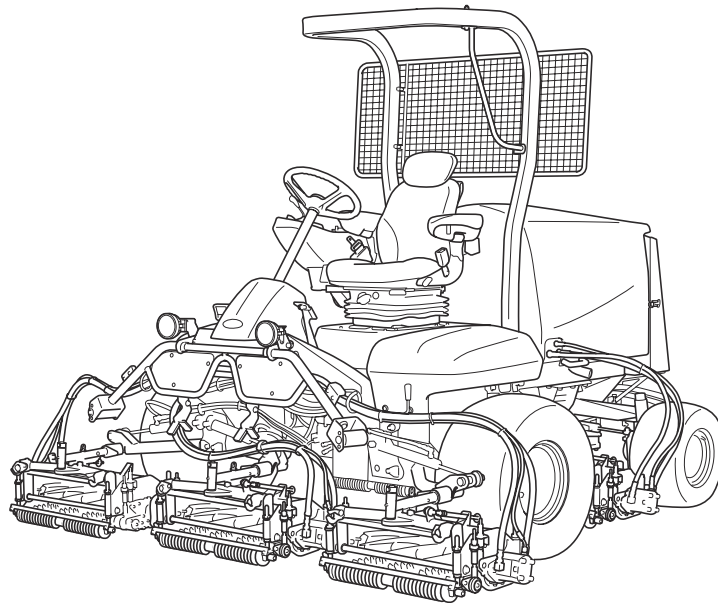


# ***LM551B***

5-Unit Reel Mower

## Owner's Operating Manual



Serial No. LM551B : 30394-

"Required reading"  
Read this manual before using the machine.

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**BARONESS**<sup>®</sup>  
Quality on Demand

Original Instructions Ver.2.5

# Regulations

## California Proposition 65

(For California, USA)

**WARNING:**  
Operating, servicing and maintaining a passenger vehicle or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to [www.P65Warnings.ca.gov/passenger-vehicle](http://www.P65Warnings.ca.gov/passenger-vehicle).

318yi8-005

California Proposition 65\_001

## California Spark Arrester

(For California, USA)

**Warning**  
Operation of this equipment may create sparks that can start fires around dry vegetation.  
A spark arrester may be required.  
The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

It is a violation of California Public Resource Code Section 4442 or 4443 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order or the engine is constructed, equipped, and maintained for the prevention of fire pursuant to Section 4443.  
The DPF installed on the engine of this machine meets requirements of California Public Resource Code Section 4443.

## EU Regulations

(For EU)  
This product complies with all relevant EU Regulations.  
For more information, please refer to the Declaration of Conformity attached.

## EU Emission Control (Stage V)

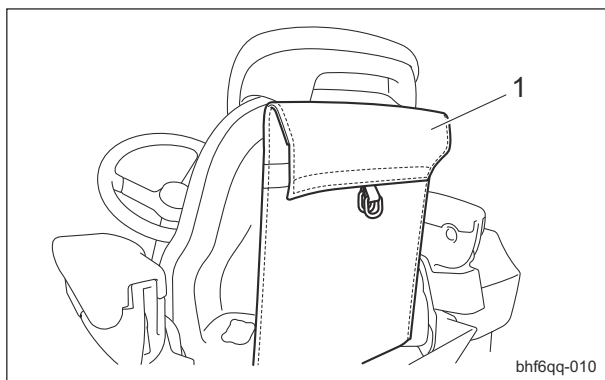
(For EU)

**Important**  
No deliberate tampering with or misuse of the engine emissions control system should take place.  
Make repairs immediately if the fault codes of PCD (Particulate Control Diagnostic) and NCD (NOx Control Diagnostic) appear.  
Tampering with and use without effect of the engine emissions control system are regulatory infringements and they are penalized.

Thank you for purchasing the Baroness product. This manual describes the proper handling, adjustment, and inspection of your product. We hope you will use the product safely, and take advantage of its best performance. For details on the handling, adjustment and inspection of the attachments, refer to the Owner's Operating Manual for the attachments.

## Keeping The Owner's Operating Manual

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



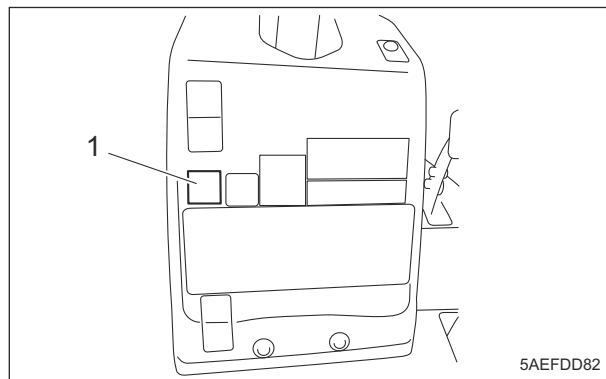
Keeping The Owner's Operating Manual\_001

|   |     |
|---|-----|
| 1 | Bag |
|---|-----|

## QR Code

(\*QR Code is a registered trademark of DENSO WAVE INCORPORATED.)

A QR code label is affixed on the machine.



QR Code\_001

|   |               |
|---|---------------|
| 1 | QR code label |
|---|---------------|

Scan the QR code with your smartphone for easy access to Baroness Manual Reference Service where you can browse Owner's Operating Manual and Parts Catalog.  
<https://doc.baroness-international.com/manuals/LM551B>



QR Code\_002

**Note:**  
A QR code for mower unit is printed on the serial number plate.

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

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

Maintenance service for this machine should be performed by a mechanic with expertise.

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

When making inquiries about your product, please specify the model and serial number.

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

Kyoisha Co., Ltd.

Warning Symbols

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

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <div><div>696cq5-001</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Warning symbol |
| <p>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.</p> <p>Failure to adequately follow these safety precautions may cause an accident.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |
| <div><div><div> Danger</div><p>This symbol indicates that serious injury or death will occur if the warning is ignored.</p><div><div> Warning</div><p>This symbol indicates that serious injury or death may occur if the warning is ignored.</p><div><div> Caution</div><p>This symbol indicates that injury or damage to property may occur if the warning is ignored.</p><div><div>Important</div><p>This symbol indicates precautions on the mechanism of the machine.</p></div></div></div></div></div> |                |



## Precautionary Statement

### Caution

The information described in this manual is subject to change for improvement without prior notice.

When replacing parts, be sure to use genuine Baroness parts or parts designated by Kyoisha.

Note that the Baroness product warranty may not apply to defects caused by the use of parts from other companies.

Prior to use, carefully read the following manuals to thoroughly understand the contents for safe and correct operation.

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

## Purpose

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

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

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

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

# Introduction

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# Safety

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

## Danger

This product is designed to ensure safe operation and has been tested and inspected thoroughly before shipment from the factory. The product is equipped with safety devices to prevent accidents.

However, whether the product demonstrates its original performance level depends on the manner in which it is operated and handled, as well as the manner in which it is managed on a daily basis.

Inappropriate use or management of the product may result in injury or death.

Observe the following safety instructions to ensure safe operation.

## Safe Operating Practices

### Training

1. Read this manual and other training material carefully.

Be familiar with the controls, safety signs, and the proper use of the equipment.

2. If the operator or mechanic can not read the language used in this manual, it is the owner's responsibility to explain this material to them.

3. All operators and mechanics should seek and obtain professional and practical instruction.

The owner is responsible for training the users.

Such instruction should emphasize:

- [1] The need for care and concentration when working with ride-on machines.

- [2] Control of a ride-on machine sliding on a slope will not be regained by the application of the brake.

The main reasons for loss of control are

- Insufficient wheel grip
- Being driven too fast
- Inadequate braking
- The type of machine is unsuitable for its task
- Lack of awareness of the effect of ground conditions, especially slopes
- Incorrect hitching and load distribution

4. Never allow children or people unfamiliar with these instructions to use or service the machine.

Local regulations may restrict the age of the operator.

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

### Preparation

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

## Warning

Fuel is highly flammable.

Take the following precautions:

- [1] Store fuel in containers specifically designed for this purpose.

- [2] Add fuel before starting the engine.  
Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
- [3] Refuel outdoors only and do not smoke while refueling.
- [4] If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until petrol vapours have dissipated;
- [5] Replace all fuel tanks and container caps securely.
6. Check that operator's presence controls, safety switches and shields are attached and functioning properly.  
Do not operate unless they are functioning properly.
7. If the brake operation is faulty, be sure to adjust or repair them before operating the machine.
8. Replace faulty mufflers.
9. On multi-cylinder/multi-reel machines, take care as rotating one cylinder/reel can cause other cylinders/reels to rotate.
8. Never operate while people, especially children, or pets are nearby.
9. Only operate in good light, keeping away from holes and hidden hazards.
10. Do not operate the machine when there is the risk of lightning.
11. Do not stop or start suddenly.
12. Look behind and down before backing up to be sure of a clear path.
13. Slow down and use caution when making turns and crossing roads and sidewalks.
14. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
15. Do not take your eyes off the road ahead.  
Do not operate the machine with no hands.
16. Remember there is no such thing as a safe slope.  
Travel on grass slopes requires particular care.  
To guard against overturning, follow these instructions.

## Operation

1. Do not operate the machine under the influence of alcohol or drugs.
2. Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
3. Be sure all drives and shift are in neutral and parking brake is engaged before starting engine.  
Only start engine from the operator's position.  
Use seat belts if provided.
4. Do not change the engine governor settings or overspeed the engine.  
Operating the engine at excessive speed may increase the hazard of personal injury.
5. Never operate the machine with damaged guards, shields, or without safety protective devices in place.  
Be sure all interlocks are attached, adjusted properly, and functioning properly.
6. Keep hands and feet away from the rotating parts.
7. Do not carry passengers.
- [1] Do not stop or start suddenly when going up or downhill.
- [2] Engage clutch slowly, always keep machine in gear, especially when traveling downhill.
- [3] Machine speeds should be kept low on slopes and during turns.
- [4] Stay alert for humps and hollows and other hidden hazards.
17. Never use 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.
18. Use extra care while operating machine with a grass catcher or other attachments.  
They can affect the stability of the machine.
19. Disengage drive to the cutting unit(s), when other than operating.
20. Do the following before leaving the operator's position.
  - [1] Stop on level ground.
  - [2] Disengage the all drives.
  - [3] Set the parking brake.
  - [4] Stop the engine.
  - [5] Remove the ignition key.
21. Stop the engine in the following conditions.
  - [1] Before refuelling.

# Safety

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- [2] Before removing the grass catcher.
- [3] Before making height or depth adjustment unless adjustment can be made from the operator's position.
- [4] Before clearing blockages.
- [5] Before checking, cleaning or working on the machine.
- [6] After striking a foreign object or if an abnormal vibration occurs.  
Inspect the machine for damage and make repairs before restarting and operating the equipment.
- 22. Reduce the throttle setting during engine run-out.
- 23. Do not direct discharge material toward anyone.  
Avoid discharging material against a wall or obstruction.  
Material may ricochet back toward the operator.
- 24. 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.
- 25. Close the fuel valve before transporting the machine.
- 3. Allow the engine/muffler to cool before checking/maintenance.
- 4. To reduce the fire hazard, keep hot parts such as the engine and silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
- 5. Appropriately manage and correctly use the tools necessary for servicing or adjusting the machine.
- 6. Disconnect battery before making any repairs.  
Disconnect the negative terminal first and the positive last.  
Reconnect positive first and negative last.
- 7. Use jack stands to support components when required.
- 8. Keep hands and feet away from moving parts.  
If possible, do not make adjustments with the engine running.
- 9. Make sure that parts such as wires are not touching each other and that their covers have not come off.
- 10. Keep all parts in good working condition and all hardware tightened.  
Replace all worn or damaged decals.
- 11. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- 12. Carefully release pressure from components with stored energy.
- 13. Be sure to depressurize the hydraulic system before performing maintenance operations on it such as removing hydraulic equipment.
- 14. Check whether line connectors in the hydraulic system are properly tightened.  
Before applying hydraulic pressure, check the connections of the hydraulic pressure lines and the condition of the hoses.

## Maintenance

- 1. Never allow untrained personnel to service machine.
- 2. Implement the following work before adjusting, cleaning or repairing.
  - [1] Stop the machine on level ground.
  - [2] Disengage drive to the cutting unit(s).
  - [3] Lower the cutting unit(s) and/or attachment(s).
  - [4] Set the parking brake.
  - [5] Stop the engine.
  - [6] Remove the ignition key.
  - [7] Wait for all movement to stop.



15. When checking the hydraulic circuit for pinhole leaks or oil leakage from nozzles, do not use your hands.  
Use items such as paper or corrugated cardboard to find leakage points.  
Be extremely careful with high-pressure oil as it may pierce your skin, 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.
  16. Use care when checking the cylinders/reels and bed knives.  
Wear gloves and use caution when servicing them.
  17. Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
  18. On multi-cylinder/multi-reel machines, take care as rotating one cylinder/reel can cause other cylinders/reels to rotate.
  19. Check the grass catcher frequently for wear or deterioration.
  20. 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.
  21. If the fuel tank has to be drained, do this outdoors.
7. Swallowing engine coolant can cause injury or death; keep out of reach from children and pets.

## Storage

1. When machine is to be parked, stored, or left unattended, lower the cutting unit(s) and/or attachment(s) unless a positive mechanical lock is provided.
2. Allow the engine to cool before storing in any enclosure.
3. Only cover the machine with a sheet after hot parts have sufficiently cooled down.
4. Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
5. If the engine is provided with a shut-off valve, shut off valve while storing or transporting.
6. Do not store fuel near flames.



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# Disposal

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## Recycle and Waste Disposal

### About Recycle

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

It may be required by local laws.

### About Waste Disposal

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

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# Product Overview

## Specifications

### Specifications

|                    |                           |                                  |                                                                              |                                             |            |           |            |
|--------------------|---------------------------|----------------------------------|------------------------------------------------------------------------------|---------------------------------------------|------------|-----------|------------|
| Model              |                           |                                  |                                                                              | LM551B                                      |            |           |            |
| Name               |                           |                                  |                                                                              | 5-Unit Reel Mower                           |            |           |            |
| Mower unit type    |                           |                                  |                                                                              | 22 in                                       |            | 26 in     |            |
| Dimensions         | Total length              |                                  |                                                                              | 295 cm                                      | 116.14 in  | ←         | ←          |
|                    | Total width               | LH52                             | During operation                                                             | 292 cm                                      | 114.96 in  | -         | -          |
|                    |                           |                                  | During transport                                                             | 220 cm                                      | 86.61 in   | -         | -          |
|                    |                           | LH62 • 66                        | During operation                                                             | 294 cm                                      | 115.75 in  | 322 cm    | 126.77 in  |
|                    |                           |                                  | During transport                                                             | 220 cm                                      | 86.61 in   | ←         | ←          |
|                    |                           | LS62 • 66                        | During operation                                                             | 292 cm                                      | 114.96 in  | 319 cm    | 125.59 in  |
|                    |                           |                                  | During transport                                                             | 220 cm                                      | 86.61 in   | ←         | ←          |
|                    | Total height              |                                  | Roof                                                                         | 239 cm                                      | 94.09 in   | ←         | ←          |
| Steering wheel     |                           |                                  | 160 cm                                                                       | 62.99 in                                    | ←          | ←         |            |
| Weight             | Machine (empty fuel tank) | LH52                             | with Groomer, CR brush, ROPS, Light and Ball proof net without Grass catcher | 1519 kg                                     | 3348.76 lb | -         | -          |
|                    |                           | LH62 • 66                        | with Groomer, CR brush, ROPS, Light and Ball proof net without Grass catcher | 1610 kg                                     | 3549.38 lb | 1664 kg   | 3668.43 lb |
|                    |                           | LS62 • 66                        | with CR brush, ROPS, Light and Ball proof net without Grass catcher          | 1549 kg                                     | 3414.90 lb | 1564 kg   | 3447.97 lb |
|                    |                           | Grass catchers (for one machine) |                                                                              |                                             | 23.0 kg    | 50.71 lb  | 25.0 kg    |
|                    | Minimum turning radius    |                                  | LH52                                                                         | Front wheel (outer wheel) outside           | 306 cm     | 120.47 in | -          |
| Outer side of unit |                           |                                  |                                                                              | 347 cm                                      | 136.61 in  | -         | -          |
| LH62 • 66          |                           |                                  | Front wheel (outer wheel) outside                                            | 306 cm                                      | 120.47 in  | ←         | ←          |
|                    |                           |                                  | Outer side of unit                                                           | 347 cm                                      | 136.61 in  | 356 cm    | 140.16 in  |
| LS62 • 66          |                           |                                  | Front wheel (outer wheel) outside                                            | 306 cm                                      | 120.47 in  | ←         | ←          |
|                    |                           |                                  | Outer side of unit                                                           | 345 cm                                      | 135.83 in  | 354 cm    | 139.37 in  |
| Engine             |                           | Model                            |                                                                              | Kubota V1505-CR-TE5                         |            | ←         |            |
|                    |                           | Type                             |                                                                              | Vertical water-cooled 4-cycle diesel engine |            | ←         |            |

# Product Overview

|                                     |                    |                                                              |                                                    |                                                              |                                                    |
|-------------------------------------|--------------------|--------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|
| Engine                              | Total displacement | 1498 cm <sup>3</sup><br>(1.498 L)                            | 91.41 cu.in.                                       | ←                                                            | ←                                                  |
|                                     | Maximum output     | -                                                            |                                                    | ←                                                            |                                                    |
|                                     | Rated output       | 33.0 kW (44.9 PS)/3000 rpm                                   |                                                    | ←                                                            |                                                    |
| Fuel tank capacity                  |                    | Diesel 51.0 dm <sup>3</sup> (51.0 L)                         | Diesel 13.47 U.S.gals                              | ←                                                            | ←                                                  |
| Fuel consumption                    |                    | 262 g/kW · h (rated output)                                  | 192 g/PS · h (rated output)                        | ←                                                            | ←                                                  |
| Engine oil capacity                 |                    | 6.7 dm <sup>3</sup> (6.7 L)                                  | 1.77 U.S.gals                                      | ←                                                            | ←                                                  |
| Coolant volume                      |                    | 12.0 dm <sup>3</sup> (12.0 L)                                | 3.17 U.S.gals                                      | ←                                                            | ←                                                  |
| Hydraulic tank capacity             |                    | 30.3 dm <sup>3</sup> (30.3 L)                                | 8.01 U.S.gals                                      | ←                                                            | ←                                                  |
| Transmission oil capacity           |                    | -                                                            |                                                    | ←                                                            |                                                    |
| Operating width (Mowing width)      |                    | 254 cm                                                       | 100.00 in                                          | 282 cm                                                       | 111 in                                             |
| Operating height<br>(Mowing height) | LH52               | 5.0 - 20.0 mm                                                | 0.197 - 0.787 in                                   | -                                                            | -                                                  |
|                                     | LH62 · 66          | 8.0 - 45.0 mm (*1)                                           | 0.315 - 1.772 in                                   | ←                                                            | ←                                                  |
|                                     | LS62 · 66          | 10.0 - 46.0 mm                                               | 0.394 - 1.811 in                                   | ←                                                            | ←                                                  |
| Number of Blades                    |                    | 7 · 9                                                        |                                                    | 9                                                            |                                                    |
| Drive                               | Traveling          | HST (Full time 4WD)                                          |                                                    | ←                                                            |                                                    |
|                                     | Mowing             | Hydraulic (Gear motor drive)                                 |                                                    | ←                                                            |                                                    |
| Speed (HST)                         | Forward            | 16.0 km/h                                                    | 9.94 mph                                           | ←                                                            | ←                                                  |
|                                     | Reverse            | 8.0 km/h                                                     | 4.97 mph                                           | ←                                                            | ←                                                  |
| Speed (Mechanical)                  |                    | -                                                            |                                                    | -                                                            |                                                    |
| Efficiency                          |                    | 24,384 m <sup>2</sup> /h<br>(12.0 km/h x mowing width x 0.8) | 6.02 acres/hour<br>(7.46 mph x mowing width x 0.8) | 27,072 m <sup>2</sup> /h<br>(12.0 km/h x mowing width x 0.8) | 6.69 acres/hour<br>(7.46 mph x mowing width x 0.8) |
| Maximum inclination for operation   |                    | 15 degrees                                                   |                                                    | ←                                                            |                                                    |
| Tire size                           | Front wheel        | 26.5 x 14.00-12                                              |                                                    | ←                                                            |                                                    |
|                                     | Rear wheel         | 20 x 12.00-10                                                |                                                    | ←                                                            |                                                    |
| Tire pneumatic pressure             | Front wheel        | 120 kPa (1.2 kgf/cm <sup>2</sup> )                           | 17 psi                                             | ←                                                            | ←                                                  |
|                                     | Rear wheel         | 140 kPa (1.4 kgf/cm <sup>2</sup> )                           | 20 psi                                             | ←                                                            | ←                                                  |
| Battery                             |                    | 105D31L                                                      |                                                    | ←                                                            |                                                    |
| Engine plug                         |                    | -                                                            |                                                    | ←                                                            |                                                    |

The factory default maximum engine rpm is 3,000 rpm.

(\*1) For 10 mm or less mowing height, a bed knife with a thickness of 5 mm or less is required.

# Product Overview

---

## Mower Units

Baroness mower unit that can fit this machine is the model marked with a circle in the "Attachable unit" column.

LM551/LM551B

| Model |       | Attachable unit | Remarks |
|-------|-------|-----------------|---------|
| LH52  | 22 in | ○               |         |
| LH62  | 22 in | ○               |         |
| LH66  | 26 in | ○               |         |
| LS60  | 30 in | -               |         |
| LS62  | 22 in | ○               |         |
| LS66  | 26 in | ○               |         |
| VM60  | 30 in | -               |         |
| VM62  | 22 in | ○               |         |
| VM66  | 26 in | ○               |         |

## Carbon Dioxide (CO<sub>2</sub>) Emissions

For the CO<sub>2</sub> value on the engine of this machine, refer to the engine's owner's manual.

## Sound Pressure Level

### Sound Pressure Level

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

## Sound Power Level

### Sound Power Level

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

## Vibration Level

### Hand-Arm Vibration

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

### Whole Body Vibration

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

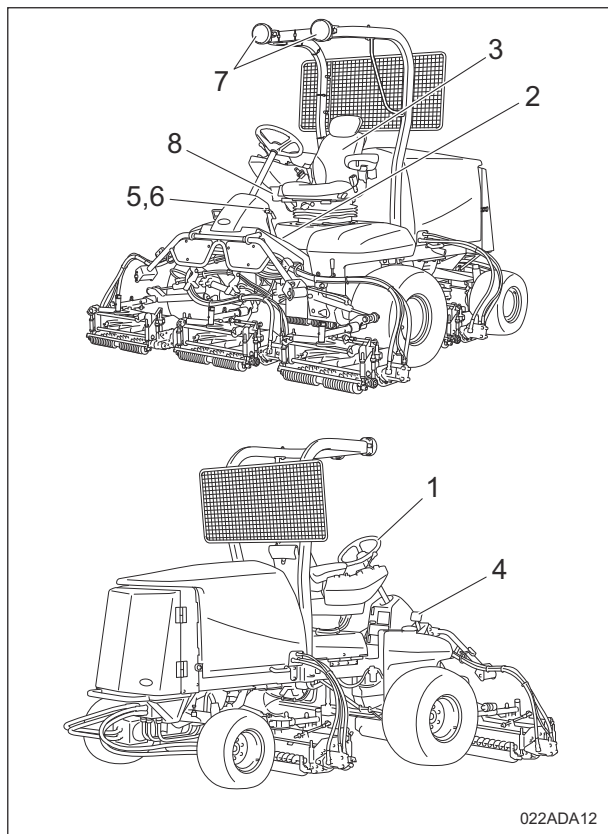


# Product Overview

## Names of Each Section

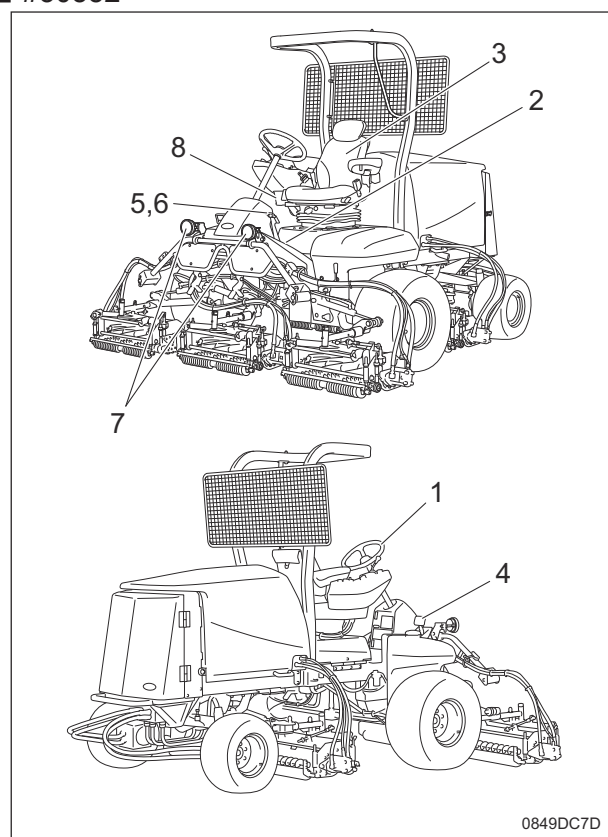
Overall view A

■ #30001 – 30551



Names of Each Section\_001

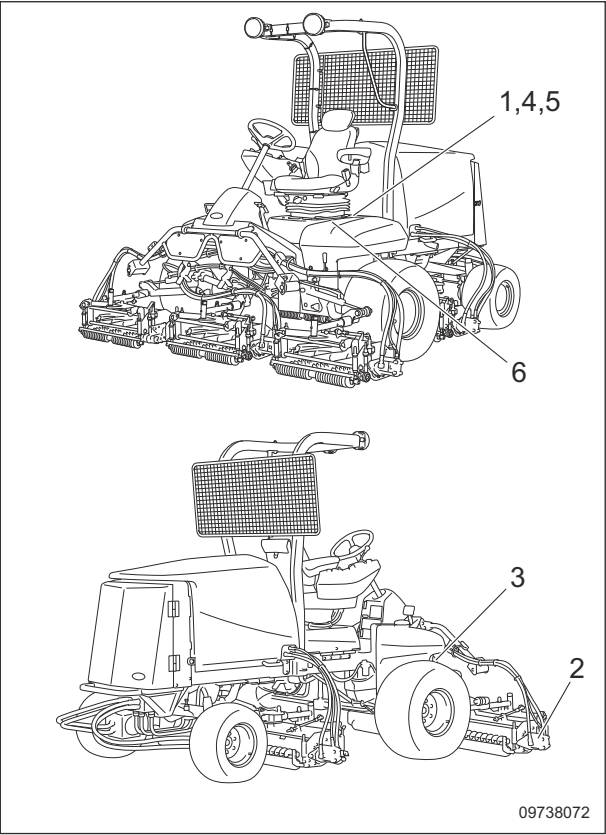
■ #30552-



Names of Each Section\_002

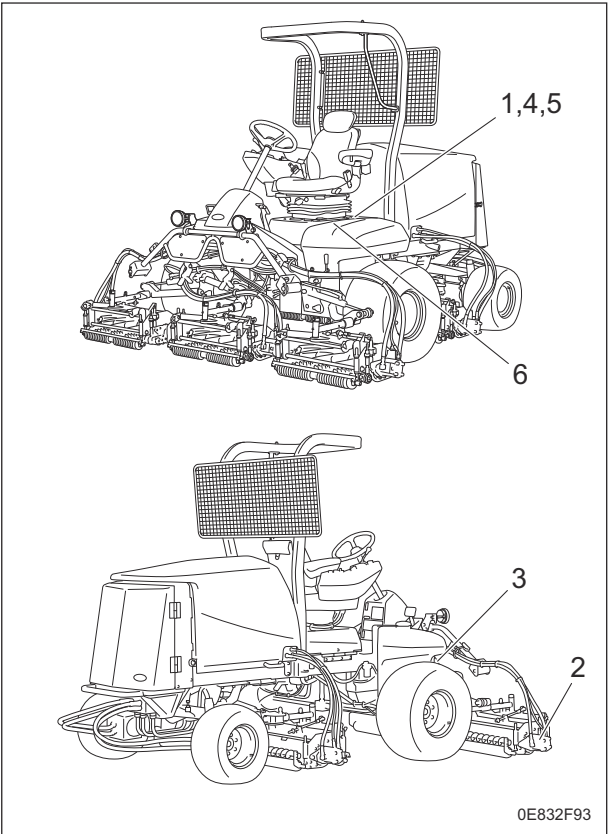
|   |                 |
|---|-----------------|
| 1 | Steering wheel  |
| 2 | Tilt lever      |
| 3 | Seat            |
| 4 | Traveling pedal |
| 5 | Brake pedal     |
| 6 | Pedal stopper   |
| 7 | Light           |
| 8 | USB socket      |

Overall view B  
■ #30001 – 30551



Names of Each Section\_003

■ #30552 -



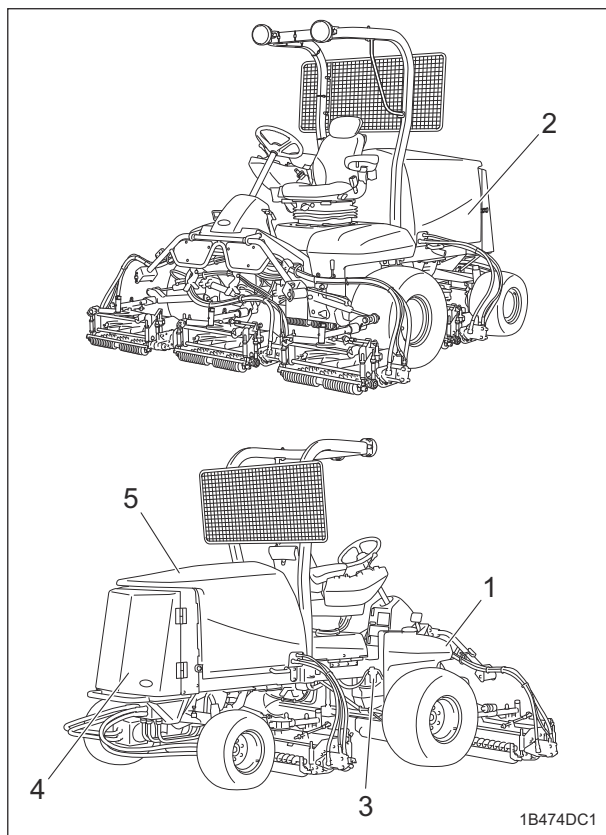
Names of Each Section\_004

|   |                                      |
|---|--------------------------------------|
| 1 | Reel forward/reverse switch          |
| 2 | Reel rotation/stop switching lever   |
| 3 | Mower lock lever (latch)             |
| 4 | DPF auto regeneration inhibit switch |
| 5 | DPF parked regeneration switch       |
| 6 | Open-Close lever                     |

# Product Overview

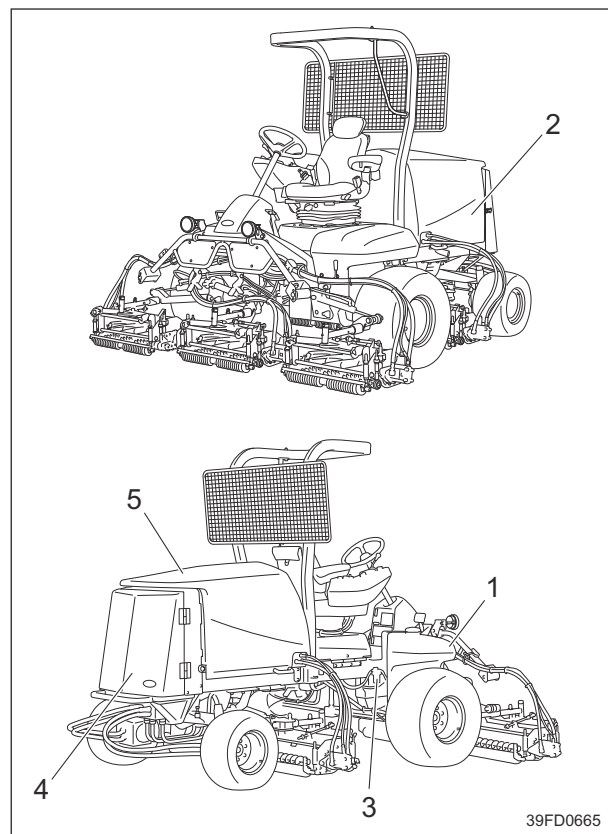
Overall view C

■ #30001 – 30551



Names of Each Section\_005

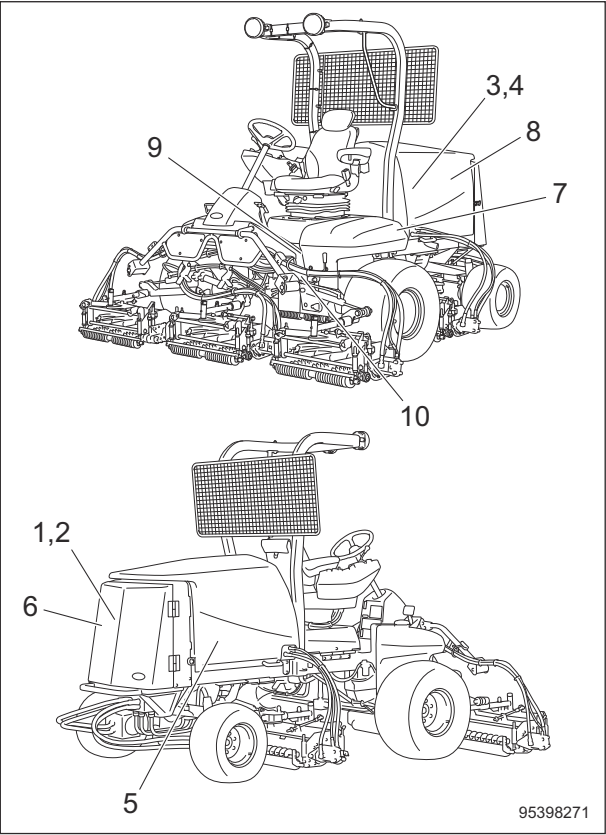
■ #30552-



Names of Each Section\_006

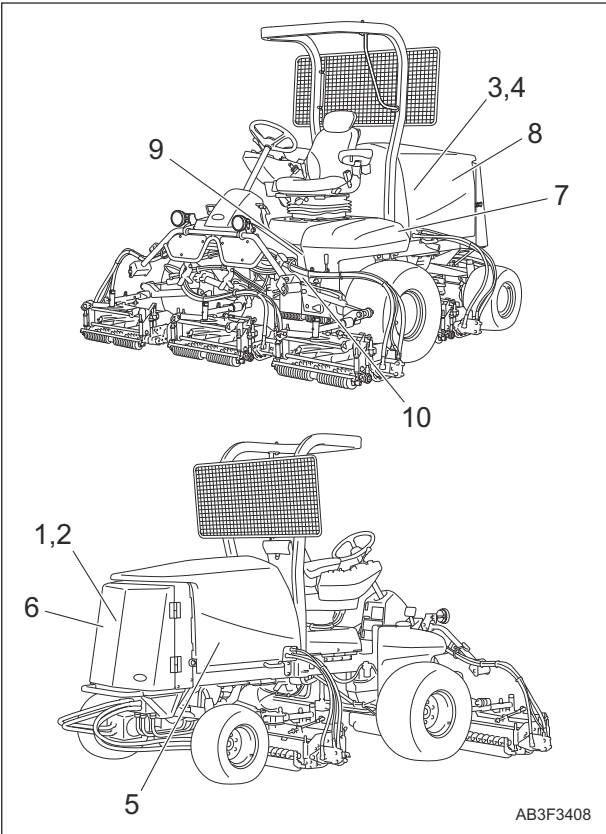
|   |                 |
|---|-----------------|
| 1 | Fuel tank       |
| 2 | Fuel filter     |
| 3 | Water separator |
| 4 | Battery         |
| 5 | Hood            |

Overall view D  
■ #30001 – 30551



Names of Each Section\_007

■ #30552-

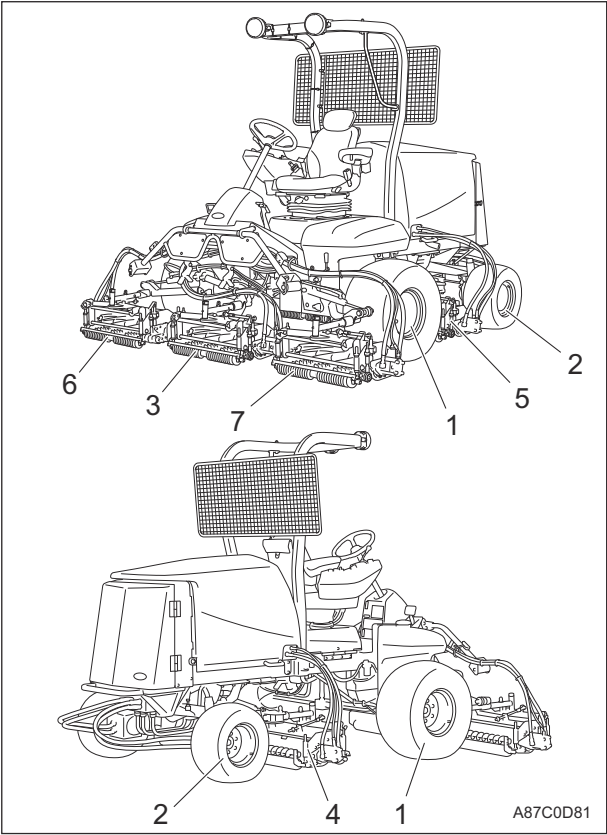


Names of Each Section\_008

|    |                              |
|----|------------------------------|
| 1  | Radiator                     |
| 2  | Radiator cover               |
| 3  | Engine                       |
| 4  | Engine oil filter            |
| 5  | Reserve tank                 |
| 6  | Oil cooler                   |
| 7  | Hydraulic tank               |
| 8  | Air cleaner                  |
| 9  | Hydraulic oil line filter    |
| 10 | Hydraulic oil suction filter |

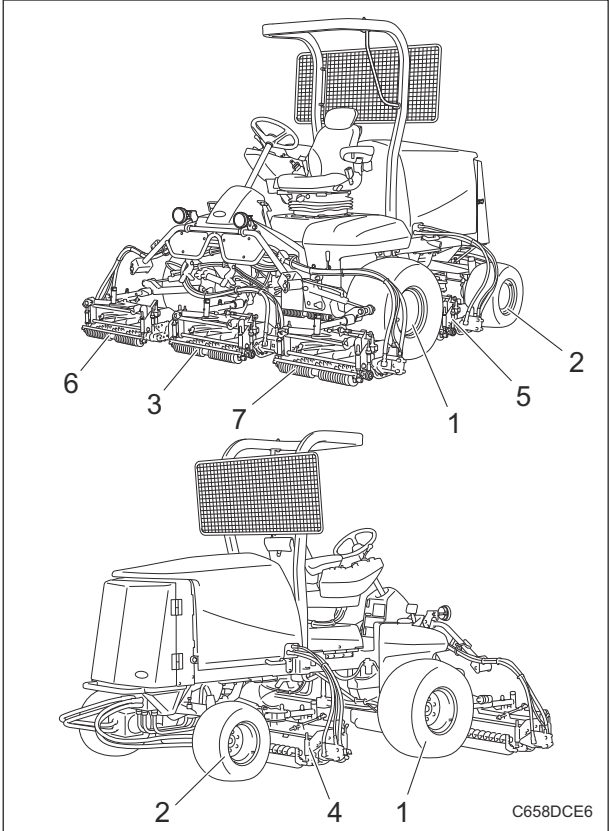
Product Overview

Overall view E  
■ #30001 – 30551



Names of Each Section\_009

■ #30552-

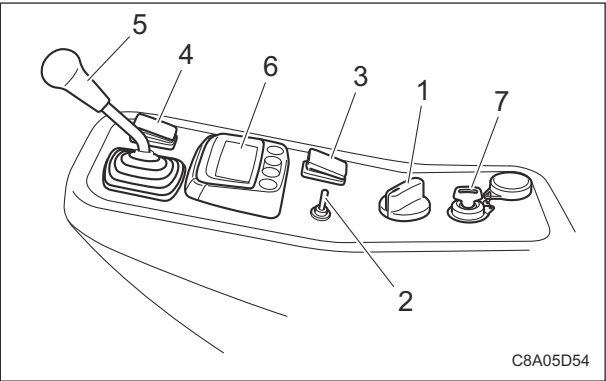


Names of Each Section\_010

|   |               |
|---|---------------|
| 1 | Front tire    |
| 2 | Rear tire     |
| 3 | Mower unit #1 |
| 4 | Mower unit #2 |
| 5 | Mower unit #3 |
| 6 | Mower unit #4 |
| 7 | Mower unit #5 |

# Product Overview

## Operation panel

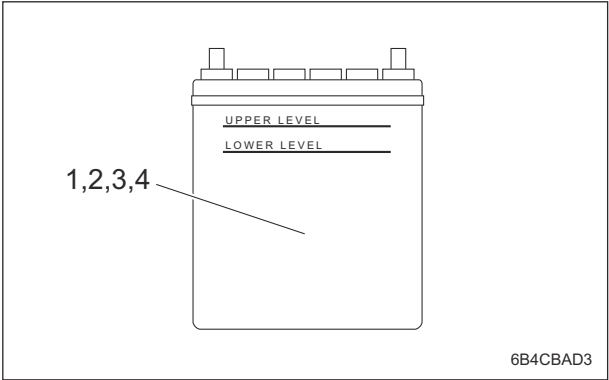


Names of Each Section\_011

|   |                                   |
|---|-----------------------------------|
| 1 | Throttle knob                     |
| 2 | Light switch                      |
| 3 | Reel rotation switch              |
| 4 | Traveling/working selector switch |
| 5 | Mower unit up/down lever          |
| 6 | Monitor                           |
| 7 | Key switch                        |

|    |                                               |
|----|-----------------------------------------------|
| 1  | Serial number plate                           |
| 2  | Specification decal                           |
| 3  | CE Mark                                       |
| 4  | UKCA mark (#30093 - 30352)                    |
| 5  | Noise emission decal                          |
| 6  | Year of manufacture decal                     |
| 7  | ROPS compliance decal                         |
| 8  | ROPS caution decal                            |
| 9  | California Proposition 65 decal (riding type) |
| 10 | Spark arrester warning decal                  |
| 11 | ISED compliance decal (#30552-)               |

## Battery



Positions of Regulation Decals\_003

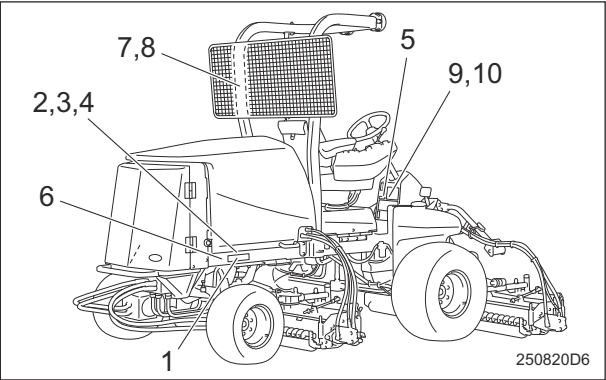
|   |                             |
|---|-----------------------------|
| 1 | Battery capacity decal      |
| 2 | EU battery regulation decal |
| 3 | Recycle decal               |
| 4 | Battery danger decal        |

## Regulation Decals

### Positions of Regulation Decals

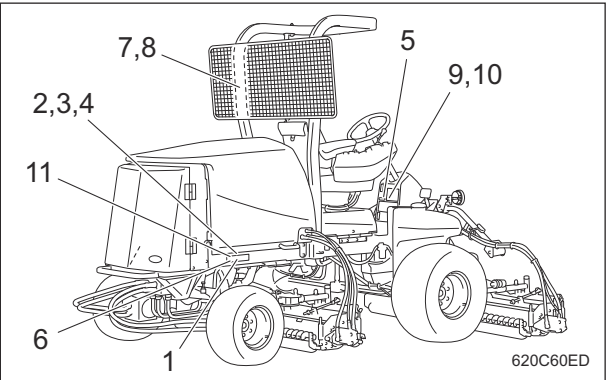
#### Main vehicle

■ #30001 - 30551



Positions of Regulation Decals\_001

■ #30552-



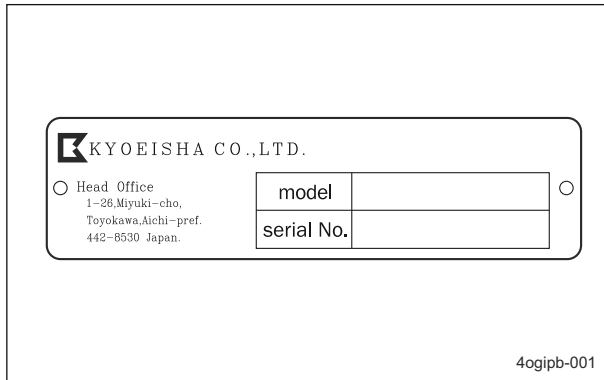
Positions of Regulation Decals\_002



## Description of Regulation Decals

### Serial Number Plate

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

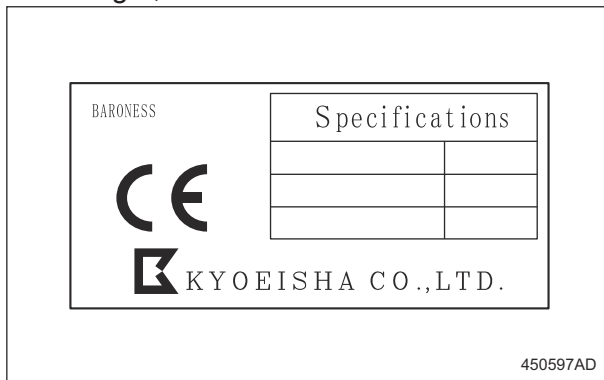


Serial Number Plate\_001

### Specification Decal

(For EU)

The Specification decal indicates the model and weight, etc.

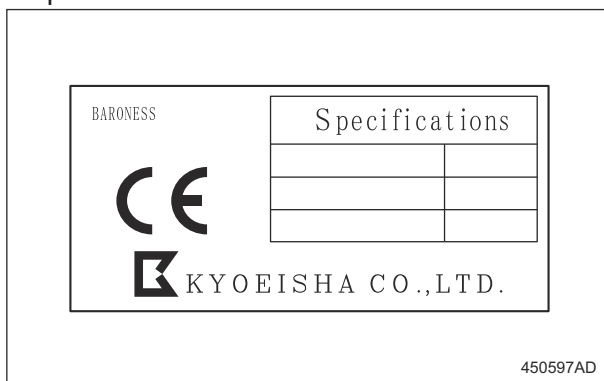


Specification Decal\_001

### CE Mark

(For EU)

CE mark indicates that the machine sold in the EU nations complies with the EU requirements.



CE Mark\_001

### UKCA Mark

(For UK)

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

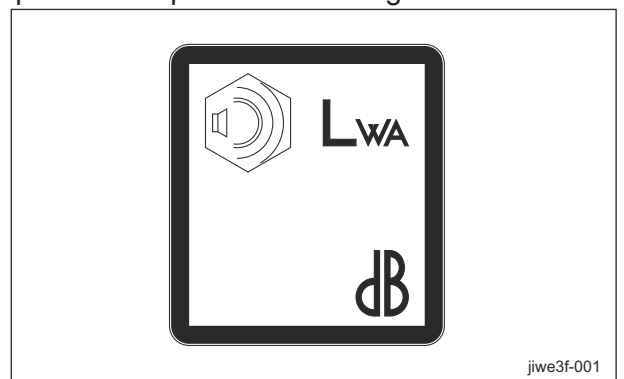


UKCA Mark\_001

### Noise Emission Decal

(For EU)

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



Noise Emission Decal\_001

### Year of Manufacture Decal

(For EU)

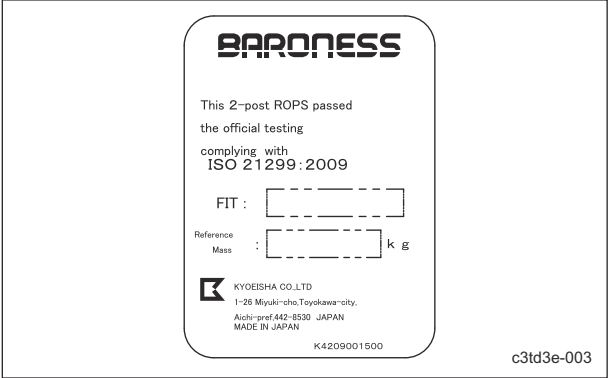
The year of manufacture decal indicates the year when this machine was manufactured.



Year of Manufacture Decal\_001

## ROPS Compliance Decal

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

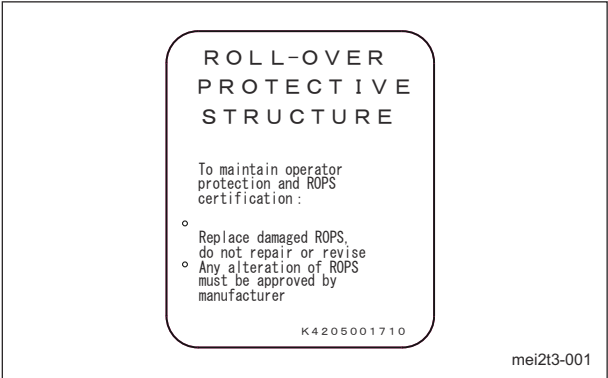


ROPS Compliance Decal\_001

## ROPS Caution Decal

ROPS caution decal describes the following caution messages.

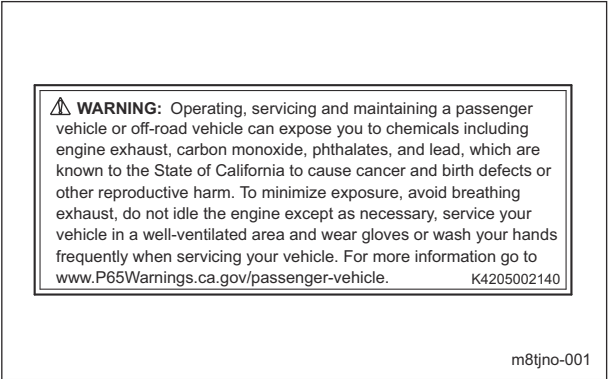
- Replace damaged ROPS.
- Do not repair or revise.



ROPS Caution Decal\_001

## California Proposition 65 Decal (Riding Type)

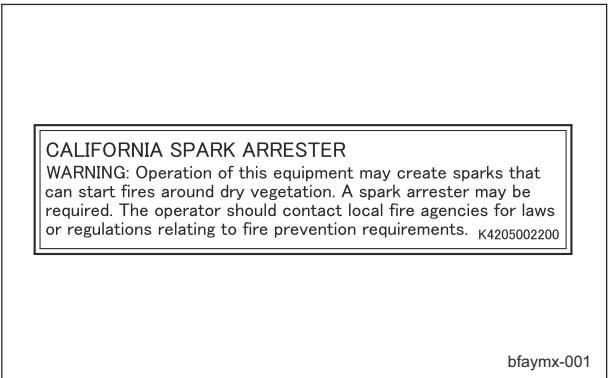
(For the State of California, USA)  
California Proposition 65 decal describes the warning messages as required by California Proposition 65.



California Proposition 65 Decal (Riding Type)\_001

## Spark Arrester Warning Decal

(For the State of California, USA)  
Spark arrester warning decal describes the warning messages as required by California Public Resources Code.



Spark Arrester Warning Decal\_001

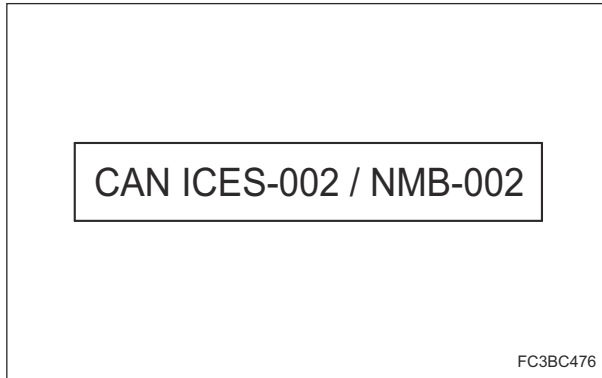


# Product Overview

## ISED Compliance Decal

(For Canada)

The ISED compliance decal indicates that the product marketed in Canada meets Canadian standard.

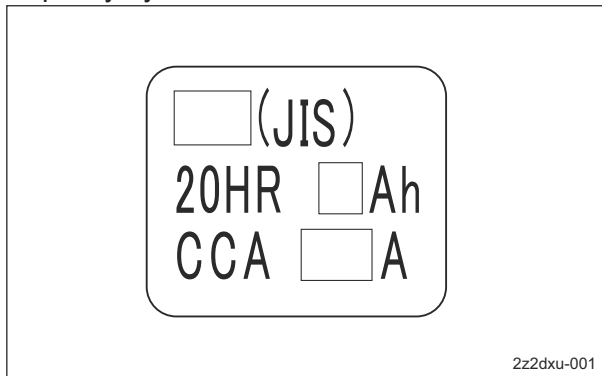


ISED Compliance Decal\_001

## Battery Capacity Decal

(For EU)

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



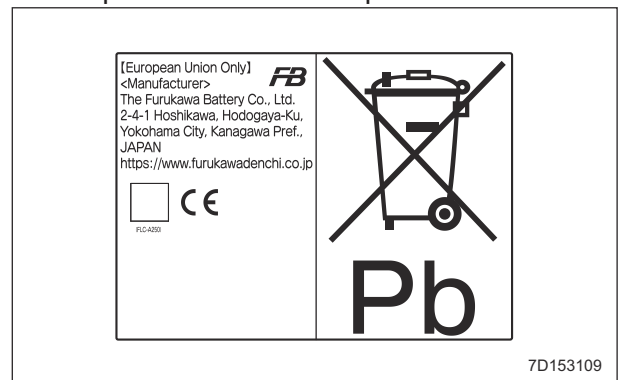
Battery Capacity Decal\_001

## EU Battery Regulation Decal

(For EU)

The EU battery regulation decal indicates compliance with the EU battery regulation.

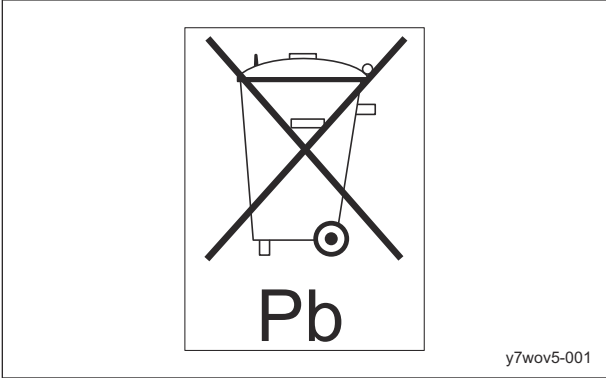
1. The following information about the battery manufacturing company is written in the decal.
  - Company name
  - Address
  - Website URL
2. You can scan the QR code with your smartphone to access the corresponding battery information.  
(\*QR Code is a registered trademark of DENSO WAVE INCORPORATED.)
3. CE mark indicates that the battery installed in a machine sold in the EU nations complies with the EU requirements.



EU Battery Regulation Decal\_001

Recycle Decal

Recycle Decal illustrates Recycle Mark in accordance with local regulation.  
(For EU)



Recycle Decal\_001

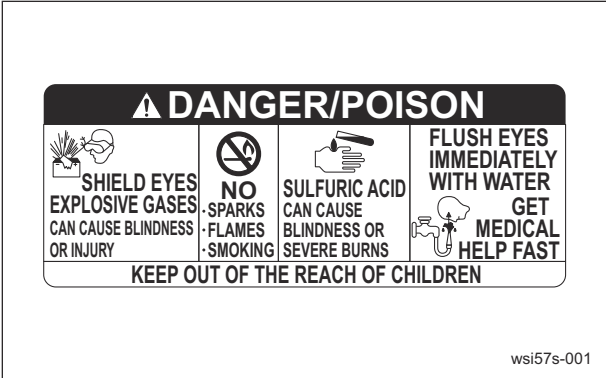
(For USA)



Recycle Decal\_002

Battery Danger Decal

(For USA)  
Battery Danger Decal describes handling precautions for battery.



Battery Danger Decal\_001

## Safety Signs and Instruction Signs

### About Safety Signs and Instruction Signs

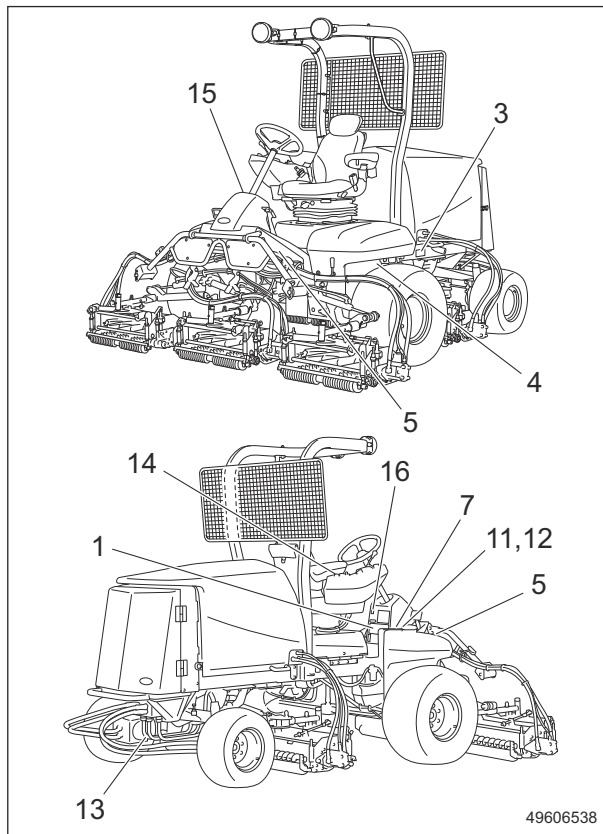
#### Important

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

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

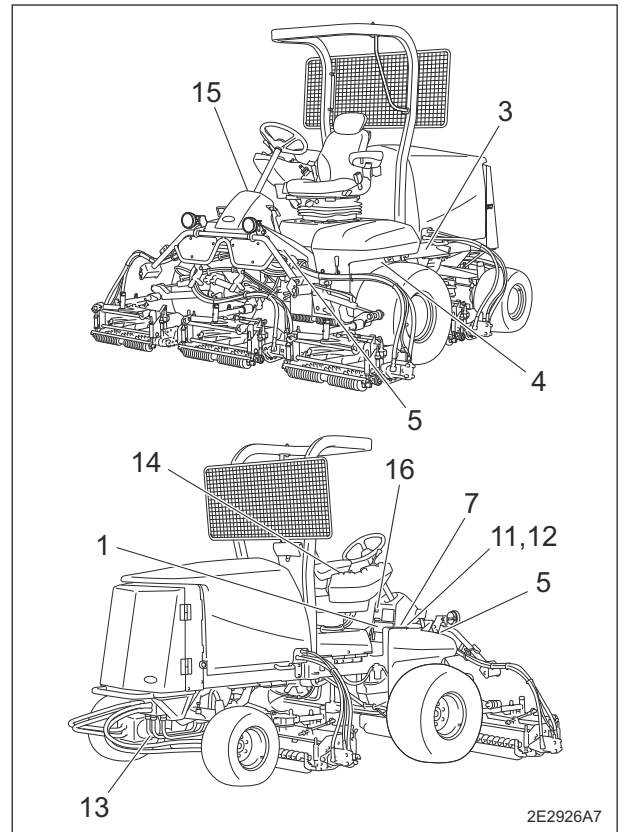
### Positions of Safety Decals and Instruction Decals

#### ■ #30001 – 30551

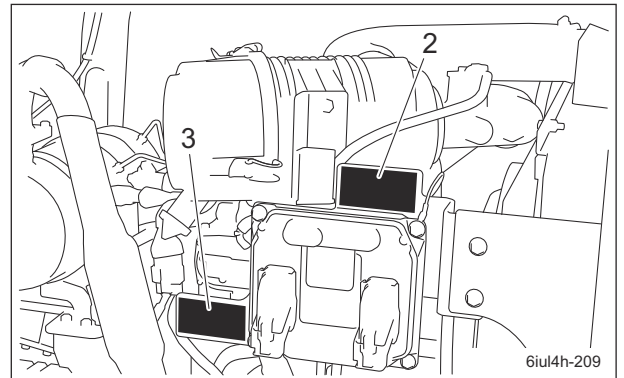


Positions of Safety Decals and Instruction Decals\_001

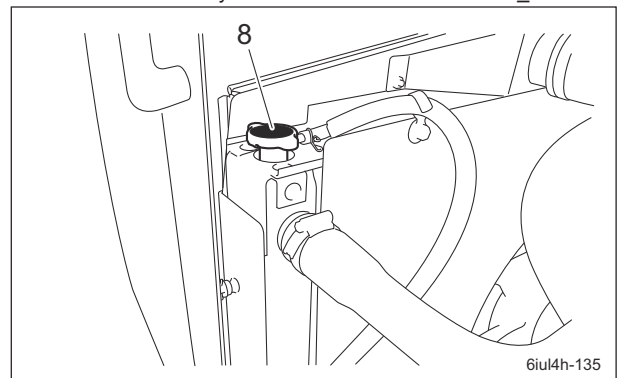
#### ■ #30552-



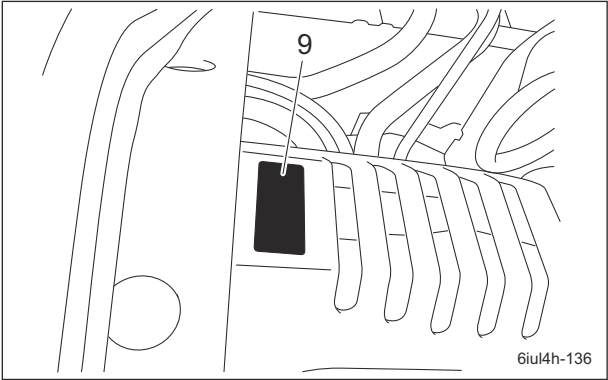
Positions of Safety Decals and Instruction Decals\_002



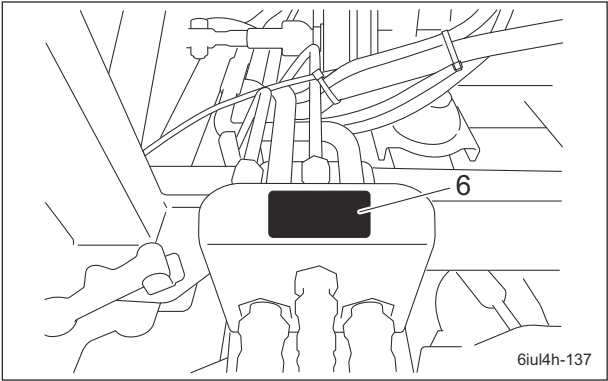
Positions of Safety Decals and Instruction Decals\_003



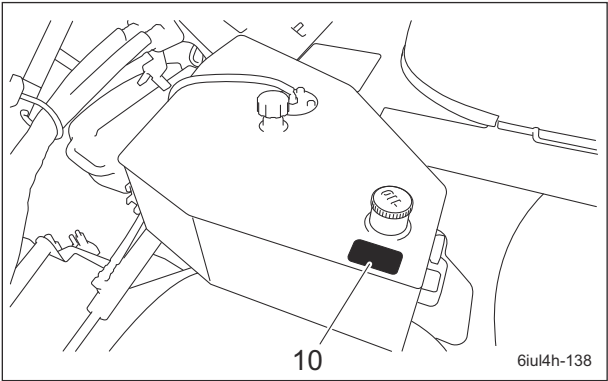
Positions of Safety Decals and Instruction Decals\_004



Positions of Safety Decals and Instruction Decals\_005



Positions of Safety Decals and Instruction Decals\_006



Positions of Safety Decals and Instruction Decals\_007

|    |                                    |
|----|------------------------------------|
| 1  | Decal for operation 2              |
| 2  | Caution to rotating object decal   |
| 3  | Caution to hot parts decal         |
| 4  | Caution for getting caught decal   |
| 5  | Caution for mower lock decal       |
| 6  | Caution for getting pinched decal  |
| 7  | Fire prohibited decal              |
| 8  | Caution for spouting coolant decal |
| 9  | PTO caution decal                  |
| 10 | Hydraulic oil decal                |
| 11 | Diesel fuel filler port decal      |
| 12 | Diesel instruction mark            |
| 13 | DO NOT JACK UP decal               |
| 14 | DPF regeneration lamp mark         |
| 15 | Engine warning lamp decal          |
| 16 | Caution to noise decal             |

## Description of Safety Decals and Instruction Decals

### Decal for Operation (E5)

STICKER, OPERATION (E5)  
LM551B-0604Z0

1.



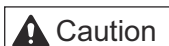
Read the Owner's Operating Manual.

2.



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

3.



Thrown objects - Be sure that people around the machine keep a safe distance away.

4.



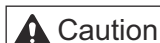
May cut your hand or leg - Keep hands and feet away from moving parts.

5.

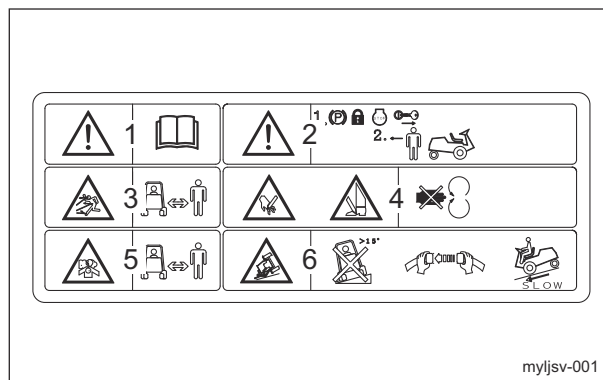


Be careful of exhaust emissions.

6.



Rollover - Do not work on slopes of 15 degrees or more.  
When you descend a slope, lower the mower units and then drive at low speed.  
For ROPS equipped machine, fasten your seatbelt.



Decal for Operation (E5)\_001

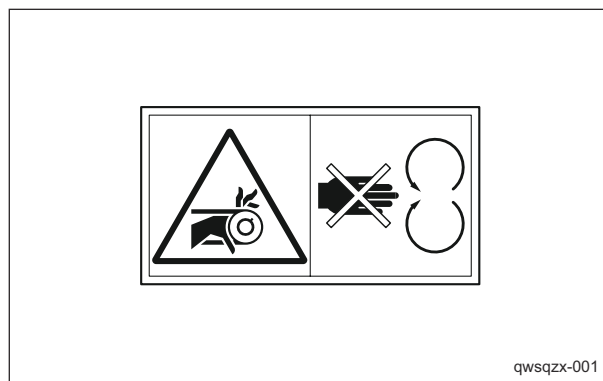
### Caution to Rotating Object Decal

K4205001530

Decal, caution to rotating object



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



Caution to Rotating Object Decal\_001

Caution to Hot Parts Decal

⚠ Caution

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



Diagram of a rectangular decal with a black border. It is divided into two sections. The left section contains a triangular warning symbol with an exclamation mark. The right section contains a pictogram of a hand with a lit match above it, indicating heat. Below the pictogram is the text 'xekv4l-001'.

Caution to Hot Parts Decal\_001

Caution for Getting Caught Decal

⚠ Caution

May get pinched - There is a risk of being pinched.

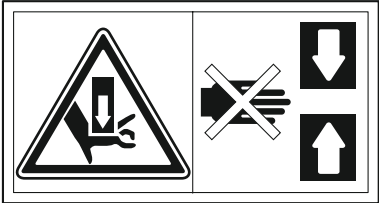


Diagram of a rectangular decal with a black border. It is divided into two sections. The left section contains a triangular warning symbol with a hand being caught in a mechanism. The right section contains a pictogram of a hand with a large 'X' over it, and two arrows pointing up and down, indicating the risk of being caught. Below the pictogram is the text 'tgp289-001'.

Caution for Getting Caught Decal\_001

Caution for Mower Lock Decal

K4205001900

Decal, caution for mower lock  
Lock the mower units when traveling or storing with the mower units #4 and 5 raised.



Diagram of a rectangular decal with a black border. It is divided into two sections. The left section contains a triangular warning symbol with an exclamation mark. The right section contains a pictogram of a hand with a large 'X' over it, and a small circle below it. Below the pictogram is the text 'K 4 2 0 5 0 0 1 9 0 0'.

Caution for Mower Lock Decal\_001

Caution for Getting Pinched Decal

K4205001930

DECAL, CAUTION GETTING CAUGHT  
HANDS/FEET

⚠ Caution

May get pinched - There is a risk of being pinched.

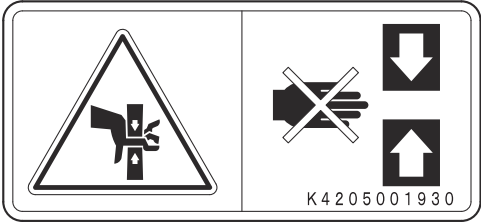


Diagram of a rectangular decal with a black border. It is divided into two sections. The left section contains a triangular warning symbol with a hand being caught in a mechanism. The right section contains a pictogram of a hand with a large 'X' over it, and two arrows pointing up and down, indicating the risk of being caught. Below the pictogram is the text 'K 4 2 0 5 0 0 1 9 3 0'.

Caution for Getting Pinched Decal\_001

# Product Overview

## Fire Prohibited Decal

K4205001940

Decal, fire prohibited



Keep away from fire.

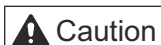


Fire Prohibited Decal\_001

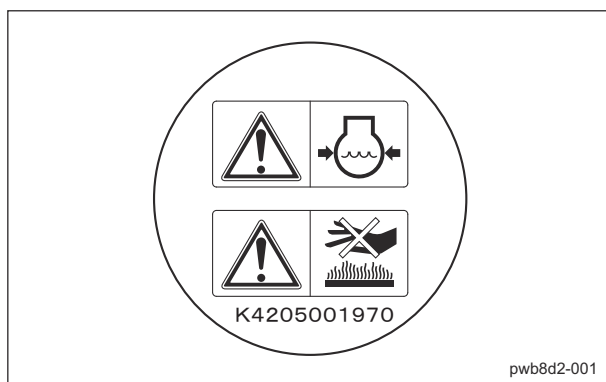
## Caution for Spouting Coolant Decal

K4205001970

Decal, caution for spouting coolant



Caution for spouting coolant - Do not open while hot.  
High temperature - Do not touch. Otherwise, you will get burned.



Caution for Spouting Coolant Decal\_001

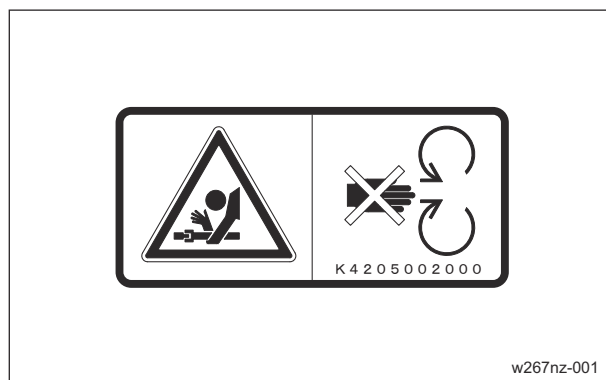
## PTO Caution Decal

K4205002000

Decal, caution PTO



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



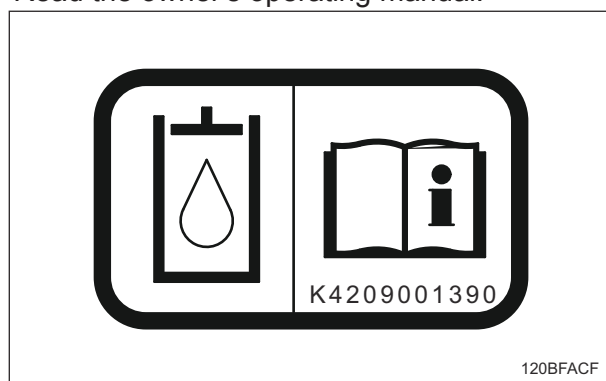
PTO Caution Decal\_001

## Hydraulic Oil Decal

K4209001390

Decal, hydraulic oil

Read the owner's operating manual.

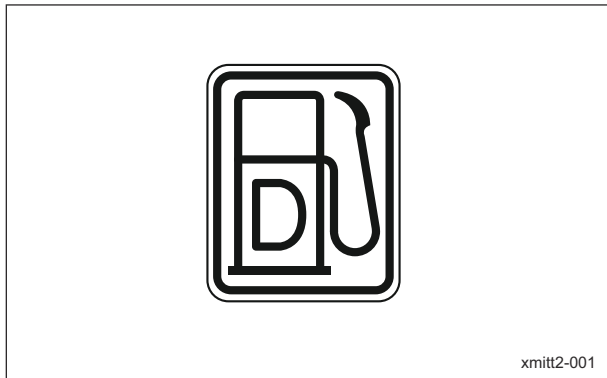


Hydraulic Oil Decal\_001

# Product Overview

## Diesel Fuel Filler Port Decal

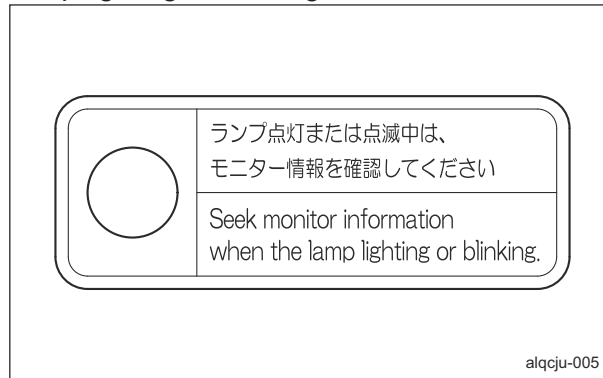
K4209001000  
DECAL, DIESEL OIL FILLER PORT  
Use diesel fuel.



Diesel Fuel Filler Port Decal\_001

## DPF Regeneration Lamp Mark

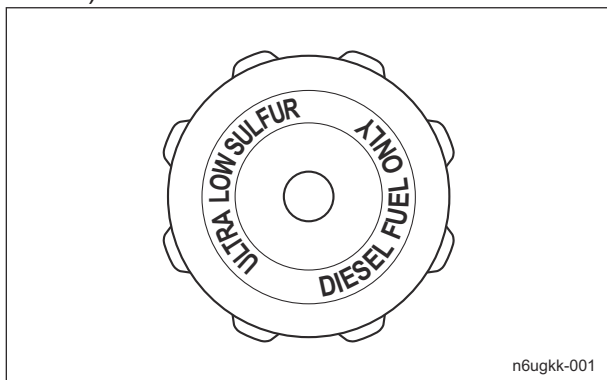
DPF regeneration lamp mark  
Seek monitor information when the green  
lamp lighting or blinking.



DPF Regeneration Lamp Mark\_001

## Diesel Instruction Mark

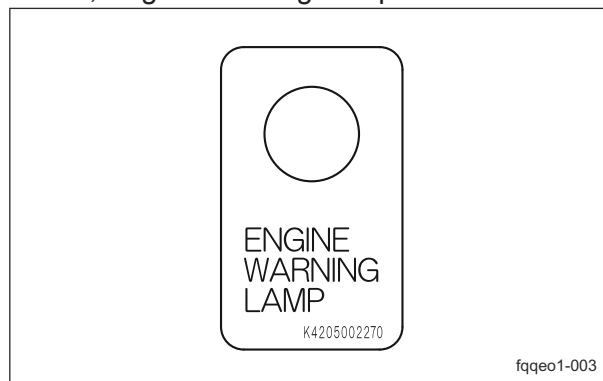
Diesel instruction mark describes the type of  
fuel to be used.  
Use Ultra Low Sulfur Diesel Fuel (sulfur-free  
diesel).



Diesel Instruction Mark\_001

## Engine Warning Lamp Decal

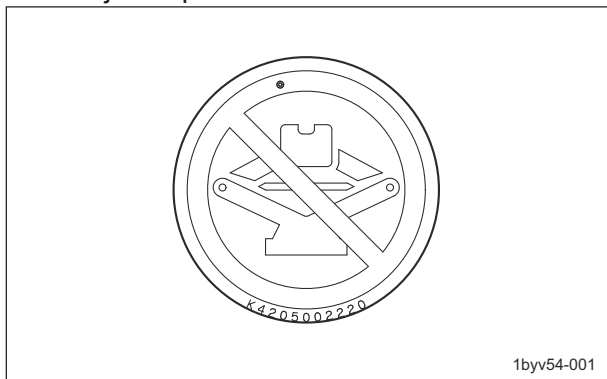
K4205002270  
Decal, Engine Warning Lamp



Engine Warning Lamp Decal\_001

## DO NOT JACK UP Decal

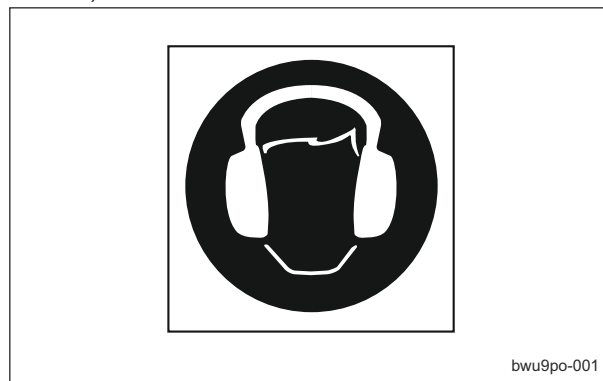
K4205002220  
Decal, DO NOT JACK UP  
Do not jack up.



DO NOT JACK UP Decal\_001

## Caution to Noise Decal

K4205002090  
Decal, caution to noise

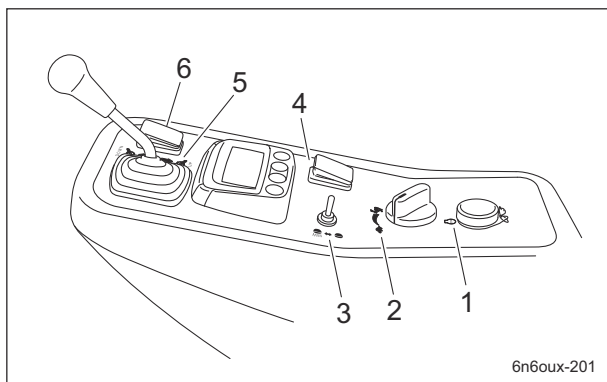


Caution to Noise Decal\_001

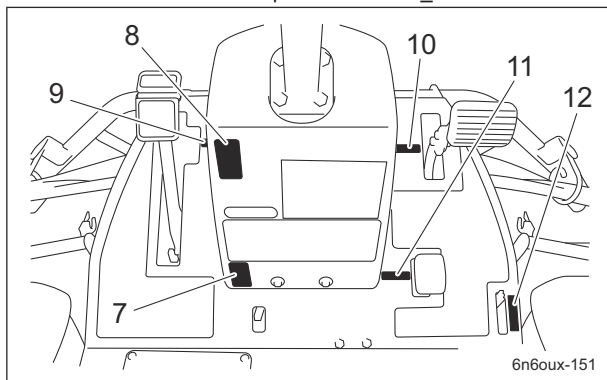


## Operation Decals

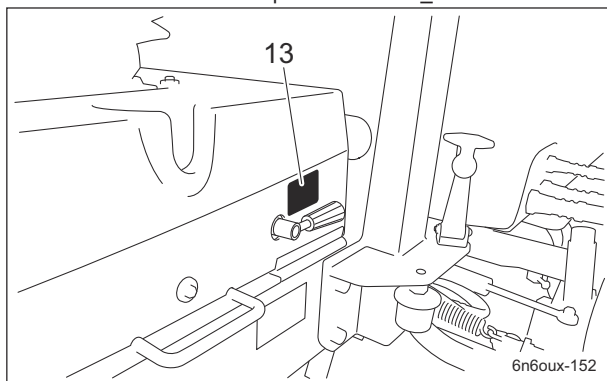
### Positions of Operation Decals



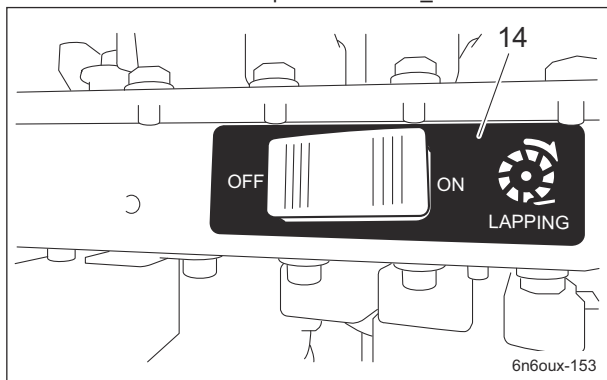
Positions of Operation Decals\_001



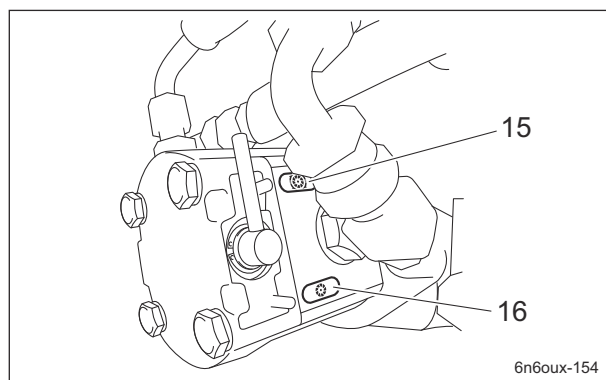
Positions of Operation Decals\_002



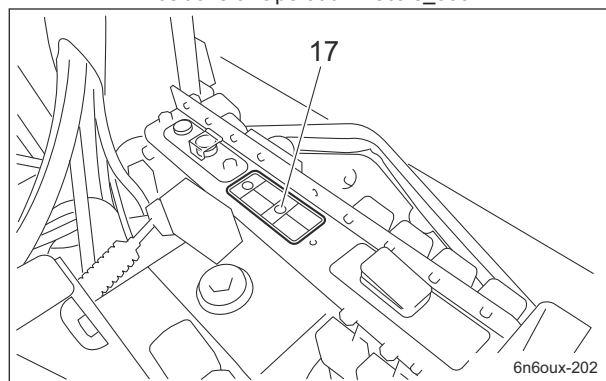
Positions of Operation Decals\_003



Positions of Operation Decals\_004



Positions of Operation Decals\_005



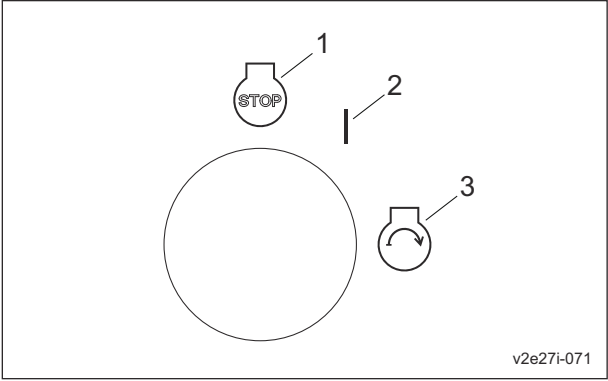
Positions of Operation Decals\_006

|    |                                 |
|----|---------------------------------|
| 1  | Key switch decal                |
| 2  | Engine rotation mark            |
| 3  | Light switch mark               |
| 4  | Reel rotation switch mark       |
| 5  | Mower unit up/down lever decal  |
| 6  | Traveling/working selector mark |
| 7  | Tilt steering decal             |
| 8  | Parking brake decal             |
| 9  | BRAKE decal                     |
| 10 | FORWARD decal                   |
| 11 | BACKWARD decal                  |
| 12 | Driving mode shift decal        |
| 13 | Lever open/close decal          |
| 14 | Lapping decal                   |
| 15 | Reel rotation decal             |
| 16 | Reel stop decal                 |
| 17 | DPF switch decal                |

Description of Operation Decals

Key Switch Decal

Decal, key switch  
This indicates the key switch positions.

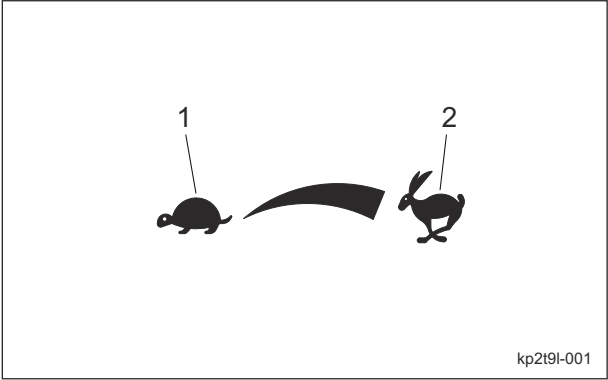


Key Switch Decal\_001

|   |             |
|---|-------------|
| 1 | OFF         |
| 2 | ON (HEATER) |
| 3 | START       |

Engine Rotation Mark

Engine rotation mark  
This indicates low/high speed of engine rotation.

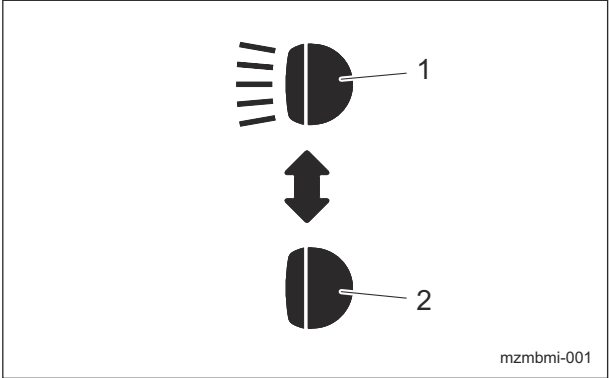


Engine Rotation Mark\_001

|   |            |
|---|------------|
| 1 | Low speed  |
| 2 | High speed |

Light Switch Mark

Note:  
Depending on the specifications, this function may not be available.  
Light switch mark  
It illustrates ON/OFF of the light.

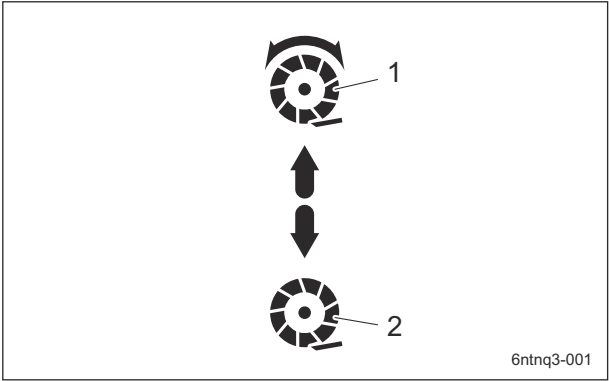


Light Switch Mark\_001

|   |     |
|---|-----|
| 1 | ON  |
| 2 | OFF |

Reel Rotation Mark

Reel rotation mark  
It illustrates Rotation/Stop of the reel cutter (cutting cylinder).



Reel Rotation Mark\_001

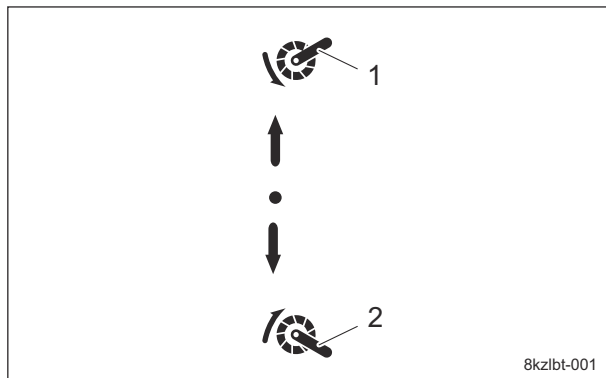
|   |          |
|---|----------|
| 1 | Rotation |
| 2 | Stop     |

# Product Overview

## Mower Unit Up/Down Decal

Decal, mower unit up/down

This indicates the Up/Down positions of the mower unit.



Mower Unit Up/Down Decal\_001

|   |      |
|---|------|
| 1 | Down |
| 2 | Up   |

## Tilt Steering Decal

K4203001710

Decal, tilt steering

This illustrates the tilt directions of the steering wheel and the locked/free positions.



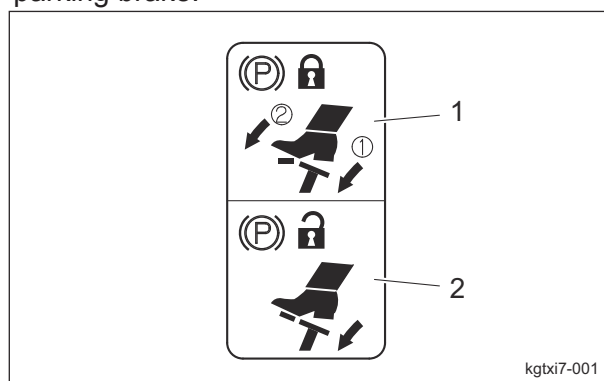
Tilt Steering Decal\_001

## Parking Brake Decal

K4203001700

Decal, parking brake

This shows how to lock and release the parking brake.



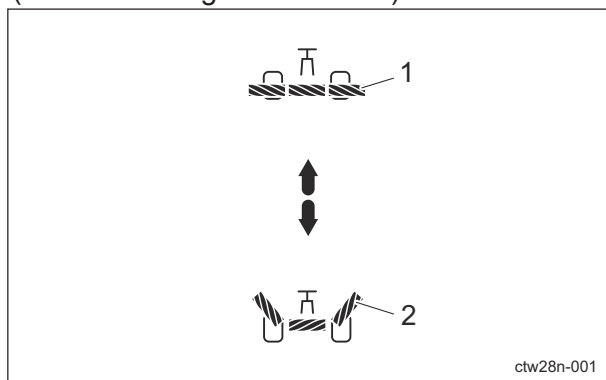
Parking Brake Decal\_001

|   |         |
|---|---------|
| 1 | Lock    |
| 2 | Release |

## Traveling/Working Selector Mark

Traveling/working selector mark

It illustrates the positions where mower units #4 and #5 stop when they are raised. (ON/OFF of slight lift function)



Traveling/Working Selector Mark\_001

|   |           |
|---|-----------|
| 1 | Working   |
| 2 | Traveling |

BRAKE Decal

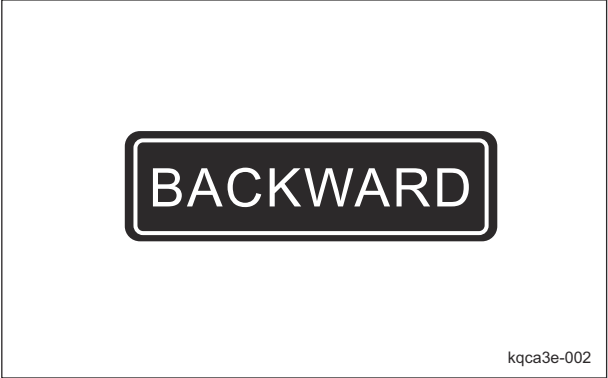
K4203001450  
Decal, BRAKE  
This indicates brake.



BRAKE Decal\_001

BACKWARD Decal

K4203001440  
Decal, BACKWARD  
This indicates backward travel.



BACKWARD Decal\_001

FORWARD Decal

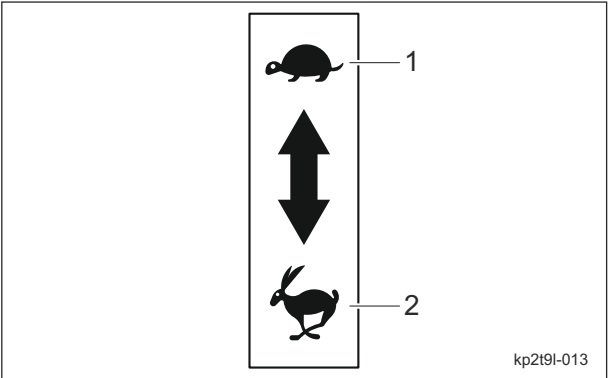
K4203001430  
Decal, FORWARD  
This indicates forward travel.



FORWARD Decal\_001

Driving Mode Shift Decal

K4203001740  
Decal, shifting driving mode  
This indicates high/low speed.



Driving Mode Shift Decal\_001

|   |                 |
|---|-----------------|
| 1 | Working speed   |
| 2 | Traveling speed |

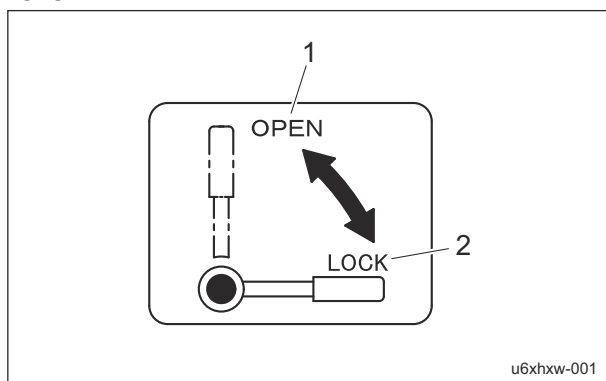
# Product Overview

## Lever Open/Close Decal

K4203001720

Decal, open/close lever

This indicates lock/release of open/close lever.



Lever Open/Close Decal\_001

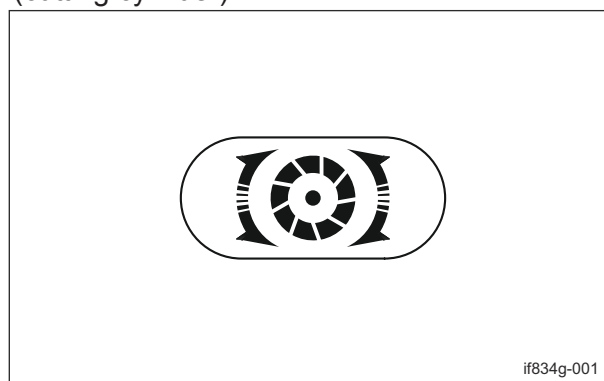
|   |         |
|---|---------|
| 1 | Release |
| 2 | Lock    |

## Reel Rotation Decal

K4203001300

Decal, reel rotation

This indicates rotation of the reel cutter (cutting cylinder).



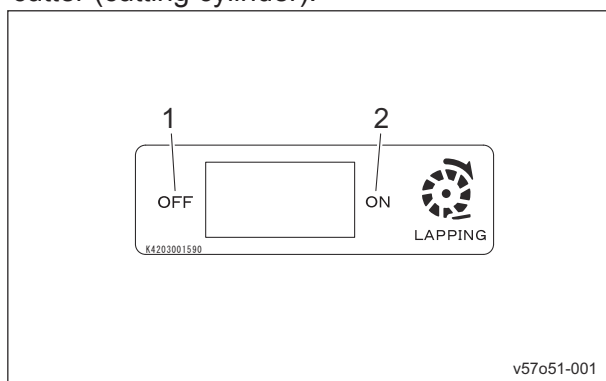
Reel Rotation Decal\_001

## Lapping Decal

K4203001590

Decal, lapping

This indicates rotational direction of the reel cutter (cutting cylinder).



Lapping Decal\_001

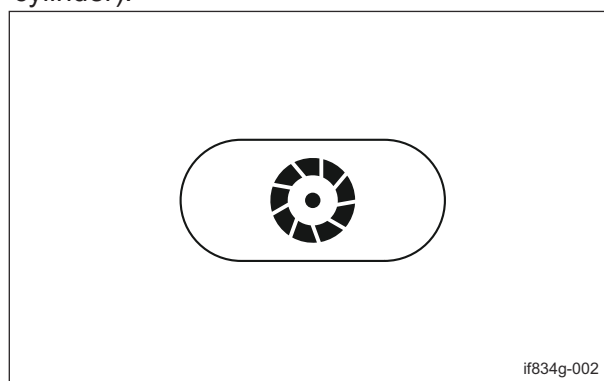
|   |                                          |
|---|------------------------------------------|
| 1 | Normal rotation (cutting rotation)       |
| 2 | Reverse rotation (back lapping rotation) |

## Reel Stop Decal

K4203001310

Decal, reel stop

This indicates stop of the reel cutter (cutting cylinder).



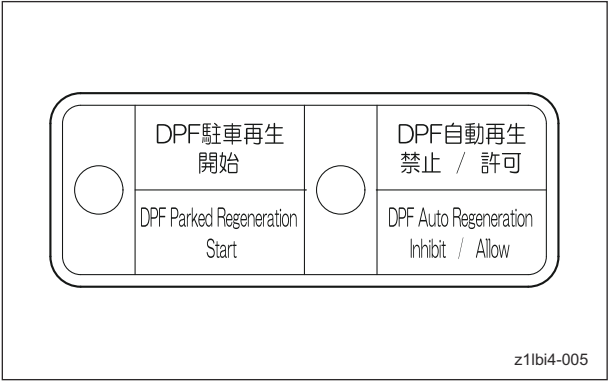
Reel Stop Decal\_001

# Product Overview

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## DPF Switch Decal

LM551--0586Z0  
Decal, DPF Switch  
This indicates the changeover of DPF regeneration.



DPF Switch Decal\_001

# Description of Functions

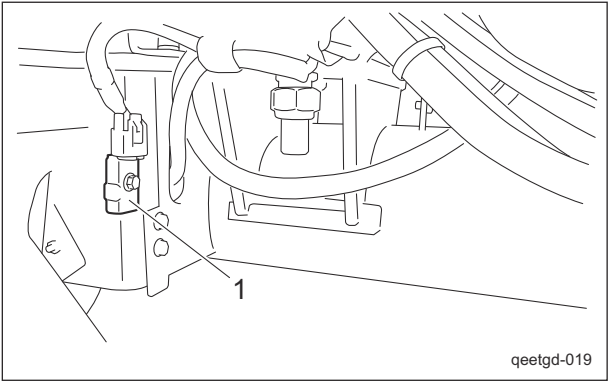
|                                                   |                  |                           |                  |
|---------------------------------------------------|------------------|---------------------------|------------------|
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| <b>Relays .....</b>                               | <b>Page 4-2</b>  | Handling Emission Control |                  |
| <b>Light Switch .....</b>                         | <b>Page 4-3</b>  | Compliant Engine .....    | Page 4-40        |
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| <b>DPF Parked Regeneration Switch .....</b>       | <b>Page 4-7</b>  |                           |                  |
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| <b>Monitor (PV380) .....</b>                      | <b>Page 4-13</b> |                           |                  |
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# Description of Functions

## Proximity Sensor

There are four proximity sensors on #1, #2, #4 and #5 mower arm fulcrums. These sensors detect the raised or lowered positions of mower units #1, #2, #4 and #5. The information is related to controlling rotation and stop of the reel cutter (cutting cylinder).

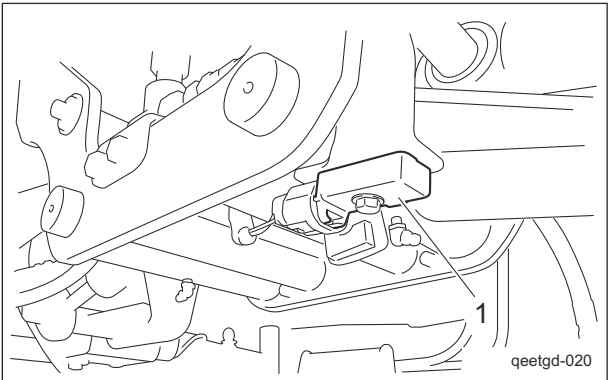
- Mower unit #1



Proximity Sensor\_001

|   |                  |
|---|------------------|
| 1 | Proximity sensor |
|---|------------------|

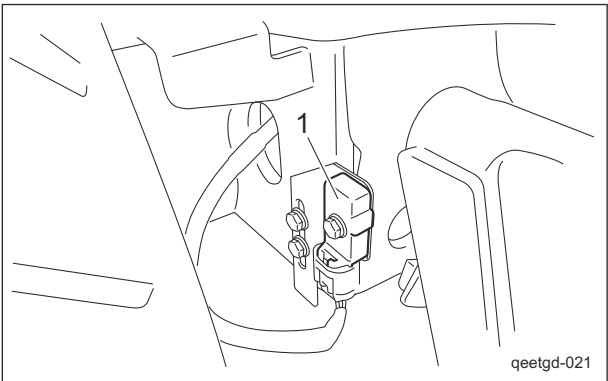
- Mower unit #2



Proximity Sensor\_002

|   |                  |
|---|------------------|
| 1 | Proximity sensor |
|---|------------------|

- Mower units #4 and #5



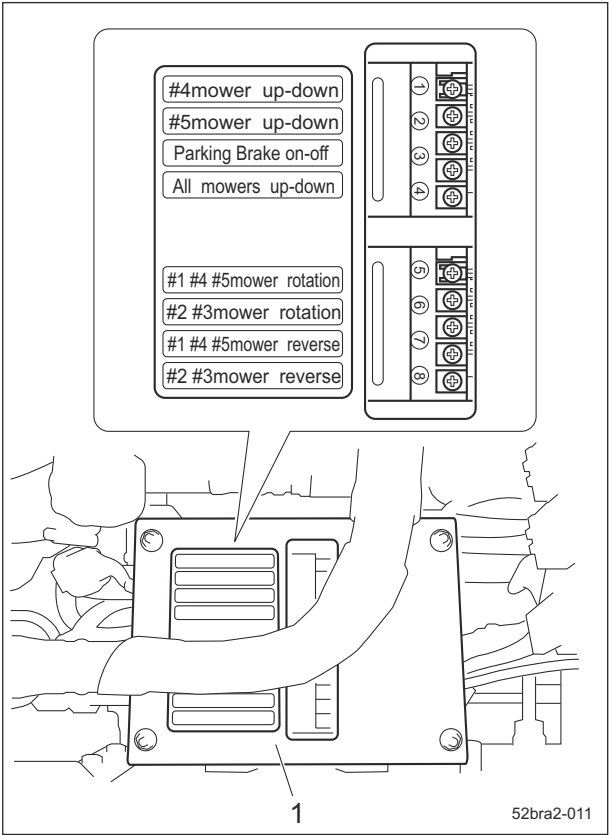
Proximity Sensor\_003

|   |                  |
|---|------------------|
| 1 | Proximity sensor |
|---|------------------|

## Relays

The relay box is located inside the underseat cover. These relays control traveling/working selection, rotation of the reel cutters (cutting cylinders), and mower unit lowering selection. The operating condition can be checked by the illumination of the LEDs.

- LEDs ① and ② light up when the traveling/working selector switch is in the "Working" position and mower units #4 and #5 are raised.
- LED ③ lights up when the parking brake is applied.
- LED ④ lights up when the mower unit up/down lever is in the "Down" position and the traveling/working selector switch is in the "Working" position.
- LEDs ⑤ and ⑥ light up when the reel rotation switch is in the "ON" position and the mower units are lowered.
- LEDs ⑦ and ⑧ light up when the reel reverse switch is in the "ON" position.



Relays\_001

|   |           |
|---|-----------|
| 1 | Relay box |
|---|-----------|



# Description of Functions

## Light Switch

Note:

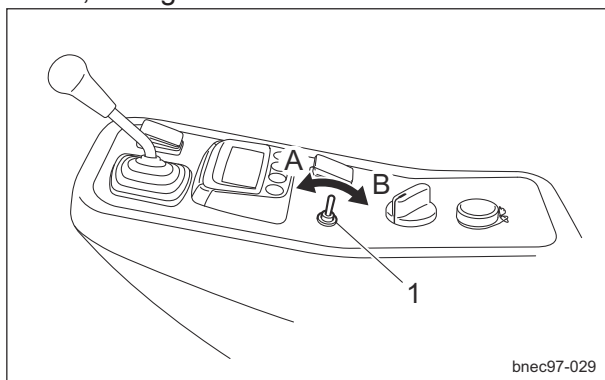
Depending on the specifications, this function may not be available.

### Caution

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 "Turn on" position, the lights turn on. When it is set to the "Turn off" position, the lights turn off.



Light Switch\_001

|   |              |
|---|--------------|
| 1 | Light switch |
| A | Turn on      |
| B | Turn off     |

## Traveling/Working Selector Switch

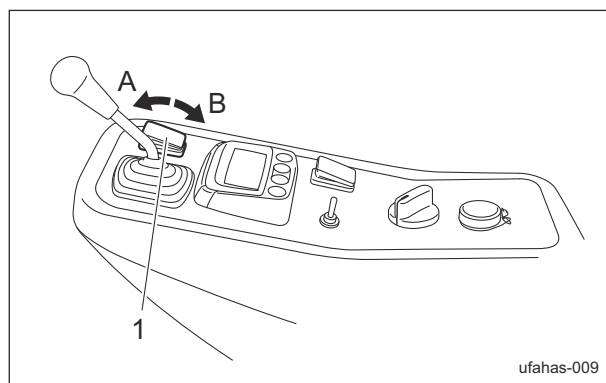
### Important

Set the traveling/working selector switch to the "Working" position before lowering the mower units.

The mower units cannot be lowered with the switch set to the "Traveling" position.

The traveling/working selector switch is located in the operation panel.

This can change the positions where mower units #4 and #5 stop when they are raised.



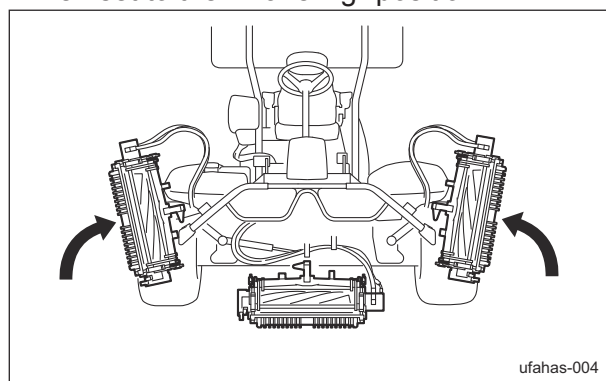
Traveling/Working Selector Switch\_001

|   |                                   |
|---|-----------------------------------|
| 1 | Traveling/working selector switch |
| A | Working                           |
| B | Traveling                         |

When the switch is set to the "Traveling" position, mower units #4 and #5 are raised to their highest positions.

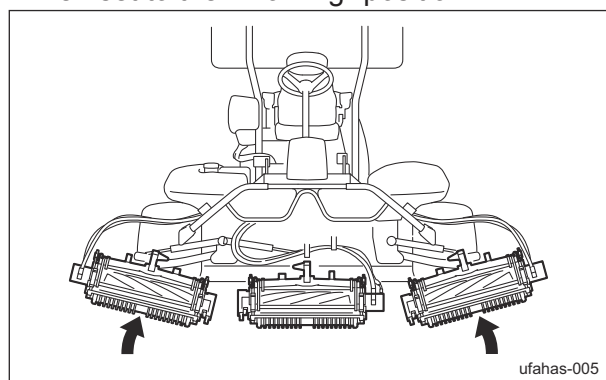
When the switch is set to the "Working" position, mower units #4 and #5 are only raised halfway.

When set to the "Traveling" position



Traveling/Working Selector Switch\_002

When set to the "Working" position

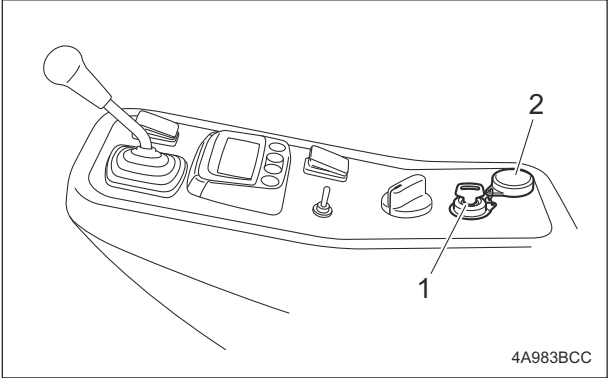


Traveling/Working Selector Switch\_003

# Description of Functions

## Key Switch

The key switch is a lock for inserting the ignition key. This is used for starting, running or stopping the engine by turning the ignition key to change the key switch position.



Key Switch\_001

|   |            |
|---|------------|
| 1 | Key switch |
| 2 | Cap        |

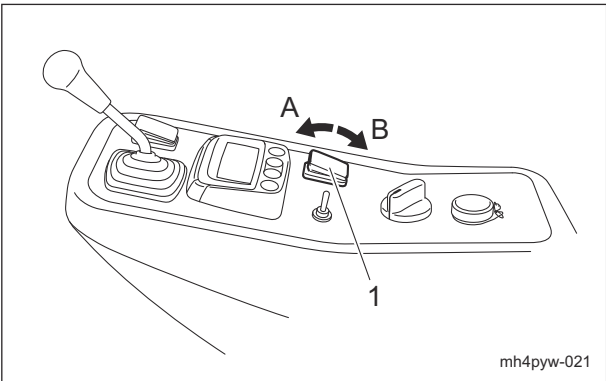
## Reel Rotation Switch

**Caution**

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

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 "Rotation" position, the reel cutters (cutting cylinders) of all mower units will rotate for cutting work. When the reel rotation switch is set to the "Stop" position, the reel cutters (cutting cylinders) will stop.

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



Reel Rotation Switch\_001

|   |                      |
|---|----------------------|
| 1 | Reel rotation switch |
| A | Rotation             |
| B | Stop                 |

## Reel Forward/Reverse Switch

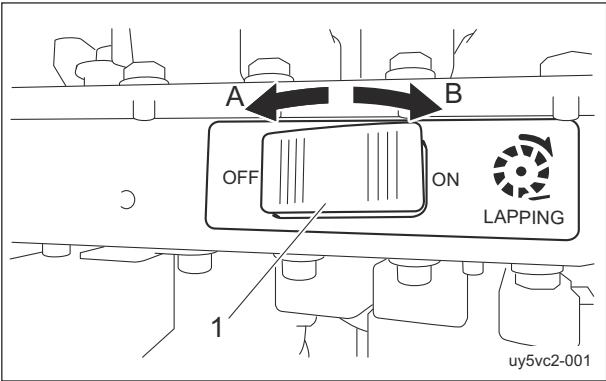
**Important**

Do not switch between "Forward" and "Reverse" while the reel cutter (cutting cylinder) is rotating. Otherwise, the hydraulic system will malfunction.

**Important**

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

The reel forward/reverse switch is located inside the underseat cover and switches the rotation direction of the reel cutters (cutting cylinders). When the reel forward/reverse switch is set to the "Forward" position, the reel cutters (cutting cylinders) of all mower units will rotate for cutting work. When the reel forward/reverse switch is set to the "Reverse" position, the reel cutters (cutting cylinders) will rotate in reverse (back lapping rotation).



Reel Forward/Reverse Switch\_001

# Description of Functions

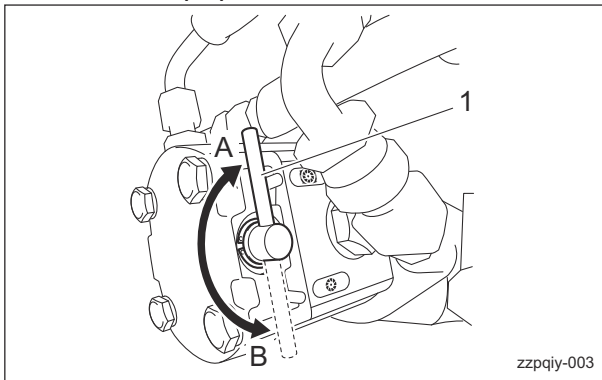
|   |                             |
|---|-----------------------------|
| 1 | Reel forward/reverse switch |
| A | Forward                     |
| B | Reverse                     |

## Reel Rotation/Stop Switching Lever

### ⚠ Caution

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

The reel rotation/stop switching lever is located on the reel motor attached to each mower unit. It is used during cutting and back lapping. Shift the lever(s) to the "Rotation" position only for the mower unit(s) to be used for cutting or back lapping. Leave the lever(s) for other mower units in the "Stop" position.



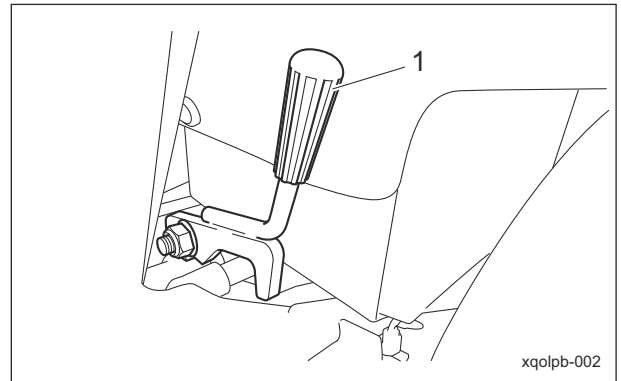
Reel Rotation/Stop Switching Lever\_001

|   |                                    |
|---|------------------------------------|
| 1 | Reel rotation/stop switching lever |
| A | Rotation                           |
| B | Stop                               |

## Mower Lock Lever (Latch)

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

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



Mower Lock Lever (Latch)\_001

|   |                          |
|---|--------------------------|
| 1 | Mower Lock Lever (Latch) |
|---|--------------------------|

## Mower Unit Up/Down Lever

### ⚠ Caution

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

### ⚠ Caution

Be careful of the mower units lowering when the mower unit up/down lever is shifted to the "Down" position and the key switch is turned to the "ON" position while the engine is stopped with the traveling/working selector switch set to the "Working" position.

### Important

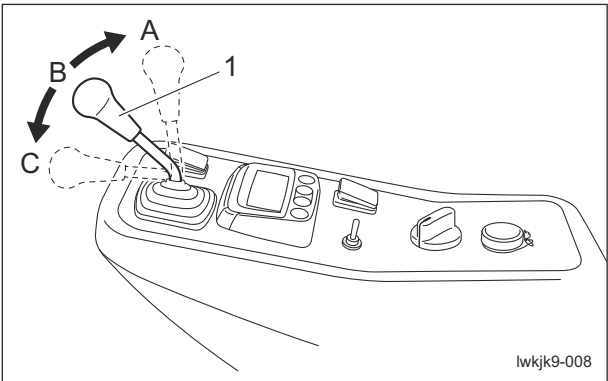
When the mower lock levers (latches) are engaged, do not operate the mower unit up/down lever.

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.

When the lever is shifted to the "UP" position and then released from the hand, the lever returns to the neutral position.

# Description of Functions



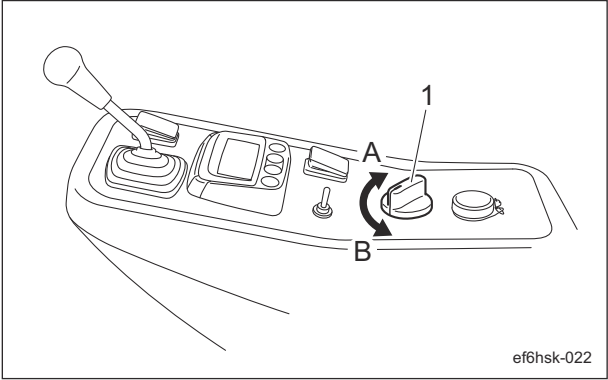
Mower Unit Up/Down Lever\_001

|   |                          |
|---|--------------------------|
| 1 | Mower unit up/down lever |
| A | Up                       |
| B | Neutral                  |
| C | Down                     |

**Note:**  
When the mower units are raised, the reel cutters (cutting cylinders) stop rotating even if the reel rotation switch is set to the "Rotation" position.

## Throttle Knob

The throttle knob is located in the operation panel and enables you to adjust the engine rpm. Move the throttle knob toward the "High speed" position to increase the engine rpm, and toward the "Low speed" position to reduce the rpm.



Throttle Knob\_001

|   |               |
|---|---------------|
| 1 | Throttle knob |
| A | High speed    |
| B | Low speed     |

## DPF Auto Regeneration Inhibit Switch

**Caution**

Normally, set to "Auto regeneration mode". Accordingly, DPF auto regeneration inhibit icon disappears. However, when operating in a location where fires may occur, set to "Auto regeneration inhibit mode".

**Caution**

Do not use the switch during back lapping.

**Important**

The DPF auto regeneration inhibit switch is reset to "Auto regeneration mode" when the engine is started even if the engine was stopped with being set to "Auto regeneration inhibit mode".

**Important**

"Auto regeneration inhibit mode" inhibits all DPF regenerations of "Auto regeneration", "Parked regeneration" and "Manual regeneration". For DPF regeneration, deactivate "Auto regeneration inhibit mode".

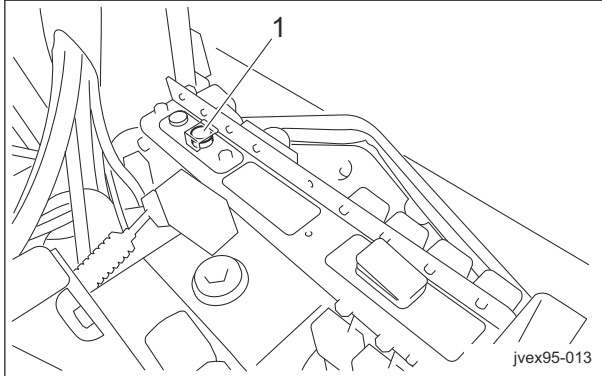
The DPF auto regeneration inhibit switch is the switch for shifting between "Auto regeneration mode" and "Auto regeneration inhibit mode". With the engine running, press this switch to shift between "Auto regeneration mode" and "Auto regeneration inhibit mode".

• Auto regeneration mode:

The DPF auto regeneration inhibit switch is reset to "Auto regeneration mode" when the engine is started. Accordingly, DPF auto regeneration inhibit icon disappears. In "Auto regeneration mode" DPF regeneration is automatically performed regardless of the main vehicle's travel and stop on the condition that a specific amount of PM is accumulated and the requirements for DPF regeneration are fulfilled.

# Description of Functions

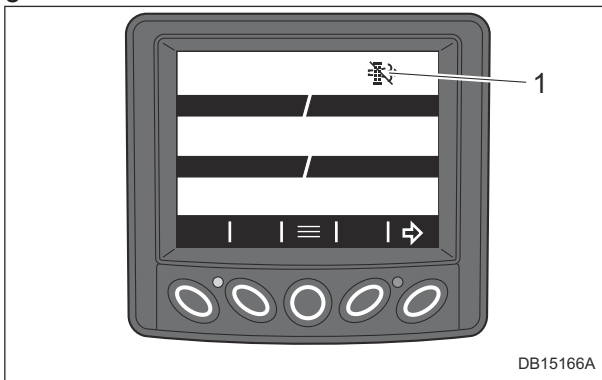
- Auto regeneration inhibit mode:  
In order to set to "Auto regeneration inhibit mode", press the DPF auto regeneration inhibit switch after the engine is started. In "Auto regeneration inhibit mode" PM accumulates in the DPF and PM accumulation level increases. Unless the operator deactivates "Auto regeneration inhibit mode" on his own will, DPF regeneration is not performed.



DPF Auto Regeneration Inhibit Switch\_001

1 DPF auto regeneration inhibit switch

When the DPF auto regeneration inhibit switch is pressed and set to "Auto regeneration inhibit mode", the monitor displays DPF auto regeneration inhibit icon.



DPF Auto Regeneration Inhibit Switch\_002

1 DPF auto regeneration inhibit icon

## DPF Parked Regeneration Switch

### **⚠ Danger**

Do not perform DPF regeneration in a location where fires may occur since it will become extremely hot around the exhaust outlet during DPF regeneration.

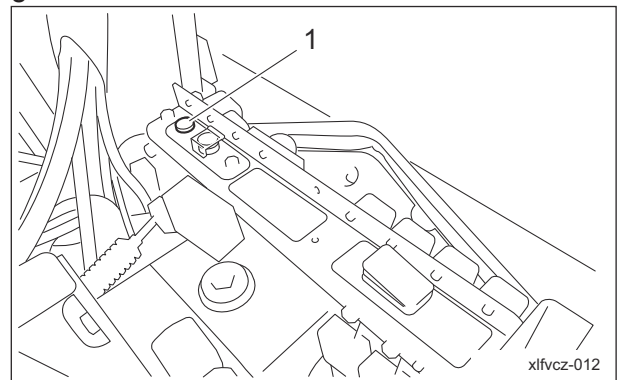
### **⚠ Caution**

Do not use the switch during back lapping.

### **Important**

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

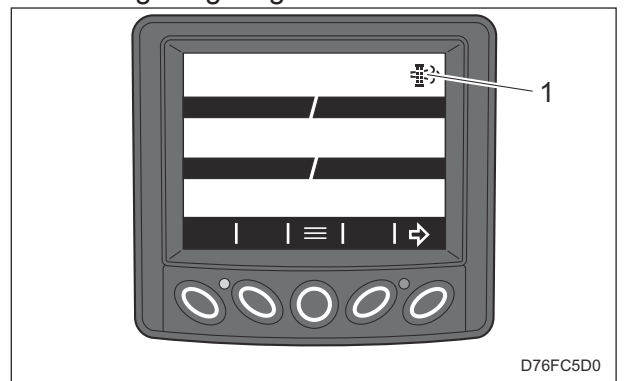
The DPF parked regeneration switch is the switch for actuating DPF parked regeneration. When the DPF regeneration icon is blinking, press the switch to start DPF parked regeneration.



DPF Parked Regeneration Switch\_001

1 DPF parked regeneration switch

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



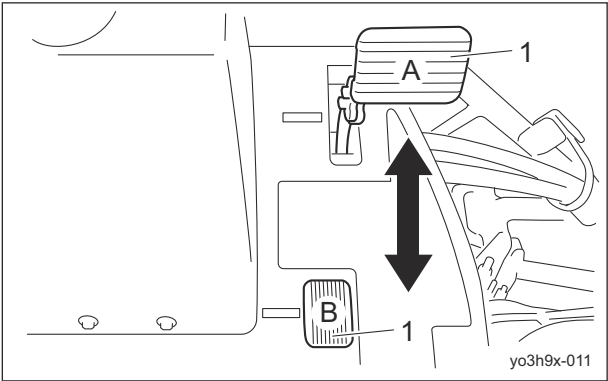
DPF Parked Regeneration Switch\_002

1 DPF regeneration icon

# Description of Functions

## Traveling Pedal

The traveling pedal is located in the right foot area.  
When forward depressed, the machine travels forward. When backward depressed, the machine travels backward.



Traveling Pedal\_001

|   |                 |
|---|-----------------|
| 1 | Traveling pedal |
| A | Forward         |
| B | Backward        |

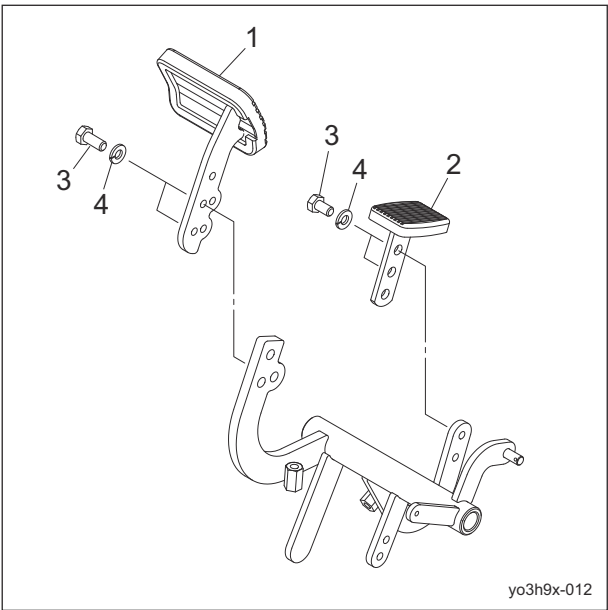
The height and angle of the traveling pedal can be adjusted to fit the operator.

Forward:

The height and angle can be adjusted by changing the installation position of the bolt and spring washer.

Backward:

The height can be adjusted by changing the installation position of the bolt and spring washer.



Traveling Pedal\_002

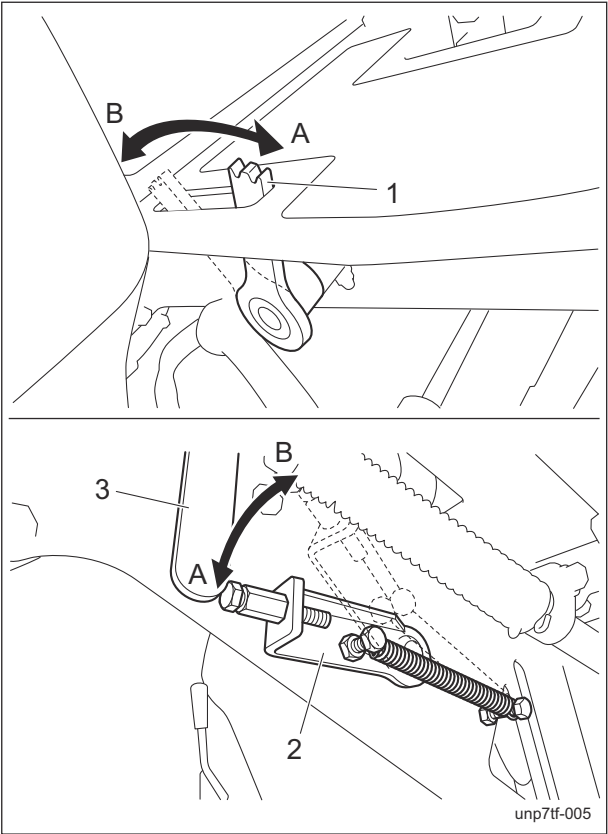
|   |                            |
|---|----------------------------|
| 1 | Traveling pedal (forward)  |
| 2 | Traveling pedal (backward) |
| 3 | Bolt                       |
| 4 | Spring washer              |

## Pedal Stopper

### Important

When the traveling speed exceeds 12.0 km/h during cutting operation, a buzzer will sound. If the operation continues, the engine and hydraulic equipments will be damaged.

The pedal stopper is located in the right foot area.  
This lever changes the amount that the forward pedal can be depressed.



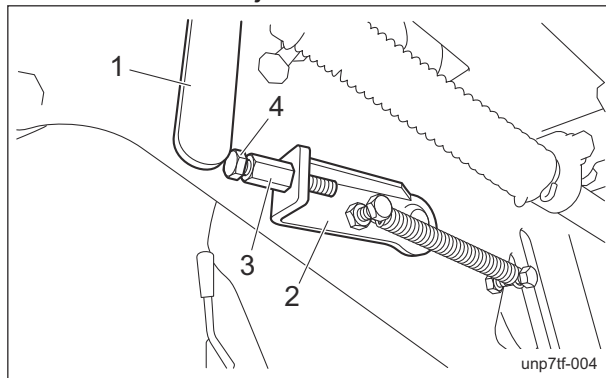
Pedal Stopper\_001

|   |                            |
|---|----------------------------|
| 1 | Pedal stopper              |
| 2 | Operating speed lock lever |
| 3 | Traveling pedal            |
| A | Working                    |
| B | Traveling                  |



# Description of Functions

Be sure to set the pedal stopper to the "Working" position during operation.  
You can adjust the amount that the forward pedal can be depressed.  
Loosen the bolt to adjust to 12 km/h or less.



Pedal Stopper\_002

|   |                            |
|---|----------------------------|
| 1 | Traveling pedal            |
| 2 | Operating speed lock lever |
| 3 | Lock nut                   |
| 4 | Bolt                       |

## Brake Pedal

### ⚠ Caution

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

### ⚠ Caution

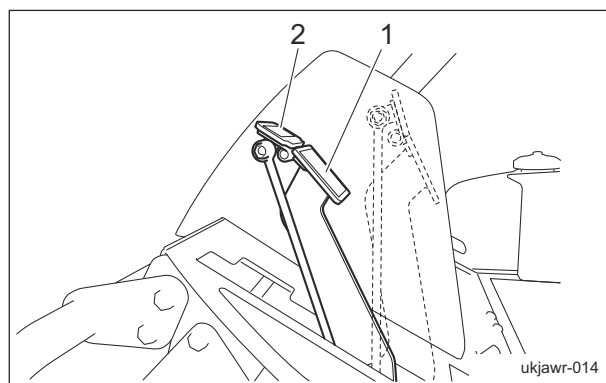
Never park the machine on a slope.

The brake pedal is located in the left foot area. To stop the machine, firmly depress the brake pedal.

When parking, depress the locking pedal while firmly depressing the brake pedal to lock it. To release the brake pedal, firmly depress the brake pedal to release the locking pedal.

Note:

Locking the brake pedal can be used as a parking brake.



Brake Pedal\_001

|   |               |
|---|---------------|
| 1 | Brake pedal   |
| 2 | Locking pedal |

## USB Socket

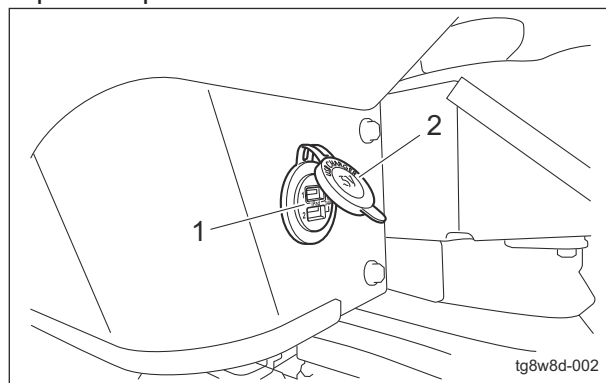
### Important

Do not use the USB socket in rainy weather to avoid malfunction of devices.

Use the USB socket to charge or power USB devices such as smartphones.

When the ignition key set to the "ON" position, it is energized and the indicator for the USB port glows blue.

1. Set the ignition key to the "ON" position.
2. Open the protective cover.

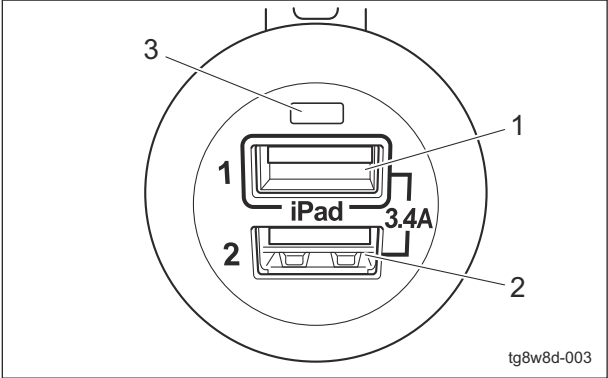


USB Socket\_001

|   |                  |
|---|------------------|
| 1 | USB port         |
| 2 | Protective cover |

# Description of Functions

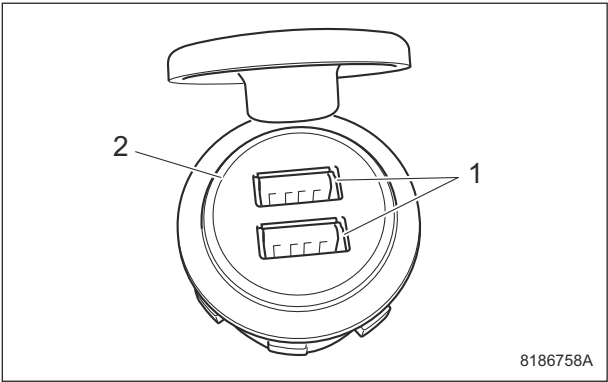
3. Check the device to be connected.  
■ #30001 - 30249  
The maximum output power is DC5 V 3.4 A  
Max (2.4 A (Upper : iPad) +1 A (Lower)).



USB Socket\_002

|   |              |
|---|--------------|
| 1 | 2.4 A (iPad) |
| 2 | 1 A          |
| 3 | Indicator    |

- #30250-  
The maximum output power is DC5 V 2.1 A  
Max for each port.  
The shape of the ports is Standard-A (Type-A)  
for each port.



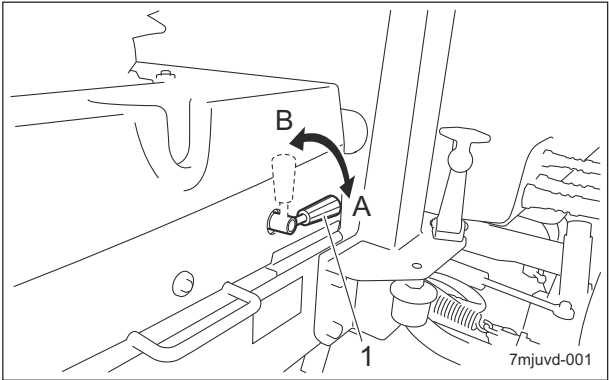
USB Socket\_002

|   |           |
|---|-----------|
| 1 | 2.1 A     |
| 2 | Indicator |

4. Insert the USB cable into the USB port.  
The indicator glows blue when energized.  
5. Close the protective cover after use.

## Open-Close Lever

The open-close lever is located at the lower-left side of the seat.  
This is used when opening and closing the underseat cover.  
When opening the underseat cover, raise the open-close lever to unlock. After closing the underseat cover, lock it.



Open-Close Lever\_001

|   |                  |
|---|------------------|
| 1 | Open-close lever |
| A | Lock             |
| B | Unlock           |

## Safety Device

### Interlock System

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

#### Important

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

2. In the event the operator leaves the seat with the parking brake not applied and the engine running, the safety device will be activated and will stop the engine.



# Description of Functions

3. In the event the operator leaves the seat with the parking brake applied and the engine running, the safety device will be activated and will stop the engine under any of the following conditions:

- The traveling pedal is not set to the neutral position. (The operator has depressed the traveling pedal.)
- The reel rotation switch is set to the "Rotate" position.  
However, when the reel reverse switch is set to the "ON" position (reverse rotation), the engine does not stop.

## Warning Mechanisms

### Warning Buzzer

There are two warning buzzers, which indicate four warnings.

- Warning buzzer 1 & 3
- Warning buzzer 2 & 4

#### 1. Overheat Warning Buzzer

If the water temperature inside the engine exceeds 110 degrees Celsius (230 °F), a buzzer will sound. (intermittent tone)  
When the buzzer sounds, stop the engine immediately after idling, and then inspect the machine and perform any necessary maintenance.

#### 2. Hydraulic Oil Level Warning Buzzer

If the oil level in the hydraulic tank decreases by approximately 3.0 dm<sup>3</sup> (3.0 L) from the specified level, a buzzer will sound. (continuous tone)

When the buzzer sounds, stop the engine immediately, and then inspect the machine and perform any necessary maintenance.

#### 3. Engine Overload Warning Buzzer

If the traveling pedal is depressed and the speed exceeds 12.0 km/h while the pedal stopper is in the "Traveling" position and the reel cutters (cutting cylinders) are rotating, a buzzer will sound. (intermittent tone)  
When the buzzer sounds, stop the engine immediately and set the pedal stopper to the "Working" position.

#### 4. Warning Buzzer for Traveling With Brake Applied

If the traveling pedal is depressed while the brake pedal is locked with the locking pedal, a buzzer will sound. (continuous tone)

When the buzzer sounds, firmly depress the brake pedal to release the locking pedal.

### DPF Regeneration Lamp

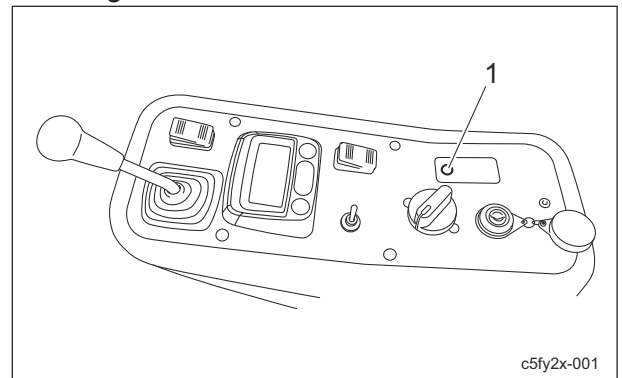
#### Important

Do not stop the engine with the DPF regeneration lamp (LED) turned on.

The DPF regeneration lamp (LED) lights up when DPF regeneration starts.

The lamp continues lighting up during DPF regeneration and it goes out when the regeneration is completed.

The DPF regeneration lamp (LED) blinks when the auto regeneration inhibit switch set to the "Auto regeneration inhibit mode".



c5fy2x-001

DPF Regeneration Lamp\_001

|   |                       |
|---|-----------------------|
| 1 | DPF regeneration lamp |
|---|-----------------------|

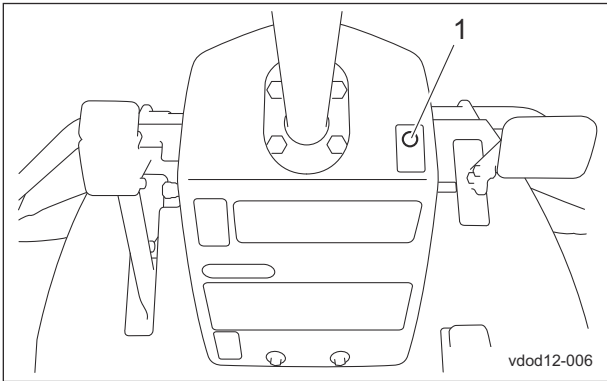
# Description of Functions

## Engine Warning Lamp

**Important**

Make repairs immediately if the fault codes of PCD (Particulate Control Diagnostic) and NCD (NOx Control Diagnostic) appear.

Engine warning lamp (LED) lights up or blinks when a failure occurs on the function of engine. Check the fault code (DTC) in the monitor display.

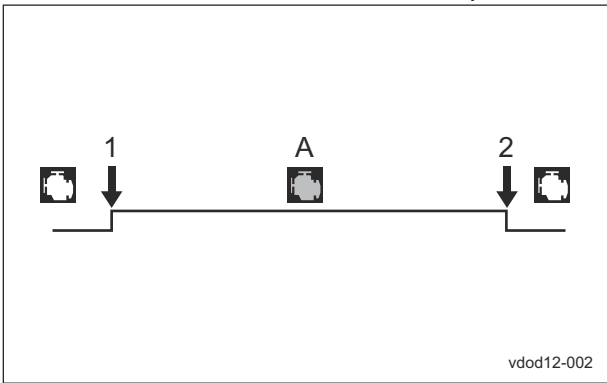


Engine Warning Lamp\_001

|   |                     |
|---|---------------------|
| 1 | Engine warning lamp |
|---|---------------------|

The lighting patterns of engine warning lamp are as follows.  
Note :  
PCD means fault codes relevant to Particulate Control Diagnostic.  
NCD means fault codes relevant to NOx Control Diagnostic.

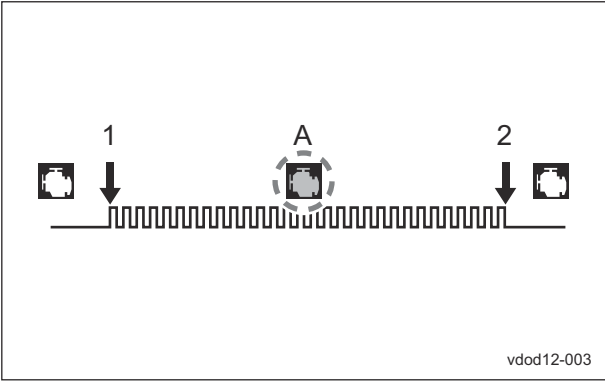
1. Engine warning lamp lights up when only DTC other than PCD/NCD come up.



Engine Warning Lamp\_002

|   |                |
|---|----------------|
| 1 | Fault detected |
| 2 | Recovery       |
| A | Lighting       |

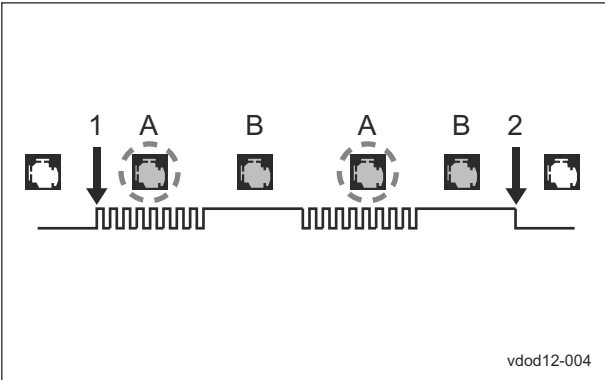
2. Engine warning lamp blinks when only DTC relevant to PCD/NCD come up.



Engine Warning Lamp\_003

|   |                |
|---|----------------|
| 1 | Fault detected |
| 2 | Recovery       |
| A | Blinking       |

3. Engine warning lamp repeats blinking and lighting alternately when DTC relevant to/ other than PCD/NCD come up at the same time. (It repeats blinking three times and lighting three seconds.)



Engine Warning Lamp\_004

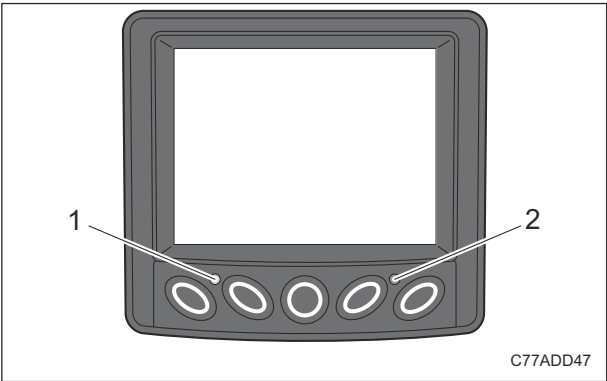
|   |                |
|---|----------------|
| 1 | Fault detected |
| 2 | Recovery       |
| A | Blinking       |
| B | Lighting       |

# Description of Functions

## Monitor LED

Monitor (LED) turns on when a failure occurs on the function of engine.  
Check the message in the monitor display when Monitor (LED) turns on.

1. LED (yellow)  
Lights up when a malfunction is detected, indicating warning and/or caution on the engine.  
Also lights up when "Service reminder" or "DPF cleaning alarm" is advised in the monitor display.
2. LED (red)  
Lights up when a critical malfunction on the engine is detected.

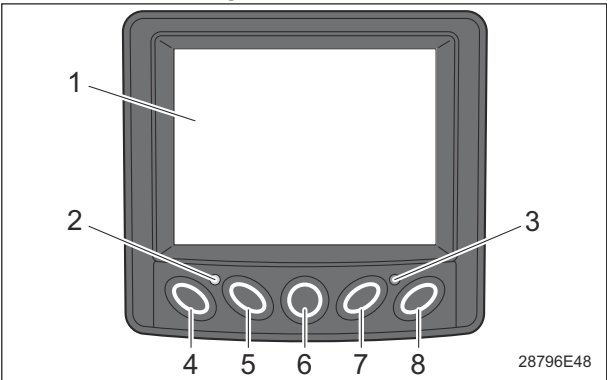


Monitor LED\_001

|   |              |
|---|--------------|
| 1 | LED (yellow) |
| 2 | LED (red)    |

## Monitor (PV380)

The monitor displays various information about the machine, such as the operating status and fault conditions.  
The information of desired items can be confirmed according to operation of the buttons.



Monitor\_001

|   |                 |
|---|-----------------|
| 1 | Monitor display |
| 2 | LED (yellow)    |
| 3 | LED (red)       |
| 4 | Button 1        |
| 5 | Button 2        |
| 6 | Button 3        |
| 7 | Button 4        |
| 8 | Button 5        |

1. Monitor display  
Displays machine conditions and items.
2. LED (yellow)  
Lights up when a malfunction is detected, indicating warning and/or caution on the engine and also lights up when SERVICE REMINDERS or DPF CLEANING ALARM advised.
3. LED (red)  
Lights up when a critical malfunction on the engine is detected.
4. Button  
The monitor has buttons 1 to 5, and their functions vary depending on the displayed screen information.

## Opening Screen

1. Set the ignition key to the "ON" position.
2. One or two seconds after activating the monitor, LOGO screen appears.



Opening Screen\_001

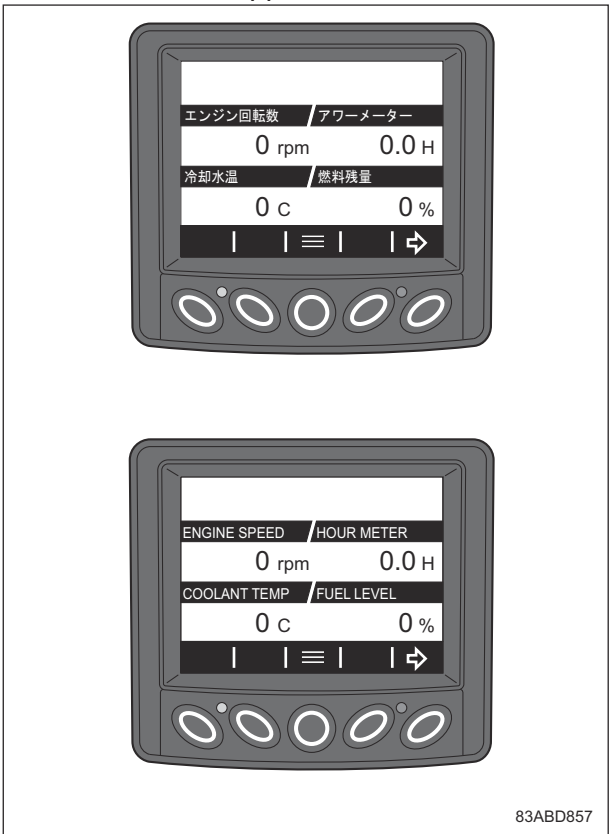
**Note:**  
When preheat required, LOGO and the message "Wait to Start...Preheating" appear at the same time and preheat automatically starts.

# Description of Functions



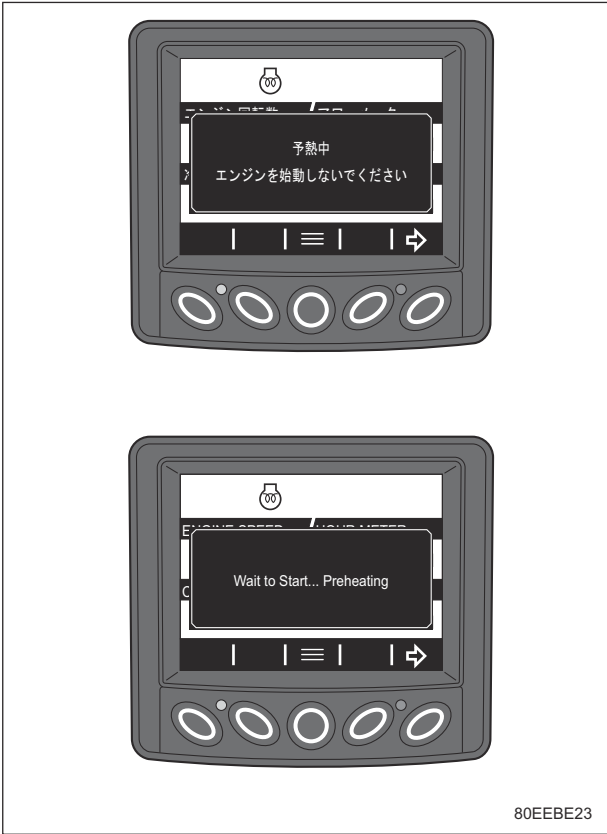
Opening Screen\_002

3. Three seconds after activating the monitor, GAUGE screen appears.



Opening Screen\_003

Note:  
While preheating, the message "Wait to Start...Preheating" is displayed.  
When the preheat completed, "Wait to Start...Preheating" disappears and GAUGE screen appears.



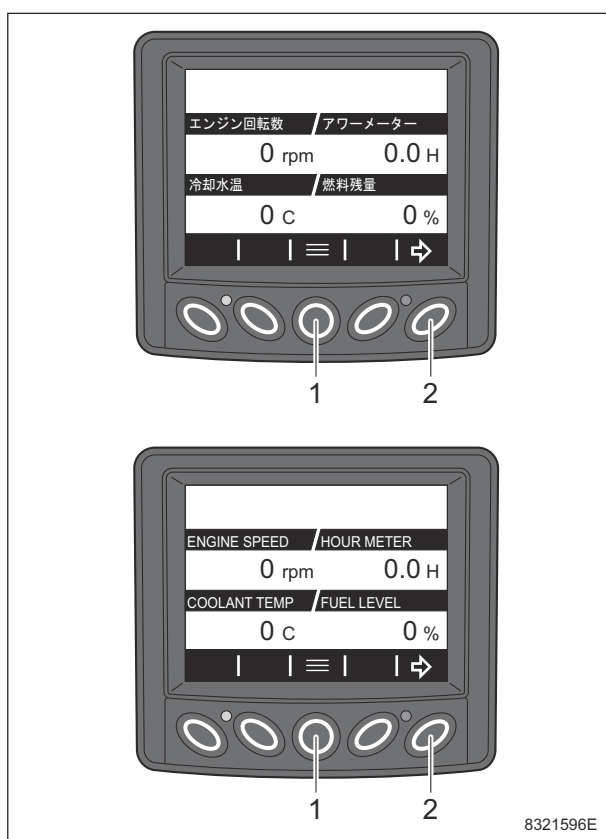
Opening Screen\_004

## Gauge Screen

Gauge screen appears after the monitor activation.  
It shows the status of the engine and the vehicle.  
Move to another screen or page with pressing your desired button.

- "Button 5": Move to another page of GAUGE screen.
- "Button 3": Move to MENU screen.

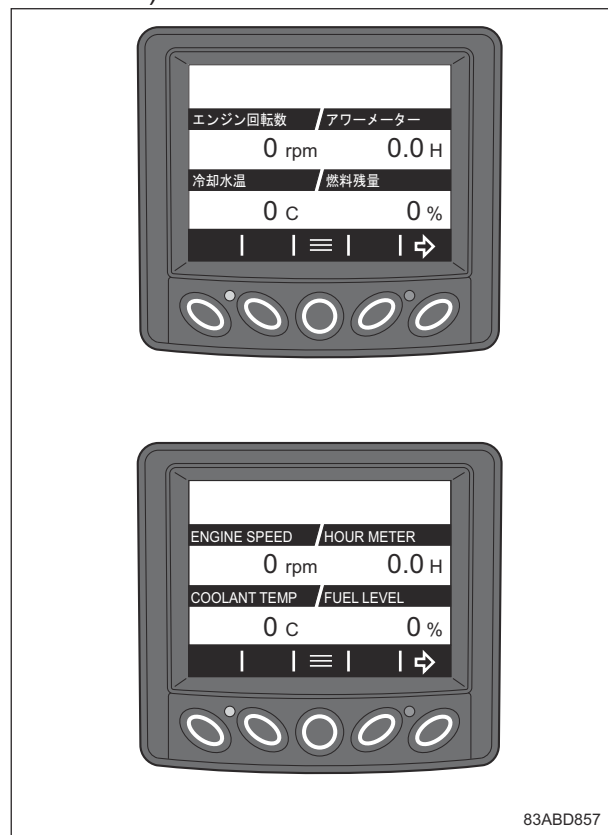
# Description of Functions



Gauge Screen\_001

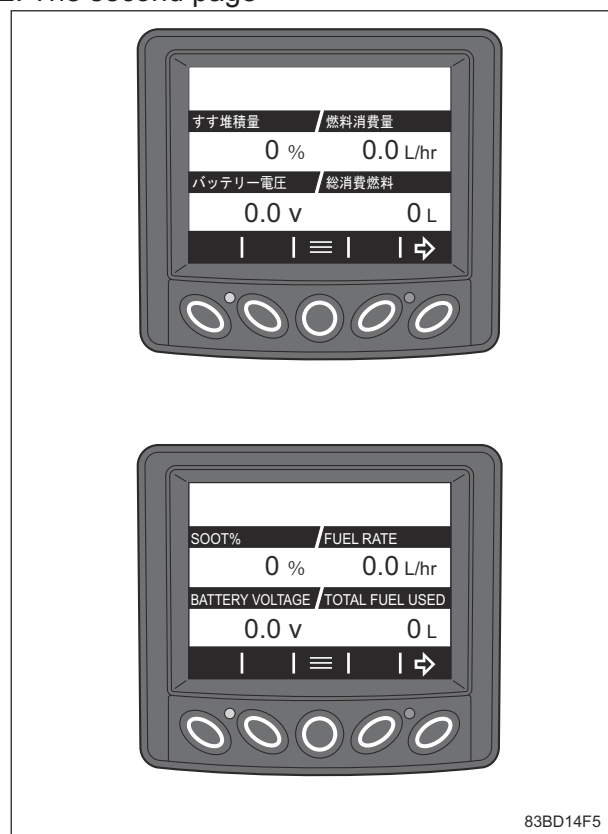
|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 5 |

## 1. The first page (displayed when the monitor activated)



Gauge Screen\_002

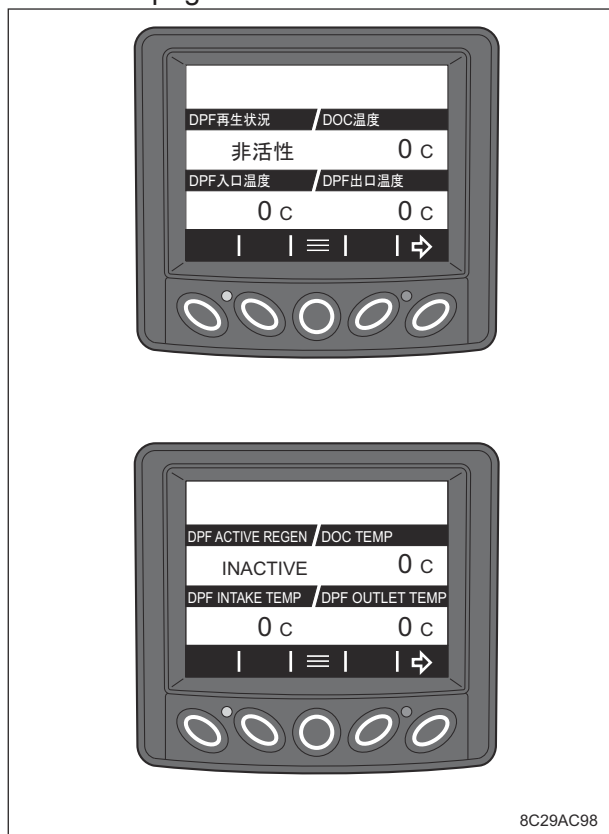
## 2. The second page



Gauge Screen\_003

# Description of Functions

## 3. The third page

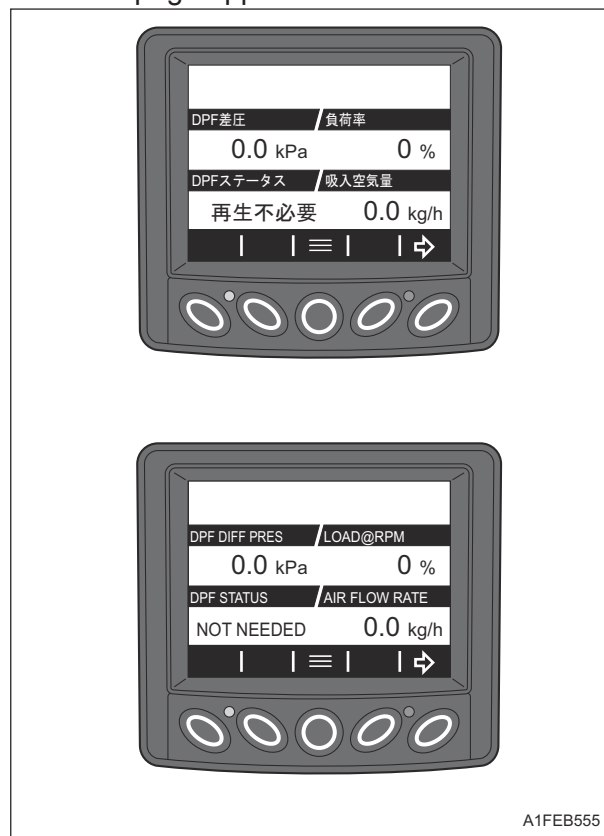


Gauge Screen\_004

## 4. The fourth page

Note:

If "Button 5" is pressed on the fourth page, the first page appears in the screen.



Gauge Screen\_005

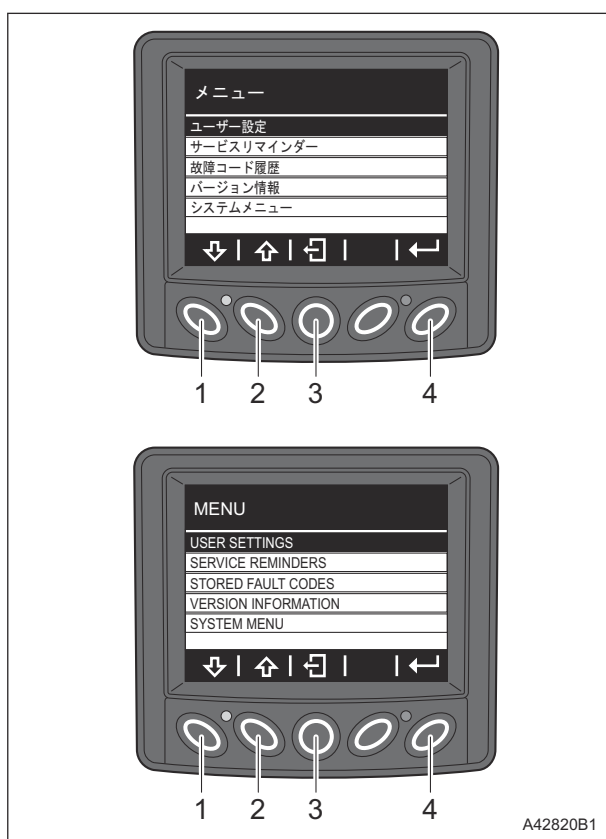
## Menu Screen

MENU screen displays a variety of information like the engine and vehicle status, etc. and the setting menu.

Press your desired button to select an item and move to the screen for checking the information or settings.

- "Button 1" or "Button 2": Select an item.
- "Button 5": Determine the selected item (or the highlighted item).
- "Button 3": Move to GAUGE screen.

# Description of Functions



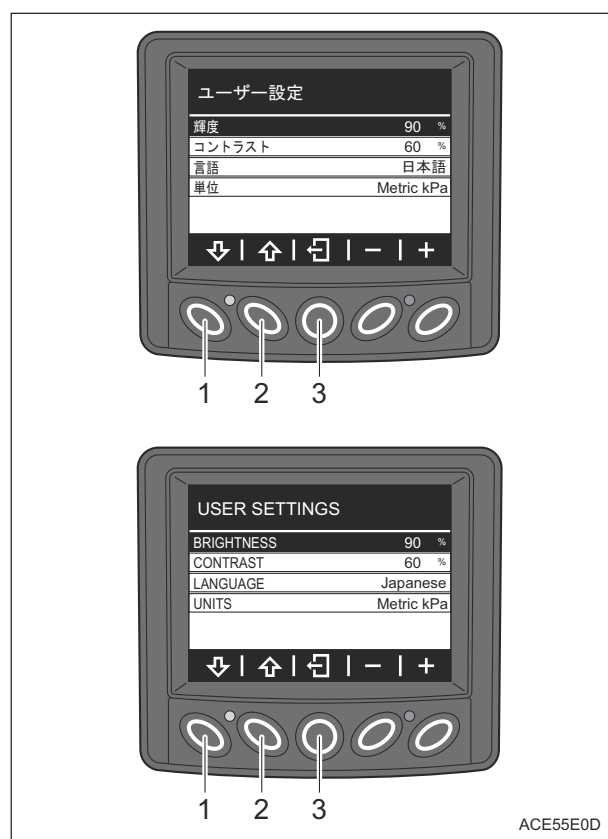
Menu Screen\_001

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 3 |
| 4 | Button 5 |

## User Settings

Press your desired button to select an item and set each item.

- "Button 1" or "Button 2": Select an item to highlight it.
- "Button 3": Move to GAUGE screen.



User Settings\_001

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 3 |

## ■Brightness

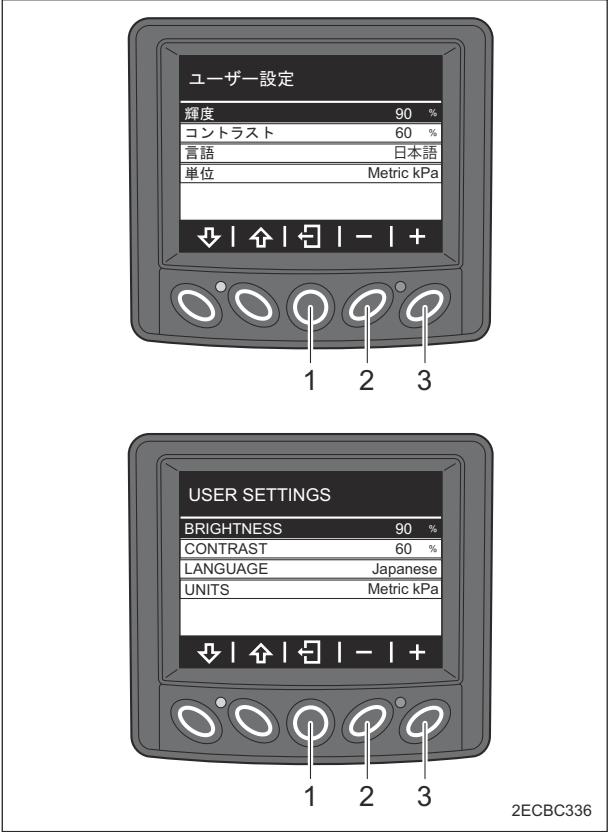
With "BRIGHTNESS", the brightness of the monitor display can be adjusted.

1. In USER SETTINGS screen, select "BRIGHTNESS" to highlight it.
2. "-" and "+" appear in the bottom of the screen.

Press the button 4 of minus sign to decrease the brightness or the button 5 of plus sign to increase it for your desired brightness.

# Description of Functions

3. Press the button 3 to move to MENU screen and save the setting.  
If you turn the ignition key to the "OFF" position before moving to MENU screen, the setting will not be saved.



Brightness\_001

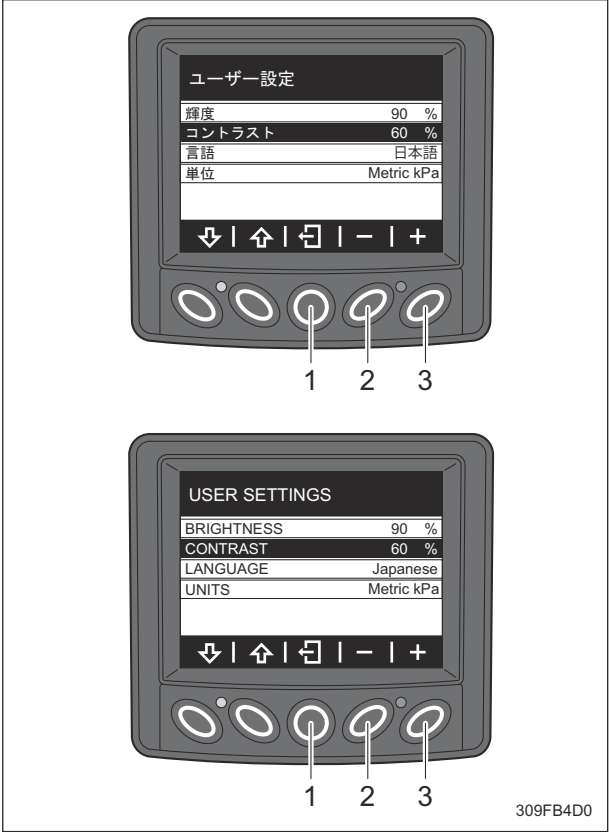
|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 4 |
| 3 | Button 5 |

■Contrast

With "CONTRAST", the contrast of the monitor display can be adjusted.

1. In USER SETTINGS screen, select "CONTRAST" to highlight it.
2. "-" and "+" appear in the bottom of the screen.  
Press the button 4 of minus sign to decrease the contrast or the button 5 of plus sign to increase it for your desired brightness.

3. Press the button 3 to move to MENU screen and save the setting.  
If you turn the ignition key to the "OFF" position before moving to MENU screen, the setting will not be saved.



Contrast\_001

|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 4 |
| 3 | Button 5 |

■Language

With "LANGUAGE", the language used in the monitor display can be set.

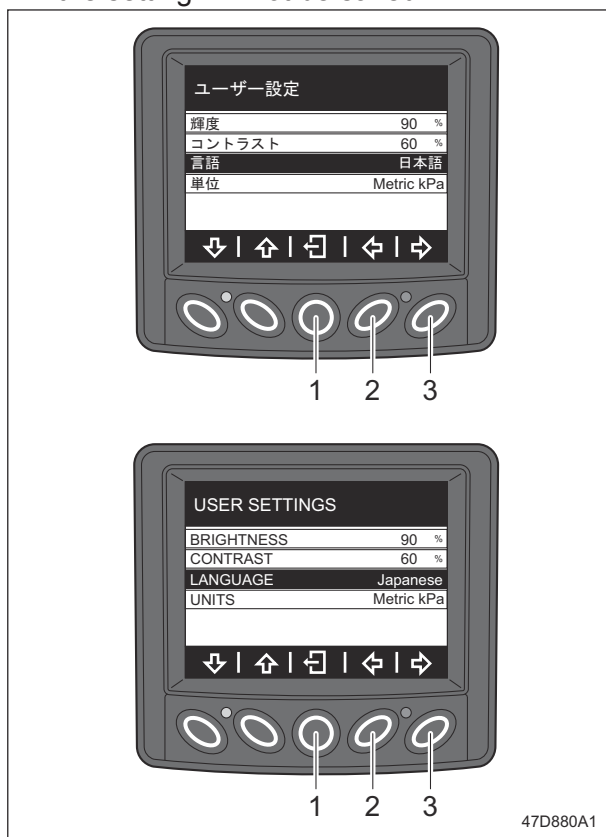
1. In USER SETTINGS screen, select "LANGUAGE" to highlight it.
2. Arrows of "←" and "→" appear in the bottom of the screen.  
Press the button 4 or the button 5 to set your desired language.  
One of the following languages can be set.
  - English
  - Japanese
  - German
  - Spanish
  - Danish
  - Swedish
  - French



# Description of Functions

- Italian
- Portuguese
- Dutch

3. Press the button 3 to move to MENU screen and save the setting.  
If you turn the ignition key to the "OFF" position before moving to MENU screen, the setting will not be saved.



Language\_001

|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 4 |
| 3 | Button 5 |

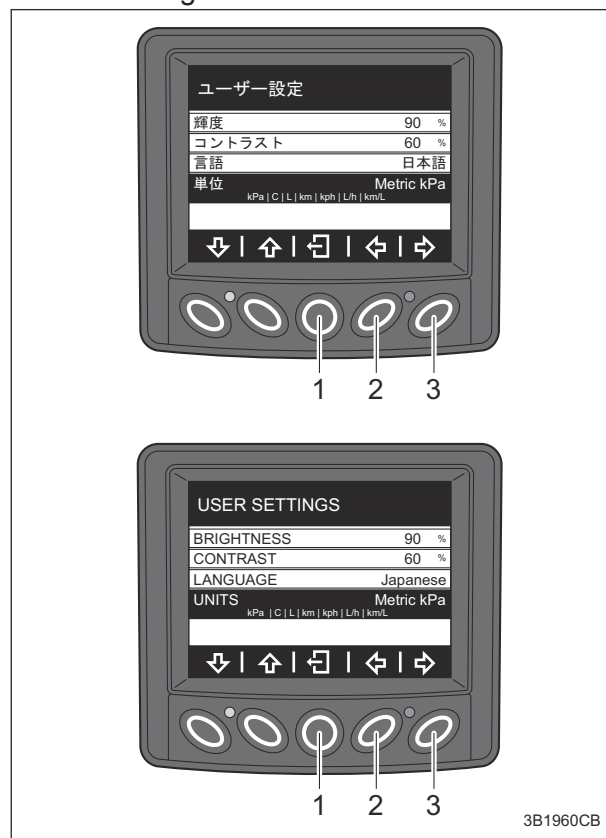
## ■Units

With "UNITS", the units of parameter values can be set.

1. In USER SETTINGS screen, select "UNITS" to highlight it.
2. Arrows of "←" and "→" appear in the bottom of the screen.  
Press the button 4 or the button 5 to set your desired unit.  
The following units can be set.  
The factory default unit is set to the "Metric kPa".

| Item            | Units      |            |        |
|-----------------|------------|------------|--------|
|                 | Metric kPa | Metric BAR | US STD |
| ENGINE SPEED    | rpm        | rpm        | rpm    |
| HOUR METER      | H          | H          | H      |
| COOLANT TEMP    | C          | C          | F      |
| FUEL LEVEL      | %          | %          | %      |
| SOOT%           | %          | %          | %      |
| FUEL RATE       | L/h        | L/h        | gal/h  |
| BATTERY VOLTAGE | V          | V          | V      |
| TOTAL FUEL USED | L          | L          | gal    |
| DOC TEMP        | C          | C          | F      |
| DPF INTAKE TEMP | C          | C          | F      |
| DPF OUTLET TEMP | C          | C          | F      |
| DPF DIFF PRES   | kPa        | bar        | psi    |
| LOAD@RPM        | %          | %          | %      |
| AIR FLOW RATE   | kg/h       | kg/h       | kg/h   |

3. Press the button 3 to move to MENU screen and save the setting.  
If you turn the ignition key to the "OFF" position before moving to MENU screen, the setting will not be saved.



Units\_001

# Description of Functions

---

|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 4 |
| 3 | Button 5 |

## Service Reminders

"SERVICE REMINDERS" functions to notify the operator of the appropriate timing of service for the following items.

- Engine oil: Notification of timely replacement of the engine oil
- Engine oil filter: Notification of timely replacement of the engine oil filter
- Hydraulic oil: Notification of timely replacement of the hydraulic oil
- Hydraulic oil filter: Notification of timely replacement of the hydraulic oil filter
- Air cleaner: Notification of timely replacement of the air cleaner element

The factory default settings are as follows.

These service interval hours are recommended by the manufacturer.

| Machine | Service interval | Engine oil | Engine oil filter | Hydraulic oil | Hydraulic oil filter | Air cleaner |
|---------|------------------|------------|-------------------|---------------|----------------------|-------------|
| LM551B  | Initial          | 50         | 50                | 100           | 100                  | 600         |
|         | Periodical       | 250        | 400               | 500           | 500                  | 600         |
| GM2810A | Initial          | 50         | 50                | 100           | 100                  | 600         |
|         | Periodical       | 400        | 400               | 500           | 500                  | 600         |
| LM3210A | Initial          | 50         | 50                | 100           | 100                  | 600         |
|         | Periodical       | 400        | 400               | 500           | 500                  | 600         |
| LM2710  | Initial          | 50         | 50                | 100           | 100                  | 600         |
|         | Periodical       | 400        | 400               | 500           | 500                  | 600         |
| FS1710  | Initial          | 50         | 50                | 100           | 100                  | 600         |
|         | Periodical       | 400        | 400               | 500           | 500                  | 600         |
| HM5500  | Initial          | 50         | 50                | 100           | 100                  | 300         |
|         | Periodical       | 200        | 400               | 500           | 500                  | 300         |

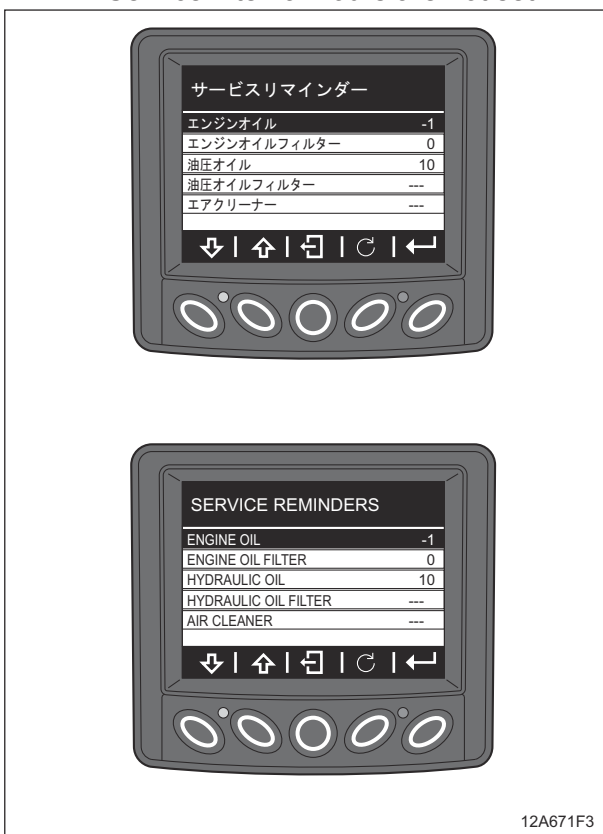
# Description of Functions

The hours calculated based on the expiry of the setup service interval hours appears as a positive or negative number on the right side of the items in "SERVICE REMINDERS".

- Negative number: The elapsed hours from the expiry of the setup service interval hours.
- "0": The setup service interval hours have now expired.
- Positive number: The remaining hours until the expiry of the setup service interval hours.
- "---": Service interval hours are not set.

## Example

- "-1": One hour has elapsed from the expiry of the setup service interval hours.
- "0": The setup service interval hours have now expired.
- "10": Ten hours remain until the expiry of the setup service interval hours.
- "---": Service interval hours are not set.



Service Reminders\_001

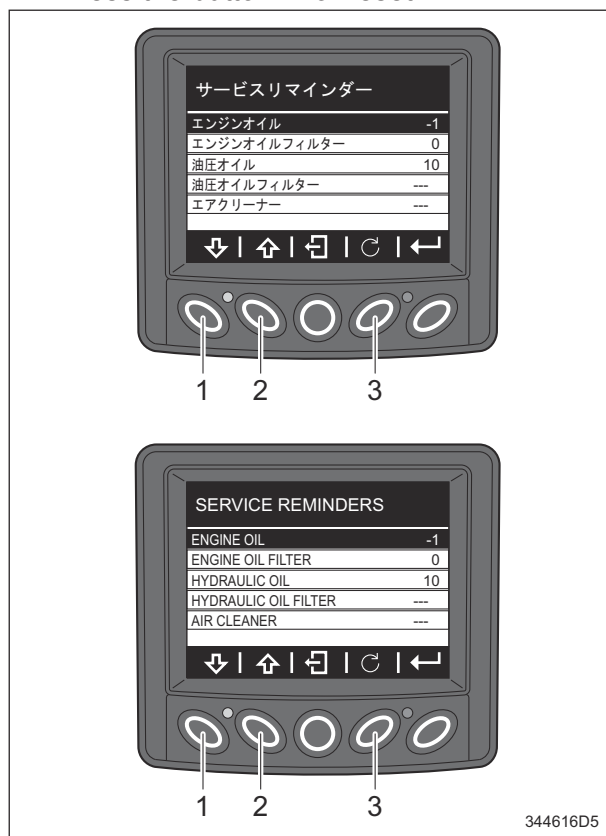
## Service Reminders Reset

With "SERVICE REMINDERS", the displayed hours can be reset.

### Important

The number in the service reminders can not be reset while the engine is running. Switch on the machine (set the ignition key to the "ON" position) after the engine is stopped (set the ignition key to the "OFF" position) when resetting the service reminders.

1. With the button 1 or the button 2, select an arbitrary item to highlight it.
2. Press the button 4 for reset.



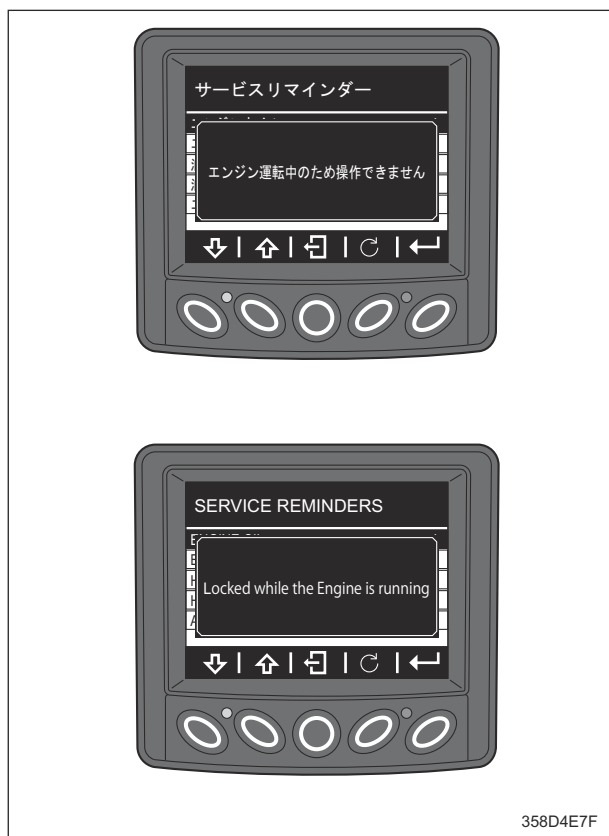
Service Reminders Reset\_001

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 4 |

### Note:

If the button 4 is pressed while the engine running, the following message appears.

## Description of Functions

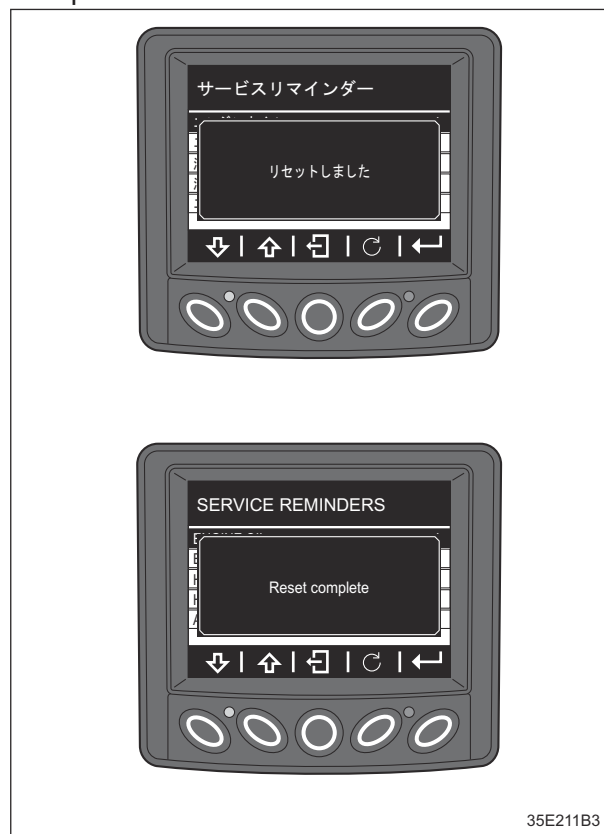


Service Reminders Reset\_002

3. The message "Reset complete" appears when the setting saved.

Note:

Once the displayed number reset, it appears as calculated based on the "periodical service interval hours".

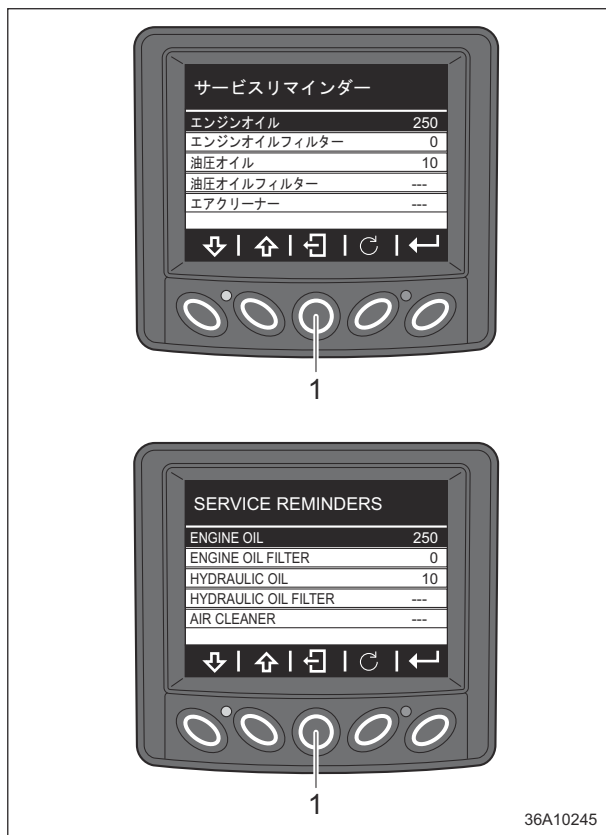


Service Reminders Reset\_003

4. The setup hours appear after the reset completed.

# Description of Functions

5. Press the button 3 to move to MENU screen.



Service Reminders Reset\_004

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

## ■Service Reminders Setting Change

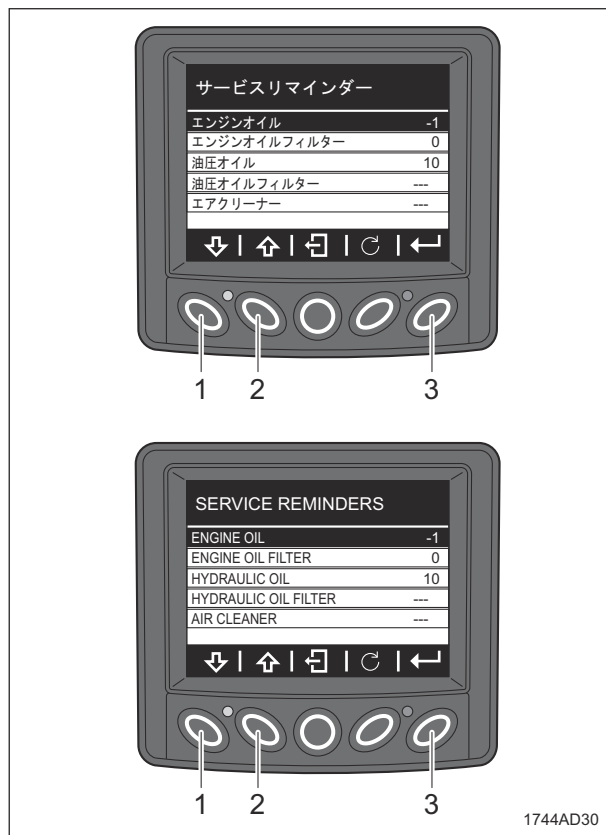
With "SERVICE REMINDERS", the setup service interval hours can be changed into an arbitrary time.

### Important

The setting of the service reminders can not be changed while the engine is running. Switch on the machine (set the ignition key to the "ON" position) after the engine is stopped (set the ignition key to the "OFF" position) when changing the service reminders setting.

1. With the button 1 or the button 2, select an arbitrary item to highlight it.

2. Press the button 5 to move to SERVICE REMINDERS SETTING screen.



Service Reminders Setting Change\_001

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 5 |

3. Change the INTERVAL of the selected item with the button 1 of minus sign or the button 2 of plus sign.

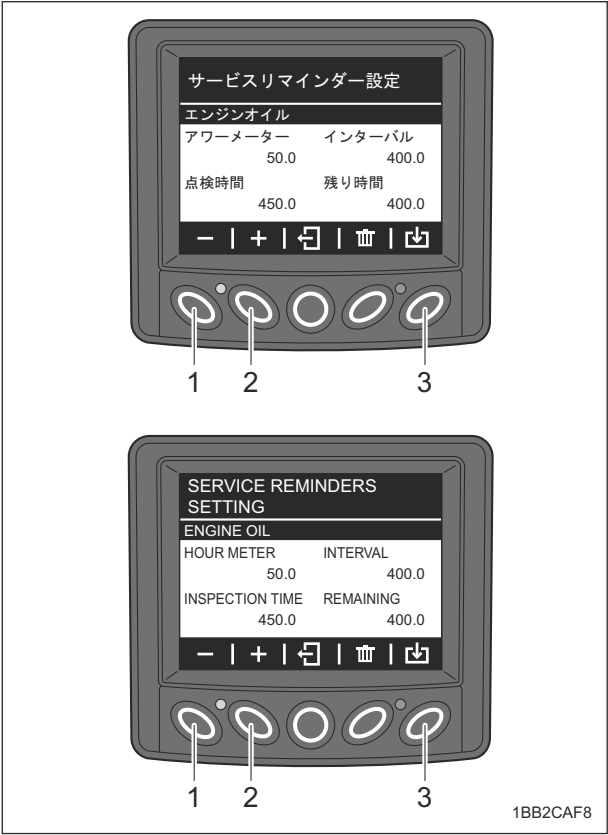
- With one press of the button, the number increases by the hour.
- With long press of the button, the number increases by the ten hours.

Note:

If the INTERVAL set to "0", the service reminders are deleted.

# Description of Functions

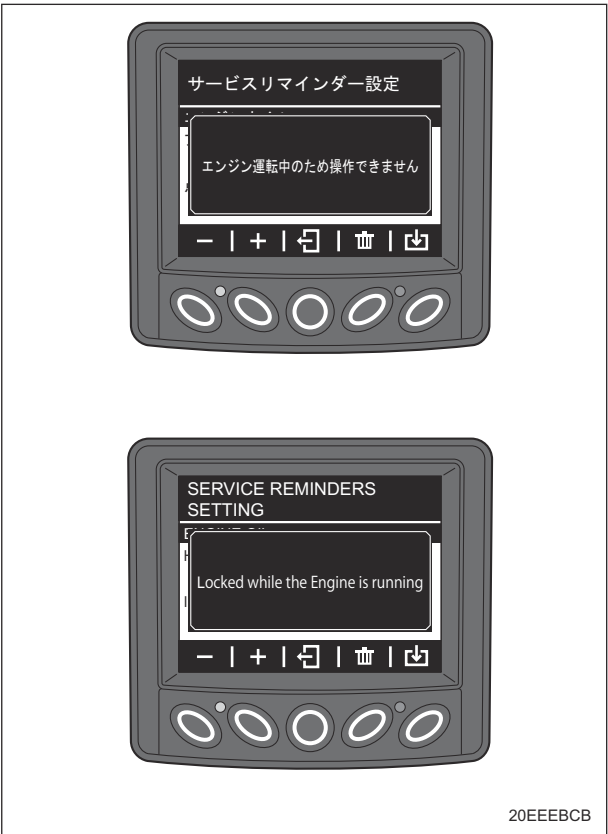
4. Press the button 5 to determine the setup hours.



Service Reminders Setting Change\_002

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 5 |

Note:  
If the button 5 is pressed while the engine running, the following message appears.



Service Reminders Setting Change\_003

5. The message "Configuration saved" appears when the setting saved.

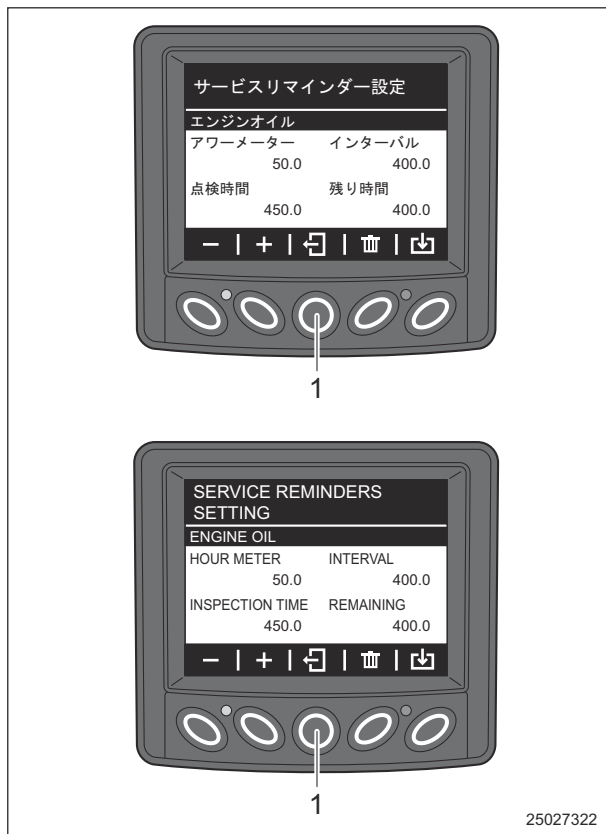


Service Reminders Setting Change\_004

# Description of Functions

6. The interval hours after configuration saved appear in SERVICE REMINDERS SETTING screen.

7. Press the button 3 to move to SERVICE REMINDERS screen.

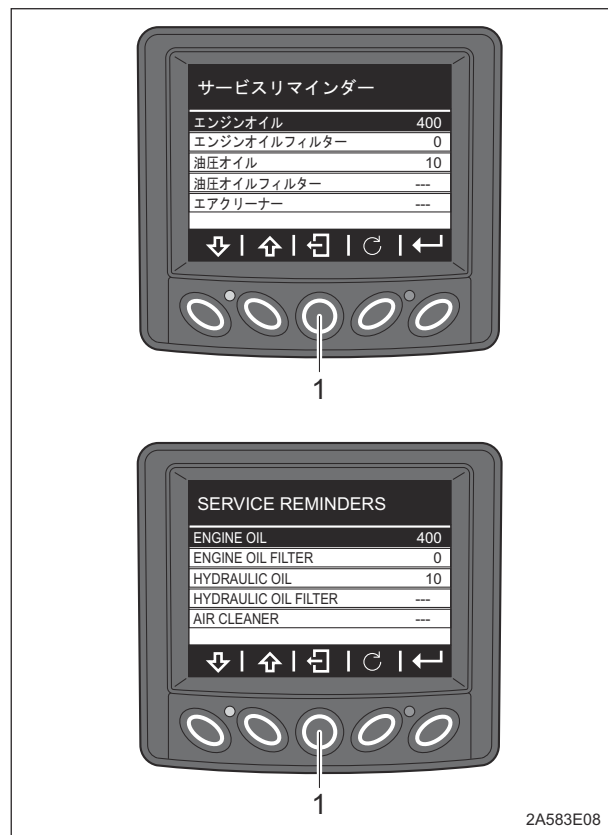


Service Reminders Setting Change\_005

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

8. The displayed hours are changed in SERVICE REMINDERS screen. Make sure that the setup hours are displayed.

9. Press the button 3 to move to MENU screen.



2A583E08

Service Reminders Setting Change\_006

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

## ■Service Reminders Setting Deletion

With "SERVICE REMINDERS", the setup hours can be deleted.

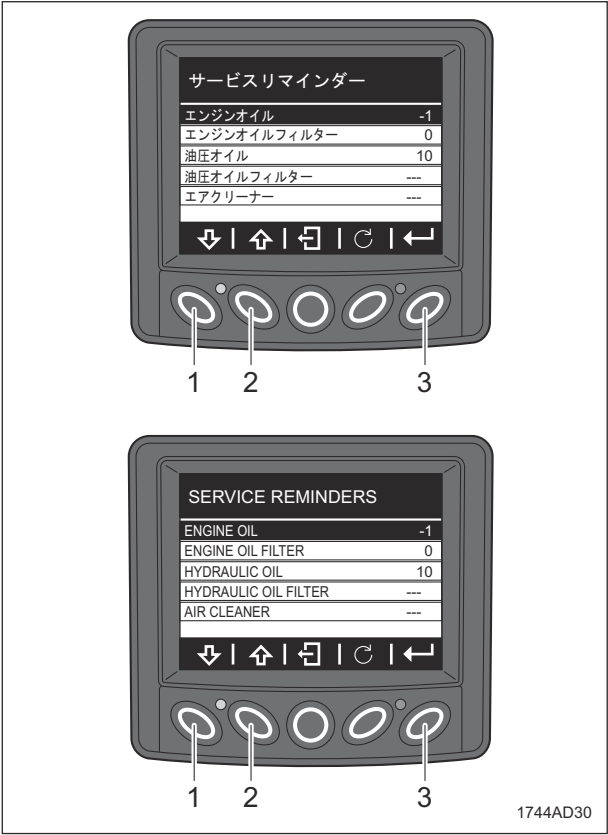
### Important

The setting of the service reminders can not be changed while the engine is running. Switch on the machine (set the ignition key to the "ON" position) after the engine is stopped (set the ignition key to the "OFF" position) when changing the service reminders setting.

1. With the button 1 or the button 2, select an arbitrary item to highlight it.

# Description of Functions

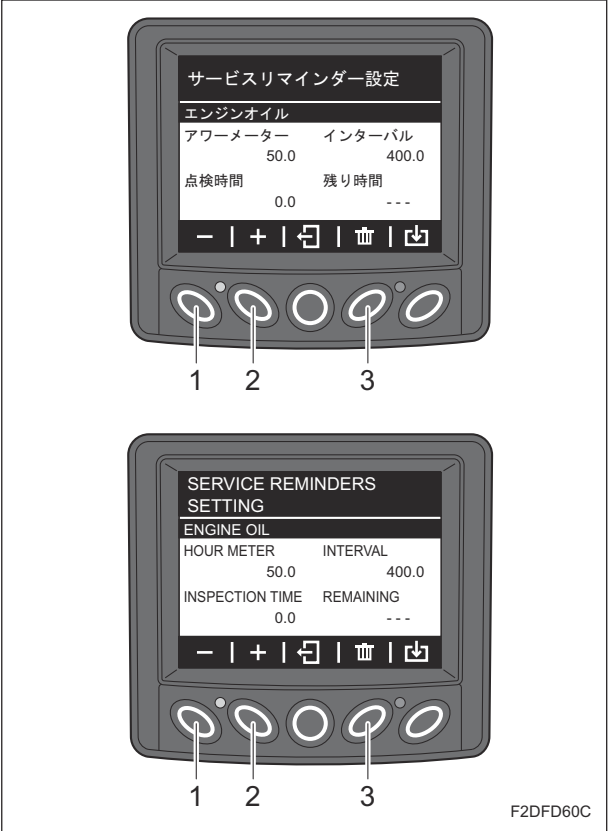
2. Press the button 5 to move to SERVICE REMINDERS SETTING screen.



Service Reminders Setting Deletion\_001

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 5 |

3. Press the button 4 to delete the settings.



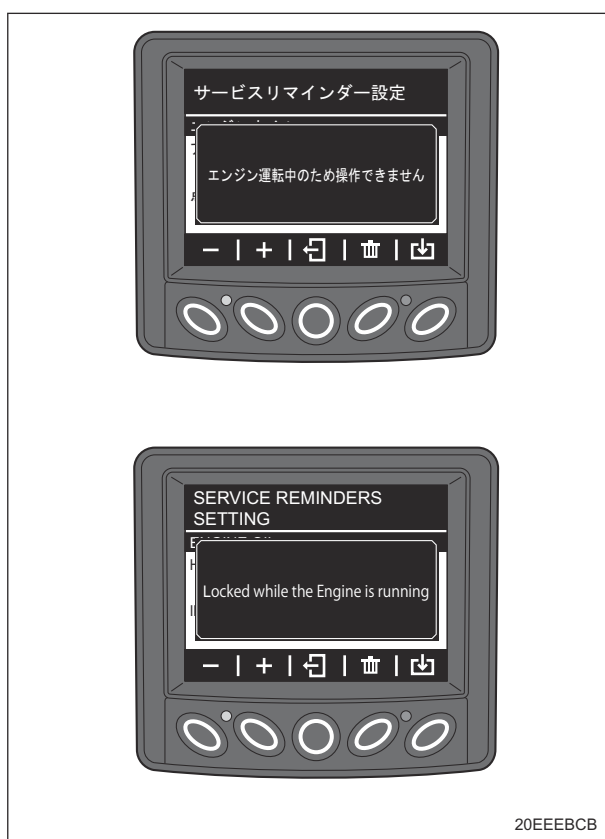
Service Reminders Setting Deletion\_002

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 4 |

Note:  
If the button 4 is pressed while the engine running, the following message appears.



# Description of Functions



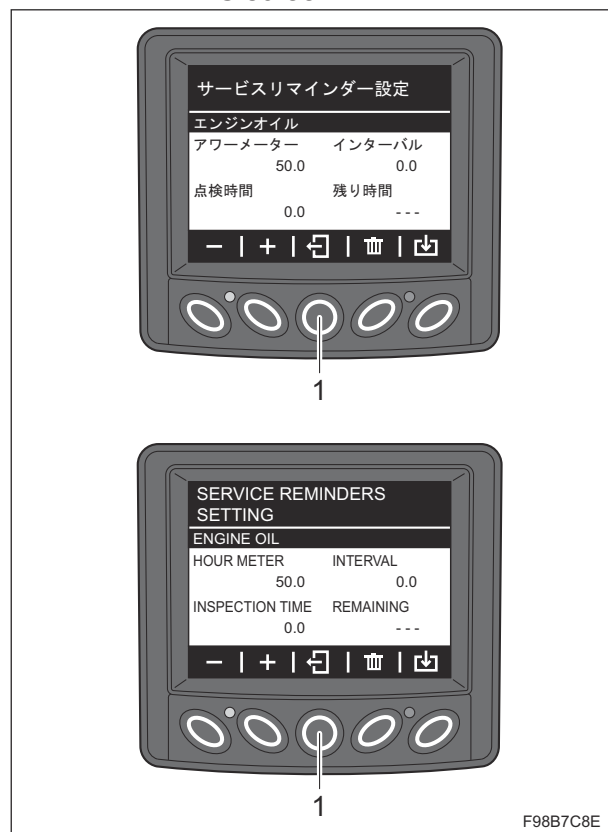
Service Reminders Setting Deletion\_003

4. The message "Deletion complete" appears when the setting saved.



Service Reminders Setting Deletion\_004

5. The interval hour "0.0" appears after deletion complete in SERVICE REMINDERS SETTING screen.  
6. Press the button 3 to move to SERVICE REMINDERS screen.



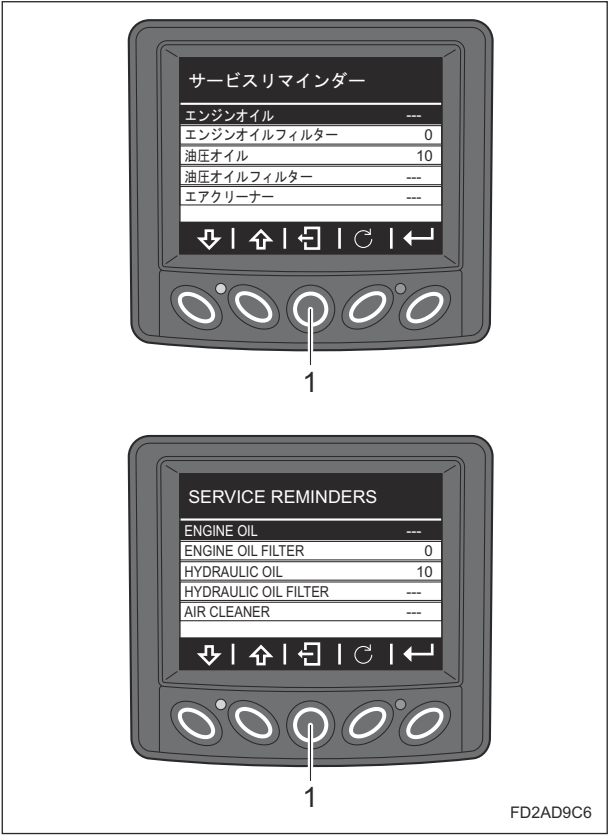
Service Reminders Setting Deletion\_005

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

7. The hours in SERVICE REMINDERS screen are changed.  
Make sure that "---" appears instead of hours.

# Description of Functions

8. Press the button 3 to move to MENU screen.



FD2AD9C6

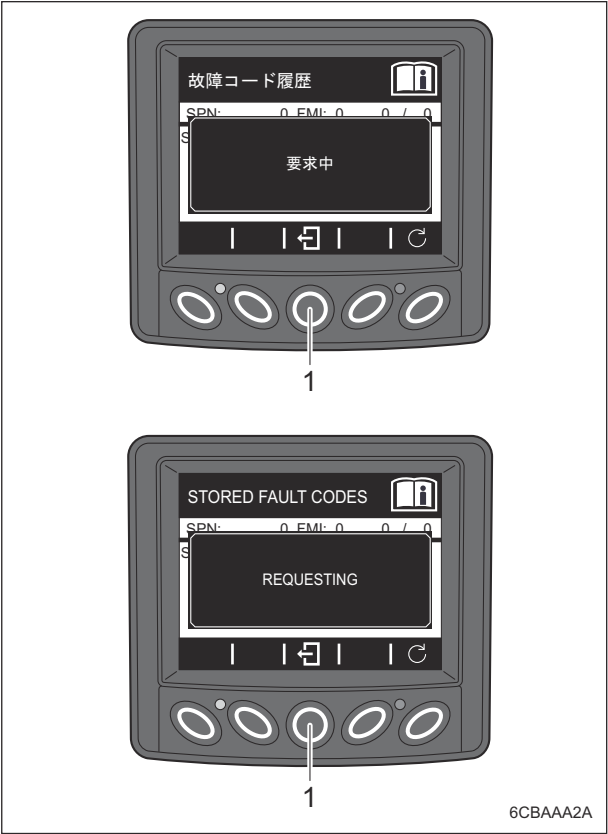
Service Reminders Setting Deletion\_006

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

## Stored Fault Codes

With "STORED FAULT CODES", the past fault codes can be checked.

1. Once "STORED FAULT CODES" is selected, the monitor automatically requests the engine ECU to send the stored fault codes while "REQUESTING" message appears.



6CBAAA2A

Stored Fault Codes\_001

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

# Description of Functions

2. The monitor receives the stored fault codes while "RECEIVING" message appears.



Stored Fault Codes\_002

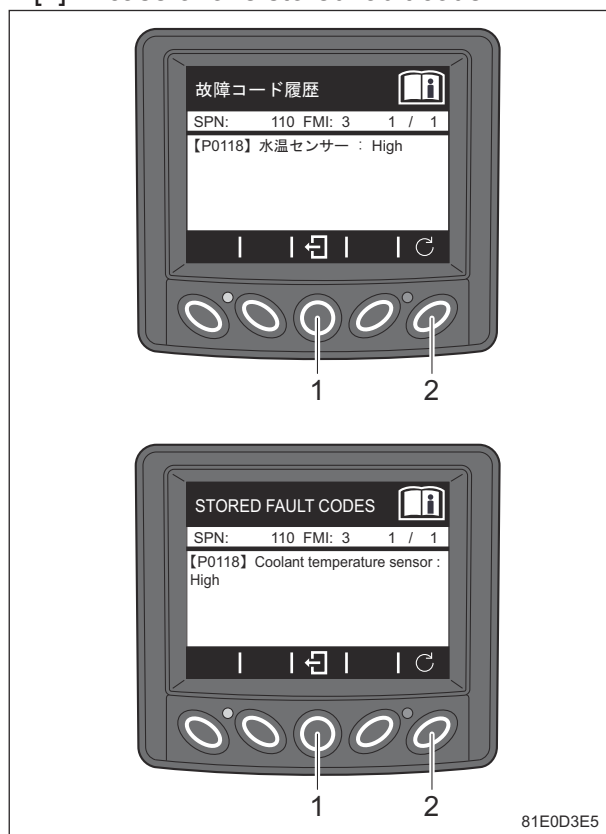
|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

3. The stored fault codes appear after the reception completed.

Note:

Press "Button 5" if you would like to receive "STORED FAULT CODES" again.

[1] In case of one stored fault code

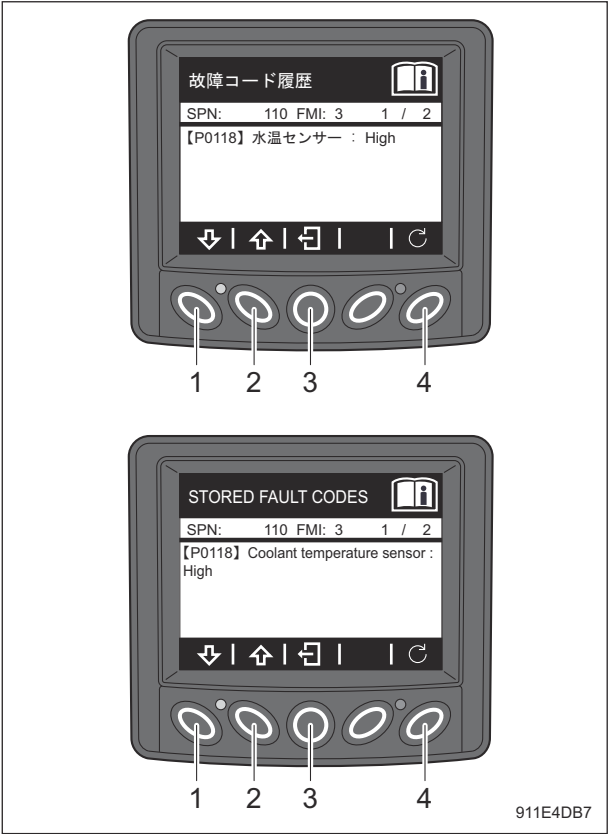


Stored Fault Codes\_003

|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 5 |

# Description of Functions

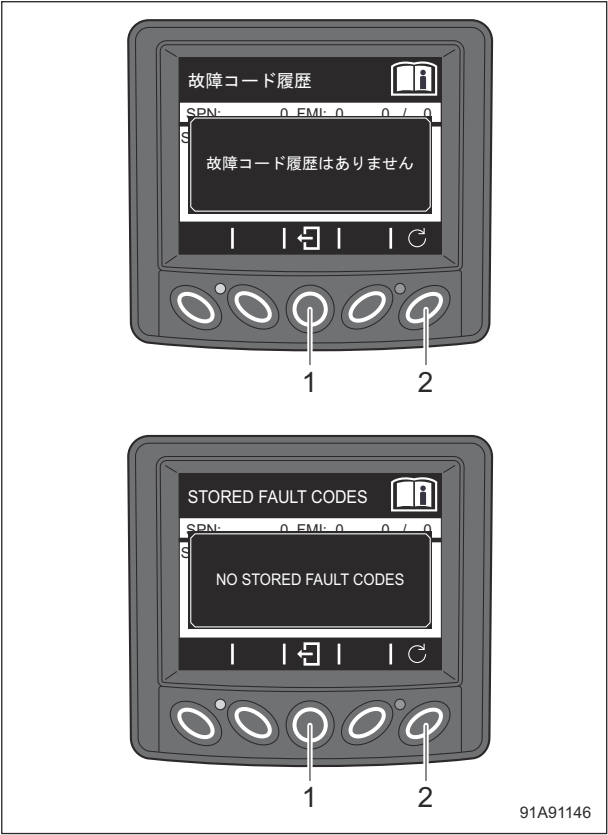
[2] In case of plural stored fault code  
The arrows of "↓" and "↑" appear in the bottom of the monitor display.  
Press "Button 1" or "Button 2" for checking the stored fault codes.



Stored Fault Codes\_004

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 3 |
| 4 | Button 5 |

[3] In case of no stored fault code  
"NO STORED FAULT CODES" appears.



Stored Fault Codes\_005

|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 5 |

4. Press "Button 3" to move to MENU screen.

## Version Information

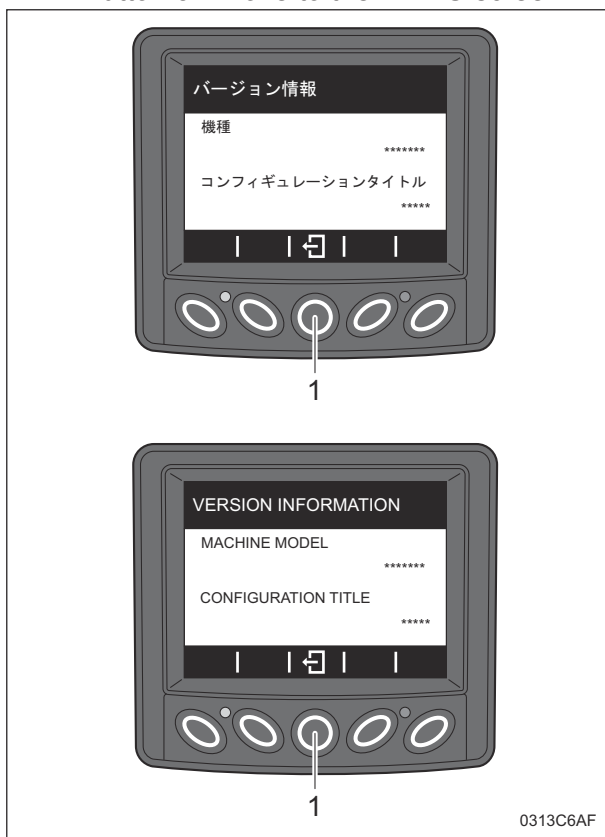
With "VERSION INFORMATION", the following information can be confirmed.

- 1. Selected "MACHINE MODEL"

# Description of Functions

## 2. Installed "CONFIGURATION TITLE"

- "Button 3": Move to the MENU screen.



0313C6AF

Version Information\_001

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

## System Menu

"SYSTEM MENU" is used when the manufacturer specifies factory default settings or when the dealer reconfigures.

### Important

No adjustments by the operator are necessary.

## Descriptions of Displayed Icons

1. The following icons appear in the GAUGE screen.

### [1] Cleaning index icon

The icon appears when the cleaning index is 50 %, 75 % or 100 %. The number in the icon changes depending on the index. The icon appears only for the machine mounted with EU Stage V engine.



A8221147

Descriptions of Displayed Icons\_001

### [2] Service icon

The icon appears when the deadline expires on a service reminder.

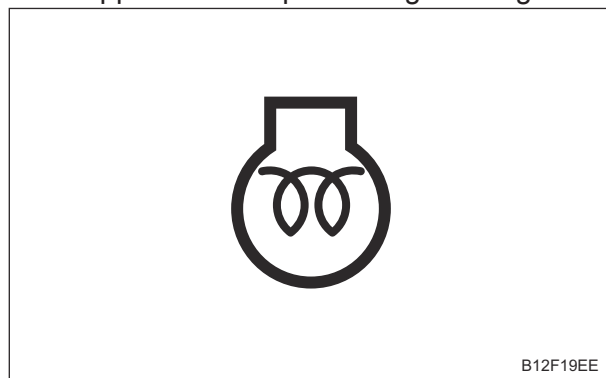


AA4C87E8

Descriptions of Displayed Icons\_002

### [3] Preheat icon

The icon appears when preheating the engine. It appears with a preheating message.



B12F19EE

Descriptions of Displayed Icons\_003

# Description of Functions

## [4] Refuel icon

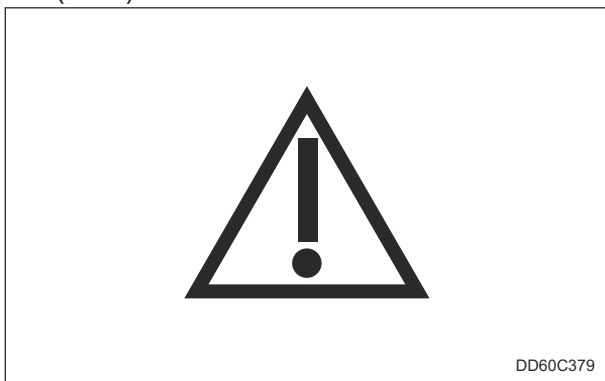
The icon appears and blinks when the remaining fuel decreases to less than 10 %.



Descriptions of Displayed Icons\_004

## [5] Warning icon

The icon appears when the fault code (DTC) advised.



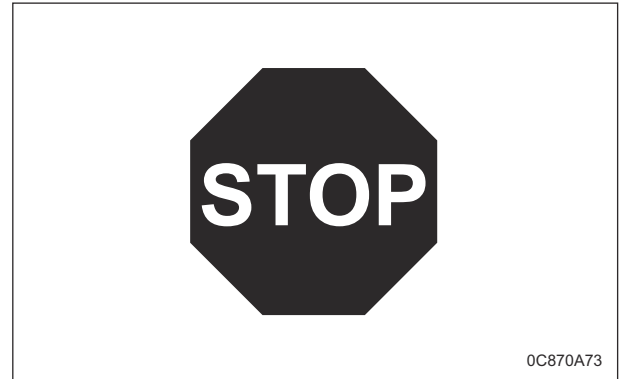
Descriptions of Displayed Icons\_005

## [6] STOP icon

The icon appears when the fault code (DTC) including engine stop advised.

- Lighting: The engine is forcibly stopped with the engine ECU processing.
- Fast blinking (Repeat of lighting up and off every 0.1 seconds): It recommends the operator to stop the engine.

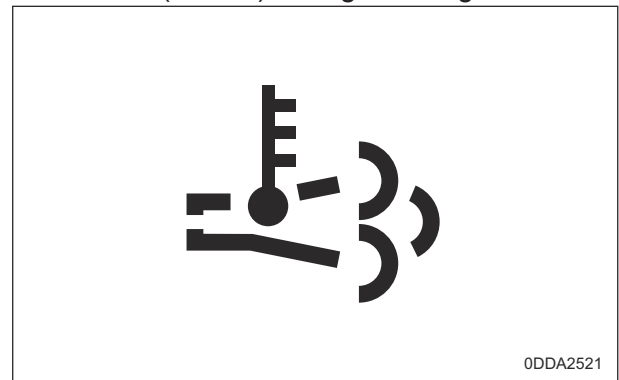
- Slow blinking (Repeat of lighting up and off every 2 seconds): The engine may be stopped in the end due to decreasing power output, etc.



Descriptions of Displayed Icons\_006

## [7] High exhaust temperature icon

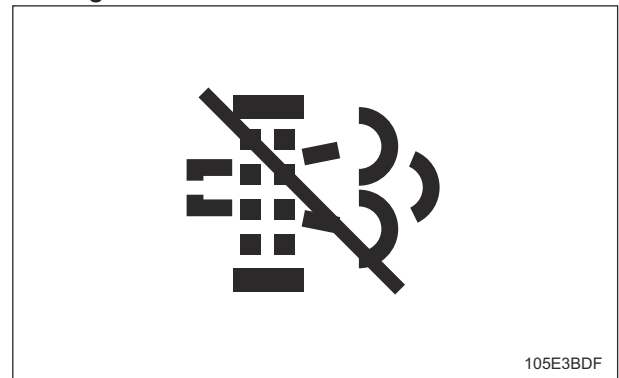
The high exhaust temperature icon lights up when the exhaust temperature reaches 450 °C (842 °F) during DPF regeneration.



Descriptions of Displayed Icons\_007

## [8] DPF auto regeneration inhibit icon

The DPF auto regeneration inhibit icon lights up when the DPF auto regeneration inhibit switch is set to the "Auto regeneration inhibit mode".



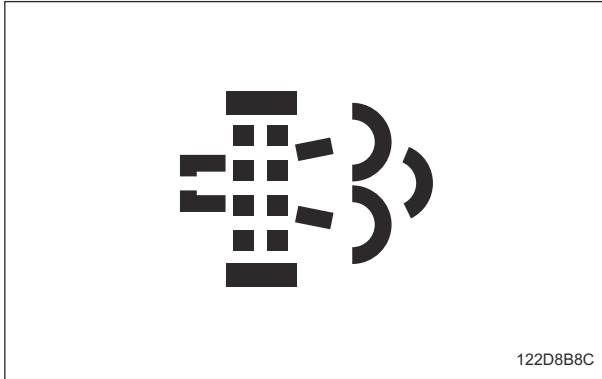
Descriptions of Displayed Icons\_008

# Description of Functions

## [9] DPF regeneration icon

The DPF regeneration icon appears with DPF regeneration request or during DPF regeneration.

- Blinking: Requesting DPF regeneration
- Lighting: Performing DPF regeneration



Descriptions of Displayed Icons\_009

## 2. The following icon appears in the message screens except the GAUGE screen.

### [1] Consulting manual icon

Consult the owner's operating manual.



Descriptions of Displayed Icons\_010

## Descriptions of Pop-up Messages

These pop-up messages appear in the monitor display.

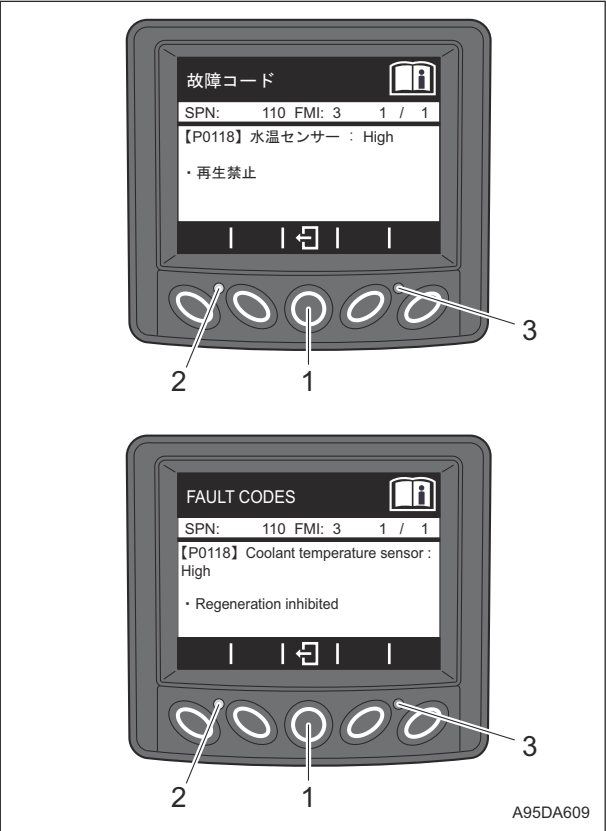
- FAULT CODES
- SERVICE REMINDERS
- DPF CLEANING ALARM

### Fault Codes

#### Important

When the fault code (DTC) appears in the monitor display, contact your dealer.

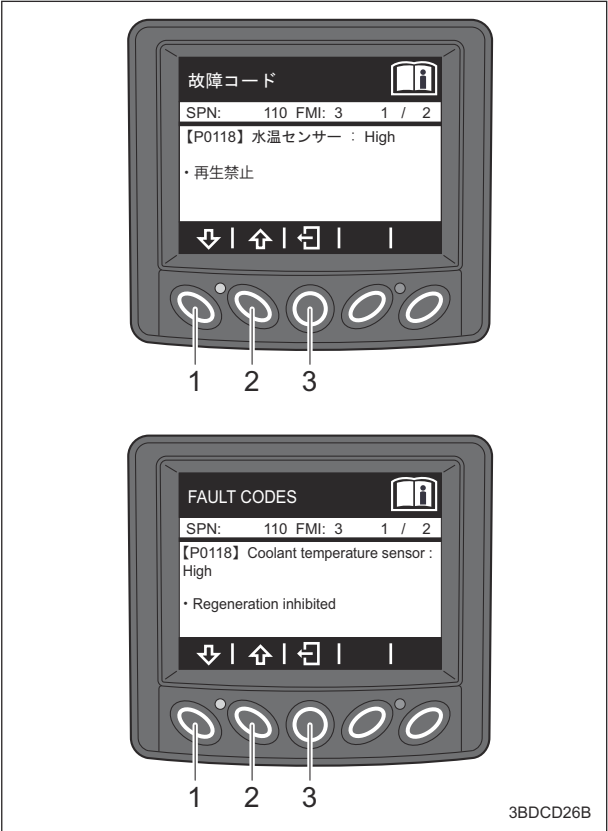
1. A fault code (DTC) appears in the monitor display and the red or yellow LED lights up when a failure occurs on the function of engine.
  - These are the pop-up messages and display examples in brackets.
- [1] SPN: (110)
- [2] FMI: (3)
- [3] Page number of the displayed fault code/  
Total number of pages of fault codes for the current failures: (1/1)
- [4] P-code and fault code name: (【P0118】  
Coolant temperature sensor: High)
- [5] Limitation of the engine ECU and recommended action: (Regeneration inhibited)



Fault Codes\_001

|   |            |
|---|------------|
| 1 | Button 3   |
| 2 | Yellow LED |
| 3 | Red LED    |

**Note 1:**  
Each fault code is displayed in one page.  
When the total number of the fault codes appearance is two or more, the arrows "↓" and "↑" appear in the bottom left of the monitor screen.  
You can move to another page with pressing Button 1 or 2 for checking all of the current fault codes.



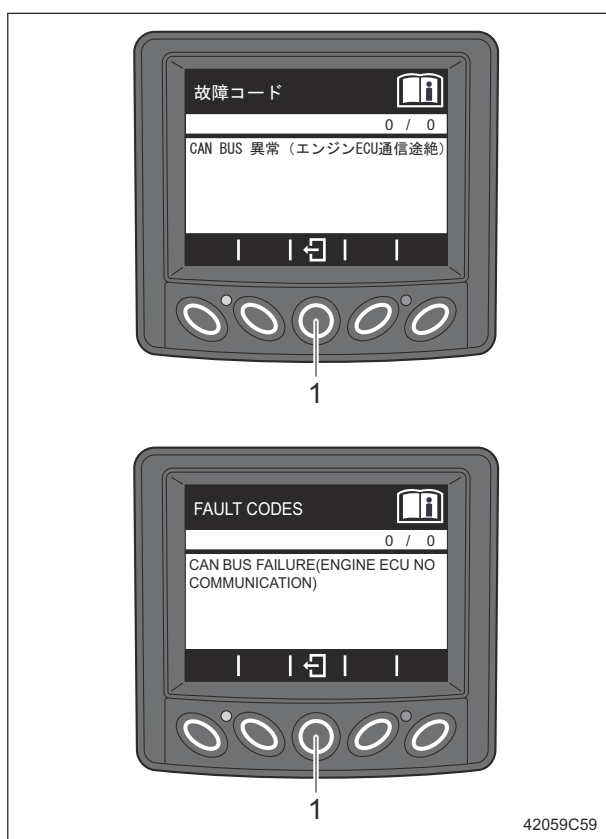
Fault Codes\_002

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 2 |
| 3 | Button 3 |

**Note 2:**  
When the monitor is out of communication with the engine ECU, the message "CAN BUS FAILURE (ENGINE ECU NO COMMUNICATION)" appears.  
Possible causes are "Engine ECU is switched off" or "CAN line is disconnected", etc.



# Description of Functions



Fault Codes\_003

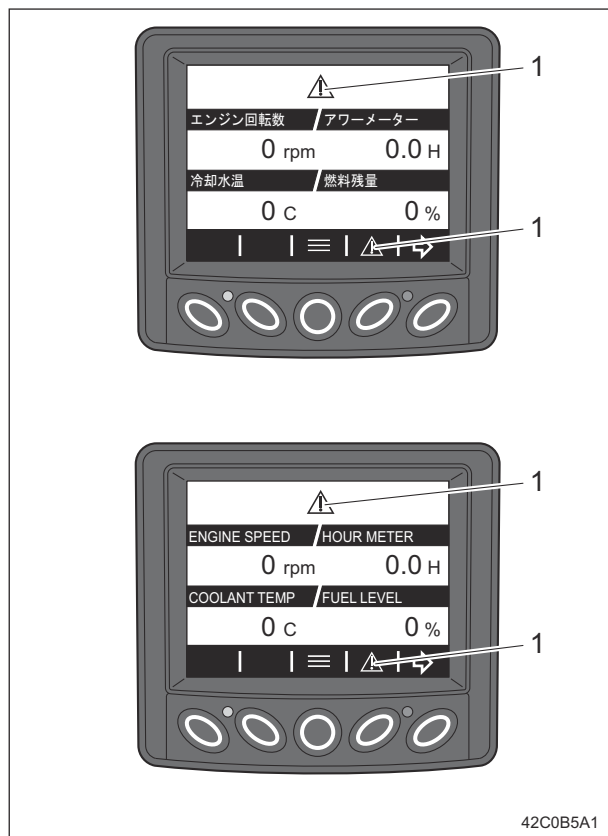
|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

2. Follow the instruction from "Recovery from error" of "List of Fault Codes."

## Important

When "FAULT CODES" and "SERVICE REMINDERS" are advised at the same time, "SERVICE REMINDERS" appears with pressing "Button 3".

3. When the fault code (DTC) appears, move to GAUGE screen with pressing "Button 3". Warning icons appear in the GAUGE screen.



Fault Codes\_004

|   |              |
|---|--------------|
| 1 | Warning icon |
|---|--------------|

4. Turn the ignition key to the "OFF" position.  
5. If the cause of the fault code (DTC) has been resolved, the warning icon disappears when the ignition key is set to the "ON" position again.

Service Reminders

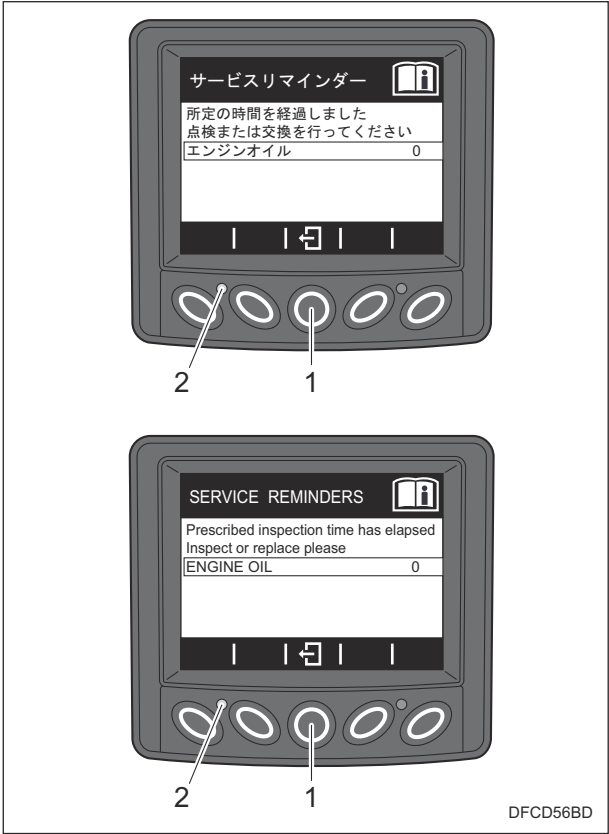
Important

When the service reminder advised, immediately perform inspection or replacement.

Important

When "SERVICE REMINDERS" and "FAULT CODES" or "DPF CLEANING ALARM" are advised at the same time, "SERVICE REMINDERS" appears with pressing "Button 3".

1. When the setup time in SERVICE REMINDERS has elapsed, the pop-up message appears in the monitor display and the yellow LED lights up.



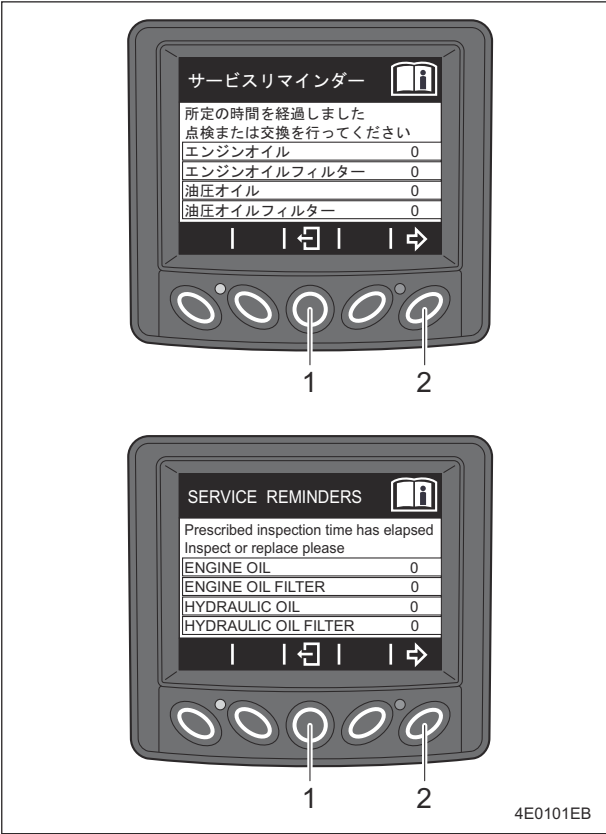
Service Reminders\_001

|   |            |
|---|------------|
| 1 | Button 3   |
| 2 | Yellow LED |

Note:  
All of the items of the appropriate service reminders appear when two or more of service reminders should be advised.

When five items should be advised for example, they appear in two pages. In that case, the arrows "←" and "→" appear in the bottom of the monitor display. You can move to another page with pressing "Button 1" or "Button 5" to check all of the advised items.

・ The first page

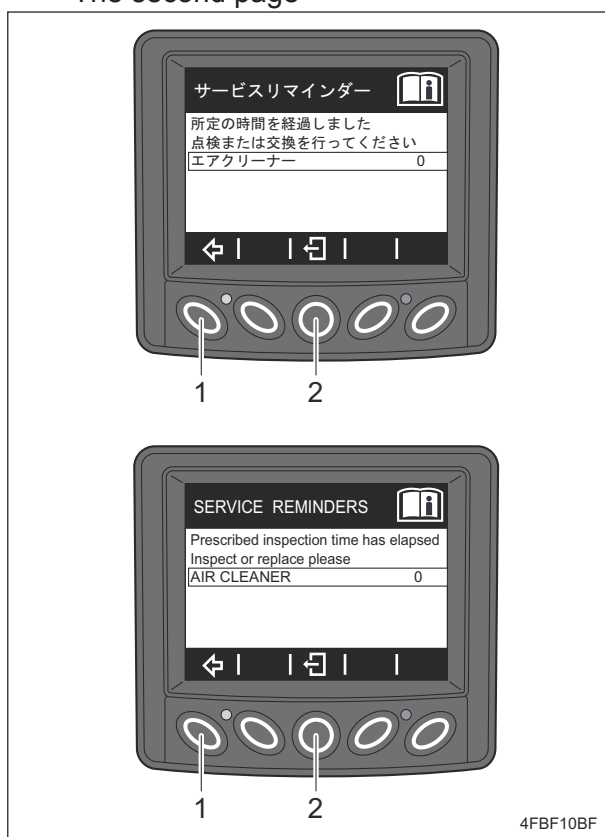


Service Reminders\_002

|   |          |
|---|----------|
| 1 | Button 3 |
| 2 | Button 5 |

# Description of Functions

## ・ The second page

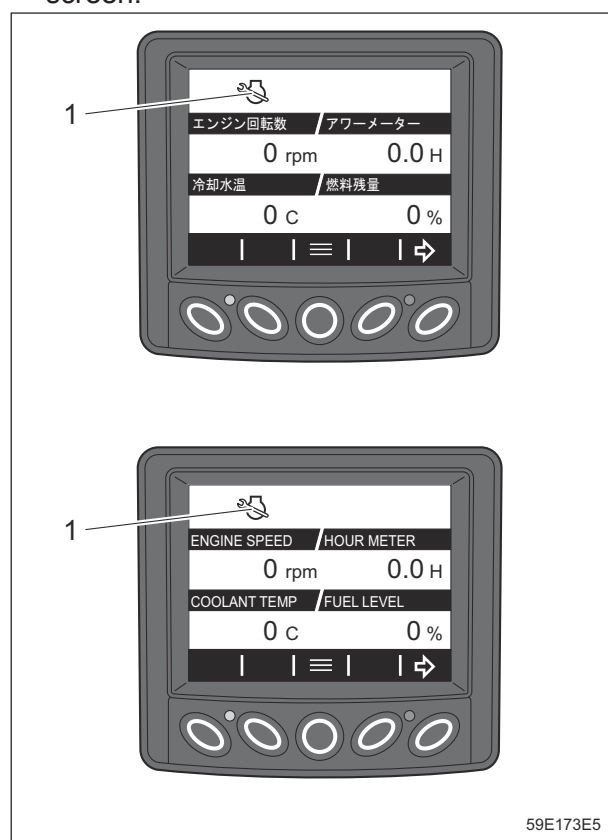


Service Reminders\_003

|   |          |
|---|----------|
| 1 | Button 1 |
| 2 | Button 3 |

2. Inspect or replace on the advised item of SERVICE REMINDERS.

3. Move to GAUGE screen with pressing "Button 3" when the message displayed. The service icon appears in GAUGE screen.



Service Reminders\_004

|   |              |
|---|--------------|
| 1 | Service icon |
|---|--------------|

4. The pop-up message and the service icon will disappear if resetting the service reminder or changing the setup time.

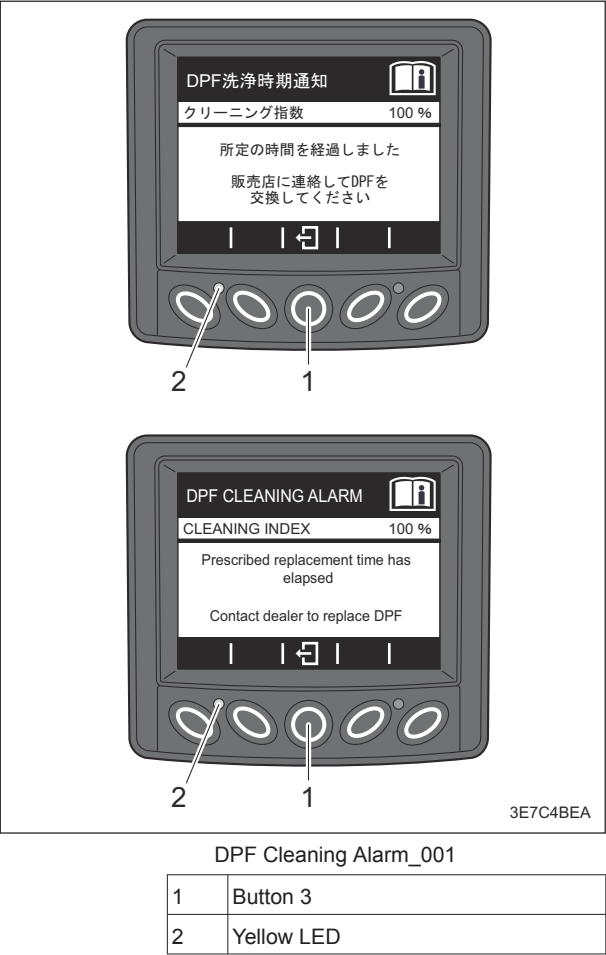
DPF Cleaning Alarm

Note:  
This function is appropriate only for the machine mounted with EU Stage V engine.

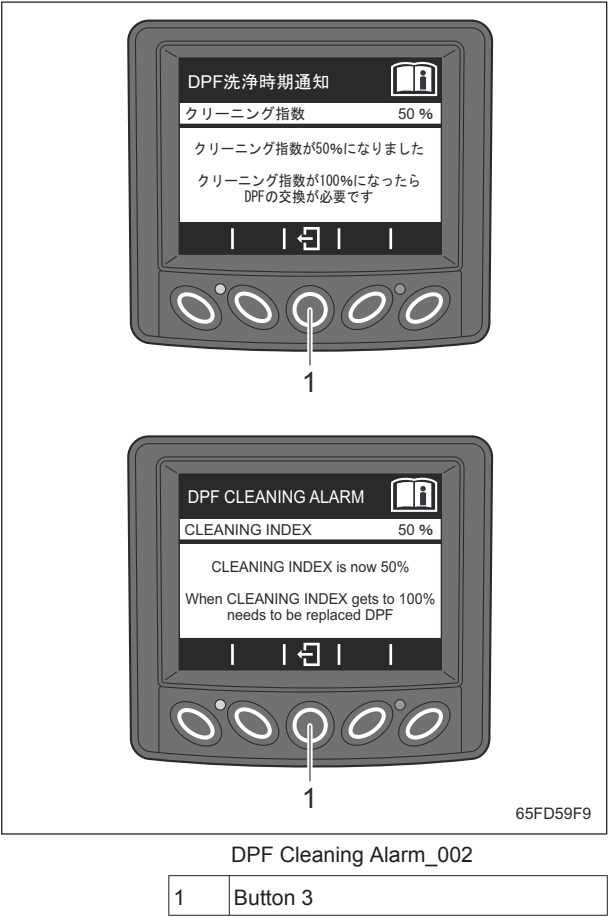
Important

When DPF CLEANING ALARM appears, contact your dealer.

1. When the prescribed time of Ash Timer has elapsed, the pop-up message appears in the monitor display and the yellow LED lights up.
- [1] When the prescribed time of Ash Timer has elapsed



- [2] When the prescribed time of Ash Timer has not elapsed yet and the cleaning index is 50 % or more
- Cleaning index 50 %



# Description of Functions

## ・ Cleaning index 75 %



DPF Cleaning Alarm\_003

|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

## ・ Cleaning index 100 %



DPF Cleaning Alarm\_004

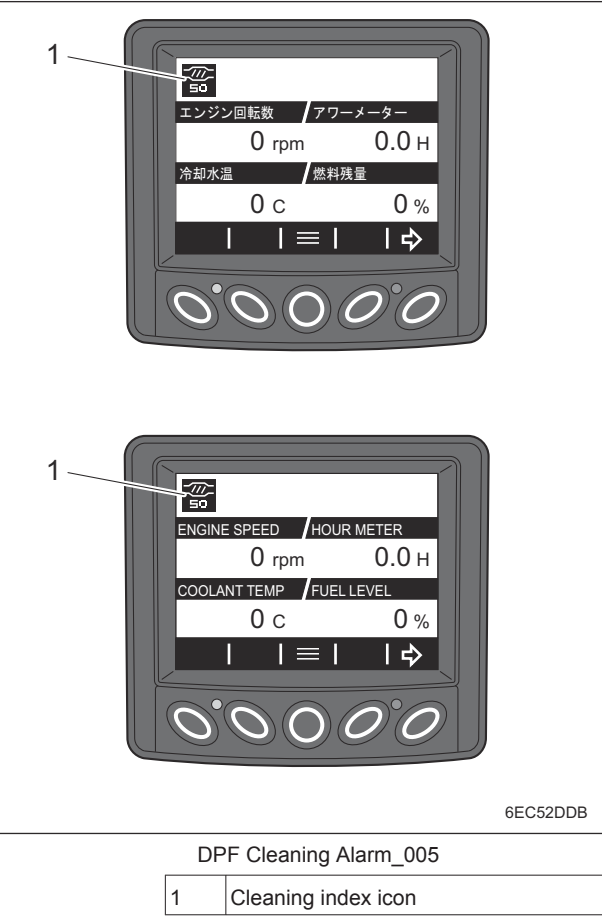
|   |          |
|---|----------|
| 1 | Button 3 |
|---|----------|

# Description of Functions

Important

When "DPF CLEANING ALARM" and "SERVICE REMINDERS" are advised at the same time, "SERVICE REMINDERS" appears with pressing "Button 3".

- 2. Move to GAUGE screen with pressing "Button 3" when the message displayed. The cleaning index icon appears in GAUGE screen.



- 3. Replace DPF.
- 4. The pop-up message and the cleaning index icon will disappear if resetting Ash Timer with the Diagmaster after replacing DPF.

## Engine

### Handling Emission Control Compliant Engine

Important

When performing maintenance or repairs on this engine, only use dedicated replacement parts specified in the relevant Kubota "Illustrated Parts List," and only perform the maintenance work described in the Kubota "Operator's Manual", " Workshop Manual" or "Diagnosis Manual."

Using incorrect replacement parts or parts that comply with different levels of emission control may result in incompliance with emission control as follows.

The engine installed in this vehicle meets emission control as follows for "non-road emission regulation."

○: Compliant  
×: Incompliant  
—: Not applicable

|                          |             | Tier 4<br>emission<br>control | EU Stage<br>III B | EU Stage<br>V | US EPA<br>Tier4 |
|--------------------------|-------------|-------------------------------|-------------------|---------------|-----------------|
| LM                       | LM2710      | ○                             | -                 | x             | ○               |
|                          | LM3210      | ○                             | ○                 | x             | ○               |
|                          | LM3210<br>A | ○                             | -                 | ○             | ○               |
|                          | LM551A      | ○                             | -                 | x             | ○               |
|                          | LM551B      | ○                             | -                 | ○             | ○               |
| GM                       | GM2810      | ○                             | ○                 | x             | ○               |
|                          | GM2810<br>A | ○                             | -                 | ○             | ○               |
| Machines for maintenance | FS1710      | ○                             | -                 | x             | x               |
| U                        | HM5500      | ○                             | -                 | x             | x               |
|                          | ULM270      | ○                             | -                 | x             | x               |
|                          | ULM271      | ○                             | -                 | x             | x               |
|                          | ULM272      | ○                             | -                 | x             | x               |

# Description of Functions

## DPF

### Precautions for DPF

#### Danger

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

#### Caution

Normally, set to "Auto regeneration mode". Accordingly, DPF auto regeneration inhibit icon disappears. However, when operating in a location where fires may occur, set to "Auto regeneration inhibit mode".

#### Caution

Do not use "DPF auto regeneration inhibit switch" or "DPF parked regeneration switch" during back lapping.

#### Important

When the system enters the level where DPF regeneration is required, perform the regeneration immediately. Interrupting the regeneration or ignoring the warning may cause the engine and DPF to malfunction.

#### Important

Do not repeat unnecessary DPF regeneration or interrupting regeneration. If repeating them, the measured level of engine oil may increase since the engine oil is mixed with a slight amount of fuel, accompanied by quality degradation.

#### Important

Perform DPF regeneration when the engine sufficiently warmed up.

### DPF Regeneration and Replacement

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.

DPF regeneration is to burn the PM (soot) which the DPF collects at high temperature of exhaust with the engine ECU controlling intake air mass and fuel injection.

In case that the PM or ash accumulates excessively in the DPF, the DPF is not allowed to be regenerated, but required to be replaced.

#### ■Conditions for DPF Regeneration

#### Important

If DPF regeneration is interrupted before it is completed, the next regeneration may be requested soon since not all of the PM (soot) was removed.

#### Important

DPF regeneration is interrupted when any condition of regeneration is not met during DPF regeneration or when the ignition key is turned to the "OFF" position.

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 "Auto regeneration mode". Accordingly, DPF auto regeneration inhibit icon disappears.
- The coolant temperature is 55 °C (131 °F) or more.

## Description of Functions

---

2. DPF parked regeneration and manual regeneration do not begin unless all of the following five conditions are met.

- The DPF auto regeneration inhibit switch is set to the "Auto regeneration mode". Accordingly, DPF auto regeneration inhibit icon disappears.
- The parking brake is applied.
- The traveling pedal is in the neutral position.
- The engine rotation speed is minimum or idling speed.
- The coolant temperature is 55 °C (131 °F) or more.

### ■PM Accumulation Level

The following table shows the regeneration method and the machine status in each PM accumulation level.

| PM accumulation level | DPF regeneration method | Displayed fault code | Monitor LED  | Engine output limit |
|-----------------------|-------------------------|----------------------|--------------|---------------------|
| Level 0               | Not required            | No fault code        | No light     | No limit            |
| Level 1               | Auto/Parked             | No fault code        | No light     | No limit            |
| Level 2               | Auto/Parked             | No fault code        | No light     | No limit            |
| Level 3               | Parked                  | Excessive PM3        | Yellow light | 50 %                |
| Level 4               | Manual                  | Excessive PM4        | Yellow light | 50 %                |
| Level 5               | DPF replacement         | Excessive PM5        | Red light    | 50 %                |



# Description of Functions

## ■DPF Auto Regeneration

### Important

During DPF auto regeneration, you can operate this machine for the other work.

### Important

DPF auto regeneration is activated only in "Auto regeneration mode". DPF auto regeneration inhibit icon disappears.

### Important

Keep engine rotation at 2,200 rpm or more during DPF auto regeneration.  
If auto regeneration is activated continuously below the specified speed of engine rotation, the engine and DPF will malfunction.

### Important

When auto regeneration starts during backlapping operation, stop backlapping immediately and keep auto regeneration activated at 2,200 rpm or more of engine rotation until it is completed.

"Auto regeneration" is the automatic control of increasing the exhaust temperature for DPF regeneration.

DPF auto regeneration is activated when PM accumulation level is "Level 1" or "Level 2". However, it may be activated in "Level 0" depending on the other condition.

### Important

If DPF regeneration remains uncompleted even after 30 minutes have passed since the start of auto regeneration in PM accumulation "Level 1", PM accumulation level enters "Level 2".

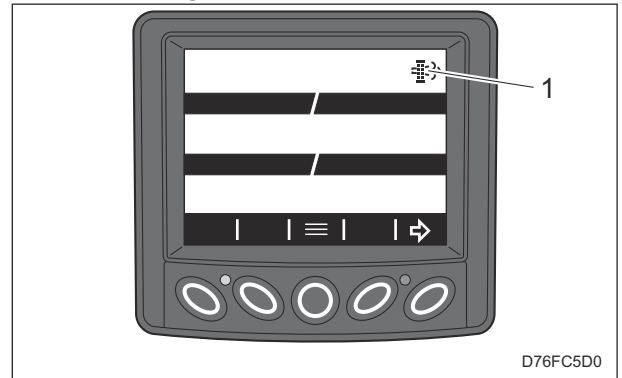
These are the procedures of DPF auto regeneration.

1. In "Auto regeneration mode" or when DPF auto regeneration inhibit icon disappears

- [1] When the conditions for auto regeneration are met, DPF auto regeneration starts with DPF regeneration icon lighting in the monitor display.

- [2] Set the engine rotation speed to 2,200 rpm or more.

- [3] When DPF regeneration completed, DPF regeneration icon disappears.



DPF Auto Regeneration\_001

|   |                       |
|---|-----------------------|
| 1 | DPF regeneration icon |
|---|-----------------------|

2. In "Auto regeneration inhibit mode" or when DPF auto regeneration inhibit icon appears

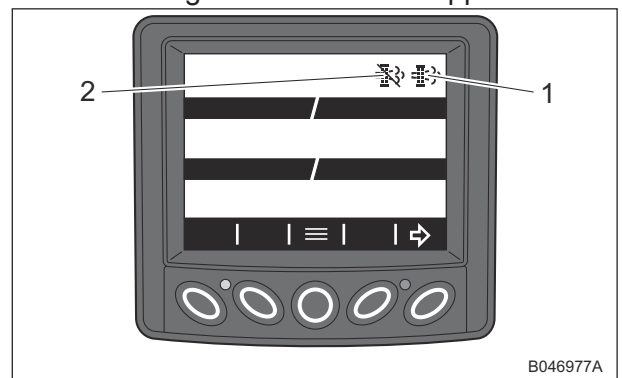
- [1] When PM accumulation level enters "Level 1" or "Level 2", the blinking DPF regeneration icon appears in the monitor display.

- [2] Set to the "Auto regeneration mode". DPF auto regeneration inhibit icon disappears.

- [3] When the conditions for auto regeneration are met, DPF auto regeneration starts and DPF regeneration icon changes from blinking to lighting.

- [4] Set the engine rotation speed to 2,200 rpm or more.

- [5] When DPF regeneration completed, DPF regeneration icon disappears.



DPF Auto Regeneration\_002

|   |                                    |
|---|------------------------------------|
| 1 | DPF regeneration icon              |
| 2 | DPF auto regeneration inhibit icon |

# Description of Functions

■DPF Parked Regeneration

Important

You can operate this machine to perform DPF parked regeneration.

Important

During DPF parked regeneration, you cannot operate this machine for the other work.

Important

DPF parked regeneration can not be performed in "Auto regeneration inhibit mode". Set to "Auto regeneration mode" to perform it.

"Parked regeneration" is the DPF regeneration forcibly performed, parking this machine in a safe location, when auto regeneration does not reduce the amount of accumulated PM to the specified value. These are the conditions for activating DPF parked regeneration.

- The machine is set in "Auto regeneration mode". DPF auto regeneration inhibit icon disappears.
- The parking brake is applied.
- The traveling pedal is in neutral.
- The engine rotation speed is minimum or idling speed.
- The coolant temperature is 55 °C (131 °F) or more.

Perform DPF parked regeneration in the following statuses.

- PM accumulation level is "Level 1" or "Level 2"
- Fault code "Excessive PM3" appears in the monitor display.

These are the procedures of DPF parked regeneration.

1. In "PM accumulation Level 1" or "Level 2":

Important

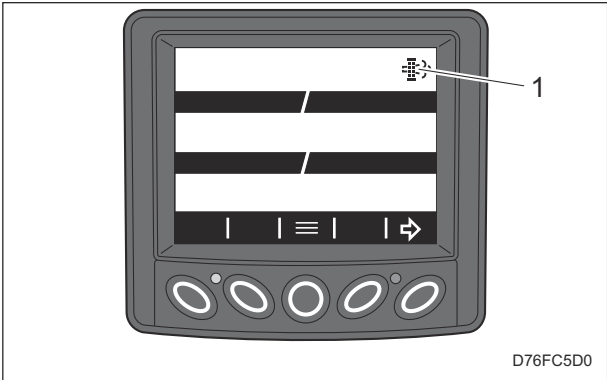
If DPF regeneration remains uncompleted in auto regeneration, parked regeneration is required with the blinking DPF regeneration icon.

Important

If you continue to ignore the parked regeneration requirement in PM accumulation "Level 1" or "Level 2", PM accumulation level enters "Level 2" or "Level 3".

[1] The blinking DPF regeneration icon appears.

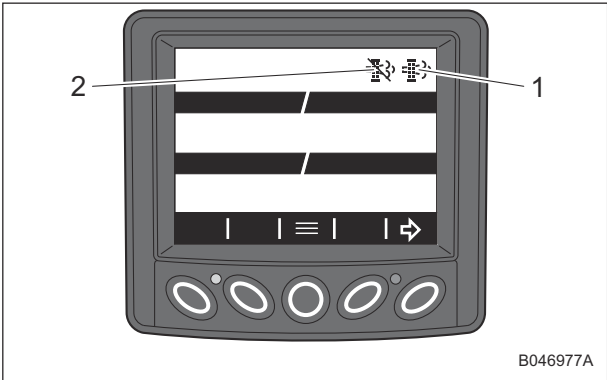
- In "Auto regeneration mode" or when DPF auto regeneration inhibit icon disappears:



DPF Parked Regeneration\_001

|   |                       |
|---|-----------------------|
| 1 | DPF regeneration icon |
|---|-----------------------|

- In "Auto regeneration inhibit mode" or when DPF auto regeneration inhibit icon appears



DPF Parked Regeneration\_002

|   |                                    |
|---|------------------------------------|
| 1 | DPF regeneration icon              |
| 2 | DPF auto regeneration inhibit icon |

# Description of Functions

- [2] Park this machine in a safe location immediately.
  - [3] Apply the parking brake.
  - [4] Set the engine to minimum rotation speed or idling speed.
  - [5] If the machine is set in "Auto regeneration inhibit mode," set it to the "Auto regeneration mode."
  - [6] Set to "Parked regeneration (Engaged)."
  - [7] Parked regeneration starts and DPF regeneration icon changes from blinking to lighting.
  - [8] When DPF regeneration completed, DPF regeneration icon disappears.
2. When fault code "Excessive PM3" appears:

## Important

If you continue to ignore the parked regeneration requirement in PM accumulation "Level 3", PM accumulation level enters "Level 4".

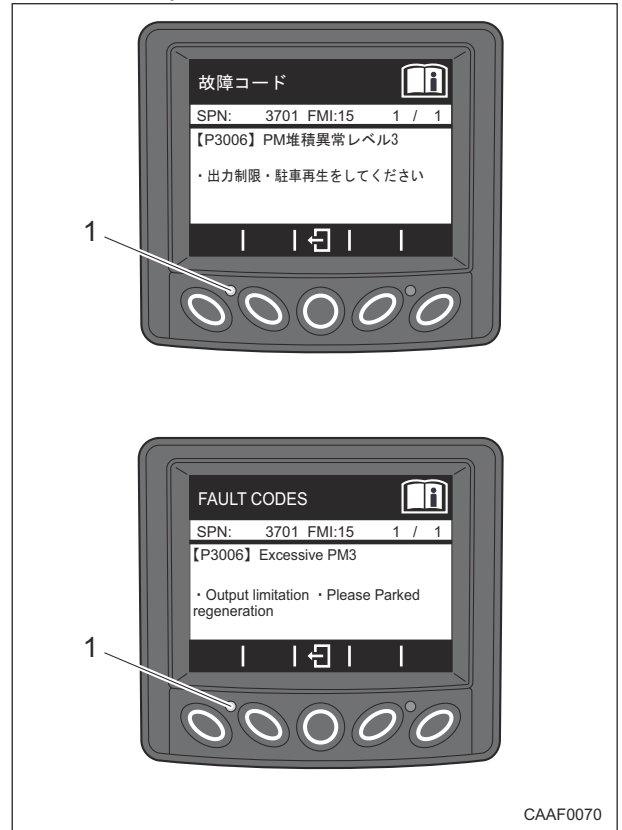
If you still continue to ignore the requirement, you will not be able to operate this machine for DPF regeneration.

## Important

DPF auto regeneration can not be activated in PM accumulation "Level 3".  
Perform parked regeneration immediately.

- [1] The engine output is limited at 50 %.
- [2] The Monitor LED (yellow) lights up.

- [3] "Excessive PM3" appears in the monitor display.



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DPF Parked Regeneration\_003

|   |              |
|---|--------------|
| 1 | LED (yellow) |
|---|--------------|

- [4] Park this machine in a safe location immediately.
- [5] Apply the parking brake.
- [6] Set the engine to minimum rotation speed or idling speed.
- [7] If the machine is set in "Auto regeneration inhibit mode," set it to the "Auto regeneration mode."
- [8] Set to "Parked regeneration (Engaged)."
- [9] DPF parked regeneration starts and DPF regeneration icon changes from blinking to lighting.
- [10] When DPF regeneration completed, DPF regeneration icon disappears.

# Description of Functions

■DPF Manual Regeneration

Important

You cannot perform DPF manual regeneration.  
Contact your dealer for DPF manual regeneration.

The expert performs "DPF Manual regeneration" with the fault diagnostic tool when normal auto regeneration or parked regeneration can not complete regeneration since large amount of PM accumulates. DPF manual regeneration is activated when the following condition met.

- When replacing DPF in any PM accumulation level
- When replacing ECU in any PM accumulation level
- When fault code "Excessive PM4" appears

Follow these procedures to request DPF manual regeneration.

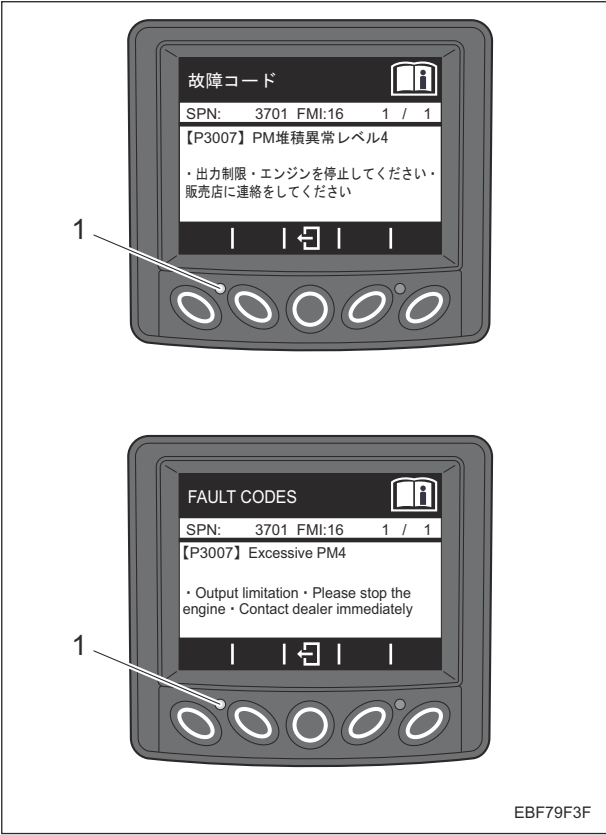
1. When replacing DPF:  
Contact your dealer for manual regeneration.
2. When replacing ECU:  
Contact your dealer for manual regeneration.
3. When fault code "Excessive PM4" appears:

Important

If you continue to ignore the manual regeneration requirement in PM accumulation "Level 4", PM accumulation level enters "Level 5".  
If you still continue to ignore the requirement, serious troubles will occur on the engine and DPF.

- [1] The engine output is limited at 50 %.  
[2] The Monitor LED (yellow) lights up.

[3] "Excessive PM4" appears in the monitor display.



DPF Manual Regeneration\_001

|   |              |
|---|--------------|
| 1 | LED (yellow) |
|---|--------------|

- [4] Park this machine in a safe location immediately.  
[5] Apply the parking brake.  
[6] Stop the engine.  
[7] Contact your dealer for manual regeneration.

# Description of Functions

## ■Replacement of DPF

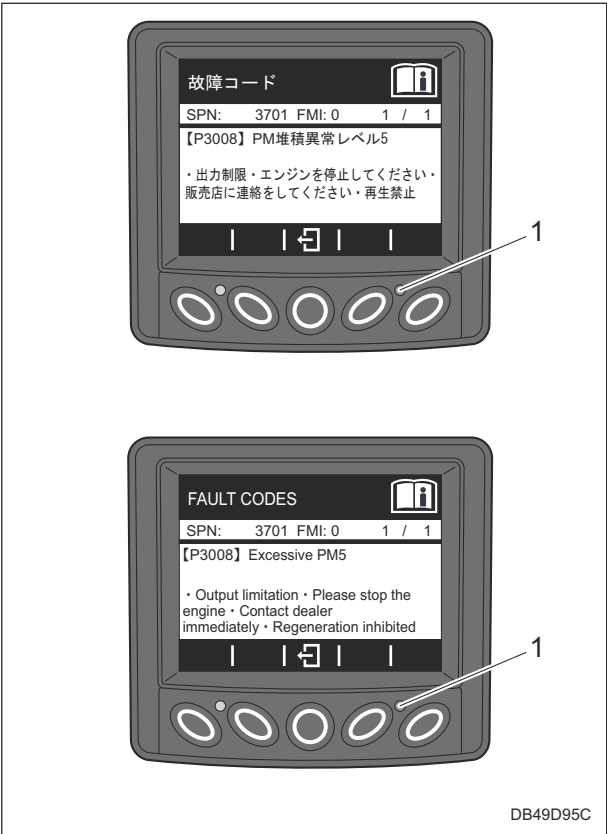
Note:  
This machine features a function of "DPF Cleaning Alarm".  
When PM and ash accumulate excessively in the DPF, the DPF is required to be replaced since DPF regeneration is prohibited.

DPF is replaced in the following statuses.

- When cleaning index of "DPF Cleaning Alarm" reaches to 100 %
- When fault code "Excessive PM5" appears in the monitor display
- When fault code "High frequency of regeneration" appears in the monitor display

Follow these procedures to request DPF replacement.

1. When cleaning index of "DPF Cleaning Alarm" reaches to 100 %:  
Contact your dealer for DPF replacement.
2. In PM accumulation "Level 5":  
[1] The engine output is limited at 50 %.  
[2] The Monitor LED (red) lights up.  
[3] "Excessive PM5" appears in the monitor display.



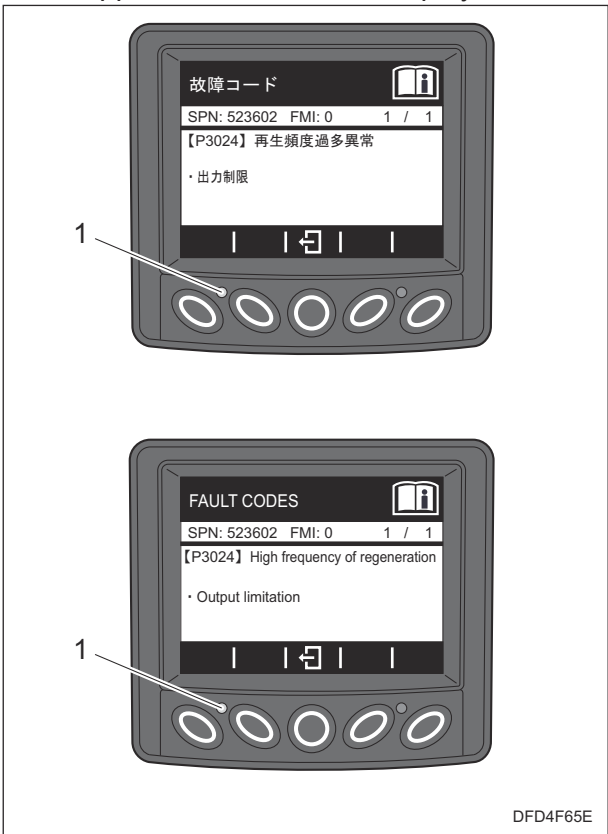
Replacement of DPF\_001

|   |           |
|---|-----------|
| 1 | LED (red) |
|---|-----------|

- [4] Park this machine in a safe location immediately.
- [5] Apply the parking brake.
- [6] Stop the engine.
- [7] Contact your dealer for DPF replacement.

3. When fault code "High frequency of regeneration" appears in the monitor display:

- [1] The engine output is limited at 50 %.
- [2] The Monitor LED (yellow) lights up.
- [3] "High frequency of regeneration" appears in the monitor display.



DFD4F65E

Replacement of DPF\_002

|   |              |
|---|--------------|
| 1 | LED (yellow) |
|---|--------------|

- [4] Park this machine in a safe location immediately.
- [5] Apply the parking brake.
- [6] Stop the engine.
- [7] Contact your dealer for DPF replacement.

# Description of Functions

## Relationship between PM Accumulation Level and DPF Regeneration

### Important

In "Auto regeneration inhibit mode", any DPF regeneration of "Auto", "Parked" and "Manual" is prohibited.

Cancel "Auto regeneration inhibit mode" to perform DPF regeneration.

In "Auto regeneration mode" or when DPF auto regeneration inhibit icon disappears:

|                                    | Level 0       | Level 1       |                                         | Level 2       |                                         | Level 3                                 | Level 4                                        | Level 5                     |
|------------------------------------|---------------|---------------|-----------------------------------------|---------------|-----------------------------------------|-----------------------------------------|------------------------------------------------|-----------------------------|
| DPF auto regeneration inhibit icon | Disappear     | Disappear     | Disappear                               | Disappear     | Disappear                               | Disappear                               | Disappear                                      | Disappear                   |
| DPF regeneration icon              | Disappear     | Lighting      | Blinking<br>→<br>Lighting               | Lighting      | Blinking<br>→<br>Lighting               | Blinking<br>→<br>Lighting               | Blinking<br>→<br>Lighting                      | Blinking                    |
| Displayed fault code               | No fault code | No fault code | No fault code                           | No fault code | No fault code                           | Warning                                 | Warning                                        | Warning                     |
| Monitor LED                        | No light      | No light      | No light                                | No light      | No light                                | Yellow light                            | Yellow light                                   | Red light                   |
| Engine output limit                | No limit      | No limit      | No limit                                | No limit      | No limit                                | 50 %                                    | 50 %                                           | 50 %                        |
| Auto regeneration                  | Not required  | Required      | Not available                           | Required      | Not available                           | Not available                           | Not available                                  | DPF regeneration impossible |
|                                    | Available     | Available     |                                         | Available     |                                         |                                         |                                                |                             |
| Parked regeneration                | Not required  | Not available | Required                                | Not available | Required                                | Required                                | Not available                                  | DPF regeneration impossible |
|                                    | Available     |               | Available                               |               | Available                               | Available                               |                                                |                             |
| Manual regeneration                | Not required  | Not required  | Not required                            | Not required  | Not required                            | Not required                            | Required                                       | DPF regeneration impossible |
|                                    | Available     | Available     | Available                               | Available     | Available                               | Available                               | Available                                      |                             |
| Remedy                             | -             | -             | DPF parked regeneration switch OFF → ON | -             | DPF parked regeneration switch OFF → ON | DPF parked regeneration switch OFF → ON | Manual regeneration with fault diagnostic tool | Replacement of DPF          |
| Continuous work                    | Possible      | Possible      | Impossible                              | Possible      | Impossible                              | Impossible                              | Impossible                                     | Impossible                  |

# Handling Instructions

|                                                 |                  |                                 |                  |
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# Handling Instructions

## Operations before Service

The following sections describe the preparatory works required before performing the services including inspection, adjustment, cleaning, maintenance and repair.

### Procedure to Open/Close Radiator Cover

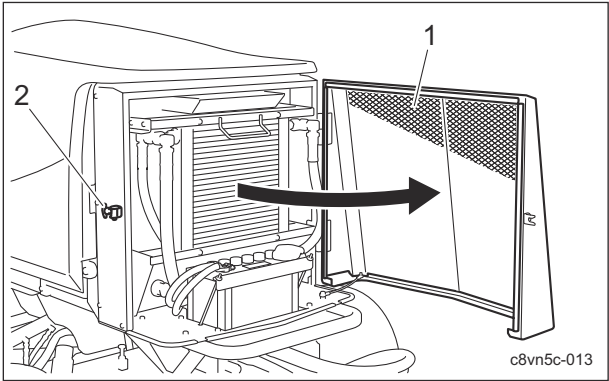
 **Caution**

Do not open the radiator cover in strong winds.

 **Caution**

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

- 1. Release the rubber catch.
- 2. Open the radiator cover to the right.



Procedure to Open/Close Radiator Cover\_001

|   |                |
|---|----------------|
| 1 | Radiator cover |
| 2 | Rubber catch   |

- 3. Close the radiator cover slowly.
- 4. Lock the rubber catch securely.

### Procedure to Open/Close Hood

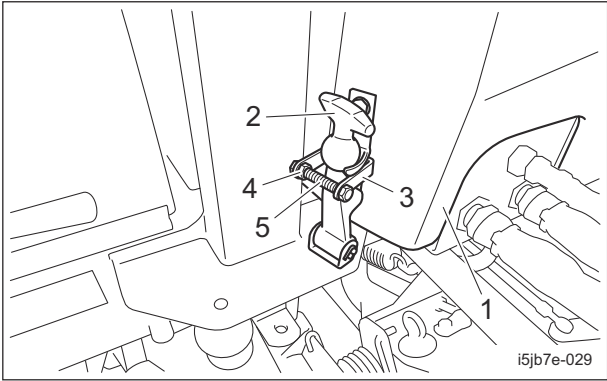
 **Caution**

Do not open the hood in strong winds.

 **Caution**

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

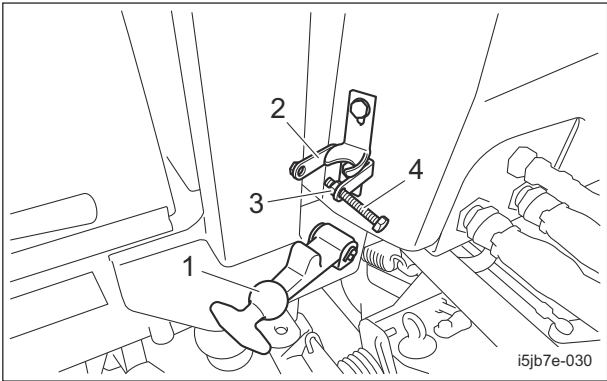
- 1. Remove the nuts and bolts locking the catch clips on the left and right sides of the hood.



Procedure to Open/Close Hood\_001

|   |              |
|---|--------------|
| 1 | Hood         |
| 2 | Rubber catch |
| 3 | Catch clip   |
| 4 | Nut          |
| 5 | Bolt         |

- 2. Release the rubber catches on the left and right sides.



Procedure to Open/Close Hood\_002

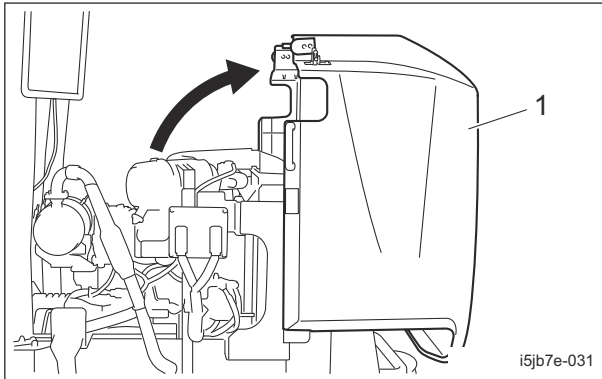
|   |              |
|---|--------------|
| 1 | Rubber catch |
| 2 | Catch clip   |
| 3 | Nut          |
| 4 | Bolt         |

- 3. Make sure that the radiator cover is closed.



# Handling Instructions

4. Lift up the hood.



Procedure to Open/Close Hood\_003

|   |      |
|---|------|
| 1 | Hood |
|---|------|

5. Close the hood slowly.  
6. Securely engage the left and right rubber catches.  
7. Install the nuts and bolts locking the left and right catch clips.

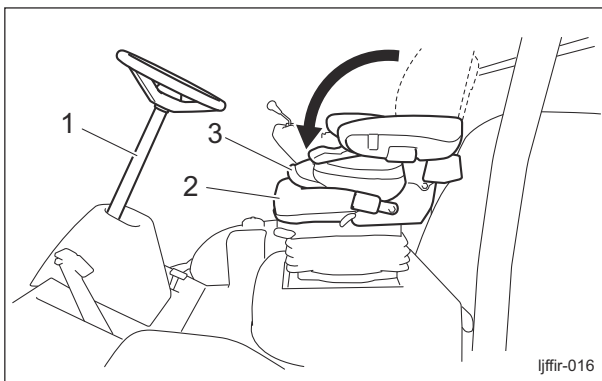
## Procedure to Open/Close Underseat Cover



**Caution**

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

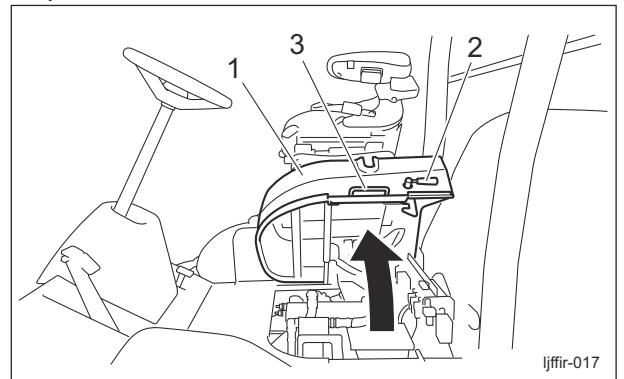
1. Make sure that the steering wheel is raised completely.  
2. Move the seat to the center between the forward and backward positions.  
3. Tilt the seat backrest forward.



Procedure to Open/Close Underseat Cover\_001

|   |                |
|---|----------------|
| 1 | Steering wheel |
| 2 | Seat           |
| 3 | Backrest       |

4. While unlocking with the open-close lever, grab the grip and tilt the seat to the right to open the underseat cover.



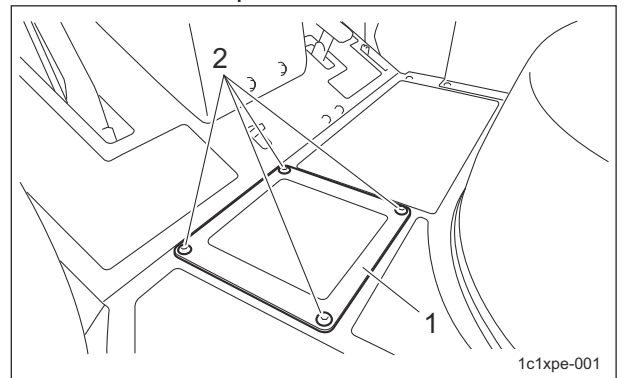
Procedure to Open/Close Underseat Cover\_002

|   |                  |
|---|------------------|
| 1 | Underseat cover  |
| 2 | Open-close lever |
| 3 | Grip             |

5. For closing the underseat cover, close it slow with holding the grip.  
6. Lock the underseat cover with the open-close lever.

## Procedure to Remove/Install Step Cover

1. Remove the button head bolts.  
2. Remove the step cover.



Procedure to Remove/Install Step Cover\_001

|   |                  |
|---|------------------|
| 1 | Step cover       |
| 2 | Button head bolt |

3. For installing the step cover, reverse the removing procedure.

# Handling Instructions

## Inspection before Use

The purpose of the machine inspection is to:

- Prevent accidents
- Prevent damage to the machine
- Maintain machine performance

Detecting machine malfunctions early helps prevent unexpected problems from occurring. If you detect any abnormalities with the machine, immediately perform maintenance or repairs.

## Engine

### Inspection of Engine Oil

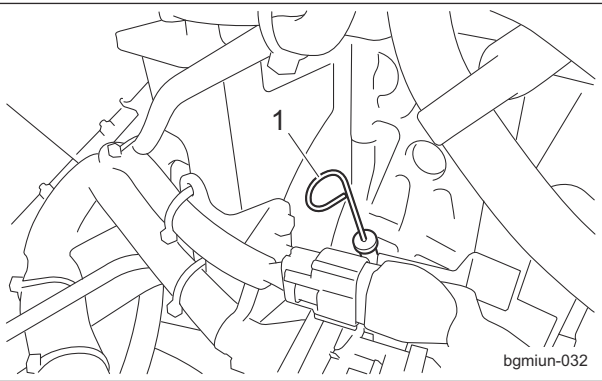
Important

Securely insert the oil level gauge.

Check the contamination of oil and oil level to inspect the engine oil.

Inspect the engine oil level 10 to 20 minutes after stopping the engine.

1. Place the machine so that the engine on the level.
2. Stop the engine.
3. Open the hood.
4. Pull out the oil level gauge.



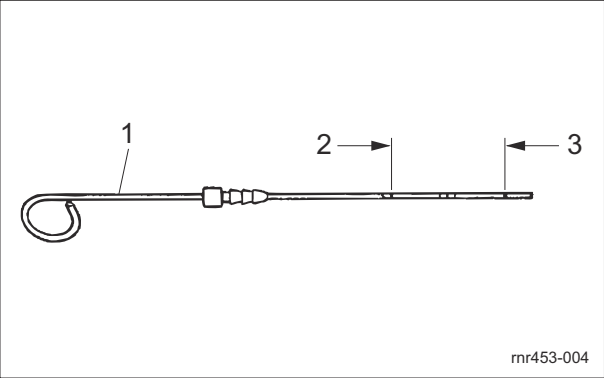
Inspection of Engine Oil\_001

|   |                 |
|---|-----------------|
| 1 | Oil level gauge |
|---|-----------------|

5. Wipe the oil off the oil level gauge cleanly with papers or cloths.
6. After wiping the oil off the oil level gauge, check the contamination.
7. Return the oil level gauge to its original position, insert tightly, and pull out again.

### 8. Check the engine oil level.

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



Inspection of Engine Oil\_002

|   |                 |
|---|-----------------|
| 1 | Oil level gauge |
| 2 | Upper limit     |
| 3 | Lower limit     |

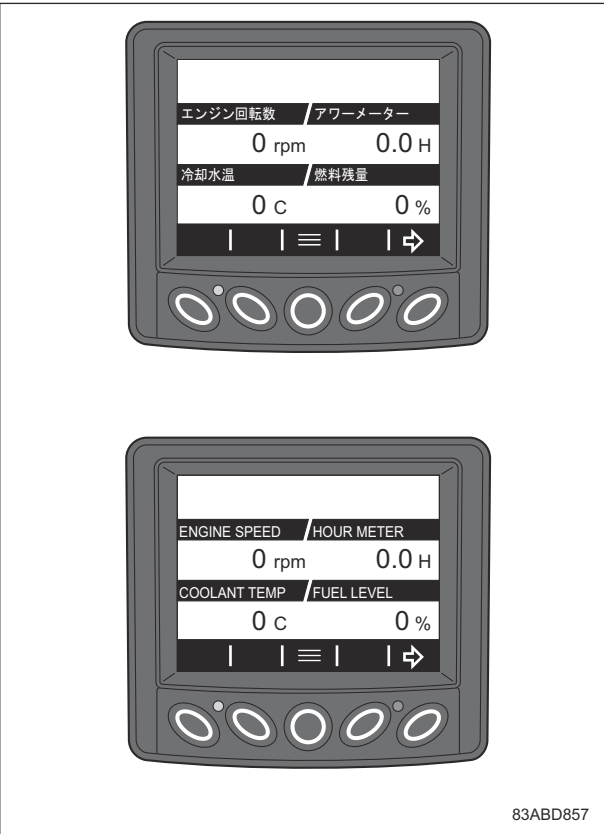
### 9. Return the oil level gauge to its original position, and insert it tightly.

### 10. Close the hood.

### Inspection of Fuel

With the machine on a level surface, check "FUEL LEVEL" in the monitor.

If the fuel level is low, supply diesel fuel.



Inspection of Fuel\_001

# Handling Instructions

## Supply of Fuel

### Warning

Do not supply additional fuel after "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.

### Important

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

### Important

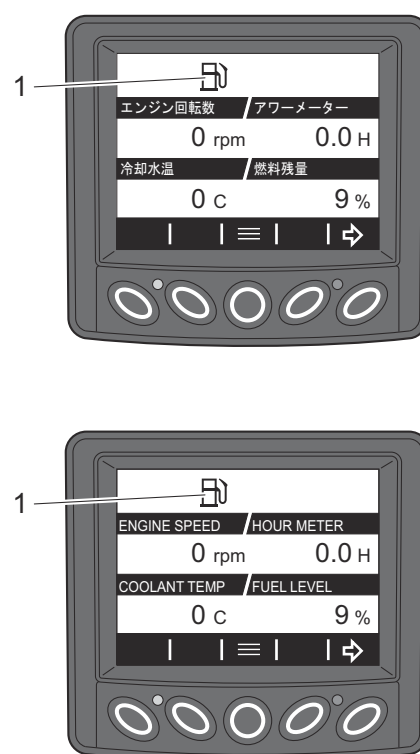
In case of lack of fuel, DPF regeneration can not be performed.

If the monitor displays "Supply fuel icon" and starts blinking, immediately stop operation, and then supply fuel (diesel).

The fuel tank capacity is approximately 51.0 dm<sup>3</sup> (51.0 L).

Note:

The factory default low fuel level is 10 %.



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Supply of Fuel\_001

|   |                  |
|---|------------------|
| 1 | Supply fuel icon |
|---|------------------|

# Handling Instructions

## Air Bleeding of Fuel System

**Important**

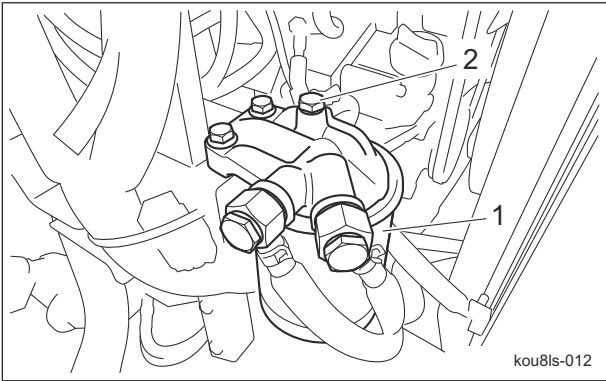
The air-bleed plug should always be in the closed position except during the air bleeding operation.  
Using the machine with the air-bleed plug in the open position may cause the engine to stall.

This machine has a function of automatic air bleeding.  
However, depending on the mechanical structure, it may not bleed air completely.  
If the automatic air bleeding does not work well, follow the steps below to perform manual air bleeding.

**Warning**

Do not perform air bleeding when the engine is hot since a fire might occur.

- 1. Set the ignition key to the "ON" position.
- 2. Turn the air-bleed plug on the fuel filter several times to loosen it.
- 3. When a bubble no longer arises, screw the air-bleed plug to the original position.
- 4. Set the ignition key to the "OFF" position.
- 5. Wipe off the spilt oil thoroughly.



Air Bleeding of Fuel System\_001

|   |                |
|---|----------------|
| 1 | Fuel filter    |
| 2 | Air-bleed plug |

## Inspection of Fuel Filter

- 1. Make sure that there is no fuel leakage.
- 2. Make sure that the filter is not damaged.
- 3. Make sure that the filter is not contaminated.

## Inspection of Coolant

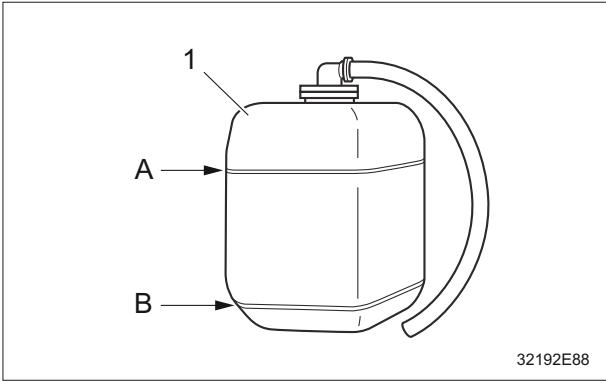
**Caution**

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

**Caution**

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

Make sure that the coolant level in the reserve tank is between "FULL" and "LOW".  
If the coolant level is lower than the "LOW" mark, supply clean water and antifreeze.



Inspection of Coolant\_001

|   |              |
|---|--------------|
| 1 | Reserve tank |
| A | Full         |
| B | Low          |

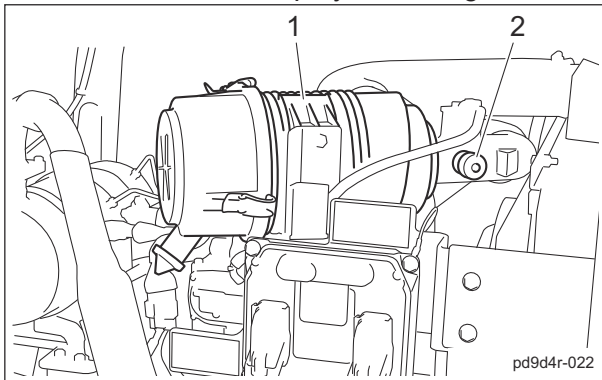
# Handling Instructions

## Inspection of Air Cleaner

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

1. Inspect the air cleaner by checking the indicator.

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



Inspection of Air Cleaner\_001

|   |             |
|---|-------------|
| 1 | Air cleaner |
| 2 | Indicator   |

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

## 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.

## Inspection of Radiator

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

## Inspection of Engine/DPF-Associated Parts

### Caution

Implement after the engine and DPF etc. have well cooled down. Otherwise, you may suffer burns.

1. Check for damages and dirt.

2. Check the mount for looseness and cracks.
3. Check for liquid leakage.
4. Check on and around the DPF for grass clippings and flammable materials.

## Main Vehicle

### Inspection of Oil Cooler for Hydraulic Oil

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

### Inspection of Battery

#### Danger

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

#### Warning

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

#### Important

Be sure to stop the engine before inspecting or charging the battery.

Battery inspection items are described below.

1. Inspecting the exterior  
Visually inspect the exterior of the battery, and check that there are no cracks, splits, missing sections, or abnormal deformation in the battery case, and that there is no electrolyte leaking. If abnormalities are found, immediately replace the battery.

# Handling Instructions

## 2. Cleaning the exterior

**Warning**

Do not clean the battery with a dry cloth. Cleaning the battery with a dry cloth may cause it to catch fire or explode due to static electricity.

Use a wet cloth for cleaning.  
Inspect the vent plugs or vent holes on the side of the battery, and if they are blocked by dirt wash them with water to remove the blockage.  
Continuing to use the battery with the vent holes blocked may cause the battery to rupture from increased internal pressure due to gases generated inside the battery.

## 3. Inspecting the mounting bracket

Inspect whether the battery is secured firmly with the mounting bracket.  
If the bracket is loose, tighten the mounting bracket nuts until the battery is secured firmly.  
An improperly mounted battery may cause damage to the battery case or electrolyte leaks due to the battery moving with vibrations while traveling.

## 4. Inspecting the cable terminals

If the connection between the battery terminals and vehicle's cable terminals are loose, tighten the nuts until the cable terminals are secured firmly.  
Insufficiently tightened terminals may result in poor battery charging, damage to the terminals due to poor contacts, or an explosion.  
If the terminals are corroded, rub them clean with a wire brush or fine grit sandpaper, and lightly apply anti-rust grease.

## 5. Inspecting the electrolyte level and refilling

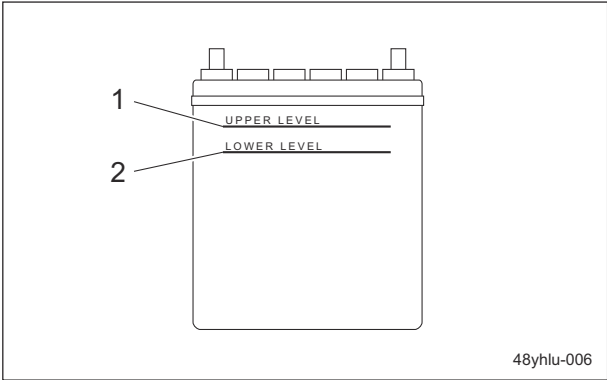
**Warning**

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).

**Warning**

When refilling, do not fill purified water above the UPPER LEVEL line.  
Doing so may result in electrolyte leaks.

Clean the areas around the battery fluid level lines using a cloth damped with water to check the electrolyte level from the side of the battery.  
Make sure that the battery fluid level is between the UPPER LEVEL (maximum fluid level line) and the LOWER LEVEL (minimum fluid level line).  
Refill with purified water up to the UPPER LEVEL line if the level is lower than halfway between the UPPER LEVEL and LOWER LEVEL lines.



Inspection of Battery\_001

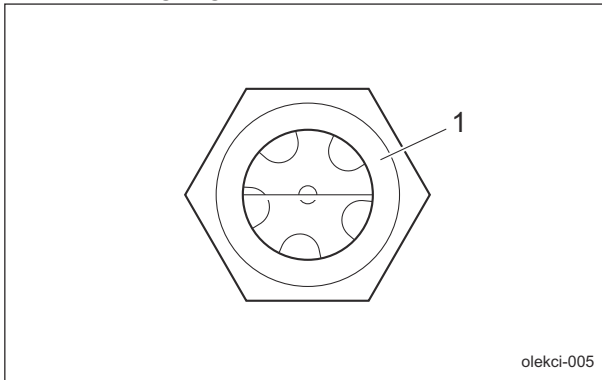
|   |                  |
|---|------------------|
| 1 | UPPER LEVEL line |
| 2 | LOWER LEVEL line |

# Handling Instructions

## Inspection of Hydraulic Oil

The oil gauge is on the side of the hydraulic tank.

1. Lower 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.



Inspection of Hydraulic Oil\_001

|   |           |
|---|-----------|
| 1 | Oil gauge |
|---|-----------|

3. Check underneath the machine for oil leakage.

## Inspection of Tires

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

|             | Tire size       | Pneumatic pressure                 |        |
|-------------|-----------------|------------------------------------|--------|
| Front wheel | 26.5 x 14.00-12 | 120 kPa (1.2 kgf/cm <sup>2</sup> ) | 17 psi |
| Rear wheel  | 20 x 12.00-10   | 140 kPa (1.4 kgf/cm <sup>2</sup> ) | 20 psi |

## Inspection of Covers

### Warning

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, or foreign objects may fly off, possibly resulting in injuries.

1. Make sure that there is no wear or deterioration of covers.
2. Make sure that there is no damage to covers.

3. Make sure that there is no interference with moving parts due to deformation of covers.
4. Make sure that covers are installed in their appropriate positions.

## Inspection of Traveling Pedal

1. Make sure that there is no play in the pedal.
2. Make sure that the pedal moves smoothly.
3. Make sure that there is no abnormal sound when the pedal is depressed.

## Inspection of Brake Pedal

1. Make sure that there is no play in the pedal.
2. Make sure that the pedal moves smoothly.
3. Make sure that there is no abnormal sound when the pedal is depressed.
4. Make sure that the pedal does not touch the floorboard when the pedal is depressed.

## Inspection of Parking Brake

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

## Inspection of Wire

1. Make sure that the wire is not cracked or damaged.
2. Make sure that the wire is not worn.
3. Make sure that the wire is not crushed.
4. Make sure that the wire is not bent.
5. Make sure that the wire is not corroded or rusted.



# Handling Instructions

---

## Inspection of Liquid Leakage

### Important

After approximately 50 hours of operation, some tightened portions may be loosened and liquid such as oil may leak.  
Be sure to retighten the parts.

### Important

Repair the machine before operation if liquid leakage found.  
Ignoring leakage will cause further trouble.

1. Check the bottom of the machine for leakage of liquid such as oil, water, fuel, etc.
2. Locate the leakage and identify the type of liquid.

## Inspection of Ball Proof Net

1. Check the ball proof net is not deteriorated.
2. Check there is no damage nor deformation of the ball proof net.

## Inspection of Bolts and Nuts

### Important

The bolts and nuts may be loosened at the earlier stage of the use.  
Be sure to retighten or replace before operating the machine whenever there is any abnormality.

1. Check the bolts and nuts for looseness and coming off.
2. Check the bolts and nuts for cracks and damages.
3. Check the bolts and nuts for rust.
4. Check around the bolts and nuts for traces of rust fluid.
5. Check for unequal bolt length.
6. Check the bolts and nuts for stripped threads and abrasion.

## Inspection of Monitor

1. Make sure that the monitor is clean.
2. Make sure that the monitor is not damaged or broken.
3. Make sure that the monitor turns on.

4. Make sure that the display appears on the monitor screen.

## Inspection of Safety Device

Repair the machine before operation whenever there is any abnormality.

1. Interlock system  
Make sure that the interlock system operates correctly.  
"Interlock System" (Page 4-10)
2. ROPS  
(If the machine is equipped with ROPS and a seat belt)  
Make sure that the ROPS is not damaged or broken.
3. Seat belt  
(If the machine is equipped with ROPS and a seat belt)  
Make sure that the seat belt is not damaged or broken.

## Inspection of Steering Wheel

1. Make sure that there is no play in the steering wheel.
2. Make sure that the steering wheel turns smoothly when it is turned.
3. Make sure that there is no abnormal sound when the steering wheel is turned.
4. Check the direction of tires when the steering wheel is turned.
  - [1] Start the engine.
  - [2] Make sure that the rear tire turns left when the steering wheel is turned right.
  - [3] Make sure that the rear tire turns right when the steering wheel is turned left.
  - [4] Stop the engine.

## Inspection of Light

1. Check the lights are not damaged.
2. Check the lights turn on/off.
  - [1] Switch the ignition key to the "ON" position.
  - [2] Set the light switch to the "ON" position.
  - [3] Check the lights have turned on.
  - [4] Set the light switch to the "OFF" position.
  - [5] Check the lights have turned off.
  - [6] Switch the ignition key to the "OFF" position.



# Handling Instructions

## Inspection of Grass Catcher

1. Make sure that there is no wear or deterioration of the grass catcher.
2. Make sure that there is no damage to the grass catcher.
3. Make sure that there is no interference to moving parts due to deformation of the grass catcher.

## Adjustment before Work

### Adjustment of Steering Wheel Position

#### Warning

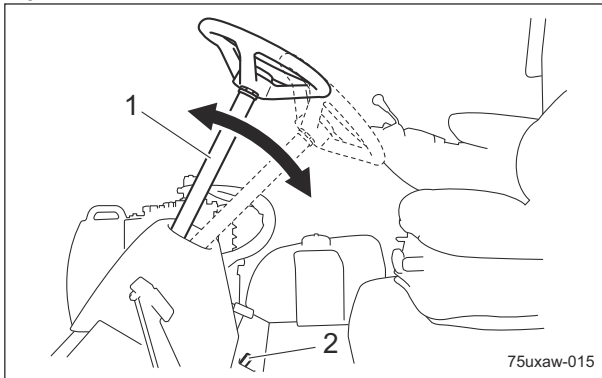
Do not make adjustments while traveling since doing so is dangerous.

#### Caution

Be sure the steering wheel position is securely locked.  
If it becomes loose while traveling, an unexpected accident may occur.

The steering wheel position can be adjusted up or down.

Adjust the position to fit the operator.

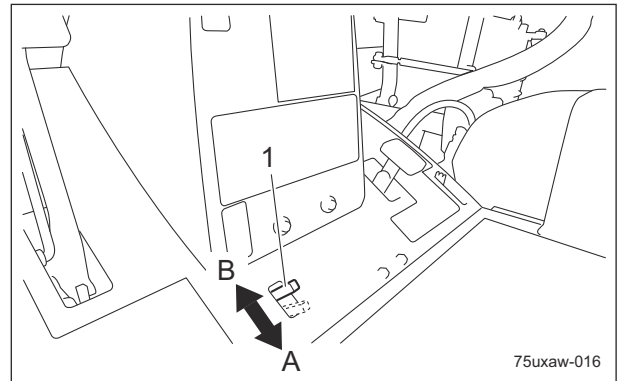


Adjustment of Steering Wheel Position\_001

|   |                |
|---|----------------|
| 1 | Steering wheel |
| 2 | Tilt lever     |

Shift the tilt lever to the "FREE" position, move the steering wheel to the position that suits the 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 driver's left foot area.



Adjustment of Steering Wheel Position\_002

|   |                 |
|---|-----------------|
| 1 | Tilt lever      |
| A | FREE (released) |
| B | LOCK (locked)   |

# Handling Instructions

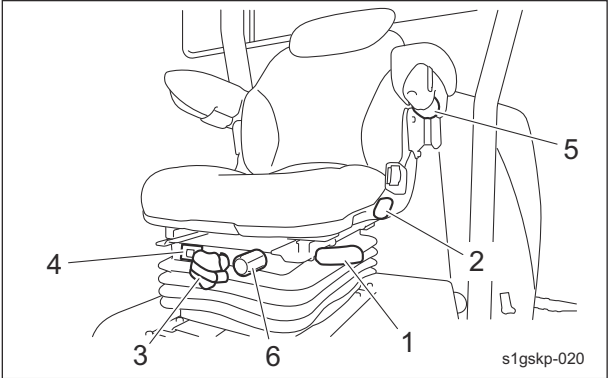
## Adjustment of Seat Position



Warning

Do not make an adjustment while traveling since it is dangerous.

- Use the adjustment levers to adjust the seat position.  
Adjust the position to fit the operator.
1. Use the forward/backward adjustment lever to adjust the seat back and forth.
  2. Use the tilt adjustment lever to adjust the angle of the backrest.
  3. Turn the suspension adjustment handle to adjust the firmness of the seat suspension. Refer to the suspension indicator while making adjustments. [45 to 130 kg (99.2 to 286.6 lb)]
  4. Turn the armrest adjustment knob to adjust the angle of the armrests.
  5. Turn the seat height adjustment knob to adjust the height of the seat steplessly. [0 to 60 mm (0 to 2.36 in)]
- Adjust the height of the seat while sitting in it.



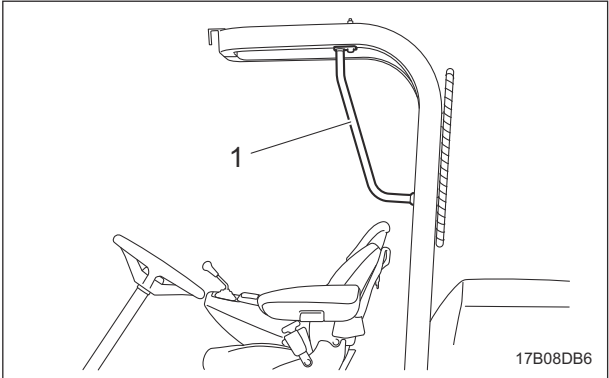
Adjustment of Seat Position\_001

|   |                                   |
|---|-----------------------------------|
| 1 | Forward/backward adjustment lever |
| 2 | Tilt adjustment lever             |
| 3 | Suspension adjustment handle      |
| 4 | Suspension indicator              |
| 5 | Armrest adjustment knob           |
| 6 | Seat height adjustment knob       |

## Mounting and Dismounting

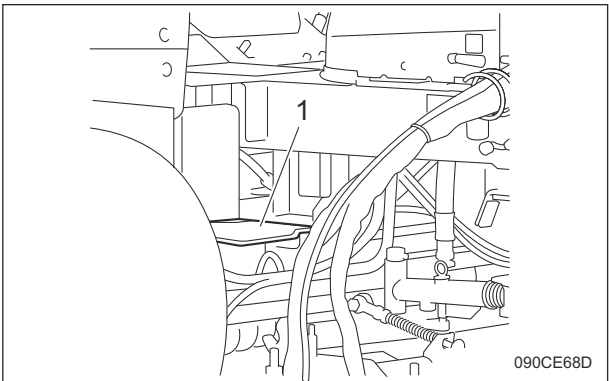
### Procedure to Mount/Dismount

This machine is equipped with a step for mounting/dismounting. Place your foot on the step and grip the supporting bar when mounting and dismounting the machine.



Procedure to Mount/Dismount\_001

|   |                |
|---|----------------|
| 1 | Supporting bar |
|---|----------------|



Procedure to Mount/Dismount\_002

|   |      |
|---|------|
| 1 | Step |
|---|------|

# Handling Instructions

## Start/Stop of Engine

### Procedure to Start Engine

#### ⚠ Caution

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

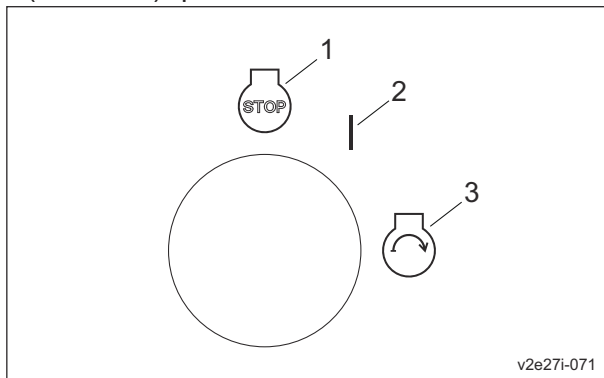
#### ⚠ Caution

Be careful of the mower units lowering when the mower unit up/down lever is shifted to the "Down" position and the key switch is turned to the "ON" position while the engine is stopped with the traveling/working selector switch set to the "Working" position.

#### Important

Starter operation must take 15 seconds or less.  
If the engine still 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 you have depressed the brake pedal and applied the parking brake.
3. Set the reel rotation switch to the "Stop" position.
4. Move the mower unit up/down lever to the neutral position.
5. Make sure that the traveling pedal is in neutral position.
6. Move the throttle knob from the "Low speed" position halfway toward the "High speed" position.
7. Switch the ignition key to the "ON (HEATER)" position.



Procedure to Start Engine\_001

|   |             |
|---|-------------|
| 1 | OFF         |
| 2 | ON (HEATER) |
| 3 | START       |

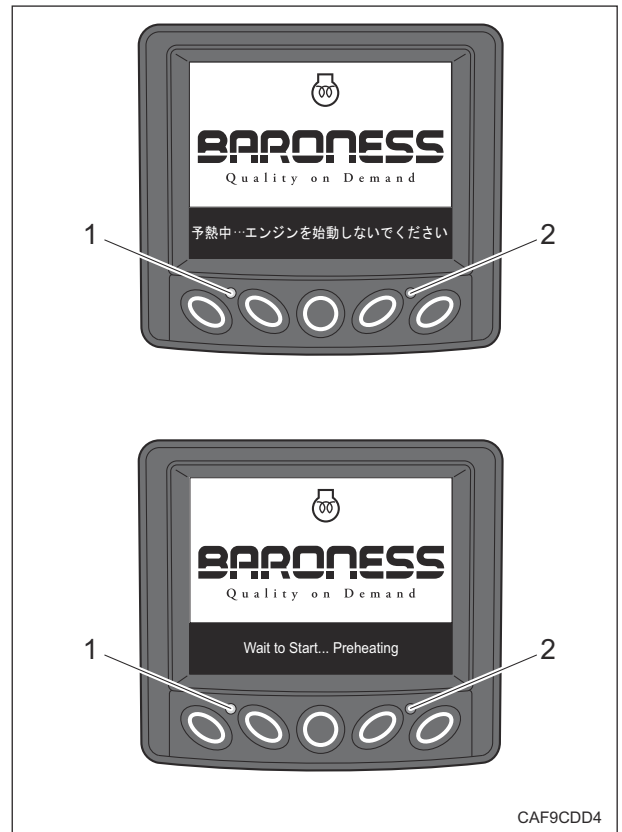
#### ⚠ Caution

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.

8. The monitor activates.

Make sure that the "BARONESS" logo or the logo and "Warming up" message appears in the monitor display, and the yellow and red LEDs turned on.



CAF9CDD4

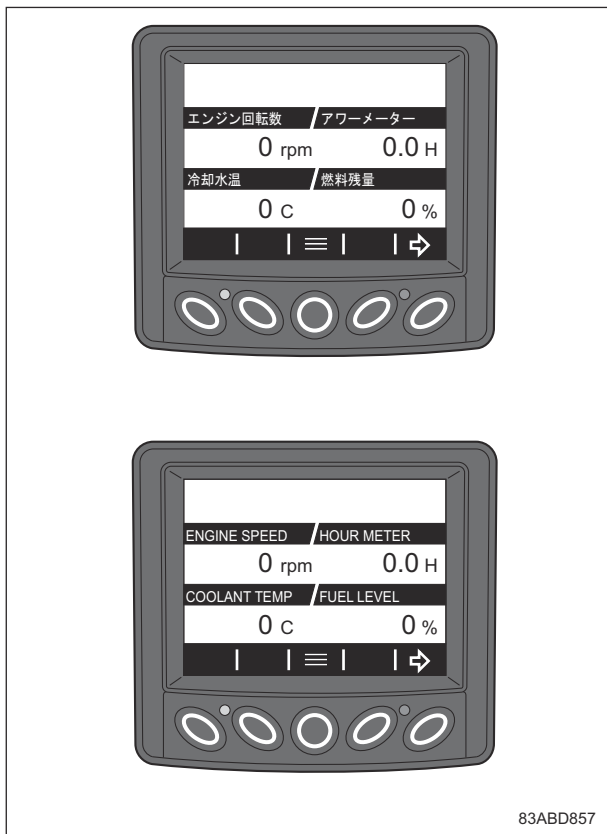
Procedure to Start Engine\_002

|   |            |
|---|------------|
| 1 | Yellow LED |
| 2 | Red LED    |

# Handling Instructions

9. GAUGE screen appears in the monitor display.

Make sure that the "BARONESS" logo and "Warming up" message disappeared in the monitor display, and the yellow and red LEDs are turned off.



83ABD857

Procedure to Start Engine\_003

## Caution

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

10. Quickly switch the ignition key to the "START" position.
11. When the starter starts rotating and the engine starts, slowly return the ignition key to the "ON" position.
12. Move the throttle knob to the "Low speed" position, and then warm up the engine so that the engine coolant temperature exceeds 50 °C (122 °F).

## Procedure to Stop Engine

### Danger

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

### Important

Do not stop the engine with the DPF regeneration lamp (LED) turned on.

1. Set the traveling pedal to the neutral position.
2. Depress the brake pedal, and then apply the parking brake.
3. Set the reel rotation switch to the "Stop" position.
4. Raise all the mower units.
5. Shift the throttle knob to the "Low speed" position, and then idle the machine for 1 to 2 minutes.
6. Make sure that the DPF regeneration lamp and the DPF regeneration icon are not lighted.
7. Switch the ignition key to the "OFF" position.
8. Make sure that the engine has stopped.
9. Latch the mower units #4 and 5 with the mower lock levers.
10. Remove the ignition key.
11. Leave the driver's seat.

## Parking and Stopping

### Procedure to Leave The Machine

### Caution

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

### Caution

Never park the machine on a slope.

1. Park the machine on a level ground.
2. Apply the parking brake.
3. Stop the engine.
4. Remove the ignition key.
5. Install the cap to the key switch.

# Handling Instructions

6. Get out of the driver's seat.

## Move

### Traveling Procedure

#### ⚠ Caution

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

#### ⚠ Caution

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

#### Important

Do not start to move or stop the machine abruptly. It will damage the hydraulic system or cause oil leakage.

1. Start the engine.
2. Make sure that all the mower units are raised and the mower lock levers (latches) for mower units #4 and #5 are hooked.
3. Slowly shift the throttle knob to the "High speed" position.
4. Depress the brake pedal to release the parking brake.
5. Release the brake pedal.
6. Slowly depress the traveling pedal.
7. The machine starts traveling.
8. The machine stops slowly when the traveling pedal released.

## Cutting Work

### Cutting Procedure

#### ⚠ Caution

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

#### ⚠ Caution

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

#### ⚠ Caution

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

#### Important

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

#### Important

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

1. Release the mower lock levers (latches) for mower units #4 and #5 just before cutting work.
2. Start the engine.  
"Procedure to Start Engine" (Page 5-13)
3. Firmly depress the brake pedal to release the locking pedal for releasing the locked brake pedal.
4. Shift the throttle knob to rev the engine up to the maximum rpm.
5. Set the traveling/working selector switch to the "Working" position.
6. Shift the mower unit up/down lever to the "Down" position to lower the mower units.

# Handling Instructions

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

**Important**

When the traveling speed exceeds 12.0 km/h during cutting operation, a buzzer will sound. If the operation continues, the engine and hydraulic equipments will be damaged.

8. Set the pedal stopper to the "Working" position.  
9. Depress the traveling pedal to start cutting work.

**Note:**

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

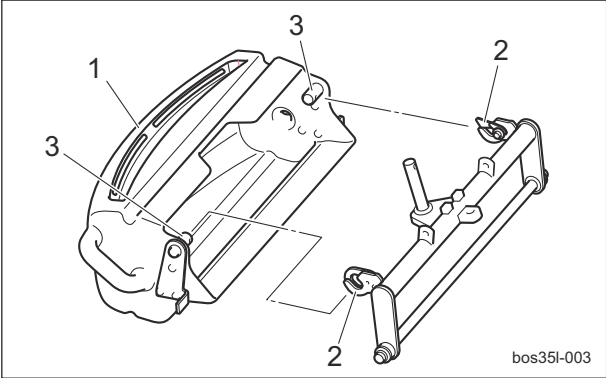
## Procedure to Remove/Install Grass Catcher

**Caution**

Stop the engine before removing or installing the grass catcher.

1. Set the reel rotation switch to the "Stop" position.  
2. Lower the mower units.  
3. Apply the parking brake.  
4. Stop the engine.  
5. Remove or install the grass catcher.
- Removal of grass catcher:  
Lift up the grass catcher, and remove the mounting pins on the left and right sides of the grass catcher from the grass catcher mounting brackets.

- Installation of grass catcher:  
Install the mounting pins on the left and right sides of the grass catcher into the grass catcher mounting brackets.



Procedure to Remove/Install Grass Catcher\_001

|   |                                |
|---|--------------------------------|
| 1 | Grass catcher                  |
| 2 | Grass catcher mounting bracket |
| 3 | Mounting pin                   |

# Handling Instructions

## Transporting

### Transporting Procedure

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

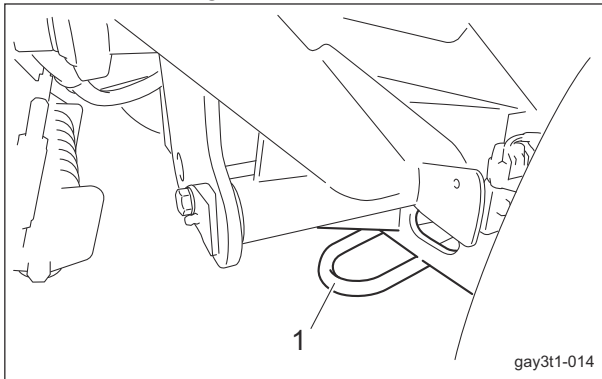
If the roof is installed on the machine, remove it.

Otherwise, the roof may be damaged by wind pressure.

Note:

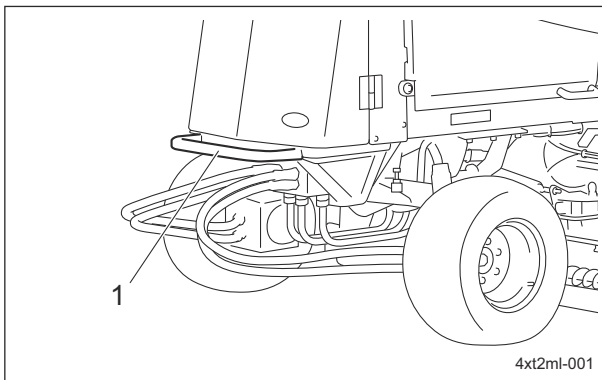
When tying down the machine, secure the rope at the following locations.

At the front of the machine, use the tow hooks on the left and right of the front axle.



Transporting Procedure\_001

|   |          |
|---|----------|
| 1 | Tow hook |
|---|----------|



Transporting Procedure\_002

|   |        |
|---|--------|
| 1 | Bumper |
|---|--------|

## Cleaning after Use

The purpose of the machine cleaning is to:

- Prevent accidents
- Prevent damage to the machine
- Maintain machine performance

Properly clean the machine to maintain its functionality and performance.

If you detect any abnormalities with the machine, immediately perform maintenance or repairs.

### Engine

#### Cleaning of Engine/DPF-Associated Parts

##### Caution

Implement after the engine and DPF etc. have well cooled down.

Otherwise, you may suffer burns.

1. Clean clippings and remove dirt.  
Remove clippings and dust in a gap thoroughly due to the intricately shaped engine.
2. Blow compressed air to clean any grass or flammable materials that may be attached on or around the DPF.

#### Cleaning of Radiator Cover

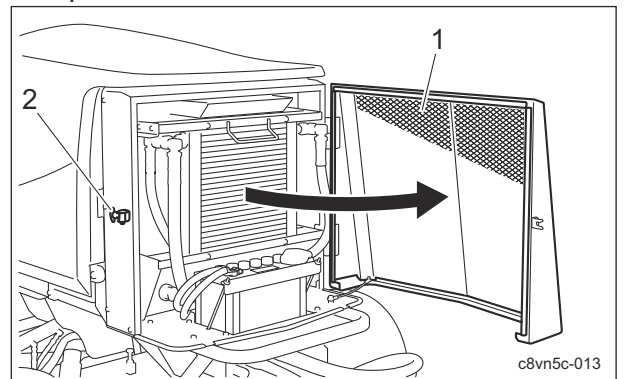
##### Important

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.



Cleaning of Radiator Cover\_001

|   |                |
|---|----------------|
| 1 | Radiator cover |
| 2 | Rubber catch   |



# Handling Instructions

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

## Cleaning of Radiator

**Important**

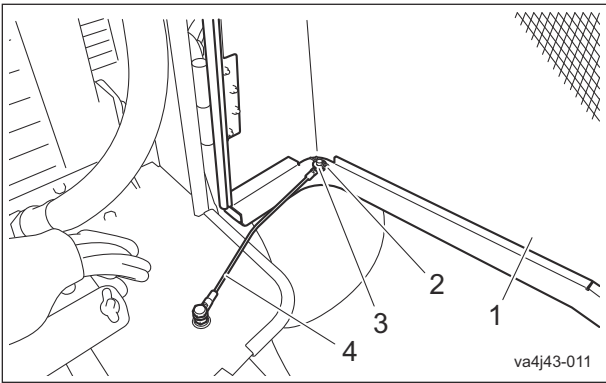
An unclean radiator may cause the engine to overheat or seize.  
It may also cause malfunction of the hydraulic system.

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

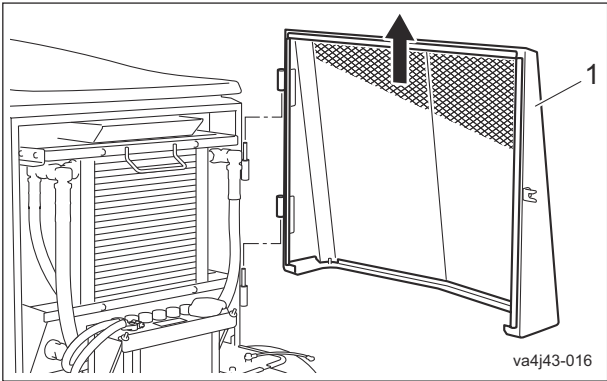
1. Open the radiator cover.  
2. Remove the cotter pin and washer, and then remove the cable.



Cleaning of Radiator\_001

|   |                |
|---|----------------|
| 1 | Radiator cover |
| 2 | Cotter pin     |
| 3 | Washer         |
| 4 | Cable          |

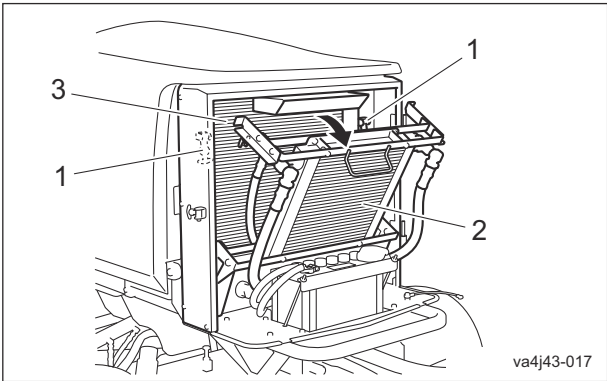
3. Pull up the radiator cover to remove it.



Cleaning of Radiator\_002

|   |                |
|---|----------------|
| 1 | Radiator cover |
|---|----------------|

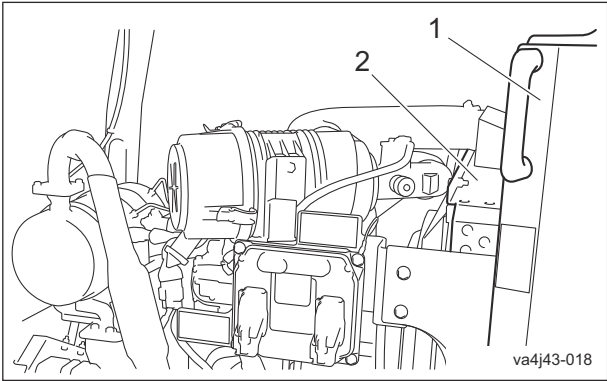
4. Unlock the rubber catches on the left and right of the oil cooler, and then tilt the oil cooler.



Cleaning of Radiator\_003

|   |              |
|---|--------------|
| 1 | Rubber catch |
| 2 | Oil cooler   |
| 3 | Radiator     |

5. Carefully clean the radiator with water or compressed air.  
6. Open the hood.



Cleaning of Radiator\_004

|   |          |
|---|----------|
| 1 | Hood     |
| 2 | Radiator |



# Handling Instructions

7. Carefully clean the radiator with water or compressed air.

## Main Vehicle

### Cleaning of Oil Cooler

#### Important

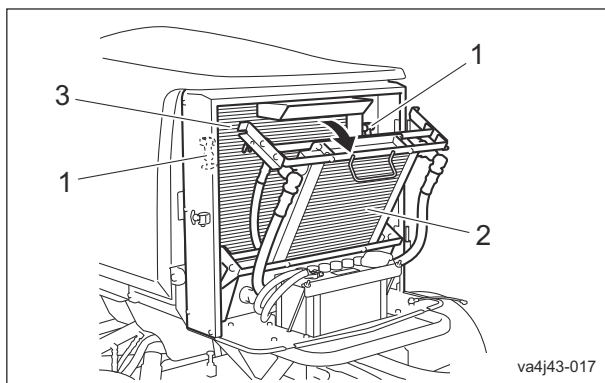
An unclean oil cooler may cause malfunction of the hydraulic system.

#### Important

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

If the oil cooler has been contaminated with dust, be sure to clean it. Especially after operating the machine in a dusty environment, it is important to remove dust as soon as possible.

1. Open the radiator cover.
2. Unlock the rubber catches on the left and right of the oil cooler, and then tilt the oil cooler.



Cleaning of Oil Cooler\_001

|   |              |
|---|--------------|
| 1 | Rubber catch |
| 2 | Oil cooler   |
| 3 | Radiator     |

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

## Storage

### Short-Term Storage

Short-term storage means that the machine is temporarily stored (within 1 month) without use.

Follow the instructions below for short-term storage of the machine.

1. Cleaning
  - Remove dirt, grass clippings, oil stains etc. completely from the main vehicle and engine.
2. Mower units
  - When storing this machine, lower all the mower units unless a positive mechanical lock is provided.
3. Storage location
  - Cover the machine and store it in a dry place where it will not be exposed to rain.

# Handling Instructions

---

|                                            |                  |
|--------------------------------------------|------------------|
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| <b>Jacking Up The Machine .....</b>        | <b>Page 6-2</b>  |
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# Maintenance

## Precautions for Maintenance

### Warning

The chapter "Maintenance" in this manual describes practical measures which should be performed by a mechanic with expertise. The owner should instruct the mechanic with expertise to perform maintenance service for this machine.

### Caution

First, learn well the operations you plan to perform.

### Important

Use tools appropriate for each operation.

### Important

Use Barons genuine parts for replacement and accessories.  
Our product warranty may be void if you use non-genuine parts for replacement or accessories.

## Jacking Up The Machine

### About Jacking Up The Machine

### Warning

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

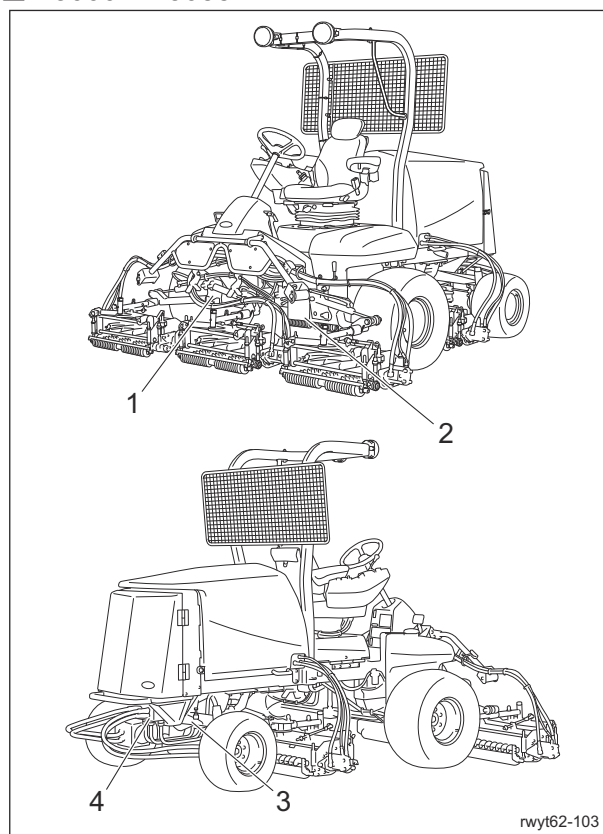
### Important

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

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

### Jack-Up Points

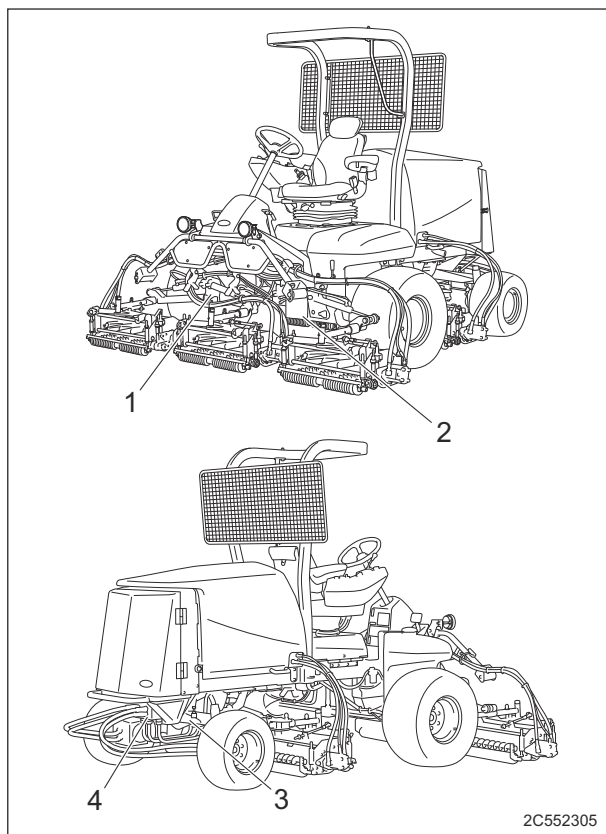
■ #30001 – 30551



rwyt62-103

Jack-Up Points\_001

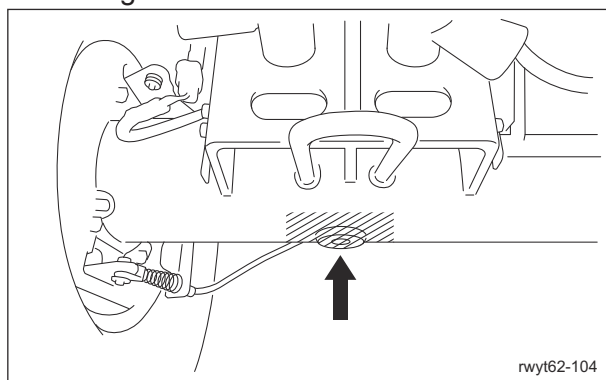
## ■ #30552-



Jack-Up Points\_002

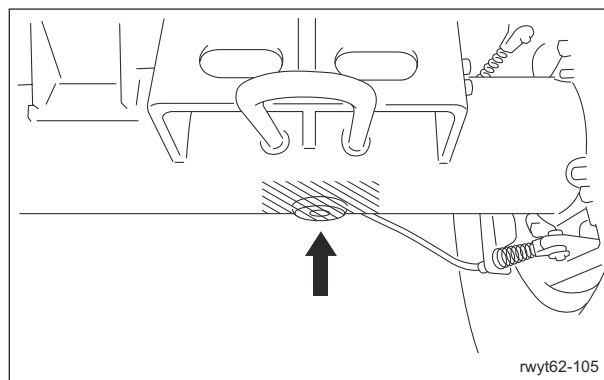
|   | Jack-up points    |
|---|-------------------|
| 1 | Front right frame |
| 2 | Front left frame  |
| 3 | Right pivot       |
| 4 | Left pivot        |

## 1. Front right frame



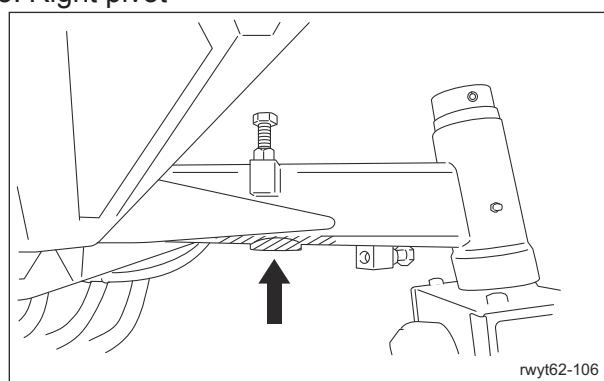
Jack-Up Points\_003

## 2. Front left frame



Jack-Up Points\_004

## 3. Right pivot

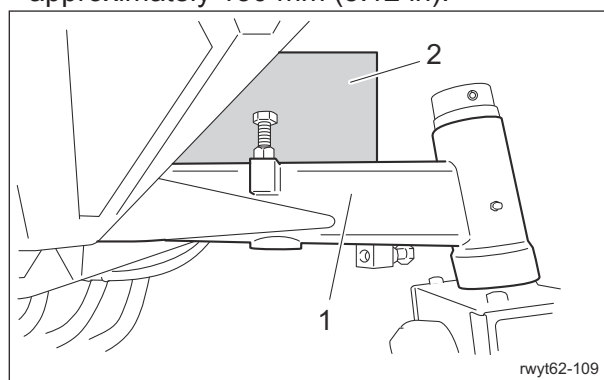


Jack-Up Points\_005

When jacking up the machine at the right pivot, place a block of wood between the right pivot and the frame.

**Note:**

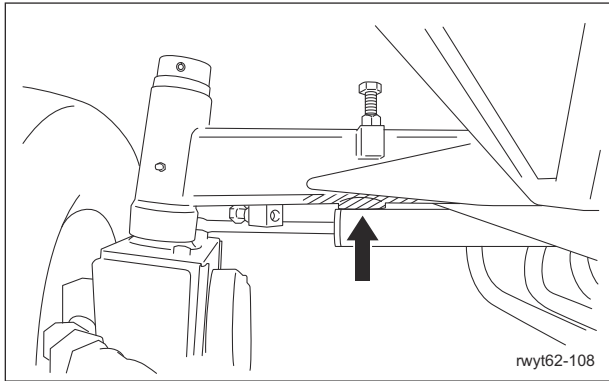
Use a block of wood with a height of approximately 130 mm (5.12 in).



Jack-Up Points\_006

|   |               |
|---|---------------|
| 1 | Pivot         |
| 2 | Block of wood |

4. Left pivot

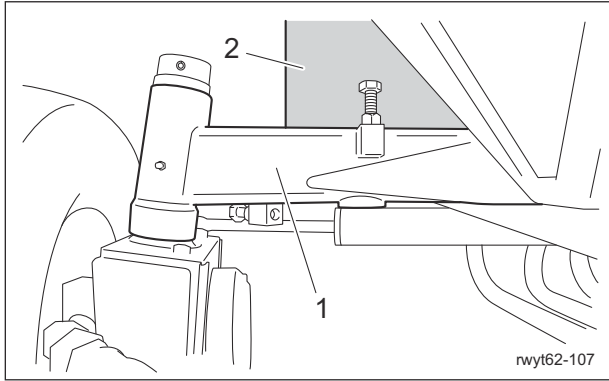


Jack-Up Points\_007

When jacking up the machine at the left pivot, place a block of wood between the left pivot and the frame.

Note:

Use a block of wood with a height of approximately 130 mm (5.12 in).



Jack-Up Points\_008

|   |               |
|---|---------------|
| 1 | Pivot         |
| 2 | Block of wood |

## Inspection and Cleaning

Inspect and clean the machine with the goals of the followings.

- Accident prevention
- Failure prevention
- Performance retention

Make efforts for early detection of the machine failure and prevention of the sudden occurrence of trouble.

Perform maintenance and repair works immediately if any abnormality is found in the machine.

## Engine

### Inspection of Belt

**Warning**

The engine must be stopped when the belt is inspected.

**Important**

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

1. Check the belt tension.
2. Make sure that there are no cracks and damage on the belt.
3. Make sure that there is no abnormal wear on the belt.

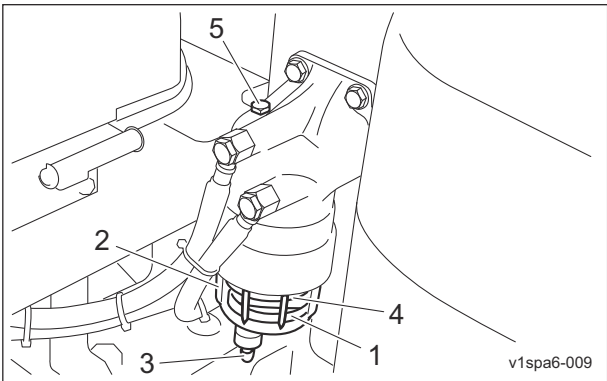
### Inspection of Water Separator

**Important**

If water contaminates the fuel, the supply pump and injector will seize due to heat.

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.



Inspection of Water Separator\_001

|   |                   |
|---|-------------------|
| 1 | Float             |
| 2 | Cup               |
| 3 | Water drain plug  |
| 4 | Element           |
| 5 | Air-bleeding bolt |

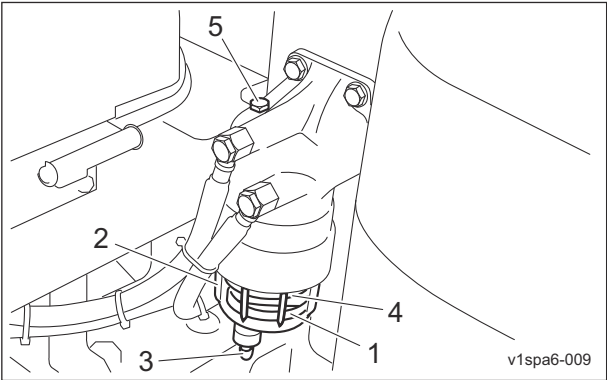
Draining of Water Separator

Important

If water contaminates the fuel, the supply pump and injector will seize due to heat.

Drain the water in accordance with the Maintenance Schedule.  
However, when the float is raised by water, drain the water even before the schedule.

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.



Draining of Water Separator\_001

|   |                   |
|---|-------------------|
| 1 | Float             |
| 2 | Cup               |
| 3 | Water drain plug  |
| 4 | Element           |
| 5 | Air-bleeding bolt |

- [4] Tighten the water drain plug and air-bleeding bolt.
- [5] Bleed air from the fuel system.

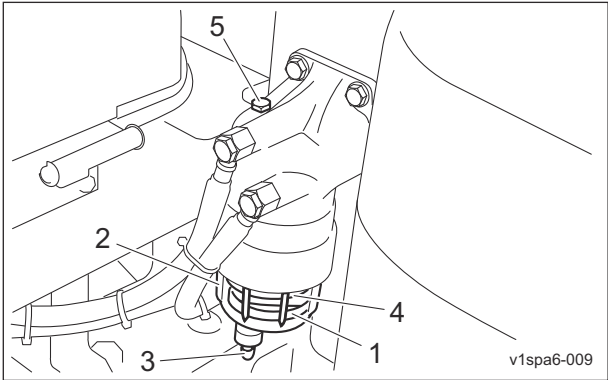
Cleaning of Water Separator

Important

If water contaminates the fuel, the supply pump and injector will seize due to heat.

Clean the water separator in accordance with the Maintenance Schedule.  
However, when debris has accumulated in the cup, clean it even before the schedule.

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.
  - [3] Remove and clean the cup, element and float.  
Replace the element with a new one when replacement needed.



Cleaning of Water Separator\_001

|   |                   |
|---|-------------------|
| 1 | Float             |
| 2 | Cup               |
| 3 | Water drain plug  |
| 4 | Element           |
| 5 | Air-bleeding bolt |

- [4] Install the cup, element and float in their original positions.
- [5] Bleed air from the fuel system.

Cleaning of Air Cleaner Element

 **Caution**

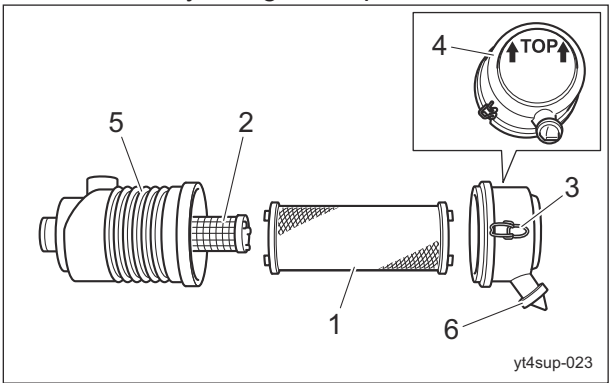
Implement after the engine and DPF etc. have well cooled down.  
Otherwise you may get burned.

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

 **Important**

The inner element cannot be cleaned.

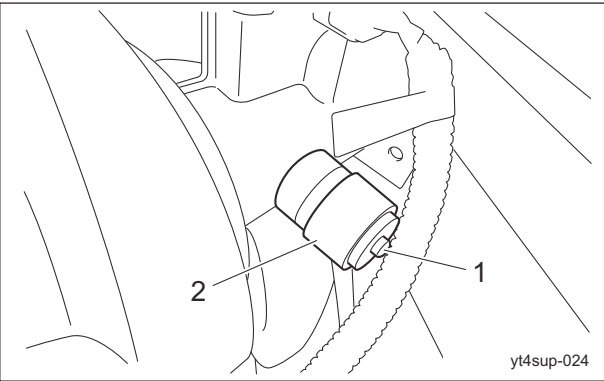
1. Follow the steps below to clean the outer element.
  - [1] Remove the clips from the three locations, remove the air cleaner cap, and then remove the outer element.
  - [2] While paying close attention not to damage the outer element, tap a solid portion of the outer element or blow compressed air 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.



Cleaning of Air Cleaner Element\_001

|   |                  |
|---|------------------|
| 1 | Outer element    |
| 2 | Inner element    |
| 3 | Clip             |
| 4 | Air cleaner cap  |
| 5 | Air cleaner body |
| 6 | Evacuator valve  |

2. Press the reset button of the indicator.



Cleaning of Air Cleaner Element\_002

|   |              |
|---|--------------|
| 1 | Reset button |
| 2 | Indicator    |

Main Vehicle

Inspection of Electrical Wiring

 **Important**

Electrical short circuit will cause fire, electrical leakage and malfunction of electrical equipments.

1. Make sure that there is no defacement in wires and terminals.
2. Make sure that there is no deterioration or damage in wires and terminals.
3. Make sure that there is no looseness in wiring connections.
4. Make sure that there is no poor terminal connection.

Inspection of Wheel Mounting Bolt

 **Important**

Tighten the wheel mounting bolts on the specified torque by using a torque wrench.

1. Check the wheel mounting bolts and wheel nuts for looseness and coming off.
2. Check the wheel mounting bolts and wheel nuts for cracks and damages.
3. Check the wheel mounting bolts and wheel nuts for rust.
4. Check around the wheel mounting bolts and wheel nuts for traces of rust fluid.
5. Check the wheel mounting bolts for unequal bolt length.
6. Check the wheel mounting bolts and wheel nuts for stripped threads and abrasion.



## Inspection of Hydraulic Hoses and Pipes

**Warning**

When checking the hydraulic circuit for pinhole leaks or oil leakage from nozzles, do not use your hands. Use items such as paper or corrugated cardboard to find leakage points.

Be extremely careful with high-pressure oil as it may pierce your skin, resulting in personal accidents.

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.

1. Make sure that there is no wear, deterioration or damage in the hydraulic hoses and pipes.
2. Make sure that there is no looseness in the connecting portion of the hydraulic hoses and pipes.
3. Check underneath the machine for hydraulic oil leakage.

## Supplying Fluids

## Engine

## Supply of Engine Oil

**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 standard:DH-2 or API Service Grade: CJ-4, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

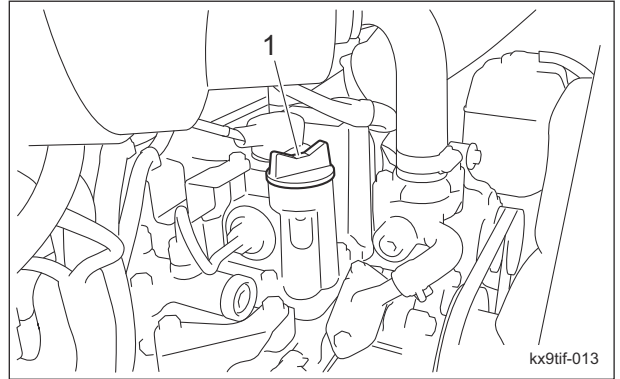
**Important**

Securely install the oil level gauge and oil filler cap.

1. Engine oil is supplied through the oil filler cap.

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. Securely install the oil filler cap.



Supply of Engine Oil\_001

|   |                |
|---|----------------|
| 1 | 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 replenishment.

Supply of Coolant

 Caution

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

 Caution

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

Important

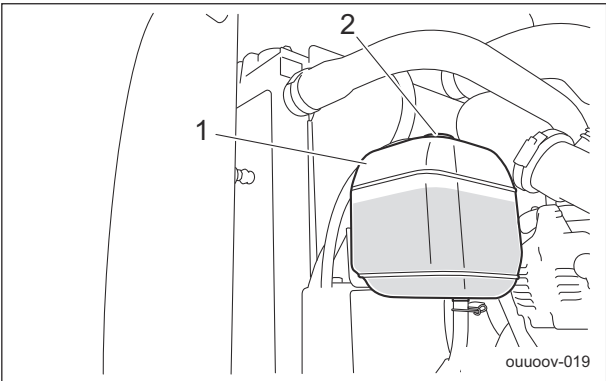
Tightly close the radiator cap. If the cap is loose or incorrectly installed, the engine will be overheated due to water leakage, resulting in engine damage.

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

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

If the coolant in the reserve tank is low, fill the tank with clean water and antifreeze.

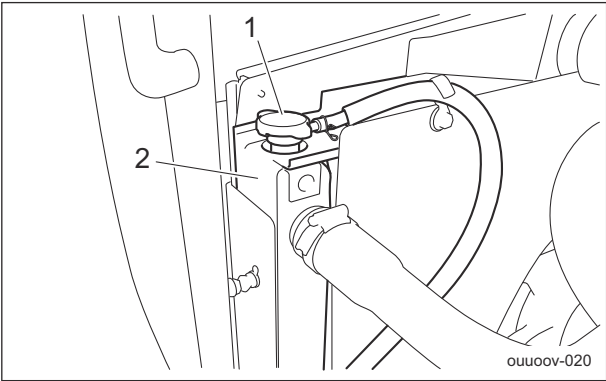
1. If the coolant level in the reserve tank is lower than the "LOW" mark, follow the steps below to fill the tank.
- [1] Remove the reserve tank cap.
  - [2] Supply clean water and antifreeze up to the "FULL" mark.
  - [3] Install the reserve tank cap.



Supply of Coolant\_001

|   |                  |
|---|------------------|
| 1 | Reserve tank     |
| 2 | Reserve tank cap |

2. If no coolant is in the reserve tank, follow the steps below to fill the tank with clean water and antifreeze.
- [1] Remove the radiator cap.
  - [2] Supply clean water and antifreeze up to the opening.
  - [3] Install the radiator cap.
  - [4] Remove the reserve tank cap.
  - [5] Supply clean water and antifreeze up to the "FULL" mark.
  - [6] Install the reserve tank cap.



Supply of Coolant\_002

|   |              |
|---|--------------|
| 1 | Radiator cap |
| 2 | Radiator     |

## Supply of Hydraulic Oil

**Important**

Do not mix different types of oil.

**Important**

For the hydraulic oil to be used, consult Characteristics of Hydraulic Oil and use the oil whose characteristics are equivalent or superior to those specified there. Especially regarding kinematic viscosity and viscosity index, use of hydraulic oil whose figures are less than those of the specified hydraulic oil will cause a malfunction in the hydraulic circuit.

**Important**

Supply hydraulic oil after checking the oil in the hydraulic tank has been sufficiently cooled down. Oil level changes depending on the hydraulic oil temperature.

## ■ Characteristics of Hydraulic Oil

| ISO Viscosity Grade    |                 | ISO VG46                                                |
|------------------------|-----------------|---------------------------------------------------------|
| Density                | 15 °C (59 °F)   | 0.873 g/cm <sup>3</sup><br>(0.0315 lb/in <sup>3</sup> ) |
| API Gravity            |                 | 30.6                                                    |
| Flash Point (Open Cup) |                 | 230 °C (446 °F)                                         |
| Pour Point             |                 | -30 °C (-22 °F)                                         |
| Kinematic              | 40 °C (104 °F)  | 46 mm <sup>2</sup> /s (46 cSt)                          |
| Viscosity              | 100 °C (212 °F) | 7 mm <sup>2</sup> /s (7 cSt)                            |
| Viscosity Index        |                 | 109                                                     |

## ■ Characteristics of Hydraulic Oil with conditions of use

Hydraulic oil of ISO viscosity grade VG68 can be used only if the following condition is met:

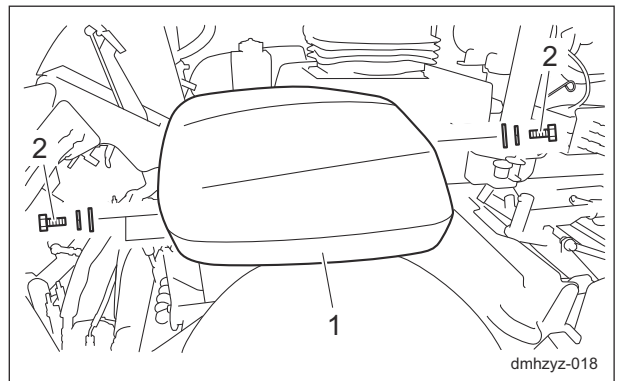
- The outside temperature must be 20 °C (68 °F) or more during engine operation.

| ISO Viscosity Grade    |                 | ISO VG68                                                |
|------------------------|-----------------|---------------------------------------------------------|
| Density                | 15 °C (59 °F)   | 0.878 g/cm <sup>3</sup><br>(0.0318 lb/in <sup>3</sup> ) |
| API Gravity            |                 | 29.7                                                    |
| Flash Point (Open Cup) |                 | 252 °C (486 °F)                                         |
| Pour Point             |                 | -30 °C (-22 °F)                                         |
| Kinematic              | 40 °C (104 °F)  | 68 mm <sup>2</sup> /s (68 cSt)                          |
| Viscosity              | 100 °C (212 °F) | 9 mm <sup>2</sup> /s (9 cSt)                            |
| Viscosity Index        |                 | 107                                                     |

**Note:**

In Japan, "Shell Tellus S2M46 (ISO VG46)" and "Shell Tellus S2M68 (ISO VG68)" meet the characteristics described above. However, in other countries, the specification of Shell Tellus S2M46 and Shell Tellus S2M68 can be below what is required. Please check the product data sheet to ensure that it meets the requirements before using.

1. Remove the screws from the tank cover, and then remove the tank cover.

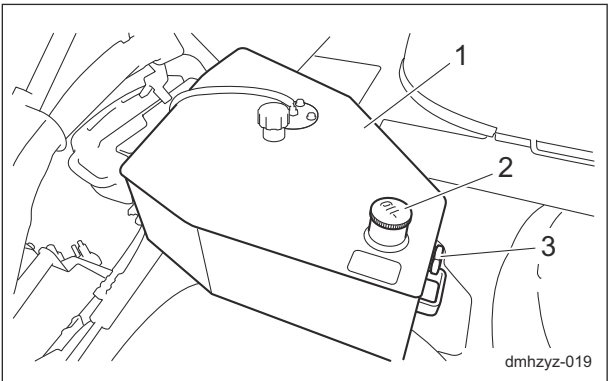


Supply of Hydraulic Oil\_001

|   |            |
|---|------------|
| 1 | Tank cover |
| 2 | Screw      |

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

- [1] Open the tank cap, and then supply hydraulic oil through the oil filling port until the oil level reaches the middle of the oil gauge on the hydraulic tank.
- [2] Tighten the tank cap securely.



Supply of Hydraulic Oil\_002

|   |                |
|---|----------------|
| 1 | Hydraulic tank |
| 2 | Tank cap       |
| 3 | Oil gauge      |

3. Start the engine, and then repeat the steps below a few times.
- Raise and lower the mower units.
  - Turn the steering wheel left and right.
  - Move forward and reverse.
4. Lower the mower units and maintain that position on a level surface, and then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.
5. Check underneath the machine for hydraulic oil leakage.
6. Install the tank cover.

Supply of Battery Fluid

**Danger**

If battery fluid comes into contact with eyes, it may result in blindness. Immediately flush with plenty of water and take medical care from an ophthalmologist.

**Danger**

Do not drink battery fluid.  
If battery fluid enters the mouth or is swallowed, it may result in burns inside the mouth. Immediately and repeatedly gargle with plenty of water, then drink plenty of water, and take medical care.

**Danger**

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

**Warning**

If battery fluid adheres to the skin or clothing, it may cause burns or damage clothing. Immediately flush with plenty of water, then wash thoroughly with soap.

**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).

**Warning**

When refilling, do not fill purified water above the UPPER LEVEL line.  
Doing so may result in electrolyte leaks.

**Caution**

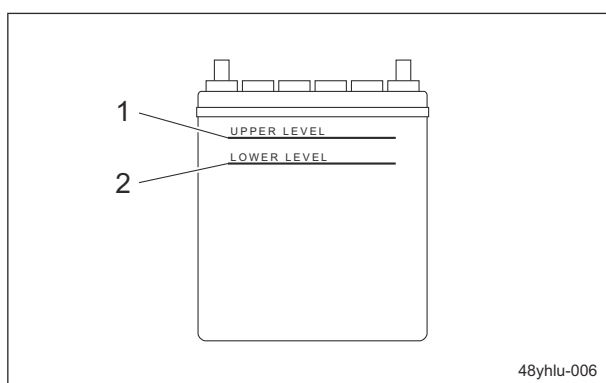
Implement after the engine and DPF etc. have well cooled down.  
Otherwise you may get burned.

**Important**

If battery fluid adheres to the vehicle, it may cause corrosion.  
Wipe it off with a cloth dampened with water, and then flush with water.

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

1. Loosen and remove the vent plug.
2. Fill purified water up to the UPPER LEVEL (Maximum fluid level line).
3. Tighten the vent plug securely.



Supply of Battery Fluid\_001

|   |                          |
|---|--------------------------|
| 1 | Maximum fluid level line |
| 2 | Minimum fluid level line |

## Greasing

### About Greasing

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

Add urea-based No. 2 grease in accordance with the Maintenance Schedule.

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

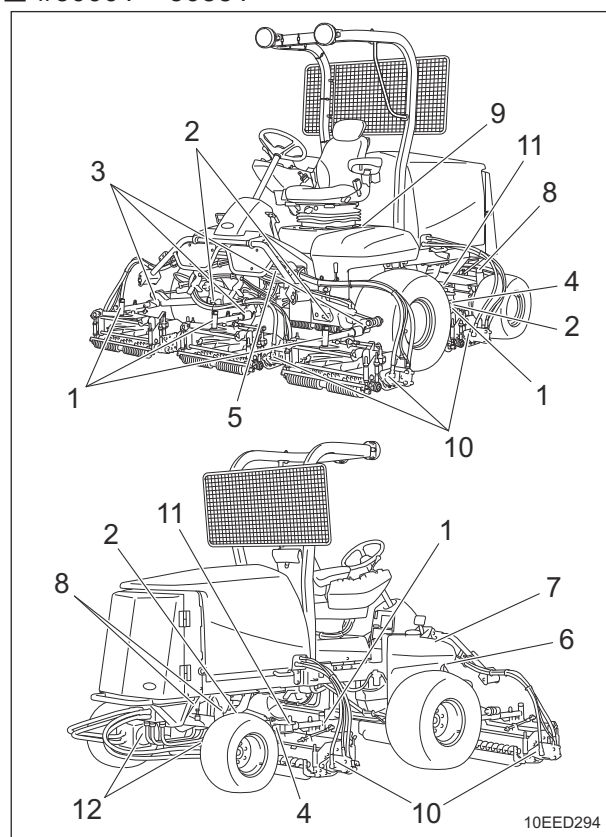
Add grease using the specified grease or lubricant.

### Greasing Points

Grease nipples are installed in the following locations.

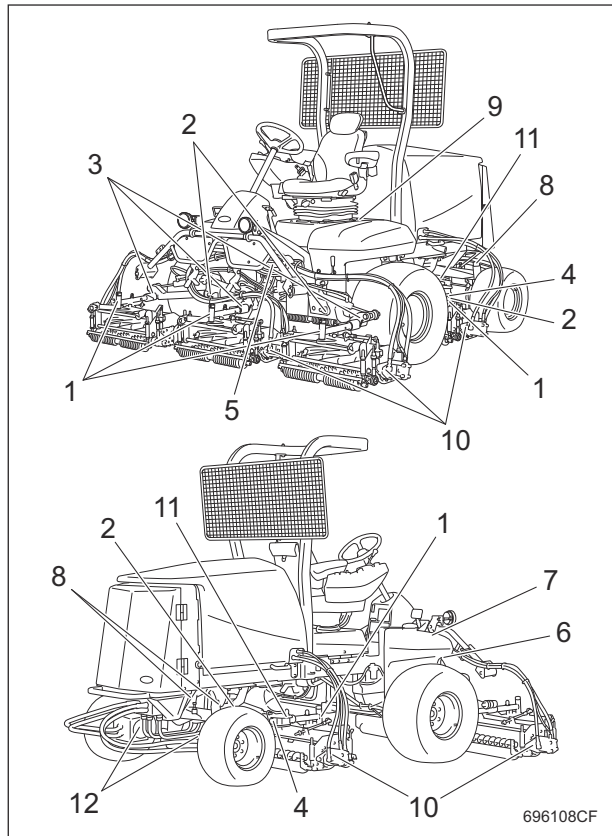
Add grease every 50 hours of operation. If specified locations, periods and grease are additionally described below, follow the instructions.

■ #30001 – 30551



Greasing Points\_001

■ #30552-

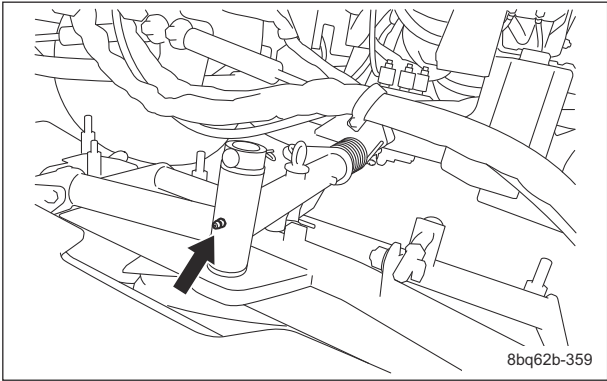


Greasing Points\_002

|    | Location                      | No. of greasing points |
|----|-------------------------------|------------------------|
| 1  | Mower arm fulcrum             | 5                      |
| 2  | Lift arm fulcrum              | 5                      |
| 3  | Lift arm fulcrum shaft        | 3                      |
| 4  | Swiveling bracket fulcrum     | 2                      |
| 5  | Brake pedal shaft fulcrum     | 1                      |
| 6  | Traveling pedal shaft fulcrum | 1                      |
| 7  | Pedal stopper                 | 1                      |
| 8  | Pivot                         | 3                      |
| 9  | Joint                         | 1                      |
| 10 | Reel motor shaft              | 5                      |
| 11 | Rear mower unit swivel pin    | 2                      |
| 12 | Tie rod end (#32051-)         | 2                      |

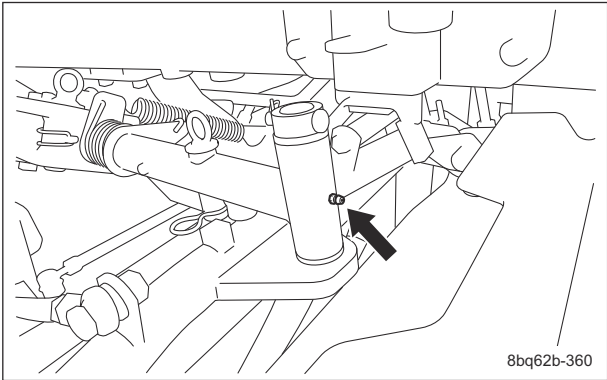
1. Mower arm fulcrum  
There is one greasing point on each mower arm fulcrum.

Mower unit #1



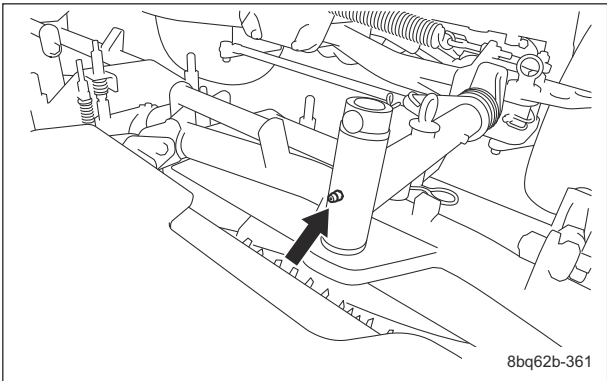
Greasing Points\_003

Mower unit #2



Greasing Points\_004

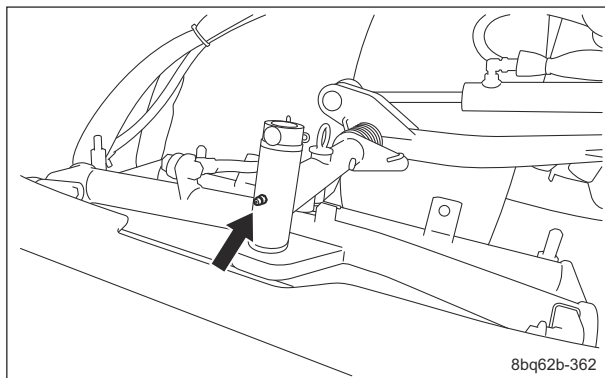
Mower unit #3



Greasing Points\_005

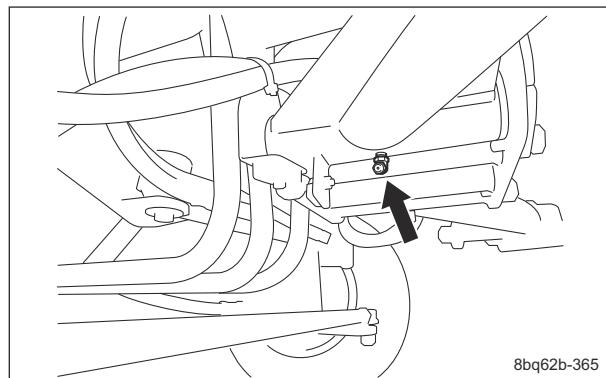


Mower unit #4



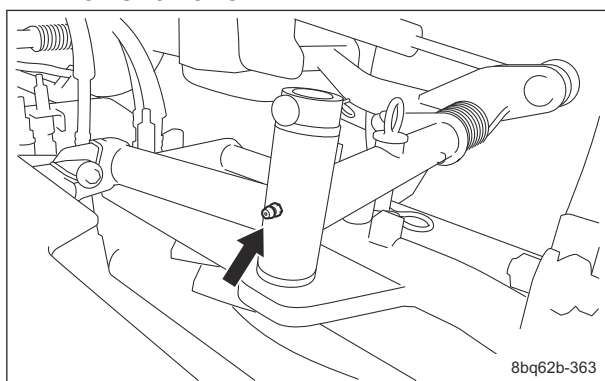
Greasing Points\_006

Mower unit #2



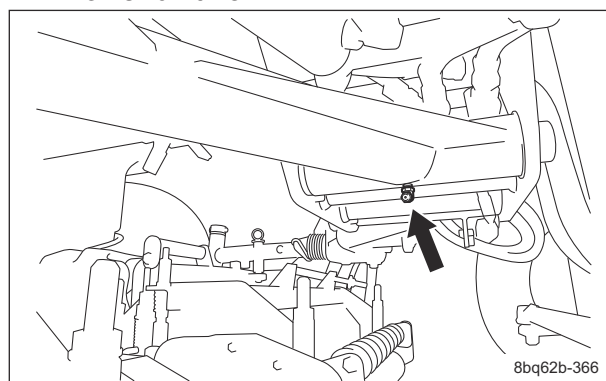
Greasing Points\_009

Mower unit #5



Greasing Points\_007

Mower unit #3

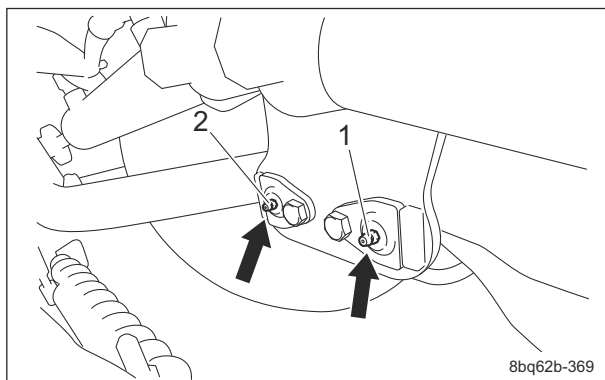


Greasing Points\_010

## 2. Lift arm fulcrum

There is one greasing point on each lift arm fulcrum (on the main vehicle side) connected to the mower unit.

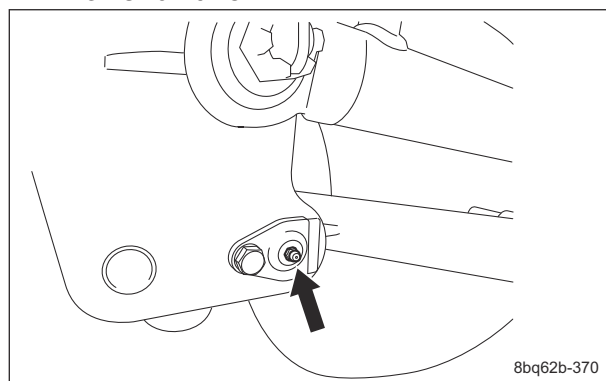
Mower units #1 and #4



Greasing Points\_008

|   |               |
|---|---------------|
| 1 | Mower unit #1 |
| 2 | Mower unit #4 |

Mower unit #5



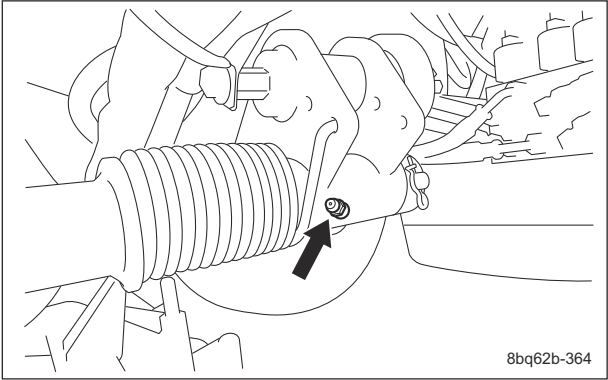
Greasing Points\_011

# Maintenance

3. Lift arm fulcrum shaft

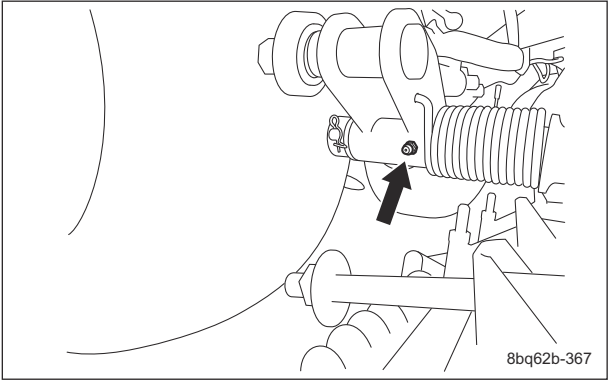
There is one greasing point on each lift arm fulcrum shaft (on the mower arm side) connected to the mower unit.

Mower unit #1



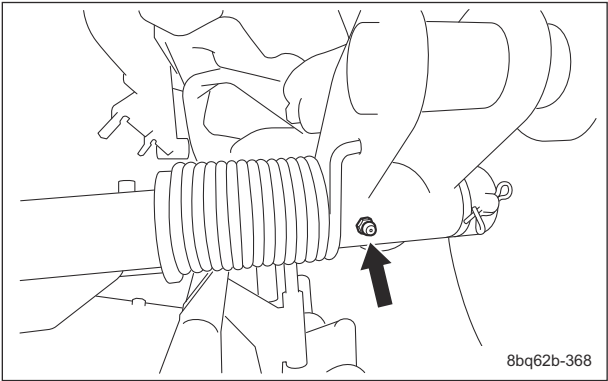
Greasing Points\_012

Mower unit #4



Greasing Points\_013

Mower unit #5

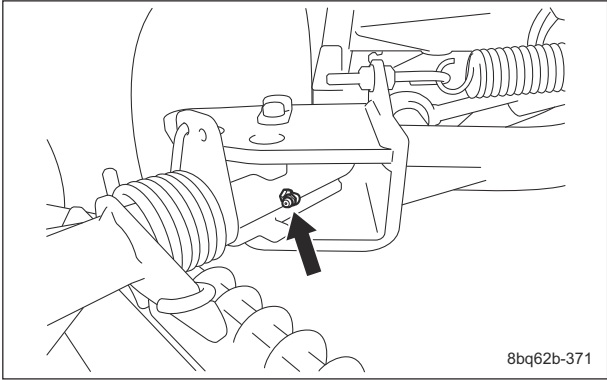


Greasing Points\_014

4. Swiveling bracket fulcrum

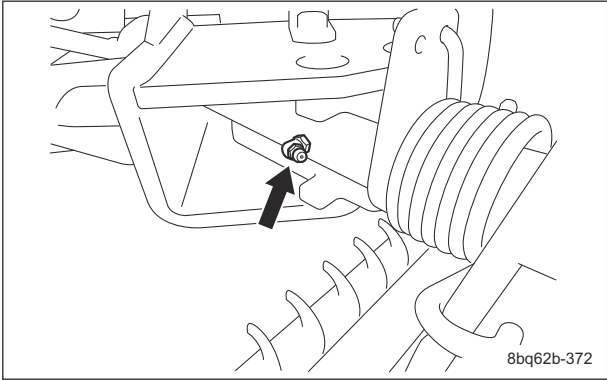
There is one greasing point on each swiveling bracket fulcrum connected to the mower unit.

Mower unit #2



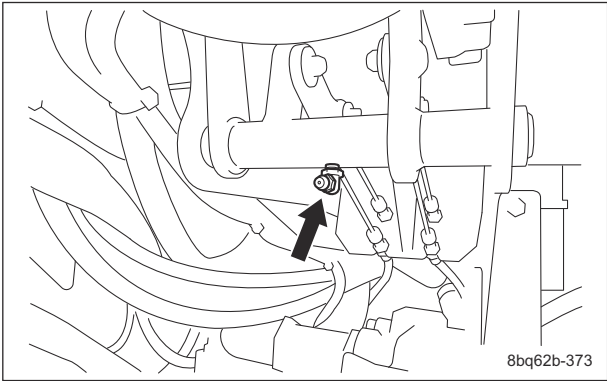
Greasing Points\_015

Mower unit #3



Greasing Points\_016

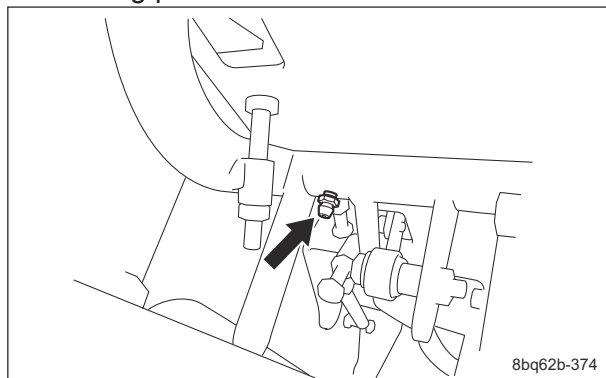
5. Brake pedal shaft fulcrum



Greasing Points\_017

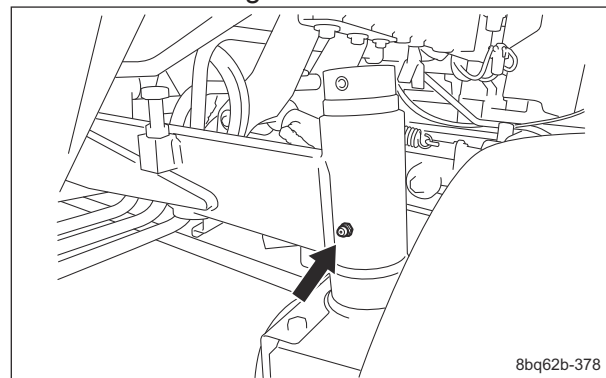


## 6. Traveling pedal shaft fulcrum



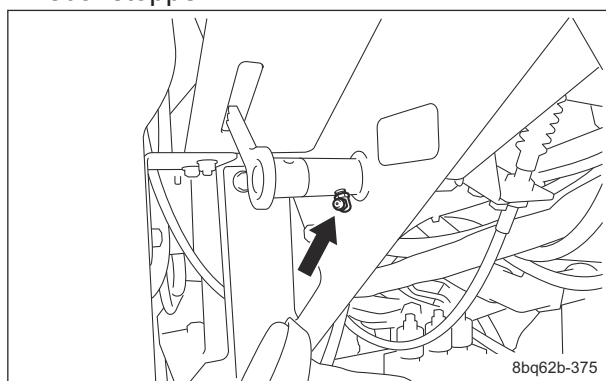
Greasing Points\_018

## Rear wheel Right



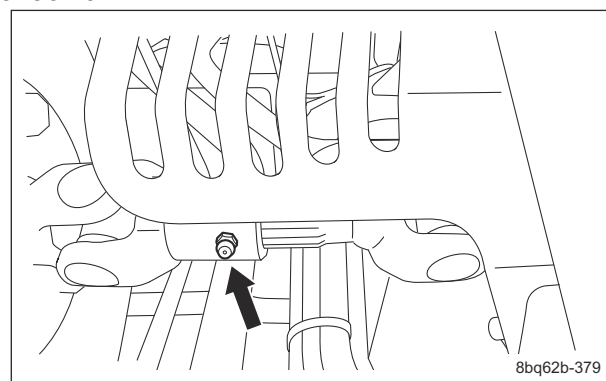
Greasing Points\_022

## 7. Pedal stopper



Greasing Points\_019

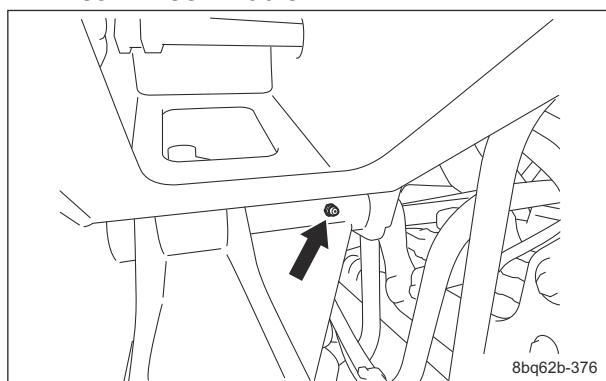
## 9. Joint



Greasing Points\_023

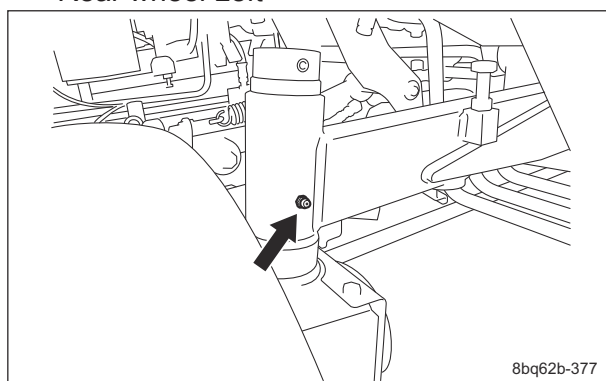
## 8. Pivot

## Rear wheel Middle



Greasing Points\_020

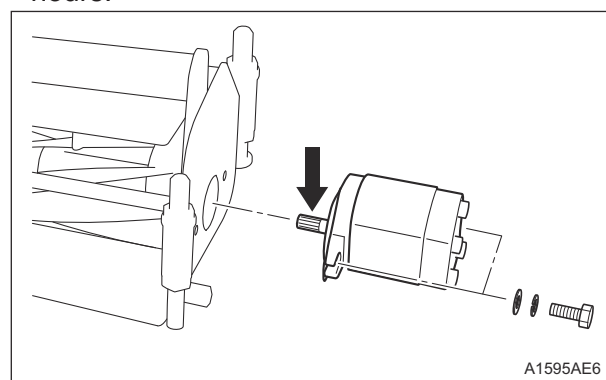
## Rear wheel Left



Greasing Points\_021

## 10. Reel motor shaft

Apply 2 g (0.004 lb) of MOLY SPEED GREASE NO.2 to the reel mower shaft mounted on each mower unit every 250 hours.

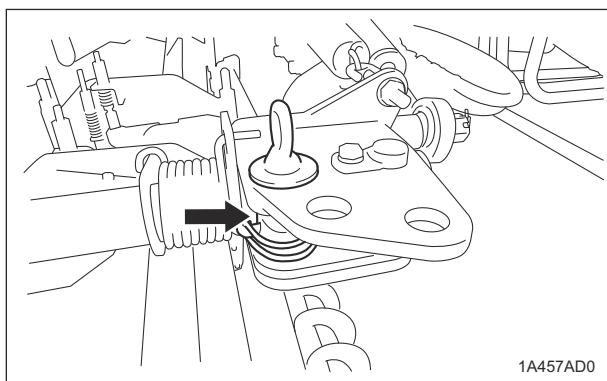


Greasing Points\_024

# Maintenance

## 11. Rear mower unit swivel pin

Apply grease to the pins on mower unit #2 and #3.



Greasing Points\_025

## 12. Tie rod end

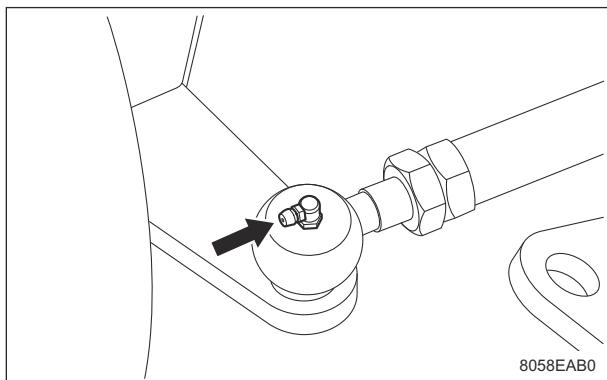
There is one point each on the left and right tie rod ends.

Add 9 g (0.02 lb) of DYNAMAX GREASE EP NO.1 every 3 months of operation.

Note:

Add grease with the steering wheel turned to the left/right completely.

The appropriate greasing amount is that it sticks out a little from the tie rod end rubber boot.

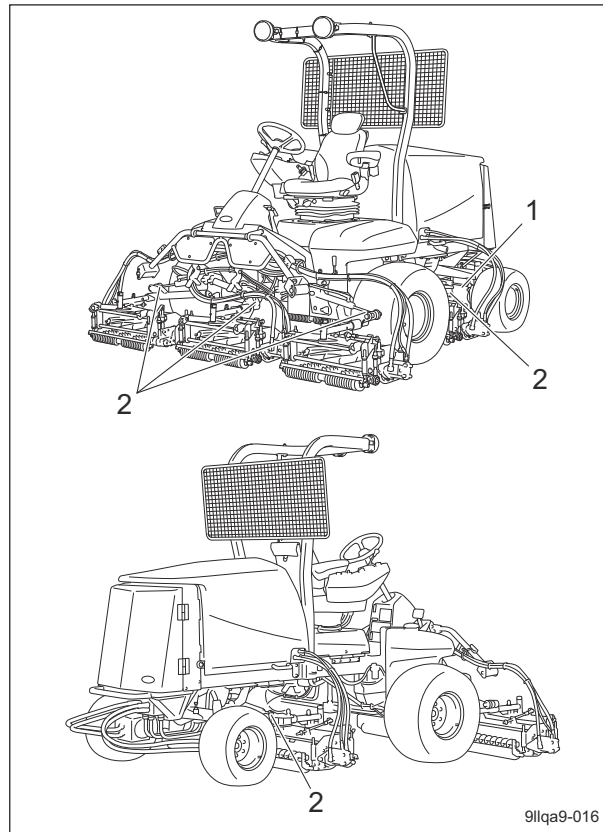


Greasing Points\_026

## Lubricating Points

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

■ #30001 – 30551



Lubricating Points\_001

## Lubrication

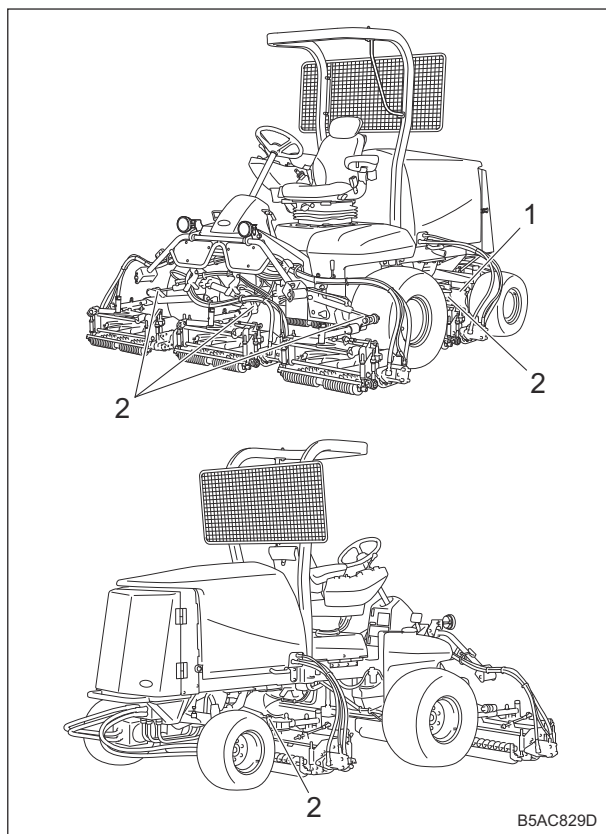
### About Lubrication

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

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

Apply the lubricant.

## ■ #30552-

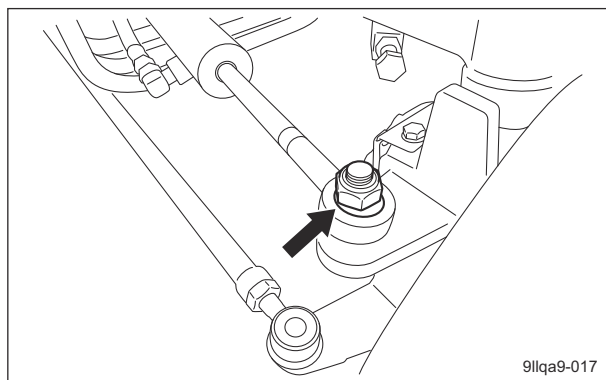


Lubricating Points\_002

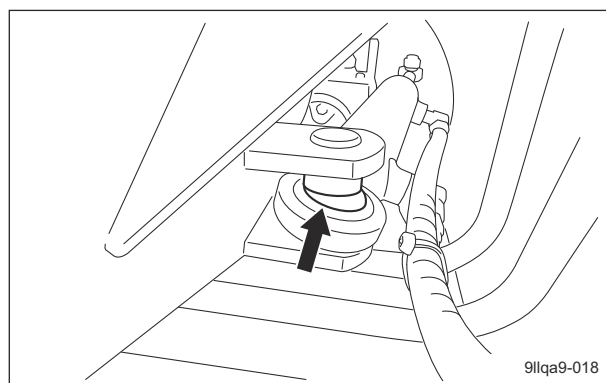
|   | Location                            | No. of greasing points |
|---|-------------------------------------|------------------------|
| 1 | Steering cylinder spherical bearing | 2                      |
| 2 | Mower cylinder spherical bearing    | 10                     |

### 1. Steering cylinder spherical bearing

There are two locations.



Lubricating Points\_003

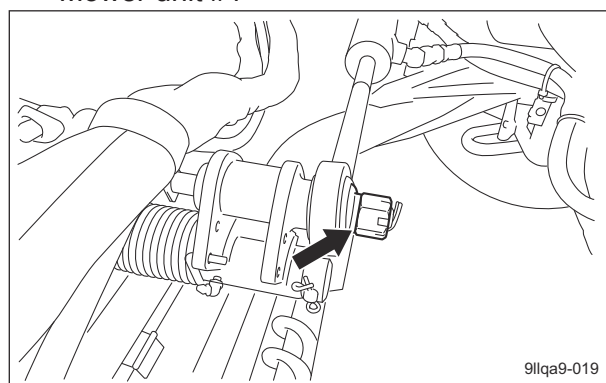


Lubricating Points\_004

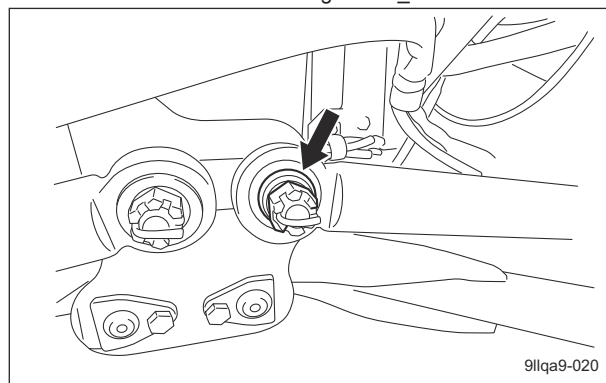
### 2. Mower cylinder spherical bearing

There are two locations on each mower cylinder.

#### Mower unit #1

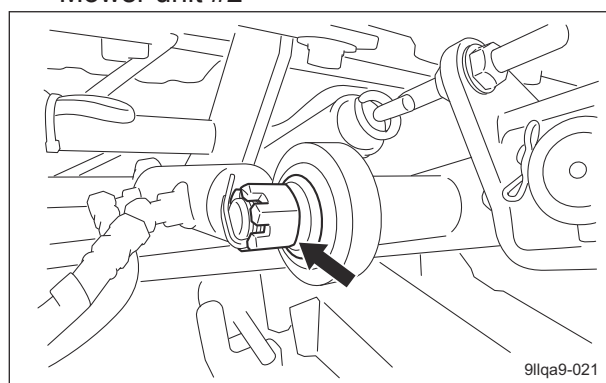


Lubricating Points\_005

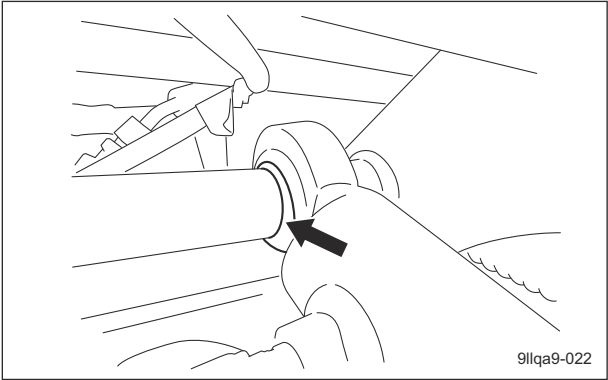


Lubricating Points\_006

#### Mower unit #2

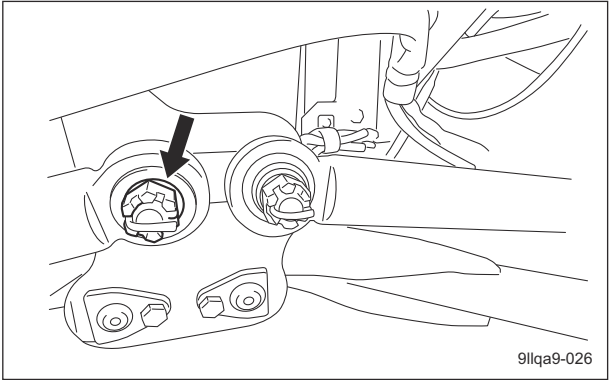


Lubricating Points\_007



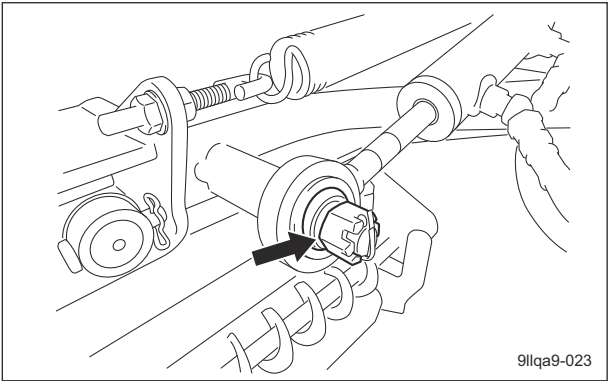
Lubricating Points\_008

Mower unit #3

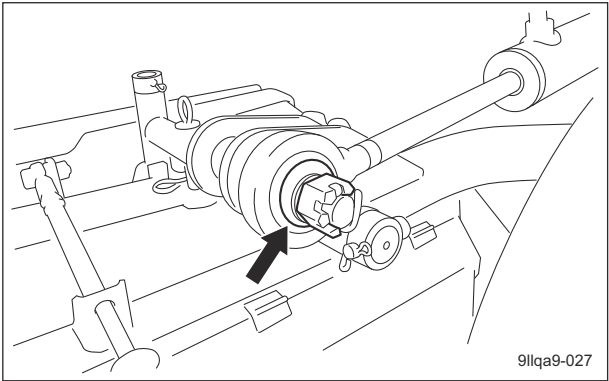


Lubricating Points\_012

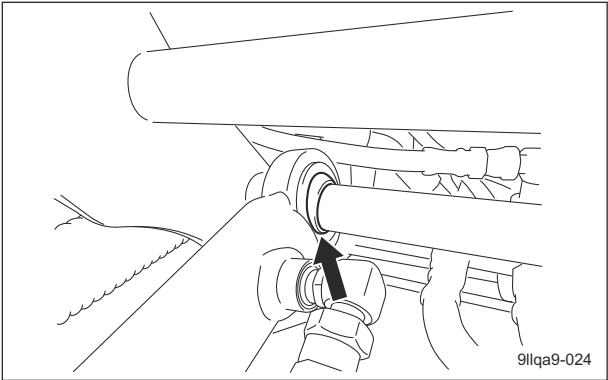
Mower unit #5



Lubricating Points\_009

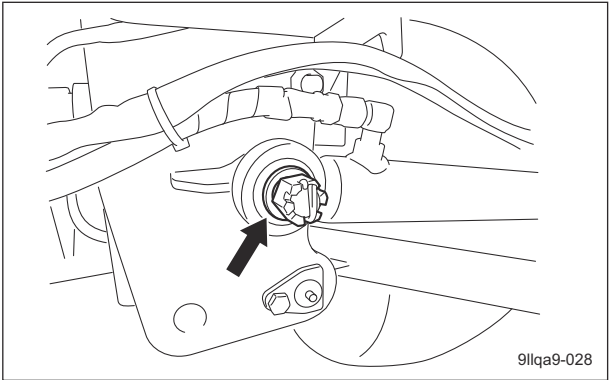


Lubricating Points\_013

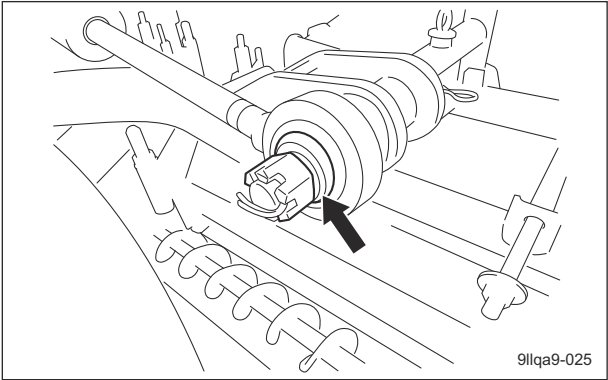


Lubricating Points\_010

Mower unit #4



Lubricating Points\_014



Lubricating Points\_011

## Operations before Maintenance

### Swiveling Mower Units #2 and #3

#### ⚠ Caution

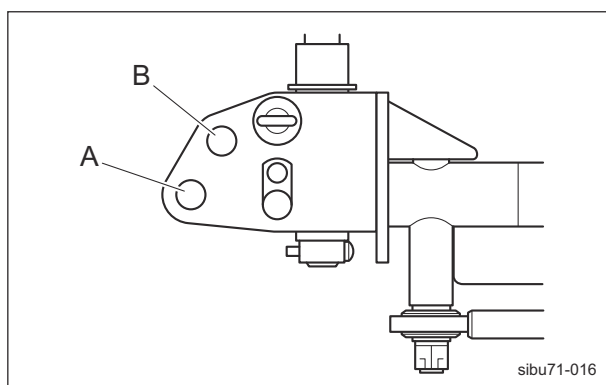
Both the reel cutter (cutting cylinder) and the bed knife (bottom blade) are edged tools. Handle them carefully, since they could cut your hands or legs.

#### ⚠ Caution

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

#### Important

With the mower units LH66 installed, they can not swivel 90 degrees.



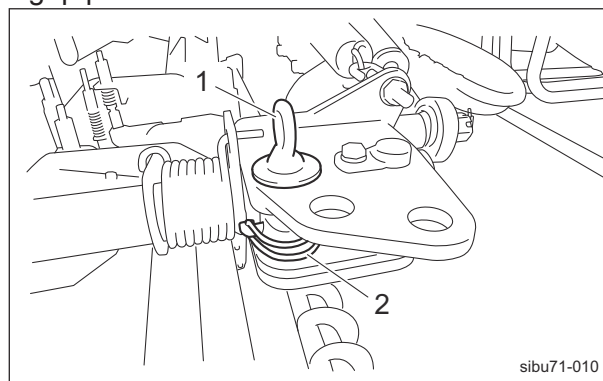
Swiveling Mower Units #2 and #3\_001

|   |                              |
|---|------------------------------|
| A | Mower unit swivel angle 90 ° |
| B | Mower unit swivel angle 45 ° |

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

1. Lower the mower units, and then stop the engine.

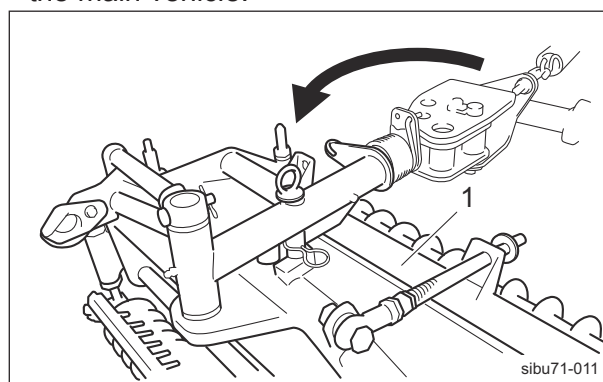
2. Remove the pipe pin, and then remove the grip pin.



Swiveling Mower Units #2 and #3\_002

|   |          |
|---|----------|
| 1 | Grip pin |
| 2 | Pipe pin |

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



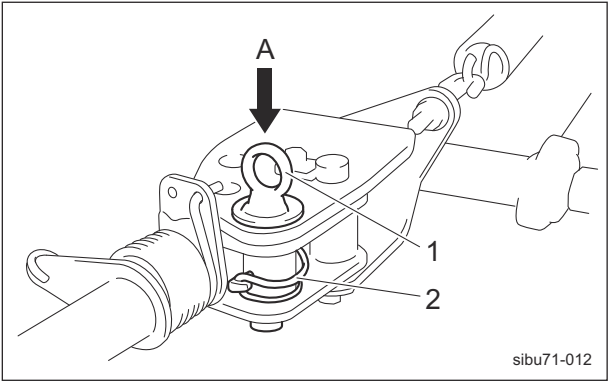
Swiveling Mower Units #2 and #3\_003

|   |            |
|---|------------|
| 1 | Mower unit |
|---|------------|

# Maintenance

4. Fully insert the grip pin into the locking hole for maintenance, and then install the pipe pin in the grip pin.  
The installation location for the locking hole for maintenance differs depending on whether the mower unit is installed in the front or rear position.

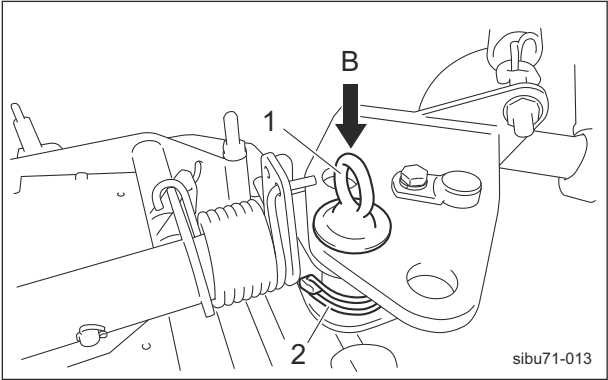
Mower unit position: Front  
Use the rear locking hole (A) for maintenance.



Swiveling Mower Units #2 and #3\_004

|   |          |
|---|----------|
| 1 | Grip pin |
| 2 | Pipe pin |

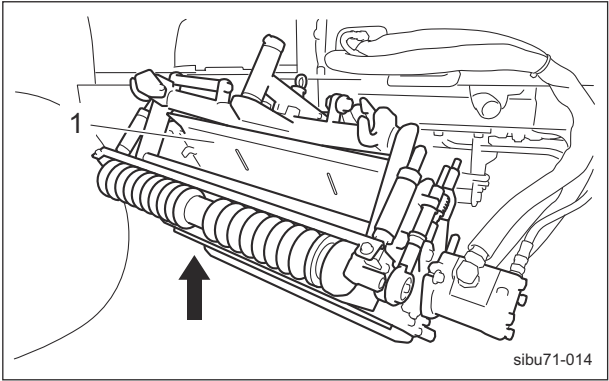
Mower unit position: Rear  
Use the center locking hole (B) for maintenance.



Swiveling Mower Units #2 and #3\_005

|   |          |
|---|----------|
| 1 | Grip pin |
| 2 | Pipe pin |

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



Swiveling Mower Units #2 and #3\_006

|   |            |
|---|------------|
| 1 | Mower unit |
|---|------------|

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



## Adjustment

### Engine

#### Adjustment of Belt Tension

##### Warning

Be sure to stop the engine before adjusting the belts.

##### Important

For the specified value of belt tension, refer to Adjusted Values.  
Before making sure of belt tension, rotate the belt several times.

#### ■ Adjustment of Fan Belt

##### Warning

Be sure to stop the engine before inspecting or adjusting the fan belt.

##### Warning

If a cover is removed due to inspection or adjustment, be sure to reinstall it in its original location.

##### Important

A slacking or damaged fan belt will cause overheating or lack of battery charge.  
Adjust or replace the belt.

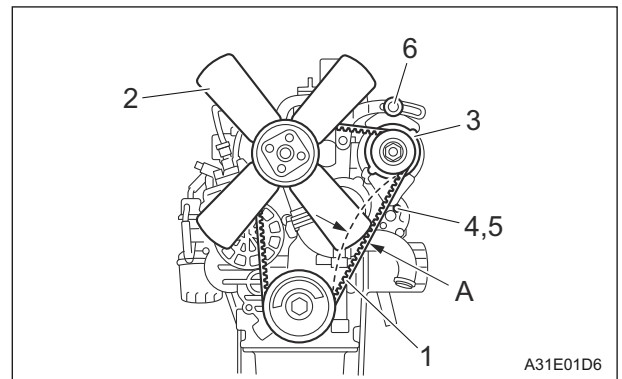
For fan belt adjustment, follow either of the methods below.

1. Adjustment on the basis of belt slack deviation when applying a specified load to a specified place
  - [1] Press the middle of the belt with your finger to check the belt tension.  
The belt tension is appropriate when the belt slacks by approximately 10 mm (0.39 in) when you apply a force of 98 N (10 kgf) to the belt at the middle point between the pulleys.
  - [2] If the belt tension is incorrect, loosen bolt A, nut and bolt B for securing the alternator, and then move the alternator to adjust the tension.

- [3] Be sure to tighten bolt A, nut and bolt B securely after adjustment.

- [4] After adjustment of belt tension, check the belt tension again.

If the belt tension is still not at the appropriate value after repeating the adjustment several times, replace the belt with a new one.



Adjustment of Fan Belt\_001

|   |                 |
|---|-----------------|
| 1 | Fan Belt        |
| 2 | Blade           |
| 3 | Alternator      |
| 4 | Bolt A          |
| 5 | Nut             |
| 6 | Bolt B          |
| A | 10 mm (0.39 in) |

2. Adjustment to suitable belt tension force by using sonic type tension meters at a specified point

##### Important

Perform correct measurement in accordance with the operations manual of the equipment being used for tension measurement.

##### Important

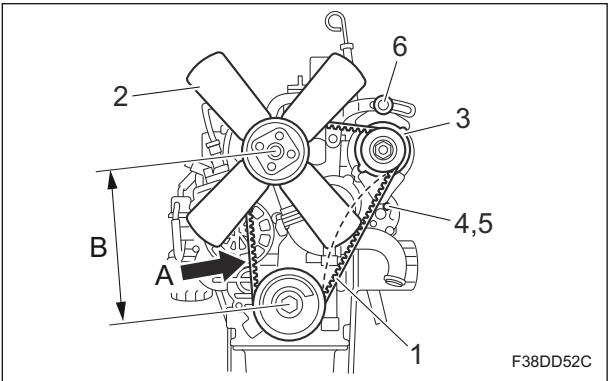
Perform measurement immediately after mounting the belt, when the pulley is not rotating.

- [1] Measure belt tension force by using a sonic type tension meter.  
For measurement position and distance between pulleys, see diagram below.  
Here is the suitable belt tension force.

|             |                                 |
|-------------|---------------------------------|
| Adjustment  | 200 – 300 N (20.39 - 30.59 kgf) |
| Replacement | 267 – 361 N (27.23 - 36.81 kgf) |

# Maintenance

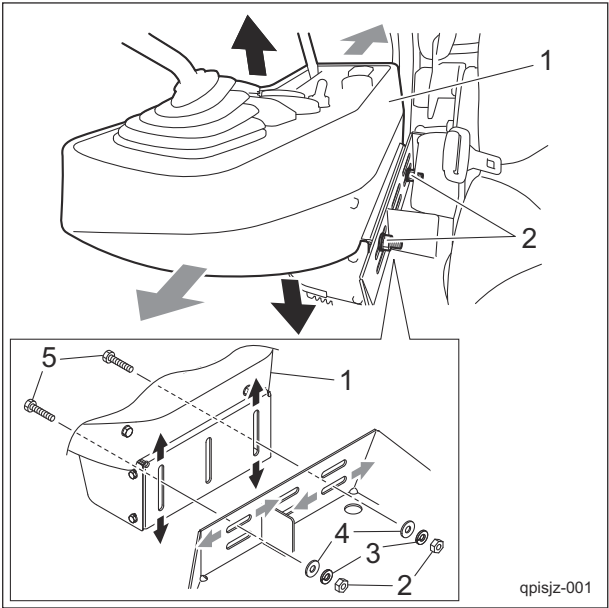
- [2] If the belt tension is inappropriate, loosen bolt A, nut and bolt B for securing the alternator, and then move the alternator to adjust the tension.
- [3] Be sure to tighten bolt A, nut and bolt B securely after adjustment.
- [4] After adjustment of belt tension, check the belt tension again. If the belt tension is still not at the appropriate value after repeating the adjustment several times, replace the belt with a new one.



Adjustment of Fan Belt\_002

|   |                          |
|---|--------------------------|
| 1 | Fan belt                 |
| 2 | Blade                    |
| 3 | Alternator               |
| 4 | Bolt A                   |
| 5 | Nut                      |
| 6 | Bolt B                   |
| A | Measurement position     |
| B | Distance between pulleys |

3. Tighten the nut.



Adjustment of Control Arm\_001

|   |               |
|---|---------------|
| 1 | Control arm   |
| 2 | Nut           |
| 3 | Spring washer |
| 4 | Washer        |
| 5 | Bolt          |

## Main Vehicle

### Adjustment of Control Arm

The control arm can be adjusted up or down and forward or backward.  
Adjust the position to fit the operator.

- 1. Loosen the nut.
- 2. Slide the control arm up or down and forward or backward to the appropriate position.



## Adjustment of Reel Rotation Control Valves

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

Adjust according to the operating conditions. A label listing dial settings for corresponding reel rotation speeds is attached.

Adjust the reel rotation control valve to the setting for the reel rotation speed listed on the reel rotation indicating decal.

"TURNS" means the rotation number of the dial's counterclockwise rotation started from the state where the dial is fully tightened clockwise.

"POS" means the dial decal number pointed by the indicating screw.

Note:

The factory default reel rotation speed is set to 1,450 rpm.

| LH6* / LS6* |     |            | LH52  |     |            |
|-------------|-----|------------|-------|-----|------------|
| TURNS       | POS | REEL SPEED | TURNS | POS | REEL SPEED |
| 2           | 6   | 1,150      | 1     | 7   | 1,250      |
|             | 8   | 1,250      |       | 8   | 1,350      |
| 3           | 2   | 1,350      | 2     | 1   | 1,450      |
|             | 4   | 1,450      |       | 2   | 1,550      |
|             | 6   | 1,500      |       | 3   | 1,700      |

FOR 0 (STARTING POS) TURN CW TO MAX POS

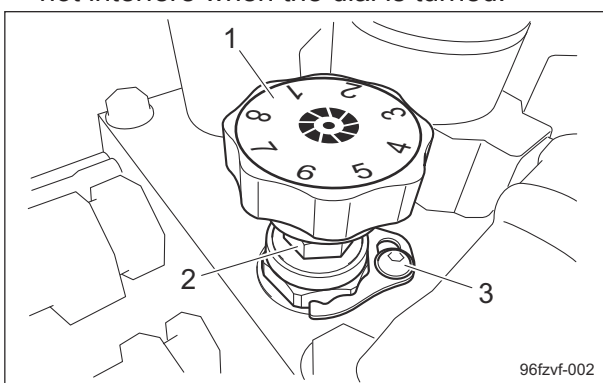
96fzvf-005

Adjustment of Reel Rotation Control Valves\_001

1. Stop the engine.
2. Open the underseat cover.
3. Use the specialized wrench (accessory) to loosen the lock nut for the dial.

Note:

Raise the lock nut to a position where it will not interfere when the dial is turned.



Adjustment of Reel Rotation Control Valves\_002

|   |                  |
|---|------------------|
| 1 | Dial             |
| 2 | Lock nut         |
| 3 | Indicating screw |

## Important

In order to maintain mowing quality, the reel rotation speed must be the same for all mower units.

4. Turn the dial to set it to your desired position.

Set the two dials to the same position.



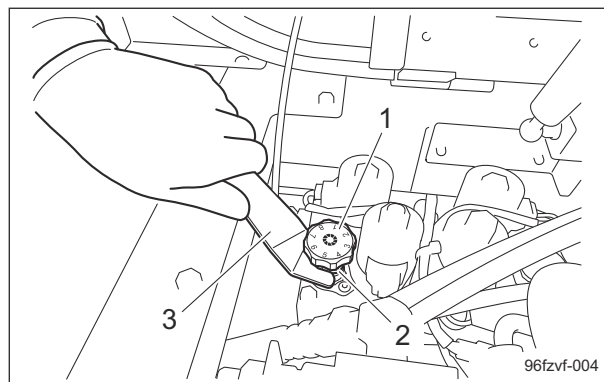
Adjustment of Reel Rotation Control Valves\_003

|   |                                  |
|---|----------------------------------|
| 1 | Dial (mower units #1, #4 and #5) |
| 2 | Dial (mower units #2 and #3)     |
| 3 | Lock nut                         |
| 4 | Indicating screw                 |
| 5 | Reel rotation indicating decal   |

5. Tighten the lock nut for the dial.

If you lost count of the dial rotation number, follow the steps below to adjust the dial.

1. Stop the engine.
2. Open the underseat cover.
3. Use the specialized wrench (accessory) to loosen the lock nut for the dial.

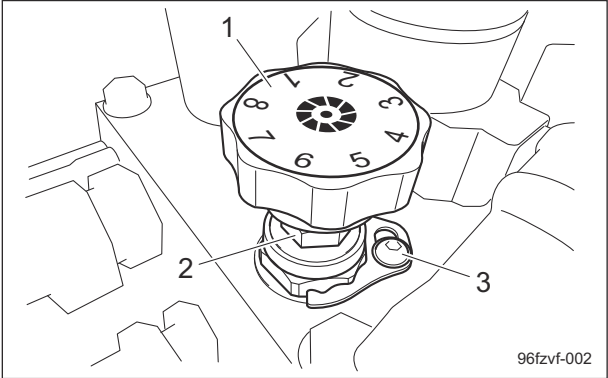


Adjustment of Reel Rotation Control Valves\_004

# Maintenance

|   |                                  |
|---|----------------------------------|
| 1 | Dial (mower units #1, #4 and #5) |
| 2 | Lock nut                         |
| 3 | Specialized wrench (accessory)   |

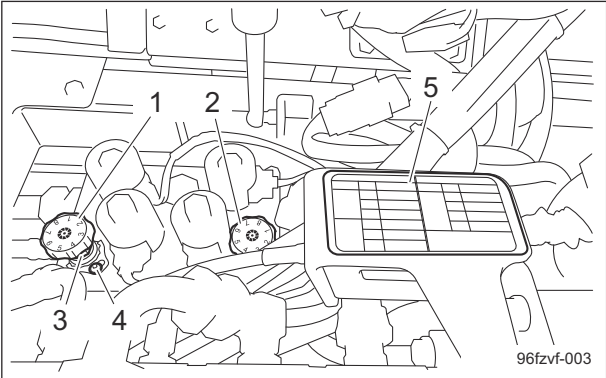
Note:  
Raise the lock nut to a position where it will not interfere when the dial is turned.



Adjustment of Reel Rotation Control Valves\_005

|   |                  |
|---|------------------|
| 1 | Dial             |
| 2 | Lock nut         |
| 3 | Indicating screw |

4. Turn the dial clockwise until it stops.
5. Turn the dial counterclockwise to set it to your desired position.  
The amount that the dial is turned differs depending on the mower unit.  
For example, the following procedures show the steps to set the reel rotation speed to 1,450 rpm.
- [1] When mower unit LS62 or LS66/LH62 · LH66 is installed:  
Turn the dial counterclockwise three times, then an additional 180 degrees.  
Position "4" on the dial sticker should be aligned with the center of the indicating screw.
- [2] When mower unit LH52 is installed:  
Turn the dial counterclockwise two times, then an additional 45 degrees.  
Position "1" on the dial sticker should be aligned with the center of the indicating screw.



Adjustment of Reel Rotation Control Valves\_006

|   |                                  |
|---|----------------------------------|
| 1 | Dial (mower units #1, #4 and #5) |
| 2 | Dial (mower units #2 and #3)     |
| 3 | Lock nut                         |
| 4 | Indicating screw                 |
| 5 | Reel rotation indicating decal   |

6. Use the specialized wrench (accessory) to tighten the lock nut for the dial.

## Adjustment of Stoppers

### Important

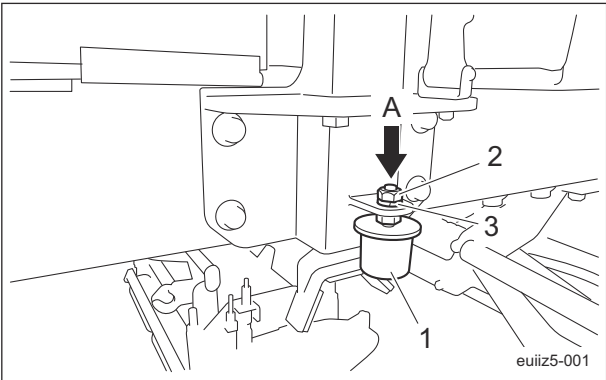
The installation method and installation position of the stoppers differ depending on the mower unit model.

The stopper is installed to prevent the mower arm from interfering with the frame when swiveling the mower units #2 and #3.

Install in the appropriate position.

Note:  
The stopper is not used when the mower units LS66/LH66 installed.  
The stopper installation position for each mower unit model is shown below.

- A: Installed at the lower position
- LS62
  - LH52

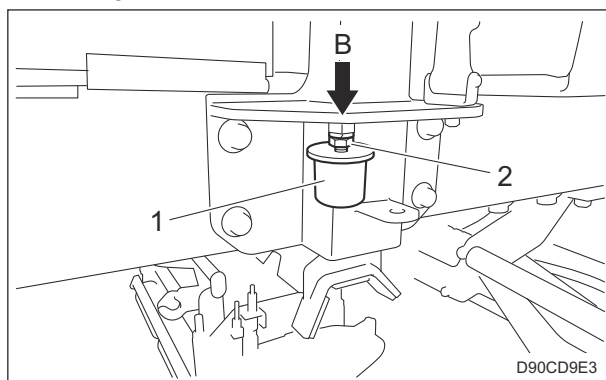


Adjustment of Stoppers\_001

|   |               |
|---|---------------|
| 1 | Stopper       |
| 2 | Nut           |
| 3 | Spring washer |

B: Installed at the upper position

• LH62



Adjustment of Stoppers\_002

|   |         |
|---|---------|
| 1 | Stopper |
| 2 | Nut     |

### Adjustment of Mower Locking Pin

The mower locking pin can prevent or allow tilting of the mower units.

Adjust according to the operating conditions.

Fixed:

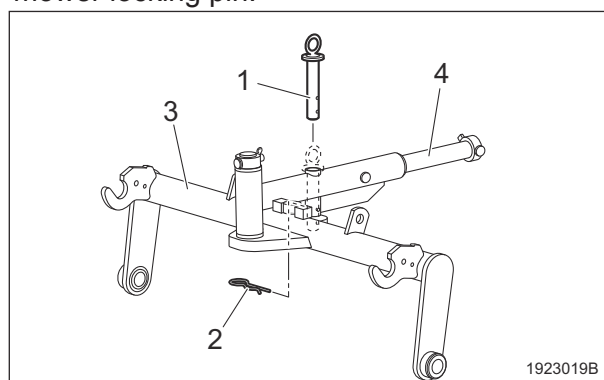
- The mowing line while traveling straight ahead is a straight line. (The mowing line is easy to see.)
- The mower units do not tilt while operating on slopes, and incomplete mowing can be reduced.

Released:

- It is appropriate when turning while mowing or it is easy to follow undulations.
1. On a level surface, lower all mower units.
  2. Apply the parking brake, and then stop the engine.
  3. Adjust the position of the mower locking pin, and then insert the cotter pin.

To fix:

Insert the cotter pin into the upper hole in the mower locking pin.

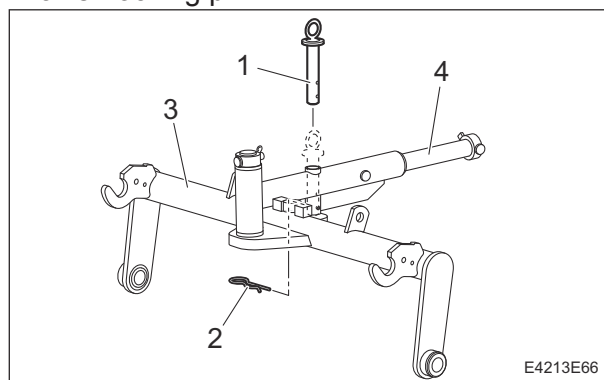


Adjustment of Mower Locking Pin\_001

|   |                   |
|---|-------------------|
| 1 | Mower locking pin |
| 2 | Cotter pin        |
| 3 | Mower arm         |
| 4 | Mower coupling    |

To release:

Insert the cotter pin into the lower hole in the mower locking pin.



Adjustment of Mower Locking Pin\_002

|   |                   |
|---|-------------------|
| 1 | Mower locking pin |
| 2 | Cotter pin        |
| 3 | Mower arm         |
| 4 | Mower coupling    |

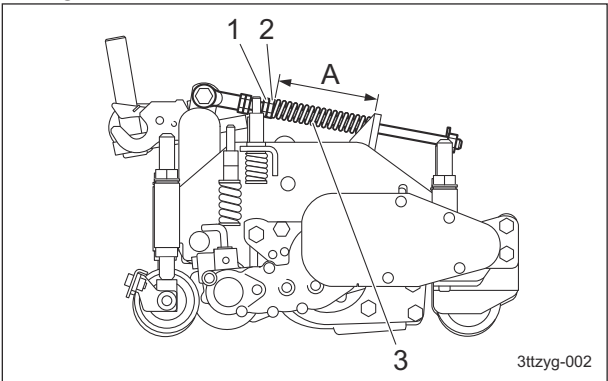
Adjustment of Mower Stabilizer

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

Important

After adjusting the cutting height, adjust the mower stabilizer.

- The mower stabilizer stabilizes the mower units and prevents an undulating finish (a phenomenon called Marcelling).
1. On a level surface, lower all mower units.
  2. Apply the parking brake, and then stop the engine.
  3. Loosen the lock nut.
  4. Tighten the nut to adjust the length of the spring (compression).
    - Mower #1 to #5: 140 mm (5.51 in)
  5. Tighten the lock nut.



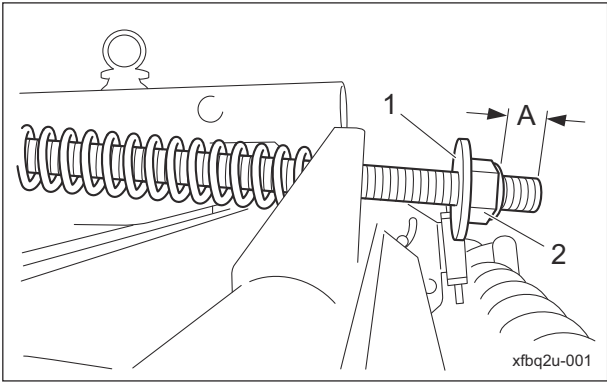
Adjustment of Mower Stabilizer\_001

|   |                  |
|---|------------------|
| 1 | Lock nut         |
| 2 | Nut              |
| 3 | Spring           |
| A | 140 mm (5.51 in) |

Important

When a grass catcher is installed on LH52, a large movement range of the mower will cause the grass catcher to come into contact with the front roller when the mower unit is raised.  
Be careful of the position of the stopper nut.

- [2] LH52
- #1, #4 and #5: 15 mm (0.59 in)
  - #1, #4 and #5 (when a grass catcher is installed): 30 mm (1.18 in)
  - #2 and #3: 40 mm (1.57 in)



Adjustment of Stopper Nuts\_001

|   |        |
|---|--------|
| 1 | Washer |
| 2 | Nut    |
| A | Length |

Adjustment of Stopper Nuts

Note:  
Depending on the specifications, this function may not be available.  
The stopper nut adjusts the movement range of the mower unit.

1. Apply the parking brake, and then stop the engine.
2. Turn the nut to adjust the length of A.  
Adjusted Values are shown below:

- [1] LH62 • 66
- #1, #4 and #5: 15 mm (0.59 in)
  - #2 and #3: 40 mm (1.57 in)

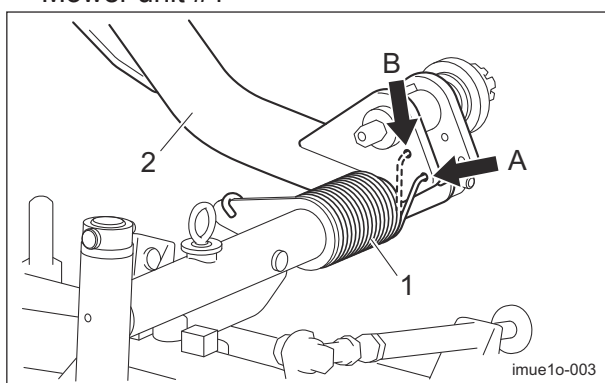
## Adjustment of Mower Unit Leveling Spring

A coil spring is installed on the mower unit coupling.

This keeps the mower unit level.

Adjust the coil spring with the holes in the lift arm.

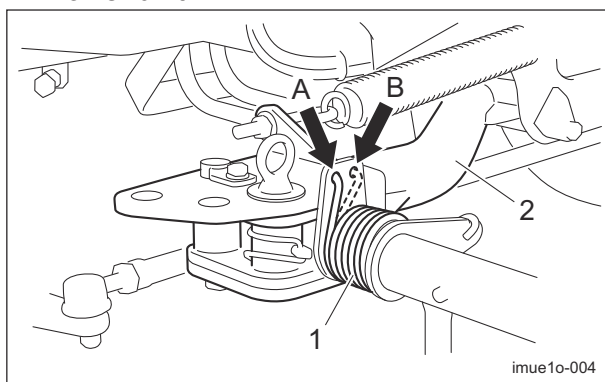
## Mower unit #1



Adjustment of Mower Unit Leveling Spring\_001

|   |                  |
|---|------------------|
| 1 | Coil spring      |
| 2 | Lift arm         |
| A | 22 in mower unit |
| B | 26 in mower unit |

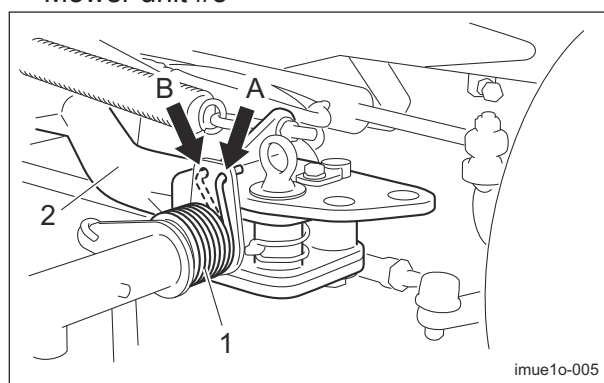
## Mower unit #2



Adjustment of Mower Unit Leveling Spring\_002

|   |                  |
|---|------------------|
| 1 | Coil spring      |
| 2 | Lift arm         |
| A | 22 in mower unit |
| B | 26 in mower unit |

## Mower unit #3

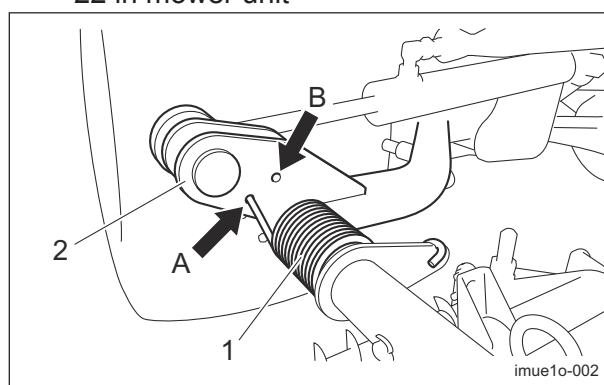


Adjustment of Mower Unit Leveling Spring\_003

|   |                  |
|---|------------------|
| 1 | Coil spring      |
| 2 | Lift arm         |
| A | 22 in mower unit |
| B | 26 in mower unit |

## Mower unit #4

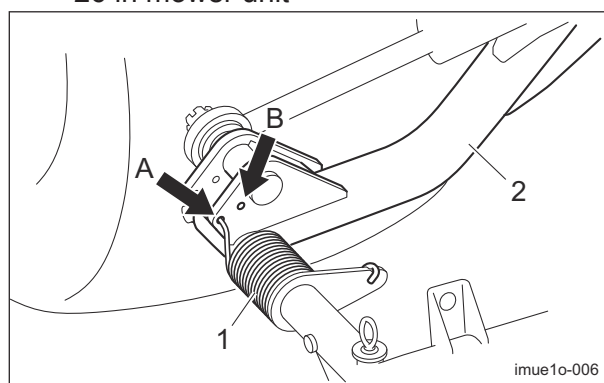
## 22 in mower unit



Adjustment of Mower Unit Leveling Spring\_004

|   |                                       |
|---|---------------------------------------|
| 1 | Coil spring                           |
| 2 | Lift arm                              |
| A | Light spring load (standard position) |
| B | Heavy spring load                     |

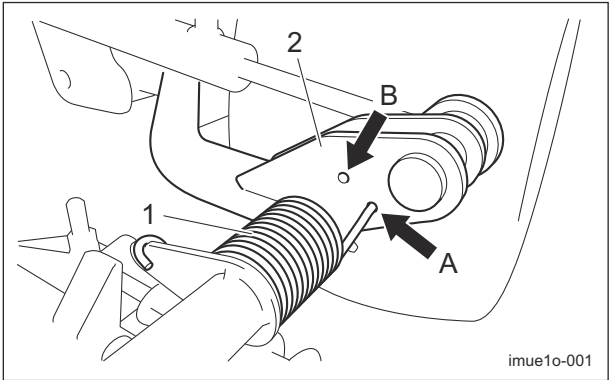
## 26 in mower unit



Adjustment of Mower Unit Leveling Spring\_005

|   |                                       |
|---|---------------------------------------|
| 1 | Coil spring                           |
| 2 | Lift arm                              |
| A | Light spring load (standard position) |
| B | Heavy spring load                     |

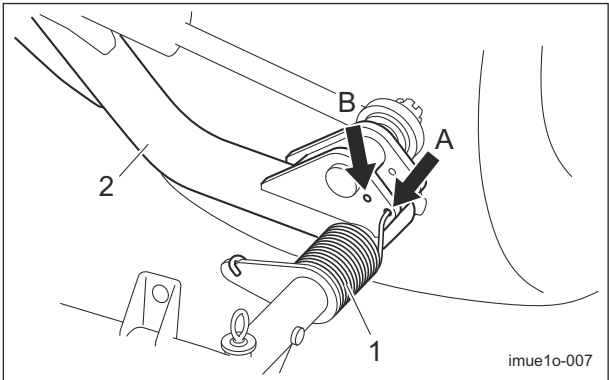
Mower unit #5  
22 in mower unit



Adjustment of Mower Unit Leveling Spring\_006

|   |                                       |
|---|---------------------------------------|
| 1 | Coil spring                           |
| 2 | Lift arm                              |
| A | Light spring load (standard position) |
| B | Heavy spring load                     |

26 in mower unit



Adjustment of Mower Unit Leveling Spring\_007

|   |                                       |
|---|---------------------------------------|
| 1 | Coil spring                           |
| 2 | Lift arm                              |
| A | Light spring load (standard position) |
| B | Heavy spring load                     |

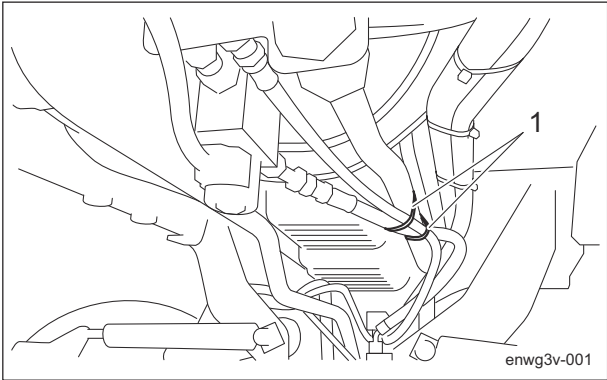
Adjustment of Positions of Mower Units #2 and #3

Important

When the grass catcher is installed, move the mower units to the rear position.

Mower units #2 and #3 can be slid to the front position or rear position. The slide distance is 200 mm (7.87 in).

1. On a level surface, lower all mower units.
2. Move the mower unit up/down lever to the neutral position.
3. Depress the locking pedal while firmly depressing the brake pedal to lock it.
4. Stop the engine.
5. Remove the clamps from the mower unit up/down cylinder hoses.



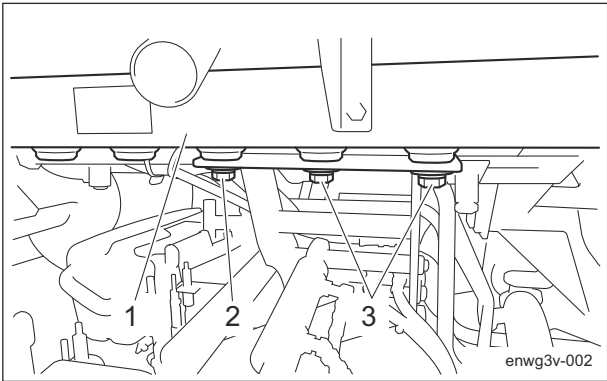
Adjustment of Positions of Mower Units #2 and #3\_001

|   |       |
|---|-------|
| 1 | Clamp |
|---|-------|

Important

Since mower units #2 and #3 are connected, slide them at the same time.

6. Follow the steps below to slide the mower units.
  - When moving to the front position:
    - [1] Loosen bolt A of mower unit #3.
    - [2] Remove bolts B of mower unit #3.

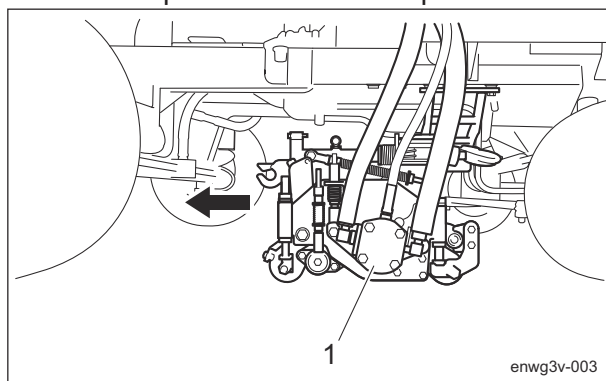


Adjustment of Positions of Mower Units #2 and #3\_002

|   |        |
|---|--------|
| 1 | Frame  |
| 2 | Bolt A |
| 3 | Bolt B |



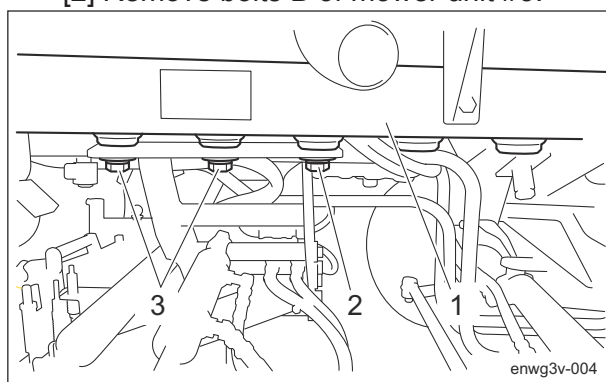
- [3] In the same way, loosen bolt A and remove bolts B of mower unit #2.
- [4] Slide mower units #2 and #3 from the rear position to the front position.



Adjustment of Positions of Mower Units #2 and #3\_003

|   |            |
|---|------------|
| 1 | Mower unit |
|---|------------|

- [5] Install bolts B of mower unit #3.
- [6] In the same way, install bolts B of mower unit #2.
- [7] Tighten bolt A and bolts B on both sides.
- When moving to the rear position:
- [1] Loosen bolt A of mower unit #3.
- [2] Remove bolts B of mower unit #3.

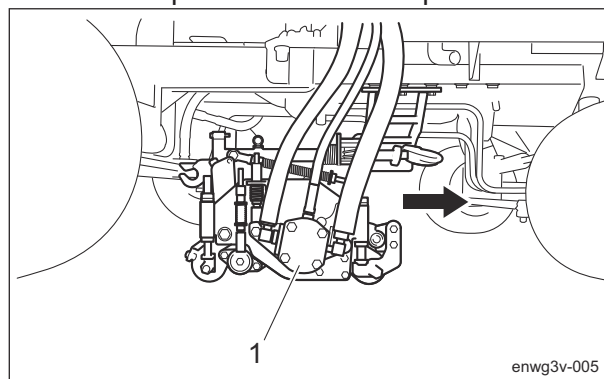


Adjustment of Positions of Mower Units #2 and #3\_004

|   |        |
|---|--------|
| 1 | Frame  |
| 2 | Bolt A |
| 3 | Bolt B |

- [3] In the same way, loosen bolt A and remove bolts B of mower unit #2.

- [4] Slide mower units #2 and #3 from the front position to the rear position.



Adjustment of Positions of Mower Units #2 and #3\_005

|   |            |
|---|------------|
| 1 | Mower unit |
|---|------------|

- [5] Install bolts B of mower unit #3.
- [6] In the same way, install bolts B of mower unit #2.
- [7] Tighten bolt A and bolts B on both sides.
7. Adjust the mower stoppers of mower units #2 and #3.  
"Adjustment of Mower Stoppers for Mower Unit #2 and #3" (Page 6-31)
8. Re-secure the mower unit up/down cylinder hoses with clamps.

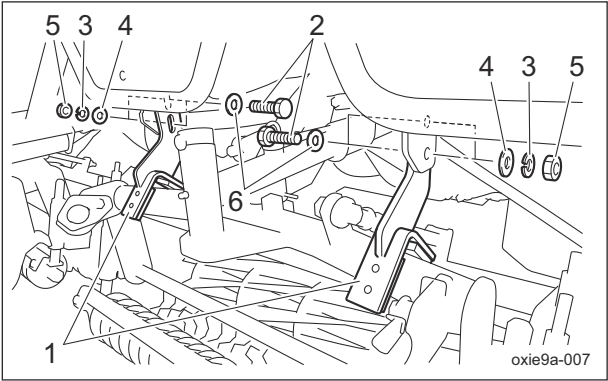
Adjustment of Mower Stopper

■Adjustment of Mower Stoppers for Mower Unit #1

The mower stopper is installed to prevent the mower unit from interfering with the frame. The attaching direction of the mower stopper for mower unit #1 differs according to the type of mower unit. Install in the appropriate direction.

- 1. Loosen the nuts of the right and left mower stoppers.
- 2. Place the right and left mower stoppers to the highest position and attach them temporarily.
- 3. On a level surface, raise all mower units.
- 4. Depress the locking pedal while firmly depressing the brake pedal to lock it.
- 5. Stop the engine.
- 6. Tighten the nuts of the right and left mower stoppers in a position where the mower unit is leveled and the mower arm contacts the center of the mower stopper.

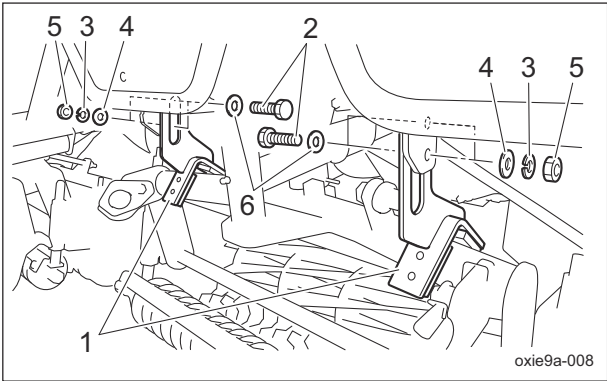
LH62



Adjustment of Mower Stoppers for Mower Unit #1\_001

|   |               |
|---|---------------|
| 1 | Mower stopper |
| 2 | Bolt          |
| 3 | Spring washer |
| 4 | Washer        |
| 5 | Nut           |
| 6 | Washer        |

LH66 • LH52 • LS62 • LS66



Adjustment of Mower Stoppers for Mower Unit #1\_002

|   |               |
|---|---------------|
| 1 | Mower stopper |
| 2 | Bolt          |
| 3 | Spring washer |
| 4 | Washer        |
| 5 | Nut           |
| 6 | Washer        |

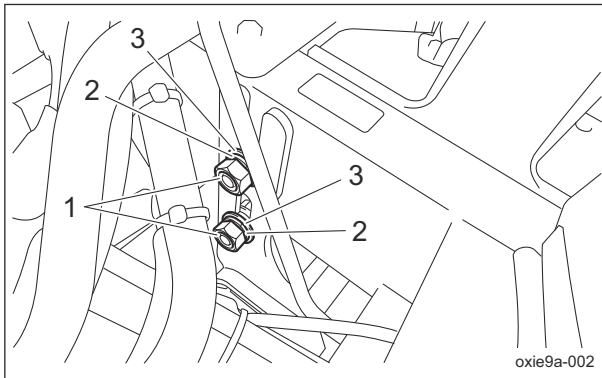


### ■ Adjustment of Mower Stoppers for Mower Unit #2 and #3

The mower stopper is installed to prevent the mower unit from interfering with the frame. The type and attaching direction of the mower stopper for mower unit #2 and #3 differ according to the type of mower unit. And adjust the attaching position of the mower stopper for mower unit #2 and #3 according to the attaching position (front or rear) of the mower unit.

Install in the appropriate direction.

1. On a level surface, lower all mower units.
2. Depress the locking pedal while firmly depressing the brake pedal to lock it.
3. Stop the engine.
4. Open the hood.
5. Open the underseat cover.
6. Remove the nuts of the mower stopper.



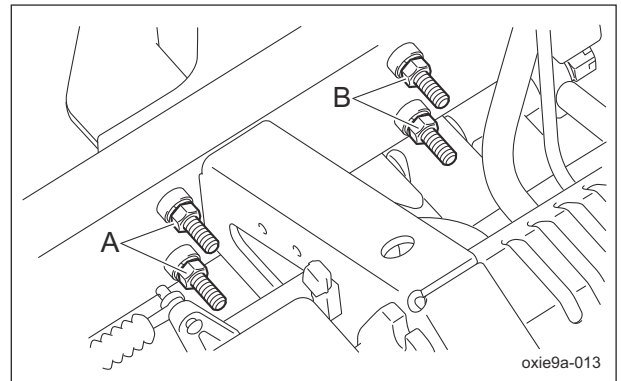
Adjustment of Mower Stoppers for Mower Unit #2 and #3\_001

|   |               |
|---|---------------|
| 1 | Nut           |
| 2 | Spring washer |
| 3 | Washer        |

#### 7. Adjust the mower stopper position.

- To set the mower unit in the front position, attach the mower stopper in the "front position".
- To set the mower unit in the rear position, attach the mower stopper in the "rear position".

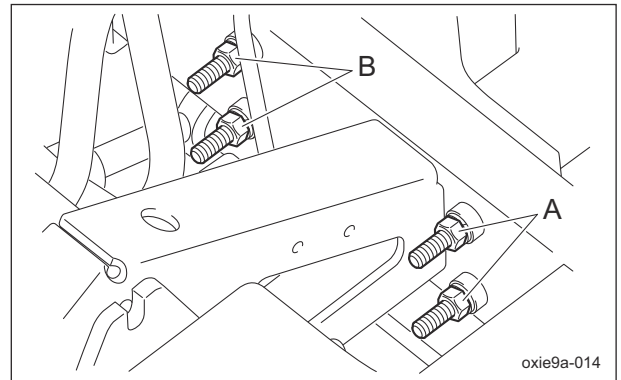
#### Mower unit #2



Adjustment of Mower Stoppers for Mower Unit #2 and #3\_002

|   |                              |
|---|------------------------------|
| A | Mower stopper front position |
| B | Mower stopper rear position  |

#### Mower unit #3



Adjustment of Mower Stoppers for Mower Unit #2 and #3\_003

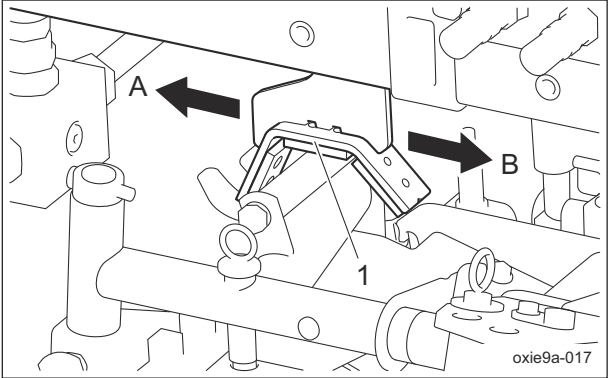
|   |                              |
|---|------------------------------|
| A | Mower stopper front position |
| B | Mower stopper rear position  |

8. Attach the mower stoppers temporarily.
9. Start the engine.
10. Raise all mower units.
11. Tighten the mower stopper nuts previously attached in a position where the mower unit is leveled and the mower stopper contacts the mower arm.

Note:

The relationship between the mower unit type and the mower stopper is as follows.

LH62



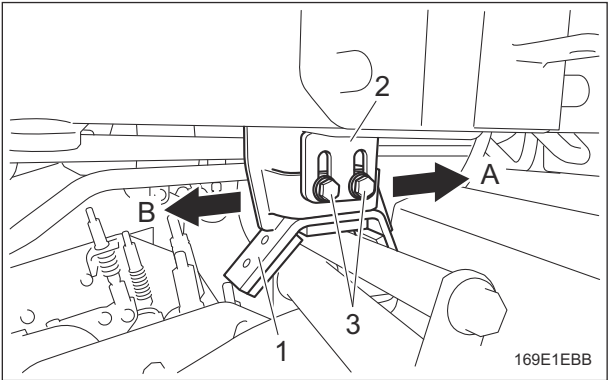
Adjustment of Mower Stoppers for Mower Unit #2 and #3\_004

|   |               |
|---|---------------|
| 1 | Mower stopper |
| A | Front         |
| B | Rear          |

LH66

Mower unit #2

After installing the mower stoppers, press the stopper auxiliary fitting COMP firmly against the bottom side of the frame and secure it with the bolts.



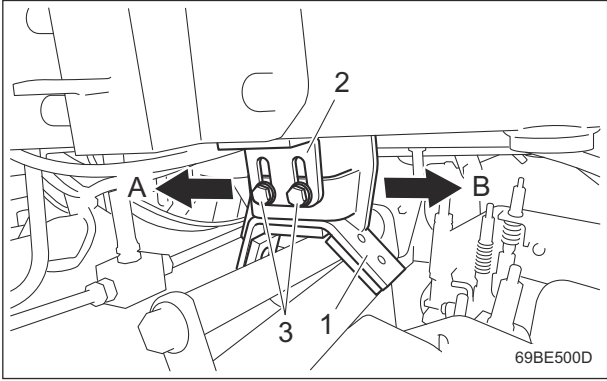
Adjustment of Mower Stoppers for Mower Unit #2 and #3\_005

|   |                                |
|---|--------------------------------|
| 1 | Mower stopper                  |
| 2 | Stopper auxiliary fitting COMP |
| 3 | Bolt                           |
| A | Front                          |
| B | Rear                           |

LH66

Mower unit #3

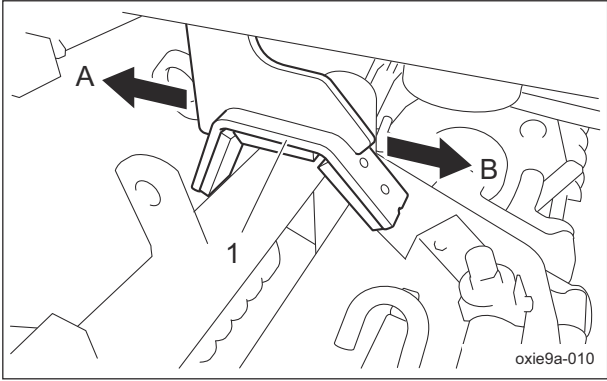
After installing the mower stoppers, press the stopper auxiliary fitting COMP firmly against the bottom side of the frame and secure it with the bolts.



Adjustment of Mower Stoppers for Mower Unit #2 and #3\_006

|   |                                |
|---|--------------------------------|
| 1 | Mower stopper                  |
| 2 | Stopper auxiliary fitting COMP |
| 3 | Bolt                           |
| A | Front                          |
| B | Rear                           |

LH52 • LS62



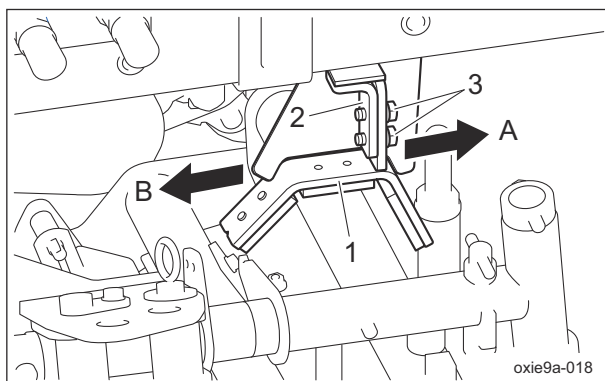
Adjustment of Mower Stoppers for Mower Unit #2 and #3\_007

|   |               |
|---|---------------|
| 1 | Mower stopper |
| A | Front         |
| B | Rear          |

## LS66

## Mower unit #2

After installing the mower stoppers, press the stopper auxiliary fitting COMP firmly against the bottom side of the frame and secure it with the bolts.



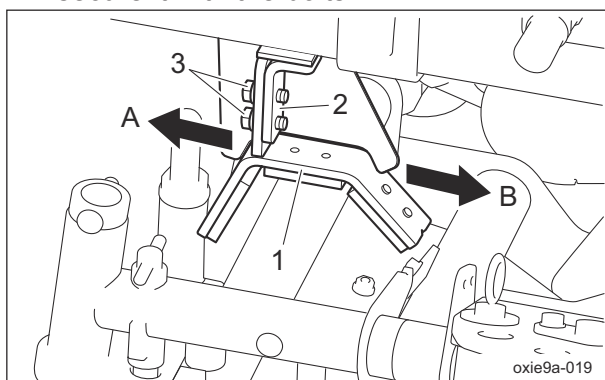
Adjustment of Mower Stoppers for Mower Unit #2 and #3\_008

|   |                                |
|---|--------------------------------|
| 1 | Mower stopper                  |
| 2 | Stopper auxiliary fitting COMP |
| 3 | Bolt                           |
| A | Front                          |
| B | Rear                           |

## LS66

## Mower unit #3

After installing the mower stoppers, press the stopper auxiliary fitting COMP firmly against the bottom side of the frame and secure it with the bolts.



Adjustment of Mower Stoppers for Mower Unit #2 and #3\_009

|   |                                |
|---|--------------------------------|
| 1 | Mower stopper                  |
| 2 | Stopper auxiliary fitting COMP |
| 3 | Bolt                           |
| A | Front                          |
| B | Rear                           |

### ■ Adjustment of Mower Stoppers for Mower Unit #4 and #5

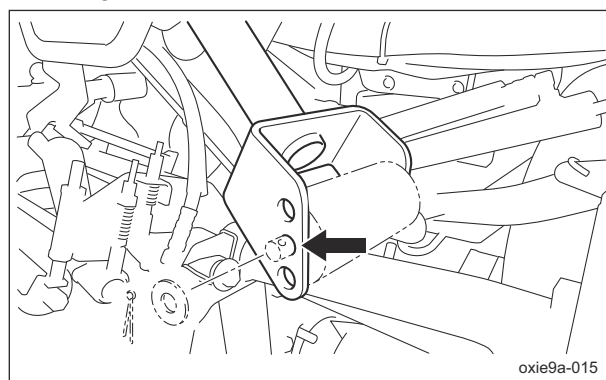
The mower stopper is installed to prevent the mower unit from interfering with the frame.

The attaching position of the mower stopper for mower unit #4 and #5 differs according to the type of mower unit.

Install in the appropriate direction.

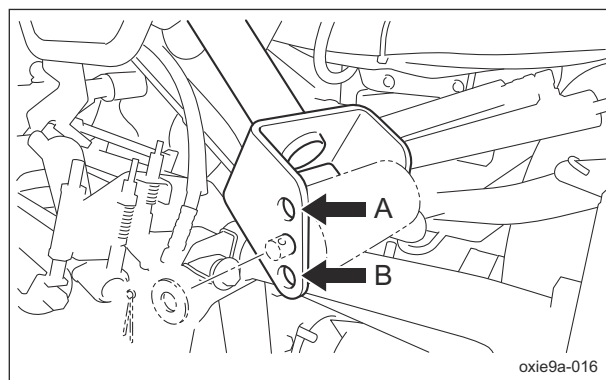
The relationship between the mower unit type and the mower stopper attaching position.

## LH62



Adjustment of Mower Stoppers for Mower Unit #4 and #5\_001

## LH52 • LS62



Adjustment of Mower Stoppers for Mower Unit #4 and #5\_002

|   |      |
|---|------|
| A | LS62 |
| B | LH52 |

1. On a level surface, lower all mower units.

2. Depress the locking pedal while firmly depressing the brake pedal to lock it.

3. Stop the engine.

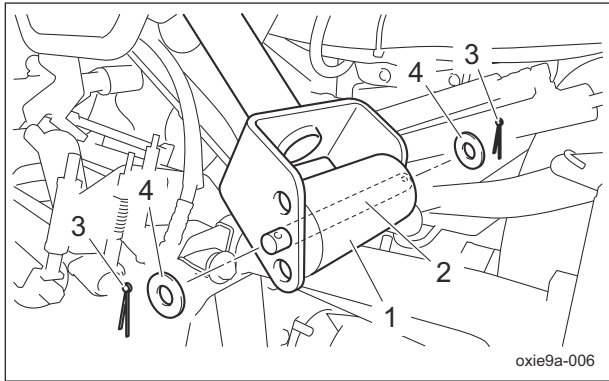
4. Follow the steps below to adjust the mower stopper position.

[1] Remove the cotter pin and washer.

[2] Install the roller shaft and rubber roller in the specified position.

# Maintenance

[3] Attach the cotter pin and washer.



Adjustment of Mower Stoppers for Mower Unit #4 and #5\_003

|   |               |
|---|---------------|
| 1 | Rubber roller |
| 2 | Roller shaft  |
| 3 | Cotter pin    |
| 4 | Washer        |

LH66 • LS66

For the mower unit LH66 • LS66, the adjustment is not required.

Adjustment of #4 and 5 Hydraulic Hose Guides

The hose guide is installed to prevent the hydraulic hose from interfering with the front tire.

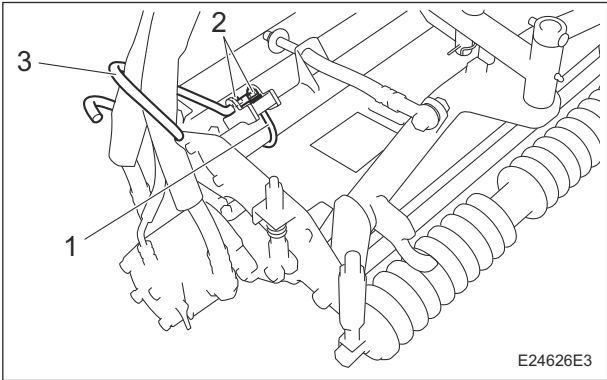
The mounting positions of the hose guides for mower units #4 and #5 differ according to the type of mower units.

Install in the appropriate mounting position.

- 1. Lower all the mower units on a level place.
- 2. Apply the parking brake.
- 3. Stop the engine.
- 4. Loosen the nuts on the U-shaped bracket.
- 5. Install the hose guide in its appropriate position.

For the fixing position and angle, refer to the following "Note" of the mounting position.

- 6. Tighten the nuts on the U-shaped bracket to fix the hose guide.  
Fix the hose guide so that the hydraulic hose can go just above the hydraulic motor when seeing the mower unit from the motor side.



Adjustment of #4 and 5 Hydraulic Hose Guides\_001

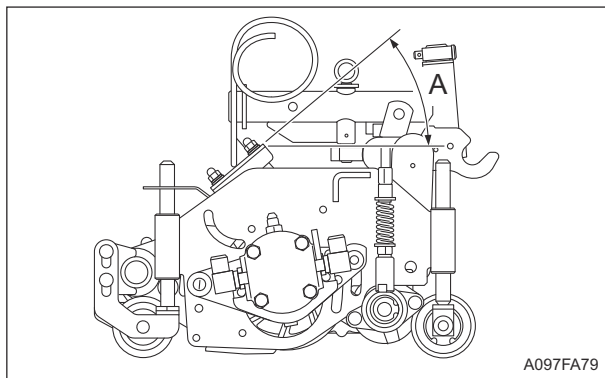
|   |                  |
|---|------------------|
| 1 | U-shaped bracket |
| 2 | Nut              |
| 3 | Hose guide       |

Note :

These are the related information about each type of the mower units and the hose guide mounting position.

- The parts of hose guide for #4 mower unit are different from those for #5.
- #4 and 5 mower units are symmetrically planned. The following figures for attaching the hose guide show those of #4 mower unit.
- The angle for attachment is shown as that between the hose guide surface in contact with the nuts and horizontal surface.
- The position for attachment is shown as the distance between the inside surface of the frame side plate and the hose guide attaching portion's side surface toward the side of the hydraulic motor.

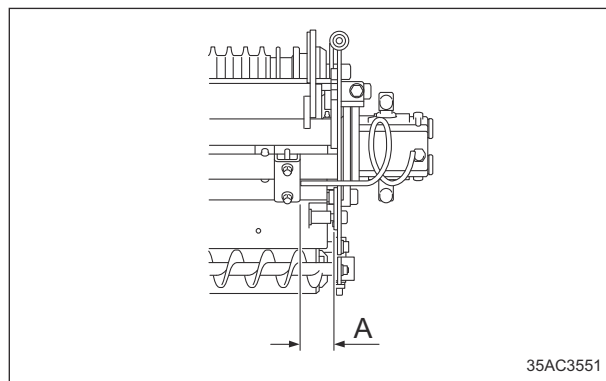
## LH62 • LH66



A097FA79

Adjustment of #4 and 5 Hydraulic Hose Guides\_002

A 40 °

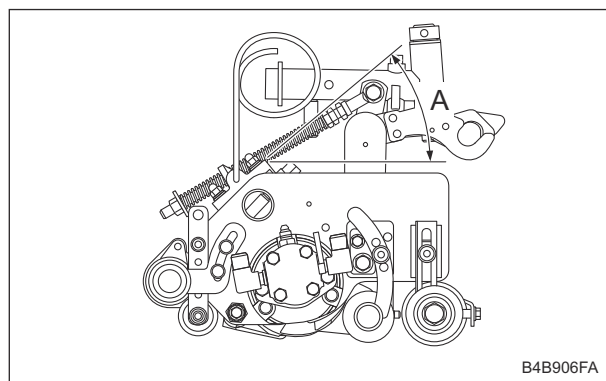


35AC3551

Adjustment of #4 and 5 Hydraulic Hose Guides\_005

A 60 mm (2.36 in)

## LH52

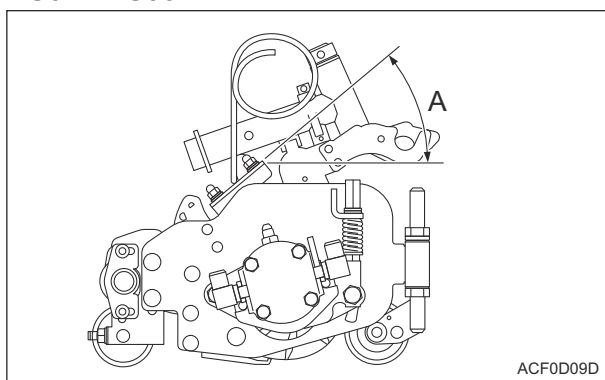


B4B906FA

Adjustment of #4 and 5 Hydraulic Hose Guides\_006

A 40 °

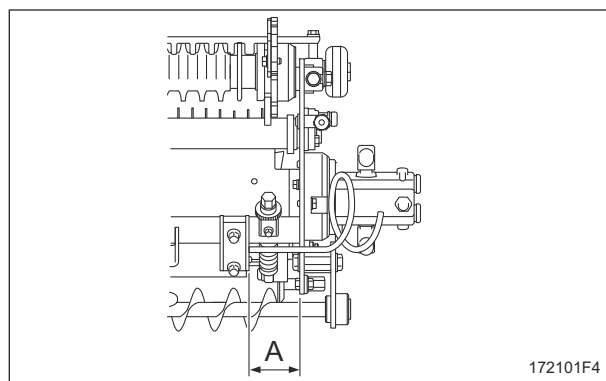
## LS62 • LS66



ACF0D09D

Adjustment of #4 and 5 Hydraulic Hose Guides\_004

A 40 °



172101F4

Adjustment of #4 and 5 Hydraulic Hose Guides\_007

A 70 mm (2.76 in)

Replacement

Engine

Replacement of Engine Oil

 Caution

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

Important

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

Important

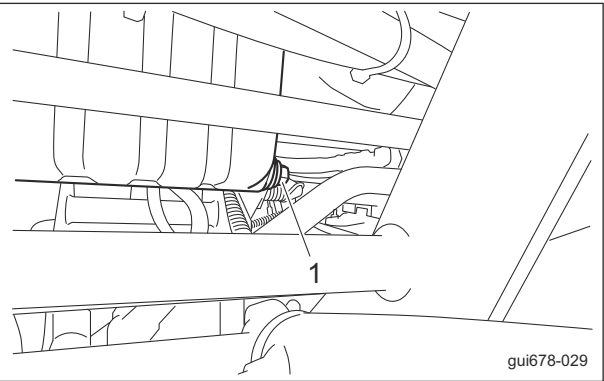
Be sure to use engine oil that is classified as JASO DH-2 or API Service Grade CJ-4, with an SAE Viscosity that is appropriate for the operating environment (ambient temperature).

Important

Securely install the oil level gauge and oil filler cap.

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

1. Follow the steps below to remove the old engine oil.
  - [1] Start and run the engine to warm up the engine oil.
  - [2] With the machine on a level surface, stop the engine.
  - [3] Remove the drain plug, and then drain the old engine oil into a container.

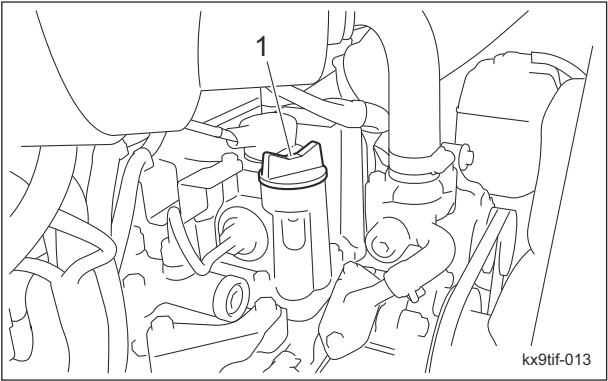


Replacement of Engine Oil\_001

|   |            |
|---|------------|
| 1 | Drain plug |
|---|------------|

- [4] Re-place the drain plug.
2. 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.

The engine oil quantity is approximately 6.7 dm<sup>3</sup> (6.7 L).
3. Securely install the oil filler cap.



Replacement of Engine Oil\_002

|   |                |
|---|----------------|
| 1 | Oil filler cap |
|---|----------------|

4. It will take a while for the supplied engine oil to descend into the oil pan.

Check the oil level again 10 to 20 minutes after replenishment.
5. Check underneath the machine for oil leakage.



## Replacement of Engine Oil Filter

**Caution**

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

**Important**

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

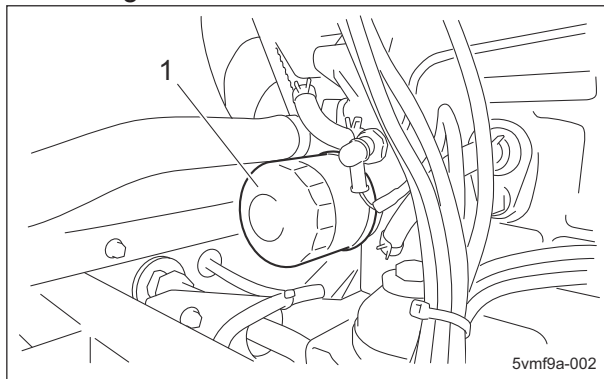
**Important**

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

**Important**

Securely install the oil level gauge and oil filler cap.

1. With the filter wrench, remove the old filter cartridge.



Replacement of Engine Oil Filter\_001

|   |                  |
|---|------------------|
| 1 | Filter cartridge |
|---|------------------|

2. Lightly coat the packing of the new filter cartridge with engine oil.
3. Hand-tighten the filter cartridge until the packing contacts the sealing surface, and then firmly hand-tighten (without using a filter wrench).
4. Supply engine oil until it reaches the specified level.  
"Supply of Engine Oil" (Page 6-7)
5. Start the engine, and then stop it after 10 to 20 minutes.

6. Make sure that there is no oil leakage at the sealing surface of the filter cartridge.
7. Check the engine oil level.  
If it is low, supply engine oil until it reaches the specified level.

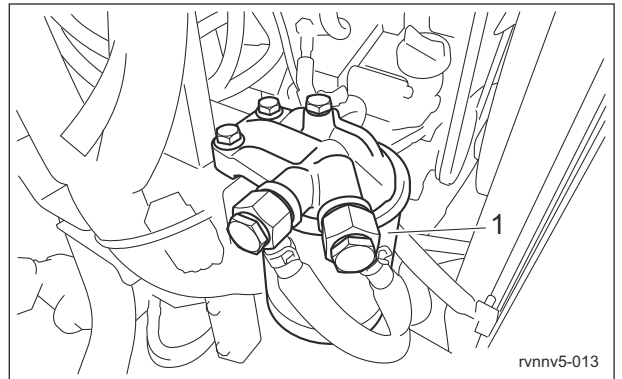
## Replacement of Fuel Filter

**Important**

During installation, prevent contamination with dirt or dust.

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

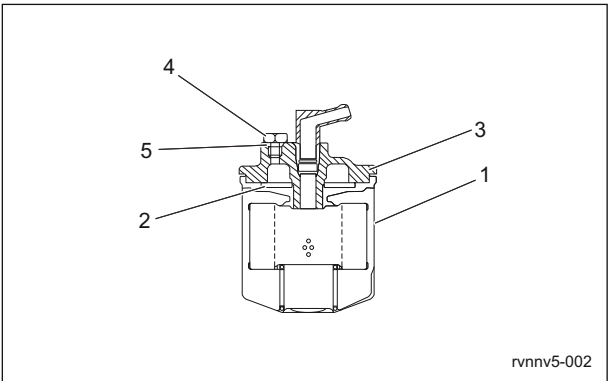
Since the fuel filter is a cartridge, it cannot be disassembled or cleaned.  
If dust or dirt accumulates in the fuel filter, the fuel flow will become insufficient.  
Replace the fuel filter at the appropriate times.



Replacement of Fuel Filter\_001

|   |             |
|---|-------------|
| 1 | Fuel filter |
|---|-------------|

1. Follow the steps below to replace the fuel filter.
  - [1] Using a filter wrench, remove the fuel filter cartridge.
  - [2] Lightly coat the packing of the new cartridge with fuel, and then firmly hand-tighten the cartridge, without using the filter wrench.



Replacement of Fuel Filter\_002

|   |                   |
|---|-------------------|
| 1 | Cartridge         |
| 2 | Packing           |
| 3 | Cover             |
| 4 | Air-bleeding plug |
| 5 | O-ring            |

2. When the ignition key is set to the "ON" position and the fuel pump is operated after replacement, air bleeding will occur automatically.  
If the automatic air bleeding is not available, remove air manually.

### Replacement of Air Cleaner Element

Important

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

1. The timing for replacing the air cleaner element is described below.
- [1] Replace the air cleaner element in accordance with the Maintenance Schedule.
- [2] If it is significantly contaminated, replace it, even if the hours of operation do not exceed the specified time.
2. Replace the air cleaner element by following the same steps as for cleaning the air cleaner element.  
"Cleaning of Air Cleaner Element" (Page 6-6)

### Replacement of Coolant

Caution

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

Caution

Change coolant after the engine has well cooled down.

Caution

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

Important

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

Important

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

Important

Tightly close the radiator cap.  
If the cap is loose or incorrectly installed, the engine will be overheated due to water leakage, resulting in engine damage.

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

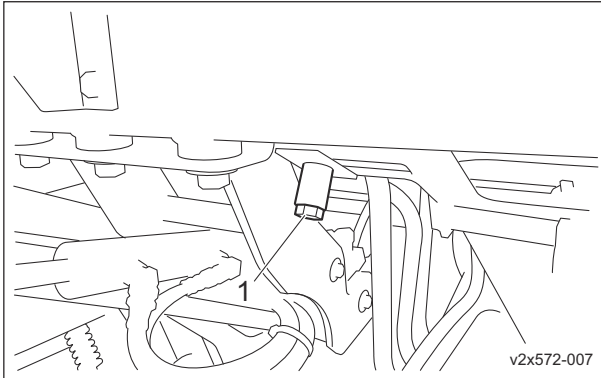


| Freezing temperature    | LLC concentration<br>(volume %) |
|-------------------------|---------------------------------|
| Down to -10 °C (14 °F)  | 20 %                            |
| Down to -15 °C (5 °F)   | 30 %                            |
| Down to -20 °C (-4 °F)  | 35 %                    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

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

[1] Position a container to drain the coolant into.

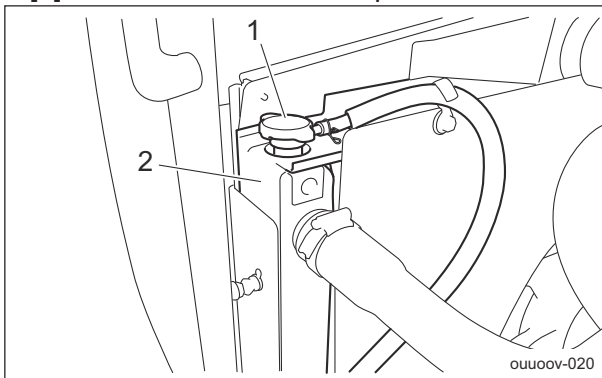
[2] Remove the drain plug from the radiator.



Replacement of Coolant\_001

|   |                     |
|---|---------------------|
| 1 | Radiator drain plug |
|---|---------------------|

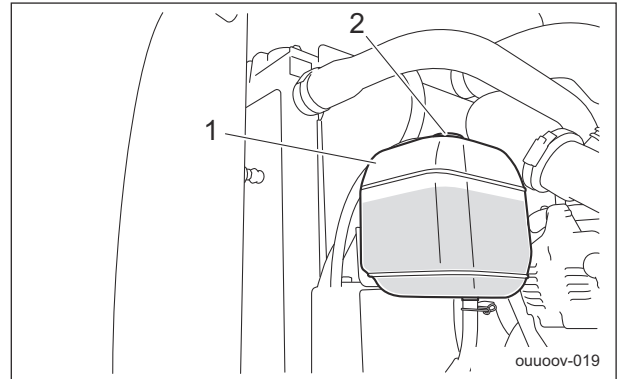
[3] Remove the radiator cap.



Replacement of Coolant\_002

|   |              |
|---|--------------|
| 1 | Radiator cap |
| 2 | Radiator     |

[4] Remove the reserve tank.



Replacement of Coolant\_003

|   |                  |
|---|------------------|
| 1 | Reserve tank     |
| 2 | Reserve tank cap |

[5] Open the reserve tank cap, and then drain the coolant.

4. Install the reserve tank.
5. Clean the radiator with clean water to remove any debris or rust.
6. Drain all water from the radiator.
7. Follow the steps below to fill with coolant.  
The coolant quantity, including the reserve tank, is 12.0 dm<sup>3</sup> (12.0 L).

[1] Install the drain plug.

[2] Supply clean water and antifreeze into the radiator up to the radiator cap opening.

[3] Close the radiator cap.

[4] Supply clean water and antifreeze into the reserve tank up to the "FULL" mark.

[5] Close the reserve tank cap.

8. Start the engine, and then idle for several minutes to bleed air from the system.
9. Stop the engine, and then allow the radiator to cool.
10. Check if the coolant level in the reserve tank is between "FULL" and "LOW", and then supply coolant if necessary.
11. Close the hood.

Main Vehicle

Replacement of Hydraulic Oil

 **Caution**

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

**Important**

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

**Important**

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

**Important**

For the hydraulic oil to be used, consult Characteristics of Hydraulic Oil and use the oil whose characteristics are equivalent or superior to those specified there. Especially regarding kinematic viscosity and viscosity index, use of hydraulic oil whose figures are less than those of the specified hydraulic oil will cause a malfunction in the hydraulic circuit.

■ Characteristics of Hydraulic Oil

| ISO Viscosity Grade    |                 | ISO VG46                                                |
|------------------------|-----------------|---------------------------------------------------------|
| Density                | 15 °C (59 °F)   | 0.873 g/cm <sup>3</sup><br>(0.0315 lb/in <sup>3</sup> ) |
| API Gravity            |                 | 30.6                                                    |
| Flash Point (Open Cup) |                 | 230 °C (446 °F)                                         |
| Pour Point             |                 | -30 °C (-22 °F)                                         |
| Kinematic              | 40 °C (104 °F)  | 46 mm <sup>2</sup> /s (46 cSt)                          |
| Viscosity              | 100 °C (212 °F) | 7 mm <sup>2</sup> /s (7 cSt)                            |
| Viscosity Index        |                 | 109                                                     |

■ Characteristics of Hydraulic Oil with conditions of use

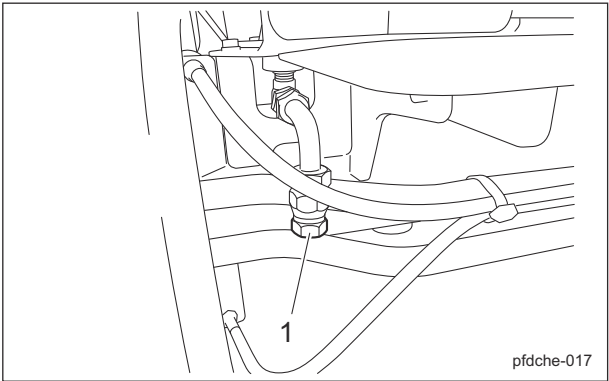
Hydraulic oil of ISO viscosity grade VG68 can be used only if the following condition is met:

- The outside temperature must be 20 °C (68 °F) or more during engine operation.

| ISO Viscosity Grade    |                 | ISO VG68                                                |
|------------------------|-----------------|---------------------------------------------------------|
| Density                | 15 °C (59 °F)   | 0.878 g/cm <sup>3</sup><br>(0.0318 lb/in <sup>3</sup> ) |
| API Gravity            |                 | 29.7                                                    |
| Flash Point (Open Cup) |                 | 252 °C (486 °F)                                         |
| Pour Point             |                 | -30 °C (-22 °F)                                         |
| Kinematic              | 40 °C (104 °F)  | 68 mm <sup>2</sup> /s (68 cSt)                          |
| Viscosity              | 100 °C (212 °F) | 9 mm <sup>2</sup> /s (9 cSt)                            |
| Viscosity Index        |                 | 107                                                     |

**Note:**  
In Japan, "Shell Tellus S2M46 (ISO VG46)" and "Shell Tellus S2M68 (ISO VG68)" meet the characteristics described above. However, in other countries, the specification of Shell Tellus S2M46 and Shell Tellus S2M68 can be below what is required. Please check the product data sheet to ensure that it meets the requirements before using.

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



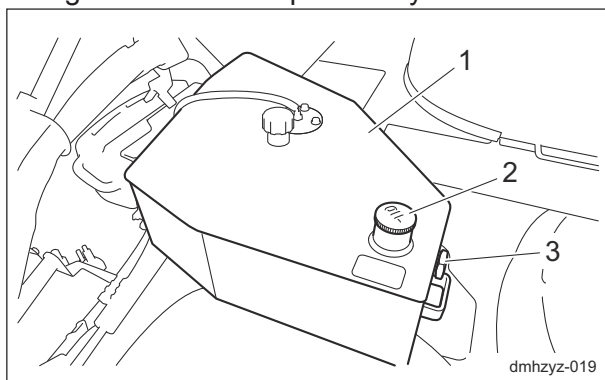
Replacement of Hydraulic Oil\_001

|   |            |
|---|------------|
| 1 | Drain plug |
|---|------------|

2. Remove the tank cover.
3. Open the tank cap, and then pour new oil from the fill port until the oil level reaches the middle of the oil gauge on the hydraulic tank.

The hydraulic tank capacity is approximately 30.3 dm<sup>3</sup> (30.3 L).

## 4. Tighten the tank cap securely.



Replacement of Hydraulic Oil\_002

|   |                |
|---|----------------|
| 1 | Hydraulic tank |
| 2 | Tank cap       |
| 3 | Oil gauge      |

## 5. Start the engine, and then repeat the steps below a few times.

- Raise and lower the mower units.
- Turn the steering wheel left and right.
- Move forward and reverse.

## 6. Lower the mower units and maintain that position on a level surface, and then check to see if the oil level is at the middle of the oil gauge. If necessary, supply oil.

## 7. Check underneath the machine for hydraulic oil leakage.

## 8. Install the tank cover.

## Replacement of Hydraulic Oil Filter

## ■Replacement of Hydraulic Oil Line Filter

## Caution

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

## Important

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

## Important

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

## Important

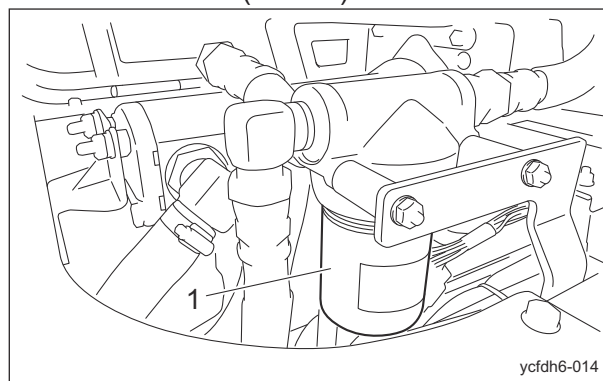
Use hydraulic oil whose specification meets the requirements.

## 1. Lower the mower units on a level surface, and then stop the engine.

## 2. Loosen the filter case and remove it.

Note:

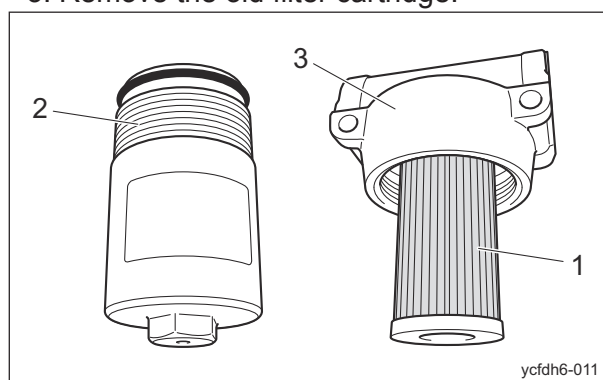
Use a 24 mm (0.94 in) socket wrench.



Replacement of Hydraulic Oil Line Filter\_001

|   |             |
|---|-------------|
| 1 | Filter case |
|---|-------------|

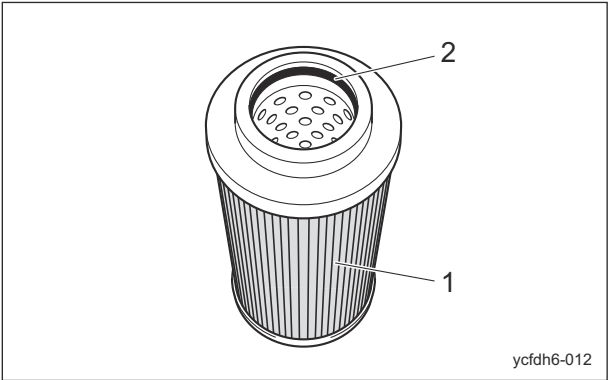
## 3. Remove the old filter cartridge.



Replacement of Hydraulic Oil Line Filter\_002

|   |                  |
|---|------------------|
| 1 | Filter cartridge |
| 2 | Filter case      |
| 3 | Body             |

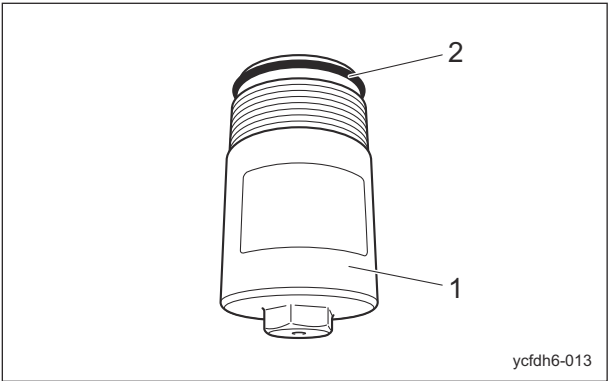
4. Lightly coat the O-ring of the new filter cartridge with hydraulic oil, and then install the cartridge.



Replacement of Hydraulic Oil Line Filter\_003

|   |                  |
|---|------------------|
| 1 | Filter cartridge |
| 2 | O-ring           |

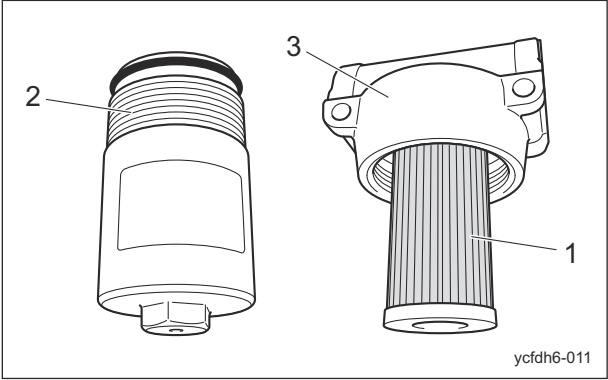
5. Clean the inside of the filter case.
6. Make sure that there is no damage to the O-ring of the filter case, and then lightly coat the O-ring with hydraulic oil.



Replacement of Hydraulic Oil Line Filter\_004

|   |             |
|---|-------------|
| 1 | Filter case |
| 2 | O-ring      |

7. Install the filter case onto the body, firmly hand-tighten it, and then tighten it to 25 to 35 N·m (254.93 to 356.90 kgf-cm).



Replacement of Hydraulic Oil Line Filter\_005

|   |                  |
|---|------------------|
| 1 | Filter cartridge |
| 2 | Filter case      |
| 3 | Body             |

8. Supply hydraulic oil until it reaches the specified level.  
"Supply of Hydraulic Oil" (Page 6-9)
9. Start the engine, and then after the hydraulic oil has warmed up, stop the engine.
10. Check underneath the machine for hydraulic oil leakage.

### ■Replacement of Hydraulic Oil Suction Filter

#### ⚠ Caution

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

#### Important

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

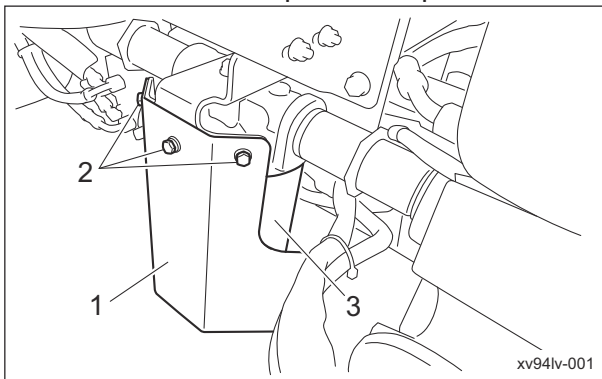
#### Important

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

#### Important

Use hydraulic oil whose specification meets the requirements.

1. Lower the mower units on a level surface, and then stop the engine.
2. Remove the filter protection plate.



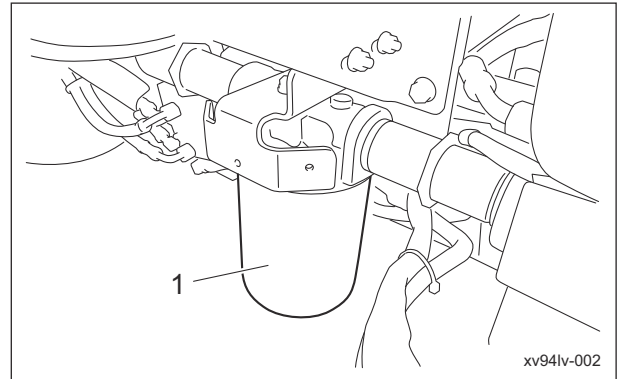
Replacement of Hydraulic Oil Suction Filter\_001

|   |                         |
|---|-------------------------|
| 1 | Filter protection plate |
| 2 | Bolt                    |
| 3 | Filter cartridge        |

3. Remove the old filter cartridge.
4. Lightly coat the packing of the new filter cartridge with hydraulic oil, and then install the cartridge.

5. Firmly tighten the filter cartridge by hand so that the packing contacts the mounting surface.

Then, tighten it an additional 1/2 turn.



Replacement of Hydraulic Oil Suction Filter\_002

|   |                  |
|---|------------------|
| 1 | Filter cartridge |
|---|------------------|

6. Supply hydraulic oil until it reaches the specified level.  
"Supply of Hydraulic Oil" (Page 6-9)
7. Start the engine, and then after the hydraulic oil has warmed up, stop the engine.
8. Check underneath the machine for hydraulic oil leakage.
9. Install the filter protection plate.

### Replacement of Resin Bushing

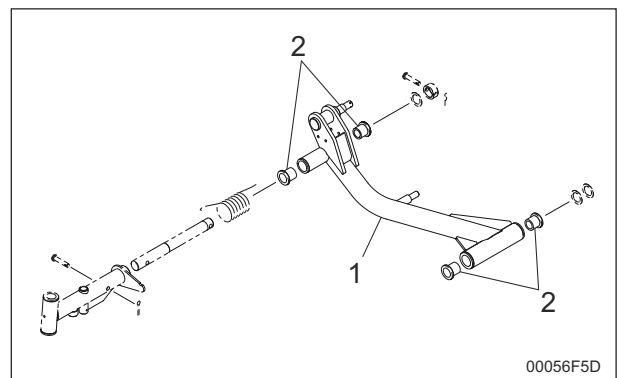
Resin bushings are installed in the following locations.

Replace resin bushings according to the maintenance schedule.

1. Lift arm (Mower unit #1, #4, #5)

Note:

The illustration shows the lift arm for mower unit #4.

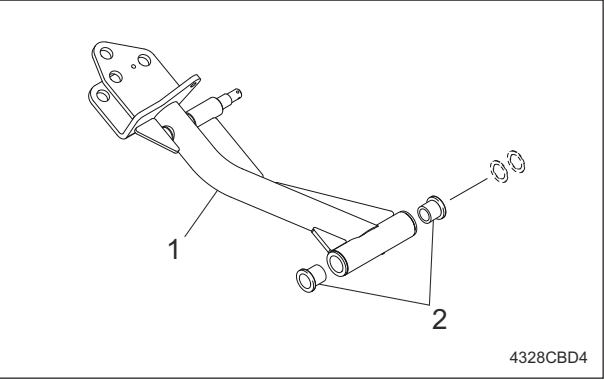


Replacement of Resin Bushing\_001

|   |               |
|---|---------------|
| 1 | Lift arm      |
| 2 | Resin bushing |

2. Lift arm (Mower unit #2, #3)

Note:  
The illustration shows the lift arm for mower unit #2.

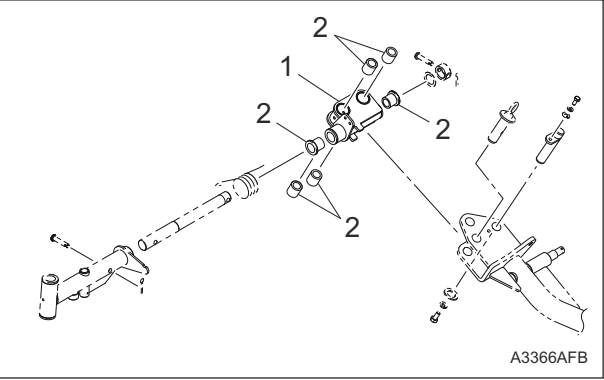


Replacement of Resin Bushing\_002

|   |               |
|---|---------------|
| 1 | Lift arm      |
| 2 | Resin bushing |

3. Swiveling bracket (Mower unit #2, #3)

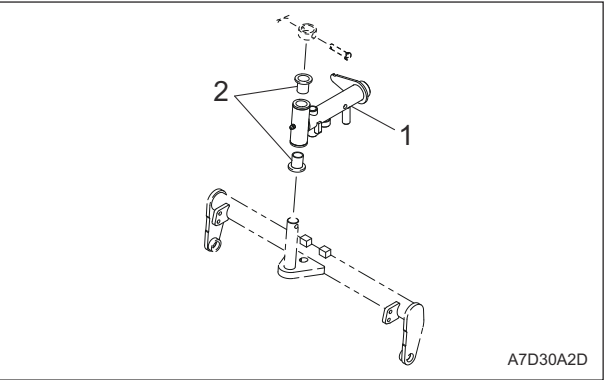
Note:  
The illustration shows the swiveling bracket for mower unit #2.



Replacement of Resin Bushing\_003

|   |                   |
|---|-------------------|
| 1 | Swiveling bracket |
| 2 | Resin bushing     |

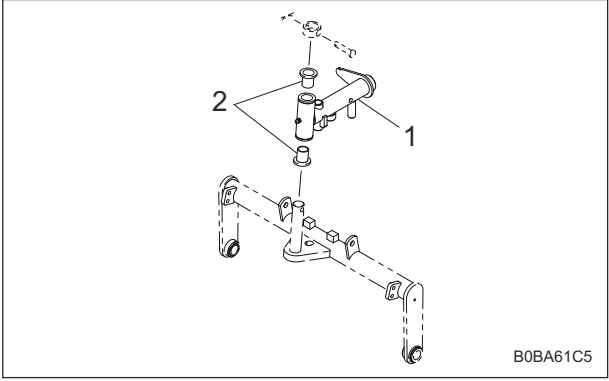
4. Mower coupling (Mower unit #1, #2, #3, #4, #5)  
■ LS62 · LS66



Replacement of Resin Bushing\_004

|   |                |
|---|----------------|
| 1 | Mower coupling |
| 2 | Resin bushing  |

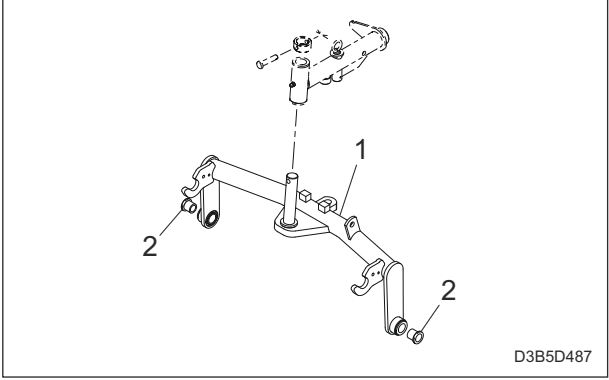
■ LH52



Replacement of Resin Bushing\_005

|   |                |
|---|----------------|
| 1 | Mower coupling |
| 2 | Resin bushing  |

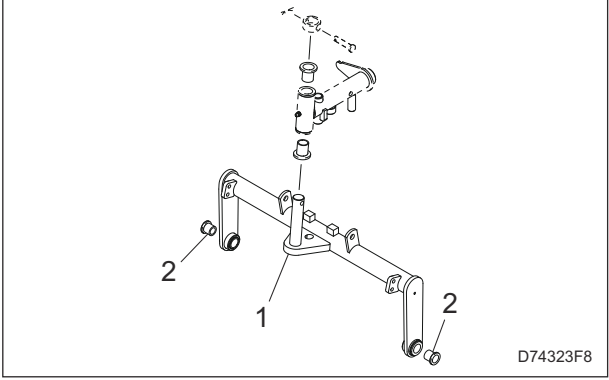
5. Mower arm (Mower unit #1, #2, #3, #4, #5)  
■ LH62 · LH66



Replacement of Resin Bushing\_006

|   |               |
|---|---------------|
| 1 | Mower arm     |
| 2 | Resin bushing |

■ LH52



Replacement of Resin Bushing\_007

|   |               |
|---|---------------|
| 1 | Mower arm     |
| 2 | Resin bushing |

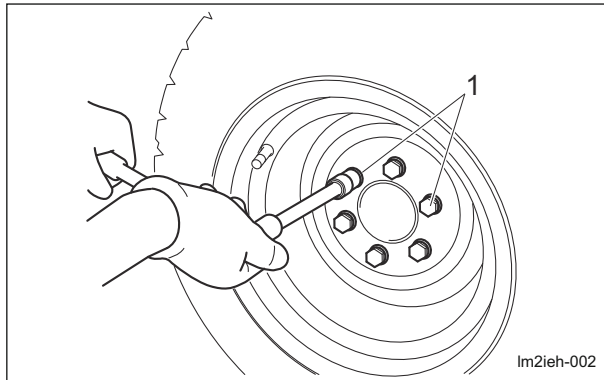
## Replacement of Tires

## ■Replacement of Front Tires

## 1. Removing front tires

Follow the steps below to remove the front tires:

## [1] Loosen the bolts.



Replacement of Front Tires\_001

|   |                   |
|---|-------------------|
| 1 | Heat-treated bolt |
|---|-------------------|

[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.

"Jack-Up Points" (Page 6-2)

[3] Remove the bolts.

[4] Remove the tire from the wheel mounting seat.

## 2. Installing front tires

**Important**

Tighten the bolts in the tightening order (diagonally).

**Important**

Tighten the wheel mounting bolts on the specified torque by using a torque wrench.

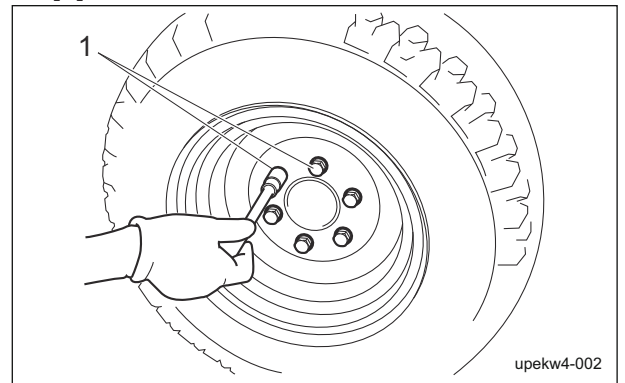
For installing the front tires, reverse the removing procedure.

## ■Replacement of Rear Tire

## 1. Removing rear tires

Follow the steps below to remove the rear tire.

## [1] Loosen the bolts.



Replacement of Rear Tire\_001

|   |                    |
|---|--------------------|
| 1 | Bolt, heat-treated |
|---|--------------------|

[2] Securely place the jack beneath the jack-up point of the pivot, and then raise it until the tires lift off the ground.

"Jack-Up Points" (Page 6-2)

[3] Remove the bolts.

[4] Remove the tire from the wheel mounting base.

## 2. Installing rear tires

**Important**

Tighten the bolts in the tightening order (diagonally).

**Important**

Tighten the wheel mounting bolts on the specified torque by using a torque wrench.

For installing the rear tire, reverse the removing procedure.



# Maintenance

---

## Storage

### Long-Term Storage

Follow the instructions below for long-term storage of the machine.

1. Cleaning

- Remove dirt, grass clippings, oil stains etc. completely from the main vehicle and engine.

2. Replacing oil

- Inspect and replace the engine oil, hydraulic oil and element.

3. Greasing and lubricating

- Supply oil and apply grease to appropriate parts.

4. Battery

- Remove the negative battery wire.

5. Fuel

- Remove the fuel from the fuel tank.

6. Tire pneumatic pressure

- Set the tire air pressure slightly higher than normal, and then place the machine on a board to avoid humidity.

7. Mower units

- When storing this machine, lower all the mower units unless a positive mechanical lock is provided.

8. Storage location

- Cover the machine and store it in a dry place where it will not be exposed to rain.



**Precautions for Repair ..... Page 7-2**

**Adjustment ..... Page 7-2**

Adjustment of Parking Brake ..... Page 7-2

Adjustment of Brake ..... Page 7-3

Adjustment of The Neutral Position  
of The Piston Pump ..... Page 7-4

**Replacement ..... Page 7-5**

Replacement of Fuse ..... Page 7-5

**Towing .....Page 7-7**

Towing The Machine in An  
Emergency .....Page 7-7

Precautions for Repair

Warning

The chapter "Repair" in this manual describes practical measures which should be performed by a mechanic with expertise. The owner should instruct the mechanic with expertise to perform repair service for this machine.

Caution

First, learn well the operations you plan to perform.

Important

Use tools appropriate for each operation.

Important

Use Baroness genuine parts for replacement and accessories.  
Our product warranty may be void if you use non-genuine parts for replacement or accessories.

Adjustment

Adjustment of Parking Brake

Caution

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

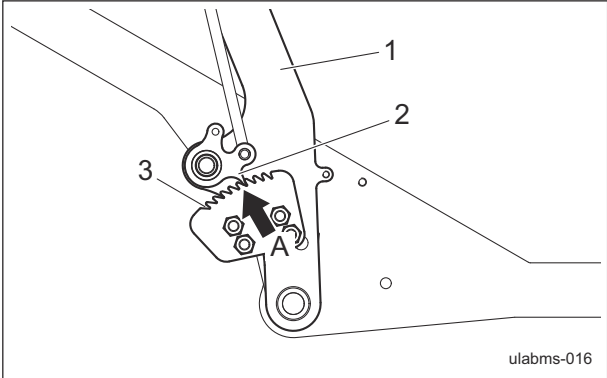
Important

Make sure that the brake is effective on slopes and that it is not applied any longer when you release it.  
Adjust the parking brake whenever there is any abnormality.

- 1. Stop the engine.
- 2. Remove the step cover.

3. Follow the steps below to adjust the parking brake.

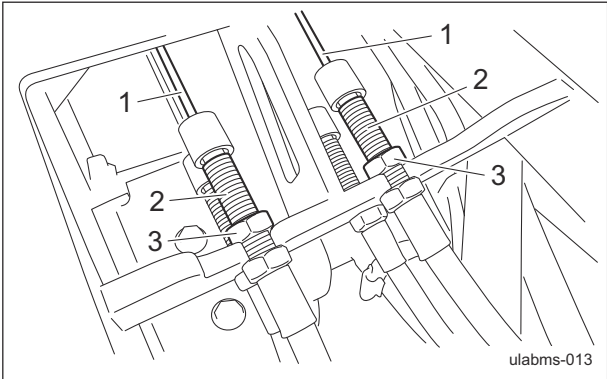
[1] Depress the locking pedal while firmly depressing the brake pedal to lock it and engage the latch in a notch.



Adjustment of Parking Brake\_001

|   |                       |
|---|-----------------------|
| 1 | Brake pedal           |
| 2 | Latch                 |
| 3 | Notch                 |
| A | Fourth or fifth notch |

[2] Adjust the adjustment bolt so that the latch is positioned in the fourth or fifth notch from the top.



Adjustment of Parking Brake\_002

|   |                 |
|---|-----------------|
| 1 | Brake wire      |
| 2 | Adjustment bolt |
| 3 | Lock nut        |

## Adjustment of Brake

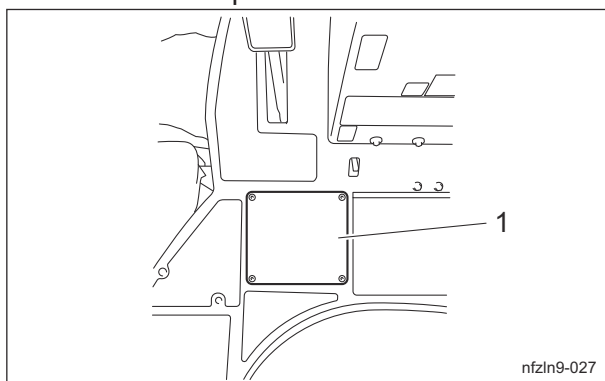
### ⚠ Caution

If the brake wire is cut, the machine will be unable to stop.  
If the brake wire is cracked or damaged, immediately replace it with a new one.  
If the brake is not sufficiently effective, adjust the brake wire.

### Important

Make sure that the brake is effective on slopes and that it is not applied any longer when you release it.  
Adjust the parking brake system whenever there is any abnormality.

1. Stop the engine.
2. Remove the step cover.

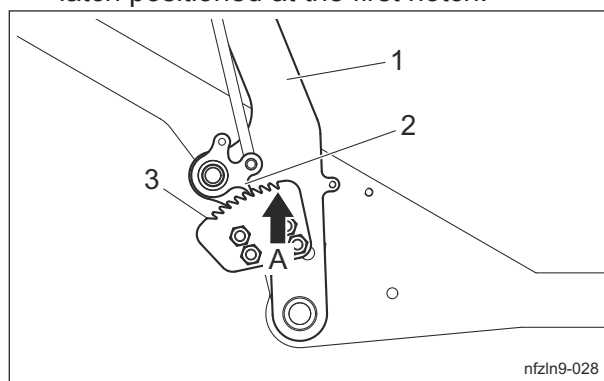


Adjustment of Brake\_001

- |   |            |
|---|------------|
| 1 | Step cover |
|---|------------|

3. Follow the steps below to adjust the brake.  
Adjust it so that the play of brake wire will be as small as possible with the latch positioned at the first notch from the top.

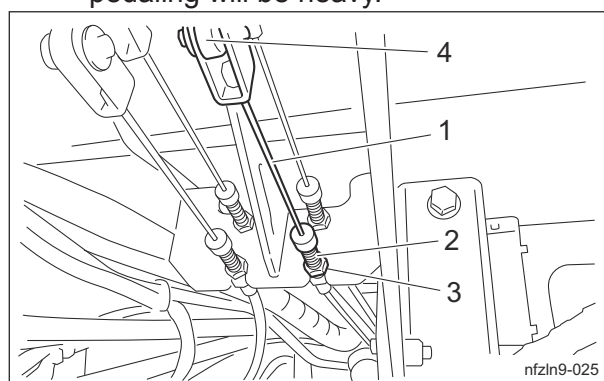
- [1] Push the locking pedal while applying mild pressure to the brake pedal with a hand so that the brake pedal will be locked with the latch positioned at the first notch.



Adjustment of Brake\_002

|   |             |
|---|-------------|
| 1 | Brake pedal |
| 2 | Latch       |
| 3 | Notch       |
| A | First notch |

- [2] Adjust the travel of the brake pedal by tightening the brake wire adjustment bolt.
- If the brake pedal play is too large, the braking power will be decreased and the pedaling will be light.
  - If the brake pedal play is too small, the braking power will be increased and the pedaling will be heavy.



Adjustment of Brake\_003

|   |                 |
|---|-----------------|
| 1 | Brake wire      |
| 2 | Adjustment bolt |
| 3 | Lock nut        |
| 4 | Brake pedal     |

4. Install the step cover.
5. Start the engine.

# Repair

6. Drive the machine to check the following.
- Make sure that the brake is effective when depressing the brake pedal all the way firmly.
  - Make sure that heat is not generated in the brake area.
  - Make sure that the left and right brakes are equally effective.

 **Caution**

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

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

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.

Adjustment of The Neutral Position of The Piston Pump

 **Caution**

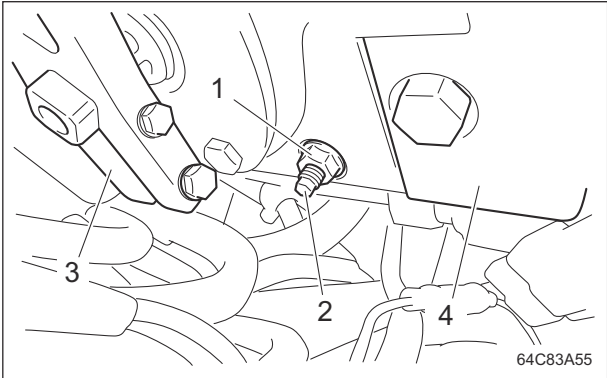
Make sure not to touch rotating tires.

 **Caution**

While adjusting the neutral position, the machine may start to move.  
Securely place jacks beneath the jack-up points, and then raise the machine until all tires lift 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. Securely place jacks beneath the jack-up points, and then lift the machine off the ground.  
"Jack-Up Points" (Page 6-2)
  3. Make sure that no tires get contact with the jack stand.

4. Open the underseat cover.
  5. Start the engine, and rev it up to the maximum rpm.
  6. Adjust the neutral position.  
Note:  
The lock nut uses a 1/2 inch wrench, and the traction adjusting cam uses a 1/4 inch wrench.  
Follow the steps below to adjust the neutral position.
- [1] Loosen the lock nuts.
- [2] Slowly rotate the traction adjusting cam until all tires stop.
- If the tires move in the direction of forward travel, rotate the traction adjusting cam clockwise.
  - If the tires move in the direction of backward travel, rotate the traction adjusting cam counterclockwise.
- Find the position where all tires stop, and then, while holding the traction adjusting cam in place, secure it with the lock nut.



Adjustment of The Neutral Position of The Piston Pump\_001

|   |                        |
|---|------------------------|
| 1 | Lock nut               |
| 2 | Traction adjusting cam |
| 3 | Cam lever              |
| 4 | Piston pump            |

7. Check that the tires do not move.

## Replacement

### Replacement of Fuse

#### Important

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

#### Important

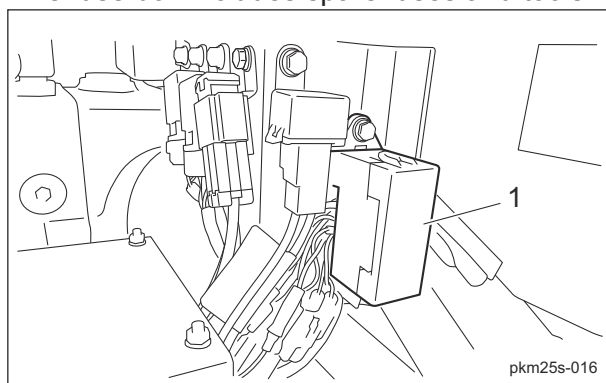
If a fuse blows, a short may have occurred within the electrical circuit. Check for the cause, such as faulty terminal connections, damaged wiring or terminals, or incorrect wiring.

#### Important

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

### Fuse Box

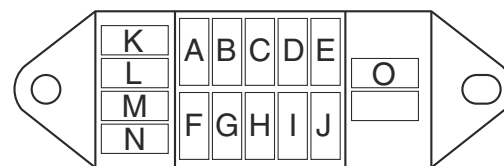
The fuse box includes spare fuses and tools.



Fuse Box\_001

1 Fuse box

The machine uses a mini fuse for automobiles.  
Replace an old fuse with a new fuse of the specified capacity.



pkm25s-003

Fuse Box\_002

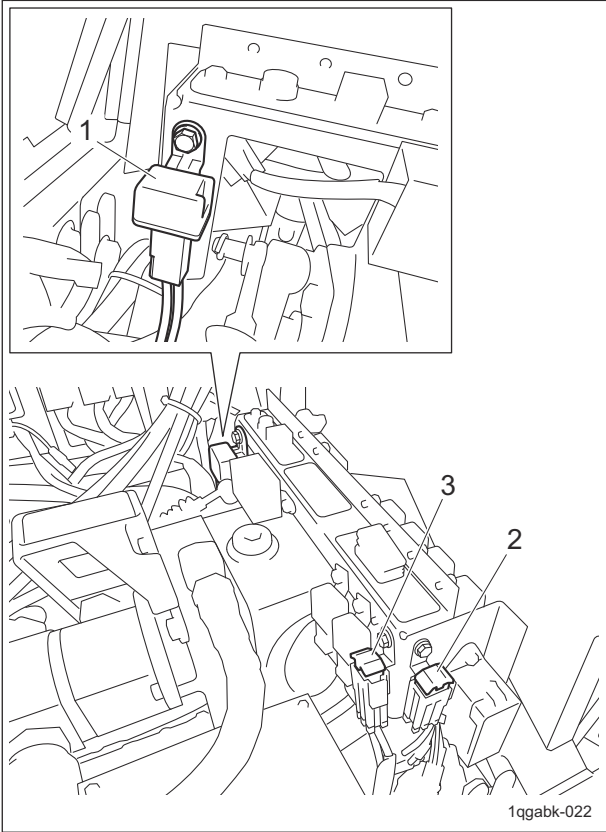
|   |      |                                                                                                                                                                                                                                                                                                                                                                               |
|---|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | 5 A  | Starter relay (CB1a-12V), alternator                                                                                                                                                                                                                                                                                                                                          |
| B | 5 A  | Ignition SW (to E/G ECU)                                                                                                                                                                                                                                                                                                                                                      |
| C | 5 A  | Water temperature warning buzzer, DPF auto regeneration inhibit SW, DPF parked regeneration SW, initial reset board, warning lamp, DPF regeneration lamp, CAN monitor                                                                                                                                                                                                         |
| D | 15 A | #2 · #3 up/down SOL relay, #4 down detection relay, #4 proximity sensor, #5 proximity sensor, operation lever proximity sensor (UP), operation lever proximity sensor (DOWN), traveling pedal position detection proximity sensor, engine stop signal (to E/G ECU), relay box L, #2 · #3 up/down SOL, #2·#3 up/down delay timer, overload detection relay, UP delay off relay |
| E | 15 A | Oil level warning buzzer, P brake SW signal (to E/G ECU), starter relay (MR5A411A1K), #2 proximity sensor, #1 proximity sensor, neutral proximity sensor, P brake SW relay, P brake proximity sensor, relay box R                                                                                                                                                             |
| F | -    | (Unused)                                                                                                                                                                                                                                                                                                                                                                      |
| G | 5 A  | Start signal (to E/G ECU)                                                                                                                                                                                                                                                                                                                                                     |
| H | -    | (Unused)                                                                                                                                                                                                                                                                                                                                                                      |
| I | 5 A  | Reel rotation SW relay, rotation detection relay, lapping SW relay, oil level SW, engine stop relay, seat OFF delay timer                                                                                                                                                                                                                                                     |
| J | 5 A  | Diagnostic connector                                                                                                                                                                                                                                                                                                                                                          |
| K | 5 A  | Spare                                                                                                                                                                                                                                                                                                                                                                         |
| L | 5 A  |                                                                                                                                                                                                                                                                                                                                                                               |
| M | 15 A |                                                                                                                                                                                                                                                                                                                                                                               |
| N | 15 A |                                                                                                                                                                                                                                                                                                                                                                               |
| O | Tool |                                                                                                                                                                                                                                                                                                                                                                               |

# Repair

## Fusible Link

Fuse capacities of the fusible links are 30 A, 50 A and 80 A.

- 30 A: ECU
- 50 A: accessories
- 80 A: Battery, Heater relay

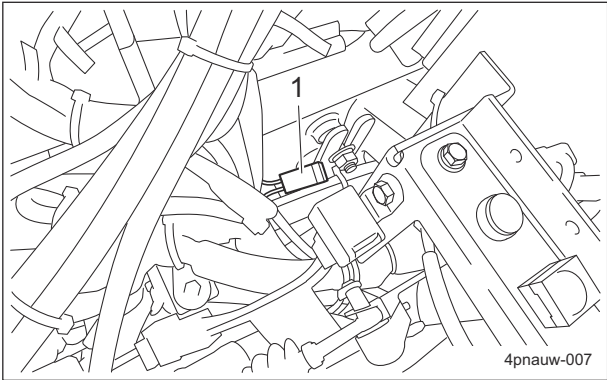


Fusible Link\_001

|   |                     |
|---|---------------------|
| 1 | Fusible link (30 A) |
| 2 | Fusible link (50 A) |
| 3 | Fusible link (80 A) |

## Fuse

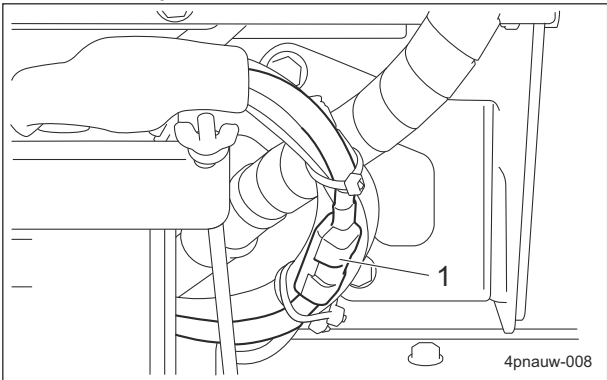
The fuse in the main harness is for USB socket and LED work lamp.  
Depending on the specifications, the LED work lamp may not be available.  
The capacity of the mini blade fuse is 15 A.



Fuse\_001

|   |                 |
|---|-----------------|
| 1 | Mini blade fuse |
|---|-----------------|

The fuse in the heater relay harness is for intake heater.  
The capacity of the MIDI fuse is 125 A.



Fuse\_002

|   |           |
|---|-----------|
| 1 | MIDI fuse |
|---|-----------|

## Towing

### Towing The Machine in An Emergency

If the machine does not travel due to engine trouble, etc., you can move it in the following way:

#### ⚠ Caution

Before starting the engine, be sure to close the bypass.

#### Important

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

#### Important

When towing the machine, obey the following restrictions.

Obey the speed and the time restrictions to prevent damaging the pump or motor.

- Speed: Do not travel at a speed more than 3.0 km/h.
- Time: Do not tow the machine for more than 3 minutes.

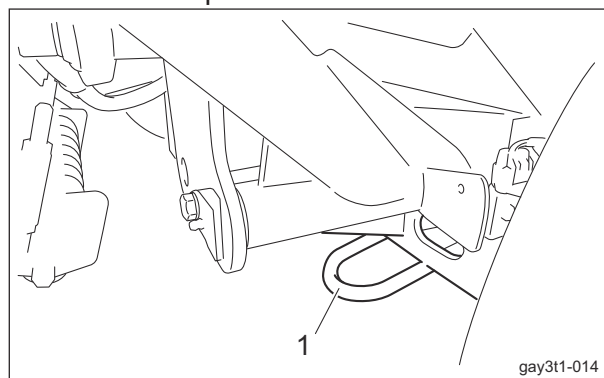
When towing the machine for more than 3 minutes, start the engine and circulate the hydraulic oil in the hydraulic circuit. Therefore, do not tow the machine until restart the engine after completed repairs.

#### Important

Do not loosen the unload valve three turns or more.

1. Stop the engine.  
"Procedure to Stop Engine" (Page 5-14)
2. Depress the locking pedal while firmly depressing the brake pedal to lock it.
3. Chock the wheels.

4. Secure the rope to the tow hook.

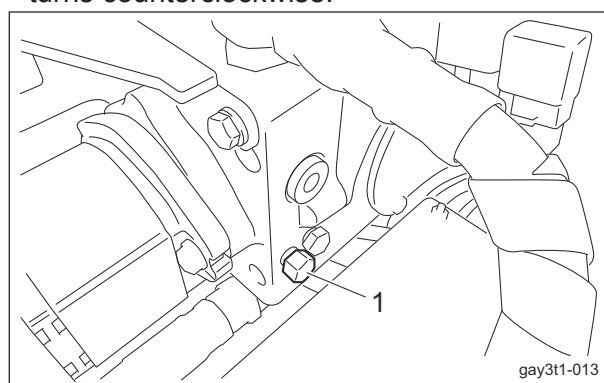


Towing The Machine in An Emergency\_001

|   |          |
|---|----------|
| 1 | Tow hook |
|---|----------|

5. Open the underseat cover.  
"Procedure to Open/Close Underseat Cover" (Page 5-3)

6. Turn the unload valve under the seat 1 to 1.5 turns counterclockwise.



Towing The Machine in An Emergency\_002

|   |              |
|---|--------------|
| 1 | Unload valve |
|---|--------------|

7. Close the underseat cover.
8. Remove the wheel stoppers.
9. Firmly depress the brake pedal to release the locking pedal.

#### ⚠ Warning

While towing, always keep your foot on the brake pedal to make sure you can depress it at any time to stop.

10. Tow the machine slowly.





**Tightening Torques .....Page 8-2**

Standard Tightening Torques .....Page 8-2

Principal Tightening Torques ..... Page 8-5

**Daily Check List ..... Page 8-7****Maintenance Schedule ..... Page 8-9****List of Adjusted Values ..... Page 8-14****List of Fault Codes ..... Page 8-15**

# Appended Table

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## Tightening Torques

Important

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

## Standard Tightening Torques

### Bolts and Nuts

Important

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

- As to the bolts and nuts without any special instruction, tighten them in appropriate tightening torque with proper tool.  
Too much tightening may cause the looseness or damage of the screw.
- The strength of tightening is determined by types of screws, strength, the friction of thread face or base face and others.  
The table below is for the galvanized or parkerized bolts.  
In case that the strength of internal thread is weak, it is not applied.
- Do not use rusty or sand attached "screw."  
Otherwise, it may cause insufficient tightening even if you apply the specified tightening torque.  
The friction of the screw face becomes higher and the tightening torque is canceled out by the friction, therefore sufficient tightening cannot be applied.
- If "screw" is wet by water or oil, do not tighten it with normal tightening torque.  
If the screw is wet, the torque coefficient will get smaller and it may result in too much tightening.  
Too much tightening may cause looseness by the screw stretched or result in damage.
- Do not use a bolt experienced too much burden.
- Using the impact wrench requires the skill.  
Do exercise as much as possible for steady tightening.

# Appended Table

| Nominal diameter | General bolt                                                                                    |                     |                     |
|------------------|-------------------------------------------------------------------------------------------------|---------------------|---------------------|
|                  | Strength classification 4.8                                                                     |                     |                     |
|                  | <br>tib3yb-001 |                     |                     |
|                  | N-m                                                                                             | kgf-cm              | lb-in               |
| M5               | 3 - 5                                                                                           | 30.59 - 50.99       | 26.55 - 44.26       |
| M6               | 7 - 9                                                                                           | 71.38 - 91.77       | 61.96 - 79.66       |
| M8               | 14 - 19                                                                                         | 142.76 - 193.74     | 123.91 - 168.17     |
| M10              | 29 - 38                                                                                         | 295.71 - 387.49     | 256.68 - 336.34     |
| M12              | 52 - 67                                                                                         | 530.24 - 683.20     | 460.25 - 593.02     |
| M14              | 70 - 94                                                                                         | 713.79 - 958.52     | 619.57 - 831.99     |
| M16              | 88 - 112                                                                                        | 897.34 - 1142.06    | 778.89 - 991.31     |
| M18              | 116 - 144                                                                                       | 1,182.85 - 1,468.37 | 1,026.72 - 1,274.54 |
| M20              | 147 - 183                                                                                       | 1,498.96 - 1,866.05 | 1,301.10 - 1,619.73 |
| M22              | 295                                                                                             | 3,008.12            | 2,611.05            |
| M24              | 370                                                                                             | 3,772.89            | 3,274.87            |
| M27              | 550                                                                                             | 5,608.35            | 4,868.05            |
| M30              | 740                                                                                             | 7,545.78            | 6,549.74            |

| Nominal diameter | Heat-treated bolt                                                                                 |                     |                     |                                                                                                     |                     |                     |
|------------------|---------------------------------------------------------------------------------------------------|---------------------|---------------------|-----------------------------------------------------------------------------------------------------|---------------------|---------------------|
|                  | Strength classification 8.8                                                                       |                     |                     | Strength classification 10.9                                                                        |                     |                     |
|                  | <br>tib3yb-002 |                     |                     | <br>tib3yb-003 |                     |                     |
|                  | N-m                                                                                               | kgf-cm              | lb-in               | N-m                                                                                                 | kgf-cm              | lb-in               |
| M5               | 5 - 7                                                                                             | 50.99 - 71.38       | 44.26 - 61.96       | 7 - 10                                                                                              | 71.38 - 101.97      | 61.96 - 88.51       |
| M6               | 8 - 11                                                                                            | 81.58 - 112.17      | 70.81 - 97.36       | 14 - 18                                                                                             | 142.76 - 183.55     | 123.91 - 159.32     |
| M8               | 23 - 29                                                                                           | 234.53 - 295.71     | 203.57 - 256.68     | 28 - 38                                                                                             | 285.52 - 387.49     | 247.83 - 336.34     |
| M10              | 45 - 57                                                                                           | 458.87 - 581.23     | 398.30 - 504.51     | 58 - 76                                                                                             | 591.43 - 774.97     | 513.36 - 672.68     |
| M12              | 67 - 85                                                                                           | 683.20 - 866.75     | 593.02 - 752.34     | 104 - 134                                                                                           | 1,060.49 - 1,366.40 | 920.50 - 1186.03    |
| M14              | 106 - 134                                                                                         | 1,080.88 - 1,366.40 | 938.21 - 1,186.03   | 140 - 188                                                                                           | 1,427.58 - 1,917.04 | 1,239.14 - 1,663.99 |
| M16              | 152 - 188                                                                                         | 1,549.94 - 1,917.04 | 1,345.35 - 1,663.99 | 210 - 260                                                                                           | 2,141.37 - 2,651.22 | 1,858.71 - 2,301.26 |
| M18              | 200 - 240                                                                                         | 2,039.40 - 2,447.28 | 1,770.20 - 2,124.24 | 280 - 340                                                                                           | 2,855.16 - 3,466.98 | 2,478.28 - 3,009.34 |
| M20              | 245 - 295                                                                                         | 2,498.27 - 3,008.12 | 2,168.50 - 2,611.05 | 370 - 450                                                                                           | 3,772.89 - 4,588.65 | 3,274.87 - 3,982.95 |
| M22              | -                                                                                                 | -                   | -                   | 530                                                                                                 | 5,404.41            | 4,691.03            |
| M24              | -                                                                                                 | -                   | -                   | 670                                                                                                 | 6,831.99            | 5,930.17            |
| M27              | -                                                                                                 | -                   | -                   | 1,000                                                                                               | 10,197.00           | 8,851.00            |
| M30              | -                                                                                                 | -                   | -                   | 1,340                                                                                               | 13,663.98           | 11,860.34           |

Note:

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

# Appended Table

## Hydraulic Hose

The tightening torques for union joints and union adaptors with parallel pipe threads (G, PF) are shown in the table below.

A union joint or adaptor will not become loose or leak as long as it is tightened by the specified torque.

If fluid leaks from the sealed portion, do not attempt to tighten the union joint or adaptor forcibly.

Examine whether any foreign matter or scratches are present on the seat surface.

Tightening a union joint or adaptor forcibly could damage the connection of the joints.

When tightening a union joint or adaptor, use a torque wrench where possible and firmly tighten it by an appropriate torque.

| Nominal diameter of the hose size | Nominal diameter of the parallel pipe threads (G, PF) | Tightening torque |          |          |
|-----------------------------------|-------------------------------------------------------|-------------------|----------|----------|
|                                   |                                                       | N-m               | kgf-cm   | lb-in    |
| 6                                 | 1/4                                                   | 25                | 254.93   | 221.28   |
| 9                                 | 3/8                                                   | 50                | 509.85   | 442.55   |
| 12                                | 1/2                                                   | 60                | 611.82   | 531.06   |
| 15                                | 3/4                                                   | 120               | 1,223.64 | 1,062.12 |
| 19                                | 3/4                                                   | 120               | 1,223.64 | 1,062.12 |
| 25                                | 1                                                     | 140               | 1,427.58 | 1,239.14 |
| 32                                | 1-1/4                                                 | 170               | 1,733.49 | 1,504.67 |
| 38                                | 1-1/2                                                 | 210               | 2,141.37 | 1,858.71 |
| 50                                | 2                                                     | 250               | 2,549.25 | 2,212.75 |

## Fittings with Parallel Threads (O-Ring Seal Type)

The tightening torques for fittings with parallel threads (O-ring seal method) are shown in the table below.

Tightening the fitting forcibly with a spanner or other such tool to secure it to a set position could damage the fitting, its washers, and other parts.

When tightening an adjustable elbow, use a torque wrench where possible and firmly tighten it by an appropriate torque.

| Nominal diameter of thread | Tightening torque |                     |                     |
|----------------------------|-------------------|---------------------|---------------------|
|                            | N-m               | kgf-cm              | lb-in.              |
| 1/4                        | 34.32 - 49.03     | 349.96 – 499.96     | 303.77 – 433.96     |
| 3/8                        | 68.65 - 78.45     | 700.02 – 799.95     | 607.62 – 694.36     |
| 1/2                        | 98.07 - 117.68    | 1,000.02 – 1,199.98 | 868.02 – 1,041.59   |
| 3/4                        | 147.10 - 176.52   | 1,499.98 – 1,799.97 | 1,301.98 – 1,562.38 |
| 1                          | 245.17 - 274.59   | 2,500.00 – 2,799.99 | 2,170.00 – 2,430.40 |
| 1-1/4                      | 294.20            | 2,999.96            | 2,603.96            |
| 1-1/2                      | 294.20            | 2,999.96            | 2,603.96            |
| 2                          | 392.27            | 3,999.98            | 3,471.98            |

# Appended Table

## Principal Tightening Torques

### Tightening Torque by Model

#### LM551B

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

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

| Location                       |                     | Code            | Part name                                | Tightening torque |                     |                     | Thread locking adhesive |
|--------------------------------|---------------------|-----------------|------------------------------------------|-------------------|---------------------|---------------------|-------------------------|
|                                |                     |                 |                                          | N-m               | kgf-cm              | lb-in               |                         |
| Front wheel                    | Motor               | K0013120702     | BOLT, HT M12-70                          | 104 - 134         | 1,060.49 - 1,366.40 | 920.50 - 1,186.03   | -                       |
|                                | Wheel mounting base | -               | Slotted nut 1-20UNEF of hydraulic motor  | 280 - 300         | 2,855.16 - 3,059.10 | 2,478.28 - 2,655.30 | -                       |
|                                | Wheel               | K0011120352     | BOLT, P1.5 M12-35                        | 110               | 1,121.67            | 973.61              | -                       |
| Rear wheel                     | Motor               | K0010120602     | BOLT, HT M12-60                          | 104 - 134         | 1,060.49 - 1,366.40 | 920.50 - 1,186.03   | -                       |
|                                | Wheel mounting base | -               | Slotted nut 1-20UNEF of hydraulic motor  | 280 - 300         | 2,855.16 - 3,059.10 | 2,478.28 - 2,655.30 | -                       |
|                                | Wheel               | K0011120352     | BOLT, P1.5 M12-35                        | 110               | 1,121.67            | 973.61              | -                       |
| Engine                         |                     | K0017100252     | BOLT, SMALL HT P1.25 M10-25              | 58 - 76           | 591.43 - 774.97     | 513.36 - 672.68     | -                       |
|                                |                     | K0010121201     | BOLT, HT M12-120                         | 67 - 85           | 683.20 - 886.75     | 593.02 - 752.34     | -                       |
|                                |                     | K3680000030     | M3.5 Screw (accessories)                 | 0.78 - 1.18       | 7.95 - 12.03        | 6.90 - 10.44        | -                       |
| Electric components for engine |                     | -               | Starter B terminal (M8)                  | 5.9 - 11.7        | 60.16 - 119.30      | 52.22 - 103.56      | -                       |
|                                |                     | -               | Alternator B terminal (M6)               | 5.9 - 9.8         | 60.16 - 99.93       | 52.22 - 86.74       | -                       |
|                                |                     | -               | Glow plug connection terminal nut (M4)   | 1.0 - 1.8         | 10.20 - 18.35       | 8.85 - 15.93        | -                       |
| Joint                          |                     | K001A100401     | BOLT, 13T W/HEX HOLE M10-40              | 62 - 72           | 632.21 - 734.18     | 548.76 - 637.27     | ○                       |
|                                |                     | K0011100252     | BOLT, HT P1.25 M10-25                    | 58 - 76           | 591.43 - 774.97     | 513.36 - 672.68     | -                       |
| Tie rod                        |                     | - (K1610000020) | Slotted nut(END ASSY, TIE-ROD MALE (RH)) | 45                | 458.87              | 398.30              | -                       |
|                                |                     | - (K1611000020) | Slotted nut(END ASSY, TIE-ROD MALE (LH)) | 45                | 458.87              | 398.30              | -                       |
| Piston pump                    |                     | K0013140452     | BOLT, HT M14-45                          | 106 - 134         | 1,080.88 - 1,366.40 | 938.21 - 1,186.03   | -                       |
| Cross valve                    |                     | K0013101202     | BOLT, HT M10-120                         | 29 - 38           | 295.71 - 387.49     | 256.68 - 336.34     | -                       |
| Seat                           |                     | - (K1700000430) | M8 Bolt and Nut (accessories)            | -                 | -                   | -                   | ○                       |
| Mower stopper                  |                     | K0041060122     | SCREW, + FLAT HEAD M6-12                 | -                 | -                   | -                   | ○                       |

# Appended Table

---

| Location                          | Code        | Part name                          | Tightening torque |                     |                   | Thread locking adhesive |
|-----------------------------------|-------------|------------------------------------|-------------------|---------------------|-------------------|-------------------------|
|                                   |             |                                    | N-m               | kgf-cm              | lb-in             |                         |
| Proximity switch NO V-in          | K0100050002 | NUT, M5                            | 2.5               | 25.49               | 22.13             | -                       |
|                                   | K0000050202 | BOLT, M5-20                        | 2.5               | 25.49               | 22.13             | -                       |
| Proximity switch NO V-out         | K0000050202 | BOLT, M5-20                        | 2.5               | 25.49               | 22.13             | -                       |
| Proximity switch NC V-in          | K0100050002 | NUT, M5                            | 2.5               | 25.49               | 22.13             | -                       |
|                                   | K0000050202 | BOLT, M5-20                        | 2.5               | 25.49               | 22.13             | -                       |
| ROPS                              | K001A121101 | BOLT, 13T W/HEX HOLE M12-110       | 104 - 134         | 1,060.49 - 1,366.40 | 920.50 - 1,186.03 | -                       |
| Battery terminal (#30407 - 32145) | K3612000140 | TERMINAL, BATTERY MULTI TYPE       | 9                 | 91.77               | 79.66             | -                       |
| Battery terminal (#32146-)        | K3612000200 | TERMINAL, BATTERY MULTI TYPE (+)   | 14                | 142.76              | 123.91            | -                       |
| Battery terminal                  | K3612000080 | TERMINAL, BATTERY (-) 4013-D-8 - 2 | 9                 | 91.77               | 79.66             | -                       |

# Appended Table

## Daily Check List

LM551B

- . . . Inspect, adjust, supply, clean (first time)
- . . . Inspect, adjust, supply, clean
- ▲ . . . Replace (first time)
- △ . . . Replace

| Maintenance Item |    |                           | Before Work | After Work | Remarks                                                                                                                                                                                                                                                        |
|------------------|----|---------------------------|-------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engine           | *1 | Check engine oil          | ○           |            |                                                                                                                                                                                                                                                                |
|                  | *1 | Check fuel                | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check fuel filter         | ○           |            |                                                                                                                                                                                                                                                                |
|                  | *1 | Check coolant             | ○           |            |                                                                                                                                                                                                                                                                |
|                  | *1 | Check air cleaner         | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check radiator cover      | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check radiator            | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check engine and DPF area | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Clean radiator cover      |             | ○          |                                                                                                                                                                                                                                                                |
|                  |    | Clean radiator            |             | ○          |                                                                                                                                                                                                                                                                |
|                  |    | Clean engine and DPF area |             | ○          |                                                                                                                                                                                                                                                                |
| Main vehicle     |    | Check oil cooler          | ○           |            |                                                                                                                                                                                                                                                                |
|                  | *2 | Check battery             | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check hydraulic oil       | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check tire                | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check cover               | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check traveling pedal     | ○           |            | With the engine turned off, make sure that the traveling pedal movement is not heavy and that the pedal returns to the neutral position. Otherwise, check for adhesion of the traveling pedal shaft and abnormality of the traveling cable and trunnion lever. |
|                  |    | Check brake pedal         | ○           |            | Make sure that the brake pedal moves 30 mm (1.18 in) when applying mild pressure with one hand.                                                                                                                                                                |
|                  |    | Check wire                | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check liquid leakage      | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check ball proof net      | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check machine exterior    | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check bolts and nuts      | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check monitor             | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check interlock system    | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check steering wheel      | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Check light               | ○           |            |                                                                                                                                                                                                                                                                |
|                  |    | Clean oil cooler          |             | ○          |                                                                                                                                                                                                                                                                |

# Appended Table

| Maintenance Item |  |                        | Before Work | After Work | Remarks |
|------------------|--|------------------------|-------------|------------|---------|
| Main vehicle     |  | Clean machine exterior |             | O          |         |

- \*1: Refer to the Engine's Owner's Manual.
- \*2: Refer to the Battery's Owner's Manual.



# Appended Table

## Maintenance Schedule

LM551B

- . . . Inspect, adjust, supply, clean (first time)
- . . . Inspect, adjust, supply, clean
- ▲ . . . Replace (first time)
- △ . . . Replace

| Maintenance Item |       |                                                 | Before Work | After Work | Every Week | Every 50 hrs. | Every 100 hrs. | Every 250 hrs. | Every 400 hrs. | Every 500 hrs. | Every 800 hrs. | Every 1500 hrs. | Every 3000 hrs. | Every month | every 3 months | Every year | Every 2 years | Every 4 years | When Required | Before Work | Remarks                                                                                |
|------------------|-------|-------------------------------------------------|-------------|------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-------------|----------------|------------|---------------|---------------|---------------|-------------|----------------------------------------------------------------------------------------|
| Engine           | *4    | Check fan belt                                  | ○           |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Open air cleaner evacuator valve to remove dust |             | ○          | ○          |               |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             | Open valve every week or daily in dusty conditions                                     |
|                  | *4    | Check fuel hoses and clamp bands                |             |            |            | ○             |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Check water separator                           |             |            |            | ○             |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Draining of water separator                     |             |            |            | ○             |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Clean air cleaner outer element                 |             |            |            |               | ○              |                |                |                |                |                 |                 |             |                |            |               |               |               |             | Air cleaner should be cleaned more often in dusty conditions than in normal conditions |
|                  | *4    | Check fan belt tension                          |             |            |            |               | ○              |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Check radiator hoses and clamp bands            |             |            |            |               | ○              |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Check intake air line (air cleaner hose)        |             |            |            |               | ○              |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *4    | Clean water separator                           |             |            |            |               |                | ○              |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *2.*4 | Clean fuel tank interior                        |             |            |            |               |                |                | ○              |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *2.*4 | Clean water jacket and radiator interior        |             |            |            |               |                |                | ○              |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |
|                  | *2.*4 | Check valve clearance                           |             |            |            |               |                |                |                | ○              |                |                 |                 |             |                |            |               |               |               |             |                                                                                        |

Appended Table

# Appended Table

| Maintenance Item |          |                                                                | Before Work | After Work | Every Week | Every 50 hrs. | Every 100 hrs. | Every 250 hrs. | Every 400 hrs. | Every 500 hrs. | Every 800 hrs. | Every 1500 hrs. | Every 3000 hrs. | Every month | every 3 months | Every year | Every 2 years | Every 4 years | When Required | Before Work | Remarks                                                                            |
|------------------|----------|----------------------------------------------------------------|-------------|------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-------------|----------------|------------|---------------|---------------|---------------|-------------|------------------------------------------------------------------------------------|
| Engine           | *2.*3.*4 | Check injector                                                 |             |            |            |               |                |                |                |                |                |                 | ○               |             |                |            |               |               |               |             |                                                                                    |
|                  | *2.*3.*4 | Check EGR cooler                                               |             |            |            |               |                |                |                |                |                |                 | ○               |             |                |            |               |               |               |             |                                                                                    |
|                  | *2.*4    | Check head cover valve                                         |             |            |            |               |                |                |                |                |                |                 | ○               |             |                |            |               |               |               |             |                                                                                    |
|                  | *2.*3.*4 | Check turbocharger                                             |             |            |            |               |                |                |                |                |                |                 |                 | ○           |                |            |               |               |               |             |                                                                                    |
|                  | *2.*3.*4 | Check EGR system                                               |             |            |            |               |                |                |                |                |                |                 |                 | ○           |                |            |               |               |               |             |                                                                                    |
|                  | *2.*4    | Check DPF-related piping                                       |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | ○             |               |               |             |                                                                                    |
|                  | *2.*4    | Check EGR piping                                               |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | ○             |               |               |             |                                                                                    |
|                  | *4       | Check intake hose (After air flow sensor)                      |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | ○             |               |               |             |                                                                                    |
|                  | *4       | Check exhaust manifold (Crack, gas leakage and mounting screw) |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | ○             |               |               |             |                                                                                    |
|                  | *4       | Replace engine oil                                             |             |            |            | ▲             | △              |                |                |                |                |                 |                 |             |                |            | △             |               |               |             | Initial 50 hours, thereafter every 250 hours or every year whichever comes earlier |
|                  | *4       | Replace oil filter cartridge                                   |             |            |            | ▲             | △              |                |                |                |                |                 |                 |             |                |            | △             |               |               |             | Initial 50 hours, thereafter every 400 hours or every year whichever comes earlier |
|                  | *1.*4    | Replace fuel filter cartridge                                  |             |            |            |               |                | △              |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                                                    |
|                  | *2.*4    | Replace fan belt                                               |             |            |            |               |                |                | △              |                |                |                 |                 |             |                |            |               | △             |               |             | Every 500 hours or 2 years whichever comes earlier                                 |

# Appended Table

| Maintenance Item |          |                                                         | Before Work | After Work | Every Week | Every 50 hrs. | Every 100 hrs. | Every 250 hrs. | Every 400 hrs. | Every 500 hrs. | Every 800 hrs. | Every 1500 hrs. | Every 3000 hrs. | Every month | every 3 months | Every year | Every 2 years | Every 4 years | When Required | Before Work | Remarks                                                                       |
|------------------|----------|---------------------------------------------------------|-------------|------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-------------|----------------|------------|---------------|---------------|---------------|-------------|-------------------------------------------------------------------------------|
| Engine           | *2.*3.*4 | Replace DPF filters                                     |             |            |            |               |                |                |                |                |                |                 |                 | Δ           |                |            |               |               |               |             |                                                                               |
|                  | *4       | Replace air cleaner outer element                       |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | Δ             |               |               |             | Replace every 6 cleanings or every year whichever comes earlier               |
|                  | *2.*4    | Replace air cleaner inner element                       |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | Δ             |               |               |             | The secondary (inner) element should be removed only if it is to be replaced. |
|                  | *2.*4    | Replace water hose                                      |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            | Δ             |               |               |             |                                                                               |
|                  | *2.*4    | Replace rubber pipe relating to oil separator           |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *2.*4    | Replace rubber hose of DPF differential pressure sensor |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *2.*4    | Replace intake hose (After air flow sensor)             |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *2.*4    | Replace EGR cooler hose                                 |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *2.*4    | Replace lubricant hose                                  |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *4       | Replace radiator coolant                                |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *2.*4    | Replace radiator hoses and clamp bands                  |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *1.*2.*4 | Replace fuel hoses and clamps                           |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |
|                  | *2.*4    | Replace intake air line (air cleaner hose)              |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               | Δ             |               |             |                                                                               |

# Appended Table

| Maintenance Item |    |                                                            | Before Work | After Work | Every Week | Every 50 hrs. | Every 100 hrs. | Every 250 hrs. | Every 400 hrs. | Every 500 hrs. | Every 800 hrs. | Every 1500 hrs. | Every 3000 hrs. | Every month | every 3 months | Every year | Every 2 years | Every 4 years | When Required | Before Work | Remarks                                                   |
|------------------|----|------------------------------------------------------------|-------------|------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-------------|----------------|------------|---------------|---------------|---------------|-------------|-----------------------------------------------------------|
| Main vehicle     |    | Check hydraulic hoses (Moving part)                        | ○           |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Grease and Lubricate                                       |             |            |            | ○             |                |                |                |                |                |                 |                 |             |                | ○          |               |               |               |             | Maintenance schedules differ according to greasing points |
|                  |    | Grease rear mower unit swing out pins                      |             |            |            | ○             |                |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Check electrical wiring                                    |             |            |            | ●             | ○              |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Check wheel mounting bolt                                  |             |            |            | ●             | ○              |                |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Check hydraulic hoses (Fixed part)                         |             |            |            |               | ○              |                |                |                |                |                 |                 |             | ○              |            |               |               |               |             | Every 100 hours or every month whichever comes earlier    |
|                  |    | Grease mower unit hydraulic motor shafts                   |             |            |            |               |                | ○              |                |                |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Replace hydraulic oil                                      |             |            |            |               | ▲              |                |                | △              |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Replace hydraulic oil suction filter                       |             |            |            |               | ▲              |                |                | △              |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Replace hydraulic oil line filter                          |             |            |            |               | ▲              |                |                | △              |                |                 |                 |             |                |            |               |               |               |             |                                                           |
|                  |    | Replace resin bushing                                      |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               | △             |             |                                                           |
|                  | *5 | Replace battery                                            |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               | △             |             |                                                           |
|                  | *2 | Replace hydraulic hoses (Moving part)                      |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               | △             |             |                                                           |
|                  | *2 | Replace hydraulic hoses (Moving part) relating to steering |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               | △             |             |                                                           |

# Appended Table

| Maintenance Item |    |                                      | Before Work | After Work | Every Week | Every 50 hrs. | Every 100 hrs. | Every 250 hrs. | Every 400 hrs. | Every 500 hrs. | Every 800 hrs. | Every 1500 hrs. | Every 3000 hrs. | Every month | every 3 months | Every year | Every 2 years | Every 4 years | When Required | Before Work | Remarks |
|------------------|----|--------------------------------------|-------------|------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-------------|----------------|------------|---------------|---------------|---------------|-------------|---------|
| Main vehicle     | *2 | Replace hydraulic hoses (Fixed part) |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               | △             |             |         |
|                  | *2 | Replace brake cable                  |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               |               | △           |         |
|                  | *2 | Replace traveling cable              |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               |               | △           |         |
|                  | *2 | Replace brake pads                   |             |            |            |               |                |                |                |                |                |                 |                 |             |                |            |               |               |               | △           |         |

- \*1: When biodiesel fuel is used, replace the fuel filter cartridge, fuel hose and clamp bands with new ones at intervals half of the usual ones.
- \*2: Consult your local Baroness Dealer or local KUBOTA Dealer for this service.
- The items above (\*3 marked) are registered as emission related critical parts by KUBOTA in the U.S. EPA nonroad emission regulation.  
As the engine owner, you are responsible for the performance of the required maintenance on the engine according to the above instruction.  
Please see the Engine's Warranty Statement in detail.
- The items listed above other than \*3 marked are not necessary to keep the emission-related warranty valid.
- Failure to perform the maintenance will cause problems that will significantly degrade the engine performance.
- \*4: Refer to the Engine's Owner's Manual.
- \*5: Refer to the Battery's Owner's Manual.
- The values for consumables are not guaranteed.
- Be sure to replace hydraulic hoses for steering cylinder and hydraulic hoses for hydraulic motor of wheel relating to steering every two years.

# Appended Table

## List of Adjusted Values

|                         |           |          |                                                                                             |                                                                         |
|-------------------------|-----------|----------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Fan belt                |           |          | 10 mm (0.39 in)                                                                             | Slack when applying 98 N (10 kgf) force to the belt at the middle point |
|                         |           |          | Adjustment: 200 - 300 N (20.39 – 30.59 kgf)<br>Replacement: 267 - 361 N (27.23 – 36.81 kgf) | Measurement of belt tension by using a sonic type tension meter         |
| Mower stabilizer spring |           | #1 - 5   | 140 mm (5.51 in)                                                                            | Total length of spring                                                  |
| Location of stopper nut | LH62 • 66 | #1, 4, 5 | 15 mm (0.59 in)                                                                             |                                                                         |
|                         |           | #2, 3    | 40 mm (1.57 in)                                                                             |                                                                         |
|                         | LH52      | #1, 4, 5 | 15 mm (0.59 in)                                                                             |                                                                         |
|                         |           |          | 30 mm (1.18 in)                                                                             | With grass catcher                                                      |
|                         |           | #2, 3    | 40 mm (1.57 in)                                                                             |                                                                         |

# Appended Table

## List of Fault Codes

### Important

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

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

| P code | J1939-73 |     | Description                                              | Limp home action<br>by engine ECU<br>(System action)                                        | Detection item                                                                                           | Behavior During<br>Malfunction                                                              | DTC recovery<br>from error                                                       | LED ON |     |
|--------|----------|-----|----------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                                          |                                                                                             |                                                                                                          |                                                                                             |                                                                                  | Yellow | Red |
| P0016  | 636      | 7   | 【P0016】 NE-G phase shift                                 | • Output limitation • Regeneration inhibited                                                | • Large phase shift between NE (crankshaft position sensor) pulse and G (camshaft position sensor) pulse | (Invalid G signal)<br>• Engine hesitates at start-up                                        | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0072  | 171      | 4   | 【P0072】 Intake air temperature built-in MAF sensor: Low  | • Regeneration inhibited                                                                    | • Ground short circuit of sensor/harness                                                                 | • None                                                                                      | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0073  | 171      | 3   | 【P0073】 Intake air temperature built-in MAF sensor: High | • Regeneration inhibited                                                                    | • Open circuit or +B short circuit of sensor/harness                                                     | • None                                                                                      | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0088  | 157      | 0   | 【P0088】 High rail pressure                               | • Output limitation • Speed limitation • Regeneration inhibited                             | • Actual pressure exceeds the command pressure                                                           | • Insufficient output<br>• Worsening exhaust gas performance                                | • Key switch turn OFF                                                            | ○      |     |
| P0089  | 1347     | 7   | 【P0089】 SCV stuck                                        | • Output limitation • Speed limitation • Engine stops in some case • Regeneration inhibited | • SCV stuck at open position (Actual rail pressure continuously exceeds the command rail pressure)       | • Insufficient output<br>• Worsening exhaust gas performance<br>• Engine stops in some case | • Key switch turn OFF                                                            |        | ○   |

# Appended Table

| P code | J1939-73 |     | Description                                                | Limp home action<br>by engine ECU<br>(System action)                                                                                                                     | Detection item                                                                                                                                                                                                                                                                                                                                                                                                 | Behavior During<br>Malfunction                                                                                                                           | DTC recovery<br>from error                                                                                                             | LED ON |     |
|--------|----------|-----|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                                            |                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                          |                                                                                                                                        | Yellow | Red |
| P0093  | 1239     | 1   | 【P0093】 Pressure abnormality in high pressured fuel system | <ul style="list-style-type: none"> <li>• Output limitation</li> <li>• Speed limitation</li> <li>• Engine stops in some case</li> <li>• Regeneration inhibited</li> </ul> | <ul style="list-style-type: none"> <li>• Lack of fuel<br/>(This error occurs when the engine stalls due to lack of fuel and air gets mixed in the fuel line)</li> <li>• Fuel leak from high pressured fuel system<br/>(Fuel consumption is calculated from the difference of fuel pressure of before and after the injection, and the error will be detected when excess fuel consumption is found)</li> </ul> | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Worsening exhaust gas emissions</li> <li>• Engine stops in some cases</li> </ul> | <ul style="list-style-type: none"> <li>• Key switch turn OFF</li> </ul>                                                                | ○      |     |
| P0101  | 132      | 1   | 【P0101】 Intake air volume: Low                             | <ul style="list-style-type: none"> <li>• Output limitation</li> <li>• Regeneration inhibited</li> </ul>                                                                  | <ul style="list-style-type: none"> <li>• Engine inlet air mass flow rate lacking<br/>(Disconnect turbo blower intake hose)</li> </ul>                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• Insufficient output</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>• Key switch turn OFF</li> </ul>                                                                | ○      |     |
| P0102  | 132      | 4   | 【P0102】 MAF sensor: Low (NCD)                              | <ul style="list-style-type: none"> <li>• Output limitation</li> <li>• Please stop the engine</li> <li>• Regeneration inhibited</li> </ul>                                | <ul style="list-style-type: none"> <li>• Open circuit or ground short circuit of sensor/harness</li> </ul>                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Worsening exhaust gas performance</li> </ul>                                     | <ul style="list-style-type: none"> <li>• Diagnostic counter = 0<br/>(returns when error is resolved)</li> </ul>                        | ○      | ○   |
| P0103  | 132      | 3   | 【P0103】 MAF sensor: High                                   | <ul style="list-style-type: none"> <li>• Output limitation</li> <li>• Please stop the engine</li> <li>• Regeneration inhibited</li> </ul>                                | <ul style="list-style-type: none"> <li>• +B short circuit of sensor/harness</li> </ul>                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Worsening exhaust gas performance</li> </ul>                                     | <ul style="list-style-type: none"> <li>• Key switch turn OFF</li> </ul>                                                                |        | ○   |
| P0112  | 172      | 4   | 【P0112】 Intake air temperature: Low                        | <ul style="list-style-type: none"> <li>• Regeneration inhibited</li> </ul>                                                                                               | <ul style="list-style-type: none"> <li>• Ground short circuit of sensor/harness</li> </ul>                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Amount of white smoke increases at low temperature</li> </ul>                                                   | <ul style="list-style-type: none"> <li>• Diagnostic counter = 0<br/>(returns when error is resolved) or Key switch turn OFF</li> </ul> | ○      |     |



# Appended Table

| P code | J1939-73 |     | Description                              | Limp home action<br>by engine ECU<br>(System action) | Detection item                                       | Behavior During<br>Malfunction                                                                                        | DTC recovery<br>from error                                                       | LED ON |     |
|--------|----------|-----|------------------------------------------|------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                          |                                                      |                                                      |                                                                                                                       |                                                                                  | Yellow | Red |
| P0113  | 172      | 3   | 【P0113】 Intake air temperature: High     | • Regeneration inhibited                             | • Open circuit or +B short circuit of sensor/harness | • Amount of white smoke increases at low temperature                                                                  | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0117  | 110      | 4   | 【P0117】 Coolant temperature sensor: Low  | • Regeneration inhibited                             | • Ground short circuit of sensor/harness             | • Amount of white smoke increases at low temperatures<br>• Insufficient output<br>• Worsening exhaust gas performance | • Key switch turn OFF                                                            | ○      |     |
| P0118  | 110      | 3   | 【P0118】 Coolant temperature sensor: High | • Regeneration inhibited                             | • Open circuit or +B short circuit of sensor/harness | • Amount of white smoke increases at low temperatures<br>• Insufficient output<br>• Worsening exhaust gas performance | • Key switch turn OFF                                                            | ○      |     |
| P0181  | 174      | 0   | 【P0181x】 Fuel high temperature           | • Output limitation • Regeneration inhibited         | • Fuel temperature high                              | • None                                                                                                                | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0182  | 174      | 4   | 【P0182】 Fuel temperature sensor: Low     | • Output limitation • Regeneration inhibited         | • Sensor/harness ground short circuit                | • None                                                                                                                | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0183  | 174      | 3   | 【P0183】 Fuel temperature sensor: High    | • Output limitation • Regeneration inhibited         | • Sensor/harness ground short circuit                | • None                                                                                                                | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |

# Appended Table

| P code | J1939-73 |     | Description                                                   | Limp home action<br>by engine ECU<br>(System action)                                                    | Detection item                                                            | Behavior During<br>Malfunction                                                                                                                                                                                                              | DTC recovery<br>from error | LED ON |     |
|--------|----------|-----|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------|-----|
|        | SPN      | FMI |                                                               |                                                                                                         |                                                                           |                                                                                                                                                                                                                                             |                            | Yellow | Red |
| P0192  | 157      | 4   | 【P0192】 Rail pressure sensor: Low                             | • Output limitation • Speed limitation • Engine forcibly stopped 60 sec. later • Regeneration inhibited | • Ground short circuit of sensor/harness<br>Failure of sensor             | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Worsening exhaust gas performance</li> <li>• Worsening running noise</li> <li>• Increase in white smoke</li> <li>• Engine forcibly stopped 60 sec. later</li> </ul> | • Key switch turn OFF      |        | ○   |
| P0193  | 157      | 3   | 【P0193】 Rail pressure sensor: High                            | • Output limitation • Speed limitation • Engine forcibly stopped 60 sec. later • Regeneration inhibited | • Open circuit or +B short circuit of sensor/harness<br>Failure of sensor | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Worsening exhaust gas performance</li> <li>• Worsening running noise</li> <li>• Increase in white smoke</li> <li>• Engine forcibly stopped 60 sec. later</li> </ul> | • Key switch turn OFF      |        | ○   |
| P0200  | 523535   | 0   | 【P0200】 Injector charge voltage: High                         | • Output limitation • Engine forcibly stopped 60 sec. later • Regeneration inhibited                    | • Injector charge voltage: High                                           | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Worsening exhaust gas performance</li> <li>• Engine forcibly stopped 60 sec. later</li> </ul>                                                                       | • Key switch turn OFF      |        | ○   |
| P0201  | 651      | 3   | 【P0201】 Open circuit of harness/coil in 1st cylinder injector | • Output limitation • Regeneration inhibited                                                            | • Open circuit of harness<br>• Open circuit of injector coil              | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Large vibration</li> <li>• Worsening exhaust gas performance</li> </ul>                                                                                             | • Key switch turn OFF      |        | ○   |
| P0202  | 653      | 3   | 【P0202】 Open circuit of harness/coil in 3rd cylinder injector | • Output limitation • Regeneration inhibited                                                            | • Open circuit of harness<br>• Open circuit of injector coil              | <ul style="list-style-type: none"> <li>• Insufficient output</li> <li>• Large vibration</li> <li>• Worsening exhaust gas performance</li> </ul>                                                                                             | • Key switch turn OFF      |        | ○   |

# Appended Table

| P code | J1939-73 |     | Description                                                    | Limp home action<br>by engine ECU<br>(System action) | Detection item                                                              | Behavior During<br>Malfunction                                                                              | DTC recovery<br>from error                                                       | LED ON |     |
|--------|----------|-----|----------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                                                |                                                      |                                                                             |                                                                                                             |                                                                                  | Yellow | Red |
| P0203  | 654      | 3   | 【P0203】 Open circuit of harness/ coil in 4th cylinder injector | • Output limitation<br>• Regeneration inhibited      | • Open circuit of harness<br>• Open circuit of injector coil                | • Insufficient output<br>• Large vibration<br>• Worsening exhaust gas performance                           | • Key switch turn OFF                                                            |        | ○   |
| P0204  | 652      | 3   | 【P0204】 Open circuit of harness/ coil in 2nd cylinder injector | • Output limitation<br>• Regeneration inhibited      | • Open circuit of harness<br>• Open circuit of injector coil                | • Insufficient output<br>• Large vibration<br>• Worsening exhaust gas performance                           | • Key switch turn OFF                                                            |        | ○   |
| P0217  | 110      | 0   | 【P0217】 Engine overheat                                        | • Output limitation<br>• Regeneration inhibited      | • Overheat of engine coolant temperature                                    | • Insufficient output<br>• Overheat                                                                         | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF |        | ○   |
| P0219  | 190      | 0   | 【P0219】 Engine overrun                                         | • Regeneration inhibited                             | • Engine speed exceeds threshold speed                                      | • Overrun                                                                                                   | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF |        | ○   |
| P0237  | 102      | 4   | 【P0237】 Boost pressure sensor: Low                             | • Regeneration inhibited                             | • Ground short circuit of sensor/ harness<br>• Failure of sensor            | • Insufficient output                                                                                       | • Key switch turn OFF                                                            | ○      |     |
| P0238  | 102      | 3   | 【P0238】 Boost pressure sensor: High                            | • Regeneration inhibited                             | • Open circuit or +B short circuit of sensor/harness<br>• Failure of sensor | • Insufficient output                                                                                       | • Key switch turn OFF                                                            | ○      |     |
| P0335  | 636      | 8   | 【P0335】 No input of NE sensor pulse                            | • Output limitation<br>• Regeneration inhibited      | • Open circuit or short circuit of sensor/harness<br>• Failure of sensor    | (Running only with G signal)<br>• Faulty starting<br>• Vibration is slightly large<br>• Insufficient output | • Diagnostic counter = 0 (returns when error is resolved)                        | ○      |     |
| P0336  | 636      | 2   | 【P0336】 NE sensor pulse number error                           | • Output limitation<br>• Regeneration inhibited      | • Open circuit or short circuit of sensor/harness<br>• Failure of sensor    | (Running only with G signal)<br>• Faulty starting<br>• Vibration is slightly large<br>• Insufficient output | • Diagnostic counter = 0 (returns when error is resolved)                        | ○      |     |

# Appended Table

| P code | J1939-73   |     | Description                                                                | Limp home action<br>by engine ECU<br>(System action)          | Detection item                                                                 | Behavior During<br>Malfunction                                               | DTC recovery<br>from error                                                                      | LED ON |     |
|--------|------------|-----|----------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------|-----|
|        | SPN        | FMI |                                                                            |                                                               |                                                                                |                                                                              |                                                                                                 | Yellow | Red |
| P0340  | 723        | 8   | 【P0340】 No input<br>of G sensor pulse                                      | • Regeneration<br>inhibited                                   | • Open circuit or<br>short circuit of<br>sensor/harness<br>• Failure of sensor | (Invalid G signal)<br>• Engine hesitates<br>at start-up                      | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF | ○      |     |
| P0341  | 723        | 2   | 【P0341】 G sensor<br>pulse number<br>error                                  | • Regeneration<br>inhibited                                   | • Open circuit or<br>short circuit of<br>sensor/harness<br>• Failure of sensor | (Invalid G signal)<br>• Engine hesitates<br>at start-up                      | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF | ○      |     |
| P0380  | 52354<br>4 | 3   | 【P0380】 +Battery<br>short of Intake air<br>heater relay<br>driving circuit | • Regeneration<br>inhibited                                   | • +B short of<br>Intake air heater<br>relay actuation<br>circuit               | (At low<br>temperature)<br>• Faulty starting<br>• Increase in white<br>smoke | • Key switch turn<br>OFF                                                                        | ○      |     |
| P0380  | 52354<br>4 | 4   | 【P0380】 Ground<br>short of Intake air<br>heater relay<br>driving circuit   | • Regeneration<br>inhibited                                   | • Ground short of<br>intake air heater<br>relay drive circuit                  | (At low<br>temperature)<br>• Faulty starting<br>• Increase in white<br>smoke | • Key switch turn<br>OFF                                                                        | ○      |     |
| P0403  | 52357<br>4 | 3   | 【P0403】 EGR<br>actuator open<br>circuit                                    | • Output<br>limitation •<br>Regeneration<br>inhibited         | • EGR actuator<br>open circuit                                                 | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance        | • Key switch turn<br>OFF                                                                        | ○      |     |
| P0404  | 52357<br>4 | 4   | 【P0404】 EGR<br>actuator coil short                                         | • Output<br>limitation •<br>Regeneration<br>inhibited         | • EGR actuator<br>coil short                                                   | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance        | • Key switch turn<br>OFF                                                                        | ○      |     |
| P0409  | 52357<br>2 | 4   | 【P0409】 EGR<br>position sensor<br>failure                                  | • Output<br>limitation •<br>Regeneration<br>inhibited         | • EGR position<br>sensor failure                                               | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance        | • Key switch turn<br>OFF                                                                        | ○      |     |
| P0524  | 100        | 1   | 【P0524】 Engine oil<br>pressure error                                       | • Engine stops in<br>some case •<br>Regeneration<br>inhibited | • Oil pressure<br>switch                                                       | • Engine stops                                                               | • Key switch turn<br>OFF                                                                        |        | ○   |
| P0543  | 3242       | 4   | 【P0543】 Exhaust<br>gas temperature<br>sensor T1: Low                       | • Output<br>limitation •<br>Regeneration<br>inhibited         | • Ground short<br>circuit of sensor/<br>harness                                | • None                                                                       | • Key switch turn<br>OFF                                                                        | ○      |     |

# Appended Table

| P code | J1939-73 |     | Description                                     | Limp home action<br>by engine ECU<br>(System action)                           | Detection item                                                             | Behavior During<br>Malfunction                                                                                   | DTC recovery<br>from error                                                       | LED ON |     |
|--------|----------|-----|-------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                                 |                                                                                |                                                                            |                                                                                                                  |                                                                                  | Yellow | Red |
| P0544  | 3242     | 3   | 【P0544】 Exhaust gas temperature sensor T1: High | • Output limitation<br>• Regeneration inhibited                                | • Open circuit or +B short circuit of sensor/harness                       | • None                                                                                                           | • Key switch turn OFF                                                            | ○      |     |
| P0546  | 4765     | 4   | 【P0546】 Exhaust gas temperature sensor T0: Low  | • Output limitation<br>• Regeneration inhibited                                | • Ground short circuit of sensor/harness                                   | • None                                                                                                           | • Key switch turn OFF                                                            | ○      |     |
| P0547  | 4765     | 3   | 【P0547】 Exhaust gas temperature sensor T0: High | • Output limitation<br>• Regeneration inhibited                                | • Open circuit or +B short circuit of sensor/harness                       | • None                                                                                                           | • Key switch turn OFF                                                            | ○      |     |
| P0562  | 168      | 4   | 【P0562】 Battery voltage: Low                    | • Output limitation<br>• Engine stops in some case<br>• Regeneration inhibited | • Open circuit, short circuit or damage of harness<br>• Failure of battery | • Faulty starting<br>• Insufficient output<br>• Worsening exhaust gas performance<br>• Engine stops in some case | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0563  | 168      | 3   | 【P0563】 Battery voltage: High                   | • Output limitation<br>• Regeneration inhibited                                | • Open circuit, short circuit or damage of harness<br>• Failure of battery | • Faulty starting<br>• Insufficient output<br>• Worsening exhaust gas performance                                | • Key switch turn OFF                                                            | ○      |     |
| P0602  | 523538   | 2   | 【P0602】 QR (IQA) data error                     | • Output limitation<br>• Regeneration inhibited                                | • QR data read error                                                       | • Insufficient output                                                                                            | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0602  | 523538   | 7   | 【P0602】 No QR (IQA) data                        | • Output limitation<br>• Regeneration inhibited                                | • QR data is unwritten                                                     | • Insufficient output                                                                                            | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P0605  | 628      | 2   | 【P0605】 ECU FLASH ROM error                     | • Engine forcibly stop<br>• Regeneration inhibited                             | • ECU FLASH ROM error                                                      | • Engine stops                                                                                                   | • Key switch turn OFF                                                            |        | ○   |
| P0606  | 1077     | 2   | 【P0606】 ECU CPU (Main IC) error                 | • Engine forcibly stop<br>• Regeneration inhibited                             | • Failure of CPU and/or IC                                                 | • Engine stops                                                                                                   | • Key switch turn OFF                                                            |        | ○   |
| P0607  | 523527   | 2   | 【P0606】 ECU CPU (Monitoring IC) error           | • Engine forcibly stop<br>• Regeneration inhibited                             | • Failure of monitoring IC of CPU                                          | • Engine stops                                                                                                   | • Key switch turn OFF                                                            |        | ○   |

# Appended Table

| P code | J1939-73   |     | Description                                 | Limp home action<br>by engine ECU<br>(System action)                                                                      | Detection item                                                             | Behavior During<br>Malfunction                                                                                               | DTC recovery<br>from error | LED ON |     |
|--------|------------|-----|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------|-----|
|        | SPN        | FMI |                                             |                                                                                                                           |                                                                            |                                                                                                                              |                            | Yellow | Red |
| P0611  | 52352<br>5 | 1   | 【P0611】 Injector<br>charge voltage:<br>Low  | • Output<br>limitation • Engine<br>stops in some<br>case •<br>Regeneration<br>inhibited                                   | • Injector charge<br>voltage: Low<br>• Failure of charge<br>circuit of ECU | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance<br>• Engine stops                                      | • Key switch turn<br>OFF   |        | ○   |
| P0628  | 1347       | 4   | 【P0628】SCV drive<br>system error            | • Engine forcibly<br>stop • Regeneration<br>inhibited                                                                     | • Ground short<br>circuit of SCV                                           | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance<br>• Engine stop                                       | • Key switch turn<br>OFF   |        | ○   |
| P0629  | 1347       | 3   | 【P0629】 +Battery<br>short circuit of<br>SCV | • Output<br>limitation • Speed<br>limitation • Engine<br>forcibly stopped 60<br>sec. later •<br>Regeneration<br>inhibited | • +B short circuit of<br>SCV                                               | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance<br>Engine forcibly<br>stopped 60 sec.<br>later         | • Key switch turn<br>OFF   |        | ○   |
| P0642  | 3509       | 4   | 【P0642】 Sensor<br>supply voltage 1:<br>Low  | • Forced Idle •<br>Engine stops in<br>some case •<br>Regeneration<br>inhibited                                            | • Sensor supply<br>voltage 1 error or<br>recognition error                 | • Faulty starting<br>• Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance<br>• Engine stops in<br>some case | • Key switch turn<br>OFF   | ○      |     |
| P0643  | 3509       | 3   | 【P0643】 Sensor<br>supply voltage 1:<br>High | • Forced Idle •<br>Engine stops in<br>some case •<br>Regeneration<br>inhibited                                            | • Sensor supply<br>voltage 1 error or<br>recognition error                 | • Faulty starting<br>• Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance<br>• Engine stops in<br>some case | • Key switch turn<br>OFF   | ○      |     |
| P0652  | 3510       | 4   | 【P0652】 Sensor<br>supply voltage 2:<br>Low  | • Output<br>limitation •<br>Regeneration<br>inhibited                                                                     | • Sensor supply<br>voltage 2 error or<br>recognition error                 | • Faulty starting<br>• Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance                                   | • Key switch turn<br>OFF   | ○      |     |

# Appended Table

| P code | J1939-73 |     | Description                                     | Limp home action<br>by engine ECU<br>(System action)                  | Detection item                                                           | Behavior During<br>Malfunction                                                    | DTC recovery<br>from error                                                       | LED ON |     |
|--------|----------|-----|-------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                                 |                                                                       |                                                                          |                                                                                   |                                                                                  | Yellow | Red |
| P0653  | 3510     | 3   | 【P0653】 Sensor supply voltage 2: High           | • Output limitation<br>• Regeneration inhibited                       | • Sensor supply voltage 2 error or recognition error                     | • Faulty starting<br>• Insufficient output<br>• Worsening exhaust gas performance | • Key switch turn OFF                                                            | ○      |     |
| P0687  | 1485     | 2   | 【P0687】 Main relay is locked in closed position | • Regeneration inhibited                                              | • Failure of main relay                                                  | • Battery goes dead                                                               | • Key switch turn OFF                                                            | ○      |     |
| P1274  | 523539   | 2   | 【P1274】 Pump seizing 1                          | • Output limitation<br>• Speed limitation<br>• Regeneration inhibited | • Abnormally high pressure 1                                             | • Insufficient output<br>• Worsening exhaust gas performance                      | • Key switch turn OFF                                                            |        | ○   |
| P1275  | 523540   | 2   | 【P1275】 Pump seizing 2                          | • Output limitation<br>• Speed limitation<br>• Regeneration inhibited | • Abnormally high pressure 2                                             | • Insufficient output<br>• Worsening exhaust gas performance                      | • Key switch turn OFF                                                            |        | ○   |
| P1C00  | 523634   | 2   | 【P1C00x】 ECU internal power supply error        | • Regeneration inhibited                                              | • ECU internal power supply error                                        | • None                                                                            | • Key switch turn OFF                                                            |        | ○   |
| P1C01  | 523635   | 2   | 【P1C01x】 ECU internal IC error                  | • Regeneration inhibited                                              | • ECU internal IC error                                                  | • None                                                                            | • Key switch turn OFF                                                            |        | ○   |
| P1C02  | 523636   | 2   | 【P1C02x】 ECU internal memory error              | • Forced idle<br>• Regeneration inhibited                             | • ECU internal memory error                                              | • None                                                                            | • Key switch turn OFF                                                            |        | ○   |
| P1C04  | 168      | 1   | 【P1C04x】 Battery voltage too low                | • Engine forcibly stop<br>• Regeneration inhibited                    | • Open circuit, short circuit or damage of harness<br>Failure of battery | Engine stops                                                                      | • Key switch turn OFF                                                            |        | ○   |
| P1990  | 523700   | 13  | 【P1990】 EEPROM check sum error                  | • Regeneration inhibited                                              | • KBT-EEPROM check sum error                                             | • None                                                                            | • Key switch turn OFF                                                            | ○      |     |
| P1A28  | 3936     | 7   | 【P1A28】 Removal of DPF (PCD)                    | ---                                                                   | • Removal of DPF                                                         | • None                                                                            | • -                                                                              | ○      | ○   |
| P2108  | 523580   | 2   | 【P2108】 Intake throttle feedback error          | • Output limitation<br>• Regeneration inhibited                       | • Intake throttle feedback error                                         | • None                                                                            | • Key switch turn OFF                                                            | ○      |     |
| P2122  | 91       | 4   | 【P2122】 Accelerator position sensor 1: Low      | • Forced Idle<br>• Regeneration inhibited                             | • Ground short circuit or open circuit of sensor/harness                 | • Insufficient output                                                             | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |

# Appended Table

| P code | J1939-73   |     | Description                                                                                            | Limp home action<br>by engine ECU<br>(System action)                                    | Detection item                                                                                                       | Behavior During<br>Malfunction                                                                                                            | DTC recovery<br>from error                                                                                                  | LED ON |     |
|--------|------------|-----|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------|-----|
|        | SPN        | FMI |                                                                                                        |                                                                                         |                                                                                                                      |                                                                                                                                           |                                                                                                                             | Yellow | Red |
| P2123  | 91         | 3   | 【P2123】<br>Accelerator<br>position sensor 1:<br>High                                                   | • Forced Idle •<br>Regeneration<br>inhibited                                            | • Battery short<br>circuit out of<br>sensor/harness                                                                  | • Insufficient<br>output                                                                                                                  | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF                             | ○      |     |
| P2127  | 29         | 4   | 【P2127】<br>Accelerator<br>position sensor 2:<br>Low                                                    | • Forced Idle •<br>Regeneration<br>inhibited                                            | • Ground short<br>circuit or open<br>circuit of sensor/<br>harness                                                   | • Insufficient<br>output                                                                                                                  | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF                             | ○      |     |
| P2128  | 29         | 3   | 【P2128】<br>Accelerator<br>position sensor 2:<br>High                                                   | • Forced Idle •<br>Regeneration<br>inhibited                                            | • Battery short<br>circuit out of<br>sensor/harness                                                                  | • Insufficient<br>output                                                                                                                  | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF                             | ○      |     |
| P2131  | 52354<br>3 | 2   | 【P2131】<br>Accelerator<br>position sensor<br>error (CAN)                                               | • Regeneration<br>inhibited                                                             | • Accelerator<br>position sensor<br>signal error<br>(sensor/harness<br>open circuit,<br>ground short<br>circuit etc) | • Insufficient<br>output                                                                                                                  | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF<br>(CAN signal<br>recovers) | ○      |     |
| P2135  | 91         | 2   | 【P2135】<br>Accelerator<br>position sensor<br>correlation error                                         | • Forced Idle •<br>Regeneration<br>inhibited                                            | • Deviation from<br>designed<br>correlation in 2<br>sensors                                                          | • Insufficient<br>output                                                                                                                  | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)                                                          | ○      |     |
| P2146  | 52352<br>3 | 2   | 【P2146】 Injector<br>actuation circuit<br>disconnection<br>(COM1 or 1&4<br>cylinders<br>simultaneously) | • Output<br>limitation • Engine<br>stops in some<br>case •<br>Regeneration<br>inhibited | • Wiring harness<br>open circuit                                                                                     | • Insufficient<br>output<br>• Large vibration<br>• Worsening<br>exhaust gas<br>performance<br>• Engine stops in<br>some case              | • Key switch turn<br>OFF                                                                                                    |        | ○   |
| P2147  | 52352<br>3 | 4   | 【P2147】 Ground<br>short at injector<br>drive circuit<br>(COM1 or 1&4<br>cylinders<br>simultaneously)   | • Output<br>limitation • Engine<br>stops in some<br>case •<br>Regeneration<br>inhibited | • Wiring harness<br>ground short                                                                                     | • Insufficient<br>output<br>• Engine Vibration<br>increases<br>• Worsening<br>exhaust gas<br>emissions<br>• Engine stops in<br>some cases | • Key switch turn<br>OFF                                                                                                    |        | ○   |



# Appended Table

| P code | J1939-73   |     | Description                                                                             | Limp home action<br>by engine ECU<br>(System action)                     | Detection item                                                 | Behavior During<br>Malfunction                                                                                             | DTC recovery<br>from error                                                       | LED ON |     |
|--------|------------|-----|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----|
|        | SPN        | FMI |                                                                                         |                                                                          |                                                                |                                                                                                                            |                                                                                  | Yellow | Red |
| P2148  | 52352<br>3 | 3   | 【P2148】 +Battery short at injector drive circuit (COM1 or 1&4 cylinders simultaneously) | • Output limitation • Engine stops in some case • Regeneration inhibited | • Wiring harness short to +B or wiring harness short to ground | • Insufficient output<br>• Large vibration<br>• Worsening exhaust gas performance<br>• Engine stops in some case           | • Key switch turn OFF                                                            |        | ○   |
| P2149  | 52352<br>4 | 2   | 【P2149】 Injector actuation circuit disconnection (COM2 or 2&3 cylinders simultaneously) | • Output limitation • Engine stops in some case • Regeneration inhibited | • Wiring harness open circuit                                  | • Insufficient output<br>• Large vibration<br>• Worsening exhaust gas performance<br>• Engine stops in some case           | • Key switch turn OFF                                                            |        | ○   |
| P2150  | 52352<br>4 | 4   | 【P2150】 Ground short at injector drive circuit (COM2 or 2&3 cylinders simultaneously)   | • Output limitation • Engine stops in some case • Regeneration inhibited | • Wiring harness ground short                                  | • Insufficient output<br>• Engine Vibration increases<br>• Worsening exhaust gas emissions<br>• Engine stops in some cases | • Key switch turn OFF                                                            |        | ○   |
| P2151  | 52352<br>4 | 3   | 【P2151】 +Battery short at injector drive circuit (COM2 or 3&3 cylinders simultaneously) | • Output limitation • Engine stops in some case • Regeneration inhibited | • Wiring harness short to +B or Wiring harness short to ground | • Insufficient output<br>• Large vibration<br>• Worsening exhaust gas performance<br>• Engine stops in some case           | • Key switch turn OFF                                                            |        | ○   |
| P2228  | 108        | 4   | 【P2228】 Barometric pressure sensor error: Low                                           | • Regeneration inhibited                                                 | • Sensor/ECU internal circuit short to ground                  | • Insufficient output                                                                                                      | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |
| P2229  | 108        | 3   | 【P2229】 Barometric pressure sensor error: High                                          | • Regeneration inhibited                                                 | • Sensor/ECU internal circuit short to +B                      | • Insufficient output                                                                                                      | • Diagnostic counter = 0 (returns when error is resolved) or Key switch turn OFF | ○      |     |

# Appended Table

| P code | J1939-73   |     | Description                                                 | Limp home action<br>by engine ECU<br>(System action)                        | Detection item                                             | Behavior During<br>Malfunction                                        | DTC recovery<br>from error                                         | LED ON |     |
|--------|------------|-----|-------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------|--------|-----|
|        | SPN        | FMI |                                                             |                                                                             |                                                            |                                                                       |                                                                    | Yellow | Red |
| P2413  | 52357<br>5 | 7   | 【P2413】 EGR<br>actuator valve<br>stuck                      | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • EGR actuator<br>valve stuck                              | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance | • Key switch turn<br>OFF                                           | ○      |     |
| P2414  | 52357<br>6 | 2   | 【P2414】 EGR (DC<br>motor) overheat                          | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • EGR (DC motor)<br>overheat                               | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance | • Key switch turn<br>OFF                                           | ○      |     |
| P2415  | 52357<br>7 | 2   | 【P2415】 EGR (DC<br>motor)<br>temperature<br>sensor failure  | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • EGR (DC motor)<br>temperature<br>sensor failure          | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance | • Key switch turn<br>OFF                                           | ○      |     |
| P242C  | 3246       | 4   | 【P242C】 Exhaust<br>gas temperature<br>sensor T2: Low        | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • Ground short<br>circuit of sensor/<br>harness            | • None                                                                | • Key switch turn<br>OFF                                           | ○      |     |
| P242D  | 3246       | 3   | 【P242D】 Exhaust<br>gas temperature<br>sensor T2: High       | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • Open circuit or<br>+B short circuit of<br>sensor/harness | • None                                                                | • Key switch turn<br>OFF                                           | ○      |     |
| P2454  | 3251       | 4   | 【P2454】<br>Differential<br>pressure sensor 1:<br>Low        | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • Ground short<br>circuit of sensor/<br>harness            | • None                                                                | • Key switch turn<br>OFF                                           | ○      |     |
| P2455  | 3251       | 3   | 【P2455】<br>Differential<br>pressure sensor 1:<br>High (PCD) | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • Open circuit or<br>+B short circuit of<br>sensor/harness | • None                                                                | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved) | ○      | ○   |
| P2621  | 52358<br>2 | 4   | 【P2621】 Intake<br>throttle lift sensor:<br>Low              | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • Intake throttle lift<br>sensor low                       | • None                                                                | • Key switch turn<br>OFF                                           | ○      |     |
| P2622  | 52358<br>2 | 3   | 【P2622】 Intake<br>throttle lift sensor:<br>High             | • Output<br>limitation •<br>Regeneration<br>inhibited                       | • Intake throttle lift<br>sensor high                      | • None                                                                | • Key switch turn<br>OFF                                           | ○      |     |
| P3001  | 3252       | 0   | 【P3001】 Emission<br>deterioration                           | • Output<br>limitation • Speed<br>limitation •<br>Regeneration<br>inhibited | • DOC is heated<br>up due to<br>unburned fuel              | • Insufficient<br>output                                              | • Key switch turn<br>OFF                                           |        | ○   |

# Appended Table

| P code | J1939-73 |     | Description                                                           | Limp home action<br>by engine ECU<br>(System action)                                                                 | Detection item                                                                                                    | Behavior During<br>Malfunction                                           | DTC recovery<br>from error                                                                      | LED ON |     |
|--------|----------|-----|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------|-----|
|        | SPN      | FMI |                                                                       |                                                                                                                      |                                                                                                                   |                                                                          |                                                                                                 | Yellow | Red |
| P3002  | 4765     | 0   | 【P3002】<br>Emergency<br>Exhaust gas<br>temperature<br>sensor T0: High | • Engine forcibly<br>stop • Regeneration<br>inhibited                                                                | • DOC inlet<br>temperature (T0)<br>high                                                                           | • Engine stops<br>• Inhibit cranking<br>until down to 300<br>°C (572 °F) | • Under 300 °C<br>(572 °F) & key<br>switch turn OFF                                             |        | ○   |
| P3003  | 3242     | 0   | 【P3003】<br>Emergency<br>Exhaust gas<br>temperature<br>sensor T1: High | • Engine forcibly<br>stop • Regeneration<br>inhibited                                                                | • DPF inlet<br>temperature (T1)<br>high                                                                           | • Engine stops<br>• Inhibit cranking<br>until down to 300<br>°C (572 °F) | • Under 300 °C<br>(572 °F) & key<br>switch turn OFF                                             |        | ○   |
| P3004  | 3246     | 0   | 【P3004】<br>Emergency<br>Exhaust gas<br>temperature<br>sensor T2: High | • Engine forcibly<br>stop • Regeneration<br>inhibited                                                                | • DPF outlet<br>temperature (T2)<br>high                                                                          | • Engine stops<br>• Inhibit cranking<br>until down to 300<br>°C (572 °F) | • Under 300 °C<br>(572 °F) & key<br>switch turn OFF                                             |        | ○   |
| P3006  | 3701     | 15  | 【P3006】Excessive<br>PM3                                               | • Output<br>limitation • Please<br>Parked<br>regeneration                                                            | • PM accumulation<br>level 3                                                                                      | • Insufficient<br>output                                                 | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF | ○      |     |
| P3007  | 3701     | 16  | 【P3007】Excessive<br>PM4                                               | • Output<br>limitation • Please<br>stop the engine •<br>Contact dealer<br>immediately                                | • PM accumulation<br>level 4                                                                                      | • Insufficient<br>output                                                 | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF | ○      |     |
| P3008  | 3701     | 0   | 【P3008】Excessive<br>PM5                                               | • Output<br>limitation • Please<br>stop the engine •<br>Contact dealer<br>immediately •<br>Regeneration<br>inhibited | • PM accumulation<br>level 5                                                                                      | • Insufficient<br>output                                                 | • Key switch turn<br>OFF<br>(Reset by Service<br>tool)                                          |        | ○   |
| P3011  | 132      | 15  | 【P3011】 Boost<br>pressure low                                         | • Output<br>limitation • Speed<br>limitation •<br>Regeneration<br>inhibited                                          | • Disconnect the<br>hose between the<br>turbo blower out<br>and intake flange<br>• Boost pressure<br>sensor error | • Insufficient<br>output                                                 | • Key switch turn<br>OFF                                                                        | ○      |     |

# Appended Table

| P code | J1939-73   |     | Description                                                                           | Limp home action<br>by engine ECU<br>(System action)  | Detection item                                                                                                          | Behavior During<br>Malfunction                | DTC recovery<br>from error                                                                                                                                   | LED ON |     |
|--------|------------|-----|---------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|
|        | SPN        | FMI |                                                                                       |                                                       |                                                                                                                         |                                               |                                                                                                                                                              | Yellow | Red |
| P3012  | 52358<br>9 | 17  | 【P3012】 Low<br>coolant<br>temperature in<br>parked<br>regeneration                    | • Regeneration<br>inhibited                           | • During<br>regeneration<br>mode, engine<br>warm-up condition<br>is not satisfied<br>(coolant<br>temperature is<br>low) | • None                                        | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF<br>(Leaving from<br>parked active<br>regeneration<br>status) | ○      |     |
| P3013  | 52359<br>0 | 16  | 【P3013】 Parked<br>regeneration time<br>out                                            | • Regeneration<br>inhibited                           | • Time out error:<br>regeneration<br>incomplete due to<br>low temperature of<br>DPF                                     | • None                                        | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF<br>(Leaving from<br>parked active<br>regeneration<br>status) | ○      |     |
| P3015  | 3936       | 2   | 【P3015】 Loss of<br>function of DPF<br>(PCD)                                           | ---                                                   | • Loss of function<br>of DPF (PCD)                                                                                      | • None                                        | • -                                                                                                                                                          | ○      | ○   |
| P3018  | 52359<br>9 | 0   | 【P3018】 All<br>exhaust gas<br>temperature<br>sensor failure                           | • Output<br>limitation •<br>Regeneration<br>inhibited | • All exhaust gas<br>temperature<br>sensor failure<br>simultaneously                                                    | • None                                        | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF                                                              | ○      |     |
| P3019  | 52360<br>0 | 0   | 【P3019】 Initial<br>pump calibration<br>incomplete                                     | • Regeneration<br>inhibited                           | • Pump calibration<br>history                                                                                           | • None                                        | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)                                                                                           | ○      |     |
| P3023  | 52360<br>1 | 0   | 【P3023】 High<br>exhaust gas<br>temperature after<br>emergency high<br>temperature DTC | • Engine forcibly<br>stop • Regeneration<br>inhibited | • Exhaust gas<br>temperature<br>sensor (T0), (T1),<br>(T2) output                                                       | • Engine stop                                 | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF                                                              |        | ○   |
| P3024  | 52360<br>2 | 0   | 【P3024】 High<br>frequency of<br>regeneration                                          | • Output limitation                                   | • Time interval<br>from the end time<br>to the start time of<br>the regeneration                                        | • Worsening<br>exhaust gas<br>emissions (NOx) | • Key switch turn<br>OFF<br>(Reset by Service<br>tool)                                                                                                       | ○      |     |

# Appended Table

| P code | J1939-73   |     | Description                                   | Limp home action<br>by engine ECU<br>(System action)  | Detection item                                                    | Behavior During<br>Malfunction                                        | DTC recovery<br>from error                                                                      | LED ON |     |
|--------|------------|-----|-----------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------|-----|
|        | SPN        | FMI |                                               |                                                       |                                                                   |                                                                       |                                                                                                 | Yellow | Red |
| P3025  | 52360<br>3 | 15  | 【P3025】Over heat<br>pre-caution               | • Regeneration<br>inhibited                           | • Coolant<br>temperature                                          | • Worsening<br>exhaust gas<br>performance<br>(NOx)                    | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF | ○      |     |
| U0075  | 52354<br>7 | 2   | 【U0075】 CAN2<br>Bus off (No<br>communication) | • Forced Idle •<br>Regeneration<br>inhibited          | • CAN2 B (+)/<br>ground short<br>circuit or high<br>traffic error | • Insufficient<br>output<br>• Transmitted data<br>is invalid          | • Key switch turn<br>OFF                                                                        |        | ○   |
| U0076  | 52357<br>8 | 2   | 【U0076】 No<br>communication<br>with EGR (NCD) | • Output<br>limitation •<br>Regeneration<br>inhibited | • No<br>communication<br>with EGR                                 | • Insufficient<br>output<br>• Worsening<br>exhaust gas<br>performance | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)                              | ○      | ○   |
| U0077  | 52360<br>4 | 2   | 【U0077】 CAN1<br>Bus off (No<br>communication) | • Output<br>limitation •<br>Regeneration<br>inhibited | • CAN1 +B/GND<br>short circuit or<br>high traffic error           | • Insufficient<br>output<br>• Transmitted data<br>is invalid          | • Key switch turn<br>OFF                                                                        |        | ○   |
| U0081  | 52354<br>8 | 2   | 【U0081】 CAN KBT<br>frame error                | • Forced Idle •<br>Regeneration<br>inhibited          | • CAN_KBT<br>original frame<br>open circuit error                 | • Insufficient<br>output                                              | • Key switch turn<br>OFF                                                                        |        | ○   |
| U0082  | 52359<br>1 | 2   | 【U0082】 CAN<br>CCVS frame error               | • Regeneration<br>inhibited                           | • CAN_CCVS<br>communication<br>stopping                           | • None                                                                | • Key switch turn<br>OFF                                                                        | ○      |     |
| U0083  | 52359<br>2 | 2   | 【U0083】 CAN<br>CM1 frame error                | • Regeneration<br>inhibited                           | • CAN_CM1<br>communication<br>stopping                            | • None                                                                | • Key switch turn<br>OFF                                                                        | ○      |     |
| U0084  | 52359<br>3 | 2   | 【U0084x】 CAN<br>DDC1 frame error              | • Regeneration<br>inhibited                           | • CAN_DDC1<br>communication<br>stopping                           | • None                                                                | • Key switch turn<br>OFF                                                                        | ○      |     |
| U0085  | 52359<br>4 | 2   | 【U0085x】 CAN<br>ETC2 frame error              | • Regeneration<br>inhibited                           | • CAN_ETC2<br>communication<br>stopping                           | • None                                                                | • Key switch turn<br>OFF                                                                        | ○      |     |
| U0087  | 52359<br>6 | 2   | 【U0087】 CAN<br>TSC1 frame error               | • Regeneration<br>inhibited                           | • CAN_TSC1<br>frame error                                         | • Insufficient<br>output                                              | • Diagnostic<br>counter = 0<br>(returns when<br>error is resolved)<br>or Key switch turn<br>OFF | ○      |     |

# Appended Table

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Maintenance Records .....Page 9-5

Records

# Records

## Daily Check Records

LM551B  
Use this table freely for your records of the daily check.

| Model  |                           | Serial Number |  |  |  |  |  |  |  |  |  |
|--------|---------------------------|---------------|--|--|--|--|--|--|--|--|--|
| Items  |                           |               |  |  |  |  |  |  |  |  |  |
| Engine | Check engine oil          |               |  |  |  |  |  |  |  |  |  |
|        | Check fuel                |               |  |  |  |  |  |  |  |  |  |
|        | Check fuel filter         |               |  |  |  |  |  |  |  |  |  |
|        | Check coolant             |               |  |  |  |  |  |  |  |  |  |
|        | Check air cleaner         |               |  |  |  |  |  |  |  |  |  |
|        | Check radiator cover      |               |  |  |  |  |  |  |  |  |  |
|        | Check radiator            |               |  |  |  |  |  |  |  |  |  |
|        | Check engine and DPF area |               |  |  |  |  |  |  |  |  |  |
|        | Clean radiator cover      |               |  |  |  |  |  |  |  |  |  |
|        | Clean radiator            |               |  |  |  |  |  |  |  |  |  |
|        | Clean engine and DPF area |               |  |  |  |  |  |  |  |  |  |



| Items        |                        |  |  |  |  |  |  |  |  |  |  |
|--------------|------------------------|--|--|--|--|--|--|--|--|--|--|
| Main vehicle | Check oil cooler       |  |  |  |  |  |  |  |  |  |  |
|              | Check battery          |  |  |  |  |  |  |  |  |  |  |
|              | Check hydraulic oil    |  |  |  |  |  |  |  |  |  |  |
|              | Check tire             |  |  |  |  |  |  |  |  |  |  |
|              | Check cover            |  |  |  |  |  |  |  |  |  |  |
|              | Check traveling pedal  |  |  |  |  |  |  |  |  |  |  |
|              | Check brake pedal      |  |  |  |  |  |  |  |  |  |  |
|              | Check wire             |  |  |  |  |  |  |  |  |  |  |
|              | Check liquid leakage   |  |  |  |  |  |  |  |  |  |  |
|              | Check ball proof net   |  |  |  |  |  |  |  |  |  |  |
|              | Check machine exterior |  |  |  |  |  |  |  |  |  |  |
|              | Check bolts and nuts   |  |  |  |  |  |  |  |  |  |  |
|              | Check monitor          |  |  |  |  |  |  |  |  |  |  |
|              | Check interlock system |  |  |  |  |  |  |  |  |  |  |

# Records

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| Items        |                        |  |  |  |  |  |  |  |  |  |  |
|--------------|------------------------|--|--|--|--|--|--|--|--|--|--|
| Main vehicle | Check steering wheel   |  |  |  |  |  |  |  |  |  |  |
|              | Check light            |  |  |  |  |  |  |  |  |  |  |
|              | Clean oil cooler       |  |  |  |  |  |  |  |  |  |  |
|              | Clean machine exterior |  |  |  |  |  |  |  |  |  |  |

## Maintenance Records

LM551B

Use this table freely for your records of the maintenance.

| Model  |                                                 |  |  |  |  | Serial Number |  |  |  |  |  |
|--------|-------------------------------------------------|--|--|--|--|---------------|--|--|--|--|--|
| Items  |                                                 |  |  |  |  |               |  |  |  |  |  |
| Engine | Check fan belt                                  |  |  |  |  |               |  |  |  |  |  |
|        | Open air cleaner evacuator valve to remove dust |  |  |  |  |               |  |  |  |  |  |
|        | Check fuel hoses and clamp bands                |  |  |  |  |               |  |  |  |  |  |
|        | Check water separator                           |  |  |  |  |               |  |  |  |  |  |
|        | Draining of water separator                     |  |  |  |  |               |  |  |  |  |  |
|        | Clean air cleaner outer element                 |  |  |  |  |               |  |  |  |  |  |
|        | Check fan belt tension                          |  |  |  |  |               |  |  |  |  |  |
|        | Check radiator hoses and clamp bands            |  |  |  |  |               |  |  |  |  |  |
|        | Check intake air line (air cleaner hose)        |  |  |  |  |               |  |  |  |  |  |
|        | Clean water separator                           |  |  |  |  |               |  |  |  |  |  |
|        | Clean fuel tank interior                        |  |  |  |  |               |  |  |  |  |  |
|        | Clean water jacket and radiator interior        |  |  |  |  |               |  |  |  |  |  |

Records

# Records

| Items  |                                                                |  |  |  |  |  |  |  |  |  |  |
|--------|----------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
| Engine | Check valve clearance                                          |  |  |  |  |  |  |  |  |  |  |
|        | Check injector                                                 |  |  |  |  |  |  |  |  |  |  |
|        | Check EGR cooler                                               |  |  |  |  |  |  |  |  |  |  |
|        | Check head cover valve                                         |  |  |  |  |  |  |  |  |  |  |
|        | Check turbocharger                                             |  |  |  |  |  |  |  |  |  |  |
|        | Check EGR system                                               |  |  |  |  |  |  |  |  |  |  |
|        | Check DPF-related piping                                       |  |  |  |  |  |  |  |  |  |  |
|        | Check EGR piping                                               |  |  |  |  |  |  |  |  |  |  |
|        | Check intake hose (After air flow sensor)                      |  |  |  |  |  |  |  |  |  |  |
|        | Check exhaust manifold (Crack, gas leakage and mounting screw) |  |  |  |  |  |  |  |  |  |  |
|        | Replace engine oil                                             |  |  |  |  |  |  |  |  |  |  |
|        | Replace oil filter cartridge                                   |  |  |  |  |  |  |  |  |  |  |
|        | Replace fuel filter cartridge                                  |  |  |  |  |  |  |  |  |  |  |
|        | Replace fan belt                                               |  |  |  |  |  |  |  |  |  |  |

| Items  |                                                         |  |  |  |  |  |  |  |  |  |  |
|--------|---------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
| Engine | Replace DPF filters                                     |  |  |  |  |  |  |  |  |  |  |
|        | Replace air cleaner outer element                       |  |  |  |  |  |  |  |  |  |  |
|        | Replace air cleaner inner element                       |  |  |  |  |  |  |  |  |  |  |
|        | Replace water hose                                      |  |  |  |  |  |  |  |  |  |  |
|        | Replace rubber pipe relating to oil separator           |  |  |  |  |  |  |  |  |  |  |
|        | Replace rubber hose of DPF differential pressure sensor |  |  |  |  |  |  |  |  |  |  |
|        | Replace intake hose (After air flow sensor)             |  |  |  |  |  |  |  |  |  |  |
|        | Replace EGR cooler hose                                 |  |  |  |  |  |  |  |  |  |  |
|        | Replace lubricant hose                                  |  |  |  |  |  |  |  |  |  |  |
|        | Replace radiator coolant                                |  |  |  |  |  |  |  |  |  |  |
|        | Replace radiator hoses and clamp bands                  |  |  |  |  |  |  |  |  |  |  |
|        | Replace fuel hoses and clamps                           |  |  |  |  |  |  |  |  |  |  |
|        | Replace intake air line (air cleaner hose)              |  |  |  |  |  |  |  |  |  |  |

# Records

| Items        |                                                            |  |  |  |  |  |  |  |  |  |  |
|--------------|------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
| Main vehicle | Check hydraulic hoses (Moving part)                        |  |  |  |  |  |  |  |  |  |  |
|              | Grease and Lubricate                                       |  |  |  |  |  |  |  |  |  |  |
|              | Grease rear mower unit swing out pins                      |  |  |  |  |  |  |  |  |  |  |
|              | Check electrical wiring                                    |  |  |  |  |  |  |  |  |  |  |
|              | Check wheel mounting bolt                                  |  |  |  |  |  |  |  |  |  |  |
|              | Check hydraulic hoses (Fixed part)                         |  |  |  |  |  |  |  |  |  |  |
|              | Grease mower unit hydraulic motor shafts                   |  |  |  |  |  |  |  |  |  |  |
|              | Replace hydraulic oil                                      |  |  |  |  |  |  |  |  |  |  |
|              | Replace hydraulic oil suction filter                       |  |  |  |  |  |  |  |  |  |  |
|              | Replace hydraulic oil line filter                          |  |  |  |  |  |  |  |  |  |  |
|              | Replace resin bushing                                      |  |  |  |  |  |  |  |  |  |  |
|              | Replace battery                                            |  |  |  |  |  |  |  |  |  |  |
|              | Replace hydraulic hoses (Moving part)                      |  |  |  |  |  |  |  |  |  |  |
|              | Replace hydraulic hoses (Moving part) relating to steering |  |  |  |  |  |  |  |  |  |  |

| Items        |                                      |  |  |  |  |  |  |  |  |  |  |
|--------------|--------------------------------------|--|--|--|--|--|--|--|--|--|--|
| Main vehicle | Replace hydraulic hoses (Fixed part) |  |  |  |  |  |  |  |  |  |  |
|              | Replace brake cable                  |  |  |  |  |  |  |  |  |  |  |
|              | Replace traveling cable              |  |  |  |  |  |  |  |  |  |  |
|              | Replace brake pads                   |  |  |  |  |  |  |  |  |  |  |

Records

# Records

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