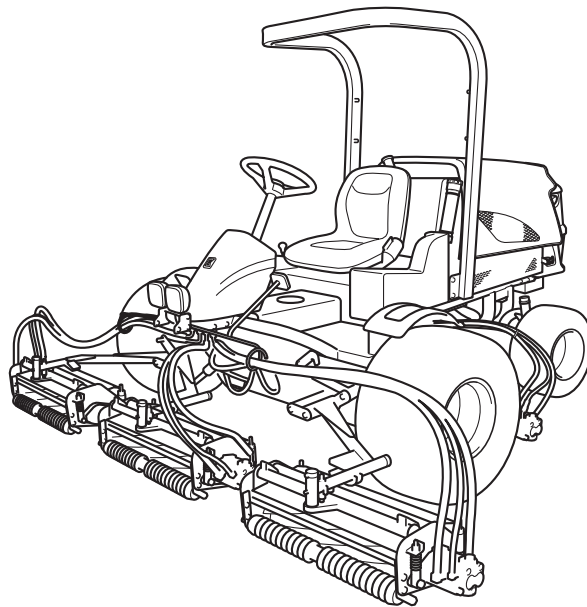


# ***LM2400***

5-Unit Reel Mower

## Owner's Operating Manual



Serial No. LM2400 : 10206-

"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

Original Instructions Ver.2.2

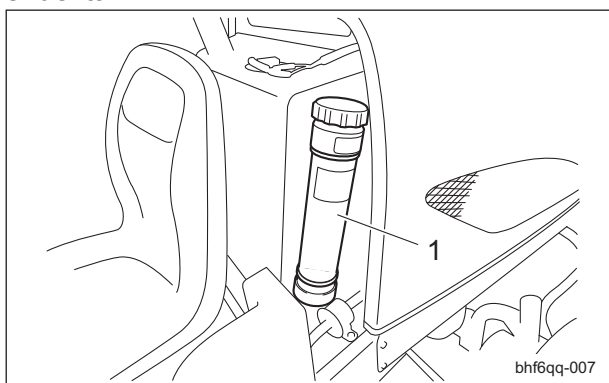
# Greeting

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

## **Keeping the Owner's Operating Manual**

Keep this Manual in the box on the left side of the fuel tank.



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.

Be sure to also read the Owner's Manual for the engine, battery, etc.

Maintenance should only be performed by a certified specialist.

If you have any questions concerning maintenance or genuine parts, please contact your local Baroness dealer or Kyoisha.

When making inquiries about this machine, please specify the machine's model designation and serial number.

When loaning or transferring this machine, please also provide this manual together with the machine.

Kyoisha Co., Ltd.

### Caution

The information described in this manual is subject to change for improvement without prior notice. 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.

## Warning Symbols

This manual uses the following warning symbols for handling precautions that are important for your safety.



696cq5-001

Warning symbol

This symbol indicates the articles regarding “Danger,” “Warning,” or “Caution.”

Those articles describe important safety precautions and so read them carefully to understand completely before operating the machine.

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.

### Important

This symbol indicates precautions on the mechanism of the machine.

# Introduction

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## Purpose

This machine is intended for cutting turf grass at golf courses.

Do not use this machine in any way other than its intended purpose, and do not modify the machine.

Operating this machine for other purposes and modifying it may be very dangerous and may cause damage to the machine.

In addition, this machine is not authorized for operation as a special motor vehicle. Do not operate it on public roads.

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LM2400

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# Safety

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.

## Safe Operating Practices

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

### Training

1. Read this 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 manual to them.
3. 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

4. Never allow children or people unfamiliar with these instructions to use or service the machine.  
Local regulations may restrict the age of the operator.
5. The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people, or property.
6. Keep in mind that the owner, operator, and mechanic are responsible for accidents or hazards occurring to other people or their property.

### Preparation

1. 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.
2. 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.
3. 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.
4. 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] 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.
- [3] Refuel outdoors only and do not smoke while refueling.
- [4] 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.
- [5] Replace all fuel tanks and container caps securely.



5. Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.
6. 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.
7. Replace faulty mufflers.
8. On multi-cylinder/multi-reel machines take care as rotating one cylinder/reel can cause other cylinder/reels to rotate.
6. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
7. Do the following before leaving the operator's position.
  - [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] Stop the engine and remove the key.

## Operation

1. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
2. Only operate in good light, keeping away from holes and hidden hazards.
3. Before attempting to start the engine, disengage all attachments, shift into neutral, and engage the parking brake. Only start engine from the operator's position. Use seat belts if provided.
4. 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.
5. Never operate the machine with damaged guards, shields, or without safety protective devices in place. Be sure all interlocks are attached, adjusted and functioning properly.
8. Disengage the drive to attachments, stop the engine, and remove the ignition key in the following conditions.
  - [1] Before refueling.
  - [2] Before removing the grass catcher/catchers.
  - [3] Before making height adjustment unless adjustment can be made from the operator's position.
  - [4] Before cleaning blockages.
  - [5] Before checking, cleaning, or working the machine.
  - [6] After striking a foreign object or if an abnormal vibration occurs. Inspect the machine for damage and make repairs before restarting and operating the equipment.
9. Keep hands and feet away from the cutting units and the rotating parts.
10. Look behind and down before backing up to be sure of a clear path.
11. Do not carry passengers.
12. Never operate while people, especially children, or pets are nearby.
13. Slow down and use caution when making turns and crossing roads and sidewalks.
14. Stop the blades rotating before crossing surfaces other than grass.
15. Disengage drive to attachments when transporting or not in use.
16. When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
17. Do not operate the machine under the influence of alcohol or drugs.

# Safety

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18. 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.  
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.  
When using a loading ramp, select one with sufficient strength, length, and width and that will not cause the machine to slip.
19. Close the fuel valve before transporting the machine.
20. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
21. Do not take your eyes off the road ahead. Do not operate the machine with no hands.
22. 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.
9. Never allow untrained personnel to service machine.
10. Allow the engine/muffler to cool before checking/maintenance.
11. Appropriately manage and correctly use the tools necessary for servicing or adjusting the machine.
12. Use jack stands to support components when required.
13. Carefully release pressure from components with stored energy.
14. Be sure to depressurize the hydraulic system before performing maintenance operations on it such as removing hydraulic equipment.
15. 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.
16. 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.  
If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

## 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. When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.
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. Allow the engine to cool before storing in any enclosure.
5. Only cover the machine with a sheet after hot parts have sufficiently cooled down.
6. Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
7. If the engine is provided with a shut-off valve, shut off valve while storing or transporting.
8. Do not store fuel near flames.
17. Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
18. Make sure that parts such as wires are not touching each other and that their covers have not come off.
19. Use care when checking the cylinders/reels and bed knives.
  - [1] Wear gloves and use caution when servicing them.
  - [2] Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
20. On multi-cylinder/multi-reel machines take care as rotating one cylinder/reel can cause other cylinder/reels to rotate.
21. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.

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. Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
24. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
25. Check the grass catcher frequently for wear or deterioration.
26. If the fuel tank has to be drained, do this outdoors.



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Disposal

# Disposal

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## Recycle and Waste Disposal

### About Recycle

Recycling battery etc. is recommended for environmental conservation and economical use of resources.

It may be required by local laws.

### 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, rubber products, and wires etc.)

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Specifications .....Page 3-2

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# Product Overview

## Specifications

### Specifications

Model		LM2400	
Dimensions	Total length		119.29 in 303 cm
	Total width	During operation	125.20 in 318 cm
		During transport	88.98 in 226 cm
	Total height	Steering wheel	52.36 in 133 cm
ROPS		77.17 in 196 cm	
Weight	Machine (empty fuel tank) with Slight lift, ROPS	2905.64 lb 1,318 kg	
Minimum turning radius		114.17 in 290 cm	
Engine	Model		Kubota D1105-T (Diesel Turbo)
	Type		Vertical Water-cooled 4-cycle diesel engine
	Total displacement		68.52 cu.in. 1,123 cm <sup>3</sup> (1.123 L)
	Maximum output		24.5 kW (33.3 PS)/3,000 rpm
Fuel tank capacity		Diesel 10.04 U.S.gal. Diesel 38.0 dm <sup>3</sup> (38.0 L)	
Fuel consumption		188 g/PS · h (rated output) 255 g/kW · h (rated output)	
Engine oil capacity		0.82 U.S.gal. 3.1 dm <sup>3</sup> (3.1 L)	
Operating width (Mowing width)		109.06 in 277 cm	
Operating height (Mowing height)		0.394 - 2.362 in 10 - 60 mm	
Blades		9	
Drive	Traveling		HST (Full time 4WD)
	Mowing		Hydraulic
Speed (HST)	Forward	0 - 9.94 mph 0 - 16.0 km/h	
	Reverse	0 - 4.97 mph 0 - 8.0 km/h	
Speed (Mechanical)		-	
Efficiency		5.4 acres/hour (6.22 mph x mowing width x 0.8) 22,160 m <sup>2</sup> /h (10.0 km/h x mowing width x 0.8)	
Maximum inclination for operation		15 degrees	
Tire size	Front wheel	26.5 x 14.00 - 12	
	Rear wheel	20 x 10.00 - 10	
Tire pneumatic pressure	Front wheel	20.30 psi 140 kPa (1.4 kgf/cm <sup>2</sup> )	
	Rear wheel	14.50 psi 100 kPa (1.0 kgf/cm <sup>2</sup> )	
Battery		75D23L	

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



Sound pressure level

## Sound pressure level

This machine was confirmed to have a continuous A-weighted sound pressure level of 88 dB by measuring identical machines in accordance with the procedure specified in ISO5395-1:2013.

Sound power level

## Sound power level

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

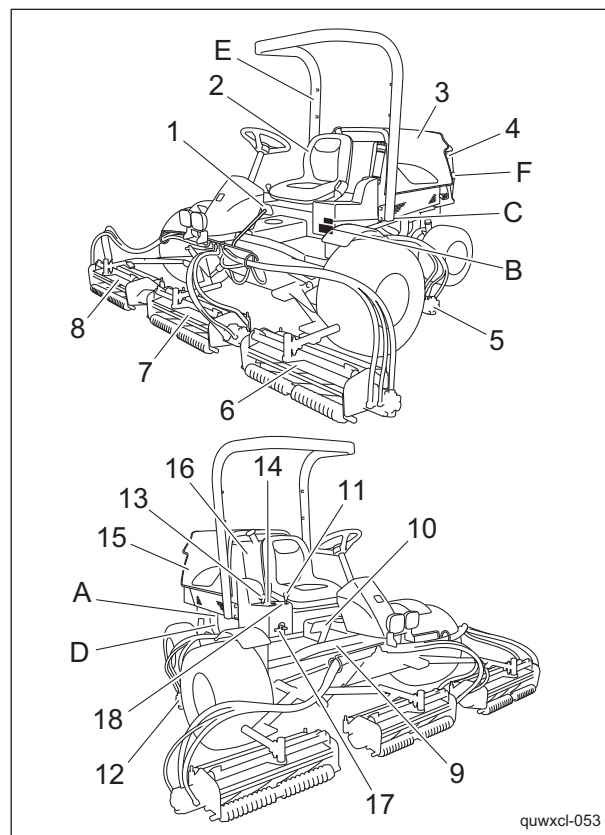
Vibration level

## Hand-arm vibration

This machine was confirmed to transmit a vibration level of  $2.90 \text{ m/s}^2$  to hands and arms by measuring identical machines in accordance with the procedure specified in ISO 5349-1:2001, ISO 5349-2:2001.

## Whole body vibration

This machine was confirmed to transmit a vibration level of  $0.97 \text{ m/s}^2$  to the whole body by measuring identical machines in accordance with the procedure specified in ISO 2631-1:1997, ISO 2631-2:2003.

**Names of Each Section**

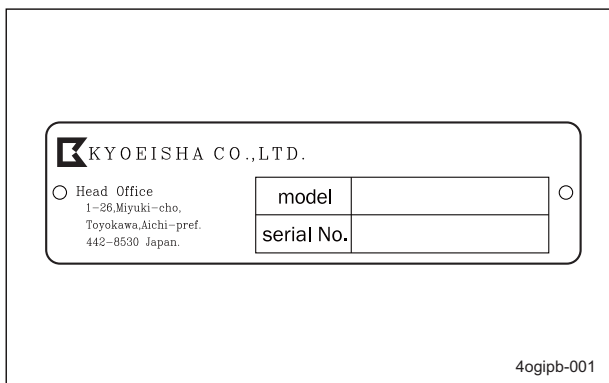
Names of Each Section\_001

# Product Overview

1	Brake pedal
2	Seat
3	Hood
4	Muffler
5	Mower unit #3
6	Mower unit #5
7	Mower unit #1
8	Mower unit #4
9	Parking brake lock lever
10	Traveling pedal
11	Mower unit up/down lever
12	Mower unit #2
13	Throttle lever
14	Reel rotation switch
15	Battery
16	Fuel tank
17	Stop valve
18	Light switch
A	Serial number plate
B	Specification decal
C	Noise emission decal
D	Year of manufacture decal
E	ROPS compliance decal
F	Battery capacity decal

## Serial Number Plate

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

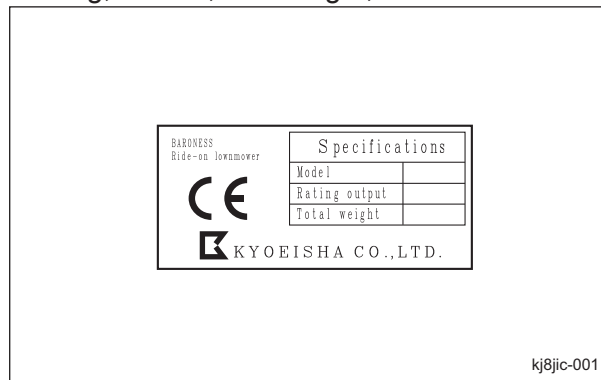


Serial Number Plate\_001

## Specification Decal

(For Europe)

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

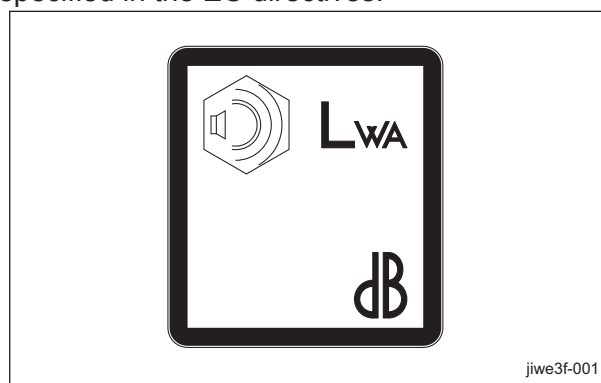


Specification Decal\_001

## Noise Emission Decal

(For Europe)

The noise emission decal indicates the sound power level determined by measuring identical machines in accordance with the procedure specified in the EC directives.

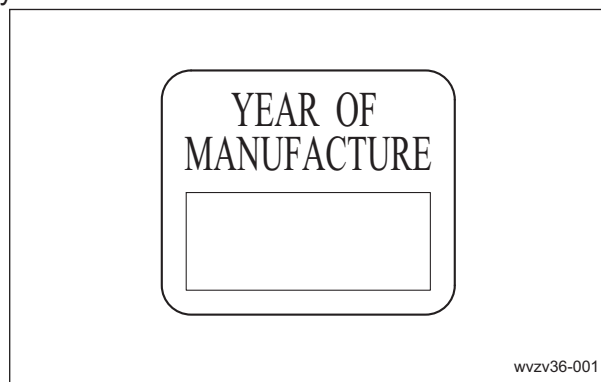


Noise Emission Decal\_001

## Year of Manufacture Decal

(For Europe)

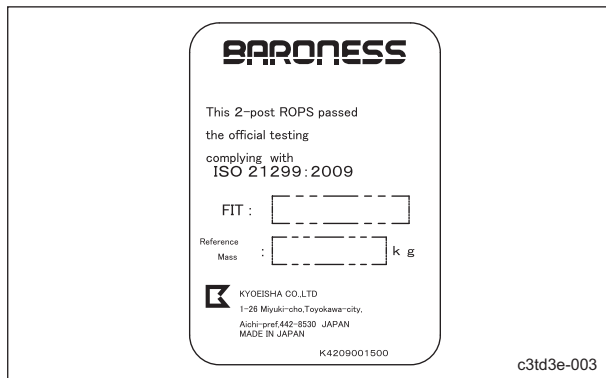
The year of manufacture decal indicates the year when this machine was manufactured.



Year of Manufacture Decal\_001

## ROPS Authentication Decal

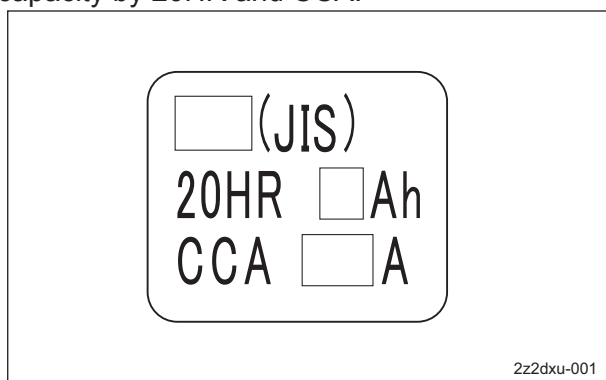
The ROPS authentication decal indicates the manufacturer, model, etc., in accordance with International Standard ISO 21299:2009.



ROPS Authentication Decal\_001

## Battery capacity decal

(For Europe)  
The battery capacity decal indicates the capacity by 20HR and CCA.

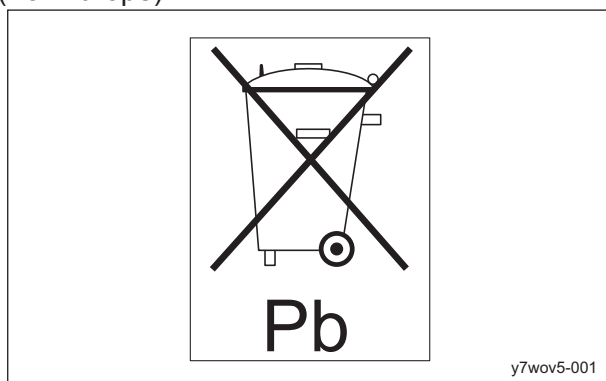


Battery capacity decal\_001

## Recycle Decal

Recycle Decal illustrates Recycle Mark in accordance with local regulation.

(For Europe)



Recycle Decal\_001

(For USA)



Recycle Decal\_002

## Safety Signs and Instruction Signs

### About Safety Signs and Instruction Signs

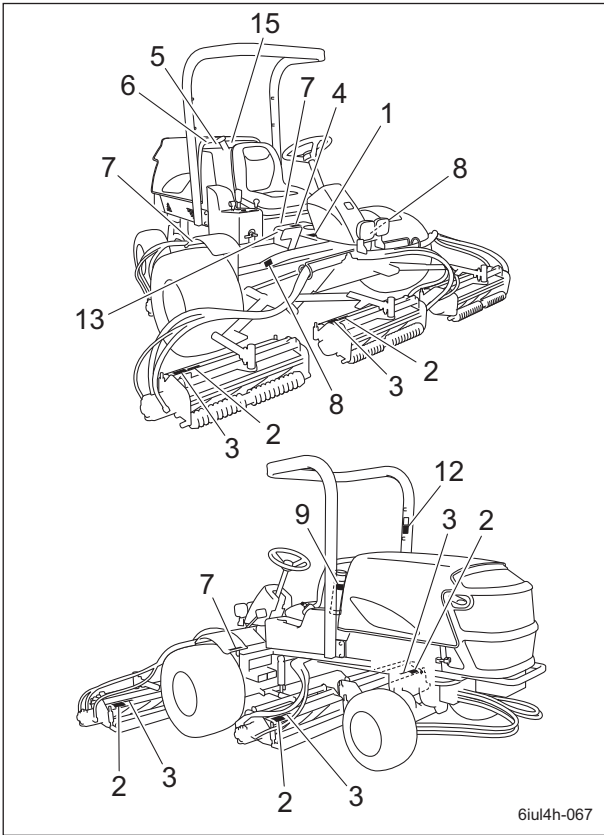


Safety decals and instruction decals are attached to this machine. Make sure that they are preserved in their entirety. If they are damaged, become dirty, or peel off, replace them with new ones.

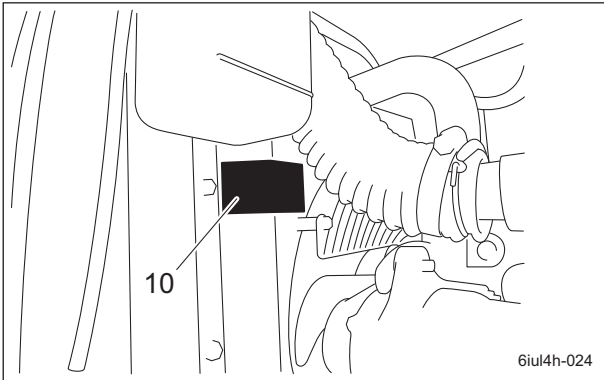
Part numbers for decals that need to be replaced are listed in the parts catalog. Order them from a Baroness dealer or Kyoisha.

# Product Overview

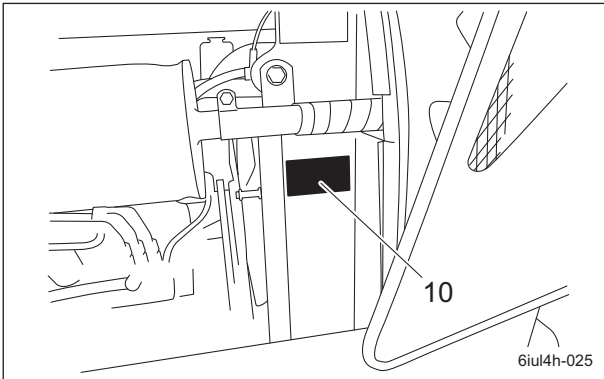
## Positions of Safety Decals and Instruction Decals



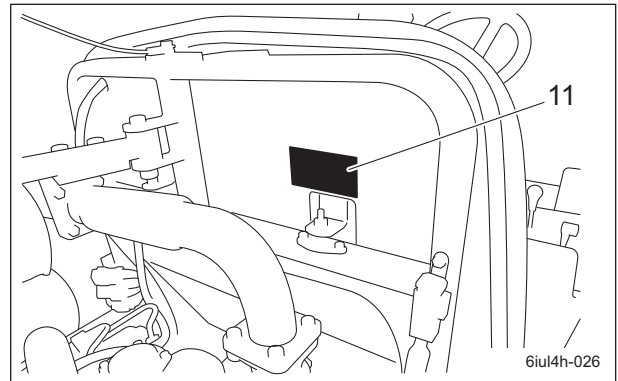
Positions of Safety Decals and Instruction Decals\_001



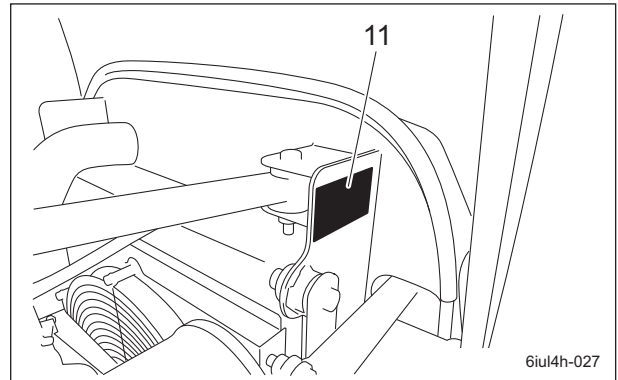
Positions of Safety Decals and Instruction Decals\_002



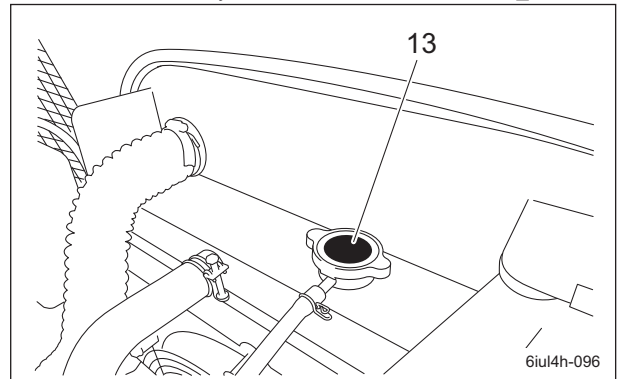
Positions of Safety Decals and Instruction Decals\_003



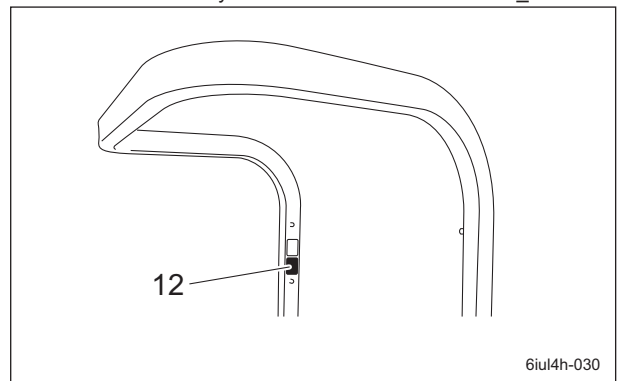
Positions of Safety Decals and Instruction Decals\_004



Positions of Safety Decals and Instruction Decals\_005


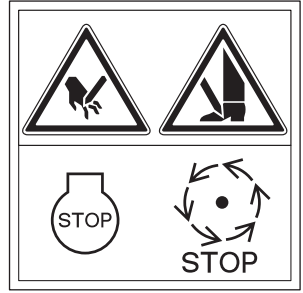


Positions of Safety Decals and Instruction Decals\_006

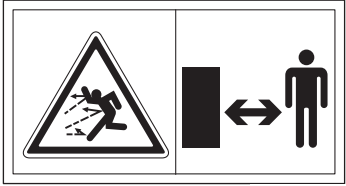
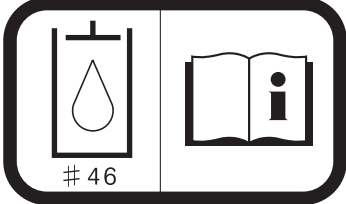






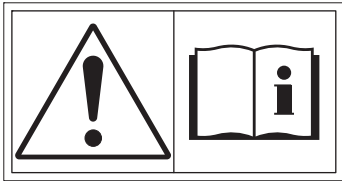
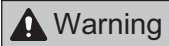
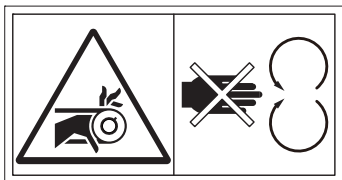


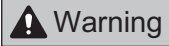
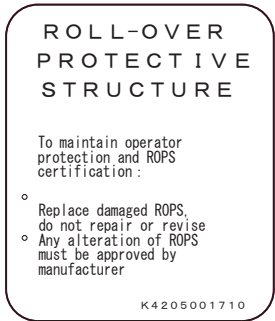

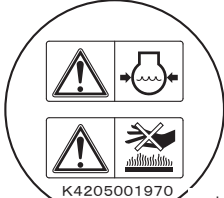

Positions of Safety Decals and Instruction Decals\_007

## Description of Safety Decals and Instruction Decals

<p>1</p>	 <p>qiqqnx-066</p>	<p>LM2400-0918Z0 Decal for operation 2</p> <ol style="list-style-type: none"> <li> <p><b>Warning</b></p> <p>Read the Owner's Operating Manual.</p> </li> <li> <p><b>Warning</b></p> <p>Apply the parking brake, stop the engine, remove the ignition key, and then leave the machine.</p> </li> <li> <p><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><b>Danger</b></p> <p>May cut your hand or leg - Keep hands and feet away from moving parts.</p> </li> <li> <p><b>Warning</b></p> <p>Be careful of exhaust emissions.</p> </li> <li> <p><b>Danger</b></p> <p>Rollover - Do not work on slopes of 15 degrees or more. When you descend a slope, lower the mower units and then drive at low speed. For ROPS equipped machine, fasten your seatbelt.</p> </li> </ol>
<p>2</p>	 <p>qiqqnx-010</p>	<p>K4205001600 Decal for caution to mutilation</p> <p><b>Danger</b></p> <p>May cut your hand or leg - Stop the cutter rotation and engine. Otherwise you may get injured.</p>

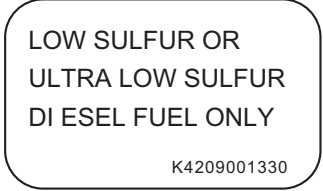
# Product Overview

<p>3</p>	 <p>qigqnx-011</p>	<p>K4205001650 Decal, caution to flying object</p> <p><b>⚠ Danger</b></p> <p>Caution to flying object - When the blades are rotating, keep away from the machine. All bystanders must keep a safe distance from the machine.</p>
<p>4</p>	 <p># 46 K4209000980 qigqnx-020</p>	<p>K4209000980 Hydraulic oil icon Read the Owner's Operating Manual.</p>
<p>5</p>	 <p>K4209001000 qigqnx-021</p>	<p>K4209001000 Diesel fuel icon Use diesel fuel.</p>
<p>6</p>	 <p>K4205001940 qigqnx-041</p>	<p>K4205001940 Decal, fire prohibited</p> <p><b>⚠ Danger</b></p> <p>Keep away from fire.</p>
<p>7</p>	 <p>K4209001340 qigqnx-036</p>	<p>K4209001340 Decal, caution "DO NOT STEP"</p> <p><b>⚠ Caution</b></p> <p>Do not step here.</p>
<p>8</p>	 <p>K4205001900 qigqnx-067</p>	<p>K4205001900 Decal, caution for mower lock</p>

<p>9</p>	 <p>qigqnx-017</p>	<p>K4205001560 Decal, read Owner's manual</p> <p> <b>Warning</b></p> <p>Read the Owner's Operating Manual.</p>
<p>10</p>	 <p>qigqnx-012</p>	<p>K4205001530 Decal, caution to rotating object</p> <p> <b>Danger</b></p> <p>Watch for rotating parts - Keep your hands away from the belts while the engine is running.</p>
<p>11</p>	 <p>K4205001540 qigqnx-022</p>	<p>K4205001540 Decal for caution to hot parts</p> <p> <b>Warning</b></p> <p>High temperature - Do not touch. Otherwise, you will get burned.</p>
<p>12</p>	 <p>qigqnx-072</p>	<p>K4205001710 Decal, caution for ROPS Replace a damaged ROPS. Do not repair or alter. (Only if equipped with ROPS)</p>
<p>13</p>	 <p>qigqnx-015</p>	<p>K4205001330 Decal, caution to noise</p>
<p>14</p>	 <p>K4205001970 qigqnx-045</p>	<p>K4205001970 Decal, caution for spouting coolant</p> <p> <b>Caution</b></p> <p>Caution for spouting coolant - Do not open while hot.</p>

# Product Overview

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15	 <p>LOW SULFUR OR ULTRA LOW SULFUR DIESEL FUEL ONLY</p> <p>K4209001330</p> <p>qigqnx-076</p>	<p>K4209001330</p> <p>Decal, diesel instructions</p> <p>Use low sulfur or ultra-low sulfur diesel fuel only.</p>
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# Handling Instructions

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# Handling Instructions

## Inspection Before Use

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

### Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)

#### Inspection of Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)

The reel cutter (cutting cylinder) and bed knife (bottom blade) may become dull due to frequent use, objects crushed during mowing, or damage caused during transportation. Inspect the reel cutter (cutting cylinder) and bed knife (bottom blade), and if necessary, adjust the blade engagement, perform back lapping, or sharpen or replace 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.
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 (relief) remains at the point of reel cutter (cutting cylinder).
6. Make sure that the welding between the reel cutter (cutting cylinder) and the disc has not come off.

### Radiator Cover

#### Inspection of Radiator Cover

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

#### Cleaning of Radiator Cover

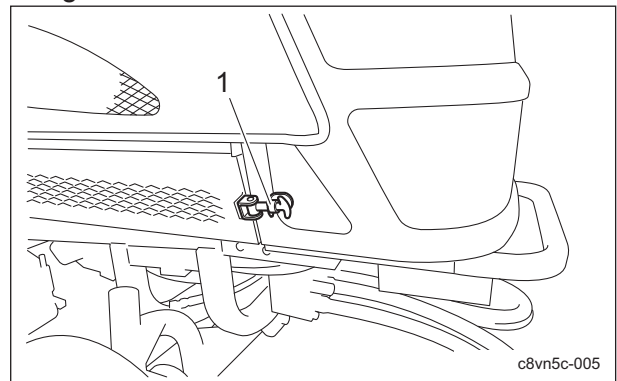
##### Important

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.

Especially after operating the machine in a dusty environment, it is important to remove dust as soon as possible.

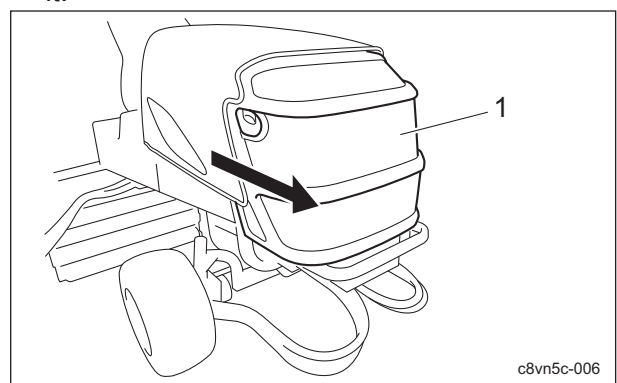
1. Unlock the rubber hooks on the left and right sides.



Cleaning of Radiator Cover\_001

1	Rubber hook
---	-------------

2. Pull the radiator cover to the back to open it.



Cleaning of Radiator Cover\_002

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

3. Carefully clean the front and back of the radiator cover with water or compressed air.

# Handling Instructions

## Radiator

1	Radiator
2	Oil cooler

### 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 to the radiator.
2. Make sure that the radiator is not contaminated.

### Cleaning of Radiator

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

#### Important

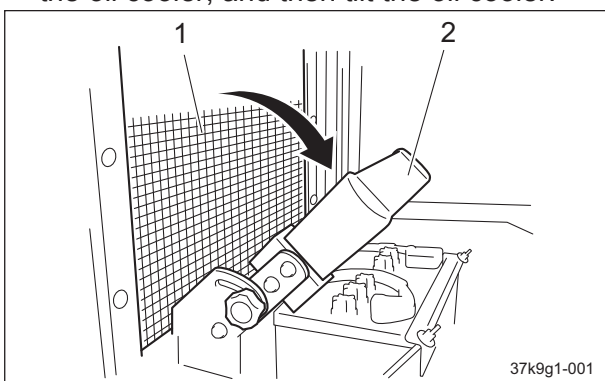
An unclean radiator may cause overheating or damage to the engine. It may also cause malfunction of the hydraulic system.

#### Important

Do not use solid objects, such as a spatula or screwdriver, or high-pressure water 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.

1. Open the radiator cover.
2. Loosen the knobs on the left and right of the oil cooler, and then tilt the oil cooler.



Cleaning of Radiator\_001

3. Carefully clean the front and back of the radiator with water or compressed air.

## Coolant

### Inspection of Coolant

For details on handling the engine, please refer to the Engine's Owner's Manual.

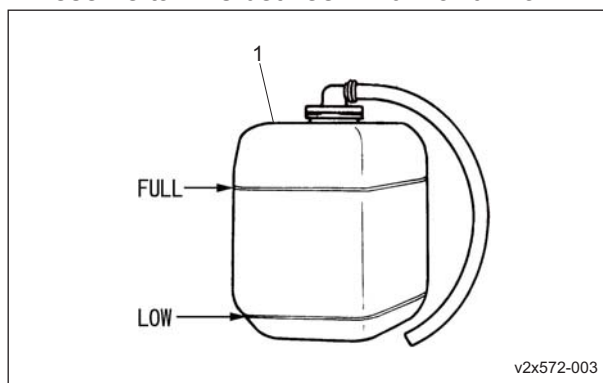
#### Warning

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."



v2x572-003

Inspection of Coolant\_001

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

# Handling Instructions

## Coolant Supply

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

**Warning**

Do not touch the radiator or coolant during engine operation or right after the engine has been turned off. Otherwise, you may get burned due to high temperatures. 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, and then grab the cap with a thick cloth and gradually open the cap.

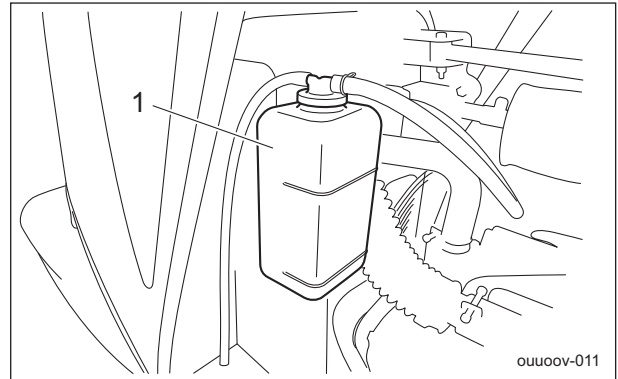
**Important**

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, and then pour it into the radiator and reserve tank.

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.

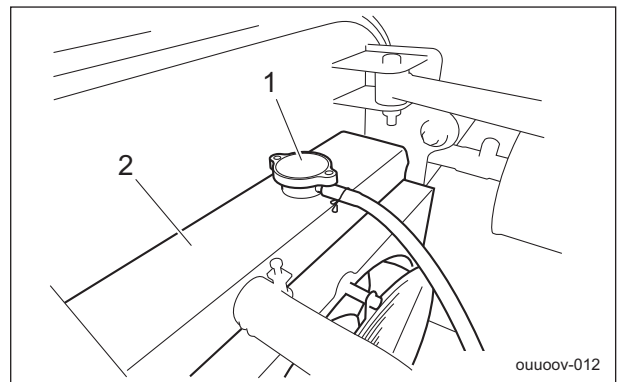


Coolant Supply\_001

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

2. If no coolant is in the reserve tank, follow the steps below to fill the tank with clean water.

- [1] Open the radiator cap, and then supply clean water up to the opening.
- [2] Open the reserve tank cap, and then supply clean water up to the "FULL" mark.



Coolant Supply\_002

1	Radiator cap
2	Radiator

# Handling Instructions

## 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, and 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).

## Oil cooler

### Inspection of Oil Cooler

1. Make sure that there is no damage to the oil cooler.
2. Make sure that the oil cooler is not contaminated.

### Cleaning of Oil Cooler

### Caution

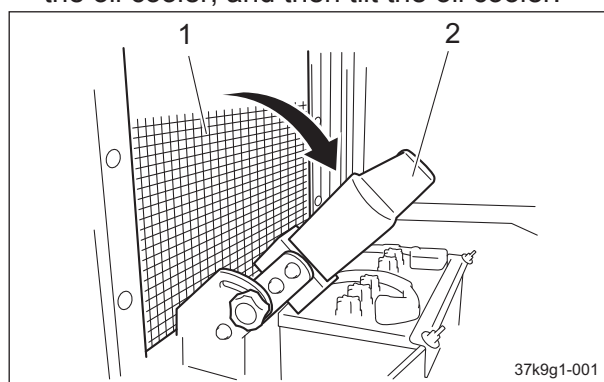
An unclean oil cooler may cause malfunction of the hydraulic system.

### Important

Do not use solid objects, such as a spatula or screwdriver, or high-pressure water 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 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.

1. Open the radiator cover.
2. Loosen the knobs on the left and right of the oil cooler, and then tilt the oil cooler.



Cleaning of Oil Cooler\_001

1	Radiator
2	Oil cooler

3. Carefully clean the front and back of the oil cooler with water or compressed air.

## Hydraulic Oil

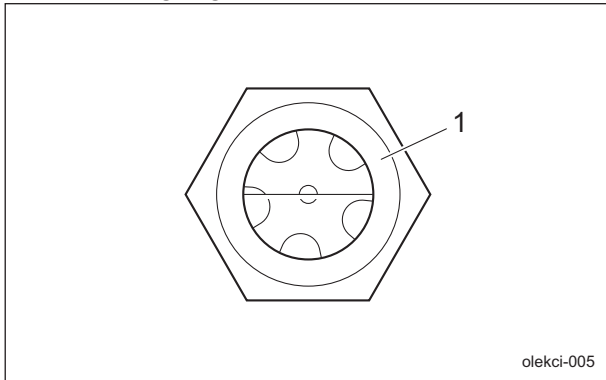
### Inspection of Hydraulic Oil

The oil gauge is on the side of the hydraulic tank.

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

# Handling Instructions

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



Inspection of Hydraulic Oil\_001

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

3. Check underneath the machine for oil leakage.

## Hydraulic Oil Supply

**Important**

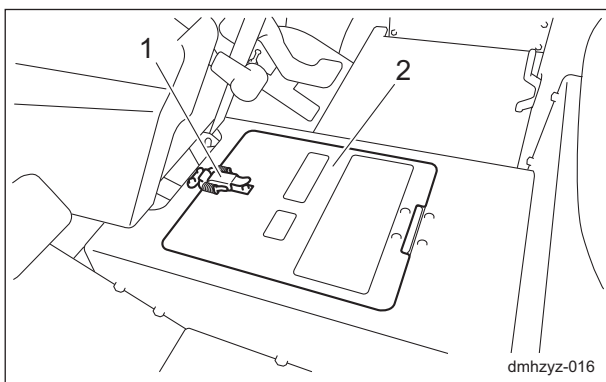
Do not mix different types of oil.

**Important**

Use Shell Tellus S2M46 (or equivalent) as hydraulic oil.

1. Follow the steps below to supply hydraulic oil if the oil level is low.

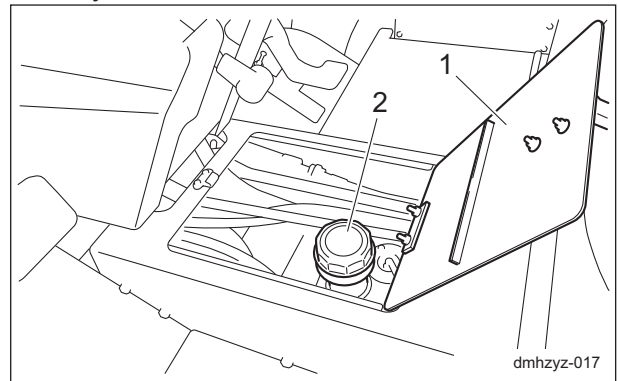
- [1] Release the catch clip and open the center cover.



Hydraulic Oil Supply\_001

1	Catch clip
2	Center cover

- [2] Open the tank cap and pour hydraulic oil from the fill port until the oil level reaches the middle of the oil gauge on the hydraulic tank.



Hydraulic Oil Supply\_002

1	Center cover
2	Tank cap

- [3] Tighten the tank cap securely.

- [4] Close the center cover and fasten with the catch clip.

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

# Handling Instructions

## 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.

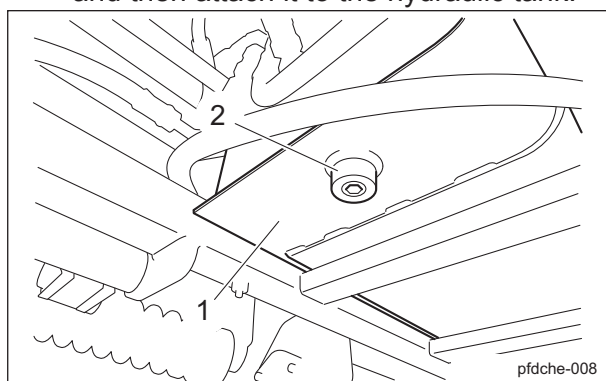
### Caution

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

### Important

Use Shell Tellus S2M46 (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.
  - [2] On a level surface, lower the mower units, and then stop the engine.
  - [3] Remove the drain plug of the hydraulic tank, and then drain the old oil into a container.
  - [4] Wind new sealing tape on the drain plug, and then attach it to the hydraulic tank.

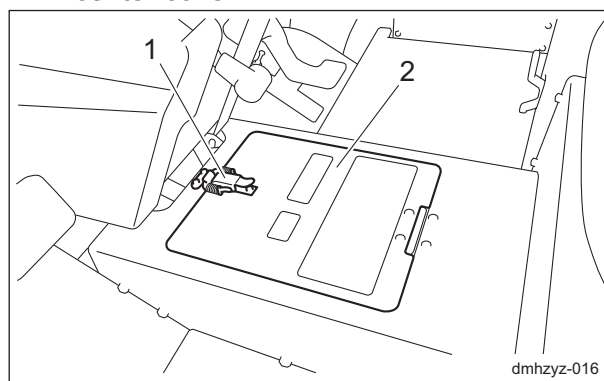


Change of Hydraulic Oil\_001

1	Hydraulic tank
2	Drain plug

2. Follow the steps below to pour new oil. The hydraulic tank capacity is approximately 35.0 dm<sup>3</sup> (35.0 L).

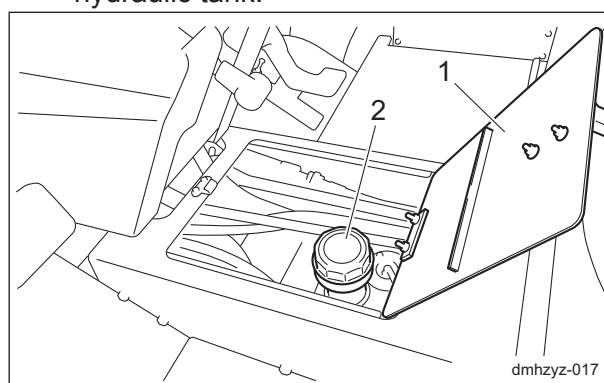
- [1] Release the catch clip and open the center cover.



Change of Hydraulic Oil\_002

1	Catch clip
2	Center cover

- [2] Open the tank cap and pour hydraulic oil from the fill port until the oil level reaches the middle of the oil gauge on the hydraulic tank.



Change of Hydraulic Oil\_003

1	Center cover
2	Tank cap

- [3] Tighten the tank cap securely.
  - [4] Close the center cover and fasten with the catch clip.
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, and then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.

# Handling Instructions

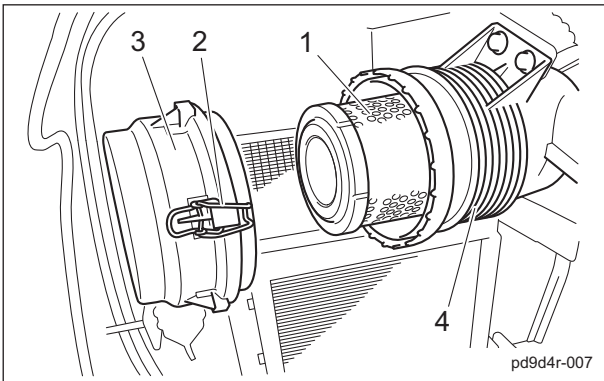
5. Check underneath the machine for oil leakage.

## Air Cleaner

### Inspection of Air Cleaner

For details on handling the engine, please refer to the separate Engine Handling Manual. The air cleaner is a component that removes dirt from the intake air to prevent wear of the cylinder liners and piston rings so that the engine will always operate smoothly. A contaminated air cleaner element may cause malfunction of the engine.

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



Inspection of Air Cleaner\_001

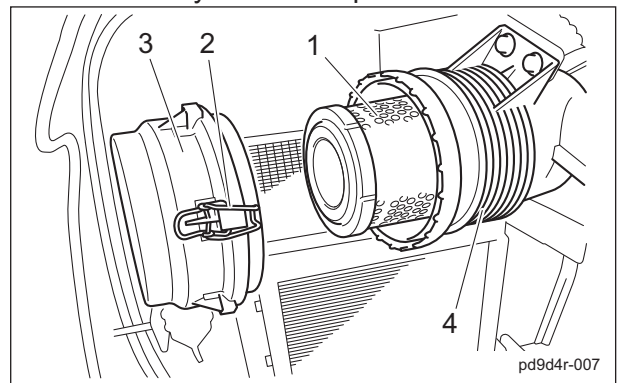
1	Air cleaner element
2	Clip
3	Air cleaner cap
4	Air cleaner body

### Cleaning of Air Cleaner

For details on handling the engine, please refer to the separate Engine Handling 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. Follow the steps below to clean the air cleaner.
  - [1] Remove the clips from the two locations, remove the air cleaner cap, and 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 compressed air from its inside to remove dust and dirt. If the air cleaner element is extremely contaminated, replace it with a new one.
- [3] Attach the air cleaner element to the air cleaner body.
- [4] Replace the air cleaner cap, and then fix it securely with 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 Engine's Owner's Manual. A contaminated air cleaner element may cause malfunction of the engine. To maximize the life of the engine, replace the air cleaner element at the appropriate times.

1. The timing for replacing the air cleaner element is described below.
  - [1] Replace the air cleaner element in accordance with the Maintenance Schedule.
  - [2] If it is significantly contaminated, replace it, even if the hours of operation do not exceed the specified time.
2. Replace the air cleaner element in the same manner as cleaning the air cleaner. "Cleaning of Air Cleaner" (Page 4-8)



# Handling Instructions

## Battery

### Inspection of Battery

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

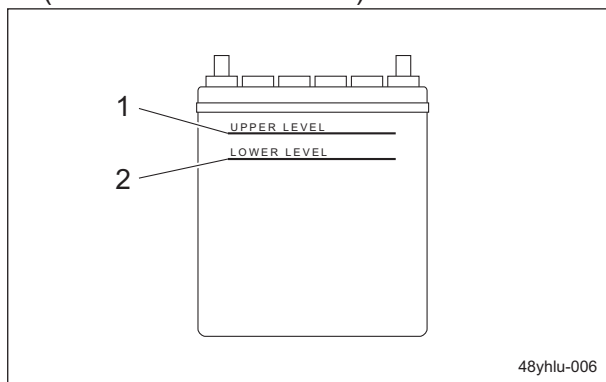
**⚠ Danger**

Keep fire away while inspecting or charging the battery.  
The battery may explode.

**⚠ Warning**

Do not allow the battery fluid level to become lower than the LOWER LEVEL (minimum fluid level line).  
The battery may explode if it is used or charged while the battery fluid level is at the LOWER LEVEL (minimum fluid level line).

1. Clean the areas around the battery fluid level lines using a cloth dampened 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 Battery's Owner's Manual.

**⚠ Danger**

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

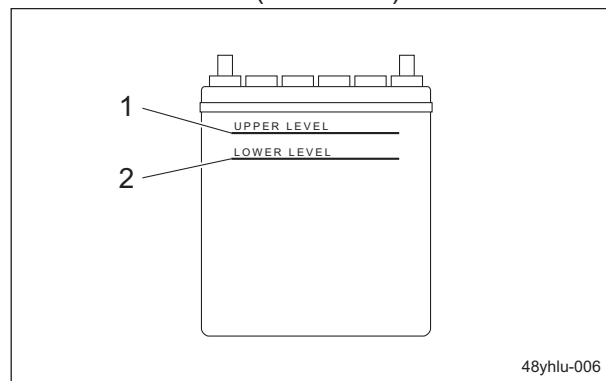
**⚠ Warning**

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

**⚠ Caution**

Implement after the engine and muffler etc. have well cooled down.  
Otherwise you may get burned.

1. If the battery fluid level is lower than halfway 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

# Handling Instructions

## Tire

### Inspection of Tires

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

	Tire size	Pneumatic pressure
Front wheel	(26.5 x 14.00 - 12)	140 kPa (1.4 kgf/cm <sup>2</sup> )
Rear wheel	(20 x 10.00 - 10)	100 kPa (1.0 kgf/cm <sup>2</sup> )

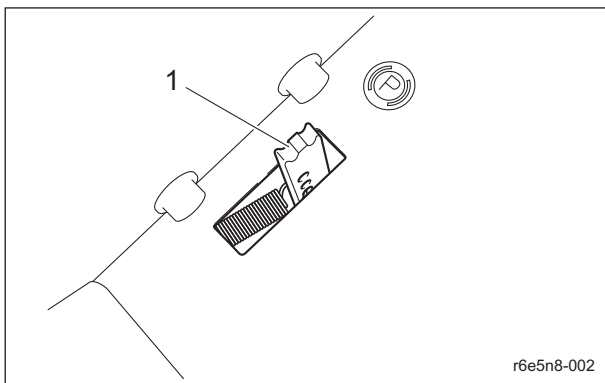
## Brake

### Inspection of Brake

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

### Inspection of Parking Brake

1. Make sure that the parking brake is applied after depressing the brake pedal and moving the parking brake lock lever forward.



Inspection of Parking Brake 001

1	Parking brake lock lever
---	--------------------------

2. Make sure that the brake is not applied even slightly after you depress the brake pedal to release it.

## Belt

### Inspection of Belt

#### Caution

The engine must be stopped when the belt is inspected.

#### Caution

If you have removed the cover during inspection, make sure that you replace it in the original position securely. If the cover remains removed, the operator may come in contact with the rotating objects 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.

## Wire

### Inspection of Wire

1. Make sure that the wire is not cracked or damaged.
2. If the wire is cracked or damaged, replace it with a new one immediately.

## Around the Engine

### Inspection of Engine-Associated Parts

For details on handling the engine, please refer to the Engine's Owner's Manual.

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

## Engine Oil

### Inspection of Engine Oil

For details on handling the engine, please refer to the Owner's Manual for the engine.

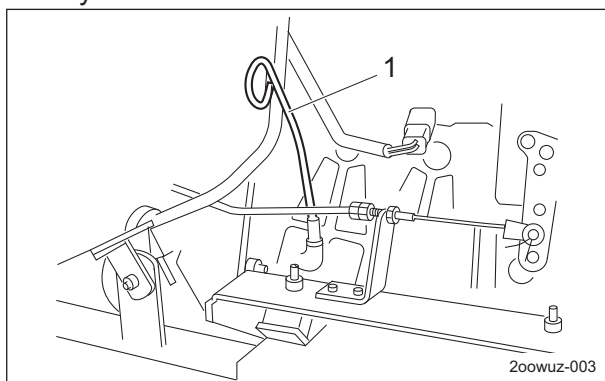
#### Important

Securely tighten the oil level gauge and oil filler cap.

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

# Handling Instructions

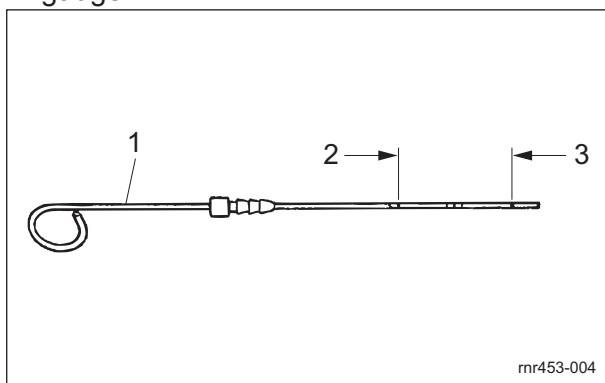
2. Position the machine so that the engine will be level, then insert the oil gauge all the way to check the oil level.



Inspection of Engine Oil\_001

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

3. 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 Owner's Manual for the engine.

**Important**

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

**Important**

Do not mix different types of engine oil.

**Important**

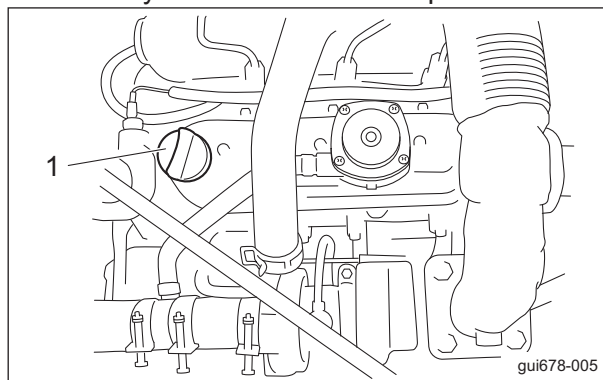
Be sure to use engine oil that is classified as API Service Grade CF or higher, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

**Important**

Securely tighten the oil level gauge and oil filler cap.

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

2. Securely install the oil filler cap.



Supply of Engine Oil\_001

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

3. 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.

# Handling Instructions

## Change of Engine Oil

For details on handling the engine, please refer to the separate Engine Handling 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**

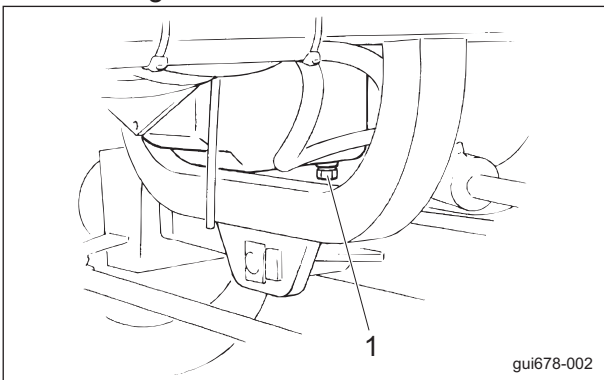
Be sure to use engine oil that is classified as API Service Grade CF or higher, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

**Important**

Securely tighten the oil level gauge and oil filler cap.

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. Follow the steps below to remove the old engine oil.
  - [1] Start and run the engine to warm up the engine oil.
  - [2] Stop the engine on a level place.
  - [3] Remove the drain plug and then drain the old engine oil into a container.



Change of Engine Oil\_001

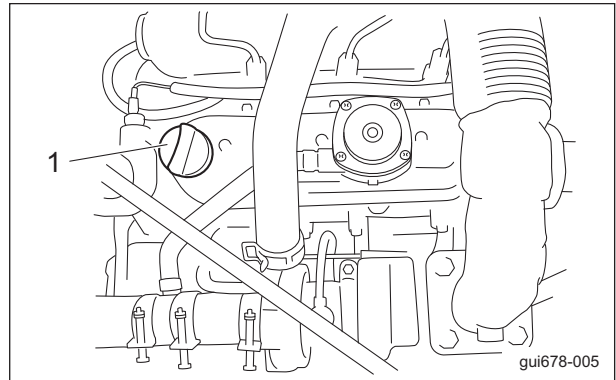
1	Drain plug
---	------------

[4] Re-place the drain plug.

2. Remove the oil filler cap, and then 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).

3. Securely install the oil filler cap.



Change of Engine Oil\_002

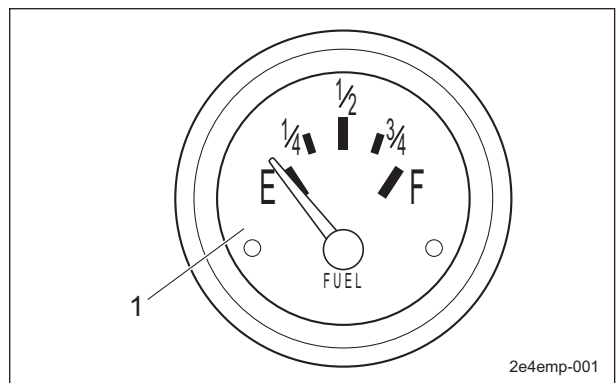
1	Oil filler cap
---	----------------

4. 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.

## Fuel

### Inspection of Fuel Quantity

With the machine on a level surface, observe the fuel gauge in the operation panel to check the fuel level.



Inspection of Fuel Quantity\_001

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

# Handling Instructions

## Fuel Supply

### **⚠ Danger**

Do not supply fuel above the middle (marked in red) of the fuel gauge.  
If you supply too much fuel, it might overflow from the fuel cap when you travel or work on a slope.

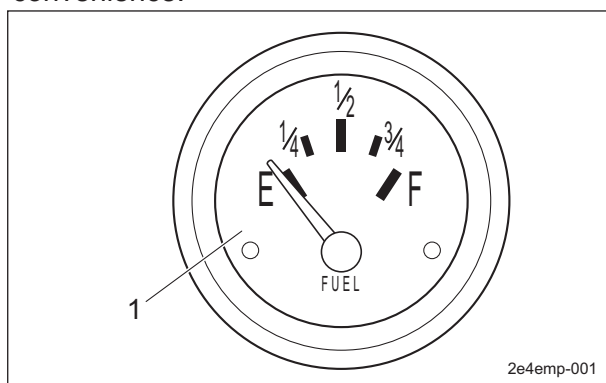
### **⚠ Warning**

Keep fire away while refueling.  
Do not smoke while refueling.

### **⚠ Caution**

Supply fuel before starting the engine.  
Never remove the tank cap or supply fuel while the engine is running.  
When opening the tank cap, wait at least 1 minute after stopping the engine, and then slowly open the cap to release the pressure in the tank.  
Opening the tank cap quickly may cause fuel to burst out.

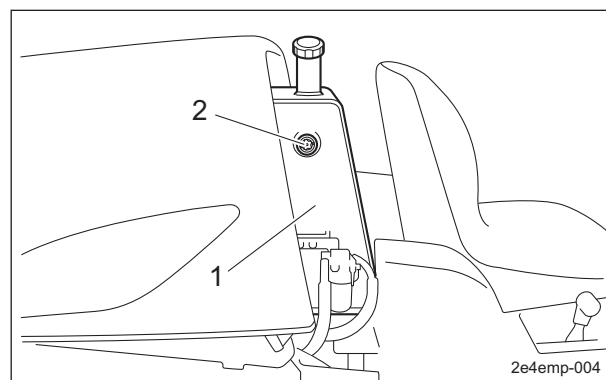
If the fuel gauge located in the operation panel indicates a level close to E (EMPTY), supply fuel (diesel) at your earliest convenience.



Fuel Supply\_001

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

Refuel up to the middle (marked in red) of the fuel gauge.  
The fuel tank capacity is approximately 38.0 dm<sup>3</sup> (38.0 L).



Fuel Supply\_002

1	Fuel tank
2	Fuel gauge

## Water Separator

### Inspection of Water Separator

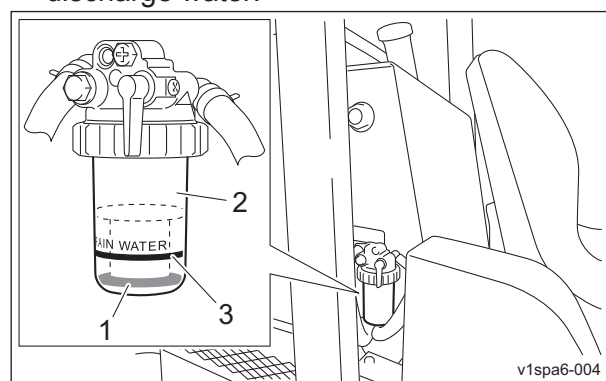
For details on handling the engine, please refer to the Engine's Owner's Manual.

#### Important

Water contamination in the fuel may decrease the engine starting performance and power output and may result in breakage of engine parts.

The water separator removes water from the fuel.

1. Make sure that debris and water have not accumulated in the cup.  
With the float raised, water incorporation is confirmed.  
When the float reaches the discharge level, discharge water.



Inspection of Water Separator\_001

1	Float
2	Cup
3	Discharge level

# Handling Instructions

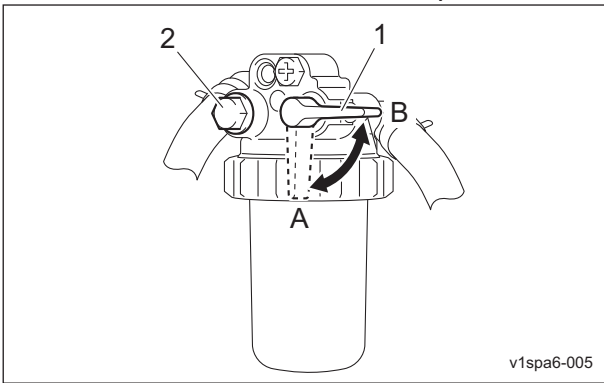
## Draining of Water Separator

**Important**

Water contamination in the fuel may decrease the engine starting performance and power output and may result in breakage of engine parts.

Drain the water at least every 50 hours and whenever the float is raised by water.

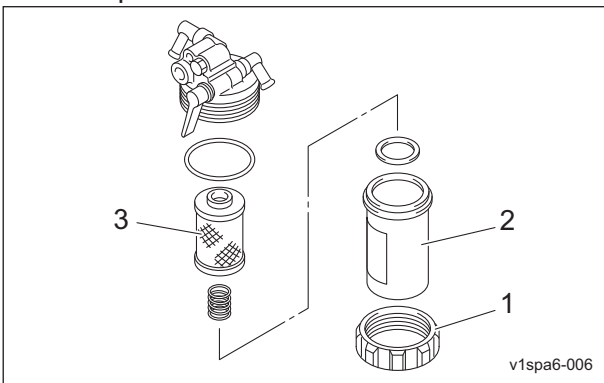
1. Stop the engine, and then turn the key switch to the "OFF" position.
2. Place a container under the water separator.
3. Close the fuel filter cock.
4. Close the fuel cock of water separator.



Draining of Water Separator\_001

1	Fuel cock
2	Air-bleeding plug
A	ON (Open)
B	OFF (Close)

5. Remove the retaining ring and then remove the cup.



Draining of Water Separator\_002

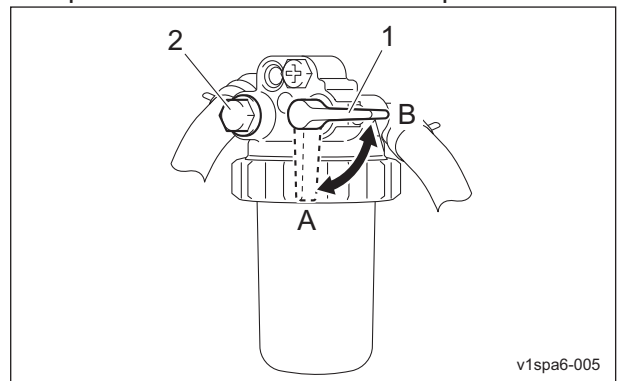
1	Retaining ring
2	Cup
3	Element

6. Discharge water from the cup.

**Important**

When installed, be careful that it is not contaminated with dirt or dust. If the fuel is contaminated with dirt or dust etc., the fuel injection pump and injection nozzle will become worn.

7. Put the parts back together.
8. Fill up the fuel tank with fuel and open the fuel cock.
9. Open the fuel cock of water separator.



Draining of Water Separator\_003

1	Fuel cock
2	Air-bleeding plug
A	ON (Open)
B	OFF (Close)

10. The key is turned to the "ON" position. The fuel pump is operated after replacement, air bleeding will occur automatically.
11. Turn the key to the "START" position and remove air out of the fuel line.
12. In the case that there are still air bubbles in the fuel from air-bleeding plug even after 15 seconds or more pass after setting the ignition key to "START", pause for 30 seconds or more and then repeat the same steps.

# Handling Instructions

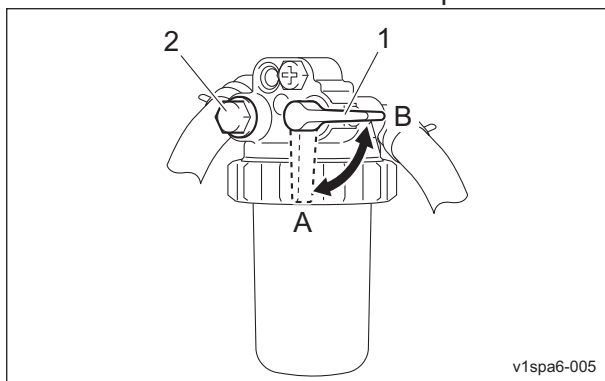
## Cleaning of Water Separator

**Important**

Water contamination in the fuel may decrease the engine starting performance and power output and may result in breakage of engine parts.

Clean the water separator at least every 450 hours and whenever debris has accumulated in the cup.

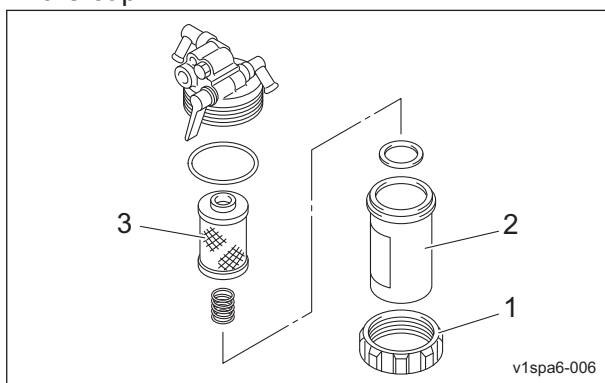
1. Stop the engine, and then turn the key switch to the "OFF" position.
2. Place a container under the water separator.
3. Close the fuel filter cock.
4. Close the fuel cock of water separator.



Cleaning of Water Separator\_001

1	Fuel cock
2	Air-bleeding plug
A	ON (Open)
B	OFF (Close)

5. Remove the retaining ring and then remove the cup.



Cleaning of Water Separator\_002

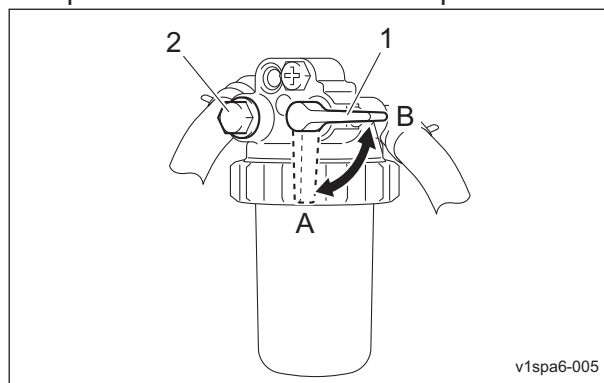
1	Retaining ring
2	Cup
3	Element

6. Discharge water from the cup.
7. Clean the cup and element with light oil. Replace the element with new one as necessary.

**Important**

When installed, be careful that it is not contaminated with dirt or dust. If the fuel is contaminated with dirt or dust etc., the fuel injection pump and injection nozzle will become worn.

8. Put the parts back together.
9. Fill up the fuel tank with fuel and open the fuel cock.
10. Open the fuel cock of water separator.



Cleaning of Water Separator\_003

1	Fuel cock
2	Air-bleeding plug
A	ON (Open)
B	OFF (Close)

11. The key is turned to the "ON" position. The fuel pump is operated after replacement, air bleeding will occur automatically.
12. Turn the key to the "START" position and remove air out of the fuel line.
13. In the case that there are still air bubbles in the fuel from air-bleeding plug even after 15 seconds or more pass after setting the ignition key to "START", pause for 30 seconds or more and then repeat the same steps.

# Handling Instructions

## Fuel filter

### Inspection of Fuel Filter

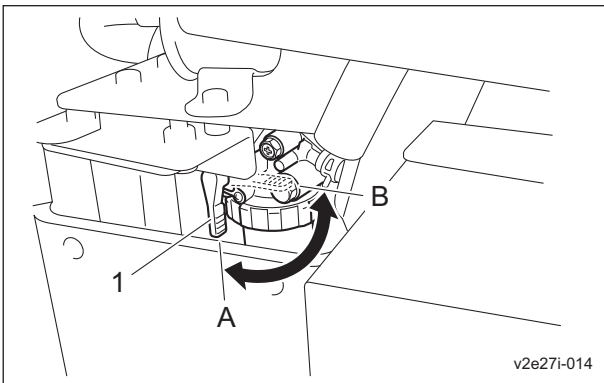
For details on handling the engine, please refer to the Engine's Owner's Manual. The fuel filter is located in the piping for fuel supply system and removes contamination.

1. Make sure that there is no fuel leakage.
2. Make sure that the fuel filter is not damaged or dirty.

### Change of Fuel Filter

If dust or dirt accumulates in the fuel filter, the fuel flow will become insufficient. Replace the fuel filter at the appropriate times. The fuel filter is located on the left under the hood.

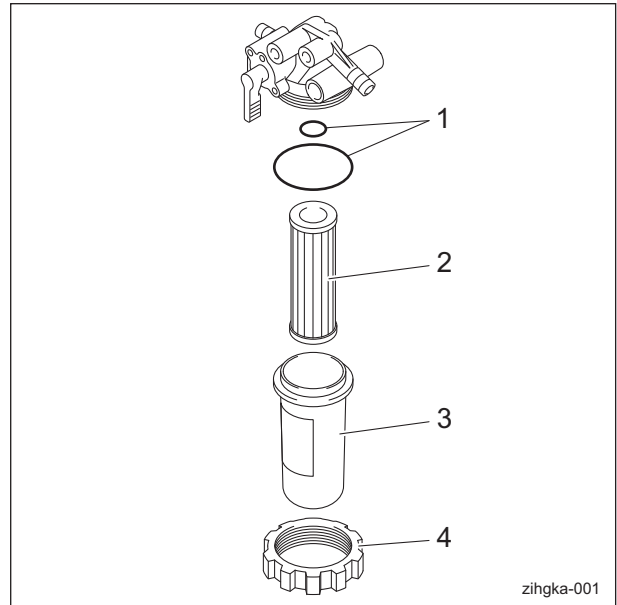
1. Close the fuel filter cock.



Change of Fuel Filter\_001

1	Fuel filter
A	ON (Open)
B	OFF (Close)

2. Remove the retaining ring and then remove the cup.



Change of Fuel Filter\_002

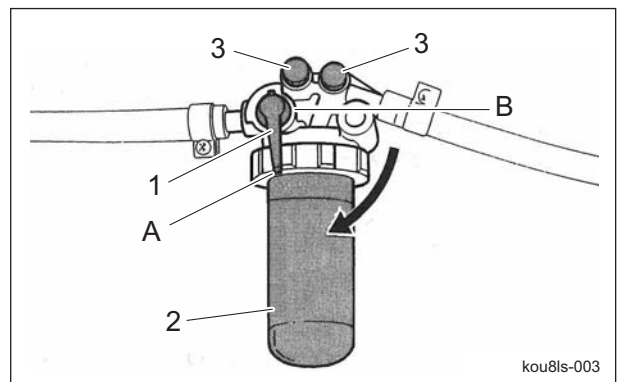
1	O-ring
2	Element
3	Cup
4	Retaining ring

3. Clean the inside of the cup with light oil.

### Important

When installed, be careful that it is not contaminated with dirt or dust. If the fuel is contaminated with dirt or dust etc., the fuel injection pump and injection nozzle will become worn.

4. Install a new fuel filter and put the parts back together.
5. Fill up the fuel tank with fuel and open the fuel cock.



Change of Fuel Filter\_003

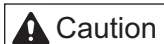


1	Fuel cock
2	Fuel filter
3	Air-bleeding plug
A	ON (Open)
B	OFF (Close)

6. The key is turned to the "ON" position.  
The fuel pump is operated after replacement, air bleeding will occur automatically.
7. Turn the key to the "START" position and remove air out of the fuel line.
8. In the case that there are still air bubbles in the fuel from air-bleeding plug even after 15 seconds or more pass after setting the ignition key to "START", pause for 30 seconds or more and then repeat the same steps.

## Oil Leakage

### Inspection of Oil Leakage



#### Caution

When performing maintenance on the hydraulic system, lower the mower units.

After approximately 50 hours of operation, some tightened portions may be loosened and oil and grease may leak. Be sure to retighten the parts. Check the bottom of the machine for oil and grease leakage.

# Handling Instructions

## Tightening torques

### Standard tightening torques

#### Bolts and Nuts

##### Important

A number of bolts are used in each part of this machine.  
Be sure to re-tighten the bolts and nuts, because they may be loosened at the earlier stage of the use.

As to the bolts and nuts without any special instruction, tighten them in appropriate tightening torque with proper tool.

Too much tightening may cause the looseness or damage of the screw.

The strength of tightening is determined by types of screws, strength, the friction of thread face or base face and others.

The table below is for the galvanized or parkerized bolts.

In case that the strength of internal thread is weak, it is not applied.

Do not use rusty or sand attached "screw."

Otherwise, it may cause insufficient tightening even if you apply the specified tightening torque.

The friction of the screw face becomes higher and the tightening torque is canceled out by the friction, therefore sufficient tightening cannot be applied.

If "screw" is wet by water or oil, do not tighten it with normal tightening torque.


If the screw is wet, the torque coefficient will get smaller and it may result in too much tightening.

Too much tightening may cause looseness by the screw stretched or result in damage.


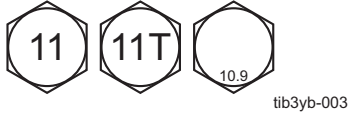
Do not use a bolt experienced too much burden.

Using the impact wrench requires the skill.

Do exercise as much as possible for steady tightening.

Nominal diameter	General bolt		
	Strength classification 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 bolt					
	Strength classification 8.8			Strength classification 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 same values are applied to "fine screw thread."

# Handling Instructions

## Principal tightening torques

### Tightening Torque by Model

#### LM2400

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 or equivalent anaerobic sealant).

Location	Code	Part name	Tightening torque			Thread locking adhesive
			N-m	kgf-cm	lb-in	
Front wheel	Motor	K0010120902 Bolt, heat-treated M12-90	104 - 134	1,060.49 - 1,366.40	920.50 - 1,186.03	—
	Wheel mounting base	1-20UNEF Slotted nut for hydraulic motor	280 - 300	2,855.16 - 3,059.10	2,478.28 - 2,655.30	—
	Wheel	K0034120352 Bolt, heat-treated M12-35P1.5	67 - 85	683.20 - 866.75	593.02 - 752.34	—
Rear wheel	Motor	K0013120702 Bolt, heat-treated M12-70	104 - 34	1,060.49 - 1,366.40	920.50 - 1,186.03	—
	Wheel mounting base	1-20UNEF Slotted nut for hydraulic motor	180 - 200	1,835.46 - 2,039.40	1,593.18 - 1,770.20	○
	Wheel	K0034120352 Bolt, heat-treated M12-35P1.5	67 - 85	683.20 - 833.75	593.02 - 752.34	—
Tie rod	K1610000020	Tie rod end right ass'y	45	158.87	398.30	—
	K1611000020	Tie rod end left ass'y	45	158.87	398.30	—
Engine	K0017100252	Bolt, heat-treated, small, 10-25 P1.25	45 - 57	158.87 - 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. "Standard tightening torques" (Page 4-18)			
	K0100080002	Nut, M8	28 - 38	285.57 - 387.49	247.83 - 336.34	○
Bed knife (bottom blade)	K0071001182	Screw, heat-treated flathead M10-16	29 - 38	295.71 - 387.49	256.68 - 336.34	—
ROPS	K0010120402	Bolt, heat-treated M12-40	52 - 67	530.24 - 683.20	460.25 - 593.02	—
Kingpin stopper	K0000100252	Bolt, M10-25	52 - 67	530.24 - 683.20	460.25 - 593.02	—
Cross valve	K0013101302	Bolt, heat-treated M10-130	29 - 38	295.71 - 387.49	256.68 - 336.34	—
Universal Joint	K001A100401	Bolt, w/hexagon hole, M10-40	62 - 72	632.21 - 734.18	548.76 - 637.27	—
	K0011100252	Bolt, heat-treated M10-25P1.25	55 - 71	560.84 - 723.99	486.81 - 628.42	○

# Handling Instructions

## Adjustment Before Operating

### Adjustment of Steering Wheel

#### ⚠ Warning

Since it is dangerous, do not adjust the steering wheel while traveling.

#### ⚠ Caution

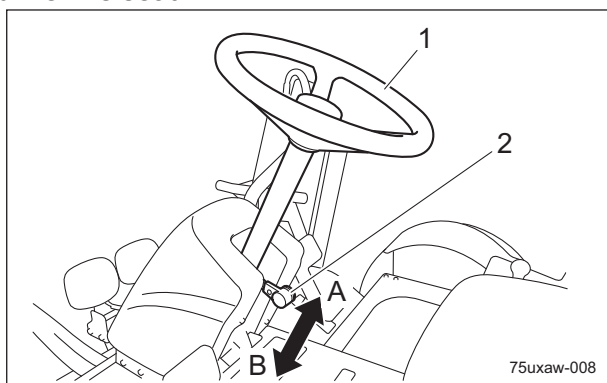
Be sure the steering wheel position is securely locked. It would be extremely dangerous if it becomes loose while traveling.

The steering wheel can be adjusted up or down.

Adjust the position according to the operator's body size.

Shift the tilt lever to the "FREE" position, move the steering wheel to the position that suits your work requirements, and then shift the tilt lever to the "LOCK" position to secure the steering wheel in place.

The tilt lever is located at the left in front of the driver's seat.



Adjustment of Steering Wheel\_001

1	Steering wheel
2	Tilt lever
A	FREE (released)
B	LOCK (locked)

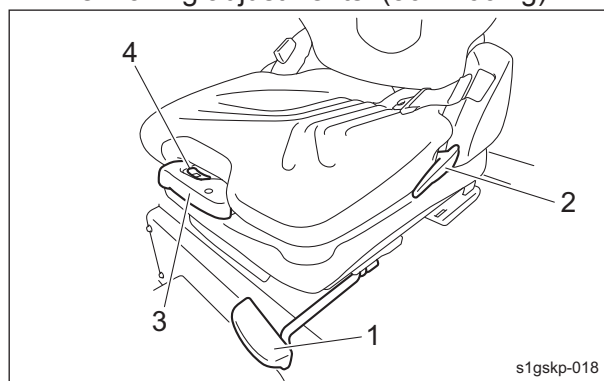
### Adjustment of Seat

Use the seat adjustment levers to adjust the seat.

Adjust the position according to the operator's body size.

1. Use the forward/backward adjustment lever to adjust the seat back and forth.

2. Use the backrest tilt adjustment lever to adjust the angle of the backrest.
3. Pull out the suspension adjustment handle and move it up or down to adjust the firmness of the seat suspension. Observe the suspension adjustment scale while making adjustments. (50 - 160 kg)



Adjustment of Seat\_001

1	Forward/backward adjustment lever
2	Angle adjustment lever
3	Suspension adjustment handle
4	Suspension adjustment scale

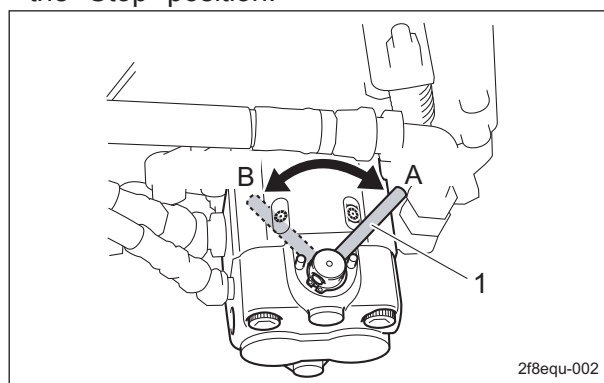
### Adjustment of Blade Engagement

#### ⚠ 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.

1. Stop the engine.
2. Set the reel rotation/stop switching lever to the "Stop" position.



Adjustment of Blade Engagement\_001

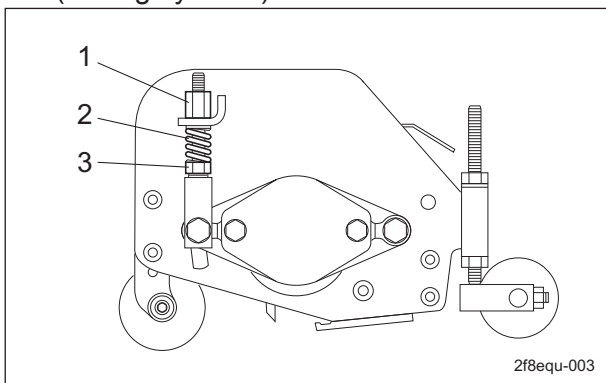
# Handling Instructions

1	Reel rotation/stop switching lever
A	Rotate
B	Stop

3. With the cutter adjustment nut, adjust the engagement between the reel cutter (cutting cylinder) and the bed knife (bottom blade) so that newspaper (two to three sheets) will be cut by the edge of both blades when the blades in their entirety come slightly into contact with each other.

4. 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).

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



Adjustment of Blade Engagement\_002

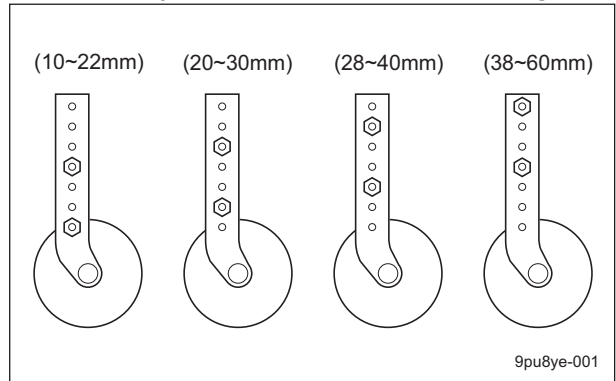
1	Cutter adjustment nut
2	Spring
3	Pipe with cutter adjusting screw

## Adjustment of Cutting Height

### Roller (Roller Type)

Adjust the cutting height to fit your cutting work.

You can adjust the front roller in four stages.



Roller (Roller Type)\_001

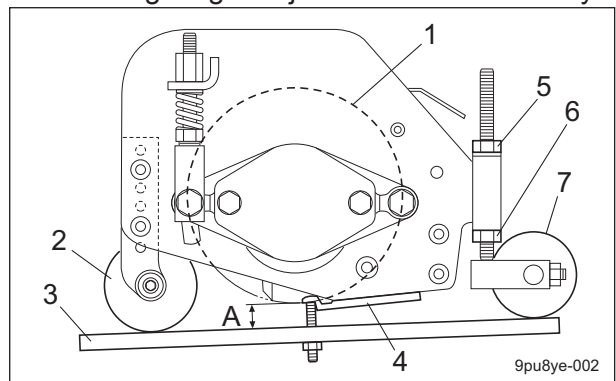
Attach the front roller in a position within the range of cutting height that suits your work requirements.

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 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 position, then tighten cutting height adjustment nut B securely.



Roller (Roller Type)\_002

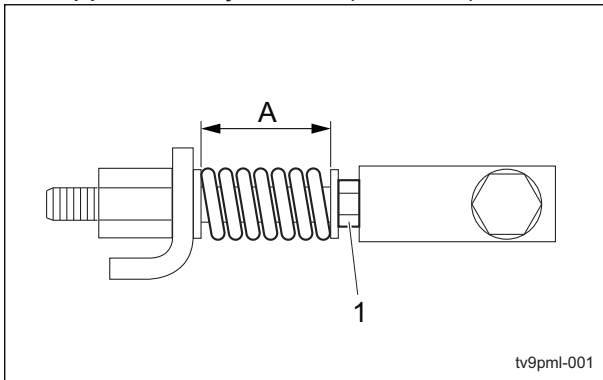
# Handling Instructions

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

## Adjustment of Cutter Adjustment Spring

If the diameter of the reel cutter (cutting cylinder) becomes smaller, adjust the cutter adjustment spring.

1. Adjust the blade engagement.
2. Loosen the pipe with cutter adjusting screw, and then adjust the length of the spring coil to approximately 40 mm (1.575 in.).



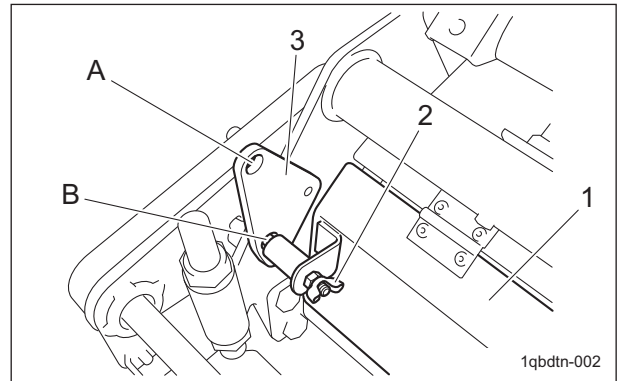
Adjustment of Cutter Adjustment Spring\_001

1	Pipe with cutter adjusting screw
A	40 mm (1.575 in.)

## Adjustment of Reel Cover

**Note:**  
Depending on the specifications, this function may not be available.  
The angle of the reel cover can be adjusted.

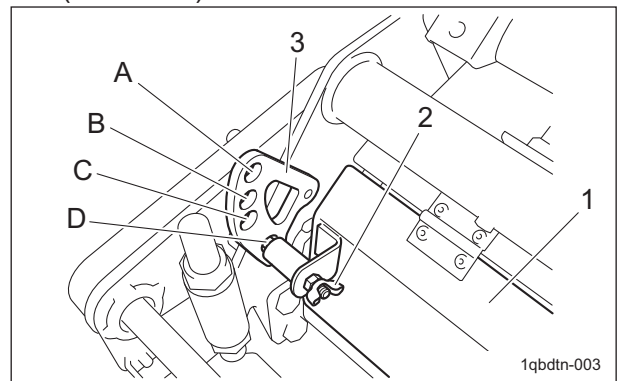
1. Pull the right and left knobs securing the reel cover to release it.  
(#10001 - #10161)



Adjustment of Reel Cover\_001

1	Reel cover
2	Knob
3	Cover adjustment plate
A	Fully open
B	Fully closed

(#10162 -)



Adjustment of Reel Cover\_002

1	Reel cover
2	Knob
3	Cover adjustment plate
A	Fully open
B	15 degrees closed
C	30 degrees closed
D	Fully closed

2. Select the hold position of the cover adjustment plate and secure the reel cover.

# Handling Instructions

## Adjustment of CR Brush

Note:  
Depending on the specifications, this function may not be available.

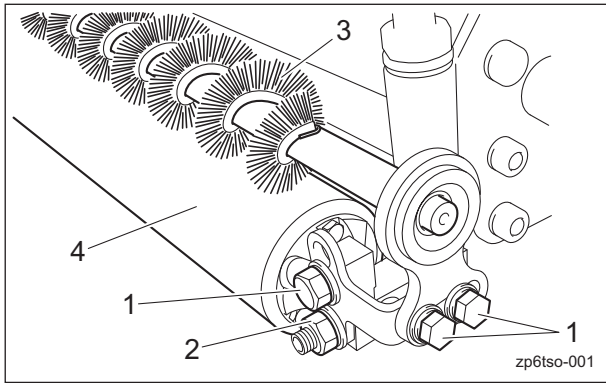
**Caution**

Pressing the brush against the roller too tightly could cause the belt to slip or break.

**Important**

CR brush prevents clippings etc. from adherence to the rear roller owing to rotating brush.

1. Loosen the bolts and nuts attached to the both ends of CR brush.



Adjustment of CR Brush\_001

1	Bolts
2	Nuts
3	Brush
4	Rear roller

2. Securely tighten the bolts and nuts loosened in step 1 as the gap between the brush and rear roller is adjusted to between 0 and 1 mm.

## Procedure to Start / Stop Engine

### Start / Stop of Engine

#### Procedure to Start Engine

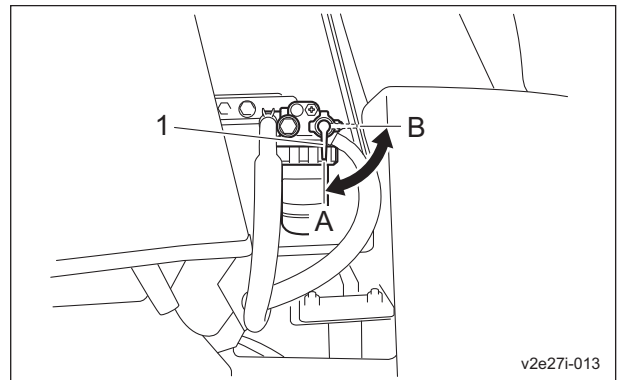
**Warning**

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

**Caution**

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

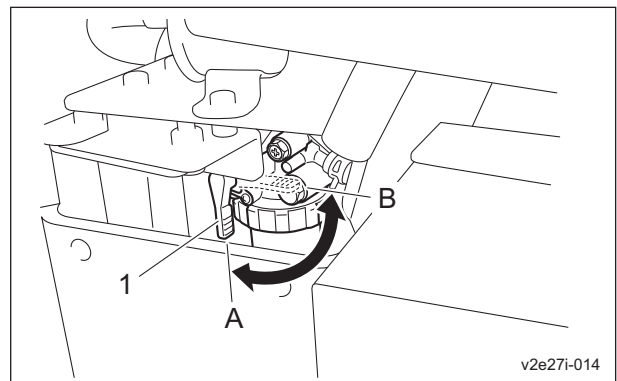
1. Open the fuel cock of the water separator. The fuel cock of the water separator is located beside the fuel tank.



Procedure to Start Engine\_001

1	Fuel cock
A	ON (Open)
B	OFF (Close)

2. Open the fuel filter cock. The fuel filter is located on the left under the hood.



Procedure to Start Engine\_002

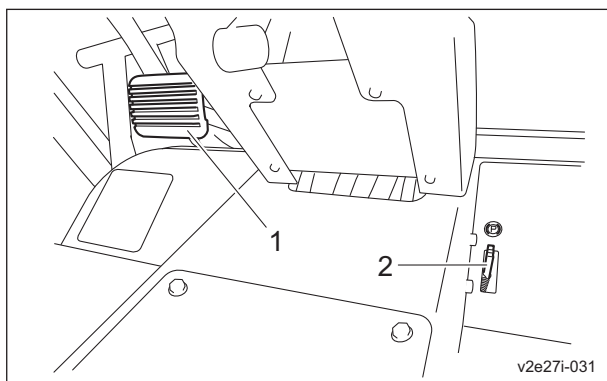
1	Fuel filter
A	ON (Open)
B	OFF (Close)

3. Sit on the seat.



# Handling Instructions

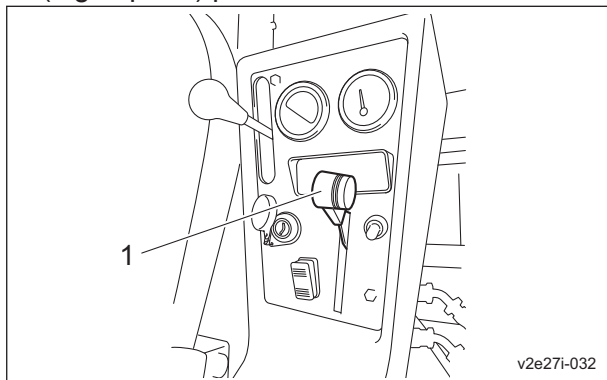
4. Depress the brake pedal and move the parking brake lock lever forward to lock the brake.



Procedure to Start Engine\_003

1	Brake pedal
2	Parking brake lock lever

5. Set the reel rotation switch to the "Stop" position.  
 6. Move the mower unit up/down lever to the neutral position.  
 7. Shift the throttle lever halfway from the turtle icon (low speed) to the rabbit icon (high speed) position.



Procedure to Start Engine\_004

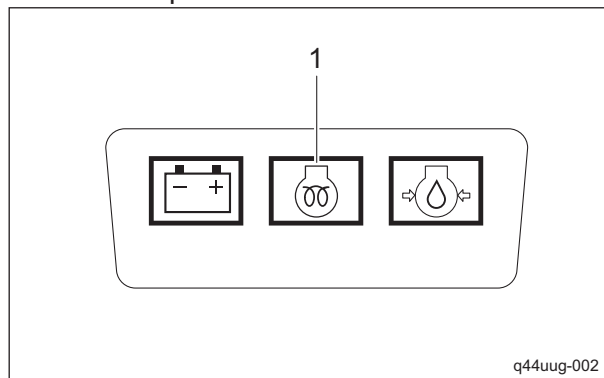
1	Throttle lever
---	----------------

### Important

The thermo-start lamp turns off at the specified time. However, the lamp turning off is not related to the glow plug generating heat. 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.

8. Switch the ignition key to the "GLOW" position.

9. Make sure that the glow plug is generating heat and the thermo-start lamp is turned on.  
 10. After the thermo-start lamp turns off, immediately set the ignition key to the "START" position.



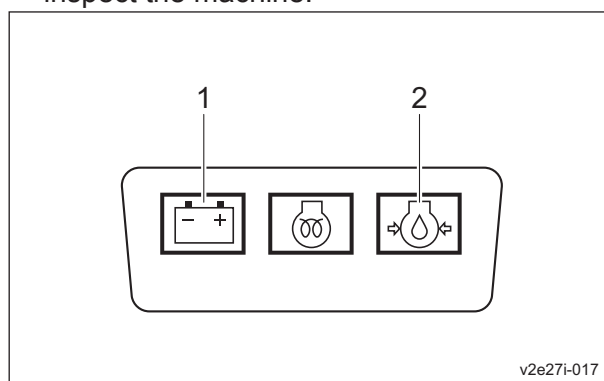
Procedure to Start Engine\_005

1	Thermo-start lamp
---	-------------------

### Caution

Quickly returning the ignition key from the "START" position to the "ON" position may result in damage to the machine.

11. When the starter starts rotating and the engine starts, return the ignition key to the "ON" position slowly.  
 12. Make sure that the charge lamp and oil pressure lamp turn off. If they do not turn off, stop the engine and inspect the machine.



Procedure to Start Engine\_006

1	Charge lamp
2	Oil pressure lamp

13. Shift the throttle lever to the turtle icon (low speed), and then warm up the engine for 1-2 minutes.  
 14. Gradually move the throttle lever to the rabbit icon (high speed).

# Handling Instructions

## Procedure to Stop Engine

1. Set the traveling pedal to the neutral position.
2. Depress the brake pedal and move the parking brake lock lever forward to lock the brake.
3. Set the reel rotation switch to the "Stop" position.
4. Shift the throttle lever to the turtle icon (low speed), and then idle the machine for 1-2 minutes.
5. Switch the ignition key to the "OFF" position.
6. Make sure that the engine has stopped.
7. Remove the ignition key.
8. Leave the driver's seat.
9. Close the fuel cock of the fuel filter.
10. Close the fuel cock of the water separator.

## Safety Mechanisms

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

1. 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 is applied.
  - The reel rotation switch is set to the "Stop" position.
  - The traveling pedal is set to the neutral position.
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 the neutral position. (The operator has depressed the traveling pedal.)
  - The reel rotation switch is set to the "Rotate" position.

## Warning Mechanisms

### Caution

When the buzzer (intermittent tone) sounds, be sure to stop operation since the engine is overheated.

Do not stop the engine without idling. Allow the engine to cool down, first. Keep the engine idling for about 5 minutes before stopping. Remove dust that is jamming in the radiator, air cleaner, and etc.

This machine features warning mechanisms for overheating and for the hydraulic oil level.

1. If water temperature inside the engine exceeds 105 degrees Celsius, a buzzer will sound. (intermittent tone)
2. If the oil level in the hydraulic tank declines from the specified level by approximately 4.2 dm<sup>3</sup> (4.2 L), a buzzer will sound. (intermittent tone)

## Operation of Each Section

### Precautions for Operating the Machine

#### Caution

Under any circumstances drive the machine at such a speed that you can stop it immediately for emergencies.

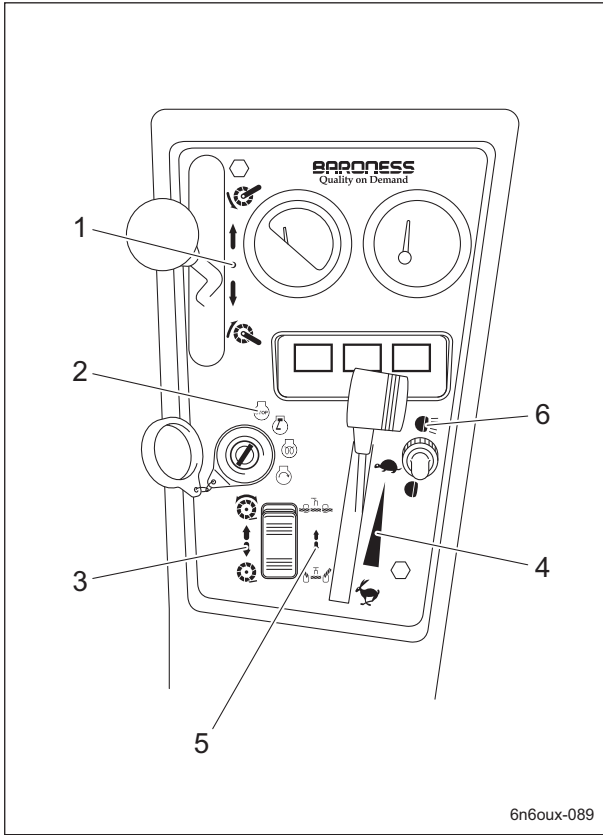
### Cautions for when You Leave the Machine

#### Caution

If the brakes are not sufficiently effective, use the wheel stoppers to secure the machine.

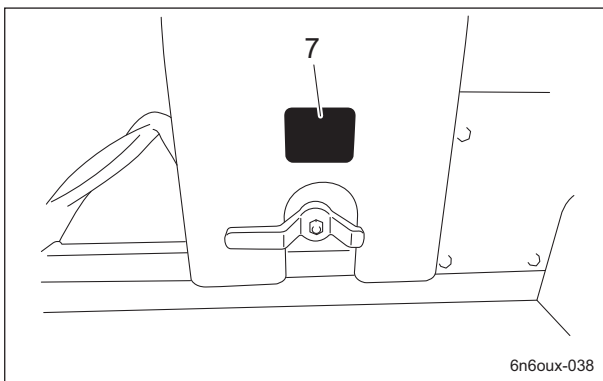
# Handling Instructions

## Operation Decals



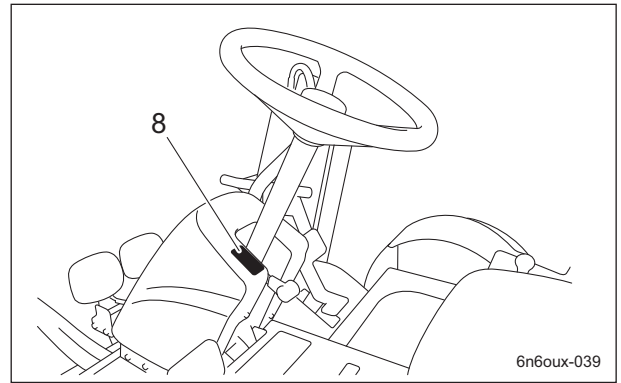
Operation Decals\_001

1	Decal, mower unit up/down lever
2	Decal, key switch
3	Decal, reel rotation switch
4	Decal, engine rotation
5	Decal, slight lift switch
6	Decal, light switch



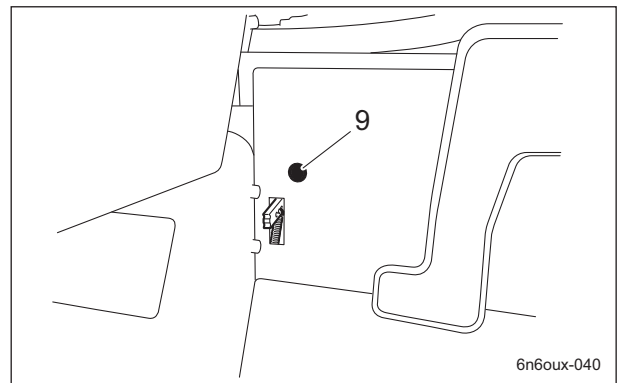
Operation Decals\_002

7	Decal, stop valve
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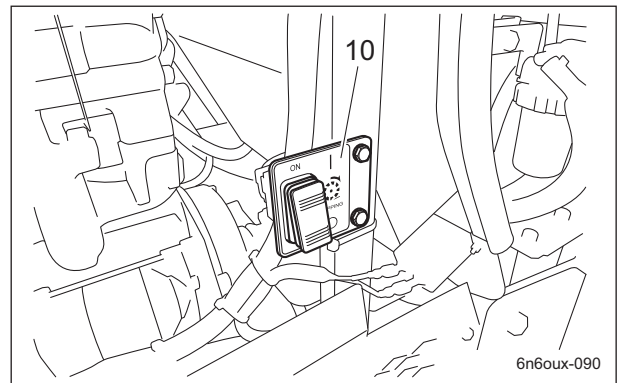
Operation Decals\_003

8	Decal, tilt steering
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Operation Decals\_004


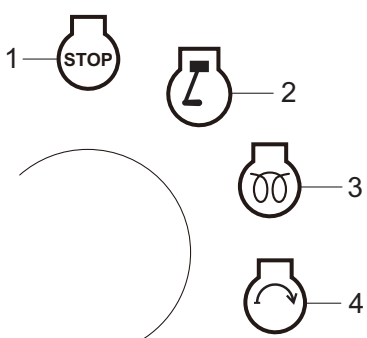
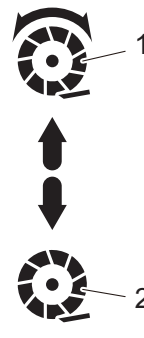

9	Decal, parking brake
---	----------------------





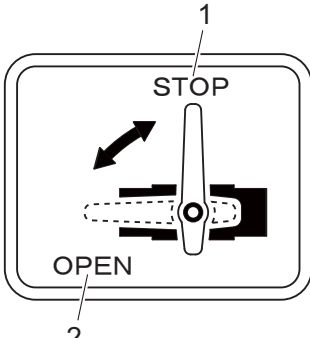

Operation Decals\_005

10	Decal, lapping switch
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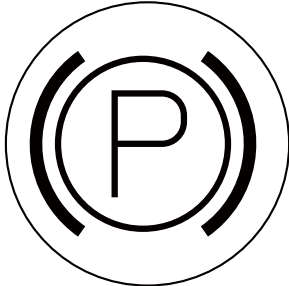
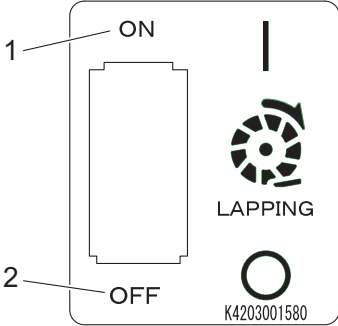
# Handling Instructions

<p>1</p>	<p>Decal, mower unit up/down lever It illustrates Up/Down of the mower unit. 1. Down 2. Up</p>	 <p>6n6oux-041</p>
<p>2</p>	<p>Decal, key switch It illustrates the position of the key switch. 1. OFF 2. ON 3. GLOW 4. START</p>	 <p>6n6oux-021</p>
<p>3</p>	<p>Decal, reel rotation switch It illustrates Rotate/Stop of the reel cutter (cutting cylinder). 1. Rotate 2. Stop</p>	 <p>6n6oux-042</p>
<p>4</p>	<p>Decal, engine rotation It illustrates Low/High of the engine rotation speed. 1. Low 2. High</p>	 <p>6n6oux-019</p>

# Handling Instructions

<p>5</p>	<p>Decal, slight lift switch</p> <p>Note: Depending on the specifications, this function may not be available. It illustrates ON/OFF of the slight lift function.</p> <p>1. ON 2. OFF</p>	 <p>6n6oux-043</p>
<p>6</p>	<p>Decal, light switch</p> <p>Note: Depending on the specifications, this function may not be available. It illustrates ON/OFF of the light.</p> <p>1. ON 2. OFF</p>	 <p>6n6oux-044</p>
<p>7</p>	<p>K4203001290 Decal, stop valve</p> <p>It illustrates Stop/Open of the stop valve.</p> <p>1. Stop 2. Open</p>	 <p>6n6oux-045</p>
<p>8</p>	<p>K4203001560 Decal, tilt steering</p> <p>It illustrates the tilt direction of the steering wheel and its LOCK/FREE position.</p>	 <p>6n6oux-022</p>

# Handling Instructions

<p>9</p>	<p>K4209001200 Decal, brake It illustrates the locking position for the parking brake.</p>	 <p>6n6oux-092</p>
<p>10</p>	<p>K4203001580 Decal, lapping switch It illustrates ON/OFF change-over of backlapping operation. 1. ON (backlapping rotation) 2. OFF (cutting rotation)</p>	 <p>6n6oux-093</p>

# Handling Instructions

## Light Switch

### Warning

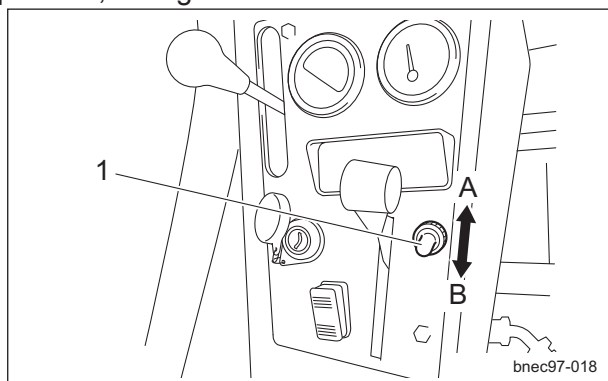
The lights provide auxiliary lighting. Do not travel or operate the machine at night or under poor visibility.

### Note:

Depending on the specifications, this function may not be available.

The light switch is located in the operation panel.

When the switch is set to the "ON" position, the lights turn on. When it is set to the "OFF" position, the lights turn off.



Light Switch\_001

1	Light switch
A	ON
B	OFF

### Note:

The lights will not turn on when the ignition key is switched to the "OFF" position.

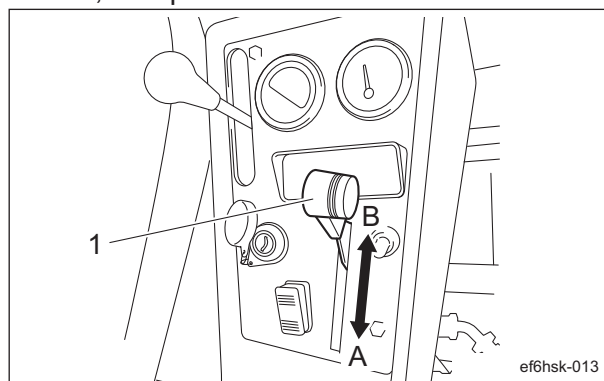
## Throttle Lever

The throttle lever is located in the operation panel and enables you to adjust the engine rpm.

Move the throttle lever toward the rabbit icon (high speed) to increase the engine rpm, and toward the turtle icon (low speed) to reduce the rpm.

### Note:

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



Throttle Lever\_001

1	Throttle lever
A	High speed
B	Low speed

# Handling Instructions

## Mower Unit Up/Down Lever

**Caution**

Before raising or lowering the mower units, make sure that there are no people around the machine.

**Caution**

Be careful since shifting the mower unit up/down lever to the "DOWN" position lowers the mowers, even while the engine is stopped.

**Caution**

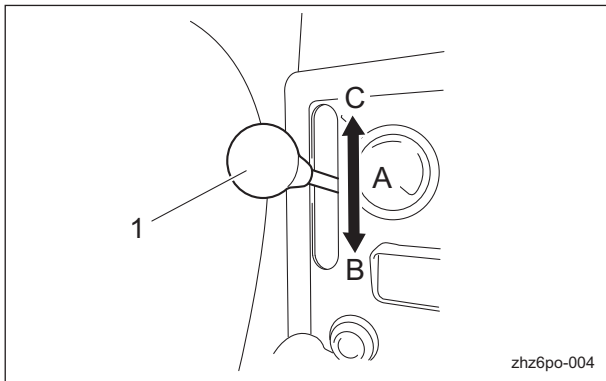
Before operating the mower unit up/down lever, be sure to set the stop valve to the "Open" position.

**Caution**

When the mower lock levers (latches) are engaged, do not operate the mower unit up/down lever.

The mower unit up/down lever is located in the operation panel and raises or lowers the mower units.

Shift the lever to the "DOWN" position to lower the mowers, and shift it to the "UP" position to raise the mowers.



Mower Unit Up/Down Lever\_001

1	Mower unit up/down lever
A	Neutral
B	Up
C	Down

**Note:**

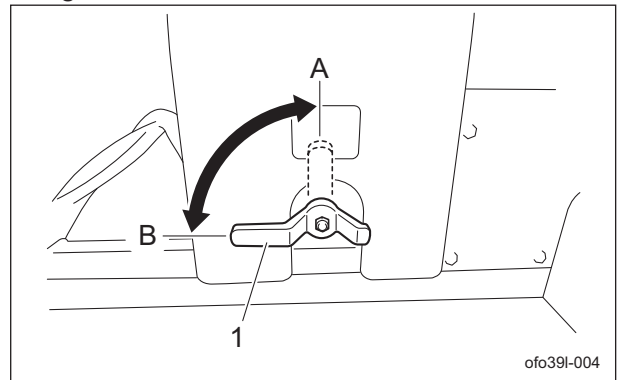
Even if the reel rotation switch is set to the "Rotate" position, the reel cutter (cutting cylinder) stops rotating when the mower unit up/down lever is moved to the neutral position or the mower units are raised.

## Stop Valve

**Caution**

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 all raised mower units from falling.



Stop Valve\_001

1	Stop valve
A	Stop
B	Open

## Mower Lock Lever (Latch)

**Caution**

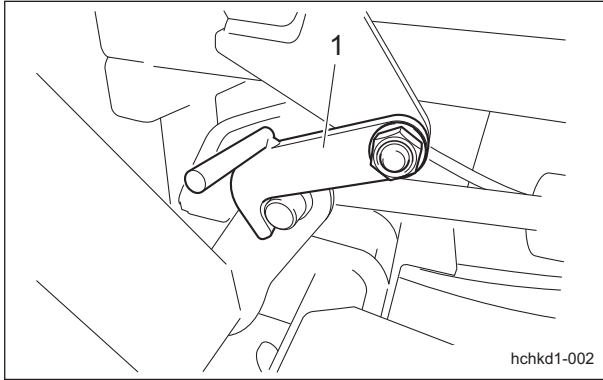
When the mower lock levers (latches) are engaged, do not operate the mower unit up/down lever.

The mower lock levers (latches) are located on the fulcrums of mower units #4 and #5 and are used when storing the machine with the mower units raised.

When storing the machine, secure the mower lock levers (latches).



# Handling Instructions



Mower Lock Lever (Latch)\_001

1	Mower lock lever (latch)
---	--------------------------

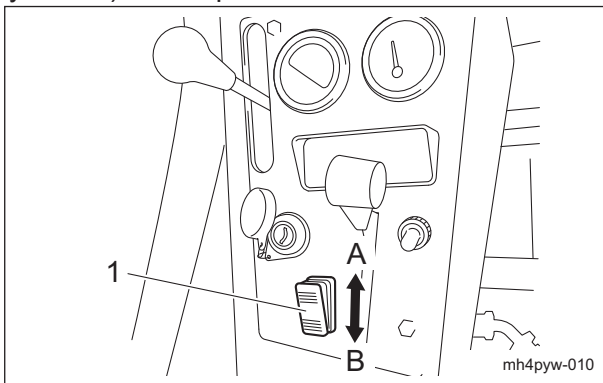
## Reel Rotation Switch

### ! Caution

The reel rotation switch must be set just before you start cutting work. In cases other than those cases, it must be returned to the "Stop" position.

The reel rotation switch is located in the operation panel and operates rotation of the reel cutters (cutting cylinders) of the mower units.

If you set the reel rotation switch to the "Rotate" position, the reel cutters (cutting cylinders) of all mower units will rotate for cutting work. If you set the reel rotation switch to the "Stop" position, the reel cutters (cutting cylinders) will stop.



Reel Rotation Switch\_001

1	Reel rotation switch
A	Rotate
B	Stop

## Slight Lift Function

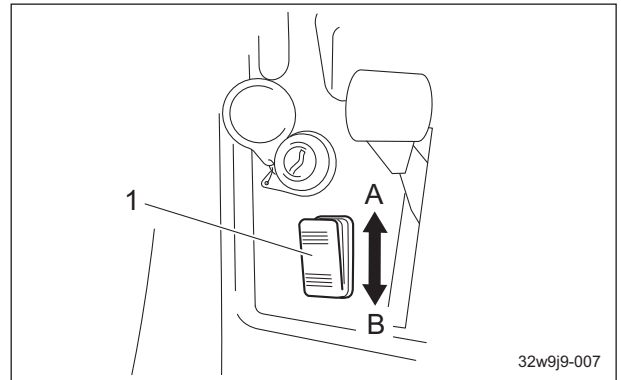
Note:

Depending on the specifications, this function may not be available.

### ! Caution

When the mower lock levers (latches) are engaged, do not operate the mower unit up/down lever.

When the reel rotation switch is shifted to the "Rotate" side, the slight lift becomes functional and the mower units are raised only to a fixed height when the mower units are raised with the mower unit up/down lever.



Slight Lift Function\_001

1	Reel rotation switch
A	Rotate
B	Stop

# Handling Instructions

## Reel Reverse Switch

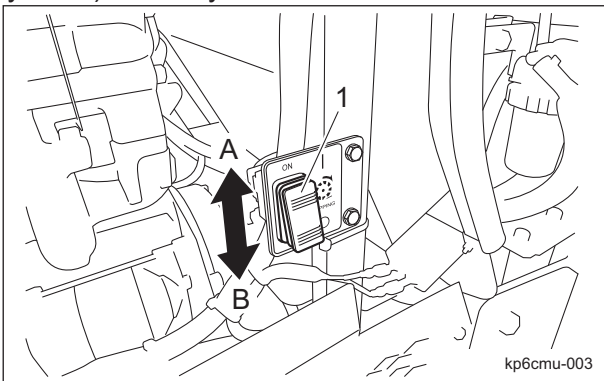
**Caution**

Do not switch the reel reverse switch to the "ON" or "OFF" position while the reel cutter (cutting cylinder) is rotating. Otherwise, a hydraulic system malfunction may result.

**Important**

If the reel rotation switch is not set to the "Rotate" position, the reel cutter (cutting cylinder) will not rotate.

The reel reverse switch is located under the hood. This switches the rotation direction of the reel cutter (cutting cylinder). When the reel reverse switch is set to the "ON" position, the reel cutters (cutting cylinder) of all mower units rotate in reverse (back lapping motion). When the reel reverse switch is set to the "OFF" position, the reel cutters (cutting cylinder) normally rotate.



Reel Reverse Switch\_001

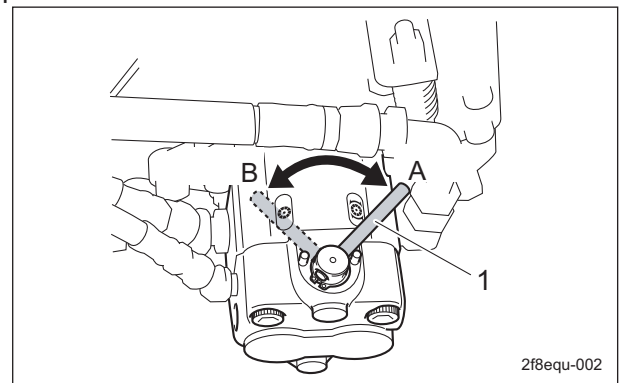
1	Reel reverse switch
A	ON (reverse)
B	OFF (normal rotation)

## Reel Rotation/Stop Switching Lever

**Caution**

Before operating the reel rotation/stop switching lever, be sure to shift the reel rotation switch 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 back lapping. You must shift only the lever(s) for the mower unit(s) that you plan to use for cutting or back 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

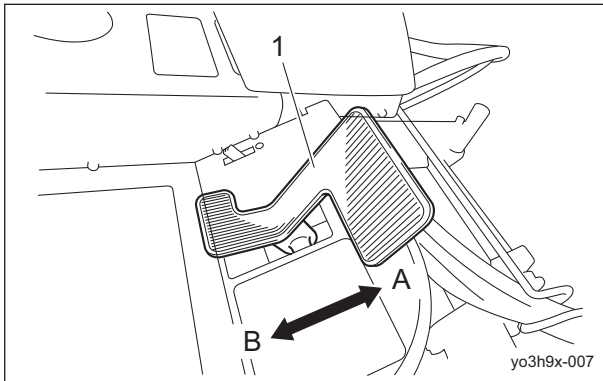
## Traveling Pedal

**Warning**

This machine is not authorized as a special motor vehicle. Do not drive it on public roads.

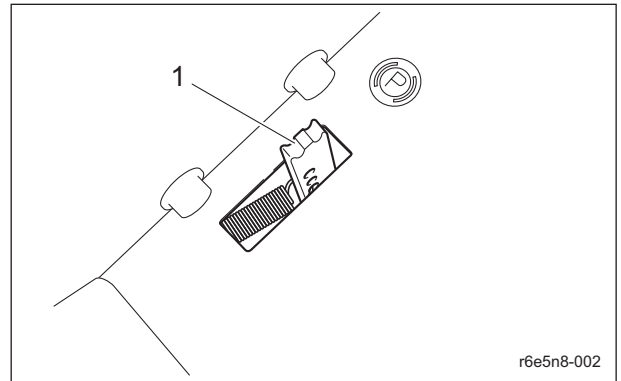
The traveling pedal is located in the right foot area. When the forward side depressed, the machine travels forward. When the backward side depressed, the machine travels backward.

# Handling Instructions



Traveling Pedal\_001

1	Traveling pedal
A	Forward
B	Backward

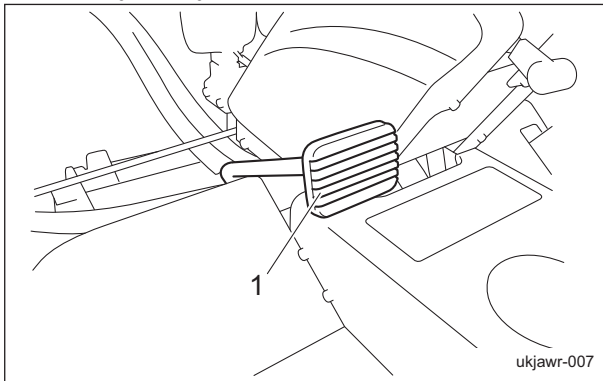


Parking Brake Lock Lever\_001

1	Parking brake lock lever
---	--------------------------

## 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
---	-------------

## Parking Brake Lock Lever

### ⚠ Caution

Be sure to release the parking brake before driving. Otherwise, it may cause the malfunction of the brake or hydraulic system.

### ⚠ Caution

Never park the machine on a slope.

The parking brake lock lever is located in the right foot area. When parking, depress the brake pedal and move the parking brake lock lever forward. To release the parking brake, depress the brake pedal.

## Hood

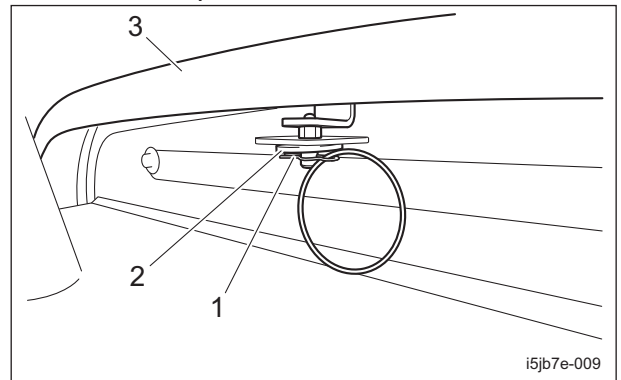
### ⚠ Caution

Do not open the hood in strong winds.

### ⚠ Caution

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

1. Remove the pin, then the washer.

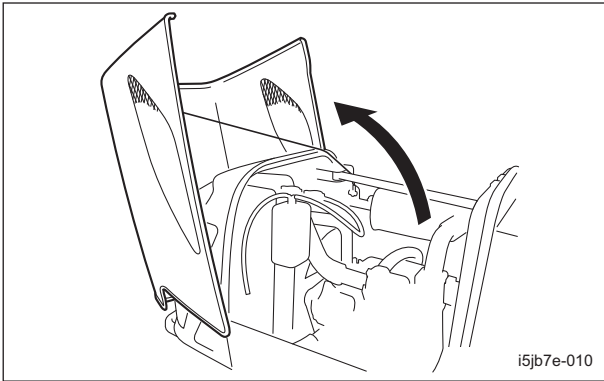


Hood\_001

1	Pin
2	Washer
3	Hood

# Handling Instructions

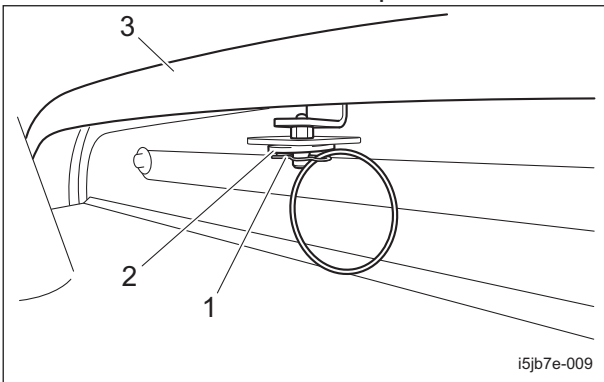
2. Lift up the hood.



Hood\_002

3. When closing the hood, do the operation slowly.

4. Insert the washer, then the pin.



Hood\_003

1	Pin
2	Washer
3	Hood

## Underseat Cover

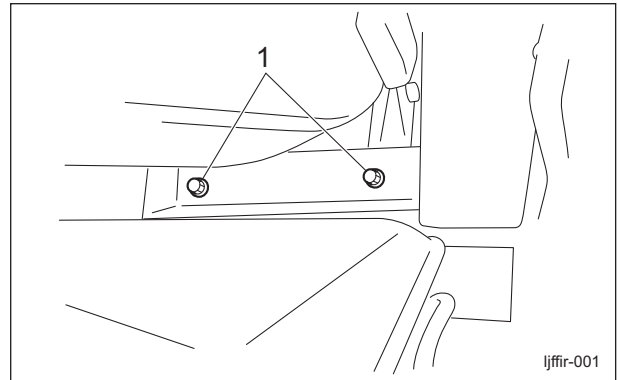


**Caution**

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

1. Bring the seat to the most front position.

2. Remove two bolts located on the rear of the seat.



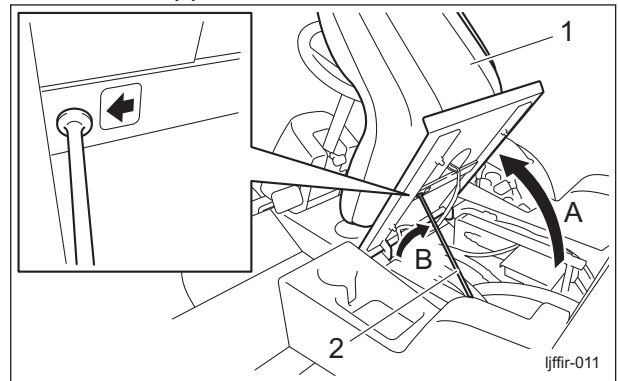
Underseat Cover\_001

1	Bolt
---	------

3. Bring the seat to the backmost position.

4. Lift the seat.

Securely support the underseat cover with the seat support rod.



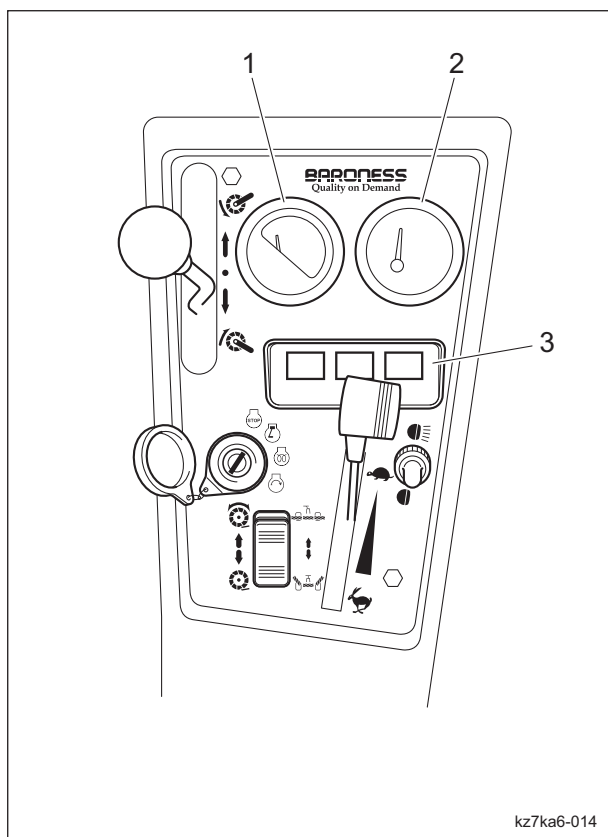
Underseat Cover\_002

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

# Handling Instructions

## Instruments

### Instruments on the Operation Panel



Instruments on the Operation Panel\_001

1	Water temperature gauge
2	Fuel gauge
3	Pilot lamps (charge lamp, thermo-start lamp, oil pressure lamp)

### Hour Meter

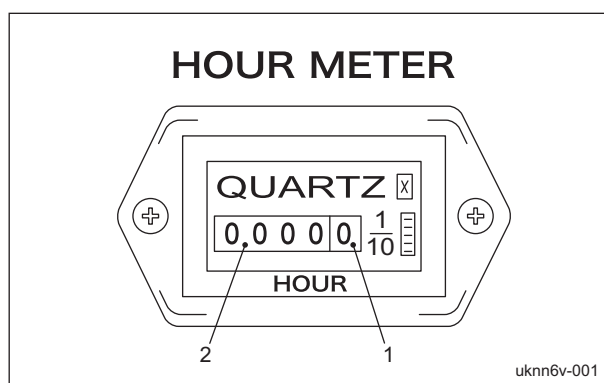
The hour meter is located at the back of the operation panel, and indicates the total operation time of the engine.

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

Odometer

1/10 digit: Black number on white background

Hour digits: White number on black background



Hour Meter\_001

1	1/10 digit
2	Hour digits

### Water Temperature Gauge

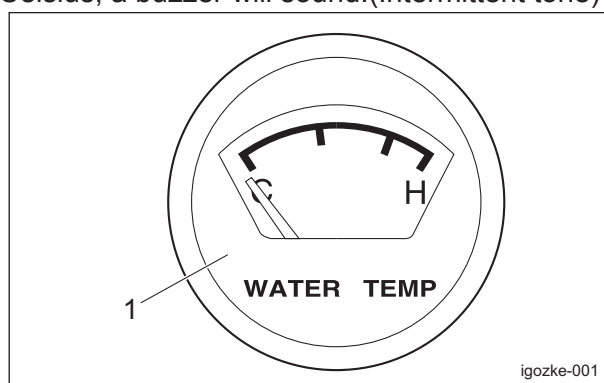
The water temperature gauge is located in the operation panel.

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, stop the engine, and then inspect the machine and perform any necessary maintenance.

If the water temperature exceeds 105 degrees Celsius, a buzzer will sound. (Intermittent tone)



Water Temperature Gauge\_001

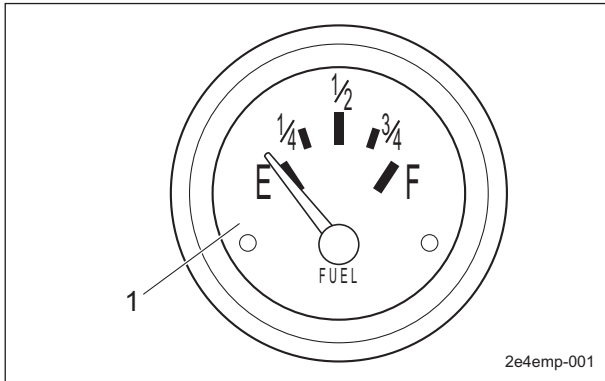
1	Water temperature gauge
---	-------------------------

# Handling Instructions

## Fuel Gauge

The fuel gauge is located in the operation panel.

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



Fuel Gauge\_001

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

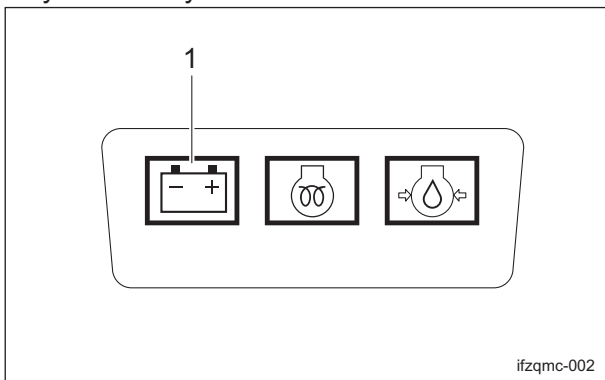
## Pilot Lamps

### Charge Lamp

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

It turns on when the ignition key is set to the "ON" position 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 then inspect the machine and perform any necessary maintenance.



Charge Lamp\_001

1	Charge lamp
---	-------------

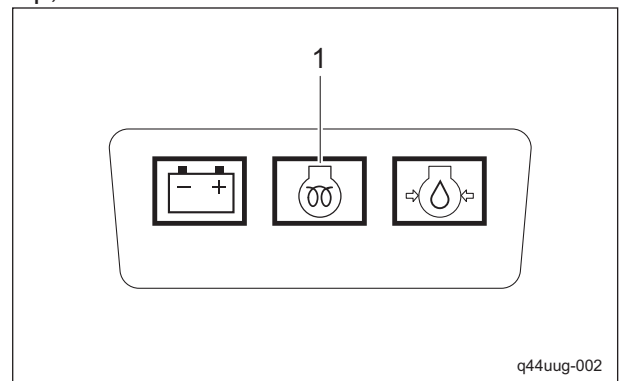
### Thermo-start Lamp

The thermo-start lamp is the middle pilot lamp located in 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.

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



Thermo-start Lamp\_001

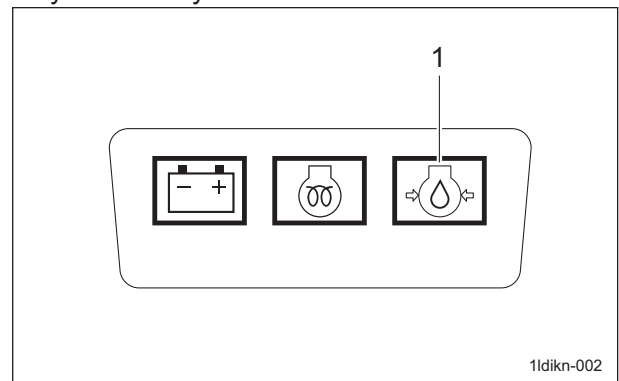
1	Thermo-start lamp
---	-------------------

### Oil Pressure Lamp

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

It turns on when the ignition key is set to the "ON" position 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 then inspect the machine and perform any necessary maintenance.



Oil Pressure Lamp\_001

1	Oil pressure lamp
---	-------------------

# Handling Instructions

## Overheat Warning Buzzer

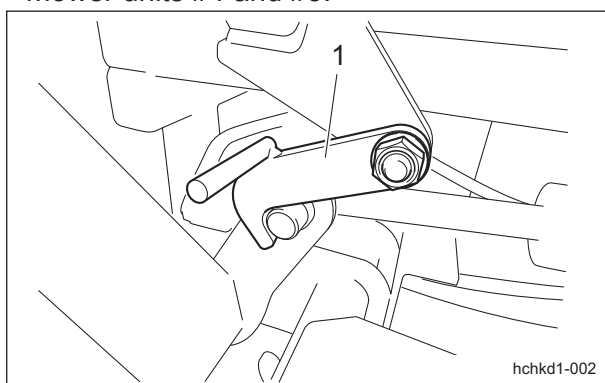
If the water temperature inside the engine exceeds 105 degrees Celsius, a buzzer will sound. (intermittent tone)

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

## Travel of Machine

### Traveling Procedure

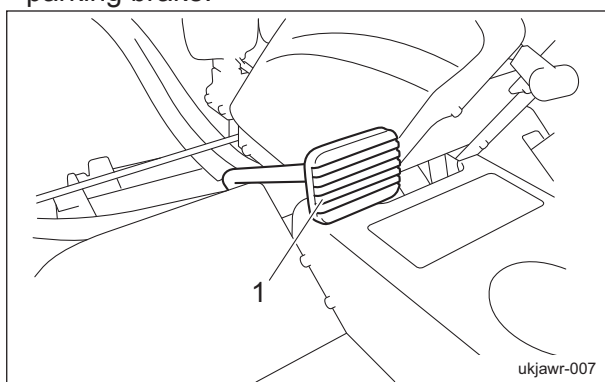
1. Start the engine.  
"Procedure to Start Engine" (Page 4-24)
2. Raise all mower units, and set the anti-falling stop valve to the "Stop" position.
3. Engage the mower lock levers (latches) for mower units #4 and #5.



Traveling Procedure\_001

1 Mower lock lever (latch)

4. Depress the brake pedal to release the parking brake.



Traveling Procedure\_002

1 Brake pedal

5. Slowly depress the traveling pedal.
6. The machine will start to travel.

## Towing the Machine

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

### Caution

Do not touch the unload valve except when towing the machine.

### Caution

When towing the machine, travel at a speed no more than 3.0 km/h.

In addition, do not tow the machine for more than 3 minutes.

If the towing speed is too fast or the machine is towed too much, the pump or motor will be damaged.

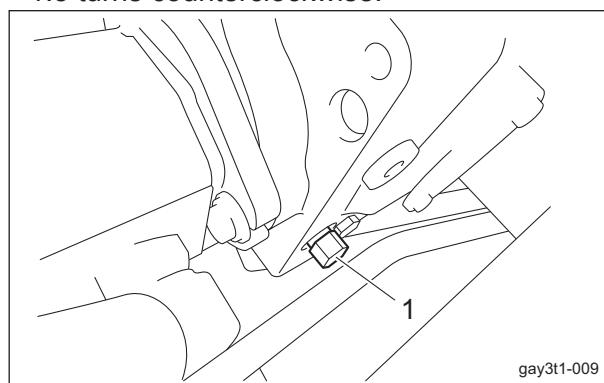
### Caution

Do not loosen the unload valve three turns or more.

### Caution

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

1. Stop the engine.  
"Procedure to Stop Engine" (Page 4-26)
2. Apply the parking brake and chock the wheels.
3. Lift up the underseat cover.  
"Underseat Cover" (Page 4-36)
4. Rotate the unload valve under the seat 1 to 1.5 turns counterclockwise.



Towing the Machine\_001

1 Unload valve

5. Remove the wheel stoppers.

# Handling Instructions

6. Depress the brake pedal to release the parking brake.
7. Tow the machine slowly.

## 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 an 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.  
Be careful since reel rotation is stopped if the mower unit up/down lever is moved to the neutral position or "UP" position.

1. Shift the reel rotation/stop switching levers of all mower units to the "Rotate" position.
2. Start the engine.  
"Procedure to Start Engine" (Page 4-24)
3. Raise all mower units, and set the anti-falling stop valve to the "Stop" position.
4. Engage the mower lock levers (latches) for mower units #4 and #5.
5. Depress the brake pedal to release the parking brake.
6. Shift the throttle lever to the rabbit icon (high speed), and rev up the engine to MAX (3,100 rpm).
7. Right before starting cutting work, set the anti-falling stop valve to the "Open" position.
8. Release the mower lock levers (latches) for mower units #4 and #5.
9. Shift the mower unit up/down lever to the "DOWN" position to lower the mower units.

10. Set the reel rotation switch to the "Rotate" position to rotate the reel cutters (cutting cylinders) for all mower units.

11. 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.

## Transporting

### Transporting Procedure

When loading the machine into a trailer or a truck to transport it, drive the machine in reverse. When unloading, drive the machine forward.

If the roof is installed on the machine, remove it.

The roof may be damaged by wind pressure.



<b>Maintenance Precautions .....</b>	<b>Page 5-2</b>
<b>Maintenance Schedule .....</b>	<b>Page 5-3</b>
Specified Values .....	Page 5-5
<b>Jacking up the machine .....</b>	<b>Page 5-6</b>
About the Jacking up the machine .....	Page 5-6
Jack-up Points .....	Page 5-6
<b>Greasing .....</b>	<b>Page 5-7</b>
About Greasing .....	Page 5-7
Greasing Points .....	Page 5-7
<b>Maintenance (Mower) .....</b>	<b>Page 5-10</b>
Back Lapping of Reel Cutter (Cutting Cylinder) .....	Page 5-10
<b>Maintenance (Main Body) .....</b>	<b>Page 5-13</b>
Removing/Installing Tires .....	Page 5-13
Adjustment of Belt Tension .....	Page 5-14
Adjustment of Parking Brake .....	Page 5-14
Adjustment of Brake .....	Page 5-15
Adjusting the Neutral Position of the Piston Pump .....	Page 5-15
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<b>Long-Term Storage .....</b>	<b>Page 5-17</b>
Before Long-Term Storage .....	Page 5-17

# Maintenance

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## Maintenance Precautions

 Caution

First, learn well the maintenance operations you plan to perform.

 Caution

Use tools appropriate for each maintenance operation.

 Caution

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.

## Maintenance Schedule

LM2400

Follow the maintenance schedule below.

- . . . Inspect, adjust, supply, clean
- . . . Replace (first time)
- △ . . . Replace

Maintenance item		Before work	After work	Every 8 hrs.	Every 10 hrs.	Every 50 hrs.	Every 100 hrs.	Every 200 hrs.	Every 250 hrs.	Every 400 hrs.	Every 450 hrs.	Every 500 hrs.	Every year	Every 2 years	Every 4 years	Remarks
Engine	Tightening the parts	○														
	Fuel	○														
	Engine oil	○		●		△										50 hrs (first time)
	Engine oil filter	○				●		△								
	Radiator	○														
	Oil cooler	○														
	Coolant	○				△										
	Fan belt	○												△		
	Battery	○													△	
	Battery fluid	○														
	Cleaning the exterior	○														
Main body	Tightening the parts	○														
	Interlock system	○														
	Electrical wiring												○			
	Reel cutter (Cutting cylinder)	○														Refer to "Inspection of Reel Cutter (Cutting Cylinder)"
	Bedknife (Bottom blade)	○														Refer to "Inspection of Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)"
	Operating height (Mowing height)	○														
	Blade engagement	○														
	Greasing, oiling					○										
Tire	○															

# Maintenance

Maintenance item		Before work	After work	Every 8 hrs.	Every 10 hrs.	Every 50 hrs.	Every 100 hrs.	Every 200 hrs.	Every 250 hrs.	Every 400 hrs.	Every 450 hrs.	Every 500 hrs.	Every year	Every 2 years	Every 4 years	Remarks	
Main body	Brake	○														Refer to "Inspection of Brake"	
	Brake wire	○						△								Refer to "Inspection of Wire"	
	Throttle wire	○						△									
	Reel cover	○															
	Oil leakage	○															
	Hydraulic oil	○					●					△					
	Hydraulic oil filter						●					△					
	Hydraulic hose (moving part)	○												△			
	Hydraulic hose (fixed part)	○													△		
	Air cleaner	○															
	Outer element								△					△			
	Inner element													△			
	Electromagnetic pump filter	○							△								
	Water separator						○	○									50 hrs (first time), Every 100hrs. Refer to "Inspection of Water Separator", "Draining of Water Separator"
											○						Refer to "Cleaning of Water Separator"
	Fuel strainer							○						△			
Fuel pipe	○																
Cleaning the exterior		○															

For the maintenance schedule of the items unlisted above, refer to the Engine's Owner's Manual.  
The values for consumables are not guaranteed.  
Replace the steering cylinder hoses every 2 years.

Specified Values

Fuel tank capacity	Approx. 38.0 dm <sup>3</sup> (38.0 L)	
Hydraulic tank capacity	Approx. 35.0 dm <sup>3</sup> (35.0 L)	Shell Tellus S2M46 (or equivalent)
Engine oil capacity	Approx. 3.1 dm <sup>3</sup> (3.1 L)	Summer: SAE30, Winter: SAE20
Coolant capacity	Approx. 6.0 dm <sup>3</sup> (6.0 L)	Including reserve tank
Front tires	140 kPa (1.4 kgf/cm <sup>2</sup> )	26.5 × 14.00 - 12
Rear tires	100 kPa (1.0 kgf/cm <sup>2</sup> )	20 × 10.00 - 10
Cutter adjustment spring	40.0 mm (1.575 in)	Length of spring coil

# Maintenance

## Jacking up the machine

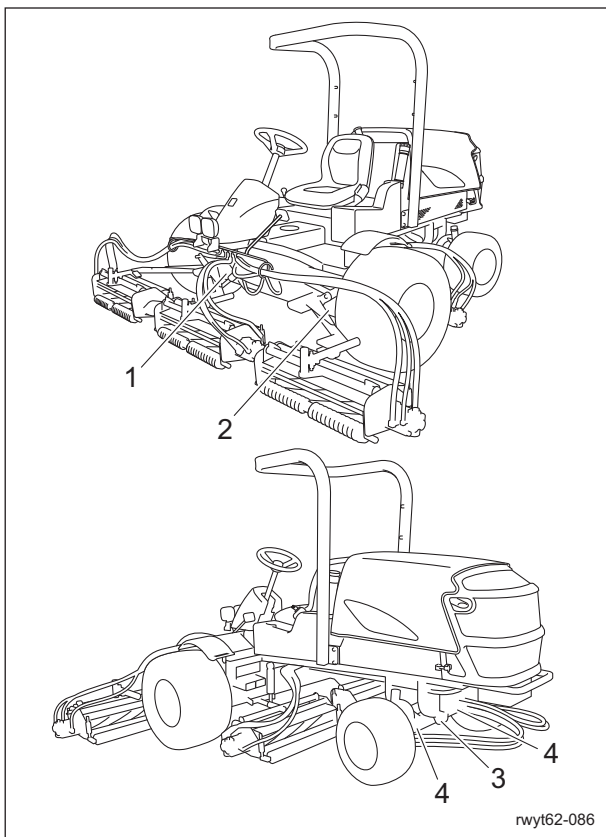
### About the Jacking up the machine

**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.

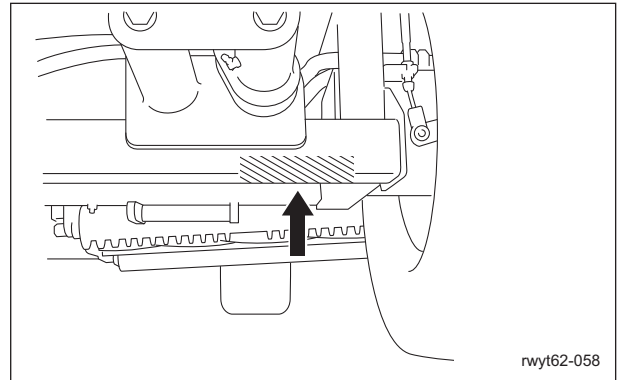
### Jack-up Points



Jack-up Points\_001

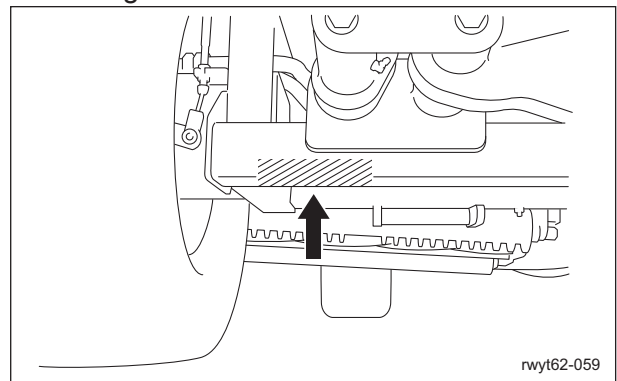
	Jack-up Points
1	Front right frame
2	Front left frame
3	Rear frame
4	Pivot

#### 1. Front left frame



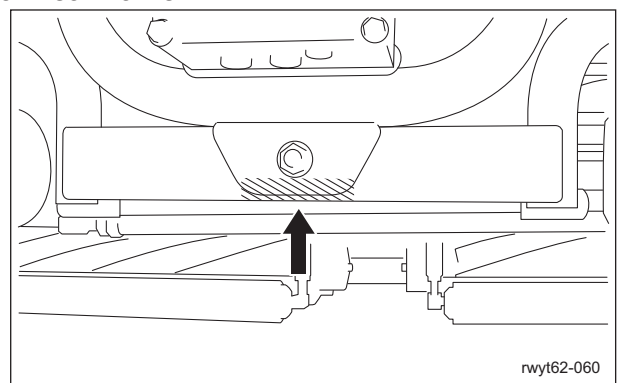
Jack-up Points\_002

#### 2. Front right frame



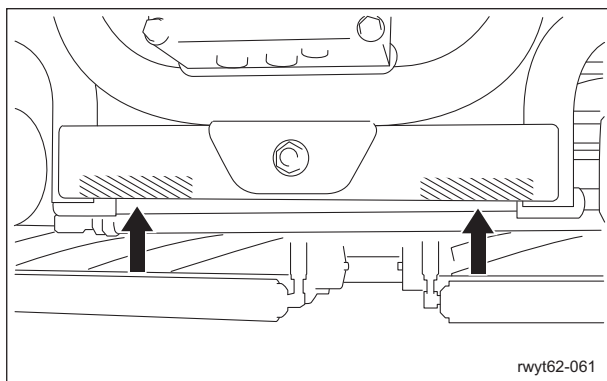
Jack-up Points\_003

#### 3. Rear frame



Jack-up Points\_004

4. Pivot  
There are two locations.



Jack-up Points\_005

## Greasing

### About Greasing

Since there may be adhesion or damage due to lack of grease on moving parts, they must be greased.

Add urea-based No. 2 grease in accordance with the Maintenance Schedule.

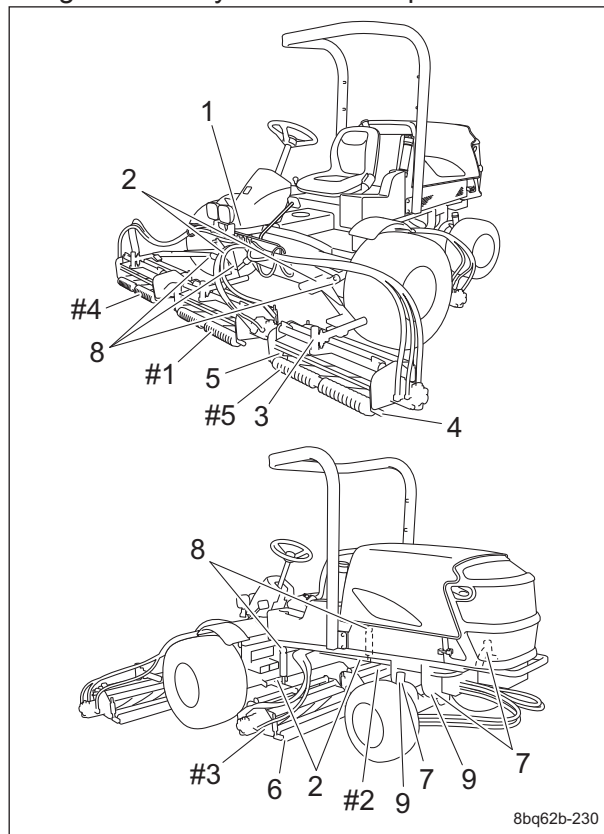
Other locations where the specified grease or lubricant is used are indicated in "Greasing Points".

Add grease using the specified grease or lubricant.

### Greasing Points

Grease nipples are installed in the following locations.

Add grease every 50 hours of operation.



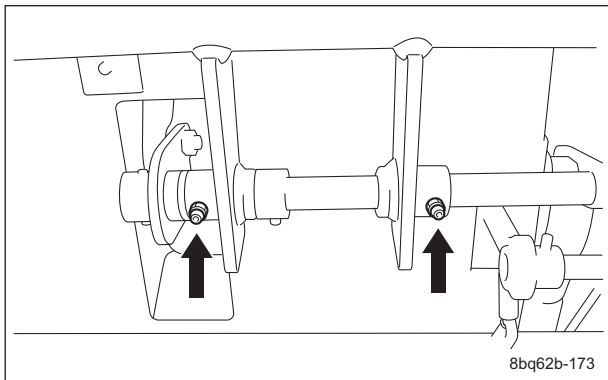
Greasing Points\_001

	Location	No. of greasing points
1	Pedal shaft fulcrum	2
2	Lift arm fulcrum	5
3	Mower unit fulcrum	5
4	Front roller	10
5	Reel housing	5
6	Rear roller	10
7	Pivot	3
8	Cylinder shaft	7
9	Power steering cylinder shaft	2

Maintenance

# Maintenance

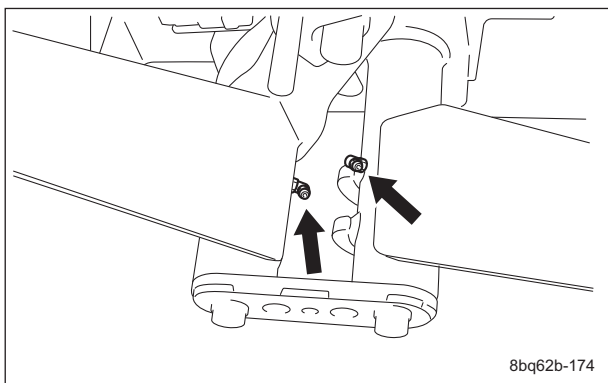
1. Pedal shaft fulcrum  
There are two locations.



Greasing Points\_002

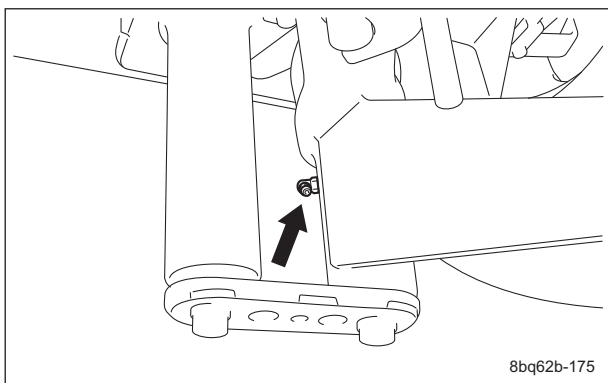
2. Lift arm fulcrum  
There is one greasing point on the lift arm fulcrum connected to each mower unit.  
Lower the mower units before greasing the lift arm fulcrums.

Mower units #1/#4



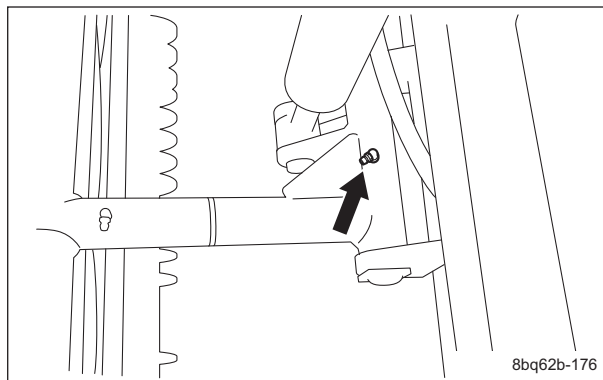
Greasing Points\_003

Mower unit #5



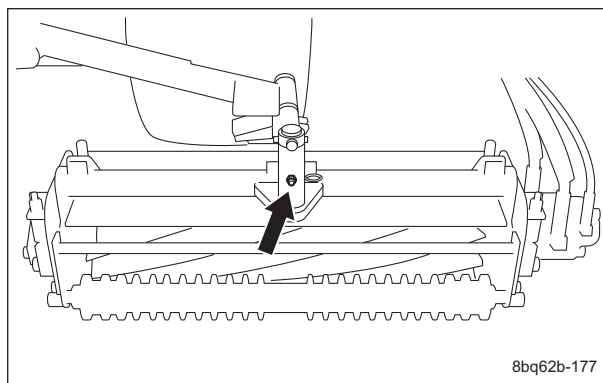
Greasing Points\_004

Mower units #2/#3



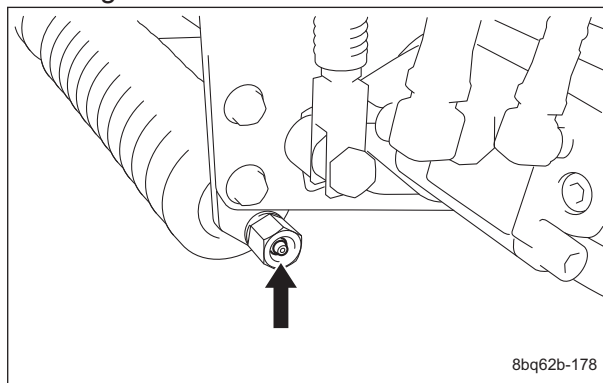
Greasing Points\_005

3. Mower unit fulcrum  
There is one greasing point on each mower unit.



Greasing Points\_006

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

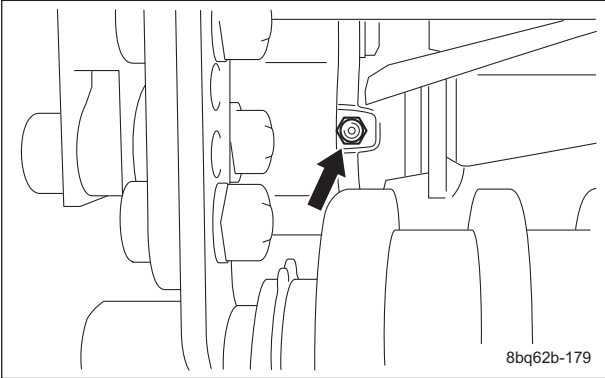


Greasing Points\_007



**5. Reel housing**

There is one greasing point on the reel housing of each mower unit.

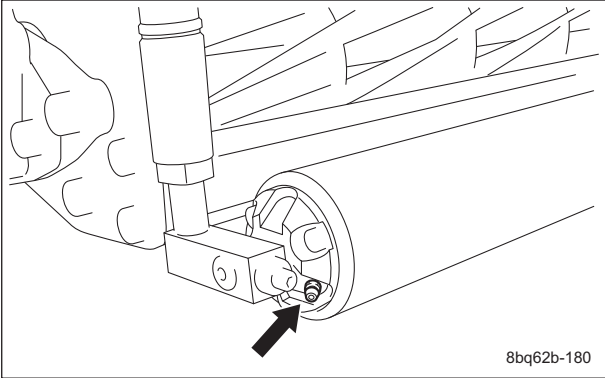


Greasing Points\_008

8bq62b-179

**6. Rear roller**

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



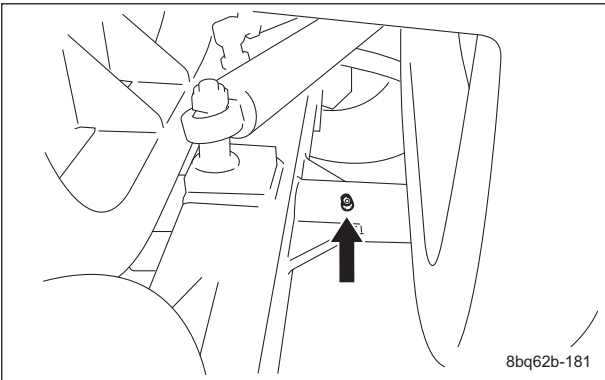
Greasing Points\_009

8bq62b-180

**7. Pivot**

There are three locations.

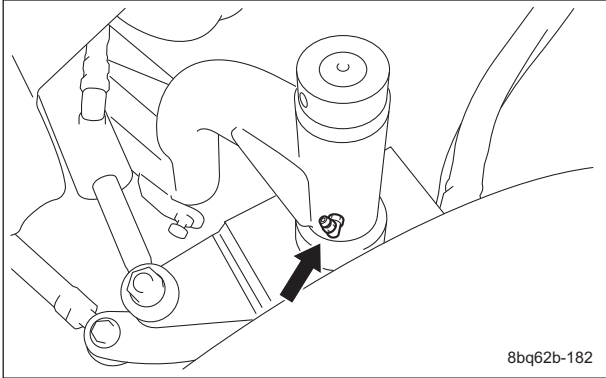
Middle between the rear wheels



Greasing Points\_010

8bq62b-181

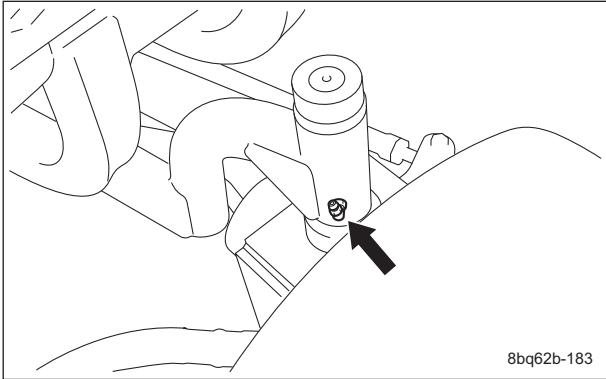
**Rear left wheel**



8bq62b-182

Greasing Points\_011

**Rear right wheel**



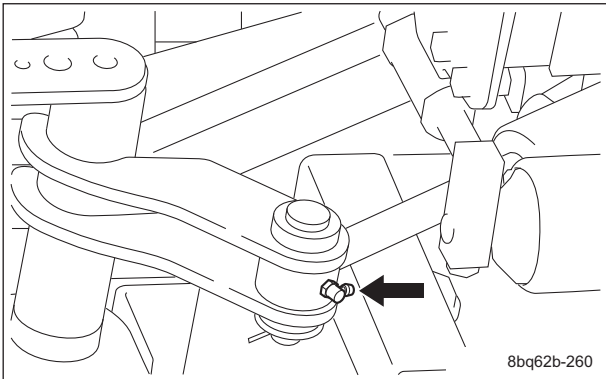
8bq62b-183

Greasing Points\_012

**8. Cylinder shaft**

**#1 cylinder shaft**

There is one greasing point on the cylinder shaft.

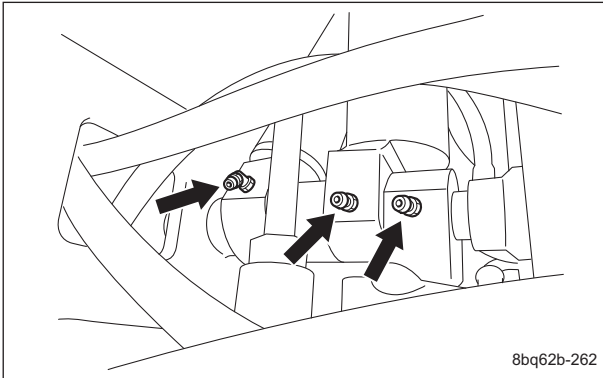


8bq62b-260

Greasing Points\_013

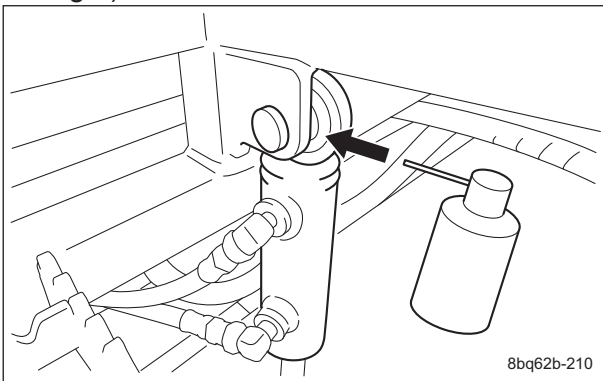
# Maintenance

**#1, #4 and #5 cylinder shafts**  
There are three greasing points on the cylinder shaft.



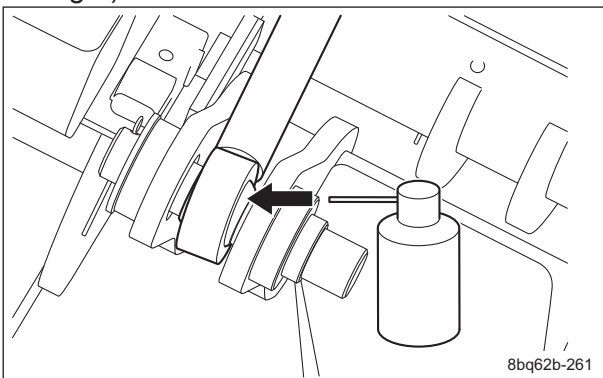
Greasing Points\_014

**#2 and #3 cylinder shafts**  
Apply lubricant to the round end of the cylinder (one point each on the left and right).



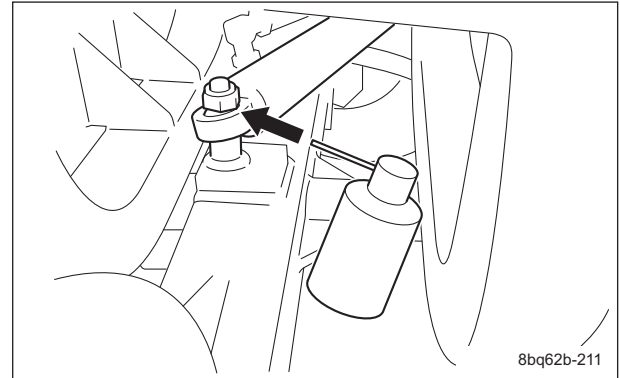
Greasing Points\_015

**#4 and #5 cylinder shafts**  
Apply lubricant to the round end of the cylinder (one point each on the left and right).



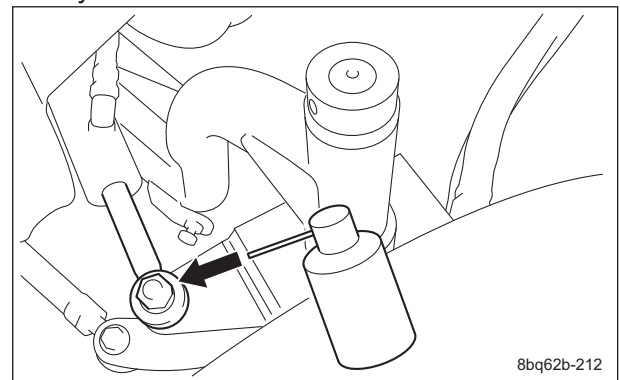
Greasing Points\_016

**9. Power steering cylinder shaft**  
Middle between the rear wheels  
Apply lubricant to the round end of the cylinder.



Greasing Points\_017

**Rear left wheel**  
Apply lubricant to the round end of the cylinder.



Greasing Points\_018

## Maintenance (Mower)

### Back Lapping of Reel Cutter (Cutting Cylinder)

Back 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, back 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 make cutting difficult, follow the steps below to perform back 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 and feet.

**Caution**

Be careful not to inhale exhaust gas during back lapping.

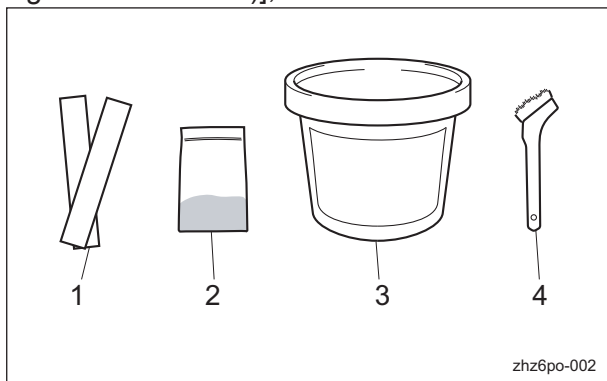
**Caution**

During back lapping, the reel cutter (cutting cylinder) rotates. Keep hands and feet away from moving parts.

**Caution**

Do not perform back lapping with any other persons.

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



Back Lapping of Reel Cutter (Cutting Cylinder)\_001

1	Newspaper
2	Back lapping powder
3	Gel compound
4	Brush

**Note:**

The mixing ratio for the abrasive, in volume, is one part back lapping powder (#150 - #200) to three or four parts oil.

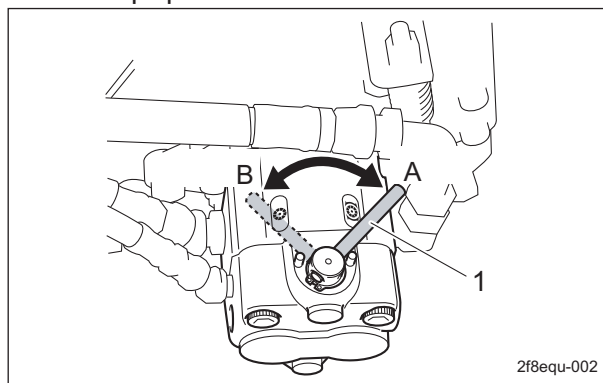
**Caution**

When handling the reel cutter (cutting cylinder) and the bed knife (bottom blade), 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.

**Important**

Check the sharpness of the blade by checking the blade engagement after cutting grass.

2. Stop the engine.
3. Set the reel rotation/stop switching lever to the "Stop" position.



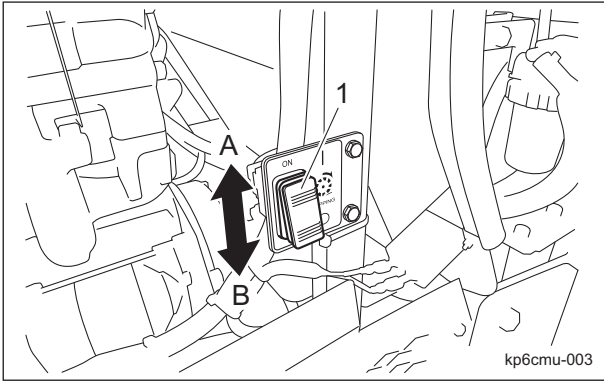
Back Lapping of Reel Cutter (Cutting Cylinder)\_002

1	Reel rotation/stop switching lever
A	Rotate
B	Stop

4. 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) by hand to check the sharpness of the blades.
5. Check the sharpness of the entire range (three or four points from the left edge to the right one) of the reel cutter (cutting cylinder).
6. Using a piece of chalk, mark locations on the blade that are sharp.
7. Shift only the reel rotation/stop switching levers of the hydraulic motors in the mower units to be used for back lapping to the "Rotate" position. Shift the levers to the "Stop" position for the mower units for which you will not perform back lapping.

# Maintenance

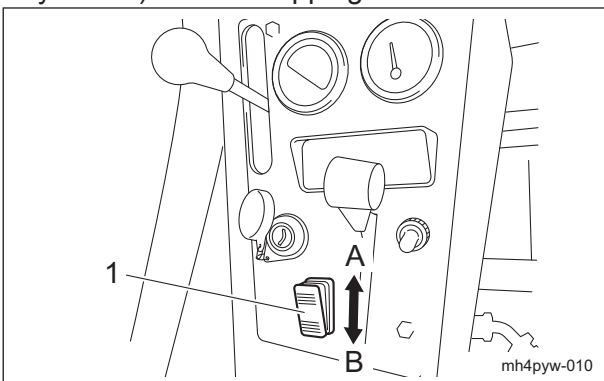
8. Lower all mower units to the ground, and then stop the engine.
9. Open the hood, and then set the reel reverse switch to the "ON" position.



Back Lapping of Reel Cutter (Cutting Cylinder)\_003

1	Reel reverse switch
A	ON (reverse)
B	OFF (normal rotation)

10. Sit on the seat, apply the parking brake, and then start the engine.
11. Run the engine at a low rpm.
12. Set the reel rotation switch to the "Rotate" position to rotate the reel cutters (cutting cylinders) for back lapping.

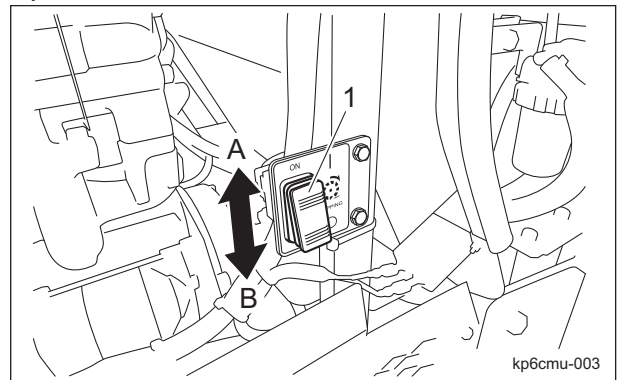


Back Lapping of Reel Cutter (Cutting Cylinder)\_004

1	Reel rotation switch
A	Rotate
B	Stop

13. With the reel rotation/stop switching lever, adjust the rotation speed of the reel cutter (cutting cylinder).
14. 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. (Never apply to blunt areas.)

15. Idle the machine for a while and, when contact noise is no longer heard, set the reel rotation switch to the "Stop" position to stop the reel cutter (cutting cylinder).
16. Stop the engine.
17. Wash off or wipe off with a cloth, etc., the abrasive from the reel cutter (cutting cylinder), and then check it for sharpness.
18. Repeat steps 4 to 17 until the entire range (three or four points from the left edge to the right one) of the reel cutter (cutting cylinder) will be uniformly sharpened.
19. Finally, apply abrasive to the entire blade width of the reel cutter (cutting cylinder) and perform final back lapping.
20. Set the reel rotation switch to the "Stop" position to stop the rotation of the reel cutter (cutting cylinder), stop the engine, and then carefully and thoroughly wash off any remaining abrasive.
21. Set the reel reverse switch to the "OFF" position.



Back Lapping of Reel Cutter (Cutting Cylinder)\_005

1	Reel reverse switch
A	ON (reverse)
B	OFF (normal rotation)

22. Shift the reel rotation/stop switching lever to the "Stop" position.
23. While checking the blade for sharpness, adjust blade engagement.

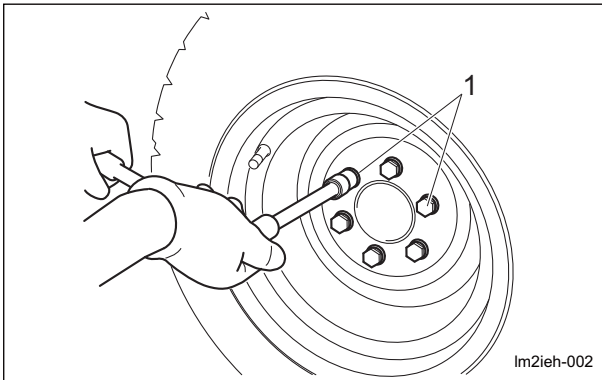
## Maintenance (Main Body)

### 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. Securely place the jack beneath the jack-up point of the front left/right frame area, and then raise it until the tire lifts off the ground. "Jack-up Points" (Page 5-6)
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 etc.

**Important**

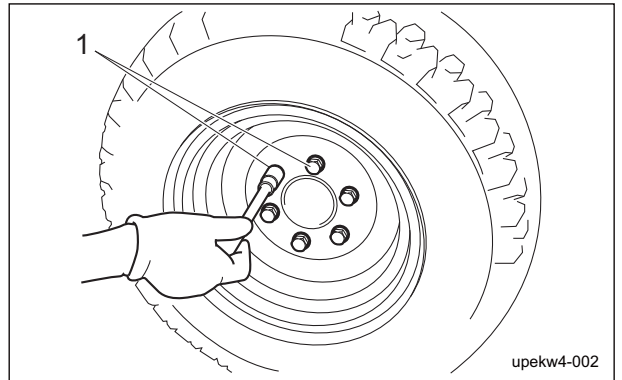
Tighten the bolts in the tightening order (diagonally).

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. Securely place the jack beneath the jack-up point of the rear frame area, and then raise it until the tire lifts off the ground. "Jack-up Points" (Page 5-6)
3. Remove the bolts.
4. Remove the tire from the wheel mounting base.

**Caution**

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

**Important**

Tighten the bolts in the tightening order (crosswise).

For installing the rear tires, reverse the removing procedure.

# Maintenance

## Adjustment of Belt Tension

**Caution**

Be sure to stop the engine before adjusting the belts.

**Important**

Make sure that the belt has the specified amount of tension.

If the belt becomes slack due to frequent use, it may jump or slip.  
 In addition, if it is overtightened, it may wear prematurely.  
 If necessary, adjust it, and always check the belt for appropriate tension.

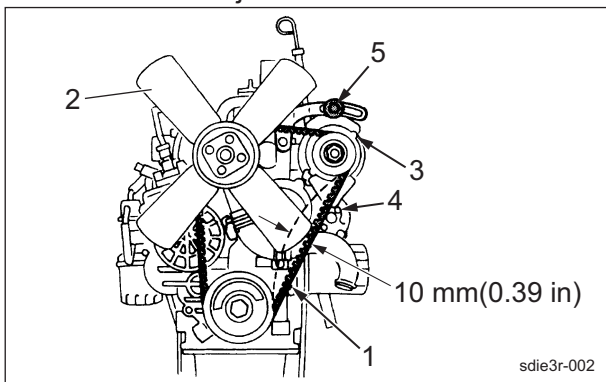
### Fan Belt

**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.
2. 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

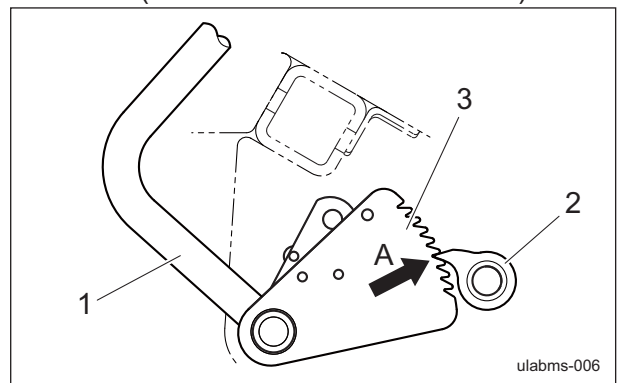
## Adjustment of Parking Brake

**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 brake is not sufficiently effective, adjust the brake wire.

1. Check position of the notch of the parking brake.
2. Depressing the brake pedal firmly, move the parking brake lock lever forward with a foot. Make adjustments with the adjustment bolt inside of the tire so that the latch of the parking brake lock lever is positioned at arrow A (fourth notch from the bottom).



Adjustment of Parking Brake\_001

1	Brake pedal
2	Latch
3	Notch

## Adjustment of Brake

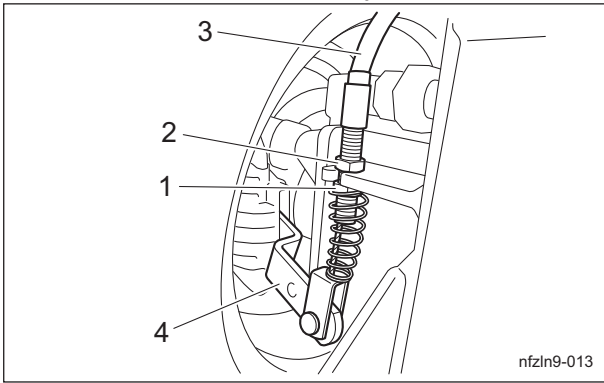
### **⚠ Danger**

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.

### Important

Adjust to reduce the play in the brake lever as much as possible so that the brake does not drag when the lever is released.

- Adjust the brake by tightening the brake wire adjustment bolt.
  - If there is too much play in the brake lever, the braking power is reduced and the brake pedal feel is light.
  - If there is too little play in the brake lever, the braking power is increased and the brake pedal feel is heavy.



Adjustment of Brake\_001

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

- Start the engine and drive to check the following.
  - Make sure that heat is not generated in the brake area.
  - Make sure that the left and right brakes are equally effective.

### **⚠ Danger**

It would be extremely dangerous and may result in an unexpected accident if the left and right brakes are not equally effective.

- If the left and right brakes are not equally effective, make fine adjustments with the adjustment bolt on the brake wire.

### Break-in of Brakes

If the brake shoes or brake pads are worn, replace them with new ones.  
 Immediately after replacement, drive to break in the brakes if the effectiveness of the brakes is low.  
 While driving, lightly operate the brakes to break in the contact areas.

## Adjusting the Neutral Position of the Piston Pump

### **⚠ Caution**

Make sure not to touch rotating tires.

### **⚠ Caution**

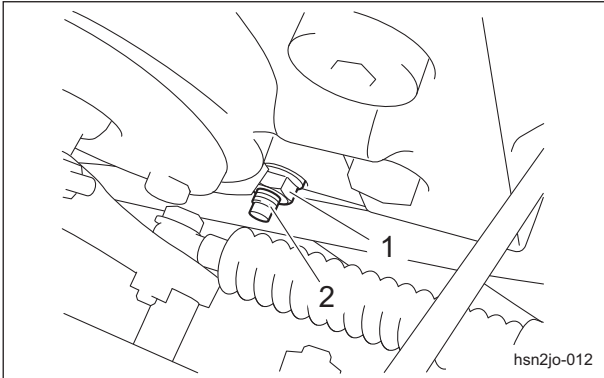
When adjusting the neutral position, pay close attention to abrupt start of the machine.  
 Place the jacks beneath the jack-up points, and then lift the machine until all the tires get off the ground.

If the machine moves forward or backward while the traveling pedals are released, they are not set to the neutral position.  
 Follow the steps below to make adjustments.

- Stop the engine.
- Place the jacks beneath the jack-up points, and then lift the machine off the ground.  
 "Jack-up Points" (Page 5-6)
- Make sure that no tires get contact with the jack stand.
- Start the engine, and rev it up to the maximum rpm.
- Adjust the neutral position.  
 [1] Loosen the lock nuts.

# Maintenance

[2] Rotate the traction adjusting cam slowly until all wheels stop. Find the position where all wheels stop and lock the traction adjusting cam with the lock nut.



Adjusting the Neutral Position of the Piston Pump\_001

1	Lock nut
2	Traction adjusting cam

## Change of Fuse

### Fuse Box

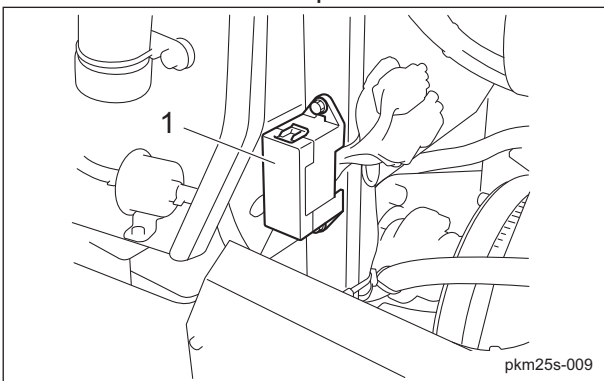
#### Warning

Before performing maintenance on the electrical system, be sure to disconnect the negative terminal of the battery.

#### Caution

If a fuse is blown, the electrical circuit may be shorted. Check to identify the cause, such as a bad terminal connection, damaged wiring or terminals, or incorrect wiring.

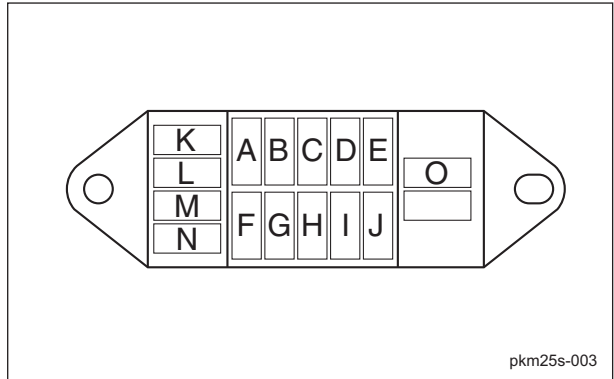
The fuse box includes spare fuses and tools.



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.



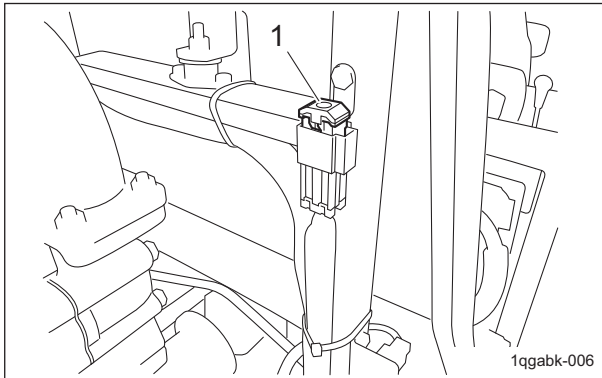
Fuse Box\_002

A	5 A	Glow lamp timer
B	5 A	Glow lamp
C	5 A	Fuel pump
D	5 A	Charge lamp, oil pressure lamp (engine oil pressure lamp), water temperature gauge, buzzer, hour meter, fuel gauge
E	15 A	Reel normal rotation solenoid, reel reverse rotation solenoid, slight lift check valve
F	15 A	Light
G	5 A	Relay (starter)
H	5 A	Alternator (IG)
I	5 A	#4/#5 proximity switch relay, #4/#5 proximity switches, stop solenoid(for backlapping), relay box
J	5 A	Starter relay, safety relay, stop solenoid, reel rotation ON relay, lever down relay, normal/reverse rotation relay, unit down proximity switch, pump neutral proximity switch, brake proximity switch
K	5 A	Spare
L	5 A	Spare
M	15 A	Spare
N	15 A	Spare
O		Tool



## Fusible Link

Fuse capacity of the fusible link is 50 A.



Fusible Link\_001

1	Fusible link
---	--------------

## Long-Term Storage

### Before Long-Term Storage

- Remove dirt, grass clippings, debris, oil stains etc. completely.
- Supply oil and apply grease to appropriate parts.
- Remove the negative terminal of the battery.

# Maintenance

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## EU Declaration of Conformity

### Product Identification

Product : Lawnmower  
Make : BARONESS  
Type : LM2400  
Version(s) : Not Applicable  
Starting Serial No. : 10200  
Measured Sound Power Level : LWA 100.21 dB  
Guaranteed Sound Power Level : LWA 103 dB  
Manufacturer Name : Kyoisha Co., Ltd.  
Address : 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

### Conforms to the following Directives

2006/42/EC Machinery (MD)  
2014/30/EU Electromagnetic compatibility (EMC)  
2000/14/EC Noise emissions from outdoor equipment

### We has been designed and manufactured using the following specifications

ISO 12100 : 2010 (2006/42/EC)  
ISO 5395-1 : 2013 (2006/42/EC)  
ISO 5395-3 : 2013 (2006/42/EC)  
ISO 14982 : 1998 (2014/30/EU)

### Technical Documentation

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

### Compiler of the technical file (2006/42/EC)

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

### Conformity assessment procedures

Internal production control : Module A (2006/42/EC)  
EC-type examination : Module B (2014/30/EU)  
Internal control of production with assessment of technical documentation and periodical checking (2000/14/EC)

### Involved Notified Body (2000/14/EC)

Name : SNCH  
Address : 11, Route de Sandweiler 5230 Sandweiler Luxembourg  
Certificate / Technical Documentation No. : SNCH\*2000/14\*2005/88\*2409\*02/TCLM2400-02

Place : Japan  
Date : 27 February 2018

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

(fr)

## Déclaration de conformité UE

### Identification du produit

Produit : Tondeuse à gazon  
Fabricant : BARONESS  
Type : LM2400  
Version(s) : Non applicable  
Numéro de série de début : 10200  
Niveau de puissance acoustique mesuré : LwA 100.21 dB  
Niveau de puissance acoustique garanti : LwA 103 dB  
Fabricant Nom : Kyoisha Co., Ltd.  
Adresse : 1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon

### Conforme aux directives suivantes :

2006/42/CE Machine (MD)  
2014/30/UE Compatibilité électromagnétique (CEM)  
2000/14/CE Émissions sonores de l'équipement de plein air

### Conception et fabrication en respect des spécifications suivantes :

ISO 12100 : 2010 (2006/42/CE)  
ISO 5395-1 : 2013 (2006/42/CE)  
ISO 5395-3 : 2013 (2006/42/CE)  
ISO 14982 : 1998 (2014/30/UE)

### Fiche technique

Marque : Kyoisha Co., Ltd.  
Adresse de la marque : 1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon

### Compilateur de la fiche technique (2006/42/CE)

Nom : Kyoisha U.K. Ltd.  
Adresse : Unit 5 Hatch Industrial Park Greywell Road, Basingstoke Hampshire RG24 7NG, Royaume-Uni

### Procédures d'évaluation de la conformité

Contrôle de production interne : module A (2006/42/CE)  
Examen de type CE : module B (2014/30/UE)  
Contrôle interne de la production avec évaluation de la fiche technique et vérification périodique (2000/14/CE)

### Organisme notifié impliqué (2000/14/CE)

Nom : SNCH  
Adresse : 11, Route de Sandweiler 5230 Sandweiler, Luxembourg  
N° de certificat/Documentation technique : SNCH\*2000/14\*2005/88\*2409\*02/TCLM2400-02

## Declaración de conformidad de la UE

### Identificación del producto

Producto: Cortacésped  
 Marca: BARONESS  
 Tipo: LM2400  
 Versión: No aplicable  
 N.º de serie inicial: 10200  
 Nivel de potencia sonora medido: LWA 100.21 dB  
 Nivel de potencia sonora garantizado: LWA 103 dB  
 Fabricante Nombre: Kyoeshisa Co., Ltd.  
 Dirección: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japón

### Cumple las siguientes Directivas

2006/42/CE Maquinaria (MD)  
 2014/30/UE Compatibilidad electromagnética (EMC)  
 2000/14/CE Emisiones sonoras de máquinas de uso al aire libre

### Se ha diseñado y fabricado utilizando las siguientes especificaciones

ISO 12100 : 2010 (2006/42/CE)  
 ISO 5395-1 : 2013 (2006/42/CE)  
 ISO 5395-3 : 2013 (2006/42/CE)  
 ISO 14982 : 1998 (2014/30/UE)

### Documentación técnica

Nombre del responsable: Kyoeshisa Co., Ltd.  
 Dirección del responsable: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japón

### Compilador del archivo técnico (2006/42/CE)

Nombre: Kyoeshisa U.K. Ltd.  
 Dirección: Unit 5 Hatch Industrial Park Greywell Road, Basingstoke Hampshire RG24 7NG, Reino Unido

### Procedimientos de evaluación de conformidad

Control de fabricación interno: Módulo A (2006/42/CE)  
 Examen de tipo CE: Módulo B (2014/30/UE)  
 Control interno de fabricación con evaluación de documentación técnica y comprobaciones periódicas (2000/14/CE)

### Organismo notificado implicado (2000/14/CE)

Nombre: SNCH  
 Dirección: 11, Route de Sandweiler 5230 Sandweiler Luxemburgo  
 Certificado/Documentación técnica n.º: SNCH\*2000/14\*2005/88\*2409\*02/TCLM2400-02

## EU-Konformitätserklärung

### Produktbeschreibung

Produkt: Rasenmäher  
 Marke: BARONESS  
 Modell: LM2400  
 Version(en): Nicht zutreffend  
 Startseriennummer: 10200  
 Gemessener Schalleistungspegel: LWA 100.21 dB  
 Garantierter Schalleistungspegel: LWA 103 dB  
 Hersteller Name: Kyoeshisa Co., Ltd.  
 Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

### Entspricht den folgenden Richtlinien

2006/42/EG Maschinenrichtlinie  
 2014/30/EU Elektromagnetische Verträglichkeit (EMV)  
 2000/14/EG Geräuschemission von im Freien betriebenen Geräten

### Unter Anwendung der folgenden Bestimmungen entwickelt und hergestellt

ISO 12100 : 2010 (2006/42/EG)  
 ISO 5395-1 : 2013 (2006/42/EG)  
 ISO 5395-3 : 2013 (2006/42/EG)  
 ISO 14982 : 1998 (2014/30/EU)

### Technische Dokumentation

Name des Halters: Kyoeshisa Co., Ltd.  
 Adresse des Halters: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

### Technische Unterlagen erstellt von (2006/42/EG)

Name: Kyoeshisa U.K.Ltd.  
 Adresse: Unit 5 Hatch Industrial Park Grewell Road, Basingstoke Hampshire RG24 7NG, Großbritannien

### Konformitätsbewertungsverfahren

Interne Produktionskontrolle : Modul A (2006/42/EG)  
 EG-Baumusterprüfung : Modul B (2014/30/EU)  
 Interne Produktionskontrolle mit Bewertung der technischen Unterlagen und regelmäßiger Überprüfung (2000/14/EG)

### Beteiligte benannte Stelle (2000/14/EG)

Name: SNCH  
 Adresse : 11, Route de Sandweiler 5230 Sandweiler Luxemburg  
 Bescheinigung/Technische Dokumentation Nr. : SNCH\*2000/14\*2005/88\*2409\*02/TCLM2400-02

## EU-försäkran om överensstämmelse

### Produktidentifikation

Produkt :	Gräsklippare
Märke:	BARONESS
Typ:	LM2400
Version(er):	Ej aktuellt
Serienummer startar på:	<b>10200</b>
Uppmätt ljudeffektivå:	LWA            100.21    dB
Garanterad ljudeffektivå:	LWA            103            dB
Tillverkare	Namn:            Kyoisha Co., Ltd.
	Adress:           1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

### Uppfyller följande direktiv

2006/42/EG	Maskindirektivet
2014/30/EU	Elektromagnetisk kompatibilitet (EMC)
2000/14/EG	Bulleremission från utomhusutrustning

### Följande kravspecifikationer har följts vid konstruktion och tillverkning

ISO 12100 : 2010 (2006/42/EG)  
 ISO 5395-1 : 2013 (2006/42/EG)  
 ISO 5395-3 : 2013 (2006/42/EG)  
 ISO 14982 : 1998 (2014/30/EU)

### Teknisk dokumentation

Innehavarens namn:	Kyoisha Co., Ltd.
Innehavarens adress:	1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

### Den tekniska filen(2006/42/EG) har tagits fram av

Namn:	Kyoisha U.K.Ltd.
Adress:	Unit 5 Hatch Industrial Park Grewell Road, Basingstoke Hampshire RG24 7NG, Storbritannien

### Förfarande för bedömning av överensstämmelse

Intern produktionskontroll: Modul A (2006/42/EG)  
 EG-typprovning: Modul B (2014/30/EU)  
 Intern kontroll av produktion med fastställande av teknisk dokumentation och periodiska kontroller (2000/14/EG)

### Anmält organ (2000/14/EG)

Namn:	SNCH
Adress:	11, Route de Sandweiler 5230 Sandweiler Luxembourg
Certifikat/Teknisk dokumentation nummer:	SNCH*2000/14*2005/88*2409*02/TCLM2400-02

**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