"Required reading" Read this manual and the owner's manual for the engine before using the machine.
Thank you for purchasing the Baroness machine. This manual explains proper handling, adjustment, and inspection of your machine. Prior to use, carefully read this manual to thoroughly understand the contents for safe and correct operation. This machine has been shipped from the factory after comprehensive test runs and inspections. However, the optimum performance of the machine depends on how you use and maintain it, including routine inspections, adjustments, and fuel supplies before and after the operation. We hope you will use the machine safely, and take advantage of its best performance.

Keeping the Owner's Operating Manual

Keep this Owner's Operating Manual in the box on the right side of the seat.
Read this manual carefully to ensure that you thoroughly understand how to properly operate and maintain this machine, and to avoid causing injury to yourself or others. The operator is responsible for operating the machine properly and safely.
Do not perform maintenance on the machine other than that described in this manual. Maintenance should only be performed by a certified specialist who fully understands the separately provided service manual.
If you have any questions concerning maintenance or genuine parts, please contact your local Baroness dealer. When making inquiries about this machine, please specify the machine’s model number and serial number.

---

**Safety warnings**

Warning symbols have been attached to this machine to ensure that you can operate it safely. The warning symbols indicate items which are particularly important for your safety. It is important to always follow the warnings and operate the machine safely.

This symbol is accompanied by the word “Danger,” “Warning,” or “Caution.” All labels with this symbol describe important safety precautions, so please read such labels carefully and only operate the machine after you have understood them completely. Failure to adequately follow these safety precautions may cause an accident.

- **Danger**
  This symbol indicates that serious injury or death will occur if the warning is ignored.

- **Warning**
  This symbol indicates that serious injury or death may occur if the warning is ignored.

- **Caution**
  This symbol indicates that injury or damage to property may occur if the warning is ignored.
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This machine met CEN standard EN 836: 1997 (if the specified label is affixed) for ride-on bunker rakes at the time of production. Improper use or maintenance may result in injury or death. To prevent an accident, be sure to follow the safety precautions described below and always pay attention to the warning symbols. The warning symbols are accompanied by the word CAUTION, WARNING, or DANGER, and all labels with these symbols describe important safety precautions. Failure to adequately follow these safety precautions may cause an accident resulting in injury or death.

**Danger**

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

**Safety management**


**For Safe Operation**

Do not use the mower for any purpose other than mowing a lawn. Operating the mower for other purposes may be very dangerous for the operator and other people in the immediate area and may cause damage to the mower.

**Training**

1. Read the Owner’s operating Manual and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
2. If the operator or mechanic cannot read English it is the owner’s responsibility to explain this material to them.
3. Never allow children or people unfamiliar with these instructions to use or service the machine. Local regulations may restrict the age of the operator.
4. Never allow untrained personnel to service machine.
5. Do not operate the machine under the influence of alcohol or drugs or if you are pregnant.
6. Never operate while people, especially children, or pets are nearby.
7. The owner/use com prevent and is responsible for accidents or injuries occurring to themselves, other people, or property.
8. Keep in mind that the owner, operator, and mechanic are responsible for accidents or hazards occurring to other people or their property.
9. 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

**Before operating the machine**

1. 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.
2. Check that operator’s presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.
3. The safety labels and operation labels should be preserved in their entirety. If they are
damaged, become dirty, or peel off, please replace them with new ones.
4. Tighten any nuts, bolts, or screws that become loose to ensure that the machine is always operated under safe conditions.
5. Evaluate the terrain to determine what accessories and attachments are needed to properly and safety perform the job. Only use accessories and attachments approved by the manufacturer.
6. 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.
7. Repair any sensors that are malfunctioning before operating the machine.
8. Check that the interlock system, safety guards, and covers are installed correctly and that they function properly. Repair these parts if there is a malfunction before operating the machine.
9. 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.
10. Do not use this machine if it has been modified.
11. Exercise care in the handling of fuel. 

**Warning**

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

[1] Store fuel in containers specifically designed for this purpose.
[2] Make sure that the fuel pipe is not damaged.
[3] 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.
[4] Refuel outdoors only and do not smoke while refueling.
[6] 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.
[7] Replace all fuel tanks and container caps securely.

12. Replace faulty mufflers.
13. Warm the engine on cold days. Set the parking brake while warming the engine.

**When operating the machine**

1. This machine is not authorized for operation as a special motor vehicle. Do not operate it on public roads.
2. Make sure that the operator sits in the operator’s seat when operating the machine. Do not carry passengers.
3. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
4. Before attempting to start the engine, disengage all attachments, shift into neutral, and engage the parking brake.
5. Only operate in good light, keeping away from holes and hidden hazards.
6. 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.
   [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.
   [7] If instructed to do so in the Owner’s Manual, use a counterbalance or wheel balance.
7. Always keep a lookout for hidden hollows or obstacles.
8. Do not take your eyes off the road ahead. Do not operate the machine with no hands.
9. Slow down and use caution when making turns and crossing roads and sidewalks.
10. Stop the blades rotating before crossing surfaces other than grass.
11. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.
12. When using attachments, never direct the discharge at bystanders or allow anyone near the machine while it is operating.
13. Do not crawl under the machine while it is in operation.
14. Before backing up, look down and behind you to check that the path is clear and that you can back up safely. Have someone guide you if it is difficult to check the area behind you.
15. Never operate the machine with damaged guards, shields, or without safety protective devices in place.
16. Be sure all interlocks are attached, adjusted and functioning properly.
17. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
18. Do not touch the exhaust system during operation or just after the engine has been turned off. Due to its high temperature, doing so could cause burns.
19. If an unusual vibration occurs, stop the engine immediately, inspect the machine and try to identify the cause. Make repairs if necessary.
20. Wear earmuffs as the noise level experienced in the operator’s position during operation may exceed the specified level.
21. Do the following before to stop the engine.
   [1] Stop on level ground.
   [2] Disengage the power take-off and lower the attachments.
   [3] Change into neutral and set the parking brake.
   [5] Stop the engine and remove the key.
22. Disengage the drive to each attachment except when operating the machine.
23. Disengage the drive to attachments, stop the engine, and remove the ignition key in the following conditions.
   [3] Before checking, cleaning, or working the machine.
   [4] After striking a foreign object or if an abnormal vibration occurs.

24. Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of operation.
25. Close the fuel valve before transporting the machine.
26. 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.
27. 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.
28. When using a running board, select one with sufficient strength, length, and width and that will not cause the machine to slip.

**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. Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
3. To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting unit and drives free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
4. Check the grass catcher frequently for wear or deterioration.
5. Make sure that parts such as wires are not touching each other and that their covers have not come off.

11. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.
12. When using attachments, never direct the discharge at bystanders or allow anyone near the machine while it is operating.
13. Do not crawl under the machine while it is in operation.
14. Before backing up, look down and behind you to check that the path is clear and that you can back up safely. Have someone guide you if it is difficult to check the area behind you.
15. Never operate the machine with damaged guards, shields, or without safety protective devices in place.
16. Be sure all interlocks are attached, adjusted and functioning properly.
17. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
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27. 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.
28. When using a running board, select one with sufficient strength, length, and width and that will not cause the machine to slip.

**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. Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
3. To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, cutting unit and drives free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
4. Check the grass catcher frequently for wear or deterioration.
5. Make sure that parts such as wires are not touching each other and that their covers have not come off.
6. When filling the tires with air, do not allow the air pressure in the tires to exceed the specified maximum.

7. Check that all nuts, bolts, and screws are properly tightened to ensure that the machine is always operated under safe working conditions.

8. Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.

9. 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.

10. Do not modify the machine.

11. Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.

12. On multi-cylinder/multi-reel machines take care as rotating one cylinder/reel can cause other cylinder/reels to rotate.

13. Use care when checking the cylinders/reels and bed knives. Wear gloves and use caution when seruicing them.

14. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.

15. Carefully release pressure from components with stored energy.

16. Be sure to depressurize the hydraulic system before performing maintenance operations on it such as removing hydraulic equipment.

17. 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.

18. Do not change the engine governor setting or operate the engine at a speed higher than this setting. Check the maximum engine speed using a tachometer.

19. Stop the engine and allow it to cool before checking or refilling the engine oil.

20. When the fuel tank needs to be cleaned, do it outdoors.

21. When machine is to be parked, stored, or left unattended, lower the cutting units unless a positive mechanical lock is provided.

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. Make sure that the electrolyte is between the “UPPER” and “LOWER” limits. Should your skin or clothes come into contact with electrolyte, immediately wash the affected area with water.

24. Use jack stands to support components when required.

25. Appropriately manage and correctly use the tools necessary for servicing or adjusting the machine.

26. Consult a Baroness dealer or Kyoeisha when major repairs or assistance is required.

27. For safety and maximum performance, use genuine Baroness parts and accessories. Note that the Baroness product warranty may not apply if parts or accessories from other companies are used.

28. Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.

29. Allow the engine to cool before storing in any enclosure.

30. When storing the machine, lower the rake.

31. If the engine is provided with a shut-off valve, shut off valve while storing or transporting.

32. When storing the machine for an extended period of time, remove the battery and the ignition key. If the machine is going to be stored with the battery still attached, disconnect the negative battery cable.

33. Only cover the machine with a sheet after hot parts have sufficiently cooled down.
Sound pressure .............................................. 2-2

Sound pressure level

LM180C

Sound pressure level
Sound pressure

This machine was confirmed to have a continuous A-weighted sound pressure level of 93 dB (A) by measuring identical machines in accordance with the procedure specified in directive EN836:1997/EC.
Sound power ................................................... 3-2
Sound power

This machine was confirmed to have a sound power level of 105 dBA/lpW by measuring identical machines in accordance with the procedure specified in directive 2000/14/EC.
Hand-arm vibration ........................................ 4-2
Whole body vibration ..................................... 4-2
Hand-arm vibration

This machine was confirmed to transmit a maximum vibration level of 3.63 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 vibration

This machine was confirmed to transmit a maximum vibration level of 1.12 m/s² to the whole body by measuring identical machines in accordance with the procedure specified in ISO 2631-1, 1997 • 2631-2, 2003.
About the Safety labels and operation labels  ........... 5-2
About the Safety labels and operation labels

⚠️ Warning

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

Part numbers for labels that need to be replaced are listed in the parts catalog. Order them from a Baroness dealer or Kyoeisha.
Waste disposal ............................................... 6-2

About the Waste disposal .............................. 6-2
Waste disposal

About the Waste disposal

Make sure that waste generated when servicing or repairing the machine is disposed of in accordance with local regulations. (e.g. waste oil, antifreeze batteries, rubber products, and wires etc.)
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Positions of the decals (Warning and Instruction) ............. 7-3
Warning and Instruction Decals ....................... 7-4
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>LM180C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td>Total length</td>
<td>215 cm</td>
</tr>
<tr>
<td>Total width</td>
<td></td>
</tr>
<tr>
<td>During operation</td>
<td>208 cm</td>
</tr>
<tr>
<td>During transport</td>
<td>185 cm</td>
</tr>
<tr>
<td>Total height</td>
<td></td>
</tr>
<tr>
<td>Seat</td>
<td>107 cm</td>
</tr>
<tr>
<td>Handle</td>
<td>102 cm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>387 kg</td>
</tr>
<tr>
<td>Minimum turning width</td>
<td>230 cm</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>Subaru EH30B</td>
</tr>
<tr>
<td>Type</td>
<td>Air-cooled 4-cycle vertical OHV-type gasoline engine</td>
</tr>
<tr>
<td>Total displacement</td>
<td>291 cm³ (0.291 L)</td>
</tr>
<tr>
<td>Maximum output</td>
<td>6.6 kW (9.0 PS)/1,800 rpm</td>
</tr>
<tr>
<td>Fuel tank capacity</td>
<td>Gasoline 6.0 dm³ (6.0 L)</td>
</tr>
<tr>
<td>Fuel consumption</td>
<td>310 g/kW.h (at continuous rated output)</td>
</tr>
<tr>
<td>Quantity of engine oil</td>
<td>1.2 dm³ (1.2 L)</td>
</tr>
<tr>
<td>Mowing width</td>
<td>188 cm</td>
</tr>
<tr>
<td>Mowing height</td>
<td>13 - 50 mm</td>
</tr>
<tr>
<td>Drive</td>
<td>Mechanical two-wheel drive</td>
</tr>
<tr>
<td><strong>Speed (HST)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Speed (Mechanical)</strong></td>
<td>Forward</td>
</tr>
<tr>
<td>1st gear:</td>
<td>3.1 km/1,800 rpm</td>
</tr>
<tr>
<td>2nd gear:</td>
<td>6.4 km/1,800 rpm</td>
</tr>
<tr>
<td>3rd gear:</td>
<td>9.4 km/1,800 rpm</td>
</tr>
<tr>
<td>Reverse</td>
<td>1st gear: 3.1 km/1,800 rpm</td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>96.3 m²/h (6.4 km/h x mowing width x 0.8)</td>
</tr>
<tr>
<td><strong>Grade ability</strong></td>
<td>18 degrees</td>
</tr>
<tr>
<td><strong>Tire size</strong></td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>4.00 - 5</td>
</tr>
<tr>
<td>Rear wheel</td>
<td>18 × 8.50 - 8</td>
</tr>
<tr>
<td><strong>Tire pneumatic pressure</strong></td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>200 kPa (2.0 kgf/cm²)</td>
</tr>
<tr>
<td>Rear wheel</td>
<td>80 kPa (2.0 kgf/cm²)</td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

* The factory default maximum engine rpm is 1,800 rpm.
Names of Portions

1. Handle
2. Traveling clutch lever
3. Change lever
4. Parking brake lever
5. Left mower unit
6. Diff-lock pedal
7. Reel rotation lever
8. Engine stop switch
9. Throttle lever
10. Box
11. Brake pedal
12. Right mower unit
13. Rear mower unit
14. Seat
A. Serial number plate
B. Specification label

Positions of the decals (Warning and Instruction)
## Warning and Instruction Decals

<table>
<thead>
<tr>
<th>Decal Code</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| LM180C-1001Z0 | Sticker, operation                             | 1. **Warning**  
   Read the Owner's Operating Manual.  

2. **Danger**  
   Flying objects - Any people other than the operator must keep a safe distance from the machine.  

3. **Danger**  
   Rollover - Do not work on any slopes of 18 degrees or more.  
   When you descend the slope, lower the mower units and drive at a low speed. |
| K4205001600  | Decal, caution to mutilation                     | **Danger**  
   May cut your hand or leg - Stop the rotation and engine. Otherwise you may get injured. |
| K4205001650  | Decal, caution to frying object                  | **Danger**  
   When the blades are rotating, keep away from the machine.  
   Any bystanders must keep a safe distance from the machine. |
| K4205001530  | Decal, caution to rotating object                | **Danger**  
   Watch for rotating parts - Keep your hands away from the belts while the engine is running. |
CHECK FOR LEAKAGE FROM HOSES AND FITTINGS.

SHUT OFF FUEL VALVE WHEN ENGINE IS NOT IN USE.

1. Read manual.
2. Exhaust gas is poisonous.
   Do not operate in an unventilated room or enclosed area.
3. Stop the engine before refueling.
4. Fire, open flame and smoking prohibited.
5. Shut off fuel valve when the engine is not in use.
6. Stay clear of the hot surface.
7. Check for leakage from hose and fittings.

SPARK PLUG COVER MUST BE IN PLACE WHEN REFUELING.

Decal, caution to noise

Decal, notice noise level LWA105

Decal, read Owner's manual

Read the Owner's Operating Manual.
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Inspection of Belts .......................................... 8-3
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Inspection of Engine Oil ................................. 8-3
Inspection of Transmission Oil ....................... 8-4
Inspection of Fuel Supply ............................... 8-5

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Operation of Parking Brake Lever ............ 8-13

Travel of Machine ......................................... 8-13

Operating Procedure .................................... 8-13

Cutting Work ............................................... 8-14
**Inspection Before Use**

Be sure to perform inspection before you start operating the machine so that you will be able to take advantage of its optimum performance for a long period of time.

**Inspection of Reel cutter (Cutting cylinder)**

The reel cutter (cutting cylinder) may become dull due to frequent use, objects crushed during mowing, or damage caused during transportation. Inspect the reel cutter (cutting cylinder), and if necessary, perform lapping, 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 or not.
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 remains at the point of reel cutter (cutting cylinder).
6. Make sure that the soldering between the reel cutter (cutting cylinder) and the disc has not peeled off.

**Inspection of Air Cleaner**

For details on handling the engine, please refer to the separate Engine Handling Manual.

Make sure that there is no damage on the air cleaner.

Make sure that the air cleaner element is not contaminated.

**Cleaning of Air Cleaner**

For details on handling the engine, please refer to the separate Engine Operating Manual. Contaminated air cleaner element may cause malfunction of the engine. To maximize the life of the engine, clean the air cleaner properly.

Clean the air cleaner periodically so that clean air will be supplied to the engine.

1. Before installing the element, clean it with white kerosene, immerse it in an admixture of three parts white kerosene to one part engine oil, and then shake/squeeze it.
2. Before installing the urethane foam, clean it with white kerosene, immerse it in an admixture mixture of three parts white kerosene to one part engine oil, and then firmly squeeze it.
Inspection of Tires
1. Check the pneumatic pressure of the tires.
2. Make sure that there are no cracks, damage or abnormal wear on the tires.

<table>
<thead>
<tr>
<th>Tire size</th>
<th>Pneumatic pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front wheel (4.00 - 5)</td>
<td>200 kPa (2.0 kgf/cm²)</td>
</tr>
<tr>
<td>Rear wheel 8.50 - 8</td>
<td>80 kPa (0.8 kgf/cm²)</td>
</tr>
</tbody>
</table>

Inspection of Parking Brake
1. Make sure that the brake is not applied any longer when you pull the parking brake lever.
2. Make sure that the brake is not applied even slightly when you press the push button to release the parking brake lever.

Inspection of Brake
While traveling, depress the brake pedal until the pedal hits the pedal stopper to make sure that the brake is applied effectively.

Inspection of Belts
Excessive belt tension will damage bearings or break shafts.
If belts are excessively loose, slippage and belt damage will result, or the reel rotation and operation speed will not be high enough for cutting.
Inspect the belts, and if necessary, adjust or replace them.
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.

Inspection of Engine Oil
1. Stop the engine, wait for 10 to 20 minutes for the engine to cool down, then check the oil level.
2. Position the machine so that the engine oil surface will become level, then insert the oil gauge all the way to check the oil level.
3. The appropriate oil level should be between the two knurl lines on the gauge.

Filling of Engine Oil
For details on handling the engine, please refer to the separate Engine Operating Manual.

Caution
Do not fill too much engine oil. Otherwise, the engine may be damaged.
Important

Do not mix different types of engine oil. Be sure to use the engine oil that is classified as API Service Grade SF or higher and that feature SAE Viscosity appropriate for your operating environment (ambient temperature).

1. Through the oil filling port, fill the engine oil.
2. Check the oil level again 10 to 20 minutes after filling the oil.

Change of Engine Oil

For details on handling the engine, please refer to the separate Engine Operating Manual.

Warning

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

Caution

Pay attention to hot oil, which could burn your skin if it gets on you.

Important

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

Change the engine oil more frequently, if the engine oil is contaminated, and also in case 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, stop the engine, remove the drain plug while the engine oil is warm, then drain the oil into a bowl.
2. Attach the drain plug, then remove the oil gauge.
3. Pour new engine oil through the oil filling port. Engine oil quantity is approximately 1.2 dm³ (1.2 L).
4. Insert the oil gauge straight into the oil filling port all the way, without twisting or turning it, to check the oil level. Make sure that the engine oil is filled up to the upper limit of the oil gauge.
5. Install the oil gauge.

Inspection of Transmission Oil

Place the machine so that its flame will be level, then make sure that the transmission oil level is at the oil level plug at any time. The oil level plug is located on the left side of the transmission.
Filling of Transmission Oil

Important
Do not mix different types of transmission oil. Be sure to pour the gear oil for automobiles that is classified as SAE Viscosity Grade #90, into the transmission.

1. Through the oil filling port, fill the transmission oil.
2. Check the oil level again 10 to 20 minutes after filling the oil.

Change of Transmission Oil

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

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

Important
Be sure to pour automobile gear oil that is classified as SAE Viscosity Grade #90 into the transmission.

Inspection of Fuel Supply

Observe the fuel gauge located on the fuel tank to check the fuel level.

Change the entire transmission oil after 50 hours of operation for the first time, and then change it every year of operation.
1. Move the machine onto a level surface, stop the engine, remove the drain plug while the transmission oil is warm, then drain the oil into a bowl.
2. Attach the drain plug, then remove the oil filling port cap and oil level plug.
3. Pour new transmission oil through the oil filling port.
4. Make sure that the transmission oil level is filled up to the tip of the oil level opening.
5. Attach the oil filling port cap and oil level plug.

Inspection Before Use
Fuel Supply

If the fuel gauge located on the fuel tank indicates a level close to E (EMPTY), supply lead-free gasoline for automobiles at your earliest convenience. The fuel tank capacity is approximately 6.0 dm$^3$ (6.0 liters).
Tightening torques

Standard tightening torques

Bolts and screws

Unless otherwise instructed, tighten bolts or nuts by the specified torque using an appropriate tool. Excessive tightening of a screw may cause it to become loose or damaged. The appropriate tightening torque depends on factors such as the type of screw, its strength, and the friction of its thread and bearing surface.

The following list is for galvanized and parkerized bolts only. The values given in this list do not apply to low-strength female screws.

Do not use a screw that has rusted or has foreign matter such as sand on it. Such a screw cannot be fully tightened even if it is tightened by the specified torque. The friction on the thread surface increases, causing a loss of torque that results in an insufficient tightening torque being exerted. If a screw is wet or oily, do not tighten it by the specified torque. If a screw gets wet, the torque coefficient decreases, resulting in excessive tightening of the screw if it is tightened by the specified torque.

Excessive tightening of a screw may cause it to elongate, resulting in the screw becoming loose or damaged. Do not use a screw that has already been subjected to a large load.

Tightening a bolt with an impact wrench requires skill. Practice tightening bolts to ensure you are able to tighten them reliably.

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>General bolts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M 4 T</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>N-m</td>
<td>kgf-cm</td>
</tr>
<tr>
<td>M5</td>
<td>3 - 5</td>
<td>30.59 - 50.99</td>
</tr>
<tr>
<td>M6</td>
<td>7 - 9</td>
<td>71.38 - 91.77</td>
</tr>
<tr>
<td>M8</td>
<td>14 - 19</td>
<td>142.76 - 193.74</td>
</tr>
<tr>
<td>M10</td>
<td>29 - 38</td>
<td>295.71 - 387.49</td>
</tr>
<tr>
<td>M12</td>
<td>52 - 67</td>
<td>530.24 - 683.20</td>
</tr>
<tr>
<td>M14</td>
<td>70 - 94</td>
<td>713.79 - 958.52</td>
</tr>
<tr>
<td>M16</td>
<td>88 - 112</td>
<td>897.34 - 1142.06</td>
</tr>
<tr>
<td>M18</td>
<td>116 - 144</td>
<td>1,182.85 - 1,468.37</td>
</tr>
<tr>
<td>M20</td>
<td>147 - 183</td>
<td>1,498.96 - 1,866.05</td>
</tr>
<tr>
<td>M22</td>
<td>295</td>
<td>3,008.12</td>
</tr>
<tr>
<td>M24</td>
<td>370</td>
<td>3,772.89</td>
</tr>
<tr>
<td>M27</td>
<td>550</td>
<td>5,608.35</td>
</tr>
<tr>
<td>M30</td>
<td>740</td>
<td>7,545.78</td>
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</table>
### Nominal Diameter

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Fine Screw Threads</th>
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<tbody>
<tr>
<td>M5</td>
<td>5 - 7</td>
</tr>
<tr>
<td>M6</td>
<td>8 - 11</td>
</tr>
<tr>
<td>M8</td>
<td>23 - 29</td>
</tr>
<tr>
<td>M10</td>
<td>45 - 57</td>
</tr>
<tr>
<td>M12</td>
<td>67 - 85</td>
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<tr>
<td>M14</td>
<td>106 - 134</td>
</tr>
<tr>
<td>M16</td>
<td>152 - 188</td>
</tr>
<tr>
<td>M18</td>
<td>200 - 240</td>
</tr>
<tr>
<td>M20</td>
<td>245 - 295</td>
</tr>
<tr>
<td>M22</td>
<td></td>
</tr>
<tr>
<td>M24</td>
<td></td>
</tr>
<tr>
<td>M27</td>
<td></td>
</tr>
<tr>
<td>M30</td>
<td></td>
</tr>
</tbody>
</table>

### Strength category: 8.8

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Fine Screw Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>50.99 - 71.38</td>
</tr>
<tr>
<td>M6</td>
<td>81.58 - 112.17</td>
</tr>
<tr>
<td>M8</td>
<td>234.53 - 295.71</td>
</tr>
<tr>
<td>M10</td>
<td>458.87 - 581.23</td>
</tr>
<tr>
<td>M12</td>
<td>683.20 - 866.75</td>
</tr>
<tr>
<td>M14</td>
<td>1,080.88 - 1,366.40</td>
</tr>
<tr>
<td>M16</td>
<td>1,549.94 - 1,917.04</td>
</tr>
<tr>
<td>M18</td>
<td>2,039.40 - 2,447.28</td>
</tr>
<tr>
<td>M20</td>
<td>2,498.27 - 3,008.12</td>
</tr>
<tr>
<td>M22</td>
<td></td>
</tr>
<tr>
<td>M24</td>
<td></td>
</tr>
<tr>
<td>M27</td>
<td></td>
</tr>
<tr>
<td>M30</td>
<td></td>
</tr>
</tbody>
</table>

### Strength category: 10.9

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Fine Screw Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>71.38 - 101.97</td>
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<tr>
<td>M6</td>
<td>142.76 - 183.55</td>
</tr>
<tr>
<td>M8</td>
<td>285.52 - 387.49</td>
</tr>
<tr>
<td>M10</td>
<td>591.43 - 774.97</td>
</tr>
<tr>
<td>M12</td>
<td>1,060.49 - 1,366.40</td>
</tr>
<tr>
<td>M14</td>
<td>1,427.58 - 1,917.04</td>
</tr>
<tr>
<td>M16</td>
<td>2,141.37 - 2,651.22</td>
</tr>
<tr>
<td>M18</td>
<td>2,855.16 - 3,466.98</td>
</tr>
<tr>
<td>M20</td>
<td>3,772.89 - 4,588.65</td>
</tr>
<tr>
<td>M22</td>
<td></td>
</tr>
<tr>
<td>M24</td>
<td></td>
</tr>
<tr>
<td>M27</td>
<td></td>
</tr>
<tr>
<td>M30</td>
<td></td>
</tr>
</tbody>
</table>

### Note:

The above values also apply for fine screw threads.

### Principal tightening torques

#### Tightening Torque by Model

**LM180C**

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

For thread locking adhesive, apply a mild to high-strength thread locker (ThreeBond 1322 Series Acrylic resin anaerobic adhesives).

<table>
<thead>
<tr>
<th>Portion</th>
<th>Code</th>
<th>Part name</th>
<th>Tightening Torque</th>
<th>Thread locking adhesive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front wheel</td>
<td>K00710000082</td>
<td>Bolt, with nipple hole M12-15</td>
<td>36 - 40</td>
<td>371.13 - 407.92</td>
</tr>
<tr>
<td>Wheel mounting shaft</td>
<td>K0000100252</td>
<td>Bolt, M10-25</td>
<td>29 - 38</td>
<td>295.71 - 387.49</td>
</tr>
<tr>
<td>Wheel</td>
<td>K0000080202</td>
<td>Bolt, M8-20</td>
<td>14 - 19</td>
<td>142.76 - 193.74</td>
</tr>
<tr>
<td>Steering</td>
<td>K1604120000</td>
<td>Rod end, spherical bearing LHSAL12</td>
<td>52 - 67</td>
<td>530.24 - 683.20</td>
</tr>
<tr>
<td>Handle</td>
<td>K0010060202</td>
<td>Bolt, heat-treated M6-20</td>
<td>7 - 9</td>
<td>71.38 - 91.77</td>
</tr>
<tr>
<td>Transmission pulley</td>
<td>K0010060151</td>
<td>Bolt, heat-treated M6-15</td>
<td>7 - 9</td>
<td>71.38 - 91.77</td>
</tr>
</tbody>
</table>
**Adjustment Before Operating**

### Adjustment of Seat

Use the seat adjustment lever to adjust the seat back and forth.
Adjust the position according to the operator's body size.
The adjustment lever is attached to the left of the seat.

![Adjustment of Seat](image)

1. If a gap is created between edges:
   [1] Loosen the lock nut and slightly loosen nut B.
   [2] Contact the reel cutter (cutting cylinder) and bed knife (bottom blade) slightly, then tighten nut A.

2. If the reel cutter (cutting cylinder) is too tight to turn:
   [1] Loosen the lock nut and slightly loosen nut A.
   [2] Reduce the contact pressure between the reel cutter (cutting cylinder) and bed knife (bottom blade), then tighten nut B.

3. If the blades still cannot cut well:
   Perform lapping of the reel cutter (cutting cylinder).

### Adjustment of Blade Engagement

Adjust the engagement between the reel cutter (cutting cylinder) and bed knife (bottom blade) so that newspaper (two pieces) can be cut, bringing the edges entirely into slight contact with each other by using the adjusting nuts.
Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and bed knife (bottom blade) at an angle of 90 degrees, then rotate the reel cutter (cutting cylinder) from up to down manually to check the sharpness.
Check the sharpness at entire range (three or four points from left edge to right one) of the reel cutter (cutting cylinder).

![Adjustment of Blade Engagement](image)
**Adjustment of Cutting Height**

**Important**

The front wheel is provided to prevent the reel cutter (cutting cylinder) from damaging a convex portion of the lawn surface. Adjust the height so that the front wheel will not be grounded but raised by 10-20mm off the ground.

The cutting height is adjusted by moving the roller up or down. Refer to the cutting height scale plate to decide the height.

1. To increase cutting height:
   - Loosen nut A, lower the roller, then tighten nut B.
2. To decrease cutting height:
   - Loosen nut B, raise the roller, then tighten nut A.

---

**Procedure to Start / Stop Engine**

**Start / Stop of Engine**

**Procedure to Start Engine**

1. Sit on the seat.
2. Make sure that you have depressed the brake pedal and pulled the parking brake lever.
3. Move the traveling clutch lever, reel rotation lever and change lever to the neutral position.
4. Open the fuel cock.
   - The fuel cock is located under the fuel tank.
5. Slightly move the throttle lever from the slow-speed side to the high-speed side.
6. Pull the choke knob.
   - Pull the choke knob half way for restarting, as necessary.
7. Turn on the engine switch, then pull the recoil starter knob.
8. Make sure that you have depressed the brake pedal and engaged the parking brake lever.
9. Engage the throttle lever at low speed to warm up the engine for 1-2 minutes.
10. Gradually move the throttle lever to the high-speed side.

**Procedure to Stop Engine**

1. Depress the brake pedal, and then pull the parking brake lever.
2. Move the traveling clutch lever, reel rotation lever and change lever to the neutral position.
3. Move the throttle lever to the slow-speed position, and continue idling for 1-2 minutes.
4. Turn off the engine switch.
5. Close the fuel cock.
   - The fuel cock is located under the fuel tank.

**Safety Mechanisms**

This machine has the safety device for starting / stopping engine.

1. As for starting the engine, the safety device prevents the engine from starting unless it meets each of the following three conditions.
   - An operator is sitting on the seat.
   - The parking brake lever is pulled.
   - The traveling clutch lever is in the "OFF" position.
2. In the case that the operator leaves the seat with the engine running, the safety device
makes the engine stop unless it meets each of the following two conditions.
- The parking brake lever is pulled.
- The traveling clutch lever is in the "OFF" position.

**Operation of Each Section**

**Precautions for Operating the Machine**

**Caution**

- Drive the machine at such a speed that you can stop it immediately for emergencies.

**Cautions for when You Leave the Machine**

**Caution**

- If the brake feels soft or ineffective, use the wheel stoppers to secure the machine.

**Instruction Decals**

![Instruction Decals](image)

<table>
<thead>
<tr>
<th>1</th>
<th>Diff-lock pedal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Brake pedal</td>
</tr>
<tr>
<td>3</td>
<td>Traveling clutch lever</td>
</tr>
<tr>
<td>4</td>
<td>Traveling clutch &quot;OFF&quot;</td>
</tr>
<tr>
<td>5</td>
<td>Traveling clutch &quot;ON&quot;</td>
</tr>
<tr>
<td>6</td>
<td>Reel rotation lever (Left and right mower units)</td>
</tr>
<tr>
<td>7</td>
<td>Reel cutter (cutting cylinder) &quot;STOP&quot;</td>
</tr>
<tr>
<td>8</td>
<td>Reel cutter (cutting cylinder) &quot;ROTATE&quot;</td>
</tr>
</tbody>
</table>

**Operation of Throttle Lever**

The throttle lever is located to the right of the steering handle and enables you to adjust the engine rpm.

Move the throttle lever toward the rabbit icon (High) to increase the engine rpm, and toward the turtle icon (Low) to reduce the rpm.

**Note:**

The factory default engine rpm is set to 1,800 rpm.

**Lifting Lever (for right/left mowers)**

**Caution**

If the reel rotation lever is set to "On," you will be unable to raise the mower units.

For lowering the left and right mower units, move the lifting lever down slowly with gripping the clutch lever.

To raise the left and right mower units, raise the lifting lever slowly until the hook metal fitting is secured by the hook.
Lifting Lever (for rear mower)

For lowering the rear mower units, move the lifting lever down slowly with gripping the clutch lever.

To raise the rear mower units, raise the lifting lever slowly, and then engage it fully forward.

Operation of Change Lever

Caution
Do not change the lever position during traveling. Otherwise, the transmission may be damaged.

The change lever is a transmission device. It was adapted from a direct change system. To change the speed, park the machine on level ground, and then engage the lever in the desired position.

Operation of Traveling Clutch Lever

Caution
Be sure not to engage the throttle lever quickly to the rabbit icon position (High), for avoiding the sudden acceleration.

To prevent sudden acceleration, pull the traveling clutch lever slowly. Start the machine while allowing the belt to slip in the same way as clutch-slipping.
Operation of Reel Rotation Lever

**Caution**

Unless both left and right mower units have been lowered all the way, you are not able to operate the reel rotation lever.

To rotate the reel cutter (cutting cylinder) for the left and right mower units, pull the reel rotation lever.

---

**Operation of Brake Pedal**

The brake pedal is located in the right foot area. In order to stop the machine, depress the brake pedal with your right foot until the pedal hits the pedal stopper.

**Operation of Diff-lock Pedal**

The diff-lock pedal is located in the left foot area. If you press the diff-lock pedal, the differential device is locked to enhance linearity, thus preventing slipping.

**Operation of Parking Brake Lever**

The parking brake lever is located on the left side of the saddle.
To park the machine, pull the parking brake lever completely.
To release the parking brake, press the push button while lowering the parking brake lever all the way to its resting position.

---

**Travel of Machine**

**Operating Procedure**

1. Before starting the engine, check the following points.
   - The left and right mower units must be raised, and the arm stopper must be secured.
   - The rear mower must be raised, the hook metal fitting must be secured, and the rear mower lifting lever must be fully forward and horizontal.
   - An operator must be sitting on the seat.
   - The parking brake lever must have been pulled.
   - The change lever must be in the neutral position.
   - The traveling clutch lever must be in the "OFF" position.

2. Start the engine.

3. Depress the brake pedal, and return the parking brake lever to its resting position.

4. Shift the change lever in the appropriate position.

5. Slowly pull the traveling clutch lever in the same way as clutch-slipping.

6. The machine can be operated.
Procedure for Cutting

1. Before starting the engine, check the following points.
   - An operator must be sitting on the seat.
   - The parking brake lever must have been engaged.
   - The change lever must be in the neutral position.
   - The traveling clutch lever must be in the "OFF" position.
2. Start the engine.
3. Lower the left, right and rear mower units.
4. Pull the reel rotation lever.
5. Depress the brake pedal, and return the parking brake lever to its resting position.
6. Shift the change lever in the appropriate position.
7. Slowly pull the traveling clutch lever in the same way as clutch-slipping.
8. When the machine is started, the reel cutters (cutting cylinders) start rotating and start to cut grasses.
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- About the Lubrication ................................ 9-6
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- Before Long-Term Storage ....................... 9-15
Follow the maintenance schedule below.

Use tools appropriate for each maintenance operation.

- ● ● Inspect, adjust, supply, clean
- ○ ● Replace (first time)
- ‡ ● Replace

<table>
<thead>
<tr>
<th>Maintenance Item</th>
<th>Before work</th>
<th>After work</th>
<th>Every 8hrs.</th>
<th>Every 50hrs.</th>
<th>Every 100hrs.</th>
<th>Every 200hrs.</th>
<th>Every 250hrs.</th>
<th>Every 400hrs.</th>
<th>Every 500hrs.</th>
<th>Every year</th>
<th>Every 2 years</th>
<th>Every 4 years</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>Engine</td>
<td></td>
<td></td>
<td></td>
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<td>Tightening the parts</td>
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<td>Greasing, oiling</td>
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<td>Oil leakage</td>
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</table>
### Maintenance Schedule

<table>
<thead>
<tr>
<th>Maintenance Item</th>
<th>Before work</th>
<th>After work</th>
<th>Every 8hrs.</th>
<th>Every 50hrs.</th>
<th>Every 100hrs.</th>
<th>Every 200hrs.</th>
<th>Every 250hrs.</th>
<th>Every 400hrs.</th>
<th>Every 500hrs.</th>
<th>Every year</th>
<th>Every 2 years</th>
<th>Every 4 years</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Hydraulic oil</td>
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<td>100hrs (first time)</td>
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<tr>
<td>Hydraulic oil filter</td>
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<td>100hrs (first time)</td>
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<td>50hrs (first time)</td>
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<td>Power unit oil</td>
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<td>50hrs (first time)</td>
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<td>Hydraulic tube (moving part)</td>
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<td>Electromagnetic pump filter</td>
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<td>Fuel strainer</td>
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<tr>
<td>Cleaning the surface</td>
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</tbody>
</table>

The values for consumables are not guaranteed.

### Maintenance Precautions

**Caution**

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

### Specified Values for Maintenance

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Fuel tank capacity</td>
<td>6.0 dm³ (6.0 L)</td>
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<tr>
<td>Transmission oil capacity</td>
<td>2.0 dm³ (2.0 L)</td>
</tr>
<tr>
<td>Transmission gear oil #90</td>
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</tr>
<tr>
<td>Quantity of engine oil</td>
<td>1.2 dm³ (1.2 L)</td>
</tr>
<tr>
<td>Front tire</td>
<td>200 kPa (2.0 kgf/cm²)</td>
</tr>
<tr>
<td>Rear tire</td>
<td>80 kPa (0.8 kgf/cm²)</td>
</tr>
<tr>
<td>Diff-lock wire</td>
<td>Create a slight play</td>
</tr>
<tr>
<td>Summer: SAE30, Winter: SAE20</td>
<td></td>
</tr>
<tr>
<td>4.00 - 5</td>
<td></td>
</tr>
<tr>
<td>18 x 8.50 - 8</td>
<td></td>
</tr>
</tbody>
</table>
Brake pedal | Clearance between pedal stopper and brake pedal | 5 - 7 mm
Traveling clutch | Clearance between rod-tension metal fitting and collar | 5 mm
Reel rotation lever | Clearance between rod-tension metal fitting and collar | 5 mm
Left and right mowers | Clearance between collar and mower lifting arm | 1 mm
Transmission | Belt slack | Approximately 10mm/98N (10kgf)
Rear mower tension | Clearance of spring | 1 mm
Rear mower | Belt slack | Approximately 10mm/98N (10kgf)
Left / right mower stopper | Angle against the frame | 90
Wire to hook the rear mower | The hook metal fitting should contact with the lever mounting bracket slightly.
Wire to hook the left / right mower | The hook metal fitting should contact with the bottom of the hook. | Create a slight play

### Main Consumable Parts

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Code</th>
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<tbody>
<tr>
<td>Air cleaner element</td>
<td>K27400000030</td>
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<td>V-belt OLB58</td>
<td>K2342058000</td>
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<td>V-belt OLB66</td>
<td>K2342066000</td>
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<tr>
<td>V-belt GLB49A-4</td>
<td>K2344049000</td>
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<td>V-belt OLB41</td>
<td>K2342041000</td>
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<td>V-belt GLA29A-4</td>
<td>K2324029000</td>
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<td>Throttle wire</td>
<td>K1110135000</td>
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<td>Reel rotation wire</td>
<td>K1160090000</td>
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<tr>
<td>Brake shoe</td>
<td>P2150-001304</td>
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<tr>
<td>Brake wire</td>
<td>K1120085010</td>
</tr>
<tr>
<td>Wire to hook the rear mower</td>
<td>K1170107000</td>
</tr>
<tr>
<td>Wire to hook the left / right mower</td>
<td>K1170051200</td>
</tr>
</tbody>
</table>

### Jacking up the machine

#### About the 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.

Use the jack-up points identified in this manual when jacking up the machine. Only place a jack under the jack-up points specified. Placing a jack at any other point could result in damage to the frame or other parts.
Jacking up the machine

1. Front axle, center

2. Front axle, right

3. Front axle, left

4. Transmission case, lower

5. Transmission axle case, left
Lubrication

About the Lubrication

The moving parts of this machine need to be lubricated as a lack of grease on such parts could cause them to seize or be damaged. Grease the moving parts according to the maintenance schedule.

Greasing Points

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

<table>
<thead>
<tr>
<th>Portion</th>
<th>No. of Greasing Points</th>
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</thead>
<tbody>
<tr>
<td>1 Front wheels</td>
<td>2</td>
</tr>
<tr>
<td>2 Front wheel front pin</td>
<td>1</td>
</tr>
<tr>
<td>3 Reel housing</td>
<td>6</td>
</tr>
<tr>
<td>4 Mower frame</td>
<td>2</td>
</tr>
<tr>
<td>5 Mower lifting arm</td>
<td>2</td>
</tr>
<tr>
<td>6 Diff-lock pedal</td>
<td>1</td>
</tr>
<tr>
<td>7 Handle tension</td>
<td>5</td>
</tr>
<tr>
<td>8 Brake pedal</td>
<td>1</td>
</tr>
<tr>
<td>9 Rear mower oscillating metal part</td>
<td>1</td>
</tr>
<tr>
<td>10 Rear roller</td>
<td>6</td>
</tr>
<tr>
<td>11 Mower tension</td>
<td>2</td>
</tr>
</tbody>
</table>

1. Front wheels
There is one point each on the left and the right wheel.

2. Front wheel front pin
3. Reel housing
   There is one point each on the left and the right of each unit.

4. Mower frame
   There is one point each on the left and the right mower units.

5. Mower lifting arm
   There is one point each on the left and the right mower units.

6. Diff-lock pedal
   Supply automobile transmission gear oil #90 every 50 hours of operation.

7. Handle tension
   Supply automobile transmission gear oil #90 every 50 hours of operation.

8. Brake pedal
9. Rear mower oscillating metal part

10. Rear roller
   There is one point each on the left and the right of each unit.

11. Mower tension

---

Maintenance (Mower)

Lapping of Reel Cutter (Cutting Cylinder)

Lapping is work similar to sharpening a cooking knife. If the edges of the reel cutter (cutting cylinder) and bed knife (bottom blade) become blunt and make cutting difficult, both the reel cutter (cutting cylinder) and bed knife (bottom blade) should be simultaneously sharpened by reversing the reel cutter (cutting cylinder) with an abrasive paste applied. However, lapping is a temporary measure and would not restore the sharpness completely. If the edges of the reel cutter (cutting cylinder) and bed knife (bottom blade) become blunt and difficult to cut, follow the steps below to perform lapping.

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

**Caution**
Do not perform lapping with any other persons.

1. Have the following items ready: Lapping machine [Baroness RM20B], Strips of newspaper, Abrasive [Lapping powder mixed with abrasive; or gel compound (Baroness genuine abrasive)], Brush, 27 socket wrench.
1. Newspaper
2. Lapping powder
3. Gel compound
4. Brush
5. 27 socket wrench

Note:
Mixing ratio for abrasive in volume is one part lapping powder to three or four parts oil.

Caution
Before cutting newspaper as a test, be sure to stop the engine and wear gloves to protect your hands. Pay attention not to let the reel cutter (cutting cylinder) to catch your gloves. Otherwise, you will injure your hand or fingers.

Important
After cutting grass, adjust the engagement of the blades, before checking the sharpness of the blade.

2. Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and bed knife (bottom blade) at an angle of 90 degrees, then rotate the reel cutter (cutting cylinder) from up to down manually to check the sharpness.
3. Check the sharpness at entire range (three or four points from left edge to right one) of the reel cutter (cutting cylinder).
4. Using a piece of chalk, mark locations on the blade that are sharp.
5. Lower the mower unit, then using the 27 socket wrench, connect the lapping machine and the shaft of reel cutter (cutting cylinder).
6. Turn on the switch of the lapping machine to rotate the reel cutter (cutting cylinder) in the direction opposite to the cutting direction.
7. Apply the abrasive evenly with the brush on the top side of reel cutter (cutting cylinder) where the newspaper was cut well or of chalk-marked locations.
8. Idle the machine for a while, and then switch off the lapping machine to stop rotation when contact noise is no longer heard.
9. Wash off or wipe off with cloth the abrasive from the reel cutter (cutting cylinder), then check it for sharpness.
10. Repeat steps 2 to 9 until the entire range (three or four points from left edge to right one) of the reel cutter (cutting cylinder) will be uniformly sharpened.
11. Finally, apply the abrasive on the entire range of the reel cutter (cutting cylinder) and perform final lapping.
12. Stop the rotation of the reel cutter (cutting cylinder), and then wash off the abrasive using a washer.
13. While checking the blade for sharpness, adjust blade engagement.

Maintenance (Main Body)

Removing/Installing Tires

Front Tires
Follow the steps below to remove the front tires:
1. Loosen the bolts.

2. Place the tire jack beneath the jack-up point of the front axle area securely, then raise it until the tire lifts off the ground. (See .)
3. Remove the bolts.
4. Remove the tire from the wheel mounting shaft.

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

Important
Tighten the bolts in the tightening order (crosswise).
For installing the front tires, reverse the removing procedure.

Rear Tires

Follow the steps below to remove the rear tires:

1. Loosen the bolts.
2. Place the tire jack beneath the jack-up point of the rear wheel transmission area securely, then raise it until the tire lifts off the ground. (See .)
3. Remove the bolts.
4. Remove the tire from the wheel mounting shaft.

**Caution**

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

**Important**

Tighten the bolts in the tightening order (crosswise).

For installing the rear tires, reverse the removing procedure.

**Adjustment of Belt Tension**

**Caution**

Be sure to stop the engine before adjusting the belts.

Excessive belt tension will damage bearings or break shafts. If belts are excessively loose, slippage and belt damage will result, or the reel rotation and operation speed will not be high enough for cutting.

Always check the belt for appropriate tension. V-belts are attached in the following locations:

1. Traveling clutch
   1. Loosen the adjusting bolt, then change the length of the rod.
   2. Adjust the clearance between the rod-tension metal fitting and the collar to be 5mm, when the traveling clutch lever is engaged.
   3. Tighten the adjusting bolt and make sure that the collar is fixed securely.

2. Reel rotation lever
   1. Loosen the adjusting bolt, then change the length of the rod.

**Adjustment of Belt Tension_001**

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Traveling clutch</td>
</tr>
<tr>
<td>2</td>
<td>Reel rotation lever</td>
</tr>
<tr>
<td>3</td>
<td>Left and right mower units</td>
</tr>
<tr>
<td>4</td>
<td>Transmission</td>
</tr>
<tr>
<td>5</td>
<td>Rear mower tension</td>
</tr>
<tr>
<td>6</td>
<td>Rear mower unit</td>
</tr>
</tbody>
</table>

**Adjustment of Belt Tension_002**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Adjusting bolt</td>
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<tr>
<td>2</td>
<td>Rod</td>
</tr>
<tr>
<td>3</td>
<td>Traveling clutch lever</td>
</tr>
<tr>
<td>4</td>
<td>Rod-tension metal fitting</td>
</tr>
<tr>
<td>5</td>
<td>Collar</td>
</tr>
</tbody>
</table>
[2] Adjust the clearance between the rod-tension metal fitting and the collar to be 5mm, when the traveling clutch lever is engaged.

[3] Tighten the adjusting bolt and make sure that the collar is fixed securely.

3. Left and right mower units

[1] V-belts are always stretched at a constant tension by the springs. Loosen the adjusting bolt, then adjust the clearance between the collar and the more lifting arm to be 1mm.

[2] Tighten the adjusting bolt and make sure that the collar is fixed securely.

[3] Follow the same steps to adjust the belts on the mower on the opposite side.

4. Transmission

[1] Loosen adjusting nut A.

[2] Tighten adjusting nut B, then change the length of the rod.

[3] Adjust the V-belt tension so that the belt slacks by approximately 10mm when you press the middle of the belt with your finger at 98N (10kgf).

[4] Tighten adjusting nut A and make sure that the rod is fixed securely.

5. Rear mower tension

[1] Loosen adjusting nut A.

[2] Tighten adjusting nut B, then change the length of the rod.

[3] Lower the rear mower unit on a level surface, then adjust the clearance of the spring to 1mm.
Adjustment of Parking Brake

If the parking brake is not effective enough when you pull the parking brake lever, adjust the brake wire.

1. While pressing the push button, return the parking brake lever to its resting position to release the parking brake.
2. Loosen the nut on the parking brake lever side.
3. Move the wire adjustment bracket toward the rear to increase the wire tension.
4. Tighten the nut securely to fix the wire adjustment metal fitting.
5. Make sure that the brake is applied properly when you pull the parking brake lever, and that there is no brake dragging when you release the parking brake lever.

6. Rear mower unit

[1] Loosen adjusting nut A.

[2] Tighten adjusting nut B, then change the length of the rod.

[3] Adjust the V-belt tension so that the belt slacks by approximately 10mm when you press the middle of the belt with your finger at 98N (10kgf).

[4] Tighten adjusting nut A and make sure that the rod is fixed securely.
Adjustment of Parking Brake

1. Pull the parking brake lever completely and make sure that the brake is effectively applied.
2. Loosen the lock nut.
3. Remove the cotter pin, washer and pin that affix the brake pedal to the front of the brake rod.
4. Screw in the nut on the front of the brake rod, then temporarily affix the brake pedal to the front of the brake rod using the pin.
5. Depress the brake pedal lightly, and adjust the clearance between the pedal stopper and brake pedal to 5-7mm. (If the clearance is larger than 7mm, the brake may be damaged.)
6. Affix the brake pedal to the front of the brake rod securely using the pin.
7. Tighten the lock nut to secure the front of the brake rod firmly.
8. Make sure that the brake is not applied any longer when you release the brake pedal.

Note:
You can also adjust the brake wire on the transmission side.

Adjustment of Brake

If the brake is not applied effectively even if you depress the pedal up to the stopper, adjust the brake rod.

1. Pull the parking brake lever completely and make sure that the brake is effectively applied.
2. Loosen the lock nut.
3. Remove the cotter pin, washer and pin that affix the brake pedal to the front of the brake rod.
4. Screw in the nut on the front of the brake rod, then temporarily affix the brake pedal to the front of the brake rod using the pin.
5. Depress the brake pedal lightly, and adjust the clearance between the pedal stopper and brake pedal to 5-7mm. (If the clearance is larger than 7mm, the brake may be damaged.)
6. Affix the brake pedal to the front of the brake rod securely using the pin.
7. Tighten the lock nut to secure the front of the brake rod firmly.
8. Make sure that the brake is not applied any longer when you release the brake pedal.

Adjustment of Diff-lock Wire

If the diff-lock seems ineffective when you depress the diff-lock pedal, adjust the diff-lock wire.

1. Make sure that the diff-lock pedal has completely returned to its resting position.
2. Loosen the nut on the transmission side.
3. Loosen the wire adjustment bracket upward to increase the wire tension.
4. Adjust the wire so that the diff-lock wire and the diff-lock lever show a little play when the lever returns to its resting position under spring tension.

5. Tighten the nut and fix the wire adjustment bracket completely.

**Adjustment of Diff-lock Wire_001**

1. Transmission
2. Nut
3. Wire adjustment bracket
4. Wire
5. Spring
6. Diff-lock lever

**Adjustment of Mower Stopper_001**

1. Nut
2. Wire adjustment bracket
3. Mower stopper
4. Frame
5. Spring
6. Left mower lifting arm
7. Right mower lifting arm

**Adjustment of Wire to hook the left / right mower**

1. Loosen the nuts and move the wire adjustment metal fitting toward the outside of the machine to increase the wire tension.
2. Without gripping the lever, raise the right mower unit, then make adjustment so that the hook metal fitting will be in touch with the bottom of the hook and the wire will have a small play.
3. Tighten the nuts and affix the wire adjustment metal fitting securely.
4. Follow the same steps to adjust the the wire of left mower.

**Note:**
You can also adjust the diff-lock wire on the pedal side.

**Adjustment of Mower Stopper**

1. Lower the left and right mower units, then engage the reel rotation lever.
2. Loosen the nut, then adjust the position of the wire adjustment bracket so that the mower stopper will be positioned at 90 degrees against the frame.
3. Tighten the nut securely to fix the wire adjustment bracket.
4. Make sure that the mower stopper will spring back when you release the reel rotation lever.
Adjustment of Wire to hook the rear mower

1. Loosen the nuts and move the wire adjustment metal fitting toward the center of the machine to increase the wire tension.
2. Lower the rear mower unit, then adjust the hook metal fitting to come into contact slightly with the lever mounting bracket when you grip the lever completely.
3. Tighten the nuts and affix the wire adjustment metal fitting securely.
4. When the hook metal fitting returns to its original position by spring tension as soon as you release the lever, raise the rear mower lifting arm and make sure that the hook metal fitting is located closer to the center of the machine than the upper tip of the hook.

Inspection of Oil Leakage
After approximately 50 hours of operation, some joints may be loosened and oil may leak. Check the bottom of the machine for oil leakage.

Long-Term Storage
Before Long-Term Storage
- Remove any dirt, grass, debris, or oil stains completely.
- Supply oil and apply grease to appropriate parts.
EC Declaration of Conformity

We

Manufacture's Name:    Kyoeisha Co., Ltd.
Manufacture's Address: 1-26 Miyuki-cho, Toyokawa, Aichi-pref. 442-8530 Japan

declare that

Product:                  Ride-on Lawnmower
Make:                     BARONESS
Type:                     LM'80C
Starting Serial No.:      15081

compiler of the technical file

Name:                     Kyoeisha U.K., Ltd.
Address:                  Unit 5 Hatch Industrial Park Grewell Road, Basingstoke
                         Hampshire RG24 7NG, the United Kingdom

in accordance with the following Directives:

2006/42/EC        The Machinery Directive and its amending directives

has been designed and manufactured using the following specifications:

ISO12100 : 2010
EN836 : 1997   
ISO5395 : 1990

References of other Community Directives applied
   2000/14/EC   , 2004/108/EC

Place:    Japan                      Signature:  
Date:     June 6, 2011           Name:    Masahisa Nakazawa
                      Position: Quality Dept. Manager
Manufacturer's Declaration of Conformity for

Product Identification
Product: Ride-on lawnmower
Make: BARONESS
Type: LM180
Version(s): C
Starting Serial No.: 15006
Measured Sound Power Level: LWA 102.51 dB
Guaranteed Sound Power Level: LWA 105 dB
Manufacturer
Name: Kyoeisha Co., Ltd.
Address: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Technical Documentation
Keeper's Name: Kyoeisha Co., Ltd.
Keeper's Address: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan


Involved Notified Body
Name: SNCH
Address: 11, Route de Sandweiler
5230 Sandweiler
Luxembourg

Technical Construction File
Date: February 28, 2011
Technical Construction File No.: TC180-00
Test Laboratory TUV Rheinland Luxemburg GmbH
2a, Kalchesbruck
L-1852 Luxembourg

Certificate / Report No.: SNCH*2000/14*2005/88*1850*00/TC180-00

Means of conformity
The product is in conformity with the Directive relating to the noise emission in the environment by equipment for use outdoors 2000/14/EC-2005/88/EC, in accordance with Article 12 of the Directive.

References of other Community Directives applied
2006/42/EC, 2004/108/EC

Signature:

Masahisa Nakazawa
Manager
Quality Dept.
Kyoeisha Co., Ltd.

Date: March 24, 2011