"Required reading"
Read this manual and the Owner's Manual for the engine before using the machine.
Thank you for purchasing the Baroness machine. This manual explains proper handling, adjustment, and inspection of your machine. Prior to use, carefully read this manual to thoroughly understand the contents for safe and correct operation. We hope you will use the machine safely, and take advantage of its best performance.

**Keeping the Owner’s Operating Manual**

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

![Diagram of the box location](bhf6qq-005)
Read this manual carefully to ensure that you thoroughly understand how to properly operate and maintain this machine, and to avoid causing injury to yourself or others.

The operator is responsible for operating the machine properly and safely.
Do not perform maintenance on the machine other than that described in this manual.
Be sure to also read the Owner's Manual for the engine, battery, etc.
Maintenance should only be performed by a certified specialist.
If you have any questions concerning maintenance or genuine parts, please contact your local Baroness dealer or Kyoeisha.
When making inquiries about this machine, please specify the machine's model designation and serial number.
When loaning or transferring this machine, please also provide this manual together with the machine.

Kyoeisha Co., Ltd.

Caution
The information described in this manual is subject to change for improvement without prior notice.
When replacing parts, be sure to use genuine Baroness parts or parts designated by Kyoeisha.
Note that the Baroness product warranty may not apply to defects caused by the use of parts from other companies.

Warning Symbols

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

Warning symbol

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

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

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

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

Important
This symbol indicates precautions on the mechanism of the machine.
Purpose

This machine is intended for cutting turf grass at golf courses. Do not use this machine in any way other than its intended purpose, and do not modify the machine. Operating this machine for other purposes and modifying it may be very dangerous and may cause damage to the machine. In addition, this machine is not authorized for operation as a special motor vehicle. Do not operate it on public roads.
LM3210

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Product Overview .......................................... Page 3-1
Specifications .................................................Page 3-2
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Failure to adequately follow these safety precautions may cause an accident resulting in injury or death.

**Danger**

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

**Safe Operating Practices**

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

**Training**

1. Read 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 cannot 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
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/use can prevent and is responsible for accidents or injuries occurring to themselves, other people, or property.
6. Keep in mind that the owner, operator, and mechanic are responsible for accidents or hazards occurring to other people or their property.

**Preparation**

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

**Warning**

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

   [1] Store fuel in containers specifically designed for this purpose.
   [2] Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
   [3] Refuel outdoors only and do not smoke while refueling.
   [4] If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until petrol vapours have dissipated.
5. Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.
6. If the brake operation is faulty or the parking brake lever has noticeable play, be sure to adjust or repair them before operating the machine.
7. Replace faulty mufflers.
8. On multi-cylinder/multi-reel machines take care as rotating one cylinder/reel can cause other cylinder/reels to rotate.

**Operation**

1. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
2. Only operate in good light, keeping away from holes and hidden hazards.
3. Before attempting to start the engine, disengage all attachments, shift into neutral, and engage the parking brake. Only start engine from the operator's position. Use seat belts if provided.
4. Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
   [1] Do not stop or start suddenly when going up or downhill.
   [5] Never operate across the face of the slope, unless the machine is designed for this purpose.
   [6] Never drive the machine on a slope with an angle of gradient that is greater than that specified or in a place where there is a danger of the machine slipping.
5. Never operate the machine with damaged guards, shields, or without safety protective devices in place. Be sure all interlocks are attached, adjusted and functioning properly.
6. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
7. Do the following before leaving the operator's position.
   [1] Stop on level ground.
   [2] Disengage the power take-off and lower the attachments.
   [3] Change into neutral and set the parking brake.
   [4] Stop the engine and remove the key.
8. Disengage the drive to attachments, stop the engine, and remove the ignition key in the following conditions.
   [3] Before making height adjustment unless adjustment can be made from the operator's position.
   [5] Before checking, cleaning, or working the machine.
   [6] After striking a foreign object or if an abnormal vibration occurs. Inspect the machine for damage and make repairs before restarting and operating the equipment.
9. Keep hands and feet away from the cutting units and the rotating parts.
10. Look behind and down before backing up to be sure of a clear path.
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. Stop the blades rotating before crossing surfaces other than grass.
15. Disengage drive to attachments when transporting or not in use.
16. When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
17. Do not operate the machine under the influence of alcohol or drugs.
18. Take care when loading or unloading the machine into a trailer or a truck. Load or unload the machine in a flat and safe place. Before loading or unloading, set the parking brake on the truck or trailer, stop the engine, and chock the wheels. When transporting the machine on a truck or a trailer, set the parking brake, stop the engine, and fasten the machine to the truck with a rope or other suitable restraining device that has sufficient strength. When using a running board, select one with sufficient strength, length, and width and that will not cause the machine to slip.

19. Close the fuel valve before transporting the machine.

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

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

22. Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of operation.

Maintenance and storage

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

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

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

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

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

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

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

8. Do not store fuel near flames.

9. Never allow untrained personnel to service machine.

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

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

12. Use jack stands to support components when required.

13. Carefully release pressure from components with stored energy.

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

15. Check whether line connectors in the hydraulic system are properly tightened. Before applying hydraulic pressure, check the connections of the hydraulic pressure lines and the condition of the hoses.

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

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

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

19. Use care when checking the cylinders/reels and bed knives.

[1] Wear gloves and use caution when servicing them.

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

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

21. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
22. Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

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

24. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.

25. Check the grass catcher frequently for wear or deterioration.

26. If the fuel tank has to be drained, do this outdoors.
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About the Waste disposal

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

### Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>LM3210 (Type_F)</th>
<th>LM3210 (Type_R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length during operation</td>
<td>124.06 in</td>
<td>129.92 in</td>
</tr>
<tr>
<td>Total width during operation</td>
<td>144.49 in</td>
<td>144.88 in</td>
</tr>
<tr>
<td>Total height</td>
<td>92.91 in</td>
<td>92.91 in</td>
</tr>
</tbody>
</table>

### Weight

<table>
<thead>
<tr>
<th>Model (empty fuel tank)</th>
<th>LM3210 (Type_F)</th>
<th>LM3210 (Type_R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total weight</td>
<td>4265.87 lb</td>
<td>4287.92 lb</td>
</tr>
</tbody>
</table>

### Engine

<table>
<thead>
<tr>
<th>Model</th>
<th>Kubota V2403-CR-TE4B</th>
<th>Kubota V2403-CR-TE4B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Vertical water-cooled 4-cycle diesel engine with turbocharger</td>
<td>Vertical water-cooled 4-cycle diesel engine with turbocharger</td>
</tr>
<tr>
<td>Total displacement</td>
<td>148.51 cu.in.</td>
<td>148.51 cu.in.</td>
</tr>
</tbody>
</table>

### Fuel tank capacity

<table>
<thead>
<tr>
<th>Fuel type</th>
<th>U.S. gals</th>
<th>dm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>13.47</td>
<td>51.0</td>
</tr>
<tr>
<td>Diesel</td>
<td>51.0</td>
<td>13.47</td>
</tr>
</tbody>
</table>

### Fuel consumption

<table>
<thead>
<tr>
<th>Fuel type</th>
<th>g/PS • h (rated output)</th>
<th>g/kW•h (rated output)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>174</td>
<td>236</td>
</tr>
<tr>
<td>Diesel</td>
<td>236</td>
<td>174</td>
</tr>
</tbody>
</table>

### Engine oil capacity

<table>
<thead>
<tr>
<th>Engine oil</th>
<th>U.S. gals</th>
<th>dm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>2.56</td>
<td>9.7</td>
</tr>
<tr>
<td>Diesel</td>
<td>9.7</td>
<td>2.56</td>
</tr>
</tbody>
</table>

### Operating width (Mowing width)

<table>
<thead>
<tr>
<th>Model</th>
<th>HST (2WD/4WD selectable)</th>
<th>HST (2WD/4WD selectable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td>2WD: 0 - 9.63 mph</td>
<td>2WD: 0 - 9.63 mph</td>
</tr>
<tr>
<td></td>
<td>4WD: 0 - 6.22 mph</td>
<td>4WD: 0 - 6.22 mph</td>
</tr>
<tr>
<td>Reverse</td>
<td>0 - 3.73 mph</td>
<td>0 - 3.73 mph</td>
</tr>
</tbody>
</table>

### Maximum inclination for operation

<table>
<thead>
<tr>
<th>Model</th>
<th>15 degrees</th>
<th>15 degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire size</td>
<td>Front wheel</td>
<td>31 x 13.50 - 15</td>
</tr>
<tr>
<td></td>
<td>Rear wheel</td>
<td>20 x 12.00 - 10</td>
</tr>
</tbody>
</table>

### Battery

| Model       | 105D31R | 105D31R |

* The factory default maximum engine rpm is 2,600 rpm.
Sound pressure level

- Sound pressure level

  This machine was confirmed to have a continuous A-weighted sound pressure level of 88 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 103 dB by measuring identical machines in accordance with the procedure specified in directive 2000/14/EC.

Vibration level

- Hand-arm vibration

  This machine was confirmed not to exceed a vibration level of 2.5 m/s² to hands and arms by measuring identical machines in accordance with the procedure specified in ISO 5395-1:2013.

- Whole body vibration

  This machine was confirmed not to exceed a vibration level of 0.5 m/s² to the whole body by measuring identical machines in accordance with the procedure specified in ISO 5395-1:2013.
**Names of Each Section**

1. Mower unit up/down lever
2. Seat
3. Diff-lock switch
4. Tilt lever
5. Forward pedal
6. Reverse pedal
7. Lights
8. Mower unit #5
9. Mower unit #1
10. Mower unit #4
11. Mower unit #2
12. Fuel filler
13. Throttle knob
14. Hood
15. Radiator
16. Oil cooler
17. Radiator cover
18. Muffler
19. Mower unit #3
20. Oil gauge
21. Parking brake lever
22. Brake pedals

A. Serial number plate
B. Specification decal
C. Decal, noise emission
D. Year of manufacture decal
E. Maintenance decal
F. ROPS authentication decal
G. Battery capacity decal
Serial Number Plate
The serial number plate indicates the model and serial number of the machine.

![Serial Number Plate](image)

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

![Year of Manufacture Decal](image)

Specification Decal
The specification decal indicates the CE logo, model name, and weight, etc.

![Specification Decal](image)

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

![Noise Emission Decal](image)

Maintenance Decal
The maintenance decal indicates the necessary inspection and maintenance items for this machine.

![Maintenance Decal](image)
ROPS compliance decal

ROPS compliance decal indicates the manufacturer of the fitted machine, the model, etc. in accordance with ISO21299:2009.

Battery capacity decal

The battery capacity decal indicates the capacity by 20HR and CCA.
### Description of Safety Decals and Instruction Decals

<table>
<thead>
<tr>
<th>Decal, operation</th>
<th>LM3210-0901Z0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Warning</strong></td>
</tr>
<tr>
<td></td>
<td>Read the Owner's Operating Manual.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Warning</strong></td>
</tr>
<tr>
<td></td>
<td>Apply the parking brake, stop the engine, and then remove the ignition key before leaving the machine.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Danger</strong></td>
</tr>
<tr>
<td></td>
<td>Flying objects - All persons other than the operator must keep a safe distance from the machine.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Danger</strong></td>
</tr>
<tr>
<td></td>
<td>May cut your hand or leg - Keep hands and feet away from moving parts.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Danger</strong></td>
</tr>
<tr>
<td></td>
<td>Rollover - Do not work on any slopes of 15 degrees or more. When you descend a slope, fasten your seatbelt, lower the mower units, and then drive at low speed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sticker, reel start/stop</th>
<th>K4205001840</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Warning</strong></td>
</tr>
<tr>
<td></td>
<td>Read the Owner's Operating Manual.</td>
</tr>
<tr>
<td>[1] Sit on the seat.</td>
<td></td>
</tr>
<tr>
<td>[2] Turn the key to the &quot;ON (GLOW)&quot; position, and then wait for the &quot;BARONESS&quot; logo to go off.</td>
<td></td>
</tr>
<tr>
<td>[3] Turn the key to the &quot;START&quot; position.</td>
<td></td>
</tr>
<tr>
<td>[4] Depress the brake pedal to release the parking brake.</td>
<td></td>
</tr>
</tbody>
</table>
### Procedure to Stop Engine

1. Set the reel rotation switch to the "OFF" position, and then raise the mower units.
2. Apply the parking brake.
3. Turn the key to the "STOP" position, and then remove it.

### Decal, caution to mutilation

**Danger**

May cut your hand or leg - Stop the rotation and engine. Otherwise you may get injured.

### Decal, caution to hot parts

**Caution**

High temperature - Do not touch. Otherwise, you will get burned.

### Decal, caution to injure

**Caution**

May pinch - There is a risk of being pinched.

### Decal, caution to rotating object

**Danger**

Watch for rotating parts - Keep your hands away from the belts while the engine is running.

### Decal, hydraulic oil

**Caution**

Read the Owner's Operating Manual.
<table>
<thead>
<tr>
<th>Page</th>
<th>Decal Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>K4209001000 Decal, diesel fuel refueling hole Use diesel fuel.</td>
</tr>
</tbody>
</table>
| 9    | K4205001940 Decal, caution fire  
**Danger**  
Keep fire away. |
| 10   | K4205001900 Decal, caution arm lock |
| 11   | K4205001970 Decal, caution spouting coolant  
**Caution**  
Caution for spouting coolant - Do not open while hot. |
| 12   | K4205001930 Decal, caution to injure  
**Caution**  
May pinch - There is a risk of being pinched. |
| 13   | K4205001950 Decal, caution exhaust gas  
**Warning**  
Caution for exhaust gas |
| 14   | K4209001530 Decal, indicating diesel fuel  
Use ultra-low sulfur diesel fuel (sulfur-free diesel fuel). |
| 15 | ROLL-OVER PROTECTIVE STRUCTURE |
|    | K4205001710                     |
|    | Decal, caution to ROPS         |
|    | Replace damaged ROPS.           |
|    | Do not repair or modify. (Only when equipped with ROPS) |

| 16 | K4205002090                     |
|    | Decal, caution to noise        |
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Inspection Before Use

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

Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)

Inspection of Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)

The reel cutter (cutting cylinder) and bed knife (bottom blade) may become dull due to frequent use, objects crushed during mowing, or damage caused during transportation. Inspect the reel cutter (cutting cylinder) and bed knife (bottom blade), and if necessary, adjust the blade engagement, perform back lapping, or resharpen or replace the reel cutter (cutting cylinder) and the bed knife (bottom blade).

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

Radiator Cover

Inspection of Radiator Cover

1. Make sure that there is no damage to the radiator cover.
2. Make sure that the radiator cover is not contaminated.

Cleaning of Radiator Cover

Important

An unclean radiator cover may cause overheating or damage to the engine. It may also cause malfunction of the hydraulic system.

If the radiator cover has been contaminated with dust, be sure to clean it. After operating the machine in a dusty environment, it is important to remove dust from the cover as soon as possible.

1. Open the radiator cover.
2. Carefully clean the front and back of the radiator cover with water or compressed air.
Radiator

Inspection of Radiator

For details on handling the engine, please refer to the Engine's Owner's Manual.
1. Make sure that there is no damage to the radiator.
2. Make sure that the radiator is not contaminated.

Cleaning of Radiator

For details on handling the engine, please refer to the Engine's Owner's Manual.

**Important**

An unclean radiator may cause overheating or damage to the engine. It may also cause malfunction of the hydraulic system.

**Important**

Do not use solid objects, such as a spatula or screwdriver, or high-pressure water to clean the radiator or oil cooler. Otherwise, special fins or tubes may be damaged, possibly resulting in reduced cooling performance or coolant leakage.

If the radiator 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 radiator cover.
2. Unlock the rubber catches on the left and right of the oil cooler, and then tilt the oil cooler.
3. Carefully clean the front and back of the radiator with water or compressed air.

Coolant

Inspection of Coolant

For details on handling the engine, please refer to the Engine's Owner's Manual.

**Warning**

Do not touch the radiator or coolant during engine operation or right after the engine has been turned off. Due to high temperatures, doing so could cause burns.

**Caution**

Inspection should take place after the engine has well cooled down.

1. Make sure that the coolant level in the reserve tank is between "Full" and "Low."
Coolant Supply

For details on handling the engine, please refer to the Engine's Owner's Manual.

**Warning**
Do not touch the radiator or coolant during engine operation or right after the engine has been turned off. Due to high temperatures, doing so could cause burns. After the radiator has well cooled down, open the radiator cap.

**Caution**
Supply coolant after the engine has well cooled down.

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

**Important**
When you supply coolant, be sure to use clean water, such as tap water. During winter, remove coolant. Alternatively, mix long-life coolant and clean water, and then pour it into the radiator and reserve tank.

<table>
<thead>
<tr>
<th>Freezing temperature</th>
<th>LLC concentration (volume %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down to -10°C (14°F)</td>
<td>20 %</td>
</tr>
<tr>
<td>Down to -15°C (5°F)</td>
<td>30 %</td>
</tr>
<tr>
<td>Down to -20°C (-4°F)</td>
<td>35 %</td>
</tr>
<tr>
<td>Down to -25°C (-13°F)</td>
<td>40 %</td>
</tr>
</tbody>
</table>

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

2. If no coolant is in the reserve tank, follow the steps below to fill the tank with clean water.
   [1] Open the radiator cap, and then supply clean water up to the opening.
   [2] Open the reserve tank cap, and then supply clean water up to the "FULL" mark.
Change of Coolant

For details on handling the engine, please refer to the Engine’s Owner’s Manual.

**Warning**

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

**Warning**

Do not touch the radiator or coolant during engine operation or right after the engine has been turned off. Otherwise, you may get burned due to high temperatures. After the radiator has well cooled down, open the radiator cap.

**Caution**

Change coolant after the engine has well cooled down.

**Important**

When you change coolant, be sure to use clean water, such as tap water. During winter, remove coolant. Alternatively, mix long-life coolant and clean water, and then pour it into the radiator and reserve tank.

For details on changing coolant, please refer to the separate Engine Operating Manual. Coolant quantity, including that of the reserve tank, is 12.0 dm³ (12.0 L).

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**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**

**Caution**

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 coolant 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 radiator cover.
2. Unlock the rubber catches on the left and right of the oil cooler, and then tilt the oil cooler.
3. Carefully clean the front and back of the oil cooler with water or compressed air.
Hydraulic Oil

Inspection of Hydraulic Oil

The oil gauge is on the side of the hydraulic tank.
1. Raise the mower units 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 S2M46 (or equivalent) as hydraulic oil.
1. If the oil level is low, remove the left tank cover, and then open the tank cap and supply oil.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tank cap</td>
</tr>
<tr>
<td>2</td>
<td>Oil gauge</td>
</tr>
</tbody>
</table>

2. Tighten the tank cap securely.
3. Start the engine, raise and lower the mower units, and turn the steering wheel left and right. Move forward and reverse repeatedly several times.
4. Raise the mower units and maintain that position on a level surface, and then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.
5. Check underneath the machine for oil leakage.
6. Attach the left tank cover.

Change of Hydraulic Oil

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

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

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

**Important**
Use Shell Tellus S2M46 (or equivalent) as hydraulic oil.
1. Follow the steps below to remove the old oil.
   [1] Start and run the engine to warm up the oil.
   [2] On a level surface, lower the mower units, and then stop the engine.
   [3] Remove the drain plug of the hydraulic tank, and then drain the old oil into a container.
Wind new sealing tape on the drain plug, and then attach it to the hydraulic tank.

1. Remove the left tank cover.
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 44.0 dm$^3$ (44.0 L).
3. Tighten the tank cap securely.

Air Cleaner

Inspection of Air Cleaner

For details on handling the engine, please refer to the Engine's Owner's Manual.
A contaminated air cleaner element may cause malfunction of the engine.

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

2. Make sure that there is no damage to the air cleaner.
3. Make sure that the air cleaner is not contaminated.

Cleaning of Air Cleaner

For details on handling the engine, please refer to the Engine's Owner's Manual.
A contaminated air cleaner element may cause malfunction of the engine.
To maximize the life of the engine, clean the air cleaner properly.

1. Follow the steps below to clean the outer element.
   [1] Remove the clips from the three locations, remove the air cleaner cap, and then remove the outer element.
   [2] While paying close attention not to damage the outer element, tap a solid portion of the outer element or blow compressed air from its inside to remove dust and dirt.
   If the outer element is extremely contaminated, replace it with a new one.
[3] Attach the outer element to the air cleaner body.

[4] Replace the air cleaner cap, and then fix it securely using the clips.

2. Press the reset button for the vacuum indicator.

Change of Air Cleaner

For details on handling the engine, please refer to the Engine's Owner's Manual. 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.

   [3] Even if the hours of operation do not exceed the specified time, change it at least once per year.

2. Replace the air cleaner element in the same manner as cleaning the air cleaner. (See "Cleaning of Air Cleaner" (Page 4-7).)

Important
The inner element cannot be cleaned.

3. Replace the inner element every year or when it becomes damaged or dirty.
Battery

Inspection of Battery

For details on handling the battery, please refer to the Battery's Owner's Manual.

⚠️ Danger

Keep away from fire 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

Perform operations after the muffler and engine have sufficiently cooled. Otherwise, you may suffer burns.

1. Clean the areas around the battery fluid level lines using a cloth damped 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

For details on handling the battery, please refer to the Battery's Owner's Manual.

⚠️ 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.

⚠️ Warning

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.

| 1 | UPPER LEVEL |
| 2 | LOWER LEVEL |
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 (31 x 13.50 - 15)</td>
<td>140 kPa (1.4 kgf/cm²)</td>
</tr>
<tr>
<td>Rear wheel (20 x 12.00 - 10)</td>
<td>140 kPa (1.4 kgf/cm²)</td>
</tr>
</tbody>
</table>

Type_R

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Pneumatic Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front wheel (31 x 15.50 - 15)</td>
<td>140 kPa (1.4 kgf/cm²)</td>
</tr>
<tr>
<td>Rear wheel (20 x 12.00 - 10)</td>
<td>140 kPa (1.4 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. Make sure that the parking brake is applied after depressing the brake pedal and pulling the parking brake lever.
2. Make sure that the parking brake is not applied even slightly after depressing the brake pedal to release the parking brake lever.

Belt
Inspection of Belt

**Caution**
The engine must be stopped when the belt is inspected.

**Caution**
If you have removed the cover during inspection, make sure that you replace it in the original position securely. If the cover remains removed, the operator may come in contact with the rotating objects or belt, possibly resulting in injuries.

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

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

Around the Engine
Inspection of Engine-Associated Parts
For details on handling the engine, please refer to the Engine's Owner's Manual.
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 inside or around the muffler.
**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 oil level.
2. Position the machine so that the engine will be level, and then insert the oil level gauge all the way to check the oil level.
3. The appropriate oil level should be between the upper and lower limit lines on the gauge.

**Supply of Engine Oil**

For details on handling the engine, please refer to the Engine's Owner's Manual.

**Important**

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

**Important**

Do not mix different types of engine oil.

**Important**

Be sure to use engine oil that is classified as JASO DH-2 or API Service Grade CJ-4, with SAE viscosity that is appropriate for the operating environment (ambient temperature).

**Important**

Securely tighten the oil level gauge and oil filler cap.

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, 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.
2. Replace the oil filler cap.
3. 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

For details on handling the engine, please refer to the Engine's Owner's Manual.

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

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

**Important**
Be sure to use engine oil that is classified as JASO DH-2 or API Service Grade CJ-4, with SAE viscosity that is appropriate for the operating environment (ambient temperature).

**Important**
Securely screw in the oil level gauge and oil filler cap.

Change the engine oil more frequently if the engine oil is contaminated, or 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, stop the engine, remove the drain plug while the engine oil is warm, and then drain the oil into a bowl.
2. Replace the drain plug in the engine.
3. Through the oil filling port, supply new engine oil until the oil reaches a level in between the upper and lower limit lines on the oil level gauge. Engine oil quantity is approximately 9.7 dm³ (9.7 L).
4. Replace the oil filler cap.
5. 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 level in the monitor to check the fuel level.
Fuel Supply

**Danger**
Do not supply additional fuel after the fuel level indicates 100%.
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.

**Caution**
Use ultra-low sulfur diesel fuel (sulfur-free diesel fuel).

For details on fuel types, please refer to the Engine’s Owner’s Manual.
If the fuel level in the monitor indicates a level close to 0%, supply fuel (diesel) at your earliest convenience.
The fuel tank capacity is approximately 51.0 dm³ (51.0 L).

Air Bleeding of Fuel System

A priming pump is installed on the feed pump. Operate the priming pump manually to bleed air from the fuel system.

Water Separator

**Inspection of Water Separator**

For details on handling the engine, please refer to the Engine’s Owner’s Manual.

**Important**
If water contaminates the fuel, the supply pump and injector may seize.

The water separator removes water from the fuel.
1. Make sure that debris and water have not accumulated in the cup.
With the float raised, water incorporation is confirmed.
Draining of Water Separator

For details on handling the engine, please refer to the Engine’s Owner’s Manual.

**Important**

If water contaminates the fuel, the supply pump and injector may be burnt out.

Drain the water at least every 50 hours and whenever the float is raised by water.

1. Follow the steps below to drain the water.
   - [1] Stop the engine, and then turn the key switch to the "OFF" position.
   - [2] Place a container under the water separator.
   - [3] Loosen the water drain plug and air-bleeding bolt to drain the water into the container.
   - [5] Bleed air from the fuel system.

Cleaning of Water Separator

For details on handling the engine, please refer to the Engine’s Owner’s Manual.

**Important**

If water contaminates the fuel, the supply pump and injector may be burnt out.

Clean the water separator at least every 500 hours and whenever debris has accumulated in the cup.

1. Follow the steps below to clean the water separator.
   - [1] Stop the engine, and then turn the key switch to the "OFF" position.
   - [2] Place a container under the water separator.
   - If replacement is necessary, install a new element.
   - [4] Install the cup, element and float in their original positions.
   - [5] Bleed air from the fuel system.
Oil Leakage

Inspection of Oil Leakage

⚠️ Caution

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

After approximately 50 hours of operation, some tightened portions may be loosened and oil and grease may leak. Be sure to retighten the parts. Check the bottom of the machine for oil and grease leakage.
Tightening torques

Standard tightening torques

Bolts and Nuts

**Important**

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

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

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

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

The table below is for the galvanized or parkerized bolts.

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

Do not use rusty or sand attached "screw."

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

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

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

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

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

Do not use a bolt experienced too much burden.

Using the impact wrench requires the skill.

Do exercise as much as possible for steady tightening.

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>General bolt</th>
<th>Strength classification 4.8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M 4 T</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>N-m</td>
<td>kgf-cm</td>
</tr>
<tr>
<td>M5</td>
<td>3 - 5</td>
<td>30.59 - 50.99</td>
</tr>
<tr>
<td>M6</td>
<td>7 - 9</td>
<td>71.38 - 91.77</td>
</tr>
<tr>
<td>M8</td>
<td>14 - 19</td>
<td>142.76 - 193.74</td>
</tr>
<tr>
<td>M10</td>
<td>29 - 38</td>
<td>296.71 - 387.49</td>
</tr>
<tr>
<td>M12</td>
<td>52 - 67</td>
<td>530.24 - 683.20</td>
</tr>
<tr>
<td>M14</td>
<td>70 - 94</td>
<td>713.79 - 958.52</td>
</tr>
<tr>
<td>M16</td>
<td>88 - 112</td>
<td>897.34 - 1142.06</td>
</tr>
<tr>
<td>M18</td>
<td>116 - 144</td>
<td>1,182.85 - 1,468.37</td>
</tr>
<tr>
<td>M20</td>
<td>147 - 183</td>
<td>1,498.96 - 1,866.05</td>
</tr>
<tr>
<td>M22</td>
<td>295</td>
<td>3,008.12</td>
</tr>
<tr>
<td>M24</td>
<td>370</td>
<td>3,772.89</td>
</tr>
<tr>
<td>M27</td>
<td>550</td>
<td>5,608.35</td>
</tr>
<tr>
<td>M30</td>
<td>740</td>
<td>7,545.78</td>
</tr>
</tbody>
</table>
### Heat-treated bolt

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>Strength classification 8.8</th>
<th>Strength classification 10.9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8 T</td>
<td>11 T</td>
</tr>
<tr>
<td></td>
<td>N-m</td>
<td>kgf-cm</td>
</tr>
<tr>
<td>M5</td>
<td>5 - 7</td>
<td>50.99 - 71.38</td>
</tr>
<tr>
<td>M6</td>
<td>8 - 11</td>
<td>81.58 - 112.17</td>
</tr>
<tr>
<td>M10</td>
<td>45 - 57</td>
<td>458.87 - 581.23</td>
</tr>
<tr>
<td>M12</td>
<td>67 - 85</td>
<td>683.20 - 866.75</td>
</tr>
<tr>
<td>M14</td>
<td>106 - 134</td>
<td>1,080.88 - 1,366.40</td>
</tr>
<tr>
<td>M16</td>
<td>152 - 188</td>
<td>1,549.94 - 1,917.04</td>
</tr>
<tr>
<td>M18</td>
<td>200 - 240</td>
<td>2,039.40 - 2,447.28</td>
</tr>
<tr>
<td>M20</td>
<td>245 - 295</td>
<td>2,498.27 - 3,008.12</td>
</tr>
<tr>
<td>M22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M27</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M30</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**

The same values are applied to "fine screw thread."
**Principal tightening torques**

**Tightening Torque by Model**

**LM3210**

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></td>
<td></td>
<td></td>
<td>152 - 188</td>
<td>1549.94 - 1917.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>1019.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>400 - 430</td>
<td>4078.80 - 4384.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28 - 38</td>
<td>285.52 - 387.49</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>67 - 85</td>
<td>683.20 - 833.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>180 - 200</td>
<td>1835.46 - 2039.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>370 - 450</td>
<td>3772.89 - 4588.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150 ± 15</td>
<td>1529.55 ± 152.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>67 - 134</td>
<td>683.20 - 1366.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Location</td>
<td>Code</td>
<td>Part name</td>
<td>Tightening torque</td>
<td>Thread locking adhesive</td>
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<tr>
<td>---------------------------</td>
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</tr>
<tr>
<td>Tie rod</td>
<td>K16110000020</td>
<td>Slotted nut of tie rod end LH</td>
<td>45 N·m</td>
<td>458.87 kgf-cm 398.30 lb-in</td>
</tr>
<tr>
<td>Piston pump</td>
<td>K0013120502</td>
<td>Bolt, heat-treated M12-50</td>
<td>67 - 134 N·m</td>
<td>683.20 - 1366.40 kgf-cm 593.02 - 1186.03 lb-in</td>
</tr>
<tr>
<td>Tandem gear pump</td>
<td>K0069000251</td>
<td>Bolt, 3/8-16 UNC 31.8</td>
<td>29 - 38 N·m</td>
<td>295.71 - 387.49 kgf-cm 256.68 - 336.34 lb-in</td>
</tr>
<tr>
<td>Diff-lock valve</td>
<td>K0024100151</td>
<td>Bolt, w/hexagon hole, M10-15</td>
<td>29 - 38 N·m</td>
<td>295.71 - 387.49 kgf-cm 256.68 - 336.34 lb-in</td>
</tr>
<tr>
<td>Bumper</td>
<td>K0010120302</td>
<td>Bolt, heat-treated M12-30</td>
<td>67 - 134 N·m</td>
<td>683.20 - 1366.40 kgf-cm 593.02 - 1186.03 lb-in</td>
</tr>
<tr>
<td>Cover mounting bracket</td>
<td>K0000080202</td>
<td>Bolt, M8-20</td>
<td>9 - 14 N·m</td>
<td>91.77 - 142.76 kgf-cm 61.96 - 123.91 lb-in</td>
</tr>
<tr>
<td>Bed knife (bottom blade)</td>
<td>K0071001182</td>
<td>Screw, heat-treated flathead M10-16</td>
<td>29 - 38 N·m</td>
<td>295.71 - 387.49 kgf-cm 256.68 - 336.34 lb-in</td>
</tr>
</tbody>
</table>
Adjustment Before Operating

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 would be extremely dangerous if it becomes loose while traveling.

The steering wheel can be adjusted up or down. Adjust the position according to the operator's body size. Shift the tilt lever to the "FREE" position, move the steering wheel to the position that suits your work requirements, and then shift the tilt lever to the "LOCK" position to secure the steering wheel in place. The tilt lever is located in the right front of the driver’s position.

2. Use the backrest tilt adjustment lever to adjust the angle of the backrest.
3. Turn the suspension adjustment handle to adjust the firmness of the seat suspension. Observe the suspension adjustment scale while making adjustments. (50 - 130 kg)
4. Turn the armrest adjustment knob to adjust the angle of the armrests.

**Adjustment of Seat**

Use the seat adjustment levers to adjust the seat. Adjust the position according to the operator's body size.

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

5. Lift the seat to adjust its height to one of three positions.

---

<table>
<thead>
<tr>
<th>1</th>
<th>Steering wheel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Tilt lever</td>
</tr>
<tr>
<td>A</td>
<td>FREE (released)</td>
</tr>
<tr>
<td>B</td>
<td>LOCK (locked)</td>
</tr>
</tbody>
</table>
Adjustment of Blade Engagement

**Caution**

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

**Caution**

Before adjusting the blade engagement, be sure to set the reel rotation/stop switching lever for the reel motor (attached to the mower unit) to the “Stop” position.

![Adjustment of Blade Engagement](image)

With the cutter adjustment nut, adjust the engagement between the reel cutter (cutting cylinder) and the bed knife (bottom blade) so that newspaper (two to three sheets) will be cut by the edge of both blades when the blades in their entirety come slightly into contact with each other.

Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and the bed knife (bottom blade) at an angle of 90 degrees. Then, rotate the reel cutter (cutting cylinder) counter-clockwise (when you face the mower unit from the left) to check the sharpness of the blades. Check the sharpness of the entire range (three or four points from left edge to right) of the reel cutter (cutting cylinder).

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

![Diagram](image)

Adjustment of Blade Engagement_002

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Cutter adjustment nut</td>
</tr>
<tr>
<td>2</td>
<td>Spring</td>
</tr>
<tr>
<td>3</td>
<td>Pipe with cutter adjusting screw</td>
</tr>
</tbody>
</table>
Adjustment of Cutting Height

Roller (Roller Type)

Adjust the cutting height to fit your cutting work. You can adjust the front roller in four stages.

(10~22mm) (20~30mm) (28~40mm) (38~60mm)

Attach the front roller in a position within the range of cutting height that suits your work requirements.

1. To increase cutting height:
[1] Loosen cutting height adjustment nut A, tighten cutting height adjustment nut B, then lower the rear roller.
[2] Use the cutting height gauge to determine the position, then tighten cutting height adjustment nut A securely.

2. To decrease cutting height:
[1] Loosen cutting height adjustment nut B, tighten cutting height adjustment nut A, then raise the rear roller.
[2] Use the cutting height gauge to determine the position, then tighten cutting height adjustment nut B securely.
Front Wheel Type

Adjust the cutting height to fit your cutting work. You can adjust the wheel to one of four levels.

(35~68mm) (29~43mm) (23~37mm) (17~32mm)

Adjustment of Cutter Adjustment Spring

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

1. Adjust the blade engagement.

2. Loosen the pipe with cutter adjusting screw, and then adjust the length of the spring coil to approximately 40 mm (1.575 in.).

<table>
<thead>
<tr>
<th>1</th>
<th>Pipe with cutter adjusting screw</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>40 mm (1.575 in.)</td>
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</tbody>
</table>
Adjustment of Reel Cover

Note:
Depending on the specifications, this function may not be available.
The angle of the reel cover can be adjusted.
1. Pull the right and left knobs securing the reel cover to release it.

2. Select the hold position of the cover adjustment plate and secure the reel cover.

Adjustment of CR Brush

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

Caution
Pressing the brush against the roller too tightly could cause the belt to slip or break.

Important
CR brush prevents clippings etc. from adherence to the rear roller owing to rotating brush.

1. Loosen the bolts and nuts attached to the both ends of CR brush.

2. Securely tighten the bolts and nuts loosened in step 1 as the gap between the brush and rear roller is adjusted to between 0 and 1 mm.
Procedure to Start / Stop Engine

Warning
When starting the engine, the reel cutter (cutting cylinder) may rotate slowly. Before starting the engine, make sure that there are no other people or obstacles around the machine.

Caution
When restarting the engine after it has been turned off, wait until the electromagnetic pump has fully stopped before restarting the engine. The electromagnetic pump will stop approximately 7 seconds after the key switch is turned to the "OFF" position.

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

1. Sit on the seat.
2. Make sure that the parking brake is applied.
3. Make sure that the knife rotation switch is in the "OFF" position.
4. Make sure that the traveling pedal is in the neutral position.
5. Move the throttle knob halfway from the turtle icon (low speed) to the rabbit icon (high speed).

6. Switch the ignition key to the "ON (GLOW)" position.

Caution
When the ignition key is switched to the "ON" position, "Warming up" may appear in the monitor display.
Do not start the engine until the message disappears.

7. Make sure that the glow plug is generating heat, the "BARONESS" logo or "Warming up" message appears in the monitor display, and the yellow and red LEDs are lit.
Quickly returning the ignition key from the "START" position to the "ON" position may result in damage to the machine.

8. After the "BARONESS" logo and the yellow and red LEDs go off and the parameters (items and values such as the rotation speed) appear, immediately set the ignition key to the "START" position.

9. When the starter starts rotating and the engine starts, slowly return the ignition key to the "ON" position.

10. Move the throttle knob to the turtle icon (low speed), and then warm up the engine for 1-2 minutes.

11. Gradually move the throttle knob to the rabbit icon (high speed).

Procedure to Stop Engine

1. Set the traveling pedal to the neutral position.
2. Apply the parking brake.
3. Set the reel rotation switch to the "Stop" position.
4. Shift the throttle lever to the turtle icon (low speed), and then idle the machine for 1-2 minutes.
5. Switch the ignition key to the "OFF" position.
6. Make sure that the engine has stopped.
7. Remove the ignition key.
8. Leave the driver's seat.

Safety Mechanisms

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

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

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

Warning Mechanisms

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

1. If the engine water temperature exceeds 115 degrees Celsius, a buzzer will sound. (intermittent tone)
2. If the oil level in the hydraulic tank declines from the specified level by approximately 2.0 dm$^3$ (2.0 L), a buzzer will sound. (continuous tone)
3. With an engine malfunction, a monitor LED lights up and a fault code appears.
### Operation of Each Section

#### Precautions for Operating the Machine

**Caution**

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

#### Cautions for when You Leave the Machine

**Caution**

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

### Instruction Decals

| 1 | Key switch icons |
| 2 | Reel rotation switch icons |
| 3 | 2WD/4WD selector switch icons |
| 4 | DPF auto regeneration inhibit switch icons |
| 5 | DPF parked regeneration switch icons |
| 6 | Light switch icons |
| 7 | Mower unit up/down lever icons |
| 8 | Engine speed icons |

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**Instruction Decals_001**

**Instruction Decals_002**

9. Sticker, tilt steering  
10. Sticker, Parking brake  
11. Differential lock decal

**Instruction Decals_003**

12. Decal, lapping
<table>
<thead>
<tr>
<th>Key switch icons</th>
<th>Reel rotation switch icons</th>
<th>2WD/4WD selector switch icons</th>
<th>DPF regeneration inhibit switch icons</th>
<th>DPF parked regeneration switch icons</th>
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<tbody>
<tr>
<td>It illustrates the positions of the key switch. 1. OFF 2. ON 3. Unused 4. START</td>
<td>This illustrates rotation/stopping of the reel cutter (cutting cylinder). 1. Rotate 2. Stop</td>
<td>This illustrates 2WD/4WD selection. 1. 4WD 2. 2WD</td>
<td>This indicates the positions of the DPF regeneration inhibit switch. 1. Regenerate 2. Regeneration inhibited</td>
<td>This indicates the position of the DPF parked regeneration switch. 1. Engaged</td>
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<td>Page</td>
<td>Description</td>
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<td>6</td>
<td><strong>Light switch icons</strong>&lt;br&gt;It illustrates ON/OFF of the light.&lt;br&gt;1. ON&lt;br&gt;2. OFF</td>
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<td>7</td>
<td><strong>Mower unit up/down lever icons</strong>&lt;br&gt;It illustrates Up/Down of the mower unit.&lt;br&gt;1. Down&lt;br&gt;2. Up</td>
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<td>8</td>
<td><strong>Engine speed icons</strong>&lt;br&gt;These indicate positions for low and high engine speeds.&lt;br&gt;1. Low speed&lt;br&gt;2. High speed</td>
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<td>9</td>
<td><strong>K4203001350</strong>&lt;br&gt;Sticker, tilt steering&lt;br&gt;This shows the steering tilt directions and how to lock and release the position.</td>
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<td>10</td>
<td><strong>K4203001340</strong>&lt;br&gt;Sticker, Parking brake&lt;br&gt;This shows how to lock and release the parking brake.&lt;br&gt;1. Locked&lt;br&gt;2. Released</td>
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<tr>
<td></td>
<td>Decal, differential lock</td>
<td>Decal, lapping</td>
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<tr>
<td>11</td>
<td>K4203001420</td>
<td>K4203001590</td>
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<tr>
<td></td>
<td>This indicates the positions for engaging or releasing the differential lock.</td>
<td>This indicates the direction of reel rotation.</td>
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<tr>
<td></td>
<td>1. Engaged</td>
<td>1. OFF (cutting rotation)</td>
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<tr>
<td></td>
<td>2. Released</td>
<td>2. ON (backlapping rotation)</td>
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</tbody>
</table>

[Image of differential lock positions]  
[Image of reel rotation positions]
Proximity Sensors

There are two proximity sensors on mower arm fulcrums #4 and #5. These sensors detect the raised or lowered positions of mower units #4 and #5 and rotate or stop the reel cutters.

Relays

The relay box is located inside the right tank cover. These relays control operation of the diff-lock, rotation of the reel cutters (cutting cylinders), and 2WD/4WD selection. The operating condition can be checked by the illumination of the LEDs.

- LEDs ① and ② light up when the diff-lock valve is in the "ON" position.
- LEDs ③ and ⑤ light up when the reel rotation switch is in the "ON" position and the mower units are lowered.
- LEDs ④ and ⑥ light up when the reel reverse switch is in the "ON" position and the mower units are lowered.
- LED ⑦ is not used.
- LED ⑧ lights up when the 2WD/4WD selector switch is in the "4WD" position, and then the machine enters 4WD.

Operation of Each Section
Reel Rotation Switch

**Caution**
Before you start cutting work, set the reel rotation switch to the "ON" position. At all other times, make sure it is set to the "OFF" position.

The reel rotation switch is located in the operation panel and operates rotation of the reel cutters (cutting cylinders) of the mower units. When the reel rotation switch is set to the "ON" position, the reel cutters (cutting cylinders) in all mower units rotates. When the reel rotation switch is set to the "OFF" position, the reel cutters (cutting cylinders) stop.

Note:
When the mower units are raised, the reel cutters (cutting cylinders) do not rotate, even if the switch is set to the "ON" position.

---

2WD/4WD Selector Switch

**Caution**
When working on a slope, be sure to use the machine in 4WD.

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

The 2WD/4WD selector switch is located in the operation panel. When the switch is set to the "2WD" position, the machine will be in two-wheel drive (front-wheel drive). When it is set to the "4WD" position, the machine will be in four-wheel drive.
**DPF Auto Regeneration Inhibit Switch**

**Caution**

Normally, set the DPF auto regeneration inhibit switch to the "Auto regeneration" position. However, when operating in a location where fires may occur, set the DPF auto regeneration inhibit switch to the "Auto regeneration inhibit" position.

The DPF auto regeneration inhibit switch is located in the operation panel. When the switch is set to the "Auto regeneration" position, auto regeneration is performed. When the switch is set to the "Auto regeneration inhibit" position, auto regeneration is inhibited.

When the switch is set to the "Auto regeneration inhibit" position, the auto regeneration inhibit icon appears in the monitor display.

**DPF Parked Regeneration Switch**

**Danger**

Since it will become extremely hot around the exhaust outlet, do not perform DPF regeneration in a location where fires may occur.

**Important**

If parked regeneration is not needed, it will not start, even if the switch is pressed.

The DPF parked regeneration switch is located in the operation panel. When the regeneration icon is blinking, set the switch to the "Engaged" position to start parked regeneration.

When parked regeneration starts, the regeneration icon in the monitor display changes from blinking to lighting.
Light Switch

**Warning**
The lights provide auxiliary lighting. Do not travel or operate the machine at night or under poor visibility.

The light switch is located in the operation panel. When the switch is set to the "ON" position, the lights turn on. When it is set to the "OFF" position, the lights turn off.

Reel Reverse Switch

**Caution**
Do not switch the reel reverse switch to the "ON" or "OFF" position while the reel cutter (cutting cylinder) is rotating. Otherwise, a hydraulic system malfunction may result.

**Important**
If the reel rotation switch is not set to the "Rotate" position, the reel cutter (cutting cylinder) will not rotate.

This is located under the hood. This switches the rotation direction of the reel cutter (cutting cylinder). When the reel reverse switch is set to the "ON" position, the reel cutters (cutting cylinders) of all mower units rotate in reverse (back lapping motion). When the reel reverse switch is set to the "OFF" position, the reel cutters (cutting cylinders) rotate normally.

Reel Rotation/Stop Switching Lever

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

The reel rotation/stop switching lever is located on the reel motor attached to each mower unit. It is used during cutting and back lapping. You must shift only the lever(s) for the mower unit(s) that you plan to use for cutting or back lapping to the "Rotate" position. Leave the lever(s) for other mower units in the "Stop" position.
**Reel Rotation Adjustment Valve**

These valves adjust the rotation speeds of the reel cutters (cutting cylinders).

**For #1 and #5**

1. Valve for mowers #1 and #5

**For #2, #3 and #4**

1. Valve for mowers #2, #3 and #4

Reduce the rotation speed by loosening the lock nut, then tightening the knob. After making adjustments, tighten the lock nut.

**Mower Lock Lever (Latch)**

**Caution**

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

The mower lock levers (latches) are located in the foot area on the left and right sides and are used when storing the machine with mower units #4 and #5 raised. When storing the machine, hook the mower lock levers (latches) on the arms.
Mower Unit Up/Down Lever

**Caution**

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

**Caution**

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

The mower unit up/down lever is located in the operation panel and raises or lowers the mower units.

When the lever is shifted to the "DOWN" position, the mower units are lowered. When the lever is shifted to the "UP" position, the mower units are raised.

Release the lever to return it to the neutral position.

Note:
When the mower units are raised, the reels stop rotating, even if the reel rotation switch is set to the "ON" position.

---

Throttle Knob

The throttle knob is located to the right of the driver’s seat and enables you to adjust the engine rpm.

Move the throttle knob toward the rabbit icon (high speed) to increase the engine rpm, and toward the turtle icon (low speed) to reduce the rpm.

Note:

The factory default engine rpm (maximum) is set to 2,600 rpm.
Diff-Lock Switch

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

⚠️ Caution
Do not operate the diff-lock switch unless it is necessary.
It may result in the hydraulic system malfunction.

The diff-lock switch is located below the right side of the steering wheel and engages the differential lock for the left and right front wheels.
Tilt the switch lever up or down to turn "ON" to engage the differential lock for the front wheels.
Release the switch lever to return it to the neutral position ("OFF" position) and disengage the differential lock.

Traveling Pedal

⚠️ Warning
This machine is not authorized as a special motor vehicle. Do not drive it on public roads.

⚠️ Caution
When the machine is traveling at a high speed, it will not stop immediately after you take your foot off the traveling pedal.
If necessary, also use the brake.

Brake Pedal

The brake pedal is located in the left foot area. To stop the machine, depress the brake pedal all the way firmly.
Parking Brake Lever

⚠️ Caution
Be sure to release the parking brake before driving. It may result in the brakes or hydraulic system malfunction.

⚠️ Caution
Never park the machine on a slope.

The parking brake lever is located to the left of the front cover. When parking, depress the brake pedal, and then pull the parking brake lever completely. To release the parking brake, depress the brake pedals.

Hood

⚠️ Caution
Do not open the hood in strong winds.

⚠️ Caution
Be careful not to pinch your fingers when you open or close the hood.

1. Unlock the rubber catch, and then lift up the hood.

2. Hook the hood support rod onto the latch inside the hood. Make sure that the hood will not close, and then remove your hands.

3. To close the hood, release the hood support rod from the latch, and then lower the hood slowly.

4. Lock the rubber catch securely.
Underseat Cover

Caution
Be careful not to pinch your fingers when you open or close the underseat cover.

1. Make sure that the steering wheel is raised completely.
2. Bring the seat to the backmost position.
3. Pull up the lever behind the seat to unlock it.
4. Tilt the seat forward to open the cover.
   To close the cover, slowly lower the seat.

Instruments

Description of Monitor

The monitor displays various information about the machine, such as the operating status and fault conditions.

| 1 | Monitor display | Displays machine conditions and items. |
| 2 | LED (yellow)    | Lights up when a malfunction is detected, warning not to decrease or stop output. |
| 3 | LED (red)       | Lights up when a decreased/stopped output malfunction is detected. |
| 4 | Enter key       | Selects the menu or parameter. Switches between displaying/hiding the current fault code. |
| 5 | Right arrow key| Scrolls the screen. Move the parameter selection to the right or down. |
| 6 | Left arrow key  | Scrolls the screen. Move the parameter selection to the left or up. |
| 7 | Menu key        | Opens or exits the menu. |

1. Lever
2. Seat
A. Pull up
B. Tilt forward

Monitor display
Displays machine conditions and items.

LED (yellow)
Lights up when a malfunction is detected, warning not to decrease or stop output.

LED (red)
Lights up when a decreased/stopped output malfunction is detected.

Enter key
Selects the menu or parameter. Switches between displaying/hiding the current fault code.

Right arrow key
Scrolls the screen. Move the parameter selection to the right or down.

Left arrow key
Scrolls the screen. Move the parameter selection to the left or up.

Menu key
Opens or exits the menu.
Main Menu Items

While any parameter is displayed, press the menu key to display the main menu with the following 11 items.

- GO TO 1-UP DISPLAY / GO TO 4-UP DISPLAY
- LANGUAGES
- STORED CODES
- ENGINE CONFIGURATION
- SETUP 1-UP DISPLAY
- SETUP 4-UP DISPLAY
- SERVICE REMINDERS
- SELECT UNITS
- ADJUST BACKLIGHT
- ADJUST CONTRAST
- UTILITIES

1. 1-up display
   One parameter is displayed individually in the monitor display.

2. 4-up display
   Four parameters are displayed in the monitor display.
   With the 4-up display, a total of 8 parameters are displayed over 2 pages.

Note:
The factory default display is the 4-up display. "GO TO 1-UP DISPLAY" appears in the main menu.
When the 1-up display is set, "GO TO 4-UP DISPLAY" appears in the main menu.
<table>
<thead>
<tr>
<th>No.</th>
<th>Monitor display L</th>
<th>Monitor display S</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENGINE SPEED</td>
<td>ENG RPM</td>
<td>Displays the engine rpm.</td>
</tr>
<tr>
<td>2</td>
<td>DRIVERS DEMAND ENGINE TORQUE</td>
<td>DEMAND TQ</td>
<td>Displays the torque required by the ECU.</td>
</tr>
<tr>
<td>3</td>
<td>ACTUAL ENGINE TORQUE</td>
<td>ENG TORQ</td>
<td>Displays the actual torque.</td>
</tr>
<tr>
<td>4</td>
<td>PERCENT LOAD AT CURRENT RPM</td>
<td>LOAD@RPM</td>
<td>Displays the engine load factor.</td>
</tr>
<tr>
<td>5</td>
<td>ACCELERATOR PEDAL POSITION 1</td>
<td>ACCEL PED1</td>
<td>Displays the accelerator sensor opening.</td>
</tr>
<tr>
<td>6</td>
<td>ENGINE DESIRED OP SPEED</td>
<td>DES ENG SP</td>
<td>Displays the engine rpm required by the ECU.</td>
</tr>
<tr>
<td>7</td>
<td>ENGINE COOLANT TEMPERATURE</td>
<td>COOL TEMP</td>
<td>Displays the temperature measured by the coolant temperature sensor.</td>
</tr>
<tr>
<td>8</td>
<td>FUEL RATE</td>
<td>FUEL RATE</td>
<td>Displays the engine fuel consumption rate.</td>
</tr>
<tr>
<td>9</td>
<td>THROTTLE POSITION</td>
<td>THROTTLE</td>
<td>Displays the engine throttle opening.</td>
</tr>
<tr>
<td>10</td>
<td>BOOST PRESSURE</td>
<td>BST PRES</td>
<td>Displays the pressure measured by the intake pressure sensor.</td>
</tr>
<tr>
<td>11</td>
<td>INTAKE MANIFOLD TEMPERATURE</td>
<td>MANI TEMP</td>
<td>Displays the temperature measured by the intake temperature sensor built into the air flow sensor.</td>
</tr>
<tr>
<td>12</td>
<td>BATTERY POTENTIAL</td>
<td>BAT VOLT</td>
<td>Displays the battery voltage.</td>
</tr>
<tr>
<td>13</td>
<td>BAROMETRIC PRESSURE</td>
<td>BARO PRES</td>
<td>Displays the atmospheric pressure measured by the atmospheric pressure sensor.</td>
</tr>
<tr>
<td>14</td>
<td>AMBIENT AIR TEMP</td>
<td>AMB TEMP</td>
<td>Displays the ambient temperature.</td>
</tr>
<tr>
<td>15</td>
<td>AIR INLET TEMPERATURE</td>
<td>AIR IN TP</td>
<td>Displays the intake air temperature measured by the air flow sensor.</td>
</tr>
<tr>
<td>16</td>
<td>TOTAL FUEL USED</td>
<td>FUEL USED</td>
<td>Displays the total fuel consumption of the engine.</td>
</tr>
<tr>
<td>17</td>
<td>TOTAL ENGINE HOURS</td>
<td>ENG HRS</td>
<td>Displays the total time that the ECU is on (time that the key is in the &quot;ON&quot; position).</td>
</tr>
<tr>
<td>18</td>
<td>ENGINE OIL PRESSURE</td>
<td>OIL PRES</td>
<td>Displays the engine oil pressure measured by the oil pressure switch.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>While the engine is running: Normal=200 kPa, Abnormal=0 kPa</td>
</tr>
<tr>
<td>19</td>
<td>INJECTOR METERRING RAIL PRESS</td>
<td>RAIL PRES</td>
<td>Displays the fuel pressure in the rail, measured by the rail pressure sensor.</td>
</tr>
<tr>
<td>20</td>
<td>ENGINE INLET AIR MASS FLOW RATE</td>
<td>AIR RATE</td>
<td>Displays the intake air volume measured by the air flow sensor.</td>
</tr>
<tr>
<td>21</td>
<td>DOC INTAKE GAS TEMP</td>
<td>DOC TEMP</td>
<td>Displays the DOC inlet gas temperature measured by the exhaust temperature sensor.</td>
</tr>
<tr>
<td>22</td>
<td>EXHAUST FILTER INLET TEMP</td>
<td>EF IN T</td>
<td>Displays the DPF inlet gas temperature measured by the exhaust temperature sensor.</td>
</tr>
<tr>
<td>23</td>
<td>DPF DIFFERENCE PRESSURE</td>
<td>DIFF PRES</td>
<td>Displays the pressure difference before and after the DPF, measured by the differential pressure sensor.</td>
</tr>
<tr>
<td>No.</td>
<td>Monitor display L</td>
<td>Monitor display S</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------</td>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>24</td>
<td>EXHAUST FILTER OUTLET TEMP</td>
<td>EF OUT T</td>
<td>Displays the DPF outlet gas temperature measured by the exhaust temperature sensor.</td>
</tr>
<tr>
<td>25</td>
<td>PARTICUATE TRAP LAMP</td>
<td>PT LAMP</td>
<td>Shows the status of the regeneration icon. Icon not displayed=&quot;OFF&quot;, Icon blinking=&quot;ON BLINK&quot;, Icon solid=&quot;ON SOLID&quot;</td>
</tr>
<tr>
<td>26</td>
<td>DPF STATUS</td>
<td>DPF ST</td>
<td>Shows the status of the DPF. DPF regeneration not needed=&quot;REGEN NOT NEEDED&quot; DPF regeneration needed=(Level 1=&quot;NEEDED LOWEST&quot;, Level 2-3=&quot;NEEDED MODERATE&quot;, Level 4=&quot;NEEDED HIGHEST&quot;)</td>
</tr>
<tr>
<td>27</td>
<td>DPF ACTIVE REGEN STATUS</td>
<td>DPF AR ST</td>
<td>Shows the DPF regeneration status. Regeneration not needed=&quot;INACTIVE&quot;, Regeneration needed=&quot;NEEDED&quot;, Regenerating=&quot;ACTIVE&quot;</td>
</tr>
<tr>
<td>28</td>
<td>DPF REGEN INHIBIT STATUS</td>
<td>INHIBIT ST</td>
<td>Shows the ECU auto regeneration inhibited status. Auto regeneration inhibit switch off=&quot;OFF&quot;, Auto regeneration inhibit switch on=&quot;ON&quot;</td>
</tr>
<tr>
<td>29</td>
<td>DPF REGENERATION INHIBITED SW</td>
<td>DPF INHIB SW</td>
<td>Shows the status of auto regeneration inhibit switch. Auto regeneration inhibit switch off=&quot;OFF&quot;, Auto regeneration inhibit switch on=&quot;ON&quot;</td>
</tr>
<tr>
<td>30</td>
<td>EXHAUST HIGH TEMP LAMP</td>
<td>EXH T LAMP</td>
<td>Displays the condition of the exhaust temperature. 450 °C or more=&quot;ON&quot;, 450 °C or less=&quot;OFF&quot;</td>
</tr>
<tr>
<td>31</td>
<td>%SOOT</td>
<td>%SOOT</td>
<td>Displays the amount of soot accumulated in the DPF.</td>
</tr>
<tr>
<td>32</td>
<td>MACHINE HOURS</td>
<td>MACH HRS</td>
<td>Displays the total operating time of the machine (time that the engine was actually running).</td>
</tr>
<tr>
<td>33</td>
<td>FUEL LEVEL</td>
<td>FUEL LEVEL</td>
<td>Displays the quantity of fuel remaining in the fuel tank.</td>
</tr>
</tbody>
</table>

Note:
When display settings are being specified, the parameters appear on "Monitor display L".
At all other times, the parameters appear on "Monitor display S".
Language

With "LANGUAGES", the language used in the monitor display can be set to either of the following two.
- ENGLISH
- JAPANESE

An asterisk appears at the right of the currently selected language.

Note:
The factory default language is "ENGLISH".

Fault Code Log

With "STORED CODES", a log of past fault codes can be checked.
When there is a fault code log, each fault is displayed over two pages.
Use the arrow keys to change the page.

CORRECTIVE ACTION:
See Service Manual
## List of Fault Codes

**Caution**

When the fault code appears in the monitor display, refer to "Kubota DIAGNOSIS MANUAL COMMON RAIL SYSTEM" or contact your dealer.

The fault codes (DTC) and corresponding information that appear in the monitor display are listed below.

<table>
<thead>
<tr>
<th>No.</th>
<th>DTC name Text 1</th>
<th>Corrective action Text 2</th>
<th>ISO 14229 P-Code</th>
<th>J1939-73 SPN</th>
<th>FMI</th>
<th>Behavioral Item</th>
<th>Behavior during malfunction</th>
<th>DTC recovery from error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NE-G phase shift</td>
<td>See Service Manual</td>
<td>P0016</td>
<td>636</td>
<td>7</td>
<td>Large phase shift between NE pulse and G pulse</td>
<td>(Invalid G signal) Slow starting</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td>2</td>
<td>Pressure limiter emergency open</td>
<td>See Service Manual</td>
<td>P0087</td>
<td>633</td>
<td>7</td>
<td>Abnormal opening of pressure limiter valve</td>
<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>3</td>
<td>High rail pressure</td>
<td>See Service Manual</td>
<td>P0088</td>
<td>157</td>
<td>0</td>
<td>Actual pressure exceeds the command pressure (when a high pressure exceeding the operating pressure range is detected)</td>
<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>4</td>
<td>SCV (MPROP) Stuck</td>
<td>See Service Manual</td>
<td>P0089</td>
<td>1347</td>
<td>7</td>
<td>SCV stuck open (when the actual rail pressure is detected to always exceed the command rail pressure)</td>
<td>Insufficient output Deterioration of emission performance * Engine stopped</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>5</td>
<td>Fuel Leak (in High Pressured Fuel System)</td>
<td>Stop ENG, See Service Manual</td>
<td>P0093</td>
<td>1239</td>
<td>1</td>
<td>Fuel leakage from high-pressure fuel system (when excessive fuel consumption is detected by calculating the difference in the rail pressure before and after fuel injection)</td>
<td>Insufficient output Deterioration of emission performance * Engine stopped</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>6</td>
<td>Intake air temp. error : Low</td>
<td>See Service Manual</td>
<td>P0112</td>
<td>172</td>
<td>4</td>
<td>Ground short circuit of sensor/harness</td>
<td>Increase in white smoke at low temperatures</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td>7</td>
<td>Intake air temp. error : High</td>
<td>See Service Manual</td>
<td>P0113</td>
<td>172</td>
<td>3</td>
<td>Circuit interruption or +B short circuit of sensor/harness</td>
<td>Increase in white smoke at low temperatures</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td>No.</td>
<td>DTC name</td>
<td>Corrective action</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
<td>DTC recovery from error</td>
</tr>
<tr>
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</tr>
<tr>
<td>8</td>
<td>Coolant Temperature Sensor Abnormality : Low</td>
<td>See Service Manual</td>
<td>P0117</td>
<td>110</td>
<td>4</td>
<td>Ground short circuit of sensor/harness</td>
<td>Increase in white smoke at low temperatures Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>9</td>
<td>Coolant Temperature Sensor Abnormality : High</td>
<td>See Service Manual</td>
<td>P0118</td>
<td>110</td>
<td>3</td>
<td>Circuit interruption or +B short circuit of sensor/harness</td>
<td>Increase in white smoke at low temperatures Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>10</td>
<td>Rail Pressure Sensor Abnormality : Low</td>
<td>Stop ENG, See Service Manual</td>
<td>P0192</td>
<td>157</td>
<td>4</td>
<td>Ground short circuit of sensor/harness Sensor malfunction</td>
<td>Insufficient output Deterioration of emission performance Increase in noise Increase in white smoke Engine stops</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>11</td>
<td>Rail Pressure Sensor Abnormality : High</td>
<td>Stop ENG, See Service Manual</td>
<td>P0193</td>
<td>157</td>
<td>3</td>
<td>Circuit interruption or +B short circuit of sensor/harness Sensor malfunction</td>
<td>Insufficient output Deterioration of emission performance Increase in noise Increase in white smoke Engine stops</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>12</td>
<td>Injector Charge Voltage Abnormality : High</td>
<td>Stop ENG, See Service Manual</td>
<td>P0200</td>
<td>523535</td>
<td>0</td>
<td>Excessive injector charge voltage ECU charge circuit malfunction</td>
<td>Insufficient output Deterioration of emission performance Engine stops</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>13</td>
<td>Open circuit of harness/coil in 1st cylinder injector</td>
<td>See Service Manual</td>
<td>P0201</td>
<td>651</td>
<td>3</td>
<td>Circuit interruption of harness Circuit interruption of injector coil</td>
<td>Insufficient output Increase in vibrations Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>14</td>
<td>Open circuit of harness/coil in 3rd cylinder injector</td>
<td>See Service Manual</td>
<td>P0202</td>
<td>653</td>
<td>3</td>
<td>Circuit interruption of harness Circuit interruption of injector coil</td>
<td>Insufficient output Increase in vibrations Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>No.</td>
<td>DTC name Text 1</td>
<td>Corrective action Text 2</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
<td>DTC recovery from error</td>
</tr>
<tr>
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</tr>
<tr>
<td>15</td>
<td>Open circuit of harness/coil in 4th cylinder injector</td>
<td>See Service Manual</td>
<td>P0203</td>
<td>654</td>
<td>3</td>
<td>Circuit interruption of harness</td>
<td>Insufficient output</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Circuit interruption of injector coil</td>
<td>Increase in vibrations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Deterioration of emission performance</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Open circuit of harness/coil in 2nd cylinder injector</td>
<td>See Service Manual</td>
<td>P0204</td>
<td>652</td>
<td>3</td>
<td>Circuit interruption of harness</td>
<td>Insufficient output</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Circuit interruption of injector coil</td>
<td>Increase in vibrations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Deterioration of emission performance</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Engine overheat</td>
<td>Stop mowing!!</td>
<td>P0217</td>
<td>110</td>
<td>0</td>
<td>Abnormally high temperature of engine coolant</td>
<td>Insufficient output</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Overheating</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Engine overrun</td>
<td>See Service Manual</td>
<td>P0219</td>
<td>190</td>
<td>0</td>
<td>Engine rpm exceeds specified value</td>
<td>Overrunning</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td>20</td>
<td>Boost Pressure Sensor Abnormality: High</td>
<td>See Service Manual</td>
<td>P0238</td>
<td>102</td>
<td>3</td>
<td>Circuit interruption or +B short circuit of sensor/harness Sensor malfunction</td>
<td>Insufficient output</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>21</td>
<td>No input of NE sensor pulse</td>
<td>See Service Manual</td>
<td>P0335</td>
<td>636</td>
<td>8</td>
<td>Circuit interruption or short circuit of sensor harness Sensor malfunction</td>
<td>(Running only with G)</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Poor starting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slight increase in vibrations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Insufficient output</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>NE sensor pulse number error</td>
<td>See Service Manual</td>
<td>P0336</td>
<td>636</td>
<td>2</td>
<td>Circuit interruption or short circuit of sensor harness Sensor malfunction</td>
<td>(Running only with G)</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Poor starting</td>
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<td></td>
<td></td>
<td></td>
<td>Slight increase in vibrations</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Insufficient output</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>No input of G sensor pulse</td>
<td>See Service Manual</td>
<td>P0340</td>
<td>723</td>
<td>8</td>
<td>Circuit interruption or short circuit of sensor harness Sensor malfunction</td>
<td>(Invalid G signal)</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slow starting</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>G sensor pulse number error</td>
<td>See Service Manual</td>
<td>P0341</td>
<td>723</td>
<td>2</td>
<td>Circuit interruption or short circuit of sensor harness Sensor malfunction</td>
<td>(Invalid G signal)</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td>25</td>
<td>Open circuit of glow relay driving circuit</td>
<td>See Service Manual</td>
<td>P0380</td>
<td>676</td>
<td>5</td>
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<td>Key switch to &quot;OFF&quot;</td>
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<td>26</td>
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<td>P0380</td>
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<td>3</td>
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<td>Key switch to &quot;OFF&quot;</td>
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<tr>
<td>27</td>
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<td>P0380</td>
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<td>(At low temperatures) Poor starting Increase in white smoke</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>28</td>
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<td>1</td>
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<td>Engine stops</td>
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<td>30</td>
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<td>Stop ENG, See Service Manual</td>
<td>P0562</td>
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<td>Diagnostic counter=0</td>
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<td>31</td>
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<td>Circuit interruption, short circuit or damage of harness Battery malfunction</td>
<td>Poor starting Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>Contact dealer</td>
<td>P0602</td>
<td>523538</td>
<td>2</td>
<td>Abnormal QR code correction data</td>
<td>Insufficient output Diagnostic counter=0</td>
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<td>33</td>
<td>No QR (IQA) Data Error</td>
<td>Contact dealer</td>
<td>P0602</td>
<td>523538</td>
<td>7</td>
<td>QR code correction data unwritten</td>
<td>Insufficient output Diagnostic counter=0</td>
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<td>34</td>
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<td>Stop ENG, See Service Manual</td>
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<td>Incorrect change in internal flash ROM observed</td>
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<td>35</td>
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<td>Engine stops</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>36</td>
<td>ECU CPU (Monitoring IC) Error</td>
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<td>Engine stops</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>ISO 14229 P-Code</td>
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<td>FMI</td>
<td>Detection item</td>
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<td>DTC recovery from error</td>
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<td>Stop ENG, See Service Manual</td>
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<td>1</td>
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<td>Insufficient output Deterioration of emission performance * Engine stopped</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>38</td>
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<td>Insufficient output Deterioration of emission performance Engine stops</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>40</td>
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<td>Stop ENG, See Service Manual</td>
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<td>Insufficient output Deterioration of emission performance * Engine stopped</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>41</td>
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<td>Key switch to &quot;OFF&quot;</td>
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<td>Key switch to &quot;OFF&quot;</td>
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<td>44</td>
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<td>3509</td>
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<td>Poor starting Insufficient output Deterioration of emission performance * Engine stopped</td>
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<td>Corrective action</td>
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<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
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<td>DTC recovery from error</td>
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<td>Sensor Supply Voltage 2</td>
<td>See Service Manual</td>
<td>P0652</td>
<td>3510</td>
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<td>Sensor supply voltage 2 error or recognition error</td>
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<td>Sensor Supply Voltage 2</td>
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<td>P0653</td>
<td>3510</td>
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<td>Sensor supply voltage 2 error or recognition error</td>
<td>Poor starting Insufficient output Deterioration of emission performance</td>
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<td>Abnormality: High</td>
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<td>47</td>
<td>Sensor Supply Voltage 3</td>
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<td>3511</td>
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<td>Sensor supply voltage 3 error or recognition error</td>
<td>Poor starting</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>Abnormality: Low</td>
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<td>Sensor Supply Voltage 3</td>
<td>See Service Manual</td>
<td>P0662</td>
<td>3511</td>
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<td>Sensor supply voltage 3 error or recognition error</td>
<td>Poor starting</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>Abnormality: High</td>
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<td>49</td>
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<td>P0687</td>
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<td>2</td>
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<td>Battery discharged</td>
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<td>50</td>
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<td>677</td>
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<td>4</td>
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<td>Insufficient output Diagnostic counter=0</td>
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<td>Abnormality: Low</td>
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<td>See Service Manual</td>
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<td>Insufficient output Diagnostic counter=0</td>
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<td>Abnormality: High</td>
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<td>Circuit interruption or ground short circuit of sensor/harness</td>
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<td>Abnormality: Low</td>
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<td>Accelerator Position Sensor 2</td>
<td>See Service Manual</td>
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<td>Insufficient output Diagnostic counter=0</td>
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<td>Abnormality: High</td>
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<td>P2148</td>
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<td>Key switch to &quot;OFF&quot;</td>
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<td>No.</td>
<td>DTC name</td>
<td>Corrective action</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
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<td>Stop ENG, See Service Manual</td>
<td>P2151</td>
<td>523524</td>
<td>+B short circuit or GND short circuit of harness</td>
<td>Insufficient output Increase in vibrations Deterioration of emission performance</td>
<td>Key switch to &quot;OFF*&quot;</td>
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<td>Insufficient output * Transmission data NG</td>
<td>Key switch to &quot;OFF*&quot;</td>
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<td>Insufficient output</td>
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<td>Diagnostic counter=0</td>
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<td>Insufficient output</td>
<td>Key switch to &quot;OFF*&quot;</td>
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<td>No.</td>
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<td>Corrective action</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
<td>DTC recovery from error</td>
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<td>See Service Manual</td>
<td>P0403</td>
<td>523574</td>
<td>3</td>
<td>Circuit interruption of EGR motor coil</td>
<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
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<tr>
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<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>Insufficient output Deterioration of emission performance</td>
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<td>See Service Manual</td>
<td>P0543</td>
<td>3242</td>
<td>4</td>
<td>Ground short circuit of sensor/harness</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
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<tr>
<td>74</td>
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<td>See Service Manual</td>
<td>P0544</td>
<td>3242</td>
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<td>Circuit interruption of sensor/harness +B short circuit of sensor/harness</td>
<td>None</td>
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<td>75</td>
<td>Exhaust Gas Temp. Sensor 0 (T0) Abnormality: Low</td>
<td>See Service Manual</td>
<td>P0546</td>
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<td>Ground short circuit of sensor/harness</td>
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<td>Exhaust Gas Temp. Sensor 0 (T0) Abnormality: High</td>
<td>See Service Manual</td>
<td>P0547</td>
<td>4765</td>
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<td>Circuit interruption of sensor/harness +B short circuit of sensor/harness</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
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<td>77</td>
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<td>See Service Manual</td>
<td>P1990</td>
<td>523700</td>
<td>13</td>
<td>KBT EEPROM Checksum discrepancy</td>
<td>None</td>
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<td>78</td>
<td>Intake throttle feedback error</td>
<td>See Service Manual</td>
<td>P2108</td>
<td>523580</td>
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<td>Abnormal feedback of intake throttle DC motor</td>
<td>None</td>
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<td>79</td>
<td>Accelerator position sensor correlation error</td>
<td>See Service Manual</td>
<td>P2135</td>
<td>91</td>
<td>2</td>
<td>Excessive discrepancy in output of two sensors</td>
<td>Insufficient output Diagnostic counter=0</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>EGR actuator valve stuck</td>
<td>See Service Manual</td>
<td>P2413</td>
<td>523575</td>
<td>7</td>
<td>Stuck EGR valve</td>
<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>No.</td>
<td>DTC name Text 1</td>
<td>Corrective action Text 2</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
<td>DTC recovery from error</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>--------------------------</td>
<td>------------------</td>
<td>-------------</td>
<td>-----</td>
<td>----------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>81</td>
<td>EGR (DC motor) Overheat</td>
<td>See Service Manual</td>
<td>P2414</td>
<td>523576</td>
<td>2</td>
<td>Abnormally high temperature of EGR motor</td>
<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>82</td>
<td>EGR (DC motor) temp. sensor failure</td>
<td>See Service Manual</td>
<td>P2415</td>
<td>523577</td>
<td>2</td>
<td>Malfunction of EGR motor temperature sensor</td>
<td>Insufficient output Deterioration of emission performance</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>85</td>
<td>Differential Pressure Sensor 1 Abnormality: Low</td>
<td>See Service Manual</td>
<td>P2454</td>
<td>3251</td>
<td>4</td>
<td>Ground short circuit of sensor/harness</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>86</td>
<td>Differential Pressure Sensor 1 Abnormality: High</td>
<td>See Service Manual</td>
<td>P2455</td>
<td>3251</td>
<td>3</td>
<td>Circuit interruption of sensor/harness +B short circuit of sensor/harness</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>87</td>
<td>Intake Throttle Lift Sensor Abnormality: Low</td>
<td>See Service Manual</td>
<td>P2621</td>
<td>523582</td>
<td>4</td>
<td>Intake throttle lift sensor low</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>88</td>
<td>Intake Throttle Lift Sensor Abnormality: High</td>
<td>See Service Manual</td>
<td>P2622</td>
<td>523582</td>
<td>3</td>
<td>Intake throttle lift sensor high</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>89</td>
<td>Emission deterioration</td>
<td>See Service Manual</td>
<td>P3001</td>
<td>3252</td>
<td>0</td>
<td>Abnormally high DOC temperature due to uncombusted fuel</td>
<td>Insufficient output</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>90</td>
<td>Exhaust Gas Tempe. Sensor 0 Emergency High</td>
<td>Stop ENG, See Service Manual</td>
<td>P3002</td>
<td>4765</td>
<td>0</td>
<td>Abnormally high DOC inlet temperature (T0)</td>
<td>Engine stops * Cannot start until 300 °C or less</td>
<td>Exhaust temperature sensor is 300 °C or less and key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>91</td>
<td>Exhaust Gas Tempe. Sensor 1 Emergency High</td>
<td>Stop ENG, See Service Manual</td>
<td>P3003</td>
<td>3242</td>
<td>0</td>
<td>Abnormally high DPF inlet temperature (T1)</td>
<td>Engine stops * Cannot start until 300 °C or less</td>
<td>Exhaust temperature sensor is 300 °C or less and key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>92</td>
<td>Exhaust Gas Tempe. Sensor 2 Emergency High</td>
<td>Stop ENG, See Service Manual</td>
<td>P3004</td>
<td>3246</td>
<td>0</td>
<td>Abnormally high DPF outlet temperature (T2)</td>
<td>Engine stops * Cannot start until 300 °C or less</td>
<td>Exhaust temperature sensor is 300 °C or less and key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>No.</td>
<td>DTC name</td>
<td>Text 1</td>
<td>Corrective action</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------</td>
<td>--------------------------------------------</td>
<td>----------------------------------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>-----</td>
<td>------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>93</td>
<td>Excessive PM3</td>
<td>Start DPF Parked Regeneration immediately</td>
<td>P3006</td>
<td>3701</td>
<td>15</td>
<td></td>
<td>Excessive accumulation of PM (estimate)-Level 3</td>
<td>Insufficient output</td>
</tr>
<tr>
<td>94</td>
<td>Excessive PM4</td>
<td>Stop engine!! Contact dealer immediately</td>
<td>P3007</td>
<td>3701</td>
<td>16</td>
<td></td>
<td>Excessive accumulation of PM (estimate)-Level 4</td>
<td>Insufficient output</td>
</tr>
<tr>
<td>95</td>
<td>Excessive PM5</td>
<td>Stop engine!! Contact dealer immediately</td>
<td>P3008</td>
<td>3701</td>
<td>0</td>
<td></td>
<td>Excessive accumulation of PM (estimate)-Level 5</td>
<td>Insufficient output</td>
</tr>
<tr>
<td>96</td>
<td>Boost pressure low</td>
<td>See Service Manual</td>
<td>P3011</td>
<td>132</td>
<td>15</td>
<td></td>
<td>Hose disconnected between turboblower OUT and intake flange Boost pressure sensor malfunction</td>
<td>Insufficient output</td>
</tr>
<tr>
<td>97</td>
<td>Low Coolant Temp. in Parked Regeneration</td>
<td>See Service Manual</td>
<td>P3012</td>
<td>523589</td>
<td>17</td>
<td></td>
<td>Engine warm-up conditions not met during regeneration (insufficient coolant temperature increase)</td>
<td>None</td>
</tr>
<tr>
<td>98</td>
<td>Parked regeneration time out</td>
<td>See Service Manual</td>
<td>P3013</td>
<td>523590</td>
<td>16</td>
<td></td>
<td>Regeneration does not end without an increase in DPF temperature</td>
<td>None</td>
</tr>
<tr>
<td>99</td>
<td>All Exhaust Gas Temp. Sensor Failure</td>
<td>See Service Manual</td>
<td>P3018</td>
<td>523599</td>
<td>0</td>
<td></td>
<td>Simultaneous circuit interruption of all exhaust temperature sensors</td>
<td>None</td>
</tr>
<tr>
<td>100</td>
<td>High Exhaust Gas Temperature After Emergency High Temp. DTC</td>
<td>Stop ENG, See Service Manual</td>
<td>P3023</td>
<td>523601</td>
<td>0</td>
<td></td>
<td>Exhaust temperature when a high exhaust temperature malfunction occurred</td>
<td>None</td>
</tr>
<tr>
<td>101</td>
<td>High frequency of regeneration</td>
<td>See Service Manual</td>
<td>P3024</td>
<td>523602</td>
<td>0</td>
<td></td>
<td>Abnormal interval from the end of regeneration until the next regeneration is triggered</td>
<td>Deterioration of emission performance * NOx increase</td>
</tr>
<tr>
<td>102</td>
<td>Over heat precaution</td>
<td>Stop mowing!!</td>
<td>P3025</td>
<td>523603</td>
<td>15</td>
<td></td>
<td>Coolant temperature</td>
<td>Deterioration of emission performance</td>
</tr>
<tr>
<td>103</td>
<td>No communication with EGR</td>
<td>See Service Manual</td>
<td>U0076</td>
<td>523578</td>
<td>2</td>
<td></td>
<td>Interruption of communication between EGR and CAN</td>
<td>Insufficient output Deterioration of emission performance</td>
</tr>
<tr>
<td>104</td>
<td>CAN CCVS frame error</td>
<td>See Service Manual</td>
<td>U0082</td>
<td>523591</td>
<td>2</td>
<td></td>
<td>Interruption of communication</td>
<td>None</td>
</tr>
<tr>
<td>No.</td>
<td>DTC name</td>
<td>Corrective action</td>
<td>ISO 14229 P-Code</td>
<td>J1939-73 SPN</td>
<td>FMI</td>
<td>Detection item</td>
<td>Behavior during malfunction</td>
<td>DTC recovery from error</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------</td>
<td>------------------------------------</td>
<td>------------------</td>
<td>-------------</td>
<td>-----</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>104</td>
<td>CAN CCVS frame error</td>
<td>See Service Manual</td>
<td>U0082</td>
<td>523591</td>
<td>2</td>
<td>between CAN and CCVS</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>105</td>
<td>CAN CM1 frame error</td>
<td>See Service Manual</td>
<td>U0083</td>
<td>523592</td>
<td>2</td>
<td>Interruption of communication between CAN and CM1</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>106</td>
<td>CAN ETC5 frame error</td>
<td>See Service Manual</td>
<td>U0086</td>
<td>523595</td>
<td>2</td>
<td>Interruption of communication between CAN and ETC5</td>
<td>None</td>
<td>Key switch to &quot;OFF&quot;</td>
</tr>
<tr>
<td>107</td>
<td>CAN TSC1 frame error</td>
<td>See Service Manual</td>
<td>U0087</td>
<td>523596</td>
<td>2</td>
<td>Abnormal interruption of communication between CAN and TSC1</td>
<td>None</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td>108</td>
<td>CAN EBC1 frame error</td>
<td>See Service Manual</td>
<td>U0089</td>
<td>523598</td>
<td>2</td>
<td>Abnormal interruption of communication between CAN and EBC1</td>
<td>None</td>
<td>Diagnostic counter=0</td>
</tr>
<tr>
<td>109</td>
<td>FUEL LEVEL LOW</td>
<td>Refuel</td>
<td>96</td>
<td>17</td>
<td></td>
<td>Remaining fuel volume at specified value or less (factory default setting=10%)</td>
<td>None</td>
<td>Supply remaining fuel volume reaches the specified value or above</td>
</tr>
</tbody>
</table>
Engine Configuration

This function is not supported.

1-Up Display Setup

With "SETUP 1-UP DISPLAY", the displayed parameters can be reset to the factory defaults, or the necessary parameters to be displayed can be selected. The following 3 items appear when "SETUP 1-UP DISPLAY" is selected.

- USE DEFAULTS
- CUSTOM SETUP
- AUTOMATIC SCAN

Use Defaults

With "USE DEFAULTS", the 1-up display parameters return to the factory defaults.

1. Press the menu key. After the main menu appears, use the arrow keys to highlight "SETUP 1-UP DISPLAY", and then press the Enter key.

2. Highlight "USE DEFAULTS", and then press the Enter key.

3. "RESTORED TO DEFAULTS" appears in the monitor display, and the parameters are reset to the factory defaults of the following 8 items.

[1] ENGINE SPEED
[2] ENGINE COOLANT TEMPERATURE
[3] %SOOT
[4] FUEL LEVEL
[5] ENGINE OIL PRESSURE
[6] MACHINE HOURS
[7] BATTERY POTENTIAL
[8] DPF STATUS

4. After the settings have been applied, pressing the menu key once returns to the main menu, and pressing the key again returns to the 1-up/4-up display screen.

Custom Setup

With "CUSTOM SETUP", the type and number of parameters as well as their display order can be specified.

1. Press the menu key. After the main menu appears, use the arrow keys to highlight "SETUP 1-UP DISPLAY", and then press the Enter key.

2. Highlight "CUSTOM SETUP", and then press the Enter key.
2. Highlight "CUSTOM SETUP", and then press the Enter key. The list of parameters appears.

3. Change the parameters.
   [1] To add a parameter
   a. Use the arrow keys to highlight the parameter to be added, and then press the Enter key.
   b. A number appears at the right of the selected parameter. This number indicates the display order for the parameter

[2] To deselect a parameter and remove it from the list of displayed parameters
a. Highlight the parameter, and then press the Enter key.

4. After the settings have been applied, pressing the menu key once returns to the main menu, and pressing the key again returns to the 1-up/4-up display screen.
**Automatic Scan**

With "AUTOMATIC SCAN", the 1-up display can be set to automatically scroll through the selected parameters one by one.

1. Press the menu key.
   After the main menu appears, use the arrow keys to highlight "SETUP 1-UP DISPLAY", and then press the Enter key.

2. When "AUTOMATIC SCAN ON" appears, the parameters are scrolled automatically. For manual scrolling, highlight "AUTOMATIC SCAN ON", and then press the Enter key. It turns into "AUTOMATIC SCAN OFF" and the parameters will be scrolled manually.

3. After the settings have been applied, pressing the menu key once returns to the main menu, and pressing the key again returns to the 1-up/4-up display screen.

**Note:**
When the parameters are scrolled automatically, press the Enter key once to pause scrolling. When scrolling is paused, press the Enter key once to restart scrolling.

**4-Up Display Setup**

With "SETUP 4-UP DISPLAY", the displayed parameters can be reset to the factory defaults, or the monitor display of selected, necessary parameters can be set up. The following 2 items appear when "SETUP 4-UP DISPLAY" is selected.

- USE DEFAULTS
- CUSTOM SETUP

**Use Defaults**

With "USE DEFAULTS", the 4-up display parameters return to the factory defaults.

1. Press the menu key.
   After the main menu appears, use the arrow keys to highlight "SETUP 4-UP DISPLAY", and then press the Enter key.
2. Highlight "USE DEFAULTS", and then press the Enter key.

3. "RESTORED TO DEFAULTS" appears in the monitor display, and the parameters are reset to the factory defaults of the following 8 items.
   - First page
     1. ENGINE SPEED
     2. ENGINE COOLANT TEMPERATURE
     3. %SOOT
     4. FUEL LEVEL
   - Second page
     1. ENGINE OIL PRESSURE
     2. MACHINE HOURS
     3. BATTERY POTENTIAL
     4. DPF STATUS

4. After the settings have been applied, pressing the menu key once returns to the main menu, and pressing the key again returns to the 1-up/4-up display screen.

■ Custom Setup

With "CUSTOM SETUP", the type and number of parameters as well as their display order can be specified.

1. Press the menu key. After the main menu appears, use the arrow keys to highlight "SETUP 4-UP DISPLAY", and then press the Enter key.

2. Highlight "CUSTOM SETUP", and then press the Enter key.
3. Select the page.
   [1] Check that the values for the four parameters are highlighted.

[2] Use the arrow keys to display the page to be changed, and then press the Enter key.

4. Change the parameters.
   [1] Check that the value for one parameter is highlighted.

[2] Use the arrow keys to highlight the value of the parameter to be changed, and then press the Enter key.

   The number at the right of the parameter indicates the location in the 4-up display.
   1=Upper left
   2=Lower left

[4] To change to a different parameter
   a. Use the arrow keys to highlight the parameter to be selected, and then press the Enter key.
b. Check that a number appeared to the right of the selected parameter.

Custom Setup_008

[5] To deselect a parameter and remove it from the list of displayed parameters
a. Highlight the parameter to be removed, and then press the Enter key.

Custom Setup_009

5. Pressing the menu key once returns to the display for selecting the page.
6. To change other parameters, repeat steps 3 to 5.

b. Check that the number at the right of the parameter disappeared.

Custom Setup_011

To deselect a parameter and remove it from the list of displayed parameters
a. Highlight the parameter to be removed, and then press the Enter key.

Custom Setup_010

Service Reminders

With "SERVICE REMINDERS", the notification of replacement time for the following 5 consumables can be specified.

- Engine oil
- Engine oil filter
- Hydraulic oil
- Hydraulic oil filter
- Air cleaner

The following 2 items appear when "SERVICE REMINDERS" is selected.
- RESET REMINDERS
- MODIFY REMINDERS
Reset Reminders

With "RESET REMINDER", displayed remaining time can be reset to the time specified with "MODIFY REMINDERS".

1. Press the menu key.
   After the main menu appears, use the arrow keys to highlight "SERVICE REMINDERS", and then press the Enter key.

2. Highlight "RESET REMINDER", and then press the Enter key.

3. Use the arrow keys to highlight the item to be changed, and then press the Enter key. A plus appears at the right of the currently selected items.

4. The remaining time for the selected item appears.

5. The screen for selecting the item appears.

[1] To reset the remaining time to the specified time, press the Enter key.
   To reset, press the Enter key.
   To cancel resetting, press the menu key.
Modify Reminders

With "MODIFY REMINDERS", the replacement time period for consumables can be specified.

1. Press the menu key. After the main menu appears, use the arrow keys to highlight "SERVICE REMINDERS", and then press the Enter key.

2. Highlight "MODIFY REMINDERS", and then press the Enter key.

3. Use the arrow keys to highlight the item to be changed, and then press the Enter key. A plus appears at the right of the currently specified items.

4. The replacement time period for the selected item appears.

5. Highlight the digit to be changed. Press the right arrow key to increase the number. Press the left arrow key to change the digit.

6. To save the specified time period, press the Enter key.
7. "MODIFY SERVICE REMINDER?" appears.
To save the changes, press the Enter key.
To cancel the changes, press the menu key.

8. The display for selecting the item appears.
Initial and regular time periods

<table>
<thead>
<tr>
<th>Item</th>
<th>Initial time period</th>
<th>Regular time period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine oil</td>
<td>8 hrs.</td>
<td>50 hrs.</td>
</tr>
<tr>
<td>Engine oil filter</td>
<td>50 hrs.</td>
<td>100 hrs.</td>
</tr>
<tr>
<td>Hydraulic oil</td>
<td>100 hrs.</td>
<td>500 hrs.</td>
</tr>
<tr>
<td>Hydraulic oil filter</td>
<td>100 hrs.</td>
<td>500 hrs.</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>200 hrs.</td>
<td>200 hrs.</td>
</tr>
</tbody>
</table>

Note:
The factory default replacement time periods are the initial time periods.

Reminder Display

1. When the specified replacement time period for a consumable has passed, a warning message appears in the monitor display and the LED (yellow) lights up.

2. Pressing the Enter key changes the screen from the warning message to the parameter display.

3. A warning mark appears in the upper-right corner of the monitor display.

4. Change the replacement time period of consumables with "RESET REMINDERS" or "MODIFY REMINDERS".
When the replacement time period is changed, the warning message and mark disappear.
Select Units

With "SELECT UNITS", the units of parameter values can be set to any of the following three formats.

- ENGLISH
- METRIC KPA
- METRIC BAR

An asterisk appears at the right of the currently selected unit.

Note:
The factory default unit is "METRIC KPA".

<table>
<thead>
<tr>
<th>Monitor display S</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG RPM</td>
<td>ENGLISH RPM</td>
</tr>
<tr>
<td>DEMAND TQ</td>
<td>METRIC KPA %</td>
</tr>
<tr>
<td>ENG TORQ</td>
<td>METRIC BAR %</td>
</tr>
<tr>
<td>LOAD@RPM</td>
<td>METRIC BAR %</td>
</tr>
<tr>
<td>ACCEL PED1</td>
<td>METRIC BAR %</td>
</tr>
<tr>
<td>DES ENG SP</td>
<td>METRIC BAR %</td>
</tr>
<tr>
<td>COOL TEMP</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>FUEL RATE</td>
<td>METRIC KPA L/HR</td>
</tr>
<tr>
<td>THROTTLE</td>
<td>METRIC KPA %</td>
</tr>
<tr>
<td>BST PRES</td>
<td>METRIC BAR PSI</td>
</tr>
<tr>
<td>MANI TEMP</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>BAT VOLT</td>
<td>METRIC VDC</td>
</tr>
<tr>
<td>BARO PRES</td>
<td>METRIC BAR PSI</td>
</tr>
<tr>
<td>AMB TEMP</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>AIR IN TP</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>FUEL USED</td>
<td>METRIC L</td>
</tr>
<tr>
<td>ENG HRS</td>
<td>METRIC H</td>
</tr>
<tr>
<td>OIL PRES</td>
<td>METRIC BAR PSI</td>
</tr>
<tr>
<td>RAIL PRES</td>
<td>METRIC BAR PSI</td>
</tr>
<tr>
<td>AIR RATE</td>
<td>METRIC L</td>
</tr>
<tr>
<td>DOC TEMP</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>EF IN T</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>DIFF PRES</td>
<td>METRIC BAR PSI</td>
</tr>
<tr>
<td>EF OUT T</td>
<td>METRIC KPA °F</td>
</tr>
<tr>
<td>%SOOT</td>
<td>METRIC KPA %</td>
</tr>
<tr>
<td>MACH HRS</td>
<td>METRIC H</td>
</tr>
<tr>
<td>FUEL LEVEL</td>
<td>METRIC KPA %</td>
</tr>
</tbody>
</table>
Adjust Backlight

With "ADJUST BACKLIGHT", the brightness of the monitor display can be adjusted. Press the right arrow key to make the display brighter. Press the left arrow key to make the display darker.

Adjust Contrast

With "ADJUST CONTRAST", the contrast of the monitor display can be adjusted. Press the right arrow key to decrease the contrast. Press the left arrow key to increase the contrast.

Utilities

With "UTILITIES", the remaining fuel volume can be specified and the monitor configuration can be displayed. The following 6 items appear when "UTILITIES" is selected.

- GAGE DATA
- REMOVE ALL GAGES
- SOFTWARE VERSION
- FAULT CONVERSION
- ANALOG INPUT
- OEM

Note:
"GAGE DATA" and "REMOVE ALL GAGES" are not supported on this machine.

Software Version

With "SOFTWARE VERSION", the software version of the monitor can be displayed.

Fault Conversion

With "FAULT CONVERSION", the J1939 fault code conversion method can be specified. The monitor normally detects J1939 version 4. Since the engine ECU of this machine uses J1939 version 4, no adjustments are necessary.

Analog Input

With "ANALOG INPUT", remaining fuel volume information can be specified. The following 2 items appear when "ANALOG INPUT" is selected.

- BACKLIGHT DIMMER
- FUEL LEVEL
Important

"BACKLIGHT DIMMER" is not supported on this machine. Always select "FUEL LEVEL". If "BACKLIGHT DIMMER" is selected, "NO DATA" appears as the value for the fuel level parameter.

Fuel Level

With "FUEL LEVEL", the low fuel level can be specified.

1. Press the menu key.
   After the main menu appears, use the arrow keys to highlight "UTILITIES", and then press the Enter key.

2. Highlight "ANALOG INPUT", and then press the Enter key.

3. Highlight "FUEL LEVEL", and then press the Enter key.

4. Highlight "SET LOW FUEL LEVEL", and then press the Enter key.

Note:
The factory default analog input is "FUEL LEVEL".

Handling Instructions
5. "LOW FUEL" appears.

6. Press the right arrow key to increase the value. Press the left arrow key to decrease the value. The value can be set between 10% and 80% in 5% increments.

7. To save the specified value, press the Enter key.

Note:
The factory default low fuel level is 10%.

Low Fuel Level Display

**Caution**

If a warning message appears, immediately stop operation, and then supply fuel.

1. When the fuel level falls below the specified low fuel level, a warning message appears in the monitor display and the LED (yellow) lights up. The warning message appears on two pages. Use the arrow keys to change the page.

2. Pressing the Enter key changes the screen from the warning message to the parameter display.

3. A warning mark appears in the upper-right corner of the monitor display.

4. When fuel is supplied to bring the fuel level above the specified low fuel level, the warning message and mark disappear.

**OEM**

"OEM" is used when the manufacturer specifies factory default settings.

**Important**

No adjustments by the operator are necessary.
Travel of Machine

Moving the Machine

1. Start the engine. (See "Procedure to Start Engine" (Page 4-25).)
2. Raise all mower units, and then engage the mower lock levers (latches) for mower units #4 and #5.
3. Depress the brake pedal to release the parking brake.
4. Slowly depress the traveling pedal.
5. The machine will start to move.

Towing the Machine

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

**Caution**

Tow the machine at a low speed while paying close attention.

**Caution**

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

**Caution**

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

1. Stop the engine. (See "Procedure to Stop Engine" (Page 4-26).)
2. Apply the parking brake and chock the wheels.
3. Set the 2WD/4WD selector switch to the "2WD" position.
4. Make sure that the steering wheel is raised completely.

5. Pull up the forward/backward adjustment lever, and then slide the seat backward completely.

6. While pulling up the lever behind the seat, tilt the seat forward.

7. Turn the unload valve, located beside the hydraulic pump, 90 degrees (so that it is vertical) to open it.
8. Remove the wheel stopper, and then depress the brake pedal to release the parking brake.
9. Tow the machine slowly.

**Cutting Work**

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

**Caution**
Cutting work must be performed at an appropriate speed for the site and location.
When cutting over bumpy surfaces, keep the engine rpm steady, and slow down the cutting speed.

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

1. Drive to the cutting area.(See "Moving the Machine" (Page 4-68).)
2. Move the throttle knob to the rabbit icon (high speed) to run the engine at the maximum rpm.
3. Right before starting cutting work, release the mower lock levers for mower units #4 and #5.

4. Shift the mower unit up/down lever to the "DOWN" position to lower the mower units.

5. Set the reel rotation switch to the "ON" position to rotate the reel cutters (cutting cylinders) of all mower units.

6. Depress the traveling pedal to start cutting work.
Note: During the work, the reel cutters (cutting cylinders) will rotate or stop in sync with the up and down motion of the mower units.
Transporting

Transporting Procedure

When loading the machine into a trailer or a truck to transport it, drive the machine forward. When unloading, drive the machine in reverse. If the roof is installed on the machine, remove it. The roof may be damaged by wind pressure.
Maintenance

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<table>
<thead>
<tr>
<th>Caution</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First, learn well the maintenance operations you plan to perform.</td>
<td></td>
</tr>
<tr>
<td>Caution</td>
<td></td>
</tr>
<tr>
<td>Use tools appropriate for each maintenance operation.</td>
<td></td>
</tr>
<tr>
<td>Caution</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
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 400 hrs.</th>
<th>Every 500 hrs.</th>
<th>Every year</th>
<th>Every 2 years</th>
<th>Every 4 years</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine</strong></td>
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<td>Tightening the parts</td>
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<td>8 hrs (first time)</td>
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<tr>
<td>Engine oil filter</td>
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<td>50 hrs (first time)</td>
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<td>Inspect Every 1,500 hrs.</td>
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<td>Replace Every 1,500 hrs.</td>
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<td>Every 3,000 hrs.</td>
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<td>Refer to &quot;Inspection of Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)&quot;</td>
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<td>Bed knife (Bottom blade)</td>
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<td>Refer to &quot;Inspection of Reel Cutter (Cutting Cylinder) and Bed Knife (Bottom Blade)&quot;</td>
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<tr>
<td>Operating height (Mowing height)</td>
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<td>Greasing, oiling</td>
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</table>
## Maintenance Schedule

<table>
<thead>
<tr>
<th>Maintenance item</th>
<th>Before work</th>
<th>After work</th>
<th>Every 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 400 hrs.</th>
<th>Every 500 hrs.</th>
<th>Every year</th>
<th>Every 2 years</th>
<th>Every 4 years</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Tire</td>
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<td>Oil leakage</td>
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<td>100 hrs (first time)</td>
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<td>Hydraulic oil filter</td>
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<td>Hydraulic hose (moving part)</td>
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<td>Hydraulic hose (fixed part)</td>
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<td>Water separator</td>
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<td>Refer to &quot;Inspection of Water Separator&quot;,&quot;Draining of Water Separator&quot;</td>
</tr>
<tr>
<td>Fuel strainer</td>
<td>O</td>
<td></td>
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<td>Refer to&quot;Cleaning of Water Separator&quot;</td>
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<tr>
<td>Fuel pipe</td>
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<tr>
<td>Cleaning the exterior</td>
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</table>

For the maintenance schedule of the items unlisted above, refer to the Engine's Owner's Manual. The values for consumables are not guaranteed. Replace the steering cylinder hoses every 2 years.
### Specified Values

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel tank capacity</td>
<td>51.0 dm³ (51.0 L)</td>
<td>Ultra-low sulfur diesel fuel (sulfur-free diesel fuel) or equivalent</td>
</tr>
<tr>
<td>Hydraulic tank capacity</td>
<td>44.0 dm³ (44.0 L)</td>
<td>Shell Tellus S2M46 or equivalent</td>
</tr>
<tr>
<td>Quantity of engine oil</td>
<td>9.7 dm³ (9.7 L)</td>
<td>JASO DH-2 or API Service Grade CJ-4</td>
</tr>
<tr>
<td>Coolant volume</td>
<td>12.0 dm³ (12.0 L)</td>
<td>Including reserve tank (1.0 L)</td>
</tr>
<tr>
<td>Front Tire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type_F</td>
<td>140 kPa (1.4 kgf/cm²)</td>
<td>31 x 13.50 - 15</td>
</tr>
<tr>
<td>Type_R</td>
<td>140 kPa (1.4 kgf/cm²)</td>
<td>31 x 13.50 - 15</td>
</tr>
<tr>
<td>Rear tire</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>140 kPa (1.4 kgf/cm²)</td>
<td>20 x 12.00 - 10</td>
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<tr>
<td>Cutter adjustment spring</td>
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<tr>
<td></td>
<td>40.0 mm (1.575 in)</td>
<td>Length of spring coil</td>
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</tbody>
</table>

### Main Consumable Parts

<table>
<thead>
<tr>
<th>Part name</th>
<th>Code</th>
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<td>PF17266-9701-0</td>
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<tr>
<td>Oil element</td>
<td>PF16414-3243-4</td>
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<tr>
<td>Air cleaner element (outer)</td>
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<tr>
<td>Air cleaner element (inner)</td>
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<tr>
<td>Fuel filter element</td>
<td>PF1J521-4317-0</td>
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<tr>
<td>Suction filter</td>
<td>K3413000040</td>
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<tr>
<td>Hydraulic cartridge filter</td>
<td>K3410000030</td>
</tr>
<tr>
<td>Hydraulic oil (20 L can)</td>
<td>K2913100200</td>
</tr>
<tr>
<td>Throttle wire</td>
<td>K1110168020</td>
</tr>
<tr>
<td>Brake wire, right</td>
<td>K1120238000</td>
</tr>
<tr>
<td>Brake wire, left</td>
<td>K1120205500</td>
</tr>
<tr>
<td>Pad kit for brake</td>
<td>Y328-2845</td>
</tr>
</tbody>
</table>
About DPF

**Danger**

Since it will become extremely hot around the exhaust outlet, do not perform DPF regeneration in a location where fires may occur.

The DPF is a purifying filter that collects PM (soot) from exhaust gas. When a certain amount of PM (soot) has accumulated, DPF regeneration must be performed automatically or manually in order to restore the filtering function.

**Types of DPF Regeneration**

DPF regeneration is performed with any of the following four methods.

1. **Auto regeneration**
   - Raising the exhaust temperature is automatically controlled to perform DPF regeneration.
   - Regeneration can be performed by this machine.

2. **Parked regeneration**
   - This machine cannot continue to be operated during regeneration.
   - If auto regeneration does not reduce the amount of accumulated PM below the specified value, park this machine in a safe location, and then forcibly perform DPF regeneration.
   - Regeneration can be performed by this machine.
   - This machine cannot continue to be operated during regeneration.

3. **Manual regeneration**
   - Manual regeneration cannot be performed by the operator.
   - If manual regeneration is necessary, contact your dealer.
   - DPF regeneration is performed using a fault diagnostic tool.
   - Regeneration cannot be performed by this machine.
   - Perform manual regeneration under any of the following conditions.
     - PM accumulation level 4 is reached.
     - The DPF was cleaned or replaced.
     - The ECU was replaced.

4. **DPF cleaning**
   - DPF cleaning cannot be performed by the operator.
   - If DPF cleaning is necessary, contact your dealer.
   - The DPF will be sent to the engine manufacturer so that DPF regeneration can be performed with specifically designed equipment.
   - Regeneration cannot be performed by this machine.
   - Perform DPF cleaning under any of the following conditions.
     - Every 3,000 hrs
     - PM accumulation level 5 is reached.
Conditions for DPF Regeneration

**Danger**
Since it will become extremely hot around the exhaust outlet, do not perform DPF regeneration in a location where fires may occur.

**Important**
If DPF regeneration is canceled before it is completed, the next regeneration request may occur soon since not all of the PM (soot) was removed.

1. DPF auto regeneration does not begin unless both of the following two conditions are met.
   - The DPF auto regeneration inhibit switch is set to the "Regenerate" position.
   - The coolant temperature is 65 °C or more.
2. DPF parked regeneration and manual regeneration do not begin unless all of the following four conditions are met.
   - The parking brake is applied.
   - The traveling pedal is in the neutral position.
   - The throttle opening is 0% (idling).
   - The coolant temperature is 65 °C or more.
3. During DPF regeneration, the operation is canceled if any of the following conditions occur.
   - Any condition for starting regeneration is violated.
   - The ignition key is switched to the "OFF" position.

DPF Regeneration Displays

**Danger**
Since it will become extremely hot around the exhaust outlet, do not perform DPF regeneration in a location where fires may occur.

The following three icons indicate the DPF regeneration status.
The icon appears at the top of the monitor display.

1. Regeneration icon
   The regeneration icon appears with DPF regeneration request or during DPF regeneration.
   - DPF regeneration request: Blinking
   - During DPF regeneration: Lighting
2. Auto regeneration inhibit icon
   The auto regeneration inhibit icon lights up when the DPF auto regeneration inhibit switch is set to the "Auto regeneration inhibit" position.
3. High exhaust temperature icon
   The high exhaust temperature icon lights up when the exhaust temperature reaches 450 °C during DPF regeneration.
DPF Auto Regeneration

Automatic Regeneration

**Danger**

Since it will become extremely hot around the exhaust outlet during DPF regeneration, do not perform the operation in a location where fires may occur.

**Caution**

Normally, set the DPF auto regeneration inhibit switch to the "Auto regeneration" position. However, when operating in a location where fires may occur, set the DPF auto regeneration inhibit switch to the "Auto regeneration inhibit" position.

When the DPF auto regeneration inhibit switch is set to the "Auto regeneration" position, perform regeneration as described below, according to the PM accumulation level.

1. **Level 0**
   - Regeneration is not necessary.

2. **Level 1**
   - The machine can continue to be operated.
   - If the conditions for auto regeneration are met, auto regeneration begins and the regeneration icon lights up.
   - However, if regeneration remains uncompleted even after 30 minutes have passed, the system enters level 2.

   ![Diagram of regeneration icon and arrow keys]

## Table: Automatic Regeneration_001

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DPF auto regeneration inhibit switch</td>
</tr>
<tr>
<td>A</td>
<td>Auto regeneration</td>
</tr>
<tr>
<td>B</td>
<td>Auto regeneration inhibit</td>
</tr>
</tbody>
</table>

## Table: Automatic Regeneration_002

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regeneration icon</td>
</tr>
<tr>
<td>2</td>
<td>Arrow keys</td>
</tr>
</tbody>
</table>
3. Level 2

**Important**
The machine can continue to be operated. However, during the parked regeneration, the machine cannot be operated.

Auto regeneration continues and the parked regeneration can also be started in level 2.
If regeneration remains uncompleted by means of auto regeneration, the regeneration icon begins blinking to request the parked regeneration.
Follow the steps below to perform the parked regeneration.
[1] Stop machine operations, park in a safe location, and then apply the parking brake.
[2] Set the throttle opening to 0% (idling).
[3] Set the DPF parked regeneration switch to the "Engaged" position.
Regeneration starts.

If the parked regeneration request is ignored and the machine continues to be operated, the system enters level 3.

4. Level 3

**Important**
The machine cannot continue to be operated.

The auto regeneration cannot be implemented in level 3. Therefore, the parked regeneration must be started immediately.

The following occur in level 3.
- "Excessive PM3" appears in the monitor display. Pressing an arrow key changes the display to "CORRECTIVE ACTION: Start DPF Parked Regeneration immediately".
- The LED (yellow) lights up.
- The engine output is limited at 50%.

If the parked regeneration request is ignored and the machine continues to be operated, the system enters level 4.
5. Level 4

**Important**

Manual regeneration cannot be performed by the operator. If manual regeneration is necessary, contact your dealer.

The following occur in level 4. Manual regeneration by your dealer must be performed with a fault diagnostic tool.

- "Excessive PM4" appears in the monitor display. Pressing an arrow key changes the display to "CORRECTIVE ACTION: Stop engine!! Contact dealer immediately".
- The LED (yellow) lights up.
- The engine output is limited at 50%.

If the manual regeneration request is ignored and the machine continues to be operated, the system enters level 5.

6. Level 5

**Important**

When the system enters level 5, the DPF is completely clogged. To perform regeneration, the DPF must be removed and DPF cleaning must be performed by the engine manufacturer. Contact your dealer.

The following occur in level 5. DPF cleaning by the engine manufacturer is required.

- "Excessive PM5" appears in the monitor display. Pressing an arrow key changes the display to "CORRECTIVE ACTION: Stop engine!! Contact dealer immediately".
- The LED (red) lights up.
- The engine output is limited at 50%.
Auto Regeneration Inhibition

**Danger**

Since it will become extremely hot around the exhaust outlet, do not perform DPF regeneration in a location where fires may occur.

**Caution**

Normally, set the DPF auto regeneration inhibit switch to the "Auto regeneration" position. However, when operating in a location where fires may occur, set the DPF auto regeneration inhibit switch to the "Auto regeneration inhibit" position.

When the DPF auto regeneration inhibit switch is set to the "Auto regeneration inhibit" position, the auto regeneration inhibit icon appears in the monitor display.

When the DPF auto regeneration inhibit switch is set to the "Auto regeneration inhibit" position, perform regeneration as described below according to the PM accumulation level.

1. **Level 0**
   - Regeneration is not necessary.

2. **Level 1**

   **Important**
   - The machine can continue to be operated.

   The regeneration icon blinks.

   When the DPF auto regeneration inhibit switch is set to the "Auto regeneration" position, regeneration begins.

   If the regeneration request is ignored and the machine continues to be operated, the system enters level 2.

---

When the DPF auto regeneration inhibit switch is set to the "Auto regeneration inhibit" position, perform regeneration as described below according to the PM accumulation level.

1. **Level 0**
   - Regeneration is not necessary.

2. **Level 1**

   **Important**
   - The machine can continue to be operated.

   The regeneration icon blinks.

   When the DPF auto regeneration inhibit switch is set to the "Auto regeneration" position, regeneration begins.

   If the regeneration request is ignored and the machine continues to be operated, the system enters level 2.

---

**Important**

The machine can continue to be operated.

The regeneration icon blinks.

When the DPF auto regeneration inhibit switch is set to the "Auto regeneration" position, regeneration begins.

If the regeneration request is ignored and the machine continues to be operated, the system enters level 2.
The machine cannot be operated during the parked regeneration.

When the system enters level 2, perform the parked regeneration. Follow the steps below to perform the parked regeneration.

1. Stop machine operations, park in a safe location, and then apply the parking brake.
2. Set the throttle opening to 0% (idling).
3. Set the DPF parked regeneration switch to the "Engaged" position.

Regeneration starts.

Levels 3, 4 and 5 are the same as if the DPF auto regeneration inhibit switch is set to the "Auto regeneration" position. Refer to "Automatic Regeneration".

---

### Jacking up the machine

#### About the Jacking up the machine

**Warning**

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

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

#### Jack-up Points

1. [Jack-up Points_001](#)

---

**Auto Regeneration Inhibition_004**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DPF parked regeneration switch</td>
</tr>
<tr>
<td>A</td>
<td>Engaged</td>
</tr>
</tbody>
</table>

Levels 3, 4 and 5 are the same as if the DPF auto regeneration inhibit switch is set to the "Auto regeneration" position. Refer to "Automatic Regeneration".
4. Below rear wheel motors
   There is one jack-up point below each rear wheel motor (left and right).

**Greasing**

**About Greasing**

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

Add urea-based No. 2 grease in accordance with the Maintenance Schedule. Other locations where the specified grease or lubricant is used are indicated in "Greasing Points". Add grease using the specified grease or lubricant.
Greasing Points

Type_F

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>1 Mower arm fulcrum</td>
<td>5</td>
</tr>
<tr>
<td>2 Lift arm fulcrum</td>
<td>5</td>
</tr>
<tr>
<td>3 Brake lever shaft</td>
<td>2</td>
</tr>
<tr>
<td>4 Traveling pedal shaft fulcrum</td>
<td>2</td>
</tr>
<tr>
<td>5 Pivot</td>
<td>3</td>
</tr>
<tr>
<td>6 Neutral position area</td>
<td>2</td>
</tr>
<tr>
<td>7 Reel housing</td>
<td>5</td>
</tr>
<tr>
<td>8 Rear roller</td>
<td>10</td>
</tr>
<tr>
<td>9 Front roller</td>
<td>10</td>
</tr>
<tr>
<td>10 Mower unit fulcrum</td>
<td>5</td>
</tr>
</tbody>
</table>

1. Mower arm fulcrum
There is one greasing point on each mower arm fulcrum connected to a mower unit.
Grease mower units #2 and #3 in the swiveled position.
(See “Swiveling Mower Units #2 and #3” (Page 5-21).)

Mower units #1, #4 and #5

2. Lift arm fulcrum
There is one greasing point on each lift arm fulcrum connected to a mower unit.
Lower the mower units before greasing the lift arm fulcrums.

Mower units #1 and #4
3. Brake lever shaft  
   There are two greasing points on the brake lever shaft.

4. Traveling pedal shaft fulcrum  
   There are two greasing points on the traveling pedal shaft fulcrum.

5. Pivot  
   Middle between the rear wheels

Rear left wheel
6. Neutral position area
   There are two greasing points on the neutral position area.

7. Reel housing
   There is one greasing point on each mower unit reel housing.

8. Rear roller
   There is one greasing point on the left and right of the rear roller of each mower unit.

9. Front roller
   There is one greasing point on the left and right of the front roller of each mower unit.

10. Mower unit fulcrum
    There is one greasing point on each mower unit fulcrum.
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>
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<tbody>
<tr>
<td>1 Mower arm fulcrum</td>
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<tr>
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</tr>
<tr>
<td>6 Neutral position area</td>
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</tr>
<tr>
<td>7 Reel housing</td>
<td>5</td>
</tr>
<tr>
<td>8 Rear roller</td>
<td>10</td>
</tr>
</tbody>
</table>

1. Mower arm fulcrum
   There is one greasing point on each mower arm fulcrum connected to a mower unit. Grease mower units #2 and #3 in the swiveled position.
   (See “Swiveling Mower Units #2 and #3” (Page 5-21).)
   Mower units #1, #4 and #5

2. Lift arm fulcrum
   There is one greasing point on each lift arm fulcrum connected to a mower unit. Lower the mower units before greasing the lift arm fulcrums.
   Mower units #1 and #4
Mower units #2 and #3

There are two greasing points on the brake lever shaft.

Mower unit #5

There are two greasing points on the traveling pedal shaft fulcrum.

3. Brake lever shaft

5. Pivot

Middle between the rear wheels

4. Traveling pedal shaft fulcrum

There are two greasing points on the traveling pedal shaft fulcrum.

Rear left wheel

Greasing
6. Neutral position area
There are two greasing points on the neutral position area.

7. Reel housing
There is one greasing point on each mower unit reel housing.

8. Rear roller
There is one greasing point on the left and right of the rear roller of each mower unit.

**Maintenance (Mower)**

**Back Lapping of Reel Cutter (Cutting Cylinder)**

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

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

- **Caution**
  Be careful not to inhale exhaust gas during back lapping.

- **Caution**
  During back lapping, the reel cutter (cutting cylinder) rotates. Keep hands and feet away from moving parts.
Caution
Do not perform back lapping with any other persons.

1. Have the following items ready: Strips of newspaper, Abrasive [Back lapping powder mixed with oil; or gel compound (Baroness genuine abrasive)], Brush.

Note:
The mixing ratio for the abrasive, in volume, is one part back lapping powder (#150 - #200) to three or four parts oil.

Important
Check the sharpness of the blade by checking the blade engagement after cutting grass.

2. Insert two or three strips of newspaper into the space between the reel cutter (cutting cylinder) and the bed knife (bottom blade) at an angle of 90 degrees. Then, rotate the reel cutter (cutting cylinder) counter-clockwise (when you face the mower unit from the left) by hand to check the sharpness of the blades.

3. Check the sharpness of the entire range (three or four points from the left edge to the right one) of the reel cutter (cutting cylinder).

4. Using a piece of chalk, mark locations on the blade that are sharp.

5. Shift the reel rotation/stop switching levers of the hydraulic motors in the mower units to be used for back lapping to the "Rotate" position.
Shift the levers for the mower units for which you will not perform back lapping to the "Stop" position.

Caution
Before adjusting the blade engagement, be sure to set the reel rotation/stop switching lever for the reel motor (attached to the mower unit) to the "Stop" position.
Before cutting newspaper as a test, be sure to stop the engine and wear gloves to protect your hands.
Pay attention not to let the reel cutter (cutting cylinder) catch your gloves. Otherwise, you may injure your hand or fingers.
6. Sit on the seat, apply the parking brake, and then start the engine.
   Note:
   If the reel rotation switch is set to the "ON" position, the engine will not start.
7. Lower all mower units to the ground.
8. Open the hood, and then set the reel reverse switch to the "ON" position (reverse rotation).
9. Run the engine at a low rpm.
10. Set the reel rotation switch to the "ON" position to rotate the reel cutters (cutting cylinders) for back lapping.
11. With the reel rotation/stop switching lever, adjust the rotation speed of the reel cutter (cutting cylinder).
12. Apply the abrasive evenly with the brush on the top side of reel cutter (cutting cylinder) where the newspaper was cut well or of chalk-marked locations. (Never apply to blunt areas.)
13. Idle the engine for a while, and when contact noise is no longer heard, set the reel rotation switch to the "OFF" position to stop the reel cutters (cutting cylinders).
14. Stop the engine.
15. Wash off or wipe off with a cloth, etc., the abrasive from the reel cutter (cutting cylinder), and then check it for sharpness.
16. Repeat steps 2 to 15 until the entire range (three or four points from the left edge to the right one) of the reel cutter (cutting cylinder) is uniformly sharpened.
17. Finally, apply abrasive to the entire blade width of the reel cutter (cutting cylinder) and perform final back lapping.
18. Set the reel rotation switch to the "OFF" position to stop the rotation of the reel cutters (cutting cylinders), stop the engine, and then carefully and thoroughly wash off any remaining abrasive.
19. Set the reel reverse switch to the "OFF" position (normal rotation).
20. Shift the reel rotation/stop switching lever to the "Stop" position.
21. While checking the blade for sharpness, adjust blade engagement.

Maintenance (Main Body)

Swiveling Mower Units #2 and #3

**Caution**

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

**Caution**

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

Maintenance can be performed more easily with mower units #2 and #3 swiveled.
1. Lower the mower units, and then stop the engine.
2. Remove the clip pin, and then remove the grip pin.

3. Swivel the mower unit toward the outside of the machine.

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

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

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

Removing/Installing Tires

Front Tires

Follow the steps below to remove the front tires:

1. Loosen the bolts.

2. Securely place the jack beneath the jack-up point of the front left/right frame area, and then raise it until the tire lifts off the ground. (See "Jack-up Points" (Page 5-12).)

3. Remove the bolts.

4. Remove the tire from the wheel mounting seat.

Caution

Refer to the Tightening Torque table. Note that the Baroness product warranty may not apply to defects caused by incorrect or overtorque tightening etc.
Important
Tighten the bolts in the tightening order (crosswise).

For installing the front tires, reverse the removing procedure.

Rear tire

Follow the steps below to remove the rear tire.

1. Loosen the bolts.

2. Securely place the jack beneath the jack-up point below the rear wheel motor, and then raise it until the tire lifts off the ground. (See "Jack-up Points" (Page 5-12).)

3. Remove the bolts.

4. Remove the tire from the wheel mounting base.

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

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

For installing the rear tire, reverse the removing procedure.

Adjustment of Belt Tension

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

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

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

Fan Belt

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

For details on handling the engine, please refer to the Engine's Owner's Manual.

1. Press the middle of the belt with your finger to check the belt tension.

2. If the belt is too slack, loosen bolts A and B (that affix the alternator), and then move the alternator to adjust the tension.
Adjustment of Brake

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

**Important**
If the brake is not sufficiently effective due to a wider clearance gap between the brake disc and the brake lining, adjust the clearance. The wire is used for fine adjustments.

**Important**
Adjust the brake with the brake lining.

The brake lining wear limit is 3.0 mm (0.12 in).

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

1. For each wheel, fully tighten the adjustment bolt on the brake disc side.

2. Reduce the clearance by loosening the lock nut, then tightening the adjustment nut. Tighten the adjustment nut until the brake lining contacts the friction surface of the disc.
Too narrow clearance gap between the brake disc and brake lining may cause heat generation and fire.

3. Loosen the adjustment nut to adjust the clearance gap between the brake disc and brake lining to about 0.2 mm (0.0079 in).
4. Securely place the jack beneath the jack-up point of the front left/right frame area, and then raise it until both tires lift off the ground.
5. Check that the disc rotates freely.
6. Fully tighten the lock nut while holding the adjustment nut in place.
7. With the brake pedal released, obtain a play of 1.0 mm (0.039 in) at the connection of the pedal and inner wire.

8. Use a wrench to loosen the lock nut and tighten it after making the adjustment with the adjustment bolt.
9. Drive, and then check the following.
   - Make sure that heat is not generated in the brake area.
   - Make sure that the left and right brakes are equally effective.

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

Break-in of Brakes
If the brake shoes or brake pads are worn, replace them with new ones. Immediately after replacement, drive to break in the brakes if the effectiveness of the brakes is low. While driving, lightly operate the brakes to break in the contact areas.

Adjusting the Neutral Position of the Piston Pump

Make sure not to touch rotating tires.

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

If the machine moves forward or backward while the traveling pedals are released, they are not set to the neutral position. Follow the steps below to make adjustments.
1. Stop the engine.
2. Place the jacks beneath the jack-up points, and then lift the machine off the ground.
3. Make sure that no tires come into contact with the jack stand.
4. Pull up the forward/backward adjustment lever, and then slide the seat backward completely.

5. While pulling up the lever, tilt the seat upward.

6. Start the engine, and rev it up to the maximum rpm.
7. Set the 2WD/4WD selector switch to the "2WD" position.
8. Adjust the neutral position.

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

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

9. Find the position where the front wheels stop, and then tighten the lock nuts.

---

**Change of Fuse**

**Fuse box**

**Warning**
Before performing maintenance on the electrical system, be sure to disconnect the negative terminal of the battery.

**Caution**
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.

The fuse box includes spare fuses and tools.
The machine uses a mini fuse for automobiles. Replace an old fuse with a new fuse of the specified capacity.

<table>
<thead>
<tr>
<th>Fuse Box_002</th>
<th>Fuse Box_002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> 5 A ECU_KeySwitch_ON</td>
<td></td>
</tr>
<tr>
<td><strong>B</strong> 5 A Alternator</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong> 5 A Display</td>
<td></td>
</tr>
<tr>
<td><strong>D</strong> 15 A Relay box 1(differential lock switch, #3 proximity switch, reel rotational direction switch)</td>
<td></td>
</tr>
<tr>
<td><strong>E</strong> 15 A Relay box 2 (2WD/4WD selector switch, #4/#5 proximity switches)</td>
<td></td>
</tr>
<tr>
<td><strong>F</strong> - -</td>
<td></td>
</tr>
<tr>
<td><strong>G</strong> 5 A ECU_KeySwitch_Start</td>
<td></td>
</tr>
<tr>
<td><strong>H</strong> 5 A ECU_Parked Regeneration Switch/Auto Regeneration Inhibit Switch</td>
<td></td>
</tr>
<tr>
<td><strong>I</strong> 5 A Operating oil buzzer</td>
<td></td>
</tr>
<tr>
<td><strong>J</strong> 5 A Water temperature buzzer</td>
<td></td>
</tr>
<tr>
<td><strong>K</strong> 5 A Spare</td>
<td></td>
</tr>
<tr>
<td><strong>L</strong> 5 A</td>
<td></td>
</tr>
<tr>
<td><strong>M</strong> 15 A</td>
<td></td>
</tr>
<tr>
<td><strong>N</strong> 15 A</td>
<td></td>
</tr>
<tr>
<td><strong>O</strong> Fuse removal tool</td>
<td></td>
</tr>
</tbody>
</table>

Fusible Link

Fuse capacities of the fusible links are 30 A and 50 A.

<table>
<thead>
<tr>
<th>Fusible Link_001</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Fusible link (50 A)</td>
</tr>
<tr>
<td><strong>2</strong> Fusible link (30 A)</td>
</tr>
</tbody>
</table>

Long-Term 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.

---

**Maintenance**

**Page 5-27**
EU Declaration of Conformity

Product Identification

<table>
<thead>
<tr>
<th>Product</th>
<th>Lawnmower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make</td>
<td>BARONESS</td>
</tr>
<tr>
<td>Type</td>
<td>LM3210</td>
</tr>
<tr>
<td>Version(s)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Starting Serial No.</td>
<td>10015</td>
</tr>
</tbody>
</table>

Measured Sound Power Level:
- LWA: 99.86 dB
- LWA: 103 dB

Manufacturer Name: Kyoelsha 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

Technical Documentation

<table>
<thead>
<tr>
<th>Keeper’s Name</th>
<th>Kyoelsha Co., Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>1-26 Miyuki-cho, Toyokawa, Aichi-ken, Japan</td>
</tr>
</tbody>
</table>

Compiler of the technical file: Kyoelsha 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 (2006/42/EC)
- EC-type examination: Module B (2014/30/EU)
- Internal control of production with assessment of technical documentation and periodical checking (2000/14/EC)

Involved Notified Body (2000/14/EC): SNCH
Address: 11, Route de Sandweiler 5230 Sandweiler, Luxembourg
Certificate/Report No.: SNCH*2000/14*2005/88/2911*00/TCLM3210-00

Place: Japan
Date: 6 July 2016 (06/07/2016)
Signature: [Signature]
Name: Kimiya Kanieko
Position: Quality Dept. Manager

Déclaration de conformité UE

Identification du produit

<table>
<thead>
<tr>
<th>Produit</th>
<th>Tondeuse à gazon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabricant</td>
<td>BARONESS</td>
</tr>
<tr>
<td>Type</td>
<td>Non applicable</td>
</tr>
<tr>
<td>Version(s)</td>
<td>10015</td>
</tr>
<tr>
<td>Numéro de série de début</td>
<td></td>
</tr>
<tr>
<td>Niveau de puissance acoustique mesuré</td>
<td>LWA: 99.86 dB</td>
</tr>
<tr>
<td>Niveau de puissance acoustique garanti</td>
<td>LWA: 103 dB</td>
</tr>
<tr>
<td>Fabricant</td>
<td>Kyoelsha Co., Ltd.</td>
</tr>
<tr>
<td>Adresse</td>
<td>1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon</td>
</tr>
</tbody>
</table>

Conforme aux directives suivantes:

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

Conception et fabrication en respect des spécifications suivantes:

- ISO 5395-1: 2013 (2006/43/CE)

Fiche technique

| Marque | Kyoelsha Co., Ltd. |
| Adresse de la marque | 1-26, Miyuki-cho, Toyokawa, préfecture d'Aichi, Japon |
| Compléteur de la fiche technique (2006/42/CE) | Kyoelsha U.K. Ltd. |
| Adresse | Unit 5 Hatch Industrial Park, Grewell Road, Basingstoke, Hampshire RG24 7NG, Royaume-Uni |

Procédures d'évaluation de la conformité

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

Organisme notifié impliqué (2000/14/CE):
| Nom | SNCH |
| Adresse | 11, Route de Sandweiler 5230 Sandweiler, Luxembourg |
| N° de certification/rapport | SNCH*2000/14*2005/88/2911*00/TCLM3210-00 |
Declaración de conformidad de la UE

Identificación del producto
Producto: Cortacésped
Marca: BARONESS
Tipo: LM3210
Versión: No aplicable
N.º de serie inicial: 10015
Nivel de potencia sonora medido: LWA 99.66 dB
Nivel de potencia sonora garantizado: LWA 103 dB
Fabricante Nombre: 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 (2006/42/CE)
Nombre: Kyoeisha U.K. Ltd.
Dirección: Unit 5 Hatch Industrial Park Greewell Road, Basingstoke Hampshire RG24 7NG, Reino Unido

Procedimientos de evaluación de conformidad
Control de fabricación interno: Módulo A (2006/42/CE)
Examen de tipo CE: Módulo B (2014/30/UE)
Control interno de fabricación con evaluación de documentación técnica y comprobaciones periódicas (2000/14/CE)

Organismo notificado implicado (2000/14/CE)
Nombre: SNCH
Dirección: 11, Route de Sandweiler 5230 Sandweiler Luxemburgo
Certificado/Informe n.º: SNCH*2000/14*2005/88*2911*00/TCLM3210-00

EU-Konformitätserklärung

Produktbeschreibung
Produkt: Rasenmäher
Marke: BARONESS
Modell: LM3210
Version(en): Nicht zutreffend
Startseriennummer: 10015
Gemessener Schallleistungspegel: LWA 99,66 dB
Garantieter Schallleistungspegel: LWA 103 dB
Hersteller Name: Kyoeisha Co., Ltd.
Adresse: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Entsprech den folgenden Richtlinien
2000/42/EG Maschinenrichtlinie
2014/30/EU Elektromagnetische Verträglichkeit (EMV)
2000/14/EU 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 Hal ters: Kyoeisha Co., Ltd.
Adresse des Hal ters: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Technische Unterlagen erstellt von (2006/42/EG)
Name: Kyoeisha U.K.Ltd.
Adresse: Unit 5 Hatch Industrial Park Greewell Road, Basingstoke Hampshire RG24 7NG, Großbritannien

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

Beteiligte benannte Stelle (2000/14/EG)
Name: SNCH
Adresse: 11, Route de Sandweiler 5230 Sandweiler Luxemburgo
Bescheinigung/Bericht Nr. : SNCH*2000/14*2005/88*2911*00/TCLM3210-00

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EU-försäkran om överensstämmelse

Produkteridentifiering

Product: Grisklippare
Märke: BARONESS
Typ: LM3210
Version(er): Ej aktuellt
Serienummer startar på: 10015
Uppmätta ljudnivåer:
LWA 99.86 dB
LWA 103 dB
Tillverkare
Namn: Kyoeisha Co., Ltd.
Adress: 1-26 Miyuki-cho, Toyokawa, Aichi-pref., Japan

Uppfyller följande direktiv
2006/42/EG Maskindirektivet
2014/30/EU Elektromagnetisk kompatibilitet (EMC)
2000/14/EG Butlerrmission 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: Kyoeisha U.K.Ltd.
Adress: Unit 5 Hatch Industrial Park Grewell Road, Basingstoke Hampshire RG24 7NG, Storbritannien

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

Anmält organ (2000/14/EG)
Namn: SNCH
Adress: 11, Route de Sandweiler 5230 Sandweiler Luxembourg
Certifikatnummer/rapportnummer: SNCH=2000/14/2000/32/2917*00/TCLM3210-00

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