

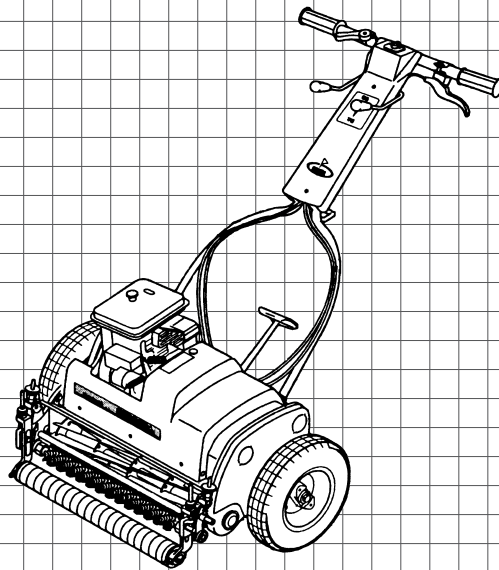
SHIBAURA

OPERATOR'S MANUAL / PARTS LIST

GREENS MOWER

MODEL

GM222 / GM262 TS262



Read this manual carefully before using the product.
It is essential that all operators study it for their own safety and proper use.
Lack of operating knowledge can lead to accidents.
Keep this manual available for ready reference.



Ishikawajima-Shibaura Machinery Co., Ltd.

Warning Symbols in this manual and on the machine

- The warning symbols described in this manual and on the machine are based on certain principles.
- Understand the principles and operate the machine by following the instructions in the warning symbols.

■ Principle of Warning Symbols

- There are three types of warning symbols.

Safety Precaution: This calls for attention to the operator because if not followed then that may lead to injury.

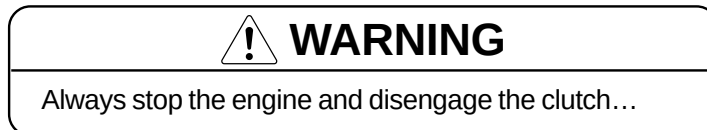
Prohibition: This describes behavior and operation that are prohibited: for not only to operator but to any other associated person.

Obligation: This elaborates on the instructions that must be followed by all operators of the machine.

Specific examples are described below.

Safety Precautions

The warning symbol "⚠" is used with the title of "DANGER", "WARNING" or "CAUTION", according to the degree of danger, when operation might cause damage to humans (death, injury, burns, etc). In this manual, these symbols are explained before the operation procedure. It is essential to understand each symbol's relevance to the safety precautions before operating the machine.



Example of warning symbol in the manual



Example of warning label on the machine

Some operations might cause mechanical damage (damage, malfunction, etc). In each such operation the safety precaution is described with the title "IMPORTANT" before its procedure.

Prohibition

Prohibited operations and actions in operating the machine are identified with the prohibition symbol mark "⊘". This mark is used with an illustration or as a designed symbol.

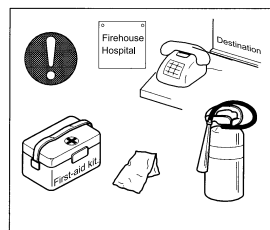


Example of use with an illustration

Example of use as a designed symbol

Obligation

Essential operations and actions in operating the machine are described with the essential symbol mark "●". This mark is used an illustration or as a designed symbol.



Example of use with an illustration



Example of use as a designed symbol



WARNING

- These lawn mowers GM222 and GM262/TS262 (hereinafter called “this machine”) described in this instruction manual (hereinafter called “this manual”) is a machine for mowing golf course lawns. Therefore, do not use it for work other than that, such as mowing and carrying on banks or steep or mountainous slopes, which are not within its design.
- Do not disassemble any section of the machine except for check, repair, or maintenance. Do not modify the machine without the prior consent of our company.
- Whenever this machine is leased, give appropriate training to the operator who is himself the lessee, and lease this manual with the machine.
- If you are leasing, request one copy of this manual from our business or sales office (under the title of “Contact for the Request for the Copy of this Manual” in the back sheet of this manual) in anticipation of its unexpected loss. Do not copy the manual. This manual might be revised for update, so keep the original (attached to the machine when delivered) in reserve.
- When this machine is transferred, always transfer it with this manual.
- If any warning labels affixed on the machine are so damaged or dirty that the instructions are indecipherable, request new labels from the business or sales office, indicated in the back sheet of this manual. Then affix the label to the machine in accordance with the instruction in “Label Affixing Positions and Meaning” on page 2 in this manual to enable the instructions to be easily read.
- Make a note of the Contact for Request for the Copy of this Manual and keep it where it can be take out at any time and where it will not be lost.

IMPORTANT

- Check the items indicated in “Check Everyday” in order to prevent malfunction. We will not compensate any malfunction or damage due to failure in the routine check.

CAUTION

- Do not pour any drained oil into any river or sewage system but dispose it in appropriate ways, including asking a special company to undertake the work.
- Battery fluid is diluted sulfuric acid and harmful for to the human body. When the battery is to be removed or the distilled water replenished, wear protective glasses and rubber gloves. If any battery fluid should enter your eyes or mouth, wash it out with large quantities of water and consult a doctor.
- In order to preserve the environment, do not simply abandon an old battery that has been replaced by a new one: recycle it. Always return the old battery to the shop where it was purchased. The old battery will then become a recycled resource.

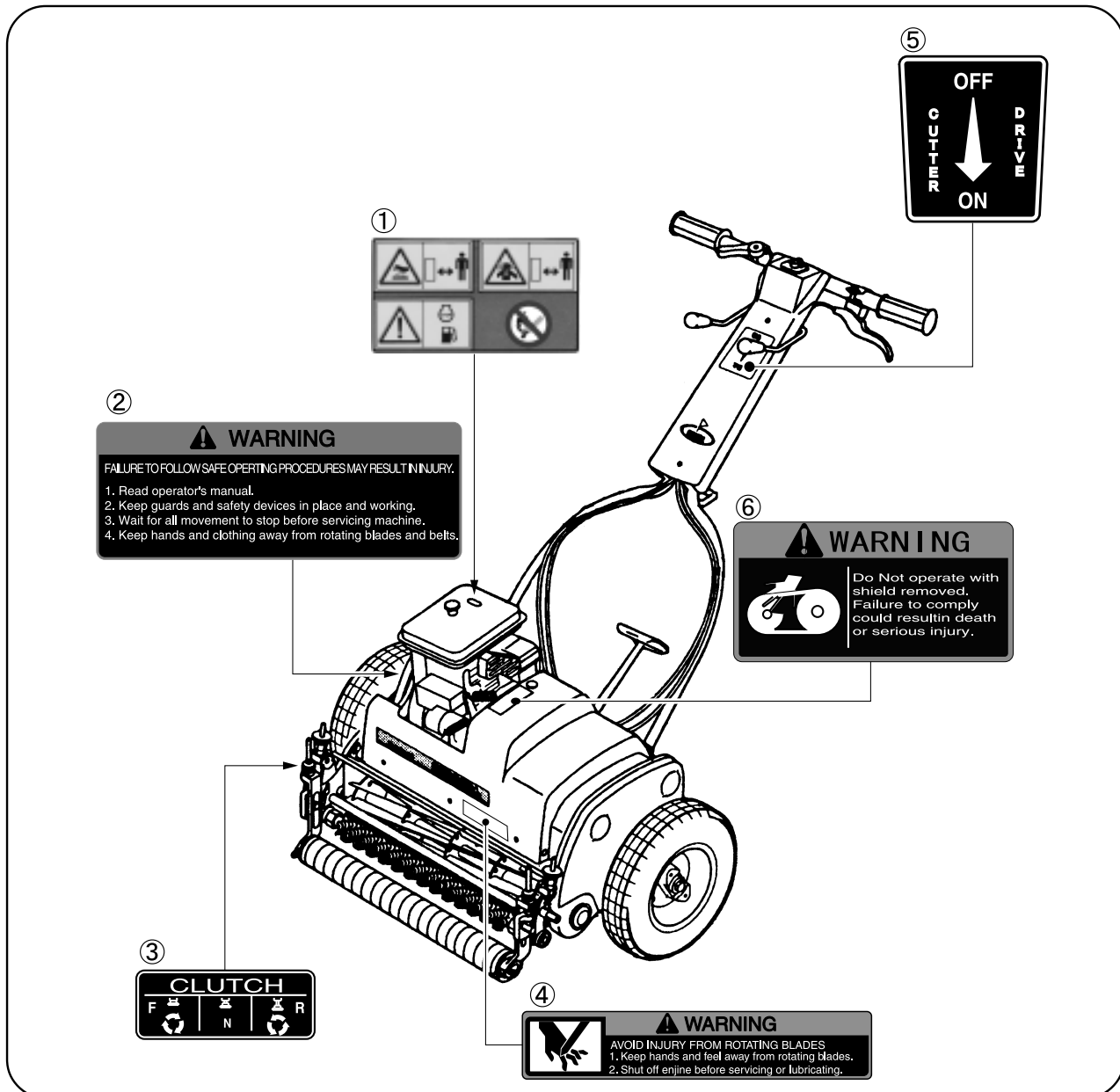
1 . Labels and Warning Labels



WARNING

- Check the labels affixing positions before operating the machine and understand the meaning of them.

■ Label Affixing Positions



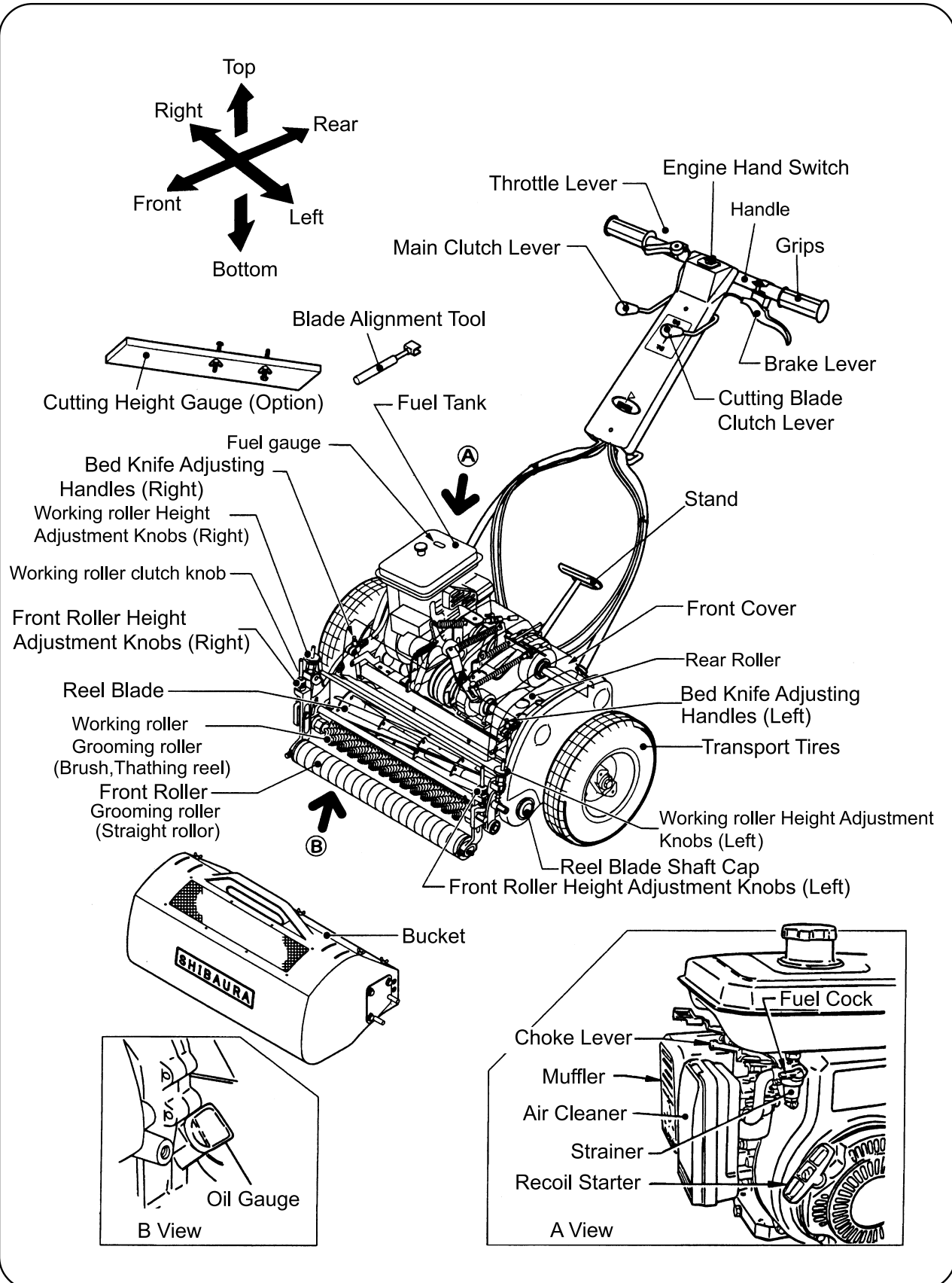
No.	Part No.	Name	No.	Part No.	Name
①	0732004450	WARNING	④	A90630020	WARNING
②	A90610290	WARNING	⑤	A90360160	Label
③	A90360170	Label	⑥	A90610300	WARNING

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2. Name of Each Section

● In this manual, the front, rear, left and right of the machine are described using each direction arrow.



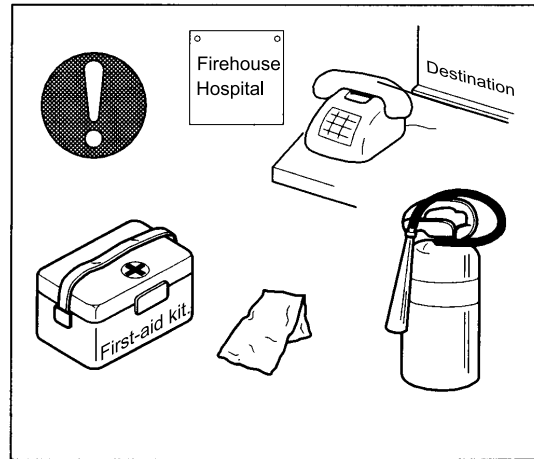
■ Name of Each Section and Function

Name	Function
Handle	●The handle is used to hold the machine in position and turn during the operation with the grips held.
Grips	●These are held when operating the machine.
Brake Lever	●This lever is used to apply the brake and stop the movement of the machine body.
Stand Grip	●This grip is held to set the stand.
Stand	● This is used when the transport tires are to be attached or removed and supports the front roller and the lawn mower body.
Front Cover	●This cover protects the operator against being accidentally caught by the transmission belt. Never remove it during the operation.
Reel Blade Clutch Lever	●This lever sets "ON" and "OFF" of the reel blade operation.
Rear Roller	●This roller is used to enable the machine to run during the operation after the transport tires are removed.
Bed Knife Adjusting Handles (Right) and (Left)	●These handles adjust the clearance between the bed knife and the reel blade. There are two handles (left and right).
Transport Tires	●These tires are used for transporting the machine to the work place.
Blade Alignment Tool	●This tool is used to manually rotate the reel blade.
Reel Blade Shaft Cap	●This cap protects the reel blade shaft.
Working roller Height Adjustment Knobs (Left and Right)	●These knobs (located on the left and right) adjust the working roller's height above the ground.
Front Roller Height Adjustment Knobs (Left and Right)	●These knobs are used to move the front roller up and down in order to adjust its height.
Front Roller	●This roller keeps the reel blade at the proper height above the ground to maintain a uniform height when cutting the lawn.
Working roller	● This roller removes the cuttings and controls the grass's direction. It then feeds the grass into the reel blade.
Reel Blade	● This blade is used for cutting lawn.
Working roller clutch knob	● This knob changes the mode of the working roller: "normal rotation", "stop" and "reverse rotation".
Engine Hand Switch/Engine Switch	●This switch starts or stops the engine. To start the engine, set it to "ON" and set it to "OFF" to stop.
Fuel Gauge	●This mark to confirm the amount of the fuel in the fuel tank.
Fuel Tank	●This container is filled with fuel.
Main Clutch Lever	●This lever transmits the power of the motor and toggles between start and stop. If it is not set to "ON" then the reel blade does not rotate.
Throttle Lever	●This lever adjusts the engine speed.
Bucket	●This bucket catches the clippings and prevents the reel blade or machine body from accidentally touching anybody's body.
Fuel Cock	●This knob is used to control the supply of the fuel.
Recoil Starter	●This is used when the handle is pulled to start the engine.
Strainer	●This tool removes and trapped air and dust from in the fuel.
Air Cleaner	●This cleaner removes dust from the engine's air intake.
Muffler (Silencer)	●This reduces engine noise.
Choke Lever	●This lever is used to reduce the fuel's air mix when the engine is started from cold.
Oil Gauge	●This gauge with its divisions is used to check the engine oil level or to show if it has any dirt.
Cutting Height Gauge	●The cutting height is set by using the two screws and this gauge is pressed against the front and rear rollers to set them at the specified height.

3 . Precautions in Operation

■ Precautions against unforeseen injury

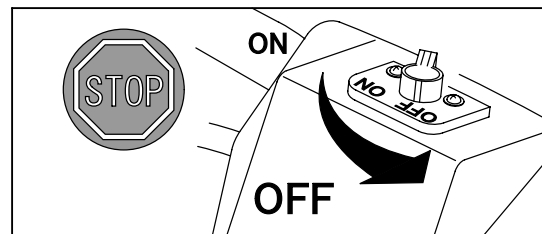
- Make a list of the telephone numbers of medical institutions and fire station (or ambulance) and locate it close to the telephone where it can be easily read.
- To facilitate calling a fire or ambulance station in an emergency, make a list of the addresses and buildings close to the sites near where most of the operation takes place.
- If the work is to be done by a single person, make a custom of writing the address of the site on the blackboard in order to identify the location for other people. It would be useful when the operator cannot return because of the accident.
- Always keep first aid kit and extra towels on the site. Such towels in the first aid kit will be useful for stopping bleeding.
- The fire stations and fire brigades in the region make efforts to pass on their knowledge and techniques in lectures and training courses in first aid. Take advantage of such opportunities and always make efforts to obtain such knowledge of and techniques in first aid.



■ Always stop the engine before check or maintenance of the machine.

WARNING

- Always turn off the engine switch before checking and maintenance and make sure that the reel blade has stopped rotating.
- Do not perform any check or maintenance when mowing. If something has been caught in the reel blade section and it is removed without stopping the engine, then the reel blade will suddenly start rotating which might cause serious injury.



- Do not perform any check or maintenance when mowing.
- Perform check and maintenance after having prepared the appropriate tools and equipment and after the engine has completely cooled.

■ Only make a check or maintenance after the engine has completely cooled down.

WARNING

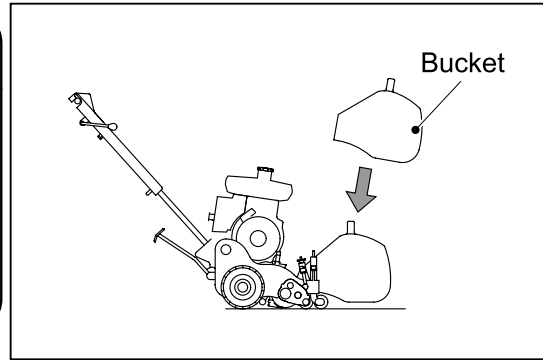
Do not touch any part of the engine or muffler (silencer) sections immediately after the engine is stopped. You might get seriously burnt if it is hot.

■ Always set the bucket before the lawn mower is operated.



WARNING

- Always set the bucket before the engine is started and the machine starts running. The bucket prevents the reel blade or the body of the machine from accidentally touching the human body.



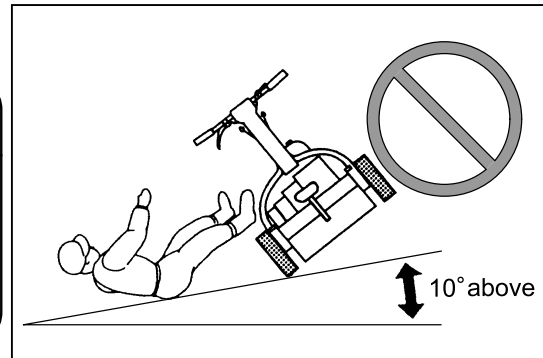
- The bucket on this machine not only functions to collect the clippings; it also acts as a bumper, as in a motor vehicle.
- Always set the bucket before the engine is started in order to prevent unexpected accidents.

■ Do not use this machine in any place with an inclination of 10 degrees or more.



WARNING

- Do not use this machine to mow in any place with an inclination of 10 degrees or more. It might cause an accident due to falling or slipping of the machine.

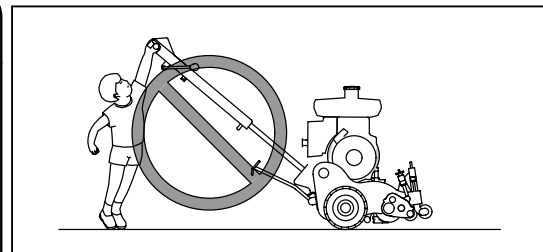


■ Do not let any child operate the machine.



WARNING

- Do not let any person under the age of junior high school operate this machine.
- Neither let this machine be operated by anybody who has not previously been observed in training to be good at its operation.



■ Ask for adjustment if the machine is not suitably adapted to your body.

- A handle height adjustment is available for this machine for any handling, depending on the person's body structure (Refer to "Handle Height Adjustment" on page 36). If it does not work, contact our business or sales office to ask for an appropriate adjustment.

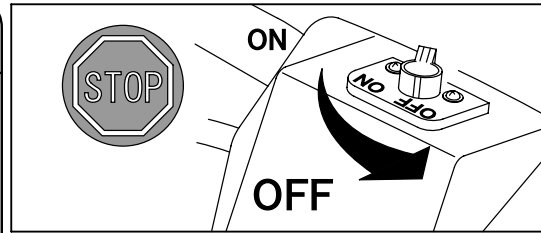
Precautions in Operation

■ Take the greatest care in handling fuel.



DANGER

- Before fuelling, always stop the engine.
- During fuelling, do not smoke or allow any naked flame close to the fuel.
- Supply or store fuel in a facility complying to the standards of the Fire Service Law.
- Do not divide and store fuel in small plastic containers or supply fuel from such small container. Static electricity might cause fire.
- Always wipe away any spilt fuel.
- Prepare different areas for storage and work. Do not work in any way that might start fire, such as starting the engine close to fuel.
- Have a chemical fire extinguisher of oil fire in the fuel storage area.



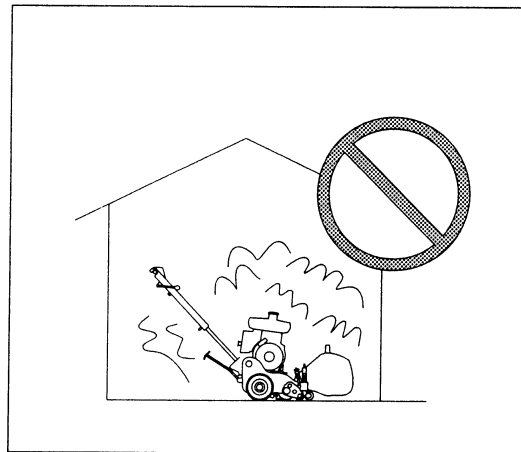
- The fuel for this machine is highly volatile, so fire or burns might be caused due to its ignition. Follow the above instructions when handling fuel.

■ Start the engine only outdoor.



DANGER

- Start the engine outdoor for good ventilation.
- Engine's exhaust gases includes gases harmful to health. Sometimes it might be fatal.
- Exhaust gas from the engine includes harmful substances, including carbon monoxide.
- When the engine is to be started, ensure ventilation. Do not start the engine in a closed room or any space with bad ventilation.



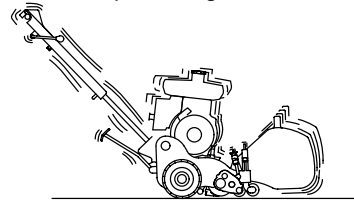
■ Stop the engine if any abnormal vibration is felt.



WARNING

- If there is any vibration from an unknown cause, turn "OFF" the engine switch. Flying objects and high temperature oil or gas, due to a damaged engine or reel blade might injure you.

Abnormal vibration?
Stop the engine!



■ Stop the engine when loading or unloading the machine on a vehicle.

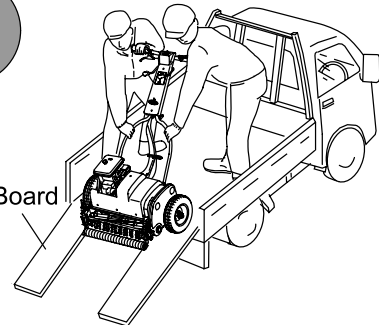


WARNING

- When this machine is to be loaded for transport onto any carrier such as a truck, do not load the machine when being driven by its engine. If the loading should fail then there could be a serious accident.
- When this machine is loaded onto any such carrier as a truck and is then to be carried, two or more persons are needed to load and unload it. On any such occasion, use the brake. (Refer to "Transporting of Lawn Mower using a Vehicle" on page 24).



Support Board



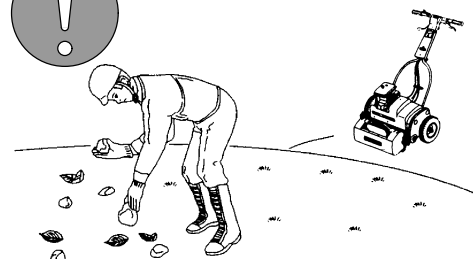
Stop the engine and have two or more persons load the machine.

■ Preliminary inspection of the work place is required.



WARNING

- Perform the preliminary inspection of the work place and remove any gravel and hard objects which might be caught by the reel blade. If such an object is caught by the reel blade, it might spread all around the machine and hurt the operator or supervisor.
- In addition, this machine cannot be used on any ground with an inclination of 10 degrees or more. Perform an advance inspection of the work place and identify any sites with steep slopes.



Remove anything that might be caught by the reel blade.

Precautions in Operation

■ Maintain conventional positions in lawn mowing and proceedings.

WARNING

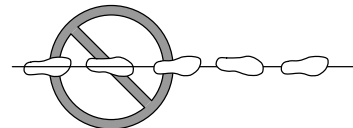
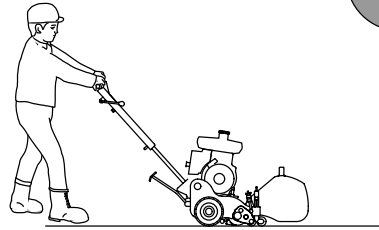
- Hold a conventional position while lawn mowing and proceeding with the engine. If you fall down or slip you may suffer unforeseen injury or accident.

- Before mowing any lawn or moving the machine while being driven by the engine, set the bucket and maintain a conventional position in the operation.

<Conventional Position>

- Always hold your body towards the front while operating, hold the handle grips, open your feet to your own shoulder width and walk.
- Look ahead and walk with the machine so that your left and right feet are not in a single line.

Keep the conventional position.



Walk so that your left and right feet are not placed in a single line.

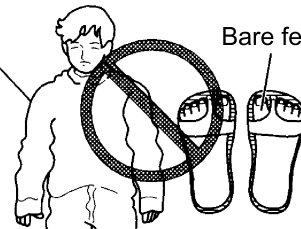
■ Wear appropriate clothes for the work.

WARNING

- Wear working clothes that fit you. If your clothes are loose fitting, they might get caught by the rotary section or other part of the machine, which might hinder the work or cause serious injury.
- Wear gloves and boots. Gloves and boots will protect your body from insect bites or other skin eruption: avoid insects and do not directly touch the clippings.
- Wear a helmet. It protects your head from any such overhead obstacles as twigs extending over the work site.
- When operating this machine, wear gloves and clothes which fit your body, with tight cuffs and hem and without any looseness.
- Wear non-slip boots or lace-up shoes. Don't leave any opening between the hem of the pants and the shoes. Depending on the region, some diseases such as scrub typhus may cause a high fever.
- Wear a helmet to protect your head from any such overhead obstacles as twigs.

Loose fitting clothing

Bare feet



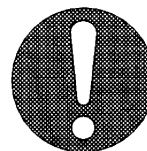
Helmet

Working clothes (long sleeve)

Gloves

Working Pants

Safety Boots

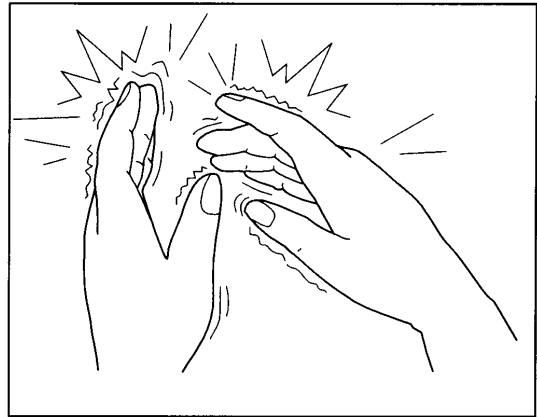


■ Beware of cold and vibration



WARNING

- When lawn mowing in cold places, take appropriate rests. After working for a long time you may sometimes feel pain in your fingertips, hands or arms due to vibration and cold.
- If you feel pain during operation, stop work and consult your doctor. You might have Raynou's disease.



- If in cold weather you feel pain in your fingertips, or hands, or arms, stop work and consult your doctor. If you have Raynou's disease (in which you feel chronic pain in your fingertips, hands, or arms) it is believed that these symptoms will appear when you are exposed for a long time in cold weather. As the exact conditions (temperature and working time) causing the symptoms are unknown, always take enough rest to recover normal warmth in your fingertips and hands.

■ Do not allow anybody who is drunk or is under the influence of any drug, operate the machine.



WARNING

- Nobody taking medication must operate the machine.
A wide range of medicines might sometimes influence your judgment or dexterity. If you are to take medicine for a cold or a pain-killer, take the greatest care.
- If you drink or are under the influence of alcohol, you should not operate the machine. It influences on your judgment and dexterity and you might cause an accident, with serious injury.



4. Preparation before Operation

■ Bucket Attachment Procedure



WARNING

- Set the bucket before mowing or running the machine.

<Bucket Attachment>

- ① Pass the attachment section of the right and left front roller height adjusting knobs between the two round bars on the bucket fixture (right) and (left). Then push the bucket from above until it stops.
- ② Make sure that the bucket is securely set. Also make sure that it has not been set obliquely or wedged by the body of the machine.

■ Procedures for Stand Setting and Removal and Attachment of Transport Tires



WARNING

- Set or release the stand and attach or remove the transport tires on a level place where the lawn mower cannot move by itself.

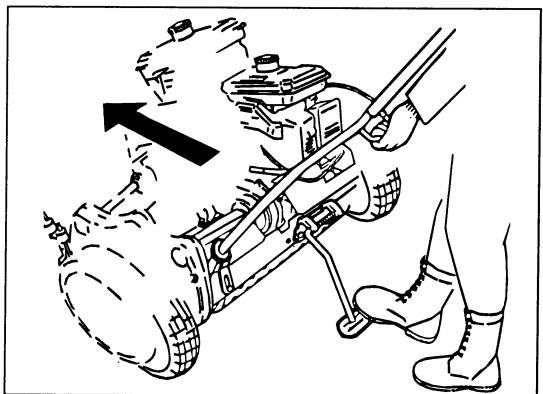
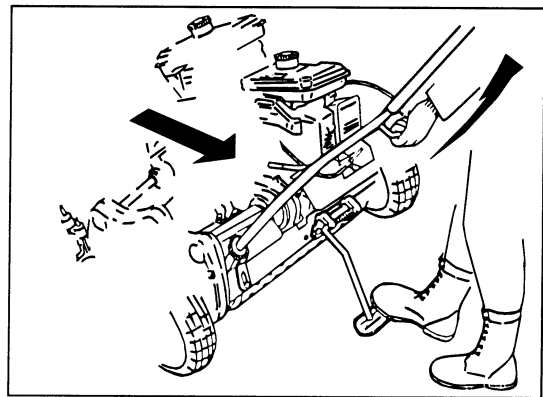
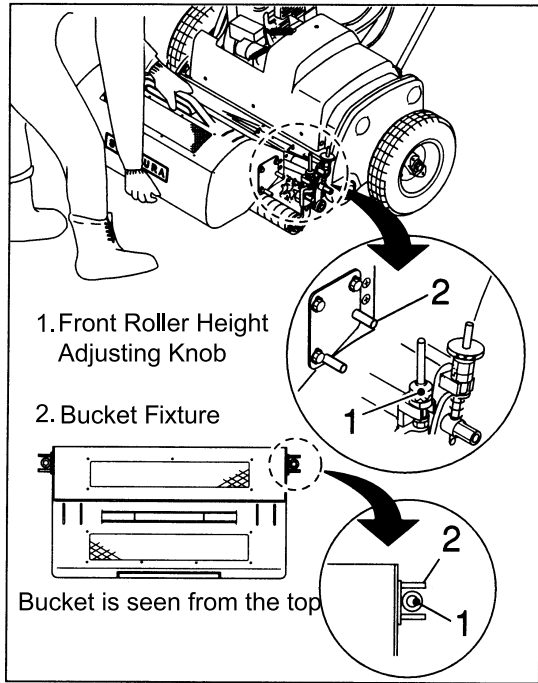
<Stand Setting and Releasing Procedure>

Stand Setting Procedure

- ① Hold the handle's horizontal section with your left hand and the stand grip with your right hand. Then push the stand with your right foot and press it against the ground: while doing so, do not lift your right foot from the stand.
 - ② So pressing the stand against the ground, pull the stand grip upward on this side.
- The stand will be set vertically and the front roller and stand will support the lawn mower body, while the transport tires are lifted from the ground.
 - In this condition perform transport tire removal or attachment operation.

Procedure for Releasing Stand

- ① Hold the stand grip securely with your right hand and press your right foot against the stand.
 - ② Press the stand hard against the ground with your right foot.
 - ③ Hold the handle's horizontal section with your left hand and carefully push the mower forward with both hands, taking care that your right foot stays pushing against the stand and is not lifted from the stand.
- The stand will be released and the transport tires (rear roller) will be grounded.
 - While doing so, do not leave your foot from the stand. The stand might forcibly spring back and hit your leg or foot.
- ④ After confirming that the transport tires (or, when the transport tires have been removed, the rear roller) have been grounded, use your right foot to return the stand, carefully, to its original position.

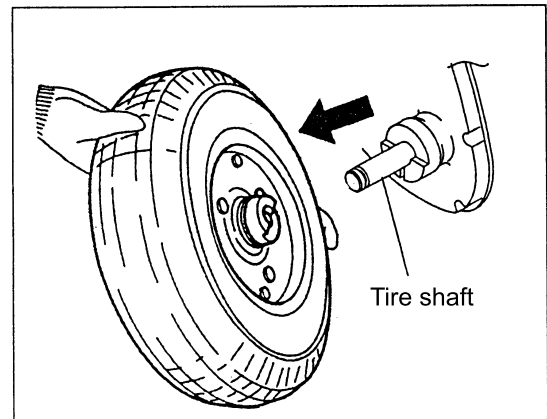
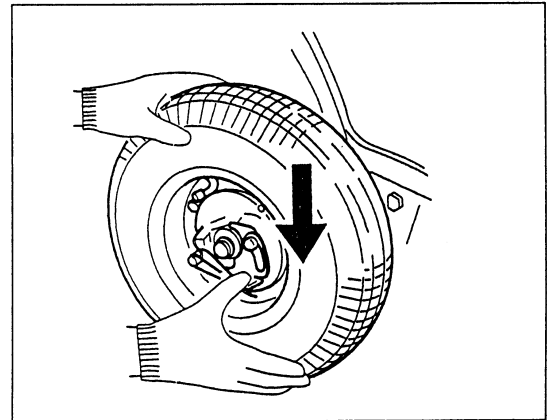
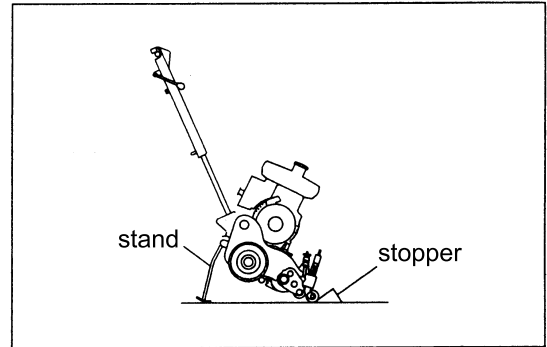


<Removal and Attachment of Transport Tires>

- After setting the stand according to the above described "Stand Setting Procedure" and checking that the machine is stable, remove or attach the transport tires.

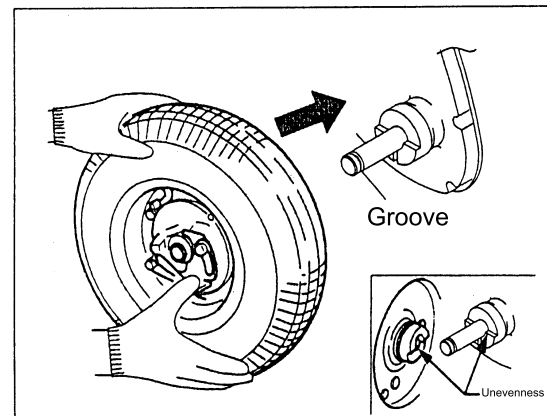
Transport Tires Removal Procedure

- ① Set the stand, and set a stone or wooden block in front of the front roller as a stopper so that the stand is not released even when the operator's body touches the machine body.
 - ② Support the transport tire with one hand and push down the set board inside the wheel with the thumb of the other hand until it stops.
 - ③ While pushing down on the set board, pull out the transport tire in parallel to the tire shaft in order to remove.
 - ④ Remove the other transport tire and remove the stone or wooden block from the front of the front roller. Then release the stand carefully according to "Stand Releasing Procedure" in the previous page.
- If there is any impact to the rear roller, the tire shaft might be bent or the rear roller damaged, which will hamper the mowing.



Transport Tire Attachment Procedure

- ① Set the stand according to the "Stand Setting Procedure" in the previous page and set a stone or wooden bar in front of the front roller as a stopper so that the stand is not released even when the operator's body touches the machine body.
- ② Support the transport tire with one hand and push down the set board inside the wheel with your thumb of the other hand until it stops.
- ③ Insert the transport tire so that it is parallel with the wheel shaft, with the clamp lowered. Then align the tire wheel with the mark on the wheel shaft. When the wheel shaft is visible from the wheel, release the clamp and insert the tire until a click is heard indicating that the clamp is set in the wheel shaft.
- ④ Attach the transport tire on the other side and remove the stone or wooden block from the front of the front roller. Then release the stand carefully according to the "Stand Releasing Procedure".

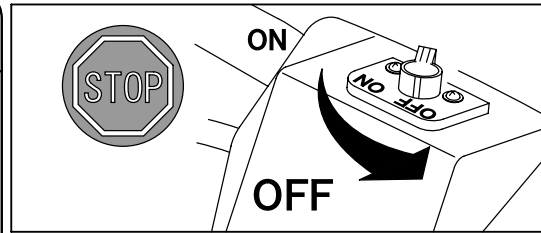


Preparation before Operation

■ Fuel Supply

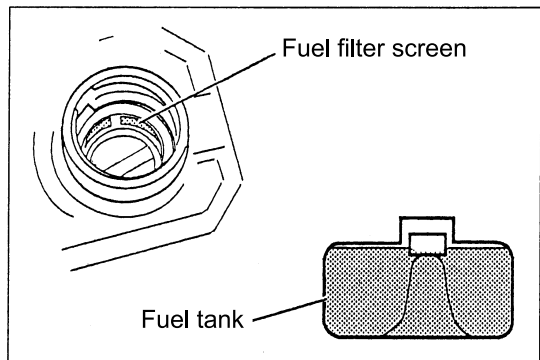
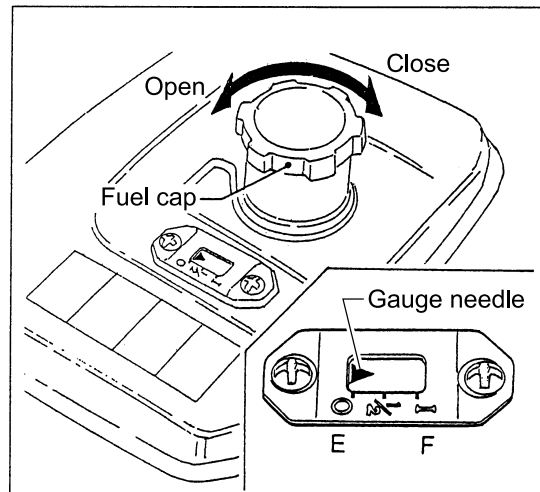
DANGER

- Always stop the engine when fuelling. While fuelling, do not smoke or allow any fire close to the fuel. It might catch alight, explode, and so cause death.
- Do not fuel when the engine is at high temperature immediately after the engine is stopped.
- Fuel supply and storage should be performed in accordance with the Fire Service Law.
- During fuelling, always wipe up any spills.
- Do not divide the fuel or store in small plastic containers or supply it from out of such a container. Its static electricity might spark off combustion.
- Don't start an engine in the refueling place.



IMPORTANT

- Use regular gasoline (lead-free) for the fuel of this machine.
 - When filling, do not remove the fuel filter screen.
- Look at the fuel gauge on the top of the fuel tank. When the hand of the fuel gauge is at "E", replenish.
 - ① Turn the fuel cap counterclockwise to remove.
 - The fuel filter screen is located inside the fuel port.
 - ② Check the fuel filter screen. If it is dirty due to dust or deposit on it, remove and wash with fuel to remove dirt.
 - When you remove or replace the fuel filter screen take care not to damage it.
 - If the fuel filter screen is damaged, for example by a hole, contact our business or sales office to replace it.
 - ③ Make sure that the fuel filter screen is set inside the fuel port and carefully pour the fuel into the fuel port and up to the level of the fuel filter screen.
 - If too much fuel is supplied, it might flow from the fuel cap, which might be dangerous.
 - When fuelling, do not remove the fuel filter screen.



■ Engine Oil Check/Change

WARNING

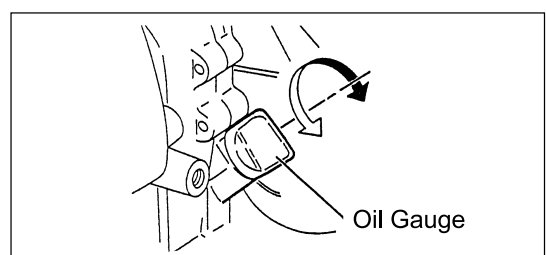
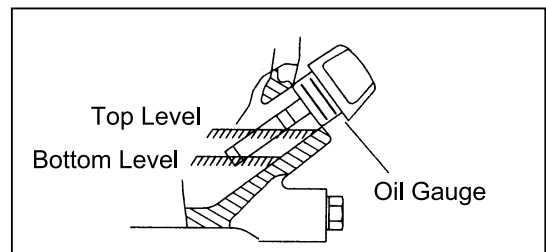
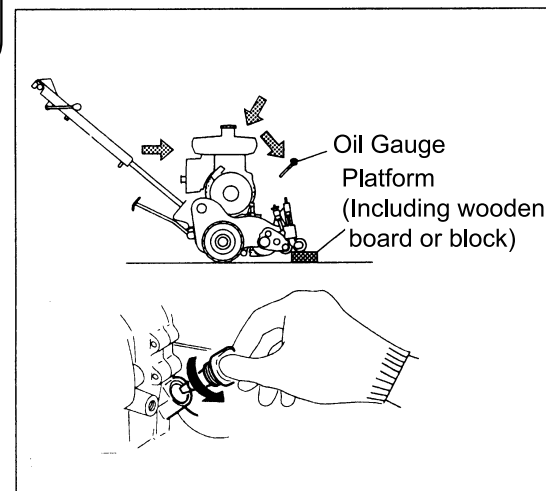
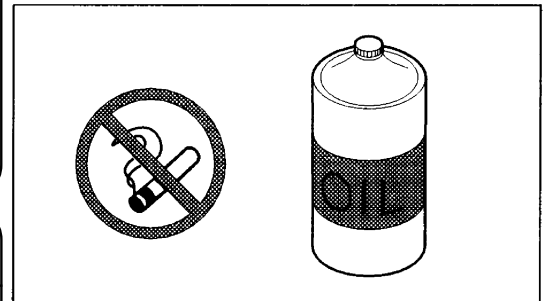
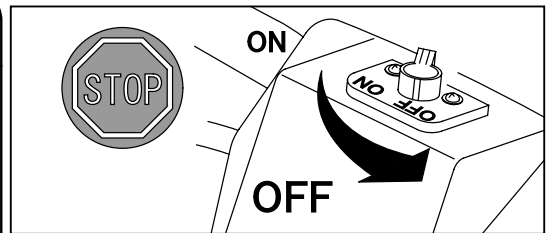
- When checking or changing oil, always stop the engine. Do not smoke or allow a spark or any fire near oil.
- During oil check or change, always wipe off any spills.
- Do not touch any section such as engine or muffler (silencer) at high temperature immediate after the engine is stopped.

IMPORTANT

- Use API:SE, SAE:10W-30 or equivalents for engine oil for this machine.
- Check engine oil everyday before operation.

<Engine Oil Check>

- The engine oil inspection hole is located in front of the engine.
- ① Place the machine on level ground and put a platform (including wooden board or block) under the front roller to position the engine horizontally.
- Select a hard platform. Take care that the front roller does not come off the platform during the check.
- ② Turn the oil gauge counterclockwise to remove.
- ③ There are division marks on the oil gauge. Wipe the division marks with a white cloth without leaving any fibers. Check the oil attached on the cloth.
- If the oil is black or polluted, change the oil even though it is not due at that time.
- ④ Insert the oil gauge again into the inspection hole (do not screw in) and pull it out. Check the oil level by looking at the oil attached on the oil gauge divisions.
- Always keep the oil at top level on the oil gauge marks, If not, replenish to the top level on the oil gauge.
- ⑤ Insert the oil gauge on the inspection hole and turn it clockwise to fix securely.
- ⑥ During the oil check, if any spills and falls on the machine body, wipe out completely with a dry cloth.



Preparation before Operation

<Engine Oil Change>

- Drain the engine oil from the drain bolt attaching port at the rear of the engine.
- Change engine oil for the first time after 20 hours of operation after the machine is delivered. Then change it every 100 hours of use as a routine.

① Place the machine on level ground. Hold the handle and pull it back until the stand is set on the ground and the machine is stable.

② Place a drained oil container at the rear of the engine.

- The amount of engine oil in the machine is 6 liters.
Prepare a container of size enough to hold the drained oil.

③ Loosen the drain bolt counterclockwise at the rear of the engine with a box spanner, etc., and remove it.

- When the drain bolt is loosened the oil will run. Adjust the position of the drained oil container and carefully remove the drain bolt.

- If the oil gauge at the engine oil inspection hole at the front of the machine is loosened, the oil drains quicker.

④ When the oil has been completely drained, hold the handle and raise the machine to the original position.

⑤ Attach the drain-hole bolt as it was, and fasten it clockwise securely.

⑥ Place the machine on level ground and put a platform (wooden board or block) under the front roller to position the engine horizontally.

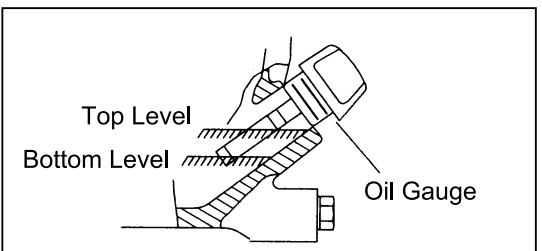
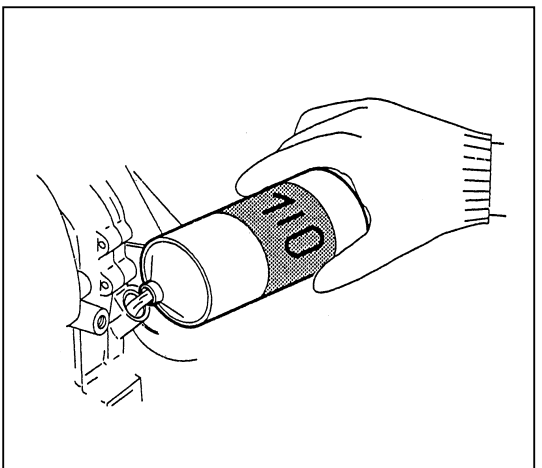
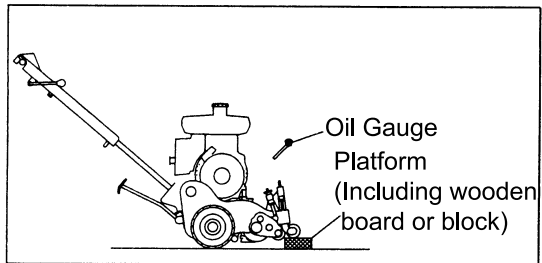
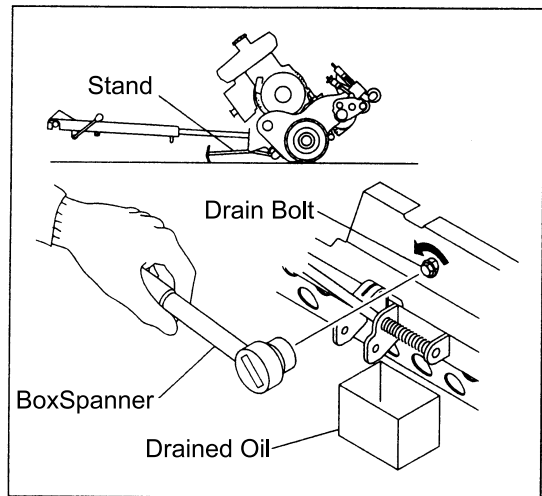
- Select a hard platform. Take care that the front roller does not come off the platform during the check.

⑦ Turn the oil gauge at the front of the engine counterclockwise to remove and pour oil up to the top level on the oil gauge, checking the oil level with the oil gauge.

- Pour oil from the oil gauge attaching hole.

⑧ Attach the oil gauge in its inspection hole and fasten it clockwise securely.

⑨ During oil change, if any oil spills and is left on the machine body, completely wipe off with a dry cloth.



■ Brake, Main Clutch and Reel Blade Clutch Performance Checks

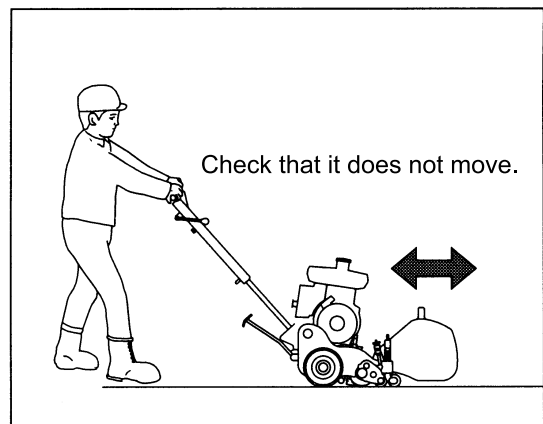
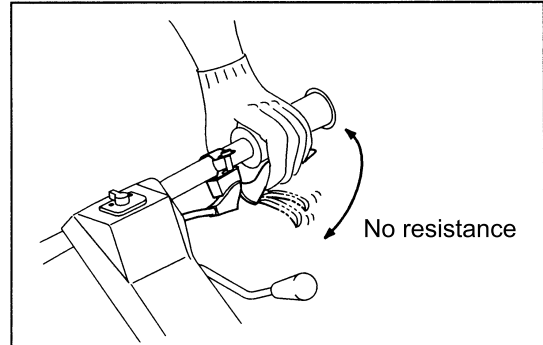


WARNING

- Before operating this machine, check the performances of the brake, the main clutch, and the reel blade clutch.
- If any abnormality is found, do not operate the machine.

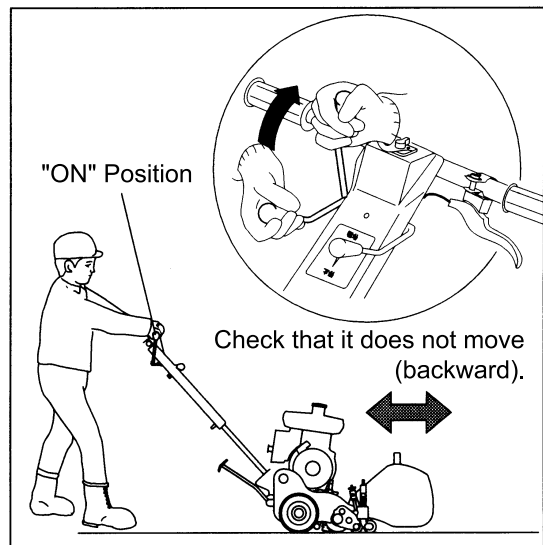
<Brake Performance Check>

- ① When you pull the brake, if you feel no resistance or you cannot move the brake lever, the brake cable might be broken or rusted. Contact our sales office and ask for a change or replacement of the brake cable.
 - ② Hold the handle grips with both hands and push the machine's body front and rear to check that the brake works.
- If the machine moves, the brake cable is too long. If so, adjust it. (Refer to "Brake Adjustment" on page 34).



<Main Clutch Performance Check>

- ① Hold the main clutch lever while the engine is stopped and lift to the "ON" position (this side).
- If the lever exceeds the midway position of its operation range, then the lever will by itself move back to the operator.
- When the main clutch level is set to "ON" position, if you feel that no resistance or you cannot move the lever, the clutch cable might be broken or rusted. Contact our business or sales office and ask for a check and replacement of the clutch cable.
- ② Turn the main clutch lever to the "ON" position and hold the handle grips with both hands. Then, pull the machine body backward to check that the machine does not move.
- If it moves, the clutch cable is too long. In that case, adjust it. (Refer to "Main Clutch Adjustment" on page 35).



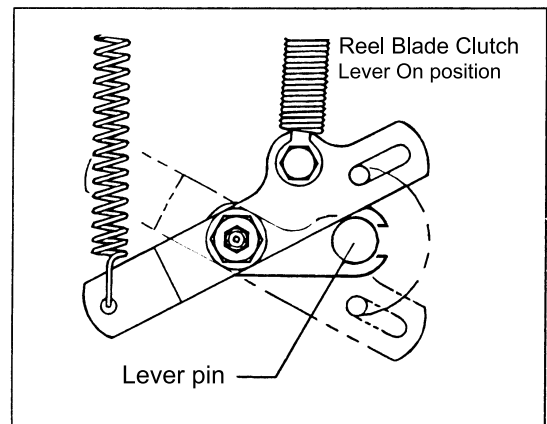
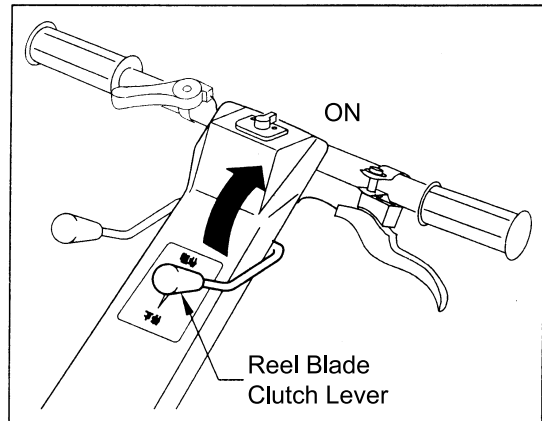
Preparation before Operation

<Reel Blade Clutch Performance Check>

IMPORTANT

- When the main clutch lever is set to “ON”, it is impossible to pull the reel blade clutch lever to set it to “ON”. If the reel blade clutch lever is then forced, then the machine might be damaged.

- ①) While the engine is shut down, hold the reel blade clutch lever and pull it up to the “ON” .
 - If no resistance is felt when the lever is pulled, the cable might be broken. If so, then contact our sales shop and ask for a cable check and replacement.
- ② Open the front cover and make sure that the clutch lever pin is in parallel with the differential speed reducer and positioned at this side.
 - If the clutch lever pin has not been correctly positioned, the cable might be slack. If so, adjust it.
(Refer to “Reel Blade Clutch Adjustment” on page 36)
 - If the main clutch has not been set to “ON” and it is impossible to pull up the reel blade clutch to the “ON” position, hold the handle and pull the reel blade clutch lever, moving the machine back and forth.



5. Operation

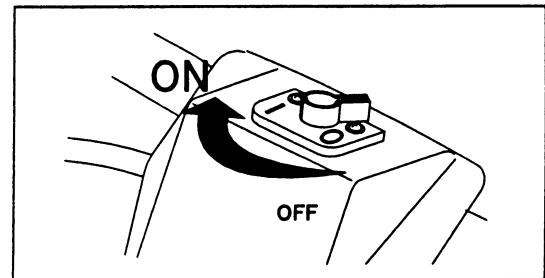
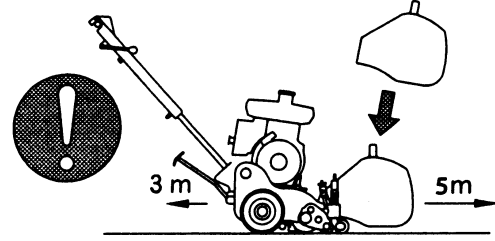
■ Engine Start-up and Shut-Down



DANGER

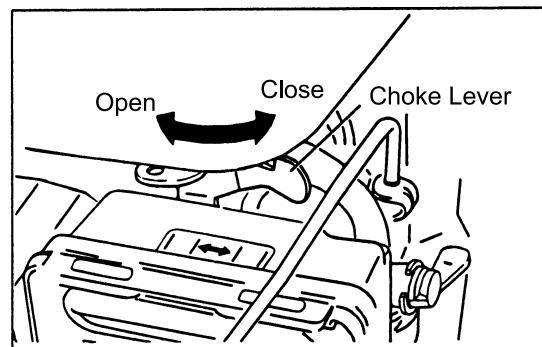
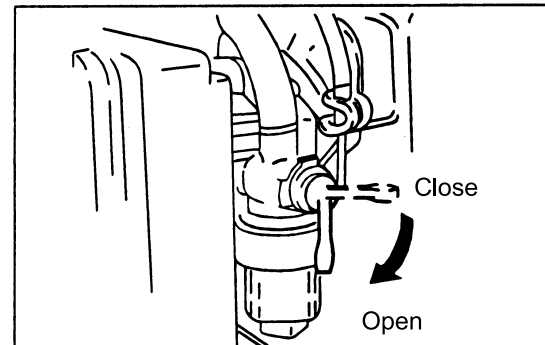
- Start the engine only outdoor.
- Before engine start-up, make sure that the main clutch and reel blade clutch are disengaged.
- Start the engine at least 5 m away from the fuel supply area.
- Attach bucket surely, and do it when you start an engine.
- Before starting the engine, make sure that there is nobody within 5 m of the front of the machine and within 3 m of the left, right and rear of the machine.
- After you have clearly understood the engine shut-down procedure, you may start up the engine.

Make sure that there is nobody around (front, rear, left and right) the machine.



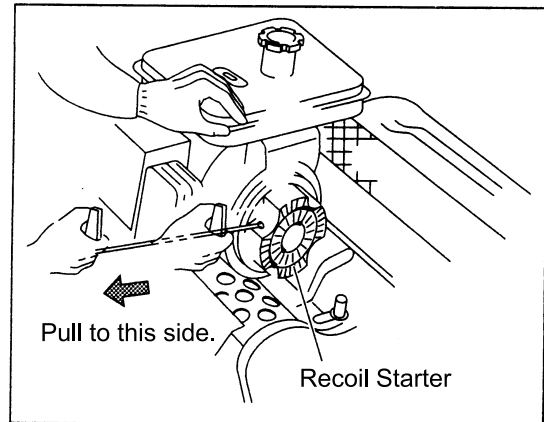
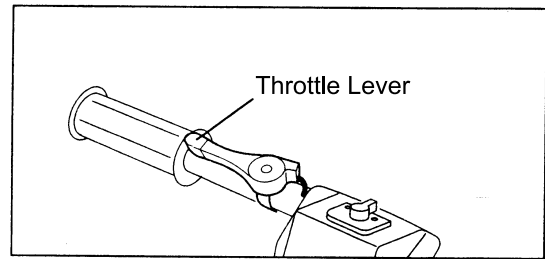
<Engine Start-up>

- ① Check the brake and main clutch according to the procedures on 17 and 18 pages above.
- ② Set the bucket according to the Bucket Attachment Procedure on 12 page above.
- ③ Make sure that the main clutch and the reel blade clutch are disengaged (STOP condition).
- ④ Turn the engine hand switch/engine switch to "ON" position.
- ⑤ Turn the fuel cock clockwise to open.
 - When the knob on the fuel cock is set in parallel with the fuel pipe, the cock is open; and when the knob is set at a right angle, it is closed.
- ⑥ Move the choke lever to The right turn and close the choke.
 - Immediately after the engine is started up, when you restart, you don't have to close the choke.



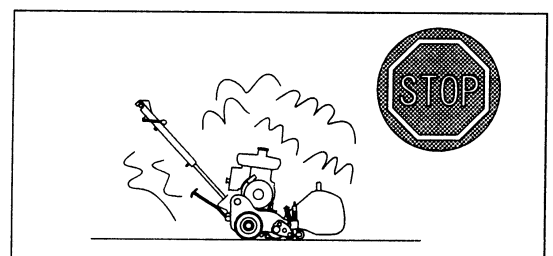
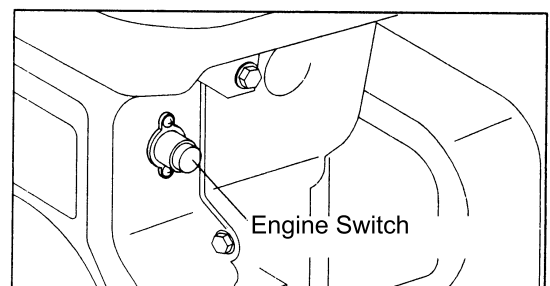
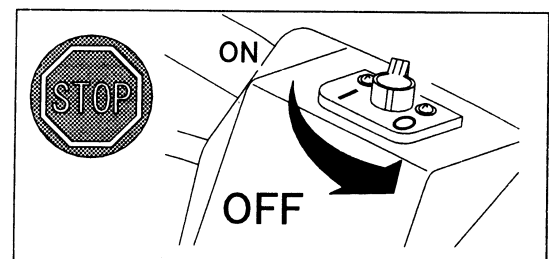
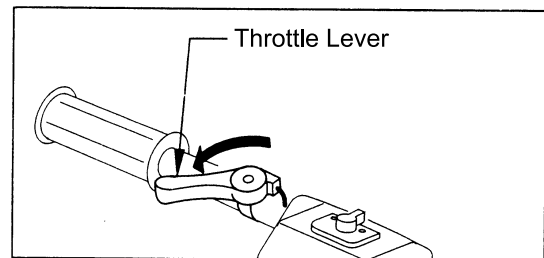
Operation

- ⑦ Set the ▽ mark on the throttle lever to the midway position between "H" and "L".
- ⑧ Holding the fuel tank with your left hand, but without moving the mower, hold the recoil starter handle and quickly pull it to this side.
- The engine will start. If it is pulled several times and the engine still does not start, contact our sales office.
- Pull the handle to about 4/5 of the maximum length of the cable.
- ⑨ Return the recoil starter handle carefully to its housing.
- ⑩ When the engine has started, gradually open the choke to full.
- ⑪ After the engine has started, run to warm up for 2 or 3 minutes.



<Engine Shut-Down>

- ① Set the ▽ mark on the throttle lever to "L" position.
- ② Turn the engine hand switch counterclockwise and set it to "OFF".
- The engine will be shut down. Pressing the switch on the engine can also shut down the engine.
- If any emergency occurs, including white smoke from the engine, immediately stop the engine.
- ③ Close the fuel cock.

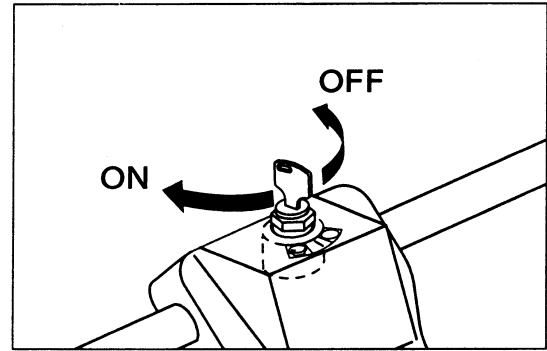


■ Engine Start-up and Shut-down (with the self-starter)



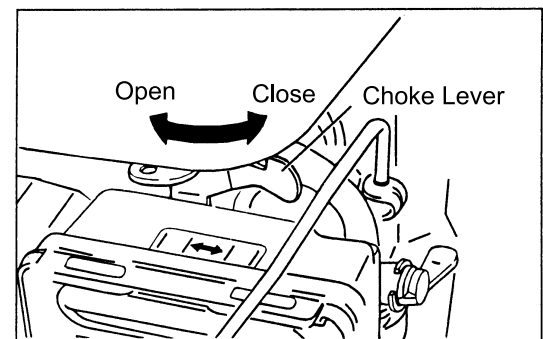
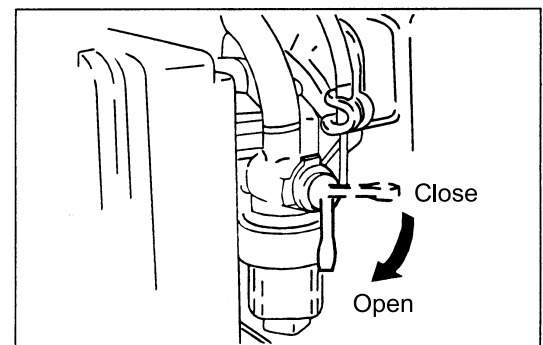
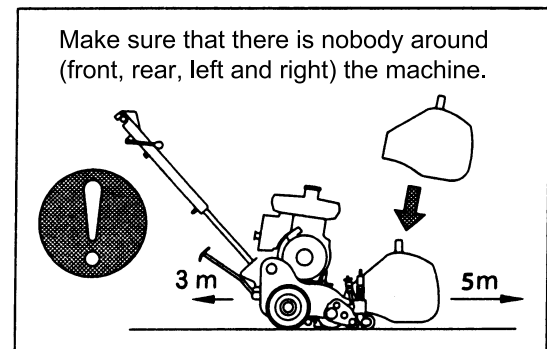
DANGER

- Only start the engine out of doors.
- Before starting the engine, make sure that neither the main clutch nor the reel blade clutch is engaged.
- Start up the engine at least 5 meters far away from a fuelling area.
- Always attach the bucket before the engine is started.
- Before starting the engine, make sure that there is nobody within 5 m of the front and 3 m of the left, right and rear of the lawn mower.
- Only start the engine when you have fully understood how to stop it.



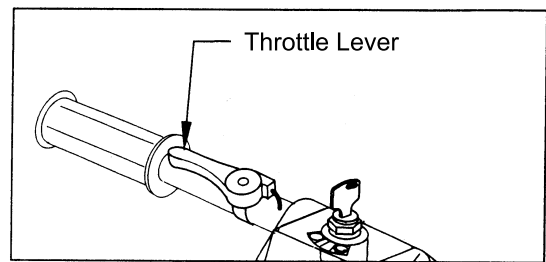
<Engine Start-up>

- ① Before starting the engine, make sure that both the main clutch lever and reel blade clutch lever are in their stop positions.
 - ② Attach the bucket, and make sure there is nobody within 5 m of the front and 3 m of the left, right, and rear of the lawn mower.
 - ③ Turn the fuel cock clockwise to open.
 - ④ Turn the choke lever to close the choke.
- After the engine has been started, it is not necessary to close the choke when restarting after it has been stopped.



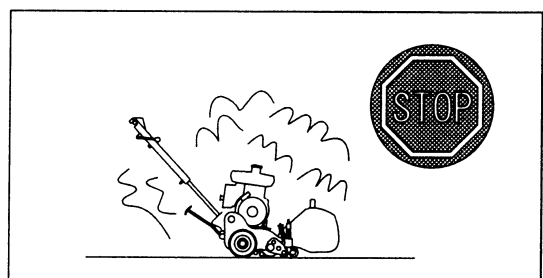
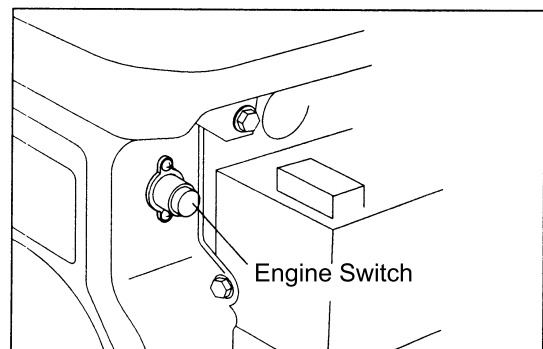
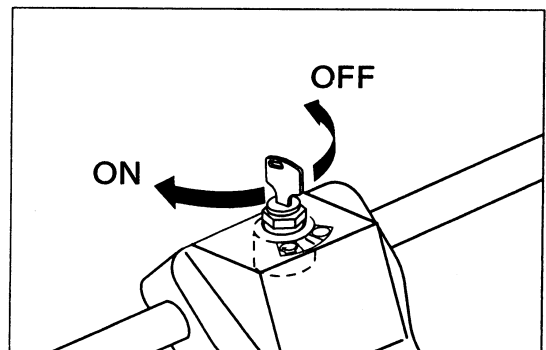
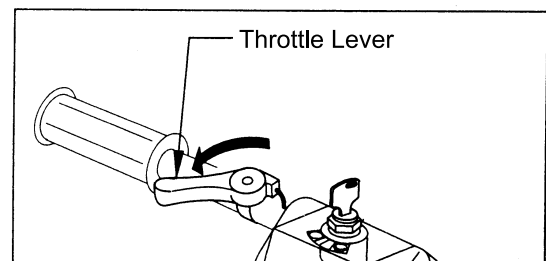
Operation

- ⑤ Set the ▽ mark on the throttle lever to the position half way between “H” and “L”.
- ⑥ Turn the starter switch to the position “”.
- The self-starter motor will be turned and the engine started up.
- To protect the battery, press the starter switch for 5 seconds for one start-up. If the engine does not start, repeat the starting procedure several times.
- ⑦ When the engine has been started, turn the choke lever counter-clockwise and open the choke gradually until finally it is fully open.
- ⑧ After having started the engine, warm it up for 2 or 3 minutes.



<Engine Shut-down>

- ① Set the ▽ mark on the throttle lever to “L”.
- ② Turn the engine switch to “O”.
- The engine will be shut down. Pressing the switch on the engine can also shut down the engine.
- If white smoke is discharged from anywhere other than the exhaust port that is an emergency: immediately turn the starter switch to “O” position.
- ③ Close the fuel cock.



■ Transport of Lawn Mower

<Transportation under own power>



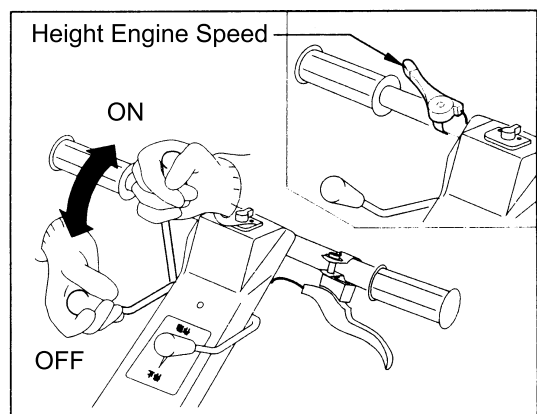
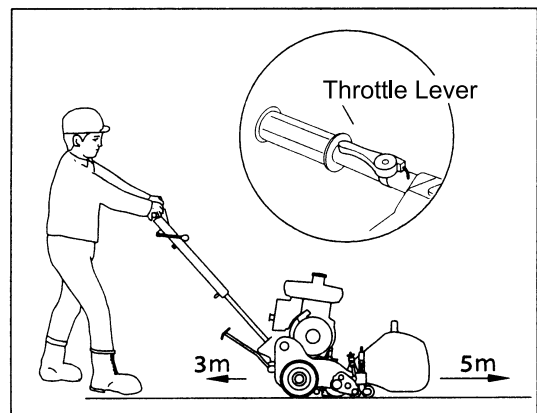
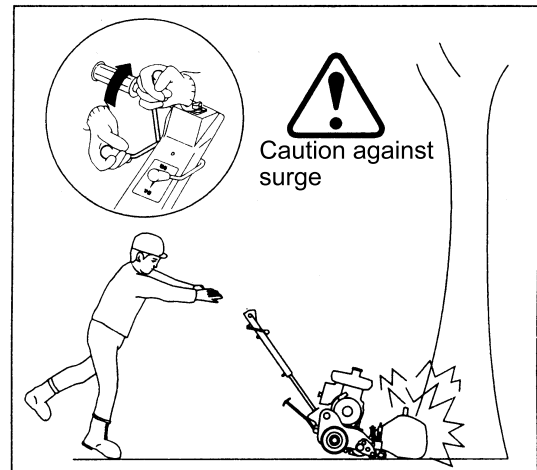
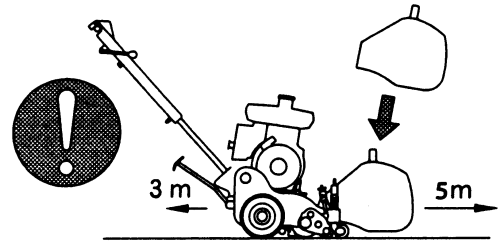
WARNING

- Before transporting the mower under its own power, make sure that there is nobody within 5 m of the front and within 3 m of the left, right and rear of the machine.
As soon as the main clutch is engaged, the lawn mower will move ahead. Take care against any accidents caused by this surge.
- Before starting the engine or moving the machine forward under its own power, always set the bucket.
- After you have understood how to stop the lawn mower, move it forward under its own power.

IMPORTANT

- Do not drive the machine forward without the tires anywhere other than on a lawn.
Not only might the rear roller be damaged, but the roller shaft might also be deformed.
That will cause abnormal rotation and the lawn will not be evenly cut.
 - Driving the machine under its own power requires considerable skill. You will need much practice to be able to drive the machine under its own power with confidence.
- ① Make sure there is nobody within 5 m of the front and 3 m of left, right and rear of the machine.
 - ② Set the ▽ mark on the throttle lever to its midway position between "L" and "H" and set the reel blade clutch lever to "OFF".
 - ③ Hold the left grip, securely, with your left hand and pull the main clutch lever carefully to this side to set it to "ON".
- As soon as the main clutch is engaged, the lawn mower will move forward.
 - When you are accustomed to running the machine under its own power, and you can operate it with stability, set the mark on the throttle lever to "H" to get used to running with a high speed engine.
 - ④ To stop the machine, push the main clutch lever forward to "OFF" position.

Make sure that there is nobody around (front, rear, left and right) the machine.



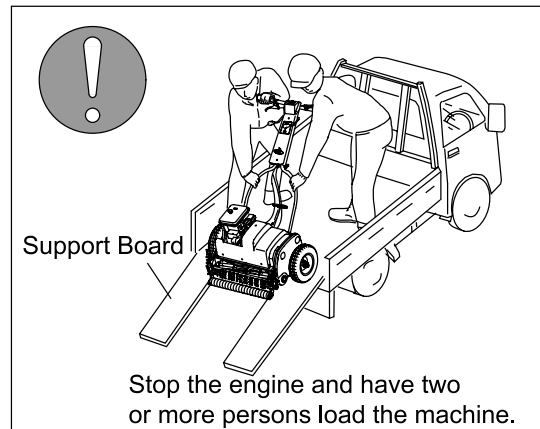
Operation

■ Transport of Lawn Mower on a vehicle



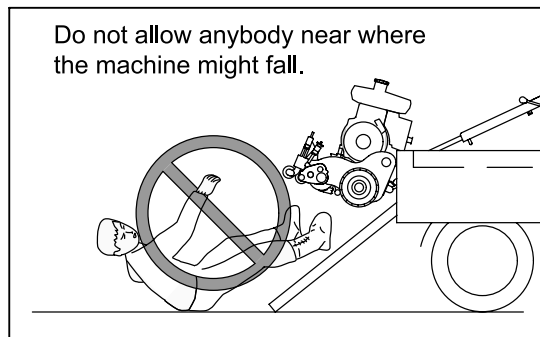
WARNING

- When this machine is loaded on or unloaded from a vehicle for transport, do not move the machine under its own power.
- When the machine is to be loaded on or unloaded from a vehicle, two or more persons are required. For loading: use support boards for loading and unloading.
- When the machine is to be loaded or unloaded, take the greatest care not to drop the mower's body.
- Do not allow anybody near where the machine might fall.



IMPORTANT

- When the machine is to be loaded on or unloaded from a vehicle, attach the transport tires. Otherwise the rear roller might be damaged or its shaft deformed, which will cause failure of evenness in cutting of the lawn.
- When the machine is to be loaded on the carriage of a truck, two or more persons are required. Do not allow anybody except other than the persons in charge be where the machine might fall, between the support boards or around the carriage.
- ① Make sure that all clutches are set to "OFF" and the engine has been shut down.
 - ② Place the end of the support board securely on the carriage. Make sure there is nobody anywhere the machine might fall, between the support boards, or around the carriage.
 - ③ Make sure that the side brake of the vehicle works and that the vehicle does not move.
 - ④ One of the two persons should be ready to operate the machine's brake. Apply the brake and hold the machine against falling, carefully lift the machine up and on to the carriage to load.
- Do not push up the lawn mower.
 - After loading the machine on to the carriage, fasten the belts to fix it on the carriage ready for transport.

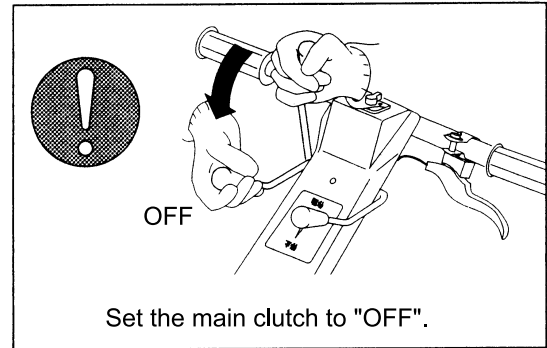


■ Operation before Mowing



WARNING

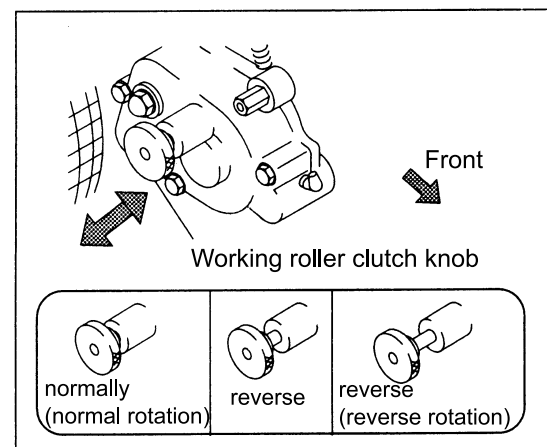
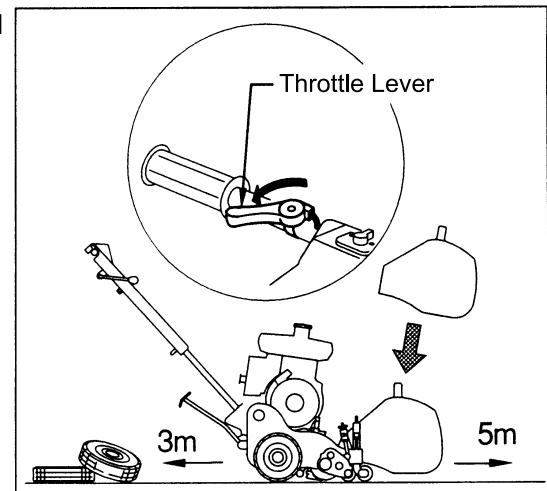
- Make sure that the main clutch is not engaged before the reel blade is operated.
 - Always control the working roller clutch knob from the side of the lawn mower.
 - Always set the bucket and then operate the clutches for mowing.
- For this machine to mow a lawn, it is necessary to engage the reel blade clutch and working roller clutch.
 - The reel blade clutch controls the rotation of the reel blade when lawn mowing.
 - The working roller clutch is used to rotate the working roller.
 - After the reel blade clutch and the working roller clutch are engaged, the reel blade and working roller will start rotating when the main clutch is engaged.



<Working Roller Clutch Engagement>

Engage the working roller clutch before engaging the reel blade clutch.

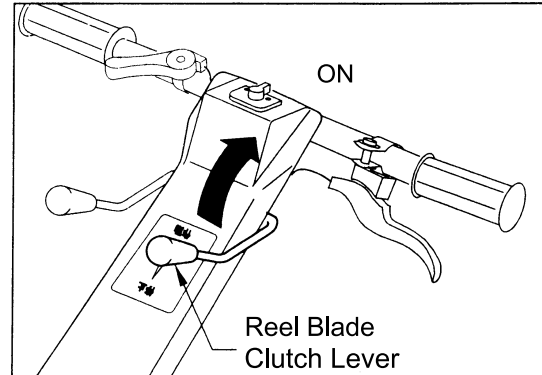
- ① Upon arrival at the work site, remove the tires on level ground with soft soil as close the lawn as possible.
 - ② When starting to mow, attach the bucket and make sure that the main clutch is not engaged, and that there is nobody within 5 meters of the front and 3 meters of the left, right and rear of the machine. Then start the engine.
- Set the ▽ mark on the throttle lever to the position "L".
 - ③ Make sure the body of the mower does not move, even without braking. Insert the working roller clutch from the right side of the machine until it stops.
 - When the clutch is pressed until it stops, the working roller will rotate normally (normal rotation). When it is pulled one notch, the working roller will be stopped (release). Then, when it is pulled up one more notch, the working roller will rotate in reverse (reverse rotation).



Operation

<Reel Blade Clutch Engagement>

- ① After engaging the working roller clutch, check once again that the mower will not move. Then set the reel blade clutch lever to the "ON" position.



<Mowing Operation Start>

WARNING

- Always set the bucket when mowing.
- Before operation, make sure there is nobody within 5 m of the front and within 3 m of the left, right and rear of the machine.
- Hold the grip, securely, to prevent any runaway or surge of the machine. When the main clutch is engaged, the lawn mower will immediately go forward.
- During mowing, maintain a conventional position. Unstable positions might cause accident.

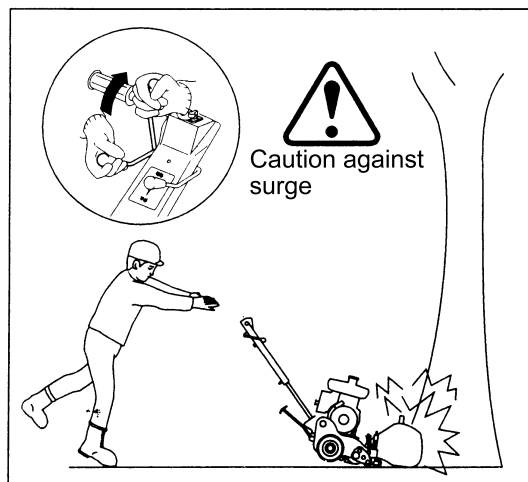
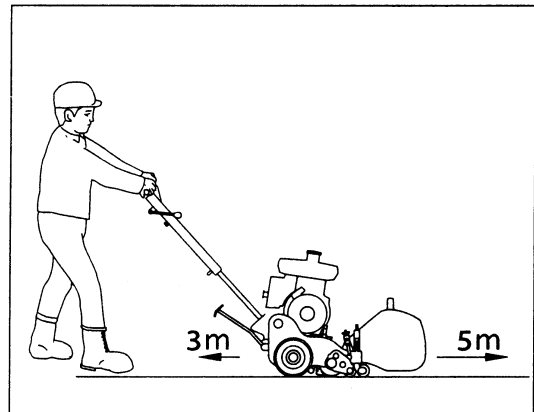
- ① Following the previous procedures, remove the transport tires on level ground close to the mowing area. Then, start the engine and engage the working roller clutch and the reel blade clutch one after another.

- ② Make sure that there is nobody within 5 m of the front and within 3 m of the left, right and rear of the machine. Also make sure that the bucket has been set.

- After getting the feel of the machine, set the throttle lever to "H" position.

- ③ Manually move the mower to the start of the mowing location and, when you get there, set the reel blade clutch lever to "ON". Then, holding the handle grip securely with your left hand, face your body forward and maintain a conventional position: then carefully pull up the main clutch lever with your right hand to set it to "ON".

- Immediately after the main clutch is engaged, the mower goes forward. Take care not to release your hands and so avoid accidents caused by runaway or surge of the machine.



Operation

■ Mowing Operation



WARNING

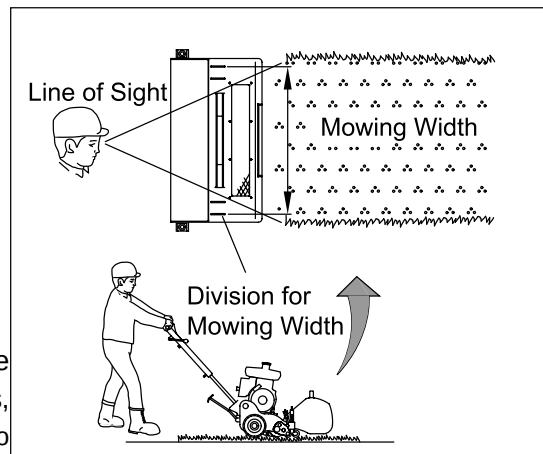
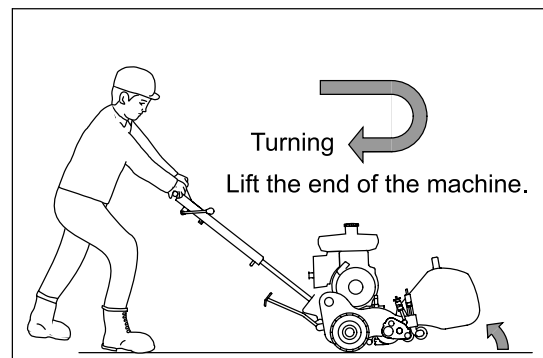
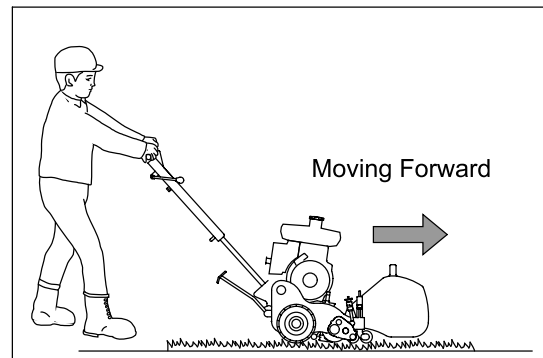
- Before operating the reel blade clutch and the working roller clutch, make sure that the main clutch is not yet engaged.
- Always operate the working roller clutch from the side of the machine.
- Always set the bucket and then, operate the clutches for mowing.

<Moving Forward and Tuning>

- We here describe how to move forward and also to turn (such operations are required in mowing). Practice several times to get the feel of the machine in operation. Get the feel of the machine's moving forward and turning as here described before setting the ▽ mark on the throttle lever to "H" to mow lawn.
- When the machine is delivered, the clearance between the reel blade and bed knife is widened so as to prevent accident caused by the reel blade during transport. If, when you mow, you feel that the cutting height is not satisfactory or the edge is not enough, adjust. (Refer to "6. Adjustment" on page 28).
- Adjust the handle height appropriate to the body structure of the operator and start mowing (Refer to "Handle Height Adjustment" on page 36).
- ① When moving the machine forward to mow lawn, maintain a conventional stance and mow as shown in the right-hand figure.
- ② When you reach the end of the lawn, lower the end of the machine as shown in the right-hand figure. Then slightly return the throttle lever and turn the machine.
- If you are not accustomed to doing this, make a wide turn of the machine.
- ③ When the bucket is filled with clippings, always stop the engine and dispose of the clippings.
- Decide on a place for the clippings, one where there is no possibility of ignition by the engine or any other source, and treat the clippings as combustible waste.

<Target for Mowing Width>

There are division marks on each side of the bucket to indicate the mowing width. Hold the handle grips with your both hands, maintain a conventional position, and mow on the basis of these two marks. The distance between the marks is the width of the mowing.



6 . Adjustment

■ Edge Adjustment

<Moving Forward and Turning>

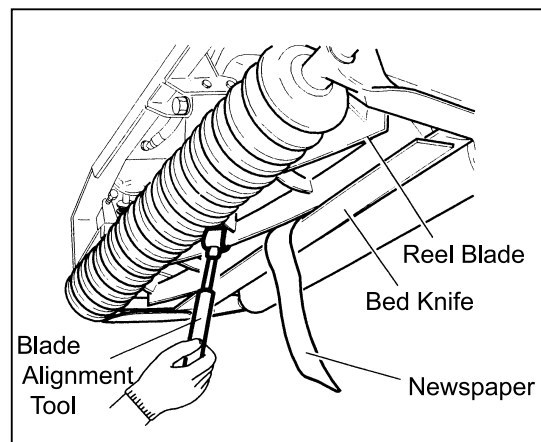
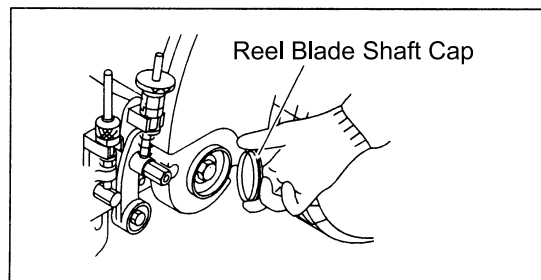
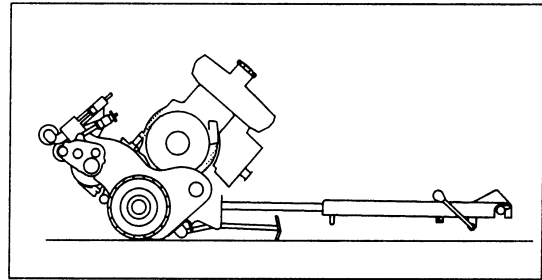
- When the machine is delivered, the clearance between the reel blade and bed knife is widened so as to prevent accidents caused by the reel blade during transport. Therefore, it is necessary to adjust the clearance before mowing.
- If the sharp edge of the blade has been lost during mowing, you will need to sharpen the reel blade and adjust the clearance between the reel blade and bed knife. When the clearance between the reel blade and bed knife is to be adjusted then do so in accordance with the procedure in “Adjustment of Reel Blade and Bed knife” on this page.
- Even after adjustment of the clearance between the reel blade and bed knife, the edge is still not improved, sharpen (lap) the reel blade. Refer to “Edge Adjustment with lapping (Sharpening the Reel Blade)” on pages 32 and 33.
- If stripes or blocks are left on the lawn after adjustment between the reel blade and bed knife and the lapping adjustment then contact our business or sales office.

<Adjustment of Reel Blade and Bed Knife>



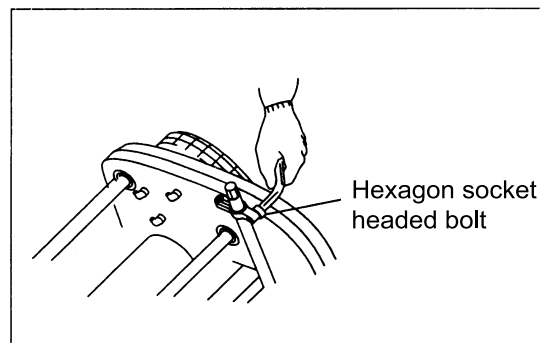
WARNING

- Always stop the engine and disengage the main clutch and reel blade clutch before adjusting the reel blade and bed knife.
 - When turning the reel blade, always use the blade alignment tool.
 - Do not touch it directly with hand.
- To adjust the reel blade and bed knife, tear newspapers into slips of about 50 mm wide.
- ① Place the lawn mower body on level ground and tilt it backward. Then, ground the stand so that the machine does not move.
- Always use the blade alignment tool when the reel blade is to be turned. Do not touch the blade with your hand.
- ② Insert the newspaper slips at the center, right and left of the reel blade (three locations) and turn the reel blade downward, using the blade alignment tool to check the edge.
- If the newspaper cannot be cut the clearance between the reel blade and bed knife is too large.
 - If the clearance is too large, turn the bed knife adjusting handle (right and left) clockwise and so reduce the clearance.



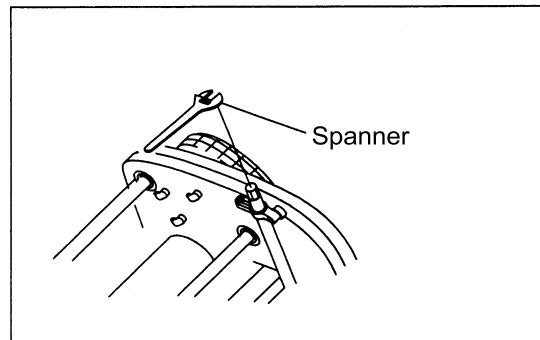
- ③ Loosen the hexagon socket type cap screws fixing the lower blade adjusting handle (on the left and right), and turn the bed knife adjusting handle (on the left and right) clockwise to shorten the distance between the reel blade and the bed knife.

- When the bed knife adjusting handle is turned clockwise, the clearance between the reel blade and bed knife is decreased and when it is turned counter clockwise, the clearance is increased.



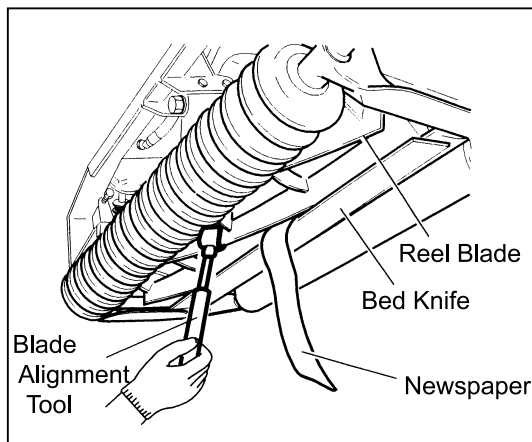
- ④ Test the edge at the center, right and left of the reel blade by using newspaper slips, and repeat until the newspaper cuts easily.

- Adjust the edges on all the reel blades and check their rotation condition.



- ⑤ Test the edge and make sure that the newspaper can be cut evenly in any location and that there is no abnormal rotation.

Fasten the hexagon socket type cap screws for fixing the lower blade adjusting handle (on the left and right) to fix it.

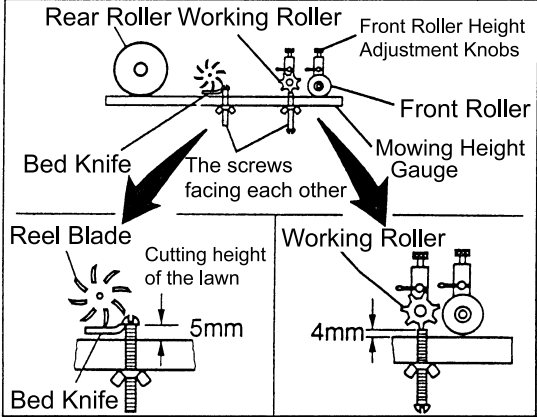
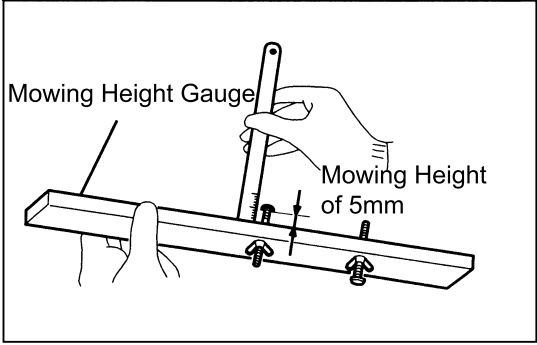
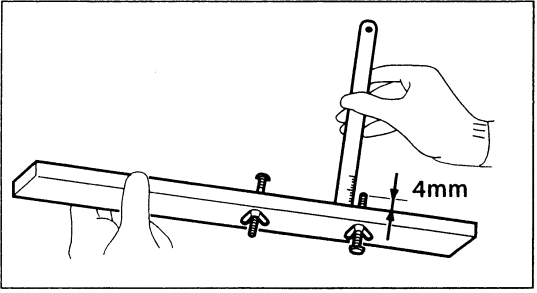


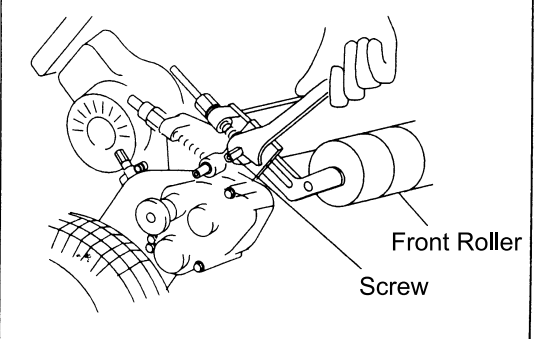
Adjustment

■ Mowing Height Adjustment



WARNING

- Always stop the engine and disengage the main clutch and reel blade clutch before adjusting the mowing height.
 - To cut the lawn evenly at the necessary height, adjust the height of the front roller. Adjust both the cutting height and also the working roller height to the lawn at the same time, and make a test cut of the lawn. Then, on the basis of the result, re-adjust.
 - Here we describe how to adjust the cutting height of the lawn to be 5mm from the ground and the working roller height to 4mm.
- ① Set the two screws on the cutting height gauge so that they face each other, as shown in the right-hand figure.
 
 - ② Loosen the butterfly nut of the screw close to the center of the mowing height gauge (separately purchased) and measure the distance between the bottom of the screw head and gauge (under the screw neck). Adjust so that the distance is 5mm. Then fasten the butterfly nut to fix the screw.
 
 - This distance will be the mowing height.
 - ③ Loosen the butterfly nut on the other screw and adjust the end of the screw so that the projection is 4 mm when measured with a scale. Then fasten the butterfly nut to fix the screw.
 
 - This then becomes the distance between the working roller and the ground.
 - ④ Place the machine on level ground and tilt it backwards. Then ground the stand and keep a pressure on the handle so that the machine does not move.
 - ⑤ Loosen the nut on the front roller height adjusting knob (left and right).



- ⑥ Press the screw end of the mowing height gauge against the front and rear rollers and turn the front roller height adjusting knobs so that the underneath of the screw head on the center of the gauge is aligned with the lower surface of the bed knife.

- When the front roller height adjusting knob is turned clockwise, the roller is lowered. When it is turned counterclockwise, the front roller is lifted.

- ⑦ Adjust the height on the left and right sides and, when the specified height of the bed knife has been decided, fasten the nut securely in order to fix the height of the front roller.

- ⑧ Loosen the set screws for the working roller height adjusting knob (on the left and right).

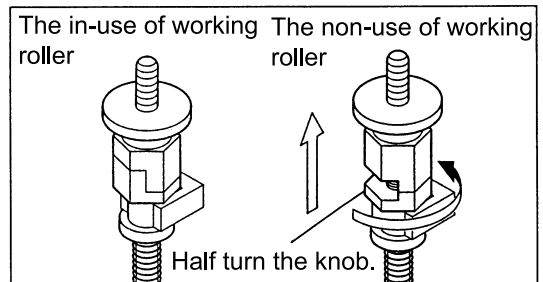
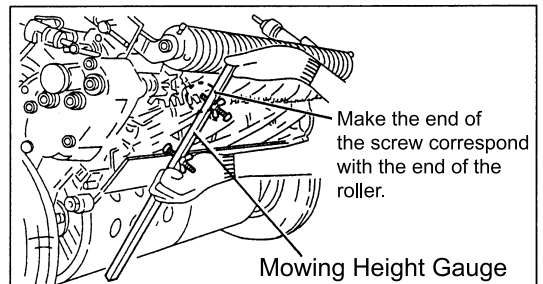
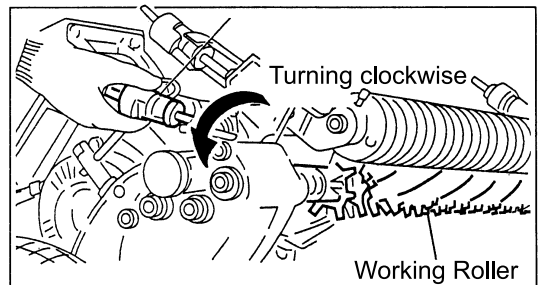
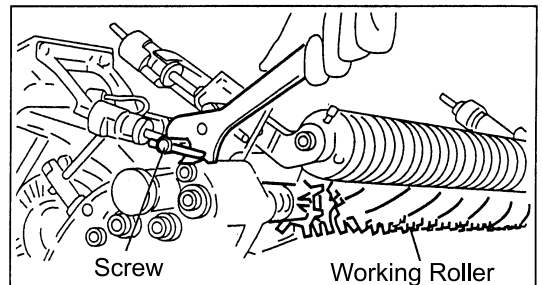
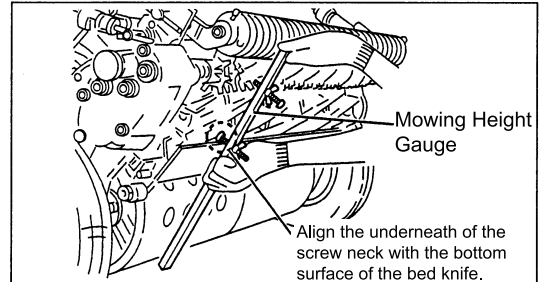
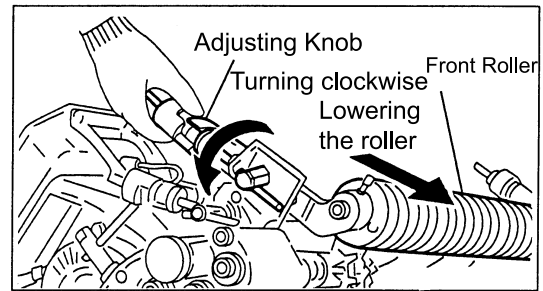
- ⑨ Press the cutting height gauge against the contact point of the front roller with the ground, and the rear roller, and turn the working roller height adjusting knob so that the projected end of the screw corresponds with the end of the working roller.

- When the working roller height adjusting knob is turned clockwise, the working roller is lowered, when it is turned counter-clockwise, the roller is raised.

- ⑩ Adjust the height on both the left and right. When the working roller height is set to the specified height, fasten the set screws to fix the working roller.

■ Working Roller Adjustment

- If the working roller is not to be used then it is possible to lift its position by 5mm.
- Loosen the set screws on the left and right and half turn the working roller knob, and set it to the non-use position.
- Adjust the height of the working roller as shown in the figure in "Use of Working Roller".



Adjustment

<Lapping Operation with Lapping Machine>

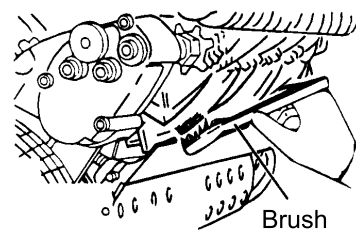


WARNING

- Always stop the engine and disengage the main and reel blade clutches before lapping.
- When using the lapping machine and turning the reel blade do not allow your hand, or foot, or any part of your clothing, near the cutting range.
- Apply abrasive to the reel blade with a brush, not your fingers.



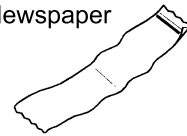
Always use a brush when applying abrasive.



Brush



Newspaper



Mixing Ratio of Abrasive

Lapping Carbon 1: Oil (neutral detergent) 3 to 4

IMPORTANT

- For lapping, always use our specified abrasive; Lapping Compound #180 to #220 or a lapping carbon with the same numbers.
- For the location of the reel blade with blunted edge, never apply abrasive.
- For lapping, prepare 50 mm wide strips of newspaper and the lapping compound or lapping carbon mixed with oil or a neutral detergent as abrasive.
- The mixing ratio is based on volume.

Lapping Carbon 1: Oil (neutral detergent) 3 to 4

† Bring the mower body down on to level ground and set the stand on the ground so that the machine cannot move.

† Pull the reel blade cap to this side to detach.

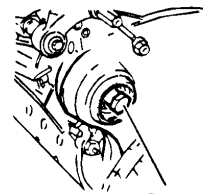
- When the reel blade cap has been detached, the heads of the bolts to be used to connect the lapping machine can be seen.

† Place the lapping machine on level ground and make sure of the rotation range of the lapping machine.

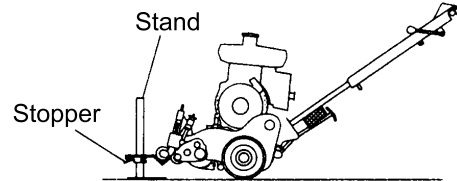
† Set the stand attached to the lapping machine and hold the stopper. Set the height of the V-shaped section so that the rotation range of the lapping machine lies within the section.

- Set the stands on the left and right of the front roller (two locations)

† Tilt the lawn mower backward and put the front roller in the V-shaped section of the stand. Align the lapping machine rotation axle with the center of the reel blade axle and connect them securely.

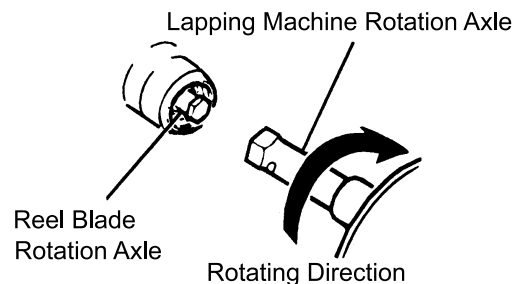


Staged Bolt for Lapping Machine



Stand

Stopper



Lapping Machine Rotation Axle

Reel Blade Rotation Axle

Rotating Direction

‡ Insert newspaper slips between the reel blade and bed knife and test the edge by cutting it by turning the reel blade downward with the blade alignment tool. Mark the location of a good edge with a chalk.

‡ Apply lapping compound with the brush onto the location marked in the preceding step ‡E. Press the switch of the lapping machine to set it to normal rotation which will turn the reel blade clockwise (opposite to the direction for mowing).

- The reason why the compound is applied to the good edge is that, since the good edge is not worn, that section should be shaved so that the level becomes the same as that of the worn section.

- The reel blade and bed knife rub against each other for lapping.

- If the reel blade connects firmly with the bed knife during lapping, then the ends of the cutters are shaved and normal lapping becomes impossible. So, lightly adjust the reel blade to the bed knife.

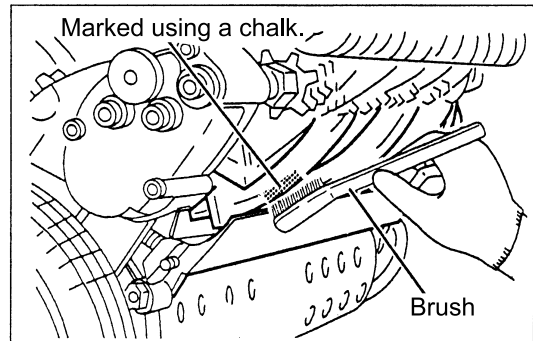
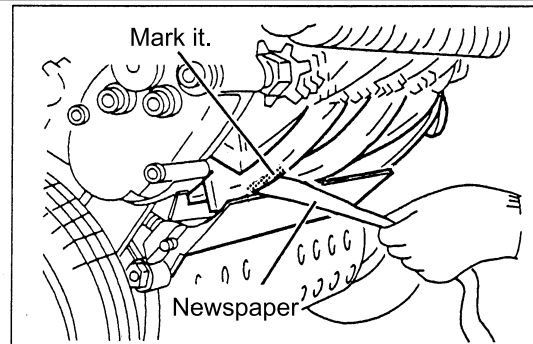
‡ Extend the locations of abrasive application, in stages, to the blunted sections of edge (locations with no marks in step ‡E) and repeat the lapping operation.

‡ When the reel blades are evenly lapped then uniformly apply lapping compound to the reel blade. Then turn the reel blade clockwise

(opposite to the direction for mowing) to finish.

‡ After finishing, wash the reel blade and bed knife with water to remove any abrasive.

- According to “Adjustment of Reel Blade and Bed Knife” on page 28, test the edge and adjust the clearance between the reel blade and bed knife.



Adjustment

• Adjustment of Each Section

<Adjustment of Each Section of Engine>

- The adjustment of parts (including the carburetor) when dealing with engine trouble might affect the basic performance of the machine. In such case, ask for our sales office.

<Brake Adjustment>



WARNING

- Always stop the engine and disengage the main and cutting blade clutches before adjusting the brake.
- Do not adjust the brake immediately after the engine has stopped. Wait until the engine has cooled.

‡ Turn the front cover set knob counter-clockwise and remove the set knob. After removing the knob, open the cover upwards.

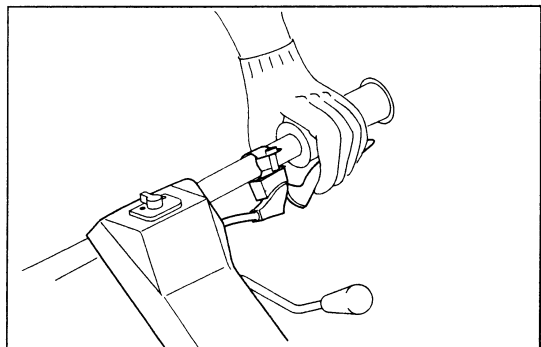
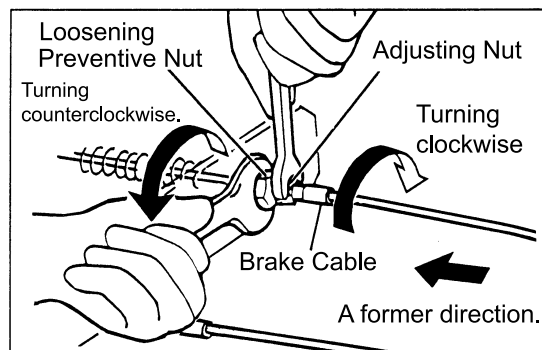
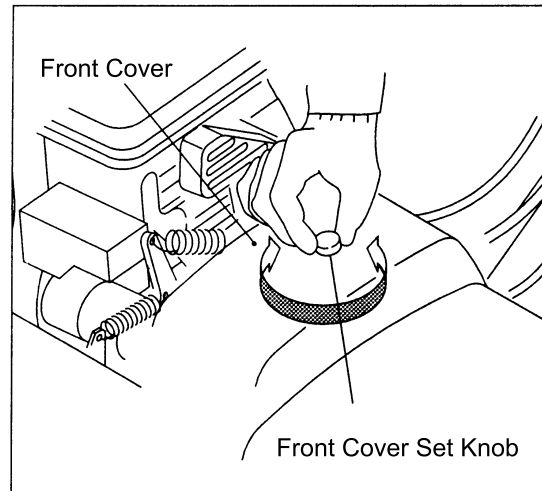
‡ Turn the nut which prevents brake cable loosening, counterclockwise, using a spanner.

‡ Turn the cable adjusting nut with a spanner and hold the brake lever tightly. Then pull the machine to this side. Then adjust it so that the transport tires are locked.

‡ After adjustment, fasten the loosening preventive nut clockwise to set the length of the cable.

‡ The brake cable adjustment is available at the brake cable fixture position at the rear of the handle. If the adjustment is not enough on the tire side, adjust it at this location.

- Following the "Brake Performance Check" on page 17, check the brake performance.
- Make sure that the brake does not hold when the brake lever is released.



<Main Clutch Adjustment>

**WARNING**

- Always stop the engine and disengage the main clutch before adjusting the clutch.
- Turn OFF the engine switch.
- After the engine has stopped, wait for the engine cool before adjustment.

‡ Always set the engine switch OFF.

‡ Turn the front cover set knob counterclockwise and after removing the set knob manually raise the cover.

‡ Turn the clutch cable loosening preventive nut counterclockwise with a spanner to loosen.

‡ Turn the cable adjusting nut with a spanner and adjust the length of the clutch cable.

- When the adjusting nut is turned clockwise the slack in the clutch wire increases (clutch take up point is getting close to the handle) and when it is turned counterclockwise, the slack of the clutch is reduced (The clutch take up point is getting away from the handle).

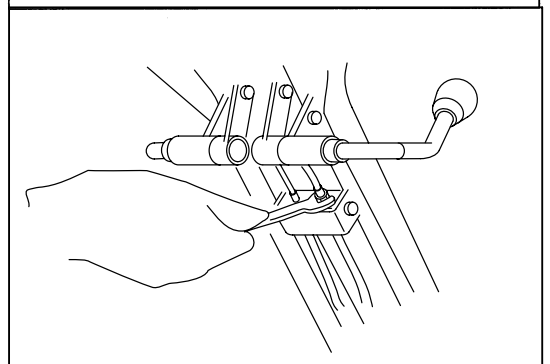
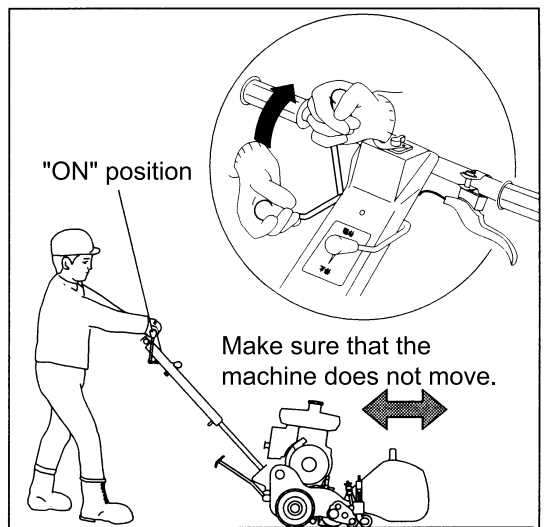
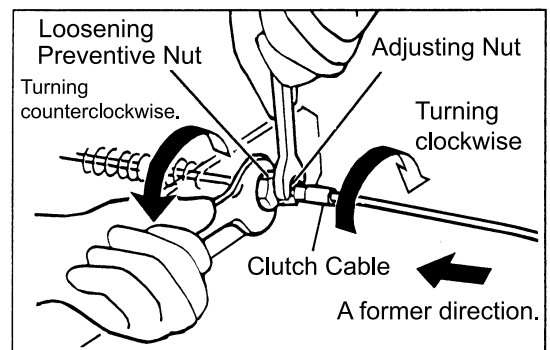
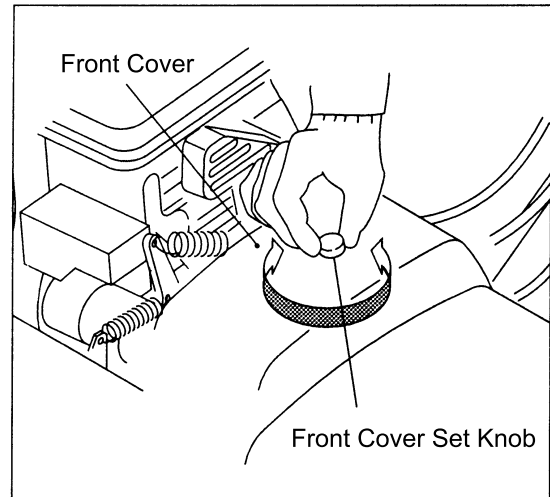
‡ Turn the clutch lever to "ON" side and check the result of the adjustment.

‡ Close the front cover and turn the front cover set knob clockwise until it stops to fix the cover.

- After the adjusting in accordance with the "Main Clutch Performance Check" on page 17, check the performance of the main clutch.

- Make sure that the main clutch is not engaged by pulling the recoil starter with the main clutch set to "OFF" and checking that the machine does not move.

‡ The clutch cable can also be adjusted at the clutch cable fixture location at the rear of the handle. If the front cover adjustment is not enough, make the same adjustment at this location.



Adjustment

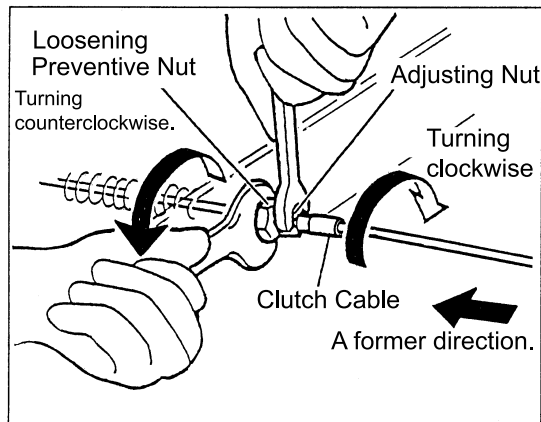
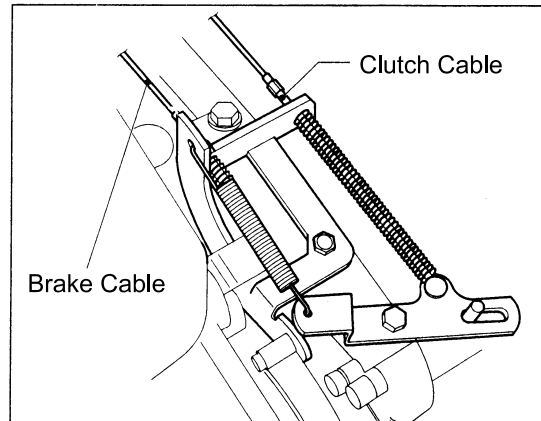
<Reel Blade Adjustment>



WARNING

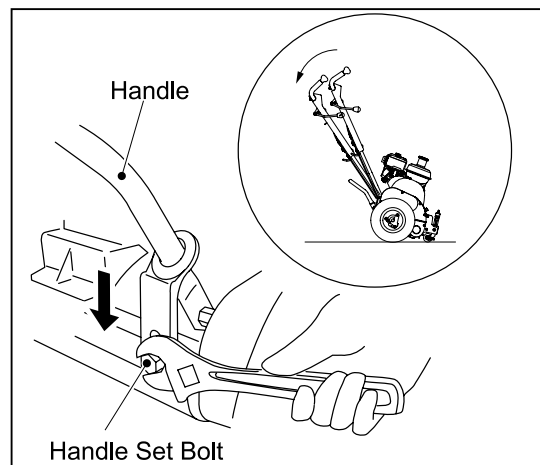
- Always stop the engine and disengage the reel blade clutch before adjusting the clutch.
- Immediately after the engine is stopped, wait for it to cool before adjusting.

- Turn the front cover set knob counterclockwise and remove the knob. Then manually raise the cover.
- Turn the clutch cable loosening preventive nut counterclockwise with a spanner to loosen.
- Turn the cable adjusting nut with a spanner and adjust the length of the clutch cable.
 - For the clutch cable, when the adjusting nut is turned clockwise to the machine's front, the reel blade clutch arm returns in direction towards the front of the machine. When it is turned counter-clockwise, the reel blade clutch arm approaches the handle.
- Turn the clutch lever to the "ON" side and check the result of the clutch adjustment.
- Close the front cover and turn the front cover set knob clockwise until it stops to fix the front cover.



<Handle Height Adjustment>

- Adjust the handle height to suit the operator's build and start mowing.
- Loosen the handle set bolts on the left and right of the machine body.
 - Move the handle up and down and adjust it so that it is set at an appropriate height. Fasten the set bolts and fix the handle.
- If, even after the adjustment steps 1 and 2 above, the handle height cannot be set appropriately to the operator's convenience, consult with the business or sales office where you purchased this machine.



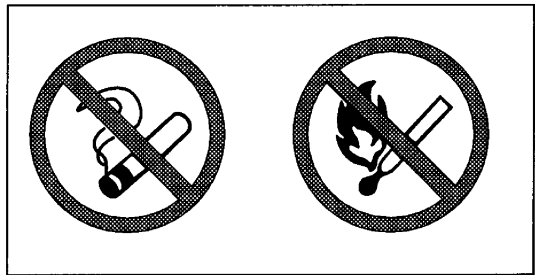
7 . Maintenance

■ Spark Plug Check/Replacement



WARNING

- Do not smoke or handle any fire during a spark plug check and replacement.



- Check the spark plug every 50 hours of use and, when the engine start up becomes difficult, replace it.

① Pull the spark plug connector to this side to remove.

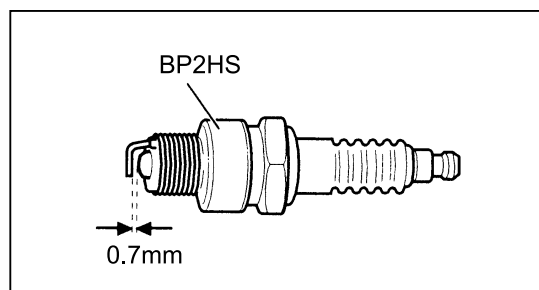
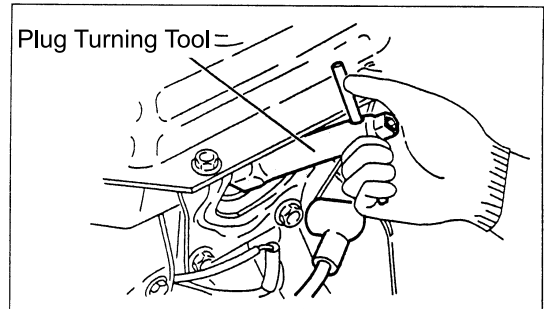
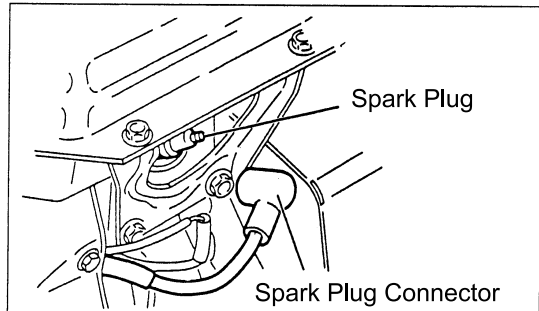
② Set the attached plug spanner on the spark plug and turn counterclockwise to remove the plug.

③ Remove any carbon (soot) on the spark plug with a brush.

- If you have a clearance gauge, adjust the electrode so that the gap is 0.6 to 0.7 mm.

④ Re-attach the spark plug and fasten it clockwise securely with the plug spanner to screw in the plug until it stops.

- In the case of replacement, attach BP2HS spark plug.



Maintenance

■ Cleaning of Lawn Mower Body

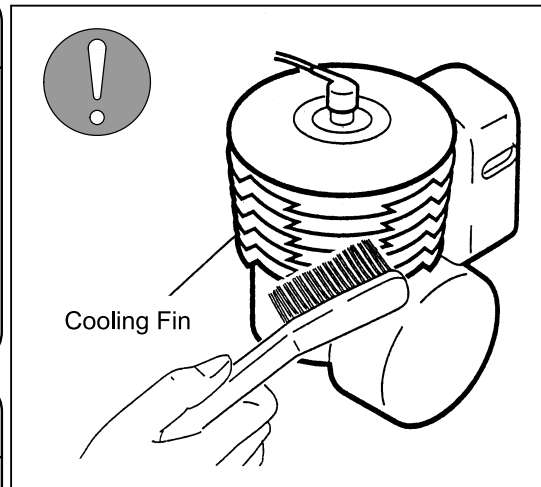


WARNING

- After each use, clean the engine cooling fins to remove dust and deposit between the fins. Otherwise, it might cause engine heating and cause fire in the machine.
- Clean after making sure of the engine's having cooled down.

IMPORTANT

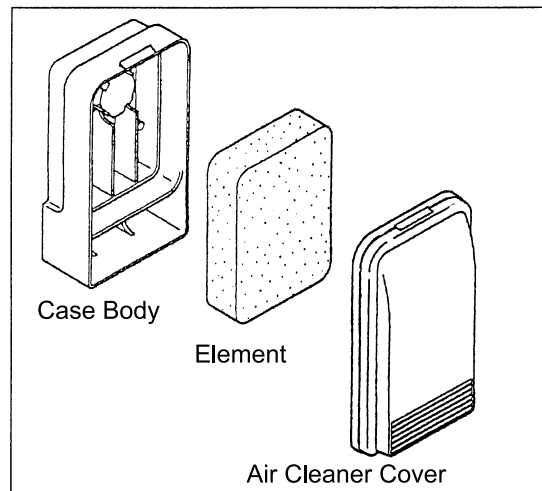
- Do not wash the cooling fins or muffler (silencer) on the engine with water. If it were left wet and became heated it might cause deformation or cracking.



- After use, always clean the mower, particularly the engine's cooling fins. Being exposed to clippings, deposits will easily attach and cause engine heating with risk of fire.
- Remove clippings or other deposits from the engine cooling fins with a brush. If there is any persistent dirt, wash with water and dry after wiping out all water.

■ Air Cleaner Cleaning

- Clean the air cleaner every 50 hours of operation.
 - If there is any deformation in the air cleaner element or clogging, order a replacement from our business or sales office.
- ① Pull down the attachment section on the lower end of the air cleaner cover to remove it.
 - ② Take out the element and wash with kerosene or neutral detergent for domestic use. Then, dry and dip it in the engine oil. Squeeze the element well and attach it.
 - ③ Remove any dust from the element by means of tapping on a level place, or spray compressed air from inside (engine side when it is attached) to blow the dust away.
 - ④ Return the cleaned element to its original position and attach the air cleaner cover.

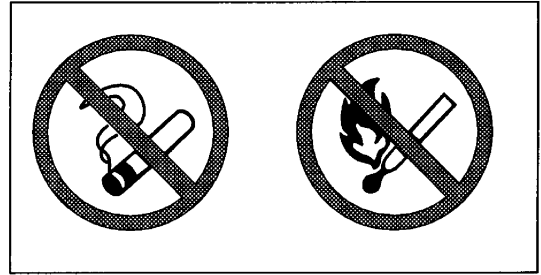


■ Strainer Cleaning

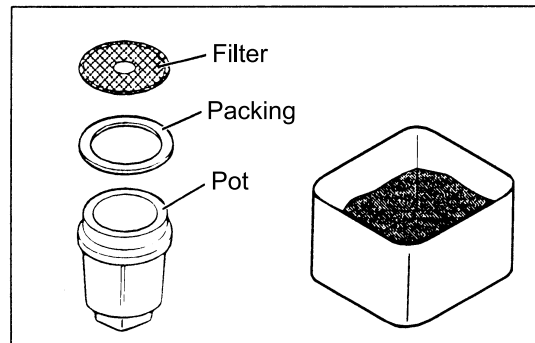
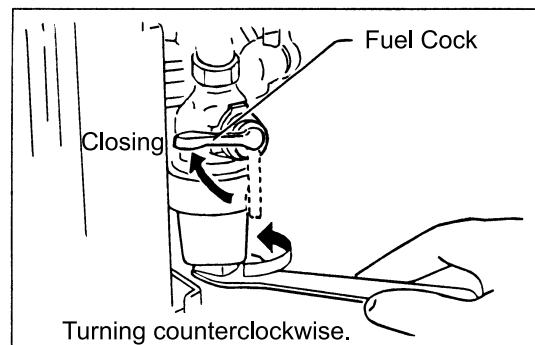


WARNING

- Always stop the engine before cleaning the strainer. During cleaning, do not smoke or allow any flame close to it.
- Immediately after the engine is stopped, wait for the engine to cool before cleaning.
- Ensure ventilation when cleaning the strainer.
- If any fuel spills during the cleaning, always wipe it off.



- Check the strainer everyday and clean it every 200 hours of operation.
 - Even within the above time frame, if any deposit is found in the strainer, clean it.
- ① Close the fuel cock.
 - ② Turn the projection on the bottom of the strainer counterclockwise with a spanner to loosen and carefully remove the strainer.
 - As the pot of the strainer is filled with fuel, loosen it gradually and remove.
 - ③ Put fuel in a container made of material not denatured by the fuel, so that the entire pot is dipped in the fuel. pot and filter, packing in the pot.
 - If deposit is not easily removed, dip in fuel for some while and wash.
 - ④ Attach the O-ring and cup to their original positions and wipe off any fuel attached to the outside of the strainer.



Maintenance

■ Battery Removal Procedure (With self-starter)

! DANGER

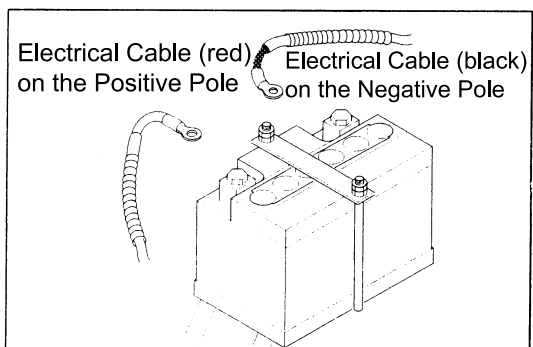
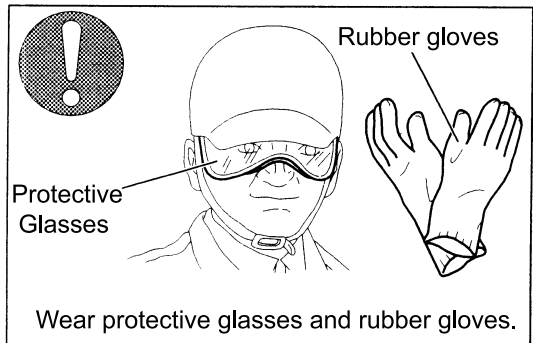
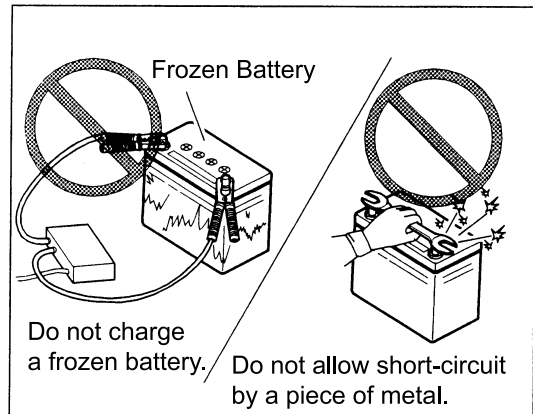
- Do not charge a frozen battery.
- Do not allow any short-circuit between the positive and negative poles by a piece of metal.
- Do not allow any naked flame close to the battery. Otherwise, it might cause an explosion.

! WARNING

- Battery fluid is diluted sulfuric acid and harmful to the human body.
- When the battery is removed or the distilled water replenished, wear protective glasses and rubber gloves.
- If battery fluid should enter your eye or mouth, wash it away with large quantity of water and consult a doctor.

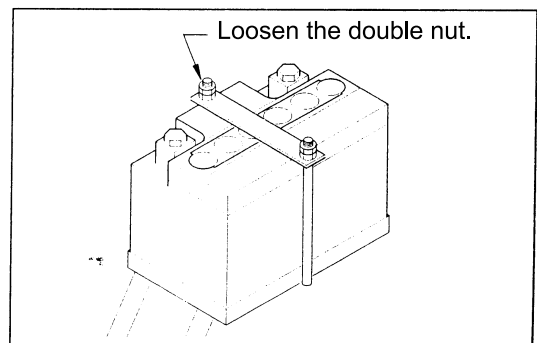
IMPORTANT

- When charging the battery, carefully read the instruction label attached to the battery.
- When charging, remove the battery from the body of the machine.



<Battery Removal Procedure>

- When the battery and its cables are removed for charging or long-term storage, proceed as follows.
- ① Set the engine switch to "O" position, and loosen the set bolts and nuts on the positive and negative poles.
 - ② First remove the black cable from the negative pole, then, remove the red cable from the positive pole.
- When the cables are to be attached to the poles, first attach the cable to the positive pole. Otherwise, if the tool should touch the pole, a short-circuit is caused.
- ③ Loosen the double nut fixing the battery and remove the battery.



■ Attachment and Removal of Reel Blades

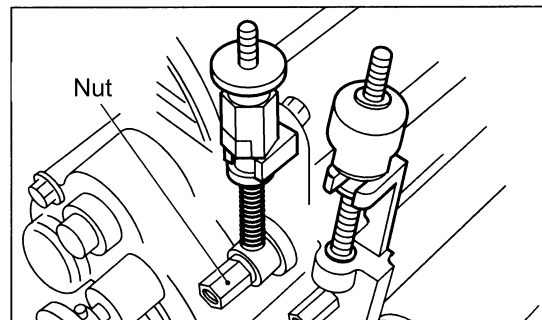
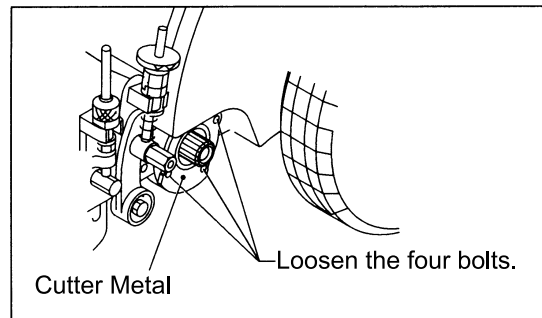
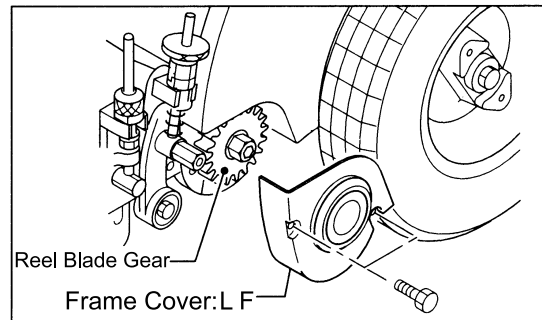


WARNING

- Always stop the engine before the reel blade is attached or removed.
- When attaching or removing the reel blade, always wear thick or leather gloves.

<Reel Blade Removal Procedure>

- Remove the transport tires on the machine according to "Transport Tire Attachment and Removal" on page 13.
- ① Turn half the bed knife adjusting handles on the left and right counterclockwise, and open a clearance between the lower and reel blades.
 - ② Remove the set band for the bed knife adjusting handle.
 - ③ Place a square bar under the reel blade so that it does not contact either of the front or rear rollers, and move the handle up and down to lower the reel blade onto the square bar.
 - ④ Loosen and remove the three M8 bolts fixing the cutter cover and remove the cover.
 - ⑤ Loosen and remove the two M6 bolts fixing the frame cover to where the left frame and reel blade shaft cover are attached and remove the cover.
 - ⑥ Loosen the lapping bolt fixing the reel blade shaft gear by turning it counter-clockwise, using an impact wrench, and remove the reel blade gear.
 - ⑦ Turn and loosen the four M8 bolts fixing the cutter metal counter-clockwise, using a socket wrench.
 - ⑧ Turn and loosen the set nut for the thatching metal "L", on the outside of the left frame, to remove and pull out the working roller (thatching and bush) to the left direction.
 - ⑨ Loosen and remove the set nut fixing the thatching box on the right and turn the box downwards and remove to this side.
 - ⑩ Turn and remove the three M8 bolts fixing the cutter metal on the right side, counter-clockwise, using a socket wrench. When the handle is pushed down, the reel blade is removed downwards.

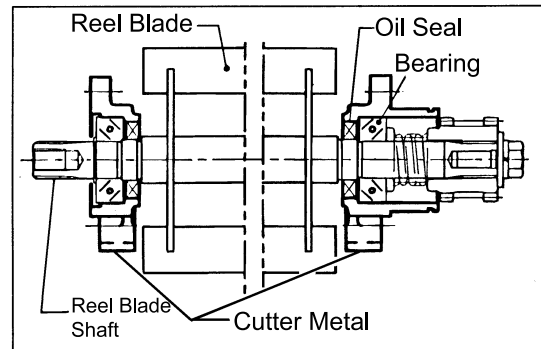


Maintenance

<Reel Blade Attachment Procedure>

Attach the cutter metals on the left and right of the reel blade shaft and align the blade.

- ① Place a square bar under the reel blade .
- ② Push down on the handle of the mower and move it with the front roller lifted from the ground. Then return the handle so that the position of the reel blade cutter metal is aligned with the cutter metal position on the frame.
- ③ From step ⑩ in the Bed Knife Platform Removal Procedure, attach the bed knife platform in a reverse procedure of steps ⑩ , ⑨ and ⑧ .



■ Long-Term Storage

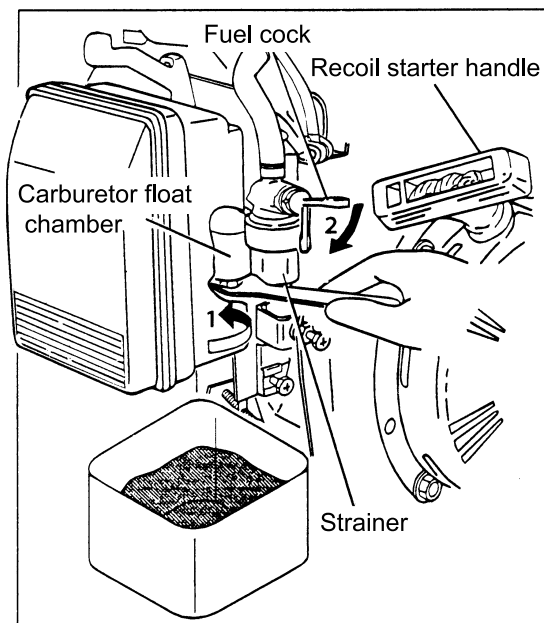
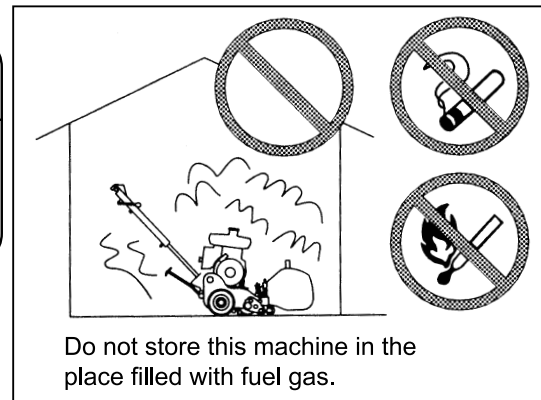
WARNING

- Do not store this machine in a place filled with fuel gas or which is enclosed, or close to any naked flame or sparks.

<Engine Treatment>

- When the machine is not to be used for 60 days or more, store it after the following treatment.

- ① Drain the gasoline from the fuel port on the fuel tank.
- Do not store the drained fuel divided in small fuel containers, but store it in a manner which complies with the Fire Service Law.
- ② Remove the strainer and open the fuel cock.
- The fuel in the tube between the fuel tank to the strainer can be drained.
- ③ Attach the strainer to the original position.
- ④ Place a container under the carburetor float chamber and loosen and remove the bolt at the bottom of the carburetor float chamber.
- As the fuel in the carburetor float chamber will then drain out, catch it in a gasoline container.
- ⑤ When the fuel is quite drained, close the fuel cock.
- ⑥ Attach the bolt on the carburetor float chamber to the original position and fasten it securely.
- ⑦ Change the engine oil according to the procedure in "Engine Oil Change" on page 16.
- ⑧ Pull the recoil starter handle and stop it at the position where it feels heavy and resistant (Compressed Position)
- ⑨ Wipe each section with an oily cloth and cover it. Then store it in a dry place.



<Machine Body Treatment>

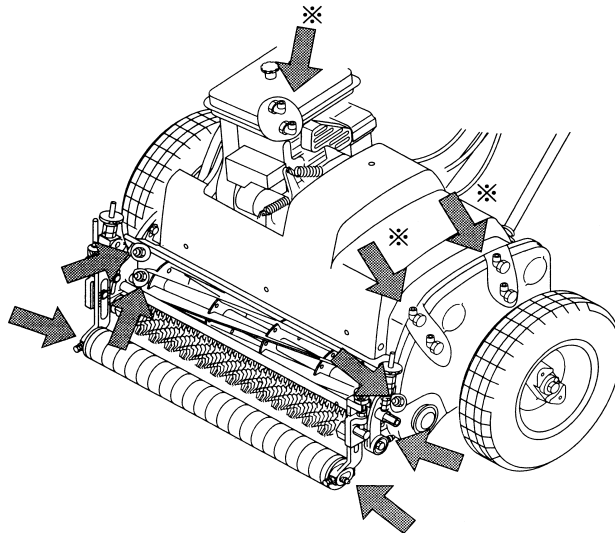
- ① Apply grease to the reel blade and bed knife.
 - ② Wipe the machine body with a dry cloth and check that no paint is peeling.
- If there is any section where the paint is peeling, apply paint for rust prevention.

■ Grease Supply

**WARNING**

- Always use grease without denaturation or degrading on the machine.
- The greasing application locations are shown in the following figure. Grease every 15 operational days.

The arrow mark shows the positions of the grease nipples (grease reinforcement locations).
Always apply grease, particularly at the ※ mark.

**IMPORTANT**

- The screw on the intermediate gear on the right frame should be turned counter-clockwise to fasten. When fastening, turn it counter-clockwise. If it is turned in reverse, the female screw will be damaged.

8 . Trouble and Treatment

For any abnormality of the reel blade, brake, or clutch that is not described in the following table, adjust it according to the procedure in "6. Adjustment" in this manual. If that does not prove effective, consult with our business or sales office where the machine was purchased.

Non-Conformity	Cause	Description	Remedy (page number is described in brackets)
Engine does not start	- No fuel to the engine - Appropriate fuel is not taken into the combustion - Fuel flow is not enough.	- No fuel in the fuel tank - The fuel cock is set to "CLOSE". - The fuel filter is clogged in the fuel strainer section. - Others	- Supply fuel.(P14) - Set the fuel cock to "OPEN". - Supply fuel - Set the fuel cock to "OPEN". - Clean or replace the fuel filter in the fuel strainer section. (P39) - Contact our sales office.
Difficult to start engine	- Strong spark not generated from the - Fuel is dirty.	- The engine switch is turned off. - The gap between the electrodes on the spark - Carbon is attached. - Spark plug malfunction - Denatured fuel - Others	- Turn ON the engine switch. - Adjust the gap between the electrodes to 0.6 to 0.7 mm (P37). - Cleaning or replacement of the spark plug. - Replace the spark plug - Replace the fuel (P14, 43) - Contact our sales office.
Engine Output Insufficient and Bad Operating Conditions	- Compression not enough/error - No compression - Less compression - Others - Heated engine and knocking	- Loosened spark plug - Loosened cylinder head - Damaged cooling fin - Excessive workload on the engine. - Spark plug not conforming to specifications - Others	- Fasten the spark plug. - Fasten further the cylinder head. - Contact our sales office. - Remove soil and dried grass and clean.(P38) - Reduce the workload to appropriate level. - Replace it with specified spark plug.(P37) - Contact our sales office.
Rotation Fluctuation	- Fuel circulation error - Air inhaled from the suction pipe system - Carburetor adjustment error	- Clogging of the fuel filter in the fuel strainer section. - Others	- Clean the fuel circuit. (P39) - Contact our sales office. - Contact our sales office.
Engine Speed not increased	- Air intake insufficient - Pressure on exhaust - Less fuel flow - Heated engine	- Dirty air cleaner - Clogging of exhaust hole and muffler - Clogging of fuel filter - Spark plug error - Workload too heavy for the engine - Others	- Cleaning/Replacement of air cleaner (P38) - Cleaning - Cleaning/Replacement (P14) - Cleaning/Replacement (P37) - Reduce workload to appropriate level. - Contact our sales office
Fuel Consumption Excessive (Black smoke)	- Incomplete combustion due to insufficient air intake - Incomplete combustion due to fuel - Others	- Dirty air cleaner - Mixed impurity or degradation of fuel	- Cleaning/Replacement (P38) - Fuel replacement (P14, 43) - Contact our sales office.
Lubricant Consumption (White smoke)	Oil burning.	- Excessive oil in crankcase. - Others	- Reduce oil to the specified level. (P15,16) - Contact our sales office.

9 . Functions and Specifications/Accessories/Options

■ Functions and Specifications

Model Name	22 inch Green Mower	26 inch Green Mower	Tee Mower
Model No.	GM222-A9	GM262-A9	TS262-S
Performance and Function			
Engine	Robin EH17-2B		
Total Displacement	172cc		
Max. Output	4.4/2000 (kw/rpm)		
Fuel to be used	Lead-free gasoline for cars		
Fuel Tank Capacity	3.6 (litre)		
Lubricant	Engine oil for cars		
Lubricant Amount	0.65 (litre)		
Ignition System	Contactless magnet ignition		
Spark plug	BP2HS (Gap: 0.7 mm)		
Starting System	Recoil Starter		
Mowing Height Adjustment	2.0 mm (for the use of thin blades) to 30 mm		
Tire	3.00/3.25-6,4PLY standard air pressure 2.5kg/cm ²		
Mowing Width	560mm(22 inch)	660mm(26 inch)	
Lawn Mowing Performance	2500~3000 m ² /h	2900~3400 m ² /h	
Outside Dimension	870(W) × 880(H) × 1320(L)	956(W) × 880(H) × 1320(L)	
Weight	96kg	102kg	

※The specifications might be changed for improvement without any notice.

■ Model composition

Function Model No.	No Cell	Exist Cell	THATCHING	GROOMING	Reel Blade			Bed Knife	
					7 blades	9 blades	11 blades	3.5	4.5
GM222-A9	○					○		○	
GM222-A11	○						○	○	
GM222B-AC9	○		○			○		○	
GM222B-AC11	○		○				○	○	
GM222B-AD9	○			○		○		○	
GM222B-AD11	○			○			○	○	
GM222BS-AD11		○		○			○	○	
GM262-A9	○					○		○	
GM262-A11	○						○	○	
GM262B-AC9	○		○			○		○	
GM262B-AC11	○		○				○	○	
GM262B-AD9	○			○		○		○	
GM262B-AD11	○			○			○	○	
GM262BS-AD11		○		○			○	○	
TS262-S	○				○				○
TS262B-C	○		○		○				○
TS262-C	○			○(Only a roller)	○				○
TS262-S9	○					○			○

■ Accessories

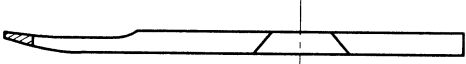
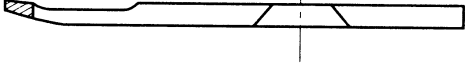
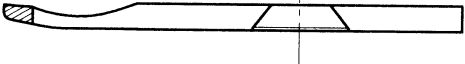
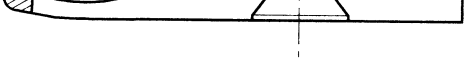
• Blade Alignment Tool	1	• Plug Turning Tool (with a bar)	1
• Cutting Height Gauge	1	• Bucket (with a fixture)	1
• wrench for the hexagon bolt (6.5m/m)	1	• Manual / Parts Catalog	1

Functions and Specifications/Accessories/Options

■ Options

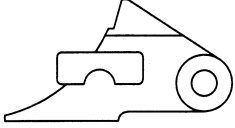
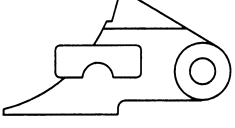
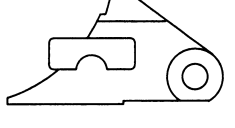
- If you don't have the lapping machine, a manual lapping machine can be provided. Contact our sales or business office.

<Bed Knife Types>

Bed Knife Name	Bed Knife Shape	General Mowing Height
Thin Bed Knife 2.5 (Tournament Blade)		2.5 ~ 3.5mm
Thin Bed Knife 3.0		3.0 ~ 4.0mm
Standard Bed Knife 3.5		3.5 ~ 4.5mm
Thick Bed Knife 4.5		5.0mm ~

The mowing height using the above blade varies depending on undulation.

■ The kind of the Bed Knife Shoe

Bed Knife Shoe	Bed Knife Shoe Shape	Bed Knife Use
Bed Knife Shoe: Standard (of 8.5)		
Bed Knife Shoe: Option (of 4.0)		For preventing uneven cutting (Bad for cutting in grass)
Bed Knife Shoe: Option (of 12.5)		For even cutting (Too good for cutting in grass)

22 inch: Bed Knife 4 Kinds, Bed Knife Shoe 3 Kinds, Bed Knife Shoe Assy 12 Kinds

26 inch: Bed Knife 4 Kinds, Bed Knife Shoe 3 Kinds, Bed Knife Shoe Assy 12 Kinds



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