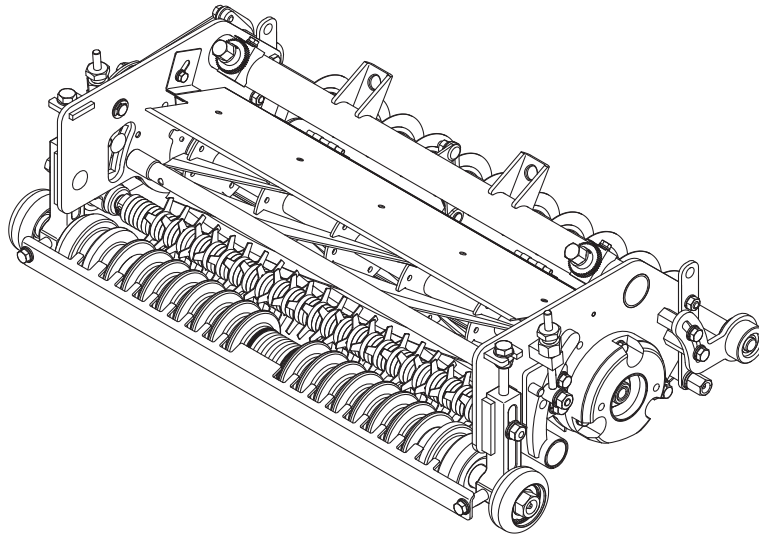


# **LH52**

Small Diameter Mower Unit

## Owner's Operating Manual



Serial No. LH52 : 10001-

"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.1.0

# Greeting

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Thank you for purchasing the Baroness machine. This manual describes the proper handling, adjustment, and inspection of your mower unit. 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. For details on the handling, adjustment and inspection of the main vehicle, refer to the Owner's Operating Manual for the main vehicle.

## Suitable Baroness Main Vehicles

Baroness Main Vehicles that can be equipped with Small Diameter Mower Units are listed below.

	LH52	Remarks
LM551	○	
LM551A	○	

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 this mower unit properly and safely.

Do not perform maintenance on the machine other than that described in this manual.

Maintenance should only be performed by a certified specialist.

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

When making inquiries about this mower unit, be sure to specify the model name and serial number.

When loaning or transferring this mower unit, be sure to also provide this manual together with it.

Kyoeisha 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 mower unit 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 mower unit for other purposes and modifying it may be very dangerous and may cause damage to the machine.

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LH52

# Contents

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**Safety**

# Safety

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

** Danger**

This mower unit 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

Read Safe Operating Practices described in the Owner's Operating Manual of Baroness main vehicle equipped with this mower unit thoroughly.



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

Disposal

# Disposal

---

## 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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Features of Small Diameter Mower

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Description of Safety Decals and

Instruction Decals ..... Page 3-4

# Product Overview

## Specifications

### Specifications list

LH52

Model		LH52			
Type		Base unit (incl. one weight)		With groomer	
Dimensions	Total length	14.13 in	359 mm	14.13 in	359 mm
	Total width	27.83 in	707 mm	28.50 in	742 mm
	Total height	8.66 in	220 mm	8.82 in	224 mm
Weight	Mower Unit	90.39 lb	41.0 kg	97.00 lb	44.0 kg
	Weight (one piece)	4.41 lb	2.0 kg	—	—
	Groomer	—	—	11.02 lb	5.0 kg
	CR brush	—	—	—	—
	Groomer + CR brush	—	—	—	—
Operating height (Mowing height)		0.197 - 0.787 in	5.0 - 20.0 mm	0.197 - 0.787 in	5.0 - 20.0 mm
Operating width (Mowing width)		22 in	557.5 mm	22 in	557.5 mm
Diameter of the reel cutter		5 in	128 mm	5 in	128 mm
Blades		7 · 9 · 11		7 · 9 · 11	

Model		LH52			
Type		With CR brush type B		With groomer and CR brush type B	
Dimensions	Total length	15.79 in	401 mm	15.79 in	401 mm
	Total width	30.12 in	765 mm	30.12 in	765 mm
	Total height	8.66 in	220 mm	8.82 in	224 mm
Weight	Mower Unit	99.21 lb	45.0 kg	105.82 lb	48.0 kg
	Weight (one piece)	—	—	—	—
	Groomer	—	—	—	—
	CR brush	13.23 lb	6.0 kg	—	—
	Groomer + CR brush	—	—	19.84 lb	9.0 kg
Operating height (Mowing height)		0.197 - 0.787 in	5.0 - 20.0 mm	0.197 - 0.787 in	5.0 - 20.0 mm
Operating width (Mowing width)		22 in	557.5 mm	22 in	557.5 mm
Diameter of the reel cutter		5 in	128 mm	5 in	128 mm
Blades		7 · 9 · 11		7 · 9 · 11	

# Product Overview

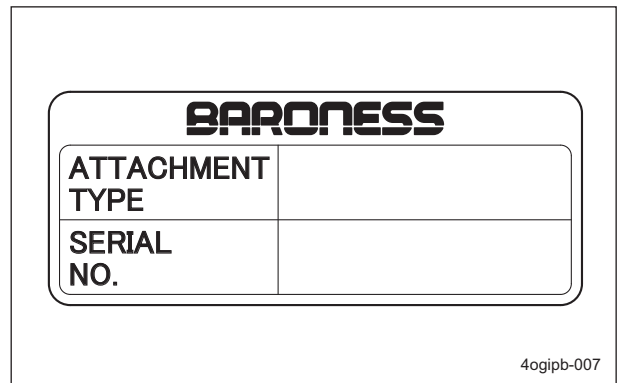
## Features of Small Diameter Mower Unit

1. Equipped with a 5.0-inch (128 mm) - diameter reel cutter (cutting cylinder).
2. The front roller is a grooved roller that will not press down the lawn.
3. Grass clippings can be discharged either forward or backward.
4. The grass catcher can be installed.
5. The groomer can be installed.
6. The CR brush can be installed onto the rear roller.
7. The groomer and CR brush can be installed at the same time.
8. The scraper can be installed on the front and rear roller.

1	Reel cover
2	Reel cutter
3	Bed knife
4	Front roller
5	Rear roller
6	Groomer
7	Scraper
8	CR brush
9	Support roller

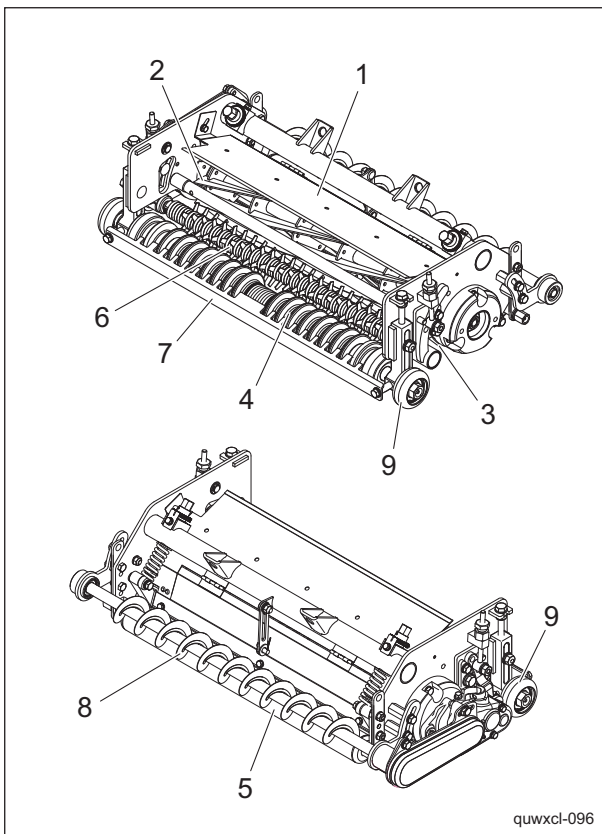
## Serial Number Plate

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



Serial Number Plate\_001

## Names of Each Section



Names of Each Section\_001

# Product Overview

## Safety Signs and Instruction Signs

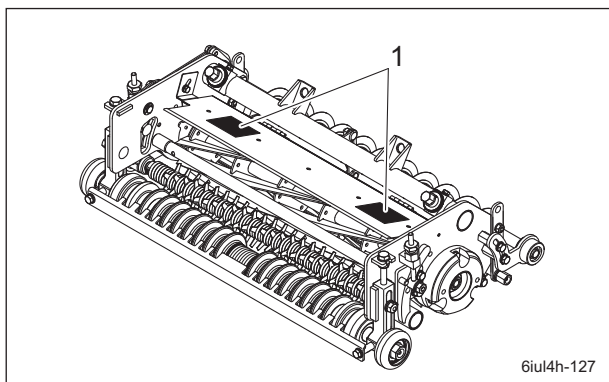
### About Safety Decals and Instruction Decals

**Important**

Safety decals and instruction decals are attached to this mower unit. Make sure that decals 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.

### Positions of Safety Decals and Instruction Decals



Positions of Safety Decals and Instruction Decals\_001

### Description of Safety Decals and Instruction Decals

1	<p style="text-align: center; font-size: small;">qigqnx-010</p>	<p>K4205001600 Decal, caution to mutilation</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Caution         </div> <p>May cut your hand or leg - Stop the cutter rotation and engine. Otherwise you may get injured.</p>
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# Handling Instructions

## Handling Precautions

### Important

This manual contains descriptions for handling the mower unit.

For details on handling the main body, refer to this manual and the Owner's Operating Manual for the main body.

## 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.

## Cover

### Inspection of Covers

#### Caution

If you have removed the covers during inspection, be sure to securely install them in their original positions.

If a cover remains removed, the operator may come into contact with rotating parts or belts and foreign objects may fly off, possibly resulting in injuries.

1. Make sure that there is no wear or deterioration of the reel cover and all other covers.
2. Make sure that there is no damage to the reel cover and all other covers.
3. Make sure that there is no interference with moving parts due to deformation of the reel cover and all other covers.
4. Make sure that the reel cover and all other covers are installed in their appropriate positions.

## 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.

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.



# Handling Instructions

## Roller

### Inspection of Rollers

Bearing wear due to frequent use or bearing damage caused by water infiltration may prevent the roller from rotating smoothly. Inspect the roller and, if necessary, replace parts such as oil seals and bearings.

1. Make sure that there is no abrasion nor adhesion of the roller.
2. Make sure that there is no wear of the roller shaft.
3. Make sure that there is no wear nor damage of the oil seal.
4. Make sure that there is no wear nor rust of the bearing.
5. Make sure that there is no play in the roller shaft.

### Inspection of Support Roller

#### Note:

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

Wear of bearings due to frequent use and/or damage of bearings, etc. caused by invasion of water may prevent the roller from rotating smoothly.

Inspect the roller and, if necessary, replace parts such as bearings.

1. Make sure that there is no abrasion nor adhesion of the roller.
2. Make sure that there is no wear of the roller shaft.
3. Make sure that there is no wear nor rust of the bearings.
4. Make sure that there is no play in the roller shaft.

## Groomer

### Inspection of Groomer

#### Note:

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

The operating efficiency may be reduced due to frequent use, objects crushed during operation, or damage to blades or the shaft during transportation.

In addition, bearing wear or bearing damage caused by water infiltration may prevent the shaft from rotating smoothly.

Inspect the groomer and, if necessary, replace parts such as blades or bearings.

1. Make sure that the blades are not cracked.
2. Check how much the blades are worn.
3. Make sure that the shaft is not worn nor bent.
4. Make sure that there is no wear nor rust of the bearing.
5. Make sure that there is no play in the groomer shaft.

## CR brush

### Inspection of CR Brush

#### Note:

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

Bearing wear due to frequent use or bearing damage caused by water infiltration may prevent the brush from rotating smoothly.

Inspect the brush and, if necessary, replace parts such as bearings.

1. Make sure that there is no abrasion nor adhesion of the brush.
2. Make sure that there is no wear of the brush shaft.
3. Make sure that there is no abnormality in the brush.
4. Make sure that there is no play in the fit of the bearing and the housing.
5. Make sure that there is no play in the brush shaft.

# Handling Instructions

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## Scraper

### Inspection of Scraper

#### ■ Inspection of Front Scraper

Note:

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

The operating efficiency may be reduced due to frequent use, objects crushed during operation, or damage during transportation. Inspect the scraper, and replace any parts if necessary.

1. Make sure that there is no damage nor deformation of the scraper.
2. Make sure that there is no contact between the scraper and roller.

#### ■ Inspection of Rear Scraper

Note:

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

The operating efficiency may be reduced due to frequent use, objects crushed during operation, or damage during transportation. Inspect the scraper, and replace any parts if necessary.

1. Make sure that there is no damage nor deformation of the scraper.
2. Make sure that there is no contact between the scraper and roller.

## 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.

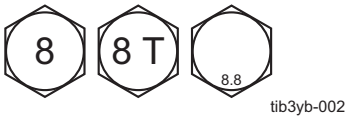
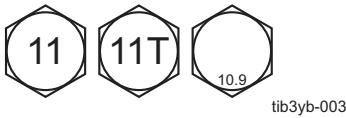
Do not use a bolt experienced too much burden.

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."

## Principal tightening torques

### Tightening Torque by Model

**LH52**

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	
Bed knife	K0071000222	SCREW, HT FLAT HEAD M6-12	7 - 9	71.38 - 91.77	61.96 - 79.66	-

# Handling Instructions

## Adjustment Before Operating

### Adjustment of Blade Engagement

**⚠ Danger**

Make sure that the parking brake is firmly applied before performing the operation.

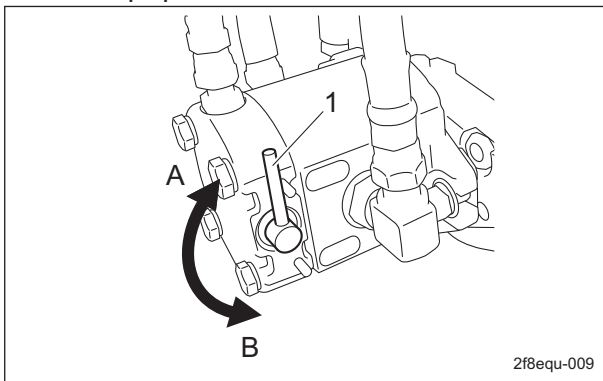
**⚠ Caution**

Be sure to perform this operation on your own.

**⚠ Caution**

When handling the reel cutter (cutting cylinder) or 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.

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



Adjustment of Blade Engagement\_001

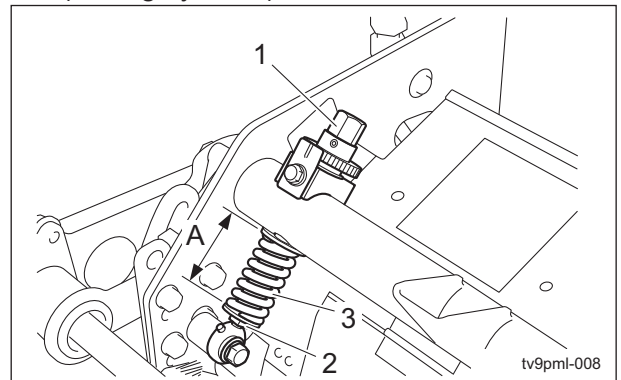
1	Reel rotation/stop switching lever
A	Rotation
B	Stop

3. With the 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) by hand to check the sharpness of the blades.

Check the sharpness of the entire range (at three or four points between the left and right ends) of the reel cutter (cutting cylinder).

- If there is a gap between the blade edges: Loosen the 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 the 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	Adjustment nut
2	Nut
3	Spring coil
A	50.0 mm (1.97 in)

# Handling Instructions

## Adjustment of Cutting Height

### Adjustment of Rear Roller

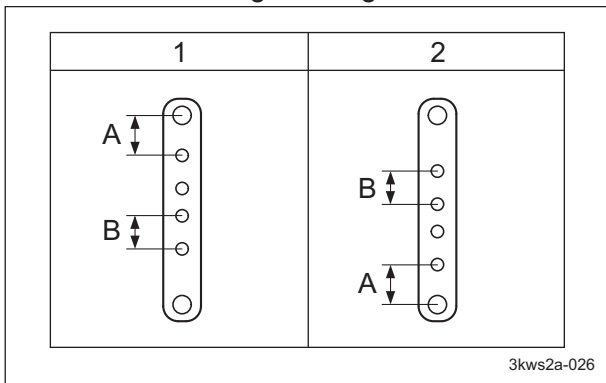
The rear roller can be adjusted to one of four settings.

Attach the rear roller within the cutting height range at a position that suits your work requirements.

**Important**

The installation orientation of the roller bracket differs depending on the specified cutting height.

- For a cutting height between 5.0 and 14.0 mm, install the roller bracket in the orientation for low cutting.
- For a cutting height between 7.0 and 20.0 mm, install the roller bracket in the orientation for high cutting.



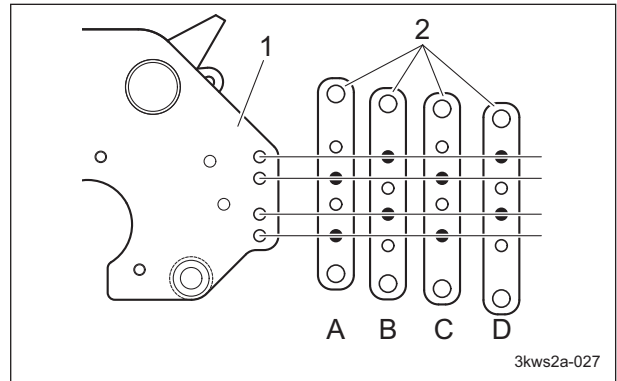
Adjustment of Rear Roller\_001

1	Low cutting
2	High cutting
A	Long
B	Short

**Important**

The figure below shows the bolt positions for the installation holes in the roller bracket and frame.

Be sure to install the bolts in the correct installation holes.



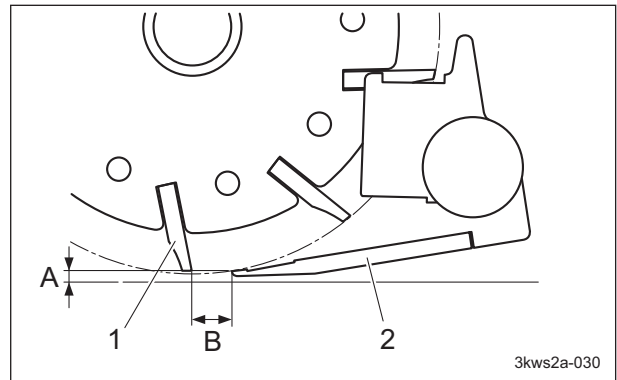
Adjustment of Rear Roller\_002

1	Frame
2	Roller bracket
A	5.0 - 10.0 mm (0.197 - 0.394 in)
B	5.0 - 14.0 mm (0.197 - 0.551 in)
C	7.0 - 16.0 mm (0.276 - 0.630 in)
D	12.0 - 20.0 mm (0.472 - 0.787 in)

**Note:**

Comparing settings A and B at the same cutting height, the offset distance of B is longer than A.

The offset distance is the distance from the center of the reel cutter (cutting cylinder) to the tip of the bed knife (bottom blade) in the horizontal direction.



Adjustment of Rear Roller\_003

1	Reel cutter (Cutting cylinder)
2	Bed knife (bottom blade)
A	Cutting height
B	Offset distance

The same goes for settings B and C and settings C and D.

If the roller bracket is not installed for the desired cutting height, follow the steps below to install the rear roller.

1. Remove the rear roller.

# Handling Instructions

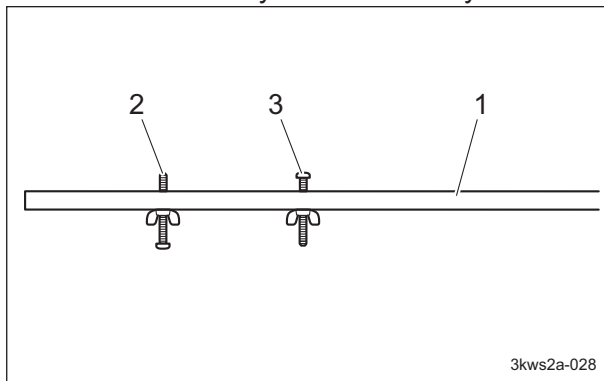
2. Position the left and right roller brackets in the orientation and at the installation holes for the desired cutting height, and then install them.
3. Install the rear roller.

## Adjustment of Front Roller

**Important**

For adjustment, be sure to use the cutting height gauge so that the right and left sides can be parallel.

1. Attach the rear roller within the cutting height range at a position that suits your work requirements.
2. Set the slide caliper to the required cutting height, adjust the position of the bottom of the head of the small screw for cutting height setup in the cutting height gauge, and then securely lock it with a fly nut.

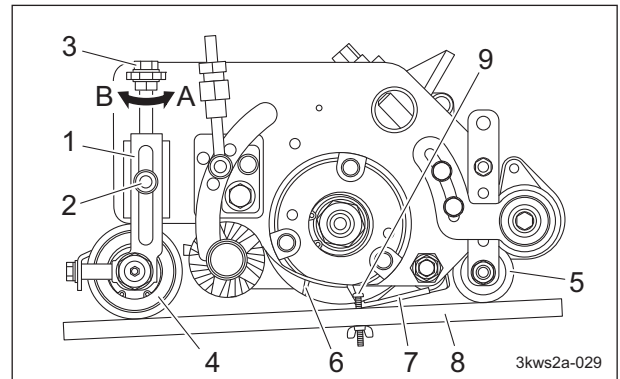


Adjustment of Front Roller\_001

1	Cutting height gauge
2	Small screw for groomer setup
3	Small screw for cutting height setup

3. Loosen the nuts of the left and right front roller brackets.
4. Position the cutting height gauge against the front roller and rear roller at the edge on the left and right sides of the mower unit.
5. Adjust the cutting height with the left and right cutting height bolts on the front roller brackets.
  - To increase the cutting height:  
Turn the cutting height bolt in direction A to lower the front roller.

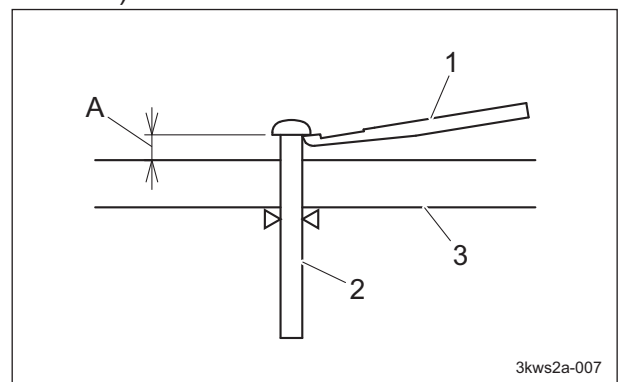
- To decrease the cutting height:  
Turn the cutting height bolt in direction B to raise the front roller.



Adjustment of Front Roller\_002

1	Front roller bracket
2	Nut
3	Cutting height bolt
4	Front roller
5	Rear roller
6	Reel cutter (Cutting cylinder)
7	Bed knife (bottom blade)
8	Cutting height gauge
9	Small screw for cutting height setup

6. Move the front roller up or down with the cutting height bolt to position the front roller so that there is no gap between the cutting edge and the small screw for cutting height setup in the cutting height gauge at the left and right edges of the bed knife (bottom blade).



Adjustment of Front Roller\_003

1	Bed knife (bottom blade)
2	Small screw for cutting height setup
3	Cutting height gauge
A	Cutting height

7. Follow the same steps to adjust the cutting height on the opposite side.

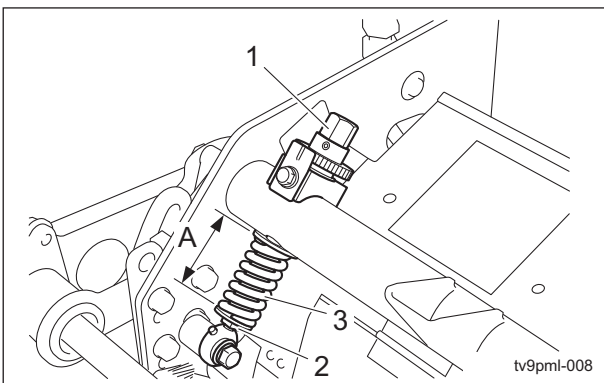
# Handling Instructions

8. Tighten the nuts that secure the left and right front roller brackets to secure them firmly.
9. Again, make sure that the cutting height is set at the required position by positioning the cutting height gauge against the front roller and rear roller at the edge on the left and right sides of the mower unit.

## Adjustment of Cutter Spring

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

1. Adjust the blade engagement.
2. Adjust the length of the spring coil with the nut so that it is approximately 50.0 mm (1.97 in).  
If it is longer than 50.0 mm (1.97 in), tighten the nut.  
If it is shorter than 50.0 mm (1.97 in), loosen the nut.



Adjustment of Cutter Spring\_001

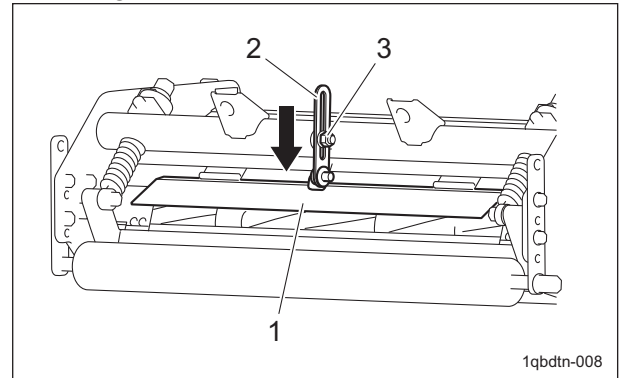
1	Adjustment nut
2	Nut
3	Spring coil
A	50.0 mm (1.97 in)

## Adjustment of Reel Cover (Variable Type)

The angle of the reel cover can be adjusted. Raise or lower the position of the nut for the reel cover opening/closing plate to adjust the angle of the reel cover.

To close the reel cover:

Loosen the nut, slide the plate down, and then tighten the nut.

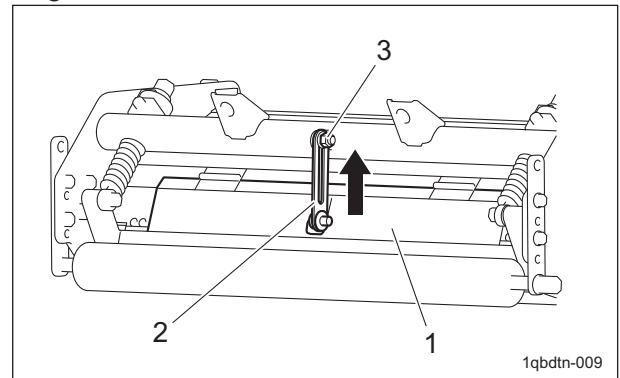


Adjustment of Reel Cover (Variable Type)\_001

1	Reel cover
2	Plate
3	Nut

To open the reel cover:

Loosen the nut, slide the plate up, and then tighten the nut.



Adjustment of Reel Cover (Variable Type)\_002

1	Reel cover
2	Plate
3	Nut

If the grass catcher is installed, close the reel cover.



# Handling Instructions

## Adjustment of Groomer

Note:

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

**Important**

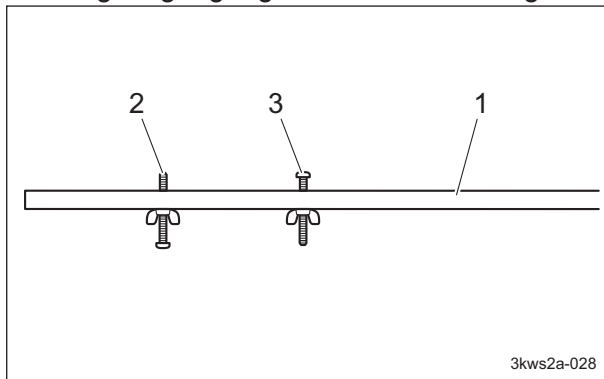
For adjustment, be sure to use the cutting height gauge so that the right and left sides can be parallel.

**Important**

Set the grooming height more than 5.0 mm (0.2 in) from the ground. If it is set lower, the groomer shaft, bearings, gears, etc., may be damaged.

Adjust the cutting height according to the grooming work.

1. Set the small screw for groomer setup of the cutting height gauge to the desired height.

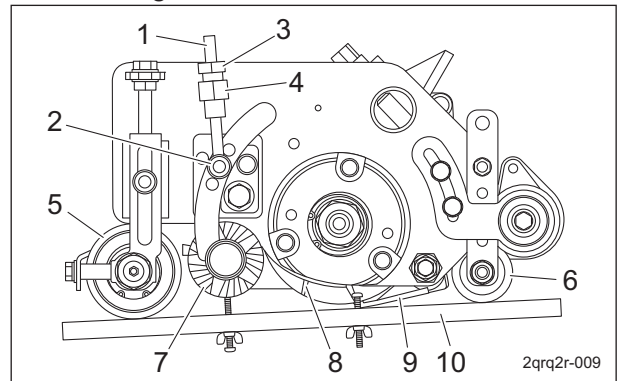


Adjustment of Groomer\_001

1	Cutting height gauge
2	Small screw for groomer setup
3	Small screw for cutting height setup

2. Loosen nuts A of the left and right groomer adjustment screws.
3. Loosen the left and right nuts B and nuts C.

4. Position the cutting height gauge against the front roller and rear roller at the edge on the left and right sides of the mower unit.

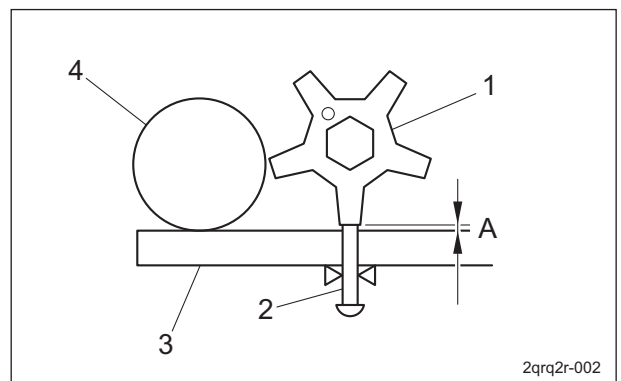


Adjustment of Groomer\_002

1	Groomer adjustment screw
2	Nut A
3	Nut B
4	Nut C
5	Front roller
6	Rear roller
7	Dethatching blade
8	Reel cutter (Cutting cylinder)
9	Bed knife (bottom blade)
10	Cutting height gauge

**Important**

Adjust so that the small screw for groomer setup contacts the dethatching blades.



Adjustment of Groomer\_003

1	Dethatching blade
2	Small screw for groomer setup
3	Cutting height gauge
4	Front roller
A	Operating height

5. Adjust nuts C up or down so that the left and right sides are parallel.

# Handling Instructions

6. Follow the same steps to adjust the groomer operating height on the opposite side.
7. Firmly tighten nuts B and nuts C.
8. Tighten nuts A of the groomer adjustment screws.
9. Again, make sure that the groomer operating height is set at the required position by positioning the cutting height gauge against the front roller and rear roller at the edge on the left and right sides of the mower unit.

Note:

If the groomer is not used, raise the groomer.

## Adjustment of CR brush

### Adjustment of CR Brush (CR Brush Only Installation)

Note:

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

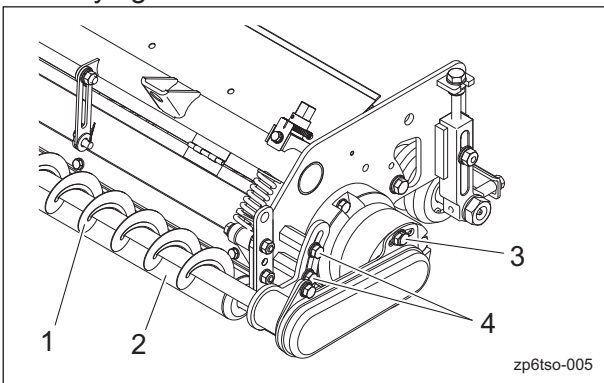
**Important**

If the contact between the brush and rear roller is too tight, the belt may slip or break.

**Important**

The rotating CR brush prevents grass clippings, etc., from attaching to the rear roller.

1. Loosen bolt A.
2. Loosen the left and right bolts B.
3. Adjust the CR brush so that there is a clearance of 0 to 1.0 mm (0 to 0.039 in) between it and the rear roller, and then firmly tighten loosened bolt A and bolts B.



Adjustment of CR Brush (CR Brush Only Installation)\_001

1	Brush
2	Rear roller
3	Bolt A
4	Bolt B

### Adjustment of CR Brush (installed together with Groomer)

Note:

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

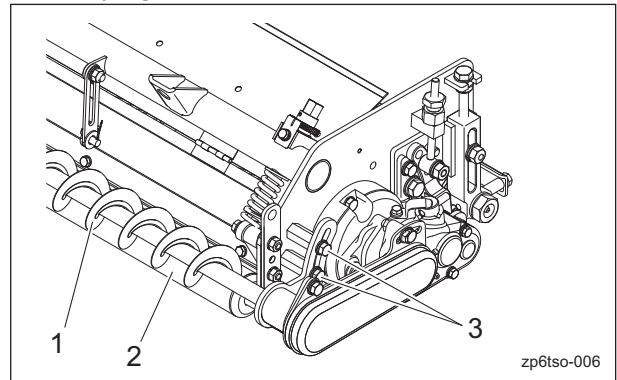
**Important**

If the contact between the brush and rear roller is too tight, the belt may slip or break.

**Important**

The rotating CR brush prevents grass clippings, etc., from attaching to the rear roller.

1. Loosen the left and right bolts.
2. Adjust the CR brush so that there is a clearance of 0 to 1.0 mm (0 to 0.039 in) between it and the rear roller, and then firmly tighten the bolts.



Adjustment of CR Brush (installed together with Groomer)\_001

1	Brush
2	Rear roller
3	Bolt

# Handling Instructions

## Adjustment of Scraper

### Adjustment of Front Scraper

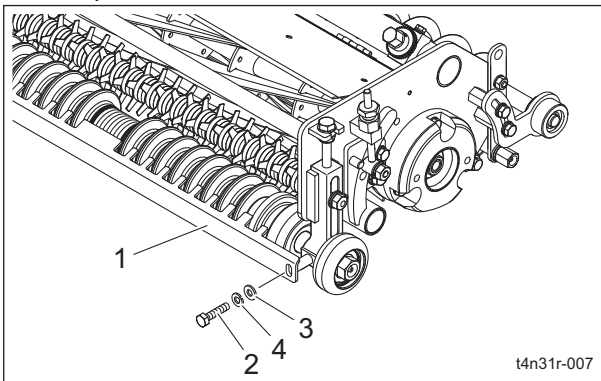
**Note:**  
Depending on the specifications, this function may not be available.

**Important**

If the contact between the scraper and the front roller is too tight, the scraper may become deformed or the front roller may be shaved.

The scraper prevents grass clippings, etc., from attaching to the front roller.

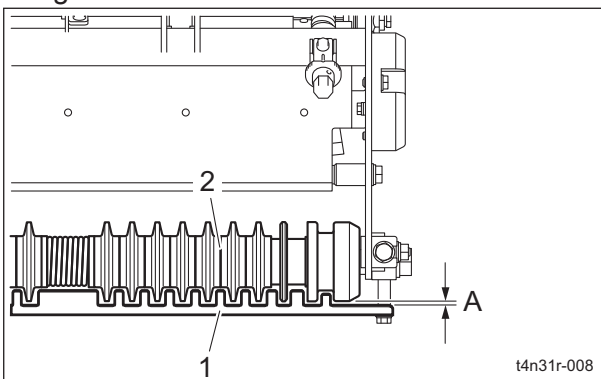
1. Loosen the left and right bolts of the scraper.



Adjustment of Front Scraper\_001

1	Scraper
2	Bolt
3	Washer
4	Spring washer

2. Adjust the scraper so that there is a clearance of 2.0 to 3.0 mm (0.079 to 0.118 in) between it and the outer diameter surface of the front roller, and then firmly tighten the loosened bolts.



Adjustment of Front Scraper\_002

1	Scraper
2	Front roller
A	2.0 - 3.0 mm (0.079 - 0.118 in)

### Adjustment of Rear Scraper

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

**Important**

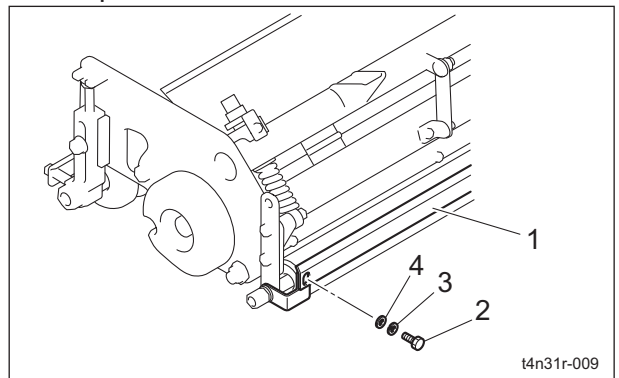
Make sure that the scraper does not contact the rear roller. Otherwise, the scraper may become deformed or the rear roller may be damaged.

**Important**

The rear scraper cannot be installed together with the CR brush.

The scraper prevents grass clippings, etc., from attaching to the rear roller.

1. Loosen the left and right bolts of the scraper.



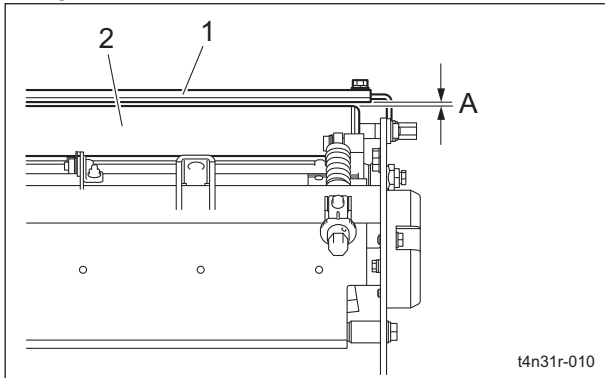
Adjustment of Rear Scraper\_001

1	Scraper
2	Bolt
3	Spring washer
4	Washer

# Handling Instructions

---

- Adjust the scraper so that there is a clearance of 1.0 to 2.0 mm (0.039 to 0.079 in) between it and the outer diameter surface of the rear roller, and then firmly tighten the loosened bolts.

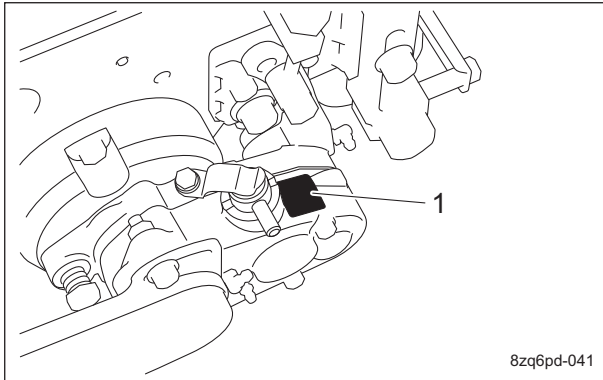


Adjustment of Rear Scraper\_002

1	Scraper
2	Rear roller
A	1.0 - 2.0 mm (0.039 - 0.079 in)

## Operation of Each Section

### Description about Operation Decals



Description about Operation Decals\_001

1	Groomer indication decal
---	--------------------------

1	<p>Left motor: K4203001120 DECAL, GROOMER INDICATION Note: Depending on the specifications, this function may not be available. It illustrates the changeover of rotational direction of the groomer. Normal: Normal rotation Stop: Stop Reverse: Reverse rotation</p>	<p>8zq6pd-014</p>
	<p>Right motor: K4203001680 DECAL, GROOMER INDICATION Note: Depending on the specifications, this function may not be available. It illustrates the changeover of rotational direction of the groomer. Normal: Normal rotation Stop: Stop Reverse: Reverse rotation</p>	<p>8zq6pd-042</p>

# Handling Instructions

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## Groomer Clutch Lever

### Note:

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

### ⚠ Caution

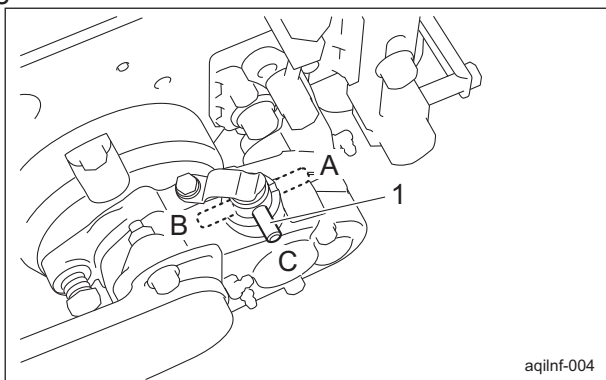
The lever should be operated while the engine is stopped, and adjusted to the position suitable for your work.

The groomer clutch lever is located on the upper side of the right frame and has three positions.

When the lever is set to the "Normal " position, the groomer rotates in the same direction as the reel cutter (cutting cylinder).

When the lever is set to the "Reverse " position, the groomer rotates in the opposite direction as the reel cutter (cutting cylinder).

When the lever is set to the "Stop" position, the groomer will not rotate.



Groomer Clutch Lever\_001

1	Groomer clutch lever
A	Normal
B	Reverse
C	Stop

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<b>Maintenance Schedule .....</b>	<b>Page 5-2</b>
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Greasing Points .....	Page 5-4
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# Maintenance

## Maintenance Precautions

### Caution

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

### Important

Use tools appropriate for each maintenance operation.

### Important

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

Follow the maintenance schedule below.

○ . . . Inspect, adjust, supply, clean

● . . . Replace (first time)

△ . . . Replace

Maintenance Item	Before Work	After Work	Every 10 hrs.	Every 50 hrs.	Every 250 hrs.	Every 500 hrs.	When Required	Remarks
Check blade condition (Reel cutter and Bed knife)	○							Refer to "Inspection of Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)"
Check cover condition	○							Refer to "Inspection of Covers"
Check roller condition	○							Refer to "Inspection of Roller"
Check support roller condition	○							Refer to "Inspection of Support Roller"
Check groomer condition	○							Refer to "Inspection of Groomer"
Check CR brush condition	○							Refer to "Inspection of CR Brush"
Check scraper condition	○							Refer to "Inspection of Scraper"
Check belt condition	○							Refer to "Inspection of Belt"
Check damaged parts	○							
Check tightening bolts and nuts	○							
Engage blades	○							Refer to "Adjustment of Blade Engagement"
Check mowing height	○							Refer to "Adjustment of Cutting Height"



Maintenance Item	Before Work	After Work	Every 10 hrs.	Every 50 hrs.	Every 250 hrs.	Every 500 hrs.	When Required	Remarks
Adjust reel cover (Variable type)	○							Refer to "Adjustment of Reel Cover (Variable Type)"
Adjust groomer	○							Refer to "Adjustment of Groomer"
Adjust CR brush	○							Refer to "Adjustment of CR Brush"
Adjust scraper	○							Refer to "Adjustment of Scraper"
Clean mower unit		○						Refer to "Cleaning of Mower Unit"
Backlap blades							○	Refer to "Back Lapping of Reel Cutter (Cutting Cylinder)"
Grease groomer gears in the case			○					Refer to "Greasing Points"
Grease				○				Refer to "Greasing Points"
Clean inside of CR brush belt cover				○				
Grease hydraulic motor shaft of mower unit					○			
Grease cam bush						○		
Adjust cutter adjustment spring							○	Refer to "Adjustment of Cutter Adjustment Spring"
Adjust belt tension of CR brush							○	Refer to "CR Brush Drive Belt"
Regrind blades (Reel cutter and Bed knife)							○	Regrind/Replace blades as and when required

· The values for consumables are not guaranteed.

### Specified Values

Cutter adjustment spring	50.0 mm (1.97 in)	Length of spring coil
CR brush	With CR brush	Gap between brush and rear roller
	With CR brush and groomer	
Front scraper	2.0 - 3.0 mm (0.079 - 0.118 in)	Gap between scraper and outer diameter surface of roller
Rear scraper	1.0 - 2.0 mm (0.039 - 0.079 in)	Gap between scraper and roller
CR brush drive belt	5.0 - 6.0 mm (0.197 - 0.236 in)	Slack when belt pressed with 10.0 N (1.0 kgf) at the middle point between pulleys

# Maintenance

## Greasing

### About Greasing

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

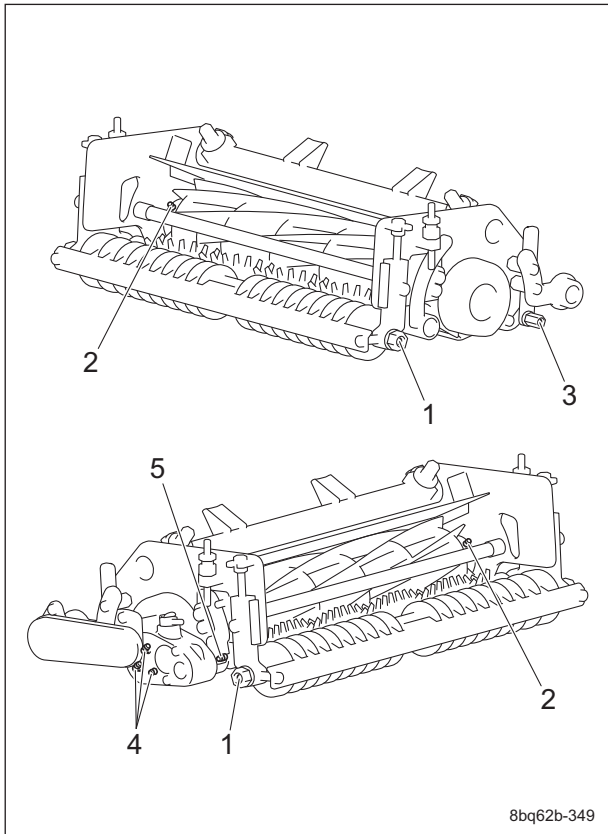
Add urea-based No. 2 grease in accordance with the Maintenance Schedule.

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.



Greasing Points\_001

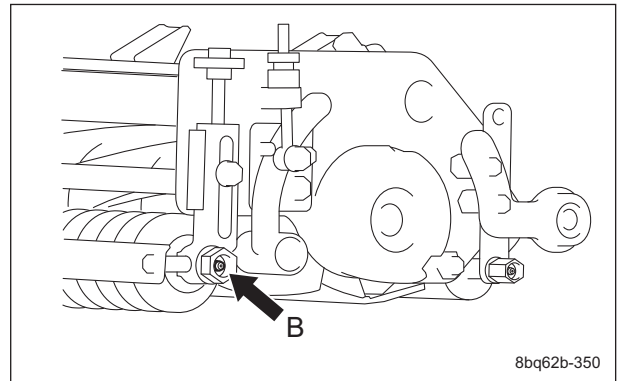
	Location	No. of greasing points	Greasing period	
1	Front roller shaft	2	-	B
2	Reel housing	2	-	B
3	Rear roller shaft	2	-	B
4	Groomer case	3	A	-
5	Groomer shaft	1	-	B

Add grease to A every 10 hours and B every 50 hours.

#### 1. Front roller shaft

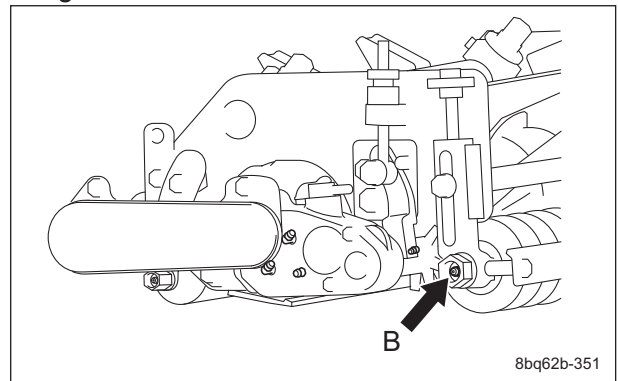
There is one point each on the left and right of the front roller shaft.

Left end of front roller



Greasing Points\_002

Right end of front roller

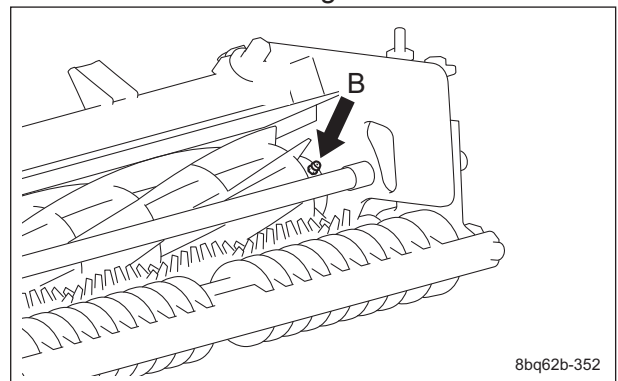


Greasing Points\_003

#### 2. Reel housing

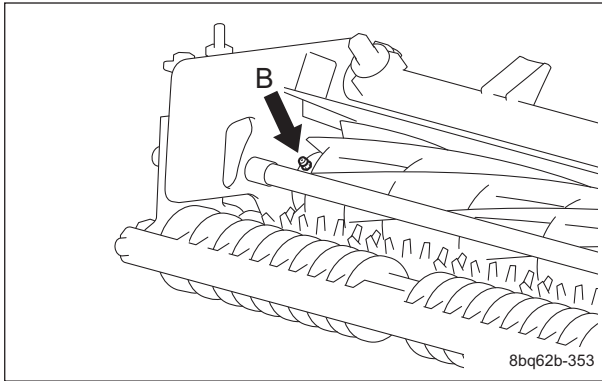
There is one point each on the left and right of the reel housing.

Left end of reel housing



Greasing Points\_004

Right end of reel housing

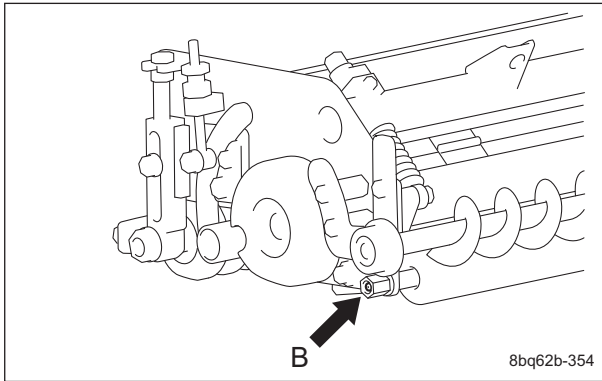


Greasing Points\_005

3. Rear roller shaft

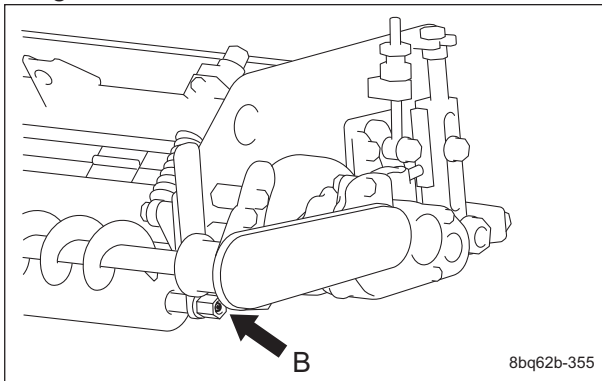
There is one point each on the left and right of the rear roller shaft.

Left end of rear roller



Greasing Points\_006

Right end of rear roller



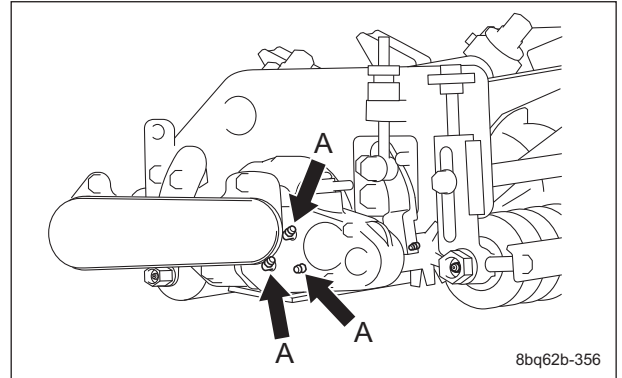
Greasing Points\_007

4. Groomer case

Note:

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

There are three points on the groomer case.



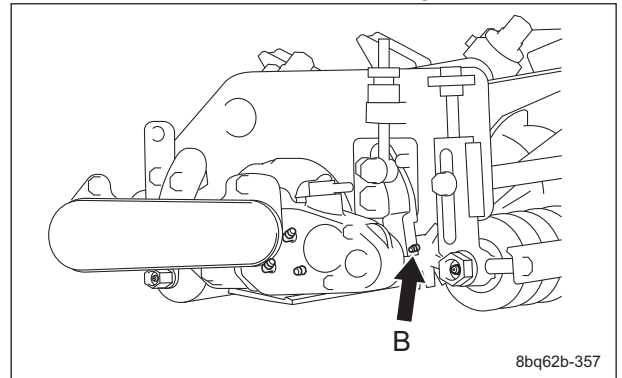
Greasing Points\_008

5. Groomer shaft

Note:

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

There is one point beside the groomer case.



Greasing Points\_009

# Maintenance

## Maintenance (Mower)

### Cleaning of Mower Unit

#### Important

While cleaning, do not allow water on the sealed parts of the reel shaft. (Avoid high-pressure water cleaning.) Otherwise, it may cause damage to the machine.

Be sure to clean the mower unit after use.

1. Stop the engine, and then remove the key.
2. Carefully clean the front and back of the mower unit with water or compressed air.
3. Remove any grass wrapped around the reel cutter (cutting cylinder).

### Adjusting CAM

Turn the cam bush on both sides of the bottom blade, and the blade can be raised and lowered respectively by maximum 0.3 mm (0.012 in).

The above method is used when the edges of the reel cutter (cutting cylinder) and the bed knife (bottom blade) are not in parallel.

Check for the gap between the reel cutter (cutting cylinder) and the bed knife (bottom blade)

When the gap appears on the left side.

1. Loosen the locknut and turn the left cam bush clockwise to eliminate only the gap distance.

When you raise the bed knife (bottom blade) by 0.1 mm (0.004 in), turn the left cam bush clockwise 30 degrees.

2. Once the adjustment completed, tighten the locknut securely.

When the gap appears on the right side.

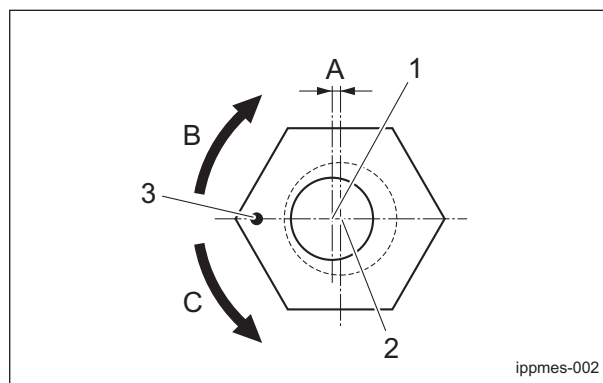
1. Loosen the locknut and turn the right cam bush anticlockwise to eliminate only the gap distance.

2. Once the adjustment completed, tighten the locknut securely.

Note:

The figure below shows the situation when you see from the left side.

The right side is mirror reversed.



Adjusting CAM\_001

1	Center of cutter pin
2	Center of cam bush
3	Punch mark
A	0.3 mm (0.012 in)
B	Raising the bed knife
C	Lowering the bed knife.

## 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.

**Warning**

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

**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.

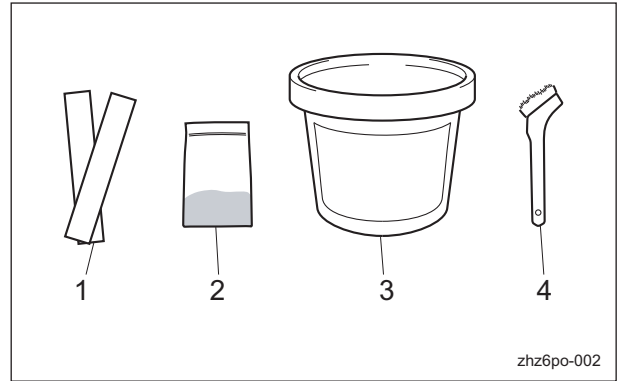
**Caution**

Be careful not to inhale exhaust gas during back lapping.

**Caution**

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) or bed knife (bottom blade), wear gloves to protect your hands. However, pay attention not to let the reel cutter (cutting cylinder) catch your gloves, etc. Otherwise, you may injure your hand or fingers.

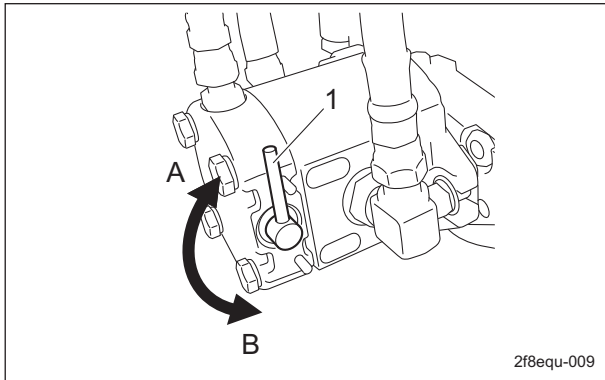
**Important**

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

2. Stop the engine.

# Maintenance

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. With a piece of chalk, etc., 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.
8. Sit on the seat, apply the parking brake, and then start the engine.  
Note:  
If the reel rotation switch is set to the "Rotate" position, the engine will not start.
9. Lower all mower units to the ground.
10. Set the reel reverse switch to the "Reverse" position.
11. Run the engine at a low rpm.
12. Set the reel rotation switch to the "Rotate" position to rotate the reel cutter (cutting cylinder) for back lapping.
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 the sharpness.
18. Repeat steps 3 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 "Normal rotation" position.
22. Shift the reel rotation/stop switching lever to the "Stop" position.
23. While checking the blade for sharpness, adjust blade engagement.



## Sharpening of Reel Cutter (Cutting Cylinder)

**⚠ 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**

Wear gloves when touching edged tools to avoid cutting your hands.

The sharpening of the reel cutter (cutting cylinder) consists in maintaining its roundness and creating a relief (second edge face). This work should be performed if the sharpness cannot be restored, even after back lapping, or if the relief (second edge face) has worn away.

Sharpen the reel cutter (cutting cylinder) when the sharpness cannot be restored, even after back lapping, or when the relief (second edge face) has worn away, there is full contact or back lapping takes too much time.

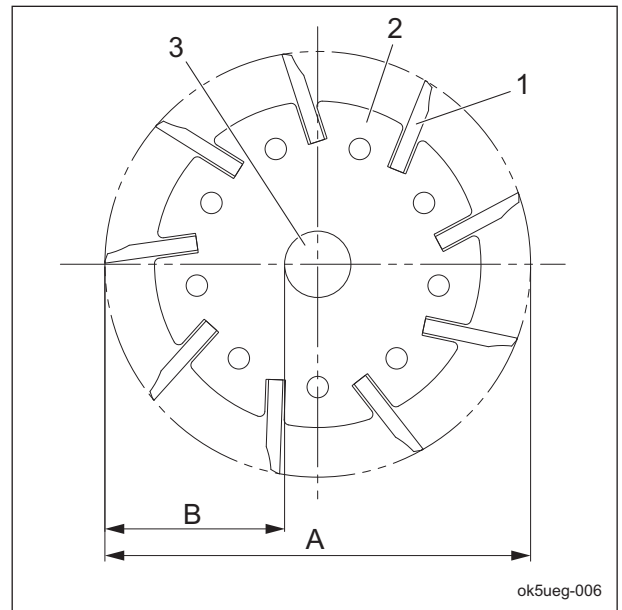
In addition, if the reel cutter (cutting cylinder) becomes worn and its shape conical, perform cylindrical grinding to return it to a cylindrical shape.

For sharpening the reel cutter (cutting cylinder), contact your dealer or Baroness. If the outer diameter of the reel cutter (cutting cylinder) after sharpening is more than the usage limit, the reel cutter (cutting cylinder) can be sharpened.

New		Usage limit	
Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)	Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)
128 mm (5.04 in)	51.3 mm (2.02 in)	118 mm (4.65 in)	46.3 mm (1.82 in)

**Note:**

The outer diameter of the reel cutter (cutting cylinder) shaft is 25.4 mm (1.00 in).



Sharpening of Reel Cutter (Cutting Cylinder)\_001

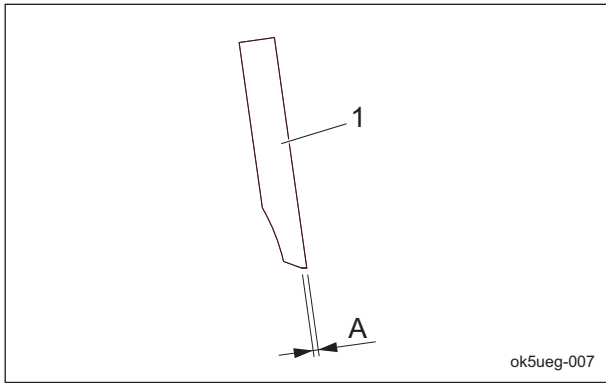
1	Reel cutter (cutting cylinder) blade
2	Reel cutter (cutting cylinder) disc
3	Reel cutter (cutting cylinder) shaft
A	Outer diameter of reel cutter (cutting cylinder)
B	Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft

Sharpening is necessary when the reel cutter (cutting cylinder) reaches a condition described below.

1. When the sharpening width (length of contacting surface of bed knife (bottom blade)) for the outer diameter of the reel cutter (cutting cylinder) is greater than the usage limit.

Outer diameter of reel cutter (cutting cylinder) (new part)	Usage limit of sharpening width for outer diameter of reel cutter (cutting cylinder)
128 mm (5.04 in)	2.5 mm (0.10 in) (factory-recommended)

# Maintenance



Sharpening of Reel Cutter (Cutting Cylinder)\_002

1	Reel cutter (cutting cylinder) blade
A	Sharpening width for outer diameter of reel cutter (cutting cylinder)

2. When the edges become blunt or the blade edge cannot be formed with back lapping
3. When the reel cutter (cutting cylinder) becomes worn and its shape conical, or when blade engagement adjustment cannot be performed

## Replacement of Reel Cutter (Cutting Cylinder)

**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**

Wear gloves when touching edged tools to avoid cutting your hands.

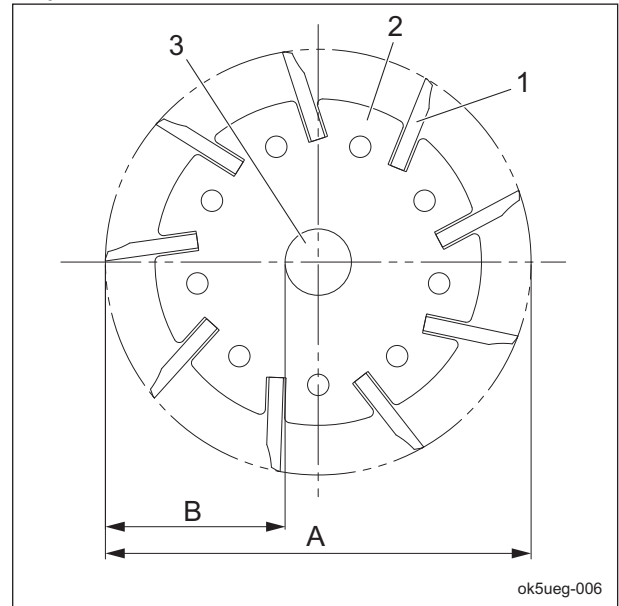
The criteria for replacing the reel cutter (cutting cylinder) are described below. However, these criteria are only a reference and do not guarantee performance like that of a new reel cutter (cutting cylinder).

1. When the outer diameter of the reel cutter (cutting cylinder) is less than the usage limit

New		Usage limit	
Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)	Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)
128 mm (5.04 in)	51.3 mm (2.02 in)	118 mm (4.65 in)	46.3 mm (1.82 in)

**Note:**

The outer diameter of the reel cutter (cutting cylinder) shaft is 25.4 mm (1.00 in).



Replacement of Reel Cutter (Cutting Cylinder)\_001

1	Reel cutter (cutting cylinder) blade
2	Reel cutter (cutting cylinder) disc
3	Reel cutter (cutting cylinder) shaft
A	Outer diameter of reel cutter (cutting cylinder)
B	Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft



## Replacement of Bed Knife (Bottom Blade)

**Caution**

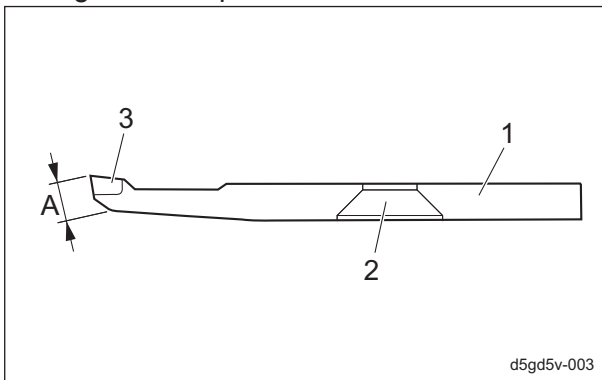
Both the reel cutter (cutting cylinder) and the bed knife (bottom blade) are edged tools. Handle them carefully, since they could cut your hands and feet.

**Caution**

Wear gloves when touching edged tools to avoid cutting your hands.

The criteria for replacing the bed knife (bottom blade) are described below.

1. When the reel cutter (cutting cylinder) is ground
  2. When the reel cutter (cutting cylinder) is replaced
  3. When the bed knife (bottom blade) is worn High-speed-steel-tipped blade
- Replace the bed knife (bottom blade) before it no longer has a tip.



Replacement of Bed Knife (Bottom Blade)\_001

1	Bed knife (bottom blade)
2	Mounting hole
3	Tip
A	Front face

## 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. Before making sure of its specified tension, rotate the belt several times.

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.

### CR Brush Drive Belt

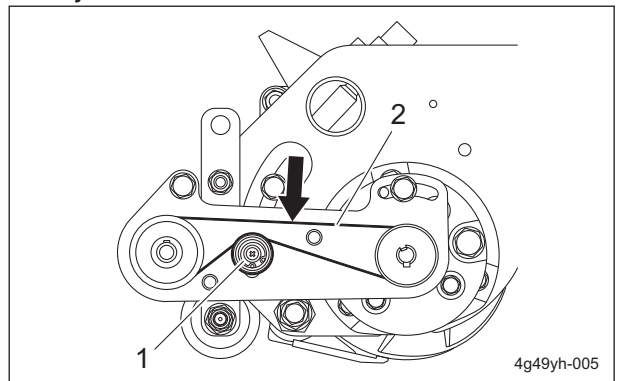
**Note:**

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

**Caution**

Be sure to stop the engine before adjusting the belts.

1. Remove the belt cover.
2. Check the belt tension.
3. If the belt tension is inappropriate, adjust the belt tension with the tension pulley adjustment bolt.



CR Brush Drive Belt\_001

1	Tension pulley adjustment bolt
2	Belt

The belt tension is appropriate when the belt slacks by approximately 5.0 to 6.0 mm (0.197 to 0.236 in) when you apply a force of 10.0 N (1.0 kgf) with your finger to the belt at the middle point between the pulleys.

# Maintenance

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## Long-Term Storage

### Before Long-Term Storage

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

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

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