

Instruction Manual

Self-Propelled Brush Cutter “Bull Mower”

ZHR800



0940-79100



- Important safety information appearing in this manual must be read carefully and fully understood before operating the product.
- When purchasing this product, please receive an explanation from the dealer regarding the safe operating procedures.
- Please keep this manual together with the warranty certificate in a safe place so that you can refer to it at any time.
- For safety maintenance, please have an annual inspection performed in accordance with the periodic inspection chart in this manual. (Paid service)
- Please use only genuine manufacturer parts for the maintenance.

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■ Regarding to the instruction manual.

- Please read this instruction manual carefully before using this machine.
- When lending or transferring this unit, be sure to hand it along with this unit.
- If lost or damaged, please order directly to the dealer shop.

《Introduction》

- ✓ Thank you for purchasing this product.
- ✓ This instruction manual describes the correct handling method and easy maintenance method so that the product can be kept in the best condition at all times for safe operation.
- ✓ Before using the product, be sure to read this instruction manual carefully to fully understand the safe operation work and correct handling method, and use it for safe and efficient work.
- ✓ After reading the manual, keep it in a safe place for future reference so that you can use this product for a long time.

《Definition and symbol mark》

In this manual, the following definitions and symbols are used according to the degree of danger (or the degree of the accident). Please fully understand the meanings of the following symbols and follow their contents.

Symbol mark	Definition
 Danger	Indicates what could result in death or serious injury if this Danger sign is not followed.
 Warning	Indicates a hazard that could result in death or serious injury if the warning is not followed.
 Caution	Indicates a risk of injury if the Caution is not followed. It also indicates what can cause damage to the product itself if not followed or corrected.
Reference	This section describes the performance of the product that you should know about operation and maintenance, and items that are easy to make mistakes.

《Regulation of this product》

- 1) This product has been developed as an agricultural machine, so please do not use it for any other purpose (use such as rental that the operator cannot identify).
- 2) Grasses such as ivy and vines that crawl along the ground may not be able to be cut.
- 3) This machine has one passenger capacity. In addition, it is not possible to drive on a road or a place that is used for general traffic (agricultural road, forest road, public plaza, etc.). Even if you get a vehicle number, you cannot drive on public roads.

《Important Notices》

- 1) Please note that the specifications of your product and the contents of this document may not match in some cases due to changes in parts etc. due to performance / durability improvement and other specification changes.
- 2) Please note that copying all or part of the contents of this document without permission is a violation of copyright, unless otherwise required by law.
- 3) In this manual, photographs and illustrations are used so that the explanation part can be understood concretely, but there are cases where the parts other than the explanation part are omitted.

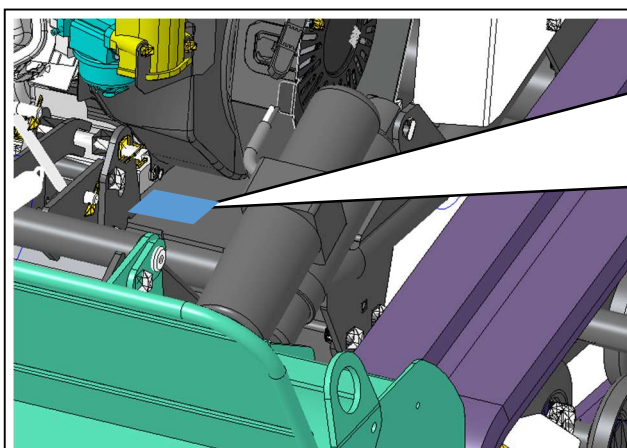
《Warranty / Contract / Disclaimer》

- 1) The warranty period of this product is one year from the time of purchase of a new product, or 50 usage hours (6 months of contract work, or 50 usage hours), whichever comes first.
- 2) It is impossible to predict all precautions. When using the product, it is necessary for the operator to pay attention to safety.
- 3) If you do not understand even after reading this manual, do not operate any arbitrary operations, and be sure to consult with the store where you purchased the product.
- 4) Regular inspection and maintenance are indispensable in order to continue to use the product safely and efficiently. Please make a regular inspection and maintenance. The warranty does not cover failures or accidents resulting from failure to perform these inspections /

maintenances, non-compliance with this manual, such as use or modification beyond specifications.

- 5) The supply period (term) of repair parts for this product will be 9 years after the production is discontinued. However, we may contact you regarding the delivery date of special parts even within the supply period.
- 6) If you have any questions or services, please contact your dealer. In that case, please refer to the following section and check "Product model number, serial number, and model name of installed engine" and contact us as well.

"Serial number" of this machine



種 類 Description	草刈機(歩行型)
型 式 名 Model	〇〇〇〇〇〇
製造番号 Serial No	〇〇〇〇〇〇〇〇〇〇〇
発 売 元	〇〇〇〇〇〇
株式会社オーレック Orec Co.,LTD.	MADE IN JAPAN FABRIQUE AU JAPON

1. Before Use ‹Please read this section carefully to ensure safe operation.›

1.1 Operating Conditions



Warning

- 1) Do not use this product if you cannot understand the contents of this manual.
This product is designed for one operator only. Do not allow any other person or animals to ride on it.
- 2) As a general rule, only the owner should operate this machine.
If you must lend the machine to someone else, be sure to explain the operating procedures. Instruct the user to thoroughly read both this machine's manual and the engine's (applicable product) "Operation Manual," and ensure they fully understand the operating procedures and safety precautions before beginning work.
- 3) Do not operate the machine if you are fatigued, ill, under the influence of medication, or otherwise unable to operate it safely.
- 4) Do not allow anyone who is intoxicated, pregnant, a child (junior high school age or younger), or inexperienced to operate the machine.
- 5) Wear appropriate work clothing to prevent entanglement in rotating parts.
Wear a long-sleeved shirt and long pants with tightened cuffs. Smoking while holding a cigarette in your mouth and wearing a towel around your waist are strictly prohibited.
- 6) Use appropriate protective equipment suitable for this product, such as safety shoes or boots with anti-slip spikes, a helmet (or protective hat), safety goggles, gloves, and shin guards.
- 7) This product is not certified under the Road Transport Vehicle Act.
Therefore, never operate it on public roads. We cannot be held responsible for any accidents or violations resulting from operating this machine on public roadways.
- 8) Do not use the machine on steep slopes, uneven ground, muddy areas, or any location where there is a risk of tipping over, slipping, or the machine becoming stuck or buried.

1.2 Before Starting Work

1.2.1 Precautions Before Operation



Danger

- 1) There is a risk of carbon monoxide poisoning from exhaust gases.
Do not operate or use the machine in enclosed or poorly ventilated areas.
Even outdoors, avoid operating or working near the exhaust outlet for extended periods of time.

**Warning**

- 1) Do not modify this machine in any way that may compromise safe operation.

(Examples include cutting or removing covers, installing non-standard parts, using belts or oils not specified, or disabling safety devices.)

We cannot be held responsible for any accidents or malfunctions resulting from such modifications.

- 2) Ensure that no people, animals, vehicles, equipment, buildings, or other property are present in the surrounding area.

After confirming the area is safe, mark any hazardous or caution-required locations—such as obstacles in the field, ditches, or soft shoulders—and keep away from them.

- 3) Remove stones and other foreign objects from the work area in advance.

If there are obstacles that cannot be removed, install warning signs or safety barriers to indicate restricted areas before beginning operation.

For safety, operate at a higher cutting height than usual in such fields. Broken knives or flying debris such as stones may pose a serious hazard す。

**Warning**

- 4) Remove any objects such as rocks or metal that may cause sparks if they come into contact with the blades.

If removal is not possible, place a clearly visible marker and keep away from the area.

- 5) When cutting dry grass, check around the engine, exhaust pipe, and other high-temperature areas once every hour to ensure that grass debris has not accumulated, and clean the area as necessary.

- 6) Dry grass may ignite due to spontaneous combustion or external heat sources.

When cutting dry grass, assign a work supervisor in addition to the operator, and perform the work under constant monitoring.い。

- 7) Exercise extreme caution when cutting grass during dry-weather advisories.

Depending on the conditions, refrain from cutting grass altogether.い。

- 8) To prevent falls or rollovers, avoid operating the machine near rivers, cliffs, or edges such as road shoulders.

Consider the risk of shoulder collapse or falling and operate only on sufficiently safe and level ground.

- 9) It is dangerous to use the machine in darkness or when visibility is poor.

Do not operate the machine if you cannot clearly confirm the surrounding conditions.

**Caution**

- 1) Avoid using the device in conditions where it may be exposed to large amounts of water, such as during rain or near puddles.

**Caution**

- 2) Pay close attention to weather and other environmental conditions and exercise appropriate judgment when deciding whether to proceed with work and when selecting equipment.

1.2.2 Pre-Operation Inspection and Checks

**Warning**

- 1) Before starting operation, always confirm that all repair items identified at the end of the previous work session have been properly repaired. Do not begin any operation until all necessary repairs have been completed.
- 2) Operating the machine without safety covers, standard safety devices, or related components is extremely dangerous. To prevent accidents, always use the machine with all such components correctly installed. If any abnormalities are found, perform the required repairs and ensure the machine is in proper working condition before operating it.
- 3) When the work clutch (such as the knife clutch) is in the "OFF" position, check that the V-belt has completely stopped. If it is moving even slightly, stop the engine and adjust the belt guide and wire.
- 4) Blade detachment is extremely dangerous. Ensure that all Blades set bolts and nuts are securely tightened. Replace any worn or aged components with new ones.
- 5) For models equipped with an opening/closing cover for knife replacement, operating the machine with the cover open is hazardous. Always operate the machine with the cover fully closed.
- 6) 駐 Always check the effectiveness of the parking brake before each operation. Improper brake adjustment can lead to serious accidents. Perform the inspection using one or more of the following methods:
 - ① With the sub-shift lever in the "N" position, apply the parking brake and confirm that the machine does not move when pushed forward or backward.
 - ② On a slope of 16.7° or less, apply the parking brake and confirm that the machine remains stationary.
- 7) Before starting operation, always remove any grass, debris, or blockages from the engine cooling air intake, around the cylinder, and especially from the areas near the exhaust pipe where temperatures become very high, as well as any debris accumulated on the machine. Failure to do so may result in engine seizure or fire. In addition to cleaning the exterior, also remove any grass or debris accumulated inside components such as the air cleaner and the HST fan cover (for applicable models)..

1.2.3 No Open Flames / Fuel Refueling



Danger

- 1) **Keep all open flames away from the machine at all times**, not only during operation and refueling. There is a risk of ignition and burns. Never smoke, use open flames, or conduct any fire-related activities near the machine.
- 2) Refuel only after stopping the engine and allowing the muffler to cool sufficiently.
- 3) For models with a fuel level upper-limit mark, fill only up to the mark (and even less when operating on slopes). If fuel exceeds the limit, drain it until the level is below the mark. Always wipe off any spilled fuel.
- 4) Do not refuel while your body is charged with static electricity. Vaporized gasoline may ignite, leading to burns or fire.

1.3 During Operation

1.3.1 Precautions During Operation



Warning

- 1) For safety, operate the machine in a controlled manner and avoid sudden starts, sudden stops, and sharp turns.
- 2) Do not work in an unnatural or strained posture. Take a rest every 1–2 hours according to your physical condition.
- 3) To prevent people, especially children—and pets from entering the work area (within a 15-meter radius), post warning signs or install guard ropes indicating that mowing work is in progress. Do not allow anyone to approach within 15 meters. If a person or pet comes near, immediately stop the operation and shut off the engine.
- 4) Do not place flammable or hazardous materials around the machine during operation. The exhaust muffler becomes extremely hot, and touching it during operation or immediately after stopping the machine may result in burns.
- 5) **When operating on slopes, use the machine only on gradients of 20° or less.** Perform mowing in the horizontal (contour) direction rather than up and down the slope. Operating in the vertical direction may cause the machine to slide downhill or cause the operator to slip and become caught in the machine.
- 6) Take sufficient precautions to prevent slipping, and do not operate the machine in areas that remain slippery even after such measures are taken.

1.3.2 Operational Precautions



Warning

- 1) Before starting the engine, set the work clutch (knife/rotary clutch) to the “OFF” position, place the shift lever in the “Neutral” position, and apply the parking brake.
- 2) Use extreme caution when turning or maneuvering on slopes. Loss of balance may cause the machine to tip over, resulting in injury.



Warning

- 3) For safety, do not perform unnecessary operations of the shift lever or clutch levers while on slopes. There is a risk of slipping, falling, or the machine sliding.
- 4) When reversing, ensure that no people (especially children), animals or obstacles are behind the machine. Also pay attention to your footing to avoid being caught between the machine and an obstacle or falling from an edge or step. (Applicable models)
- 5) When working around trees, walls, or similar areas, take great care to avoid having your body or hands caught between the machine and objects such as greenhouse posts, tree branches, or wires. Be alert to prevent impact or entanglement with branches.
- 6) Pay close attention to your footing when turning, and ensure that you do not become entangled in the working components (such as knives or blades) or the traveling components (such as tires or crawlers).
- 7) When changing the cutting direction, first confirm that the area in front of and behind the machine is safe before proceeding.
- 8) Operate the work (knife/rotary) clutch only after confirming that no people—including children—or animals are nearby, and exercise full caution during operation.
- 9) During operation, foreign objects may be thrown from the machine. The area in front of the machine is particularly hazardous, so do not direct the front of the machine toward people, animals, or equipment.

1.3.3 Inspection, Shutdown, and Cleaning During Operation



Warning

- 1) If the machine strikes or becomes jammed with a foreign object during operation (such as mowing or tilling), stop the operation immediately and shut off the engine. Inspect the knife, knife stay, tines (for applicable models), and all covers for looseness, cracks, or deformation. Tighten, repair, or replace parts as necessary.
- 2) Check the cooling air intake, the area around the cylinder, and especially the high-temperature exhaust pipe area once every hour for grass clogging. Carefully remove any accumulated grass or debris, as it may cause engine seizure or fire.

Clean not only the exterior but also the interior frequently. At the same time, clean the inside of the air cleaner and remove any grass debris accumulated on the HST fan cover (for applicable models).

**Caution**

- 1) When performing inspections during operation, always stop the engine first. After all components have cooled down, wear durable gloves such as leather gloves to protect your hands before starting the inspection.
- 2) Always stop the engine before leaving the machine. Park the machine securely on a stable, level surface.
- 3) When shutting off the engine, perform the following steps for applicable models:
 - ① Apply the brake. ② Remove the key. ③ Close the fuel cock.
- 4) If you notice any abnormal noise, smell, or excessive heat during operation, stop the engine immediately. Inspect and repair the machine, as such abnormalities may lead to fire.
- 5) If you sense any other irregularities during operation, always stop the engine before performing an inspection.

1.4 Precautions for Loading, Unloading, and Transportation

**Danger**

- 1) When transporting the machine, always stop the engine and set the fuel cock to the "OFF" position. Fuel leakage may occur, and spilled fuel could ignite.
- 2) Do not tilt the machine more than necessary. Fuel may leak out.

1.4.1 Precautions for Loading, Unloading, and Transport Using Ramps

**Warning**

- 1) Use a transport vehicle that is appropriate for the product.
(Consider load capacity, bed size, and any possible interference.)
- 2) Park the transport vehicle on a flat and safe surface. To prevent any movement during loading, stop the engine, apply the parking brake, and place wheel chocks.
- 3) Adjust the machine height so that the knife or tins do not come into contact with the ramps. Also, set the work clutch to the "DISENGAGED" position.
- 4) Secure sturdy ramps that meet the required standards, ensuring they are set at a gentle incline (15° or less). Set the transmission to "LOW" and reduce engine speed.
Load the machine slowly in forward gear and unload it slowly in reverse gear.
Do not perform any steering or turning operations during forward or reverse movement

on the ramps, as the machine may turn and become dangerous.

Do not disengage the drive (main) clutch while the machine is on the ramps.い.

- 5) When loading or unloading the machine, step off the machine.
- 6) When the machine crosses the boundary between the ramps and the truck bed, its center of gravity may shift suddenly. Always lower the working unit and proceed with great caution.
- 7) Secure the machine firmly with strong ropes or straps during transport. Also, drive safely at all times.

1.4.2 Precautions for Loading and Unloading by Lifting



Warning

- 1) Before lifting the machine, always check the lifting hook area for any deformation or abnormalities.
- 2) Never go underneath the machine while it is suspended.
- 3) When lifting the machine, take extreme care to ensure that the sling belt does not come off.
- 4) Use strong sling belts or equivalent lifting equipment capable of supporting the weight of the machine.
(Use JIS-compliant products with a safety factor of 5 or higher and a load capacity of 1,250 kg or more.)
- 5) Do not lift the machine while any objects other than the machine itself are loaded on it.



Caution

- 1) When lifting the machine, ensure that the sling belt does not place any load on wires or other components.
- 2) During transport, follow the instructions described in section 1.4.1.

1.5 Battery Handling

- Do not remove the battery or the battery protection cover except for inspection or repair.
- Do not dispose of used batteries with regular household waste. Consult your dealer for proper disposal.



Danger

Failure to follow the instructions below may result in burns, personal injury, or machine damage.

- 1) Do not throw the battery into fire, heat it, or use it in high-temperature conditions.
- 2) Do not place the battery near fire, stoves, or inside a vehicle under direct sunlight where temperatures may become high. Also, do not leave it in direct sunlight for extended periods.

- 3) The battery is automatically charged while the engine is running. Do not charge it by any method other than the one specified.
- 4) Do not disassemble, repair, or modify the battery.
- 5) Do not allow metal objects or tools to come into direct contact with the battery terminals. This may ignite gasoline or oil and cause an explosion or fire.
- 6) Do not drop the battery or subject it to strong impacts. If the battery has been impacted or if any deformation or damage is found on the case, stop using it and consult your dealer.
- 7) Do not store the battery in places accessible to children or pets.

**Warning**

Failure to follow the instructions below may result in burns, personal injury, or machine damage.

- 1) Do not splash water near the battery or immerse the battery in water.
- 2) When installing or removing the battery, always turn the key switch to the “OFF” position.
- 3) After finishing work, cover the machine or store it indoors to prevent rain or moisture from directly contacting the battery area or electrical components.
(Only place the cover on the machine after it has completely cooled down.)
- 4) If you notice any unusual smell, noise, or anything different from normal, stop using the machine immediately and consult your dealer.

1.6 Inspection and Maintenance

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

Daily pre-operation inspections and monthly inspections should be performed by the owner, while annual inspections should be carried out by the dealer (fees apply).

⟨Please note that we cannot be held responsible for any accidents or malfunctions resulting from failure to perform regular inspections.⟩

**Warning**

Failure to follow the instructions below may result in burns, personal injury, or machine damage

- 1) Before and after use, perform routine inspections and maintenance, and also carry out periodic inspections and maintenance to keep the product in a safe and comfortable operating condition at all times.
- 2) When inspecting, adjusting, or servicing the machine, stop the engine and allow the muffler and any other heated areas such as the transmission case to cool completely. Wear sturdy gloves such as leather gloves, and use the proper tools correctly.

**Warning**

- 3) Perform inspections, adjustments, and maintenance on flat, hard, spacious, and well-lit ground. Always pay attention to the machine's balance and take great care to prevent it from tipping over.
- 4) When lifting the machine for inspection, always take proper measures to prevent it from falling.
- 5) After replacing or attaching/detaching components of the working section (knives or blades) or the driving section (tires or crawlers), make sure that all parts are securely installed in the designated positions and properly tightened.
- 6) For safety, when replacing the working section (knives or blades) or the driving section (tires or crawlers) with new parts, also replace all mounting bolts with new genuine manufacturer bolts.
- 7) Damage to safety covers for belts or knife sections, as well as debris-prevention covers, is hazardous. If you notice any abnormality during operation, stop work immediately and inspect the machine. After completing the work, inspect it again and perform any necessary repairs.
- 8) Always reinstall any removed covers correctly in their original positions.
- 9) Never install non-specified attachments or perform any modifications.
- 10) Fuel pipes can deteriorate over time and may cause dangerous fuel leaks. Replace them with new genuine parts every three years, or immediately if any damage is found, along with the tightening bands.

**Caution**

Failure to follow the instructions described below may result in machine malfunction.

- 1) When washing the machine, do not spray water on the engine area (including electrical components, around the air cleaner, and the fuel cap) or on any warning label locations.
- 2) Carefully inspect and adjust the clutch system, throttle, gear shift, and related components.
- 3) When covering the machine with a sheet, to prevent burns or fire, make sure the engine has been completely stopped and all high-temperature parts—such as the muffler and engine body—have fully cooled down.

1.7 During Storage

**Warning**

- 1) For safety, always close the fuel cock.
- 2) When storing the machine for an extended period, keep it indoors. (See section 5.5 "Long-Term Storage".)
- 3) Remove any dirt, debris, or foreign objects from the main body and working components.

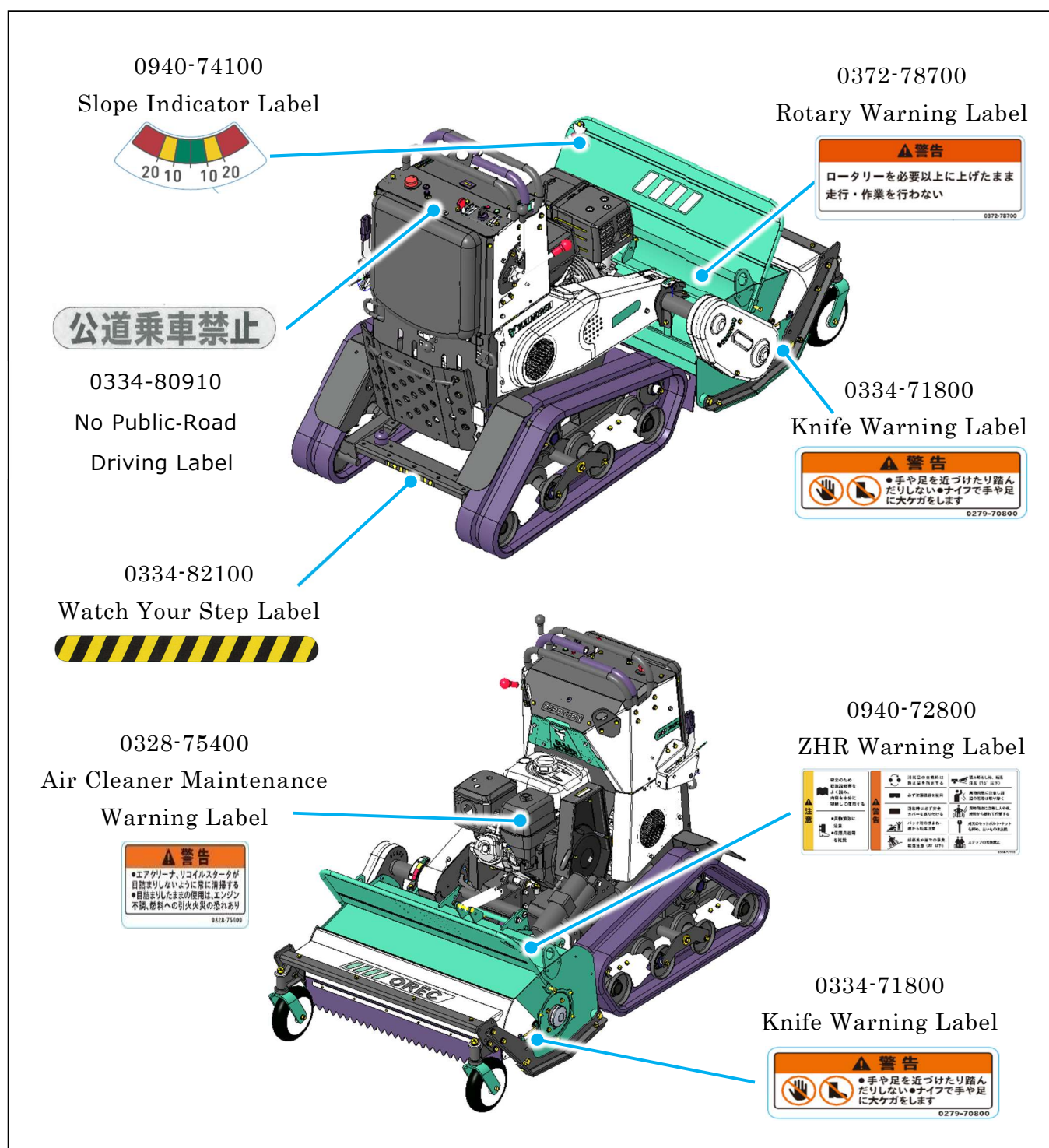
1.8 Warning Label



Warning

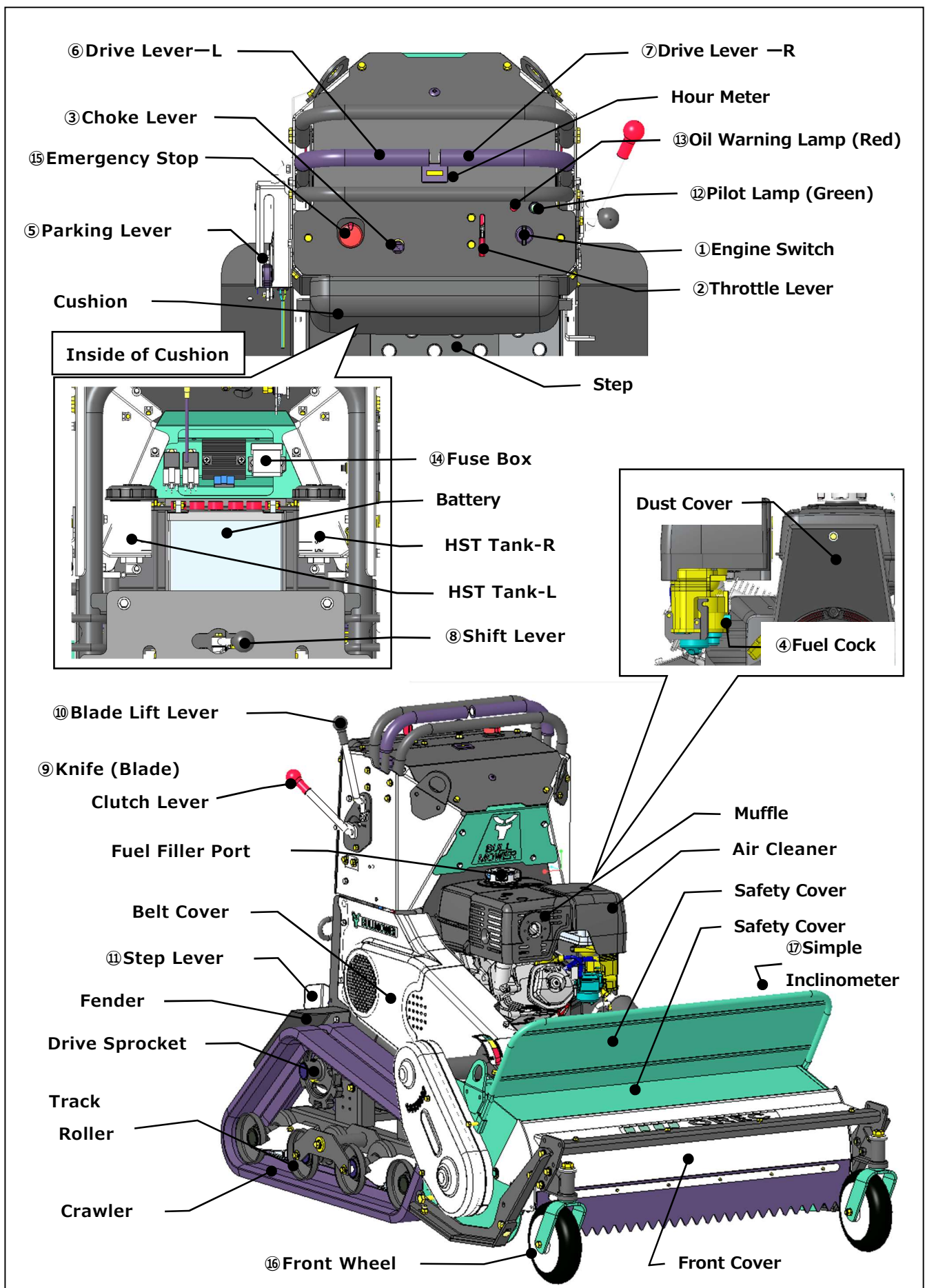
- The warning symbols are carefully selected from the critical hazards described in this section and are affixed to the machine. Be sure to read them before use, fully understand their meaning, and strictly follow all instructions.
- ※ If any warning label becomes difficult to see, be sure to purchase the same label from your dealer and replace it so that it remains clearly identifiable at all times.

Locations of Warning Labels



2. Names and Functions of Each Part

2.1 Names of Each Part



2.2 Function of Each Part

① Engine Switch

Turning the key allows you to select "START," "RUN," or "OFF."

② Throttle Lever

Move the lever to adjust the engine speed.

Pushing it forward increases the engine speed. []

Pulling it back decreases the engine speed. []

③ Choke Lever

Used for starting the engine in cold weather. Pulling the lever sets it to the "CLOSE"  position, and pushing it back sets it to the "OPEN"  position. No operation is required when the engine is already warm.

④ Fuel Cock

This valve controls the fuel flow. Turn the lever to the right to open it when starting the engine, and turn it to the left to close it after use. Be sure to close the valve before transporting or storing the machine.

⑤ Parking Lever

This lever engages and releases the parking brake, and also connects or disconnects the power from the engine to the transmission.

Pulling the lever toward you applies the brake and puts the machine in the parked position. Pushing the lever forward releases the brake and allows the machine to move.

⑥ Drive Lever—L

⑦ Drive Lever—R

Used when operating the machine for travel. Moving the left Drive lever moves the left crawler, and moving the right Drive lever moves the right crawler. The Drive speed changes sleeplessly depending on how far the lever is moved; the farther you push it, the faster the machine moves.

Pushing the lever forward moves the machine forward and pulling it back moves it in reverse.

Pushing only the left drive lever forward turns the machine to the right, and pushing only the right drive lever forward turns it to the left.

⑧ Shift Lever

Used when selecting the drive speed.

Moving the shift lever to the right selects "LOW," moving it to the left selects "HIGH," and placing it in the center sets it to "N." Always release the drive clutch lever and bring the machine to a complete stop before shifting. In the "LOW" position, the machine moves slowly, while in the "HIGH" position, it can drive more efficiently.



Caution

Always release the travel levers and bring the machine to a complete stop before operating the shift lever.

Shifting while the machine is moving may damage the gears inside the transmission.

2. Names and Functions of Each Component

⑨ Knife (Blade)Clutch Lever

This lever engages or disengages the power from the engine to the knife, turning the knife rotation ON or OFF.

Pushing the knife-clutch lever forward sets it to the “ENGAGE” position and the knife begins to rotate. Pulling the lever toward you sets it to the “DISENGAGE” position, activates the brake and stops the knife.



Caution

Regardless of the travel clutch position, the knife will rotate at high speed when the engine is running and the knife-clutch lever is set to the “ENGAGE” position.

Use extreme caution when operating the lever.

⑩ Blade Lift Lever

This lever is used to adjust the cutting height according to the working conditions.

Pulling the lever toward you raises the cutting height, and pushing it forward lowers it.す。

⑪ Step Lever

This lever is used to release the step lock. Lift the step slightly and push the lever to unlock it. The step can be locked in two positions: raised and lowered.

⑫ Pilot Lamp (Green)

The indicator lights up when the key switch is in the “ON” position.

When set to “ON,” the implement can be raised and lowered, and the battery will be consumed.

When the machine is not in use, turn the key switch to “OFF” and remove the key.

⑬ Oil Warning Lamp (Red)

This indicator lights up when the engine oil level becomes low.

If it comes on, stop the engine immediately and check the engine oil level.

⑭ Fuse Box

Fuses are installed to protect the wiring harness and electrical components in the event of an overcurrent. From left to right, the fuses are: 10A (accessory), 15A (charging), and 25A (implement lift). If a fuse blows, be sure to eliminate the cause before replacing it.。

⑮ Emergency Stop

You can stop the engine immediately by pressing the emergency stop button.

To release the emergency stop, turn the button to the right and pull it upward.

When the engine has been stopped using the emergency stop switch, always release the emergency stop and then turn the engine switch to “OFF.”

⑯ Front Wheel

The front wheels stay on the ground to guide the mower over uneven surfaces and maintain the cutting height.

2. Names and Functions of Each Component

Reference ;

For low cutting heights, keep the front wheels on the ground as a guide. Raising the cutting unit and lifting the front wheels allows higher cutting.

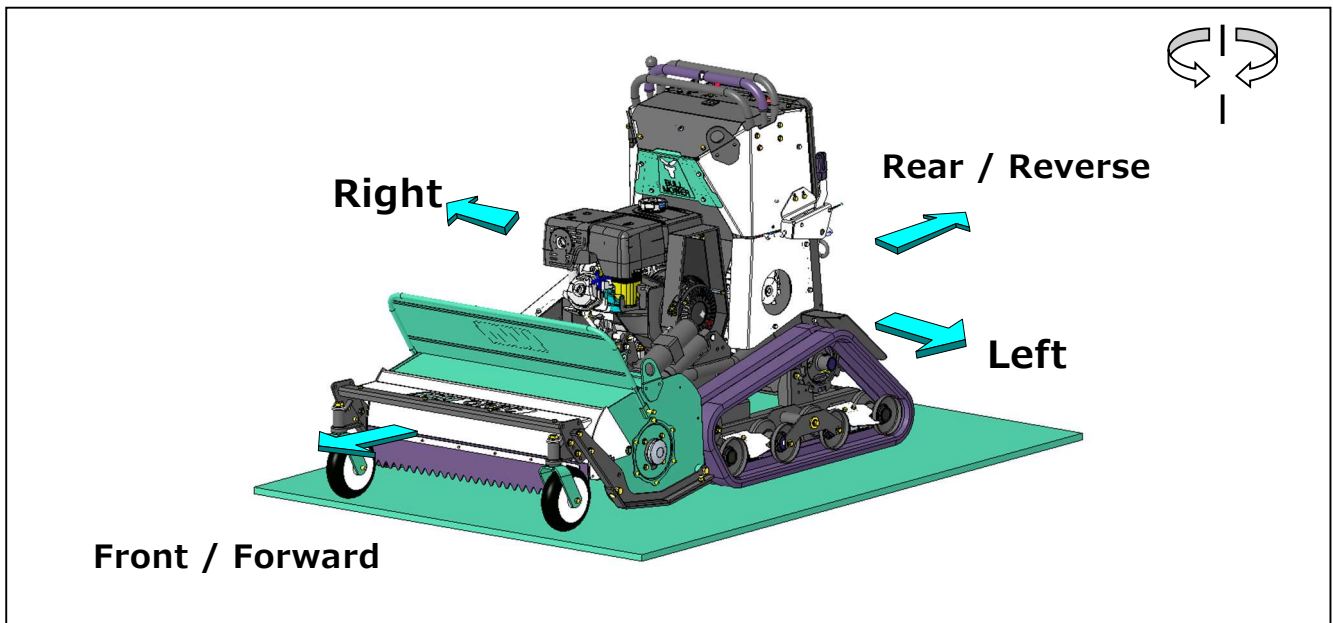
⑰ Simple Inclinometer

During operation on slopes, the pointer of the simple inclinometer will tilt to indicate the approximate angle. For more accurate measurements, use a handheld inclinometer or similar measuring device.

2.3 Product Direction

The directions of the machine (front, rear, left, and right) are defined based on the operator's viewpoint, as shown in the figure below.

References to "forward" and "reverse" in this manual also indicate directions as seen from the operator's position.



3 . Pre-Operation Inspection

- Before starting any work, review section “1.2 Before Starting Work” and be sure to perform the pre-operation inspection in accordance with the “Pre-Operation Inspection Checklist” below and the “7.1 Periodic Inspection Checklist.”

※If you notice anything unclear or abnormal, please contact the dealer from whom you purchased the product.

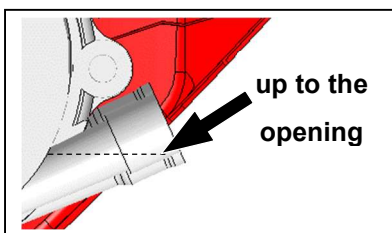
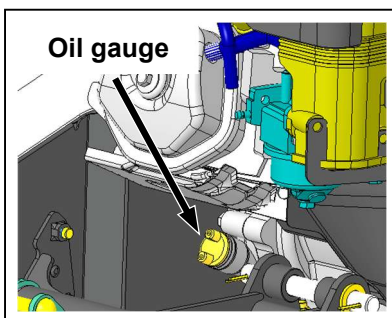
Pre-operation checklist (summary from regular checklist)

	Item	Inspection Details
Engine	① Engine Oil	Check the oil level and contamination (see 3.1).
	②Air Cleaner	Inspect and clean any contamination (see 5.2.1).
	③Engine Body	Check for looseness and cracks.
	④Around the Muffler	Inspect and clean any debris clogging.
	⑤Fuel Tube, Fuel Filter	Inspect and clean for fuel leaks, deterioration, deformation, and clogging.
Main Unit	① Knife (Blade)	〈5: Inspection and Maintenance〉
	②Brake (applicable Unit)	「1」 Check for loose or missing bolts and nuts.
	③Tire (crawler)	「2」 Inspect for deformation, wear, or interference.
	④Levers	「3」 Verify smooth operation and check for sticking.
	⑤Covers	「4」 Remove any foreign matter such as debris, grass, or straw.
	⑥HST Oil (applicable Unit)	Check the oil level and contamination.

Warning

- 1) Be sure to stop the engine before Checking, Refueling, Adjusting or Servicing.
- 2) When starting the engine to check the operation of the travel clutch lever or other controls, make sure each lever is in the correct position and confirm that the surrounding area is safe before proceeding.
- 3) Be sure to read all warning labels attached to this machine carefully.

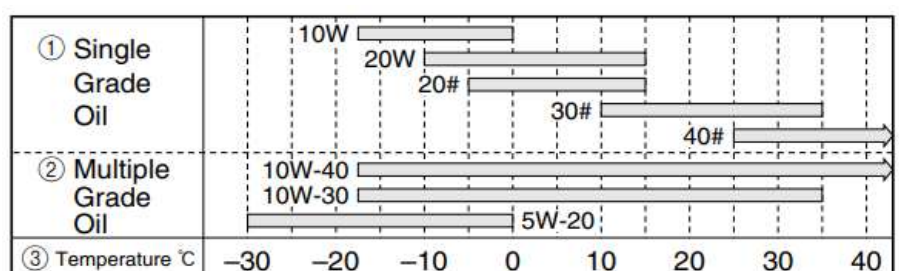
3.1 Engine Oil Inspection



- ① Place the machine on a level surface and remove the oil gauge.
- ② Make sure the oil reaches the bottom edge of the filler opening.
- ③ If the oil level is low, add oil until it reaches the bottom edge of the filler opening.

If the oil is heavily contaminated or discolored, replace it.

<Engine Oil Replacement: See 5.1.3>

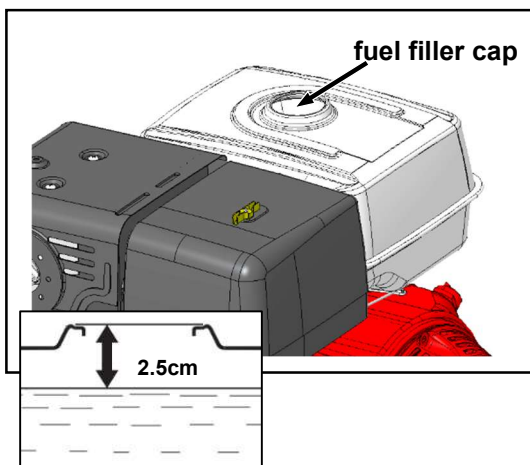




Caution

- 1) If you check the engine oil after running the engine, wait at least about 5 minutes after stopping the engine, and make sure the muffler and engine body have cooled sufficiently before performing the inspection.
- 2) An incorrect engine oil level can cause damage, so always check the engine oil level before starting the engine.
- 3) Use high-quality, fresh engine oil of SE grade or higher, and select the appropriate viscosity according to the ambient temperature.
- 4) After refilling, make sure the oil gauge is securely tightened. If it is not tightened properly, engine oil may leak.

3.2 Fuel Inspection and Refueling



- ① Place the machine on a level surface, remove the fuel filler cap, and check the fuel level through the filler opening.
 - ② If the fuel level is low, refer to the illustration on the left and refill through the filler opening, taking care not to spill any fuel.
 〈 Fuel: Unleaded regular gasoline〉
 〈Fuel tank capacity: See 6.1 Specifications〉
 - ③ After refueling, make sure the fuel filler cap is securely tightened.
- ※ When operating on slopes, keep the fuel level even lower (only enough to prevent spilling).



Danger

- 1) **Keep all flames and ignition sources away from the machine at all times.**
There is a risk of fire or burns. Never smoke or use open flames such as campfires near the machine.
- 2) Refuel only after stopping the engine and allowing the muffler to cool sufficiently.
- 3) For models with an upper fuel level mark, keep the fuel level below the mark (and even lower when operating on slopes). If you overfill the tank, drain the fuel until it is below the mark. Also, be sure to wipe off any spilled fuel.
- 4) Do not refuel if you are carrying static electricity. Vaporized gasoline may ignite, leading to burns or fire.



Warning

Perform the procedure on a flat, stable, and well-ventilated area..



Caution

- 1) When refueling, prevent dust, grass, rain, snow, or any foreign matter from entering the fuel tank. Contamination may cause engine malfunction..
- 2) Use only unleaded regular gasoline. Using any other fuel may damage the engine.
- 3) Gasoline deteriorates over time. If the machine is not used for more than one month, replace the old gasoline with fresh fuel. Do not use gasoline stored in plastic containers, as it may also cause poor engine performance.

4. Operation and Work Procedures



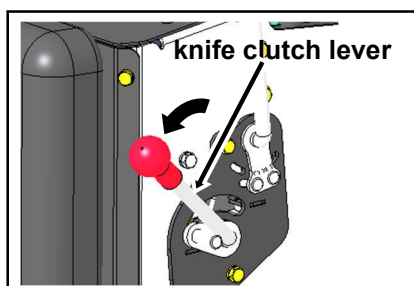
Warning

※Please be sure to read "1.Before Use" before operating the equipment.

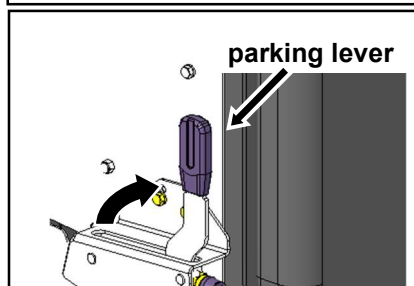
Be sure to read and fully understand "1.1 Operating Conditions," "1.2 Before Starting Work," and "1.3 During Operation" before performing any operation or work.

4.1 How to Start and Stop the Engine

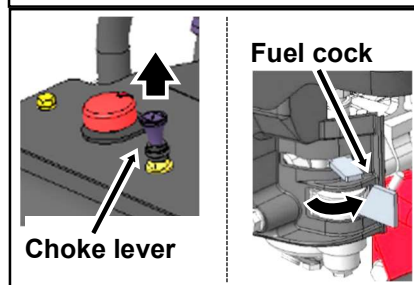
4.1.1 How to Start the Engine



① Pull the knife clutch lever toward you and set it to the "Disengaged" position.

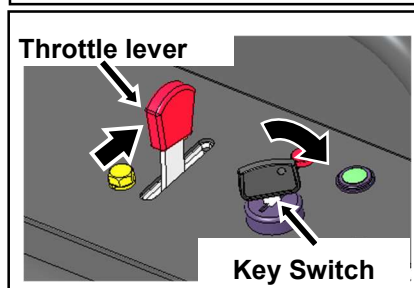


② Pull the parking lever toward you and set it to the "Engaged" position..



③ After setting the fuel cock to the "Open (ON)" position, pull the choke lever to fully close the choke valve.

Refer ; When the engine is warm, operation of the choke lever is not necessary.



④ Set the throttle lever to the midpoint between the " 🐢 " and " 🐇 " positions, then insert the key into the engine switch and turn it to the "START" position.

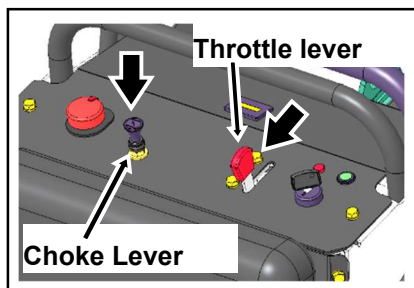
Refer ; Make sure that the emergency stop switch is in the "RUN" position before starting the engine.



Caution

1) If the engine does not start within 5 seconds, return the engine switch to the "OFF" position, wait for at least 10 seconds, and then repeat the starting procedure.

Do not turn the engine switch to the "START" position while the engine is running. Doing so may cause damage to the starter motor.



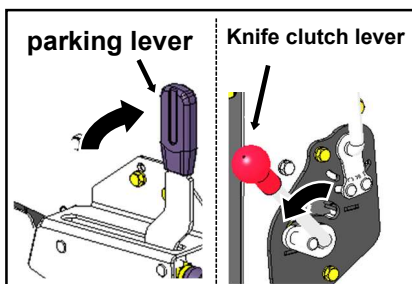
⑤ After the engine starts, check the engine speed and slowly push the choke lever back to the fully open position. After that, run the engine at the low-speed throttle lever position "🐢" for a short warm-up period (approximately five minutes). Performing a warm-up operation helps extend the engine's service life.



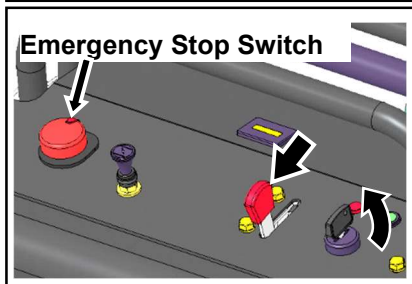
Caution

- 1) For the first week after purchasing the new product (approximately 3–4 hours of operation), operate the unit gently as a break-in period and avoid applying excessive loads.
- 2) Using the engine with the choke lever pulled out (fully closed position) may adversely affect engine components and shorten the engine's service life. Please use caution

4.1.2 How to Stop the Engine

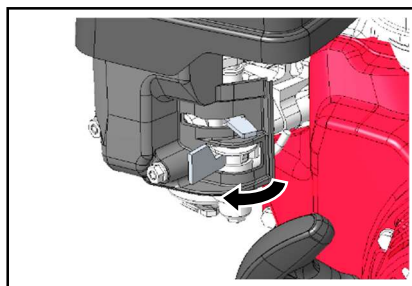


① Pull the parking lever toward the operator to the "Engage" position and pull the Knife clutch lever toward the operator to the "Disengage" position.



② Set the throttle lever to the low-speed "🐢" position.

③ Return the engine switch to the "STOP (OFF)" position to shut off the engine.



④ After stopping the engine, set the fuel cock to the "CLOSE (OFF)" position.

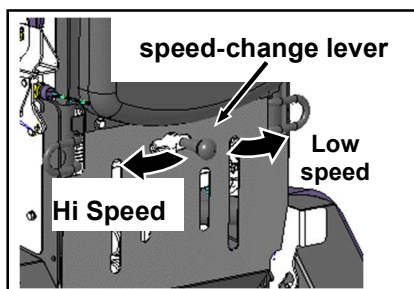


Caution

- 1) Always stop the engine using the engine switch except in an emergency. If the engine stops due to any other cause, be sure to turn the engine switch to the "OFF" position following the procedure above. Remove the key before leaving the machine, as failure to do so may result in battery discharge.

4.2 Operating Procedures

4.2.1 Driving Procedure

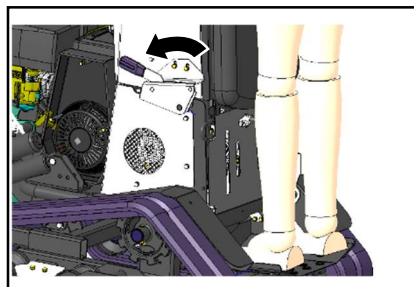


① Start the engine.

〈Refer to “4.1.1 How to Start the Engine.”〉

② Make sure to shift the speed-change lever firmly into either the High or Low position.

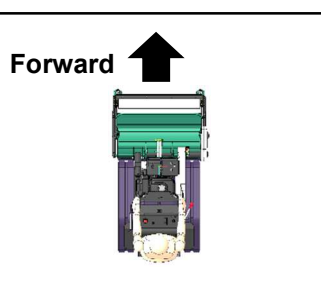
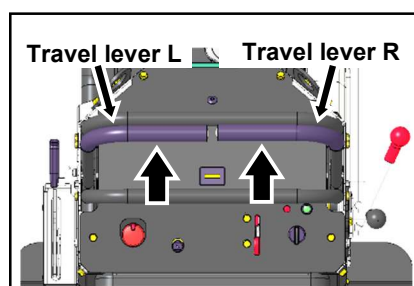
Refer ; Operate at low speed until you become familiar with the controls.



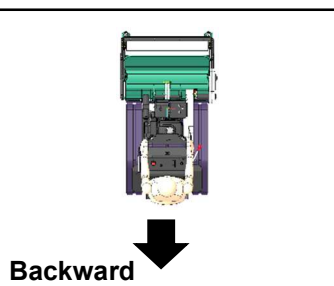
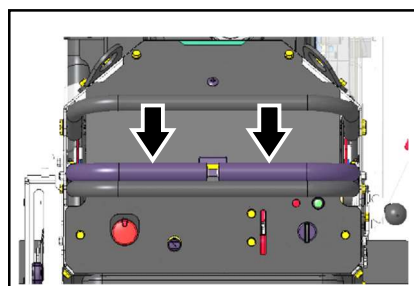
③ Step onto the platform and set the parking lever to the “Disengage” position.

Refer ; If the operator is not standing on the step or the step is not raised, the safety switch will be activated when the travel clutch lever is engaged, causing the engine to stop. When operating in walk-behind mode, raise the step and lock it in place.

Refer ; The machine may move slowly when the parking lever is set to the “Disengage” position. In that case, move the travel level slightly and adjust it until the machine comes to a stop.



④ The machine will move forward when both travel levers are slowly pushed forward at the same time.



⑤ In the same way as forward travel, the machine will move backward when both travel levers are slowly pulled rearward at the same time.



Warning

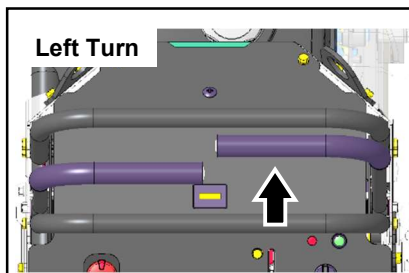
- 1) When switching from forward to backward or from backward to forward, always check for safety in both directions before operating the machine. In backward, pay particular attention to your footing and the area behind you, and make sure to check for safety. **Lack of familiarity or insufficient checking may result in unexpected injury accidents.**
- 2) When setting the parking lever to the “Disengage” position, make sure the travel lever is in the neutral position. In some cases, the machine may begin to move slowly. Also, operating the parking lever while holding the travel lever may cause sudden starts or sharp turns, creating a hazardous situation.



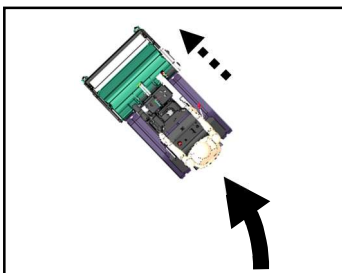
Caution

- 1) The travel speed of the machine varies continuously depending on the angle at which the travel lever is moved. Sudden lever operation may cause the machine to start or stop abruptly, creating a hazardous situation. Move the travel lever slowly and return it slowly.
- 2) When the travel lever is fully pushed forward, the machine will operate at high speed. Do not operate the machine at high speed except in areas where it is safe to do so.

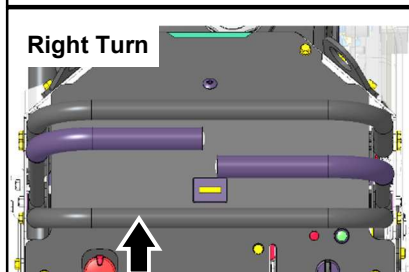
4.2.2 Turning Procedure



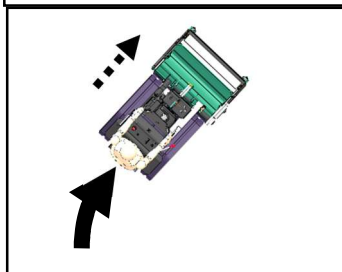
Left Turn



- ① Pushing the right Travel lever forward travels the right crawler forward, causing the machine to turn left.



Right Turn



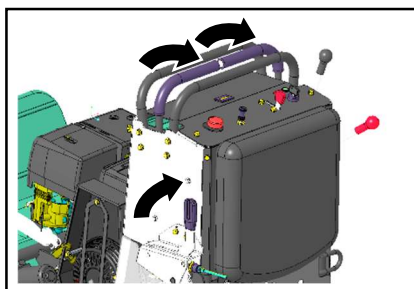
- ② Pushing the left Travel lever forward travels the left crawler forward, causing the machine to turn right.



Warning

- 1) Always slow down before turning and make the turn at a low speed. High-speed turning may cause the operator to be thrown from the machine, creating a serious safety hazard.

4.2.3 Stopping Procedure



- ① Return the Travel lever slowly to the neutral position until the machine comes to a stop. Then set the parking lever to the "Engaged" position. The machine will stop.
- ② When stopping the engine, return the throttle lever to the low-speed position, then turn the engine switch to the "OFF" position to shut down the engine.

⟨Refer to 4.1.2 "How to Stop the Engine."⟩

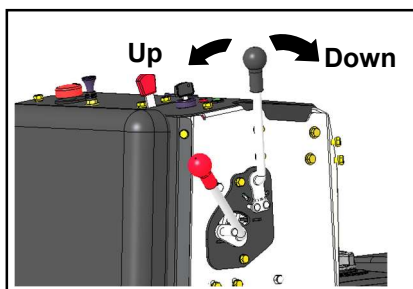


Caution

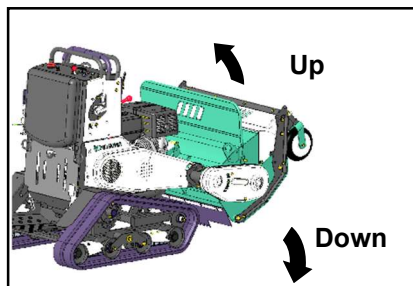
- 1) Park the machine on a flat, open area free of obstacles.
- 2) Always stop the engine and remove the key before leaving the machine..

Refer ; When returning the Travel lever, do not release your hand. Slowly move it back until the machine comes to a stop. If you release the lever to stop the machine, it may stop abruptly or may not come to a complete stop.

4.2.4 Procedure for Raising and Lowering the Work Equipment



① Move the knife lift lever forward and backward.



② Pushing the knife lift lever forward lowers the work equipment. Pulling it backward raises the work equipment. After moving the work equipment to the desired position, release the lever to stop its movement.

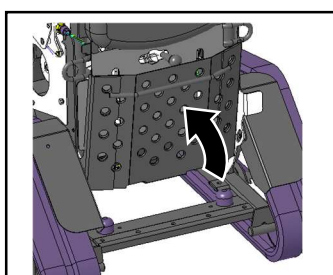
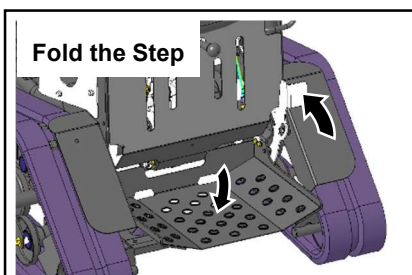


Caution

- 1) The work equipment will not move beyond its uppermost or lowermost positions. In that case, immediately release the lever. It may place excessive load on the machine.

4.2.5 Procedure for Adjusting the Step Position

The step can be folded when driving over uneven surfaces or when loading the machine onto a vehicle. However, basic operations must be performed while standing on the step.

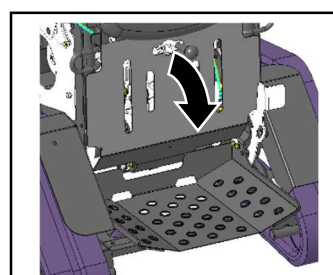
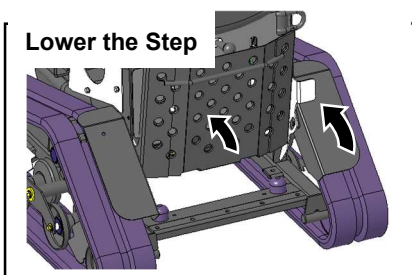


① By pressing the step downward slightly and pushing the step lever to release the lock, the step can be raised.



Caution

When folding the step, be careful of the upward rebound.



① By lifting the step slightly and pushing the step lever to release the lock, the step can be lowered.



Caution

- 1) Before adjusting the step position, always park the vehicle on a level surface and apply the parking brake.
- 2) When operating the machine after stepping off, keep the transmission lever in the low-speed range and take extra care when reversing or turning. High-speed operation can cause sudden starts or sharp turns, increasing the risk of contact or entanglement. When reversing, the machine moves toward you, creating a risk of being pinned or run over.
- 3) The position of the control lever and the operator's posture may change when getting on or off the step. Please operate the machine with great care.

4.3 Efficient Work Practice

Warning

- 1) Always keep all standard covers and flappers installed during operation.
Operating with them removed or damaged is extremely dangerous and may cause wire or debris to scatter toward the operator.
- 2) Do not operate with the front cover fixed. Debris from the cutting section may be thrown forward and cause hazards.
- 3) Always stop the engine before removing grass, wire, or any debris tangled around the rotary.
- 4) The covers on this machine are designed to reduce debris scattering from the cutting section, but cannot prevent it completely. Before operation, the operator must remove all foreign objects in the field such as stumps, stones, wire, cans, and sticks.
- 5) If the knife scrapes mud or scatters stones, adjust the cutting height to a level where these issues do not occur. Failure to do so may cause premature wear, chipping, breakage, loose bolts or nuts, or even knife detachment.
- 6) The inside of the rotary cover is extremely dangerous while the knife is rotating.
Do not stand in the direction of travel, and never kick grass or other material into the knife cover.
- 7) Do not allow grass, leaves, or debris to accumulate around the engine, especially near the recoil cover, air cleaner, or muffler. This may cause overheating or fire.
- 8) For safety, always stop the engine before leaving the machine.

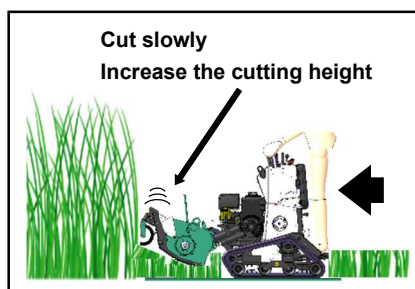
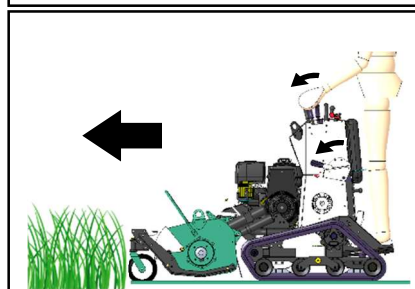
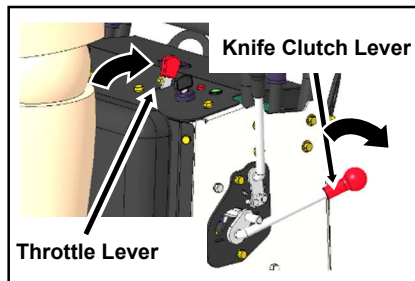
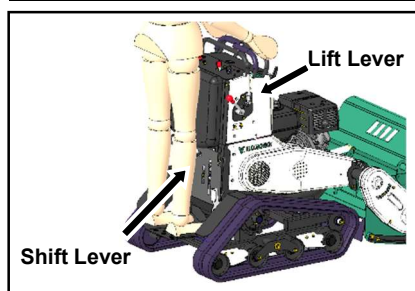
Caution

- 1) Wear a long-sleeved shirt, long pants with tight cuffs, spike shoes, and always use a hat or helmet, shin guards, and protective goggles.
- 2) Always operate from the rear step and hold the handle firmly.
Standing near the crawler or in front of the rotary may result in entanglement hazards.
- 3) Remove stumps, stones, wire, cans, and other debris as much as possible before operation.
If any foreign object becomes caught in the crawler or machine during work, stop the machine immediately, shut off the engine, and remove the object.
- 4) In fields with many stones or debris, raise the cutting height or take other precautions to prevent scattering. Debris may be thrown in all directions, so keep people, vehicles, and buildings at a safe distance during operation.
- 5) The muffler becomes very hot during operation. Do not touch it until it has fully cooled..
- 6) Always operate moving forward. Working in reverse is dangerous..

Reference ;

- 1) Start the machine on a flat area free of debris and use the Low Speed position.
Mow straight ahead at a slow speed, allowing the cutting paths to overlap for a cleaner finish

4.3.1 Grass-Cutting Procedure



① Step onto the platform and start the engine.

〈Refer 4.1.1: Engine Starting Procedure〉

② Adjust the speed and cutting height according to the working conditions. 〈Refer 4.2.1 Driving Procedure〉

〈Refer 4.2.4 Raising and Lowering the Work Equipment〉

③ Set the throttle lever to the “High”  position, then slowly push the knife-clutch lever forward. Engage it fully only after the cutting blades have reached sufficient speed.

 **Warning**

High-speed blades rotate. Use extreme caution.

④ Move the parking lever forward to the “Disengaged” position. Then operate the travel lever to begin work.

〈Refer 4.2.1 Driving Procedure〉

⑤ If the mowing load is too heavy and the engine speed drops excessively, reduce the travel speed or increase the cutting height and mow in two passes. This not only places excessive strain on the machine but also results in uncut areas and poor finishing quality.

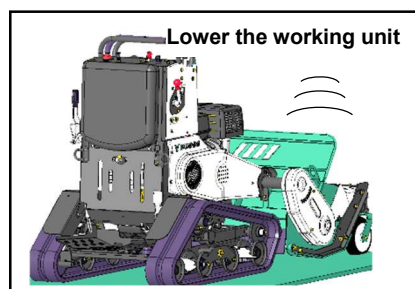
 **Caution**

Use the throttle lever at High speed during mowing. "Low-speed operation may cause overheating from insufficient engine cooling.

参考 ;

- 1) Cut grass is finely shredded within the knife cover and expelled from the rear. Wet-grass operation may cause buildup in the knife cover, reducing discharge and increasing the risk of engine stalling. Remove accumulated grass from the knife cover regularly or wait for the grass to dry before operating.

4.3.2 Procedure for Ending Mowing Operations



① To end operation, park the machine on a flat surface and move the knife-clutch lever toward you to the OFF position.

② Ensure the knife has come to a complete stop, then pull the parking lever followed by the throttle lever toward you, lower the rotary unit to the ground, and shut off the engine.

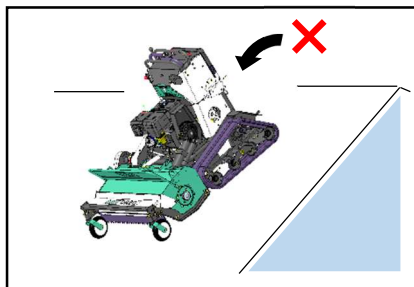
〈Refer 4.2.1 Driving Procedure〉

4.3.3 Safety Precautions During Operation



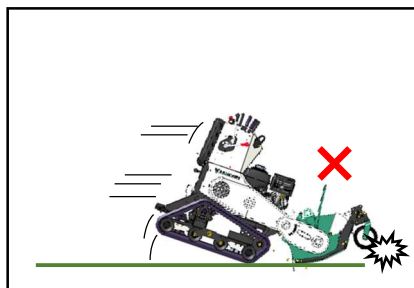
Warning

- 1) Do not operate on slopes exceeding 20° (contour line). Risk of machine overturning.
* Slipping may occur, particularly in wet or adverse field conditions.
- 2) Do not stand on the downhill side of the machine. There is a risk of being entangled in the machine or the rotating knife.



- ① Do not operate the machine facing downhill.

Poor visibility of the footing may cause foreign objects to be entangled, and uneven ground may cause the machine to lose balance, creating a hazardous situation..



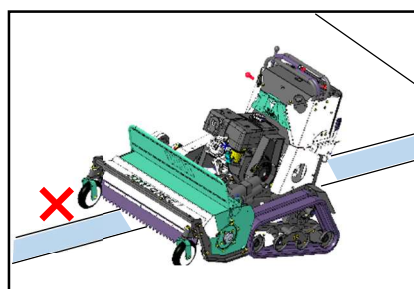
- ② Do not drive with the rotary unit raised higher than necessary.

The machine may lose balance when stopping or when traveling over uneven ground.



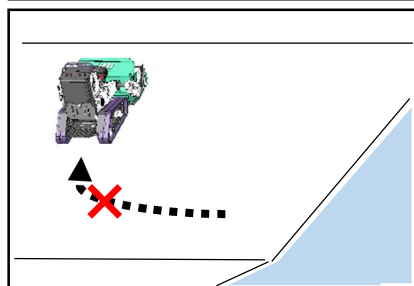
Warning

Do not operate with the rotary unit raised higher than necessary. Excessive debris scattering and a widened rotary opening may lead to unforeseen accidents, including damage to property and entanglement of third parties. Adjust the cutting height according to the grass length and density. Always disengage the knife clutch when not cutting, and move the machine only after confirming that the knife has completely stopped rotating.



- ③ Do not operate the machine with one wheel lifted.

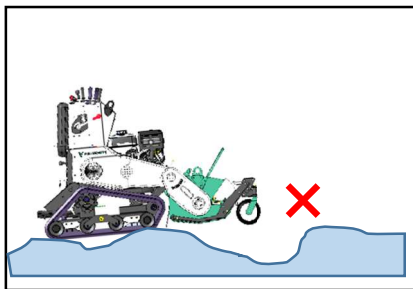
The crawler may come off more easily, and turning the machine in this condition significantly increases the risk of crawler disengagement.



- ④ Do not turn the machine on slopes.

An unstable riding posture may cause you to be thrown from the machine. When turning, make large turns on flat ground as much as possible..

4. Operation and Work Procedures



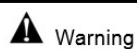
- ⑤ Do not force the machine to drive or turn on uneven ground or in areas with a large amount of scattered stones. This may cause the crawler to come off or lead to premature damage.

4.4 Loading, Unloading, and Transport



Danger

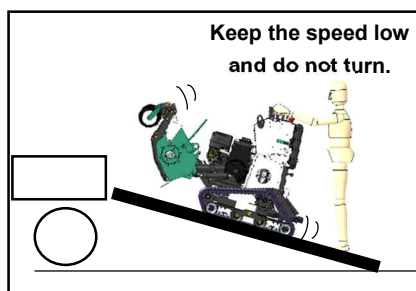
- 1) Always stop the engine and set the fuel cock to the 'OFF' position before transporting the machine. Fuel leakage may occur, and spilled fuel could ignite.
- 2) Also, do not tilt the machine more than necessary. Fuel may leak out.



Warning

- 1) Use a transport vehicle appropriate for the product, considering factors such as load capacity, bed size, and possible interference.
Particular attention when loading the machine onto vehicles equipped with canopies or roofs.
- 2) Park the transport vehicle on a level and safe surface. Before loading the machine, stop the engine, apply the parking brake, and secure the wheels with chocks to prevent any movement.
- 3) Adjust the height so that the knives or tines do not come into contact with the bridge. For models to which this applies, ensure the following settings. ① Work clutch: DISENGAGED. ② Differential lock: ENGAGED.
- 4) Set a sturdy bridge that meets the required standards at a gentle slope (15° or less). Reduce engine speed and proceed at low speed. Load the machine by driving forward, and unload it by reversing slowly.
Do not disengage the drive (main) clutch while the machine is on the bridge. Also, do not perform any operations other than straight driving, including shifting or other lever operations.
- 5) When the machine crosses the boundary between the bridge and the truck bed, its center of gravity shifts suddenly. Exercise extreme caution at this moment.
- 6) Secure the machine firmly with sturdy ropes or equivalent restraints during transport. Also, operate the vehicle safely at all times.

4.4.1 Procedures for Loading and Unloading with Bridge Ramps



- ① Choose a flat location free of hazardous materials.
- ② Ensure the bridge conforms to specifications, is installed at a gentle slope (15 degrees or less), and is securely positioned at the appropriate width for the product.
- ③ Ensure that the machine's wheels are positioned at the center of the bridge.

④ Reduce the engine speed and set the work clutch to the "disengaged" position.

⑤ Load the machine by moving forward, and unload it by moving in reverse, operating slowly at low speed.

* The center of gravity may shift and cause the machine to tilt forward when crossing the bridge. Lower the working unit before crossing the bridge.

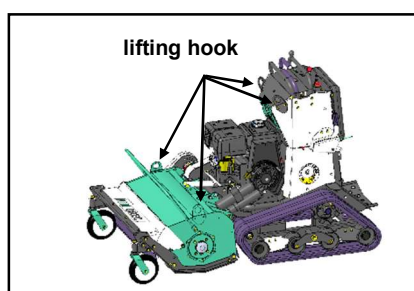
* Step off the platform before loading or unloading.

Reference : Bridge Standards

Use a bridge that meets the required standards and provides sufficient strength.

- Length: At least 3.5 times the height of the truck bed.
- Width: Appropriate for the wheel width of the machine.
- Strength: Sufficient to withstand the total weight of the machine and the operator.
- The surface must be treated to prevent slipping.

4.4.2 Loading and Unloading by Hoisting



- ① The machine is equipped with four lifting hooks.
- ② Before hoisting, check the lifting hook points for any deformation or abnormalities. Never carry out hoisting if any abnormality is detected.
- ③ Use lifting gear with sufficient strength, such as sling belts (see below), for all hoisting operations.
- ④ Always attach lifting gear to all hook points, and ensure that the gear is securely engaged with each hook before starting hoisting operations.



Warning

- 1) Perform hoisting operations slowly. Never go under the machine while it is suspended.
- 2) Similarly, perform the hoisting-down operation slowly. Work especially slowly at the moment the load makes contact with the ground.
- 3) Always use the four designated lifting points. Reducing the number of lifting points or attempting to lift from non-designated points may result in damage.

Refer: Standard for sling belts

Use sling belts that comply with the applicable JIS standards and provide sufficient strength.

- Strength... JIS-compliant, safety factor ≥ 5 , load capacity $\geq 1,250$ kg.
- Belt width ... A width of 50 mm or less allows for easy installation.
- Belt length... 1.5 m or more

Belts deteriorate due to various factors such as wear, heat, and ultraviolet exposure.

Always inspect the condition of the belt before use, and do not use it if it shows significant deterioration.

5. Inspection, Maintenance, and Adjustment

5.1 Oil Check, Oil Change, and Lubrication



Caution

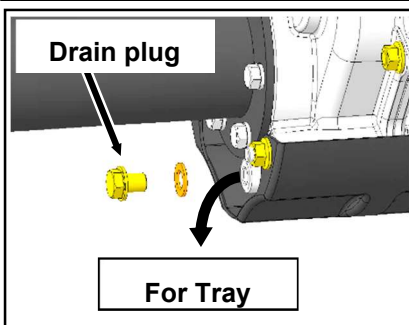
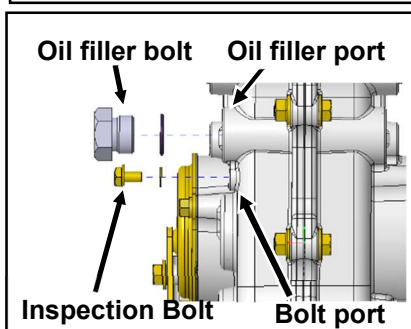
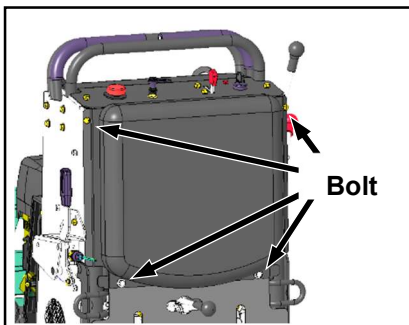
- 1) Although the machine is pre-lubricated before shipment, be sure to confirm that the specified locations contain the specified type and amount of oil before using the machine for the first time
- 2) Regular oil replacement is indispensable for maintaining the machine in its best operating condition.
- 3) Lubricate the machine slowly and in small amounts. If oil is added all at once, air cannot escape and the oil will immediately overflow from the oil inlet. Make sure that the oil level reaches the oil inlet.
- 4) When inspecting, replacing, or lubricating the oil in any part of the machine, place the unit on a flat, spacious surface, warm up the engine, then stop it. Wait at least five minutes until all components have cooled to a temperature safe to touch before beginning any maintenance work.

... **If maintenance work is performed immediately after stopping the engine ...**

*** the engine body will still be extremely hot, creating a risk of burns.**

*** Immediately after shutting off the engine, oil remains in various components, preventing an accurate oil-level reading.**

5.1.1 Inspection and Replacement of Transmission Oil



◎ Inspection and refueling

- ① Remove the 4 bolts and take off the cover.
- ② Remove the M6 inspection bolt; oil seepage indicates proper level. If the oil level is low, refill through the oil filler port.
- ③ Replace it if heavily contaminated (see below).

◎ Replacement...

- ① Prepare a tray to catch the oil.
- ② Remove the Drain plug at the bottom of the transmission case and drain the oil.
- ③ After draining the oil, securely reinstall the Drain plug.
Remove the Oil filler bolt and put 2.0 liters of transmission oil (#80 or #90).

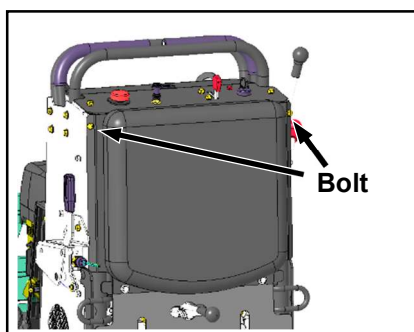
This machine is filled with #80 oil at the time of shipment..

- ④ Ensure that the O-ring and copper washer are free from damage or debris. Reinstall the removed bolts and cover securely.

Replacement guidelines

First : 2 0 hours、 After 2nd time : Each 100 hours

5.1.2 HST Oil Inspection, Refill, and Replacement

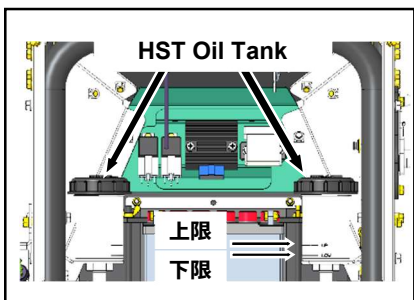


◎ Inspection...

- ① Remove the 2 bolts and take off the cover.
- ② Check the oil level in the HST oil tank and make sure it is between the upper and lower limits.

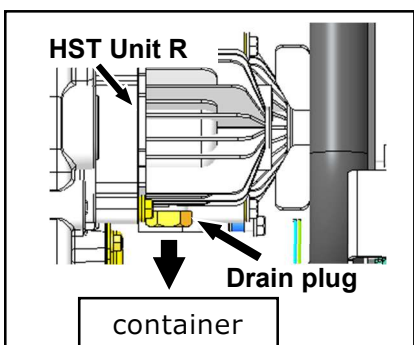
◎ Refill...

- ① If the oil level is low, carefully open the cap to prevent debris from entering the HST oil tank, and refill the oil up to the upper limit.
- ② Refer to the table below. Replacement is necessary if heavy contamination or any sign of water contamination is found.



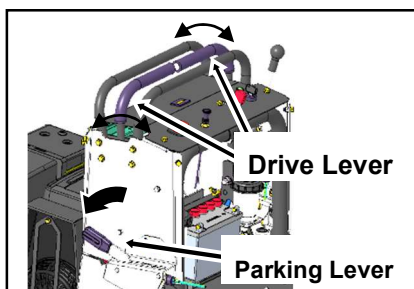
◎ Replacement...

- ① Prepare an appropriate container to catch the oil. Remove the oil drain plug (22 mm hex) and drain the oil from the HST unit.
- ② After the oil has been completely drained, check that no debris is attached to the oil drain plug and tighten it securely.
- ③ Fill the HST oil up to the upper level of the oil tank.



◎ Check After Replacement...

- ① After the oil change, test-run the machine and confirm proper operation.
- ② If the machine does not move after replacement or shows reduced driving power, air has entered the pump. Start the engine, release the parking lever, and move the travel lever forward and backward repeatedly. Air bubbles will gradually be released from the HST oil tank.



Perform this procedure only at low engine speed. Operating at high speed may cause the oil film to break down and shorten the service life of the HST..

- ③ After completing the operation check, inspect the HST oil tank. If the oil level has dropped, refill the tank and repeat the inspection until the level no longer decreases.
- ④ Tighten the lid securely and replace the cover.

**Caution**

- 1) Allow the HST tank and HST unit to cool completely before changing the HST oil. The components are extremely hot immediately after engine shutdown and may cause burns.
- 2) HST oil serves an essential function in transmitting engine rotation to driving power. It also provides lubrication, rust prevention, and cooling. Contamination by debris or incompatible oils may cause damage. Perform inspection, refilling, and replacement in a clean area to prevent contamination by foreign matter.
- 3) Always use the specified oil for replacement and refilling. Using other oils may cause malfunctions or damage.

Refer ;

- 1) The product is filled with anti-wear hydraulic oil equivalent to VG46 at the time of shipment.
- 2) For HST oil replacement, please contact the dealer from whom you purchased the product. Specialized tools and technical expertise are required for this service, and additional charges will apply.
- 3) This product is equipped with an HST unit on both the left and right sides. Please perform oil replacement and inspection for each unit individually.
- 4) HST oil may deteriorate and accumulate contaminants during extended use, affecting smooth operation. Replace the HST oil regularly to maintain safe and reliable performance.

• Recommended Interval for HST Oil Replacement

● ...First : **7 0 hours use** ● ...

After this : Once a year or every 200 operating hours, whichever is sooner

Under particularly severe operating conditions, replace the oil before the initial 30 hours of use.

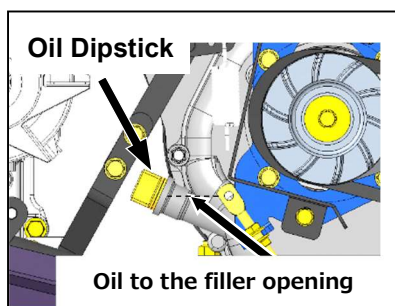
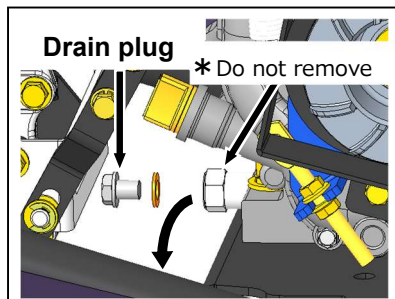
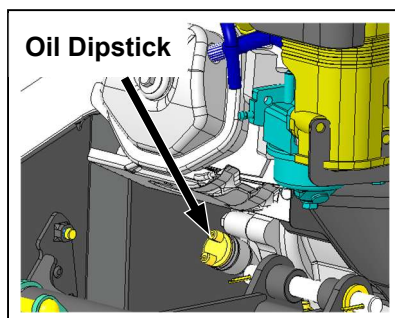
• HST Oil Contamination Checkpoints

Appearance	Odor	Condition	Action
Clear with no discoloration	good	Good	Use as is.
Changed to a milky color.	good	Moisture is mixed in	Change the oil.
Changed to a black color.	Foul odor	Oxidized and deteriorated.	Change the oil.

• Designated HST Oil

	Idemitsu	Shell	ENEOS (JXTG)	Cosmo	Mobil
Anti-wear hydraulic fluid	Daphne Super Hydro A 46	Super Hyland 46	Super Hydro 4 6	Cosmo Hydro AW 46	Mobil DTE 25

5.1.3 Inspection and Replacement of Engine Oil



◎ Inspection and Replenishment...

- ① Before each operation, visually inspect the engine oil level and condition with (refer 3.1 Engine Oil Inspection.) If the oil level is outside the specified range or the oil is excessively dirty, replenish the oil or perform a complete oil change. (For refer to "3.1 Engine Oil Inspection.")

◎ Replacement...

- ① Remove the belt cover and place a suitable container underneath to collect the oil.
- ② Remove the drain plug at the lower rear of the engine to drain the oil, then reinstall it securely.
- ④ Refer to the recommended oil chart and fill the engine with the specified engine oil.
- ⑤ Fill the engine oil up to the filler opening and securely reinstall the oil dipstick.

「Recommended Oil」

① Single Grade Oil	10W																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												</
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Replacement guidelines

First : 5 hours、 After 2nd time : Each 25 hours

Refer ;

- 1) Using the funnel and hose included in the tool bag allows you to fill the oil smoothly. Please be careful, as the oil may flow out rapidly and cause spills around the area.
- 2) After completing the oil change, make sure to securely reinstall the removed cover, drain plug, and oil gauge.
- 3) When operating continuously under high load or high-temperature conditions, replace the oil earlier than the recommended interval (approximately at half the usual operating time)..
- 4) The engine oil has two dipstick locations, one at the front and one at the rear. Either one can be used without any issue. (In this manual, the front dipstick is used for inspection, and the rear dipstick is used for refilling.)

5.1.4 Lubrication of moving parts



Caution

- 1) Apply grease approximately every 30 hours of operation and apply engine oil (#30) to other areas as needed. Failure to supply sufficient grease may result in inadequate lubrication and could lead to damage.
- 2) When the grease is fully applied, any excess will be discharged through the relief passage.
- 3) For lubricating the rollers, use the grease plug included with the unit. Remove the existing bolt, install the grease plug (hand-tightening is sufficient), and apply grease using a grease gun or equivalent tool.

Knife Shaft BB Case (Left and Right) : Grease

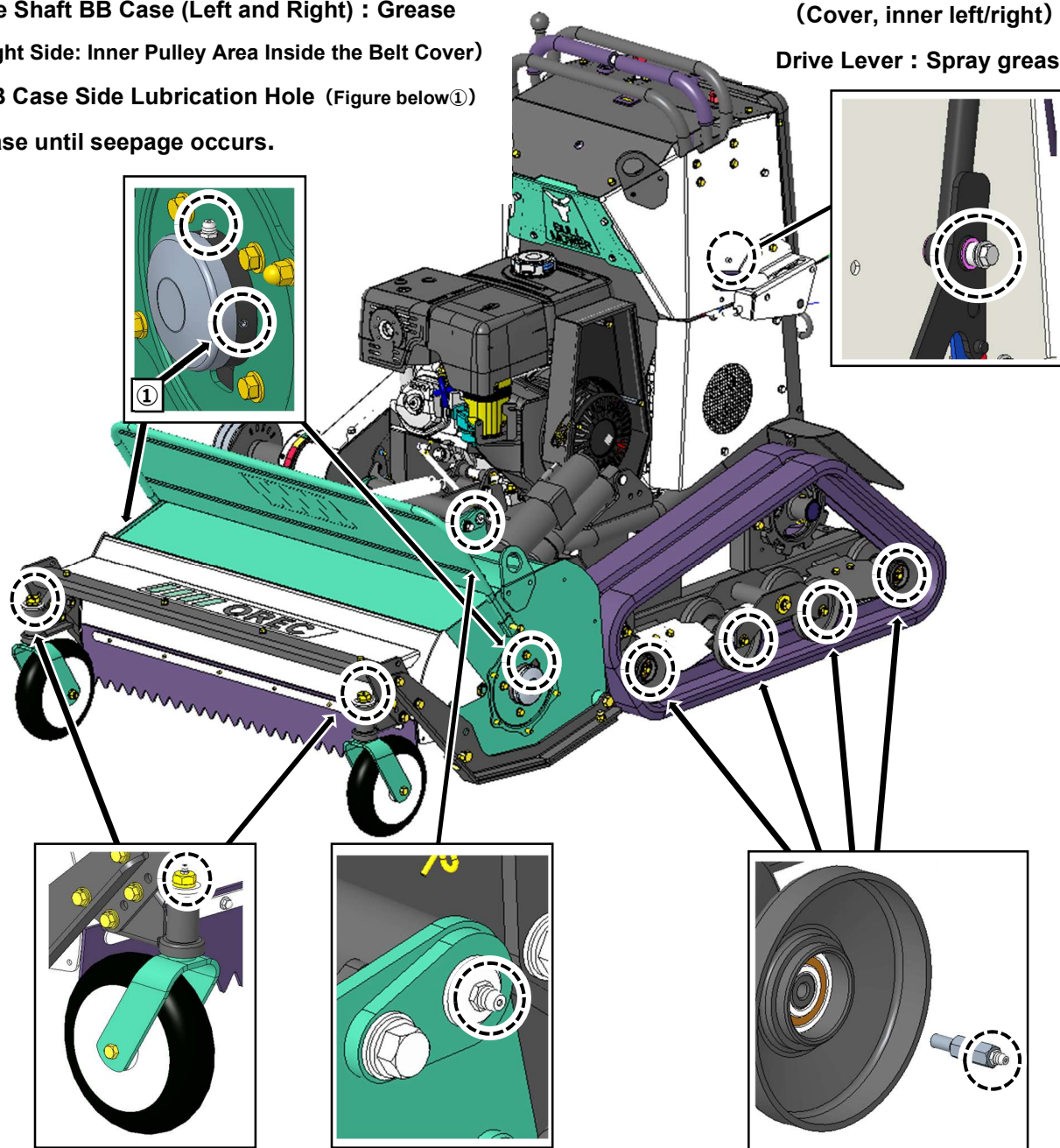
(Right Side: Inner Pulley Area Inside the Belt Cover)

※BB Case Side Lubrication Hole (Figure below①)

Grease until seepage occurs.

(Cover, inner left/right)

Drive Lever : Spray grease



Front axle, L/R : Grease

**Rotary vertical shaft
(upper/lower) : Grease**

All rollers : Grease
Use the included grease plug.
* Do not overtighten

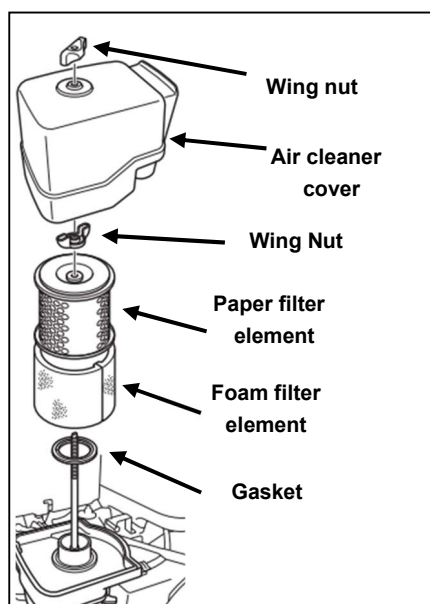
5.2 Cleaning, inspection, and adjustment of engine components

5.2.1 Air cleaner cleaning



Warning

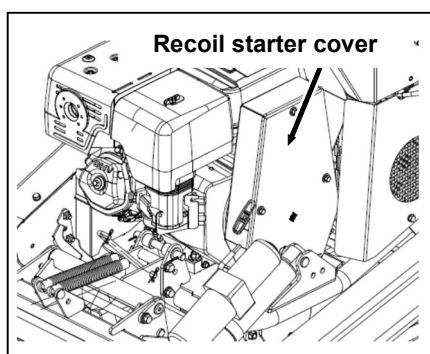
- 1) If the air cleaner or recoil starter becomes clogged with grass debris or similar materials and the machine is operated in that condition, it may lead to reduced power output, increased fuel consumption, and a rise in exhaust gas temperature. This can cause the fuel to ignite and result in a fire hazard. Always inspect and clean these components regularly.
- 2) Do not start the engine with the air cleaner removed. Doing so may allow dirt and dust to enter the engine, causing poor performance and abnormal wear.



- ① Remove the cover and take out the foam and paper elements, making sure that dust and debris do not enter the carburetor side.
- ② Clean the cover by blowing compressed air from the outside or by lightly tapping it to remove dirt. Wipe off any remaining dirt inside the cover with a cloth.
- ③ Wash the foam element with white kerosene (or a neutral detergent), then squeeze it thoroughly. After it has dried, soak it in clean engine oil, wrap it in a cloth, and squeeze out the excess oil.
- ④ Clean the paper element by blowing compressed air from the inside or by lightly tapping it to remove dirt.

- ⑤ Wipe off any dirt inside the case with a cloth, then reassemble the parts in their original positions.

5.2.2 Recoil starter cleaning



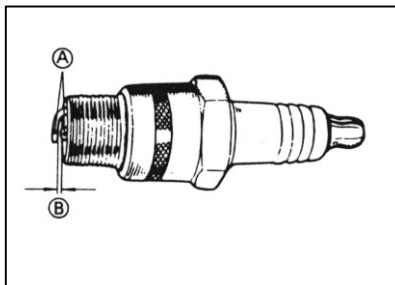
- ① Inspect the recoil starter cover.
- ② If the cover is clogged with dust or cut grass, clean it by brushing the debris off by hand or using a similar method.

Air cleaner cleaning and replacement schedule		
	Cleaning	Replacement
Foam element	Before each use	Every 100 hours
Paper element	Before each use	Every 100 hours

Refer ;

- Dry grass and tall vegetation tend to clog the cover more easily. In such working conditions, check it more frequently and clean it as necessary.

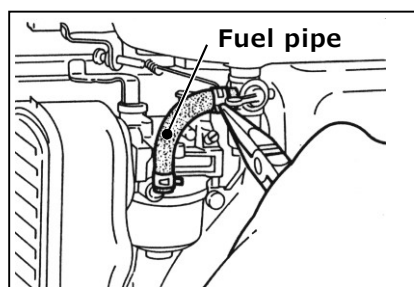
5.2.3 Spark plug inspection and adjustment



- ① Remove the spark plug using a plug wrench. If carbon has accumulated on the electrode (A), clean it with a wire brush. If the plug is wet, wipe it dry.
- ② If the insulator is cracked or the electrode shows signs of wear, replace the spark plug with a new one.
- ③ Adjust the spark plug gap (B) to 0.7–0.8 mm.

Refer ; When tightening, first thread the spark plug in by hand until the gasket contacts the seat, then use the plug wrench. Be careful not to damage the threads, as tightening with the plug wrench from the beginning may strip them.

5.2.4 Fuel pipe inspection



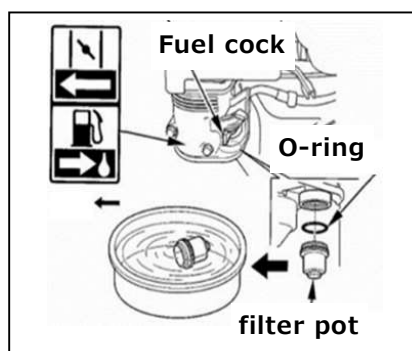
- ① Rubber components such as the fuel pipe will deteriorate over time even if they are not used. Replace the fuel pipe and the clamp every three years, or immediately if they show signs of damage.
- ② Always check that the pipes and clamps are not loose or damaged.

**Danger**

No smoking or open flames

Refer ; When replacing the pipes, make sure no dust or debris enters the inside of the pipe.

5.2.5 Fuel filter pot cleaning



Clean the inside of the fuel cock every 50 hours of operation.

- ① Set the fuel cock to the OFF position.
- ② Remove the fuel filter pot, then clean the sediment (such as dirt or water) accumulated at the bottom, as well as the filter, using a low-flammability solvent such as kerosene. Blow air to dry them completely.

**Danger**

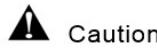
No smoking or open flames

**Warning**

Do not use highly flammable cleaners such as gasoline or thinner.

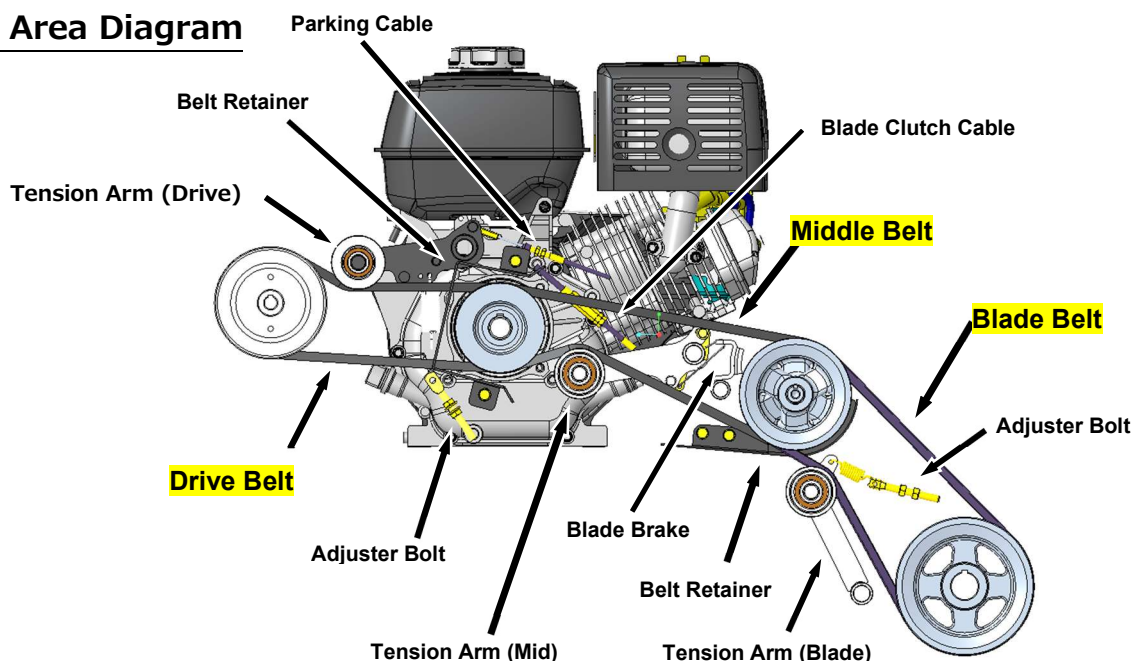
Refer ; Perform cleaning in a clean area free of dust and debris.

5.3 Inspection and adjustment of the main unit

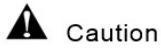
**Caution**

- 1) Place the machine on a flat area and stop the engine before inspection or adjustment.
- 2) Check that each control lever operates correctly. (Before each operation)
- 3) Since the wire and belt will initially stretch, readjust them after 2–3 hours of operation
- 4) The wire belt is a consumable component. Replace it with a new one if any abnormality is detected. (Refer to Specification 6.1 for size details.)
- 5) Operate the machine briefly and check for any abnormal noise or excessive heat.
- 6) After adjustment, always check ON/OFF and directional operation.
- 7) Check all bolts and nuts for loose or missing parts and tighten them securely.
- 8) Reinstall all covers removed for adjustment in their original positions.
- 9) To allow all components to break in properly, avoid heavy operation the first 2–3 hours.
- 10) Perform post-operation cleaning and regular inspections. (Refer to Checklist 7.1.)
- 11) Inspect the entire machine and check all areas for oil leaks.
 - If any oil leakage is found, contact your dealer.
 - Using the machine with an oil leak is dangerous and can cause damage.

Belt Area Diagram



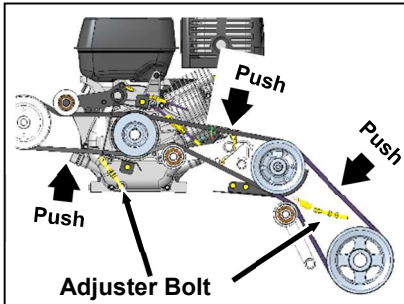
5.3.1 Belt Adjustment



Caution

- 1) Belts stretch at first, so readjust after 2–3 hours of use.
- 2) The belt is a consumable part. Replace it with a new one if any abnormality is found. Adjust it after the first 20 hours of use and every 100 hours thereafter. <Belt size: See Specification 6.1.>

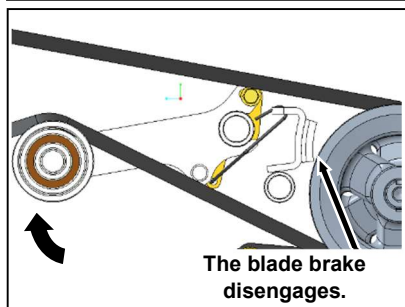
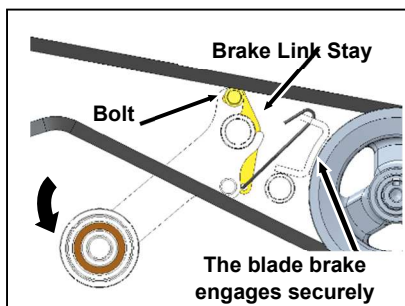
① Belt Tension Adjustment



<Refer 5.3.1 "Wire Adjustment.">

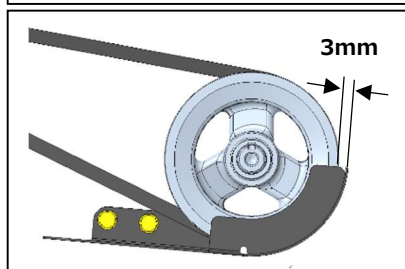
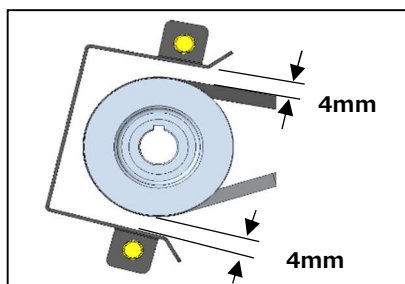
- If the belt slips during operation, adjust it.
- Remove the belt cover and tension each belt. Press the center of the tensioned side with your finger; a deflection of 4–6 mm indicates proper tension. If the belt deflects beyond the specified limit, adjust the adjuster bolt or the wire to increase spring tension.
- After adjustment, tighten the nut securely.

② Blade Brake Adjustment



- When the Blade clutch lever is disengaged, the Blade brake activates and stops the Blade rotation. If the Blade takes longer to stop, adjust the Blade brake.
- Loosen the bolt and adjust the brake link stay so the knife brake fits into the pulley groove when the clutch lever is disengaged.
- Tighten the loosened bolt securely and check that the Blade brake is clear of the pulley groove when the Blade clutch lever is engaged.

③ Belt Retainer Adjustment



- When replacing the belt, adjust the belt retainer accordingly.
- Adjust the position of the belt retainer using the Middle belt, and perform the adjustment with the belt tensioned.
- Adjust the gap between the belt retainer and the belt to match the spacing shown in the left figure.
- Reinstall all covers removed for adjustment in their original positions.



Caution

- 1) After making the adjustment, securely tighten the locknut.
- 2) Reinstall all covers removed for adjustment in their original positions.
- 3) After completing the adjustment, check the operation of the adjusted section.

5.3.2 Wire Adjustment

① Parking Wire Adjustment

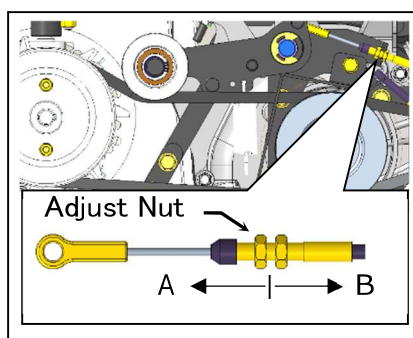


Figure 1

Adjust the parking wire using the adjust nut shown in Figure 1.

- ☐ If the machine does not stop when the parking lever is engaged.

...Turn the adjust nut in direction A...

- ☐ If the machine does not move even when the parking lever is released.

...Turn the adjust nut in direction B...

<Refer 5.3.5 Belt Adjustment>

② Blade Clutch Wire Adjustment

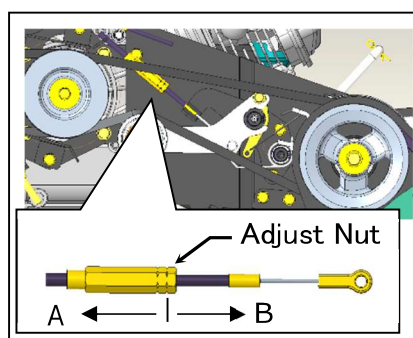


Figure 2

Adjust the Blade clutch wire using the adjustment nut shown in Figure 2.

- ☐ If the Blade rotation stops under load even when the Blade clutch lever is engaged.

...Turn the adjustment nut in direction B...

- ☐ If the knife rotation does not stop even when the Blade clutch lever is disengaged

...Turn the adjustment nut in direction A...

<Refer 5.3.5 Belt Adjustment>

③ Throttle Wire Adjustment

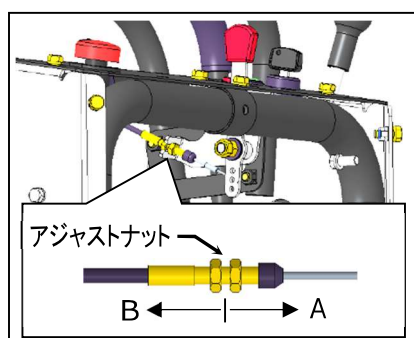


Figure 3

Adjust the throttle wire using the adjustment nut shown in Figure 3.

- ☐ If the engine speed does not reach the maximum RPM.

...Turn the adjustment nut in direction A...

- ☐ If the engine speed does not reach the idling RPM

...Turn the adjustment nut in direction B...

④Choke wire adjustment

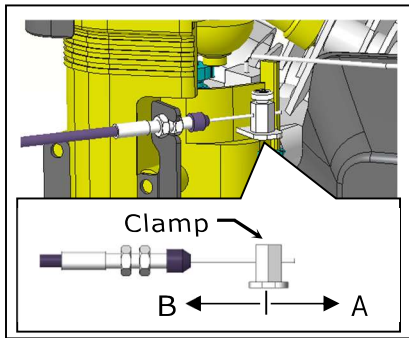


Figure 4

Adjust the choke wire at the clamp position shown in Figure 4.

- ☐ If pulling the choke lever does not engage the choke

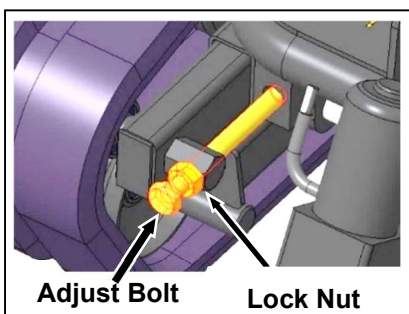
...**Move the clamp in direction B.**...

- ☐ If the choke does not fully return even after releasing the choke lever.

...**Move the clamp in direction A.**...

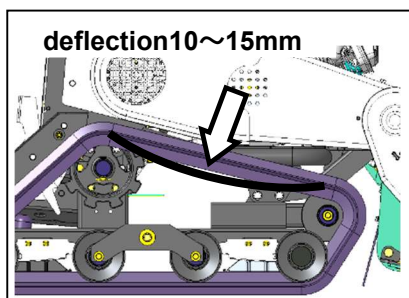
Refer ; After adjusting the wire, make sure all components operate correctly..

5.3.3 Crawler Adjustment



- Adjust the crawler tension when it becomes too loose.
- Loosen the locknut (M14) on the adjustment bolt located at the front of the machine. (There is one on each side.)
- Adjust the tension by turning the adjustment bolt in either direction.

Clockwise → Tighten the crawler
counterclockwise → Loosen the crawler



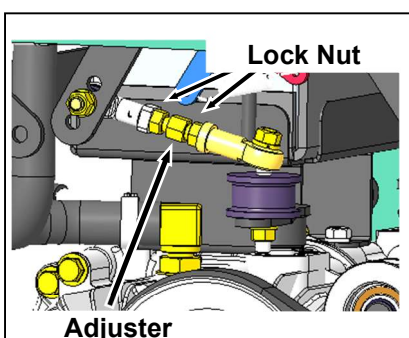
- Adjust the crawler so that there is no excessive slack and the tension is even on both sides. As a guideline, when you press the center of the crawler (indicated by the arrow in the left figure) with 5 kgf, the amount of deflection should be 10–15 mm.

- After adjustment, tighten the locknut securely.

Refer ;

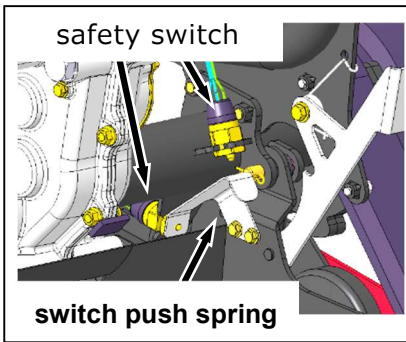
- The crawler will wear over time with use. If the tension cannot be restored even after adjusting the adjustment bolt, the crawler may be excessively worn. Check the outer lug height, inner guide wear, and any cracks in the rubber, and replace the crawler as necessary. Excessive wear increases the risk of crawler derailment.

5.3.4 Neutral adjustment



- If travel occurs with the lever in the neutral position, adjustment is required. Left side for the left crawler, right side for the right crawler. Remove the belt cover and the left cover, then adjust each component accordingly.
- Loosen the locknuts on both sides and adjust the adjuster.
Moving forward in neutral → Extend the adjuster.
Moving backward in neutral → Retract the adjuster.

5.3.5 Safety switch adjustment



- Four safety switches are installed for operator safety: behind the parking lever, behind the Blade-clutch lever, and on the upper and lower steps. Adjustment is performed only on the upper and lower step switches.
- Confirm that the step-switch push spring presses the safety switch. If not, reposition the spring and adjust it to ensure proper contact.

5.4 Inspection, Replacement, and Installation of the Blade

■ For safety, perform a pre-operation inspection of the Blade. ■

Warning

- 1) Only genuine manufacturer Blades shall be used for replacement. The use of third-party Blades is dangerous and avoids any warranty for failures or accidents caused by such use.
- 2) Before starting operation, check that the blade was not bent, damaged, loosened, or worn due to contact with curbstones, tree roots, or other obstacles during the previous work.
- 3) Operating with a worn or damaged knife, or loose bolts, may result in knife breakage, detachment, serious injury, or machine damage.
- 4) The blade rotates at high speed, and any chipping or breakage can cause vibration. Continued operation under vibration is dangerous and may result in component damage, reduced machine life, or engine ignition hazards.
- 5) All blades must be replaced simultaneously. Partial replacement can unbalance the knives and lead to vibration.
- 6) To prevent injury, wear sturdy gloves or wrap the blade tip with a cloth when inspecting or replacing the knife.

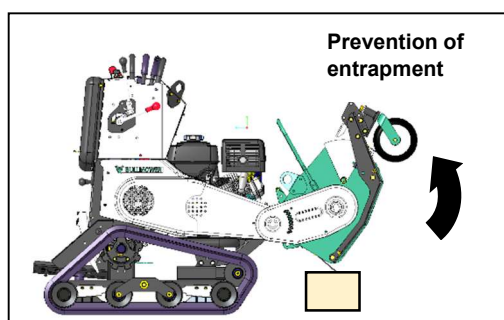
Caution

- 1) Place the machine on a flat, open area and stop the engine before inspection or adjustment.
- 2) Blade replacement must be performed by personnel with proper tools and maintenance skills.
- 3) For safety, replace the blade setting bolts and nuts whenever you replace the blade. Always use genuine parts.
- 4) Take great care during operation to avoid slipping.
- 5) Using new and worn blades together can cause abnormal vibrations.

Refer ;

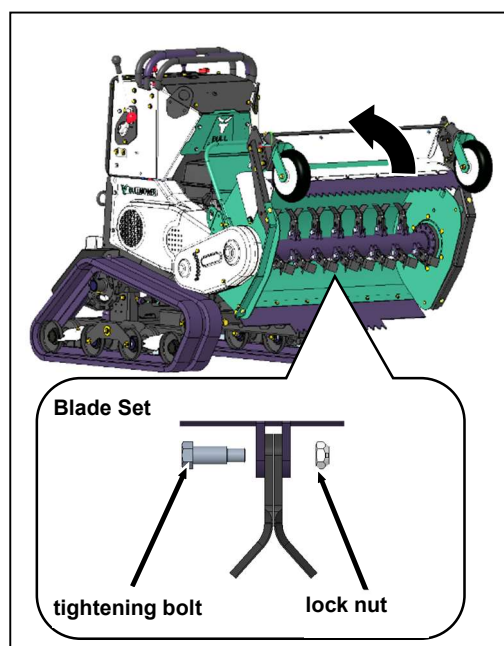
- 1) In areas with dry soil or sand, or when operating at a low cutting height, the blade wears quickly. Inspect it frequently.
- 2) It is recommended to purchase spare blades in advance and keep them on hand.
- 3) Runout of the knife drum can also cause vibration. Since the knife drum cannot be corrected, if severe vibration occurs when the knife rotates, replace the knife drum assembly.
- 4) The tightening torque for the blade setting bolts is 500–550 kgf (49–53.9 N·m). As a guideline, tighten them using a 30 cm long box wrench (size 17) with a force of at least 20 kgf. o

5.4.1 Blade Inspection and Replacement



① Stop the engine and remove the spark plug cap as a precaution.

② Raise the cutting height to a position that allows easy access for blade replacement. Place blocks or other supports under the lifted rotary unit to prevent it from falling and causing injury.

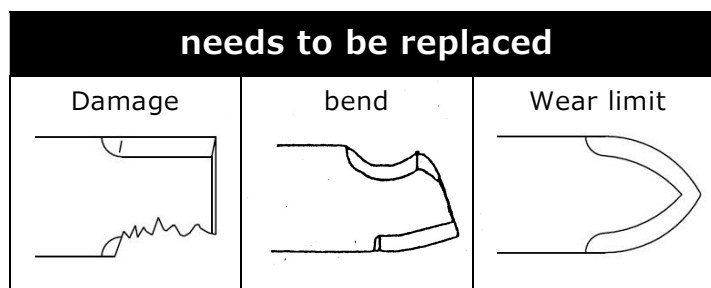
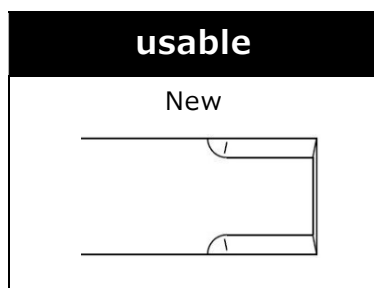


③ Inspect the free blades for cracks, bending, or wear.

④ Inspect the mounting condition of the tightening nuts on the free blades.

⑤ Replace the blade if it is in an abnormal condition as shown in the figure below.

⑥ After inspection or replacement, ensure that all bolts and nuts are securely tightened to their original condition.



5.5 Long-Term Storage Procedure

5.5.1 Preparation for Long-Term Storage



Danger

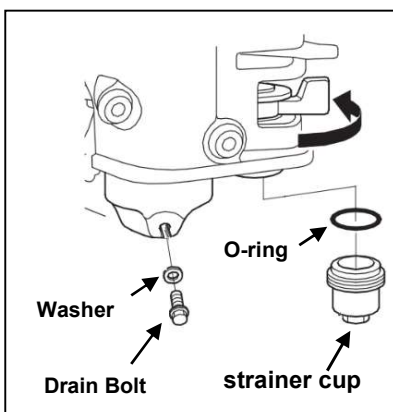
- 1) When draining the fuel, work in a well-ventilated area, keep away from lit cigarettes and open flames, and handle the drained fuel with extreme care.
- 2) When draining the gasoline from the fuel tank or covering the machine, make sure that the engine and muffler have completely cooled down beforehand.



Caution

- Storing the machine for a long period with fuel remaining in the fuel tank or carburetor may cause starting difficulties, reduced engine performance, and other problems.
- Remove the key for storage and keep it under the administrator's control.

- 1) If the machine will not be used for more than 30 days, drain the fuel from the fuel tank and carburetor to prevent starting problems or poor engine performance caused by fuel deterioration.



① Fuel in the fuel tank

Remove the strainer cup, place a container underneath, and then turn the fuel cock to the "OPEN" position to drain the fuel.

② Fuel in the carburetor

Remove the float chamber drain bolt to drain the fuel.

- ③ After completing the work, make sure all removed parts are securely reinstalled, and always close the fuel cock.

- 2) In particular, remove any accumulated mud or dust around the recoil starter, air cleaner, muffler, carburetor area, and inside the belt cover using compressed air or equivalent methods. If any rust is present, remove it completely and apply an anti-corrosion coating to the affected areas.
- 3) Apply oil and grease to all designated points, and repair any defective areas in advance.
- 4) Store the machine with the rotary fully lowered and the cylinder fully retracted to prevent rust or dust from damaging the oil seal.
- 5) Store the machine horizontally in a dry, well-ventilated area under a roof.
- 6) Cover the machine to prevent dust accumulation. (* cover is not included.)

5.5.2 Notes for Next Use

**Caution**

- 1) Use fresh fuel.
- 2) Perform a pre-operation inspection.
- 3) Ensure all control levers operate correctly (at the start of each work session).
- 4) Check that all bolts and nuts are tight and not missing.
- 5) Move the machine slightly and check for abnormal noise or overheating.
- 6) Avoid heavy operation for the first 2–3 hours to allow all components to break in properly.

6. Note

6.1 Specifications (reference values)

Name		BULL MOWER
Type		ZHR800
L×W×H(mm)		1,725 × 1,000 × 1,140
Cutting width (mm)		800
Weight (kg)		320
Cutting Height (mm)		30 ~ 320 (Stepless)
Blade (Pcs)		Free Knife × 46
Belt (Pcs)	Drive	SB34 W800×1
	Middle	SB41 W800×2
	Cutting	SB39 W800×2
Crawler size		W160 × P 60 × Link 35 × 2pcs
Transmission		HST continuously variable transmission
Sub Transmission		Gear Mission 2 Speed (Low/Hi)
Speed (km/h)	Forward	Low : 0 ~ 4.5 km/h Hi : 0 ~ 7.5 km/h
	Backward	Low : 0 ~ 2.6 km/h Hi : 0 ~ 4.5 km/h
Clutch	Drive	Belt tension system
	Cutting	Belt tension system
Transmission Oil (ℓ)		2.0 (90)
HST Oil (ℓ)		One side 0.5 (ISO VG46 equivalent)
Battery		30A - 19L
ENGINE	Name	HONDA
	Type	GX390
	Displacement (cc)	389
	OIL (ℓ)	1.1
	Starting method	Electric starter (Manual recoil starting is also available.)
	Spark Plug	BPR6ES
	Fuel Tank (ℓ)	6.1

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

6.2 Tool bag / bundled items details

Name	Size	Q'ty	Remarks
User's manual		1	
		1	
Engine Tool	Accessories	1	
Funnel for oiling	83-1517-992-00	1	
Lubrication hose	83-1517-993-00	1	
Protective Gogel	0328-76100	1	Protective equipment
Grease plug	0940-30500	1	Grease injection tool
Grease nipple M6	83-1415-975-00	1	Grease injection tool

6.4 Consumable item details

No.	部 品 名	部 品 番 号	個数/台	備 考
1.	Free Knife	0354-70400	46	
2.	Knife setting Bolt Set	0354-56000	23	
3.	Drive Belt	89-6123-003402	1	V Belt SB-34 W800
4.	Middle Belt	89-6123-004102	2	V Belt SB-41 W800
5.	Knife Belt	89-6123-003902	2	V Belt SB-39 W800
6.	Throttle wire	0310-70100	1	
7.	Choke wire	0940-70600	1	
8.	Parking brake wire	0940-70500	1	
9.	Blade clutch wire	83-1484-937-20	1	* 共用品の為、デフロックワイヤと表示
10.	Knife brake	0231-37100	1	
11.	Sprocket pin	89-2181-100502	2	
12.	R-Pine	89-2132-100002	2	
13.	Crawler	80-1920-401-00	2	

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?	Blade	○	○	○
				Blade stay	○	○	○
			Is the bolt / nut loose, worn, or dropped?	Bolt Nut	○	○	○
	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?	OIL	○	○	○
				Filter	○	○	○
	【Engine oil: 5H for the first time, change every 50H thereafter, and every 100H 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					○	○	○
Decelera tion		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】			
Hydrauli c		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 your engine is not running properly, diagnose it using the following table and take appropriate action.

phenomenon	Cause	Treatment
Starter motor not rotating	Drive / knife clutch lever set to ENGAGED	Drive / knife clutch lever set to DIS ENGAGED
	Battery over-discharge	Start with the recoil starter to recharge the battery.
	Coupler wiring disconnected	Make the connection
	Harness cut or short-circuit	Wiring harness replacement
	Blown fuse	Replace the fuse
Charging failure	Faulty charge coil	Replace the charge coil
	Defective regulator	Replace the regulator
	End-of-life battery	Replace the battery
If starting is difficult (If it doesn't start)	fuel shortage	Refuel
	The fuel cock is closed	Open the fuel cock
	The throttle lever is not in the "start" position	Move the throttle lever to the "Start" position
	The choke lever is not closed	When the engine is cooling, set the choke lever to the  position
	The starter was turned repeatedly with the choke lever closed.	Wait a while and then clean the spark plugs to start the engine.
	Fuel not flowing	Inspect the fuel tank and fuel cock strainer to remove any sediment, moisture, or debris.
	Air or water has entered the fuel supply system.	Remove any foreign matter, inspect the tightening band, and
	Oil viscosity is high in cold weather, causing	Use different oils depending on the temperature
	Faulty ignition coil or unit	*Replace the ignition coil or unit
	Spark plug malfunction	Check the electrode gap of the spark plug and adjust or replace
Insufficient power output, and If the engine speed does not stabilize (increase)	fuel shortage	Refuel
	Clogged air cleaner	Cleaning the element
	Poor quality fuel	Replace with quality fuel
	The choke is not fully open	Return the choke lever to its full  position
	The cooling system is clogged	Clean the area around the recoil starter
If it suddenly stops	fuel shortage	Refuel
	The fuel cock is closed	Open the fuel cock
Exhaust color is abnormal If black	Poor quality fuel	Replace with quality fuel
	Too much engine oil	Adjust oil level to normal
Black smoke coming out of the muffler When output drops	Clogged air cleaner element	Cleaning the element
	The choke is not fully open	Return the choke lever to its full  position
Blue-white smoke coming from the muffler	Too much engine oil	Adjust oil level to normal
	Cylinder and piston ring wear	*Replace the ring
After a while Stalling	Faulty ignition coil	*Replace the ignition coil
	Clogged fuel filter	Clean the fuel filter
The exhaust has a pungent	Poor quality fuel	Replace with quality fuel

7. Checklist

Items marked with an asterisk () should be handled by an authorized dealer. Service charges may apply.

*If you are unsure about the procedure, please consult the dealer from whom you purchased the product.

7.3 Troubleshooting Guide

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

Symptom	Cause	Action
Grass clippings are not being discharged properly.	The grass is wet.	Wait until the grass is dry before operating.
	Grass is too long.	Increase the cutting height and mow twice.
	The cutting height is too low.	Increase the cutting height.
	Engine RPM is low.	Set to maximum RPM.
	Working speed is too fast.	Reduce the travel speed during operation.
Uneven cutting occur.	Working speed is too fast.	Reduce the travel speed during operation.
	Engine RPM is low.	Increase to maximum RPM.
	Knife wear or damage.	Replace with a new blade.
	Accumulation of grass debris inside the knife cover.	Clean the inside surface of the blade cover.
	Grass is too long.	Perform a second cut.
Soil scraping occurs.	Cutting height is too low.	Increase the cutting height.
	The turning speed is too fast.	Reduce the speed during turns.
	The terrain has undulations.	Change the mowing pattern (cutting direction).
	Terrain has many undulations (bumps and dips).	Increase the cutting height.
	Knife bending.	Replace with a new blade.
The belt is slipping.	Belt tension is low.	Adjust the belt tension.
	Foreign matter is clogged inside the knife cover.	Clean inside the knife cover.
	Grass or debris is wrapped around the knife drum.	Remove the entanglement.
	Belt wear.	Replace with a new belt.
Does not travel straight.	HST lever position is misaligned.	Adjust the shift rod.
	Transmission malfunction.	Repair the transmission.
Excessive vibration.	Poor knife balance.	Replace the blades. (All blades)
	Damaged blades.	Replace with new Blades.
	Knife drum is bent.	Replace the knife drum assembly.
	Belt damage.	Replace with a new belt.
	Old and new knives are mixed together.	Do not mix old and new knives.
	Grass or debris is wrapped around the knife drum.	Remove the entanglement.
The harvesting workload is heavy.	Engine RPM is low.	Increase engine RPM.
	The operating speed is too fast.	Reduce the operating speed.
	Grass is accumulated or wrapped around the knife	Clean the knife thoroughly.
	Grass is too long.	Increase the cutting height and mow twice.
	The cutting height is too low.	Increase the cutting height.
Not moving. Crawlers are slipping.	The field is soft.	Suspend operation until the field dries.
	Crawler and drive sprocket wear.	Replace the crawler tracks and drive sprocket.
	HST air ingress, oil shortage	Add oil to the HST tank and bleed the air.
The oil filler plug flew out	Overfilled transmission oil. (Excessive internal	Adjust to the correct oil level.

※If you are unsure, please consult the dealer where you purchased the vehicle.

7.4 Battery Maintenance and Inspection

Improper handling of the battery may shorten its lifespan or lead to serious accidents.

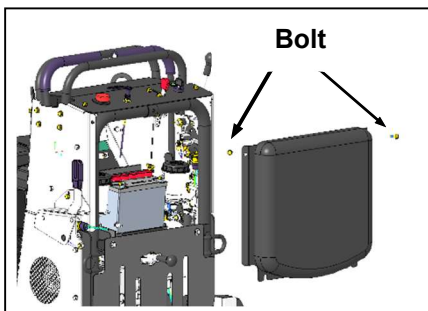
Ensure it functions properly by following the correct handling procedures. Also, use a battery with a voltage specification of 12V (250CCA or higher recommended) for this product.



Warning

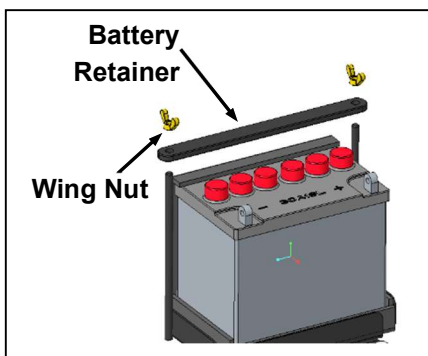
- 1) When handling the battery, be careful of short circuits, sparks, and open flames.
- 2) Batteries emit flammable hydrogen gas. To prevent ignition and explosion, do not bring open flames (matches, lighters, cigarette flames, sparks from welders or grinders, etc.) near the battery or generate sparks at the terminals.
- 3) Do not touch the battery with an electrically charged body or clean it with dry cloths. This may cause ignition or explosion due to static electricity.
- 4) Battery fluid is dilute sulfuric acid. Contact with eyes or skin can cause severe damage. Exercise extreme caution. If an accident occurs, follow the procedures outlined in Section 7.4.5 for accidents involving electrolyte.
- 5) Always remove the battery from the unit during charging. Failure to do so may damage electrical components or wiring. Rapid charging is not suitable as a method for supplemental charging. Use rapid charging only in emergencies; otherwise, strictly adhere to normal charging procedures.

7.4.1 Battery Removal and Installation Procedure



◎ Removal Procedure

- ① Stop the engine and remove the key.
- ② Remove the bolt beside the cushion and remove the cushion.
- ③ Disconnect the cables attached to the battery in the following order: $\ominus$ (black) cable first, then $\oplus$ (red) cable.
- ④ Loosen the wing nut, remove the battery retainer, and detach the battery from the main unit.



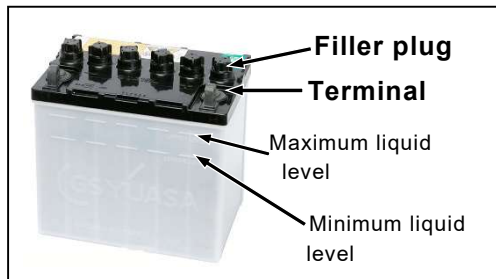
◎ Installation Method

- ① Ensure the battery mounting base is free of foreign objects. Place the battery in the same position as when it was removed and securely fasten the battery retainer with the wing nut.
- ② Carefully connect the $\oplus$ (red) and $\ominus$ (black) cables to the battery in that order, ensuring they are tightened securely without contact with other parts.

Note: Applying a thin layer of grease to the metal parts of the cable terminals is effective for rust prevention. If the cable terminals are corroded, clean them using a wire brush or fine-grit sandpaper.

7.4.2 How to Add Battery Fluid

Check the electrolyte level during the daily pre-operation inspection. Even when not in use, inspect the electrolyte level at least once a month.



• If the fluid level has dropped below half the distance between the UPPER (maximum fluid level) and LOWER (minimum fluid level) marks, top up with distilled water to the UPPER level. (* Excluding sealed types)



Warning

- 1) Do not allow the electrolyte level in the battery to fall below the LOWER (minimum liquid level) mark. Doing so may shorten the battery life, cause overheating, or lead to an explosion.
- 2) Only distilled water should be added to the battery. (Do not add dilute sulfuric acid.) Adding impurities may cause overheating, ignition, or toxic gas generation.
- 3) Overfilling with distilled water may cause electrolyte spillage, leading to metal corrosion. Do not fill above the UPPER (maximum fluid level). If battery fluid spills, rinse thoroughly with water.
- 4) After adding water, securely fasten the filler cap to prevent leakage.

7.4.3 Battery Recharging Procedure

Even if the battery fluid level is properly maintained, the engine may fail to start, or the starter motor may turn more slowly and weakly than usual. In such cases, the battery is discharged. Recharge the battery for 5 to 10 hours following the procedure below.

※Charger sold separately.

〈Refer to 7.4.6 Estimated Battery Charging Time〉

- ① Ensure the charger's power switch is OFF before use. Connecting it to the battery while ON may cause sparks, leading to ignition or explosion.
- ② Connect the charger's positive (+) terminal to the battery's positive (+) terminal, and the charger's negative (-) terminal to the battery's negative (-) terminal. Incorrect connection may cause electrical circuit failure or wiring damage.
- ③ Remove all six liquid vent plugs.
- ④ Follow the standard charging current and charging time for supplemental charging. Failure to do so may cause leakage, ignition, or explosion.

7. Inspection Checklist

- ⑤ After supplemental charging is complete, securely reinstall all six liquid plugs as originally configured.
- Do not use rapid charging to recover batteries that have been left unused for extended periods. If rapid charging is unavoidable, use a charging current below the battery's rated capacity value.

Guidelines for completing supplemental charging (must satisfy the following conditions)

①	The electrolyte specific gravity is 1.270/20°C or higher and remains stable for at least one hour.
②	The terminal voltage is 15V or higher and remains constant for at least one hour.
③	Gas is being vigorously generated from each cell.
④	The scheduled charging time has been reached.



Caution

- 1) When using a charger with a boost (starting assist) function, follow the charger's instruction manual. Improper handling may cause battery explosion or damage to the unit and equipment.
- 2) Charge in a well-ventilated area and keep away from open flames. Failure to do so may cause ignitions or explosion.

7.4.4 Approximate Battery Charging Times

Batteries charged rapidly will discharge rapidly. Adhere to the charging times below and limit rapid charging to emergencies only. (Current: 3A to 4A)

Specific Gravity (20°C)	Charge Time (Hours)
1,240 or higher	4 to 5
1,200–1,240	6–7
1,160–1,200	8–9
1,120–1,160	10–12
1,120 or less	15 or more

Specific Gravity (20°C)	Discharge Electricity Quantity (%)	Remaining charge (%)
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



Caution

If the electrolyte temperature during charging reaches 45°C or higher (hot to the touch), reduce the current by half or pause charging until the temperature drops before resuming.

7.4.5 Battery Life

Batteries gradually lose capacity during use until they reach end-of-life. Batteries that do not recover performance after recharging have reached end-of-life. The following factors shorten battery life:

- 1) High or low temperatures (ambient temperature)
 - 2) Usage frequency (Both underuse and overuse have an impact.)
 - 3) Insufficient charging (e.g., due to generator failure causing inadequate supply)
 - 4) Harsh usage (Frequent use in cold regions, operation with insufficient charge, etc.)
 - 5) Inadequate maintenance (Battery failure due to neglecting electrolyte level checks or water replenishment, loose terminals causing poor contact, forgetting to turn off the engine switch, etc.)
 - 6) Overcharging (Due to regulator failure or continuing to charge beyond the completion point.)
- The following signs may appear toward the end of the battery's life:
 - 1) The starter motor's rotation sound is lower and weaker than usual.
 - 2) Rapid loss of battery electrolyte fluid.

If these signs appear, perform a supplemental charge while paying attention to the points above. If the signs persist even after supplemental charging, the battery has reached the end of its life and replacement is recommended.

- Dispose of unwanted batteries according to your local municipality's regulations.

7.4.6 Battery Failure and Handling Methods

Symptom	Cause	Action	Prevention Method
Starter does not operate	Neglected charging	Charge for an extended period using normal charging. Replace the battery.	If the machine will not be used for an extended period, charge it promptly.
	Terminal contact failure	Remove rust and debris from terminals and tighten securely	Keep terminals clean, tighten securely, and apply grease
	Battery life	Battery replacement	
The starter operates weakly. The upper portion of the plates appears white.	Incomplete charging	Perform a standard charge for	Fully charge before use
	Electrolyte deficiency	Refill with distilled water and	Regularly check the fluid level
	Battery overuse (deep discharge) occurred	Charge for an extended period using normal charging. Replace the battery.	If the machine will not be used for an extended period, charge it promptly.
The battery does not charge.	Battery life	Replace the battery	
	Blown fuse	Replace fuse	
terminal corrosion causes the terminals to become hot.	Terminal contact failure	Remove rust and debris from terminals and tighten securely	Clean the terminal area, tighten securely, and apply grease
	Dirt on the terminal area		
Electrolyte level drops rapidly	Cracks in the battery case	Battery replacement	Ensure secure installation
	Charging voltage too high	Replace the charger	
	Battery life	Battery Replacement	

*If you are unsure, please consult the retailer where you purchased the product.

7.4.7 Handling Procedures for Accidents Involving Electrolyte

Degree of Hazard	Type of Accident	Action
 Danger	If in eyes	Immediately flush eyes with copious amounts of clean water, then promptly seek medical attention
	If swallowed	Immediately rinse your mouth repeatedly with drinking water, then drink plenty of water and seek
 Warning	If on skin or clothing	Immediately rinse off with plenty of water, then wash thoroughly with soap.
 Caution	If it gets on a vehicle	Immediately wipe off with a rag or similar material, then rinse with water.
	If spilled on the floor or ground	Sprinkle baking soda until no more bubbles appear, then rinse thoroughly with plenty of water.