"Required reading"
Read this manual before using the machine.
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 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 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 a Baroness dealer or Kyoeisha. 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.

Kyoeisha Co., Ltd.

Warning Symbols

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

![Warning symbol](image)

This symbol indicates the articles regarding “Danger,” “Warning,” or “Caution.” Those articles describe important safety precautions and so read them carefully to understand completely before operating the machine. Failure to adequately follow these safety precautions may cause an accident.

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

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

- **Caution**
  This symbol indicates that injury or damage to property may occur if the warning is ignored.

- **Important**
  This symbol indicates precautions on the mechanism of the machine.
Introduction

Precautionary Statement

⚠️ Caution

The information described in this manual is subject to change for improvement without prior notice.
When replacing parts, be sure to use genuine Baroness parts or parts designated by Kyoeisha.
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 leveling bunkers at golf courses.
Do not use this product in any other way than its intended purpose, and do not modify the product.
Operating this product for other purposes and modifying it may be very dangerous and may cause damage to the machine.
In addition, this product is not authorized for operation as a special motor vehicle. Do not operate it on public roads.
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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 manual 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. You can find additional safety information where needed throughout this manual.
8. 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 safety perform the job.
   - Only use accessories and attachments approved by the manufacturer.
2. While operating, always wear substantial footwear, long trousers, hard hat, safety glasses, and ear protection.
   - Long hair, loose clothing, or jewelry may get tangled in moving parts.
   - Do not operate the equipment when barefoot or wearing open sandals.
3. Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.
4. 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**

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.
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.

Replace all fuel tanks and container caps securely.

Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

If the brake operation is faulty, be sure to adjust or repair them before operating the machine.

Replace faulty mufflers.

Operation

1. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.

2. Only operate in good light, keeping away from holes and hidden hazards.

3. Before attempting to start the engine, disengage all attachments, shift into neutral, and engage the parking brake. Only start engine from the operator's position.

Use seat belts if provided.

4. Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care.

To guard against overturning:

1. Do not stop or start suddenly when going up or downhill.

2. Engage clutch slowly, always keep machine in gear, especially when traveling downhill.

3. Machine speeds should be kept low on slopes and during tight turns.

4. Stay alert for humps and hollows and other hidden hazards.

5. Never operate across the face of the slope, unless the machine is designed for this purpose.

6. Never drive the machine on a slope with an angle of gradient that is greater than that specified or in a place where there is a danger of the machine slipping.

5. 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 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. Change into neutral and set the parking brake.

3. Stop the engine and remove the key.

9. Stop the engine, and remove the ignition key in the following conditions.

1. Before refueling.

2. Before making height adjustment unless adjustment can be made from the operator's position.

3. Before checking, cleaning or working the machine.

4. 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. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while backing.

11. Do not carry passengers.

12. Never operate while people, especially children, or pets are nearby.

13. Slow down and use caution when making turns and crossing roads and sidewalks.

14. Do not operate the machine under the influence of alcohol or drugs.

15. 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 loading ramp, select one with sufficient strength, length, and width and that will not cause the machine to slip.

16. Close the fuel valve before transporting the machine.

17. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

18. Do not take your eyes off the road ahead. Do not operate the machine with no hands.

19. 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.

20. Do not operate the machine when there is the risk of lightning.

**Maintenance and Storage**

1. Disengage drives on level ground, set parking brake, stop engine and remove key from ignition. Wait for all movement to stop before adjusting, cleaning or repairing.

2. To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment fuel storage area, attachments and drives free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.

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

4. Only cover the machine with a sheet after hot parts have sufficiently cooled down.

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

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

7. Do not store fuel near flames.

8. Never allow untrained personnel to service machine.

9. Allow the engine/muffler to cool before checking/maintenance.

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

11. Use jack stands to support components when required.

12. Carefully release pressure from components with stored energy.

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

14. 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.

15. When checking the hydraulic circuit for pinhole leaks or oil leakage from nozzles, do not use your hands. Use items such as paper or corrugated cardboard to find leakage points. Be extremely careful with high-pressure oil as it may pierce your skin, result. If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

16. Disconnect battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.

17. Make sure that parts such as wires are not touching each other and that their covers have not come off.

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

19. 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.

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

21. Keep all nuts, bolts and screws tight. Be sure the equipment is in safe working condition.

22. If the fuel tank has to be drained, do this outdoors.
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Recycle and Waste Disposal

About Recycle

Recycling battery etc. is recommended for environmental conservation and economical use of resources.
It may be required by local laws.

About Waste Disposal

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

### Model

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<tr>
<th>Model</th>
<th>SP05A (2WD)</th>
<th>SP05A (3WD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total length with Rake and Blade</td>
<td>84.65 in</td>
<td>215 cm</td>
</tr>
<tr>
<td>with Blade</td>
<td>90.55 in</td>
<td>230 cm</td>
</tr>
<tr>
<td>Total width</td>
<td>74.80 in</td>
<td>190 cm</td>
</tr>
<tr>
<td>Total height</td>
<td>47.24 in</td>
<td>120 cm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine (empty fuel tank) with Rake</td>
<td>987.65 lb</td>
<td>448 kg</td>
</tr>
<tr>
<td>Blade</td>
<td>55.11 lb</td>
<td>25 kg</td>
</tr>
<tr>
<td>Cultivator</td>
<td>41.89 lb</td>
<td>19 kg</td>
</tr>
<tr>
<td>Finishing brush</td>
<td>23.37 lb</td>
<td>10.6 kg</td>
</tr>
<tr>
<td>Minimum turning radius</td>
<td>133.46 in</td>
<td>339 cm</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>Vanguard 356447</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Air-cooled 4-cycle gasoline engine</td>
<td></td>
</tr>
<tr>
<td>Total displacement</td>
<td>34.78 cu.in.</td>
<td>570 cm³ (0.57 L)</td>
</tr>
<tr>
<td>Maximum output</td>
<td>13.2 kW (18.0 PS)/3,600 rpm</td>
<td></td>
</tr>
<tr>
<td><strong>Fuel tank capacity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasoline</td>
<td>3.96 U.S.gal.</td>
<td>Gasoline 15.0 dm³ (15.0 L)</td>
</tr>
<tr>
<td><strong>Fuel consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>228 g/PS・h (rated output)</td>
<td>310 g/kW・h (rated output)</td>
<td></td>
</tr>
<tr>
<td><strong>Engine oil capacity</strong></td>
<td>0.42 U.S.gal.</td>
<td>1.6 dm³ (1.6 L)</td>
</tr>
<tr>
<td><strong>Coolant volume</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic tank capacity</strong></td>
<td>3.96 U.S.gal.</td>
<td>15.0 dm³ (15.0 L)</td>
</tr>
<tr>
<td><strong>Operating width</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rake</td>
<td>74.80 in</td>
<td>190 cm</td>
</tr>
<tr>
<td>Blade</td>
<td>31.50 in</td>
<td>80 cm</td>
</tr>
<tr>
<td>Cultivator</td>
<td>45.67 in</td>
<td>116 cm</td>
</tr>
<tr>
<td>Finishing brush</td>
<td>76.77 in</td>
<td>195 cm</td>
</tr>
<tr>
<td><strong>Drive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traveling</td>
<td>HST 2WD [3WD(2WD/3WD selectable)]</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Speed (HST)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward</td>
<td>0 - 9.94 mph</td>
<td>0 - 16.0 km/h</td>
</tr>
<tr>
<td>Reverse</td>
<td>0 - 3.73 mph</td>
<td>0 - 6.0 km/h</td>
</tr>
<tr>
<td><strong>Speed (Mechanical)</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Maximum inclination for operation</strong></td>
<td>15 degrees</td>
<td></td>
</tr>
<tr>
<td><strong>Tire size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>PD21 x 11.00 - 10</td>
<td></td>
</tr>
<tr>
<td>Rear wheel</td>
<td>25 x 13.00 - 9</td>
<td></td>
</tr>
<tr>
<td><strong>Tire pneumatic pressure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel</td>
<td>10.15 psi</td>
<td>70 kPa (0.7 kgf/cm²)</td>
</tr>
<tr>
<td>Rear wheel</td>
<td>5.80 psi</td>
<td>40 kPa (0.4 kgf/cm²)</td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>46B19R</td>
<td></td>
</tr>
</tbody>
</table>
The factory default maximum engine rpm is 3,000 rpm.

**Sound Pressure Level**

Sound Pressure Level

This machine was confirmed to have a continuous A-weighted sound pressure level of 84 dB by measuring identical machines in accordance with the procedure specified in ISO5395-1:2013.

**Sound Power Level**

Sound Power Level

This machine was confirmed to have a sound power level of 98 dB by measuring identical machines in accordance with the procedure specified in ISO5395-1:2013.

**Vibration Level**

Hand-Arm Vibration

This machine was confirmed not to exceed a vibration level of 2.5 m/s\(^2\) to hands and arms by measuring identical machines in accordance with the procedure specified in ISO 5395-1:2013.

Whole Body Vibration

This machine was confirmed not to exceed a vibration level of 0.5 m/s\(^2\) to the whole body by measuring identical machines in accordance with the procedure specified in ISO 5395-1:2013.

**Carbon Dioxide (CO\(_2\)) Emissions Measurement**

For CO\(_2\) emissions measurement on the engine of this machine, refer to the engine's owner's manual.
### Names of Each Section

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
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<tr>
<td>1</td>
<td>Steering wheel</td>
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<tr>
<td>2</td>
<td>Front cover</td>
</tr>
<tr>
<td>3</td>
<td>Blade (option)</td>
</tr>
<tr>
<td>4</td>
<td>Front tire</td>
</tr>
<tr>
<td>5</td>
<td>Traveling pedal</td>
</tr>
<tr>
<td>6</td>
<td>Oil gauge</td>
</tr>
<tr>
<td>7</td>
<td>Cultivator (option)</td>
</tr>
<tr>
<td>8</td>
<td>Rear tire</td>
</tr>
<tr>
<td>9</td>
<td>Air cleaner</td>
</tr>
<tr>
<td>10</td>
<td>2WD/3WD selector lever (3WD specifications)</td>
</tr>
<tr>
<td>11</td>
<td>Brake pedal</td>
</tr>
<tr>
<td>12</td>
<td>Tilt lever</td>
</tr>
<tr>
<td>13</td>
<td>Throttle lever</td>
</tr>
<tr>
<td>14</td>
<td>Up/down lever</td>
</tr>
<tr>
<td>15</td>
<td>Fuel filler</td>
</tr>
<tr>
<td>16</td>
<td>Broom holder</td>
</tr>
<tr>
<td>17</td>
<td>Rear cover</td>
</tr>
<tr>
<td>18</td>
<td>Fuel cock</td>
</tr>
<tr>
<td>19</td>
<td>Finishing brush (option)</td>
</tr>
</tbody>
</table>

### Regulation Decals

#### Positions of Regulation Decals

<table>
<thead>
<tr>
<th>No.</th>
<th>Decal</th>
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<tbody>
<tr>
<td>A</td>
<td>Serial number plate</td>
</tr>
<tr>
<td>B</td>
<td>Specification decal</td>
</tr>
<tr>
<td>C</td>
<td>UKCA mark</td>
</tr>
<tr>
<td>D</td>
<td>Year of manufacture decal</td>
</tr>
<tr>
<td>E</td>
<td>Battery capacity decal</td>
</tr>
<tr>
<td>F</td>
<td>Recycle decal</td>
</tr>
</tbody>
</table>

---

Page 3-4 Names of Each Section
Description of Regulation Decals

Serial Number Plate

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

Specification Decal

(For Europe)
CE mark indicates that the machine sold in the EU nations complies with the EU requirements.
The Specification decal indicates the CE marking, model, and weight, etc.

UKCA Mark

(For UK)
UKCA mark indicates that the machine sold in the UK complies with the UK requirements.

Year of Manufacture Decal

(For Europe)
The year of manufacture decal indicates the year when this machine was manufactured.

Battery Capacity Decal

(For Europe)
The battery capacity decal indicates the capacity by 20HR and CCA.
Recycle Decal

Recycle Decal illustrates Recycle Mark in accordance with local regulation.

(For Europe)

![Recycle Decal](image1)

(For USA)

![Recycle Decal](image2)

---

### Safety Signs and Instruction Signs

#### 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 Kyoeisha.

#### Positions of Safety Decals and Instruction Decals

<table>
<thead>
<tr>
<th>Position</th>
<th>Decal Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operation decal</td>
</tr>
<tr>
<td>2</td>
<td>Caution to getting pinched decal</td>
</tr>
<tr>
<td>3</td>
<td>Caution exhaust gas decal</td>
</tr>
<tr>
<td>4</td>
<td>Lead-free gasoline decal</td>
</tr>
<tr>
<td>5</td>
<td>Fire prohibited decal</td>
</tr>
<tr>
<td>6</td>
<td>Caution to getting entangled decal</td>
</tr>
<tr>
<td>7</td>
<td>Caution for high temperatures decal</td>
</tr>
<tr>
<td>8</td>
<td>Caution to noise decal</td>
</tr>
</tbody>
</table>
Description of Safety Decals and Instruction Decals

Operation Decal

SP05-0560C0
Sticker, operation

1. 

⚠️ Warning
Read the Owner’s Operating Manual.

2. 

⚠️ Warning
Apply the parking brake, stop the engine, remove the ignition key, and then leave the machine.

3. 

⚠️ Warning
Rollover - Do not work on slopes of 15 degrees or more. When you descend a slope, drive at low speed.

4. 

⚠️ Caution
Flying objects - Be sure that people around the machine keep a safe distance away.

Caution to Getting Pinched Decal

K4205001930
Decal, caution to getting pinched

⚠️ Caution
May pinch - There is a risk of being pinched.

Caution Exhaust Gas Decal

K4205001950
Decal, caution exhaust gas

⚠️ Warning
Caution for exhaust gas
Lead-Free Gasoline Decal

K4209001310
Decal, lead-free gasoline
Use lead-free gasoline.

![Image of lead-free gasoline decal]

Fire Prohibited Decal

K4205001940
Decal, fire prohibited

![Image of fire prohibited decal]

Caution to Getting Entangled Decal

K4205001910
Decal, caution to getting entangled

![Image of caution to getting entangled decal]

Caution for High Temperatures Decal

K4205001920
Decal, caution for high temperatures

![Image of caution for high temperatures decal]
Caution to Noise Decal

K4205002090
Decal, caution to noise
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Inspections

Inspect the machine according to the maintenance schedule so that you will be able to take advantage of its optimum performance for a long period of time.

Rake

Inspection of Rake

Due to frequent use or damage caused during use or transportation, tracks, such as from tires, may remain after use. Inspect, and if necessary, repair or replace.

Caution

Wear gloves when touching a fork prong bar.

1. Make sure that the rake pipe is not bent.
2. Make sure that the cross-link chain is not twisted or worn.
3. Make sure that the rake shaft is not worn.
4. Make sure that the center shaft of the fulcrum swing fitting is not worn.
5. Make sure that a spring pin is not missing from the rake shaft.
6. Make sure that a hardened flat-head pin on the rake hanging arm is not worn.
7. Make sure that the plate springs are not cracked or bent.
8. Make sure that a spring pin is not missing from the rake fulcrum fitting.
9. Make sure that the rake mounting bracket is not bent.
10. Make sure that the smoother plate is not bent, cracked or unevenly worn.
11. Make sure that the warp board is not bent, cracked or worn.
12. Make sure that the fork prong bar is not bent or worn.

Blade

Inspection of Blade

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

Due to frequent use or damage caused during use or transportation, it may become difficult to move sand around.
Inspect, and if necessary, repair or replace.
1. Make sure that the spring pin is not missing from the lever arm.

2. Make sure that the connecting shaft is not bent.
3. Make sure that the hook spring is not bent or stretched.
4. Make sure that a delta pin is not missing.
5. Make sure that the small blade is not bent, cracked or worn.
**Handling Instructions**

### Cultivator

**Inspection of Cultivator**

**Note:**
Depending on the specifications, this function may not be available.
Due to frequent use or damage caused during use or transportation, it may become difficult to adjust the sand depth.
Inspect, and if necessary, repair or replace.
1. Make sure that the cultivator wire is not broken.
2. Make sure that the free lock pin is not missing.
3. Make sure that the parker clamp is not loose.
4. Make sure that the trapezoidal cultivator fitting is not worn.

**Finishing Brush**

**Inspection of Finishing Brush**

**Note:**
Depending on the specifications, this function may not be available.
Due to frequent use or damage caused during use or transportation, the rake may leave tracks.
Inspect, and if necessary, repair or replace.
1. Make sure that the brush mounting frame is not bent.
2. Make sure that the brush is not bent or excessively worn.

---

### Oil Cooler

**Inspection of Oil Cooler**

1. Make sure that there is no damage to the oil cooler.
2. Make sure that the oil cooler is not contaminated.

**Cleaning of Oil Cooler**

- **Important**
  An unclean oil cooler may 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 hydraulic oil leakage.

If the oil cooler has been contaminated with dust, be sure to clean it.
After operating the machine in a dusty environment, it is important to remove dust as soon as possible.
1. Open the rear cover.
2. Carefully clean the front and back of the oil cooler with water or compressed air.
Hydraulic Oil

Inspection of Hydraulic Oil

1. Raise the rake and maintain that position on a level surface.
2. Make sure that the oil level is at the middle of the oil gauge.
3. Check underneath the machine for oil leakage.

Hydraulic Oil Supply

**Important**

Do not mix different types of oil.

**Important**

Use Shell Tellus S2V32 (or equivalent) as hydraulic oil. In case of an equivalent, consult Characteristics of Hydraulic Oil and use hydraulic oil whose characteristics are superior to those of the specific hydraulic oil. Especially regarding kinematic viscosity and viscosity index, use of hydraulic oil whose figures are less than those of the specified hydraulic oil will cause a malfunction in the hydraulic circuit.

Note:

**Characteristics of Hydraulic Oil**

<table>
<thead>
<tr>
<th>Specified Hydraulic Oil</th>
<th>Shell Tellus S2V32</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO Viscosity Grade</td>
<td>ISO VG32</td>
</tr>
<tr>
<td>Density</td>
<td>15 °C (59 °F)</td>
</tr>
<tr>
<td></td>
<td>0.869 g/cm³ (0.0313 lb/in³)</td>
</tr>
<tr>
<td>API Gravity</td>
<td>31.3</td>
</tr>
<tr>
<td>Flash Point (Open Cup)</td>
<td>202 °C (396 °F)</td>
</tr>
<tr>
<td>Pour Point</td>
<td>-40 °C (-40 °F)</td>
</tr>
<tr>
<td>Kinematic Viscosity 40 °C (104 °F)</td>
<td>32 mm²/s (32 cSt)</td>
</tr>
<tr>
<td>Viscosity 100 °C (212 °F)</td>
<td>6.1 mm²/s (6.1 cSt)</td>
</tr>
<tr>
<td>Viscosity Index</td>
<td>141</td>
</tr>
</tbody>
</table>

1. Remove the dimple knobs, and then open the front cover.
2. Remove the bolts, and then remove the cover.
3. If the oil level is low, open the tank cap and supply oil.

4. Start the engine, raise and lower the rake, and repeatedly move forward and backward several times with the rake raised.

5. Raise the rake 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 oil leakage.

**Hydraulic Hoses**

**Inspection of Hydraulic Hoses**

**Warning**

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 personal accidents.

Check the pipes and hoses to make sure that there is no oil leakage, circuit damage, looseness, wear, connector looseness, weather deterioration and chemical deterioration.

Make any necessary repairs before operating the machine.

**Air Cleaner**

**Inspection of Air Cleaner**

The air cleaner is a component that removes dirt from the intake air to prevent wear of the cylinder liners and piston rings so that the engine will always operate smoothly.

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

1. Make sure that the outer element is neither damaged nor dirty.
2. Make sure that the inner element is neither damaged nor dirty.
Cleaning of Air Cleaner

A contaminated air cleaner may cause malfunction of the engine. To maximize the life of the engine, clean the air cleaner properly.

**Important**

- When cleaning the air cleaner element, do not use a petroleum solvent.
- When cleaning and drying the air cleaner element, do not use compressed air.

**Important**

The inner element cannot be cleaned.

1. Follow the steps below to clean the outer element.

   [1] Remove the clip, remove the cover, and then remove the element.
   
   [2] While paying close attention not to damage the element, tap a solid portion of the element to remove dust and dirt.
   
   If the element is extremely contaminated, replace it with a new one.
   
   [3] Attach the air cleaner element to the air cleaner body.
   
   [4] Install the cover, and then affix it securely using the clip.

---

**Battery**

**Inspection of Battery**

**Danger**

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

**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.

1. Clean the areas around the battery fluid level lines using a cloth dampened with water.

2. Make sure that the battery fluid level is between the UPPER LEVEL (maximum fluid level line) and the LOWER LEVEL (minimum fluid level line).
Supply of Battery Fluid

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.

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

1. 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.

Tire

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

<table>
<thead>
<tr>
<th>Tire size</th>
<th>Pneumatic pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front wheel (PD21 x 11.00 - 10)</td>
<td>70 kPa (0.7 kgf/cm²)</td>
</tr>
<tr>
<td>Rear wheel (25 x 13.00 - 9)</td>
<td>40 kPa (0.4 kgf/cm²)</td>
</tr>
</tbody>
</table>

Brake

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

Inspection of Parking Brake
1. Depress the locking pedal while firmly depressing the brake pedal to lock it and check that the brake is applied effectively.
2. Firmly depress the brake pedal and release the locking pedal to release the brake pedal, and then check that the brake is not applied.

Belt

Inspection of Belt

Caution
The engine must be stopped when the belt is inspected. Be careful since the belt may rotate and something may get caught in it, even if the engine is stopped.

Caution
The engine muffler is near the belt. Inspect the belt after the muffler has sufficiently cooled.

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.
Wire

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.

Steering Wheel

Inspection of Steering Wheel

1. Make sure that there is no play in the steering wheel.
2. Make sure that the steering wheel can be turned smoothly without abnormal noise, etc.
3. Make sure that the steering chain is not overtightened and is not loose.
4. Make sure that there are no cracks, damage or abnormal wear in the steering chain.

Around The Engine

Inspection of Engine-Associated Parts

1. Check the fuel system parts for loosened or cracked joints and leakage. Replace the parts if necessary.
2. Blow compressed air to clean any grass or flammable materials that may be attached on or around the muffler.

Engine Oil

Inspection of Engine Oil

Important

Securely tighten the oil level gauge and oil filler cap.

1. Stop the engine, wait for 10 to 20 minutes for the engine to cool down, and then check the engine oil.
Supply of Engine Oil

Important
Do not fill 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 SF 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 they are insufficiently tightened or there is an insufficient seal, negative pressure inside the crankcase cannot be maintained, causing the oil to rise, possibly resulting in the production of white smoke and damage to the engine.

1. 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.
   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. Re-place 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.

Fuel
Inspection of Fuel Quantity

With the machine on a level surface, observe the fuel gauge on the fuel tank to check the fuel level.
Fuel Supply

**Warning**
Supply fuel before starting the engine. Never remove the tank cap or supply fuel while the engine is running. When opening the tank cap, wait at least 1 minute after stopping the engine, and then slowly open the cap to release the pressure in the tank. Opening the tank cap quickly may cause fuel to burst out.

**Warning**
Do not supply fuel above 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.

If the fuel gauge located on the fuel tank indicates a level close to E (EMPTY), supply gasoline at your earliest convenience.

---

The fuel tank capacity up to the red ring of strainer is approximately 15.0 dm³ (15.0 L).

**Fuel Filter**

**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.
Fuel Strainer

Inspection of Fuel Strainer

The fuel strainer is installed near the fuel tank and cleans the fuel that enters the carburetor. If the fuel flow is insufficient, clean or replace the fuel strainer as necessary.
1. Make sure that there is no fuel leakage.
2. Make sure that the fuel strainer is not damaged or dirty.

Cleaning of Fuel Strainer

If the fuel strainer becomes clogged with dust and dirt, the fuel flow will become insufficient. Periodically clean it.

Important

Shut off the fuel valve, and then clean the fuel strainer in a clean location, free of dust and dirt.

1. Remove the filter pot, wash the filter and inside of the filter pot using a solvent, such as a hardly flammable kerosene, and then blow compressed air to dry them.

<table>
<thead>
<tr>
<th>Cleaning of Fuel Strainer_001</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Filter</td>
</tr>
<tr>
<td>2  Packing</td>
</tr>
<tr>
<td>3  Filter pot</td>
</tr>
<tr>
<td>4  Ring</td>
</tr>
</tbody>
</table>

2. Make sure that there is no fuel leakage after it is installed.

Oil Leakage

Inspection of Oil Leakage

After approximately 50 hours of operation, some joints 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.
Tightening Torques

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

**Standard Tightening Torques**

### Bolts and Nuts

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

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

Too much tightening may cause the looseness or damage of the screw. The strength of tightening is determined by types of screws, strength, the friction of thread face or base face and others.

The table below is for the galvanized or parkerized bolts. In case that the strength of internal thread is weak, it is not applied. Do not use rusty or sand attached "screw."

Otherwise, it may cause insufficient tightening even if you apply the specified tightening torque. The friction of the screw face becomes higher and the tightening torque is canceled out by the friction, therefore sufficient tightening cannot be applied. If "screw" is wet by water or oil, do not tighten it with normal tightening torque. If the screw is wet, the torque coefficient will get smaller and it may result in too much tightening.

Too much tightening may cause looseness by the screw stretched or result in damage. Do not use a bolt experienced too much burden. Using the impact wrench requires the skill.

Do exercise as much as possible for steady tightening.
### General bolt

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>Strength classification 4.8</th>
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</thead>
<tbody>
<tr>
<td><strong>M5</strong></td>
<td>3 - 5</td>
</tr>
<tr>
<td><strong>M6</strong></td>
<td>7 - 9</td>
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<tr>
<td><strong>M8</strong></td>
<td>14 - 19</td>
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<td><strong>M10</strong></td>
<td>29 - 38</td>
</tr>
<tr>
<td><strong>M12</strong></td>
<td>52 - 67</td>
</tr>
<tr>
<td><strong>M14</strong></td>
<td>70 - 94</td>
</tr>
<tr>
<td><strong>M16</strong></td>
<td>88 - 112</td>
</tr>
<tr>
<td><strong>M18</strong></td>
<td>116 - 144</td>
</tr>
<tr>
<td><strong>M20</strong></td>
<td>147 - 183</td>
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<tr>
<td><strong>M22</strong></td>
<td>295</td>
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<tr>
<td><strong>M24</strong></td>
<td>370</td>
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<tr>
<td><strong>M27</strong></td>
<td>550</td>
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<td>26.55 - 44.26</td>
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<td>M6</td>
<td>71.38 - 91.77</td>
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<td>142.76 - 193.74</td>
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<td>295.71 - 387.49</td>
<td>256.68 - 336.34</td>
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<td>530.24 - 683.20</td>
<td>460.25 - 593.02</td>
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<td>713.79 - 958.52</td>
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<td>897.34 - 1142.06</td>
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### Heat-treated bolt

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<td>23 - 29</td>
<td>28 - 38</td>
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<tr>
<td><strong>M10</strong></td>
<td>45 - 57</td>
<td>58 - 76</td>
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<td><strong>M12</strong></td>
<td>67 - 85</td>
<td>104 - 134</td>
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<tr>
<td><strong>M14</strong></td>
<td>106 - 134</td>
<td>140 - 188</td>
</tr>
<tr>
<td><strong>M16</strong></td>
<td>152 - 188</td>
<td>210 - 260</td>
</tr>
<tr>
<td><strong>M18</strong></td>
<td>200 - 240</td>
<td>280 - 340</td>
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<tr>
<td><strong>M20</strong></td>
<td>245 - 295</td>
<td>370 - 450</td>
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<td><strong>M22</strong></td>
<td>-</td>
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<td><strong>M30</strong></td>
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<table>
<thead>
<tr>
<th>N-m</th>
<th>kgf-cm</th>
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</tr>
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<tbody>
<tr>
<td>M5</td>
<td>50.99 - 71.38</td>
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<tr>
<td>M6</td>
<td>81.58 - 112.17</td>
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<td>234.53 - 295.71</td>
<td>203.57 - 256.68</td>
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<td>M10</td>
<td>458.87 - 581.23</td>
<td>398.30 - 504.51</td>
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<td>683.20 - 866.75</td>
<td>593.02 - 752.34</td>
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<tr>
<td>M14</td>
<td>1,080.88 - 1,366.40</td>
<td>938.21 - 1,186.03</td>
</tr>
<tr>
<td>M16</td>
<td>1,549.94 - 1,917.04</td>
<td>1,345.35 - 1,663.99</td>
</tr>
<tr>
<td>M18</td>
<td>2,039.40 - 2,447.28</td>
<td>1,770.20 - 2,124.24</td>
</tr>
<tr>
<td>M20</td>
<td>2,498.27 - 3,008.12</td>
<td>2,168.50 - 2,611.05</td>
</tr>
<tr>
<td>M22</td>
<td>-</td>
<td>530</td>
</tr>
<tr>
<td>M24</td>
<td>-</td>
<td>670</td>
</tr>
<tr>
<td>M27</td>
<td>-</td>
<td>1,000</td>
</tr>
<tr>
<td>M30</td>
<td>-</td>
<td>1,340</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N-m</th>
<th>kgf-cm</th>
<th>lb-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>71.38 - 101.97</td>
<td>61.96 - 88.51</td>
</tr>
<tr>
<td>M6</td>
<td>142.76 - 183.55</td>
<td>123.91 - 159.32</td>
</tr>
<tr>
<td>M8</td>
<td>285.52 - 387.49</td>
<td>247.83 - 336.34</td>
</tr>
<tr>
<td>M10</td>
<td>591.43 - 774.97</td>
<td>513.36 - 672.68</td>
</tr>
<tr>
<td>M12</td>
<td>1,060.49 - 1,366.40</td>
<td>920.50 - 1,186.03</td>
</tr>
<tr>
<td>M14</td>
<td>1,427.58 - 1,917.04</td>
<td>1,239.14 - 1,663.99</td>
</tr>
<tr>
<td>M16</td>
<td>2,141.37 - 2,651.22</td>
<td>1,858.71 - 2,301.26</td>
</tr>
<tr>
<td>M18</td>
<td>2,855.16 - 3,466.98</td>
<td>2,478.28 - 3,009.34</td>
</tr>
<tr>
<td>M20</td>
<td>3,772.89 - 4,588.65</td>
<td>3,274.87 - 3,982.95</td>
</tr>
<tr>
<td>M22</td>
<td>-</td>
<td>5,404.41</td>
</tr>
<tr>
<td>M24</td>
<td>-</td>
<td>6,831.99</td>
</tr>
<tr>
<td>M27</td>
<td>-</td>
<td>10,197.00</td>
</tr>
<tr>
<td>M30</td>
<td>-</td>
<td>14,628.78</td>
</tr>
</tbody>
</table>

**Note:**
The same values are applied to "fine screw thread."
Principal Tightening Torques

Tightening Torque by Model

SP05A
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).

<table>
<thead>
<tr>
<th>Location</th>
<th>Code</th>
<th>Part name</th>
<th>Tightening torque</th>
<th>Thread locking adhesive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>N·m</td>
<td>kgf-cm</td>
</tr>
<tr>
<td>2WD front wheel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front wheel bracket</td>
<td>K0000100202</td>
<td>Bolt, M10-20</td>
<td>29 - 38</td>
<td>295.71 - 387.49</td>
</tr>
<tr>
<td>Wheel</td>
<td>K0011120302</td>
<td>Bolt, heat-treated M12-30P1.5</td>
<td>67 - 85</td>
<td>683.20 - 866.75</td>
</tr>
<tr>
<td>Rhombic flange unit</td>
<td>K0661205000</td>
<td>Rhombic flange unit UCFL205</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Front wheel bracket</td>
<td>K0000100202</td>
<td>Bolt, M10-20</td>
<td>180 - 200</td>
<td>1,835.46 - 2,039.40</td>
</tr>
<tr>
<td>Motor mounting base</td>
<td>K0160000492</td>
<td>24 special nut P1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheel</td>
<td>K0014120602</td>
<td>Bolt, heat-treated M12-60P1.5</td>
<td>67 - 85</td>
<td>683.20 - 866.75</td>
</tr>
<tr>
<td>Spacer</td>
<td>K0014120502</td>
<td>Bolt, heat-treated M12-50P1.5</td>
<td>67 - 85</td>
<td>683.20 - 866.75</td>
</tr>
<tr>
<td>Rhombic flange unit</td>
<td>K0661205000</td>
<td>Rhombic flange unit UCFL205</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Front wheel arm</td>
<td>K0010100502</td>
<td>Bolt, heat-treated M10-50</td>
<td>29 - 38</td>
<td>295.71 - 387.49</td>
</tr>
<tr>
<td>Wheel</td>
<td>K0011120302</td>
<td>Bolt, heat-treated M12-30P1.5</td>
<td>180 - 200</td>
<td>1,835.46 - 2,039.40</td>
</tr>
<tr>
<td>Wheel mounting base</td>
<td>K0160000492</td>
<td>24 special nut P1.5</td>
<td>10 - 25</td>
<td>101.97 - 254.93</td>
</tr>
<tr>
<td>Oil cooler port fitting</td>
<td>K3006000022-Y</td>
<td>ELBOW, ODD SIZED PT1/2*PF3/8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Adjustment before Work

Adjustment of Steering Wheel

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

**Caution**
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 with the tilt lever. 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 at the center of the driver's seat.

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 located beneath the front part of the seat.

<table>
<thead>
<tr>
<th>1</th>
<th>Seat</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Adjuster lever</td>
</tr>
</tbody>
</table>
Adjustment of Speed Adjustment Plate

⚠️ Warning
Since it is dangerous, do not adjust the speed adjustment plate while traveling.

The height of the speed adjustment plate can be adjusted with the bolts.
Use the speed adjustment plate to operate the machine at a constant speed.

1. Loosen the bolts.
2. Determine the operating speed, adjust the height of the speed adjustment plate, and then tighten the bolts.

Adjustment of Rake

⚠️ Caution
Before adjusting the rake, be sure to stop the engine.

1. The rake can be adjusted with the nut.
   [1] On a level surface, lower the rake, and then drive the machine forward about approximately 200 mm (7.87 in).
   [2] Place a wooden board with a thickness of about 15 mm (0.59 in) under the warp board.

   [3] Adjust the fork prong bar to a position where the rake load is applied to the wooden board and the tip of the fork prong bar lightly touches the ground, and then lock it in place with the nut.

2. When adjusting the links of the cross-link chains, adjust the rake stopper.
   As a standard, 7 links of the chain are used.
   [1] Loosen the nut.
   [3] Adjust the rake stopper so that it lightly touches the rake, and then tighten the nut.
   [4] Raise and lower the rake to check that it lightly touches the rake stopper.
**Adjustment of Blade**

Note:
Depending on the specifications, this function may not be available.
The blade can be adjusted with the bolt.
1. Loosen the bolt, and then move the small blade to the desired position.
   1. Toward A to take a thin layer from the surface of the sand
   2. Toward B to take a thick layer from the surface of the sand
2. Tighten the bolt.

---

**Adjustment of Finishing Brush**

Note:
Depending on the specifications, this function may not be available.
The height of the finishing brush can be adjusted by moving the right and left movable arms while gripping the right and left clutch levers.
Return the clutch levers after adjusting the height of the brush on the ground according to the bunker conditions.
The mounting height can be adjusted to one of four levels.
1. When traveling, adjust to the lowest position.
2. When used for light finishing, adjust to the position second from the bottom.
3. When used for normal finishing, adjust to the position third from the bottom.

![Adjustment of Finishing Brush_003](image1)

| 1 | Clutch lever |
| 2 | Movable arm |

4. When used for heavy finishing, adjust to the highest position.

![Adjustment of Finishing Brush_004](image2)

| 1 | Clutch lever |
| 2 | Movable arm |

## Procedure to Start/Stop Engine

### Start/Stop of Engine

#### Procedure to Start Engine

| **Caution** |
| Do not start the engine in a building with insufficient ventilation. |

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

### Important

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

1. Open the fuel cock. This is near the fuel tank.
2. Sit on the seat.
3. Make sure that the parking brake is applied.
4. Make sure that the traveling pedal is in neutral position.
5. Move the throttle lever to the middle position between "High" and "Low".
6. Pull the choke knob. Pull the choke knob half way for restarting, as necessary.
7. Switch the ignition key to the "START" position.

8. When the starter starts rotating and the engine starts, slowly return the ignition key to the "ON" position.
9. Check that the engine has started, and then return the choke knob to its original position.
10. Shift the throttle lever to "Low", and then warm up the engine for 1-2 minutes.
11. Gradually move the throttle lever to "High".

#### Procedure to Stop Engine

1. Raise the rake section.
2. Raise the attachment if any installed.
3. Set the traveling pedal in neutral position.
4. Apply the parking brake.
5. Move the throttle lever to "Low", and continue idling for 1-2 minutes.
6. Switch the ignition key to the "OFF" position.
7. Make sure that the engine has stopped.
8. Remove the ignition key.
9. Leave the driver’s seat.
10. Close the fuel cock.
   The fuel cock is located near the fuel tank.

**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 three conditions.
   - An operator is sitting on the seat.
   - The parking brake is applied.
   - The traveling pedal is set to the neutral position.
2. In the event the operator leaves the seat with the engine running, the safety device will be activated and will stop the engine under any of the following conditions:
   - The operator leaves the seat without applying the parking brake.
   - The traveling pedal is operated after the parking brake is applied and the operator leaves the seat.

**Warning Mechanisms**

This machine features a warning mechanism to prevent operation while the parking brake is applied.
1. If the traveling pedal is depressed while the parking brake is applied, a buzzer will sound. (intermittent tone)

**Operation Method**

**Cautions for when You Leave The Machine**

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

*Caution*
Never park the machine on a slope.

1. Park the machine on level ground.
2. Apply the parking brake.
3. Stop the engine.
4. Remove the ignition key.
5. Leave the machine.
Description of Operation Decals

Key Switch Mark

Key switch mark
It illustrates the position of the key switch.

Engine Rotation Decal

Engine rotation decal
This indicates high/low speed of the engine rotation.

Rake Up/Down Mark

Rake up/down mark
This indicates up/down of the rake.

Tilt Steering Mark

Tilt steering mark
This indicates the direction of tilt steering and lock/free of the position.
Parking Brake Mark

Parking brake mark
This indicates lock/release of the parking brake.

1 2

Light Switch Mark

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

K4203001410
STICKER, LIGHT SWITCH
This indicates the light switch positions.

1 2

BRAKE Decal

K4203001450
Decal, BRAKE
This indicates brake.

FORWARD Decal

K4203001430
Decal, FORWARD
This indicates forward travel.

BACKWARD Decal

K4203001440
Decal, BACKWARD
This indicates backward travel.
2WD/3WD Selector Lever Mark

Note:
Depending on the specifications, this function may not be available.
K4203001380
2WD - 3WD shift lever sticker
This indicates 2WD/3WD changeover.

Throttle Lever

The throttle lever is located on the right side below the steering wheel and enables you to adjust the engine rpm.
Move the throttle lever toward "High speed" to increase the engine rpm, and toward "Low speed" to reduce the rpm.

Choke Lever

The choke lever is located on the left side below the steering wheel and its knob is to be pulled when starting the engine.
Pull the knob half way for restarting, as necessary.

Up/Down Switch Lever

Important
If the engine rpm is low, the rake will not be raised and lowered due to insufficient hydraulic oil.
Move the throttle lever above the middle position toward "High speed".

The up/down switch lever is on the right side below the steering wheel and is used to operate the rake.
- Shift the up/down switch lever to the "UP" position to raise the rake.
  When the lever is released, it returns to the neutral position and stops there.
- Shift the up/down switch lever to the "DOWN" position to lower the rake.
  When the lever is released, it returns to the neutral position and stops there.
2WD/3WD Selector Lever

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

Important
When switching between 2WD and 3WD operation, make sure to stop the machine completely.

The 2WD/3WD selector lever is on the right side of the driver's seat and is used to switch the traveling and operation mode.
- Shift the 2WD/3WD selector lever to the "2WD" position to operate in rear-wheel 2WD.
- Shift the 2WD/3WD selector lever to the "3WD" position to operate in all-wheel 3WD.

* Use of 2WD or 3WD
- Use 2WD when working with the blade and high-speed traveling (maximum 16 km/h) is possible.
- Use 3WD when working on steeply sloped or soft bunkers or bunkers with a small diameter.

Light Switch

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

**Caution**
When leaving the driver's seat, park the machine on a stable, flat surface and be sure to apply the parking brake.

**Caution**
Do not park on a slope.

The brake pedal is located in the left foot area. To stop the machine, depress the brake pedal all the way firmly.
When parking, firmly depress the brake pedal and lock it with the lock fitting.
To release it, firmly depress the brake pedal and release the lock fitting.

Front Cover

**Caution**
Do not open the cover in strong winds.

**Caution**
When closing the cover, be careful not to pinch your hands.

The front cover is in front of the steering wheel and is opened in order to perform maintenance.
1. Remove the dimple knobs.
2. Open the front cover, and then tilt it forward until the wire is fully extended.

---

1. Brake pedal
2. Lock fitting

---

1. Dimple knobs
2. Front cover

---

1. Front cover
2. Wire
**Rear Cover**

**Warning**

Stop the engine when performing recommended maintenance operations that do not require the engine to start when the rear cover is opened. When performing maintenance with the engine started, stay away from moving parts.

**Caution**

Do not open the cover in strong winds.

**Caution**

When closing the cover, be careful not to pinch your hands.

The rear cover is under the seat and is opened in order to perform maintenance.

1. Release the cover fastener.

   ![Rear Cover_001](uemj7o-001)

   **Rear Cover_001**

   1. Cover fastener (released)
   2. Rear cover

2. Open the rear cover, and then lift it until the gas spring is fully extended.

   ![Rear Cover_002](uemj7o-002)

   **Rear Cover_002**

3. When closing the rear cover, slowly lower it while firmly supporting it, and then engage the cover fastener.

   ![Rear Cover_003](uemj7o-003)

   **Rear Cover_003**

   1. Cover fastener (engaged)
   2. Rear cover

**Broom Holder**

Broom and rake can be stored in these holders for transport.

![Broom Holder_001](mdr5p1-003)

**Broom Holder_001**

1. Broom Holder
Cargo Box

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

Important
The maximum loading weight is 15 kg (33.07 lb).

Cargo Box is a container to transport equipments such as a back pack blower which may be used together during cutting work. There are two types of cargo boxes.
Small type:

![Cargo Box_001](njvfy4-005)

Large type:

![Cargo Box_002](njvfy4-006)

Instruments

Instruments on The Operation Panel

Hour Meter

The hour meter indicates the accumulated operation time of the engine. The number in red figures on a white background is incremented every thirty-six seconds. The number in white figures on a black background is incremented every hour. 1/100 wheel … red figures on a white background Hour wheel … white figures on a black background

![Hour Meter_001](uknn6v-007)
Move

Traveling Procedure

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

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

1. Start the engine.
   "Procedure to Start Engine" (Page 4-18)
2. Make sure that the rake section is raised.
3. Make sure that all the attachments are raised if any installed.
4. Firmly depress the brake pedal and release the lock fitting to release the brake pedal.
5. Slowly depress the traveling pedal.
6. The machine starts traveling.
7. Release the traveling pedal and depress the brake pedal to stop the machine.

**Towing The Machine**

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

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

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

**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 there is excessive movement, the pump or motor will be damaged.

1. Stop the engine.
   "Procedure to Stop Engine" (Page 4-18)
2. Apply the parking brake.
3. Chock the wheels.
4. Secure the machine with ropes.
5. Release the cover fastener.
6. Open the rear cover, and then lift it until the gas spring is fully extended.
7. Loosen the lock nuts.
Important
When pushing in the unload valve operating pins, be careful about overtightening the bolts. It will damage the unload valve operating pins.

8. Tighten the bolts, and then push in the unload valve operating pins to open the unload valve.

Towing The Machine_003

1. Piston pump
2. Unload valve operating pins
3. Bolt
4. Lock nut

Important
Before towing, be sure to open the unload valves in two locations.

9. Close the rear cover and apply the cover fastener.
10. Remove the wheel stopper.
11. 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.

12. Tow the machine slowly.

Operations

Rake

Warning
Do NOT start to move or stop the machine abruptly.

Caution
Perform operations at an appropriate speed for the site and location.

Caution
Before starting operations, check that the area where the operations are to be performed is safe.

Caution
Before raising or lowering the rake, make sure that there are no people around the rake.

1. Start the engine.
   "Procedure to Start Engine" (Page 4-18)

Important
If the engine rpm is low, the rake will not be raised and lowered due to insufficient hydraulic oil.
Move the throttle lever above the middle position toward "High speed".

2. Make sure that the rake section is raised.
3. Make sure that all the attachments are raised if any installed.
4. Firmly depress the brake pedal and release the lock fitting.
   The parking brake is released at the same time.
5. Move the throttle lever toward "High speed" to rev up the engine to MAX.
Caution
Do not enter or leave a bunker via a steep slope or extremely uneven ground.

Important
When switching between 2WD and 3WD operation, make sure to stop the machine completely.

6. Enter the bunker.

Important
Do not back up with the rake, cultivator or finishing brush lowered.

7. Depress the traveling pedal to travel.
8. At the bunker area where the operation is to be started, shift the up/down switch lever to the "DOWN" position to lower the rake.
9. At the bunker area where the operation is to be stopped, shift the up/down switch lever to the "UP" position to raise the rake.
10. Leave the bunker.
11. If tire tracks remain, use the broom to remove them.

Blade

Warning
Do NOT start to move or stop the machine abruptly.

Caution
Perform operations at an appropriate speed for the site and location.

Caution
Before starting operations, check that the area where the operations are to be performed is safe.

Caution
Before raising or lowering the rake, make sure that there are no people around the rake.

Caution
If the blade is raised, do not touch the lifting lever.

Caution
When getting on and off the machine, watch out the blade lever lest you should get your foot caught on it and fall.

1. Start the engine.
"Procedure to Start Engine" (Page 4-18)

Important
If the engine rpm is low, the rake will not be raised and lowered due to insufficient hydraulic oil.
Move the throttle lever above the middle position toward "High speed".

2. Make sure that the rake section is raised.
3. Make sure that all the attachments are raised if any installed.
4. Firmly depress the brake pedal and release the lock fitting.
The parking brake is released at the same time.
5. Move the throttle lever toward "High speed" to rev up the engine to MAX.

Caution
Do not enter or leave a bunker via a steep slope or extremely uneven ground.

Important
When switching between 2WD and 3WD operation, make sure to stop the machine completely.

6. Enter the bunker.
Important
Perform blade operations in 2WD.

7. Shift the 2WD/3WD selector lever to the "2WD" position to operate in rear-wheel 2WD.

Important
Do not back up with the rake, cultivator or finishing brush lowered.

8. Depress the traveling pedal to travel.
9. At the bunker area where the operation is to be started, repeatedly perform the following operations.
   - Move the blade lever forward to lower the blade, and then keep pushing the blade lever forward to lift the sand while driving forward.
   - Pull the blade lever toward you to raise the blade.

Cultivator

Warning
Do NOT start to move or stop the machine abruptly.

Caution
Perform operations at an appropriate speed for the site and location.

Caution
Before starting operations, check that the area where the operations are to be performed is safe.

1. Start the engine. "Procedure to Start Engine" (Page 4-18)

Important
If the engine rpm is low, the rake will not be raised and lowered due to insufficient hydraulic oil.
Move the throttle lever above the middle position toward "High speed".

2. Make sure that the rake section is raised.
3. Make sure that all the attachments are raised if any installed.
4. Firmly depress the brake pedal and release the lock fitting.
The parking brake is released at the same time.
5. Move the throttle lever toward "High speed" to rev up the engine to MAX.

Caution
Do not enter or leave a bunker via a steep slope or extremely uneven ground.

Important
When switching between 2WD and 3WD operation, make sure to stop the machine completely.

Important
Do not back up with the rake, cultivator or finishing brush lowered.

6. Enter the bunker.

7. Depress the traveling pedal to travel.
8. At the bunker area where the operation is to be started, squeeze the clutch lever and pull the cultivator lever toward you.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
</tbody>
</table>

- Cultivator lever
- Clutch lever
- Cultivator board
- Pull (lowered)
- Push (raised)

9. Lower the cultivator board to the desired depth, and then release the clutch lever.

10. At the bunker area where the operation is to be stopped, squeeze the clutch lever and push the cultivator lever to raise the cultivator board.

11. At the bunker area where the operation is to be started, shift the up/down switch lever to the "DOWN" position to lower the rake.

12. At the bunker area where the operation is to be stopped, shift the up/down switch lever to the "UP" position to raise the rake.

13. Leave the bunker.

14. If tire tracks remain, use the broom to remove them.

Finishing Brush

**Warning**

Do NOT start to move or stop the machine abruptly.

**Caution**

Perform operations at an appropriate speed for the site and location.

**Important**

Before starting operations, check that the area where the operations are to be performed is safe.

1. Start the engine.
   "Procedure to Start Engine" (Page 4-18)

2. Make sure that the rake section is raised.

3. Make sure that all the attachments are raised if any installed.

4. Firmly depress the brake pedal and release the lock fitting.
   The parking brake is released at the same time.

5. Move the throttle lever toward "High speed" to rev up the engine to MAX.

**Caution**

Do not enter or leave a bunker via a steep slope or extremely uneven ground.

6. Enter the bunker.

7. Stop the machine and apply the parking brake.

**Important**

When switching between 2WD and 3WD operation, make sure to stop the machine completely.

8. Adjust the height of the brush from the ground according to the bunker conditions.

9. Release the parking brake.

10. Depress the traveling pedal to travel.

11. At the bunker area where the operation is to be started, shift the up/down switch lever to the "DOWN" position to lower the rake.
   The finishing brush is lowered at the same time.
12. At the bunker area where the operation is to be stopped, shift the up/down switch lever to the "UP" position to raise the rake. The finishing brush is raised at the same time.

13. Leave the bunker.

14. If tire tracks remain, use the broom to remove them.

**Transporting**

**Transporting Procedure**

When loading the machine into a trailer or a truck to transport it, drive the machine in reverse. When unloading, drive the machine forward.

**Storage**

**Before Long-Term Storage**

- Remove dirt, grass clippings, debris, oil stains etc. completely.
- Supply oil and apply grease to appropriate parts.
- Remove the negative terminal of the battery.
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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.

Maintain the machine according to the maintenance schedule so that you will be able to take advantage of its optimum performance for a long period of time.
## Maintenance Schedule

Follow the maintenance schedule below.

- ○ • • 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 8 hrs.</th>
<th>Every 10 hrs.</th>
<th>Every 50 hrs.</th>
<th>Every 100 hrs.</th>
<th>Every 200 hrs.</th>
<th>Every 250 hrs.</th>
<th>Every 300 hrs.</th>
<th>Every 400 hrs.</th>
<th>Every 500 hrs.</th>
<th>Every year</th>
<th>Every 2 years</th>
<th>Every 3 years</th>
<th>Every 4 years</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
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<td>Hydraulic hose (fixed part)</td>
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<td>Air cleaner</td>
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</tbody>
</table>

Remarks

- Engine oil filter: 8 hrs (first time)
- Ignition plug: 50 hrs (first time)

Refer to "Change of Air Cleaner"
For engine maintenance, refer to the Engine's Owner's Manual.

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

### Adjusted Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Measurement</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belt</td>
<td>Approximately 10 mm/98 N (10 kgf)</td>
<td>BELT SLACK</td>
</tr>
<tr>
<td>Steering chain</td>
<td>Approximately 5 mm (0.20 in)</td>
<td>Steering chain slack</td>
</tr>
<tr>
<td>Rake</td>
<td>Fork depth (standard)</td>
<td>15 mm (0.59 in)</td>
</tr>
<tr>
<td>Blade</td>
<td>Arm stopper</td>
<td>23 mm (0.91 in)</td>
</tr>
<tr>
<td></td>
<td>Raised height</td>
<td>200 mm (7.87 in)</td>
</tr>
<tr>
<td></td>
<td>Exposed length of screw shaft from spherical joint</td>
<td>65 mm (2.56 in)</td>
</tr>
<tr>
<td></td>
<td>Exposed length of threaded end of connecting shaft</td>
<td>20 mm (0.79 in)</td>
</tr>
<tr>
<td></td>
<td>Installation depth of spherical joint</td>
<td>15 mm (0.59 in)</td>
</tr>
</tbody>
</table>
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.

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.

---

### Jack-Up Points

<table>
<thead>
<tr>
<th>Jack-up Points</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front right frame</td>
<td>1</td>
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<tr>
<td>Front left frame</td>
<td>2</td>
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<tr>
<td>Rear right frame</td>
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<tr>
<td>Rear left frame</td>
<td>4</td>
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</tr>
</tbody>
</table>

1. Front right frame

---

[Reinforcing plate]
2. Front left frame

**Important**

One nut is used to install the reinforcing plate. Be careful that the jack does not hit the nut.

---

**Greasing**

**About Greasing**

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

---

3. Rear right frame

<table>
<thead>
<tr>
<th>Jack-Up Points_003</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Reinforcing plate</td>
</tr>
<tr>
<td>2 Nut</td>
</tr>
</tbody>
</table>

---

4. Rear left frame

---
**Greasing Points**

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

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of Greasing Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traveling pedal fulcrum</td>
<td>1 1</td>
</tr>
<tr>
<td>Brake pedal fulcrum</td>
<td>1 1</td>
</tr>
<tr>
<td>Belt tension lever</td>
<td>1 1</td>
</tr>
<tr>
<td>Pump neutral lever fulcrum</td>
<td>1 1</td>
</tr>
<tr>
<td>Front wheel shaft rhombic flange unit</td>
<td>2 1</td>
</tr>
<tr>
<td>Rear wheel brake lever fulcrum</td>
<td>2 2</td>
</tr>
<tr>
<td>Blade lever fulcrum</td>
<td>1 1</td>
</tr>
<tr>
<td>Blade arm fulcrum</td>
<td>2 2</td>
</tr>
<tr>
<td>Rake mount</td>
<td>3 3</td>
</tr>
<tr>
<td>Rake fulcrum</td>
<td>1 1</td>
</tr>
</tbody>
</table>

1. Traveling pedal fulcrum

2. Brake pedal fulcrum

3. Belt tension lever (below pump pulley)
4. Pump neutral lever fulcrum (above piston pump)

5. Front wheel shaft rhombic flange unit

6. Rear wheel brake lever fulcrum

7. Blade lever fulcrum

8. Blade arm fulcrum
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.

Lubricating Points

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

<table>
<thead>
<tr>
<th>Location</th>
<th>No. of lubricating points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rake up/down cylinder spherical bearing</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Rake up/down cylinder spherical bearing
   There is one point.

Change of Fork Prong Bar

Caution

Wear gloves when touching a fork prong bar.

When wear of the fork prong bar results in no margin for tightening the nut on the fork prong bar, replace the fork prong bar.

1. Loosen the nut, and then replace the fork prong bar.

2. Adjust the fork prong bar.

"Adjustment of Rake" (Page 4-16)

3. Tighten the nut.
Change of Small Blade

Note:
Depending on the specifications, this function may not be available.
When wear of the small blade causes a reduction in the amount of sand that is lifted up, replace the small blade.
1. Loosen the bolts installing the small blade, and then replace the small blade.

2. Adjust the small blade. "Adjustment of Blade" (Page 4-17)
3. Tighten the bolts.

Change of The Cultivator Fitting

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

Caution
When removing the cultivator, be careful not to pinch your hands.

When wear of the trapezoidal cultivator fitting disables unhardening the sand, replace the trapezoidal cultivator fitting.
1. Remove the bolts at the bottom of the machine on the right side.
2. Remove the bolts at the bottom of the machine on the left side.
3. Pull out the cultivator from the bottom of the machine.
4. Remove the bolts, and then replace the trapezoidal cultivator fittings.
5. Tighten the bolts for the trapezoidal cultivator fitting.

**Caution**
When installing the cultivator, pay attention to its falling.

6. Install the cultivator to the machine with bolts.

**Change of Finishing Brush**

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

**Caution**
Be careful since the finishing brush is heavy.

When wear of the finishing brush results in rake tracks remaining, replace the finishing brush.

1. Remove the bolts from the rake, and then remove the finishing brush.

2. Remove the bolts, and then replace the finishing brush.

3. Tighten the bolts.

**Removing/Installing Tires**

**Front Tire**

Follow the steps below to remove the front tire:

1. Securely place the jack beneath the jack-up points of the front left/right frame area, and then raise it until the tire lifts off the ground. "Jack-Up Points" (Page 5-5)

2. Follow the steps below to remove the tire.

   [1] Loosen the lock bolts (2 locations) for the right rhombic flange unit, and then remove bolt A.

   [2] Remove bolt B and nut B of the right rhombic flange unit, and then remove the right rhombic flange unit.

   [3] Remove bolt C, attaching the left and right front wheel bracket to the front wheel arm, and then lower the front wheel to the floor.

   [4] Remove the wheel mounting bolt, and then remove the tire.
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. Securely place the jack beneath the jack-up point of the rear left/right frame area, and then raise it until the tire lifts off the ground. "Jack-Up Points" (Page 5-5)
3. Remove the bolts.
4. Remove the tire from the wheel mounting seat.

Important
Tighten the bolts in the tightening order (crosswise).

For installing the rear tires, reverse the removing procedure.

Adjustment of Belt Tension

Warning
Be sure to stop the engine before adjusting the belts.

Important
Before making sure of belt tension, rotate the belt several times.

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

Adjustment of Pump Drive Belt

1. The belt tension is appropriate when there is approximately 10 mm (0.39 in) of slack when the belt is pressed lightly by finger at 98 N (10 kgf) around the center section between the belt pulleys (arrow in the diagram).
2. Tighten the high nut until there is no clearance between the spring cover and the tension fulcrum fitting, and then lock it in place with the nut.

Adjustment of Steering Chain

Excessive play with a loose steering chain may stretch the chain further while you may feel a heavy steering wheel with an excessively tight chain and the chain and wheel may wear prematurely.

Important
Make sure that the steering chain has the specified amount of slack.

1. Open the front cover.
2. With the nuts on each end of the steering chain, adjust the chain tension so that there is approximately 5 mm (0.20 in) of slack.
3. After making adjustments, firmly secure the nuts.
Adjustment of Brake

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

⚠️ Caution
If the brake is not sufficiently effective, adjust the brake wire.

⚠️ Caution
Perform the adjustment with the engine stopped.

Adjust the brake by tightening the brake wire adjustment bolt and the spring rod.

Adjustment of Adjustment Bolt

When the brake wire is stretched, the play of the brake pedal may become large, the braking effectiveness may become worse and the brake pedal may lock.

Important
Adjust the play of the brake lever so that it is as small as possible and the brakes do not drag when the lever is released.

Adjust the brake wire adjustment bolts to adjust the pull length for the brake lever.
- If the brake lever play is too large, the braking power will be decreased and the brake pedal will be soft.
- If the brake lever play is too small, the braking power will be increased and the brake pedal will be hard.

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.
Adjusting The Neutral Position of The Piston Pump

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. Remove the cotter pin and washer at the pedal end, and then remove the end of the push-pull cable.
3. Place the jacks securely beneath the jack-up points, and then lift the machine off the ground. Use stable jack stands, and raise the machine until the tires lift off the ground. "Jack-Up Points" (Page 5-5)
4. Start the engine, and rev it up to the maximum rpm.
5. Set the 2WD/3WD selector lever to the "2WD" position.

**Warning**

When adjusting the neutral position, exercise care so that the hand does not get entangled in the rotating parts.

6. Slowly turn the camshaft until the rear wheel stops, and then use the nut to lock the camshaft at the stopped position.

7. Loosen the lock nuts.

8. Adjust the end of the push-pull cable at the pedal end so that it attaches to the connection point on the pedal, and then tighten the lock nuts.
9. Insert the push-pull cable, and then install the washer and cotter pin.

Change of Hydraulic Oil

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

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

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

**Important**
Use Shell Tellus S2V32 (or equivalent) as hydraulic oil. In case of an equivalent, consult Characteristics of Hydraulic Oil and use hydraulic oil whose characteristics are superior to those of the specific hydraulic oil. Especially regarding kinematic viscosity and viscosity index, use of hydraulic oil whose figures are less than those of the specified hydraulic oil will cause a malfunction in the hydraulic circuit.

Note:
Characteristics of Hydraulic Oil

<table>
<thead>
<tr>
<th>Specified Hydraulic Oil</th>
<th>Shell Tellus S2V32</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO Viscosity Grade</td>
<td>ISO VG32</td>
</tr>
<tr>
<td>Density</td>
<td>0.869 g/cm³ (0.0313 lb/in³)</td>
</tr>
<tr>
<td>API Gravity</td>
<td>31.3</td>
</tr>
<tr>
<td>Flash Point (Open Cup)</td>
<td>202 °C (396 °F)</td>
</tr>
<tr>
<td>Pour Point</td>
<td>-40 °C (-40 °F)</td>
</tr>
<tr>
<td>Kinematic Viscosity</td>
<td>32 mm²/s (32 cSt)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>6.1 mm²/s (6.1 cSt)</td>
</tr>
<tr>
<td>Viscosity Index</td>
<td>141</td>
</tr>
</tbody>
</table>

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 rake, and then stop the engine.
[3] Remove the drain plug of the hydraulic tank, and then drain the old oil into a container.
Wind new sealing tape on the drain plug, and then attach it to the hydraulic tank.

2. 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 15.0 dm$^3$ (15.0 L).

3. Tighten the tank cap securely.
2. Lightly coat the packing of the new filter cartridge with hydraulic oil, and then install the cartridge.
3. Screw in the filter by hand until the packing contacts the mounting surface. Then tighten additional 1/2 turn from that point.
4. Supply hydraulic oil until it reaches the specified level. "Hydraulic Oil Supply" (Page 4-4)
5. Start the engine, and then stop it after 10 to 20 minutes.

4. Start the engine, raise and lower the rake, and repeatedly move forward and backward several times with the rake raised.
5. Raise the rake 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 oil leakage.
6. Make sure that there is no oil leakage at the sealing surface of the filter cartridge.
7. Check the hydraulic oil level.
   If it is low, supply hydraulic oil until it reaches the specified level.

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.
   "Cleaning of Air Cleaner" (Page 4-6)

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 SF 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. Wind new sealing tape around the drain plug, and then replace it in the engine.
4. Remove the oil filler cap, and then supply new engine oil until the oil reaches a level in between the upper and lower limit lines on the oil level gauge.
5. Supply 1.0 dm³ (1.0 L) of engine oil, remove the oil level gauge, and then insert it all the way to check the oil level.
   After checking the oil level with the oil level gauge, add more engine oil if it is insufficient. The engine oil quantity (including the oil filter) is approximately 1.6 dm³ (1.6 L).
6. Replace the oil filler cap.
7. 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.

**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 SF 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 hand-tighten additional 1/2 to 3/4 turn from that point (without using a filter wrench).

4. Supply engine oil until it reaches the specified level. "Supply of Engine Oil" (Page 4-9)

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.

**Change of Fuel Filter**

**Important**

While installing the fuel filter, prevent contamination with dirt or dust. The fuel contaminated with dirt or dust will cause engine failure.

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. Remove the old fuel filter.

2. Install a new fuel filter with the arrow marked on it pointing toward the engine.

1. Engine
2. Filter cartridge
3. Oil filler cap
4. Oil level gauge
5. Drain plug

1. Fuel filter
A. Engine
B. Fuel cock
### Change of Fuse

**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.

#### Fuses

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main harness fuse</td>
</tr>
<tr>
<td>2</td>
<td>Light harness fuse</td>
</tr>
</tbody>
</table>

The fuses are located at the lower right inside the front cover and consist of the light harness fuse and the main harness fuse for the entire circuit. The fuse capacities are both 20 A.

- Main harness fuse: Glass fuse
- Light harness fuse: Mini blade fuse
EU Declaration of Conformity

Product Identification
- Product: Bunker rake
- Brand-Name: BARONESS
- Type: SPO0A
- Version(s): Not Applicable
- Starting Serial No.: 20889
- Measured Sound Power Level:
  - LWA: 95.00 dB
- Guaranteed Sound Power Level:
  - LWA: 98 dB
- Manufacturer Name: Kyoelsa Co., Ltd.
- Address: 1-26 Miyuki-cho, Toyokawa, Aichi-ken, 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 5395-1 : 2013 (2006/42/EC)

Keeper of Technical Documentation
- Name: Kyoelsa Co., Ltd.
- Address: 1-26 Miyuki-cho, Toyokawa, Aichi-ken, Japan

Compiler of the technical file (2006/42/EC)
- Name: Friedrich E. Barthels Nachf. Glioclicin KG (GmbH & Co.)
- Address: 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)

Place: Japan
Date: 6 January 2021 (6/01/2021)
Signature: [Signature]
Name: Akio Hayashi
Position: Quality Dept. Director

Déclaration de conformité UE

Identification du produit
- Produit: Râteau pour fosse
- Fabricant: BARONESS
- Type: SPO0A
- Version(s): Non applicable
- Numéro de série de début: 20889
- Niveau de puissance acoustique mesuré:
  - LWA: 95.00 dB
- Niveau de puissance acoustique garantie:
  - LWA: 98 dB
- Fabricant: Kyoelsa Co., Ltd.
- Adresse: 1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon

Conformes aux directives suivantes:
- 2006/42/CE 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:

Fiche technique
- Marque: Kyoelsa Co., Ltd.
- Adresse de la marque: 1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon
- Compilateur de la fiche technique (2006/42/CE)
- Nom: Friedrich E. Barthels Nachf. Glioclicin KG (GmbH & Co.)
- Adresse: 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)

EU01a - 1
Declaración de conformidad de la UE

Identificación del producto
Producto: Rastrillo para búnker
Marca: BARONESS
Tipo: SP05A
Versión: No aplicable
N° de serie inicial: 20889
Nivel de potencia sonora medido: LWA 95.00 dB
Nivel de potencia sonora garantizado: LWA 98 dB
Fabricante: Kyoeisha 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 Emisiones sonoras de máquinas de uso al aire libre

Se ha diseñado y fabricado utilizando las siguientes especificaciones
ISO 5395-1 : 2013 (2006/42/CE)

Documentación técnica
Nombre del responsable: Kyoeisha Co., Ltd.
Dirección del responsable: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japón
Compilador del archivo técnico: Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Dirección: Gerhard-Falk-Str. 1 21035 Hamburg Alemania

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)

EU-Konformitätserklärung

Produktbeschreibung
Produkt: Bunkerharke
Marke: BARONESS
Modell: SPO5A
Version(en): Nicht zutreffend
Startseriennummer: 20889
Gemessener Schallleistungspegel: LWA 95.00 dB
Garantierte Schallleistungspegel: LWA 98 dB
Hersteller
Name: Kyoeisha Co., Ltd.
Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Entspricht den folgenden Richtlinien
2000/14/EG Maschinenrichtlinie
2014/30/EG 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)

Technische Dokumentation
Name des Halter: Kyoeisha Co., Ltd.
Adresse des Halter: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan
Technische Unterlagen erstellt von: Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Adresse: Gerhard-Falk-Str. 1 21035 Hamburg Deutschland

Konformitätsbewertungsverfahren
Interne Produktionskontrolle: Modul A (2006/42/EG)
EG-Baumusterprüfung: Modul B (2014/30/EG)
Interne Produktionskontrolle mit Bewertung der technischen Unterlagen und regelmäßiger Überprüfung (2000/14/EG)
EU-försäkran om överensstämme

Produktidentifiering

Produkt: Åagräskläppare
Märke: BARONESS
Typ: SP05A
Version(er): Ej aktuellt
Serienummer startar på: 20889
Uppmätta ljudemissionsnivå: LWA 95.00 dB
Garantierad ljudemissionsnivå: LWA 98 dB
Tillverkare: Kyoeisha Co., Ltd.
Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Uppfyller följande direktiv
2006/42/EG Maskindirektivet
2014/30/EU Elektromagnetisk kompatibilitet (EMC)
2020/14/EU Bärraremission från utomhusutrustning

Följande kravspecifikationer har följts vid konstruktion och tillverkning
ISO 12100 : 2010 (2006/42/EG)
ISO 5395-1 : 2013 (2006/42/EG)
ISO 5395-3 : 2013 (2006/42/EG)

Teknisk dokumentation

Innehavarens namn: Kyoeisha Co., Ltd.
Innehavarens adress: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan
Den tekniska filen (2006/42/EG) har tagits fram av Namn: Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Adresse: Gerhard-Falk-Str. 1 21035 Hamburg Tyskland

Förfarande för bedömning av överensstämme

Intern produktionskontroll: Modul A (2006/42/EG)
EG-typprovning: Modul B (2014/30/EU)
Intern kontroll av produktion med fastställande av teknisk dokumentation och periodiska kontroller (2000/14/EG)

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EU-overensstimmelseerkläring

Produktidentifiering

Produkt: Bunkrinsyr
Märkenavn: BARONESS
Typ: SP05A
Version(er): Ikke användelig
Startande seriem.: 20889
Mål ljudemissionsnivå: LWA 95.00 dB
Garantierad ljudemissionsnivå: LWA 98 dB
Producent: Kyoeisha Co., Ltd.
Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-praef., Japan

Er i överensstämme med följande direktiver
2006/42/EF Maskindirektivet (MD)
2014/30/EU Elektromagnetisk kompatibilitet (EMC)
2000/14/EF Statemissioner från utomhus utstyr

Vi har designat och producerat under följande specifikationer
ISO 5395-1 : 2013 (2006/42/EF)
ISO 5395-3 : 2013 (2006/42/EF)

Innehavare av teknisk dokumentation

Namn: Kyoeisha Co., Ltd.
Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-praef., Japan
Komplator av den tekniska filen (2006/42/EF)
Namn: Friedrich E. Barthels Nachf. Glockzin KG (GmbH & Co.)
Adresse: Gerhard-Falk-Str. 1 21035 Hamburg Tyskland

Procedurer för överensstimmelseerklaring

Intern produktionskontroll: Modul A (2006/42/EF)
EF-typprovning: Modul B (2014/30/EU)
Intern fabrikationskontroll med värdering av teknisk dokumentation och periodisk kontroll (2000/14/EF)
UK Declaration of Conformity

Product Identification
Product: Bunker rake
Brand-Name: BARONESS
Type: SPOSA
Starting Serial No.: 21011
Measured Sound Power Level: LWA 95.00 dB
Guaranteed Sound Power Level: LWA 98 dB
Manufacturer: Kyoeisha Co., Ltd.
Address: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Conforms to the following Directives
Supply of Machinery (Safety) Regulations 2008 (SMD2008)
Electromagnetic Compatibility Regulations 2016 (EMC2016)
Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 (Noise2001)

We have been designed and manufactured under the following specifications
ISO 12100: 2010 (SMD2008)
ISO 5395-1: 2013 (SMD2008)
ISO 5395-3: 2013 (SMD2008)
ISO 14982: 1998 (EMC2016)

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

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

Conformity assessment procedures
Internal production control: Module A (SMD2008)
EC-type examination: Module B (EMC2016)
Internal control of production with assessment of technical documentation and periodical checking (Noise2001)

Place: Japan
Date: 1 February 2021 (1/2/2021)
Signature: [Signature]
Name: Akio Hayashi
Position: Quality Dept. Director

UK01