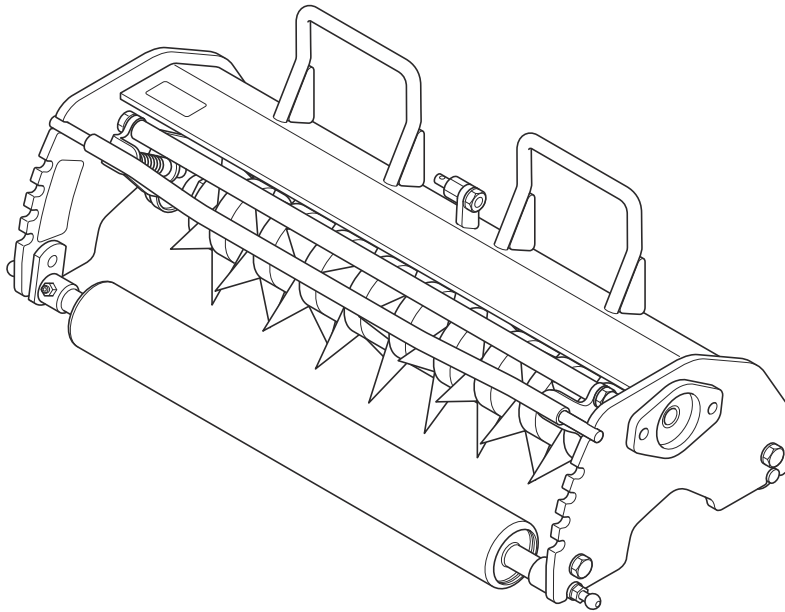


ASP311

Spiker Unit

Owner's Operating Manual



Serial No. ASP311 : 10001-

"Required reading"

Read this manual before using the machine.

BARONESS
Quality on Demand

Introduction

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.

Greeting

Thank you for purchasing the Baroness product.

This manual describes how to operate this product safely and correctly, as well as daily inspection and maintenance methods.

Prior to use, carefully read this manual to thoroughly understand the contents.

For handling the main vehicle, please refer to the owner's operating manual for the main vehicle.

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

About This Manual

1. Attention

- [1] The operator is responsible for operating the product properly and safely.
Read this manual carefully to ensure that you thoroughly understand the contents, and to avoid causing injury to yourself or others.
- [2] Maintenance service for this product should be performed by a mechanic with expertise.
- [3] If you have any questions concerning handling, maintenance or genuine parts, please contact a Baroness dealer or Kyoisha.
- [4] When loaning or transferring the product, please also provide this manual together with the product.
- [5] When making inquiries about your product, please specify the model and serial number.

2. Notice

- [1] Due to product improvements or specification changes, the contents described in this manual may be altered without notice.
- [2] This manual has been prepared with the utmost care to avoid mistakes or omissions, however, if you find any mistakes or omissions, please contact a Baroness dealer or Kyoisha.
- [3] If you take this product out of the designated country for sale and use it, it may not comply with the regulations of the destination country or region (such as safety standards or radio laws), and it will not be covered by the warranty.
Furthermore, Kyoisha assumes no responsibility whatsoever for any troubles or penalties arising from these issues.
- [4] If the contents of this manual differ depending on the destination, the product details are explained using the ISO3166 country code (two characters).
Please check the applicable destination for your purchased model and read the relevant contents.
e.g.

Country	Country code
Japan	JP (*1)
USA	US
UK	GB (*2)
Australia	AU

(*1: Including South Korea and China)

(*2: Including European countries)

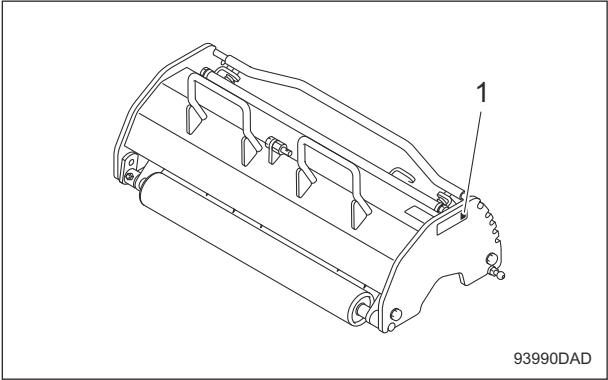
- [5] Kyoisha assumes no responsibility for any damages or lost profits caused by improper handling by customers or third parties, product disassembly or modification, or other force majeure events (such as natural disasters).
- [6] Kyoisha assumes no responsibility for any loss or damage of data or programs caused by malfunctions, failures, or repairs of the equipment.
We recommend regularly backing up your important data.

Introduction

QR Code

(*QR Code is a registered trademark of DENSO WAVE INCORPORATED.)

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



93990DAD

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/ASP311>



9ABAB864

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

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 spiker unit is intended for spiking in golf courses.

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

Operating this spiker 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

Disposal Page 2-1

Recycle and Waste Disposal Page 2-2

Product Overview Page 3-1

Specifications Page 3-2

Names of Each Section Page 3-3

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Cleaning after Use Page 4-7

Storage Page 4-7

Maintenance Page 5-1

Precautions for Maintenance Page 5-2

Replacement Page 5-2

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Daily Check List Page 6-4

Maintenance Schedule Page 6-4

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Daily Check Records Page 7-2

Maintenance Records Page 7-3

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 spiker 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 Spiker 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

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 About Safety Decals and Instruction
 DecalsPage 3-4

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 Instruction Decals Page 3-4

 Description of Safety Decals and
 Instruction Decals Page 3-4

Operation Decals Page 3-5

 Positions of Operation Decals Page 3-5

 Description of Operation Decals Page 3-5

Specifications

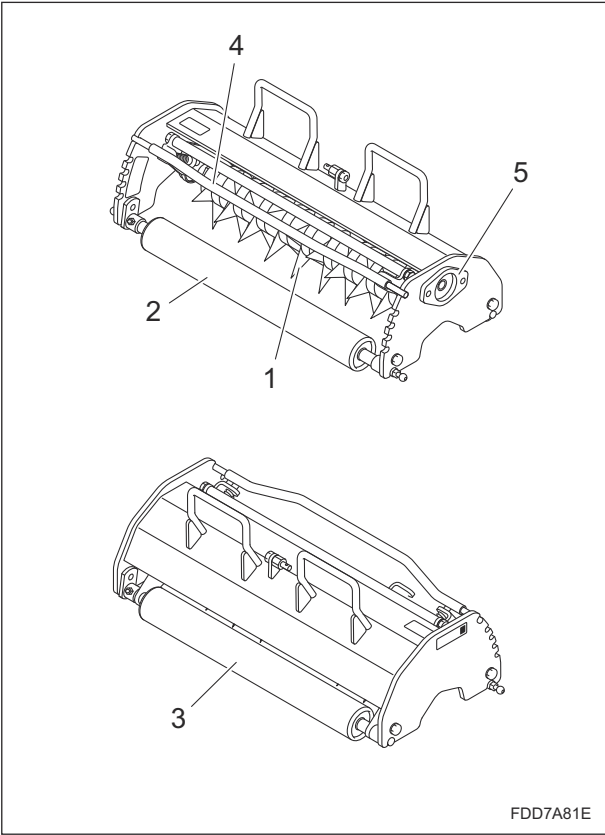
Specifications

Model		ASP311	
Name		Spiker Unit	
Dimensions	Total length	296 mm	11.65 in
	Total width	693 mm	27.28 in
	Total height	277 mm	10.91 in
Weight		46.0 kg	101.41 lb
Operating width		415 mm	16.34 in
Operating depth		10,20,30,40 mm (4 levels)	0.39,0.79,1.18,1.57 in (4 levels)
Spiking Blade	Number per unit	9	
	Diameter	160 mm	6.30 in
	Thickness	1.6 mm	0.063 in
	Space between blades	50 mm	1.97 in

Features of Spiker Unit

Light aeration on the surface layer improves water permeability and air permeability to help root growth.

Names of Each Section

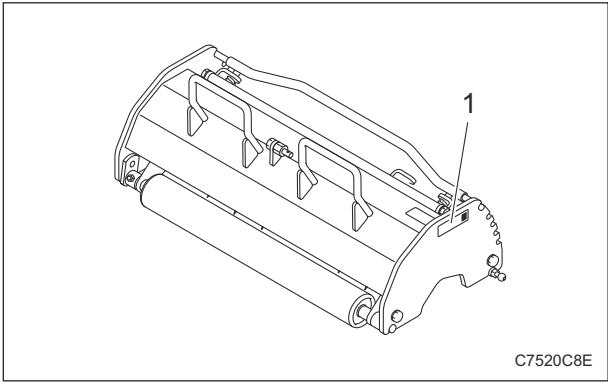


FDD7A81E

1	Spiking blade
2	Front roller
3	Rear roller
4	Depth adjusting lever
5	Motor mounting plate

Regulation Decals

Positions of Regulation Decals



C7520C8E

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. (*QR Code is a registered trademark of DENSO WAVE INCORPORATED.)



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5395CB08

Product Overview

Safety Signs and Instruction Signs

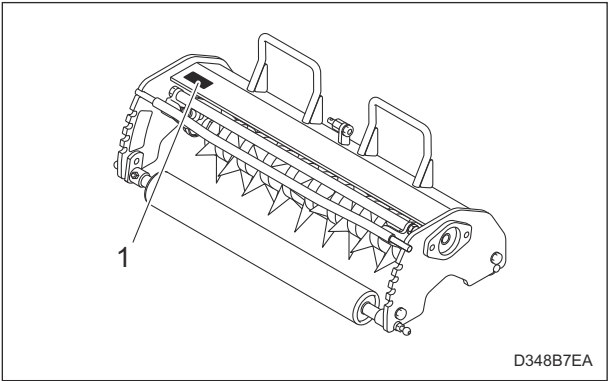
About Safety Decals and Instruction Decals

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 Kyoeisha.

Positions of Safety Decals and Instruction Decals



D348B7EA

1	Hands and feet caution decal
---	------------------------------

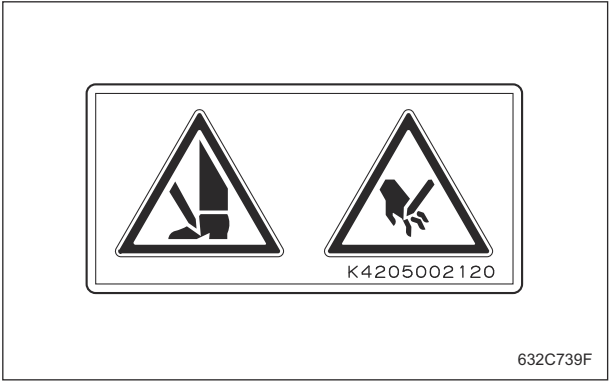
Description of Safety Decals and Instruction Decals

Hands and Feet Caution Decal

K4205002120
DECAL, CAUTION HANDS/FEET

Warning

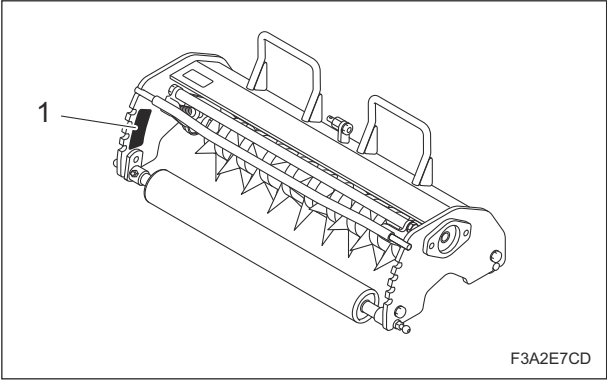
There is a danger of cutting your hands or feet



632C739F

Operation Decals

Positions of Operation Decals



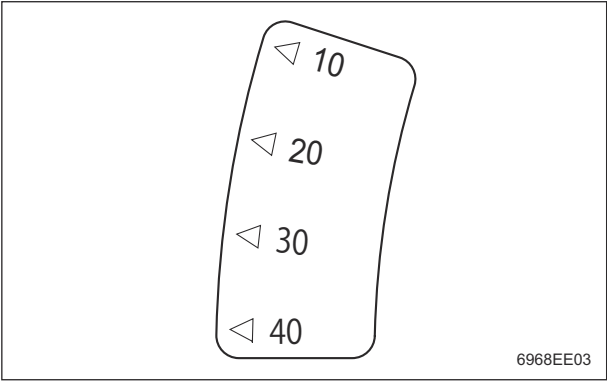
F3A2E7CD

1	Depth indicating decal
---	------------------------

Description of Operation Decals

Depth Indicating Decal

LM315P-1315A0
LABEL, INDICATING DEPTH
This is a scale that indicates the spiking depth.



6968EE03

Product Overview

Handling Instructions

Handling Precautions Page 4-2

Installation Page 4-2

 Procedure to Install Spiker Unit Page 4-2

 Procedure to Remove Spiker Unit Page 4-2

Inspection before Use Page 4-4

 Spiker Unit Page 4-4

Adjustment before Work Page 4-5

 Adjustment of Spiking Depth Page 4-5

Move Page 4-6

 Traveling Procedure Page 4-6

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 Spiking Procedure Page 4-6

Cleaning after Use Page 4-7

 Spiker Unit Page 4-7

Storage Page 4-7

 Short-Term Storage Page 4-7

Handling Instructions

Handling Precautions

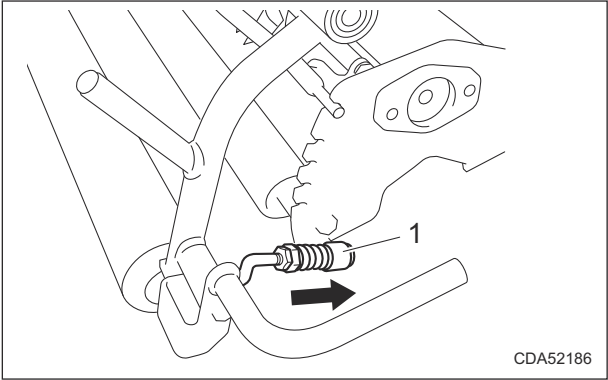
Important

This manual contains descriptions for handling the spiker 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 Spiker Unit

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



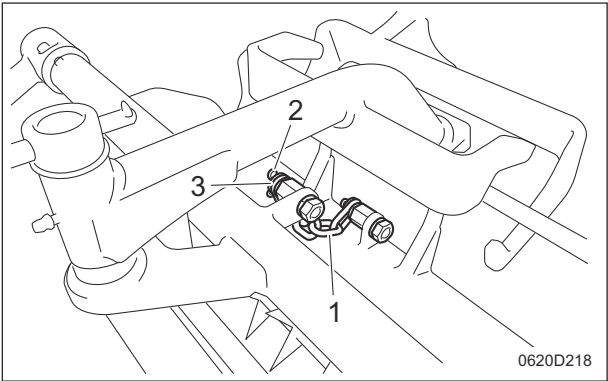
CDA52186

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

Important

When installing the spiker 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 stretched, and the hydraulic hose will be damaged.

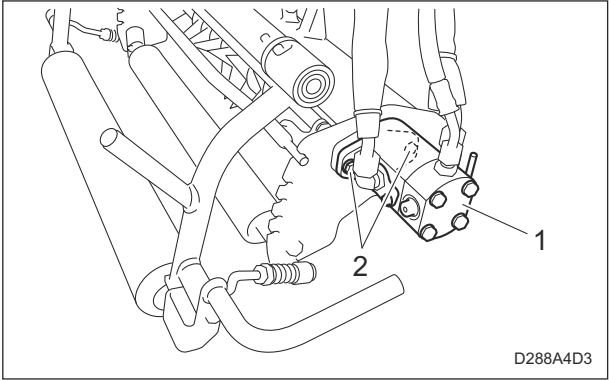
- 3. Install the chain into the spiker unit with a washer and snap pin.



0620D218

1	Chain
2	Snap pin
3	Washer

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

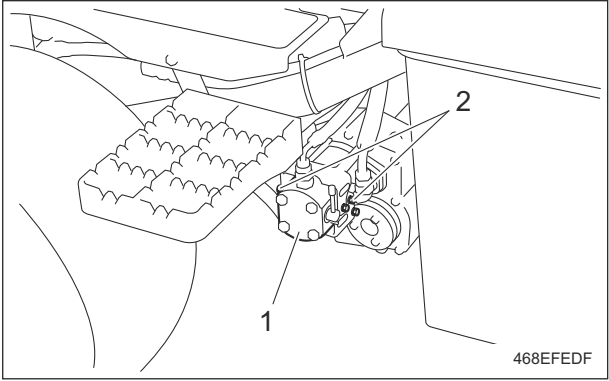


D288A4D3

1	Motor
2	Bolt

Procedure to Remove Spiker Unit

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



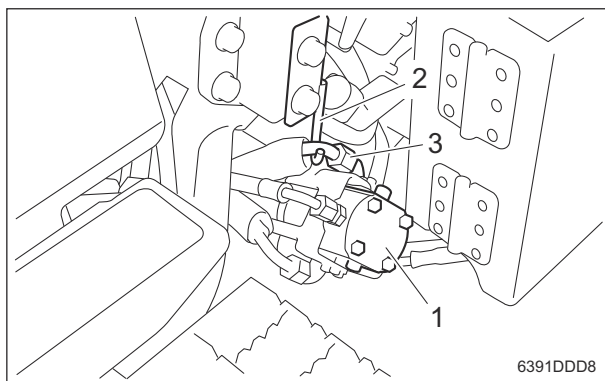
468EFEDF

1	Motor
2	Bolt

- [2] Remove the motor.

Handling Instructions

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

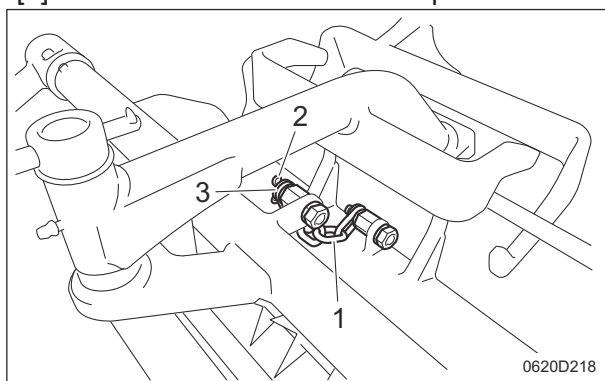


6391DDD8

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 spiker unit.

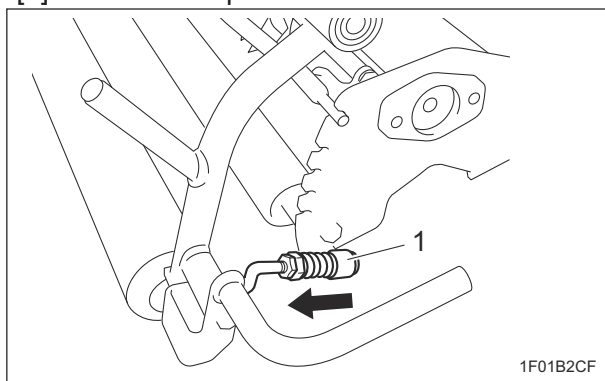


0620D218

1	Chain
2	Snap pin
3	Washer

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

- [7] Pull out the spiker unit and remove it.

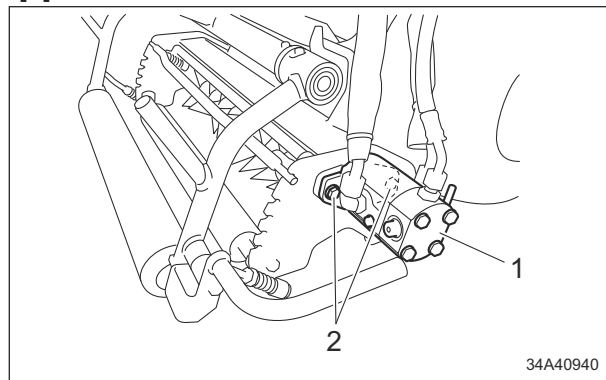


1F01B2CF

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

2. Removing the spiker unit #2 and #3

- [1] Remove the bolts which install the motor.



34A40940

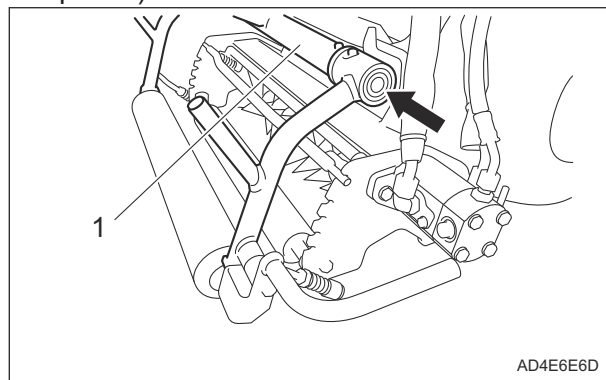
1	Motor
2	Bolt

- [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.



AD4E6E6D

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

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

- [5] Remove the chain from the spiker unit.

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

- [7] Pull out the spiker unit and remove it.

Handling Instructions

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.

Spiker Unit

Inspection of Spiking Blades

Caution

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

1. Make sure that the edges of the spiking blades are not too blunt to cut.
2. Make sure that the spiking blades are not bent.
3. Make sure that the spiking blades are not chipped.
4. Check the wear amount of the spiking blades.
5. Make sure that the blade shaft does not have distortion.

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 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 Covers

Warning

If you have removed a protective cover during inspection, be sure to securely install it in its original position.

If a protective cover remains removed, foreign objects may fly off, and the operator or the mechanic can be injured.

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

Inspection of Depth Adjusting Lever

1. Make sure that there is no damage nor deformation of the depth adjusting lever.
2. Make sure that the lever moves smoothly.

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

Adjustment before Work

Adjustment of Spiking Depth

⚠ Caution

Spiking blades are edged tools. Handle them carefully, since they could cut your hands or legs.

Important

The standard spiking depth is 10 to 40 mm (0.39 to 1.57 in). The setting deeper than 40 mm (1.57 in) will cause damage to the blades and the machine.

Important

Lowering the spiker unit in an area other than lawn may cause damage to the spiking blades. By putting the lever into the groove of "For travel and storage", contact between the spiking blades and the ground can be avoided.

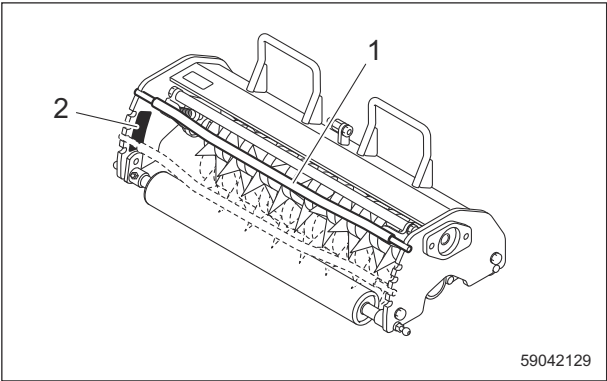
The spiking depth can be adjusted by changing the position of the depth adjusting lever.

- 1. Pull the depth adjusting lever toward your side.

Important

The spiking depth values show rough indications. They may not be the same as the actual depth.

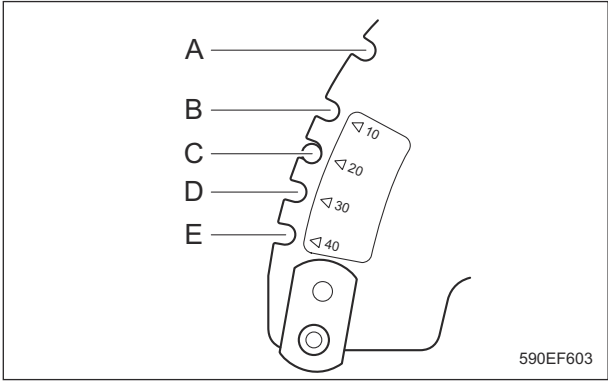
- 2. Adjust the spiking depth to the desired position by putting the lever into the grooves other than the top with using the scale of the depth indicating decal.



59042129

1	Depth adjusting lever
2	Depth indicating decal

Spiking depth adjusting groove



590EF603

A	For travel and storage
B	10 mm (0.39 in)
C	20 mm (0.79 in)
D	30 mm (1.18 in)
E	40 mm (1.57 in)

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 spiker unit lowered.
Otherwise, the spiker 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 spiker 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

Spiking 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

Spiking work must be performed at an appropriate speed for the site and location. When spiking 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 spiker units.
3. Stop the engine.
4. Adjust the spiking depth.
5. Start the engine.
6. Shift the throttle lever to the "High speed" position to run the engine at the maximum speed.
7. Release the parking brake.
8. Start the work following the procedure below.
 - [1] Depress the traveling pedal.
 - [2] Lower the spiker units at the working position.
 - [3] Raise all the spiker 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.

Spiker Unit

Cleaning of Spiker Unit

Be sure to clean the spiker unit after use.

1. Stop the engine.
2. Carefully clean the front and back of the spiker unit with water or compressed air.
3. Remove any grass wrapped around the spiking blades.

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 spiker unit.

1. Cleaning
 - Remove dirt, grass clippings, oil stains etc. completely.
2. Spiker unit
 - Set the spiking depth to which the spiking blades do not touch the ground.
3. Storage location
 - Cover the spiker unit and store it in a dry place where it will not be exposed to rain.

Handling Instructions

Precautions for MaintenancePage 5-2

Replacement Page 5-2

Spiker Unit Page 5-2

Storage Page 5-5

Long-Term StoragePage 5-5

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.

Replacement

Spiker Unit

Replacement of Spiking Blades

Warning

Be sure to stop the engine before change of the spiking blades.

Caution

The spiking blades are edged tools. Take extra care in handling since they could cut your hands or legs.

Caution

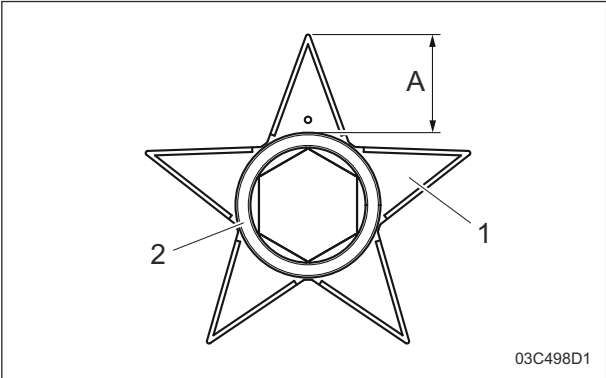
When touching edged tools, be sure to wear gloves since they could cut your hands.

Important

Replace all spiking blades.

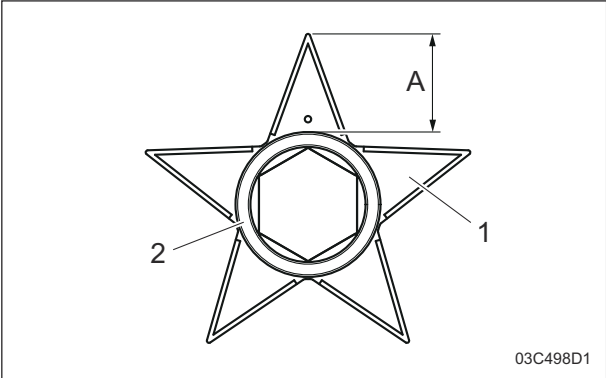
Replace the spiking blade with a new one if the cutting edge is chipped or worn. The usage limit of the spiking blade is when it wears 5 mm (0.20 in) from new. For the wear amount of the spiking blade, refer to the figure below to check the dimensions from the outer diameter of the collar to the cutting edge.

■ New



03C498D1	
1	Spiking blade
2	Collar
A	46 mm (1.81 in)

■ Usage limit



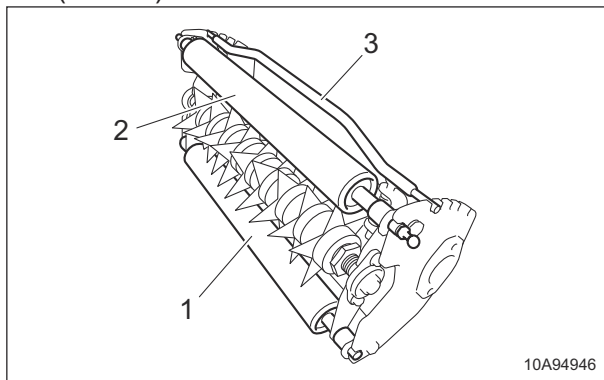
03C498D1	
1	Spiking blade
2	Collar
A	41 mm (1.61 in)

■Removal of Spiking Blades

⚠ Caution

If your hands or fingers come into contact with the spiking blades, you may be injured. Be sure to wear gloves when handling and be careful not to get injured.

1. Stand the spiker unit with the front roller facing upward.
2. Put the depth adjusting lever into the bottom grooves for a depth of 40 mm (1.57 in).

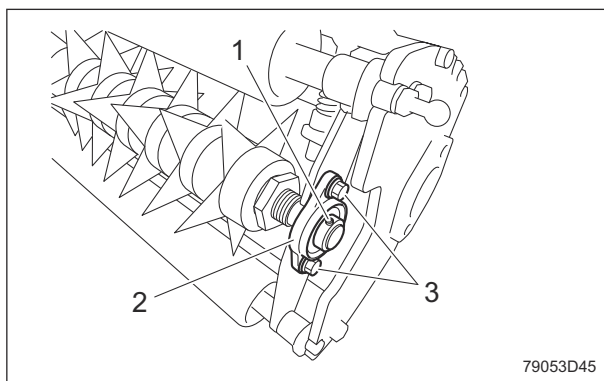


10A94946

10A94946

1	Rear roller
2	Front roller
3	Depth adjusting lever

3. Loosen the left and right hollow screws.
4. Remove the bolts from the flange unit on the right side when you face the spiker unit from the front.



79053D45

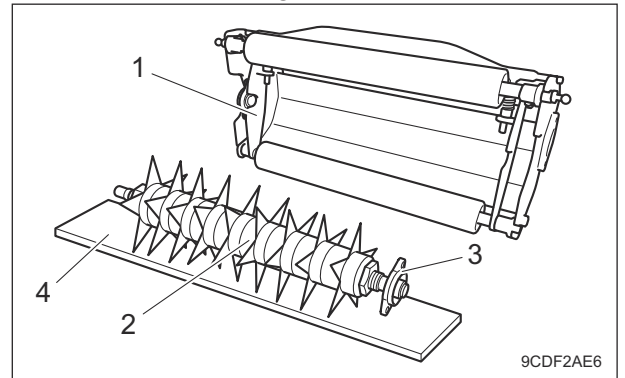
79053D45

1	Hollow screw
2	Flange unit
3	Bolt

5. Remove the spiking blade Assy from the frame.

6. Place the spiking blade Assy on a wooden board or other material in order not to rotate it.

7. Remove the flange unit.



9CDF2AE6

9CDF2AE6

1	Frame
2	Spiking blade Assy
3	Flange unit
4	Wooden board

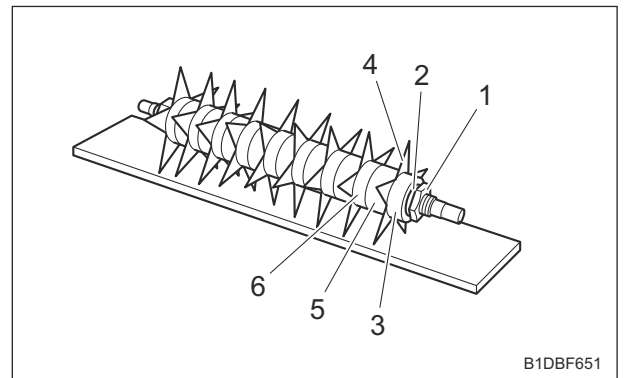
8. Disassemble the spiking blade Assy.

[1] Remove the special nut on the side which the flange unit was removed.

[2] Remove the disc spring washer.

[3] Remove the end collar.

[4] Remove the spiking blade, collar A and collar B.



B1DBF651

B1DBF651

1	Special nut
2	Disc spring washer
3	End collar
4	Spiking blade
5	Collar A
6	Collar B

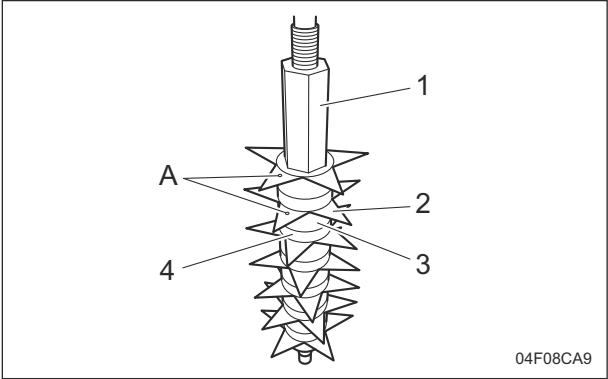
Maintenance

■Installation of Spiking Blades

 **Caution**

If your hands or fingers come into contact with the spiking blades, you may be injured. Be sure to wear gloves when handling and be careful not to get injured.

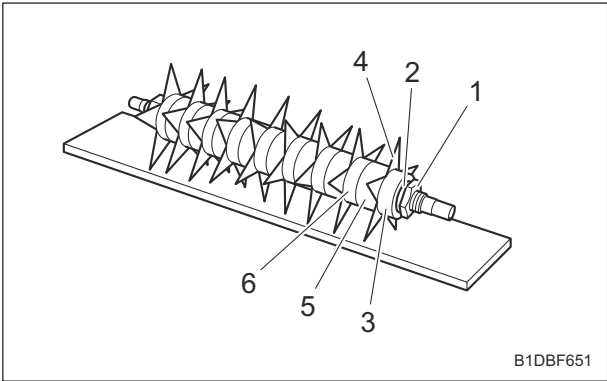
1. Assemble the spiking blade Assy.
- [1] Stand up the blade shaft with the left flange unit side facing downward (when you face the spiker unit from the front).
- [2] Install the end collar.
- [3] Install in order of a spiking blade, collar B and collar A.
- [4] Rotate the blade shaft counterclockwise by one of its six sides, and install in order of a spiking blade, collar B and collar A.
- Each time inserting one spiking blade into the blade shaft, rotate the blade shaft counterclockwise by one of its six sides.
- Using the position of the hole in the blade as a guide, shift the position of the hole by 60 degrees to arrange the blade tips in a spiral.



1	Blade shaft
2	Spiking blade
3	Collar A
4	Collar B
A	Hole

- [5] Install the end collar.
- [6] Install the disc spring washer.

[7] Install the special nut.



1	Special nut
2	Disc spring washer
3	End collar
4	Spiking blade
5	Collar A
6	Collar B

Important

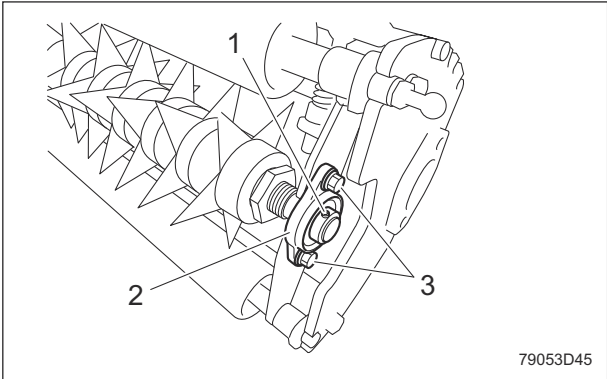
Install the spiking blade Assy to the frame with the side which installed disc spring washer to the right side (when you face the frame from the front).

2. Install the spiking blade Assy into the frame.

Important

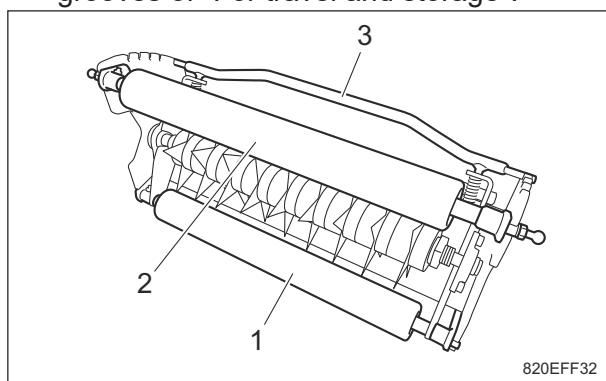
Make sure that the length of the left and right protrusions of the shaft of the spiking blade Assy are equal.

3. Install the flange unit to the side which installed disc spring washer.
4. Install the bolts into the flange unit.
5. Tighten the hollow screws on the left and right sides.



1	Hollow screw
2	Flange unit
3	Bolt

6. Put the depth adjusting lever into the top grooves of "For travel and storage".



820EFF32

1	Rear roller
2	Front roller
3	Depth adjusting lever

Storage

Long-Term Storage

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

1. Cleaning

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

2. Spiker unit

- Set the spiking depth to which the spiking blades do not touch the ground.

3. Storage location

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

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

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

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

Maintenance Item		Before Work	After Work	Remarks
Mower unit	Check spiking blade	○		
	Check roller	○		
	Check cover	○		
	Check depth adjusting lever	○		
	Check spiker unit exterior	○		
	Check bolts and nuts	○		
	Adjust spiking depth	○		
	Clean spiker unit		○	

Maintenance Schedule

ASP311

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

Maintenance Item		When Required	Remarks
Mower unit	Replace spiking blade	△	

Daily Check Records Page 7-2

Maintenance RecordsPage 7-3

Daily Check Records

ASP311
Use this table freely for your records of the daily check.

Model		Serial Number									
Items											
Mower unit	Check spiking blade										
	Check roller										
	Check cover										
	Check depth adjusting lever										
	Check spiker unit exterior										
	Check bolts and nuts										
	Adjust spiking depth										
	Clean spiker unit										

Maintenance Records

ASP311

Use this table freely for your records of the maintenance.

Model						Serial Number					
Items											
Mower unit	Replace spiking blade										

Records



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