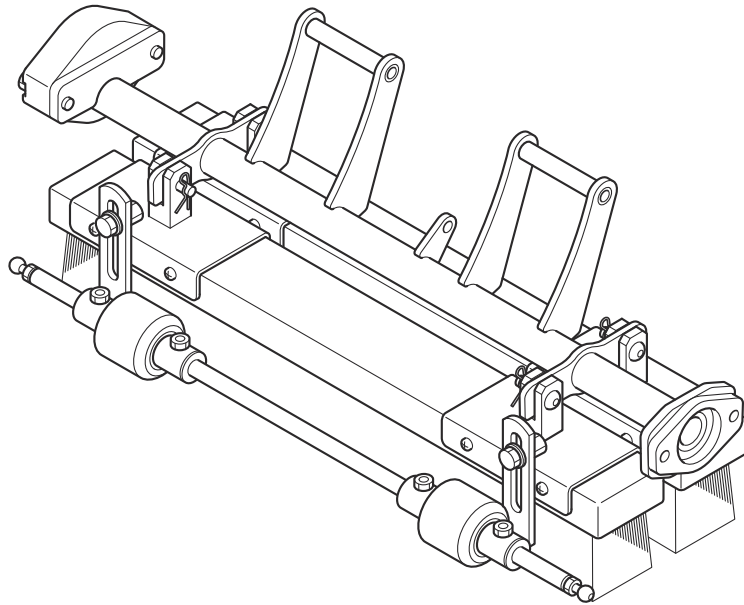


APB311

Push Brush Unit

Owner's Operating Manual



Serial No. APB311 : 10001-

"Required reading"
Read this manual before using the machine.

BARONESS[®]
Quality on Demand

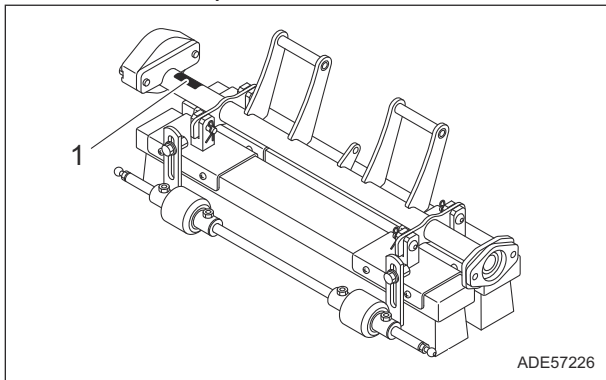
Ver.1.0

Greeting

Thank you for purchasing the Baroness product. This manual describes the proper handling, adjustment, and inspection of your product. We hope you will use the product 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.

QR Code

A QR code for this push brush unit is printed on the serial number plate.



QR Code_001

1	QR code
---	---------

Scan the QR code with your smartphone for easy access to Baroness Manual Reference Service where you can browse Owner's Operating Manual and Parts Catalog.
<https://doc.baroness-international.com/manuals/APB311>



QR Code_002

Read this manual carefully to ensure that you thoroughly understand how to properly operate and maintain the product, and to avoid causing injury to yourself or others.

The operator is responsible for operating the product properly and safely.

Maintenance service for this machine should be performed by a mechanic with expertise.

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





When making inquiries about your product, please specify the model and serial number.

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

Kyoisha Co., Ltd.


Warning Symbols

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

 <small>696cq5-001</small>	Warning symbol
<p>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.</p> <p>Failure to adequately follow these safety precautions may cause an accident.</p>	
<p> Danger</p> <p>This symbol indicates that serious injury or death will occur if the warning is ignored.</p>	
<p> Warning</p> <p>This symbol indicates that serious injury or death may occur if the warning is ignored.</p>	
<p> Caution</p> <p>This symbol indicates that injury or damage to property may occur if the warning is ignored.</p>	
<p>Important</p> <p>This symbol indicates precautions on the mechanism of the machine.</p>	

Introduction

Precautionary Statement

 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.

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

- Baroness Owner's Operating Manual

Purpose

This push brush unit is intended for settling sand after spreading it on lawns in golf courses.

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

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

Safety	Page 1-1
Safe Operating Practices	Page 1-2
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Recycle and Waste Disposal	Page 2-2
Product Overview	Page 3-1
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Contents

Safe Operating Practices Page 1-2

Safety

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

⚠ Danger

This product is designed to ensure safe operation and has been tested and inspected thoroughly before shipment from the factory. The product is equipped with safety devices to prevent accidents.

However, whether the product 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 product 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 push brush unit thoroughly.

Recycle and Waste Disposal Page 2-2

About RecyclePage 2-2

About Waste Disposal Page 2-2



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 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.)

Specifications Page 3-2

SpecificationsPage 3-2

Features of Push Brush Unit Page 3-2

Names of Each Section Page 3-3

Regulation DecalsPage 3-3

Positions of Regulation Decals Page 3-3

Description of Regulation Decals Page 3-3



Product Overview

Specifications

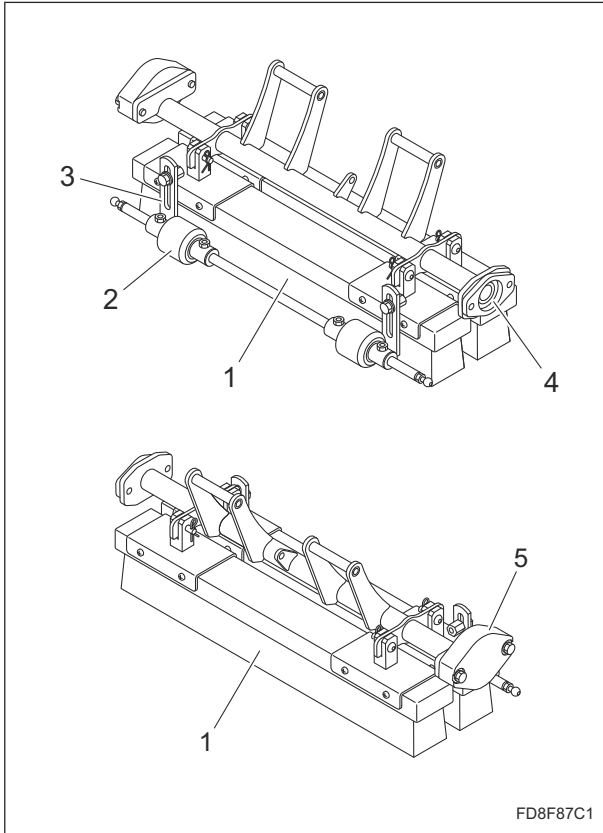
Specifications

Model		APB311	
Name		Push Brush Unit	
Dimensions	Total length	240 mm	9.45 in
	Total width	748 mm	29.45 in
	Total height	286 mm	11.26 in
Weight		45.0 kg	99.21 lb
Operating width		630 mm	24.80 in

Features of Push Brush Unit

This unit is capable of settling the top-dressed sand with two connected brushes.

Names of Each Section

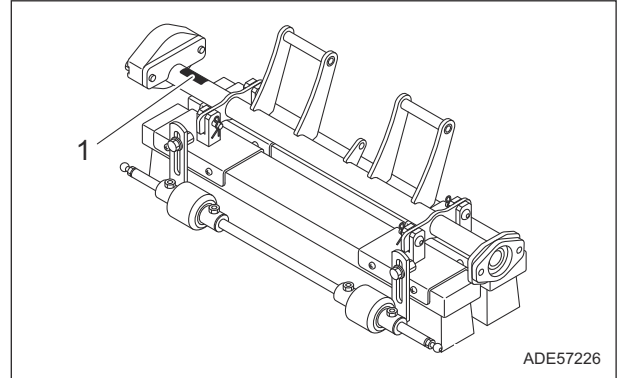


Names of Each Section_001

1	Brush
2	Front roller
3	Roller hoisting bracket
4	Motor mounting plate
5	Weight

Regulation Decals

Positions of Regulation Decals



Positions of Regulation Decals_001

1	Serial number plate
---	---------------------

Description of Regulation Decals

Serial Number Plate

The serial number plate indicates the model and serial number of the machine. A QR code is also printed for browsing Owner's Operating Manual and Parts Catalog.



Serial Number Plate_001

Product Overview

Handling Precautions	Page 4-2
Installation	Page 4-2
Procedure to Install Push Brush Unit	Page 4-2
Procedure to Remove Push Brush Unit	Page 4-2
Inspection Before Use	Page 4-4
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Handling Instructions

Handling Precautions

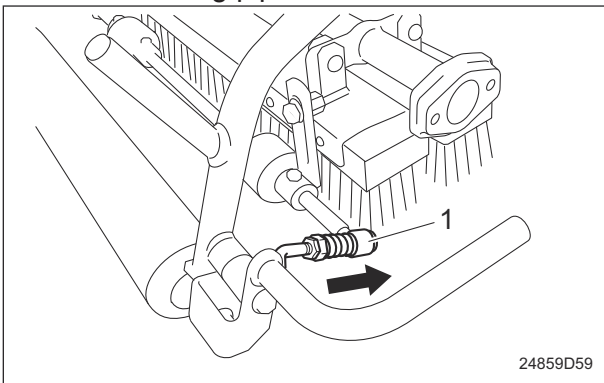
Important

This manual contains descriptions for handling the push brush unit.
For details on handling the main vehicle, refer to this manual and the Owner's Operating Manual for the main vehicle.

Installation

Procedure to Install Push Brush Unit

1. Place the push brush unit.
2. Install the stoppers of the left and right push brush unit fixing pipes into the frame.



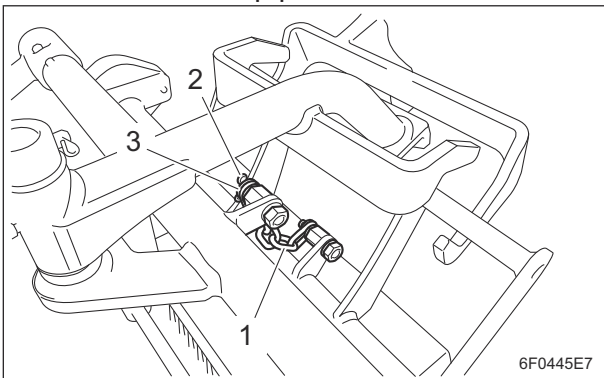
Procedure to Install Push Brush Unit_001

1	Stopper (left/right)
---	----------------------

Important

When installing the push brush unit #1, install the chain on the upper side of the hydraulic hose.
Otherwise, it will interfere with the hydraulic hose when the chain is strained and the hydraulic hose will be damaged.

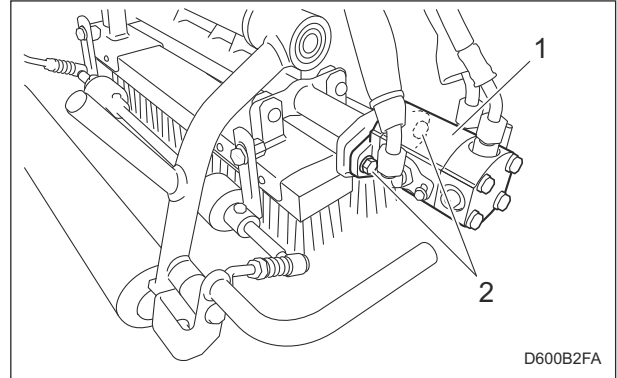
3. Install the chain into the push brush unit with a washer and snap pin.



Procedure to Install Push Brush Unit_002

1	Chain
2	Snap pin
3	Washer

4. Install the motor with bolts.
5. Tighten the bolts.

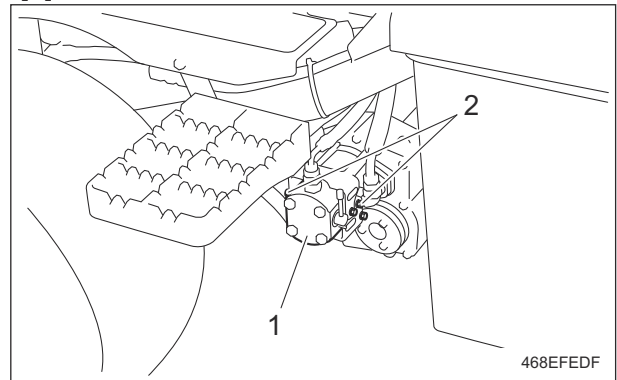


Procedure to Install Push Brush Unit_003

1	Motor
2	Bolt

Procedure to Remove Push Brush Unit

1. Removing the push brush unit #1
- [1] Remove the bolts which install the motor.



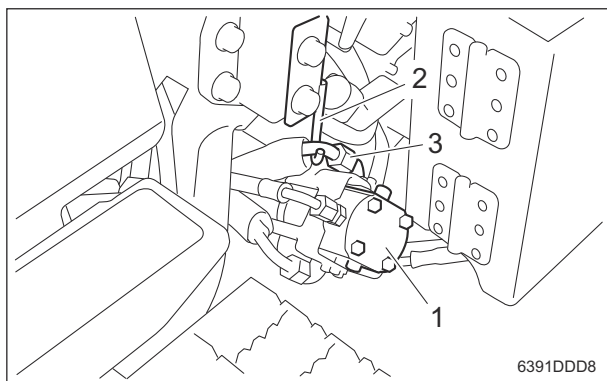
Procedure to Remove Push Brush Unit_001

1	Motor
2	Bolt

- [2] Remove the motor.

Handling Instructions

[3] Hang the hydraulic hose fitting of the removed motor on the hook.

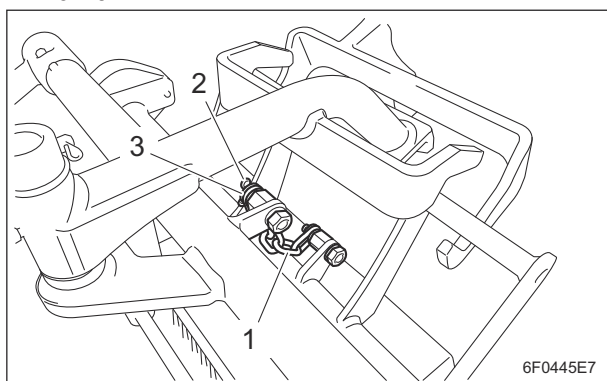


Procedure to Remove Push Brush Unit_002

1	Motor
2	Hook
3	Hydraulic hose fitting

[4] Remove the snap pin and washer which install the chain.

[5] Remove the chain from the push brush unit.

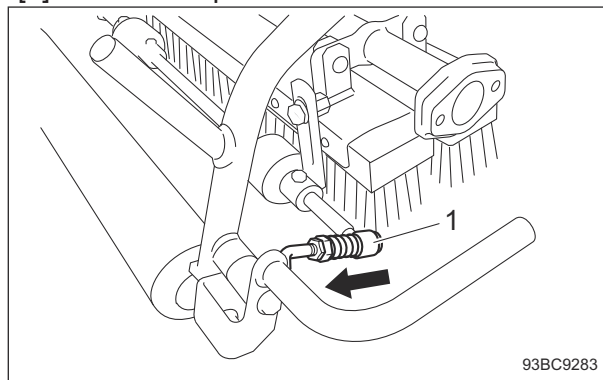


Procedure to Remove Push Brush Unit_003

1	Chain
2	Snap pin
3	Washer

[6] Slide the stoppers of the left and right push brush unit fixing pipes forward and pull them up.

[7] Pull out the push brush unit and remove it.

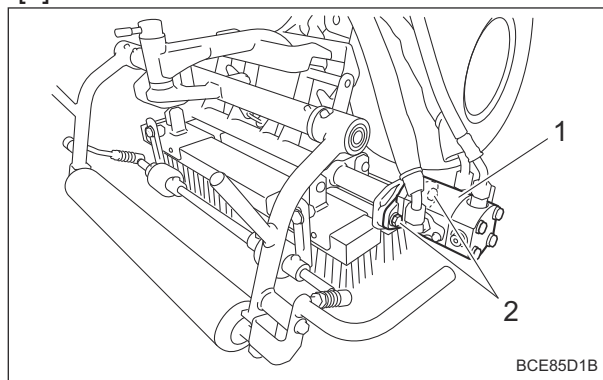


Procedure to Remove Push Brush Unit_004

1	Stopper (left/right)
---	----------------------

2. Removing the push brush unit #2 and #3

[1] Remove the bolts which install the motor.



Procedure to Remove Push Brush Unit_005

1	Motor
2	Bolt

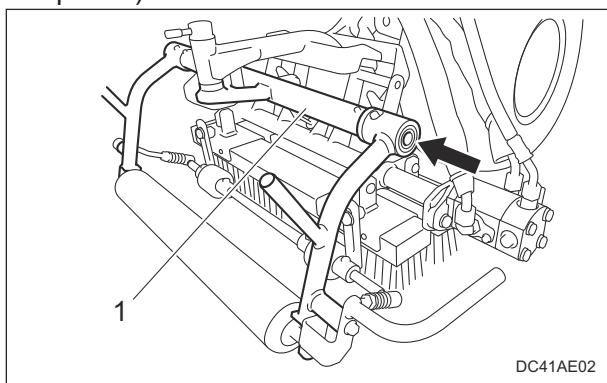
Handling Instructions

[2] Remove the motor.

Important

The hole on the mower arm is for putting the motor during maintenance. Do not use it while traveling. Otherwise, the hydraulic system and the machine will be damaged.

[3] Insert the shaft of the removed motor into the hole (where the arrow in the diagram points) in the mower arm.



Procedure to Remove Push Brush Unit_006

1	Mower arm
---	-----------

- [4] Remove the snap pin and washer which install the chain.
- [5] Remove the chain from the push brush unit.
- [6] Slide the stoppers of the left and right push brush unit fixing pipes forward and pull them up.
- [7] Pull out the push brush unit and remove it.

Inspection Before Use

The purpose of the machine inspection is to:

- Prevent accidents
- Prevent damage to the machine
- Maintain machine performance

Detecting machine malfunctions early helps prevent unexpected problems from occurring. If you detect any abnormalities with the machine, immediately perform maintenance or repairs.

Push Brush Unit

Inspection of Brush

1. Make sure that the brush mounting frame is not bent.

2. Make sure that the brush is not bent or excessively worn.

Inspection of Rollers

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 bearing.
4. Make sure that there is no play in the roller shaft.

Inspection of Bolts and Nuts

Important

The bolts and nuts may be loosened at the earlier stage of the use. Be sure to retighten or replace before operating the machine whenever there is any abnormality.

1. Check the bolts and nuts for looseness and coming off.
2. Check the bolts and nuts for cracks and damages.
3. Check the bolts and nuts for rust.
4. Check around the bolts and nuts for traces of rust fluid.
5. Check for unequal bolt length.
6. Check the bolts and nuts for stripped threads and abrasion.

Handling Instructions

Move

Traveling Procedure

Warning

In the case of 2WD/3WD model, travel in 2WD mode since it is dangerous to travel on steep downward slopes, wet road surface or downward slopes of wet lawn in 3WD mode. Rear tire going into a skid may cause loss of traveling control.

Caution

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

Important

Do NOT start to move or stop the machine abruptly. It will damage the hydraulic system or result in oil leakage.

Important

Do not travel backward with the push brush unit lowered. Otherwise, the push brush unit comes off the lift fork when it is raised.

1. Start the engine.
2. Gradually move the throttle lever to the "High speed" position.
3. Raise all the push brush units.
4. Release the parking brake.
5. Slowly depress the traveling pedal.
6. The machine starts traveling.
7. The machine stops slowly when the traveling pedal released.

Operations

Sand-Settling Procedure

Warning

In the case of 2WD/3WD model, travel in 2WD mode since it is dangerous to travel on steep downward slopes, wet road surface or downward slopes of wet lawn in 3WD mode. Rear tire going into a skid may cause loss of traveling control.

Caution

Sand-settling work must be performed at an appropriate speed for the site and location. When settling sand over bumpy surfaces, slow down the traveling speed.

Important

Do NOT start to move or stop the machine abruptly. It will damage the hydraulic system or result in oil leakage.

1. Start the engine.
2. Raise all the push brush units.
3. Shift the throttle lever to the "High speed" position to run the engine at the maximum speed.
4. Release the parking brake.
5. Start the work following the procedure below.
 - [1] Depress the traveling pedal.
 - [2] Lower the push brush units at the working position.
 - [3] Raise all the push brush units after work is completed.

Cleaning After Use

The purpose of the machine cleaning is to:

- Prevent accidents
- Prevent damage to the machine
- Maintain machine performance

Properly clean the machine to maintain its functionality and performance.

If you detect any abnormalities with the machine, immediately perform maintenance or repairs.

Handling Instructions

Push Brush Unit

Cleaning of Push Brush Unit

Be sure to clean the push brush unit after use.

1. Stop the engine.
2. Carefully clean the front and back of the push brush unit with compressed air.

Storage

Short-Term Storage

Short-term storage means that the machine is temporarily stored (within 1 month) without use.

Follow the instructions below for short-term storage of this push brush unit.

1. Cleaning
 - Remove dirt, grass clippings, oil stains etc. completely.
2. Storage location
 - Cover the push brush unit and store it in a dry place where it will not be exposed to rain.

Precautions for MaintenancePage 5-2

Adjustment Page 5-2

Push Brush UnitPage 5-2

Replace Page 5-3

Push Brush UnitPage 5-3

Storage Page 5-5

Long-Term StoragePage 5-5

Maintenance

Precautions for Maintenance

Warning

The chapter "Maintenance" in this manual describes practical measures which should be performed by a mechanic with expertise. The owner should instruct the mechanic with expertise to perform maintenance service for this machine.

Caution

First, learn well the operations you plan to perform.

Important

Use tools appropriate for each operation.

Important

Use Baroness genuine parts for replacement and accessories. Our product warranty may be void if you use non-genuine parts for replacement or accessories.

Adjustment

Push Brush Unit

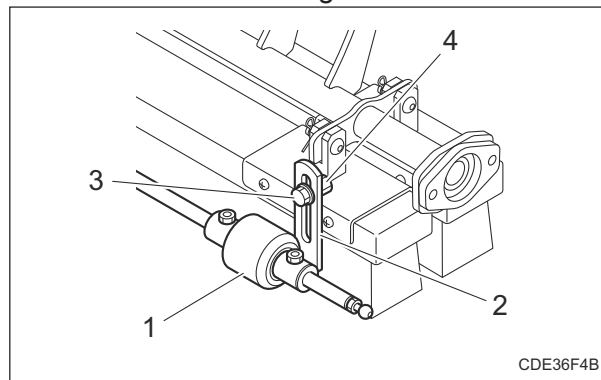
Adjustment of Brush Height

Important

When adjusting the brush height, set the brush shaft parallel to the ground.

Adjust the amount of contact between the lawn surface and the bottom of the brush by raising and lowering the front roller.

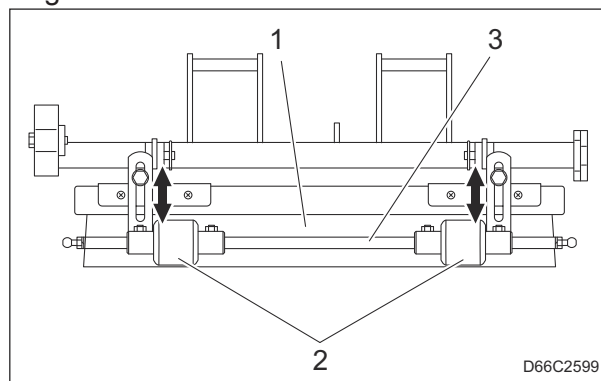
1. Loosen the left and right bolts.



Adjustment of Brush Height_001

1	Front roller
2	Roller hoisting bracket
3	Bolt
4	Nut

2. Set the brush to your desired height by raising and lowering the front roller. Adjust the left and right rollers to touch the ground.



Adjustment of Brush Height_002

1	Brush
2	Front roller
3	Roller shaft

3. Tighten the left and right bolts.

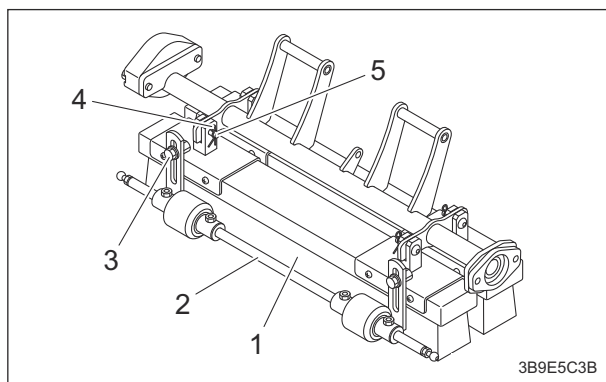
Replace

Push Brush Unit

Replacement of Brush

■Removal of Brush

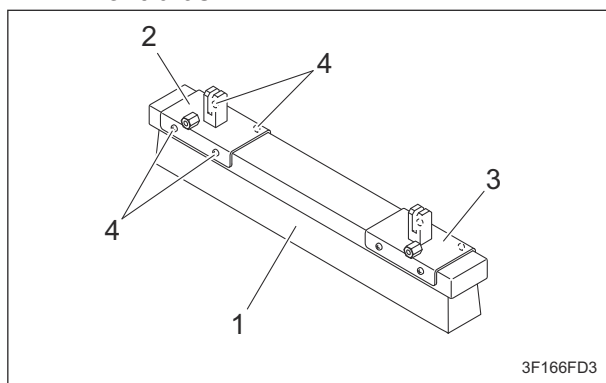
1. Remove the attachment from the main vehicle.
2. Follow the steps below to remove the front brush.
 - [1] Remove the left and right bolts.
 - [2] Remove the front roller COMP.
 - [3] Remove the left and right snap pins and pins.
 - [4] Remove the front brush from the brush unit.



Removal of Brush_001

1	Front brush
2	Front roller COMP
3	Bolt
4	Snap pin
5	Pin

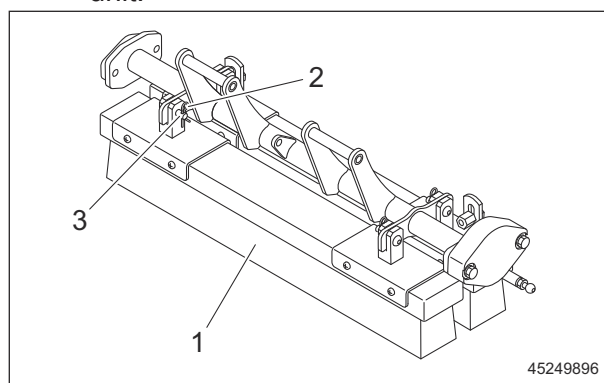
- [5] Remove the screws fixing the left and right brush clampers.
- [6] Remove the brush clampers from the front brush.



Removal of Brush_002

1	Front brush
2	Brush clamber right
3	Brush clamber left
4	Screw

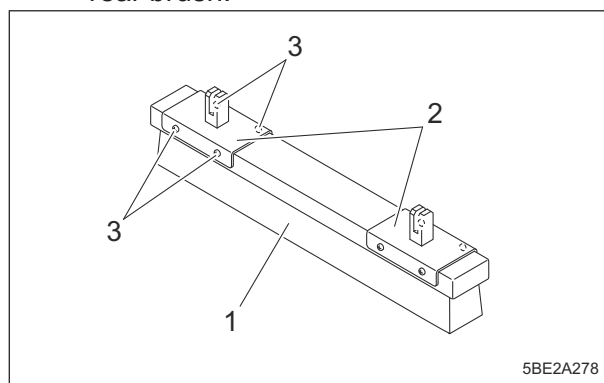
3. Follow the steps below to remove the rear brush.
 - [1] Remove the left and right snap pins and pins.
 - [2] Remove the rear brush from the brush unit.



Removal of Brush_003

1	Rear brush
2	Snap pin
3	Pin

- [3] Remove the screws fixing the left and right brush clampers.
- [4] Remove the brush clampers from the rear brush.



Removal of Brush_004

1	Rear brush
2	Brush clamber
3	Screw

Maintenance

■ Installation of Brush

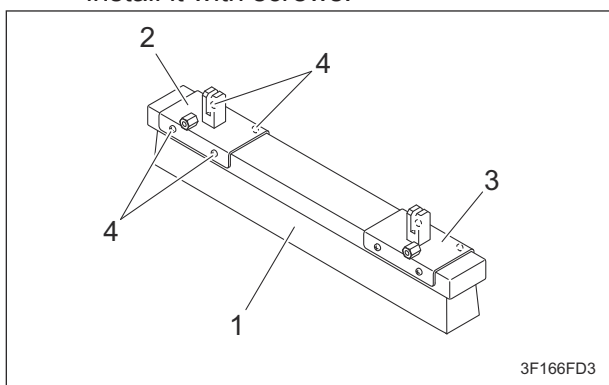
Important

The left and right brush clamps for the front brush have different shapes.

1. Follow the steps below to install the front brush.

[1] Install the brush clamp onto the front brush.

[2] Align the pilot holes of the front brush with the holes of the brush clamp and install it with screws.



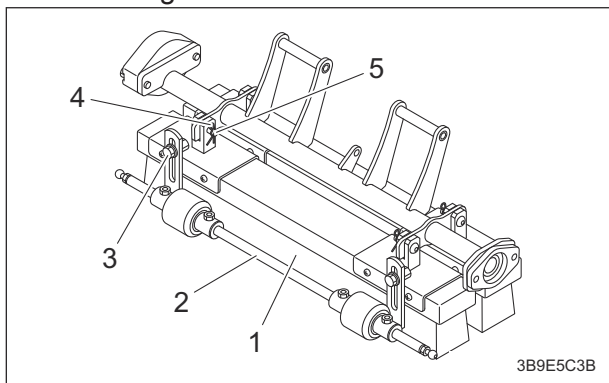
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Installation of Brush_001

1	Front brush
2	Right brush clamp
3	Left brush clamp
4	Screw

[3] Install the front brush onto the brush unit with the left and right snap pins and pins.

[4] Install the front roller COMP with the left and right bolts.



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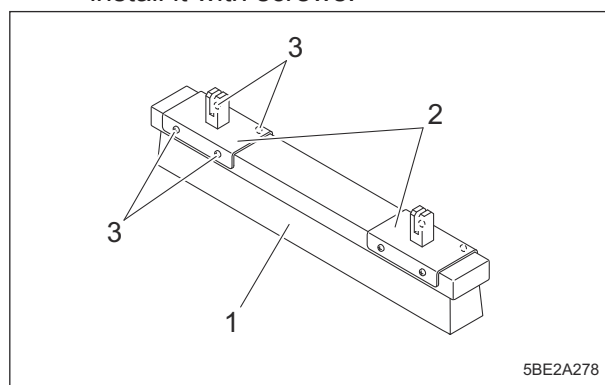
Installation of Brush_002

1	Front brush
2	Front roller COMP
3	Bolt
4	Snap pin
5	Pin

2. Follow the steps below to install the rear brush.

[1] Install the brush clamp onto the rear brush.

[2] Align the pilot holes of the rear brush with the holes of the brush clamp and install it with screws.

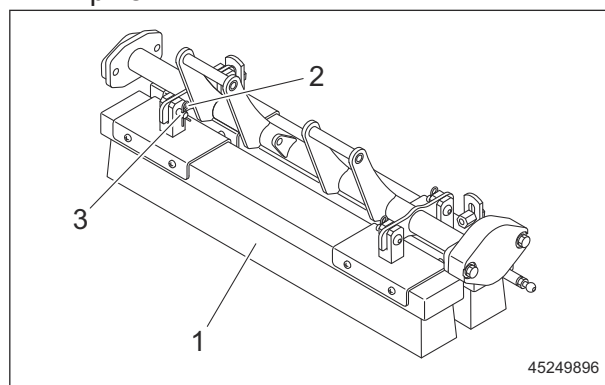


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Installation of Brush_003

1	Rear brush
2	Brush clamp
3	Screw

[3] Install the rear brush onto the brush unit with the left and right snap pins and pins.



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Installation of Brush_004

1	Rear brush
2	Snap pin
3	Pin

Storage

Long-Term Storage

Follow the instructions below for long-term storage of this push brush unit.

1. Cleaning

- Remove dirt, grass clippings, oil stains etc. completely.

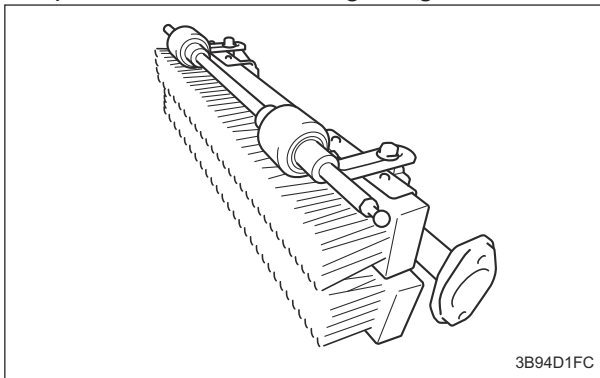
2. Storage location

- Cover the push brush unit and store it in a dry place where it will not be exposed to rain.

Important

If the brush remains in contact with the ground for a long time, it can be deformed.

- Remove the brush from the main vehicle and store it.
Place the brush on a level surface to prevent it from touching the ground.



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Long-Term Storage_001

Maintenance

Appended Table

Tightening TorquesPage 6-2
 Standard Tightening TorquesPage 6-2

Daily Check List Page 6-4

Maintenance Schedule Page 6-4

Appended Table

Appended Table

Tightening Torques

Important

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

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.

Appended Table

Nominal diameter	General bolt		
	Strength classification 4.8		
	 tib3yb-001		
	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

Appended Table

Nominal diameter	Heat-treated bolt					
	Strength classification 8.8			Strength classification 10.9		
	 tib3yb-002			 tib3yb-003		
	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	13,663.98	11,860.34

Note:
The same values are applied to "fine screw thread."

Appended Table

Daily Check List

APB311

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

Maintenance Item		Before Work	After Work	Remarks
Mower unit	Check brush	○		
	Check roller	○		
	Check push brush unit exterior	○		
	Check bolts and nuts	○		
	Clean push brush unit exterior		○	

Maintenance Schedule

APB311

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

Maintenance Item		When Required	Remarks
Mower unit	Adjust brush height	○	
	Replace brush	△	

Daily Check Records Page 7-2

Maintenance RecordsPage 7-2

Records

Records

Daily Check Records

APB311

Use this table freely for your records of the daily check.

Model											Serial Number								
Items																			
Mower unit	Check brush																		
	Check roller																		
	Check push brush unit exterior																		
	Check bolts and nuts																		
	Clean push brush unit exterior																		

Maintenance Records

APB311

Use this table freely for your records of the maintenance.

Model											Serial Number								
Items																			
Mower unit	Adjust brush height																		
	Replace brush																		

BARONESS[®]
Quality on Demand

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