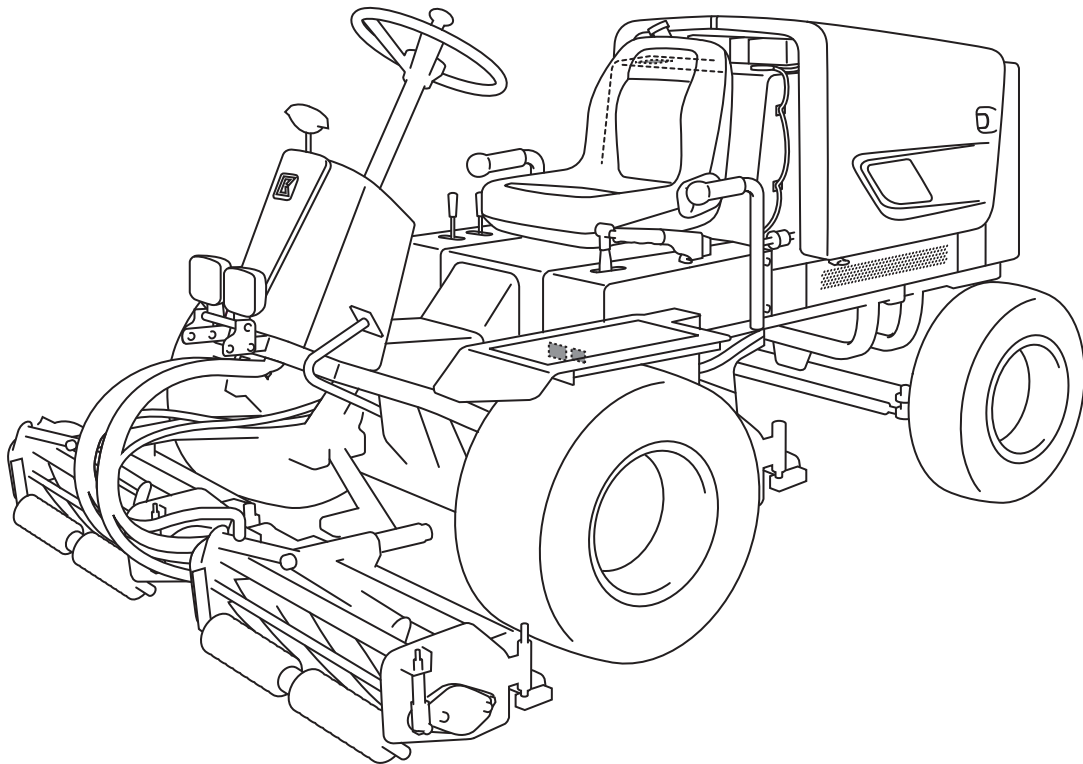


# ***LM283***

3-Unit Reel Mower

## Owner's operating manual



"Required reading" Read this manual and the owner's manual for the engine before using the machine.

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**BARONESS**<sup>®</sup>  
Quality on Demand

Serial No.10001-

Original Instructions Ver.1.0

# Greeting

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Thank you for purchasing the Baroness machine. This manual explains proper handling, adjustment, and inspection of your machine.

Prior to use, carefully read this manual to thoroughly understand the contents for safe and correct operation.

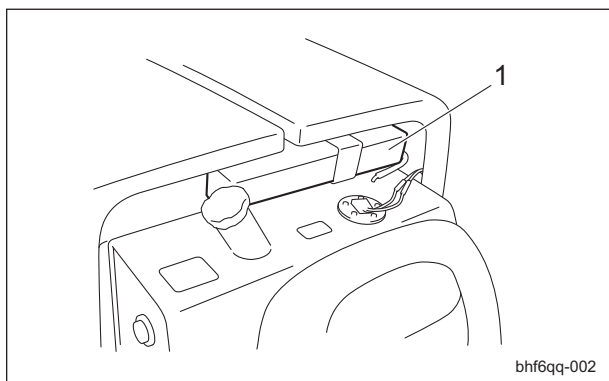
This machine has been shipped from the factory after comprehensive test runs and inspections.

However, the optimum performance of the machine depends on how you use and maintain it, including routine inspections, adjustments, and fuel supplies before and after the operation.

We hope you will use the machine safely, and take advantage of its best performance.

## Keeping the Owner's Operating Manual

Keep this Owner's Operating Manual in the box located in the rear of the seat.



Keeping the Owner's Operating Manual\_001

1	Box
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Read this manual carefully to ensure that you thoroughly understand how to properly operate and maintain this machine, and to avoid causing injury to yourself or others. The operator is responsible for operating the machine properly and safely.

Do not perform maintenance on the machine other than that described in this manual. Maintenance should only be performed by a certified specialist who fully understands the separately provided service manual.

If you have any questions concerning maintenance or genuine parts, please contact your local Baroness dealer. When making inquiries about this machine, please specify the machine's model number and serial number.

 **Caution**

The information described in this manual is subject to change without prior notice for improvement. When replacing parts, be sure to use genuine Baroness parts or parts designated by Kyoisha. Note that the Baroness product warranty may not apply to defects caused by the use of parts from other companies.

## Safety warnings

Warning symbols have been attached to this machine to ensure that you can operate it safely. The warning symbols indicate items which are particularly important for your safety. It is important to always follow the warnings and operate the machine safely.



696cq5-001


This symbol is accompanied by the word “Danger,” “Warning,” or “Caution.” All labels with this symbol describe important safety precautions, so please read such labels carefully and only operate the machine after you have understood them completely. Failure to adequately follow these safety precautions may cause an accident.

 **Danger**

This symbol indicates that serious injury or death will occur if the warning is ignored.

 **Warning**

This symbol indicates that serious injury or death may occur if the warning is ignored.

 **Caution**

This symbol indicates that injury or damage to property may occur if the warning is ignored.

LM283

# Introduction

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# Safety

This machine met CEN standard EN 836: 1997 (if the specified label is affixed) for Garden equipment-Powered lawnmowers at the time of production.

Improper use or maintenance may result in injury or death. To prevent an accident, be sure to follow the safety precautions described below and always pay attention to the warning symbols. The warning symbols are accompanied by the word CAUTION, WARNING, or DANGER, and all labels with these symbols describe important safety precautions.

Failure to adequately follow these safety precautions may cause an accident resulting in injury or death.

## Danger

This machine is designed to ensure safe operation and has been tested and inspected thoroughly before shipment from the factory. The machine is equipped with safety devices to prevent accidents. However, whether the machine demonstrates its original performance level depends on the manner in which it is operated and handled, as well as the manner in which it is managed on a daily basis. Inappropriate use or management of the machine may result in injury or death. Observe the following safety instructions to ensure safe operation.

## Safety management

The following instructions are taken from CEN standard EN 836: 1997, ISO standard 5395: 1990, and ANSI B71.4-2004.

## For Safe Operation

Do not use the mower for any purpose other than mowing a lawn.

Operating the mower for other purposes may be very dangerous for the operator and other people in the immediate area and may cause damage to the mower.

## Training

1. Read the Owner's operating Manual and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
2. If the operator or mechanic can not read English it is the owner's responsibility to explain this material to them.

3. Never allow children or people unfamiliar with these instructions to use or service the machine. Local regulations may restrict the age of the operator.
4. Never allow untrained personnel to service machine.
5. Do not operate the machine under the influence of alcohol or drugs or if you are pregnant.
6. Never operate while people, especially children, or pets are nearby.
7. The owner/use com prevent and is responsible for accidents or injuries occurring to themselves, other people, or property.
8. Keep in mind that the owner, operator, and mechanic are responsible for accidents or hazards occurring to other people or their property.
9. All operators and mechanics should seek and obtain professional and practical instruction. The owner is responsible for training the users. Such instruction should emphasize.
  - [1] The need for care and concentration when working with ride-on machines.
  - [2] Control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are
    - Insufficient wheel grip
    - Being driven too fast
    - Inadequate braking
    - The type of machine is unsuitable for its task
    - Lack of awareness of the effect of ground conditions, especially slopes
    - Incorrect hitching and load distribution

## Before operating the machine

1. While operating, always wear substantial footwear, long trousers, hard hat, safety glasses, and ear protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
2. Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.



3. The safety labels and operation labels should be preserved in their entirety. If they are damaged, become dirty, or peel off, please replace them with new ones.
4. Tighten any nuts, bolts, or screws that become loose to ensure that the machine is always operated under safe conditions.
5. Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
6. Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.
7. Repair any sensors that are malfunctioning before operating the machine.
8. Check that the interlock system, safety guards, and covers are installed correctly and that they function properly. Repair these parts if there is a malfunction before operating the machine.
9. If the brake operation is faulty or the parking brake lever has noticeable play, be sure to adjust or repair them before operating the machine.
10. Do not use this machine if it has been modified.
11. Exercise care in the handling of fuel.

 **Warning**

Warning-Fuel is highly flammable. Take the following precautions.

- [1] Store fuel in containers specifically designed for this purpose.
- [2] Make sure that the fuel pipe is not damaged.
- [3] Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
- [4] Refuel outdoors only and do not smoke while refueling.
- [5] Do not add too much fuel.
- [6] If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until petrol vapours have dissipated.

- [7] Replace all fuel tanks and container caps securely.
12. Replace faulty mufflers.
13. Warm the engine on cold days. Set the parking brake while warming the engine.

### When operating the machine

1. This machine is not authorized for operation as a special motor vehicle. Do not operate it on public roads.
2. Make sure that the operator sits in the operator's seat when operating the machine. Do not carry passengers.
3. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
4. Before attempting to start the engine, disengage all attachments, shift into neutral, and engage the parking brake.
5. Only operate in good light, keeping away from holes and hidden hazards.
6. Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care.  
To guard against overturning:
  - [1] Do not stop or start suddenly when going up or downhill.
  - [2] Engage clutch slowly, always keep machine in gear, especially when traveling downhill.
  - [3] Machine speeds should be kept low on slopes and during tight turns.
  - [4] Stay alert for humps and hollows and other hidden hazards.
  - [5] Never operate across the face of the slope, unless the machine is designed for this purpose.
  - [6] Never drive the machine on a slope with an angle of gradient that is greater than that specified or in a place where there is a danger of the machine slipping.
  - [7] If instructed to do so in the Owner's Manual, use a counterbalance or wheel balance.
7. Always keep a lookout for hidden hollows or obstacles.
8. Do not take your eyes off the road ahead. Do not operate the machine with no hands.
9. Slow down and use caution when making turns and crossing roads and sidewalks.

# Safety

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10. Stop the blades rotating before crossing surfaces other than grass.
11. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.
12. When using attachments, never direct the discharge at bystanders or allow anyone near the machine while it is operating.
13. Do not crawl under the machine while it is in operation.
14. Before backing up, look down and behind you to check that the path is clear and that you can back up safely. Have someone guide you if it is difficult to check the area behind you.
15. Never operate the machine with damaged guards, shields, or without safety protective devices in place.
16. Be sure all interlocks are attached, adjusted and functioning properly.
17. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
18. Do not touch the exhaust system during operation or just after the engine has been turned off. Due to its high temperature, doing so could cause burns.
19. If an unusual vibration occurs, stop the engine immediately, inspect the machine and try to identify the cause. Make repairs if necessary.
20. Wear earmuffs as the noise level experienced in the operator's position during operation may exceed the specified level.
21. Do the following before to stop the engine.
  - [1] Stop on level ground.
  - [2] Disengage the power take-off and lower the attachments.
  - [3] Change into neutral and set the parking brake.
  - [4] Reduce the engine speed.
  - [5] Stop the engine and remove the key.
22. Disengage the drive to each attachment except when operating the machine.
23. Disengage the drive to attachments, stop the engine, and remove the ignition key in the following conditions.
  - [1] Before refueling.
  - [2] Before cleaning blockages.
  - [3] Before checking, cleaning, or working the machine.
  - [4] After striking a foreign object or if an abnormal vibration occurs.
  - [5] Inspect the machine for damage and make repairs before restarting and operating the equipment.
  - [6] Before removing the grass catcher/catchers.
  - [7] Before making height adjustment unless adjustment can be made from the operator's position.
24. Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of operation.
25. Close the fuel valve before transporting the machine.
26. Take care when loading or unloading the machine into a trailer or a truck. Load or unload the machine in a flat and safe place. Before loading or unloading, set the parking brake on the truck or trailer, stop the engine, and chock the wheels.
27. When transporting the machine on a truck or a trailer, set the parking brake, stop the engine, and fasten the machine to the truck with a rope or other suitable restraining device that has sufficient strength.
28. When using a running board, select one with sufficient strength, length, and width and that will not cause the machine to slip.

## Maintenance and storage

1. Disengage drives on level ground, lower the attachments, set parking brake, stop engine and remove key from ignition. Wait for all movement to stop before adjusting, cleaning or repairing.
2. Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
3. To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting unit and drives free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
4. Check the grass catcher frequently for wear or deterioration.
5. Make sure that parts such as wires are not touching each other and that their covers have not come off.

6. When filling the tires with air, do not allow the air pressure in the tires to exceed the specified maximum.
7. Check that all nuts, bolts, and screws are properly tightened to ensure that the machine is always operated under safe working conditions.
8. Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
9. Check whether line connectors in the hydraulic system are properly tightened. Before applying hydraulic pressure, check the connections of the hydraulic pressure lines and the condition of the hoses.
10. Do not modify the machine.
11. Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
12. On multi-cylinder/multi-reel machines take care as rotating one cylinder/reel can cause other cylinder/reels to rotate.
13. Use care when checking the cylinders/reels and bed knives.  
Wear gloves and use caution when servicing them.
14. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
15. Carefully release pressure from components with stored energy.
16. Be sure to depressurize the hydraulic system before performing maintenance operations on it such as removing hydraulic equipment.
17. When checking the hydraulic circuit for pinhole leaks or oil leakage from nozzles, do not use your hands. Use items such as paper or corrugated cardboard to find leakage points. Be extremely careful with high-pressure oil as it may pierce your skin, resulting in an injury.
18. Do not change the engine governor setting or operate the engine at a speed higher than this setting. Check the maximum engine speed using a tachometer.
19. Stop the engine and allow it to cool before checking or refilling the engine oil.
20. When the fuel tank needs to be cleaned, do it outdoors.
21. When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.
22. Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
23. Make sure that the electrolyte is between the "UPPER" and "LOWER" limits. Should your skin or clothes come into contact with electrolyte, immediately wash the affected area with water.
24. Use jack stands to support components when required.
25. Appropriately manage and correctly use the tools necessary for servicing or adjusting the machine.
26. Consult a Baronesse dealer or Kyo-eisha when major repairs or assistance is required.
27. For safety and maximum performance, use genuine Baronesse parts and accessories. Note that the Baronesse product warranty may not apply if parts or accessories from other companies are used.
28. Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
29. Allow the engine to cool before storing in any enclosure.
30. When storing the machine, lower the rake.
31. If the engine is provided with a shut-off valve, shut off valve while storing or transporting.
32. When storing the machine for an extended period of time, remove the battery and the ignition key. If the machine is going to be stored with the battery still attached, disconnect the negative battery cable.
33. Only cover the machine with a sheet after hot parts have sufficiently cooled down.



# Sound pressure level

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Sound Pressure..... Page 2-2

Sound pressure level

# Sound pressure level

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## Sound Pressure

This machine was confirmed to have a continuous A-weighted sound pressure level of 89 dB (A) by measuring identical machines (at operator ear-level) in accordance with the procedure specified in directive CEN EN836:1997.

# Sound power level

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Sound Power.....Page 3-2

Sound power level

# Sound power level

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## Sound Power

This machine has been confirmed to have a sound power level of 103 dBA/lpW by measuring identical machines in accordance with the procedure specified in directive 2000/14/EC.



**Hand-arm vibration..... Page 4-2**

**Whole Body Vibration..... Page 4-2**

# Vibration level

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## Hand-arm vibration

This machine has been confirmed to transmit a maximum vibration level of less than  $3.81 \text{ m/s}^2$  to hands and arms by measuring identical machines in accordance with the procedure specified in ISO 5349-1, 2001 • 5349-2, 2001.

## Whole Body Vibration

This machine has been confirmed to transmit a maximum vibration level of less than  $0.99 \text{ m/s}^2$  to the whole body by measuring identical machines in accordance with the procedure specified in ISO 2631-1, 1997 • 2631-2, 2003.

# Safety labels and operation labels

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**About the Safety labels and operation labels..... Page 5-2**

# Safety labels and operation labels

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## About the Safety labels and operation labels

 Warning

Safety labels and operation labels are attached to this machine. Make sure that they are preserved in their entirety. If they are damaged, become dirty, or peel off, replace them with new ones.

Part numbers for labels that need to be replaced are listed in the parts catalog. Order them from a Baroness dealer or Kyoisha.

**Waste disposal.....Page 6-2**

About the Waste disposal.....Page 6-2

Disposal

# Disposal

---

## Waste disposal

### About the Waste disposal

Make sure that waste generated when servicing or repairing the machine is disposed of in accordance with local regulations.  
(e.g. waste oil, antifreeze batteries, rubber products, and wires etc.)

# Product Overview

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**Warning and Instruction Decals..... Page 7-4**

# Product Overview

## Specifications

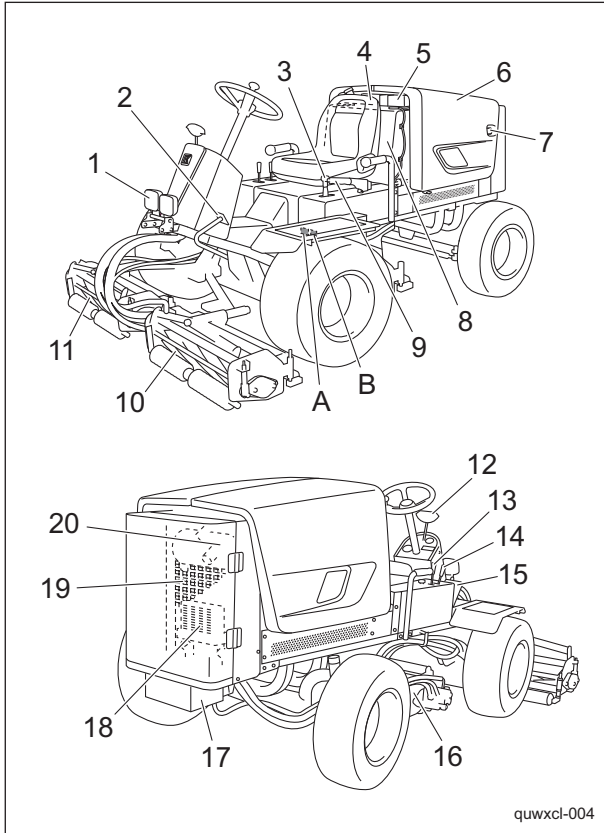
Model		LM283	
Dimensions	Total length	Mower roller type	265 cm
		Mower wheel type	276 cm
	Total width	During operation	203 cm
		During transport	203 cm
Total height		133 cm	
Weight		1,080 kg	
Minimum turning radius		277 cm	
Engine	Model		Kubota D1105-T
	Type		Water-cooled 4-cycle diesel engine
	Total displacement		1,123 cm <sup>3</sup> (1.123 L)
	Maximum output		24.5 kW(33.3PS)/3,100 rpm
Fuel tank capacity		Diesel 38.0 dm <sup>3</sup> (38.0 L)	
Fuel consumption		255 g/kW.h (rated output)	
Quantity of engine oil		3.1 dm <sup>3</sup> (3.1 L)	
Mowing width		180 cm	
Mowing height	Mower roller type		10 - 60 mm
	Mower wheel type		19 - 68 mm
Drive		HST full time 4-wheel drive	
Speed (HST)	Forward		0 - 14.4 km/h
	Reverse		0 - 8.5 km/h
Speed (Mechanical)		-	
Efficiency		11,520 m <sup>2</sup> /h (8.0 km/h x mowing width x 0.8)	
Maximum inclination for operation		20 degrees	
Tire size	Front wheel		23 x 10.50 - 12 4P
	Rear wheel		23 x 8.50 - 12 4P
Tire pneumatic pressure	Front wheel		120 kPa (1.2 kgf/cm <sup>2</sup> )
	Rear wheel		150 kPa (1.5 kgf/cm <sup>2</sup> )
Battery		75D23L	

\* The factory default maximum engine rpm is 3,100 rpm.



# Product Overview

## Names of Each Section

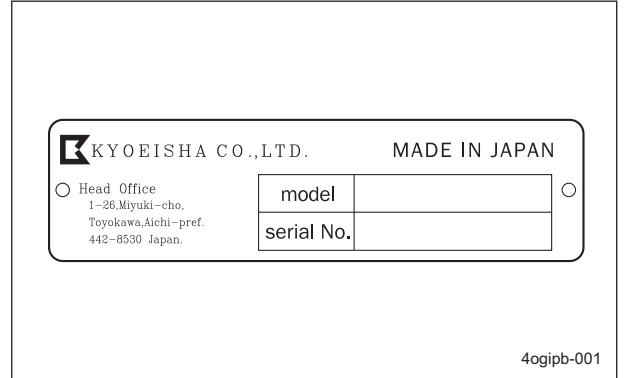


Names of Each Section\_001

1	Headlight
2	Brake pedal
3	Throttle lever
4	Seat
5	Box
6	Hood
7	Muffler
8	Fuel tank
9	Parking brake lever
10	Mower unit #3
11	Mower unit #2
12	Angle meter
13	Reel rotation lever
14	Reel up/down lever
15	Traveling pedal
16	Mower unit #1
17	Battery
18	Oil cooler
19	Radiator
20	Air cleaner
A	Serial number plate
B	Decal, specifications

## Serial Number Plate

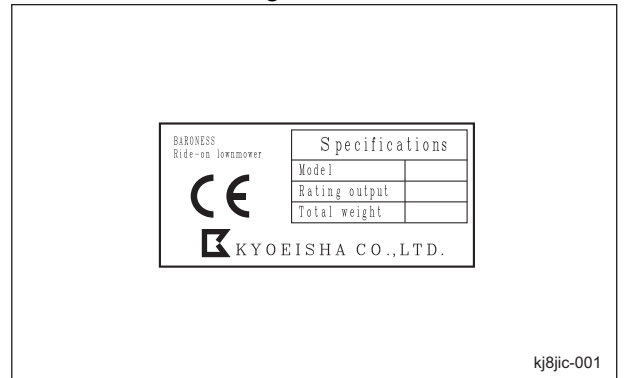
The serial number plate indicates the name and serial number of the machine.



Serial Number Plate\_001

## Specification Decal

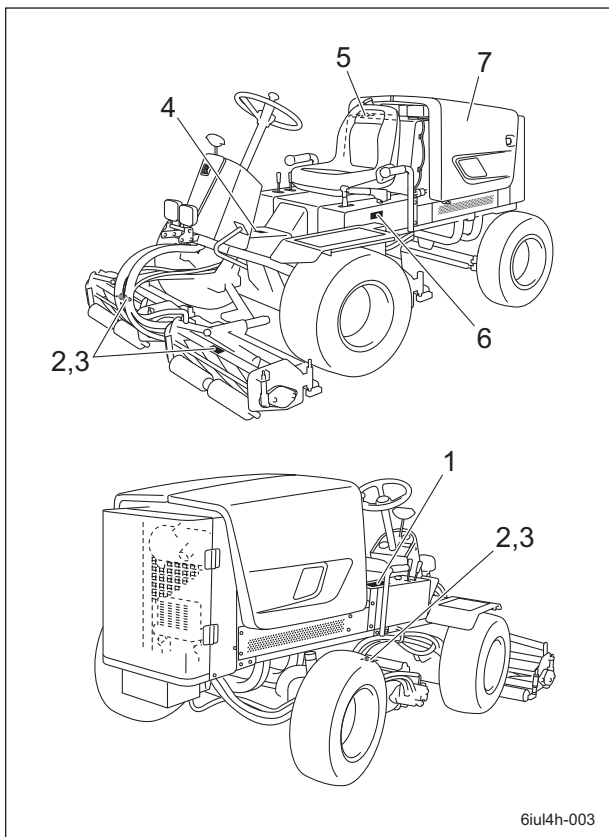
The Specification decal indicates the CE logo, model name, and weight, etc.



Decal, Specifications\_001

# Product Overview

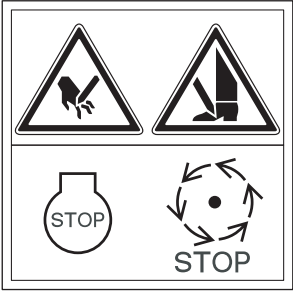
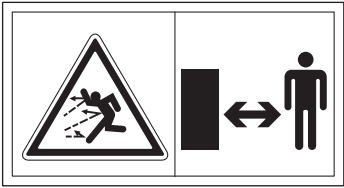
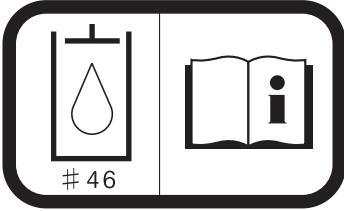



## Positions of the Decals (Warning and Instruction)



Positions of the Decals (Warning and Instruction)\_001

## Warning and Instruction Decals

<div> </div> <p>qigqnx-019</p>	<p>LM283--0967Z0</p> <p>Decal, lever operation</p> <ol style="list-style-type: none"> <li> <p>1. <b>Warning</b></p> <p>Read the Owner's Operating Manual.</p> </li> <li> <p>2. <b>Warning</b></p> <p>Apply the parking brake, stop the engine, remove the engine key, then leave the machine.</p> </li> <li> <p>3. <b>Danger</b></p> <p>Flying objects - All persons other than the operator must keep a safe distance from the machine.</p> </li> <li> <p>4. <b>Danger</b></p> <p>May cut your hand or leg - Keep hands and feet away from moving parts.</p> </li> <li> <p>5. <b>Danger</b></p> <p>Rollover - Do not work on slopes of 20 degrees or more.</p> <p>When you descend a slope, lower the mower units and drive at low speed.</p> </li> </ol>
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2	 <p style="text-align: center;">qigqnx-010</p>	<p>K4205001600 Decal, caution for severe injury</p> <p><b>⚠ Danger</b></p> <p>May cut your hand or leg - Stop the cutter rotation and engine. Otherwise you may be injured.</p>
3	 <p style="text-align: center;">qigqnx-011</p>	<p>K4205001650 Decal, caution for flying object</p> <p><b>⚠ Danger</b></p> <p>Caution for flying object - When the blades are rotating, keep away from the machine. All bystanders must keep a safe distance from the machine.</p>
4	 <p style="text-align: center;">K4209000980 qigqnx-020</p>	<p>K4209000980 Hydraulic oil icon Read the Owner's Operating Manual.</p>
5	 <p style="text-align: center;">K4209001000 qigqnx-021</p>	<p>K4209001000 Fuel icon Use No. 2 diesel fuel. (Low sulfur or ultra-low sulfur diesel fuel only)</p>
6	 <p style="text-align: center;">K4205001540 qigqnx-022</p>	<p>K4205001540 Decal, caution for high temperature</p> <p><b>⚠ Caution</b></p> <p>High temperature - Do not touch. Otherwise, you will be burned.</p>
7	 <p style="text-align: center;">qigqnx-012</p>	<p>K4205001530 Decal, caution for rotating cutter</p> <p><b>⚠ Danger</b></p> <p>Watch for rotating parts - Keep your hands away from the belts while the engine is running.</p>

# Product Overview

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# Handling Instructions

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# Handling Instructions

## Inspection Before Use

Be sure to perform inspection before you start operating the machine so that you will be able to take advantage of its optimum performance for a long period of time.

### Inspection of Reel cutter (Cutting cylinder)

The reel cutter (cutting cylinder) may become dull due to frequent use, objects crushed during mowing, or damage caused during transportation.

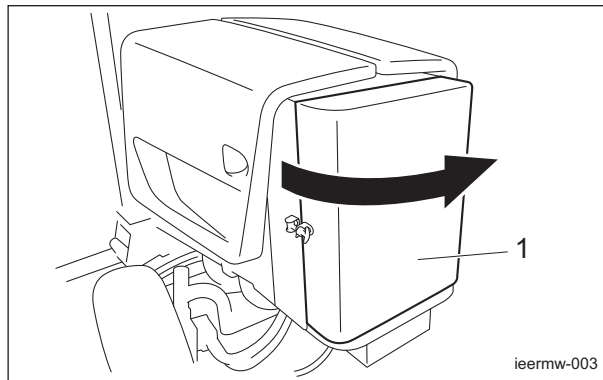
Inspect the reel cutter (cutting cylinder), and if necessary, perform lapping, resharpen, or replace the the reel cutter (cutting cylinder) and the bed knife (bottom blade).

1. Check to see whether or not the edge of the reel cutter (cutting cylinder) and the bed knife (bottom blade) are too blunt to cut or not.
2. Make sure that the reel cutter (cutting cylinder) and the bed knife (bottom blade) are not cracked.
3. Check to see how much the reel cutter (cutting cylinder) and the bed knife (bottom blade) are worn.
4. Make sure that the reel cutter (cutting cylinder) and the bed knife (bottom blade) have not changed color due to heat from grinding.
5. Check to see whether or not the second edge face remains at the point of reel cutter (cutting cylinder).
6. Make sure that the soldering between the reel cutter (cutting cylinder) and the disc has not peeled off.

### Inspection of Radiator Cover

1. Make sure that there is no damage on the radiator cover.

2. Make sure that the radiator cover is not contaminated.



Inspection of Radiator Cover\_001

1	Radiator cover
---	----------------

### Cleaning of Radiator Cover

#### Important

An unclean radiator cover may cause overheating or damage to the engine. It may also cause malfunction of the hydraulic system.

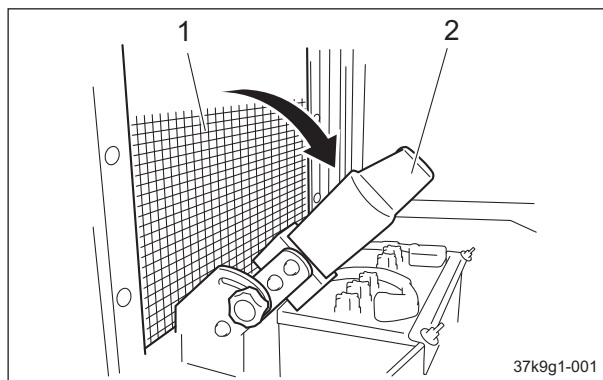
If the radiator cover has been contaminated with dust, be sure to clean it.

After operating the machine in a dusty environment, it is important to remove dust from the cover as soon as possible.

### Inspection of Radiator

For details on handling the engine, please refer to the separate Engine Operating Manual.

1. Make sure that there is no damage on the radiator.
2. Make sure that the radiator is not contaminated.



Inspection of Radiator\_001

1	Radiator
2	Oil cooler

# Handling Instructions

## Cleaning of Radiator

For details on handling the engine, please refer to the separate Engine Operating Manual.

**Important**

An unclean radiator may cause overheating or damage to the engine. It may also cause malfunction of the hydraulic system.

**Important**

Do not use solid objects, such as a spatula or screwdriver, to clean the radiator or oil cooler. Otherwise, special fins or tubes may be damaged, possibly resulting in reduced cooling performance or coolant leakage.

If the radiator has been contaminated with dust, be sure to clean it. After operating the machine in a dusty environment, it is important to remove dust as soon as possible.

## Inspection of Coolant

For details on handling the engine, please refer to the separate Engine Operating Manual.

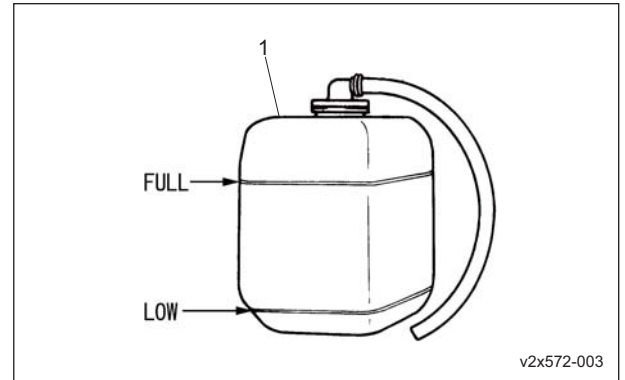
**Warning**

Do not touch the radiator or coolant during engine operation or right after the engine has been turned off. Due to high temperatures, doing so could cause burns.

**Caution**

Inspection should take place after the engine has well cooled down.

1. Make sure that the coolant level in the reserve tank is between "Full" and "Low."



Inspection of Coolant\_001

1	Reserve tank
---	--------------

## Coolant Supply

For details on handling the engine, please refer to the separate Engine Operating Manual.

**Warning**

Do not touch the radiator or coolant during engine operation or right after the engine has been turned off. Due to high temperatures, doing so could cause burns. After the radiator has well cooled down, open the radiator cap.

**Caution**

Supply coolant after the engine has well cooled down.

**Caution**

The radiator cap is pressurized. If you remove the radiator cap while the engine is overheated, hot steam will burst out, possibly resulting in burns. Make sure that the water temperature and pressure are reduced, then grab the cap with a thick cloth and gradually open the cap.

**Important**

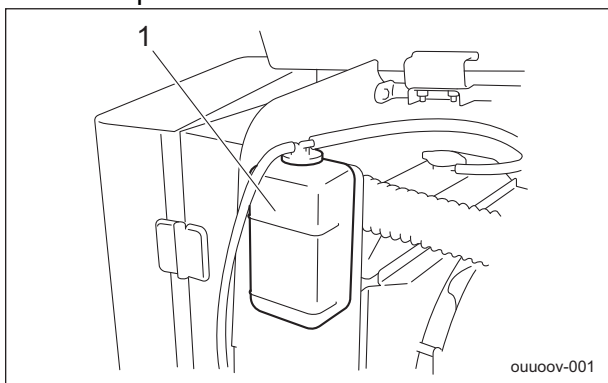
When you supply coolant, be sure to use clean water, such as tap water. During winter, remove coolant. Alternatively, mix long-life coolant and clean water, then pour it into the radiator and reserve tank.

# Handling Instructions

Relationship between concentration of long-life coolant (LLC) and freezing temperature

Freezing temperature	LLC concentration (volume %)
Down to -10°C (14°F)	20%
Down to -15 °C (5°F)	30%
Down to -20 °C (-4°F)	35%
Down to -25 °C (-13°F)	40%

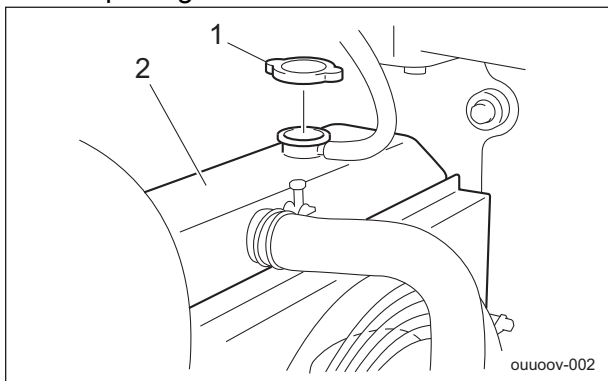
1. If the coolant level in the reserve tank is lower than the "LOW mark, open the reserve tank cap and fill the tank with clean water up to the "FULL" mark.



Coolant Supply\_001

1	Reserve tank
---	--------------

2. If no coolant is in the reserve tank, open the radiator cap and supply clean water up to the opening.



Coolant Supply\_002

1	Pressurized cap
2	Radiator

3. Open the reserve tank cap, then supply clean water up to the "FULL" mark.

## Change of Coolant

For details on handling the engine, please refer to the separate Engine Operating Manual.

### Warning

When you change the coolant, be sure to drain it into a bowl and discard it in accordance with local laws and regulations.

### Warning

Do not touch the radiator or coolant during engine operation or right after the engine has been turned off.

Due to high temperatures, doing so could cause burns.

After the radiator has well cooled down, open the radiator cap.

### Caution

Change coolant after the engine has well cooled down.

### Important

When you change coolant, be sure to use clean water, such as tap water. During winter, remove coolant. Alternatively, mix long-life coolant and clean water, then pour it into the radiator and reserve tank.

For details on changing coolant, please refer to the separate Engine Operating Manual.

Coolant quantity, including the reserve tank, is 6.0 dm<sup>3</sup> (6.0 L).

## Inspection of Oil Cooler

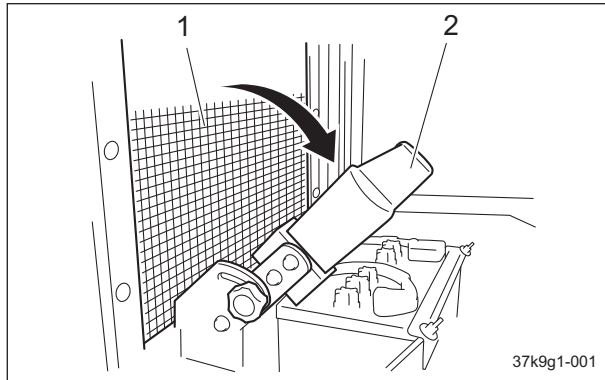
For details on handling the engine, please refer to the separate Engine Operating Manual.

1. Make sure that there is no damage on the oil cooler.



# Handling Instructions

2. Make sure that the oil cooler is not contaminated.



Inspection of Oil Cooler\_001

1	Radiator
2	Oil cooler

### Cleaning of Oil Cooler

For details on handling the engine, please refer to the separate Engine Operating Manual.

**Caution**

An unclean oil cooler may cause overheating or damage to the engine. It may also cause malfunction of the hydraulic system.

**Important**

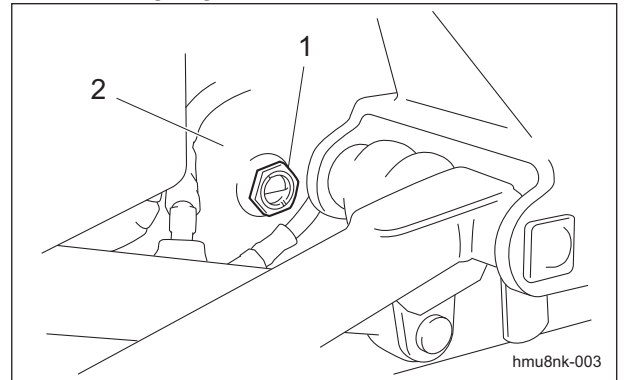
Do not use solid objects, such as a spatula or screwdriver, to clean the radiator or oil cooler. Otherwise, special cooling fins or tubes may be damaged, possibly resulting in reduced cooling performance or coolant leakage.

If the oil cooler has been contaminated with dust, be sure to clean it. After operating the machine in a dusty environment, it is important to remove dust as soon as possible.

### Inspection of Hydraulic Oil

1. Raise the mower units and maintain that position on a level surface.

2. Make sure that the oil level is at the middle of the oil gauge.



Inspection of Hydraulic Oil\_001

1	Oil gauge
2	Hydraulic tank

3. Check underneath the machine for oil leakage.

### Hydraulic Oil Supply

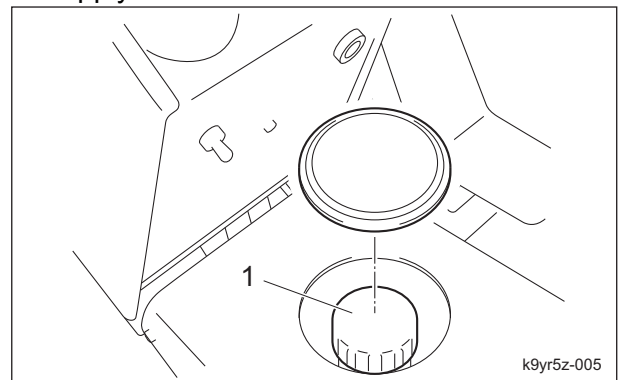
**Important**

Do not mix different types of oil.

**Important**

Use Shell Tellus 46 (or equivalent) as hydraulic oil.

1. If the oil level is low, open the tank cap and supply oil.



Hydraulic Oil Supply\_001

1	Tank cap
---	----------

2. Start the engine, raise and lower the mower units, and turn the steering wheel left and right. Move forward and reverse repeatedly several times.

# Handling Instructions

3. Raise the mower units and maintain that position on a level surface, then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.
4. Check underneath the machine for oil leakage.

## Change of Hydraulic Oil

**Warning**

When you change the hydraulic oil, be sure to drain it into a bowl and discard it in accordance with local laws and regulations.

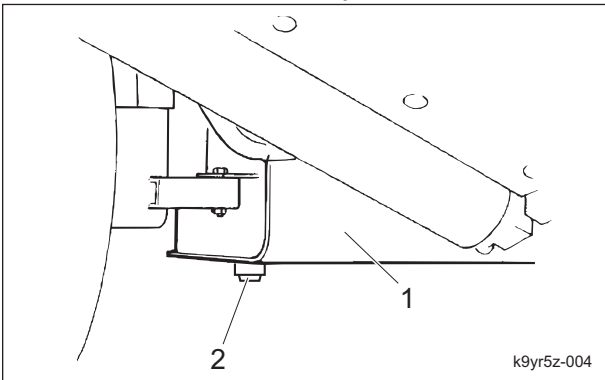
**Caution**

If the oil emulsifies or if it becomes even slightly less transparent, change the oil immediately.

**Important**

Use Shell Tellus 46 (or equivalent) as hydraulic oil.

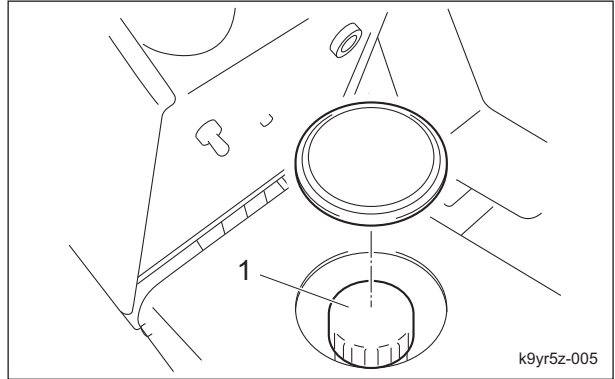
1. Follow the steps below to remove the old oil.
  - [1] Start and run the engine to warm up the oil. On a level surface, remove the drain plug on the hydraulic tank, then drain old oil into a container.
  - [2] Wind new sealing tape on the drain plug, then attach it to the hydraulic tank.



Change of Hydraulic Oil\_001

1	Hydraulic tank
2	Drain plug

2. Remove the tank cap, pour new oil from the fill port until the oil level reaches the middle of the oil gauge on the hydraulic tank, then replace the tank cap.  
The hydraulic tank capacity is approximately 24.0 dm<sup>3</sup> (24.0 L).



Change of Hydraulic Oil\_002

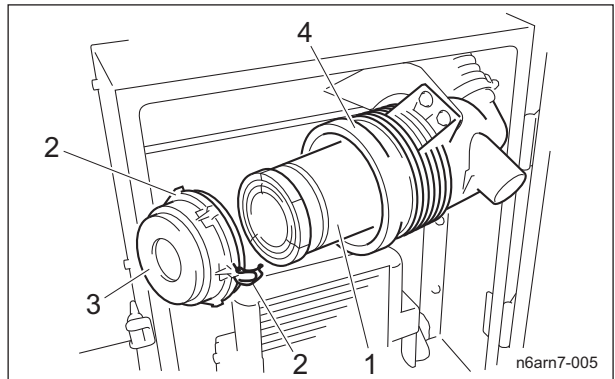
1	Tank cap
---	----------

3. Start the engine, raise and lower the mower units, and turn the steering wheel left and right. Move forward and reverse repeatedly several times.
4. Raise the mower units and maintain that position on a level surface, then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.
5. Check underneath the machine for oil leakage.

## Inspection of Air Cleaner

For details on handling the engine, please refer to the separate Engine Operating Manual.

1. Make sure that there is no damage on the air cleaner.
2. Make sure that the air cleaner element is not contaminated.



Inspection of Air Cleaner\_001

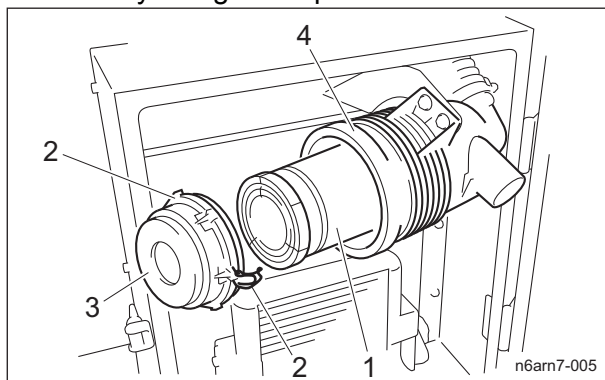
# Handling Instructions

1	Air cleaner element
2	Clip
3	Air cleaner cap
4	Air cleaner body

## Cleaning of Air Cleaner

For details on handling the engine, please refer to the separate Engine Operating Manual. A contaminated air cleaner element may cause malfunction of the engine. To maximize the life of the engine, clean the air cleaner properly.

1. Remove clips from two locations, remove the air cleaner cap, then remove the air cleaner element.
2. While paying close attention not to damage the air cleaner element, tap a solid portion of the air cleaner element or blow air from its inside to remove dust and dirt.
3. Attach the air cleaner element to the air cleaner body.
4. Replace the air cleaner cap, then affix it securely using the clips.



Cleaning of Air Cleaner\_001

1	Air cleaner element
2	Clip
3	Air cleaner cap
4	Air cleaner body

## Change of Air Cleaner

For details on handling the engine, please refer to the separate Engine Operating Manual. A contaminated air cleaner element may cause malfunction of the engine. To maximize the life of the engine, clean and change properly.

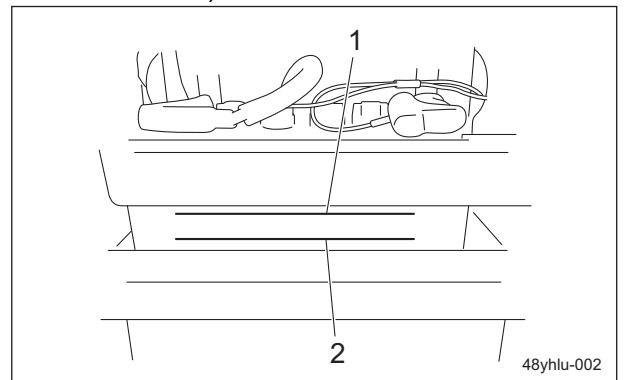
1. Clean the air cleaner element before using the machine, and change the element every 200 hours of operation.

2. If it is significantly contaminated, clean and change it more frequently.
3. Even if the hours of operation do not exceed the recommended number of hours, change the air cleaner element at least once per year.

## Inspection of Battery

For details on handling the battery, please refer to the separate Battery Instruction Manual.

1. Clean the areas around the battery fluid level lines using a cloth damp with water.
2. Make sure that the battery fluid level is between the UPPER LEVEL (maximum fluid level line) and the LOWER LEVEL (minimum fluid level line).



Inspection of Battery\_001

1	UPPER LEVEL
2	LOWER LEVEL

## Supply of Battery Fluid

For details on handling the battery, please refer to the separate Battery Instruction Manual.

### **Danger**

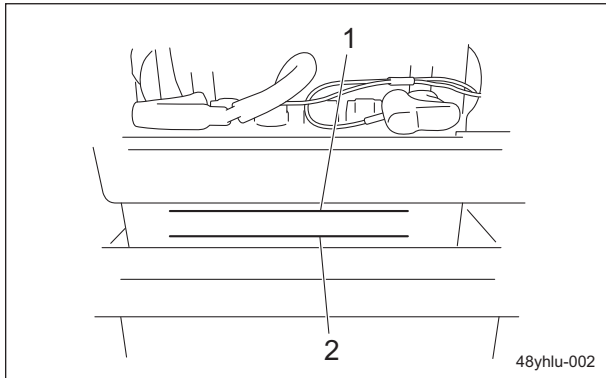
Be careful not to let your skin or clothes etc. come into contact with battery fluid (electrolytes) or accidentally swallow the fluid. Should your skin or clothes come into contact with electrolytes, immediately wash them away with water.

### **Warning**

When you supply battery fluid, wear protective garments and safety glasses etc.

# Handling Instructions

1. If the battery fluid level is lower than half way between the UPPER LEVEL (maximum) line and LOWER LEVEL (minimum) line, add purified water up to the UPPER LEVEL (maximum) line.



Supply of Battery Fluid\_001

1	UPPER LEVEL
2	LOWER LEVEL

## Inspection of Tires

1. Check the pneumatic pressure of the tires.
2. Make sure that there are no cracks, damage or abnormal wear on the tires.

Tire size	Pneumatic pressure
Front wheel (23 x 10.50 - 12 4P)	120 kPa (1.2 kgf/cm <sup>2</sup> )
Rear wheel (23 x 8.50 - 12 4P)	150 kPa (1.5 kgf/cm <sup>2</sup> )

## Inspection of Parking Brake

1. Make sure that the brake is not applied any longer when you pull the parking brake lever.
2. Make sure that the brake is not applied even slightly when you press the push button to release the parking brake lever.

## Inspection of Brake

While traveling, depress the brake pedal firmly to make sure that the brake is applied effectively.

## Inspection of Belt

### Caution

If you have removed the shield during inspection, make sure that you re-attach it in the original position securely. If the shield remains removed, the operator may come in contact with the fan or belt, possibly resulting in injuries.

### Important

A slacking or damaged belt or damaged fan may cause overheating or lack of a battery charge.

1. Press the middle of the belt with your finger to check the belt tension.
2. Make sure that there are no cracks, damage or abnormal wear.

## Inspection of Engine associated parts

For details on handling the engine, please refer to the separate Engine Operating Manual.

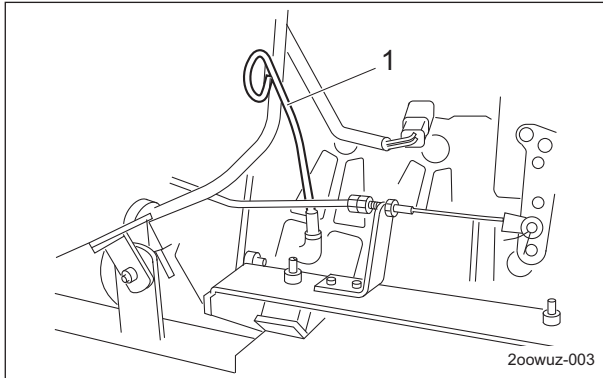
1. Check the fuel system parts for loosened or cracked joints and leakage. Replace parts if necessary.
2. Blow air to clean any grass or flammable materials that may be attached inside or around the muffler.
3. Blow air to clean any grass or flammable materials that may be attached around the fan.

## Inspection of Engine Oil

1. Stop the engine, wait for 10 to 20 minutes for the engine to cool down, then check the oil level.

# Handling Instructions

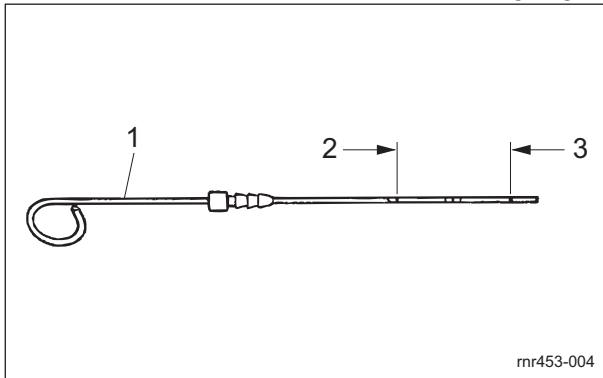
- Position the machine so that the engine will be level, then insert the oil gauge all the way to check the oil level.



Inspection of Engine Oil\_001

1	Oil gauge
---	-----------

- The appropriate oil level should be between the upper and lower limit lines on the gauge.



Inspection of Engine Oil\_002

1	Oil gauge
2	Upper limit
3	Lower limit

### Supply of Engine Oil

For details on handling the engine, please refer to the separate Engine Operating Manual.

**Important**

Do not fill too much engine oil. Otherwise, the engine may be damaged.

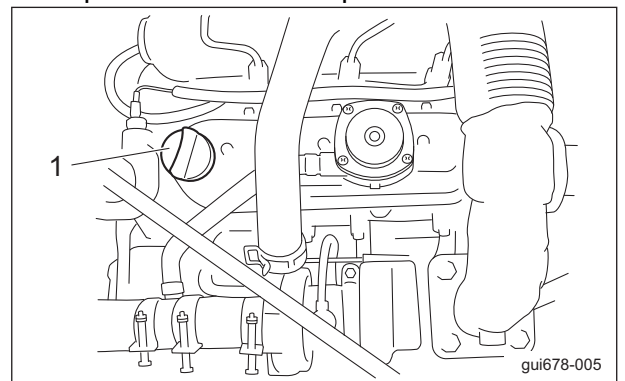
**Important**

Do not mix different types of engine oil.

**Important**

Be sure to use engine oil that is classified as API Service Grade CF or higher, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

- Engine oil is supplied through the oil filling port.  
Remove the oil filler cap, then supply new engine oil until the oil reaches a level in between the upper and lower limit lines on the oil gauge.
- Replace the oil filler cap.



Supply of Engine Oil\_001

1	Oil filler cap
---	----------------

- It will take a while for the supplied engine oil to descend into the oil pan.  
Check the oil level again 10 to 20 minutes after supplying the oil.

### Change of Engine Oil

For details on handling the engine, please refer to the separate Engine Operating Manual.

**Warning**

When you change the engine oil, be sure to drain it into a bowl and discard it in accordance with local laws and regulations.

**Caution**

Be careful with hot oil, which could cause burns if it contacts your skin.

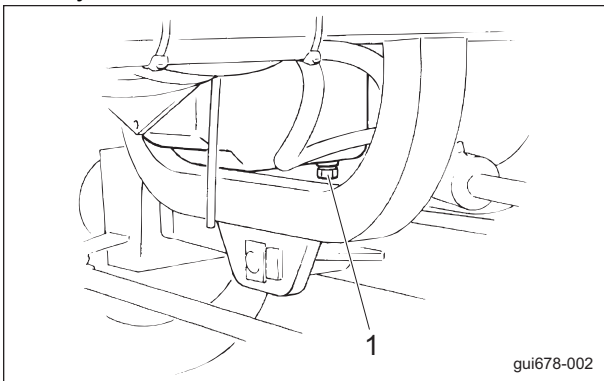
**Important**

Be sure to use engine oil that is classified as API Service Grade CF or higher, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

# Handling Instructions

Change the engine oil more frequently, if the engine oil is contaminated, and especially if you use the machine in dusty areas or operate the engine at high loads or in high temperatures.

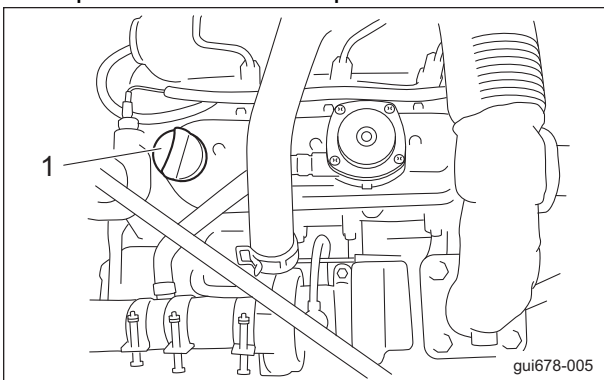
1. Move the machine onto a level surface, stop the engine, remove the drain plug while the engine oil is warm, then drain the oil into a bowl.
2. Replace the drain plug, remove the oil level gauge, then insert the oil level gauge all the way to check the oil level.



Change of Engine Oil\_001

- |   |            |
|---|------------|
| 1 | Drain plug |
|---|------------|

3. Through the oil filling port, supply new engine oil until the oil reaches a level in between the upper and lower limit lines on the oil level gauge.  
Engine oil quantity is approximately 3.1 dm<sup>3</sup> (3.1 L).
4. Replace the oil filler cap.



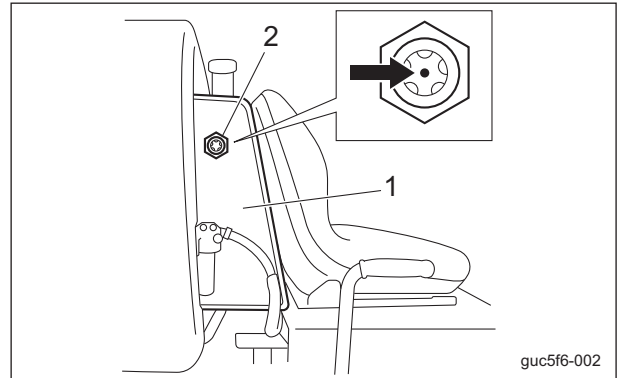
Change of Engine Oil\_002

- |   |                |
|---|----------------|
| 1 | Oil filler cap |
|---|----------------|

5. It will take a while for the supplied engine oil to descend into the oil pan.  
Check the oil level again 10 to 20 minutes after supplying the oil.

## Inspection of Fuel Quantity

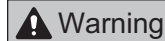
Observe the fuel gauge located next to the fuel tank to check the fuel level.



Inspection of Fuel Quantity\_001

- |   |            |
|---|------------|
| 1 | Fuel tank  |
| 2 | Fuel gauge |

## Fuel Supply



**Warning**

Keep fire away while refueling.

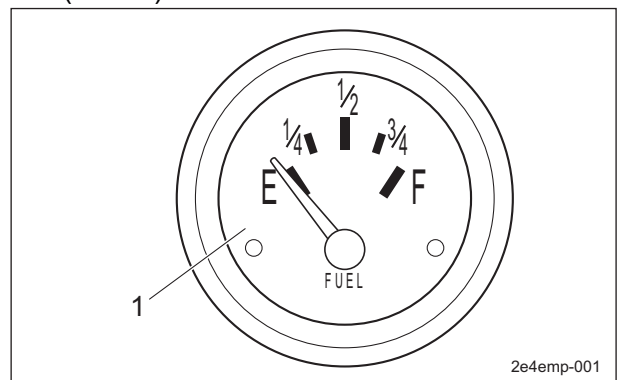
### Important

If you supply too much fuel, it might overflow from the fuel cap when you travel or work on a slope.

Refuel up to the middle (marked in red) of the fuel gauge.

If the fuel gauge located in the upper right corner of the operation panel indicates a level close to E (EMPTY), supply fuel (diesel) at your earliest convenience.

The fuel tank capacity is approximately 38.0 dm<sup>3</sup> (38.0 L).



Fuel Supply\_001

- |   |            |
|---|------------|
| 1 | Fuel gauge |
|---|------------|

## Tightening torques

### Standard tightening torques

#### Bolts and screws

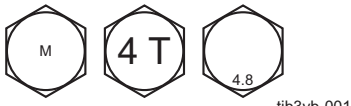
Unless otherwise instructed, tighten bolts or nuts by the specified torque using an appropriate tool. Excessive tightening of a screw may cause it to become loose or damaged. The appropriate tightening torque depends on factors such as the type of screw, its strength, and the friction of its thread and bearing surface.

The following list is for galvanized and parkerized bolts only. The values given in this list do not apply to low-strength female screws.

Do not use a screw that has rusted or has foreign matter such as sand on it. Such a screw cannot be fully tightened even if it is tightened by the specified torque. The friction on the thread surface increases, causing a loss of torque that results in an insufficient tightening torque being exerted. If a screw is wet or oily, do not tighten it by the specified torque. If a screw gets wet, the torque coefficient decreases, resulting in excessive tightening of the screw if it is tightened by the specified torque.



Excessive tightening of a screw may cause it to elongate, resulting in the screw becoming loose or damaged. Do not use a screw that has already been subjected to a large load.

Tightening a bolt with an impact wrench requires skill. Practice tightening bolts to ensure you are able to tighten them reliably.

Nominal diameter	General bolts		
	Strength class: 4.8		
			
	N-m	kgf-cm	lb-in
M5	3 - 5	30.59 - 50.99	26.55 - 44.26
M6	7 - 9	71.38 - 91.77	61.96 - 79.66
M8	14 - 19	142.76 - 193.74	123.91 - 168.17
M10	29 - 38	295.71 - 387.49	256.68 - 336.34
M12	52 - 67	530.24 - 683.20	460.25 - 593.02
M14	70 - 94	713.79 - 958.52	619.57 - 831.99
M16	88 - 112	897.34 - 1142.06	778.89 - 991.31
M18	116 - 144	1,182.85 - 1,468.37	1,026.72 - 1,274.54
M20	147 - 183	1,498.96 - 1,866.05	1,301.10 - 1,619.73
M22	295	3,008.12	2,611.05
M24	370	3,772.89	3,274.87
M27	550	5,608.35	4,868.05
M30	740	7,545.78	6,549.74



# Handling Instructions

Nominal diameter	Heat-treated screws					
	Strength category: 8.8			Strength category: 10.9		
						
	N-m	kgf-cm	lb-in	N-m	kgf-cm	lb-in
M5	5 - 7	50.99 - 71.38	44.26 - 61.96	7 - 10	71.38 - 101.97	61.96 - 88.51
M6	8 - 11	81.58 - 112.17	70.81 - 97.36	14 - 18	142.76 - 183.55	123.91 - 159.32
M8	23 - 29	234.53 - 295.71	203.57 - 256.68	28 - 38	285.52 - 387.49	247.83 - 336.34
M10	45 - 57	458.87 - 581.23	398.30 - 504.51	58 - 76	591.43 - 774.97	513.36 - 672.68
M12	67 - 85	683.20 - 866.75	593.02 - 752.34	104 - 134	1,060.49 - 1,366.40	920.50 - 1186.03
M14	106 - 134	1,080.88 - 1,366.40	938.21 - 1,186.03	140 - 188	1,427.58 - 1,917.04	1,239.14 - 1,663.99
M16	152 - 188	1,549.94 - 1,917.04	1,345.35 - 1,663.99	210 - 260	2,141.37 - 2,651.22	1,858.71 - 2,301.26
M18	200 - 240	2,039.40 - 2,447.28	1,770.20 - 2,124.24	280 - 340	2,855.16 - 3,466.98	2,478.28 - 3,009.34
M20	245 - 295	2,498.27 - 3,008.12	2,168.50 - 2,611.05	370 - 450	3,772.89 - 4,588.65	3,274.87 - 3,982.95
M22	-	-	-	530	5,404.41	4,691.03
M24	-	-	-	670	6,831.99	5,930.17
M27	-	-	-	1,000	10,197.00	8,851.00
M30	-	-	-	1,340	14,628.78	11,860.34

**Note:**

The above values also apply for fine screw threads.

## Principal tightening torques

### Tightening Torque by Model

#### LM283

Tighten the following bolts and nuts at the torque specified in the table.

For thread locking adhesive, apply a middle strength thread locker (ThreeBond 1322 anaerobic adhesives).

Portion	Code	Part name	Tightening Torque			Thread locking adhesive
			N-m	kgf-cm	lb-in	
Front wheel	Motor	K0013120602 Bolt, 11T, heat-treated M12-60	104 - 134	1,060.49 - 1,366.40	920.50 - 1,186.03	-
	Wheel mounting base	K0160000492 24 special nut P1.5	180 - 200	1,835.46 - 2,039.40	1,593.18 - 1,770.20	○
	Wheel	K0034120302 Bolt, 8T, heat-treated M12-30P1.5	67 - 85	683.20 - 866.75	593.02 - 752.34	-
Rear wheel	Wheel mounting base	K0138240002 24 slotted nut high P1.5	180 - 200	1,835.46 - 2,039.40	1,593.18 - 1,770.20	-
	Wheel	K0034120302 Bolt, 8T, heat-treated M12-30P1.5	67 - 85	683.20 - 866.75	593.02 - 752.34	-
Tie rod	K1610000020	Tie rod end right ass'y	45	458.87	398.30	-
	K1611000020	Tie rod end left ass'y	45	458.87	398.30	-
Lever damper	K0144080002	8U nut	-	-	-	○



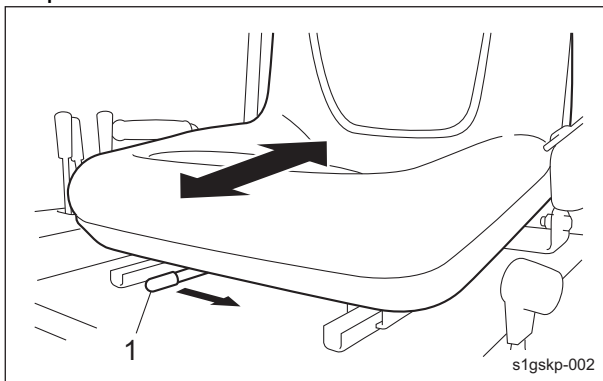
# Handling Instructions

Portion	Code	Part name	Tightening Torque			Thread locking adhesive
			N-m	kgf-cm	lb-in	
Engine	K00171002 52	Bolt, heat-treated, small, 10-25 P1.25	45 - 57	458.87 - 581.23	398.30 - 504.51	—
			Since it may be difficult to tighten bolts and nuts in the upper front left area of the engine, the strength category should be 4.8 torque. (See .)			
	K40400001 50	Nut for attaching anti-vibration rubber	28 - 38	285.57 - 387.49	247.83 - 336.34	○
Coupling	K00241003 51	Bolt, 12T, w/hexagon hole, M10-35	60 - 70	611.82 - 713.79	531.06 - 619.57	—
	K00131003 52	Bolt, 11T, heat-treated M10-35	45 - 76	458.87 - 774.97	398.30 - 672.68	—
	K00101002 02	Bolt, 11T, heat-treated M10-20	45 - 76	458.87 - 774.97	398.30 - 672.68	○
	K00100802 02	Bolt, 11T, heat-treated M8-20	23 - 38	234.53 - 387.49	203.57 - 336.34	○
Bed knife (Bottom blade)	K00710000 92	Screw, heat-treated flathead M10-20	29 - 38	295.71 - 387.49	256.68 - 336.34	—
Arm frame Roll bar	K00131203 02	Bolt, 11T, heat-treated M12-45	52 - 67	530.24 - 683.20	460.25 - 593.02	—

## Adjustment Before Operating

### Adjustment of Seat

Use the seat adjustment lever to adjust the seat back and forth.  
Adjust the position according to the operator's body size.  
The adjustment lever is located beneath the front part of the seat.



Adjustment of Seat\_001

1	Adjustment lever
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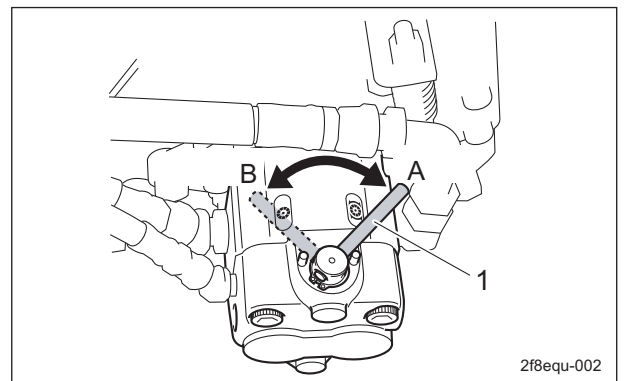
## Adjustment of Blade Engagement

### ⚠ Caution

Before cutting newspaper as a test, be sure to stop the engine and wear gloves to protect your hands.  
Pay attention not to let the reel cutter (cutting cylinder) catch your gloves. Otherwise, you may injure your hand or fingers.

### ⚠ Caution

Before adjusting the blade engagement, be sure to set the reel rotation/stop switching lever for the reel motor (attached to the mower unit) to the "Stop" position.



Adjustment of Blade Engagement\_001

# Handling Instructions

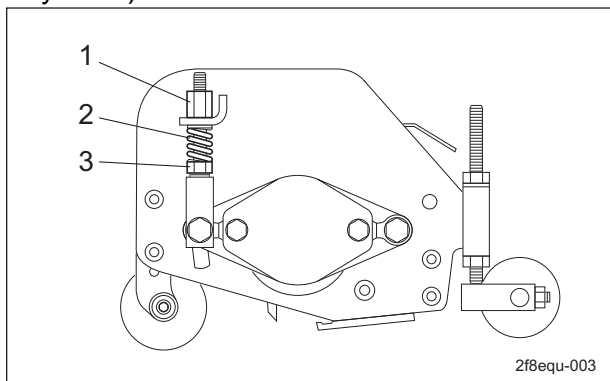
1	Reel rotation/stop switching lever
A	Rotate
B	Stop

Adjust the engagement between the reel cutter (cutting cylinder) and the bed knife (bottom blade) so that newspaper (two pieces) will be cut by the edge of both blades when the blades in their entirety come slightly into contact with each other via the adjusting nuts.

Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and the bed knife (bottom blade) at an angle of 90 degrees. Then, rotate the reel cutter (cutting cylinder) counter-clockwise (when you face the mower unit from the left) to check the sharpness of the blades.

Check the sharpness of the entire range (three or four points from left edge to right) of the reel cutter (cutting cylinder).

1. If a gap is created between edges:  
Loosen the cutter adjustment nut to apply more contact pressure between the reel cutter (cutting cylinder) and the bed knife (bottom blade).
2. If the reel cutter (cutting cylinder) is too tight to turn:  
Tighten the cutter adjustment nut to reduce the contact pressure between the reel cutter (cutting cylinder) and the bed knife (bottom blade).
3. If the blades still cannot cut well:  
Perform lapping of the reel cutter (cutting cylinder).



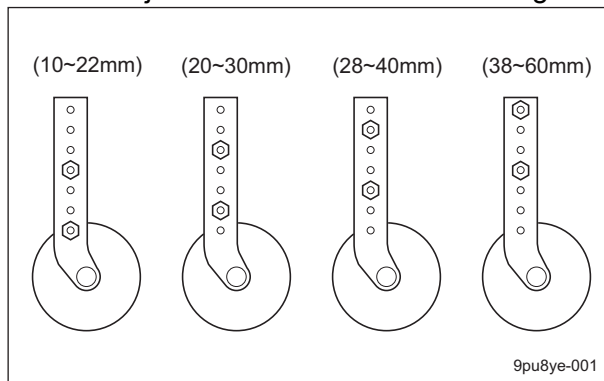
Adjustment of Blade Engagement\_002

1	Cutter adjustment nut
2	Spring
3	Pipe with cutter adjustment screw

## Adjustment of Cutting Height

### Roller (Roller Type)

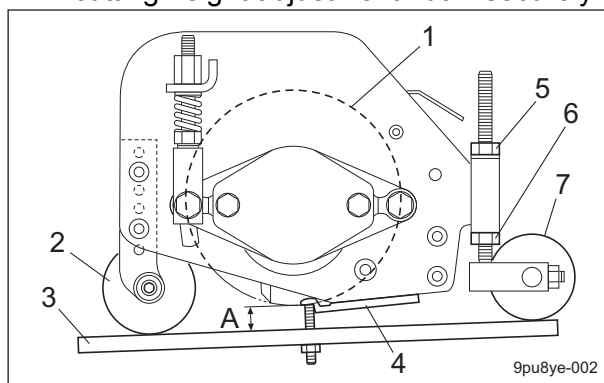
Adjust the cutting height to fit your cutting work. You can adjust the front rollers in four stages.



Roller (Roller Type)\_001

Attach the front rollers in a position within the range of cutting height that suits your work requirements.

1. To increase cutting height:
  - [1] Loosen cutting height adjustment nut A, tighten cutting height adjustment nut B, then lower the rear roller.
  - [2] Use the cutting height gauge to determine the roller position, then tighten cutting height adjustment nut A securely.
2. To decrease cutting height:
  - [1] Loosen cutting height adjustment nut B, tighten cutting height adjustment nut A, then raise the rear roller.
  - [2] Use the cutting height gauge to determine the roller position, then tighten cutting height adjustment nut B securely.



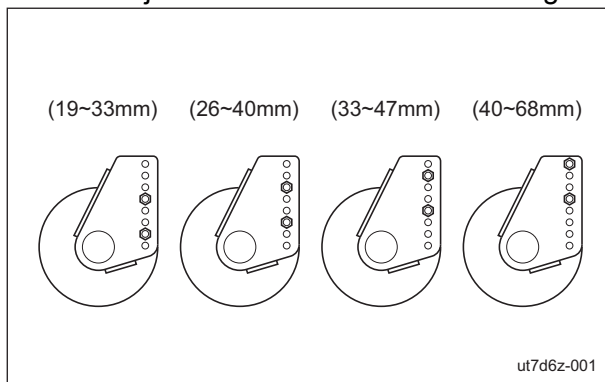
Roller (Roller Type)\_002

# Handling Instructions

1	Reel cutter (Cutting cylinder)
2	Front roller
3	Cutting height gauge
4	Bed knife (Bottom blade)
5	Cutting height adjustment nut A
6	Cutting height adjustment nut B
7	Rear roller
A	Cutting height

## Front Wheel Type

Adjust the cutting height to fit your cutting work. You can adjust the front wheels in four stages.

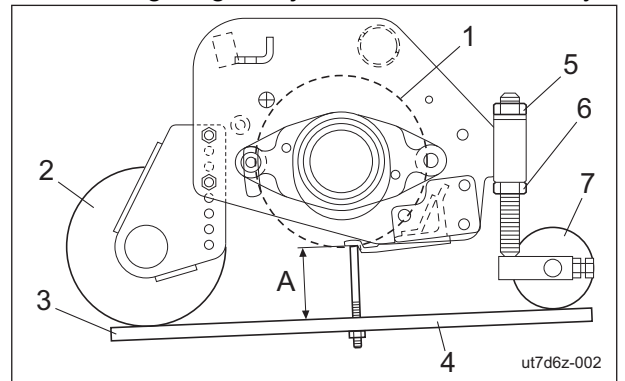


Front Wheel Type\_001

Attach the front wheels in a position within the range of cutting height that suits your work requirements.

- To increase cutting height:
  - [1] Loosen cutting height adjustment nut A, tighten cutting height adjustment nut B, then lower the rear roller.
  - [2] Use the cutting height gauge to determine the position, then tighten cutting height adjustment nut A securely.
- To decrease cutting height:
  - [1] Loosen cutting height adjustment nut B, tighten cutting height adjustment nut A, then raise the rear roller.

[2] Use the cutting height gauge to determine the position, then tighten cutting height adjustment nut B securely.



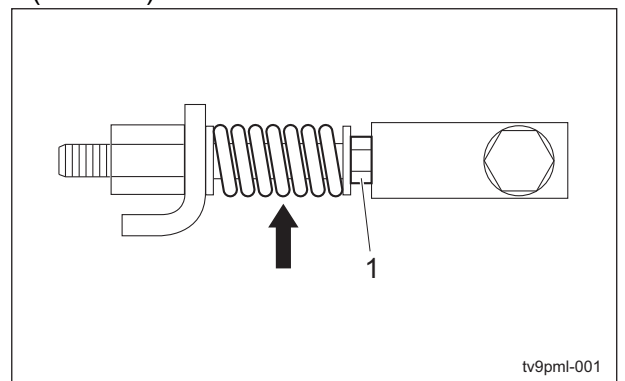
Front Wheel Type\_002

1	Reel cutter (Cutting cylinder)
2	Front Wheel
3	Cutting height gauge
4	Bed knife (Bottom blade)
5	Cutting height adjustment nut A
6	Cutting height adjustment nut B
7	Rear roller
A	Cutting height

## Adjustment of Cutter Adjustment Spring

Due to working conditions, the gap between the reel cutter (cutting cylinder) and the bed knife (bottom blade) may fluctuate. In such a case, adjust the cutter adjustment spring.

- Adjust the blade engagement.
- Loosen the pipe (that features a cutter adjustment screw), then adjust the gap next to the spring coil to approximately 1 mm (0.040 in).



Adjustment of Cutter Adjustment Spring\_001

1	Pipe with cutter adjustment screw
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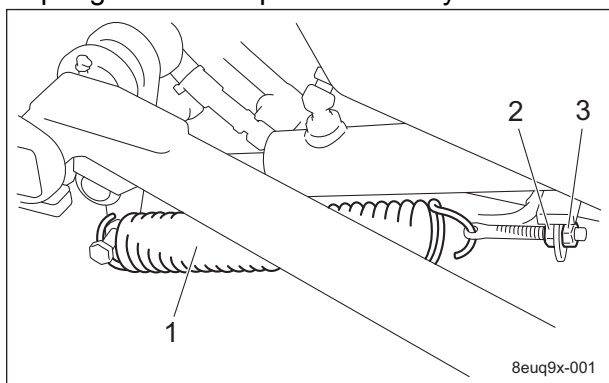
# Handling Instructions

## Adjustment of Lift Arm Spring

### Important

Adjust the spring if the front wheels slip on an ascending slope.

1. Raise the mower units.
2. Loosen lock nut A, then tighten lock nut B to adjust the spring.
3. Perform the same procedure for both left and right.  
Make an adjustment so that the lift arm spring will be compressed evenly.



Adjustment of Lift Arm Spring\_001

1	Lift arm spring
2	Lock nut A
3	Lock nut B

## Procedure to Start / Stop Engine

### Start / Stop of Engine

#### Procedure to Start Engine

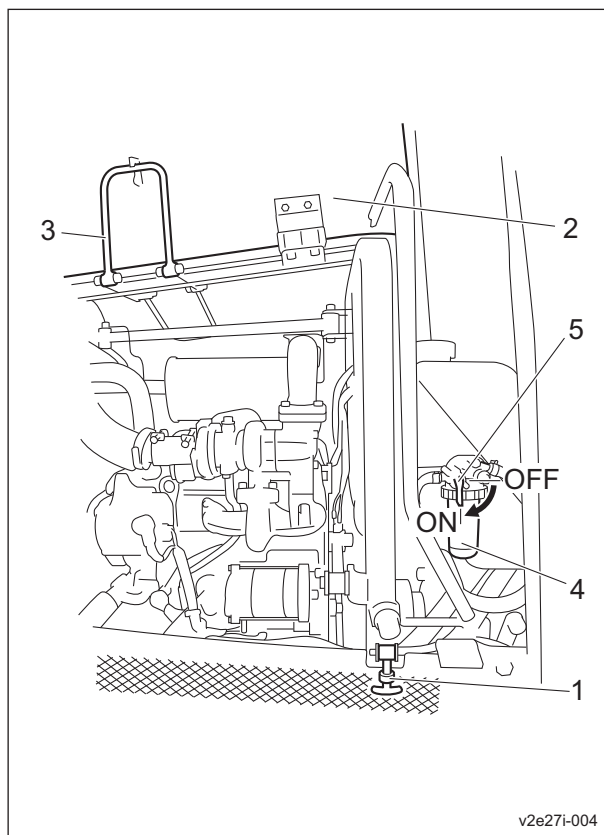
### Warning

Before starting the engine, make sure that there are no other people or obstacles around the machine.

### Important

Starter operation must take 15 seconds or less.  
If the engine does not start, stop using the battery for 30 to 60 seconds to avoid exhausting the battery.

1. Open the fuel cock.  
The fuel cock is located by the side of the fuel tank.



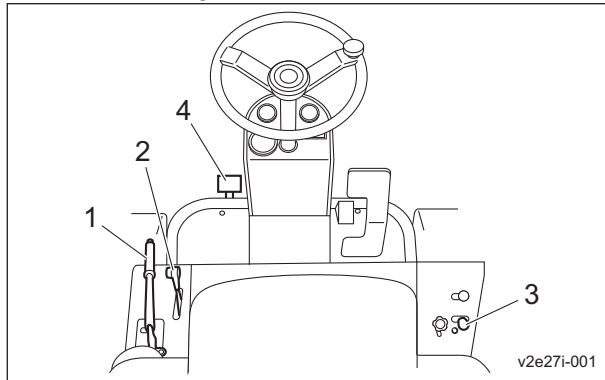
Procedure to Start Engine\_001

1	Rubber catch, small
2	Hood COMP, right
3	Hood support rod
4	Fuel filter
5	Fuel cock

2. Sit on the seat.
3. Depress the brake pedal, and then pull the parking brake lever.
4. Shift the reel rotation lever to the "Stop" position.

# Handling Instructions

- Shift the throttle lever halfway from the "Low" to "High" position.



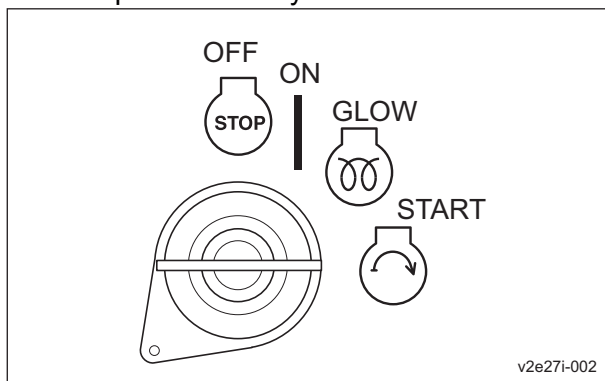
Procedure to Start Engine\_002

1	Parking Brake Lever
2	Throttle lever
3	Reel rotation lever
4	Brake pedal

**Important**

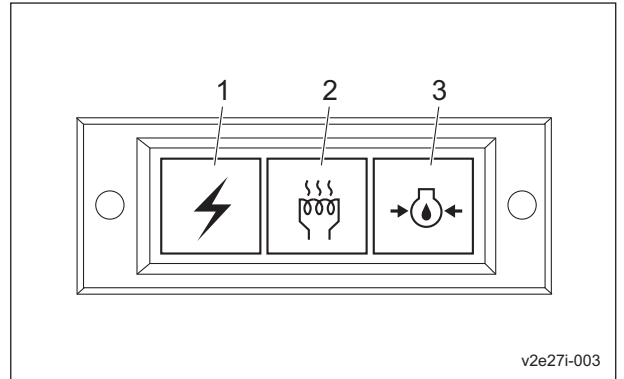
The thermo-start lamp turns off at the specified time. However, the lamp turning off does not relate to the glow plug heat generation. If the ignition key is left in the "GLOW" position after the lamp is turned off, the plug will still generate heat. The thermo-start lamp will stay illuminated for five seconds.

- Switch the ignition key to the "GLOW" position. Make sure that the glow plug is generating heat and the thermo-start lamp is turned on.
- After the thermo-start lamp turns off, immediately set the ignition key to the "START" position. When the starter starts rotating and the engine starts, return the ignition key to the "ON" position slowly.



Procedure to Start Engine\_003

- Make sure that the charge lamp and engine oil pressure lamp turn off. If they do not turn off, stop the engine and inspect the machine.



Procedure to Start Engine\_004

1	Charge lamp
2	Thermo-start lamp
3	Oil pressure lamp

### Procedure to Stop Engine

- Depress the brake pedal, and then pull the parking brake lever.
- Shift the reel rotation lever to the "Stop" position.
- Move the throttle lever to the slow-speed position, and continue idling for 1-2 minutes.
- Switch the ignition key to the "OFF" position.
- Close the fuel cock. The fuel cock is located by the side of the fuel tank.

### Safety Mechanisms

This machine features a safety device for starting / stopping engine.

- As for starting the engine, the safety device prevents the engine from starting unless it meets each of the following four conditions.
  - An operator is sitting on the seat.
  - The parking brake lever is pulled.
  - The reel rotation lever is shifted to the "Stop" position.
  - The traveling pedal is set to neutral.

# Handling Instructions

2. In the event the operator leaves the seat with the parking brake applied and the engine running, the safety device will be activated and will stop the engine under any of the following conditions:
- The traveling pedal is not set to neutral. (The operator has depressed the traveling pedal.)
  - The reel rotation lever is shifted to the cutting work position (positive rotation). Note that if the reel rotation lever is set in the lapping position (negative rotation), the reel cutter (cutting cylinder) will rotate in reverse.

## Operation of Each Section

### Precautions for Operating the Machine

#### ⚠ Caution

- Drive the machine at such a speed that you can stop it immediately for emergencies.

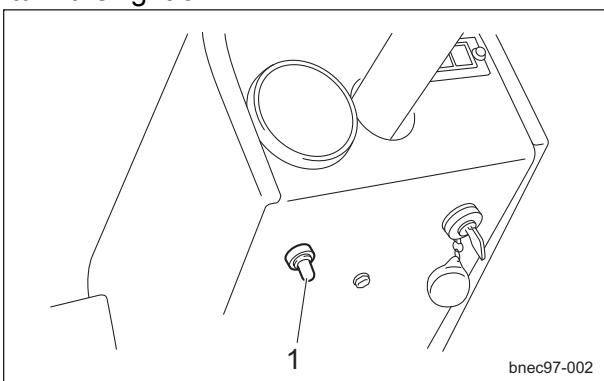
### Cautions for when You Leave the Machine

#### ⚠ Caution

- If the brake feels soft or ineffective, use the wheel stoppers to secure the machine.

### Light Switch

The light switch is located beneath the left side of the operation panel. Flip the switch up to turn the light on, and down to turn the light off.



Light Switch\_001

1	Light Switch
---	--------------

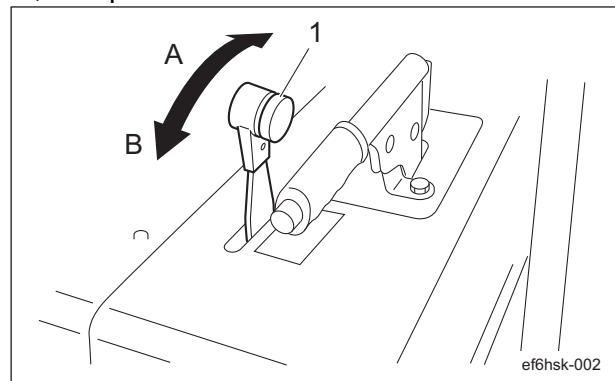
### Throttle Lever

The throttle lever is located to the right of the driver's seat and enables you to adjust the engine rpm.

Move the throttle lever toward full (High) to increase the engine rpm, and toward idling (Low) to reduce the rpm.

Note:

The factory default engine rpm (maximum) is set to 3,100 rpm.



Throttle Lever\_001

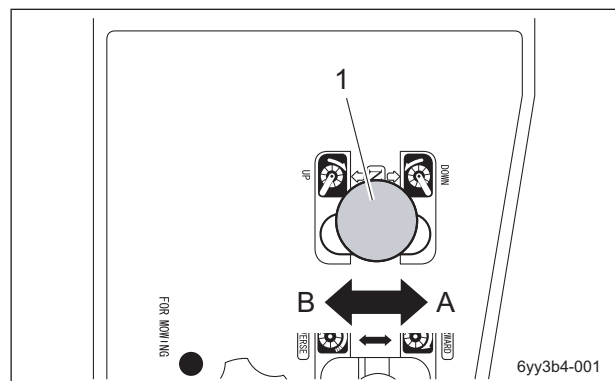
1	Throttle lever
A	Full
B	Idling

### Reel Up/Down Lever

#### ⚠ Caution

Before operating the reel up/down lever, be sure to set the stop valve to the "Open" position.

The reel up/down lever is located on the right side of the driver's seat and operates raising or lowering the mower units. If you shift the lever to the "DOWN" position, all mower units will be lowered. If you shift the lever to the "UP" position, all mower units will be raised.

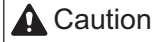


Reel Up/Down Lever\_001

# Handling Instructions

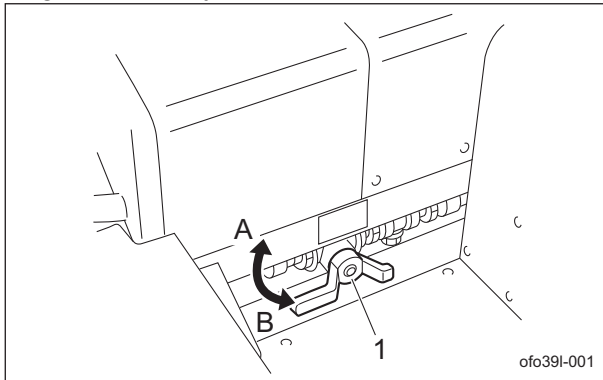
1	Reel up/down lever
A	Lower
B	Raise

## Stop Valve



When you move the machine, or if you stop the engine with the mower units raised, be sure to set the stop valve to the "Stop" position.

The stop valve is located underneath the right side of the driver's seat. This valve prevents the raised mower units from falling accidentally.



Stop Valve\_001

1	Stop valve
A	Stop
B	Open

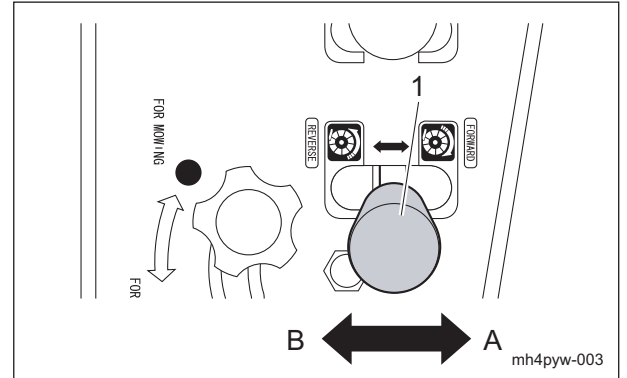
## Reel Rotation Lever



The reel rotation lever must be shifted to an appropriate position just before you start cutting work or lapping. In other than those cases, it must be returned to the neutral position.

The reel rotation lever is located on the right side of the driver's seat and operates rotation of the reel cutters (cutting cylinders) of the mower units.

If you shift the reel rotation lever to the "FORWARD" position, the reel cutters (cutting cylinders) on all mower units will rotate forward for cutting work. If you shift the reel rotation lever to "REVERSE," the reel cutters (cutting cylinders) will rotate in reverse for lapping.



Reel Rotation Lever\_001

1	Reel rotation lever
A	Cutting motion (FORWARD)
B	Lapping motion (REVERSE)

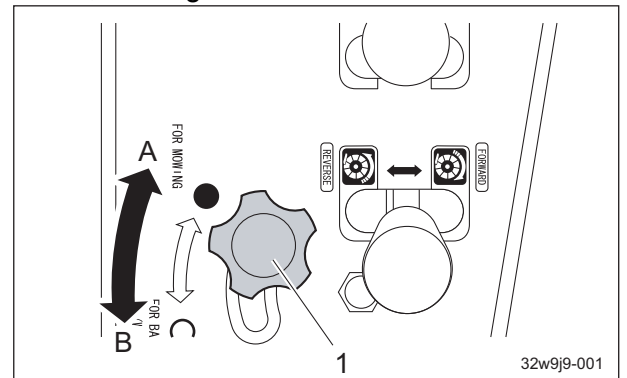
## Anti-reverse Reel Rotation Stopper



Before you start cutting work, make sure that the stopper knob is tightened.

The anti-reverse reel rotation stopper is located on the right side of the driver's seat. It prevents the reel cutters (cutting cylinders) from rotating in reverse during cutting work.

Except for lapping operations, be sure to shift the stopper knob to the "FOR MOWING" position, then tighten the knob.



Anti-reverse Reel Rotation Stopper\_001



# Handling Instructions

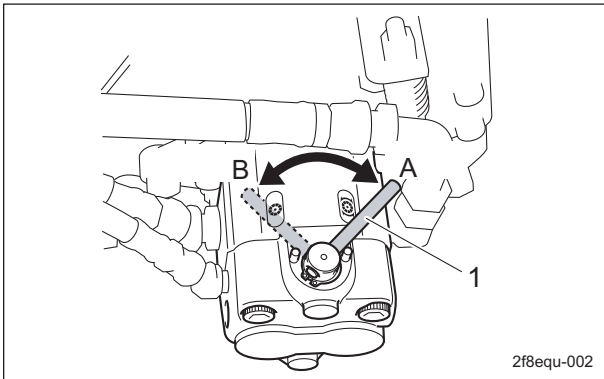
1	Anti-reverse reel rotation stopper
A	FOR MOWING
B	FOR BACKLAPPING

## Reel Rotation/Stop Switching Lever

### ⚠ Caution

Before operating the reel rotation/stop switching lever, be sure to shift the reel rotation lever to the "Stop" position.

The reel rotation/stop switching lever is located on the reel motor attached to each mower unit. It is used during cutting and lapping. You must shift only the lever(s) for the mower unit(s) that you plan to use for cutting or lapping to the "Rotate" position. Leave the lever(s) for other mower units in the "Stop" position.

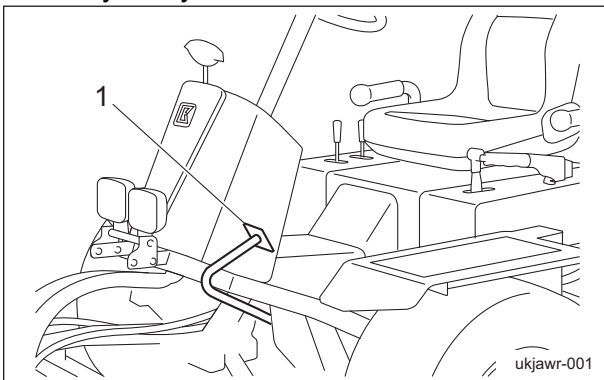


Reel Rotation/Stop Switching Lever\_001

1	Reel rotation/stop switching lever
A	Rotate
B	Stop

## Brake Pedal

The brake pedal is located in the left foot area. To stop the machine, depress the brake pedal all the way firmly.



Brake Pedal\_001

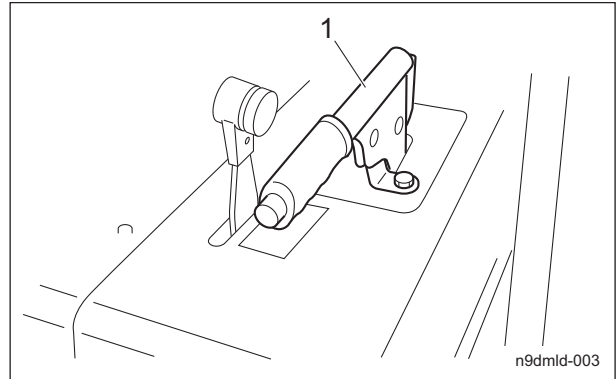
1	Brake pedal
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## Parking Brake Lever

The parking brake lever is located to the left of the driver's seat.

To park the machine, pull the parking brake lever completely.

To release the parking brake, press the push button while lowering the parking brake lever all the way to its resting position.



Parking Brake Lever\_001

1	Parking brake lever
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## Hood

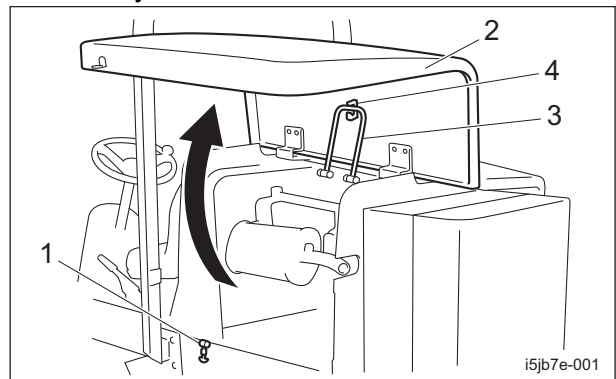
### ⚠ Caution

Do not open the hood in strong winds.

### ⚠ Caution

Be careful not to pinch your fingers when you open or close the hood.

1. Unlock the rubber catch, then lift up the hood.
2. Hook the hood support rod to the latch inside the hood.  
Make sure that the hood will not close, then release your hands.



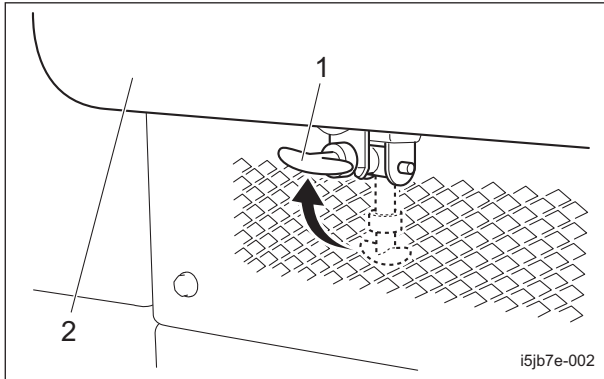
Hood\_001



# Handling Instructions

1	Rubber catch
2	Hood
3	Hood support rod
4	Latch

- To close the hood, release the hood support rod from the latch, then lower the hood slowly.
- Lock the rubber catch securely.



Hood\_002

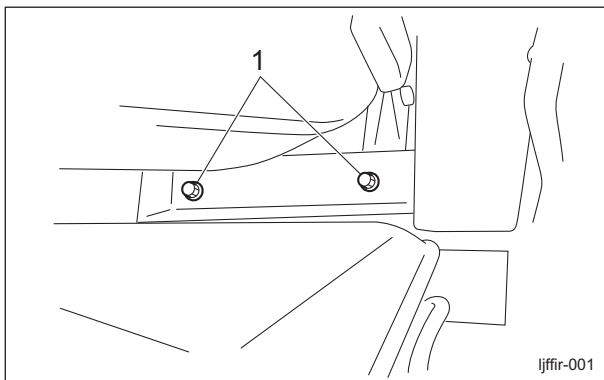
1	Rubber catch
2	Hood

## Underseat Cover

**Caution**

Be careful not to pinch your fingers when you open or close the underseat cover.

- Bring the seat to the most front position.
- Remove two bolts located on the rear of the seat.

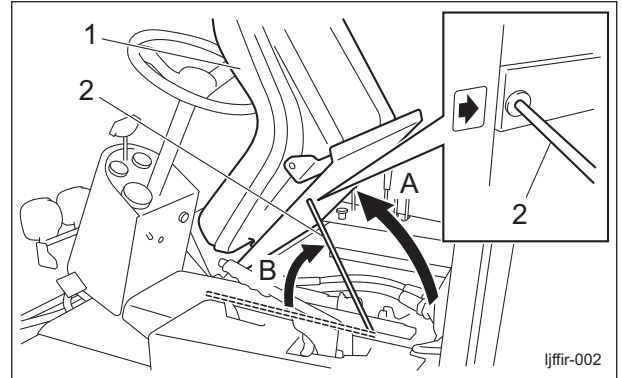


Underseat Cover\_001

1	Bolt
---	------

- Lift the seat.

- Securely support the underseat cover with the seat support rod.

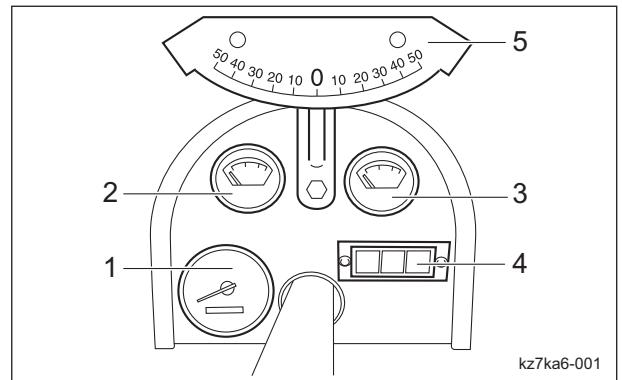


Underseat Cover\_002

1	Seat
2	Seat support rod
A	Step 1
B	Step 2

## Instruments

### Instruments on the Operation Panel



Instruments on the Operation Panel\_001

1	Tachometer/Hour meter
2	Water temperature gauge
3	Fuel gauge
4	Pilot lamps (charge lamp, thermo-start lamp, oil pressure lamp)
5	Angle meter

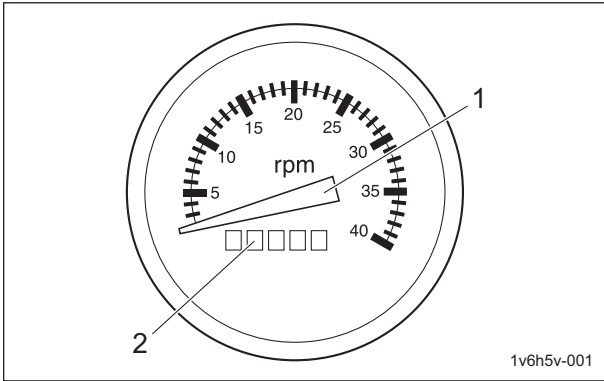
### Tachometer/Hour Meter

The tachometer and hour meter are located in the lower left corner of the operation panel. The tachometer indicates the engine rpm. It is connected to a rotation sensor in the engine flywheel area, and converts the signal output from the rotation sensor into an rpm value.

# Handling Instructions

The hour meter indicates total operation time of the engine.

Every six minutes of engine operation will increase the number on the first digit (black number on a white background) by one. Every one hour of engine operation will increase the number on the next digit (white number on a black background) by one.



Tachometer/Hour Meter\_001

1	Tachometer
2	Hour meter

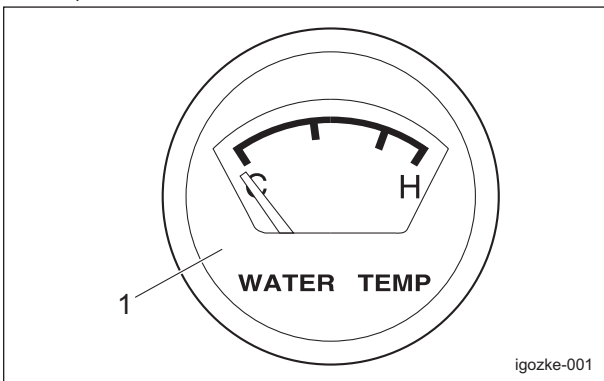
## Water Temperature Gauge

The water temperature gauge is located in the upper left corner of the operation panel. This instrument indicates the water temperature inside the engine.

If the water temperature gauge indicates a level close to "H" during operation, the machine is overheated.

Remove the load from the engine, idle the machine for five minutes, then stop the engine and inspect and perform a necessary maintenance of the machine.

If the water temperature exceeds 105 degrees Celsius, a buzzer will sound.



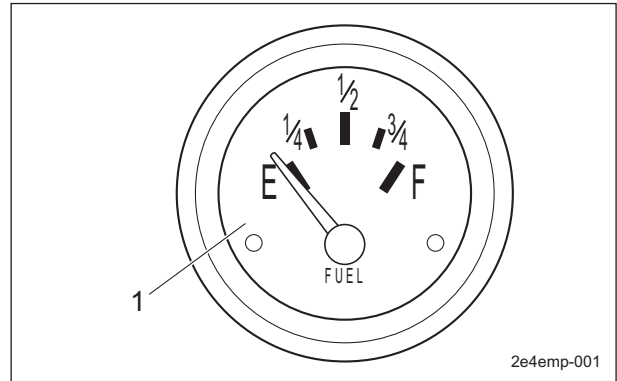
Water Temperature Gauge\_001

1	Water temperature gauge
---	-------------------------

## Fuel Gauge

The fuel gauge is located in the upper right corner of the operation panel.

This instrument indicates the quantity of fuel inside the fuel tank.



Fuel Gauge\_001

1	Fuel gauge
---	------------

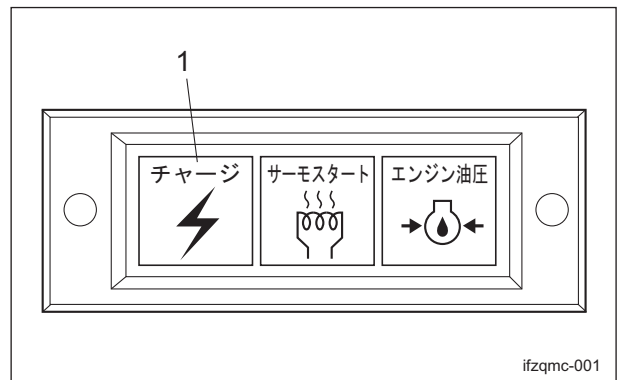
## Pilot Lamps

### Charge Lamp

The charge lamp is the left pilot lamp located in the lower right of the operation panel.

It turns on when the ignition key is set to "ON" before the engine starts. It turns off when the engine starts and the alternator starts operating properly.

If this lamp illuminates while you are operating the machine, stop the engine immediately, and inspect and perform necessary maintenance of the machine.



Charge Lamp\_001

1	Charge lamp
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# Handling Instructions

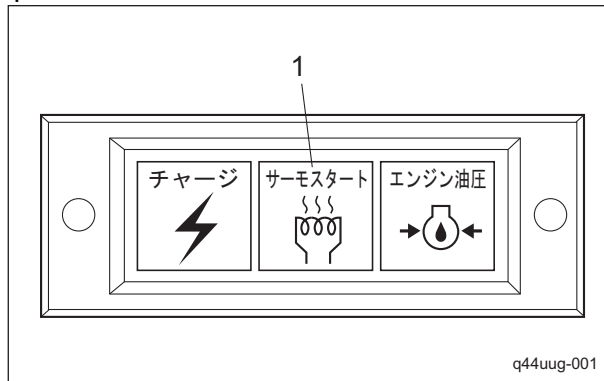
## Thermo-start Lamp

The thermo-start lamp is the middle pilot lamp located in the lower right of the operation panel.

When the ignition key is set to the "GLOW" position, it illuminates as the glow plug generates heat.

Illumination of the thermo-start lamp is controlled by the glow lamp timer, and the lamp is turned off after a specified amount of time passes.

Duration of illumination indicates an approximate period of time required for warm-up, and has been fixed to five seconds.



Thermo-start Lamp\_001

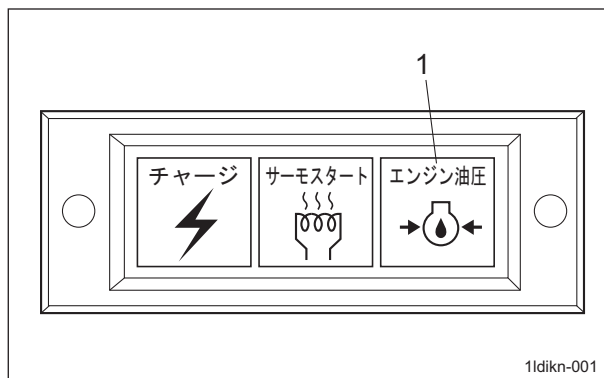
1	Thermo-start lamp
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## Oil Pressure Lamp

The oil pressure lamp is the right pilot lamp located in the lower right of the operation panel.

It turns on when the ignition key is set to "ON" before the engine starts. It turns off when the engine starts and engine oil pressure is generated properly.

If this lamp illuminates while you are operating the machine, stop the engine immediately, and inspect and perform necessary maintenance of the machine.



Oil Pressure Lamp\_001

1	Oil pressure lamp
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## Angle Meter

The angle meter is located in the upper center of the operation panel.

This instrument indicates the angle of the machine position.

## Travel of Machine

### Moving the Machine

- Before starting the engine, check the following points.
  - An operator is sitting on the seat.
  - The parking brake lever is pulled.
  - The reel rotation lever is shifted to the "Stop" position.
- Start the engine.
- Raise all mower units, and set the anti-falling stop valves to the "Stop" position.
- Depress the brake pedal, and while pressing the push button, return the parking brake lever to its resting position.
- Slowly depress the traveling pedal.
- The machine will start to move.

### Towing the Machine

If the machine does not travel due to engine trouble, etc., you can move it in the following ways:

- Pushing by hand
- Towing (See the following instruction.)

#### ⚠ Caution

Tow the machine at a low speed while paying close attention.

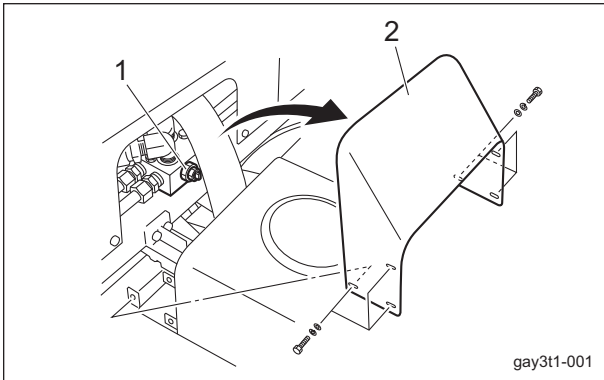
#### ⚠ Caution

Before restarting the engine, be sure to close the unload valve.

- Stop the engine.
- Pull the parking brake lever and chock the wheels.
- Lift the seat.

# Handling Instructions

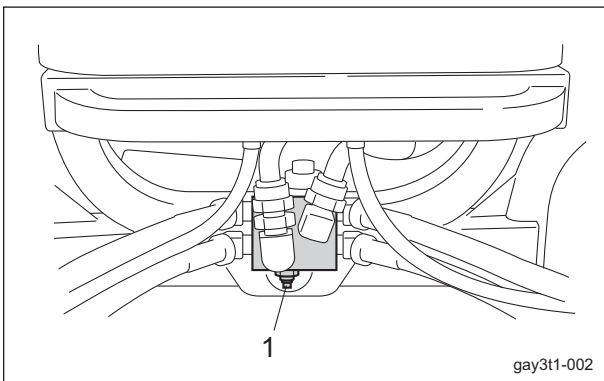
4. Open the unload valve located on the frame under the seat.



Towing the Machine\_001

1	Unload valve
2	Center cover (rear)

5. Open the unload valve located on the rear frame.



Towing the Machine\_002

1	Unload valve
---	--------------

### Important

Before towing, be sure to open the unload valves in two locations.

6. While pressing the push button, release the parking brake lever and remove the wheel stopper.  
7. Tow the machine slowly.

### Opening and Closing the Unload Valve

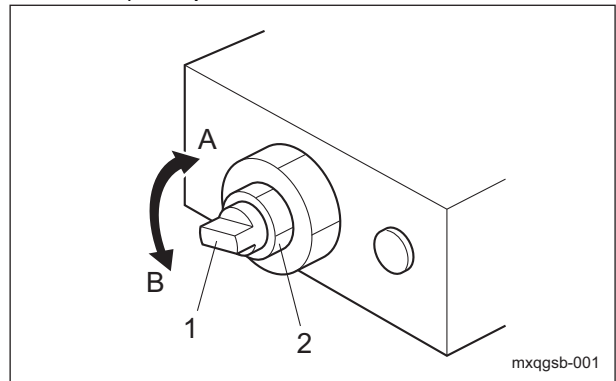
### Caution

Unless you plan to tow the machine, tighten the needle valve of the unload valve securely and tighten the lock nut firmly.

### Important

Do not rotate the needle valve of the unload valve more than once.

1. Loosen the lock nut.
2. Loosen the needle valve (located in the center) to open the unload valve.



Opening and Closing the Unload Valve\_001

1	Needle valve
2	Lock nut
A	Tighten
B	Loosen

## Cutting Work

### Cutting Operation

### Warning

Do NOT start to move or stop the machine abruptly. To do so is very dangerous. In addition, it may damage the hydraulic system or result in oil leakage.

### Caution

Cutting work must be performed at appropriate speed for the site and location. When cutting bumpy surfaces, keep the engine rpm steady, and slow down the cutting speed.

### Caution

Reel rotation will be turned on or off based on the sensor-detected position of the mower units. Please note that if you stop operating the reel up/down lever before the mower units are raised completely, reel rotation may not stop.

1. Before starting the engine, check the following points.
  - An operator is sitting on the seat.
  - The parking brake lever is pulled.
  - The reel rotation lever is shifted to the "Stop" position.
  - The anti-reverse reel rotation stopper is set to the "FOR MOWING" position.
  - The reel rotation/stop switching lever on the reel motor is shifted to the "Rotate" position.
2. Start the engine.
3. Raise all mower units, and set the anti-falling stop valves to the "Stop" position.
4. Depress the brake pedal, and while pressing the push button, return the parking brake lever to its resting position.
5. Shift the throttle lever to full throttle (High), and rev up the engine to MAX (3,100 rpm).
6. Right before starting cutting work, set the anti-falling stop valves to the "Open" position.
7. Shift the reel up/down lever to the "DOWN" position to lower the mower units.
8. Shift the reel rotation lever to "FORWARD" to rotate the reel cutters (cutting cylinders) for all mower units in cutting (positive) motion.
9. Depress the traveling pedal to start cutting work.

Note:

During the work, the reel cutters (cutting cylinders) will rotate or stop in sync with the up and down motion of the mower units.

# Handling Instructions

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About the Lubrication..... Page 9-5

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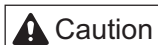
**Long-Term Storage..... Page 9-13**

Before Long-Term Storage..... Page 9-13

# Maintenance

## Maintenance Schedule

Follow the maintenance schedule below.



Caution

Use tools appropriate for each maintenance operation.

○ . . . Inspect, adjust, supply, clean

● . . . Replace (first time)

△ . . . Replace

Maintenance Item		Before work	After work	Every 8hrs.	Every 50hrs.	Every 100hrs.	Every 200hrs.	Every 250hrs.	Every 400hrs.	Every 500hrs.	Every year	Every 2 years	Every 4 years	Remarks
Engine	Tightening the parts	○												
	Fuel	○												
	Air cleaner	○				△								
	Engine oil	○		●	△									8hrs (first time)
	Engine oil filter	○			●	△								50hrs (first time)
	Ignition plug				○	△								
	Radiator	○												
	Oil cooler	○												
	Coolant	○			△									
	Fan belt	○									△			
	Battery	○										△		
	Battery fluid	○												
Cleaning the surface	○													
Main body	Tightening the parts	○												
	Interlock system	○												
	Emergency switch	○												
	Knife	○												
	Steering chain	○												
	Cutting (or brush) height	○												
	Greasing, oiling				○									
	Tire	○												
	Rubber crawler	○												
	V-belt	○									△			
	Brake	○												
	Wire	○					△							
	Cover	○												
Oil leakage	○													



Maintenance Item		Before work	After work	Every 8hrs.	Every 50hrs.	Every 100hrs.	Every 200hrs.	Every 250hrs.	Every 400hrs.	Every 500hrs.	Every year	Every 2 years	Every 4 years	Remarks
Main body	Hydraulic oil	○				●				△				100hrs (first time)
	Hydraulic oil filter					●				△				100hrs (first time)
	Hydraulic motor oil				●		△							50hrs (first time)
	Power unit oil	○				●				△				100hrs (first time)
	Transmission oil	○			●						△			50hrs (first time)
	Hydraulic hose (moving part)	○										△		
	Hydraulic hose (fixed part)	○											△	
	Air cleaner	○						△						
	Electromagnetic pump filter	○						△						
	Fuel strainer						○				△			
	Fuel pipe	○												
Cleaning the surface	○													

The values for consumables are not guaranteed.

### Maintenance Precautions

#### Caution

- First, learn well the maintenance operations you plan to perform.
- For the safe and best performance of your machine, use Baroness genuine parts for replacement and accessories.  
Please note that our product warranty may be void if you use non-genuine parts for replacement or accessories.

### Specified Values for Maintenance

Fuel tank capacity	38.0 dm <sup>3</sup> (38.0 L)	
Hydraulic tank capacity	24.0 dm <sup>3</sup> (24.0 L)	Shell Tellus 46 (or equivalent)
Quantity of lubricating oil	3.1 dm <sup>3</sup> (3.1 L)	Summer: SAE30, Winter: SAE20
Coolant volume	6.0 dm <sup>3</sup> (6.0 L)	Including reserve tank (1.0 L)
Front Tires	120 kPa (1.2 kgf/cm <sup>2</sup> )	23 x 10.50 - 12 4P

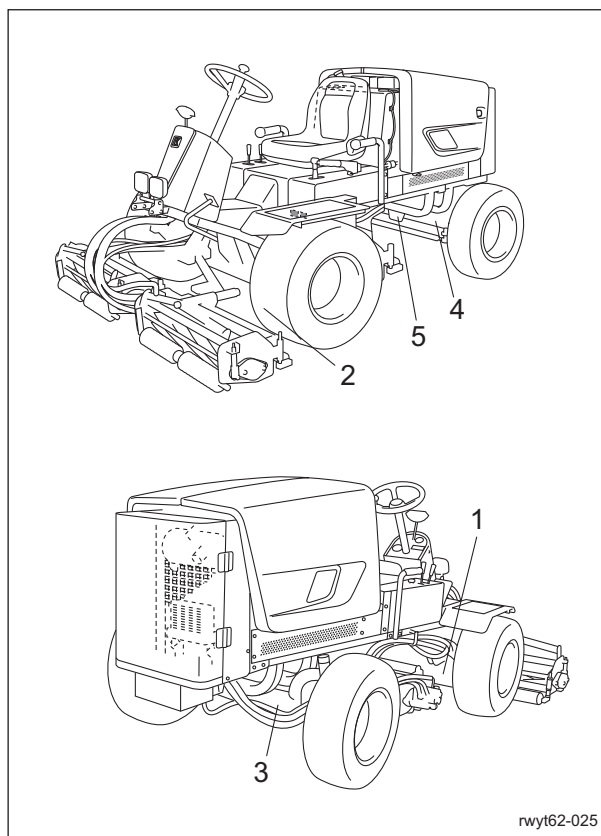
# Maintenance

Rear Tires	150 kPa (1.5 kgf/cm <sup>2</sup> )	23 x 8.50 - 12 4P
Cutter adjustment spring	1 mm	Clearance of spring

## Main Consumable Parts

Part Name	Code
Fan belt	PF1G345-9701-0
Oil element	PF16271-3209-2
Air cleaner element	PFT0270-1632-0
Fuel filter element	PF15231-4356-0
Suction filter element	K3413000020
Hydraulic cartridge filter	K3412000060
Hydraulic oil (20 L can)	K2913100200
Brake wire, left	K1120107000
Brake wire, right	K1120125000
Side brake wire	K1120141010
Throttle wire	K1110101000
Brake shoe, front right	P741-8005-00
Brake shoe, rear right	P741-8007-00
Brake shoe, front left	P741-8006-00
Brake shoe, rear left	P741-8008-00

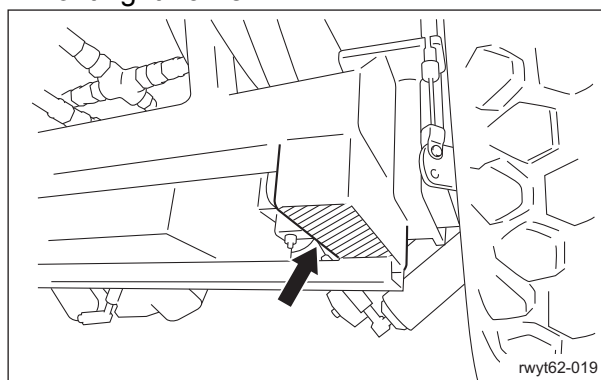
## Jack-up Points



Jack-up Points\_001

1	Front right frame
2	Front left frame
3	Rear right pivot
4	Rear left pivot
5	Rear center frame

### 1. Front right frame



Jack-up Points\_002

## Jacking up the machine

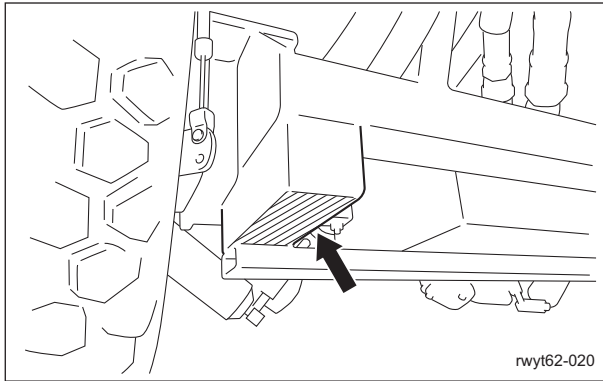
### About the Jacking up the machine

#### Warning

When replacing a tire or beginning any other maintenance or repairs, be sure to chock the wheels to prevent the machine from moving. Before jacking up the machine, park it on a hard, flat surface such as a concrete floor and remove any obstacles that could prevent you from performing the work safely. When necessary, use an appropriate chain block, hoist, or jack. Support the machine securely with jack stands or appropriate blocks. Failure to do so may cause the machine to move or fall, resulting in injury or death.

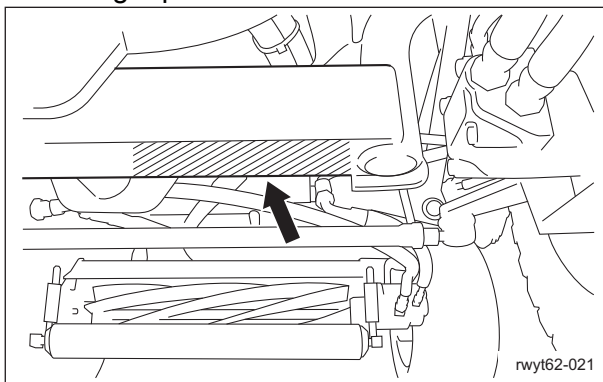
Use the jack-up points identified in this manual when jacking up the machine. Only place a jack under the jack-up points specified. Placing a jack at any other point could result in damage to the frame or other parts.

## 2. Front left frame



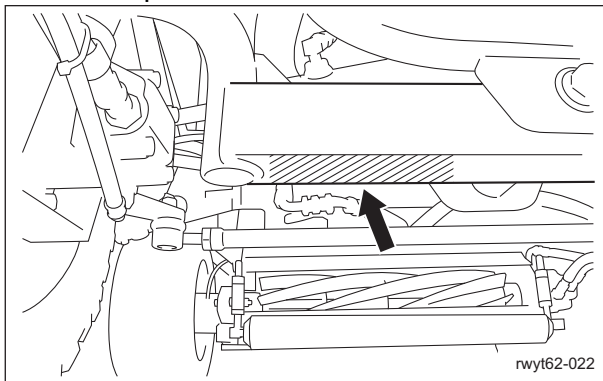
Jack-up Points\_003

## 3. Rear right pivot



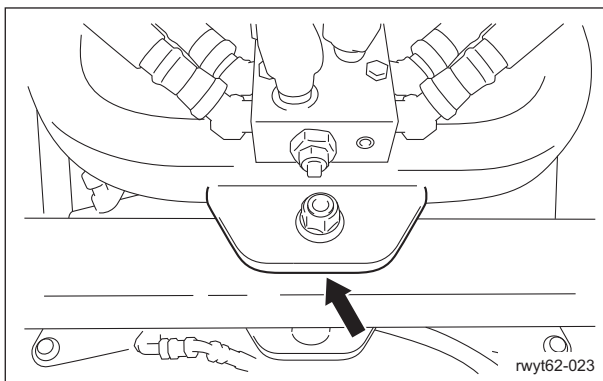
Jack-up Points\_004

## 4. Rear left pivot



Jack-up Points\_005

## 5. Rear center frame



Jack-up Points\_006

## Lubrication

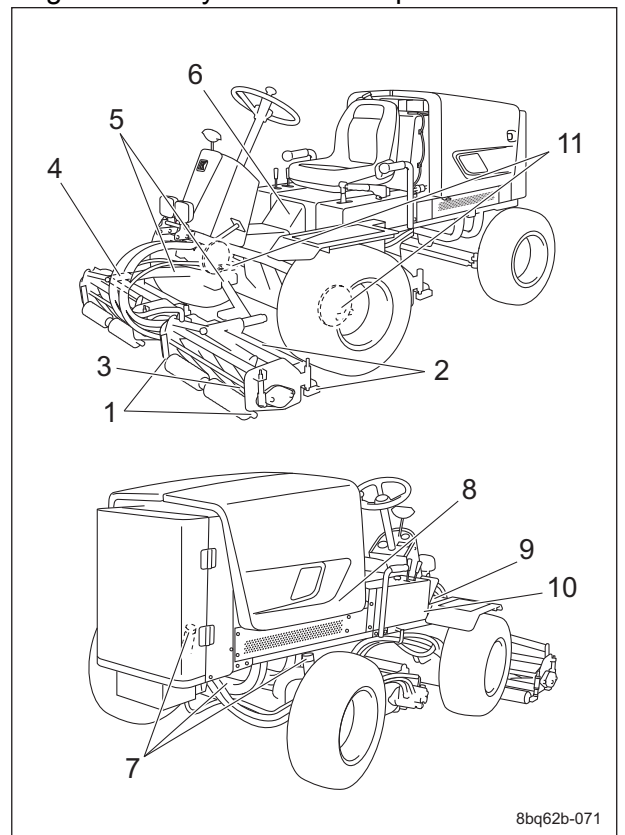
### About the Lubrication

The moving parts of this machine need to be lubricated as a lack of grease on such parts could cause them to seize or be damaged. Grease the moving parts according to the maintenance schedule.

### Greasing Points

Grease nipples are installed in the following locations.

Add grease every 50 hours of operation.



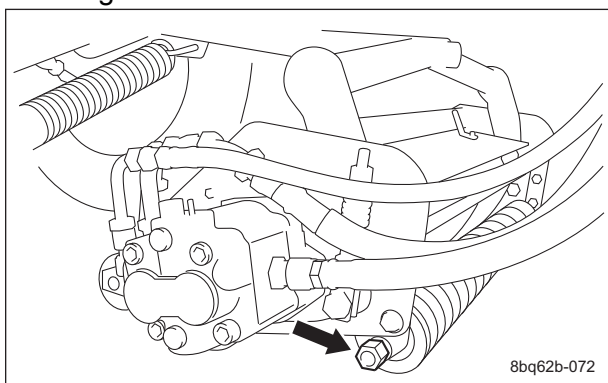
Greasing Points\_001

# Maintenance

	Portion	No. of Greasing Points
1	Front roller	6
2	Rear roller	6
3	Reel housing	3
4	Mower arm fulcrum	3
5	Lift arm fulcrum	3
6	Idle lever fulcrum	1
7	Pivot	3
8	Piston pump	2
9	Traveling pedal fulcrum	1
10	Traveling pedal shaft fulcrum	1
11	Brake lever shaft	2

## 1. Front roller

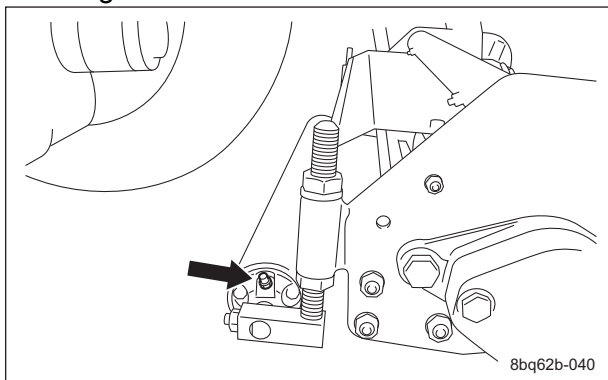
There is one greasing point each on the left and right of each mower unit.



Greasing Points\_002

## 2. Rear roller

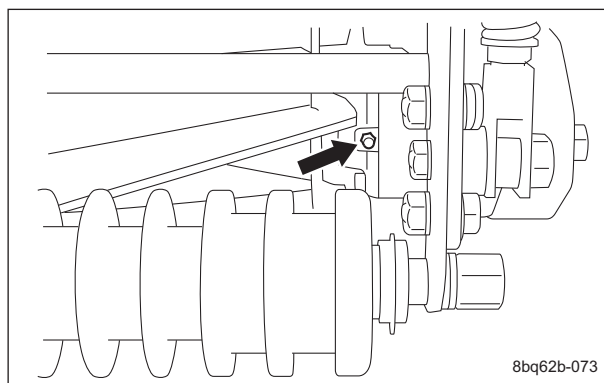
There is one greasing point each on the left and right of each mower unit.



Greasing Points\_003

## 3. Reel housing

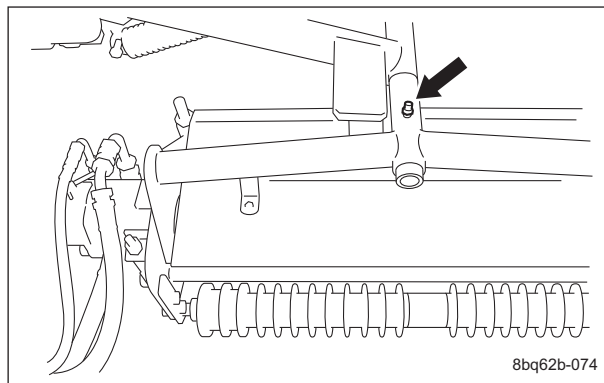
There is one greasing point on each mower unit.



Greasing Points\_004

## 4. Mower frame fulcrum

There is one greasing point on each mower unit.

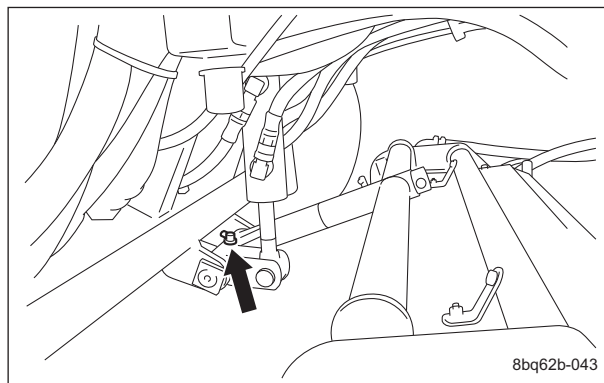


Greasing Points\_005

## 5. Lift arm fulcrum

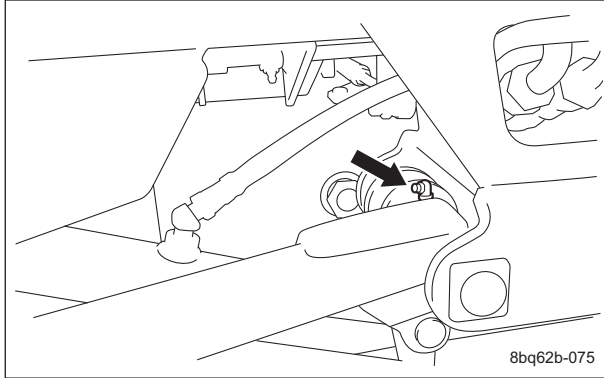
There is one greasing point each on the left and right mower units.

Mower #1



Greasing Points\_006

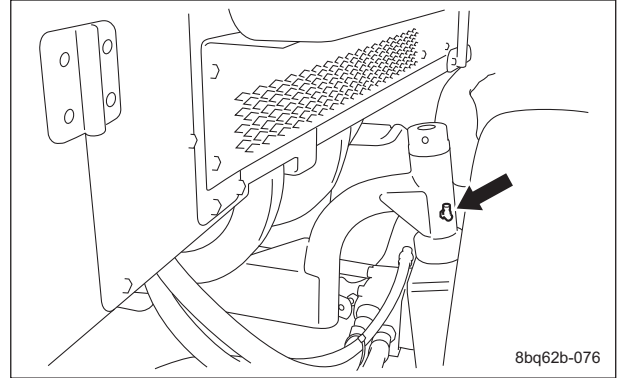
### Mower #2 and #3



8bq62b-075

Greasing Points\_007

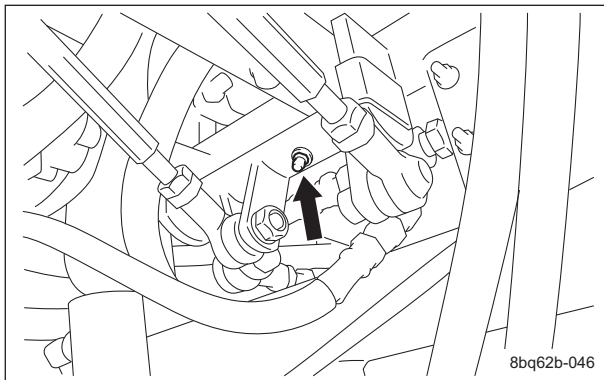
### Rear right wheel



8bq62b-076

Greasing Points\_010

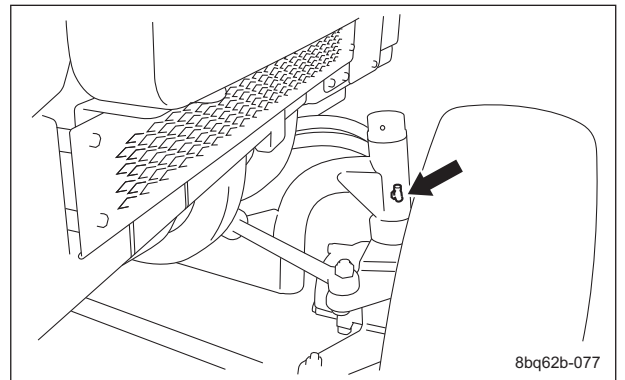
### 6. Idle lever fulcrum



8bq62b-046

Greasing Points\_008

### Rear left wheel



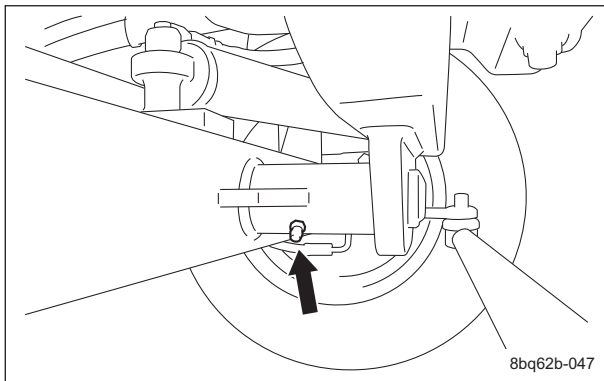
8bq62b-077

Greasing Points\_011

### 7. Pivot

Use jack stands to support the machine and apply grease.

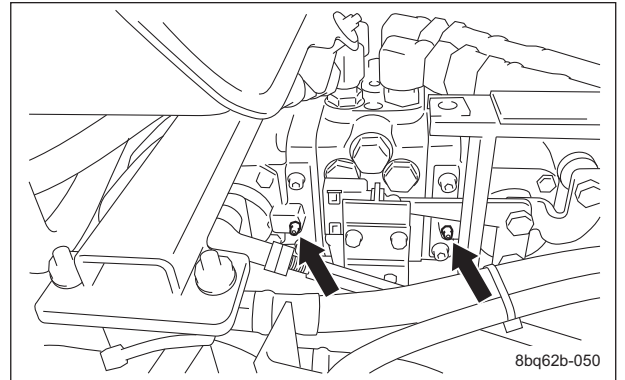
Middle between the rear wheels



8bq62b-047

Greasing Points\_009

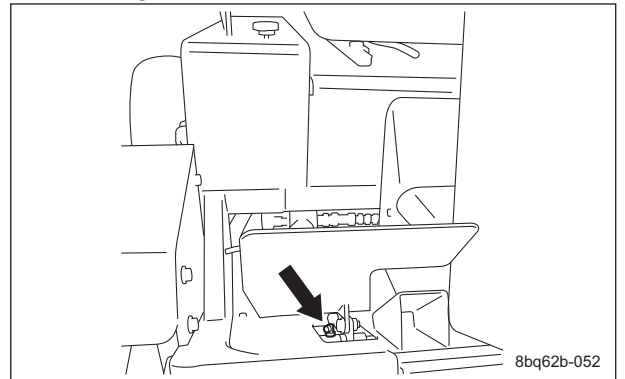
### 8. Piston pump



8bq62b-050

Greasing Points\_012

### 9. Traveling pedal fulcrum

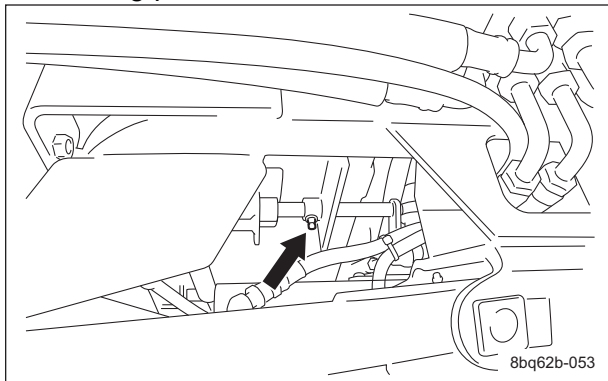


8bq62b-052

Greasing Points\_013

# Maintenance

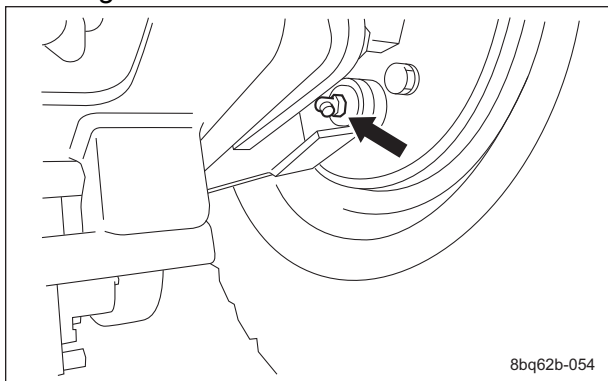
## 10. Traveling pedal shaft fulcrum



Greasing Points\_014

## 11. Brake lever shaft

There is one greasing point each in the left and right brake areas.



Greasing Points\_015

## Maintenance (Mower)

### Lapping of Reel Cutter (Cutting Cylinder)

Lapping is work similar to sharpening a cooking knife. If the edges of the reel cutter (cutting cylinder) and the bed knife (bottom blade) become blunt and make cutting difficult, both the reel cutter (cutting cylinder) and the bed knife (bottom blade) should be simultaneously sharpened by reversing the reel cutter (cutting cylinder) with an abrasive paste applied. However, lapping is a temporary measure and would not restore the sharpness completely. If the edges of the reel cutter (cutting cylinder) and the bed knife (bottom blade) become blunt and difficult to cut, follow the steps below to perform lapping.

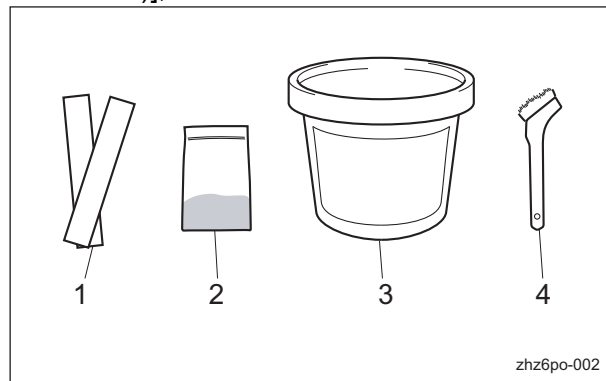
#### ⚠ Caution

Both the reel cutter (cutting cylinder) and the bed knife (bottom blade) are edged tools. Handle them carefully, since they could cut your hands or legs.

#### ⚠ Caution

Do not perform lapping with any other persons.

1. Have the following items ready: Strips of newspaper, Abrasive [Lapping powder mixed with oil; or gel compound (Baroness genuine abrasive)], Brush.



Lapping of Reel Cutter (Cutting Cylinder)\_001

1	Newspaper
2	Lapping powder
3	Gel compound
4	Brush

#### Note:

Mixing ratio for abrasive in volume is one part lapping powder to three or four parts oil.

#### ⚠ Caution

Before cutting newspaper as a test, be sure to stop the engine and wear gloves to protect your hands. Pay attention not to let the reel cutter (cutting cylinder) catch your gloves. Otherwise, you may injure your hand or fingers.

#### ⚠ Caution

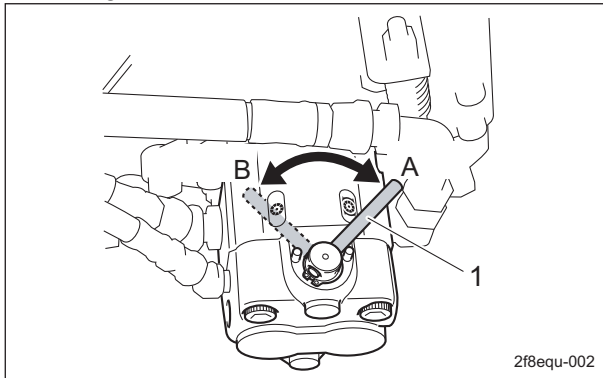
Before adjusting the blade engagement, be sure to set the reel rotation/stop switching lever for the reel motor (attached to the mower unit) to the "Stop" position.

#### Important

After cutting grass, adjust the engagement of the blades, before checking the sharpness of the blade.



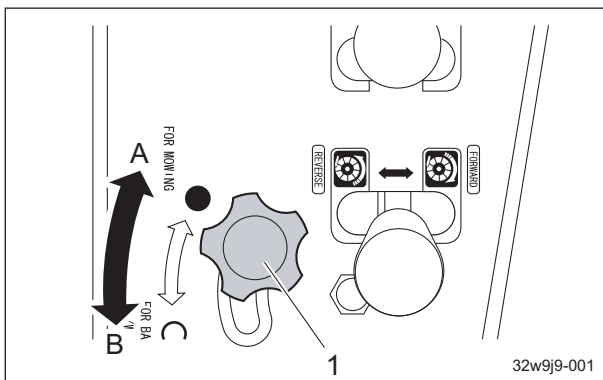
- Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and the bed knife (bottom blade) at an angle of 90 degrees, then rotate the reel cutter (cutting cylinder) from up to down manually to check the sharpness.
- Check the sharpness at entire range (three or four points from left edge to right one) of the reel cutter (cutting cylinder).
- Using a piece of chalk, mark locations on the blade that are sharp.
- Shift only the reel rotation/stop lever(s) of the reel motor(s) in the mower unit(s) that you plan to use for lapping to the "Rotate" position. Shift the lever(s) to the "Stop" position for the mower unit(s) for which you will not perform lapping.



Lapping of Reel Cutter (Cutting Cylinder)\_002

1	Reel rotation/stop switching lever
A	Rotate
B	Stop

- Loosen the anti-reverse reel rotation stopper knob, shift the stopper all the way to the "FOR BACKLAPPING" position, then tighten the knob.



Lapping of Reel Cutter (Cutting Cylinder)\_003

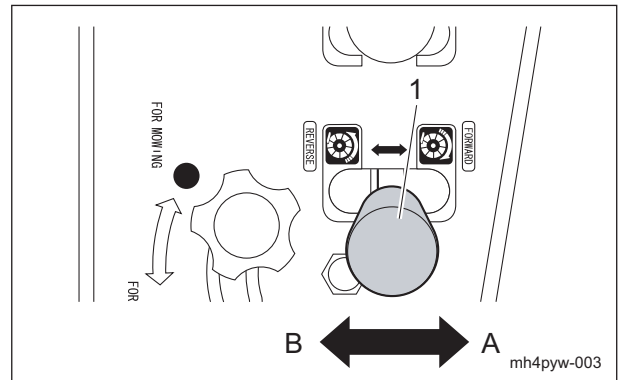
1	Anti-reverse reel rotation stopper
A	FOR MOWING
B	FOR BACKLAPPING

- Start the engine, and run it at a low rpm.

**Important**

If you shift the reel rotation lever to the "REVERSE" position while the anti-reverse reel rotation stopper knob is not completely shifted to the "FOR BACKLAPPING" position, the safety device will be activated and will stop the engine.

- Shift the reel rotation lever to the "REVERSE" (lapping motion) position to rotate the reel cutter (cutting cylinder) in reverse.



Lapping of Reel Cutter (Cutting Cylinder)\_004

1	Reel rotation lever
A	Cutting motion (FORWARD)
B	Lapping motion (REVERSE)

- Apply the abrasive evenly with the brush on the top side of reel cutter (cutting cylinder) where the newspaper was cut well or of chalk-marked locations.
- Idle the machine for a while, and when contact noise is no longer heard, return the reel rotation lever to the neutral position to stop reel cutter (cutting cylinder).
- Stop the engine.
- Wash off or wipe off with cloth etc. the abrasive from the reel cutter (cutting cylinder), then check it for sharpness.
- Repeat steps 2 to 12 until the entire range (three or four points from left edge to right one) of the reel cutter (cutting cylinder) will be uniformly sharpened.

# Maintenance

14. Finally, apply the abrasive on the entire range of the reel cutter (cutting cylinder) and perform final lapping.
15. Stop the rotation of the reel cutter (cutting cylinder), stop the engine, and then wash off the abrasive using a washer etc.
16. While checking the blade for sharpness, adjust blade engagement.

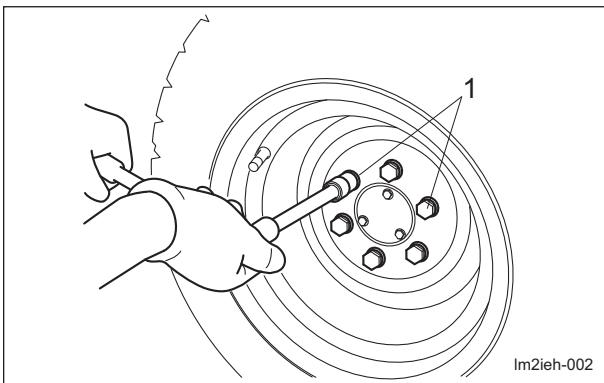
## Maintenance (Main Body)

### Removing/Installing Tires

#### Front Tires

Follow the steps below to remove the front tires:

1. Loosen the bolts.



Front Tires\_001

1 Heat-treated bolt

2. Place the jack beneath the jack-up point of the front left/right frame area securely, then raise it until the tire lifts off the ground. ((See "Jack-up Points" (Page 9-4) .)
3. Remove the bolts.
4. Remove the tire from the wheel mounting seat.

#### Caution

Refer to the Tightening Torque table. Note that the Baroness product warranty may not apply to defects caused by incorrect or overtorque tightening.

#### Important

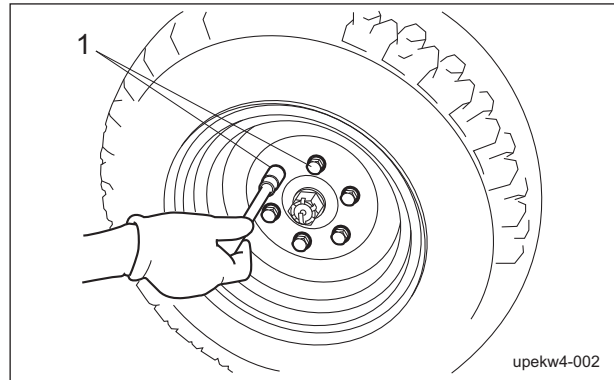
Tighten the bolts in the tightening order (crosswise).

For installing the front tires, reverse the removing procedure.

#### Rear Tires

Follow the steps below to remove the rear tires:

1. Loosen the bolts.



Rear Tires\_001

1 Heat-treated bolt

2. Place the jack beneath the jack-up point of the rear left/right frame area securely, then raise it until the tire lifts off the ground. ((See "Jack-up Points" (Page 9-4) .)
3. Remove the bolts.
4. Remove the tire from the wheel mounting seat.

#### Caution

Refer to the Tightening Torque table. Note that the Baroness product warranty may not apply to defects caused by incorrect or overtorque tightening.

#### Important

Tighten the bolts in the tightening order (crosswise).

For installing the rear tires, reverse the removing procedure.

### Adjustment of Belt Tension

#### Fan Belt

#### Caution

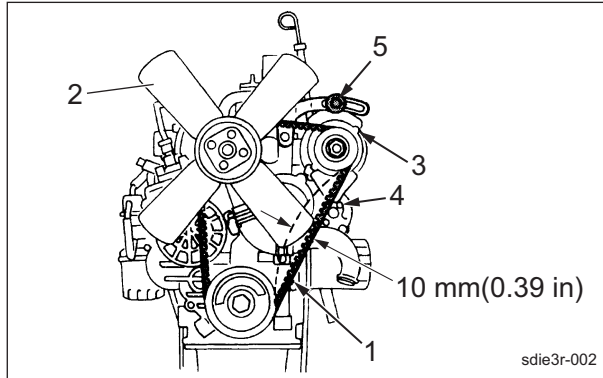
Be sure to stop the engine before adjusting the belts.

For details on handling the engine, please refer to the separate Engine Operating Manual.

1. Press the middle of the belt with your finger to check the belt tension.



- If the belt is too slack, loosen bolts A and B (that affix the alternator), then move the alternator to adjust the tension.



Fan Belt\_001

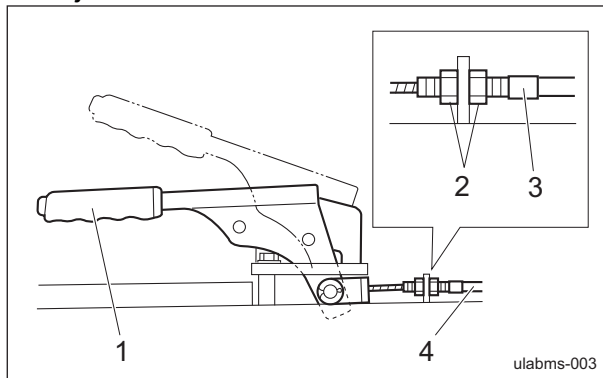
1	Fan belt
2	Blade
3	Alternator
4	Bolt A
5	Bolt B

## Adjustment of Parking Brake

### **Danger**

If the brake wire is cut, the machine will be unable to stop. This would be extremely dangerous.  
 If the brake wire is cracked or damaged, replace it with a new one immediately.  
 If the parking brake is not sufficiently effective when you pull the parking brake lever, adjust the brake wire.

Adjust the parking brake by tightening the brake wire adjustment bolt.



Adjustment of Parking Brake\_001

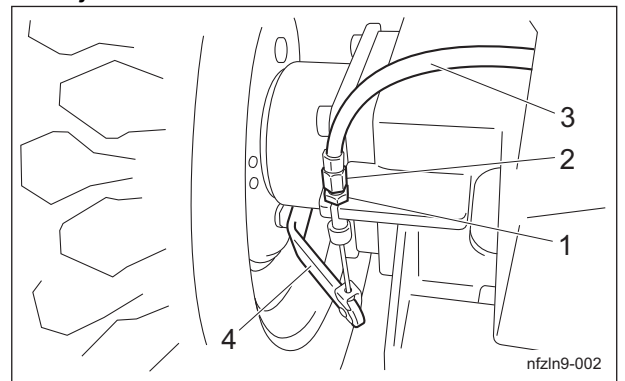
1	Parking brake lever
2	Lock nut
3	Adjustment bolt
4	Brake wire

## Adjustment of Brake

### **Danger**

If the brake wire is cut, the machine will be unable to stop. This would be extremely dangerous.  
 If the brake wire is cracked or damaged, replace it with a new one immediately.  
 If the brake is not sufficiently effective, adjust the brake wire.

Adjust the foot brake by tightening the foot brake wire adjustment bolt.



Adjustment of Brake\_001

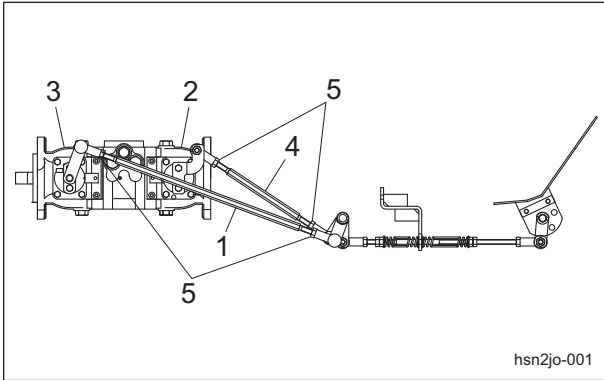
1	Lock nut
2	Adjustment bolt
3	Brake wire
4	Brake lever

## Adjusting the Neutral Position of the Piston Pump

- Stop the engine.
- Place the jacks beneath the jack-up points, then lift the machine off the ground. Use stable jack stands and elevate until the tires lift off the ground. ((See "Jack-up Points" (Page 9-4) .)
- Start the engine, and rev it up to the maximum rpm.
- Adjust the neutral position.  
 [1] If the front tires rotate forward, loosen the lock nuts, then turn the front wheel rod to shorten it.

# Maintenance

[2] If the front tires rotate in reverse, loosen the lock nuts, then turn the front wheel rod to extend it.



Adjusting the Neutral Position of the Piston Pump\_001

1	Rear wheel rod
2	Front wheel pump
3	Rear wheel pump
4	Front wheel rod
5	Lock nut

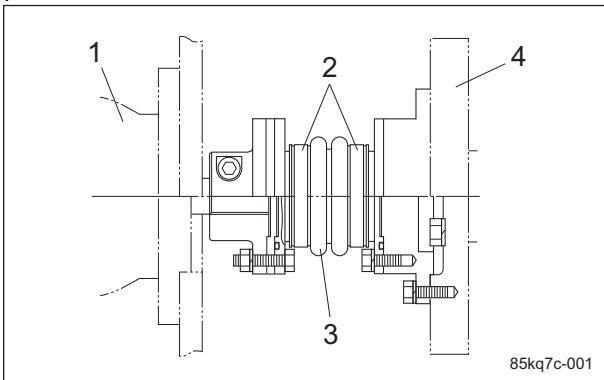
5. Find the position where the front wheels stop, then tighten the lock nuts.
6. Follow the same steps to adjust the rear wheels.

## Change of Constant Velocity Joint

**⚠ Caution**

Do not use grease for the NTN constant velocity joint and other grease at the same time.

If grease leaks from the joint and attaching portion or boot band attaching portion, replace the boot and O-ring. You cannot reuse the boot band. Be sure to replace it with a new one.



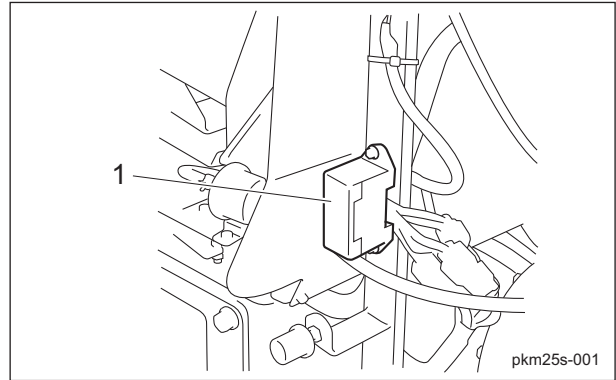
Change of Constant Velocity Joint\_001

1	Hydraulic pump
2	Boot band
3	Boot
4	Engine

## Change of Fuse

### Fuse Box

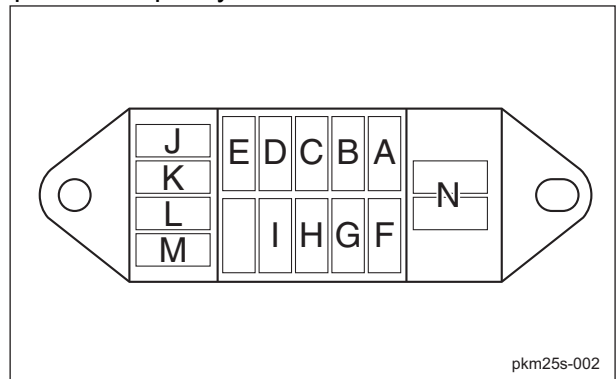
The fuse box includes spare fuses and tools.



Fuse Box\_001

1	Fuse box
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The machine uses a mini fuse for automobiles. Replace an old fuse with a new fuse of the specified capacity.

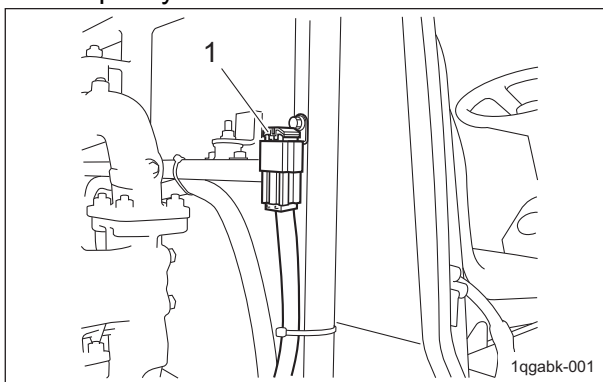


pkm25s-002

A	5A	Proximity sensor, reel rotation stop solenoid
B		Charge lamp, hydraulic lamp, water temperature gauge, buzzer, hour meter, tachometer, fuel gauge
C		Fuel pump
D		Thermo-start lamp
E		Glow lamp timer
F		Starter relay
G		Engine stop solenoid
H		Alternator (IG)
I		Glow lamp timer
J		Spare
K		
L		
M		
N		

### Fusible Link

Fuse capacity of the fusible link is 50 A.



Fusible Link\_001

1	Fusible link
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### Inspection of Oil Leakage

After approximately 50 hours of operation, some joints may be loosened and oil may leak. Check the bottom of the machine for oil leakage.

## Long-Term Storage

### Before Long-Term Storage

- Remove any dirt, grass, debris, or oil stains completely.
- Supply oil and apply grease to appropriate parts.



# EC Declaration of Conformity

We

Manufacture's Name: Kyoisha Co., Ltd.  
Manufacture's Address: 1-26 Miyuki-cho, Toyokawa, Aichi-pref. 442-8530 Japan

declare that

Product: Ride-on Lawnmower  
Make: BARONESS  
Type: LM283  
Starting Serial No.: 10053

compiler of the technical file

Name: Kyoisha U.K.Ltd.  
Address: Unit 5 Hatch Industrial Park Grewell Road, Basingstoke  
Hampshire RG24 7NG, the United Kingdom

in accordance with the following Directives :

2006/42/EC                      The Machinery Directive and its amending directives

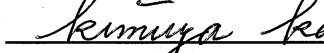
has been designed and manufactured using the following specifications :

ISO12100 : 2010  
EN836 : 1997  
ISO5395 : 1990

References of other Community Directives applied

2000/14/EC , 2004/108/EC

Place: Japan  
Date : January 30, 2012

Signature :   
Name : Kimiya Kaneko  
Position : Quality Dept. Manager

# Manufacturer's Declaration of Conformity for

## Product Identification

Product : Ride-on lawnmower  
Make : BARONESS  
Type : LM283  
Version(s) : Not Applicable  
Starting Serial No. : 10053  
Measured Sound Power Level : LWA 98.63 dB  
Guaranteed Sound Power Level : LWA 103 dB  
Manufacturer  
Name : Kyoisha Co., Ltd.  
Address : 1-26 Miyuki-cho, Toyokawa, Aichi-pref.,  
Japan

## Technical Documentation

Keeper's Name : Kyoisha Co., Ltd.  
Keeper's Address : 1-26 Miyuki-cho, Toyokawa, Aichi-pref.,  
Japan

Conformity Assessment Procedure : Internal Control of Production with Assessment of  
Technical Documentation and Periodical Checking  
( Annex VI ) of 2000/14/EC-2005/88/EC

## Involved Notified Body

Name : SNCH  
Address : 11, Route de Sandweiler  
5230 Sandweiler  
Luxembourg

## Technical Construction File

Date : December 8, 2011  
Technical Construction File No. : TCLM283-01  
Test Laboratory : TUV Rheinland Luxemburg GmbH  
2a, Kalchesbruck  
L-1852 Luxembourg

Certificate / Report No. : SNCH\*2000/14\*2005/88\*1837\*01/TCLM283-01

## Means of conformity

The product is in conformity with the Directive relating to the noise emission in the environment by  
equipment for use outdoors 2000/14/EC-2005/88/EC, in accordance with Article 12 of the Directive.

## References of other Community Directives applied

2006/42/EC , 2004/108/EC

Signature :

  
Kimiya Kaneko

Manager  
Quality Dept.  
Kyoisha Co., Ltd.

Date : January 30, 2012

**BARONESS**<sup>®</sup>  
Quality on Demand

 **KYOEISHA CO., LTD.**  
Head Office 1-26, Miyuki-cho, Toyokawa, Tel : (0533) 84-1390  
Aichi-Pref. 442-8530 Japan. Fax : (0533) 89-3623