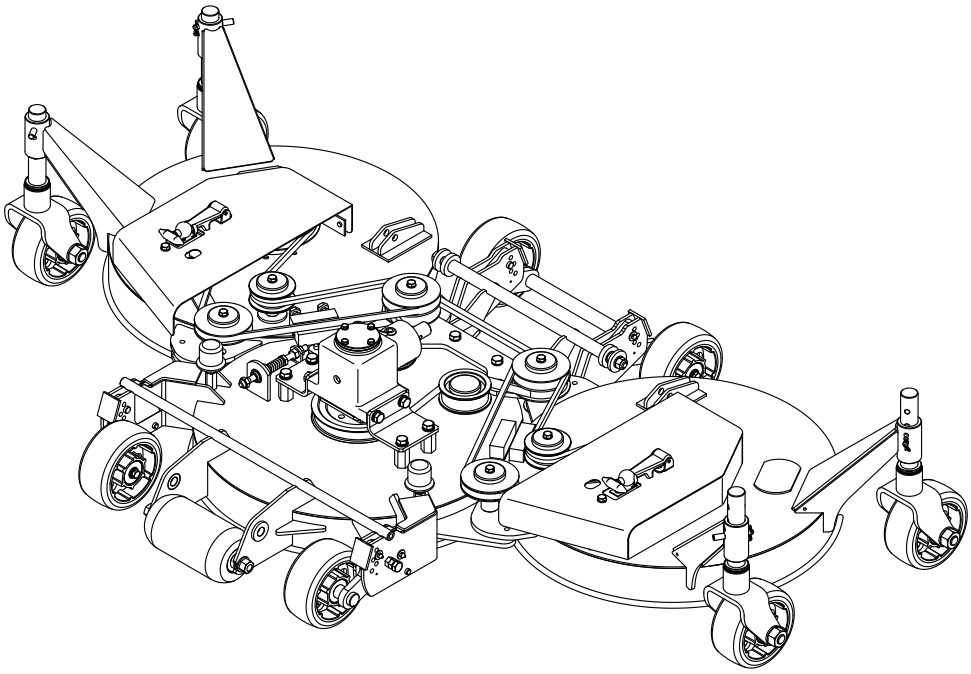
GM1700

Contour Rotary Unit for GM1700

Owner's operating manual



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

BARONESS®

Quality on Demand

Serial No.10038-

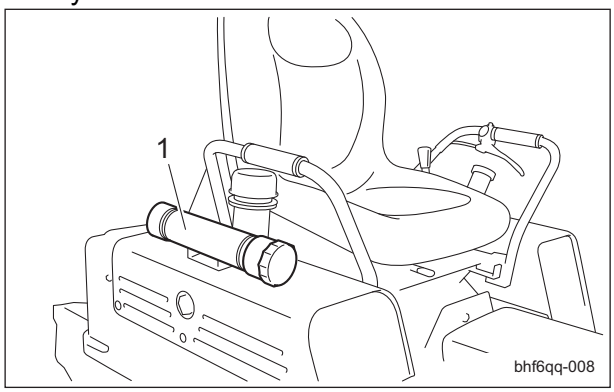
Original Instructions Ver.1.0

Greeting

Thank you for purchasing the Baroness machine.
This manual explains proper handling, adjustment, and inspection of your machine.
Prior to use, carefully read this manual to thoroughly understand the contents for safe and correct operation.
We hope you will use the machine safely, and take advantage of its best performance.

Keeping the Owner's Operating Manual

Keep this Owner's Operating Manual in the box on the hydraulic tank.



Keeping the Owner's Operating Manual_001

1	Box

Introduction

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

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

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

Be sure to also read the operating manuals for the engine, battery, etc.

Maintenance should only be performed by a certified specialist.

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

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

When loaning or transferring this machine, please also provide the Owner's Operating Manual together with the machine.

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 Kyoeisha.
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

Purpose

This machine is intended for cutting turf grass at golf courses.
Do not use this machine in any way other than its intended purpose, and do not modify the machine.
Operating this machine for other purposes and modifying it may be very dangerous and may cause damage to the machine.
In addition, this machine is not authorized for operation as a special motor vehicle. Do not operate it on public roads.

Contents

Contents

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

⚠ Danger

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

Safe Operating Practices

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

Training

1. Read the Owner's operating Manual and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
2. If the operator or mechanic can not read English it is the owner's responsibility to explain this material to them.
3. All operators and mechanics should seek and obtain professional and practical instruction.
   The owner is responsible for training the users.
   Such instruction should emphasize.
   [1] The need for care and concentration when working with ride-on machines.
   [2] Control of a ride-on machine sliding on a slope will not be regained by the application of the brake.
   The main reasons for loss of control are
   - Insufficient wheel grip
   - Being driven too fast
   - Inadequate braking
   - The type of machine is unsuitable for its task
   - Lack of awareness of the effect of ground conditions, especially slopes
   - Incorrect hitching and load distribution
4. Never allow untrained personnel to service machine.
   Local regulations may restrict the age of the operator.
5. The owner/use can prevent and is responsible for accidents or injuries occurring to themselves, other people, or property.
6. Keep in mind that the owner, operator, and mechanic are responsible for accidents or hazards occurring to other people or their property.

Preparation

1. Evaluate the terrain to determine what accessories and attachments are needed to properly and safety perform the job.
   Only use accessories and attachments approved by the manufacturer.
2. While operating, always wear substantial footwear, long trousers, hard hat, safety glasses, and ear protection.
   Long hair, loose clothing, or jewelry may get tangled in moving parts.
   Do not operate the equipment when barefoot or wearing open sandals.
3. Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.
4. Exercise care in the handling of fuel.

⚠ Warning

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

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

[5] Replace all fuel tanks and container caps securely.

5. Check that operator's presence controls, safety switches and shields are attached and functioning properly.
   Do not operate unless they are functioning properly.
6. If the brake operation is faulty or the parking brake lever has noticeable play, be sure to adjust or repair them before operating the machine.
7. Replace faulty mufflers.
8. Before using, always visually inspect to see that the blades, blade bolts, and cutting assembly are not worn or damaged.
   Replace worn or damaged blades and bolts in sets to preserve balance.
9. On multi-blanded machines, take care as rotating one blade can cause other blades to rotate.

Operation

1. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
2. Only operate in good light, keeping away from holes and hidden hazards.
3. Before attempting to start the engine, disengage all attachments, shift into neutral, and engage the parking brake.
   Only start engine from the operator's position.
   Use seat belts if provided.
4. Remember there is no such thing as a safe slope.
   Travel on grass slopes requires particular care.
   To guard against overturning:
   [1] Do not stop or start suddenly when going up or downhill.
   [2] Engage clutch slowly, always keep machine in gear, especially when traveling downhill.
   [3] Machine speeds should be kept low on slopes and during tight turns.
   [4] Stay alert for humps and hollows and other hidden hazards.
   [5] Never operate across the face of the slope, unless the machine is designed for this purpose.
   [6] Never drive the machine on a slope with an angle of gradient that is greater than that specified or in a place where there is a danger of the machine slipping.
5. Never raise deck with the blades running.
6. Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
   Do not crawl under the machine while it is in operation.
7. Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
8. Do not change the engine governor settings or overspeed the engine.
   Operating the engine at excessive speed may increase the hazard of personal injury.
9. Do the following before leaving the operator’s position.
   [1] Stop on level ground.
   [2] Disengage the power take-off and lower the attachments.
   [3] Change into neutral and set the parking brake.
   [4] Stop the engine and remove the key.
10. Disengage the drive to attachments, stop the engine, and remove the ignition key in the following conditions.
    [1] Before refueling.
    [2] Before removing the grass catcher/ catchers;
    [3] Before making height adjustment unless adjustment can be made from the operator’s position:
    [4] Before cleaning blockages.
    [5] Before checking, cleaning or working the machine.
    [6] After striking a foreign object or if an abnormal vibration occurs.
    Inspect the machine for damage and make repairs before restarting and operating the equipment.
11. Keep hands and feet away from the cutting units and the rotating parts.
12. Look behind and down before backing up to be sure of a clear path.
13. Do not carry passengers.
14. Never operate while people, especially children, or pets are nearby.

15. Slow down and use caution when making turns and crossing roads and sidewalks.
16. Stop the blades rotating before crossing surfaces other than grass.
17. Disengage drive to attachments when transporting or not in use.
18. When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
19. Do not operate the machine under the influence of alcohol or drugs.
20. Take care when loading or unloading the machine into a trailer or a truck.
    Load or unload the machine in a flat and safe place.
    Before loading or unloading, set the parking brake on the truck or trailer, stop the engine, and chock the wheels.
    When transporting the machine on a truck or a trailer, set the parking brake, stop the engine, and fasten the machine to the truck with a rope or other suitable restraining device that has sufficient strength.
    When using a running board, select one with sufficient strength, length, and width and that will not cause the machine to slip.
21. Close the fuel valve before transporting the machine.
22. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
23. Do not take your eyes off the road ahead.
    Do not operate the machine with no hands.
24. Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of operation.

Maintenance and storage

1. Disengage drives on level ground, lower the atattachments, set parking brake, stop engine and remove key from ignition.
   Wait for all movement to stop before adjusting, cleaning or repairing.
2. When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.
3. To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting units and drives free of grass, leaves, or excessive grease.
   Clean up oil or fuel spillage.
4. Allow the engine to cool before storing in any enclosure.
5. Only cover the machine with a sheet after hot parts have sufficiently cooled down.
6. Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
7. If the engine is provided with a shut-off valve, shut off valve while storing or transporting.
8. Do not store fuel near flames.
9. Never allow untrained personnel to service machine.
10. Allow the engine/muffler to cool before checking/maintenance.
11. Appropriately manage and correctly use the tools necessary for servicing or adjusting the machine.
12. Use jack stands to support components when required.
13. Carefully release pressure from components with stored energy.
14. Be sure to depressurize the hydraulic system before performing maintenance operations on it such as removing hydraulic equipment.
15. Check whether line connectors in the hydraulic system are properly tightened.
    Before applying hydraulic pressure, check the connections of the hydraulic pressure lines and the condition of the hoses.
16. When checking the hydraulic circuit for pinhole leaks or oil leakage from nozzles, do not use your hands.
    Use items such as paper or corrugated cardboard to find leakage points.
    Be extremely careful with high-pressure oil as it may pierce your skin, result.
    If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.
17. Disconnect battery before making any repairs.
    Disconnect the negative terminal first and the positive last.
    Reconnect positive first and negative last.

18. Make sure that parts such as wires are not touching each other and that their covers have not come off.
19. Use care when checking the blades.
    [1] Wrap the blades or wear gloves, and use caution when servicing them.
    [2] Only replace blades.
    [3] Never straighten or weld them.
20. On multi-bladed machines, take care as rotating one blade can cause other blades to rotate.
21. Keep hands and feet away from moving parts.
    If possible, do not make adjustments with the engine running.
22. Charge batteries in an open well ventilated area, away from spark and flames.
    Unplug charger before connecting or disconnecting from battery.
    Wear protective clothing and use insulated tools.
23. Keep all parts in good working condition and all hardware tightened.
    Replace all worn or damaged decals.
24. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
25. Check the grass catcher frequently for wear or deterioration.
26. If the fuel tank has to be drained, do this outdoors.

Disposal

Waste Disposal

About the Waste disposal

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

Specifications

Specifications

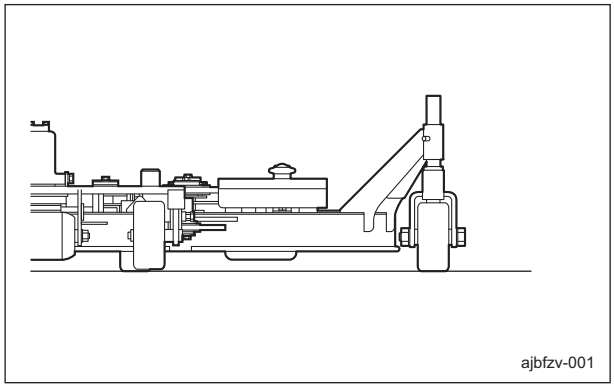
Type		GM1700 contour deck
Dimensions	Total length	108 cm [255 cm]
	Total width	183 cm [183 cm]
	Total height	37 cm
Weight		166 kg [895 kg]
Operating width (Mowing width)		151 cm
Operating height (Mowing height)		35 - 95 mm (15 mm spacing, 5 levels)
Number of blades		3
Blade length		533 mm
Efficiency		6,040 m^2/h (5.0 km/h x mowing width x 0.8)

* Values within [ ] are dimensions and weight of GM1700 equipped with the contour deck.

Features of contour deck

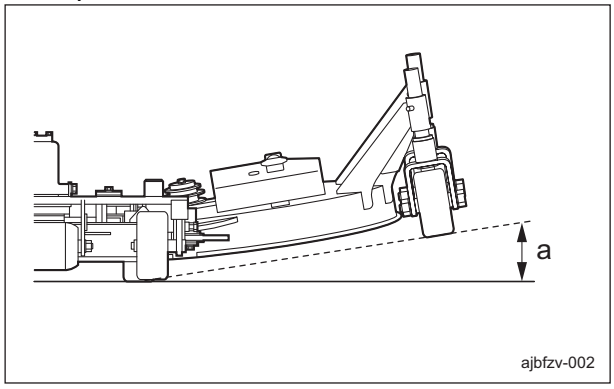
1. The swing of the left and right decks enables you to cut grass on undulations.
   The left and right decks each swing 8° up and down (up and down movement of left/ right blade tips is ±76 mm).

Level



Features of contour deck_001

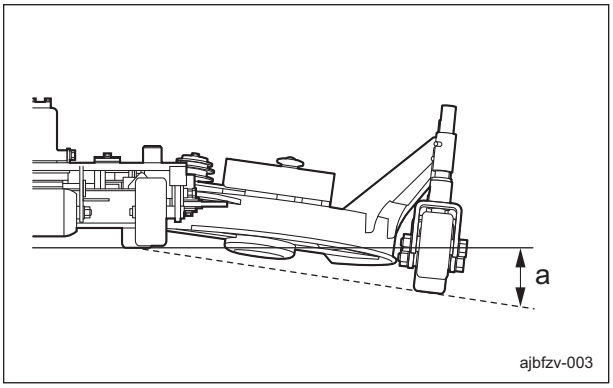
Up



Features of contour deck_002

a	8°

Down

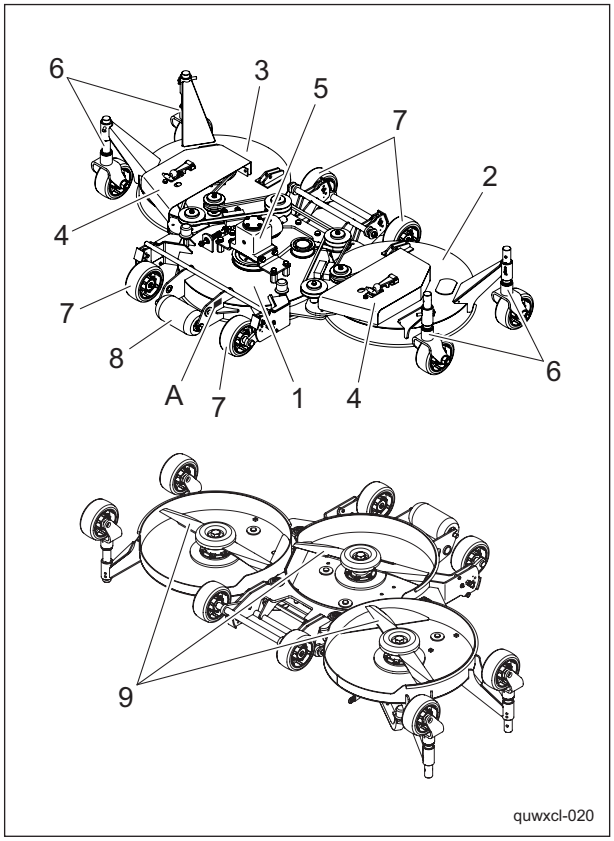


Features of contour deck_003

a	8°

2. Grass clippings are discharged toward the back.

Names of Each Section



Names of Each Section_001

1	Center deck
2	Left deck
3	Right deck
4	Belt cover
5	Gearbox
6	Caster
7	Cutting height gauge wheel
8	Front roller
9	Rotary knife
A	Serial number plate

Serial Number Plate

The serial number plate indicates the serial number.

Serial Number Plate_001

Safety Signs and Instruction Signs

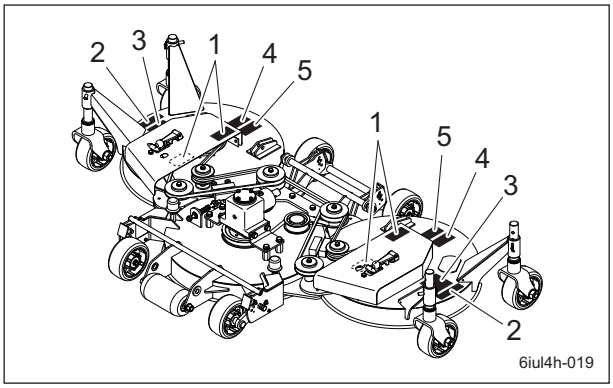
About Safety Signs and Instruction Signs

Warning

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

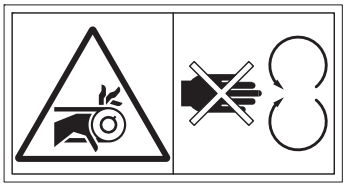
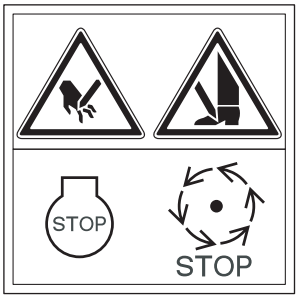
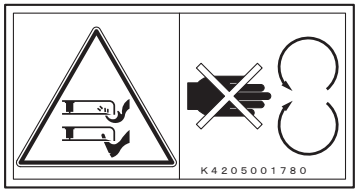
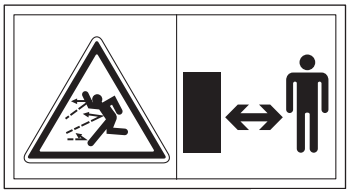
Part numbers for decals that need to be replaced are listed in the parts catalog. Order them from a Baroness dealer or Kyoeisha.

Positions of Safety Decals and Instruction Decals



Positions of Safety Decals and Instruction Decals_001

Explanation about Safety Decals and Instruction Decals

1	 qigqnx-012	K4205001530 Decal for caution to rotating object **Danger** Watch for rotating parts - Keep your hands away from the belts while the engine is running.
2	 qigqnx-036	K4209001340 Decal, caution “DO NOT STEP” Caution Do not step here.
3	 qigqnx-010	K4205001600 Decal, caution to mutilation **Danger** May cut your hand or leg - Stop the rotation and engine. Otherwise you may get injured.
4	 qigqnx-034	K4205001780 Decal, caution for hand or leg injury **Danger** May cut your hand or leg - When the blades are rotating, keep away from the machine.
5	 qigqnx-011	K4205001650 Decal, caution to flying object **Danger** Caution to flying object - When the blades are rotating, keep away from the machine. All bystanders must keep a safe distance from the machine.

Handling Instructions

Handling Precautions

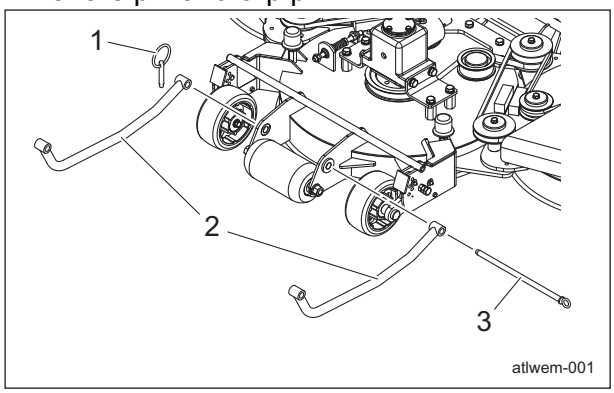
Important

This manual contains descriptions for handling the operating machine.
For details on handling, refer to this manual and the GM1700 Owner's Operating Manual.

Pre-installation Adjustments

Installation of Contour Deck

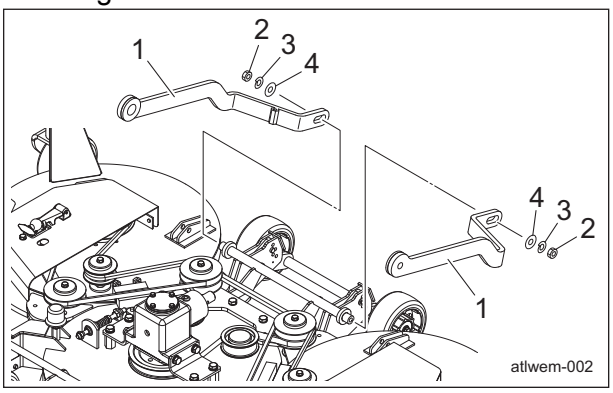
1. Move the machine and contour deck onto a level surface.
2. If any unnecessary attachments are mounted on the machine, remove them.
   Note:
   Tie the universal joint to the machine with string, etc., in order to prevent it from falling.
3. Install the front rods onto the contour deck with the pin and clip pin.



Installation of Contour Deck_001

1	Clip pin
2	Front rod
3	Pin

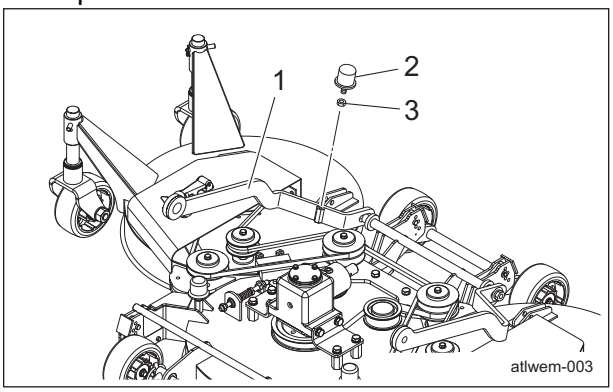
4. Install the deck tow plates onto the contour deck with the nuts.
   Follow the same installation step for the left and right sides.



Installation of Contour Deck_002

1	Deck tow plate
2	Nut
3	Spring washer
4	Washer

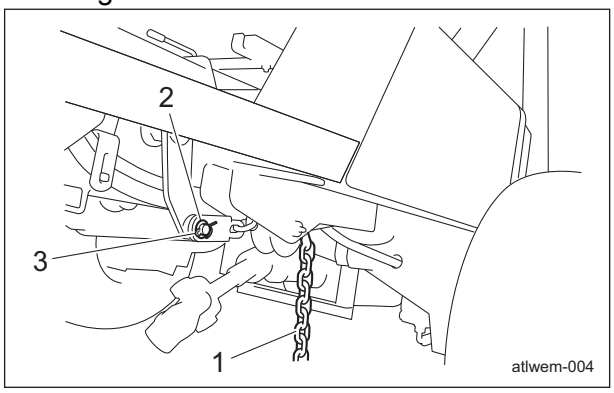
5. Install the rubber stopper onto the right deck tow plate.



Installation of Contour Deck_003

1	Deck tow plate
2	Rubber stopper
3	Nut

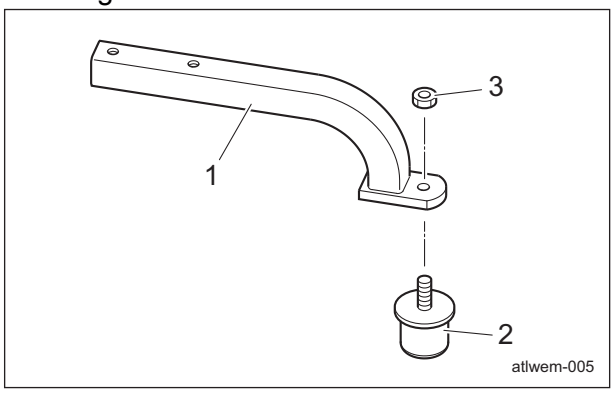
6. Install the lift chain, and then secure it with the cotter pin.
   Follow the same installation step for the left and right sides.



Installation of Contour Deck_004

1	Lift chain
2	Washer
3	Cotter pin

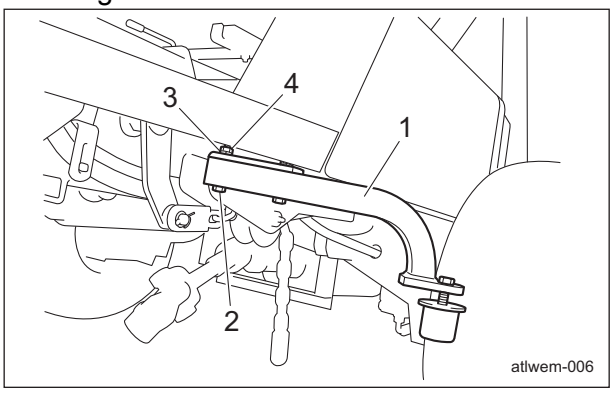
7. Install the rubber stopper onto the stopper arm.
   Follow the same installation step for the left and right sides.



Installation of Contour Deck_005

1	Stopper arm
2	Rubber stopper
3	Nut

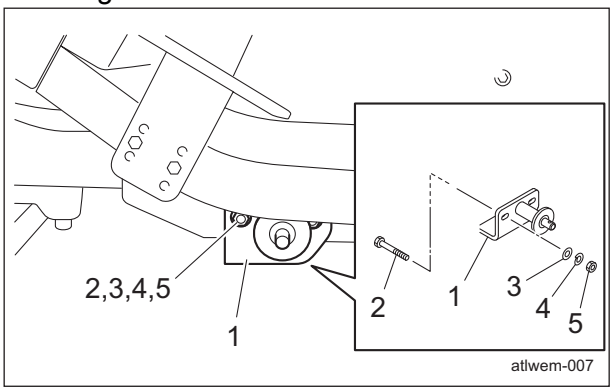
8. Install the stopper arm onto the frame with the bolt and nut.
   Follow the same installation step for the left and right sides.



Installation of Contour Deck_006

1	Stopper arm
2	Bolt
3	Spring washer
4	Nut

9. Install the link fulcrum shaft onto the frame with the bolt and nut.
   Follow the same installation step for the left and right sides.

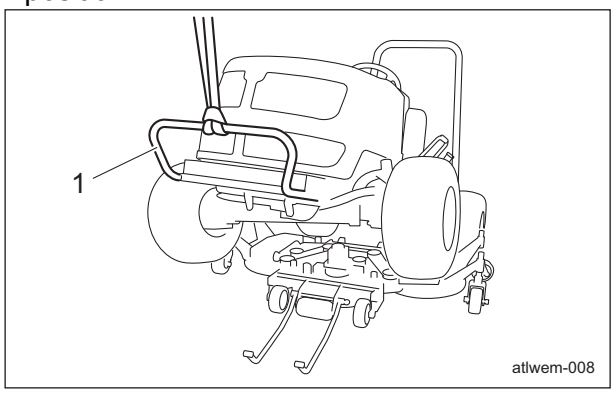


Installation of Contour Deck_007

1	Link fulcrum shaft
2	Bolt
3	Washer
4	Spring washer
5	Nut

10. Raise the bumper with a hoist, etc., to lift up the front wheels of the machine.

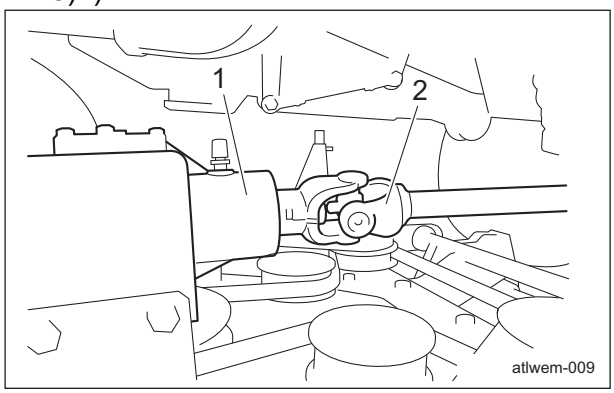
11. Place the contour deck in the appropriate position.



Installation of Contour Deck_008

1	Bumper

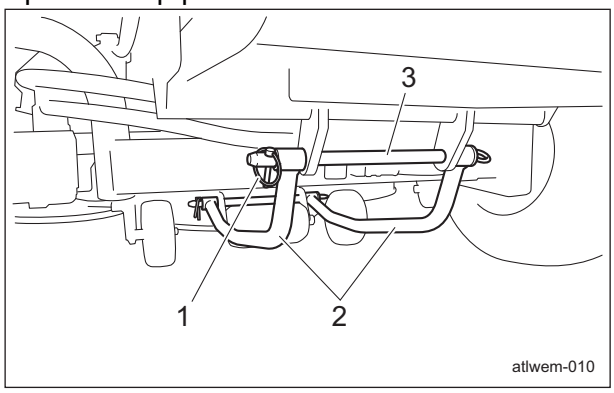
12. Install the universal joint onto the gearbox. (See "Installation of Universal Joint" (Page 4-5) .)



Installation of Contour Deck_009

1	Gearbox
2	Universal joint

13. Lower the machine until it is level.
14. Install the front rods onto the frame with the pin and clip pin.



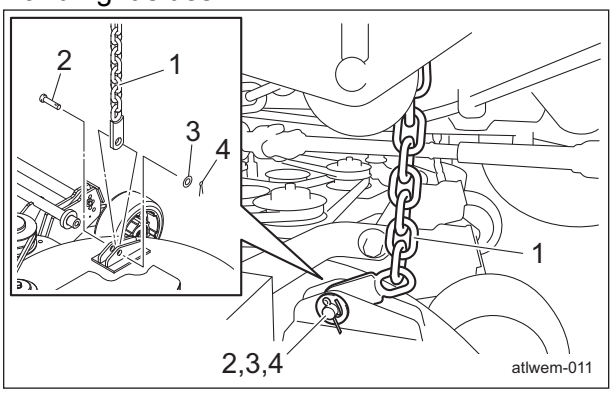
Installation of Contour Deck_010

1	Clip pin
2	Front rod
3	Pin

Important

Make sure that the lift chain is not twisted.

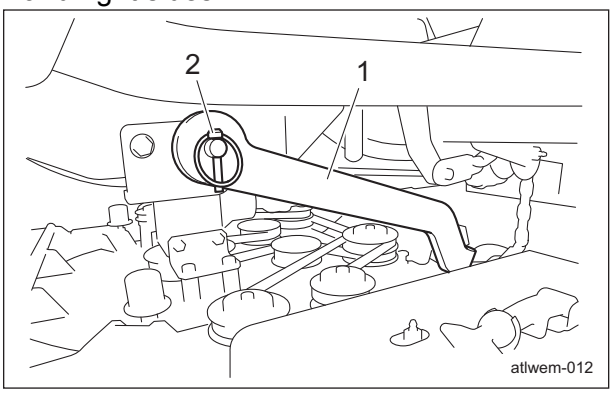
15. Install the lift chain onto the contour deck with the pin, and then secure it with the cotter pin.
Follow the same installation step for the left and right sides.



Installation of Contour Deck_011

1	Lift chain
2	Pin
3	Washer
4	Cotter pin

16. Install the deck tow plate onto the frame with the cotter pin.
Follow the same installation step for the left and right sides.



Installation of Contour Deck_012

1	Deck tow plate
2	Clip pin

17. Start the engine, and then raise the mower unit to the highest position.

18. Make sure that the heights of the left and right decks are the same.

> **Caution**
>
> Be sure to stop the engine before making adjustments.

Note:
If the decks are not equally raised, adjust the installation position of the link fulcrum shafts.

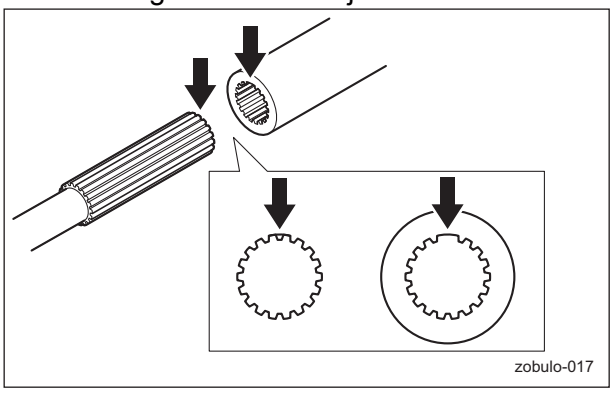
19. Make sure that the swing stoppers make contact equally on the left and right sides. (See "Swing Stoppers" (Page 5-13) .)
20. Adjust lift stopper contact. (See "Lift Stoppers" (Page 5-14) .)

Note:
For removing the contour deck, reverse the installation procedure.

Installation of Universal Joint

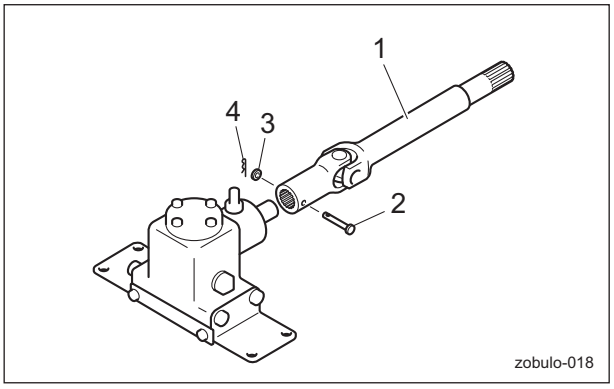
> **Important**
>
> Check the alignment point of the splines before installing (inserting) the universal joint.

1. Check the alignment point of the splines for connecting the universal joint.



Installation of Universal Joint_001

2. Align the holes of the universal joint and gearbox, and then install it with the pin, washer and cotter pin.



Installation of Universal Joint_002

1	Universal joint
2	Pin
3	Washer
4	Cotter pin

Note:
For removing the universal joint, reverse the installation procedure.

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.

Rotary Knife

Inspection of Rotary Knife

Danger

The rotary knife is an edged tool.
Handle them carefully, since they could cut your hands or legs.

Caution

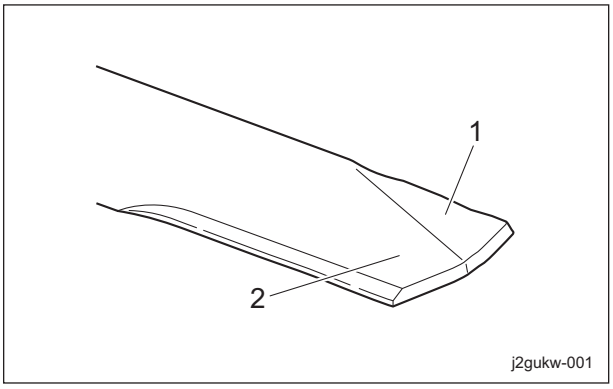
When touching edged tools, wear gloves, since they could cut your hands.

Due to frequent use, objects crushed during mowing, or damage during transportation and so forth, the rotary knife may vibrate from imbalance or become dull.
Inspect the rotary knife, and if necessary, resharpen, balance or replace it.

Important

Frequently inspect the rotary knife since it may become dull quickly if the machine is operated in an environment of dry soil or sand.

1. Make sure that the rotary knife is not bent.
2. Make sure that the rotary knife is not chipped.
3. Check to see how much the rotary knife is worn.
4. Make sure that the rotary knife is not worn asymmetrically.
5. Make sure that the mounting bolt for the rotary knife is not loose.
6. Make sure that there are no cracks or tears between the sail and flat part of the rotary knife.



Inspection of Rotary Knife_001

1	Sail
2	Flat part

Cover

Inspection of Covers

Caution

If you have removed the shield during inspection, make sure that you re-attach it in the original position securely.
If the shield remains removed, foreign objects may fly off, possibly resulting in injuries.

1. Make sure that there is no wear or deterioration in the rotary cover or shield, etc.
2. Make sure that there is no damage to the rotary cover or shield, etc.
3. Make sure that there is no interference to moving parts due to deformation of the rotary cover or shield, etc.
4. Make sure that the shield, etc., are installed in the specified locations.

Belt

Inspection of Belts

> ⚠ 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.

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  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	14,628.78	11,860.34

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

Principal tightening torques

Tightening Torque by Model

GM1700_Contour deck
Tighten the following bolts and nuts at the torque specified in the table.
For thread locking adhesive, apply a middle strength thread locker (ThreeBond 1322 anaerobic adhesives).

Location	Code	Part name	Tightening torque			Thread locking adhesive
			N-m	kgf-cm	lb-in	
Link fulcrum shaft	K0013100802	Bolt, 11T, heat-treated M10-80	29 - 38	295.71 - 387.49	256.68 - 336.34	—
Center knife shaft	K0017100251	Bolt, 8T, heat-treated, small, 10-25 P1.25	45 -57	458.87 - 581.23	398.30 - 504.51	○
Rotary knife shaft	K0010100251	Bolt, 11T, heat-treated M10-25	58 -76	591.43 - 774.97	513.36 - 672.68	○
Rotary knife	GM1700-2149Z1	Knife mounting bolt	130 - 150	1325.61 -1529.55	1150.63 - 1327.65	—
Deck connector	K0010100202	Bolt, 11T, heat-treated M10-20	58 - 76	591.43 - 774.97	513.36 - 672.68	—
Stopper arm	K0013080502	Bolt, 11T, heat-treated M8-50	14 - 19	142.76 - 193.74	123.91 - 168.17	—

Adjustment Before Operating

Adjustment of Cutting Height

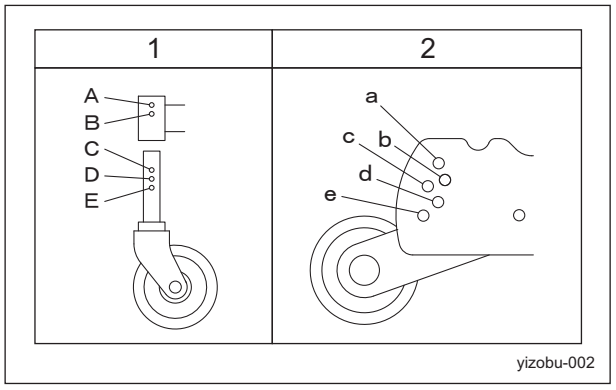
Cutting Height Table

Important

Adjust all mower units to the same cutting height.

The adjustment range for the cutting height is 35 - 95 mm (15 mm spacing, 5 levels).

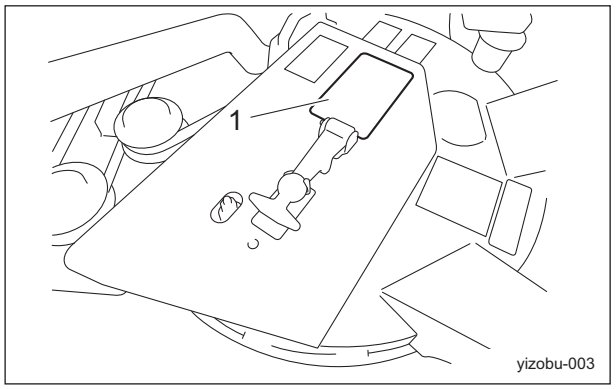
Left/Right Decks	Cutting Height (mm)	Center Deck
A-C	95	e
B-D	80	d
A-D	65	c
B-E	50	b
A-E	35	a



Cutting Height Table_001

1	Left/right decks
2	Center deck

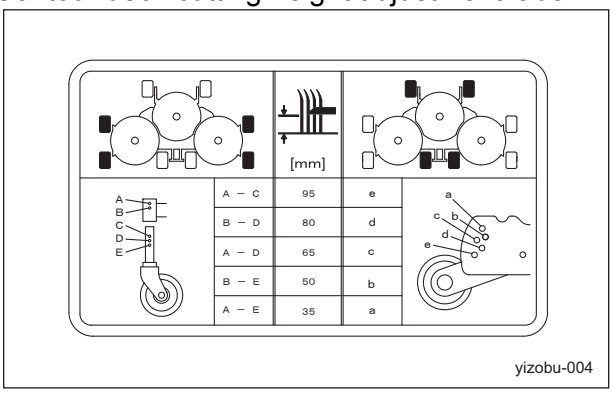
Attach the cutting height adjustment label to the mower unit.



Cutting Height Table_002

1	Cutting height adjustment label

GM1700-2161Z0
Contour deck cutting height adjustment label



Cutting Height Table_003

Adjustment of Center Deck

The cutting height of the center deck is adjusted with the cutting height gauge wheels mounted at the front and back of the deck. There are four cutting height gauge wheels.

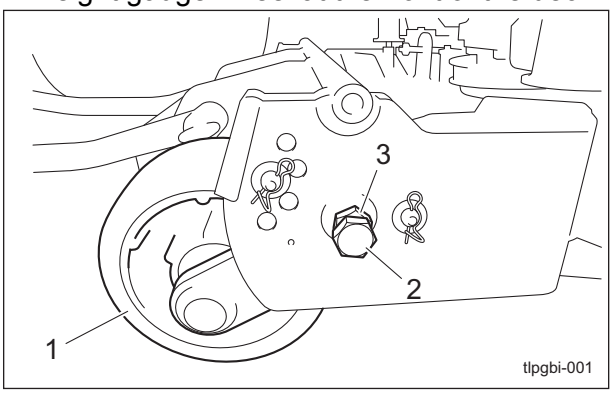
Important

The length of grass cut off at any one time must be no more than 30 mm.

Important

Do not cut off more than 1/3 of the grass height.

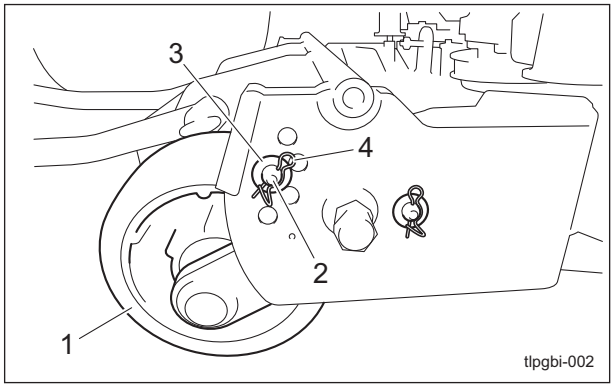
1. Apply the parking brake, and then raise the mower unit so that the cutting height gauge wheels do not touch the ground.
2. Stop the engine, and then remove the key.
3. Loosen the bolt and nut on the cutting height gauge wheel at the front of the deck.



Adjustment of Center Deck_001

1	Cutting height gauge wheel
2	Bolt
3	Nut

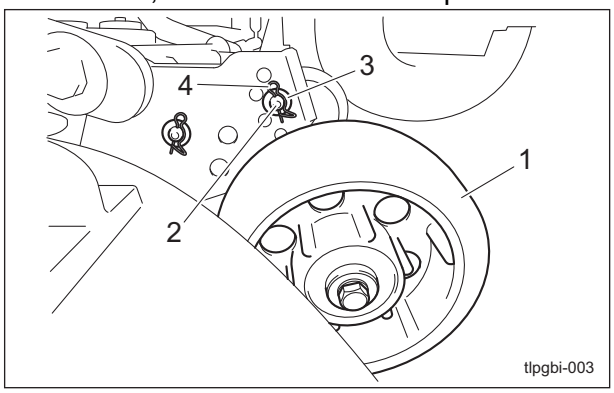
4. Remove the cotter pin and washer from the cutting height gauge wheel at the front of the deck, and then remove the pin.



Adjustment of Center Deck_002

1	Cutting height gauge wheel
2	Pin
3	Washer
4	Cotter pin

5. Refer to the Cutting Height Table, and then change the hole positions.
6. Insert the pin, and then securely install the cutting height gauge wheel with the washer and cotter pin.
7. Firmly tighten the bolt and nut to secure the wheel.
8. Remove the cotter pin and washer from the cutting height gauge wheel at the back of the deck, and then remove the pin.



Adjustment of Center Deck_003

1	Cutting height gauge wheel
2	Pin
3	Washer
4	Cotter pin

9. Refer to the Cutting Height Table, and then change the hole positions.
10. Insert the pin, and then securely install the cutting height gauge wheel with the washer and cotter pin.

Adjustment of Left and Right Decks

The cutting heights of the left and right decks are adjusted with the casters mounted at the front and back of each deck.
There are four casters.

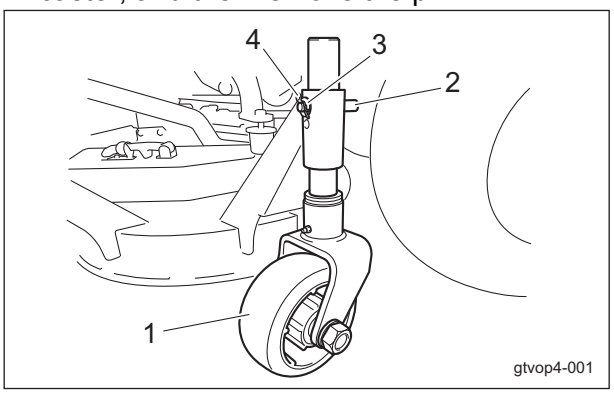
Important

The length of grass cut off at any one time must be no more than 30 mm.

Important

Do not cut off more than 1/3 of the grass height.

1. Apply the parking brake, and then raise the mower unit so that the casters do not touch the ground.
2. Stop the engine, and then remove the key.
3. Remove the cotter pin and washer from the caster, and then remove the pin.



Adjustment of Left and Right Decks_001

1	Caster
2	Pin
3	Washer
4	Cotter pin

4. Refer to the Cutting Height Table, and then change the hole positions.
5. Insert the pin, and then securely install the caster with the washer and cotter pin.

Maintenance Precautions

⚠ Caution

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

⚠ Caution

Use tools appropriate for each maintenance operation.

⚠ Caution

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

Maintenance Schedule

GM1700
Follow the maintenance schedule below.
○ ・ ・ ・ Inspect, adjust, supply, clean
● ・ ・ ・ Replace (first time)
△ ・ ・ ・ Replace

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

Maintenance item		Before work	After work	Every 8 hrs.	Every 50 hrs.	Every 100 hrs.	Every 200 hrs.	Every 250 hrs.	Every 400 hrs.	Every 500 hrs.	Every year	Every 2 years	Every 4 years	Remarks
Main body	Hydraulic motor oil				●		△							
	Power unit oil	-	-	-	-	-	-	-	-	-	-	-	-	-
	Transmission oil	○			●						△			
	Hydraulic hose (moving part)	○										△		
	Hydraulic hose (fixed part)	○											△	
	Air cleaner	○					△				△			See "Replacement of Air Cleaner".
	Electromagnetic pump filter	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel strainer					○					△			
	Fuel pipe	○												
	Cleaning the exterior	○												
By model (operating machine)	Brake (knife)	○												
By model (mower unit)	Tightening the parts	○												
	Knife	○												
	Cutting height	○												
	Greasing, oiling				○									
	Tire (cutting height gauge wheel)	○												
	V-belt	○									△			
	Cover	○												
	Grease (gearbox)										△			
	Cleaning the exterior	○												
By model (grass collector)	Tightening the parts	○												
	Greasing, oiling				○									
	V-belt	○									△			
	Cover	○												
	Fan	○												
	Duct	○												
	Cleaning the exterior	○												

Maintenance item		Before work	After work	Every 8 hrs.	Every 50 hrs.	Every 100 hrs.	Every 200 hrs.	Every 250 hrs.	Every 400 hrs.	Every 500 hrs.	Every year	Every 2 years	Every 4 years	Remarks
By model (high-dump sweeper)	Tightening the parts	○												
	Greasing, oiling				○									
	V-belt	○									△			
	Cover	○												
	Oil leakage	○												
	Hydraulic hose (moving part)	○										△		
	Hydraulic hose (fixed part)	○											△	
	Fan	○												
	Duct	○												
	Cleaning the exterior	○												

The values for consumables are not guaranteed.
Replace the steering cylinder hoses every 2 years.

Specified Values

Tension spring (center deck belt)	Spring extends 35.0 mm from end of spring guide	Total length of spring compresses to 55.0 mm
Tension spring (left and right deck belts)	Spring extends 35.0 mm from end of spring guide	Total length of spring compresses to 55.0 mm
Gearbox grease quantity	260 g	

Main Consumable Parts

Part name	Code
Rotary knife	K2530000120
V-belt LB56AG-X (center deck)	K2347056000
V-belt LA64-AG-6A (left and right decks)	K2325064000

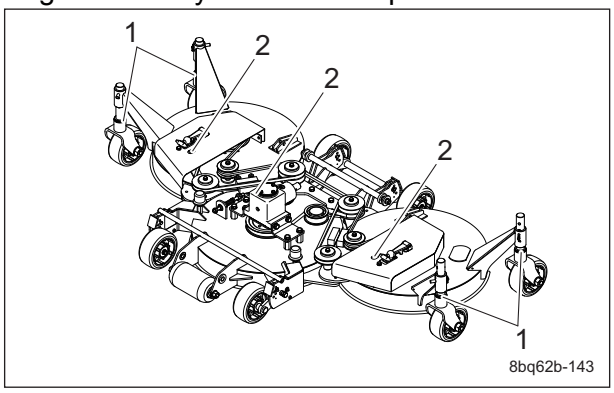
Greasing

About Greasing

Since there may be adhesion or damage due to lack of grease on moving parts, they must be greased.
Add urea-based No. 2 grease in accordance with the Maintenance Schedule.
Other locations where the specified grease or lubricant is used are indicated in "Greasing Points".
Add grease using the specified grease or lubricant.

Greasing Points

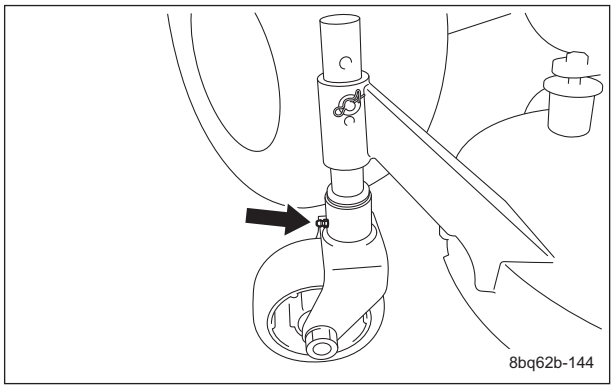
Grease nipples are installed in the following locations.
Add grease every 50 hours of operation.



Greasing Points_001

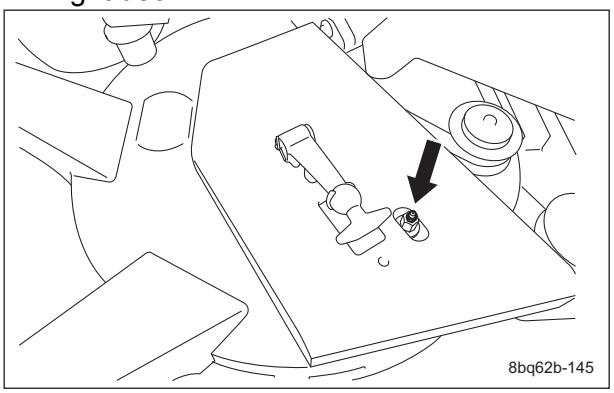
	Location	No. of greasing points
1	Caster fulcrum	4
2	Tension lever fulcrum	3

1. Caster fulcrum
There are four locations.



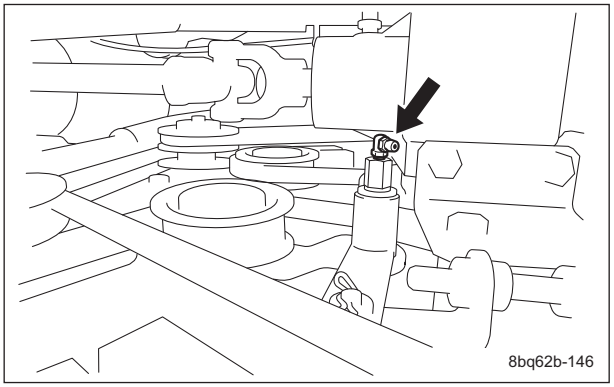
Greasing Points_002

2. Tension lever fulcrum
Left/right decks
There is one point each on the left and the right deck.



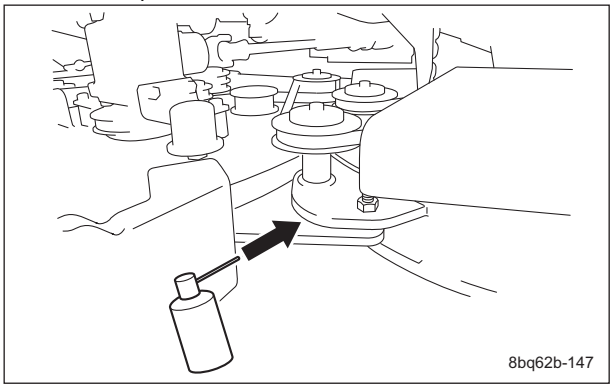
Greasing Points_003

Center deck



Greasing Points_004

Note:
Apply lubricant to the deck connections (four locations).



Greasing Points_005

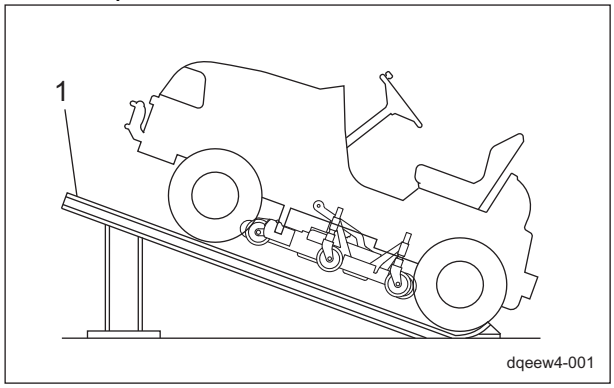
Maintenance (Mower)

Cleaning of Mower Unit

Caution

When using a ramp, etc., apply the parking brake, and chock the tires.

Note:
Use a ramp, etc., if it is available.



Cleaning of Mower Unit_001

1	Ramp

Important

When cleaning, do not allow water to come into contact with pulleys.
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 pulleys or rotary knives.

Change of Rotary Knife

Danger

The rotary knife is an edged tool.
Take extra care in handling since they could cut your hands or legs.

Danger

If the rotary knife becomes worn or damaged, a crack or tear between the sail and flat part will result.
Take extra care since a broken piece of the rotary knife may fly off while it is rotating.

Caution

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

Caution

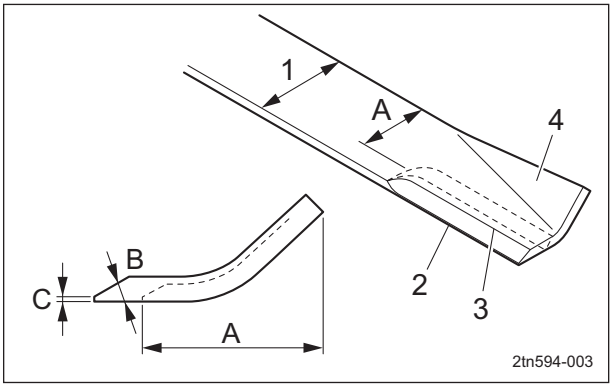
The rotary knife has a specific installation direction.
Do not install it facing the wrong direction.

Important

Before installing the rotary knife, make sure that it is balanced.

If the edge of the rotary knife becomes chipped or thin, replace it with a new one.
The criteria for replacing the rotary knife are described below.

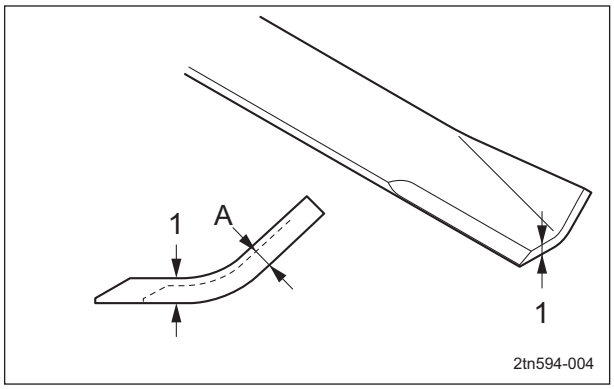
1. When the narrowest part of the rotary knife has a width of less than 2/3 of the width of a new knife



Replacement of Rotary Knife_001

1	Total width
2	Blade edge
3	Blade base
4	Sail
A	less than 2/3
B	30 - 40°
C	0.5 - 1.0 mm

2. When the thinnest part of the rotary knife has a thickness of less than 1/3 of the thickness of a new knife



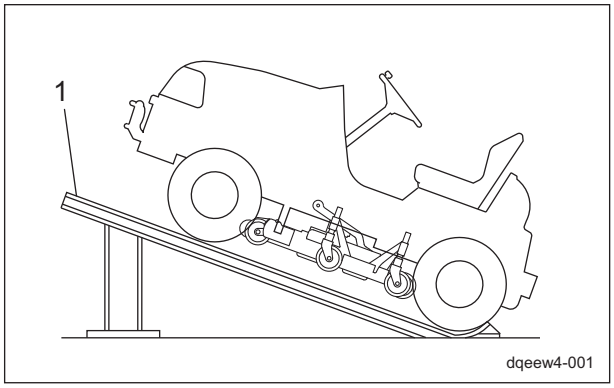
Replacement of Rotary Knife_002

1	Thickness
A	less than 1/3

Contour Deck

> **Caution**
> When using a ramp, etc., apply the parking brake, and chock the tires.

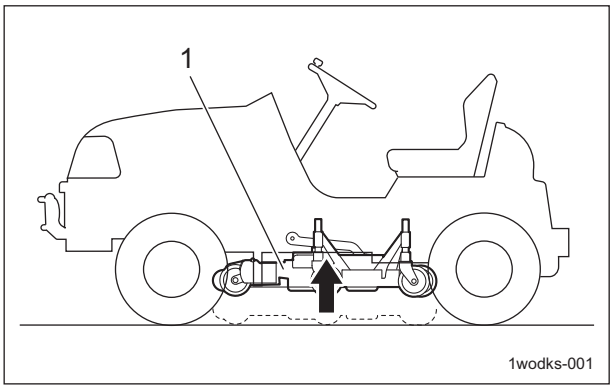
Note:
Use a ramp, etc., if it is available.



Contour Deck_001

1	Ramp

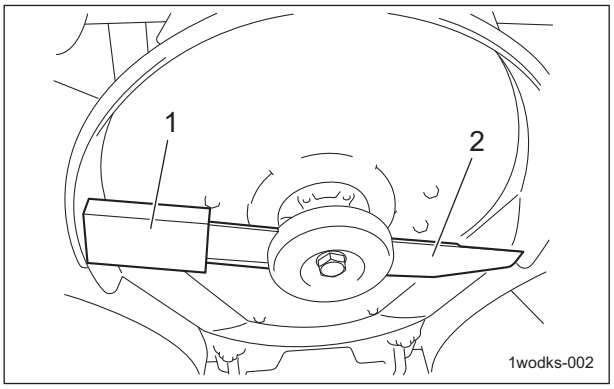
1. Start the engine, and then raise the mower units.



Contour Deck_002

1	Mower unit

2. Stop the engine, and then remove the key.
3. Follow the steps below to remove the rotary knife.
   [1] Use the square pipe from the included tools to secure the rotary knife so that it does not turn.

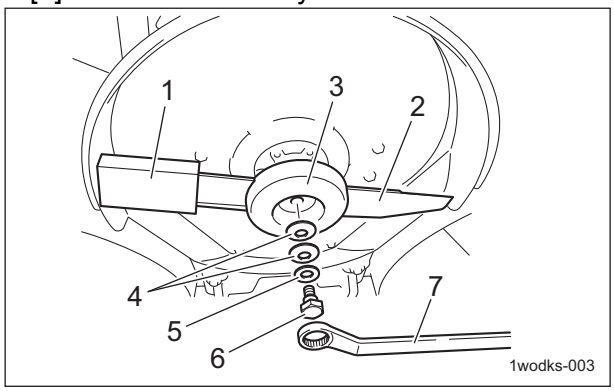


Contour Deck_003

1	Square pipe
2	Rotary knife

   [2] Slide the pipe for the offset wrench onto the offset wrench from the included tools.
   [3] Remove the bolt, washer and disc spring used to install the rotary knife.
   [4] Remove the knife guide disc.

[5] Remove the rotary knife.

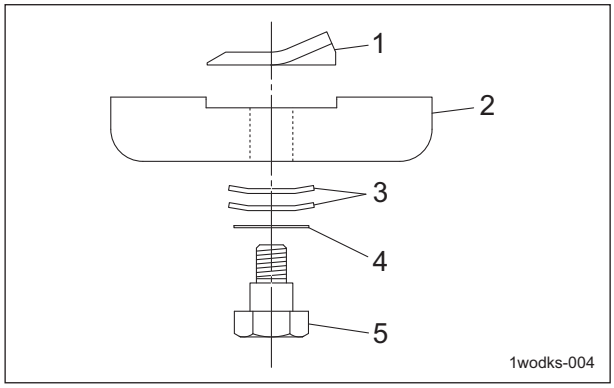


Contour Deck_004

1	Square pipe
2	Rotary knife
3	Knife guide disc
4	Disc spring
5	Washer
6	Knife mounting bolt
7	Offset wrench

Caution

The disc spring has a specific installation orientation.
Do not install it facing the wrong direction.



Contour Deck_005

1	Rotary knife
2	Knife guide disc
3	Disc spring
4	Washer
5	Knife mounting bolt

Important

The tightening torque for the knife mounting bolt is 130 - 150 N-m (1,325.61 - 1,529.55 kgf-cm).

4. Install the rotary knife.
   For installing the rotary knife, reverse the removing procedure.

Grinding of Rotary Knife

Danger

The rotary knife is an edged tool.
Take extra care in handling since they could cut your hands or legs.

Danger

If the rotary knife becomes worn or damaged, a crack or tear between the sail and flat part will result.
Take extra care since a broken piece of the rotary knife may fly off while it is rotating.

Warning

Using an imbalanced rotary knife may cause vibrations, resulting in damage to the machine.

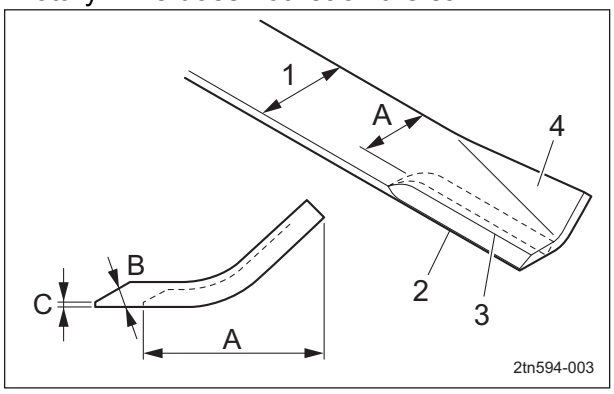
Caution

When grinding the rotary knife, be sure to wear safety glasses and gloves.

When the edge of the rotary knife becomes rounded and no longer cuts well, sharpen the worn cutting edge with a grinder or sander.
If the edge of the rotary knife becomes chipped or thin, replace it with a new one.
The criteria for grinding the rotary knife is described below.

1. When, after grinding, the width of the rotary knife to the blade edge is 2/3 or more of the total width of a new knife

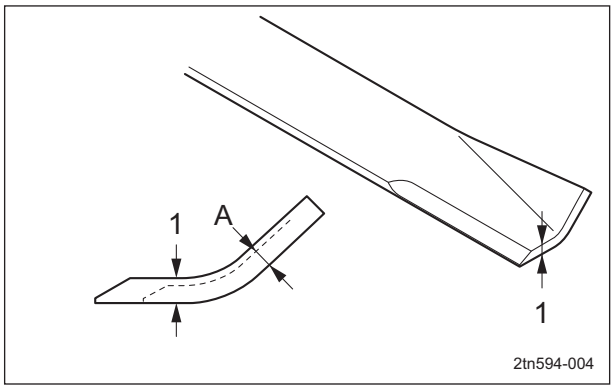
2. When, after grinding, the blade base of the rotary knife does not reach the sail



Grinding of Rotary Knife_001

1	Total width
2	Blade edge
3	Blade base
4	Sail
A	2/3 or more
B	30 - 40°
C	0.5 - 1.0 mm

3. When the thinnest part of the rotary knife has a thickness of 1/3 or more of the thickness of a new knife



Grinding of Rotary Knife_002

1	Thickness
A	1/3 or more

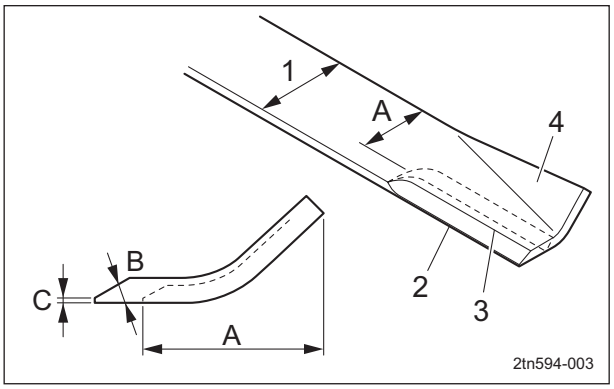
Follow the steps below to grind the rotary knife.

1. Remove the rotary knife from the machine. (See "Contour Deck" (Page 5-9) .)

Important

Grind only the top surface of the edge, and be sure to maintain the original angle.
By equally grinding the left and right ends of the rotary knife, it can be sharpened without becoming imbalanced.

2. Grind the cutting edge of the rotary knife with a grinder.
   Grind so that the edge angle is 30 - 40 degrees, the point thickness is 0.5 - 1.0 mm, and the blade base does not reach the sail.



Grinding of Rotary Knife_003

1	Total width
2	Blade edge
3	Blade base
4	Sail
A	2/3 or more
B	30 - 40°
C	0.5 - 1.0 mm

3. Balance the rotary knife. (See "Balancing of Rotary Knife" (Page 5-12) .)
4. If it is not balanced, repeat steps 2. - 3.

Balancing of Rotary Knife

Danger

The rotary knife is an edged tool.
Take extra care in handling since they could cut your hands or legs.

Danger

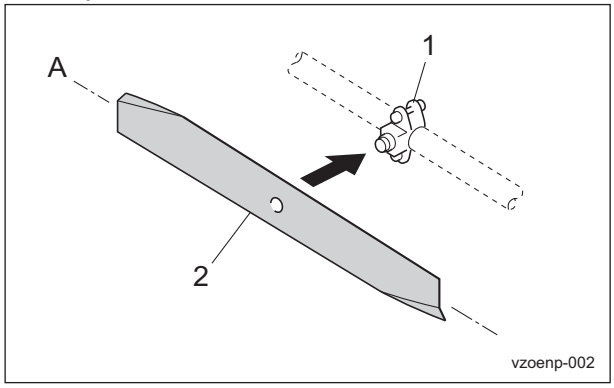
Using an imbalanced rotary knife may cause vibrations, resulting in damage to the machine.

Caution

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

When the rotary knife is worn asymmetrically, causing vibrations, or when it becomes dull or worn, remove the rotary knife from the machine and balance it.
Follow the steps below to balance the rotary knife.

1. Remove the rotary knife from the machine. （See "Contour Deck" (Page 5-9) .)
2. Install the balancer equipment in an appropriate location.
3. Fit the hole at the center of the rotary knife onto the balancer equipment, and then balance the left and right ends so that the rotary knife is level.



Balancing of Rotary Knife_001

1	Balancer equipment
2	Rotary knife
A	Level

Adjustment of Belt Tension

Caution

Be sure to stop the engine before adjusting the belts.

Important

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

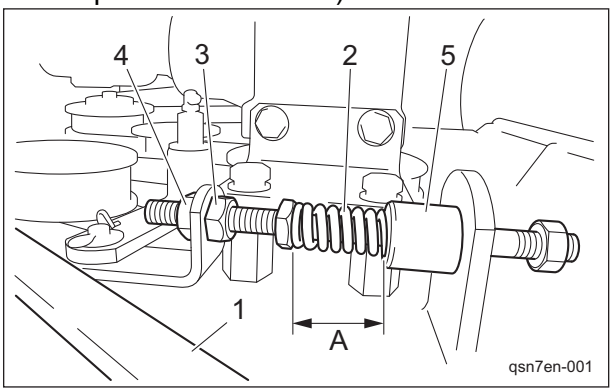
If the belt becomes slack due to frequent use, it may jump or slip.
In addition, if it is overtightened, it may wear prematurely.
If necessary, adjust it, and always check the belt for appropriate tension.

Center Deck Belt

Caution

Be sure to stop the engine before adjusting the belts.

1. Press the middle of the belt with your finger to check the belt tension.
2. If the belt is too slack, adjust it by tightening the nut so that the length of the tension spring extends 35.0 mm from the end of the spring guide. (Total length of spring compresses to 5.0 mm)



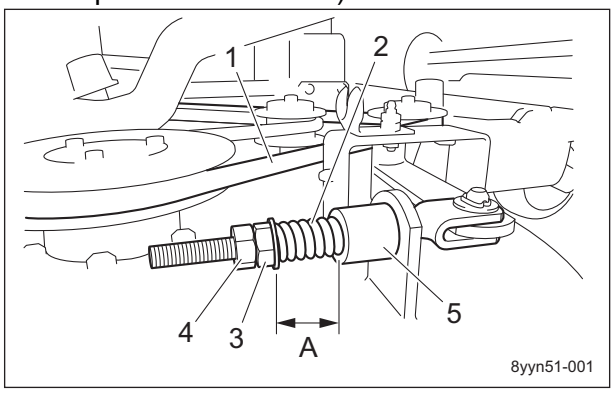
Center Deck Belt_001

1	Belt
2	Tension spring
3	Nut
4	Lock nut
5	Spring guide
A	35.0 mm

Left and Right Deck Belts

> **Caution**
> Be sure to stop the engine before adjusting the belts.

1. Remove the belt cover.
2. Press the middle of the belt with your finger to check the belt tension.
3. If the belt is too slack, adjust it by tightening the nut so that the length of the tension spring extends 35.0 mm from the end of the spring guide. (Total length of spring compresses to 5.0 mm)



Left and Right Deck Belts_001

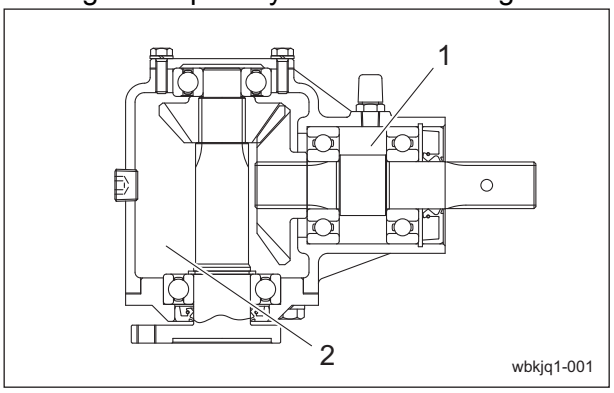
1	Belt
2	Tension spring
3	Nut
4	Lock nut
5	Spring guide
A	35.0 mm

4. Install the belt cover.

Replacement of Gearbox Grease

> **Important**
> Use Pyronoc CC 0 for the grease.

1. Disassemble the gearbox once a year and replace the gearbox grease.
   The grease quantity is a total of 260 g.



Replacement of Gearbox Grease_001

1	20 g Pyronoc CC 0
2	240 g Pyronoc CC 0

Adjustment of Stoppers

The rubber stoppers may wear or deteriorate due to frequent use and may no longer perform as expected.
If necessary, adjust the stoppers.

Swing Stoppers

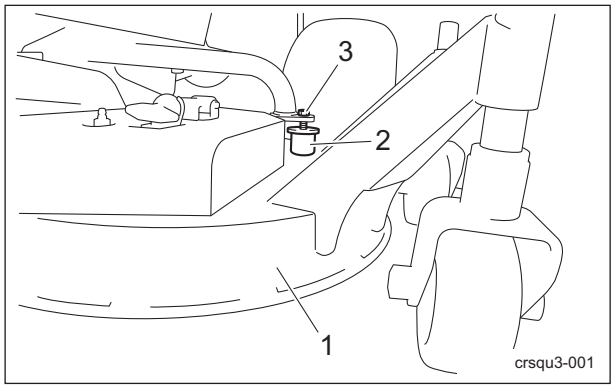
The swing stoppers fulfill the role of suppressing swing when the mower unit is raised while keeping the deck horizontal by lever action.
There are two installed, one each on the left and the right.

1. Temporarily tighten the rubber stopper in the direction away from the deck.
2. Raise the mower unit.
3. Make sure that the right and left decks are equally raised.
   Note:
   If the decks are not equally raised, adjust the installation position of the link fulcrum shafts.

Important

Adjust the rubber stoppers on the left and right decks so that they make contact equally and so that the left and right decks are level.

4. Adjust the contact for the rubber stoppers, and then lock them with the nuts.



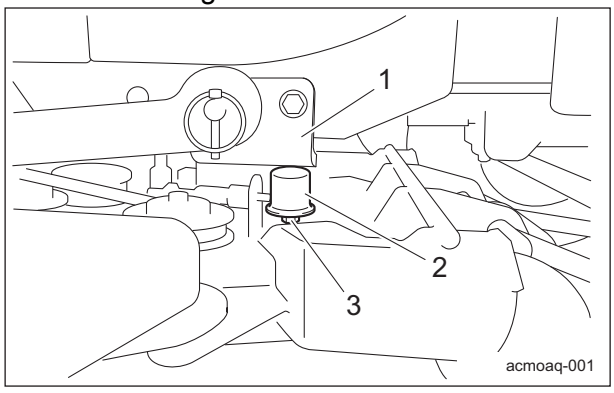
Swing Stoppers_001

1	Mower unit
2	Rubber stopper
3	Nut

Lift Stoppers

The lift stoppers fulfill the role of preventing interference between the mower unit and the frame.
There are three installed.

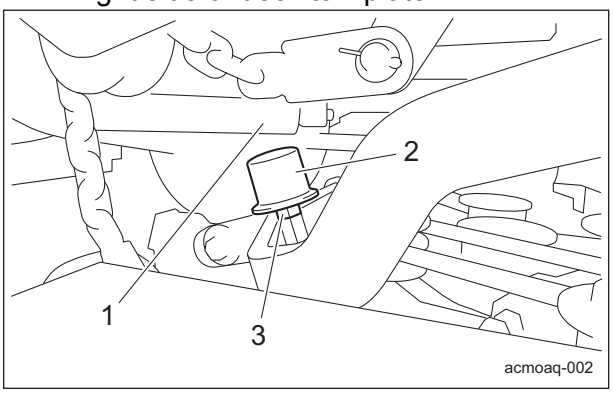
1. Raise the mower unit.
2. Make sure that all decks of the mower unit are raised horizontally.
3. Adjust the rubber stoppers so that they slightly come into contact with the frame, and then lock them with the nuts.
   - Left and right sides of front of center deck



Lift Stoppers_001

1	Frame (link fulcrum shaft)
2	Rubber stopper
3	Nut

   - Right side of deck tow plate



Lift Stoppers_002

1	Frame
2	Rubber stopper
3	Nut

Long-Term Storage

Before Long-Term Storage

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

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