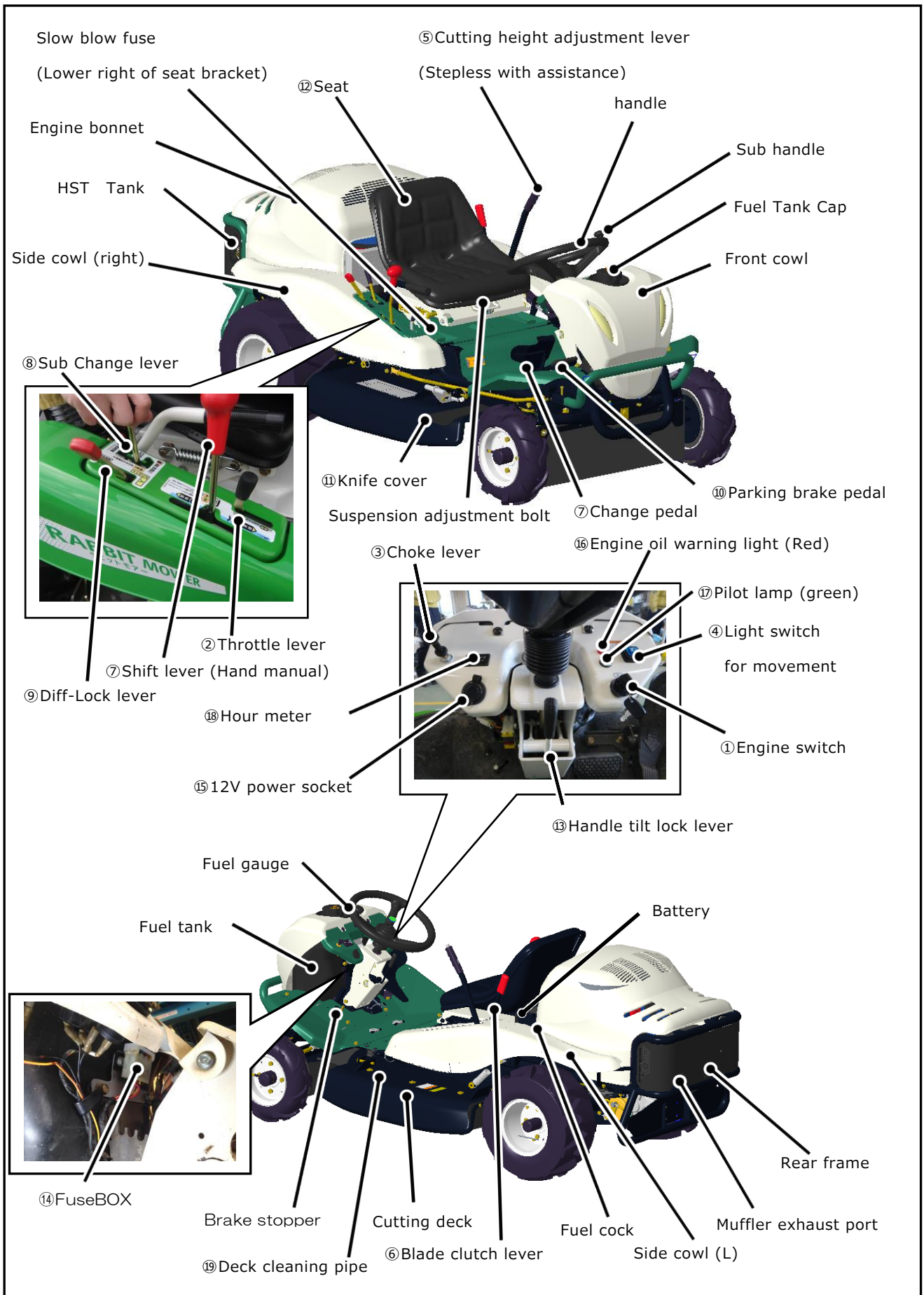
0223-76100



0215-83200

## 2. Names and functions of each part

### 2.1 Name of each part



## 2.2 Functions of each part

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### ① Engine switch

Insert the key and perform "START", "RUN" and "OFF" of the engine.

### ② Throttle lever

Adjust the Engine speed from "High speed" to "Low speed".

### ③ Choke lever

Used to start the engine in cold weather. If you pull it, it will be in the "closed"  position, and if you return it, it will be in the "open"  position.

No action required if the engine is warm.

### ④ Light switch for movement

Press to turn "ON (turn on, light on)" and press again to turn "OFF (off, light off)".

When the switch is "ON", the switch lights up in blue.



This light is for moving. Never use it for work.

There is a risk of collision, fall, etc. because the surrounding situation cannot be grasped.

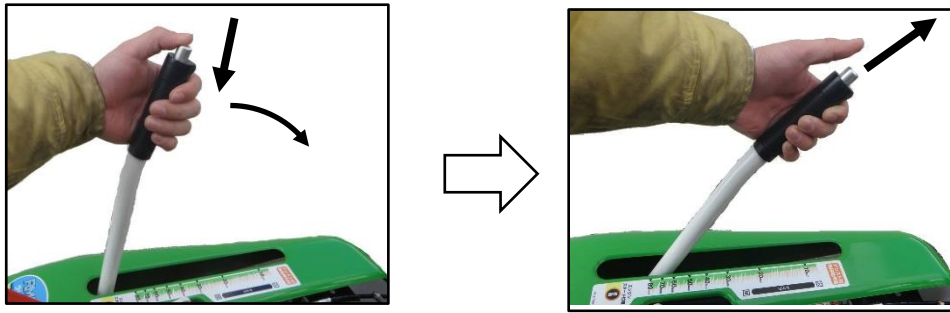
Please drive at low speed when the light is on.

### ⑤ Cutting height adjustment lever

This product can be set to any cutting height between 10 and 80 mm. Press the cutting height lock button at the tip of the cutting height adjustment lever with your thumb, adjust the height to your liking, and then release the lock button to fix the cutting height at that position (see the figure below). As a guide for the cutting height when adjusting, align the lever position with the scale label (\* displayed in 10 mm increments) on the right side of the lever. The engine will not start except in the "move" position. The knife height is different when the knife is rotated and when it is stopped. (This is because the knife lifts up a little due to the centrifugal force caused by high-speed rotation.) The scale is the value when the knife is rotated in the test field. Please refer to it as the mowing height during actual mowing work. (Slightly different depending on the field.)



Press the lock button firmly to the end to adjust the cutting height. If you operate press the button while it is stopped halfway (half-pressed), it may cause a malfunction. 安全のため、For safety, be sure to set the cutting height adjustment lever to the "move" position when entering, exiting, or moving backward in the work field.



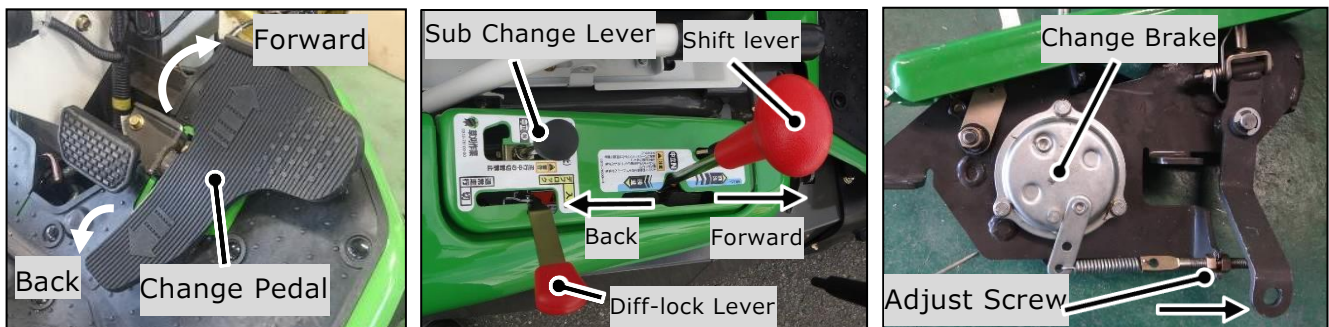
⑥Blade clutch lever

Turns the Blade on (rotates) and turns off (stops). The Blade clutch lever cannot be operated when the cutting height adjustment lever is in the "move" position.

⑦Change pedal · Shift lever (Hand manual)

It is used for driving / stopping operation of this machine, driving direction and its speed adjustment. Stepping the change pedal forward from the neutral position will move it forward, and stepping it toward the heel will move it backward.

The speed can be adjusted steplessly depending on the stepping angle. If you do not step on it, the pedal will automatically return to neutral.



Reference ;

- 1) If you want to make it more difficult to return the shift lever while driving, tighten the change brake adjustment screw (see the photo on the upper right) in the right direction (arrow direction) to apply the brake and make it difficult to return. But please note that it will also be heavy.
- 2) The change pedal moves in tandem only when the shift lever is tilted to the right and inserted into the guide groove. Other than that, the change pedal works alone.

⑧Sub Change lever

For safety reasons, use only in the slow 🐢 "mowing" position when mowing.

When moving, it is also possible to switch to the high-speed 🐾 "move" position.

Alos for safety, work on slopes should be 10 ° or less.

For operation, make sure to insert the lever to the notch of the shift guide at each position.

In the neutral "N" position, it can be pushed Machine without starting the engine.



Be sure to insert the sub-chain lever operation to the notch position with the operation stopped. Operation while driving or inadequate shifting operation may cause slipping due to gear disengagement, which is extremely dangerous. Be sure to mow the grass only on the "Mowing work" side. On the "moving" side, the speed is fast, and it is dangerous because there is a delay in the danger avoidance measures in the case of an emergency.

(※Products with sub-change levers)

### ⑨Diff-Lock lever

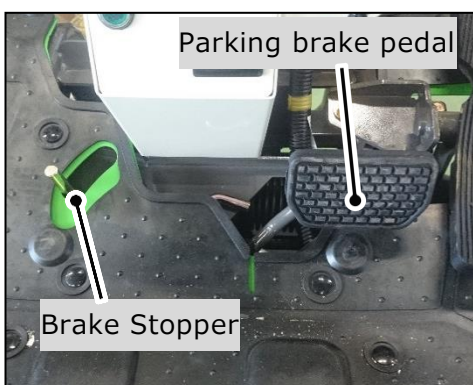
Normally, use it in the "off" position. When working on gentle slopes or on soft ground, when one side of the rear wheel slips and it is difficult to go straight, or when loading and unloading on a truck, Set the diff-lock lever to the "on" position to both rear wheels will be directly connected for the straightness will increase.



When used on flat ground, the turning radius will be large, which may cause tire wear and mission damage.

### ⑩Parking brake pedal

When the Parking brake pedal is fully depressed, the brake is engaged, the Machine stops, and the shift lever returns to the neutral "N" position. Get in the habit of using the change pedal or shift lever to perform normal stop operations. If you lock it with the brake stopper while depressing the pedal, it becomes a parking brake. If you step more deeper, the lock will be released. The engine cannot be started unless the pedal is depressed (locked).



### ⑪Knife cover

When inspecting or replacing the knife, you can fix it with the cover open.

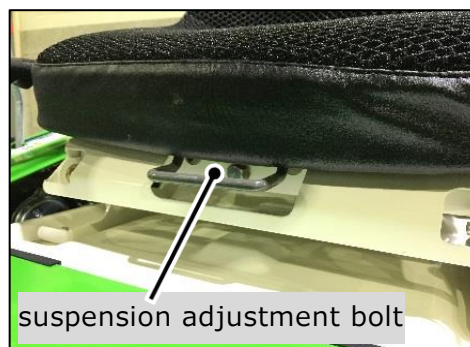
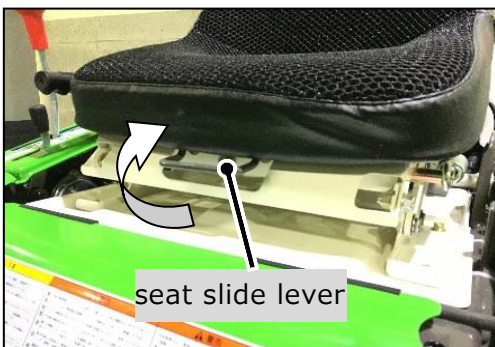




Be sure to close the knife cover during work. Mowing work with the cover open is extremely dangerous because it causes an increase in the scattering of foreign substances such as stones. Make sure that the knife cover is closed and locked except when inspecting or replacing the knife.

### ⑫ Seat (with seat slide and seat suspension function)

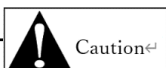
Adjust the seat slide back and forth by raising the seat slide lever in front of the seat. The suspension can adjust the strength of the spring force according to the weight of the operator by using the "suspension adjustment bolt" in front of the seat in the left photo. Turn clockwise to make it stronger, and turn it counterclockwise to make it weaker. After starting the engine, if the cutting height adjustment lever is not in the "move" position and the parking brake pedal is not in the "lock" position, the engine will stop for safety when operatee leave the seat . However, the pilot lamp does not go out and the key switch is in the "ON (operation)" state.



If the engine stops, immediately turn the engine switch "OFF" or restart the engine.  
If the engine is stopped for a while, the battery may be exhausted.

### ⑬ Handle tilt lock lever

The angle of the handle can be adjusted according to the physique of the worker. With the lock lever loosened, tighten it at the desired position to lock it. The lever becomes free when pulled up. After deciding the handle angle, you can fix it at your favorite position.



Do not tilt the steering wheel while driving as it is dangerous.

⑭ Fuse BOX

Protects harnesses and electrical components in the event of overcurrent. There are 10A (accessory) and 20A (charging) fuses, and a separate 20A fuse is included as a spare.

If the fuse blows, be sure to eliminate the cause and replace it with a spare fuse. Also, use the spare fuse only for emergencies and immediately replace it with a regular A (ampere) fuse.

⑮ 12V power socket

A power supply for accessories with a waterproof cap. 12V (maximum current: up to 10A in total)



Be sure to close the waterproof cap when not using the accessory power supply, as it may cause a short circuit or dust that may cause ignition.

⑯ Engine oil warning light (Red)

The engine switch is in the "Run" position and is lighting when the engine is stopped, but off while the engine is running. If it is lighting when the engine is running, it means that the engine is out of oil. Stop the engine immediately, check the amount of oil, and add the proper amount.

⑰ Pilot lamp (green)

Lights when the engine switch is in the "run" position.

⑱ Hour counter meter

Approximate usage time is measured and displayed.

Please use it as a guide for maintenance time.

⑲ Deck cleaning pipe



It is used to clean the inside of the safety cover of the knife part.

By connecting a hose to the pipe, starting the engine while running water, and turning the knife clutch lever "on", there is a function to remove dirt inside the safety cover.

Reference ;

- 1) The deck cleaning function with running water is only an auxiliary role to remove dirt inside the safety cover.
- 2) It is effective to use it after work and before the dirt inside the safety cover dries. Dirt that has dried and hardened cannot be removed.
- 3) If the dirt does not come off even after using it for about 3 minutes, wash it off with a high-pressure washer.

## 2.3 Machine direction

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The front, back, left, and right sides of the machine are shown in the direction seen by the operator sitting on the seat, as shown in the figure below. "Forward" and "backward" in the text are also expressed in the direction from the worker's point of view.



## 3. Inspection before work

- Before starting work, check "1.2 Before work", and check the "Pre-start checklist" below and Be sure to perform the pre-start inspection according to "7.1 Periodic inspection table".

※If you have any questions or concerns, please be sure to contact the store where you purchased the product.

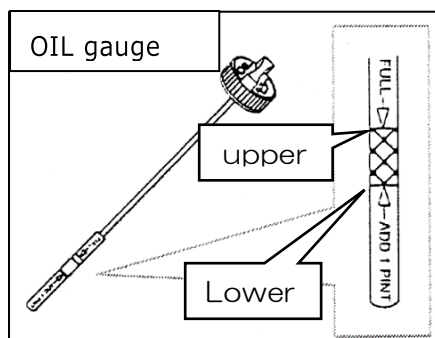
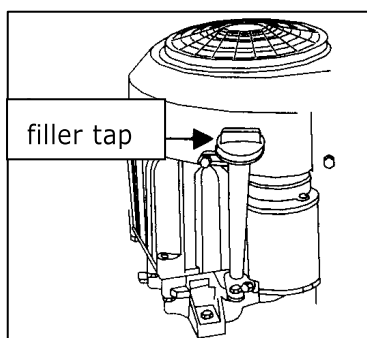
Pre-start checklist (summary from regular checklist)		
	Item	Inspection contents
Engine	① Engine Oil	Check "Oil amount, dirt" <Refer to 3.1>
	② Air cleaner	Check for "dirt" and clean <Refer to 5.2.1>
本機	① Knife (Blade)	<Refer to 5. Inspection / Maintenance>
	③ Brake (Applicable product)	"1" Loose bolts and nuts, Fall off
	③ Tires (Crawlers)	"2" Deformation, Wear, Interference
	④ Lever	"3" Moves smoothly or sticks
	④ Covers	"4" Remove foreign substances such as dust, grass and straw
	⑤ HST oil (Applicable product)	Check "Oil amount, dirt"



Warning ←

- 1) Be sure to stop the engine before performing inspections, refueling, adjustments, and maintenance.
- 2) Before starting the engine and checking the operation of the Driving clutch lever, etc., check the position of each lever and the safety of the surrounding area.
- 3) Carefully read the warning mark on the machine.

### 3.1 Checking the Engine oil



- ① Level the machine and remove the oil gauge.
- ② The tip of the filler tap is an oil gauge. Wipe the gauge part with a cloth, level the engine, screw in the filler plug for the Briggs engine,

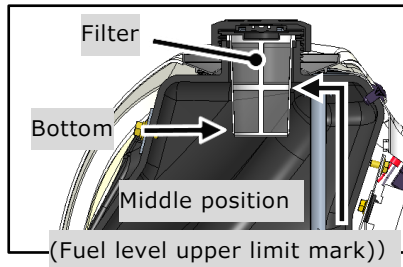
insert it without screwing in the Kawasaki engine, Check the amount of oil.

If there is no oil between the upper and lower scale lines, replenish the engine oil so that the oil reaches the upper scale line.



### 3.作業前の点検

If it spills, wipe it clean. Especially when using on slopes, there is a risk of fuel leaking, so use the amount of refueling below the bottom of the filter.



- 1) **The use of fire around the machine at all times, not just during work and refueling, is not permitted.** There is a risk of ignition and burns. In addition, never use open flames such as cigarettes, bonfires, etc. near the machine.
- 2) Refuel after the engine is stopped and the temperature of the muffler has dropped sufficiently.
- 3) For refueling, if there is a "Fuel level upper limit mark", make it below the mark (even less when using slopes). If you put too much, pull it out until it is below the mark. Also, be sure to wipe off any spilled fuel.
- 4) Do not do this when your body is charged with static electricity. Vaporized gasoline may catch fire, resulting in burns or fire.



Work on a flat, stable, well-ventilated place. If gasoline spills, it may catch fire or cause burns.



- 1) When refueling, make sure that foreign matter such as dust, grass, rain, and snow does not enter the fuel tank. It may cause engine malfunction.
- 2) Do not use anything other than unleaded regular gasoline. It may cause damage to the engine.
- 3) Gasoline deteriorates naturally. If you do not use it for more than a month, replace it with new gasoline. Also, do not store gasoline in a plastic tank. It may cause engine malfunction.

## 4. How to operate and work



※Please be sure to read 「1. Before use」 before using.

In particular, after carefully reading and understanding 「1.1 Working Conditions」, 「1.2 Before Working」, and 「1.3 During Working」 then going to operation.

### 4.1 How to start / stop the engine

#### 4.1.1 How to start the engine

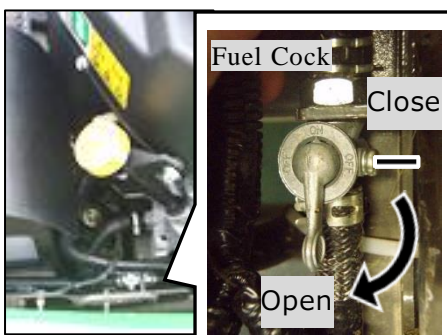


When starting the engine, carefully check the position of each lever and the safety around it. Do not start or warm up the engine in a closed room. Starting the engine in a closed room can pollute the air with harmful exhaust gas and cause gas poisoning. Since it is equipped with a gasoline engine, there is a risk of ignition of cigarettes and bonfires near this product, which is extremely dangerous. Please never do it.

#### Reference ;

- 1) **Be sure to sit in the seat and start.**
- 2) **Be sure to depress (lock) the parking brake pedal to start.** If the pedal is not depressed, the safety switch will operate and the engine will not start.
- 3) **Be sure to set the cutting height adjustment lever to the "move" position.** The safety switch is activated except in the "move" position and the engine does not start.

**For safety, please observe the above three "must" when starting the engine.**



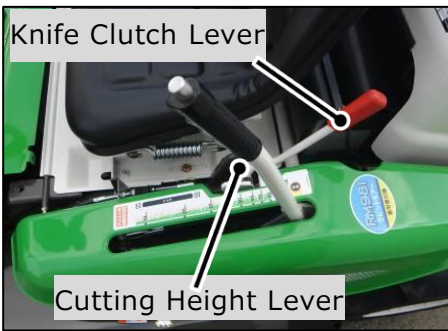
① Set the fuel cock to the "open" position.

② Please sit on the seat.



③ Depress the parking brake pedal to apply the brake stopper. If the change pedal or shift lever is in a position other than the neutral "N" position, return it to the neutral "N" position.

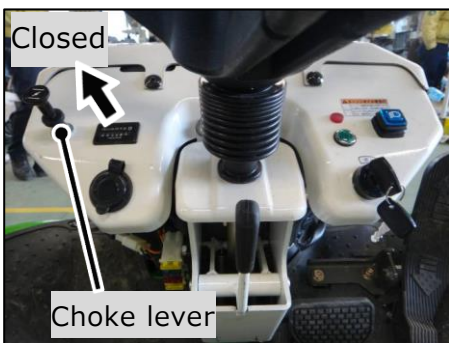
## 4. 運転・作業のしかた



- ④ Set the knife clutch lever to the "off" position and the cutting height adjustment lever to the "move" position.

### Reference ;

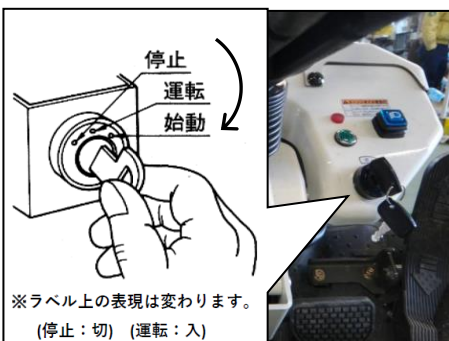
The knife clutch lever is linked to the cutting height adjustment lever. When the cutting height adjustment lever is moved to the "move" position, the knife clutch lever also returns to the "off" position.



- ⑤ After confirming that the shift lever is in the neutral "N" position, Pull the choke lever. (The state where the lever is pulled is the "closed" position of the choke valve, and the state where it is pushed is the "open" position.) (This operation is not necessary if the engine is warm.)



- ⑥ Set the throttle lever to the middle position between the "high speed" position and the "low speed" position.



- ⑦ Insert the key into the engine switch and turn the key from the "run" position to the "start" position to start the engine.
- ⑧ Release the key as soon as the engine starts. Automatically returns to the "driving" position.
- ⑨ After starting the engine, push the choke lever back to the "open" position, return the throttle lever to the "low speed" position, and warm up for a while (about 5 minutes).

### Reference ;

Warming up distributes oil to each part of the engine, extending the life of the engine.



When the engine switch is set to the "START" position, a large current flows through the starter motor, so avoid continuous use for more than 5 seconds.

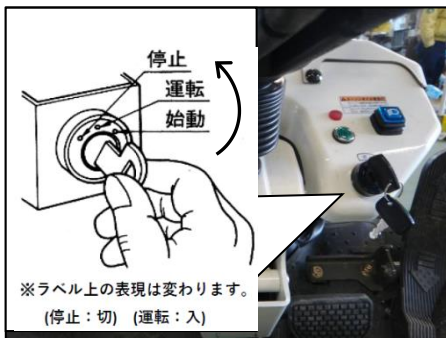
If it does not start within 5 seconds, return the engine switch to the "stop" position, pause for 10 seconds, or more, and then repeat the same operation.

Do not put the engine switch in the "start" position while the engine is running. It may cause a cell motor failure. If the engine is warm enough, start the throttle lever in the "medium speed" position. (It does not necessarily have to be in the choke "closed" position)



For safety, be sure to "lock" (park) the parking brake pedal with the brake stopper during warm-up operation.

### 4.1.2 How to stop the engine



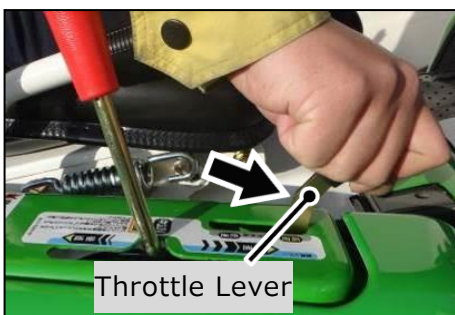
- ① Move the throttle lever toward the "low speed" position.
- ② After a few seconds in the low speed position, turn the key to the "OFF" position and stop the engine.
- ③ Remove the key from the engine switch.
- ④ Finally, put the fuel cock in the "closed" position.

### 4.2 How to drive. Speed shift. Turn. Stop



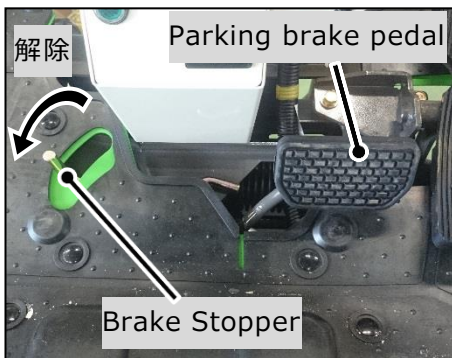
Do not use by unskilled persons (other than the owner) regarding safe work and operation methods. When operating the first time, check the safety of the surroundings, and practice thoroughly on a flat place with no obstacles and at low speed until you become accustomed to the operation and features of the product.

#### 4.2.1 How to Drive



- ① Start the engine.
- ② Move the throttle lever to the "high speed" side to increase the engine speed.

- ③ Depress the parking brake pedal deeply to release the brake stopper. Never operate the change pedal (shift lever) with the parking brake pedal "locked". It will force the braked wheels to be driven, which will overload the brakes and transmission and lead to damage.



- ④ Slowly move (depress) the shift lever (change pedal) forward to move the unit forward.



Caution

Never operate the change pedal (shift lever) with the parking brake pedal "locked". It will force the braked wheels to be driven, which will overload the brakes and transmission and cause damage.

### Reference ;

The traveling speed changes steplessly depending on the angle at the shift lever (change pedal) is tilted. Release your foot off the change pedal, it will return to the neutral "N" position.

## 4.2.2 How to stop (park)



Caution

When the parking brake pedal is depressed, driving stops and the shift lever and change pedal return to the neutral "N" position at once and stop, but make it a habit to use the shift lever or change pedal for normal driving stop operation. Especially when driving at high speeds, stepping on the parking brake pedal or releasing the foot from the change pedal may cause physical shock to the operator due to a sudden stop and overload the vehicle body.



- ① Use the shift lever or change pedal to set the shift lever to the neutral "N" position and stop the machine.  
 ② Set the throttle lever to the "low speed" side to slow down the engine.  
 ③ After a few seconds in the low speed position, set the key to the "OFF" position and stop the engine.



Caution

- ④ Depress the parking brake pedal, "lock" with the brake stopper and park.

The machine should be flat and parked in a large area with no obstacles around it, and the key should be removed to prevent theft.

## Reference ;

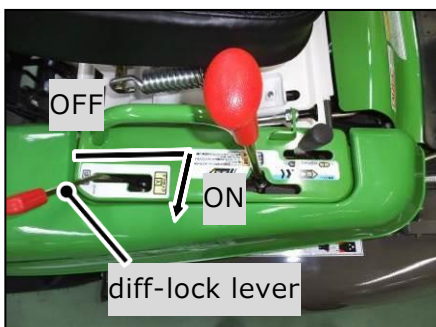
Be sure to use the engine switch to stop the engine. If you "lock" the parking brake and set the cutting height adjustment lever to the "move" position, the engine will not stop even if you stand up from the seat, but if you stand up from the seat in any other position, the engine will stop for safety (The pilot lamp does not go out and the engine switch is in the "RUN" state). In this case, if you leave it, the battery may be run down. Be sure to return the parking brake and cutting height adjustment lever to the moving position, and return the key to the "OFF" position. After starting the engine, the engine will not stop if you sit in the seat regardless of the position of the parking brake pedal and the cutting height adjustment lever.

### 4.2.3 How to operate the diff-lock lever



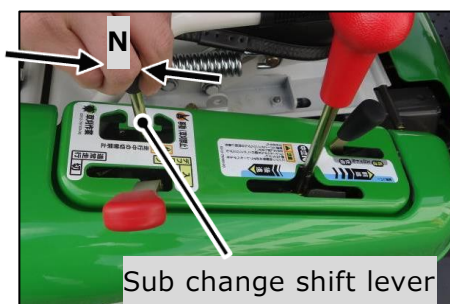
Caution

Use diff-locks only when loading and unloading, working on gentle slopes, in soft ground, and when one of the rear wheels slips and it is difficult to go straight. When using other than the above, be sure to return the diff-lock lever to the "OFF" position. If you use a diff lock on a flat ground, not only will the inner tire be dragged when turning and the turning radius will increase, but also each part of the main body (especially inside the mission) will be overloaded, such as tire unevenness, which may cause a malfunction.



- ① Normally leave it in the "off" position. Only when a diff lock is required on a muddy or steep slope, put the lever in the "on" position and hook it into the notch to "lock" it.
- ② After escaping from muddy water, be sure to return the diff-lock lever to the "off" position.

### 4.2.4 How to move when you cannot drive



On flat ground, setting the Sub change shift lever to the neutral "N" position makes it easier to push the car without starting the engine.

Used in case of engine trouble etc.



Warning

- 1) Always put the Sub change shift lever in the "mowing work" position or "move" position except when pushing without Engine power.
- 2) For safety, please be sure to perform push with 2 people or more.
- 3) Do not set the Sub Change shift lever to the neutral "N" position on slopes. as it may cause slipping.

### 4.3 Loading and unloading and transportation



When transporting this machine, be sure to stop the engine and put the fuel cock in the "closed" state.

Fuel leaks can ignite spilled fuel. Also, do not tilt the unit more than necessary. Fuel may leak



- 1) Be sure to use a bridge. Hanging and unloading this product (using a UNIC vehicle, etc.) not only causes problems such as frame deformation, but is also extremely dangerous because it may fall. Please never do it.
- 2) Do not stop in the middle of the bridge. Especially in the case of rear load, the front wheels may rise when restarting, which is dangerous. Please load and unload at a low speed at once.
- 3) The truck to be used should have no ceiling (hood) on the loading platform. When loading and unloading, there is a risk of collision with workers depending on the height of the ceiling.
- 4) Choose a flat and stable place and do not do it on public roads.
- 5) The truck to be used should be able to withstand the total weight of this product and the total weight of the driver.
- 6) If you work with more than one person, please decide in advance a signal with the truck driver to prevent accidents.
- 7) Do not load or unload at night. If it is unavoidable, work in a place where sufficient lighting is available.
- 8) For trucks, stop the engine, pull the side brakes and chock the tires.
- 9) Be sure to set the cutting height adjustment lever to the "move" position. The knife may come in contact with the bridge and tip over.
- 10) Be sure to set the diff lock lever to the "ON" position and do not operate it on the bridge.
- 11) Make sure that the hook of the bridge is hooked on the truck bed so that there is no step and it does not come off.
- 12) Make sure that the left and right tires of this product are located in the center of the bridge.
- 13) The engine should be stopped on the loading platform, the fuel cock should be "closed", and the key should be removed. Use a rope that is strong enough to securely fix this product on the loading platform.

### 4.3.1 How to load and unload



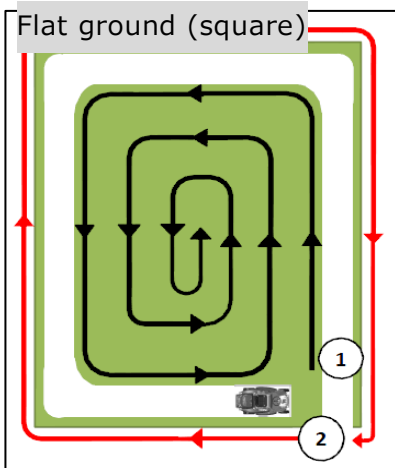
• Cutting height adjustment lever is in the "move" position



The diff-lock lever is in the "on" position

- ② Please load in the forward direction and unload in the reverse direction.
- ② Use a bridge that meets the standards.
- ③ Put the diff lock lever in the "on" position, the cutting height adjustment lever in the "move" position, and do not put it in any other position.
- ③ Set the throttle lever to the medium speed position.

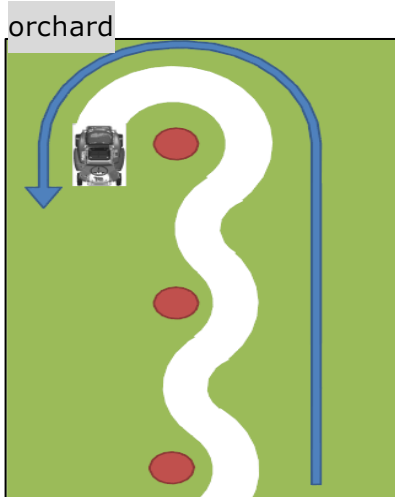
### 4.4 How to make good mowing work



When mowing on flat ground (squares, etc.)

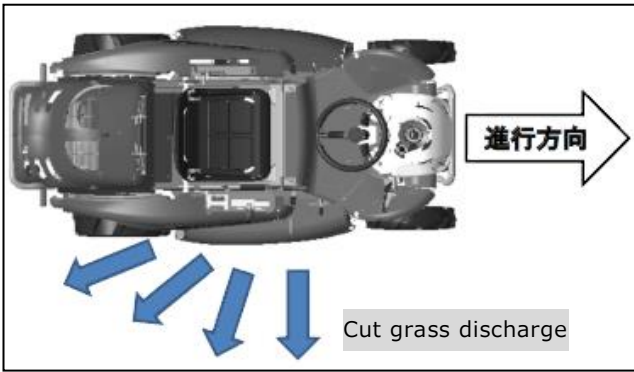
In order to prevent scattering to the outside of the field, mow the grass counterclockwise from the outside to the inside, leaving about one row of grass on the outside.

After cutting, cut the remaining outer grass clockwise.



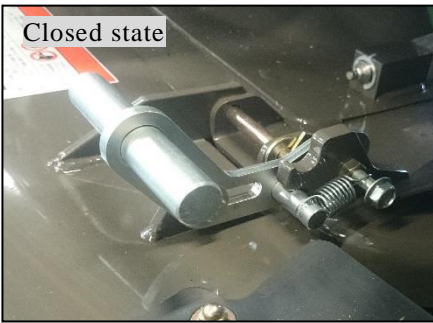
When mowing in an orchard

To eliminate damage to the trees due to scattering, mow the grass so that it passes through the right side of the trees as much as possible.



reference;

If there is a lot of grass, mow it twice. Try to mow at a higher mowing height first, and then mow at a lower mowing height and mow again.



- ① Be sure to mow the grass with the knife replacement cover on the right side of this product closed.
- ② Start the engine.
- ③ Set the throttle lever to the high speed position and increase the engine speed.



- ④ First, adjust the cutting height adjustment lever to the cutting height position of about 70 mm. Adjust the lever position referring to the scale display.



- ⑤ Then slowly tilt the knife clutch lever to the "on" position.

- ⑥ Fine-tune the cutting height adjustment lever again to the required cutting height.

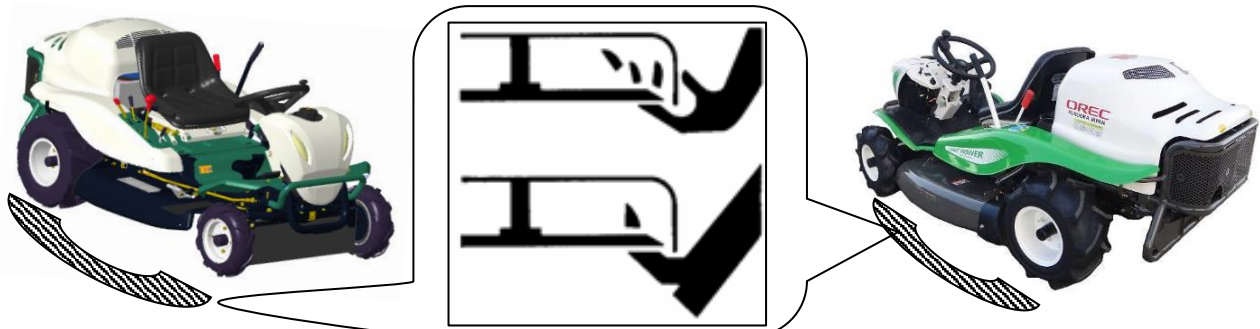


- ⑦ Start this machine and start work.
- ⑧ To finish the work, reverse the above procedure.
- ⑨ Please stop the engine.



- 1) Continuing to work with grass accumulated around the engine may cause a fire or engine seizure. Frequently remove grass debris that has accumulated around the exhaust pipe, which is particularly hot. Also, clean the inside of the engine cover regularly as well as the outside.

- 2) The cut grass is spit out from the knife replacement cover on the right side of this product, but foreign matter such as stone blocks, wires, empty cans, etc. may be scattered from the entire of the cutting part and cause damage to the surroundings. In fields near buildings or in fields with a lot of foreign matter, remove them before work and mow high or to prevent people (especially children), vehicles, etc. from entering the work area. Do not bring these things close to each other at a sufficient distance of 15 m or more, such as by putting up a preventive net.
- 3) If the cooling part is clogged with mud or dust, the oil temperature of the engine and HST will rise. Requires regular maintenance.
- 4) Be careful not to approach dangerous places such as obstacles, gutters, soft shoulders, slopes (gradient of 10 ° or more), and unevenness of the ground in the field. To prevent falls and collisions, do not work in the direction of buildings, rivers, cliffs, or people.
- 5) When working on slopes, it is especially dangerous to stand on the upper side (mountain side) of this product. If you slip your foot, you may get caught in a rotating knife and get seriously injured.
- 6) Always stop the engine and make sure the knife has stopped spinning before removing any grass, wires or other foreign objects that may be entangled in the knife.
- 7) Do not start the work until you confirm that the part where the defect was confirmed in the previous work has been repaired.
- 8) For safe work, please perform pre-work inspection of knives and knife stays with reference to <5.4 Knife inspection / replacement / installation>.
- 9) Be sure to use the attached special tool to attach and detach the knife. If it is not used, sufficient tightening torque cannot be obtained, and there is a risk that the knife will scatter due to the mounting bolt falling off.
- 10) Be sure to use the attached special tool to attach and detach the knife. If it is not used, sufficient tightening torque cannot be obtained, and there is a risk that the knife will scatter due to the mounting bolt falling off.
- 11) Be sure to use the attached special tool to attach and detach the knife. If it is not used, sufficient tightening torque cannot be obtained, and there is a risk that the knife will scatter due to the mounting bolt falling off.
- 12) The unit may slip when the grass is wet or when it rains. In addition, the mowing will clog the inside of the mowing deck, etc., which will overwhelm the engine. In such a case, stop the work and start the work after the grass has dried.
- 13) While the knife is rotating, the knife will reach the inside of the covers on both the left and right sides, so be sure not to put grass etc. into the cutting deck with your hands or feet during work. <Refer to the below figure>





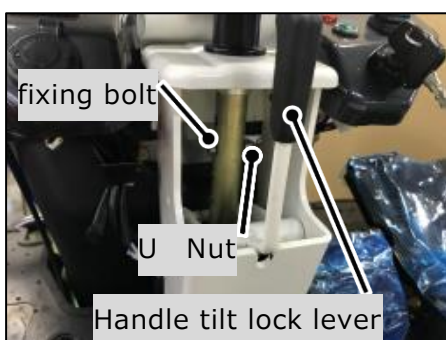
- 1) For work clothes, wear long-sleeved jackets and trousers with a squeezed hem, and be sure to wear non-slip boots, a hat or helmet, dust-proof glasses, and protective gloves.
- 2) Remove foreign objects such as stumps, stone blocks, wires, empty cans, and broken sticks before starting work.
- 3) Be sure to use the bridge when climbing over steps of about 70 mm or more.  
Overcoming a step at high speed may cause a fall accident or breakdown. Be sure to ride at low speeds and ride the tires perpendicular to the steps. Passing over at high speed is a very dangerous act as well as causing a breakdown even if the step is 70 mm or less.
- 4) If the front wheel falls into a hole or groove, be sure to stop the engine without turning the steering wheel unnecessarily, and then lift this product to escape. Unnecessarily operating the steering wheel may cause a malfunction.
- 5) A front wheel collision with a stump, curb, etc. while driving or working may cause a malfunction.
- 6) When working under a branch or on a slope, pay close attention to accidents such as being caught in a branch and falling over.
- 7) Please note that the knife rotates at high speed.
- 8) Operate the knife clutch lever slowly.
- 9) Suddenly setting the knife clutch lever to the "on" position at the lowest cutting height position (around 10 mm) will lead to premature damage to the cutting belt due to a sudden overload.
- 10) When disengaging the knife clutch, be sure to return the knife clutch lever to the "off" position, wait a few seconds (about 5 seconds), and then move the cutting height adjustment lever to the "move" position. Please note that the knife may rotate, which may cause foreign matter such as stones to scatter.
- 11) Do not deposit grass, leaves, etc. on the engine. Accumulation of these combustibles may cause a fire or malfunction.
- 12) 草の量が多く、頻繁にエンストするようであれば、作業速度を落とすか、刈高さを上げて数回に分けて刈る等してください。

Reference ;

- 1) When using this product for the first time, select a flat ground without foreign matter such as stones, and slowly mow straight so that the mowing marks overlap a little.
- 2) The cut grass is discharged from the right side of the product to the rear. Always place trees, pillars, fences and other obstacles on the left side of the product when mowing near obstacles.
- 3) When working on gentle slopes, mow so that the plug side (right side of the vehicle body) of the engine always faces the top (mountain) side. If you mow in the opposite way, the engine oil may burn and emit white smoke.

- 4) For safety, if the cutting height adjustment lever is returned to the "move" position, the knife clutch lever will also be linked and returned to the "off" position., Its lifespan is significantly shortened. Except in an emergency, please observe the operation method of 4.4 Mowing work.
- 5) The knife clutch lever cannot be operated when the cutting height adjustment lever is in the "move" position.
- 6) Use the Speed change lever (change pedal) to perform normal stop operations. If you depress the parking brake pedal in an emergency, this product will stop in an emergency, at this time, the speed change lever (change pedal) returns to the neutral "N" position at the same time.
- 7) Be sure to stop the engine when you leave the machine, and be sure to remove the key and store it by the owner.

## 4.5 Adjusting the handle / seat position according to work and physique



- Depending on the physique of the user, the handle can be adjusted in 4 steps up and down, 4 steps back and forth, and the seat can be slid back and forth to adjust.

### ① Seat slide back and forth

The seat position can be adjusted back and forth by pulling the lever and sliding it according to the physique of the worker.

### ② Handle up and down

When adjusting the handle height, remove the fixing bolt, adjust the handle height, insert the fixing bolt, and then fix it with the U nut.

### ③ Handle front-back direction

The front-back (tilt) position of the handle can be adjusted in the front-back direction.

## 4.6 How to use the moving light



Caution

This light is for moving. Please do not use it for work.



The light switch is on the lower right side of the steering wheel.

Press to "ON" and press again to move to the "OFF" position. When "ON", the switch lights up in blue.

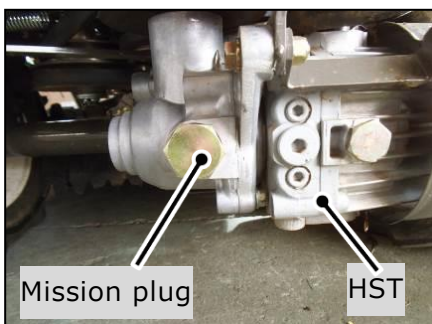
## 5. Inspection / maintenance / adjustment

### 5.1 Oil inspection / replacement / lubrication



- 1) Refer to the hour meter display on the meter panel of this product for a guideline for checking, replacing, and lubricating oil in each part.
- 2) The machine is filled with oil at the time of shipment, but before using the machine for the first time, be sure to check that the specified amount of oil is contained in the specified part before using it.
- 3) Regular oil changes are a must to always keep your machine in top condition.
- 4) When inspecting or changing the oil in each part, be sure to place the machine on a wide flat place, warm up the engine, stop it, and cool it to the extent that it is not hot to the touch (about 5 minutes). Please wait before starting work.
  - …If you work immediately after stopping the engine…
  - ※Each part of the engine body is very hot and there is a risk of burns.
  - ※Immediately after the engine is stopped, oil still remains in the engine and each part of the mission, and the exact amount of oil is not shown.
- 5) For safety, remove the key and keep it with the owner until the work is completed.

#### 5.1.1 Inspection and replacement of mission oil



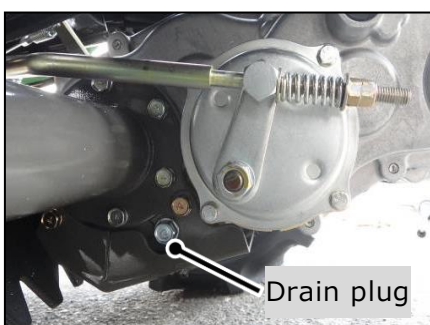
##### ◎ Inspection / replenishment.

- ① For inspection, remove the mission plug at the rear of the mission case. If the mission oil can be visually confirmed through the Mission plug port (up to the full port), almost the specified amount of mission oil is contained.

The Mission plug port doubles as the oil inspection port.

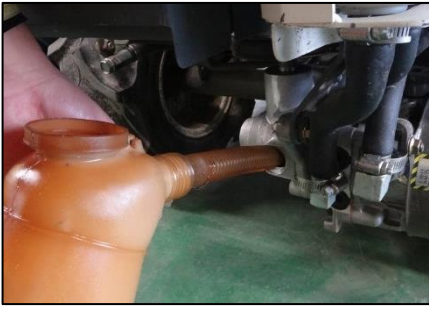
##### ◎ Exchange…

- ② For replacement, prepare an appropriate container to receive the oil, and remove the drain plug (oil drain plug) at the bottom of the left side of the mission case every 20 hours for the first time and 100 hours after that..



##### **Time for replacement**

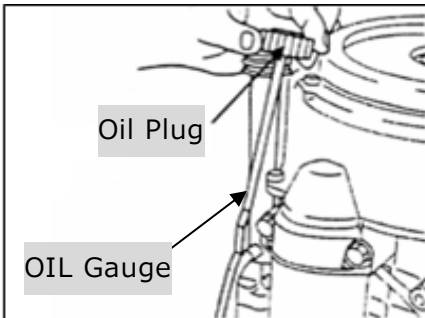
**First time: 20th hour 、 From the second time onwards : Every 100 hours**



- ③ For oiling, after installing the drain plug (drain plug), remove the mission plug at the rear of the mission case and add 1.0 liter of mission oil (# 90). After Oiling, be sure to tighten the mission plug so that there is no oil leakage. Be careful not to overtighten the mission plug. After the gasket (O-ring) comes into contact with the mounting surface, tighten it further 3/4 turn.

### 5.1.2 Engine oil inspection / replacement

#### ◎ Inspection / replenishment ... Strictly observe the amount of Oil.



- ① Check the quality and quantity of engine oil every day before starting work with the oil gauge attached to Oil Plug.
- ② Always keep engine oil up to the upper limit of the level gauge.

#### ◎ Exchange...



- ※ Replace it **5 hours** for the first time, every **50 hours** after that (with oil filter), or every season, whichever comes first. **However, in heavy load work conditions or continuous work in a high temperature environment, it is recommended to replace the engine oil (about 25 hours) and oil filter (about 50 hours).**



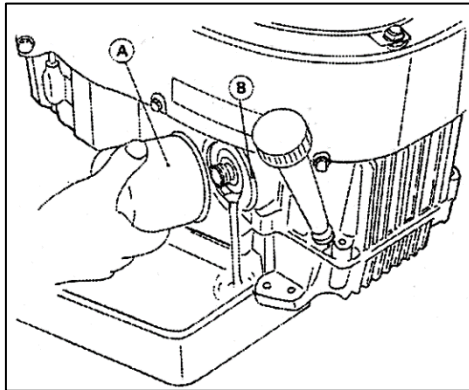
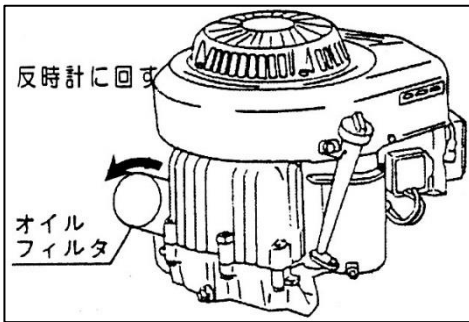
- ① Prepare a suitable container to receive the drain oil, loosen the oil inlet plug, and then remove the drain plug (oil drain plug) at the rear left of the engine using the tool M12 (width 17).
- ② After draining the oil, tighten the drain plug as before and remove the oil inlet plug.

- ③ First refuel with 1 liter of oil and run at low speed for about 30 seconds. Stop the engine, wait for about 30 seconds, and slowly replenish the oil to the "FULL" position on the level gauge.
- ④ Tighten the Oil inlet plug firmly so that the oil does not seep out after lubricating the engine oil.



Too much engine oil can cause engine malfunction. If you add too much, remove it, and keep the proper amount.

### 5.1.3 Oil filter replacement



After draining the engine oil, replace the oil filter according to the following procedure.

- ① Turn filter A counterclockwise to remove it.
- ② To prevent twisting, apply a thin coat of new engine oil to the gasket (O-ring) of the new filter with your fingertips.
- ③ Turn the filter clockwise and screw it in until the gasket begins to contact the mounting surface B. Further screw in 3/4 turn from there.
- ④ Refuel with the specified oil from the Oil Plug port.
- ⑤ After checking the amount of oil with the level gauge, tighten the oil inlet plug firmly.
- ⑥ After running the engine at low speed for **about 2 minutes**, check the oil filter mounting surface for oil bleeding.
- ⑦ Stop the engine, check the amount of oil again, and replenish if it is insufficient.



Caution

Replace the oil filter by hand without using any tools.

Change the oil filter **once every two engine oil changes** or **every season**.

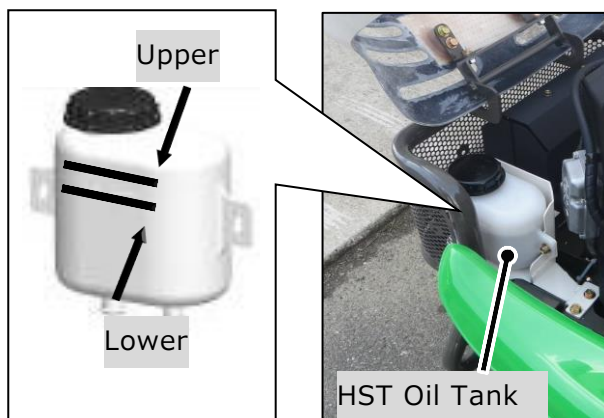
### 5.1.4 HST oil inspection / replacement



Caution

Even if the HST oil is initially clean, foreign matter will settle into the unit and the oil will deteriorate over a long period of operation, which will interfere with the smooth operation of the HST. Change the HST oil regularly to keep your work safe and comfortable. Especially when working in a harsh environment, please try to replace it before the first 30 hours.

#### ◎ Inspection / replenishment



Check the amount of oil in the HST oil tank from the outside, and if it is not between the upper and lower limits of the level gauge, open the cap of the oil tank and replenish the HST oil to the upper limit.

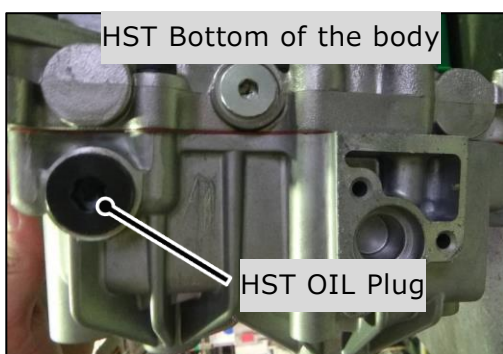
## ◎ Exchange



When changing the HST oil, wait until the HST tank and HST main unit have cooled sufficiently before starting work.

Immediately after the engine is stopped, the temperature is high and there is a risk of burns. HST oil, also called hydraulic fluid, plays an important role in converting engine rotation into drive.

It also has other functions such as lubrication, rust prevention, and cooling, but if it is not properly managed, it may cause malfunctions such as running system troubles. Be sure to use the specified special oil for replacement and replenishment.



- ① Prepare a suitable container to receive the oil, loosen the HST tank cap, and then remove the oil plug (hexagonal hole diameter 3/8 inch) on the underside of the HST.
- ② After draining the oil, firmly tighten the oil plug as before and remove the HST tank cap.
- ③ The total amount of oil is about 1.8L.
- ④ After lubricating HST oil, tighten the HST tank cap firmly.

## Reference ;

HSToil change guideline

First time: 30 hours and later: Once a year or every 200 hours, whichever is shorter

(How to judge HST oil visually)

Appearance	Smell	condition	measures
Make it transparent and there is no color change	good	good	Use as it is
Make it transparent and have small black spots	good	Foreign matter is mixed	Use after filtering
Discolored to milky white	good	Moisture is mixed	Change the oil
Discolored to black	Stink	Oxidized and deteriorated	Change the oil

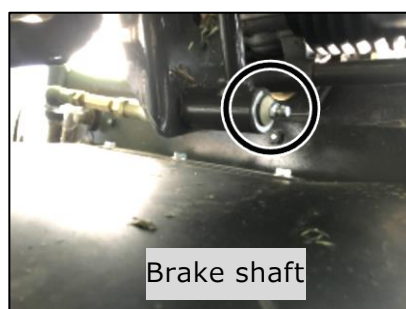
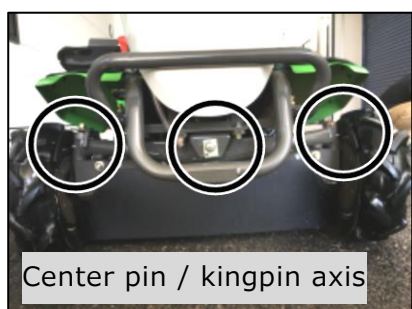
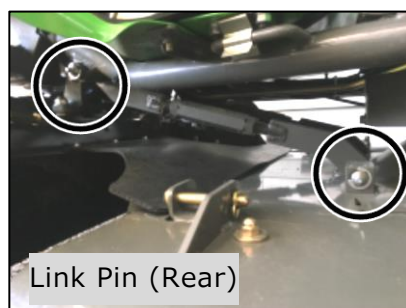
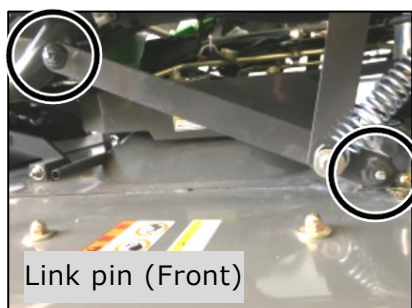
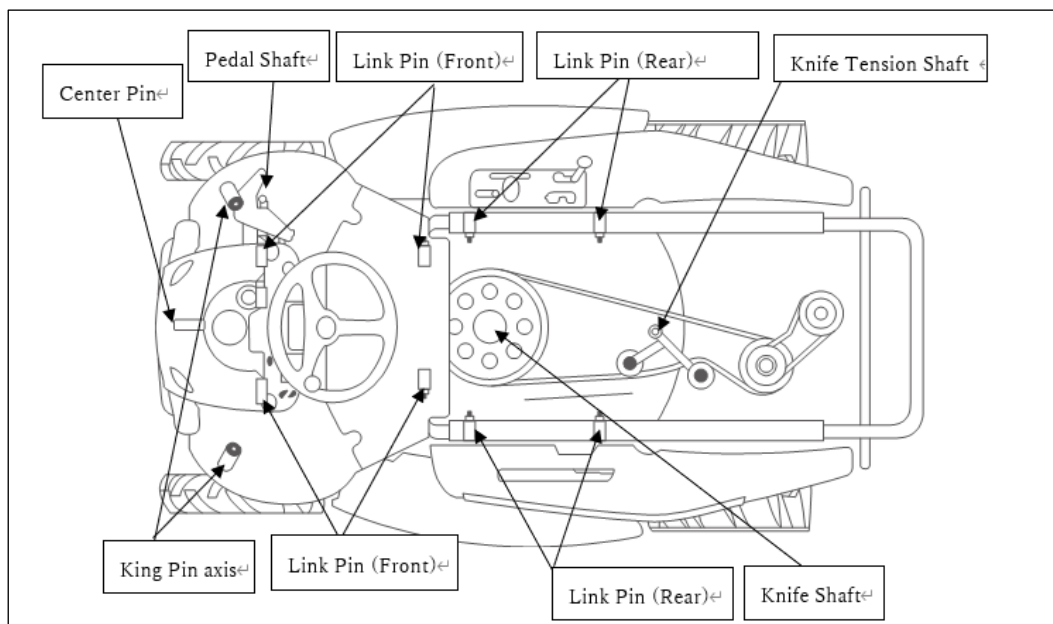
- 1) Abrasion resistant hydraulic fluid equivalent to VG46 is lubricated at the time of product shipment.
- 2) When changing the HST oil, please contact the store where you purchased the product. Special tools and maintenance techniques are required for replacement.

## 5.1.5 Lubricate to each part



Caution

- 1) Grease about every 30 hours, and lubricate other parts with rust preventive / lubricant as needed. In particular, if you neglect to lubricate the grease, it may cause damage due to poor lubrication. Lubricate referring to the grease nipple part in the figure below.

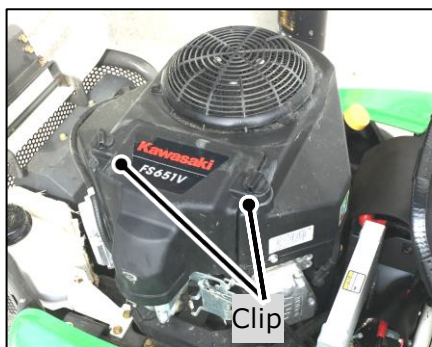


## 5.2 Engine Cleaning / Inspection / Adjustment

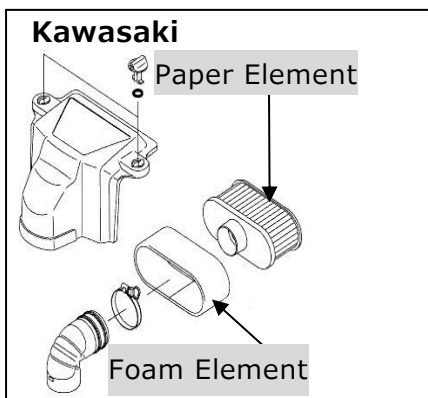
### 5.2.1 Air cleaner Cleaning



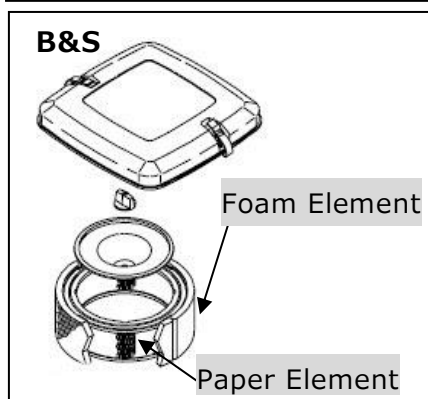
- 1) If you continue to work with an air cleaner / recoil starter that is clogged with grass dust, not only will the output be insufficient and fuel efficiency will increase, but the exhaust gas temperature will also rise, causing a fire. It is dangerous. Be sure to inspect and clean it regularly.
- 2) Do not start the engine with the air cleaner removed. Dirt and dust are sucked into the engine, causing engine malfunction and abnormal wear.



- ① Twist the clip and remove the air cleaner cover.



- ② Remove the foam element and paper element, being careful not to let dust or dirt get into the carburetor side.
- ③ After cleaning the foam element with a detergent, squeeze it well and dry it.
- ④ Tap the cartridge (paper element) lightly or blow air from the inside to remove dust and dirt.
- ⑤ Wipe off the dirt inside the hose with a waste cloth, etc., and assemble it as before.

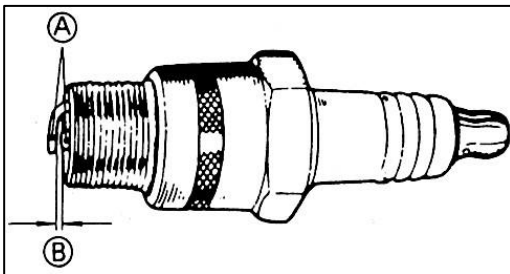


Cleaning and Replacement time of the air cleaner		
	Cleaning	Replacement
Foam Element	Before every operation	Every 100 hours
Paper Element	Before every operation	Every 100 hours

### Reference ;

- 1) If the paper element is very dirty, replace it with a new one, or wash it with soap (wash), wash it with water, and dry it well. Do not pull or squeeze the foam element during cleaning. The element breaks.
- 2) Be careful not to damage the filter paper when hitting the paper element.
- 3) When drying, applying hot air may damage the adhesive part of the paper element. Dry with low warm air or let it air dry.
- 4) When using in a work environment with a lot of dust and dirt, please try to clean it frequently (half of the above replacement time is a guide).

### 5.2.2 Inspection and adjustment of spark plugs



- ① Remove the spark plug with a plug wrench, remove carbon from the electrode part A with a wire brush, and wipe it off if it is damp.
- ② If the central pottery part is cracked or the electrode part is worn out, replace the spark plug with a new one.
- ③ Adjust the electrode gap B of the spark plug to 0.7 to 0.8 mm.

### Reference ;

- 1) The installed engine is a V-type 2-cylinder. Check and replace two plugs at the same time, and do not clean or replace only one side. It may cause engine malfunction.
- 2) When tightening, first lightly screw in by hand (until the gasket hits the seat surface), and then use a plug wrench. If you tighten it from the beginning with a plug wrench, the threads may be crushed.

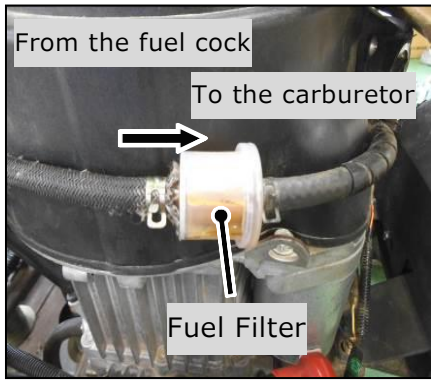


Do not test the spark plug for ignition near the plug hole in the cylinder.  
It is dangerous to catch fire.

### 5.2.3 Inspection of fuel hose



This product uses gasoline as fuel, and it is extremely dangerous because there is a risk of ignition, such as fuel leaks during work, as well as cigarettes and bonfires in the vicinity of this product.



Caution

- ① Rubber products such as fuel hoses deteriorate even if they are not used.
- ② Replace it with a new one every 3 years with the tightening band or if it is damaged.
- ③ Always be careful that the hoses and tightening bands are not loose or damaged.
- ④ When replacing, be careful not to let dust or dirt get inside the hose.

### 5.2.4 Checking the fuel filter

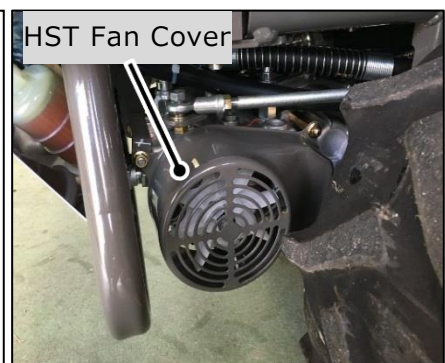
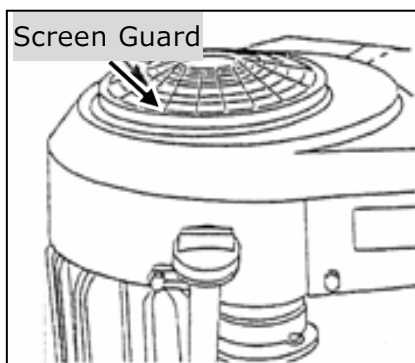
The fuel filter cannot be disassembled or cleaned, so replace it every season or as soon as necessary. Pay attention to the insertion direction when replacing.

### 5.2.5 How to clean the engine cooling system



Warning

- 1) Remove each part after the engine has cooled, and after cleaning, do not start the engine until all parts are installed.
- 2) If you continue to work with grass dust accumulated on the engine cooling system, it will not only cause overheating, but also cause a fire due to the rise in engine temperature.
- 3) Keep your hands away from the rotating screen. There is a risk of injury.  
On models equipped with the Briggs engine, the screen guard rotates with the engine.
- 4) Remove foreign matter such as mud and grass that has accumulated on the screen guard before each use.

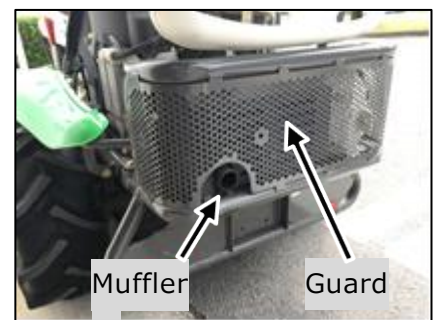
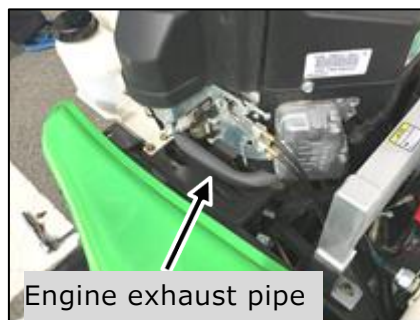


- ① Please remove foreign matter such as mud and grass accumulated on the screen guard and the upper part of the engine bonnet before each use. When blowing air, it is easier to discharge grass dust, dust, etc. by standing the sheet. (Avoid using water such as a high-pressure washer as it may cause engine malfunction.)
- ② As shown in the picture, put your hand on the arrow and pull it up to open the engine bonnet. Please stand the engine bonnet and blow air inside. At the same time, remove the

grass etc. accumulated around the inside and outside of the HST fan cover. If you continue to use it as it is, the original performance of HST will not be exhibited due to the rise in HST oil temperature.

- ③ After finishing the work, be sure to put back the covers that were removed for cleaning.

### 5.2.6 How to clean the engine exhaust system



- ① Open the engine bonnet and remove foreign matter such as mud and grass around the engine exhaust pipe by blowing air.
- ② Please remove the grass debris attached to the mesh part. at the rear part (rear frame part) of the car body.



- 1) Remove each part after the engine has cooled, and after cleaning, do not start the engine until all parts are installed.
- 2) Continuing to work with grass debris accumulated on the engine exhaust system not only causes overheating, but also causes a fire due to the rise in engine temperature.
- 3) Remove foreign matter such as mud and grass that has accumulated on the exhaust cover and muffler cover before each use.

### 5.3 Product Inspection / adjustment



- 1) When inspecting, servicing, or adjusting each part of this product, place the machine on a flat surface with no obstacles around it, be sure to stop the engine, remove the key, and wait for each part of the engine to cool down before starting work.
- 2) Make sure that each operating lever works properly. (Every time at the start of work)
- 3) The wire & belt will initially stretch, so readjust it after 2-3 hours of operation.
- 4) Wires and belts are consumables. If there is something wrong, replace it with a new one.
- 5) Move the unit a little and check for abnormal noise and abnormal heat generation.
- 6) Check that the bolts and nuts of each part are not loosened and fall off, and tighten them securely.

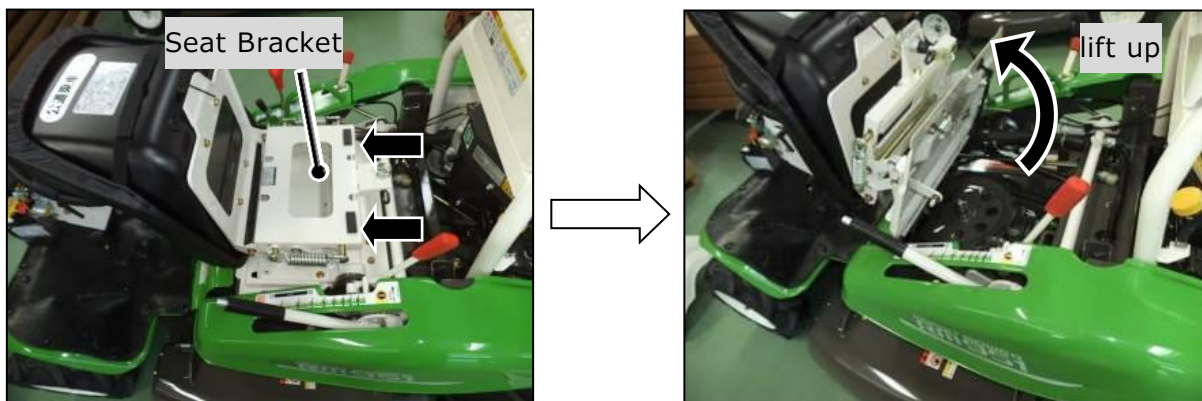
- 7) Be sure to replace the covers removed for adjustment.
- 8) Please avoid unreasonable work for the first 2-3 hours so that each part will be fully familiarized.
- 9) Don't forget to take care of it after work and perform regular inspections.
- 10) Look around the entire machine and check each part for oil leaks.

### 5.3.1 Wire / Belt adjustment for each part



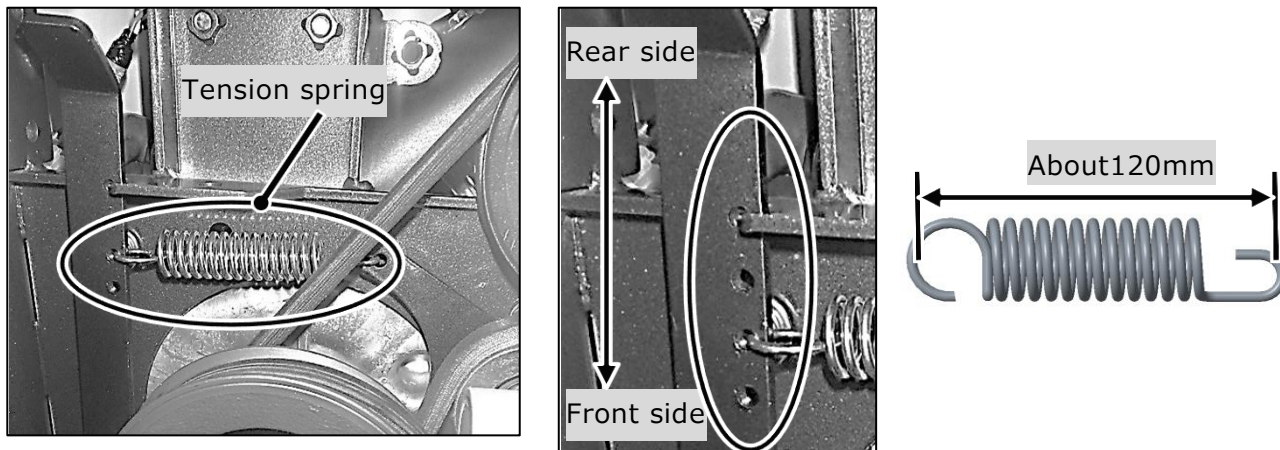
Before adjusting the belt, wire, and rod, be sure to stop the engine on a flat and wide area. After removing the key and applying the parking brake, check the safety sufficiently before proceeding.

- ① To adjust the belt and knife brake, place your hand on the arrow, open the seat bracket so that it is pulled up, and stand the seat upright. (When you lift it, it will be fixed in that position.)
- ② When adjusting the wire rod, make sure to remove the side cowl.
- ③ Ask your dealer to replace the Driving belt and Knife belt. Special tools and techniques are required to replace the belt.



#### ① Driving belt adjustment (Under part of engine)

The Driving belt is always in tension. If the belt slips while driving, change the tension spring hooking position and adjust the belt tension by referring to the photo below. Normally, a tension spring is applied to the third hole from the rear side. To increase the tension, re-hang it on the second hole from the rear side. In addition, the extension of the spring when the belt is normally stretched is about 120 mm as a guide. (Free length of spring is 80mm).

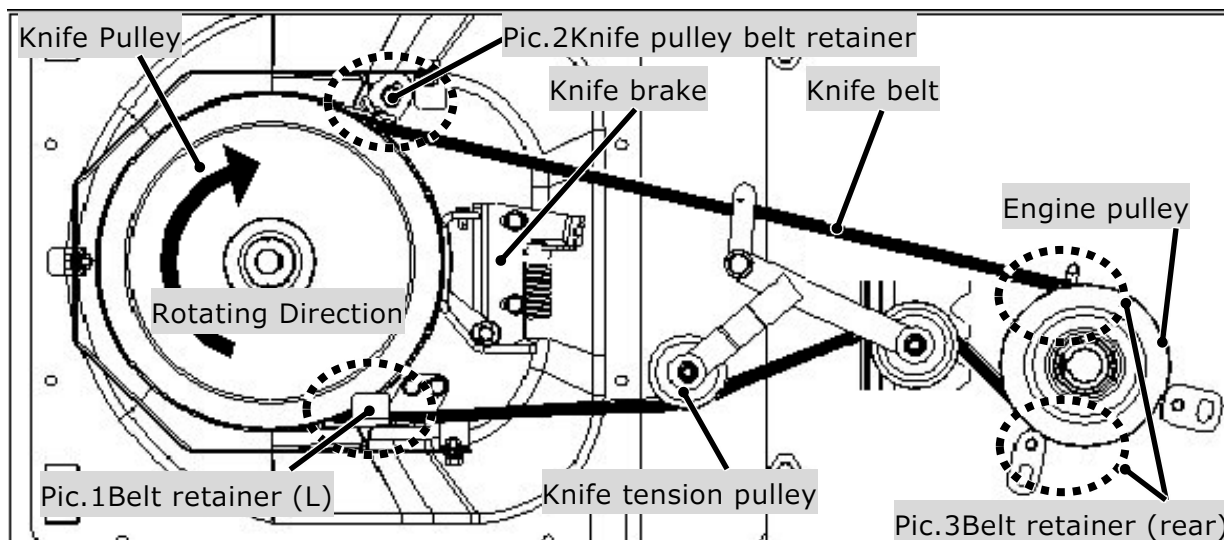


### ② Knife belt adjustment (under the seat bracket)

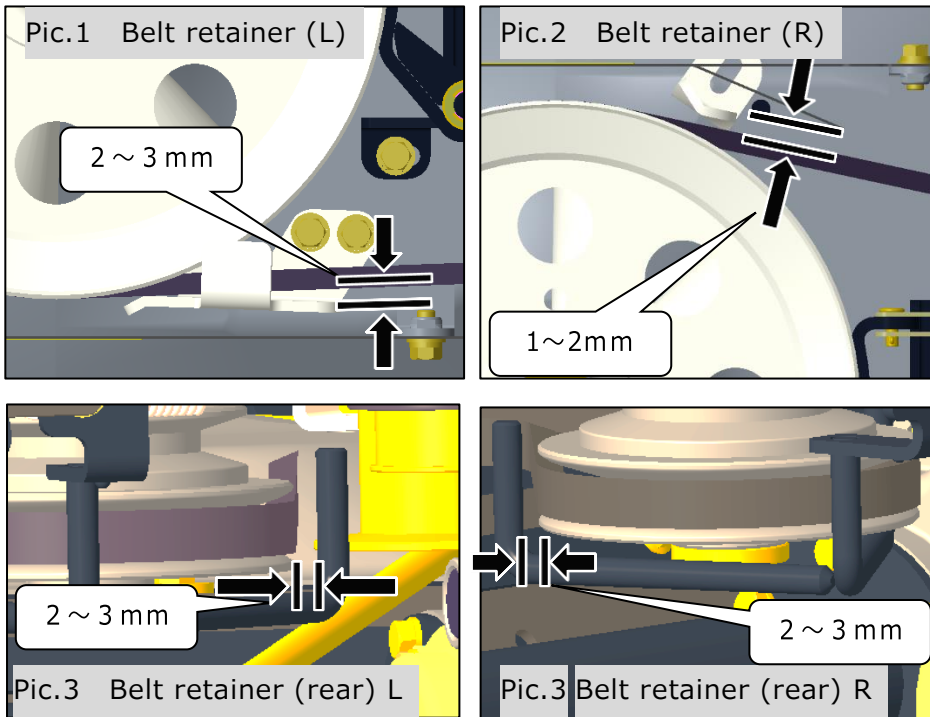


Visually inspect the belt for damage. If he has any damage such as cracks or wear, replace it with a new one.

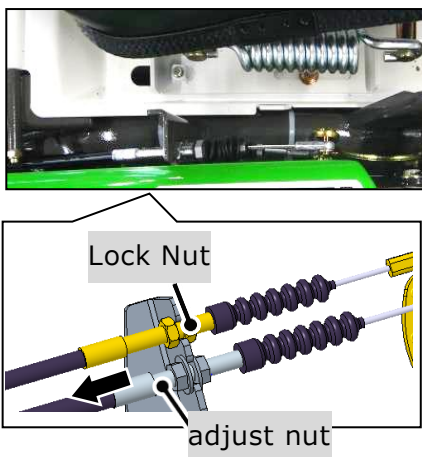
### ③ Belt retainer adjustment (under the seat bracket)



- ① Set the cutting height adjustment lever to a position of **about 30 mm**.
- ② Put the knife clutch lever in the "on" position.
- ③ Adjust the gap between each belt retainer by referring to the following..

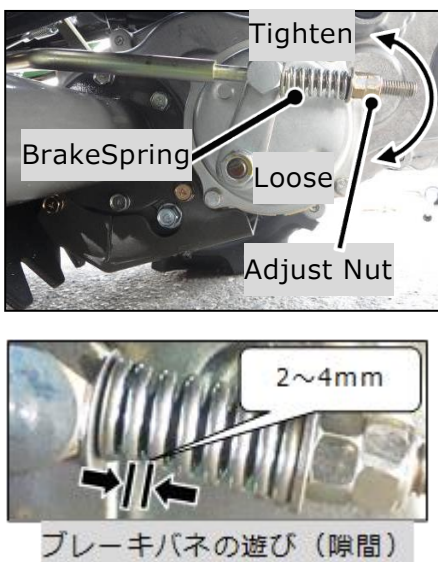


④ Knife brake adjustment



- ① The knife will stop within about 5 seconds when the knife clutch lever is in the "off" position. If it does not stop, loosen the lock nut and move the brake wire adjust nut in the direction of the arrow to adjust. (Brake drag may cause the product to malfunction.) After adjustment, please fix it securely with the lock nut.
- ② If it cannot be adjusted, the brake shoes may be worn. Ask your dealer for inspection and replacement.

⑤ Parking brake adjustment



- ① The parking brake is on the left rear of the mission and should be adjusted with the brake rod which connected to it.
- ② Adjustment is when the parking brake pedal is fully depressed (when the pedal is locked with the brake stopper). Loosen the lock nut so that the rear wheel "locks" and adjust with the adjusting nut. If you turn the adjust nut to the right and tighten it, it will start to work faster, and if you loosen it, it will work slower. Adjust so that the play of the brake spring is about 2 to 4 mm, and fix the locknut securely after adjustment.



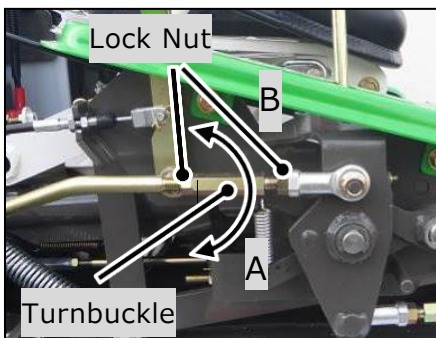
- 1) Regular inspections is not only for maintaining performance but also for braking surfaces are indispensable for maintaining safety. In the case of Ride on type, there is a risk of causing a serious accident, so be sure to perform inspections according to the regular inspection table at least before the start of work and once a month, and once a year at the store where you purchased the product.
- 2) After adjustment, lock the parking brake pedal and make sure that it does not move even if you push the unit back and forth with the Sub chang shift lever in the "neutral" position, or it does not move even on slopes.



Ask the dealer for the following work.

- 1) The brakes will also wear out. If the adjustment allowance cannot be obtained by the above method, the brake shoes may be worn. Also, for safety, please replace it regularly when the usage time does not exceed 100 hours.
- 2) The driving and knife belt will also wear out. If there is something wrong, replace it with a new one. Adjust every 10 hours for the first time and every 50 hours thereafter.

### ⑥ Speed change lever (change pedal) adjustment

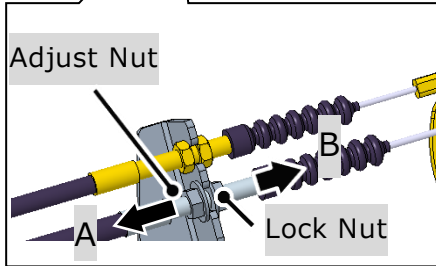
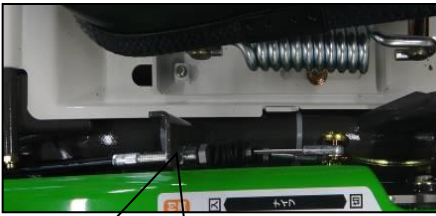


- ① Set the speed change lever to the neutral "N" position.
- ② Adjust the turnbuckle connected to the speed change lever by loosening and turning the locknut.
  - When unit is slight move in the forward direction  
 ...Turn the turnbuckle in the A direction.
  - When unit is slight move in the backward direction  
 ...Turn the turnbuckle in the B direction.
- ③ After adjustment, fix it securely with the lock nut.

Reference ;

Adjustment of the shift lever (change pedal) is not necessary except when disassembling the mission. Adjust if the position of the shift lever deviates from the guide display.

## ⑦ Knife clutch wire adjustment



- ① Move the cutting height adjustment lever Low position so that the knife clutch lever is in the "on" state.
- ③ Loosen the lock nut of the knife clutch wire and adjust with the adjust nut, referring to the photo on the left.

The elongation of the spring

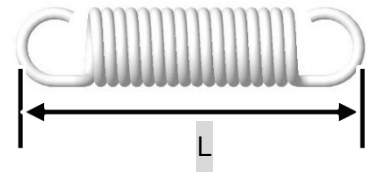
- When the tension of the knife belt is weak.  
…Adjust nut in the direction of A…
- When the knife belt is tight.  
…Adjust nut in the direction of B…

- ④ After adjustment, securely fix it with the lock nut.

Reference ;

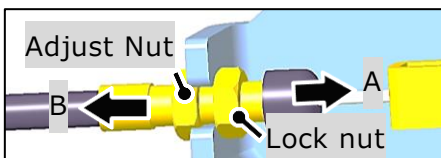
Spring elongation : Highest cutting height : about L=125mm

Lowest Cutting height : about L=135mm



## ⑧ Diff-lock wire adjustment

- ① Loosen the lock nut of the diff lock wire, referring to the photo on the left.

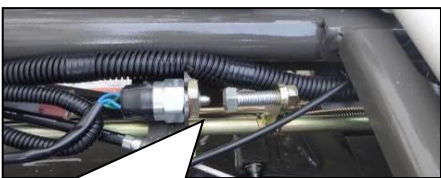


Adjust with the adjustment nut and check if it works properly after adjustment.

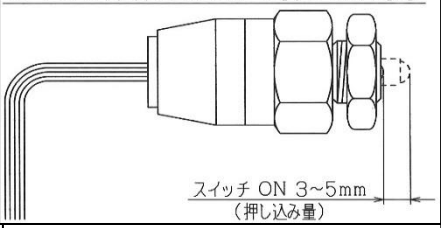
- If not diff-lock engaged.  
…Adjust nut in the direction for A…
- If the diff-lock is not released.  
…Adjust nut in the direction for B…

- ② After adjustment, please fix it securely with the lock nut.

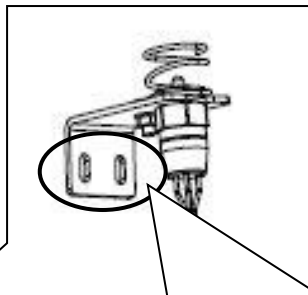
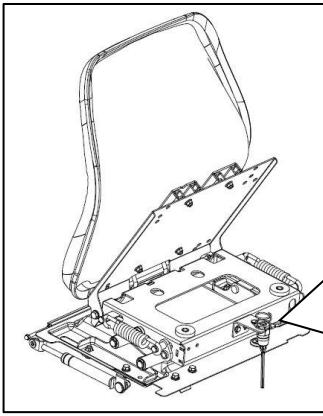
## ⑨ Safety switch adjustment



スイッチ本体をボルトで押さない事。



- ① There are three safety switches on the lower right side of the seat bracket, at the base of the cutting height adjustment lever, and under the seat.
- ② Adjust the safety switch so that it operates when the tip of the switch is pushed in the range of 3.0 to 5.0 mm, tighten the locknut, and return the seat to its original position.



③ Check the operation of the tip of the safety switch, and if it is sluggish, apply a commercially available grease spray to the operation part of the switch. If it does not improve, replace the safety switch.

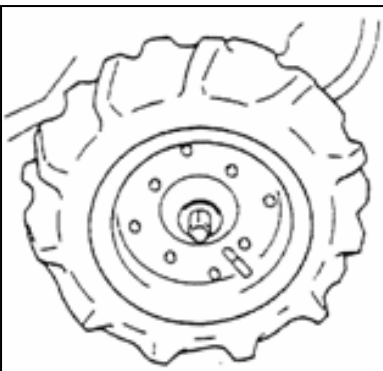
Individually adjusted with the slotted holes in the seat switch stay



Caution

- 1) If you sit on the seat and move the mowing height adjustment lever to "move" and the engine does not start even though the parking brake pedal is locked, adjust the safety switch. The engine will not start if the tip of the safety switch is pushed too much or not enough. In particular, if you press it too much, the switch body may be damaged, so adjust the safety switch referring to the above figure.
- 2) The safety switch under the seat may not be pushed in normally depending on the usage conditions, etc.  
In that case, please adjust individually with the long hole of the seat switch stay.

### 5.3.2 Tire air pressure adjustment



Check the tire pressure of the front and rear wheels according to the table below.

	Tire SIZE	Air Pressure ( k P a )
Front	3.50-7	1 2 0
Rear	17x8.00-8	1 6 0



Caution

If the air pressure of the left and right tires is not even, the steering wheel may be taken off during work.

### 5.3.3 Inspection of front tires



Caution

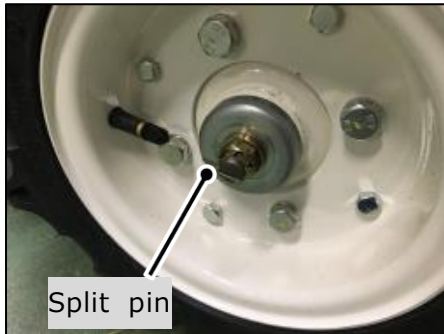
If dirt or grass gets in through a small gap, leaving it for a long time may damage the tire wheel, front wheel oil seals and bearings.



The front wheel rubber cover prevents the grass from rolling up and dust from entering, but please remove the front wheel Regularly for inspecting and cleaning.



Please lift the front with a jack referring to the photo on the left. When lifting, please do so on a flat surface with the parking brake applied.



① Remove the wheel cap, split pin and nut, and remove the tire. When assembling after inspection and cleaning, do not reuse the split pin, use a new one. Tighten the nut by setting the hole for the split pin.



② Clean the inside of the tire wheel. When assembling, grease up and lubricate the kingpin shaft.

## 5.4 Knife inspection / replacement / installation

■ For safety, please inspect the knife and knife stay before work. ■



- 1) Since a sharp knife is used in this machine, be sure to use the "knife replacement tool" that comes with the product when attaching or detaching the knife during inspection or replacement. Never touch the knife directly with your bare hands using gloves. There is a risk of injury.
- 2) Please specify all parts required for knife replacement, including knife stays, as genuine manufacturer's products.



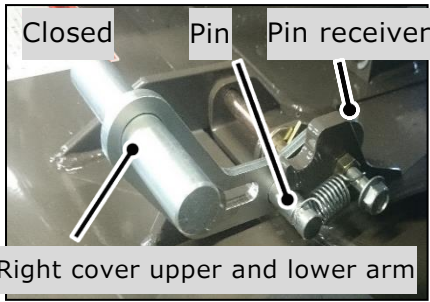
The warranty does not cover failures or accidents caused by using non-genuine manufacturers.

- 3) If the knife hits a curb or a tree root during work and there is an impact, immediately stop the work, check the knife and knife stay for bending, chipping or wear, and replace if necessary. Before starting work, make sure that the parts requiring repair at the time of the previous work have been repaired and adjusted.
- 4) If the knife and knife stay are left the unattended of wear, cracking, bending, defects, etc., the knife may suddenly break and pop out during the work, causing serious personal injury to the worker or people in the vicinity.
- 5) Like the knife, the knife stay also wears out. Even if bending, wear, etc. are not observed, replace it every 100 hours or every two years, whichever comes first.
- 6) The knife rotates at high speed. If the knife is chipped or broken even a little, it will cause vibration. Continuing to work while vibrating is not only dangerous, but also causes cracks in various parts of the product, significantly shortening the life of the machine.
- 7) Replacing the knife stay requires special tools and maintenance skills. Please ask the store where you purchased the product for the work. At the same time, it is necessary to replace the cap nut and knife stay setting bolt.
- 8) Be sure to replace the knife mounting bolts when replacing the front and back of the knife, and replace other parts (hard lock nut, nut guard, knife collar) including the knife mounting bolts at the same time when replacing the knife, and never used Non genuine bolts and nuts.
- 9) When replacing or exchanging the knife, be sure to do it both knives at same time. Replacing only one side or confusing the old and new knives may cause abnormal vibration.

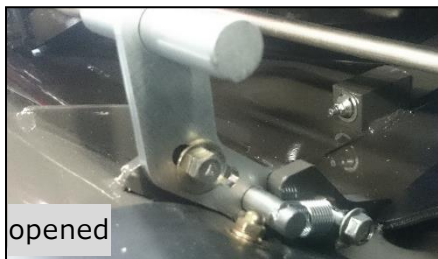


- 1) Knife replacement work should be done by someone with the right tools and maintenance skills.
- 2) The cap nut also wears. When polishing the knife, replace the cap nut at the same time, and never use another nut.

### 5.4.1 Open and Close the knife replacement cover

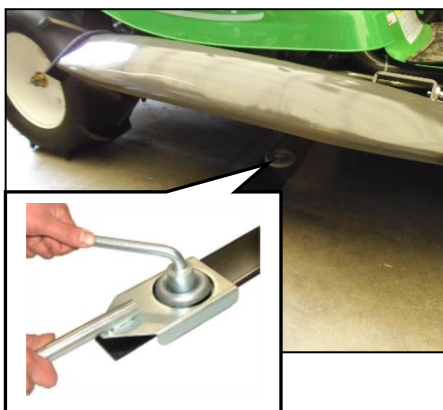


- ① Stop the engine and remove the key from the engine switch.
- ② Use the cutting height adjustment lever to set the cutting height to the middle position.
- ③ Pull the "upper and lower arm" of the right cover outward and pull up the cover.



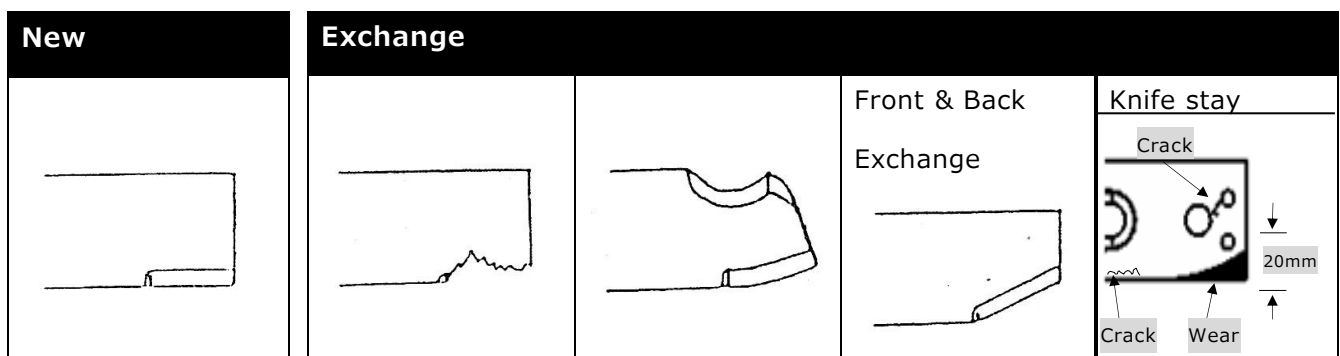
- ④ The cover can be opened and fixed by inserting the pins of the upper and lower arms of the right cover into the notch on the upper side of the pin holder.
- ⑤ When closing the cover, pull the "upper and lower arm" of the right cover outward, down the cover, and then insert the pin into the lower notch.

### 5.4.2 Inspection and replacement of knives



- ① Stop the engine and remove the key from the engine switch.
- ② Use the cutting height adjustment lever to set the cutting height to the middle position.
- ③ Fully open and secure the knife replacement cover.
- ④ Check the mounting condition of the knife and knife stay.
- ④ Check the knife and knife stay for cracks, bends and wear.

※ If the condition is abnormal as shown below, replace the knife. The front and back of the knife stay cannot be exchanged. Please replace all.



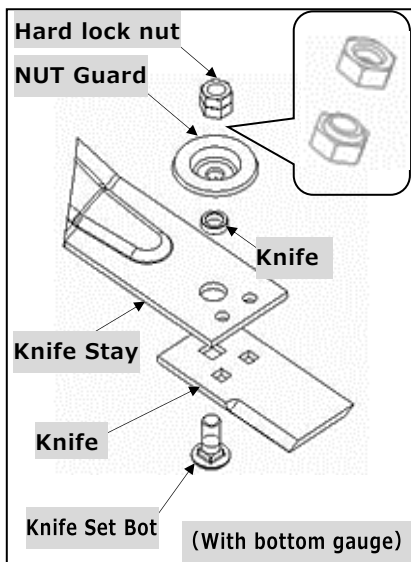


Insufficient installation of the knife may cause the knife to suddenly break and pop out during work, resulting in serious personal injury to workers or people nearby. Please attach securely referring to the following. If it is not replaced, the knife may scatter during work due to wear, deformation, damage, etc.

Reference ;

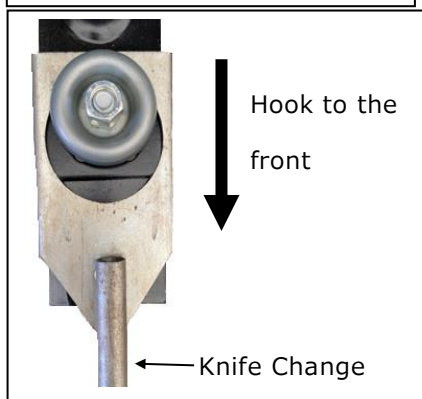
- 1) Check frequently when using in places with dry soil or sand as the knife wears quickly.
- 2) We recommend that you purchase a spare set of knives in advance and keep them handy.

### 5.4.3 How to replace the knife



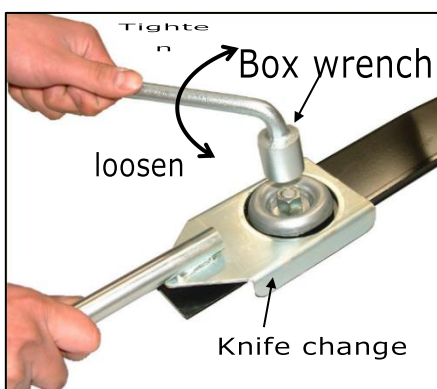
If you need to replace the knife (replacement of the front and back), please refer to the following to attach and detach the knife.

Be sure to use "Knife Change" to loosen and tighten the hard locknut.



① First, hang "Knife Change" over the knife stay and knife, and fix the knife securely. At this time, pull the "knife change" toward you as shown in the figure on the left and hook it on the nut guard.

② Use 22 boxes Wrench to remove only the upper locknut, and then remove the lower nut in the same way. When replacing the front and back of the knife, replace the knife mounting bolts, and when replacing the knife, replace other parts including the knife mounting bolts at the same time.

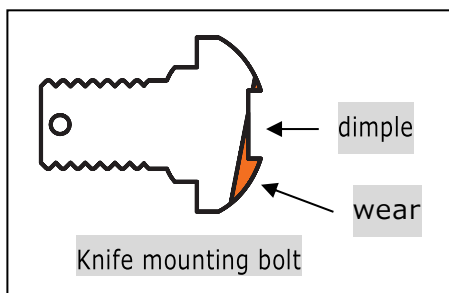


③ After replacing with a new knife (replacement of the front and back), be sure to tighten the hard locknuts one by one in the order of the lower side and the upper side.

The hard lock nut is divided into two parts, and the upper part of the lower nut has a protrusion, which is slightly thinner than the upper part. There is a recess on the bottom of the nut on the top, and there is a "HARD-LOCK" stamp on the top.

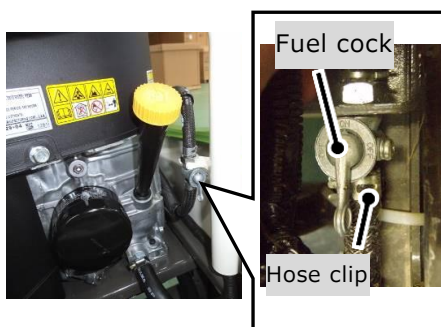
### Reference ;

- 1) The tightening torque of the hard lock nut is "**800kgf · cm**" (**78.4N · m**). As a guide, use a 30 cm long box wrench (size 22) and tighten with **a force of approximately 32 kgf or more.**
- 2) A torque wrench is required to check the tightening torque. It is recommended to confirm (acquire) in advance how much tightening force the above torque is at the store etc.
- 3) If you use it in a place containing dry soil or sand, the knife will wear quickly, so check it frequently.
- 4) We recommend that you have a spare knife and a set of parts necessary for installation in advance.
- 5) Be careful not to lose the knife collar when replacing the knife.
- 6) If the gauge (dent) on the back of the knife mounting bolt is worn, replace it.



## 5.5 How to store for a long time

### 5.5.1 Preparation for long-term storage



- ① When the machine will not be used for 30 days or more, the fuel in the fuel tank is drained from the fuel filler port to the container with a pump. Then start the engine with the remaining fuel and run the engine until it stops.
- ② Set the engine switch key to "OFF" and the fuel cock to "Close".
- ③ Clean the outer surface of the engine and this machine.  
(Reinstall the removed parts.)
- ④ Please change the engine oil.

- ⑤ Thoroughly clean each part. In particular, cleanly remove grass and dust accumulated near the rotating screen, exhaust system, air cleaner, muffler, HST fan cover, carburetor and belt cover by air blowing, etc., and remove rust on the rust-proof paint.
- ⑥ Grease and lubricate lubricated areas, respectively.
- ⑦ Apply the parking brake and store the unit horizontally in a well-ventilated and dry place with a roof.
- ⑧ When covering the machine, make sure that each part of the engine has cooled down. During storage, check the tire pressure regularly and inflate if necessary.



- 1) This product uses gasoline as fuel, and it is extremely dangerous because there is a risk of fuel leaks during work, then cigarettes and bonfires are led to fire.
- 2) Work in a well-ventilated place, and store the machine horizontally on a hard and flat place.
- 3) When draining the gasoline from the fuel tank or covering the machine, wait for the engine and muffler to be cool down (about 5 minutes or more) after the engine is stopped.
- 4) When starting the engine and putting it in an "out of gas state", make sure that there are no flammable materials in the vicinity, and then perform sufficient ventilation.



If you start work with grass or dust accumulated, the engine will overheat due to clogging and grass dust, which may cause a burn or fire.



- 1) Long-term storage with fuel left in the fuel tank or carburetor may cause problems such as start-up failure and output reduction.
- 2) For safety, remove the key and store it by the operator of this product.
- 3) Do not store the removed fuel in a plastic tank or use oxidized fuel that has been used for more than 3 months as it may cause troubles.
- 4) Reinstall the removed hoses, clips, and drain bolts.
- 5) When cleaning the machine with water pressurized with a hose, etc., be careful to cover the engine's electrical components, carburetor, air cleaner, and muffler exhaust port so that water does not get on it. It may cause an engine start failure.

## Reference ;

The grass debris inside the knife cover can be washed off relatively easily by cleaning it with water pressurized with a hose etc. before it dries.

## Storage in cold regions

- 1) In winter, be sure to remove mud and foreign matter from the machine after use and park it on a flat, concrete or hard, dry road surface. The deposit may freeze and cause a malfunction.
- 2) On flat terrain, do not "lock" the parking brake pedals and use "chock" to prevent the brake shoes from sticking.
- 3) If it freezes and becomes inoperable, do not try to force it to move, but melt the frozen part with hot water or wait until the freeze melts.

### 5.5.2 Precautions for next use



- 1) Use fresh fuel.
- 2) Perform an inspection before work.
- 3) Make sure that each operating lever works properly. (Every time at the start of work)
- 4) Check that the bolts and nuts of each part are not loosened and fall off.
- 5) Move the unit a little and check for abnormal noise and abnormal heat generation.
- 6) Please avoid unreasonable work for the first 2 to 3 hours so that each part will be fully familiarized.

## 6. Note

## 6.1 Specifications (reference values)

Name		Rabbit Mower	
Type		RM983・RM983X	
L×W×H(mm)		2000×1070×830	
Cutting width (mm)		975	
Weight (kg)		290	
Cutting Height (mm)		1 0～8 0 (Stepless with assistance)	
Knife (Pcs)		Free Knife×2 & Knife Stay×1	
Belt (Pcs)	Drive	W800 SB 28×1	
	Cutting	W800 SB 83×1	
Tire Size (Pcs)	Front	3.50-7(φ350)×2、Tube tire	
	Rear	17×8.00-8(φ450)×2、Tube tire	
Differential lock		YES	
Handle		Round handle with sub handle (Adjustable up and down 4 steps, front and back 4 steps)	
Transmission		HST continuously variable transmission	
Mission oil amount (L)		1.0(#90)	
HST Oil amount (L)		1.8(VG46)	
Brake		Mission brake・(Parking Brake)	
Speed (km/h)	Forward	Sub transmission [Low] 0～8.0 / [Hi] 0～14.0	
	Backward	Sub transmission [Low] 0～6.0 / [Hi] 0～10.0	
Battery		3 0 A – 1 9 L	
E N G I N E	Name	Briggs & Stratton	KAWASAKI
	Type	Vanguard 385777-0137-B5	FS651V-EG81
	Displacement (cc)	627	726
	OIL (L)	1.7(Including oil filter)	2.2(Including oil filter)
	Starting method	Electric starter	
	Spark plug (2 pcs)	CHAMPION-RC12YC	NGK – BPR 4 ES (KAWASAKI)
	Fuel Tank (L)	14	

※This specification is subject to change without notice for improvement.

## 6.2 Tool bag / bundled items details

Name of Item	Size	Q'ty	Remarks
User's manual		1	
Double-ended wrench	10×12	1	
"	14×17	1	
L-Type wrench	22mm	1	
safety goggles	0328-76100	1	
Setting Bolt	M 1 4用	2	For replacing the knife
Knife change tool	"	1	Knife replacement tool
Hex wrench	3/8 inch	1	For HST oil drain

## 6.3 Consumables details

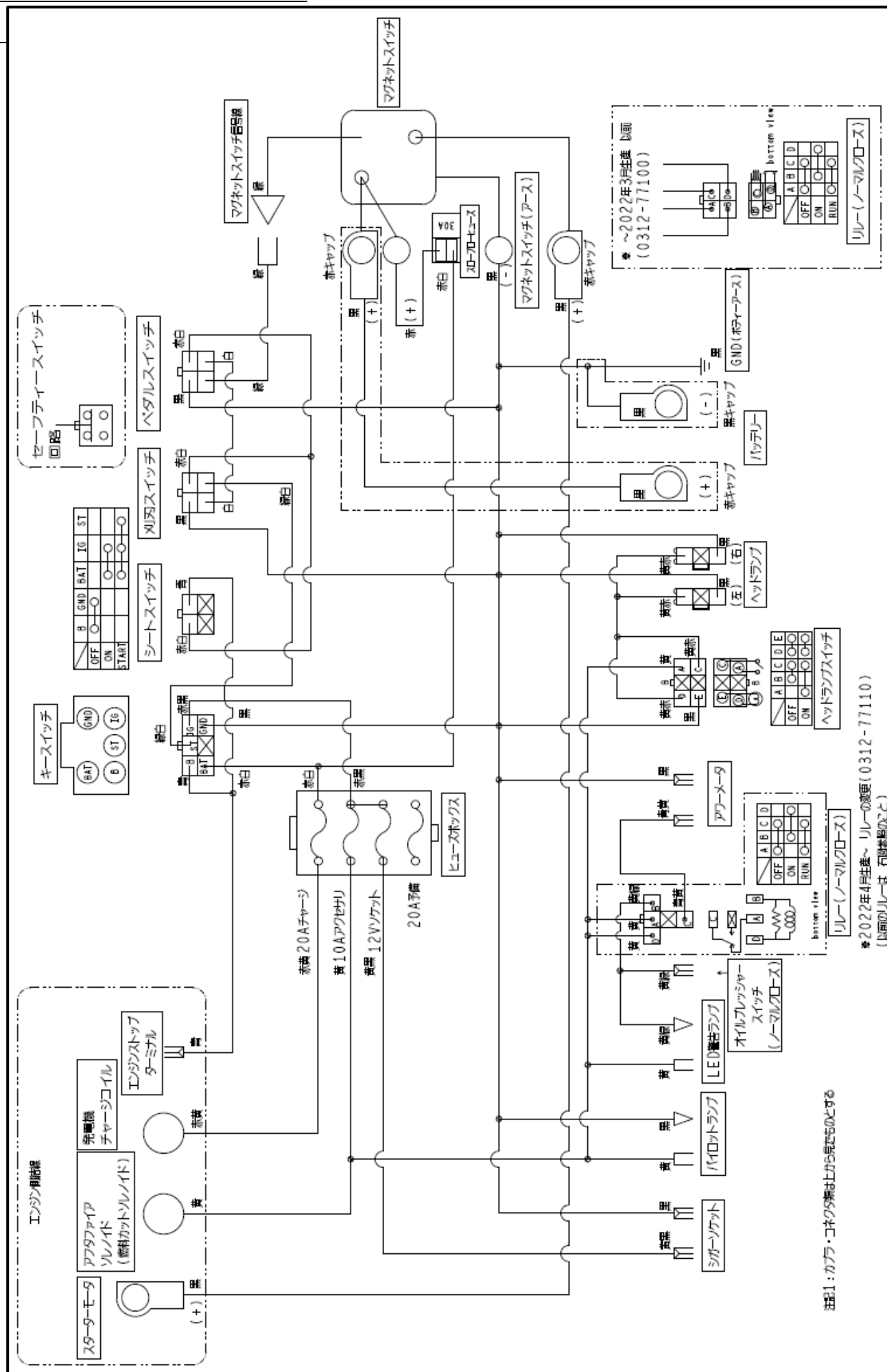
Parts Name	Parts No	Qty/Unit	Remarks
Knife (Blade)	0244-89100	2	
Knife Stay	0244-51100	1	
Knife & Setting Bolt Set	0244-78010	1	Knifex 2、Setting Boltx 4、Nut guard x 2 Hard lock Nutx 2、Collarx 2
Setting Bolt Set	0244-78210	2	Setting Bolt set x 2、Nut Guard x 1、Hard Lock Nut x 1
Knife Change tool	0244-52400	1	Knife replacement tool
Knife collar	80-1483-818-00	2	
Knife Setting Bolt	0207-50200	2	M14×32
Hard lock NutM14	0244-74600	2	Specal Duble Nut 1set
Nut guard	0244-51800	2	For M14
Cap Nut	83-1483-175-00	1	Fine nut、M20 メック付
Spring washer	89-1750-200002	1	Φ20
Knife stay Setting Bolt	0244-51600	2	8T/M14×30/メック付
Spring washer	89-1750-140002	2	Φ14
Battery(30A-19L)	80-1792-976-00	1	
V Belt (Drive)	89-6123-002802	1	SB-28 W800
V Belt (刈取)	89-6123-008302	1	SB-83 W800
Tire tube (3.50-7)	80-1260-404-00	2	Front wheel tube
Tire tube (17×8.00-8)	0244-78300	2	Rear wheel tube
Knife clutch wire	0312-75310	1	

## 6. 付表

Parts Name	Parts No	Qty/Unit	Remarks
Brake shoe set (PA-7)	0244-88100	1	
Knife brake wire	0312-75210	1	
Diff lock wire	0244-72410	1	
Choke wire (K)	0312-75400	1	KAWASAKI
Choke wire (B&S)	0312-75500	1	B & S
Throttle wire (K)	0312-75100	1	KAWASAKI
Throttle wire (B&S)	0244-72100	1	B & S
Oil filter	88-49065-7007	1	Kawasaki (oil element)
Oil filter	88-842921	1	B & S (oil element)
Form element	88-11013-7046	1	Kawasaki (for air Cleaner, Sponge )
Pre-cleaner filter	88-692520	1	B & S (for air cleaner, Sponge )
Paper element	88-11013-7049	1	Kawasaki (for Air cleaner , Cartridge)
Air Cartridge filter	88-692519	1	B&S (Paper filter for Air Cleaner)
Fuel filter	88-49019-0031	1	KAWASAKI
Fuel filter	88-691035	1	B&S
HST Oil filter	0312-00600	1	In the HST oil tank
Fuel hose (Front)	0312-72400	1	Fuel tank - Fuel cock
Fuel hose (Rear)	0312-72500	1	Fuel cock - Fuel filter
Fuel hose L185	88-92192-7172	1	Kawasaki (fuel filter-fuel pump)
Fuel hose L390	88-92192-1555	1	Kawasaki (fuel pump ~ carburetor)
Fuel hose L150	88-92192-7148	1	Kawasaki (fuel pump-rocker case)
HST Oil 1.0L	0244-79000	1	Super Hydro 46
Headlight	0312-70200	2	bulb T19

※For the Briggs fuel hose, Cut to the proper length before use.

6.4 Electrical schematic





## 7. check list

## 7.1 Periodic inspection table

★ Failure to perform inspection or maintenance may result in an accident or malfunction. Please perform inspection by referring to this "Periodic inspection table" so that normal functions can be exerted and always in a safe state.

★ Make annual inspection a year, monthly inspection a month, and start-up inspection every time before work.

item		Inspection items	Items to check	Check	S	M	Y
Braking device	Brake	Parking brake effectiveness	Is there no drag, or is it not lose?	Brake shoe	○	○	○
		Brake rod Joint	Is there deformation or backlash?	Rod	○	○	○
				Joint	○	○	○
		U Nut, W Nut	Is it loose or missing?	U Nut, W Nut	○	○	○
	Split pin	Is it missing?	Split pin	○	○	○	
Cutting device	Cover	Cover condition	No bends, cracks or corrosion. Is the flapper rubber attached properly?	cover	○	○	○
				flapper		○	○
	Rotating part	Blade & Stay (Knife) and installation	Is there any warp or wear? Is the bolt / nut loose, worn, or dropped?	Blade	○	○	○
				Blade stay	○	○	○
	Blade brake	Braking effect (Stop within 5 seconds)	Brake	○	○	○	
Engine	Main body	Acceleration, exhaust, choke operating status.	Acceleration is smooth, exhaust color and odor are normal, and choke operation is smooth?	Acceleration		○	○
				Exhaustion		○	○
				Chock	○	○	○
		Muffler, Battery	Setting is loose or not corroded Is the state of charge of the battery good?	Muffler		○	○
	Battery				○	○	
	Engine body	Is the engine mounted loose and cracked?	Mounting		○	○	
	Air Cleaner	Is it dirty, clogged, torn or scratched?	Air Cleaner	○	○	○	
	Oil	Engine oil, oil filter	Check for quantity, quality, leakage, and foreign matter. Is replacement time appropriate? 【Engine oil: 5H for the first time, change every 50H thereafter, and every 100H filter】	OIL	○	○	○
				Filter	○	○	○
	Oil line	Fuel tube, Filter	Check for fuel leaks, deterioration, deformation, or clogging	Tube		○	○
				Filter		○	○
	Ignition system	Spark plug	Is there any crack in the insulator or carbon accumulation?	Plug		○	○
		High-voltage cord, plug cap	Is there deterioration, cracks, or cracks in the cap?	Cord		○	○
	Cooling	Engine housing	Is there any accumulation of grass debris in the housing?	Inside Cover		○	○
Wiring	Harness	Is it loose or damaged?	Harness		○	○	
Transmission system	Belt	Drive, Blade Belt	Check for tension, cracks, damage, and significant dirt.	Drive	○	○	○
				Blade	○	○	○
	Deceleration	Mission oil	Quantity, quality, oil leakage, foreign matter (water, air) mixing	M-OIL		○	○
		【Mission oil: 20H for the first time. After that, exchange at 100H】					
Hydraulic	HST Oil (Applicable products)	Quantity, quality, oil leakage, foreign matter (water, air) mixing	H-OIL	○	○	○	
	【HST oil (equivalent to VG46): First time "Refer to each instruction manual". After that, 200H or exchange once a year. (Replace the HST oil filter at the same time)】						
movable part	Movable state of levers, wires, etc.	Is the operation smooth? Check for sticking or rust.	Diff-lock	○	○	○	
			Cutting part	○	○	○	
			Sub Change	○	○	○	
Speed change	Shift lever	Operation, N position is proper, lose or loose	Lever	○	○	○	
Driving part	Tire (Crawler)	Is the air pressure proper and is there no damage or uneven wear?	Tire	○	○	○	
	Setting state	Check the bolts and nuts for looseness and dropped out.	setting	○	○	○	
Handle	Installation state	Check the bolts and nuts for looseness and dropped out.	Handle	○	○	○	
Instrument	Hour meter (Applicable products)	Is the display time applicable and is the operating status appropriate?	Hour meter			○	
Label	Warning label and nameplate	Adhesion is proper (peeling), damage, dirt	Label			○	

## 7.2 Engine malfunction and how to deal with it

If the engine is not in good condition, check it according to the table below and take appropriate action.

phenomenon	Cause	treatment
Starter does not run	Not press the parking brake pedal	Depress the pedal and lock with the stopper
	Cutting height lever is not in "move"	Cutting height lever set to "moving" position
	Not sitting on the seat.	Sit on the seat and start
	Poorly adjusted safety switch	Adjust the switch range to 2 to 8 mm
	Battery over discharge	Charge with normal current
	Disconnection of battery cord	Connect the cord
	Disconnection of coupler wiring	Connecting
	Fuse blown	Replace the fuse (30A)
	Harness cut or short	Harness replacement
Poor charging	Defective charge coil	Replace charge coil
	Fuse blown	Replace the fuse (charge: 20A)
	Regulator failure	Replace regulator
	Battery life	Replace battery
Difficult to start	Throttle lever is not "low speed" position	Move the throttle lever to "low speed" position
	Choke lever is not in the "start" or "closed" position.	Pull and close the choke lever when the engine is cooled.
	Fuel does not flow	Inspect the fuel tank to remove any impurities or moisture that may have settled
		Fuel cock to the "open" (ON) position.
	Fuel filter plugging	Replace fuel filter
	Air or water is mixed in the fuel line system	Remove foreign matter, inspect the tightening band, and if damaged, replace with a new one.
	Oil viscosity is high and engine rotation is heavy in cold weather	Use different oil depending on temperature
	Ignition coil or Unit IS defective.	*Replace the ignition coil or unit
	Spark plug malfunction	Check the gap between the spark plug electrodes
		Replace with a new spark plug
	Battery is discharge	Remove the battery when not in use, store it in a fully charged room indoors, and install it when using
	Poor fuel quality	Replace with new good fuel
Lack of fuel	Refuel	
output is insufficient	Lack of fuel	Refuel
	Clogged air cleaner	Clean the element
	Poor fuel quality	Replace with good fuel
	The Choke is not completely open	Fully return the choke lever to the "open"
	The cooling system is clogged	Clean around the screen guard
In case of sudden stop	Lack of fuel	Refuel
	Fuel cock closed	Fuel cock to the "open" (ON) position
Exhaust color is abnormally black	Poor fuel quality	Replace with good fuel
	Clogged air cleaner	Clean the element
Black color Exhaust came out and output decreased	Clogged air cleaner element	Clean the element
	Chock is not completely open	Fully return the choke lever to the "open" position
Blue-white exhaust gas	Too much engine oil	Adjust to the specified amount of oil
	Cylinder/piston ring wear	* Replace ring
Engine rotation is not stable	Choke is not completely open	Choke lever move to completely "open" position
	Poor fuel quality	Replace with good fuel
EG Stop after a while	Defective ignition coil	* Replace ignition coil
	Fuel filter is clogged	Clean the fuel filter
Exhaust gas pungent odor	Poor fuel quality	Replace with good fuel

## 7.3 Self-diagnosis table

If any of the following problems occur, refer to the instruction manual and take appropriate action.

Phenomenon	Cause	Treatment
The grass is not discharge well	The grass is wet.	Work after the grass has dried.
	The grass is long.	Increase the cutting height and cut twice.
	The cutting height is low.	Increase the cutting height.
	The engine speed is low.	Set to the maximum speed.
	Working speed is fast.	Reduce working speed.
There is left uncut part.	Working speed is fast.	Reduce working speed.
	The engine speed is low.	Set to maximum RPM.
	Worn or damaged Blade.	Replace with a new Blade.
	Accumulation of grass debris in the Blade cover.	Clean the inside of the Blade cover.
	The grass is long.	Mowing twice.
Mow the grass in the falling direction	Change the mowing pattern (mowing direction).	
Soil cutting occurred.	The cutting height is low.	Increase the cutting height.
	The turning speed is fast.	Reduce the turning speed.
	The terrain has undulations.	Change the mowing pattern (mowing direction).
	There are many undulations on the terrain.	Increase the cutting height.
	Bending of the blade.	Replace with a new Blade.
Belt slips.	Belt tension is low.	Adjust the belt tension.
	There is a foreign object inside the Blade	Clean inside the Blade cover.
	Accumulation of grass on pulley.	Clean the pulley.
	Belt wear out.	Replace with a new belt.
Blade does not stop within 5 seconds	Wear of Blade brake shoes	Replace Blade brake
	Misaligned Blade brake	Adjust Blade brake
Vibration is large.	The Blade is out of balance	Fix the Blade (Both side Blade)
	damage of the Blade	Replace with new blade or fix it
	Accumulate of grass on knife neck	Clean the inside of the knife neck guard
	Knife shaft is bent	Replace knife shaft
	Damaged knife belt	Replace with a new belt
	Bending the knife stay	Replace knife stay
A mixture of old and new Blades	Do not mix old and new blades	
Mowing workload is large	Low engine speed	Increase engine speed
	Work speed is fast	Slow down workspeed
	Wrapping grass around the knife	Clean the knife shaft
	Long grass	Increase the cutting height and cut twice
	Low cutting height	Increase the cutting height
Tire slips and does not go straight	The diff lock is in the "off" position	Set the diff lock to the "on" position
	The field is weak	Stop working until the field is dry
Not stop the shift lever in the "N" position	The neutral "N" position of the shift lever is misaligned	Adjust the neutral "N" position with the turnbuckle of the shift lever
Reduced climbing power	Insufficient tension on the driving belt	Tension or replace driving belt
	Lack of HST oil, deterioration, mixing of air/water	HST oil replenishment, replacement, air bleeding
The unit does not move even if the change pedal is operated	Lack of HST oil	Replenishing HST oil
	HST hose disconnection and tear	Attach hose, replace damaged product.
	Parking brake is not released	Release the parking brake
	Driving clutch lever is in the "off" position	Driving clutch lever move in "ON" position
Parking brake is not effective	Brake shoe wear	Brake shoe replacement
	Oil comes in the brake drum	cleaning and replacing the oil seal
	Water comes in the brake drum	Turn on/off the brake and dry the inside of the drum.
	Tire wear	Replace tires

## 7.4 Battery maintenance/inspection

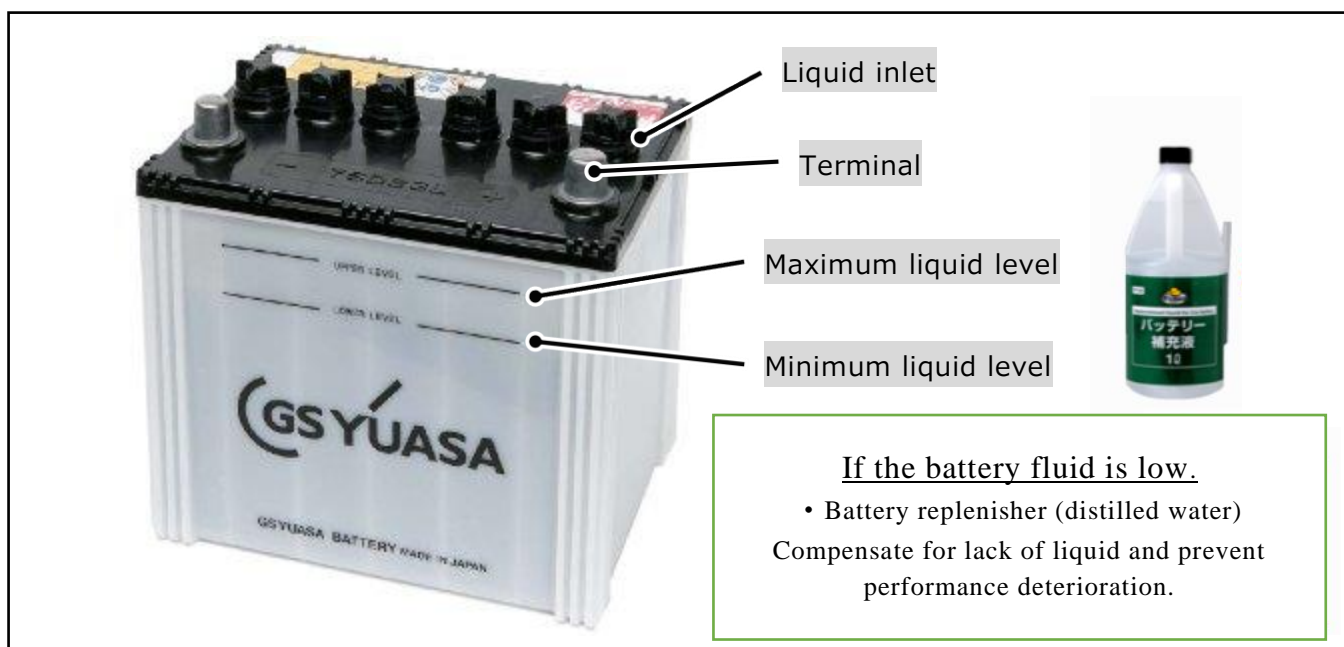
Improper handling of the battery can shorten the battery life or cause a serious accident.

Please use with the correct handling method to the full effect.

### Warning

- 1) Be aware of short circuits, sparks, and fire when handling the battery.
- 2) Combustible hydrogen gas is generated from the battery. Do not generate fire (matches, lighters, cigarettes, sparks from welders or grinders, sparks on terminals, etc.) near the battery as this may cause a fire or explosion.
- 3) Do not touch the battery with a charged body or clean it with a dry cloth. It may cause a fire explosion due to static electricity.
- 4) Battery fluid is dilute sulfuric acid. Be aware when you touch the eyes and skin as it may be injured. If an accident occurs, act according to [7.4.5 Electrolyte Solution Procedures for Accidents](#).
- 5) Be sure to remove the battery from the unit when charging. It may damage the electrical components or damage the wiring. Fast charging is not a suitable method for supplementary charging. Fast charge is only for emergencies, and for other cases, strictly follow normal charge.

### 7.4.1 How to replenish the battery fluid



Check the height of the electrolyte in the daily before using. Check the height of the electrolyte once a month even when not in use. If the liquid level drops below half between UPPER and LOWER, add purified water (distilled water) to the UPPER level.



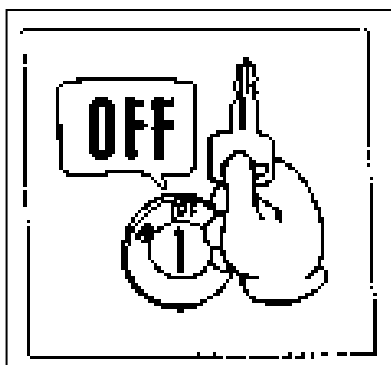
## Warning

- 1) The battery electrolyte must not have the below "LOWER" level. It may cause short life, heat generation and explosion.
- 2) Only put purified water into the battery. (Do not replenish with dilute sulfuric acid.)  
If impurities are put in, it may cause heat generation, ignition, and generation of toxic gas.
- 3) If too much purified water (distilled water) is put in, the electrolyte may spill and cause metal corrosion. Do not fill more than UPPER (maximum liquid level). If you should spill the battery fluid, be sure to wash it with water.
- 4) After replenishing water, install the inlet port plug firmly so that no liquid leaks.

### 7.4.2 How to auxiliary charge.

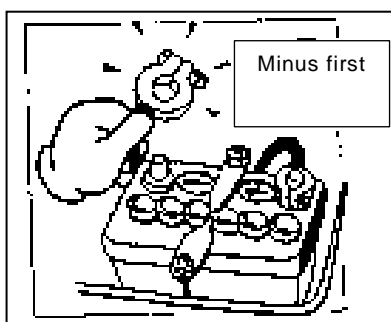
If the engine does not start even if the battery level is controlled, or if the rotation of the starter motor is lower and weaker than usual, the battery was discharged. Follow the procedure below

for charging for 5 to 10 hours.



#### • Battery removal procedure

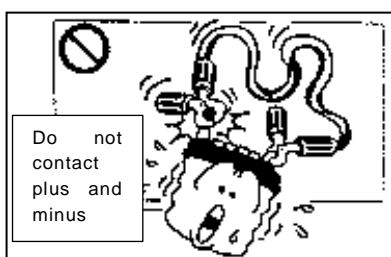
- ① Stop the engine of this product and remove the key.
- ② Make a note of the battery installation status (terminal polarity position).
- ③ Loosen the bolt on the "-" (minus) terminal of the unit and disconnect the cable terminal from the "-" (minus) terminal of the battery.
- ④ Then, loosen the bolt of the "+" (plus) cable terminal and disconnect the cable from the battery "+" (plus) terminal.
- ⑤ Loosen the battery mounting bracket and remove the battery horizontally. Handle the battery carefully as it is a heavy item.



#### • auxiliary charge ※An optional charger is required.

〈7.4.5 Reference, Battery charging time〉

- ① Before using the charger, make sure that the power is turned off. If it is connected to the battery while it is ON, a spark will be generated, which may cause ignition or explosion.
- ② Connect the + (plus) side of the charger to the + (plus) side of the battery, and the—(minus) side of the charger to the—(minus) side of the battery. Incorrect connection may cause electric circuit failure or wiring damage.
- ③ Take out all 6 liquid inlet cap.





- ④ For supplementary charging, keep the normal charging electrical current and charging time. It may cause liquid leakage, ignition, or explosion.
- ⑤ After completing the charging, attach the 6 liquid inlet cap firmly as before.

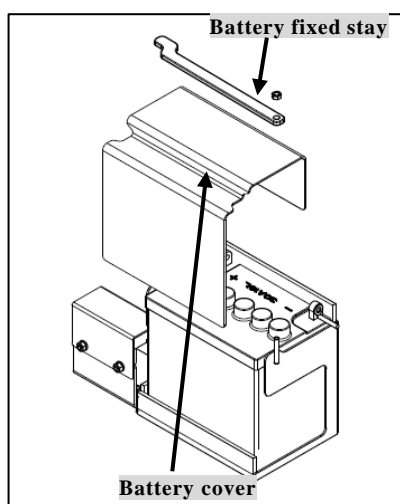
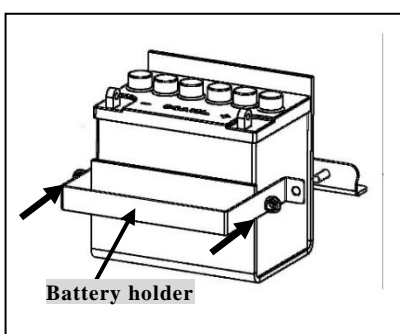
Do not use quick charge, as it is not suitable for recovering a battery that has been left for a long time. If it is unavoidable that you want to perform rapid charging, use a charging current that is less than or equal to the rated battery capacity.

**⚠ Caution**

- 1) To use the charger with boost function, follow the charger instruction manual. If handled improperly, it may cause the battery to explode or damage the product and equipment.
- 2) Charge the battery in a well-ventilated area, and keep it away from fire. It may cause ignition or explosion.

Guidelines for charging completion (must satisfy the following conditions)

①	The specific gravity of the electrolyte has been kept constant at 1.270/20°C or higher for 1 hour or longer.
②	The terminal voltage is 15 V or higher and keeps a constant value for 1 hour or longer.
③	Gas is actively generated from each cell.
④	The scheduled charging time has been reached.



• Battery installation procedure.

- ① Check that there are no foreign objects on the battery mounting base, put them on the mounting base so that the terminals polarity of the removed battery are in the same position, and there is no rattling in the battery holder (applicable model only) or battery fixing stay (applicable model only). fix it firmly.
- ② Attach the + (plus) cable terminal on the unit to the battery + (plus) terminal, and tighten the bolts securely so that there is no looseness.
- ③ Next, attach the machine-side (minus) cable terminal to the battery (minus) terminal, and tighten the bolts securely so that there is no looseness.
- ④ It is effective for rust prevention to apply a thin layer of grease to the metal parts of the cable terminals to prevent rust. If the cable terminals are corroded, clean them with a wire brush or fine sandpaper.

・ Start

Start the engine when it is installed in the machine. The start operation should be within 5 seconds, and if it does not start at one time, pause for 10 seconds, or more and then start again. However, if the operation does not start even after performing this operation, the battery life may be suspected. Check the battery and starting circuit.

### 7.4.3 Battery life

During use, the battery gradually loses its capacity and reaches the end of its life. If the performance does not recover even with supplementary charging, it has reached the end of its life. ・ The life is shortened by the following factors.

- 1) High temperature (environmental temperature)
- 2) Frequency of use (too little or too much is affected)
- 3) Insufficient charging (insufficient supply due to generator failure, etc.)
- 4) Severe use (usual use in cold regions, insufficient charge, etc.)
- 5) Inadequate maintenance (when the battery goes up due to failure to check the liquid level of the battery or water supply, contact failure due to loose terminals, forgetting to turn off the engine switch, etc.)
- 6) Excessive charging (regulator failure, overcharging without finishing charging even after completion time)

・ The following signs occur at the end of life.

- 1) The rotation noise of the starter motor is lower and weaker than usual.
- 2) The amount of electrolyte in the battery decreases quickly.




When any of these signs appear, pay attention to the above and perform supplementary charging. If the sign does not disappear after supplementary charging, it is recommended that you replace the battery as it has reached the end of battery life.

## 7.4.4 Battery failure and how to deal with it

phenomenon	Cause	treatment	Prevention method
Starter does not turn	Neglected to charge	Charging for a long time with normal charging	Do not use the battery forcibly and charge it early.
	Poor contact of terminal	Thoroughly wash and tighten the terminal	Clean the terminal, tighten tightly and apply grease
	Battery life	Battery replacement	
The starter doesn't run fast. The top of the electrode plate is white when viewed from the inlet hole	Incomplete charging	Charging for a long time with normal charging	Fully charge before use
	Insufficient electrolyte	Recharge by adding distilled water	Regularly check the liquid volume
	Battery overuse (over discharge)	Charging for a long time with normal charging	Do not use the battery forcibly and charge it early.
Can't charge even if charged	Battery life	Battery replacement	3 0 A – 1 9 L
	Fuse blown	Fuse replacement	2 0 A
Corrosion of the terminals is severe and the terminals become hot	Poor contact of terminal	Wash the terminal well and tighten it	Clean the terminal and tighten it firmly and apply grease.
	Dirty terminal		
Electrolyte decreases quickly	The battery case is cracked	Battery replacement	Secure the installation
	Charge voltage is too high	Charger replacement	
	Battery life	Battery replacement	

※If you have any questions, please contact the dealer where you purchased the product.

## 7.4.5 Treatment method in case of accident with electrolyte

degree of Danger	Accident type	Treatment method
	In case of eye contact	Immediately wash your eyes with a large amount of clean water, and then immediately seek medical treatment from a doctor (ophthalmologist).
	If swallowed	Immediately repeat gargle with drinking water, drink a large amount of fresh water, and seek medical treatment immediately.
	When it adheres to skin or clothes	Immediately rinse with plenty of water, then rinse thoroughly with soap.
	When it adheres to vehicle body.	Immediately wipe off with a waste cloth, then rinse with water.
	When spill it on the floor or the ground.	Sprinkle with sodium bicarbonate (sodium bicarbonate), etc. until no bubbles appear, then rinse with plenty of water.

## 7.4.6 Estimated battery charging time

A fast-charged battery will discharge quickly. Please follow the charging time below for the battery and fast charge only in an emergency. (Electric current 3 A ~ 4 A)

Specific gravity (20 °C)	charging time (Hour)
1,240 以上	4~5
1,200~1,240	6~7
1,160~1,200	8~9
1,120~1,160	10~12
1,120 以下	15 以上

Specific gravity (20 °C)	Discharged electricity (%)	Residual electricity (%)
1,280(1,260)	0	100
1,230(1,210)	25	75
1,180(1,160)	50	50
1,130(1,110)	75	25
1,080(1,060)	100	0



- 1) If the temperature of the liquid during charging rises above 45°C (feeling hot to the touch with the palm of the hand), reduce the liquid temperature by halve the current value charging or suspend charging, and then charge the battery.