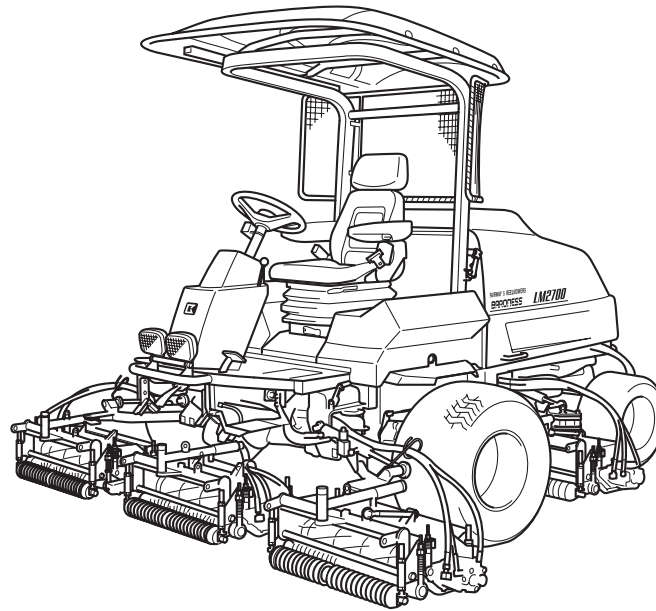


LM2700

5-Unit Reel Mower

Owner's Operating Manual



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

BARONNESS[®]
Quality on Demand

Serial No. LM2700 : 11208-

Original Instructions Ver.3.5

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Greeting

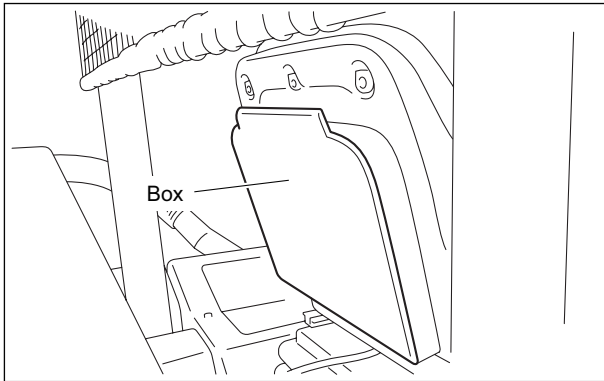
Thank you for purchasing the Baroness product.

This manual describes the proper handling, adjustment, and inspection of your product.

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

Keeping the owner's operating manual

Keep this Manual in the box located in the rear of the seat.



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 should only be performed by a certified specialist.

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






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

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

Kyoisha Co., Ltd.

Warning Symbols

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

	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.
	This symbol indicates that serious injury or death will occur if the warning is ignored.
	This symbol indicates that serious injury or death may occur if the warning is ignored.
	This symbol indicates that injury or damage to property may occur if the warning is ignored.
	This symbol indicates precautions on the mechanism of the machine.

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 Kyoehisha.

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
- The Engine's Owner's Manual
- The Battery's Owner's Manual

Purpose

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

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

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

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

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

Training

1. Read this manual and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
2. If the operator or mechanic can not read English it is the owner's responsibility to explain this 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 children or people unfamiliar with these instructions to use or service the machine. Local regulations may restrict the age of the operator.
5. The owner/user can prevent and is responsible for accidents or injuries occurring to

themselves, other people, or property.

6. Keep in mind that the owner, operator, and mechanic are responsible for accidents or hazards occurring to other people or their property.
7. The ROPS is an integral and effective safety device. Do not remove or alter the ROPS.
8. Replace a damaged ROPS. Do not repair or alter.
9. You can find additional safety information where needed throughout this manual.
10. Determine the left and right sides of the machine from the normal operating position.

Preparation

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

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.
6. Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.
 7. 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.
 8. Replace faulty mufflers.
 9. On multi-cylinder/multi-reel machines, take care as rotating one cylinder/reel can cause other cylinders/reels 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 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. Use extra care while operating machine with a grass catcher or other attachments. They can affect the stability of the machine.
6. Never operate the machine with damaged guards, shields, or without safety protective devices in place.
Be sure all interlocks are attached, adjusted properly, and functioning properly.
7. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
8. 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.
9. Disengage the drive to attachments, stop the engine, and remove the ignition key in the following conditions.
 - [1] Before refuelling.
 - [2] Before removing the grass catcher.
 - [3] Before making height adjustment unless adjustment can be made from the operator's position.
 - [4] Before clearing blockages.
 - [5] Before checking, cleaning or working on 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.
10. Keep hands and feet away from the cutting units and the rotating parts.
11. Do not mow in reverse unless absolutely necessary.
Always look down and behind before and while backing.
12. Do not carry passengers.
13. Never operate while people, especially children, or pets are nearby.
14. Slow down and use caution when making turns and crossing roads and sidewalks.
15. Stop the blades rotating before crossing surfaces other than grass.
16. Disengage drive to attachments when transporting or not in use.
17. When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
18. Do not operate the machine under the influence of alcohol or drugs.
19. 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.
20. Close the fuel valve before transporting the machine.
21. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
22. Do not take your eyes off the road ahead. Do not operate the machine with no hands.
23. 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.
24. Do not operate the machine when there is the risk of lightning.

Maintenance and Storage

1. Disengage drives on level ground, lower the attachments, set parking brake, stop engine and remove key from ignition. Wait for all movement to stop before adjusting, cleaning or repairing.
2. When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.
3. To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting 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, resulting in an injury.
If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.
17. Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
18. Make sure that parts such as wires are not touching each other and that their covers have not come off.
19. Use care when checking the cylinders/reels and bed knives.
 - [1] Wear gloves and use caution when servicing them.
 - [2] Be careful during adjustment of the machine to prevent entrapment of the fingers

between moving blades and fixed parts of the machine.

20. On multi-cylinder/multi-reel machines, take care as rotating one cylinder/reel can cause other cylinders/reels to rotate.
21. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
22. Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
23. Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
24. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
25. Check the grass catcher frequently for wear or deterioration
26. If the fuel tank has to be drained, do this outdoors.
27. Swallowing engine coolant can cause injury or death; keep out of reach from children and pets.

Disposal

Recycle and Waste Disposal

About Recycle

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

It may be required by local laws.

About The Waste Disposal

Make sure that waste generated when servicing or repairing the machine is disposed of in accordance with local regulations.

(e.g. waste oil, antifreeze, rubber products, and wires etc.)

Product Overview

1. Specifications

■ Specifications

Model		LM2700				
Mower unit type		26in	22in			
Dimensions	Total length		118.11in	300cm	←	
	Total width	During operation	124.41in	316cm	115.35in	293cm
		During transport	89.76in	228cm	←	
	Total height	Roof	86.61in	220cm	←	
		Roof bar	80.31in	204cm	←	
Steering wheel		59.06in	150cm	←		
Weight	Machine (empty fuel tank) with ROPS	3,977.07lb	1,804kg	3,877.87lb	1,759kg	
		Minimum turning radius				110.24in
Engine	Model		Kubota V2203-M		←	
	Type		Vertical water-cooled 4-cycle diesel engine		←	
	Total displacement		134.05cu.in.	2,197cm ³ (2.197L)	←	
	Maximum output		33.0kW (44.9PS) /2,600rpm		←	
Fuel tank capacity		Diesel 12.42 U.S.gals	Diesel 47.0dm ³ (47.0L)	←		
Fuel consumption		184 g/PS · h (rated output)	250 g/kW · h (rated output)	←		
Engine oil capacity		2.56U.S.gals	9.7dm ³ (9.7 L)	←		
Coolant volume		3.17 U.S.gals	12.0 dm ³ (12.0 L)	←		
Hydraulic tank capacity		11.36 U.S.gals	43.0 dm ³ (43.0 L)	←		
Operating width (Mowing width)		109.06in	277cm	100.00in	254cm	
Operating height (Mowing height)		0.315-1.772in(*1)	8 - 45mm(*1)	←		
Blades		9		←		
Drive	Traveling		HST (2WD/4WD selectable)		←	
	Mowing		Hydraulic		←	
Speed(HST)	Forward	2WD: 0 - 13.67 mph	2WD:0 - 22.0km/h	←		
		4WD: 0 - 8.70 mph	4WD: 0 - 14.0km/h	←		
	Reverse	0 - 4.97mph	0 - 8.0km/h	←		
Speed (Mechanical)		-		←		
Efficiency		7.6acres/hour (8.70 mph x mowing width x 0.8)	31,024m ² /h (14.0 km/h x mowing width x 0.8)	7.0 acres/hour (8.70 mph x mowing width x 0.8)	28,448m ² /h (14.0 km/h x mowing width x 0.8)	
Maximum inclination for operation		15 degrees		←		
Tire size	Front wheel		26.5×14.00 - 12		←	
	Rear wheel		20×12.00 - 10		←	
Tire pneumatic pressure	Front wheel		21.75psi	150kPa (1.5 kgf/cm ²)	←	
	Rear wheel		20.30psi	140kPa (1.4 kgf/cm ²)	←	
Battery		105D31R		←		
Engine plug		-		←		

Maximum engine rpm is set up 2,600 rpm before shipment.

(*1) For 0.394 in (10 mm) or less mowing height, the optional bedknife is required

■ Sound Pressure Level

This machine was confirmed to have a continuous A-weighted sound pressure level of 88dB by measuring identical machines in accordance with the procedure specified in ISO 5395-1:2013.

■ Sound Power Level

This machine was confirmed to have a sound power level of 103dB by measuring identical machines in accordance with the procedure specified in ISO 5395-1:2013.

■ Vibration Level

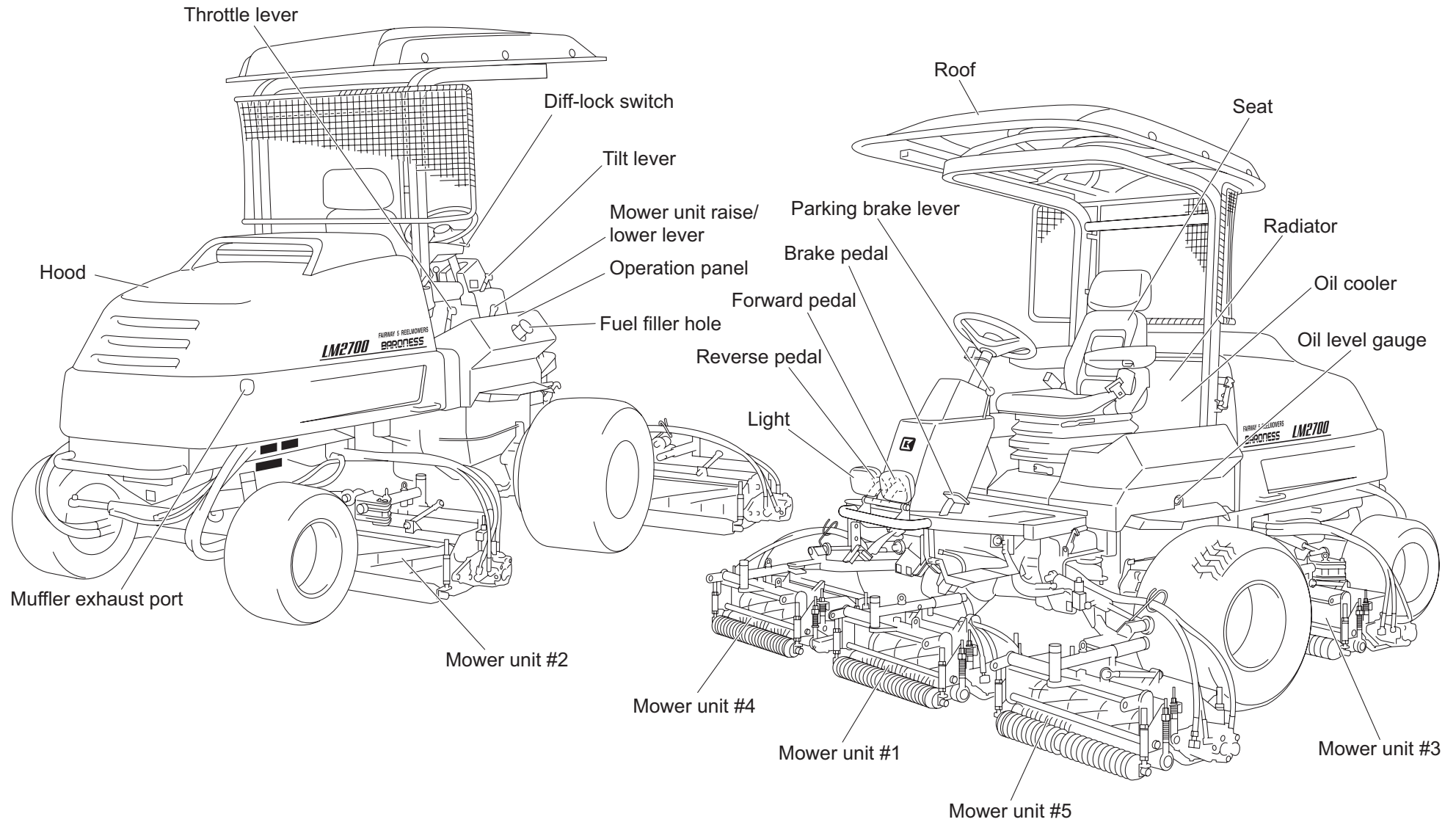
Hand-Arm Vibration

This machine was confirmed not to exceed a vibration level of 2.5 m/s² to hands and arms by measuring identical machines in accordance with the procedure specified in ISO 5349-1:2001, 5349-2:2001.

Whole Body

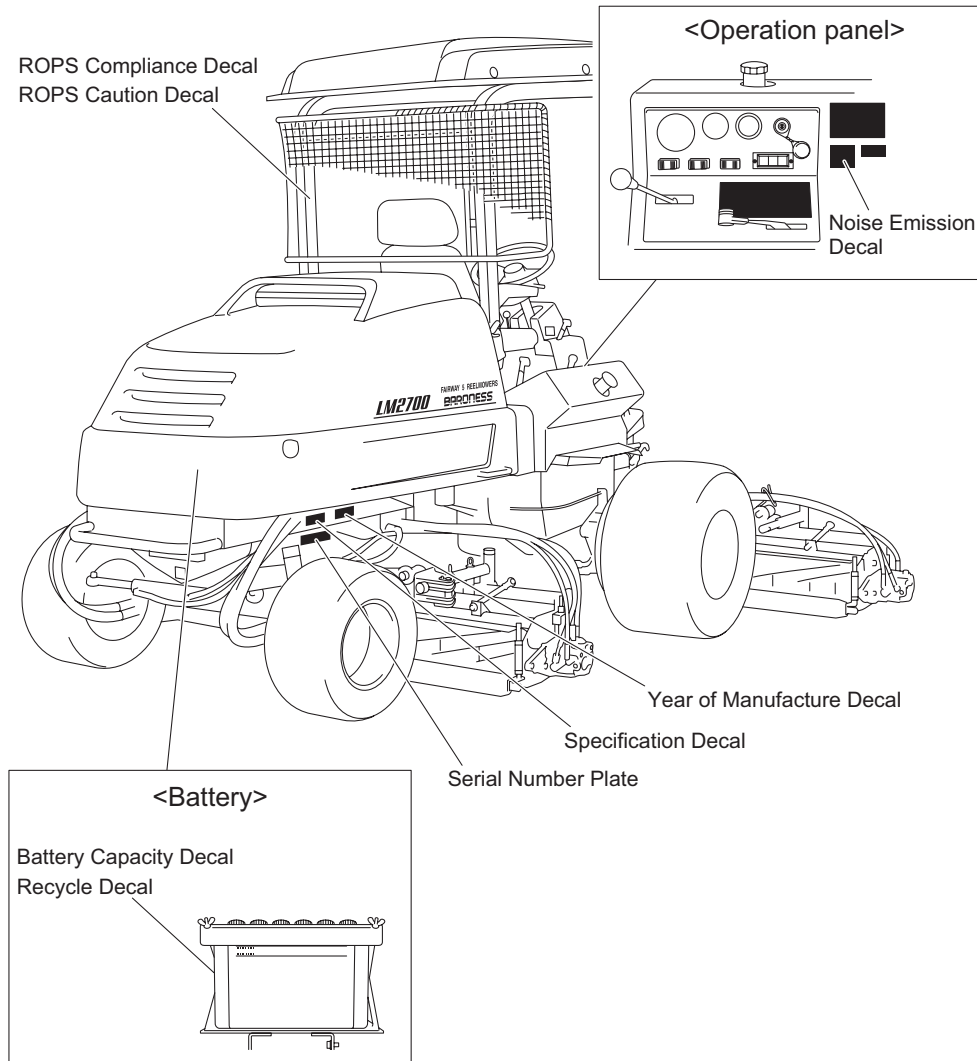
This machine was confirmed to transmit a vibration level of 0.52 m/s² to the whole body by measuring identical machines in accordance with the procedure specified in ISO 2631-1:1997, 2631-2:2003

2. Names of Each Section



3. Regulation Decals

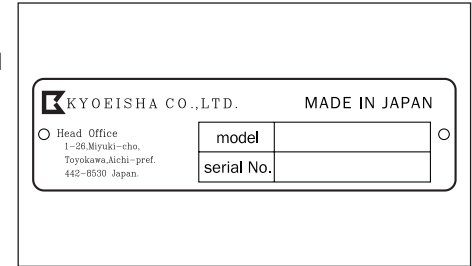
3-1. Positions of Regulation Decals



3-2. Description of Regulation Decals

■ Serial number plate

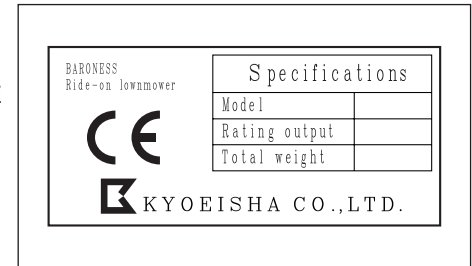
The serial number plate indicates the model and serial number of the machine.



■ Specification Decal

(For Europe)

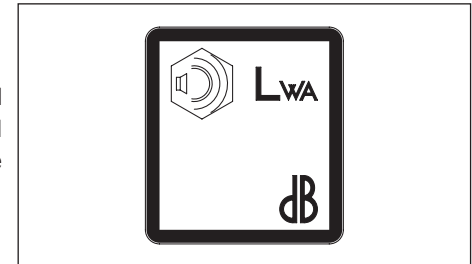
The Specification decal indicates the CE marking, model, and weight, etc.



■ Noise Emission Decal

(For Europe)

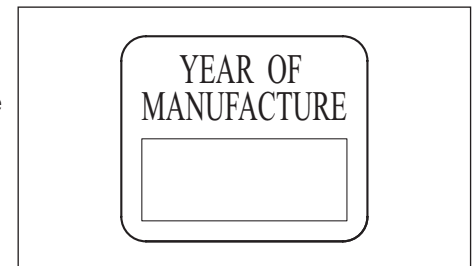
The noise emission decal indicates the sound power level determined by measuring identical machines in accordance with the procedure specified in the EC directives.



■ Year of Manufacture Decal

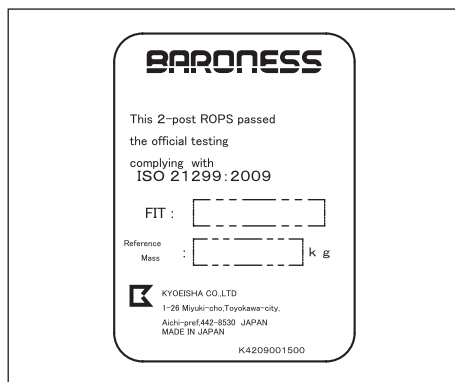
(For Europe)

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



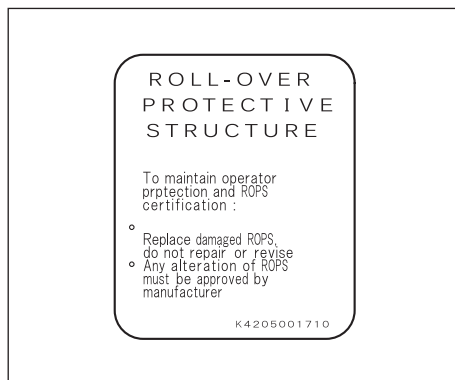
■ ROPS Compliance Decal

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



■ ROPS Caution Decal

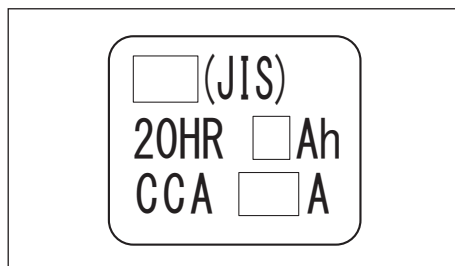
ROPS caution decal describes the following caution messages.
Replace damaged ROPS.
Do not repair or revise.



■ Battery Capacity Decal

(For Europe)

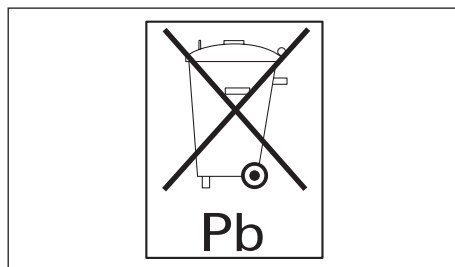
The battery capacity decal indicates the capacity by 20HR and CCA.



■ Recycle Decal

(For Europe)

Recycle Decal illustrates Recycle Mark in accordance with local regulation.



4. Safety Signs and Instruction Signs

4-1. About Safety Signs and Instruction Signs

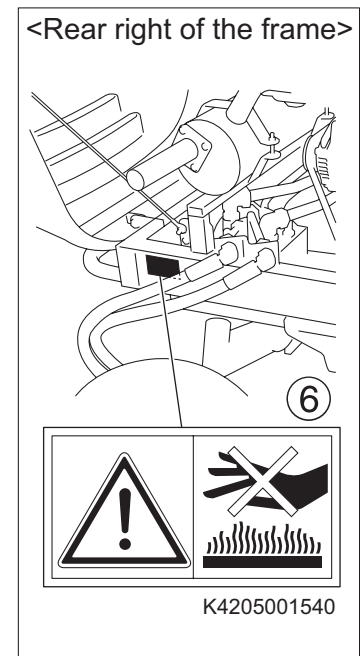
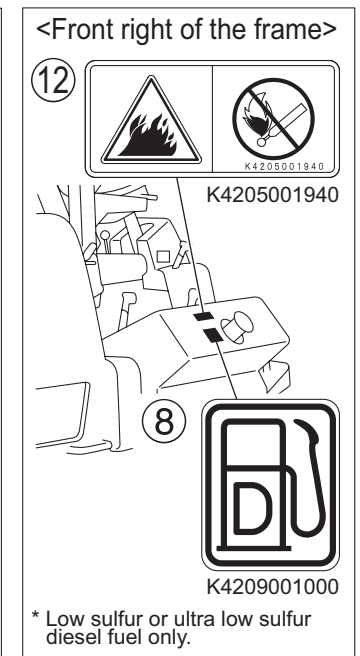
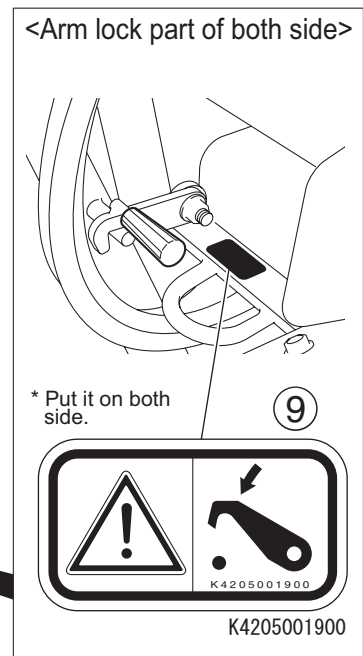
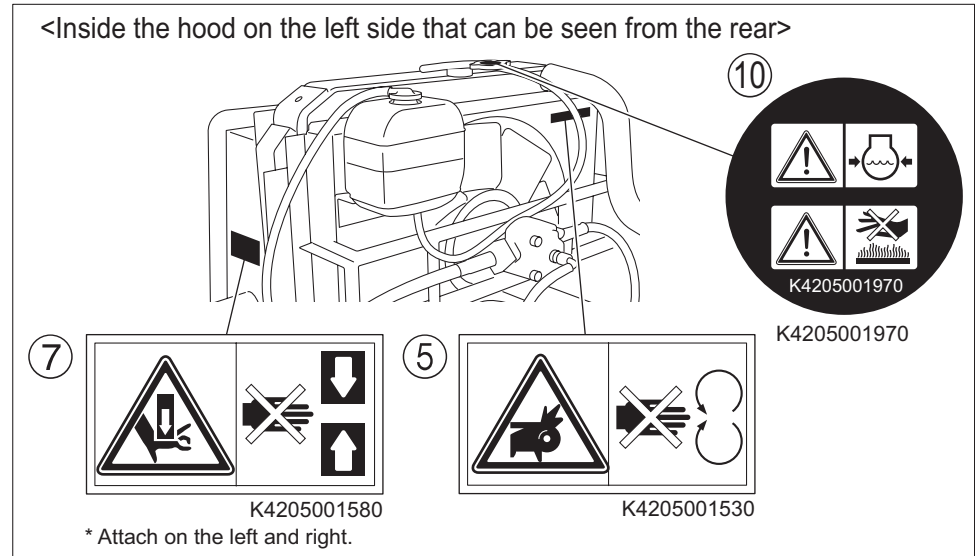
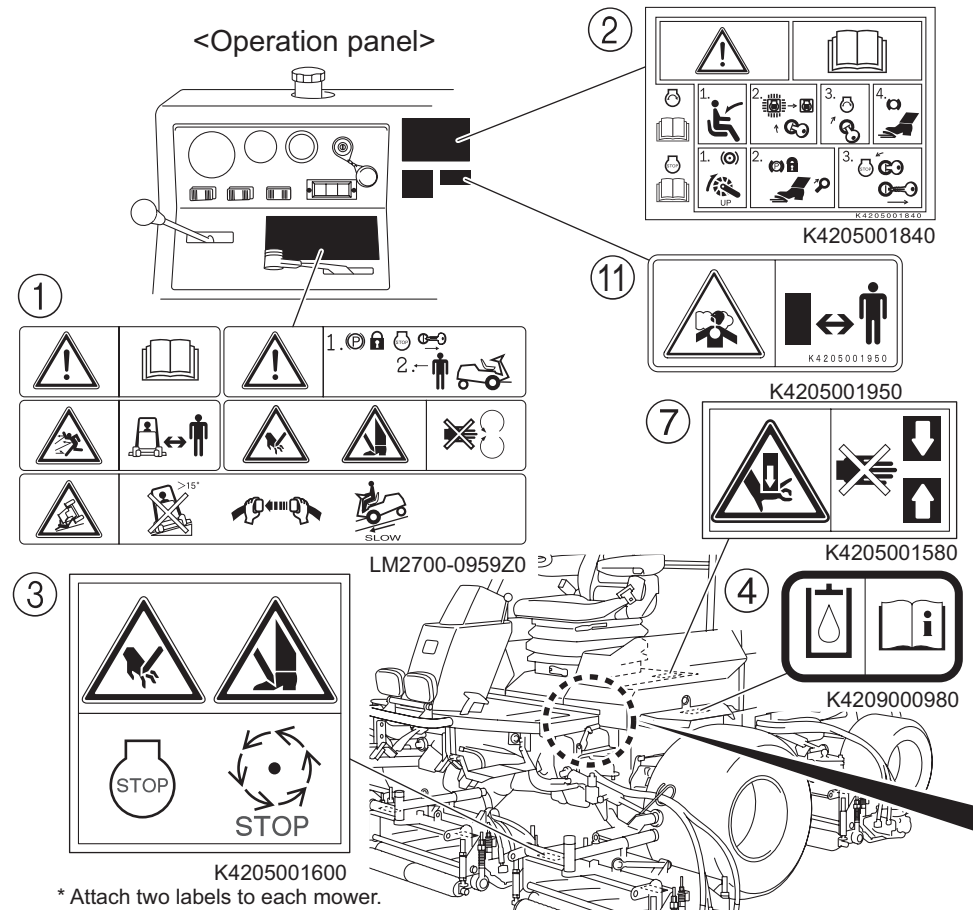
Important

Safety decals and instruction decals are attached to this product.

Make sure that they are preserved in their entirety. If they are damaged, become dirty, or peel off, replace them with new ones.

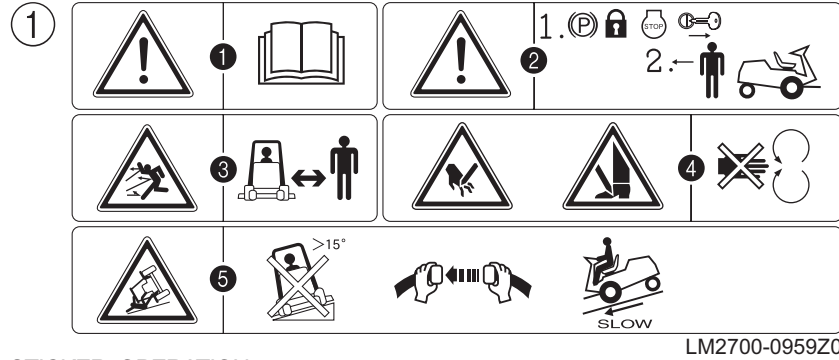
Part numbers for decals that need to be replaced are listed in the parts catalog. Order them from a Baroness dealer or Kyo-eisha.

4-2. Positions of Safety Decals and Instruction Decals



4-3. Description of Safety Decals and Instruction Decals

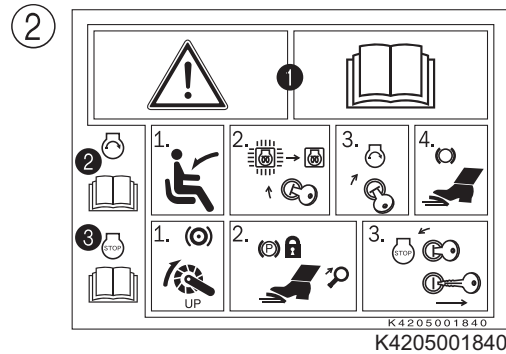
Attach the warning labels and operation labels in the locations that are close to dangerous parts and in which the labels can be easily seen.
If a label is damaged or peels off, attach a new label to the machine.



LM2700-0959Z0

STICKER, OPERATION

- ① **Warning** : Read the Operator's manual.
- ② **Warning** : Leave the machine after setting the parking brake, turning the engine off, and removing the engine key.
- ③ **Caution** : Flying objects - Be sure that people around the machine keep a safe distance away.
- ④ **Warning** : Cutting hands or feet - Do not put near moving parts.
- ⑤ **Caution** : Overturning - Do not operate the machine on a slop of 15 degrees or more to avoid overturning.
When going down a slope, fasten the seat belt and operate the machine at slow speeds.



K4205001840

DECAL, REEL START/STOP

- ① **Warning** : Read the Operator's manual
- ② Engine starting-up procedure (please read the Operator's manual.)
 - ① Take a seat.
 - ② Turn the key to the "Glow" position, and wait until the "thermo-start" lamp goes out.
 - ③ Turn to the "START" position.
 - ④ Step on the brake pedal and release the parking braking.
- ③ : Engine stop procedure
 - ① Turn off the reel rotation switch and raise the mower.
 - ② Apply parking brake system.
 - ③ Turn the key to the "STOP" position and remove it.

- ③ **DECAL, CAUTION CUTTING HANDS/FEET**
Warning : Cutting hands or feet
If you do not stop rotating the reel and the engine is not turned off, you may get injured.
K4205001600
- ④ **DECAL, HYDRAULIC OIL**
Read the Operator's manual.
K4209000980
- ⑤ **DECAL, CAUTION ROTATING OBJECT**
Caution : Cutting of Hand
Placing your hand near the fan and the belt while the engine is running might result in injury.
K4205001530
- ⑥ **DECAL, CAUTION HOT PARTS**
Caution : Hot surface
Do not touch. It can cause burns.
K4205001540
- ⑦ **DECAL, CAUTION GETTING CAUGHT HANDS/FEET**
Caution : Pinch
You can get pinched.
K4205001580
- ⑧ **DECAL, DIESEL FUEL REFUELING HOLE**
(diesel fuel only)
Low sulfur or ultra low sulfur diesel fuel only.
K4209001000
- ⑨ **DECAL, CAUTION MOWER LOCK**
Lock the mower units when traveling or storing with the mower units #4 and 5 raised.
K4205001900
- ⑩ **DECAL, CAUTION SPOUTING COOLANT**
Caution : Caution for spouting coolant - Do not open while hot.
High temperature - Do not touch. Otherwise, you will get burned.
K4205001970
- ⑪ **DECAL, CAUTION EXHAUST GAS**
Warning : Caution for exhaust gas.
K4205001950
- ⑫ **DECAL, DANGER "NO FIRE"**
Warning : Keep away from fire.
K4205001940

Handling Instructions

5. Inspections

Be sure to perform an inspection according to the maintenance schedule so that you will be able to take advantage of its optimum performance for a long period of time.

5-1. Inspection of Reel Cutter and Bed Knife

The reel cutter (cutting cylinder) and bed knife (bottom blade) may become dull due to frequent use, objects crushed during mowing, or damage caused during transportation.

Inspect the reel cutter (cutting cylinder) and bed knife (bottom blade), and if necessary, adjust the blade engagement, perform back lapping, or resharpen or replace the reel cutter (cutting cylinder) and the bed knife (bottom blade).

- 1) Check to see whether or not the edge of the reel cutter (cutting cylinder) and the bed knife (bottom blade) are too blunt to cut.
- 2) Make sure that the reel cutter (cutting cylinder) and the bed knife (bottom blade) are not cracked.
- 3) Check to see how much the reel cutter (cutting cylinder) and the bed knife (bottom blade) are worn.
- 4) Make sure that the reel cutter (cutting cylinder) and the bed knife (bottom blade) have not changed color due to heat from grinding.
- 5) Check to see whether or not the second edge face (relief) remains at the point of reel cutter (cutting cylinder).
- 6) Make sure that the welding between the reel cutter (cutting cylinder) and the disc has not come off.

5-2. Inspection of Covers



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

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

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

5-3. Inspection of Rollers

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

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

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

5-4. Inspection of Groomer

Note:

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

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

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

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

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

5-5. Inspection of CR Brush

Note:

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

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

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

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

5-6. Inspection of Scraper

Inspection of Front Scraper

Note:

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

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

Inspect the scraper, and replace any parts if necessary.

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

Inspection of Rear Scraper (Rod Type)

Note:

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

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

Inspect the scraper, and replace any parts if necessary.

- 1) Make sure that there is no damage to or deformation of the scraper.
- 2) Make sure that there is no adhesion on the scraper mount.

Inspection of Rear Scraper (Wire Type)

Note:

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

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

Inspect the scraper, and replace any parts if necessary.

- 1) Make sure that there are no breaks nor sagging in the scraper (wire).
- 2) Make sure that there is no contact between the scraper and roller.

5-7. Inspection and Cleaning of Radiator and Oil Cooler

- 1) Make sure that there is no damage to the radiator.
- 2) Make sure that the radiator is not contaminated.
- 3) Make sure that there is no damage to the oil cooler.
- 4) Make sure that the oil cooler is not contaminated.

Important

An unclean radiator may cause overheating or damage to the engine.

It may also cause malfunction of the hydraulic system.

Important

Do not use solid objects, such as a spatula or screwdriver, or high-pressure water to clean the radiator or oil cooler.

Otherwise, special fins or tubes may be damaged, possibly resulting in reduced cooling performance or coolant leakage.

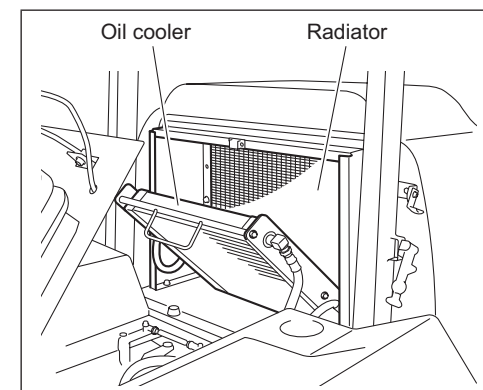
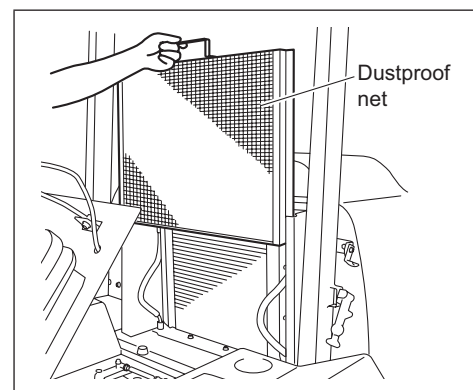
If the radiator, oil cooler and dust-proof mesh have been contaminated with dust, be sure to clean it.

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

[1] Lift up the dust-proof mesh to remove it.

[2] Unlock the rubber catches on the left of the oil cooler, and then tilt the oil cooler.

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



5-8. Inspection and Supply of Coolant

Caution

Do not touch the radiator or coolant during engine operation or immediately after the engine has been turned off.

Caution

Supply coolant after the engine has well cooled down.

Caution

The radiator cap is pressurized.
If you remove the radiator cap while the engine is overheated, hot steam will burst out, possibly resulting in burns.
Make sure that the water temperature and pressure are reduced, and then grab the cap with a thick cloth and gradually open the cap.

Important

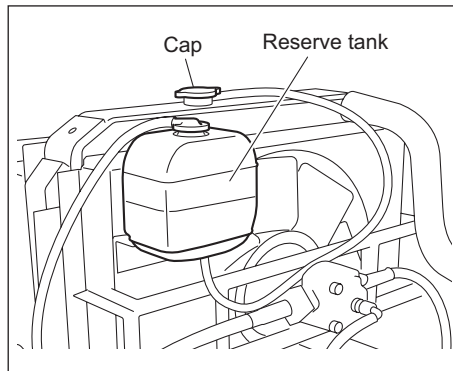
When you supply coolant, be sure to use clean water, such as tap water.

Important

Tightly close the radiator cap.
If the cap is loose or incorrectly installed, water will leak and the engine will be damaged due to overheat.

Make sure that the coolant level in the reserve tank is between "FULL" and "LOW".
If the coolant level in the reserve tank is lower than the "LOW" mark, open the reserve tank cap and fill the tank with clean water up to the "FULL" mark.

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



5-9. Inspection and Supply of Hydraulic Oil

The oil gauge is on the hydraulic tank.
Check with the mower units lowered on a level surface.

- 1) Make sure that the oil level is at the middle of the oil gauge.
- 2) Check underneath the machine for oil leakage.

Important

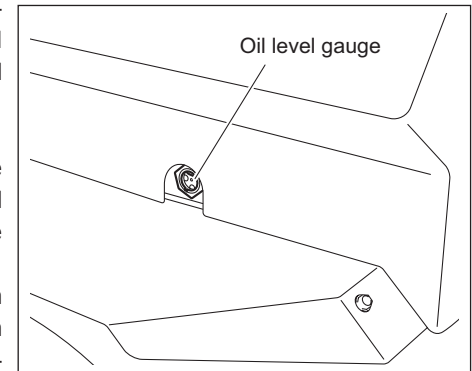
Do not mix different types of oil.

Important

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

If the hydraulic oil level is low, follow the steps below to supply oil.

- [1] Remove the left tank cover.
- [2] Open the tank cap, and then supply hydraulic oil through the oil filling port until the oil level reaches the middle of the oil gauge on the hydraulic tank.
- [3] Tighten the tank cap securely.
- [4] Start the engine, raise and lower the mower units, and turn the steering wheel right and left. Move forward and reverse repeatedly several times.
- [5] Lower the mower units and maintain that position on a level surface, and then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.
- [6] Check underneath the machine for hydraulic oil leakage.
- [7] Install the left tank cover.



5-10. Inspection and Cleaning of Air Cleaner

Inspect the air cleaner by checking the vacuum indicator.

If the air cleaner element is contaminated, the vacuum indicator will display a red ring.

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

A contaminated air cleaner element may cause malfunction of the engine.

To maximize the life of the engine, clean the air cleaner properly.

[1] Remove the clips, remove the air cleaner cap, and then remove the air cleaner element.

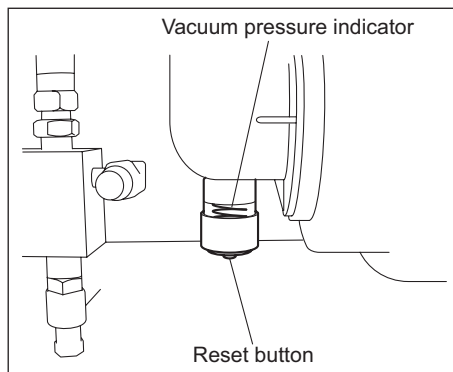
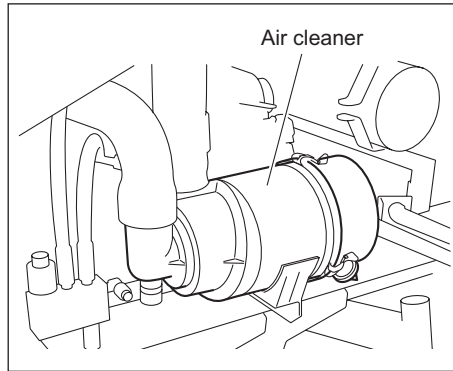
[2] While paying close attention not to damage the air cleaner element, tap a solid portion of the air cleaner element or blow compressed air from its inside to remove dust and dirt.

If the air cleaner element is extremely contaminated, replace it with a new one

[3] Attach the air cleaner element to the air cleaner body.

[4] Re-place the air cleaner cap, and then af-
fix it securely using the clips.

[5] Press the reset button for the vacuum in-
dicator.



Important

The inner element cannot be cleaned.

3) Replace the inner element every year.

Also replace it whenever it has become damaged or dirty.

5-11. Inspection of Battery and Supply of Battery Fluid

! Danger

- When removing the battery, remove the negative (-) cable first, and positive (+) cable last. Install the battery, assemble the positive (+) cable first and negative (-) cable last.
- When you connect the battery cables, connect the positive and negative side correctly. When you mistake, the battery and the electrical equipment may be damaged. (The red-color cable is the positive side.)
- If a dry cloth is used to clean the battery, the static electricity may occur and there is danger of fire or explosion.

! Danger

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

! Danger

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

! Danger

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

! Warning

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

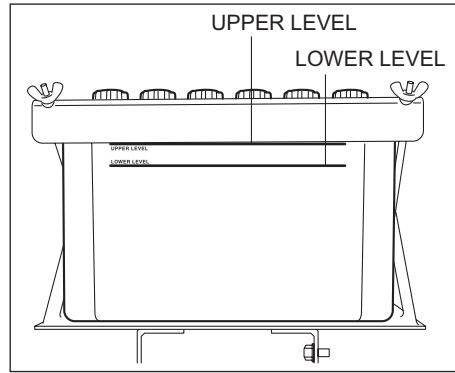
! Caution

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

Before inspection of battery, clean the areas around the battery fluid level lines with a cloth dampened with water.

Make sure that the battery fluid level is between the UPPER LEVEL (maximum fluid level line) and the LOWER LEVEL (minimum fluid level line).

If the battery fluid level is lower than halfway between the UPPER LEVEL (maximum) line and LOWER LEVEL (minimum) line, add purified water up to the UPPER LEVEL (maximum) line.



5-12. Inspection of Tires

Important

When filling the tires with air, do not fill the tires over the specified maximum air pressure. Otherwise, the tires may burst.

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

Tire size	Pneumatic pressure
Front wheel (26.5 x 14.00 - 12)	150kPa (1.5kgf/cm ²)
Rear wheel (20.0 x 12.00 - 10)	140kPa (1.4kgf/cm ²)

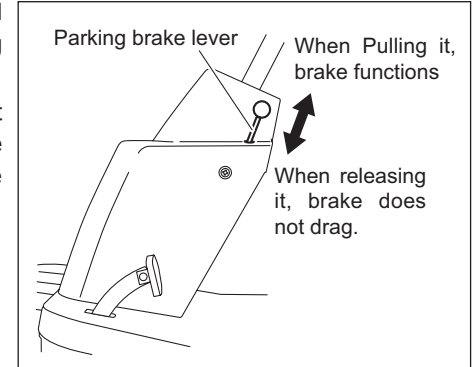
5-13. Inspection of Brake

■ Foot brake

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

■ Parking brake

- 1) Make sure that the parking brake is applied after depressing the brake pedal and pulling the parking brake lever.
- 2) Make sure that the parking brake is not applied even slightly after depressing the brake pedal to release the parking brake lever.



5-14. Inspection of Belt

⚠ Warning

The engine must be stopped when the belt is inspected.

Important

A slacking or damaged belt or damaged fan may cause overheating or lack of a battery charge.

- 1) Press the middle of the belt with your finger to check the belt tension.
- 2) Make sure that there are no cracks, damage or abnormal wear.

5-15. Inspection of Wire

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

5-16. Inspection of The Engine and Its Surroundings

- 1) Check the parts of the fuel system for crack and leakage, and replace with new ones if necessary.
- 2) When the grass, the leaf, etc. have jammed to the muffler and its surroundings, blow out by air.

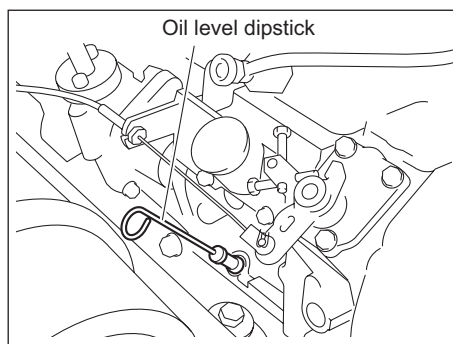
5-17. Inspection and Supply of Engine Oil

Important

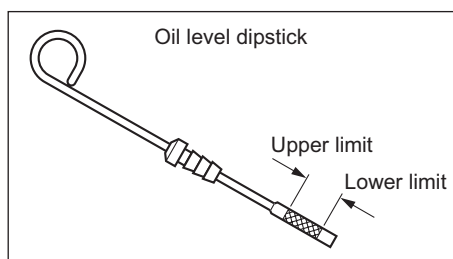
Securely tighten the oil level gauge and oil filler cap.

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

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



The appropriate oil level should be between the upper and lower limit lines on the gauge.



Important

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

Important

Do not mix different types of engine oil.

Important

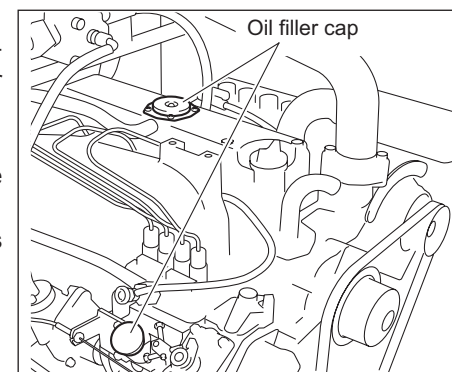
Be sure to use engine oil that is classified as API Service Grade CF or higher, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

Important

Securely tighten the oil level gauge and oil filler cap.

If the engine oil level is lower than the lower limit line on the oil level gauge, supply engine oil through the oil filling port.

- [1] Remove the oil filler cap.
- [2] Supply new engine oil until the oil reaches a level in between the upper and lower limit lines on the oil level gauge.
- [3] Replace the oil filler cap.
- [4] It will take a while for the supplied engine oil to descend into the oil pan. Check the oil level again 10 to 20 minutes after supplying the oil.



5-18. Inspection and Supply of Fuel

Warning

- To prevent a fire, keep the machine clean and free of dust, grease and oil.
- Clean up any spilled fuel.
- Don't oversupply the fuel. It may cause the fire, if the fuel overflow from the fuel tank.

Warning

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

Warning

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

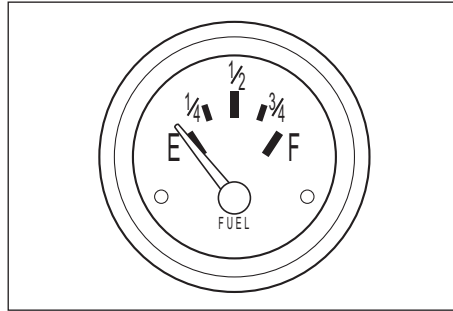
Warning

Supply fuel after the engine is stopped and has well cooled down.

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

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

The fuel tank capacity is approximately 47.0 dm³ (47.0 L).



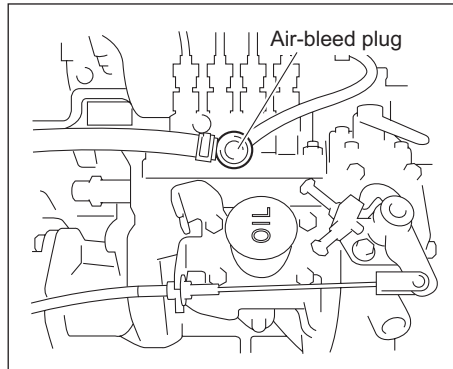
5-19. Air Bleeding of Fuel System

Important

The air-bleed plug should always be in the closed position except during the air bleeding operation.

Using the machine with the air-bleed plug in the open position may cause the engine to stall.

Air bleeding is not a required operation for this machine since it occurs automatically.



5-20. Inspection of Fuel Filter

The fuel filter works to remove foreign objects mixed into the fuel. When the fuel flow becomes insufficient, replace the fuel filter if necessary.

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

5-21. Inspection of Oil Leakage

Caution

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

After approximately 50 hours of operation, some tightened portions may be loosened and oil and grease may leak.

Be sure to retighten the parts.

Check the bottom of the machine for oil and grease leakage.

6. 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.

6-1. Standard Tightening Torques

Important

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

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

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

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

The table below is for the galvanized or parkerized bolts.

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

Do not use rusty or sand attached "screw."

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

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


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



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

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

Do not use a bolt experienced too much burden.

Using the impact wrench requires the skill. Do exercise as much as possible for steady tightening.

Nominal diameter	General bolt		
	Strength classification 4.8		
			
	N-m	kgf-cm	lb-in
M5	3 - 5	30.59 - 50.99	26.55 - 44.26
M6	7 - 9	71.38 - 91.77	61.96 - 79.66
M8	14 - 19	142.76 - 193.74	123.91 - 168.17
M10	29 - 38	295.71 - 387.49	256.68 - 336.34
M12	52 - 67	530.24 - 683.20	460.25 - 593.02
M14	70 - 94	713.79 - 958.52	619.57 - 831.99
M16	88 - 112	897.34 - 1142.06	778.89 - 991.31
M18	116 - 144	1,182.85 - 1,468.37	1,026.72 - 1,274.54
M20	147 - 183	1,498.96 - 1,866.05	1,301.10 - 1,619.73
M22	295	3,008.12	2,611.05
M24	370	3,772.89	3,274.87
M27	550	5,608.35	4,868.05
M30	740	7,545.78	6,549.74

Nominal diameter	Heat-treated bolt					
	Strength classification 8.8			Strength classification 10.9		
						
	N-m	kgf-cm	lb-in	N-m	kgf-cm	lb-in
M5	5 - 7	50.99 - 71.38	44.26 - 61.96	7 - 10	71.38 - 101.97	61.96 - 88.51
M6	8 - 11	81.58 - 112.17	70.81 - 97.36	14 - 18	142.76 - 183.55	123.91 - 159.32
M8	23 - 29	234.53 - 295.71	203.57 - 256.68	28 - 38	285.52 - 387.49	247.83 - 336.34
M10	45 - 57	458.87 - 581.23	398.30 - 504.51	58 - 76	591.43 - 774.97	513.36 - 672.68
M12	67 - 85	683.20 - 866.75	593.02 - 752.34	104 - 134	1,060.49 - 1,366.40	920.50 - 1186.03
M14	106 - 134	1,080.88 - 1,366.40	938.21 - 1,186.03	140 - 188	1,427.58 - 1,917.04	1,239.14 - 1,663.99
M16	152 - 188	1,549.94 - 1,917.04	1,345.35 - 1,663.99	210 - 260	2,141.37 - 2,651.22	1,858.71 - 2,301.26
M18	200 - 240	2,039.40 - 2,447.28	1,770.20 - 2,124.24	280 - 340	2,855.16 - 3,466.98	2,478.28 - 3,009.34
M20	245 - 295	2,498.27 - 3,008.12	2,168.50 - 2,611.05	370 - 450	3,772.89 - 4,588.65	3,274.87 - 3,982.95
M22	-	-	-	530	5,404.41	4,691.03
M24	-	-	-	670	6,831.99	5,930.17
M27	-	-	-	1,000	10,197.00	8,851.00
M30	-	-	-	1,340	14,628.78	11,860.34

6-2. Tightening Torque by Model

LM2700

Tighten the following bolts and nuts at the torque specified in the table.

For thread locking adhesive, apply a middle strength thread locker (ThreeBond 1322 or equivalent anaerobic sealant).

Location		Code	Part name	Tightening torque			Thread locking adhesive
				N-m	kgf-cm	lb-in	
Front wheel	Motor housing	K0014160402	Bolt, heat-treated M16-40P1.5	152 - 188	1549.94 - 1917.04	1345.35 - 1663.99	—
	Motor	K0013140502	Bolt, heat-treated M14-50	100	1019.7	885.1	—
	Wheel mounting base	1•1/4-18UNF	Slotted nut (Hydraulic motor)	400 - 430	4078.80 - 4384.71	3540.40 - 3805.93	—
	Disc brake	K001A080401	Bolt, 13T W/HEX. HOLE, M8-40	28 - 38	285.52 - 387.49	247.83 - 336.34	—
	Wheel	K0014120652	Bolt, heat-treated M12-65P1.5	67 - 85	683.20 - 833.75	593.02 - 752.34	—
	Front axle	K0015200702	Bolt, heat-treated M20-70P1.5	370 - 450	3772.89 - 4588.65	3274.87 - 3982.95	—
Rear wheel	Motor housing	K0138240002	24 slotted nut high P1.5	180 - 200	1835.46 - 2039.40	1593.18 - 1770.20	—
	Motor	K0014120652	Bolt, heat-treated M12-65P1.5	67 - 85	683.20 - 866.75	593.02 - 752.34	—
Brake ass'y		K1720000260 K1720000270	Nult, M12 (accessories)	50 - 70	509.85 - 713.79	442.55 - 619.57	○
Engine area	Engine bracket	K0012120352	Bolt, heat-treated M12-35P1.25	67 - 134	683.20 - 1366.40	593.02 - 1186.03	—
		K0011100302	Bolt, heat-treated M10-30P1.25	45 - 76	458.87 - 774.97	398.30 - 672.68	—
	Engine mount	K0013121102	Bolt, heat-treated M12-110	67 - 134	683.20 - 1366.40	593.02 - 1186.03	—
	Joint	K001A100401	Bolt, 13T W/HEX. HOLE, M10-40	80	815.76	708.08	—
		K0010140302	Bolt, heat-treated M14-30	106 - 188	1080.88 - 1917.04	938.21 - 1663.99	—
		K0010100402	Bolt, heat-treated M10-40	45 - 76	458.87 - 774.97	398.30 - 672.68	—
Terminal relay	K3680000030	Screw, M3.5 (accessories)	0.78 - 1.18	7.95 - 12.03	6.90 - 10.44	—	
Rear wheel	Kingpin stopper	K0010120502	Bolt, heat-treated M12-50	52 - 67	530.24 - 683.20	460.25 - 593.02	—
	Tie rod end	K1610000020	Slotted nut of tie rod end RH	45	458.87	398.3	—
		K1611000020	Slotted nut of tie rod end LH	45	458.87	398.3	—
Piston pump		K0010120502	Bolt, heat-treated M12-50	67 - 134	683.20 - 1366.40	593.02 - 1186.03	—
Mower rotating fitting		K0011100302	Bolt, heat-treated M10-30P1.25	29 - 38	295.71 - 387.49	256.68 - 336.34	—
Pedal stopper		K0010100702	Bolt, heat-treated M10-70	29 - 38	295.71 - 387.49	256.68 - 336.34	—
Gear pump flange (Piston pump)		K001A080601	Bolt, 13T W/HEX. HOLE, M8-60	24.5	249.83	216.85	—
		K001A080251	Bolt, 13T W/HEX. HOLE, M8-25	24.5	249.83	216.85	—
Gear pump flange (Engine)		K001A080251	Bolt, 13T W/HEX. HOLE, M8-25	24.5	249.83	216.85	—
Gear motor flange		K001A060301	Bolt, 13T W/HEX. HOLE, M6-30	10.8	110.13	95.59	—
Diff-lock valve		K001A100151	Bolt, 13T W/HEX. HOLE, M10-15	29 - 38	295.71 - 387.49	256.68 - 336.34	—
Mower unit	Bed knife	K0071001182	Screw, ht flat head M10-16	29 - 38	295.71 - 387.49	256.68 - 336.34	—
	Housing B (#11215-)	K0028080200	Setscrew, SUS M8-20	3	30.59	26.55	—

7. Adjustment Before Operating

7-1. Adjustment of Steering Wheel



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



Be sure the steering wheel position is securely locked. It may result in an unexpected accident if it becomes loose while traveling.

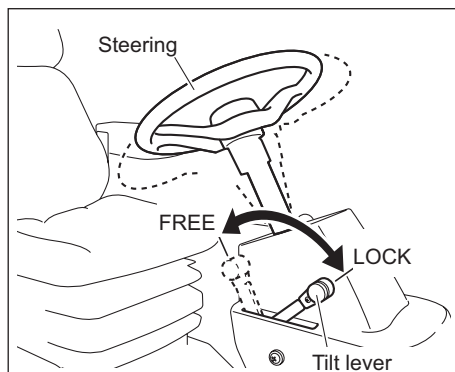
The steering wheel can be adjusted up or down.

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

Shift the tilt lever to the "FREE" position, move the steering wheel to the position that suits your work requirements,

and then shift the tilt lever to the "LOCK" position to secure the steering wheel in place.

The tilt lever is located in the right front of the driver's position.



7-2. Adjustment of Seat

Use the adjustment levers to adjust the seat.

Adjust the position to fit the operator.

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

2) Use the tilt adjustment lever to adjust the angle of the backrest.

3) Turn the suspension adjustment handle to adjust the firmness of the seat suspension.

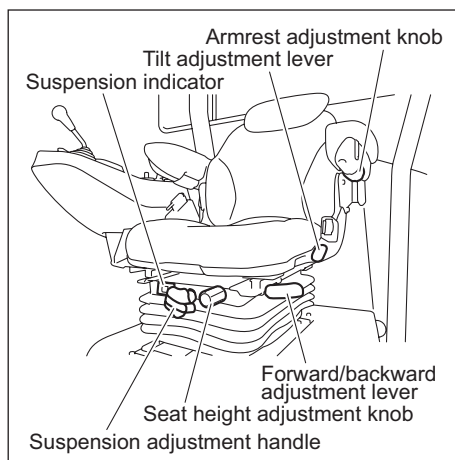
Refer to the suspension indicator while making adjustments. [45 to 130 kg (99.2 to 286.6 lb)]

4) Turn the armrest adjustment knob to adjust the angle of the armrests.

5) Turn the seat height adjustment knob to adjust the height of the seat steplessly.

[0 - 60 mm (0 - 2.36 in)]

Adjust the height of the seat while sitting in it.



7-3. Adjustment of Blade Engagement



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



Be sure to perform this operation on your own.



When handling the reel cutter (cutting cylinder) or bed knife (bottom blade), wear gloves to protect your hands.

Pay attention not to let the reel cutter (cutting cylinder) catch your gloves. Otherwise, you may injure your hand or fingers.



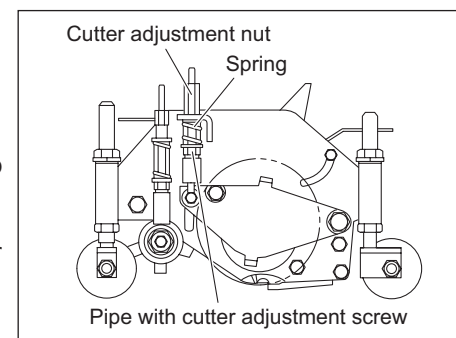
If the CR brush is installed (the mower unit equipped with only CR brush), loosen the left and right bolts and nuts used to install the CR brush before adjusting the blade engagement.

After adjusting the blade engagement, adjust the CR brush, and then firmly tighten the loosened bolts and nuts.

- 1) Stop the engine.
- 2) Shift the reel rotation / stop switching lever to the "Stop" position.
- 3) With the cutter adjustment nut, adjust the engagement between the reel cutter (cutting cylinder) and the bed knife (bottom blade) so that newspaper (two to three sheets) will be cut by the edge of both blades when the blades in their entirety come slightly into contact with each other.
- 4) Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and the bed knife (bottom blade) at an angle of 90 degrees. Then, rotate the reel cutter (cutting cylinder) counter-clockwise (when you face the mower unit from the left) by hand to check the sharpness of the blades.

Check the sharpness of the entire range (at three or four points) of the reel cutter (cutting cylinder).

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



7-4. Cutting Height Adjustment



Caution Do not perform the operation with any other persons.

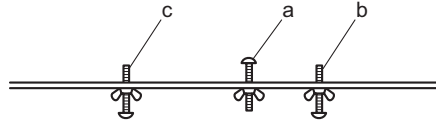
Adjust the cutting height to fit your cutting work.

1) Set the enclosed cutting height gauge.

[1] Set the small screw for cutting height setup to the cutting height.

[2] Set the angle of the bed knife (bottom blade) with the small screw for bed knife angle setup.

- a. Small screw for cutting height setup
- b. Small screw for bed knife angle setup
- c. Small screw for groomer setup



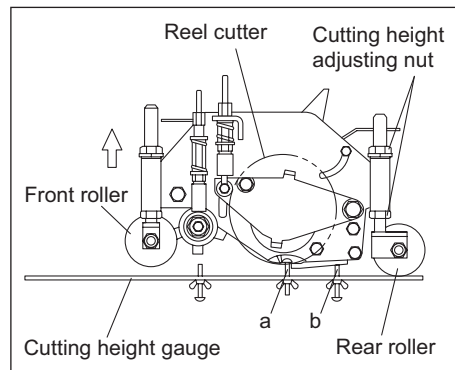
2) Position the small screw for cutting height setup set on the cutting height gauge as well as the small screw for bed knife angle setup against the bed knife (bottom blade), and then adjust the rear roller.

[1] Adjust the left and right ends of the bed knife (bottom blade) until it is level, and then determine the position of the rear roller based on the angle of the bed knife (bottom blade).

[2] Loosen the cutting height adjustment nuts, and then adjust the rear roller so that it comes into contact with the cutting height gauge.

Since the rear roller cannot be accurately adjusted if the front roller is in contact with the cutting height gauge, raise the front roller so it is not in contact with the cutting height gauge.

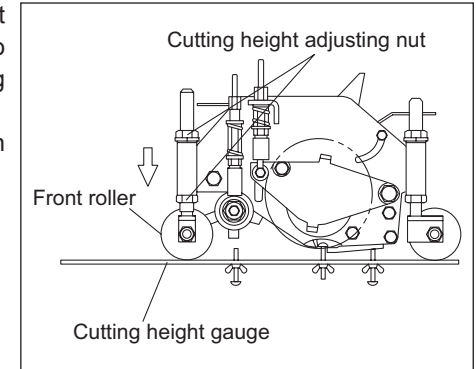
[3] After making adjustments, firmly tighten the cutting height adjustment nuts.



3) Adjust the front roller.

[1] Loosen the cutting height adjustment nuts, and then adjust the front roller so that it comes into contact with the cutting height gauge.

[2] After making adjustments, firmly tighten the cutting height adjustment nuts.

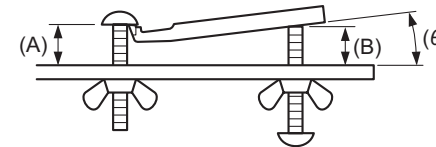


Bed Knife (Bottom Blade) Angle Table

Make adjustments according to the conditions based on a bed knife (bottom blade) angle of 5°.

<Example>

For a bed knife (bottom blade) angle of 5° at a cutting height of 15.0 mm (0.59 in), set the height of the bottom of the bed knife (bottom blade) to 12.0 mm (0.47 in).

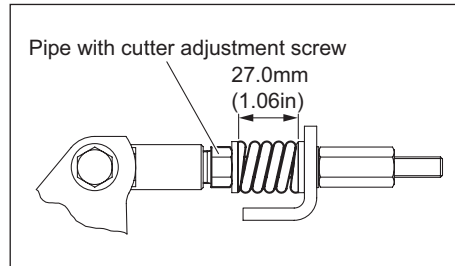


Bed knife angle (θ)	Value of (B)
7°	Cutting height of (A) - 0.6mm (0.024in)
6°	Cutting height of (A) - 1.8mm (0.071in)
5°	Cutting height of (A) - 3.0mm (0.118in)
4°	Cutting height of (A) - 4.2mm (0.165in)
3°	Cutting height of (A) - 5.4mm (0.213in)
2°	Cutting height of (A) - 6.6mm (0.260in)
1°	Cutting height of (A) - 7.8mm (0.307in)

7-5. Adjustment of Cutter Adjustment Spring

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

- 1) Adjust the blade engagement.
- 2) Loosen the pipe with cutter adjustment screw and adjust it so that the length of the spring coil is approximately 27.0 mm (1.06 in).



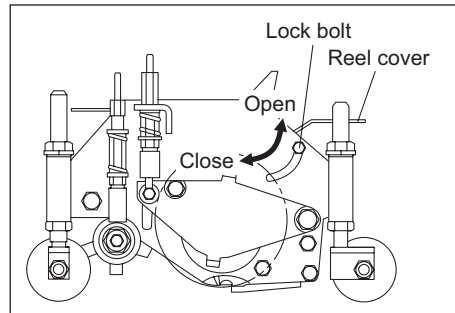
7-6. Adjustment of Reel Cover

The angle of the reel cover can be adjusted.

Loosen the left and right bolts securing the reel cover, and then adjust the angle of the cover.

If the grass catcher is installed, position the reel cover as follows.

- Front collection: Close the reel cover.
- Rear collection: Open the reel cover.



7-7. Adjustment of Groomer

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

Important

Adjust the groomer height so that it is the same level on the right and left sides.

Important

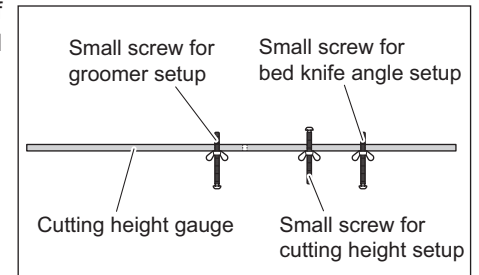
Set the groomer height more than 5.0 mm (0.2 in) from the ground.

If it is set lower, the groomer shaft, bearings, gears, etc., will be damaged.

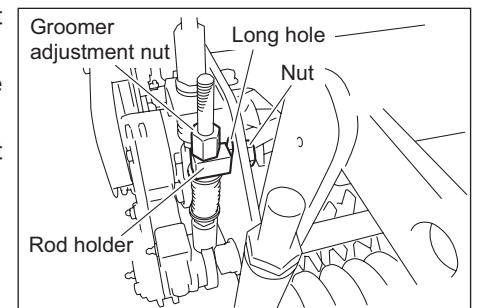
Adjust the groomer height according to the grooming work.

Note: While the groomer is not used, raise the groomer height.

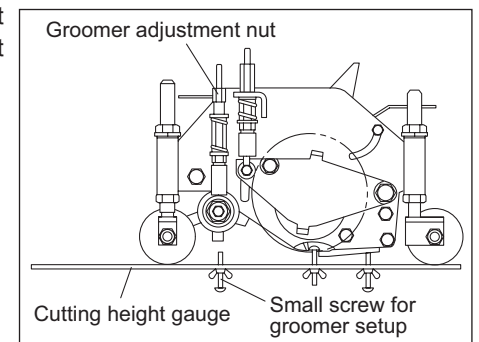
- 1) Set the small screw for groomer setup of the cutting height gauge to the desired height.



- 2) Loosen the nuts securing the right and left rod holders.
- 3) Lower the right and left rod holders to the bottoms of the long holes.
- 4) Tighten the nuts to firmly secure the right and left rod holders.



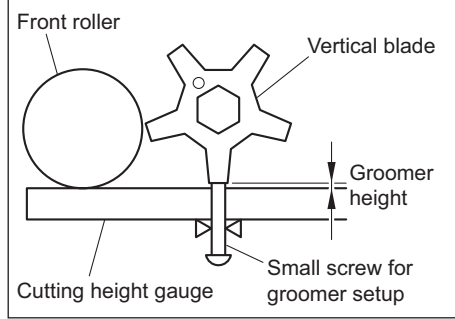
- 5) Position the front and rear rollers against the cutting height gauge at the right and left ends of the mower unit.



Important

Adjust the position so that the vertical blade can make contact with the small screw for groomer setup.

- 6) Adjust the groomer height with the groomer adjustment nut.
- 7) Follow the same steps to adjust the groomer height on the opposite side.
- 8) Bring the cutting height gauge into contact with the front and rear rollers at the left and right ends of the mower unit again, and check that the groomer is at the desired height.



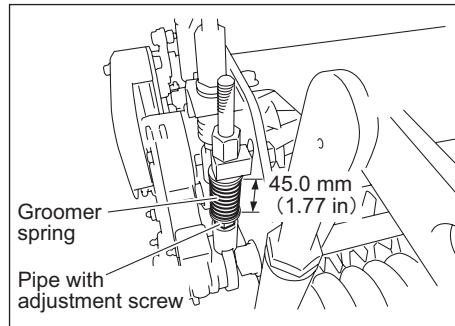
7-8. Adjustment of Groomer Spring

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

Caution

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

- 1) Adjust the height of groomer.
- 2) Loosen the pipe with adjustment screw and adjust it so that the length of the groomer spring is approximately 45.0 mm (1.77 in).



7-9. Adjustment of CR Brush

Adjustment of CR Brush (CR Brush Only Installation)

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

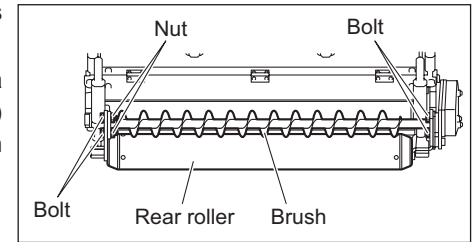
Important

Do not place the brush in contact with the rear roller too tightly. It will cause belt slip and break.

Important

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

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



Adjustment of CR Brush (installed together with Groomer)

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

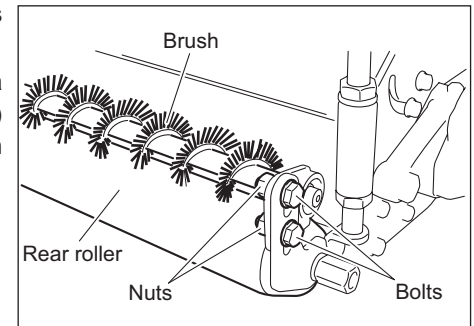
Important

Do not place the brush in contact with the rear roller too tightly. It will cause belt slip and break.

Important

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

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



7-10. Adjustment of Scraper

Adjustment of Front Scraper

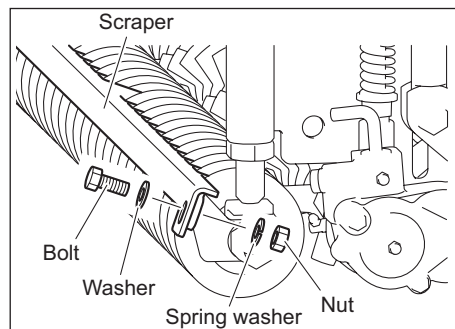
Note: Depending on the specifications, this function may not be available.

Important

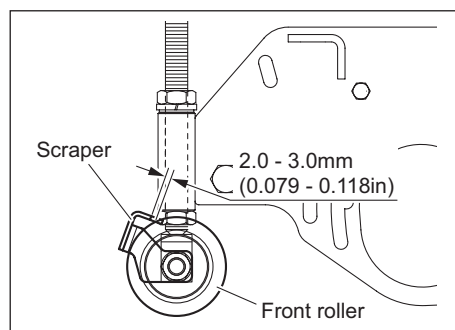
Do not place the scraper in contact with the front roller too tightly.
It will cause deformation of the scraper and damage of the front roller.

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

- 1) Loosen the left and right bolts and nuts of the scraper.



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



Adjustment of Rear Scraper (Wire Type)

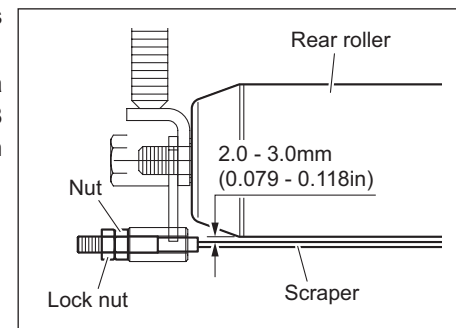
Note: Depending on the specifications, this function may not be available.

Important

Do not place the scraper in contact with the rear roller too tightly.
It will cause the scraper break and slack.

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

- 1) Loosen the left and right lock nuts and nuts of the scraper.
- 2) Adjust the scraper so that there is a clearance of 2.0 to 3.0 mm (0.079 to 0.118 in) between it and the rear roller, and then secure it with the lock nuts.



8. Start / Stop of Engine

Caution

- When the engine is cold, be sure to warm it up. Failure to follow this precaution may not allow the machine to sufficiently demonstrate its performance capability.
- Set the parking brake while warming the engine up. Failure to follow this precaution can cause the machine to move spontaneously and cause an accident..
- Pay attention if you put the key switch ON position, when the engine stops and mowing units raise/lower lever is DOWN position, then the mowing units would lower.
- Do not step on the forward/reverse pedals. Safety device prevents the engine from starting.
- Do not touch the V-Belt, the Pulley, etc. during the engine rotation.

8-1. Procedure to Start Engine

Caution

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

Important

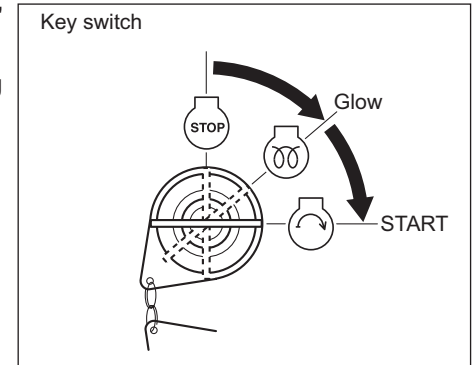
Starter operation must take 15 seconds or less.
If the engine does not start, stop using the battery for 30 to 60 seconds to avoid exhausting the battery.

- 1) Sit on the seat.
- 2) Make sure that the parking brake is applied.
- 3) Make sure that the reel rotation switch is in the "Stop" position.
- 4) Make sure that the traveling pedal is in the neutral position.
- 5) Shift the throttle lever halfway from the "Low speed" position toward the "High speed" position.

Important

The thermo-start lamp turns off at the specified time. However, the lamp turning off is not related to the glow plug generating heat.
If the ignition key is left in the "GLOW" position after the lamp is turned off, the plug will still generate heat.
The lamp will stay illuminated for five seconds.

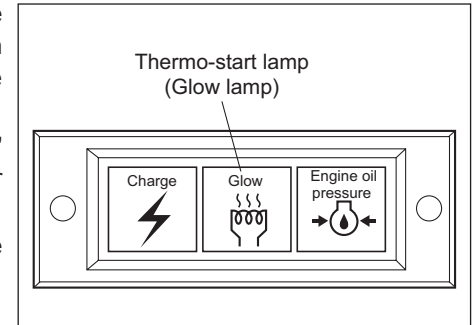
- 6) Switch the ignition key to the "GLOW" position.
- 7) Make sure that the glow plug is generating heat and the thermo-start lamp is turned on.



Important

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

- 8) After the thermo-start lamp turns off, immediately set the ignition key to the "START" position.
- 9) When the starter starts rotating and the engine starts, slowly return the ignition key to the "ON" position.
- 10) Make sure that the charge lamp and engine oil pressure lamp turn off. If they do not turn off, stop the engine and inspect the machine.
- 11) Shift the throttle lever to the "Low speed" position, and then warm up the engine for 1-2 minutes.
- 12) Gradually move the throttle lever toward the "High speed" position.



8-2. Procedure to Stop Engine

- 1) Set the traveling pedal to the neutral position.
- 2) Apply the parking brake.
- 3) Set the reel rotation switch to the "Stop" position.
- 4) Raise the mower units.
- 5) Shift the throttle lever to the "Low speed" position, and then idle the machine for 1-2 minutes.
- 6) Switch the ignition key to the "OFF" position.
- 7) Make sure that the engine has stopped.
- 8) Hook the mower lock levers (latches) for the mower units #4 and #5.
- 9) Remove the ignition key.
- 10) Leave the driver's seat.

8-3. Safety Mechanisms

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

- 1) As for starting the engine, the safety device prevents the engine from starting unless it meets each of the following four conditions.
 - An operator is sitting on the seat.
 - The parking brake is applied.
 - The reel rotation switch is set to the "OFF" position.
 - The traveling pedal is set to the neutral position.

Important

When you restart the engine after the safety device stops the engine, be sure to return the ignition key to the "OFF" position first, and then restart it.
Otherwise the engine does not start.

- 2) In the event the operator leaves the seat with the parking brake applied and the engine running, the safety device will be activated and will stop the engine under any of the following conditions:
 - The traveling pedal is not set to the neutral position. (The operator has depressed the traveling pedal.)
 - The reel rotation switch is set to the "Rotate" position. However, when the reel reverse switch is set to the "ON" position (reverse rotation), the engine does not stop.

Conditions and functions of the interlock system.

	Seat	Parking Brake	Reel Reverse Rotation Switch	Reel Rotating Switch	Travelling Pedals	Travelling-Mowing Changeover Switch
To start the engine	ON	ON	-	OFF	Neutral	-
To travel	ON	OFF	-	-	ON (F or R)	Travelling Position
To operate	ON	OFF	-	ON	-	Mowing Position
To leave the seat with the engine running	-	ON	-	OFF	Neutral	-
Maintenance of backlapping (The reel cutter rotates reversely)	-	ON	ON	ON	Neutral	Mowing Position

8-4. Warning Mechanisms

Important

When the buzzer (intermittent tone) sounds, be sure to stop operation since the engine is overheated.
Do not stop the engine without idling. Allow the engine to cool down, first. Keep the engine idling for about 5 minutes before stopping.
Remove dust that is jamming in the radiator, air cleaner, and etc.

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

- 1) If the engine water temperature exceeds 115 degrees Celsius, a buzzer will sound. (intermittent tone)
- 2) If the oil level in the hydraulic tank declines from the specified level by approximately 2.0 dm³ (2.0 L), a buzzer will sound. (continuous tone)

9. Operation Method of Each Part

9-1. Cautions when Leaving The Machine



Caution

Do not park on the slopes.

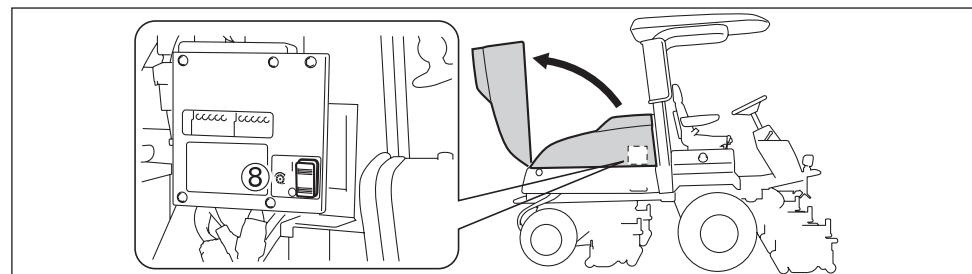
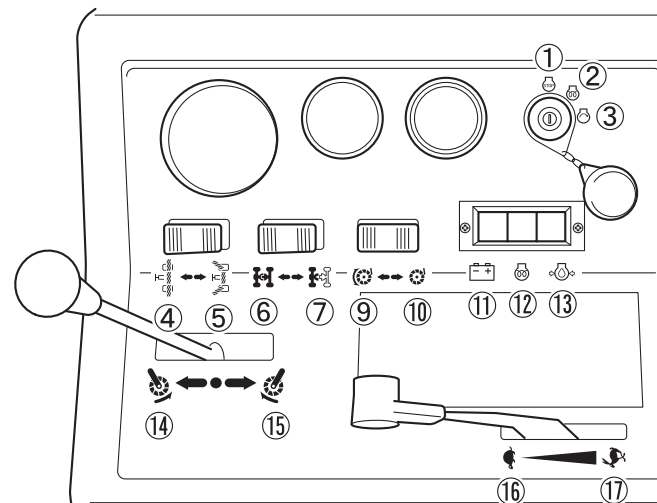


Caution

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

- 1) Stop the machine in level place and engage the parking brake.
- 2) Set the reel rotation switch to the "STOP" position.
- 3) Stop the engine.
- 4) Remove the ignition key.

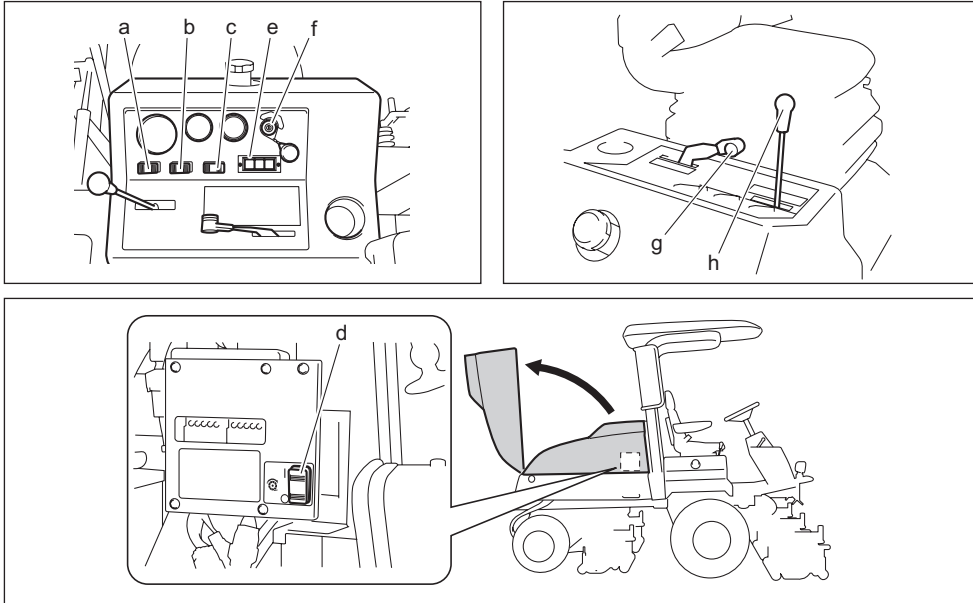
9-2. Positions and Descriptions of Operation Panel Marks



No.	Decal	Description	No.	Decal	Description	No.	Decal	Description
①		Stop	⑦		2WD	⑬		HP of engine
②		Glow	⑧		Backlapping	⑭		Lowering mowers
③		Start	⑨		Reel rotation	⑮		Raising mowers
④		Mowing	⑩		Reel stop	⑯		Low speed
⑤		Travelling	⑪		Charging battery	⑰		High speed
⑥		4WD	⑫		Thermo start			

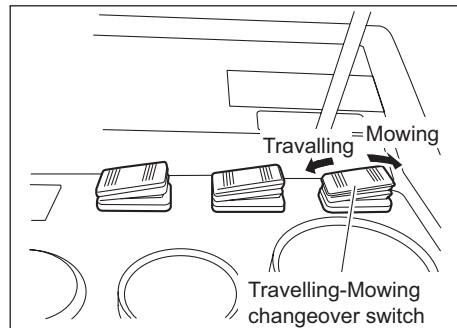
9-3. Switch and Levers on The Operation Panel

- a. Travelling –Mowing changeover switch
- b. 2WD-4WD changeover switch
- c. Reel rotation switch
- d. Reel reverse rotation switch
- e. Pilot lamp
- f. Key switch
- g. Throttle lever
- h. Mower unit raise/lower lever



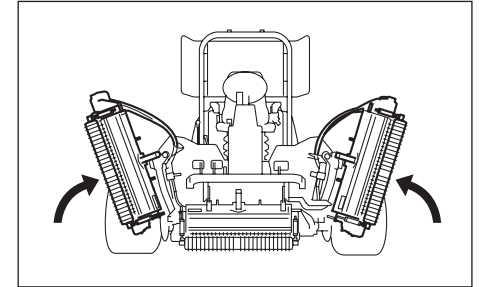
9-4. Travelling-Mowing Changeover Switch

When it is set to UP, the position of mower unit #4 & #5 can be changed.

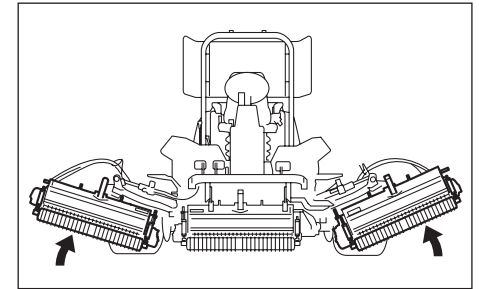


Press switch to the "Travelling" position, #4 & #5 mower units raise to top. Press switch to the "Operating" position, #4 & #5 mower units raise up to middle.

Select "Travelling"



Select "Mowing"



9-5. 2WD - 4WD Changeover Switch

Caution

When you move under the operation and by the sloping ground, be sure to choose the four-wheel drive.

Caution

When traveling, be sure to stop the reel cutters and raise the mower units.

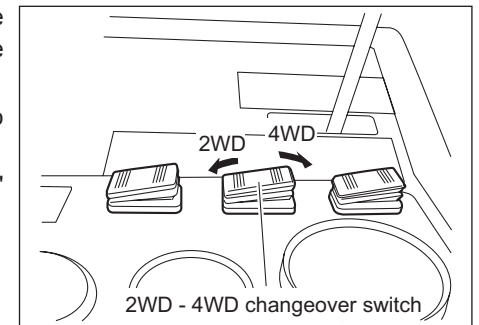
Important

To prevent the damage of hydraulic equipments, be sure to stop the machine and flip a switch.

It is the switch that chooses two-wheel drive (front wheel) travelling or four-wheel drive travelling.

For front two-wheel drive, press the switch to the "2WD" position.

For four-wheel drive, press it to the "4WD" position.



9-6. Reel Rotation Switch

Caution

Set the reel rotation switch to the "Rotation" position immediately before starting cutting work. At all other times, be sure to leave the reel rotation switch set to the "Stop" position.

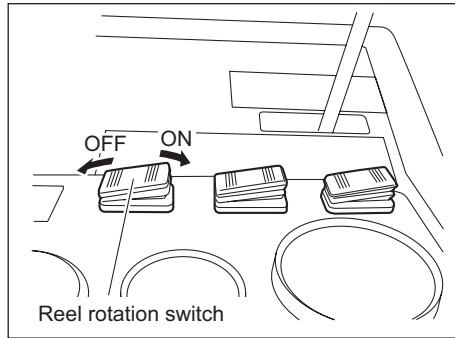
Important

While the mower units raised, the reel will not rotate even if pressing the switch to "ON(Rotation)" position.

This is the switch to start or stop the rotation of the reel cutter of the mower unit.

To start mowing rotation of the reel cutters of all the mower units, press it to "ON (Rotation)" position. To stop rotation, press it to "OFF (Stop)" position.

Before using the reel rotation switch, select the rotational direction with the reel forward/reverse switch.



9-7. Reel Reverse Switch

Important

Do not switch the reel reverse switch to the "Reverse rotation" or "Normal rotation" position while the reel cutters (cutting cylinders) are rotating. Otherwise, a hydraulic system malfunction will occur.

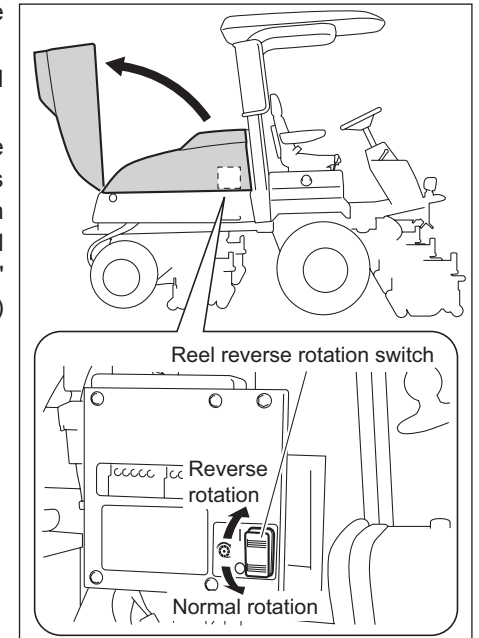
Important

If the reel rotation switch is not set to the "Rotation" position, the reel cutters (cutting cylinders) will not rotate.

The reel reverse switch is located under the hood.

This switches the rotation direction of the reel cutter (cutting cylinder).

When the reel reverse switch is set to the "Reverse rotation" position, the reel cutters (cutting cylinders) of all mower units rotate in reverse (back lapping rotation). When the reel reverse switch is set to the "Normal rotation" position, the reel cutters (cutting cylinders) rotate for mowing.

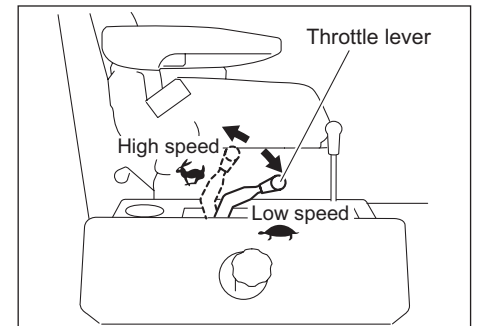


9-8. Throttle Lever

Throttle lever is the lever to adjust the rotational speed of the engine.

To increase the speed, move toward the "High speed" position.

To decrease, toward the "Low speed" position.



9-9. Mower Unit Raise / Lower Lever

⚠ Caution

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

⚠ Caution

Pay attention if you put the key switch ON position, when the engine stops and mowing units raise/lower lever is DOWN position, then the mowing units would lower.

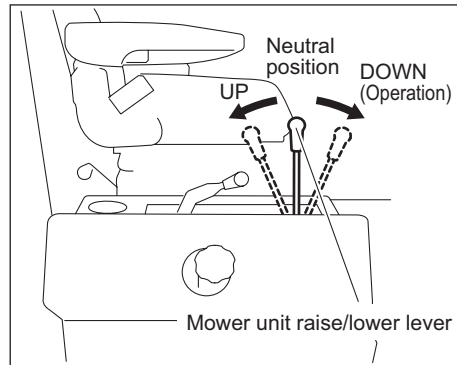
Important

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

It is the shifter lever that raises or lowers the mower unit.

If the shifter lever is moved to the "UP" position, the mower unit will go up, and if it is moved to the "DOWN" position, the mower unit will descend.

At the time of the mowing, move the shift lever to the "DOWN" position. If it is shifted to the neutral position, the cylinder is fixed and it cannot respond to the undulation.



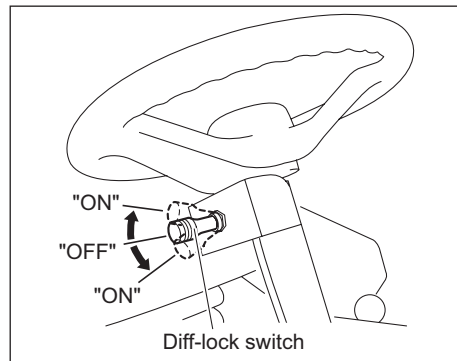
9-10. Diff-Lock Switch

Important

Do not operate the diff-lock switch unless it is necessary. Otherwise it will result in the hydraulic system malfunction.

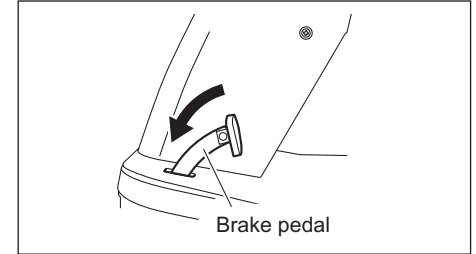
The diff-lock switch is located below the right side of the steering wheel and engages the differential lock for the left and right front wheels.

Tilt the switch lever up or down to turn "ON" to engage the differential lock for the front wheels. Release the switch lever to return it to the neutral position ("OFF" position) and disengage the differential lock.



9-11. Brake Pedal

To stop the machine, depress the brake pedal when needed.



9-12. Parking Brake Lever

⚠ Caution

Do not park the machine on the slope.

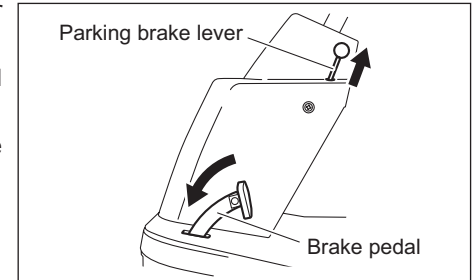
Important

Be sure to run after releasing the parking brake. Otherwise, the brake disc and the hydraulic equipment are will malfunction.

The parking brake lever is on the center cover left side.

When parking, depress the brake pedal, and then pull the parking brake lever completely.

To release the parking brake, depress the brake pedals.



9-13. Forward / Backward Pedal

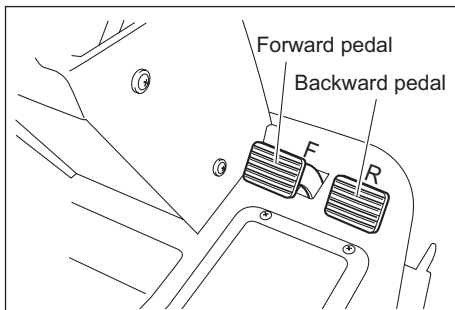
Caution

When the machine travels high speed, it does not stop immediately even if you release the travelling pedals. Please apply the brake pedals as necessary.

Two pedals system is adopted. To move forward, press the inside pedal down. To move backward, press the outside pedal down.

The speed changes in accordance with how much the pedal is depressed.

If the pedal is returned, the machine will stop automatically.



9-14. Pedal Stopper

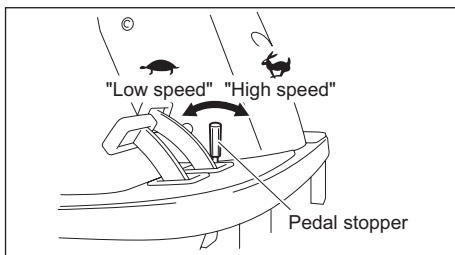
Caution

When traveling in 2WD, be sure to set to the "Low speed" position.

Traveling in the "High speed" position may cause an accident because the machine travels too fast when the pedal is completely depressed.

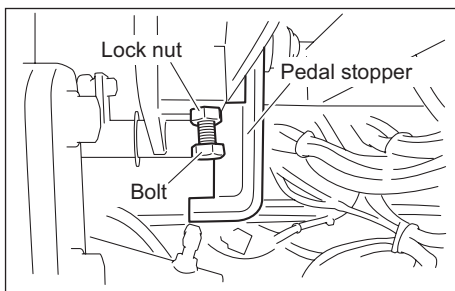
This lever changes the amount that the forward pedal can be depressed.

When set to the "Low speed" position, the amount that the pedal can be depressed will decrease.



When the pedal stopper is set to the "Low speed" position, you can adjust the amount that the forward pedal can be depressed.

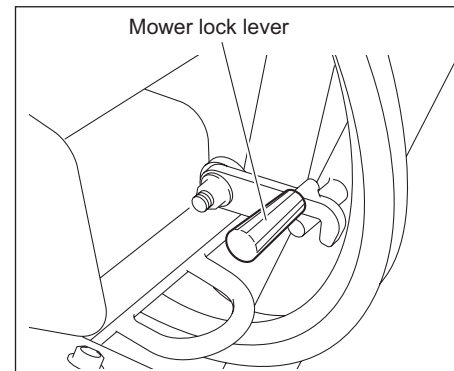
Increase the amount that the pedal can be depressed by loosening the lock nut, then tightening the bolt.



9-15. Mower Lock Lever (Latch)

The mower lock levers (latches) are located in the foot area on the left and right sides and are used when traveling or storing the machine with mower units #4 and #5 raised.

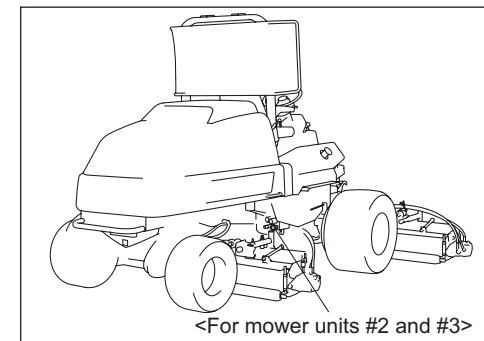
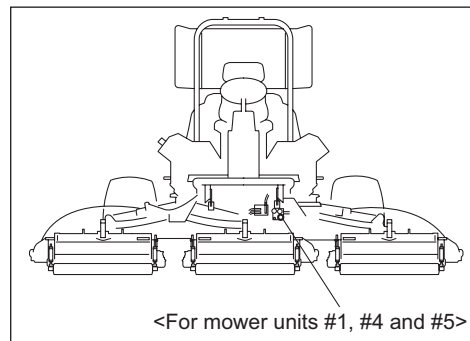
When storing the machine, hook the mower lock levers (latches) on the arms.



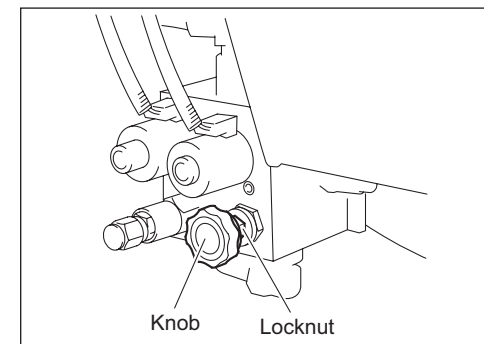
9-16. Reel Rotation Adjusting Valve

<For mower units #1, #4 and #5>

<For mower units #2 and #3>



It is the valve that adjusts the rotation speed of the reel cutter. Loosen the locknut and turn in the knob, the rotation speed will become slow.



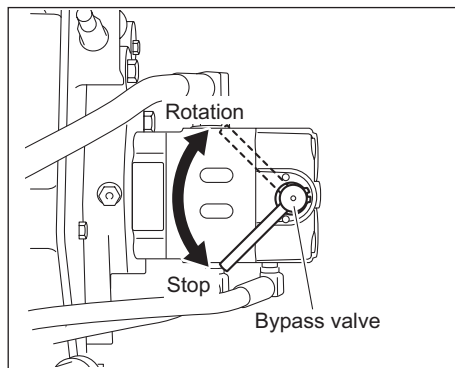
9-17. Reel Rotation / Stop Switching Lever

⚠ Caution

Before operating the reel rotation/stop switching lever, be sure to shift the reel rotation switch to the "Stop" position.

The reel rotation/stop switching lever is located on the reel motor attached to each mower unit. It is used during cutting and back lapping.

You must shift only the lever(s) for the mower unit(s) that you plan to use for cutting or back lapping to the "Rotate" position. Leave the lever(s) for other mower units in the "Stop" position.



9-18. Groomer Clutch Lever

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

⚠ Caution

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

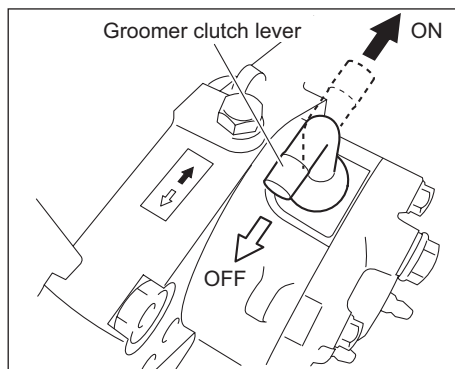
Important

Do not lift up the groomer clutch lever. Otherwise the lever will be pulled up and the inner switch ball will drop inside the groomer case.

The groomer clutch lever is located on the groomer installed on each mower unit and is used during grooming.

When the groomer clutch lever is set to the "ON" position, the groomer rotates. When the groomer clutch lever is set to the "OFF" position, the groomer stops rotating.

When grooming is not being performed, be sure to set the lever to the "OFF" position.



9-19. Hood

⚠ Caution

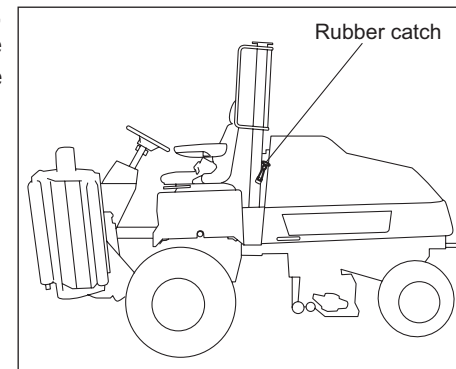
Do not open the hood in strong winds.

⚠ Caution

When you open or close the hood, be careful not to pinch your hand.

Disconnect the rubber catch in right and left, and pull up the engine hood upwards until the wire stretches to the limit. When you close the engine hood, lower it slowly.

And lock the rubber catch securely.

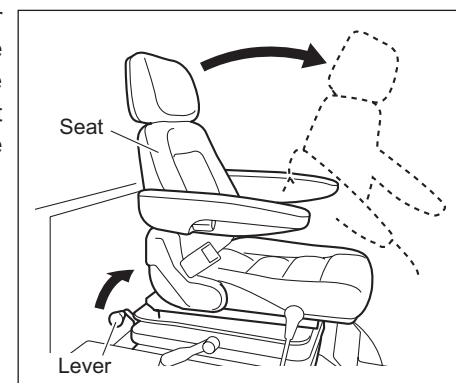


9-20. Underseat Cover

⚠ Caution

When you open or close the cover, be careful not to pinch your hand.

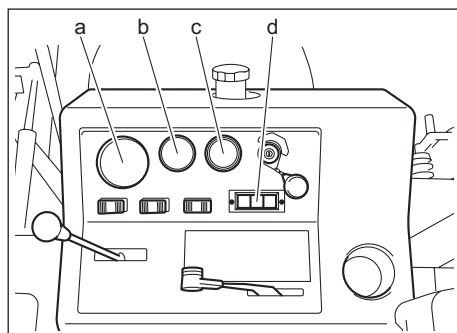
Raise the tilt steering column to the upper position first, and then move the seat to the rear end position. Pull up the lever behind the seat to release the lock, and then raise the seat and open the underseat cover. To close the underseat cover, lower it slowly.



10. Measuring Instrument

10-1. Instruments of Operation Panel

- a. Tachometer & hour meter
- b. Water temperature gauge
- c. Fuel level gauge
- d. Pilot lamp
 - Charge lamp
 - Glow lamp
 - Oil pressure lamp
 (Engine oil pressure lamp)

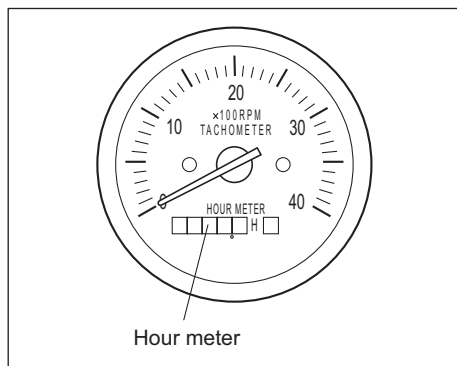


10-2. Tachometer & Hour Meter

The tachometer indicates the engine rpm. It is connected to a rotation sensor in the engine flywheel area, and converts the signal output from the rotation sensor into an rpm value.

The hour meter indicates total operation time of the engine.

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

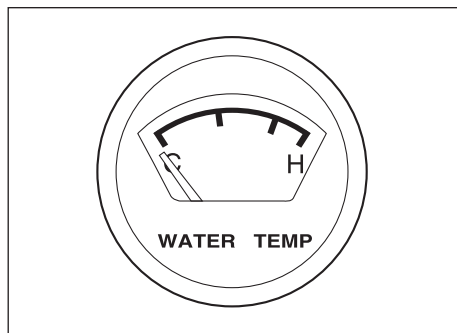


10-3. Water Temperature Gauge

This instrument indicates the water temperature inside the engine.

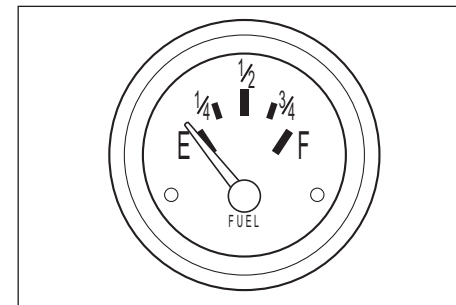
When the water temperature gauge rises to near "H" during the operation, it is in the overheating state. Stop the engine and carry out the maintenance and repair, after making the engine no-load and operating for 5 minutes in idling.

- If the water temperature raise above 115°C, the warning alarm (discontinuous sounds) will sound.



10-4. Fuel Gauge

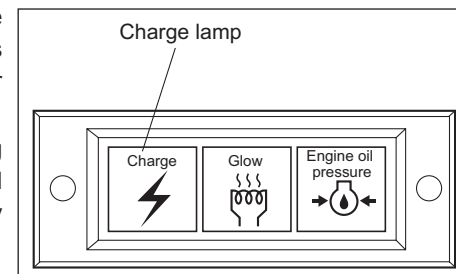
It indicates current fuel level in the fuel tank.



10-5. Charge Lamp

It turns on when the ignition key is set to the "ON" position before the engine starts. It turns off when the engine starts and the alternator starts operating properly.

If this lamp illuminates while you are operating the machine, stop the engine immediately, and then inspect the machine and perform any necessary maintenance.

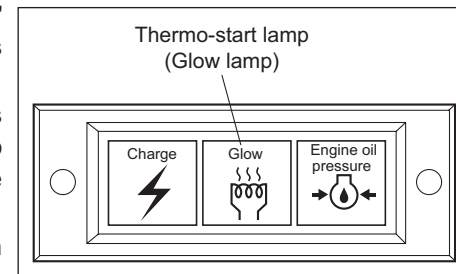


10-6. Thermo-Start Lamp (Glow Lamp)

When the ignition key is set to the "GLOW" position, it illuminates as the glow plug generates heat.

Illumination of the thermo-start lamp is controlled by the glow lamp timer, and the lamp is turned off after a specified amount of time passes.

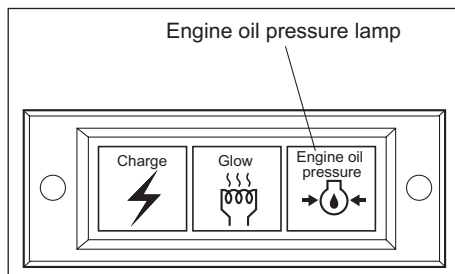
The duration of illumination indicates an approximate period of time required for warm-up, and has been fixed at five seconds.



10-7. Oil Pressure Lamp (Engine Oil Pressure Lamp)

It turns on when the ignition key is set to the "ON" position before the engine starts. It turns off when the engine starts and engine oil pressure is generated properly.

If this lamp illuminates while you are operating the machine, stop the engine immediately, and then inspect the machine and perform any necessary maintenance.



11. Travel

Caution

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

Caution

On roads with ditches or on roads where both sides are inclined, take sufficient precaution with the shoulder of the road. Failure to follow the precaution can cause the machine to fall.

Caution

When operating at high speeds do not hit the brakes and do not turn the steering wheel. Failure to follow this precaution can cause the machine to overturn or fall.

Caution

When traveling, be sure to stop the reel cutters and raise the mower units.

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) Make sure that all the mower units are raised and that the mower lock levers (latches) for mower units #4 and #5 are hooked.
- 3) Depress the brake pedal to release the parking brake.
- 4) Slowly depress the traveling pedal.
- 5) The machine starts traveling.
- 6) Release the traveling pedal to stop the machine slowly.

12. Towing The Machine

If the machine does not travel due to engine trouble, etc., you can move it by towing it.

⚠ Caution

Before towing, check that the brake is applied effectively.

⚠ Caution

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

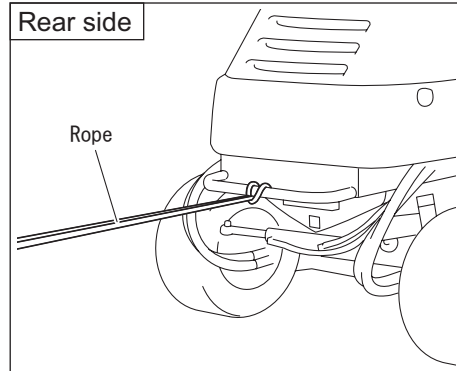
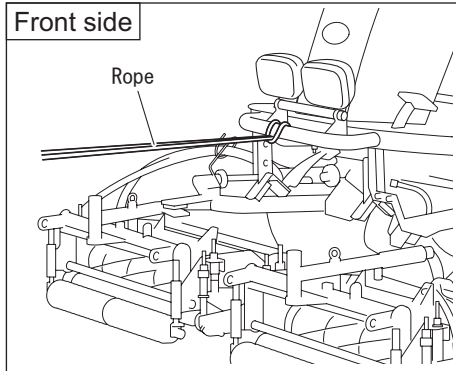
Important

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

Important

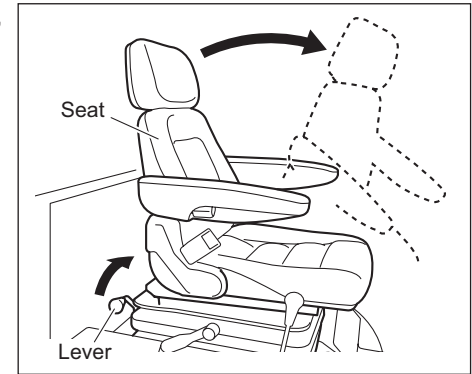
When towing the machine, travel at a speed no more than 3.0 km/h.
In addition, do not tow the machine for more than 3 minutes.
If the towing speed is too fast or the machine is towed too much, the pump or motor will be damaged.

- 1) Stop the engine.
- 2) Apply the parking brake.
- 3) Chock the wheels.
- 4) Secure the machine with ropes.

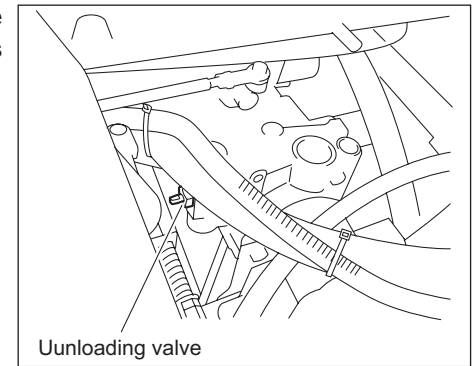


- 5) Set the 2WD/4WD selector switch to the "2WD" position.
- 6) Make sure that the steering wheel is raised completely.
- 7) Pull up the forward/backward adjustment lever, and then slide the seat backward completely.

- 8) While pulling up the lever behind the seat, tilt the seat forward.



- 9) Turn the unload valve, located beside the hydraulic pump, 90 degrees (so that it is vertical) to open it.
- 10) Put the seat back into place.
- 11) Remove the wheel stopper.
- 12) Release the parking brake.



⚠ Warning

While towing, always keep your foot on the brake pedal and depress the brake pedal at any time to stop.

- 13) Tow the machine slowly.

13. Cutting Work

Warning

Do not start to move or stop the machine abruptly. To do so is very dangerous. In addition, it may damage the hydraulic system or result in oil leakage.

Caution

Be sure to operate at an appropriate speed for the mowing site. When cutting over bumpy surfaces, keep the engine rpm steady, and slow down the cutting speed.

Caution

Note that if you stop operating the mower unit up/down lever before the mower units are raised completely, reel rotation may not stop. Reel rotation will be turned on or off based on the sensor-detected position of the mower units.

Caution

After sand topdressing, close the cutter cover. Otherwise, sand may fly out and get in your eyes.

Important

Mow with the lever shifted to the "Down" position. When the lever is returned to the neutral position, the cylinders are fixed, preventing mowing on undulations.

Important

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

- 1) Release the mower lock levers (latches) for mower units #4 and #5.
- 2) Start the engine.
- 3) Depress the brake pedal to release the parking brake.
- 4) Shift the throttle lever to rev the engine up to the maximum rpm.
- 5) Press the 2WD - 4WD changeover switch to the "4WD" position.
- 6) Set the traveling/working selector switch to the "Working" position.
- 7) Shift the mower unit up/down lever to the "Down" position to lower the mower units.
- 8) Set the reel rotation switch to the "Rotation" position to rotate the reel cutters (cutting cylinders) of all mower units.
- 9) Depress the traveling pedal to start cutting work.

Note:

During the work, the reel cutters (cutting cylinders) will rotate or stop in sync with the up and down motion of the mower units.

14. Transportation

When using a truck or trailer for transporting, drive the machine forward to load it and in reverse to unload it.

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

Otherwise, the roof may be damaged by wind pressure.

15. Long-Term Storage

1. Clean up dirt, grass and oil spot etc.
2. Inspect and replace the engine oil and air filter element.
3. Refill oil and apply lubricating/greasing to each lubrication part.
4. Empty the fuel tank and keep the machine away from ignition sources when storing the machine indoors where sparks and open flames are used.
5. Set the air pressure in the tires slightly higher than normal.
6. Inspect all bolts, nuts and screws tightened. If loose or missing, tighten or repair them.
7. Repair or replace damaged parts and paint peelings.
8. Store the machine in the place where is dry and prevent exposure to rain.
9. Remove the battery and ignition key from the machine. If you keep the battery installed in the machine, disconnect the ground battery cable (negative side).
10. When storing the machine with the mower units #4 & #5 raised, be sure to hook the mower lock levers.

16. Maintenance

16-1. Maintenance Precautions

Caution

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

Important

Use tools appropriate for each maintenance operation.

Important

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

16-2. Maintenance Schedule

Follow the maintenance schedule below.

	Maintenance	Before use	Every 50hrs	Every 100hrs	Every 200hrs	Every 500hrs	Every year
Engine	Inspection of engine oil	○					
	Change of engine oil		○ (Initial operation)	○			
	Replacement of oil filter		○ (Initial operation)	○			
	Cleaning of radiator and oil cooler	○					
	Inspection of coolant	○					
	Inspection and cleaning of air filter	○					
	Replacement of air filter element				○		
	Inspection of fan belt	○					
	Inspection of battery electrolyte	○					
	Replacement of fuel filter					○	
Main vehicle	Inspection of tires	○					
	Inspection of fuel	○					
	Inspection of hydraulic hose	○					
	Inspection of hydraulic oil	○					
	Replacement of hydraulic oil			○ (Initial operation)		○	
	Replacement of oil filter			○ (Initial operation)		○	
	Inspection of brake	○					
	Inspection of electrical wires						○
	Oil leakage of each part	○					
	Inspection of slack or damage on each part	○					
	Grease up*		○ (partially every 10hrs)				
	Inspection of grease in the hydraulic motor housing				○		
	Contact condition of the blades on reel cutter	○					
Remove adhesion of cutting grass, etc.	○						

* Refer to "Greasing Points" and "Lubricating Points."

- The operations in the table above should be performed whenever necessary, regardless of the time intervals specified.
- For the maintenance schedule of the items unlisted above, refer to the Engine's Owner's Manual.
- The values for consumables are not guaranteed.

17. Jacking Up The Machine

17-1. About Jacking Up The Machine

Warning

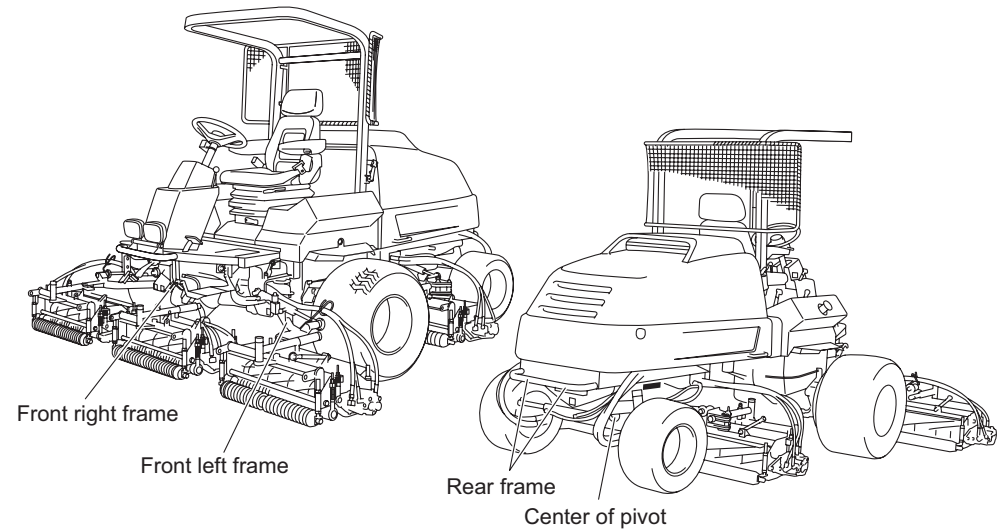
- When replacing a tire or beginning any other maintenance or repairs, be sure to chock the wheels to prevent the machine from moving.
- Before jacking up the machine, park it on a hard, flat surface such as a concrete floor and remove any obstacles that could prevent you from performing the work safely.
- When necessary, use an appropriate chain block, hoist, or jack.
- Support the machine securely with jack stands or appropriate blocks.
- Failure to do so may cause the machine to move or fall, resulting in injury or death.

Important

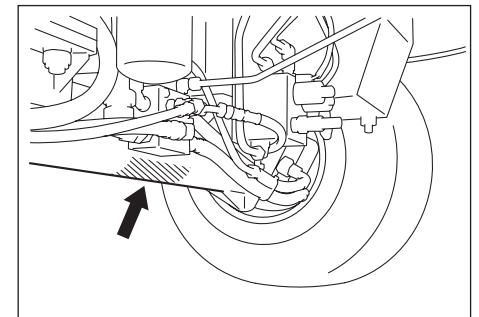
Only place a jack under the jack-up points specified. Placing a jack at any other point will result in damage to the frame or other parts.

Use the jack-up points identified in this manual when jacking up the machine.

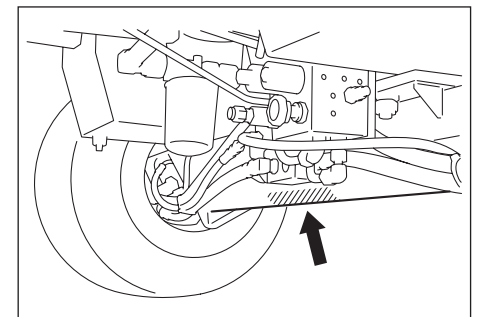
17-2. Jack-Up Points



1) Front right frame



2) Front left frame

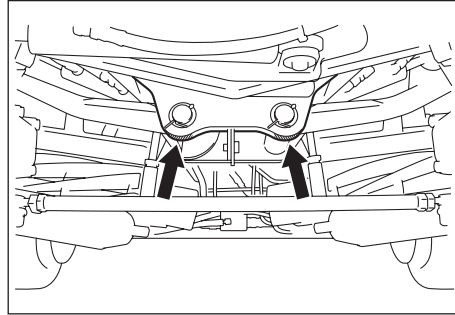


3) Center of pivot

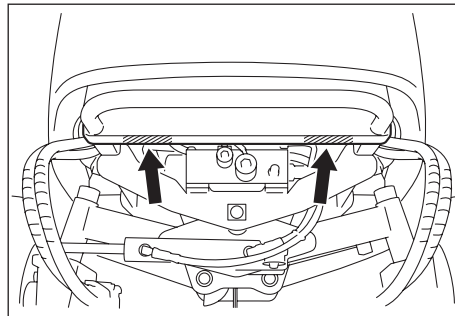


Caution

The jack-up point of the center of the pivot is not the center of the machine. Securely place the jack onto the jack-up point, and perform the operations with care



4) Rear frame



18. Greasing

18-1. About Greasing

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

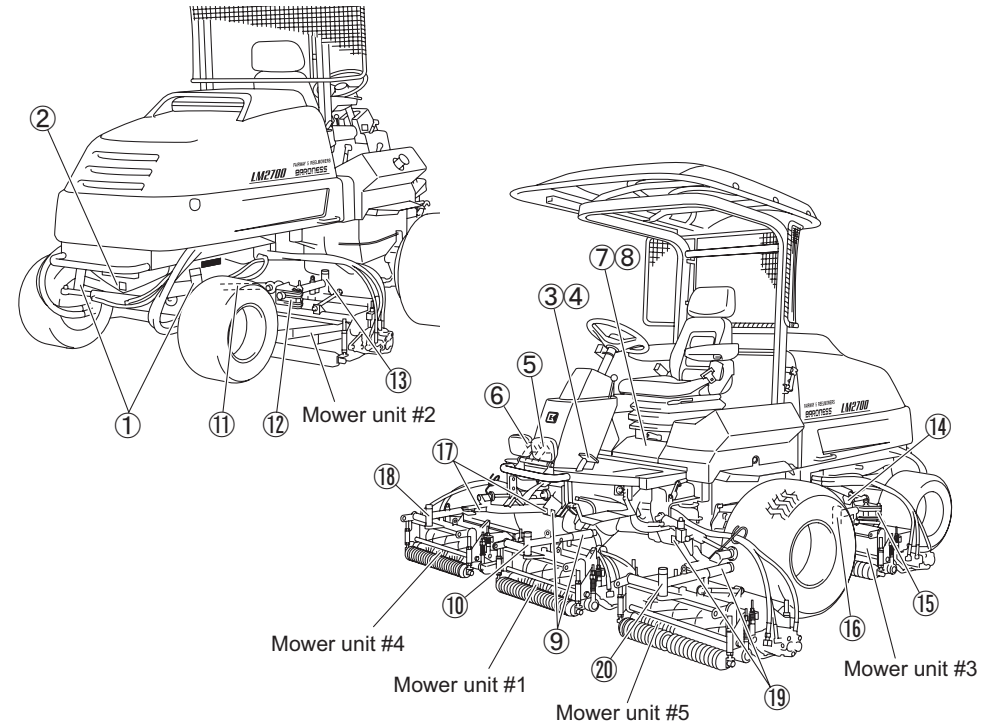
Add urea-based No. 2 grease in accordance with the maintenance schedule.

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

Add grease using the specified grease or lubricant.

18-2. Greasing Points (Main Vehicle)

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



Rear wheel parts			⑩	#1 mower joint fitting	1 place
①	Kingpin	2 places	⑪	#2 lift arm	1 place
②	Pivot	1 place	⑫	#2 rotation fitting	1 place
Pedal parts			⑬	#2 mower joint fitting	1 place
③	Brake pedal	1 place	⑭	#3 lift arm	1 place
④	Brake fitting	1 place	⑮	#3 rotation fitting	1 place
⑤	Forward pedal	1 place	⑯	#3 mower joint fitting	1 place
⑥	Backward pedal	1 place	⑰	#4 lift arm	2 places
⑦	Pump idle lever	1 place	⑱	#4 mower joint fitting	1 place
⑧	Pump neutral lever	1 place	⑲	#5 lift arm	2 places
Lift arm parts			⑳	#5 mower joint fitting	1 place
⑨	#1 lift arm	2 places			

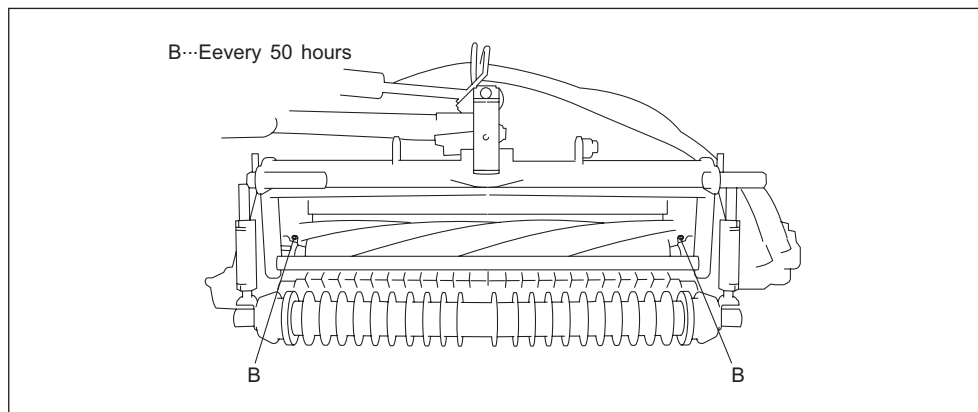
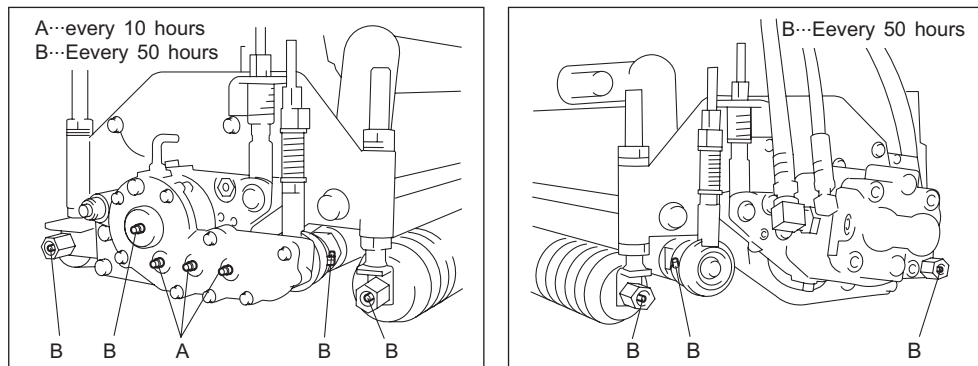
18-3. Greasing Points (Mower Units)

Grease nipples are installed in the following locations.

Carry out the greasing up periodically to each part grease fitting.

The parts greasing up every 10 hours is using the needle bearing. Be careful of the lubrication interval.

Carry out about 1g (1 to 2 times with manual-type small grease gun) grease up for each part with the grease (Excelite EP No. 2) respectively.



19. Lubrication

19-1. About Lubrication

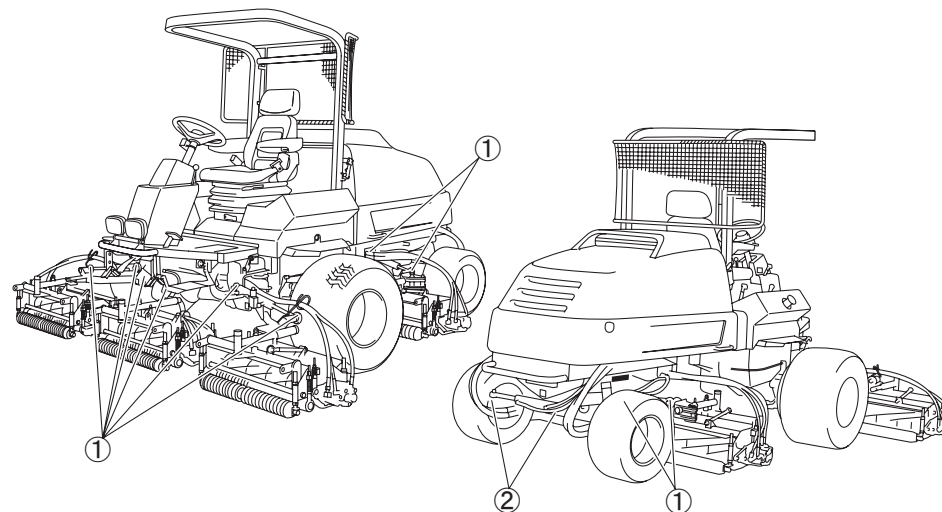
It is necessary to lubricate moving parts so that they will not become stuck or damaged.

The locations where lubricant is used are indicated in "Lubricating Points".

Apply the lubricant.

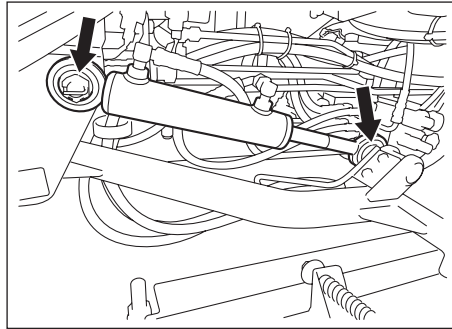
19-2. Lubricating Points

Apply lubricant at the following locations every 50 hours of operation.

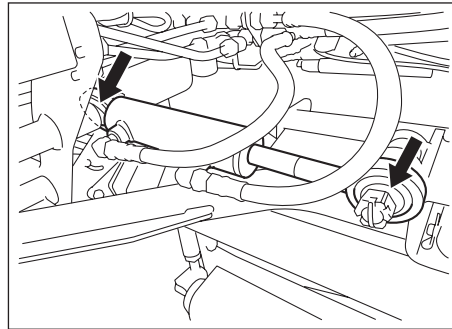


	Location	No. of lubricating points
①	Mower cylinder spherical bearing	10
②	Steering cylinder spherical bearing	2

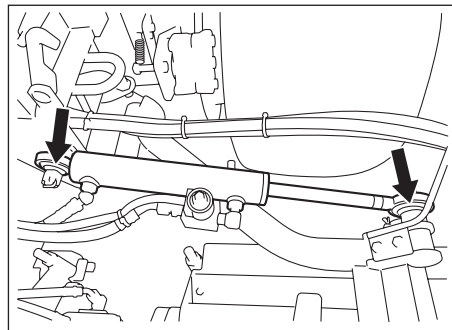
① Mower cylinder spherical bearing
#1 Mower cylinder



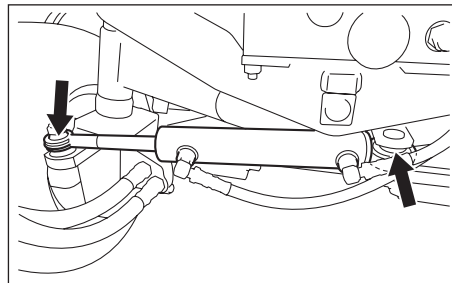
#2, #3 Mower cylinder



#4, #5 Mower cylinder



② Steering cylinder spherical bearing



20. Maintenance Work

20-1. Swiveling Mower Units #2 and #3

⚠ Caution

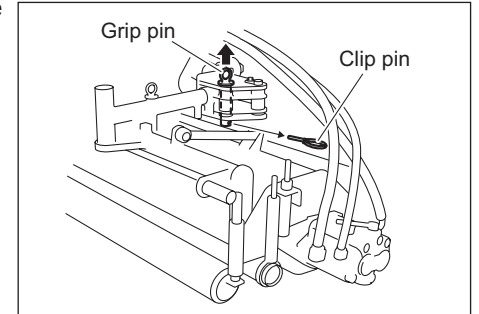
Both the reel cutter (cutting cylinder) and the bed knife (bottom blade) are edged tools. Handle them carefully, since they could cut your hands and feet.

⚠ Caution

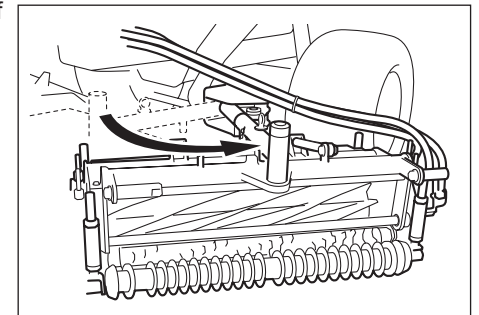
Be careful not to inhale exhaust gas while swiveling the mower units.

Maintenance can be performed more easily with mower units #2 and #3 swiveled.

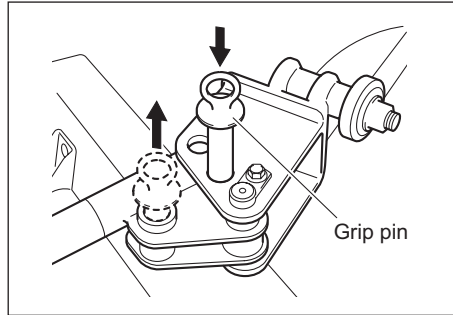
- 1) Lower the mower units, and then stop the engine.
- 2) Remove the clip pin, and then remove the grip pin.



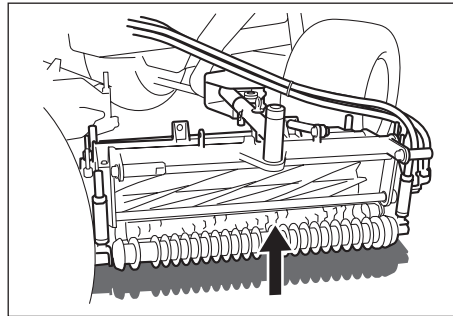
- 3) Swivel the mower unit toward the outside of the main vehicle.



- 4) Fully insert the grip pin into the locking hole for maintenance, and then install the clip pin in the grip pin.



- 5) Start the engine, and then raise the mower units.



- 6) After the maintenance is completed, reverse the procedure to return the machine to its original condition.

20-2. Cleaning of Mower Unit

Important

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

Be sure to clean the mower unit after use.

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

20-3. Back Lapping

Back lapping is work similar to sharpening a cooking knife. If the edges of the reel cutter (cutting cylinder) and the bed knife (bottom blade) become blunt and make cutting difficult, both the reel cutter (cutting cylinder) and the bed knife (bottom blade) should be simultaneously sharpened by reversing the reel cutter (cutting cylinder) with an abrasive paste applied.

However, back lapping is a temporary measure and would not restore the sharpness completely.

If the edges of the reel cutter (cutting cylinder) and the bed knife (bottom blade) become blunt and make cutting difficult, perform back lapping in the following procedure.

Warning

The reel cutter rotates during back lapping work. Keep hands and feet away from moving parts.

Caution

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

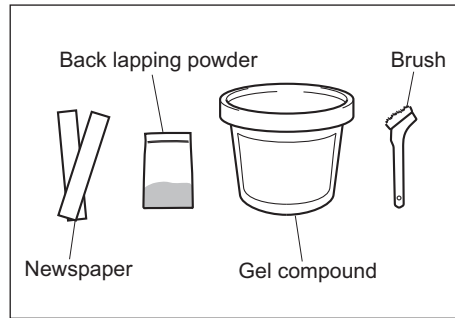
Caution

Be careful not to inhale exhaust gas during back lapping.

Caution

Do not perform back lapping work with any other persons.

- 1) Prepare newspaper cut into strip, abrasive with back lapping powder mixed with oil or gel compound (Baroness genuine abrasive), and a brush.



Note:

The mixture ratio of the abrasive is 1 part back lapping powder (#150 - #200) : 3-4 parts oil.

Caution

When handling the reel cutter or bed knife, wear gloves to protect your hands.
Pay attention not to let the reel cutter catch your gloves, etc. Otherwise, your hand or fingers may be injured.

Important

Check sharpness with the blade engagement condition after cutting.

- 2) Stop the engine and apply the parking brake.
- 3) Set the reel rotation/stop switching lever to the "Stop" position.
- 4) Insert two or three strips of newspaper into the space between the reel cutter and the bed knife at an angle of 90 degrees. Then, rotate the reel cutter counterclockwise (as seen from the left side of the mower unit) by hand to check the sharpness.
- 5) Check the sharpness along the entire reel cutter surface (around 3 to 4 positions).
- 6) Check the sharpness and mark areas that are sharp with chalk or similar.
- 7) Set the reel rotation/stop switching lever of the hydraulic motors for the mower units that require back lapping to the "Rotation" position. For mower units that do not require back lapping, set the lever to the "Stop" position.
- 8) Sit on the seat, apply the parking brake and then start the engine.

Note:

The engine will not start if the reel rotation switch is to the "Rotation" side.

- 9) Lower all mower units to the ground.
- 10) Move the reel reverse switch to the "Reverse" side.
- 11) Run the engine at low speed.
- 12) Move the reel rotation switch to the "Rotation" side and rotate the reel cutter for back lapping.
- 13) Adjust the rotation speed of the reel cutter with the reel rotation/stop switching lever.

- 14) Apply abrasive to a brush, and apply evenly to areas of the reel cutter that are sharp using the chalk markings as a guide. (Never apply it to areas that have poor sharpness.)
- 15) Keep the engine rotating for a while until there is no contact noise, and move the reel rotation switch to the "Stop" side to stop the rotation of the reel cutter.
- 16) Raise all mower units.
- 17) Stop the engine.
- 18) Wash off the abrasive applied to the reel cutter or wipe it clean with waste cloth or similar, and check the sharpness.
- 19) Repeat the procedures from 3 through 18 for back lapping until the entire reel cutter surface (around 3 to 4 positions) is even.
- 20) Next, apply abrasive across the entire reel cutter blade edge for final back lapping.
- 21) Move the reel rotation switch to the "Stop" side, stop the reel rotation, stop the engine, and carefully wash off all the remaining abrasive completely until it is clean.
- 22) Move the reel forward/reverse switch to the "Forward" side.
- 23) Return the reel rotation/stop switching lever to the "Stop" position.
- 24) Adjust the blade engagement while checking the sharpness.

20-4. Sharpening of Reel Cutter

The sharpening of the reel cutter (cutting cylinder) consists in maintaining its roundness and creating a relief (second edge face).

This work should be performed if the sharpness cannot be restored, even after back lapping, or if the relief (second edge face) has worn away.

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

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

For sharpening the reel cutter (cutting cylinder), contact your dealer or Baroness unless you have a grinding machine.



Caution

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



Caution

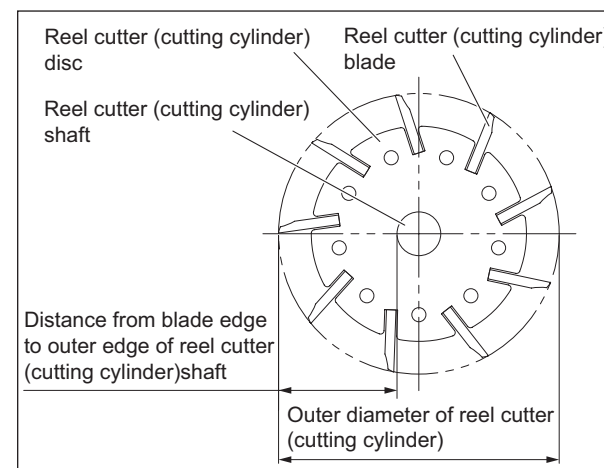
Wear gloves when touching edged tools to avoid cutting your hands.

If the outer diameter of the reel cutter (cutting cylinder) after sharpening is more than the usage limit, the reel cutter (cutting cylinder) can be sharpened.

New		Usage limit	
Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)	Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)
163mm(6.42in)	68.8mm(2.71in)	143mm(5.63in)	58.8mm(2.31in)

Note:

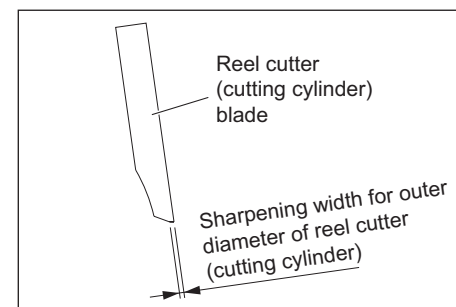
The outer diameter of the reel cutter (cutting cylinder) shaft is 25.4 mm (1.00 in).



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

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

Outer diameter of reel cutter (cutting cylinder) (new part)	Usage limit of sharpening width for outer diameter of reel cutter (cutting cylinder)
163mm(6.42in)	3.0 mm(0.12 in) (factory-recommended)



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

20-5. Replacement of Reel Cutter

⚠ Caution

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

⚠ Caution

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

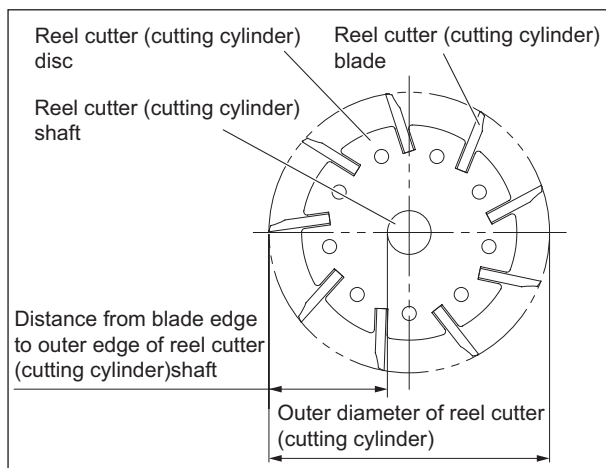
The criteria for replacing the reel cutter (cutting cylinder) are described below. However, these criteria are only a reference and do not guarantee performance like that of a new reel cutter (cutting cylinder).

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

New		Usage limit	
Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)	Dimension A (Outer diameter of reel cutter (cutting cylinder))	Dimension B (Distance from blade edge to outer edge of reel cutter (cutting cylinder) shaft)
163mm(6.42in)	68.8mm(2.71in)	143mm(5.63in)	58.8mm(2.31in)

Note:

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



20-6. Replacement of Bed Knife

⚠ Caution

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

⚠ Caution

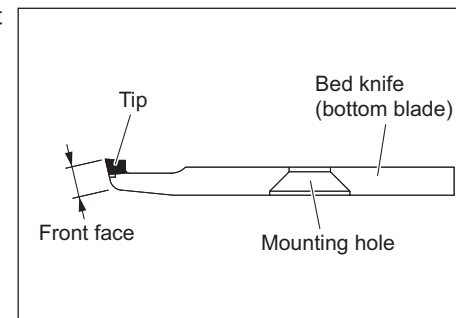
Wear gloves when touching edged tools to avoid cutting your hands.

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

- 1) When the reel cutter (cutting cylinder) is ground.
- 2) When the reel cutter (cutting cylinder) is replaced.
- 3) When the bed knife (bottom blade) is worn.

High-speed-steel-tipped blade

Replace the bed knife (bottom blade) before it no longer has a tip.

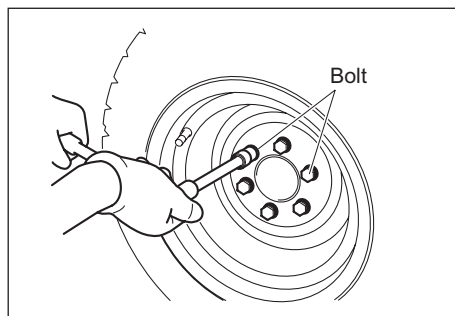


20-7. Removing/Installing Tires

Front Tire

Follow the steps below to remove the front tires:

- 1) Loosen the bolts.
- 2) Securely place the jack beneath the jack-up point of the front left/right frame area, and then raise it until the tire lifts off the ground.
- 3) Remove the bolts.
- 4) Remove the tire from the wheel mounting seat.



Important

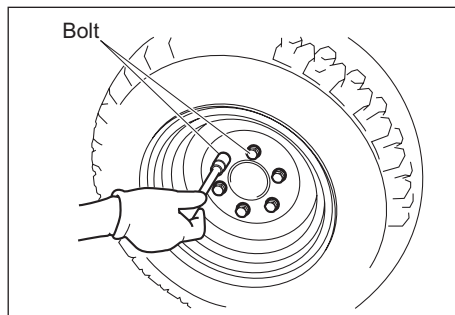
Tighten the bolts in the tightening order (diagonally).

For installing the front tires, reverse the removing procedure.

Rear Tire

Follow the steps below to remove the rear tire:

- 1) Loosen the bolts.
- 2) Securely place the jack beneath the jack-up point of the pivot, and then raise it until the tires lift off the ground.
- 3) Remove the bolts.
- 4) Remove the tire from the wheel mounting base.



Important

Tighten the bolts in the tightening order (diagonally).

For installing the rear tire, reverse the removing procedure.

20-8. Adjustment of Brake

Caution

Make sure that the brake wire is not cracked or damaged.

Important

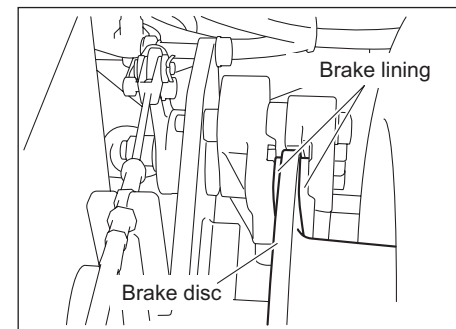
If the brake is not sufficiently effective due to a wider clearance gap between the brake disc and the brake lining, adjust the clearance.

The wire is used for fine adjustments.

Important

Adjust the brake with the brake lining.

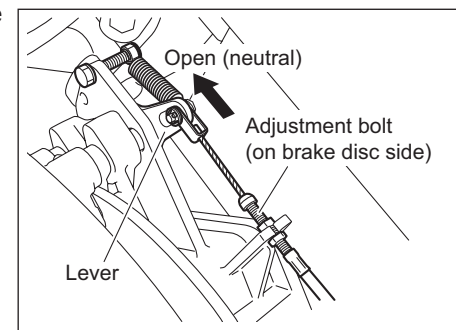
The brake lining wear limit is 3.0 mm (0.118 in).



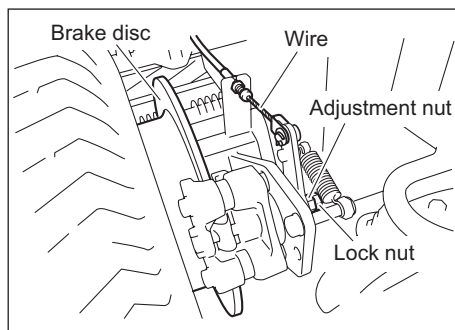
Important

Make sure that the lever is maintained in the open position (neutral).

- 1) For each wheel, f u l l y tighten the adjustment bolt on the brake disc side.



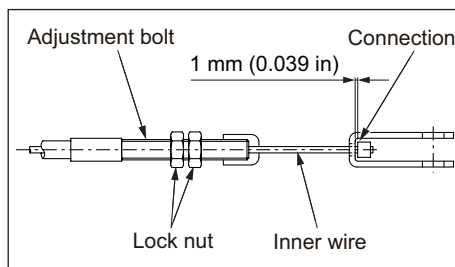
- 2) Reduce the clearance by loosening the lock nut, then tightening the adjustment nut. Tighten the adjustment nut until the brake lining contacts the friction surface of the disc.



Warning

Too narrow clearance gap between the brake disc and brake lining may cause heat generation and fire.

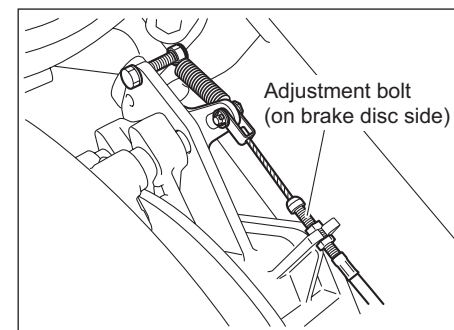
- 3) Loosen the adjustment nut to adjust the clearance gap between the brake disc and brake lining to about 0.2 mm (0.0079 in).
- 4) Securely place the jack beneath the jack-up point of the front left/right frame area, and then raise it until both tires lift off the ground.
- 5) Check that the disc rotates freely.
- 6) Fully tighten the lock nut while holding the adjustment nut in place.
- 7) With the brake pedal released, obtain a play of 1.0 mm (0.039 in) at the connection of the pedal and inner wire.
- 8) Use a wrench to loosen the lock nut and tighten it after making the adjustment with the adjustment bolt.
- 9) Drive, and then check the following. Make sure that heat is not generated in the brake area.



Caution

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

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



<Break-in of Brakes>

If the brake shoes or brake pads are worn, replace them with new ones.

Immediately after replacement, drive to break in the brakes if the effectiveness of the brakes is low.

While driving, lightly operate the brakes to break in the contact areas.

20-9. Adjusting The Neutral Position of The Piston Pump

⚠ Caution

Make sure not to touch rotating tires.

⚠ Caution

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

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

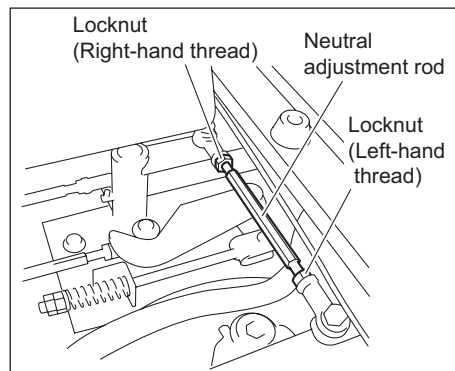
Follow the steps below to make adjustments.

- 1) Stop the engine.
- 2) Place the jacks beneath the jack-up points, and then lift the machine off the ground.
- 3) Make sure that no tires come into contact with the jack stand.
- 4) Make sure that the steering wheel is raised completely.
- 5) Pull up the forward/backward adjustment lever, and then slide the seat back completely.
- 6) While pulling up the lever, tilt the seat upward.
- 7) Start the engine, and rev it up to the maximum rpm.
- 8) Set the 2WD/4WD selector switch to the "2WD" position.
- 9) Adjust the neutral position.

[1] If the front tires rotate forward, loosen the lock nuts, and then turn the neutral adjustment rod to shorten it.

[2] If the front tires rotate in reverse, loosen the lock nuts, and then turn the neutral adjustment rod to extend it.

- 10) Find the position where the front wheels stop, and then tighten the lock nuts.



20-10. Change of Coolant

⚠ Caution

Do not touch the radiator or coolant during engine operation or immediately after the engine has been turned off. Otherwise, you may get burned.

⚠ Caution

Change coolant after the engine has well cooled down.

⚠ Caution

The radiator cap is pressurized. If you remove the radiator cap while the engine is overheated, hot steam will burst out, possibly resulting in burns. Make sure that the water temperature and pressure are reduced, and then grab the cap with a thick cloth and gradually open the cap.

Important

When changing the coolant, be sure to drain it into a container and discard it in accordance with local laws and regulations.

Important

When changing the coolant, be sure to mix clean water and antifreeze (long-life coolant), and then pour it into the radiator and reserve tank.

Important

Tightly close the radiator cap. If the cap is loose or incorrectly installed, water will leak and the engine will be damaged due to overheat.

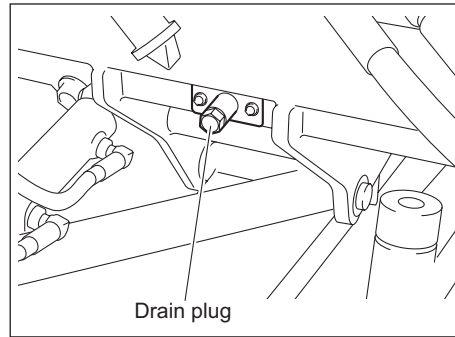
When mixing antifreeze and clean water, refer to "Relationship between concentration of long-life coolant (LLC) and freezing temperature" below for the mixing ratio.

Relationship between concentration of long-life coolant (LLC) and freezing temperature.

Freezing temperature	LLC concentration (volume %)
Down to -10 °C (14 °F)	20%
Down to -15 °C (5 °F)	30%
Down to -20 °C (-4 °F)	35%
Down to -25 °C (-13 °F)	40%

- 1) Stop the engine, and then allow the radiator to cool.
- 2) Open the hood.
- 3) Follow the steps below to drain the coolant.

- [1] Position a container to drain the coolant into.
- [2] Remove the drain plug from the radiator.
- [3] Remove the radiator cap.
- [4] Remove the reserve tank.
- [5] Open the reserve tank cap, and then drain the coolant.



- 4) Install the reserve tank.
- 5) Clean the radiator with clean water to remove any debris or rust.
- 6) Drain all water from the radiator.
- 7) Follow the steps below to fill with coolant.

The coolant quantity, including the reserve tank, is 12.0 dm³ (12.0 L).

- [1] Install the drain plug.
 - [2] Supply clean water and antifreeze into the radiator up to the radiator cap opening.
 - [3] Close the radiator cap.
 - [4] Supply clean water and antifreeze into the reserve tank up to the "FULL" mark.
 - [5] Close the reserve tank cap.
- 8) Start the engine, and then idle for several minutes to bleed air from the system.
 - 9) Stop the engine, and then allow the radiator to cool.
 - 10) Check if the coolant level in the reserve tank is between "FULL" and "LOW", and then supply coolant if necessary.
 - 11) Close the hood.

20-11. Change of Hydraulic Oil

Caution

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

Important

When you change the hydraulic oil, be sure to drain it into a container and discard it in accordance with local laws and regulations.

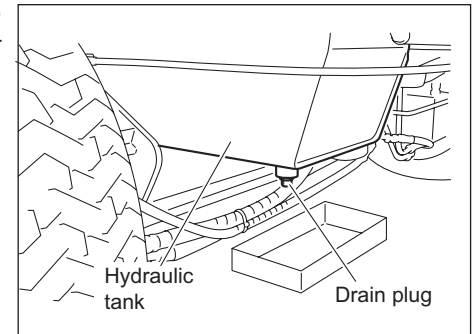
Important

If the hydraulic oil emulsifies or if it becomes even slightly less transparent, change the oil immediately.

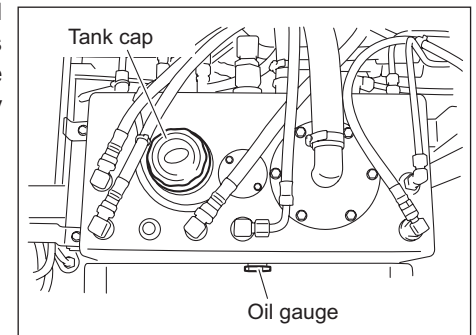
Important

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

- 1) Follow the steps below to remove the old oil.
 - [1] Start and run the engine to warm up the oil.
 - [2] On a level surface, lower the mower units, and then stop the engine.
 - [3] Remove the drain plug of the hydraulic tank and drain the old oil into a bowl.
 - [4] Wind new sealing tape on the drain plug, and then install the drain plug into the hydraulic tank.
- 2) Remove the left tank cover.



- 3) Open the tank cap, and then pour new oil from the fill port until the oil level reaches the middle of the oil gauge on the hydraulic tank. The hydraulic tank capacity is approximately 43.0 dm³ (43.0 L).



- 4) Tighten the tank cap securely.
- 5) Start the engine, raise and lower the mower units, and turn the steering wheel left and right. Move forward and reverse repeatedly several times.
- 6) On a level surface, lower the mower units, and then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.
- 7) Check underneath the machine for hydraulic oil leakage.
- 8) Install the left tank cover.

20-12. Change of Hydraulic Oil Filter

Hydraulic Oil Line Filter

Caution

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

Important

When replacing the hydraulic oil filter, be sure to drain the oil into a container and discard it in accordance with local laws and regulations.

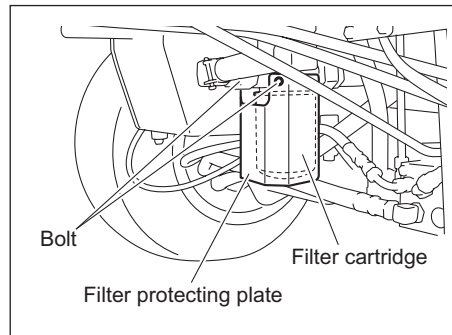
Important

If the hydraulic oil emulsifies or if it becomes even slightly less transparent, change the oil immediately.

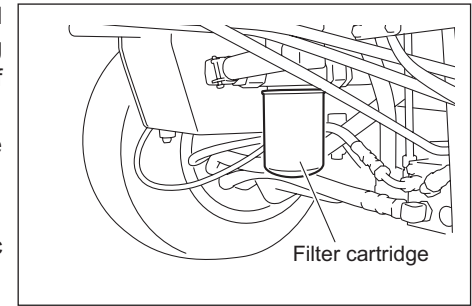
Important

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

- 1) On a level surface, lower the mower units, and then stop the engine.
- 2) Remove the filter protecting plate
- 3) Loosen the old filter cartridge by hand and remove it.
- 4) Lightly coat the packing of the new filter cartridge with hydraulic oil, and then install the cartridge.



- 5) Firmly tighten the filter cartridge by hand until the packing contacts the mounting surface. And then tighten it with a half more turn.
- 6) Supply hydraulic oil until it reaches the specified level.
- 7) Install the filter protecting plate.
- 8) Start the engine and stop it after hydraulic oil warmed.
- 9) Check underneath the machine for hydraulic oil leakage.



Hydraulic Oil Suction Filter

Caution

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

Important

If the hydraulic oil emulsifies or if it becomes even slightly less transparent, change the oil immediately.

Important

When replacing the hydraulic oil filter, be sure to drain the oil into a container and discard it in accordance with local laws and regulations.

Important

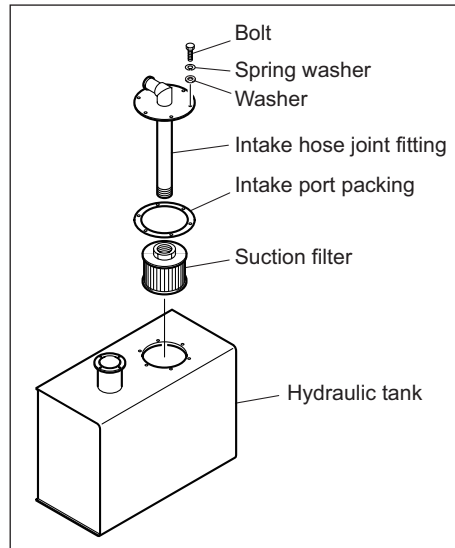
Use Shell Tellus S2M46 (or equivalent) as hydraulic oil.

Important

Replace the intake port packing with a new one.

- 1) On a level surface, lower the mower units, and then stop the engine.
- 2) Remove the left tank cover.
- 3) Remove bolts, spring washers and washers, and then remove the intake hose joint fitting.
- 4) Remove the old suction filter and intake port packing.
- 5) Remove all of the old liquid gasket from the hydraulic tank.
- 6) Remove all of the old liquid gasket and the intake port packing from the intake hose joint fitting.
- 7) Wash and clean the intake hose joint fitting.
- 8) Apply liquid gasket to the new intake port packing and then install it to the intake hose joint fitting.
- 9) Install the new suction filter to the intake hose joint fitting.

- 10) Install the intake hose joint fitting to the hydraulic tank.
- 11) Supply hydraulic oil until it reaches the specified level.
- 12) Start the engine and stop it after hydraulic oil warmed.
- 13) Check underneath the machine for hydraulic oil leakage.
- 14) Install the left tank cover.



20-13. Change of Air Cleaner

A contaminated air cleaner element may cause malfunction of the engine. To maximize the life of the engine, replace the air cleaner element at the appropriate times.

- 1) The timing for replacing the air cleaner element is described below.
 - [1] Replace the air cleaner element in accordance with the maintenance schedule.
 - [2] If it is significantly contaminated, replace it, even if the hours of operation do not exceed the specified time.
- 2) Replace the air cleaner element by following the same steps as for cleaning the air cleaner.

20-14. Change of Engine Oil

Caution

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

Important

When you change the engine oil, be sure to drain it into a bowl and discard it in accordance with local laws and regulations.

Important

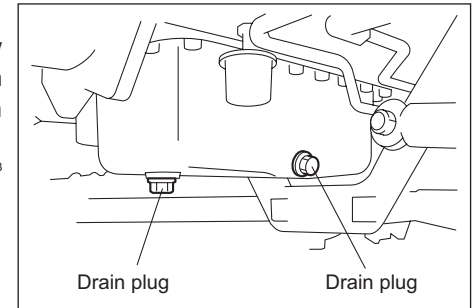
Be sure to use engine oil that is classified as API Service Grade CF or higher, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

Important

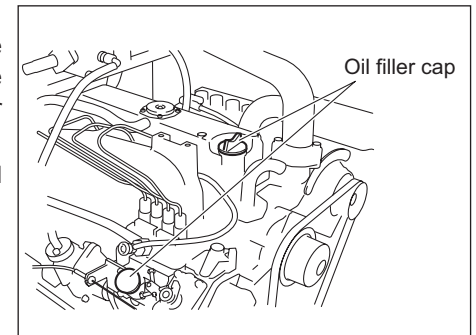
Securely tighten the oil level gauge and oil filler cap.

Change the engine oil more frequently if the engine oil is contaminated, and especially if you use the machine in dusty areas or operate the engine at high loads or in high temperatures.

- 1) Move the machine onto a level surface and stop the engine.
- 2) Remove the drain plug while the engine oil is warm, and then drain the oil into a bowl.
- 3) Replace the drain plug in the engine.
- 4) Through the oil filling port, supply new engine oil until the oil reaches a level in between the upper and lower limit lines on the oil level gauge.
Engine oil quantity is approximately 9.7 dm³ (9.7 L).



- 5) Re-place the oil filler cap.
- 6) It will take a while for the supplied engine oil to descend into the oil pan. Check the oil level again 10 to 20 minutes after supplying the oil.
- 7) Check underneath the machine for oil leakage.



20-15. Change of Engine Oil Filter

Caution

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

Important

When replacing the engine oil filter, be sure to drain the engine oil into a container and discard it in accordance with local laws and regulations.

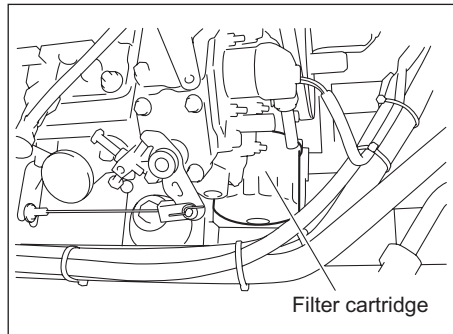
Important

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

Important

Securely tighten the oil level gauge and oil filler cap.

- 1) With the filter wrench, remove the old filter cartridge.
- 2) Lightly coat the packing of the new filter cartridge with engine oil.
- 3) Hand-tighten the filter cartridge until the packing contacts the sealing surface, and then firmly hand-tighten (without using a filter wrench).
- 4) Supply engine oil until it reaches the specified level.
- 5) Start the engine, and then stop it after 10 to 20 minutes.
- 6) Make sure that there is no oil leakage at the sealing surface of the filter cartridge.
- 7) Check the engine oil level.
If it is low, supply engine oil until it reaches the specified level.



20-16. Change of Fuel Filter

Important

When installed, be careful that it is not contaminated with dirt or dust.

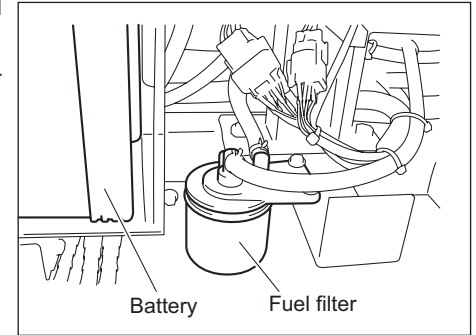
If the fuel is contaminated with dirt or dust etc., the fuel injection pump and injection nozzle will become worn.

Since the fuel filter is a cartridge, it cannot be disassembled or cleaned.

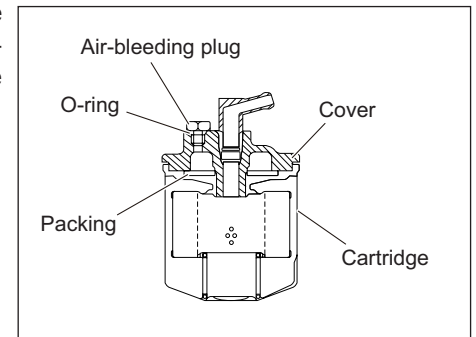
If dust or dirt accumulates in the fuel filter, the fuel flow will become insufficient.

Replace the fuel filter at the appropriate times.

- 1) Follow the steps below to replace the fuel filter.
[1] Using a filter wrench, remove the fuel filter cartridge.



- [2] Lightly apply fuel to the packing of the new cartridge, and then properly hand-tighten the cartridge, without using the filter wrench.



- 2) If the key is turned to the "ON" position and the fuel pump is operated after replacement, air bleeding will occur automatically.

20-17. Change of Fuses

Important

When performing maintenance on the electrical system, be sure to remove the negative battery wire.

Important

If a fuse blows, a short may have occurred within the electrical circuit. Check for the cause, such as faulty terminal connections, damaged wiring or terminals, or incorrect wiring.

Important

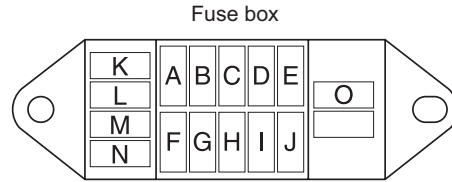
For fuse replacement, clean the fuse mounting area with use of compressed air before mounting the fuse.

1) Fuse box.

The spare fuse and the replacement tool are attached in the fuse box.

Replace with the fuses of the requirement rated capacity.

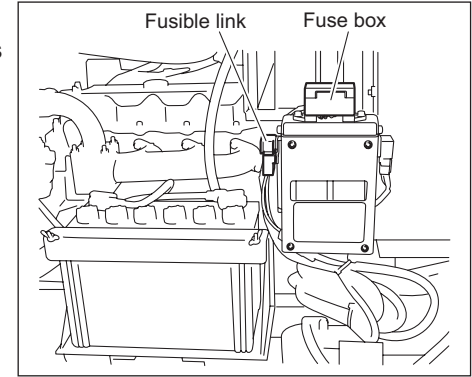
The fuses are mini-fuse for automobiles.



A	5A	Timer
B	5A	Glow lamp
C	5A	Tachometer, fuel gauge, water temperature gauge, charge lamp, oil pressure (engine oil pressure) lamp, Water temperature warning alarm, Hydraulic oil warning alarm
D	15A	Relay box 1
E	15A	Relay box 2, differential lock
F	-	
G	5A	Timer
H	5A	Alternator
I	5A	Fuel pump, cooling-fan valve safety relay, stop solenoid
J	5A	Relay (starter)
K	5A	Spare fuse
L	5A	
M	15A	
N	15A	
O	Fuse replacement tool	

2) Fusible link

The fuse rated capacity of the fusible link is 50A.



EU Declaration of Conformity**Product Identification**

Product :
Brand-Name :
Type :
Version(s) :
Starting Serial No. :
Measured Sound Power Level :
Guaranteed Sound Power Level :
Manufacturer

Lawnmower
BARONESS
LM2700
Not Applicable
11165

LWA 100.52 dB
LWA 103 dB

Kyoeshsha Co., Ltd.
1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Conforms to the following Directives

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

We have been designed and manufactured under the following specifications

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

Kyoeshsha Co., Ltd.
1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

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

Name :

Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Gerhard-Falk-Str. 1 21035 Hamburg Germany

Conformity assessment procedures

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

SNCH

Name :
Address :
Certificate / Technical Documentation No. :

11, Route de Sandweiler 5230 Sandweiler Luxembourg
SNCH*2000/14*2005/88*1355*04/CLM2700-04

Place : Japan
Date : 6 January 2021 (6 / 01 / 2021)

Signature : 
Name : Akio Hayashi
Position : Quality Dept. Director

(4)

Déclaration de conformité UE**Identification du produit**

Produit :
Fabricant :
Type :
Version(s) :
Numéro de série de début :
Niveau de puissance acoustique mesuré :
Niveau de puissance acoustique garanti :
Fabricant

Tondeuse à gazon
BARONESS
LM2700
Non applicable
11165

LWA 100.52 dB
LWA 103 dB

Kyoeshsha Co., Ltd.
1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon

Conforme aux directives suivantes :

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

Conception et fabrication en respect des spécifications suivantes :

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

Fiche technique

Marque :
Adresse de la marque :
Compilateur de la fiche technique (2006/42/CE)

Kyoeshsha Co., Ltd.
1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon
Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Gerhard-Falk-Str. 1 21035 Hamburg Allemagne

Procédures d'évaluation de la conformité

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

SNCH

Adresse :
N° de certificat/Documentation technique :

11, Route de Sandweiler 5230 Sandweiler, Luxembourg
SNCH*2000/14*2005/88*1355*04/CLM2700-04

Declaración de conformidad de la UE

Identificación del producto

Producto: Cortacésped
 Marca: BARONESS
 Tipo: LM2700
 Versión: No aplicable
 N.º de serie inicial: 11165
 Nivel de potencia sonora medido: 100,52 dB
 Nivel de potencia sonora garantizado: 103 dB
 Fabricante: Kyoetsu Co., Ltd.
 Dirección: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japón

Cumple las siguientes Directivas

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

Se ha diseñado y fabricado utilizando las siguientes especificaciones

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

Documentación técnica

Nombre del responsable:	Kyoetsu Co., Ltd.
Dirección del responsable:	1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japón
Compilador del archivo técnico (2006/42/CE)	Friedrich E. Barthels Nacht, Glockzin KG (GmbH & Co.) Gerhard-Falk-Str. 1 21035 Hamburgo Alemania
Nombre:	
Dirección:	

Procedimientos de evaluación de conformidad

Control de fabricación interno: Módulo A (2006/42/CE)

Examen de tipo CE: Módulo B (2014/30/UE)

Control interno de fabricación con evaluación de documentación técnica y comprobaciones periódicas (2000/14/CE)

Organismo notificado implicado (2000/14/CE)

Nombre:	SNCH
Dirección:	11, Route de Sandweiler 5230 Sandweiler Luxemburgo
Certificador/Documentación técnica n.º:	SNCH*2000/14*2005/88*1355*04/TC/CLM2700-04

EU-Konformitätserklärung

Produktbeschreibung

Produkt: Rasenmäher
 Marke: BARONESS
 Modell: LM2700
 Version(en): Nicht zutreffend
 Startseriennummer: 11165
 Gemessener Schalleistungspegel: 100,52 dB
 Garantierter Schalleistungspegel: 103 dB
 Hersteller: Kyoetsu Co., Ltd.
 Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Entspricht den folgenden Richtlinien

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

Unter Anwendung der folgenden Bestimmungen entwickelt und hergestellt

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

Technische Dokumentation

Name des Halters	Kyoetsu Co., Ltd.
Adresse des Halters	1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan
Technische Unterlagen erstellt von (2006/42/EG)	Friedrich E. Barthels Nacht, Glockzin KG (GmbH & Co.) Gerhard-Falk-Str. 1 21035 Hamburgo Deutschland
Name:	
Adresse:	

Konformitätsbewertungsverfahren

Interne Produktionskontrolle : Modul A (2006/42/EG)

EG-Baumusterprüfung : Modul B (2014/30/UE)

Interne Produktionskontrolle mit Bewertung der technischen Unterlagen und regelmäßiger Überprüfung (2000/14/EG)

Beteiligte benannte Stelle (2000/14/EG)

Name:	SNCH
Adresse :	11, Route de Sandweiler 5230 Sandweiler Luxemburg
Beschreibung/Technische Dokumentation Nr. :	SNCH*2000/14*2005/88*1355*04/TC/CLM2700-04

EU-försäkran om överensstämmelse

Produktidentifikation

Produkt :	Gräsklippare
Markte:	BARONESS
Typ:	LM2700
Version(er):	Ej aktuell
Serienummer startar på:	11165
Uppmätt ljudeffektnivå:	LWA 100.52 dB
Garanterad ljudeffektnivå:	LWA 103 dB
Tillverkare	Kyoeshia Co., Ltd.
Adress:	1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Uppfyller följande direktiv

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

Føljande kravspecifikationer har följts vid konstruktion och tillverknin

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

Teknisk dokumentation

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

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

Namn:	Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Adress:	Gerhard-Falk-Str. 1 21035 Hamburg Tyskland

Førfarande för bedömning av överensstämmelse

Intern produktionskontroll:	Modul A (2006/42/EG)
EG-typprovning:	Modul B (2014/30/EU)

Intern kontroll av produktion med fastställda av teknisk dokumentation och periodiska kontroller (2000/14/EG)

Arnmått organ (2000/14/EG)	SNCH
Namn:	11, Route de Sandweiler 5230 Sandweiler Luxembourg
Adress:	SNCH*2000/14*2005/88*1355*04/TC/LM2700-04
Certifikat/Teknisk dokumentation nummer:	

EU-overensstemmelseserklæring

Produktidentificering

Produkt :	Plæneklipper
Mærkenavn:	BARONESS
Type:	LM2700
Version(er):	Ikke anvendelig
Startende serienr.:	11165
Målt lydtekniveau:	LWA 100.52 dB
Garanteret lydtekniveau:	LWA 103 dB
Produent	Kyoeshia Co., Ltd.
Adress:	1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Er i overensstemmelse med følgende direktiver

2006/42/EF	Maskinerel (MD)
2014/30/EU	Elektromagnetisk kompatibilitet (EMC)
2000/14/EF	Støjemissioner fra uendørs udstyr

Vi har designet og produceret under følgende specifikationer

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

Indehaver af teknisk dokumentation

Navn:	Kyoeshia Co., Ltd.
Adress:	1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Kompliator af den tekniske fil (2006/42/EF)

Navn:	Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Adress:	Gerhard-Falk-Str. 1 21035 Hamburg Tyskland

Procedureer for overensstemmelsesvurdering

Intern produktionskontrol :	Modul A (2006/42/EF)
EF-typetesting :	Modul B (2014/30/EU)

Intern fabrikkationskontrol med vurdering af teknisk dokumentation og periodisk kontrol (2000/14/EF)

Berørt bemyndiget organ (2000/14/EF)	SNCH
Navn:	11, Route de Sandweiler 5230 Sandweiler Luxembourg
Adress:	SNCH*2000/14*2005/88*1355*04/TC/LM2700-04
Certifikat:	

MEMO

MEMO

BARONESS[®]
Quality on Demand

 **KYOEISHA CO., LTD.**
Head Office 1-26, Miyuki-cho, Toyokawa-city, Tel :+81-533-84-1390
Aichi-pref, 442-8530 JAPAN Fax:+81-533-84-1220