

INSTRUCTION MANUAL



GRASSLAND MOWER RABBIT RM60W



Read this instruction manual carefully before any use of the machine, keep it as a reference. For any question about this manual, please report to your OREC dealer or to the distributor of your country.

OREC CO LTD
548-22 HIYOSHI HIROKAWA-MACHI YAME-GUN JAPON
<http://www.orec-jp.com>

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“only the English version of this manual can be used as a reference.”

INTRODUCTION

Forward to the user

Read this manual before any use of your mower, only the herein instructions shall help you to achieve an efficient and safe work.

A safe use will only result from the manner you will use the machine in accordance with the restrictions described in this manual. Thus, you must know and follow all the safety measures in this manual and those relating to the use of your tractor.

The mower that you have just bought has been designed and manufactured for your entire satisfaction. As any other mechanical machine, it requires a proper maintenance and must be kept clean. Grease the machine like indicated. Follow the rules and safety indications as described in this manual and as showed on the preventive instruction stickers.

About maintenance, always mind that your OREC dealer has the skills, the genuine parts and the necessary tools to solve the possible problems.

Use only the OREC original parts : “ non genuine ” parts will not assure you of a correct and safe working and are likely to make the guarantee null and void. Write the name and the serial number of your machine hereunder :



OREC CO.,LTD MADE IN JAPAN	
YEAR	_____
TYPE	_____
SERIAL NO,	_____
POWER	_____
WEIGHT	_____
CE	

MODEL :

SERIAL NUMBER (refer to the pictures herein) :

Always mention these informations to your dealer in order to obtain the right parts.

Concerned about constant progress, OREC keeps the right to modify the machines without being compelled to modify those already sold.

The illustrations and characteristics in this manual might lightly differ from your machine because of the constant improvements made by our production department.

In this manual, the left and the right hand or the rear and the front position are determined according to the tractor seat.

All along this manual the word IMPORTANT is used to indicate that a fault might cause damage to the machine. The words DANGER, WARNING, and CAUTION are used with the “ safety/warning ” pictogram (triangle with an exclamation mark) in order to indicate a hazard for your safety.

DANGER

Indicates danger that causes serious injury or death if the right precautions are not taken.

WARNING

Indicates risk that is likely to cause serious injury or death if the right precaution is not taken.

CAUTION

Indicates risk that might cause injury if the right precautions are not taken or that might cause damage on the product.

TIP :

Indicates useful hint for operation and maintenance of the product, and to avoid faulty operation.

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SPECIFICATIONS

Model	RMK60W
Engine	KAWASAKI FS541V
Transmission	Hydrostatic
Forward speed	0 - 9 km/h
Reverse speed	0 - 7 km/h
Cutting width	705 - 1155 mm
Height of cut	50 - 100 mm
Weight	310 kg
Fuel Tank	14 liters
Blade transmission	belt
Steering	Rack and pinion
Blade engagement	Belt tension
Width mm	1175

CHECK LIST

INSTRUCTIONS TO THE DEALER

The assembly, the installation and the first application of the machine is under the OREC dealer’s responsibility.

Read the instruction manual as well as the safety measures. Check that all the before delivery and at delivery check points specified in the following lists have been verified and possibly modified before delivering the machine to its owner.

CHECKS BEFORE DELIVERY

- Check that all the shields, grids and safety guards are in place and in a good condition.
- Check that the hydraulic hoses are in place and in a good condition. Replace them if necessary.
- Check that there is no oil leak, repair if necessary.
- Check that the safety instruction stickers are in place and in a good condition. Replace them if necessary.
- Check that all the bolts and screws are properly tightened with the correct torque (refer to chart).
- Protect the grease nipples by coating them with grease and lubricate the machine.
- Check that the machine can work properly : check blade engagement and disengagement, check that the safety switches work properly.

CHECKS ON DELIVERY

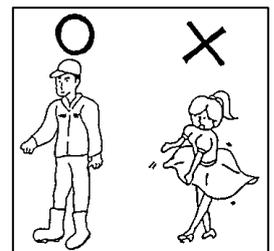
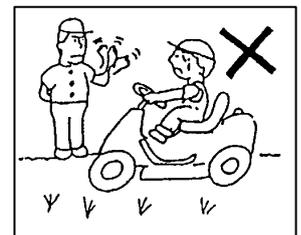
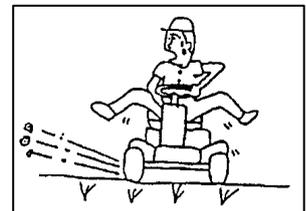
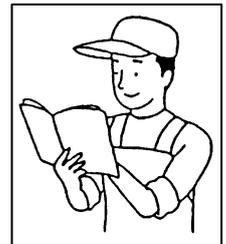
- Show the user how to use the machine and perform the adjustments.
- Explain to the user the importance of the lubrication and show him the different greasing points on the machine.
- Show him the safety devices, shields, guards and the optional equipments.
- Give the instruction manual to the customer, ask him to read it carefully.
- Explain to the customer that drive on the public roads is forbidden.
- Explain to the customer how to use each control and how works the blade engagement. Explain to never use the machine if the blade doesn't disengage properly.

SAFETY RULES

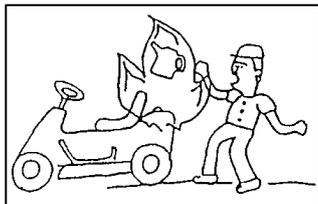
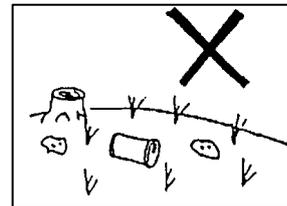
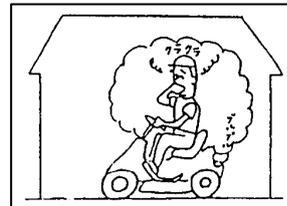
CAUTION

Some of the illustrations show the machine with no guard, no shield. Never use the machine without these devices.

- Learn to stop the machine in case of emergency.
- Read, understand and respect all the safety instructions of this manual.
- Do not let anybody use the machine before having read and understood this manual.
- Do not use the machine near bystanders : they can be hit by thrown objects
- Do not let children use the machine.
- Do not wear loose clothes. They might be grasped by moving parts.
- Always wear protection equipments when using the machine.
- Only work during daylight or with a good artificial light.
- Check that the safety instruction stickers are in place and in a good state.
- Keep the machine free from debris or mud.
- Check that the machine can work properly before any use.
- Check that all the shields, grids and safety guards are in place and in a good condition.
- It is strictly forbidden to carry persons or animals onto the machine during the work or during the transportation.
- Check that nobody stands behind the machine before moving back.
- Never stop or start roughly when working on a slope. Never use the machine to work on a stepping terrain.
- Do not use machine on a slope more than 10°.
- Reduce the ground speed when running on a slope and when turning straight in order to prevent from any risk of losing control.
- Be very careful when bordering ditches.
- Stop the engine, apply the handbrake and remove the ignition key before any intervention on the machine.
- Never work under the machine or its parts when lifted, unless they are blocked and maintained into position with sufficient security.
- When running on a slope, always work going up or down but never across the slope.
- Steer clear of unsteady embankments, holes or rocks. They might be dangerous during manœuvres or transport.
- Be careful when working on slopes.
- Keep away from high-tension lines and obstacles. A contact with a high-tension line cause electrocution and death.
- Stop the machine progressively when travelling up and down slopes.



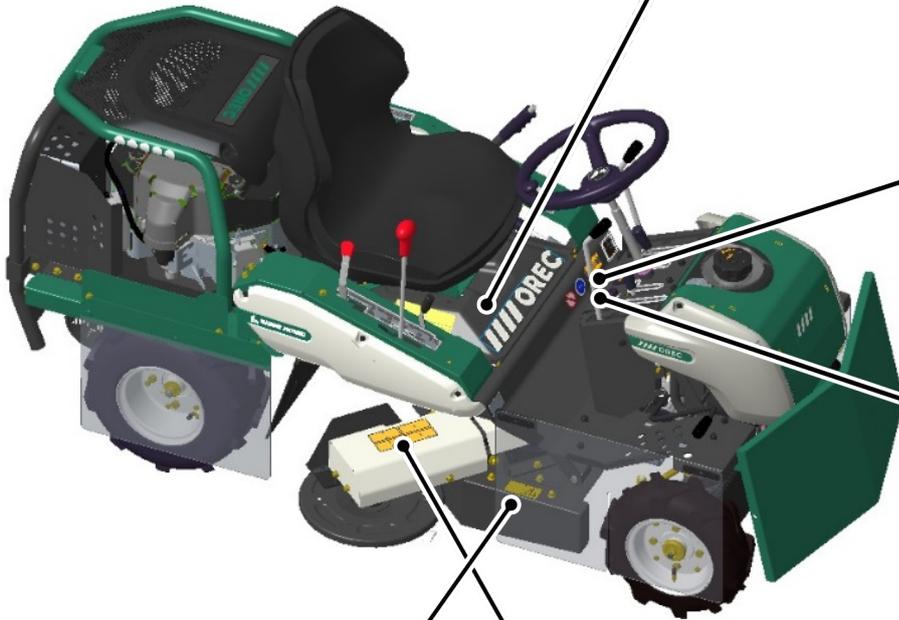
- When stopping the work, stop the engine and put on the handbrake before leaving the mower.
- Engage all the safety equipments.
- Move the controls only when the operator is correctly seat down in the operator seat
- Visually check hydraulic leaks and if some parts are faulty or missing. Repair before use.
- A hydraulic oil jet due to a leak can penetrate under the skin causing serious injuries. In this case you must immediately consult a doctor.
- Never change the adjustment of the safety valve, it is set in the factory. Unsetting this valve would cause failures.
- Ensure that the user of the machine has already read and understood this manual and that he is aware of all the safety instructions before any use.
- Always use a chuck and bronze hammer when replacing or intervening on the pins and bolts at the end of rams, rod ... etc in order to avoid the projection of metal fragments



SAFETY INSTRUCTION STICKERS

Note their location and replace them immediately if they are damaged or missing.

Remove the spark plug wire before maintenance	Beware of thrown objects	Stay away from the machine	Read owner's manual



Do not exceed 15° slope

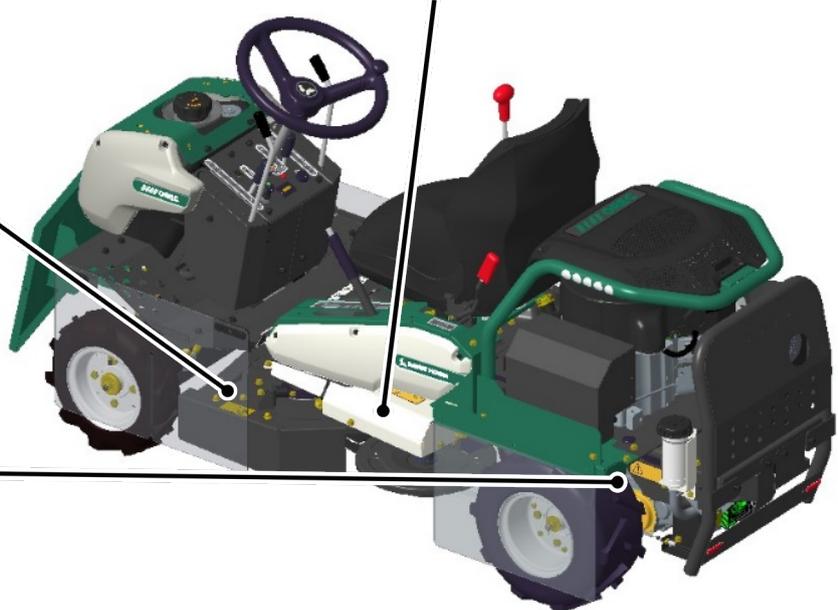


Always wear protective equipment against noise, dust

Keep hands and feet away from rotating blades	Stay away from the machine	Beware of rotating parts under the shields	Beware of thrown objects

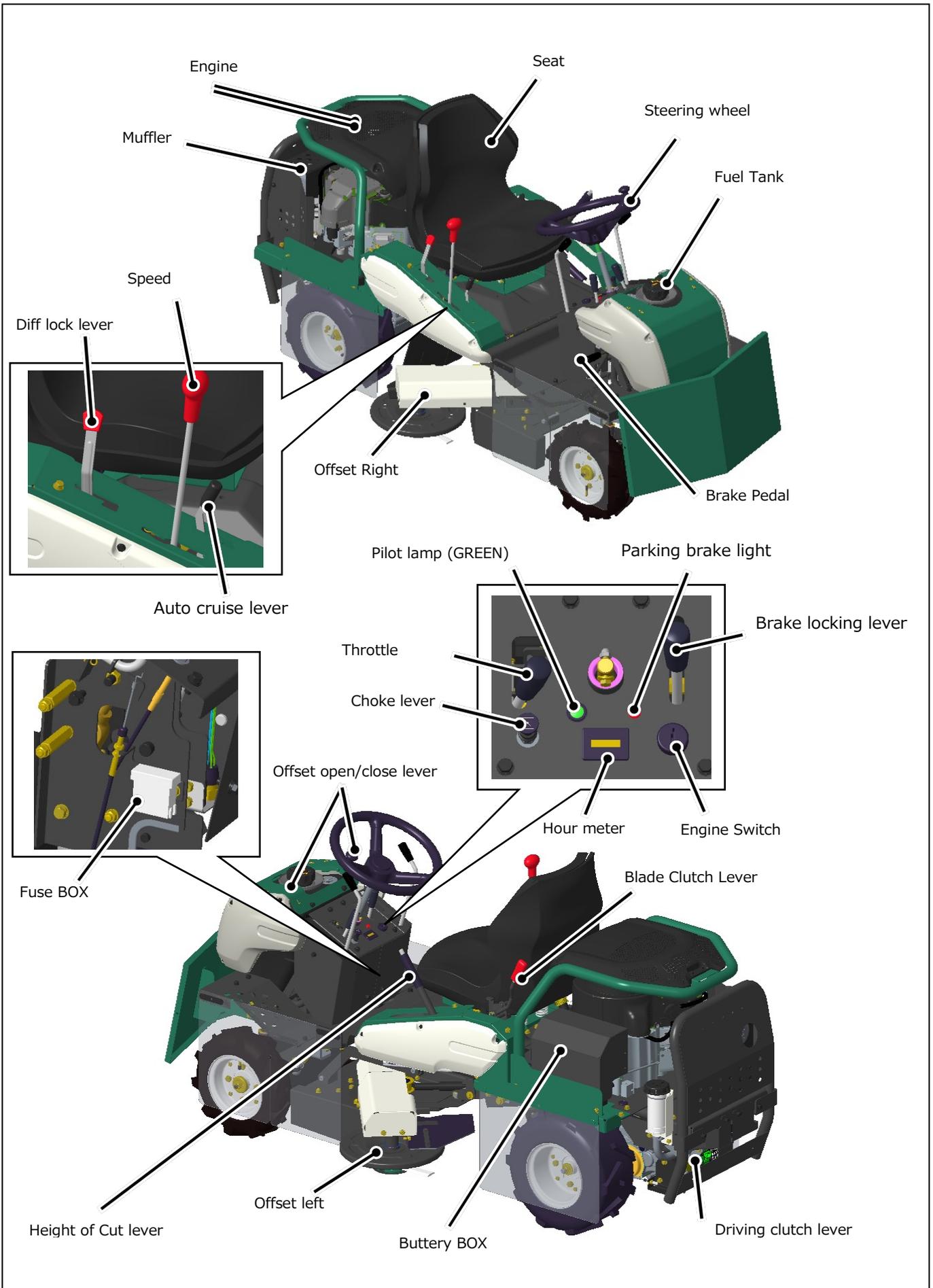


Keep hands and feet away from rotating blades



Beware of rotating parts under the shields

MACHINE DESCRIPTION



CONTROLS

ENGINE SWITCH

Insert ignition key to select start(🔑), ON(I), and Stop(O).

THROTTLE LEVER

Use throttle lever to adjust engine rpm between MAX and MINI.

CHOKE LEVER

Use choke lever when it is cold to start engine.
Pull to close the choke(🔒), and push to open(🔓).
There is no need to use choke lever when engine is warm enough.

HEIGHT OF CUT LEVER

Height of cut is adjustable between 50mm and 100mm.
Press the lock button, select the height and release the finger from lock button. Height of cut is indicated on the label near the lever.
Engine is stated only when this lever is in transport position.

⚠️ CAUTION

Push the lock button completely while height of cut lever is adjusted. If not, machine may be damaged. For your safety, select the transport position when machine enter/exit the field and also when going reverse.

BLADE CLUTCH LEVER

Use the blade clutch lever to switch the blade rotation ON(🔘) or OFF(🔙).
Blade clutch lever cannot be activated when height of cut lever is in transport position.

DIFFERENTIAL LOCK LEVER

Normally operate the machine with differential lock lever in OFF position. Shift the differential lock lever to ON in case of light slope, soft ground, or when single rear wheel slips too much to go straight. It is also recommended to shift the differential lock lever to ON when machine is loaded/unloaded to/from the track.

⚠️ CAUTION

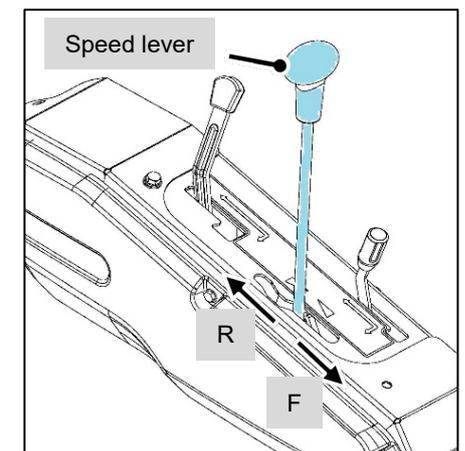
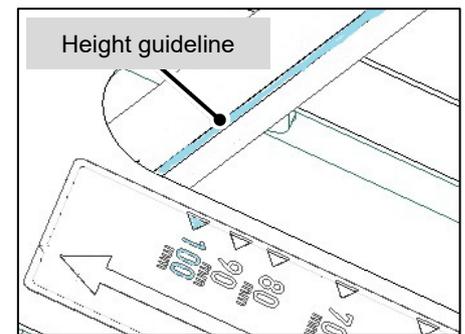
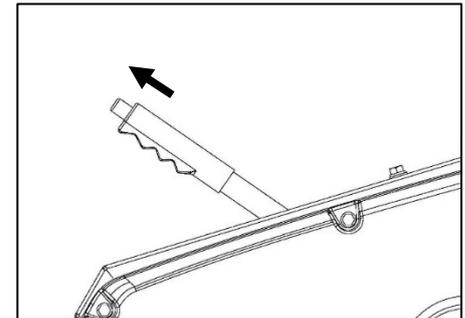
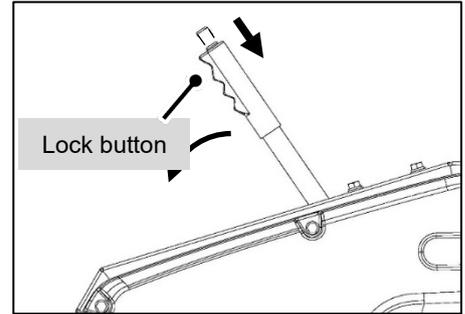
The diff lock should be used only in straight line : never use the diff lock lever when turning. The damage to the transmission will not be covered by the warranty

SPEED LEVER

Use the speed lever when driving, stopping, turning, and adjusting the speed.

AUTO CRUISE LEVER

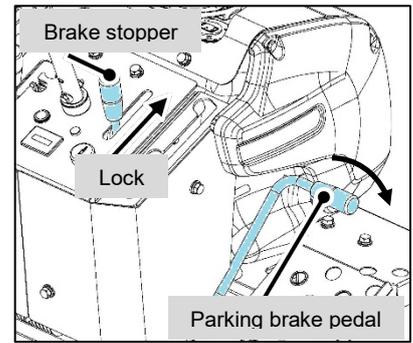
Use the auto cruise lever to fix the driving speed. While auto cruise lever is in “🕒” position, speed control lever does not return to neutral position(except reverse speed).
Remember to activate the auto cruise only when machine is stopped. Auto cruise is cancelled when brake pedal is pressed, then speed control lever returns to neutral position.



PARKING BRAKE PEDAL

In case of emergency, when parking brake pedal is pressed, brake is activated to stop the machine and speed control lever returns to N position. Normally use the speed control lever to stop the machine.

While brake pedal is pressed, it is possible to use brake stopper to lock the parking brake. Parking brake is cancelled when brake pedal is further pressed. Engine is started only when parking brake is pressed.



BLADE COVER

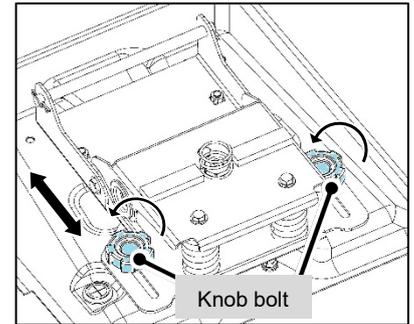
It is possible to remove this cover in case of blade inspection or maintenance. Normally operate the machine with this cover fixed.

WARNING

It is very dangerous to cut grass without blade cover because a lot of thrown object is expected. Except blade inspection or maintenance, make sure that blade cover is properly fixed.

SEAT(SEAT SLIDE)

Seat slide is adjustable. Loosen the 2x knob bolt behind the seat, and slide the seat as needed. Pay attention to securely tighten the knob bolt in order to avoid unexpected movement during operation. After the engine is started, when operator leave the seat, engine is stopped for safety(engine switch remains "I").



CAUTION

Switch off the engine switch when engine is stopped. Or start the engine again. If engine is left stopped, battery power may be lowered.

DRIVING CLUTCH LEVER

Normally operate the machine with this lever in ON position.

In case of low battery or transport in a closed room, it is not good to start engine, therefore shift the driving clutch lever to OFF to manually push the machine.

FUSE BOX

Fuse box protect harness and electrical components in case of over current. It contains 10A(accessory), 20A(charge) and another 20A(spare). When fuse is cut, solve the problem and replace with spare fuse. Spare fuse is only for emergency use, and replace it with genuine fuse.

PILOT LAMP(GREEN)

Pilot lamp is turned on when engine switch is in "I" position.

HOURLY METER

Hour meter shows rough hours of use. Refer it for maintenance.

PARKING BRAKE LAMP(RED)

Parking brake lamp is turned on when parking brake is activated.

OFFSET OPEN/CLOSE LEVER

It is possible to move the offset angle in 3 positions. When the lever is in MAX position, offset is fully open. When the lever is in MINI position, offset is fully closed. Offset lever is located in both right and left. Right lever operates offset R, and left lever operates offset L.

INSPECTION BEFORE USE

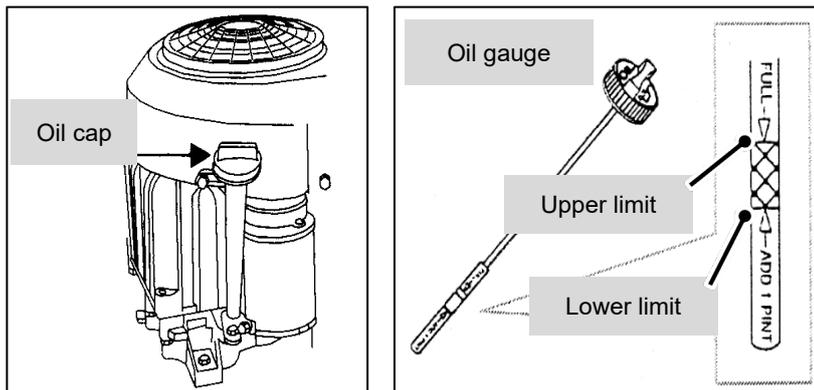
Before each use of machine, refer to table below and realize the inspection.

LIST OF PRE-USE INSPECTION		
	Where to check	Check point
Engine	Engine oil	Quantity and dirt of oil
	Air cleaner	Dirt
Machine	Blade	(1) Looseness or loss of bolt
	Brake(if equiped)	(2) Deformation, wear or contact
	Tire	(3) Smooth movement or sticking
	Lever(s)	(4) Remove dust and grass
	Cover(s)	
	HST oil(if equiped)	Quantity and dirt of oil

WARNING

- 1) Always make inspection, re-fueling, adjustment and maintenance only after engine is stopped.]
- 2) Make sure about position of each lever and safety around the machine, before to start engine and check the movement of levers.
- 3) Check and read the safety labels on the machine.

ENGINE OIL INSPECTION

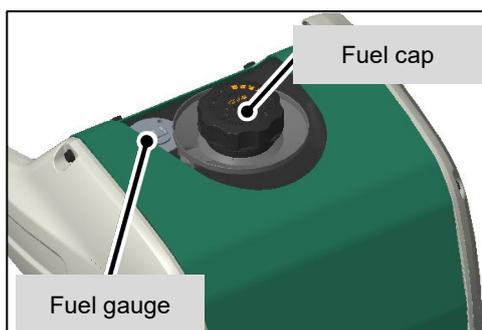


- 1) Place the machine on flat surface and remove the oil gauge.
- 2) Edge of oil cap is designed as oil gauge. Wipe the oil gauge with cloth and insert it to check the oil level. If oil level is not between upper and lower limit, add engine oil until the level comes between upper and lower limit.

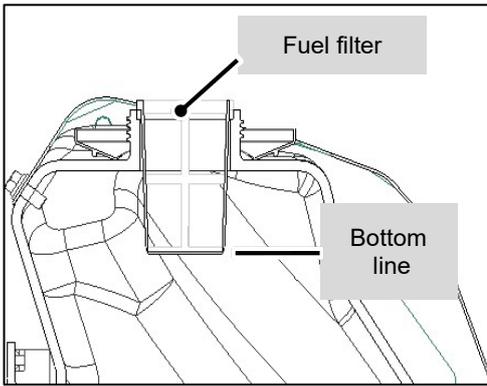
CAUTION

- 1) In case of checking engine oil after the work, wait more than 5 minutes to cool down the engine. Make sure if muffler and engine is cooled enough.
- 2) Shortage of excess of engine oil cause engine trouble. Check the engine oil before every use.
- 3) Recommended engine oil type is 10W-30.
- 4) After the engine oil is filled up, securely fix the oil gauge. If the fixing is loose, engine oil may leak.

FUEL INSPECTION AND REFUELLING



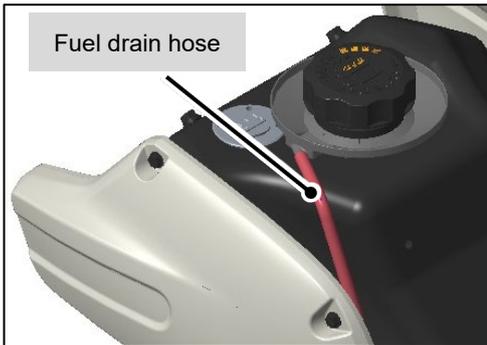
- 1) Place the machine on flat surface and remove fuel cap. Check the level of fuel through fuel mouth.
- 2) In case fuel gauge is close to "E", it is necessary to refuel.



3) Do not put fuel higher than bottom level of fuel filter. Otherwise fuel may spill out on uneven ground or on slope. Spilled fuel comes out through the fuel drain hose and drained underneath the machine. Wipe the spilled fuel.

4) After refuelling, place the fuel cap and tighten it.

Fuel gauge is only for reference. In case of slope operation, put less fuel than bottom level of oil filter. Fuel may spill out depending on angle of slope.



⚠ DANGER

- 1) Never use fire while working with machine or while refueling. It causes catch fire or burn. Smoking and open-air-fire is strictly prohibited near the machine.
- 2) Wait until the muffler is cooled enough for refueling.
- 3) Do not add fuel more than upper limit if it is indicated.
- 4) Do not refuel in case your body is charged. It may lead to catch fire.

⚠ WARNING

Work with fuel only on a flat surface well ventilated.

⚠ CAUTION

- 1) Do not let dust or grass to come inside the fuel tank. It leads to engine trouble.
- 2) Use only lead-free regular gasoline. Otherwise, engine might be damaged.
- 3) Gasoline degrades by time. In case of non-use for more than 1 month, replace gasoline to new one. Also, do not use gasoline stored in polyethylene tank.

OPERATION

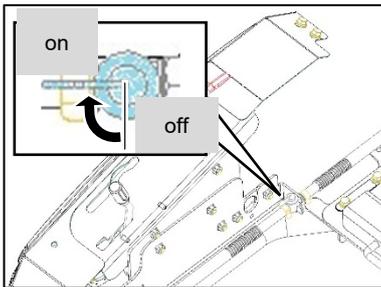
WARNING

Remember to read the instruction before the use to understand the operation and work of this product.

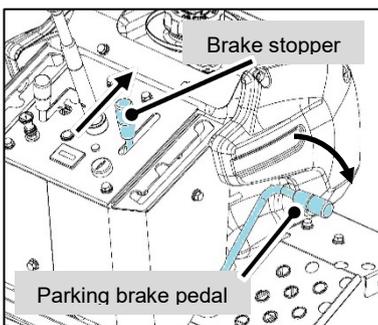
STARTING THE ENGINE

TIP :

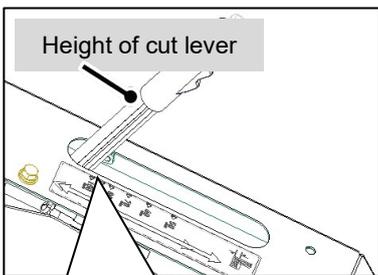
- 1) Make sure to be seated.
- 2) Make sure to press the parking brake pedal(=locked) to start engine. If brake pedal is not pressed, safety switch works and engine cannot be started.
- 3) Make sure that height of cut lever is in transport position. In other position, engine cannot be started.
- 4) Make sure that above 1) ~ 3) procedure is respected when starting the engine.



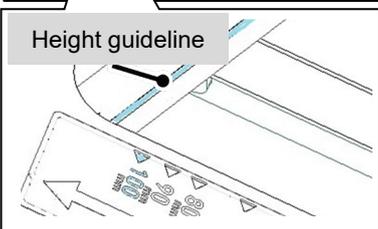
- 1) Open the fuel cock.
- 2) Stay on the seat.



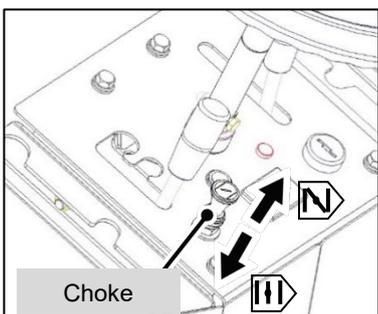
- 3) Press the parking brake pedal and lock the brake stopper. If speed control lever is not in N position, shift it to N position.



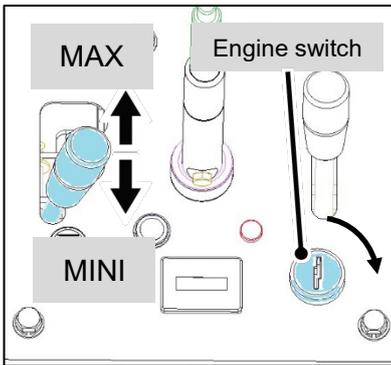
- 4) Adjust the height of cut lever to top(=transport position).



- 5) Make sure that speed lever is in N position, then pull the choke lever(pull to close, push to open) if engine is not warm enough.



- 6) Move the throttle lever to intermediate position between MAX and MINI(upper position is MAX and lower position is MINI).



- 7) Insert the ignition key to engine switch, then turn the key from "I" position to "⊗" to start engine.
- 8) When engine is started, leave hand from the key. Key automatically turns back to "I" position.
- 9) After engine is started, push back the choke lever (to ) then move the throttle lever to MINI to warm the engine for about 5 minutes.

⚠ WARNING

For your safety, make sure to keep parking brake pedal "locked" by brake stopper, while warming the engine.

⚠ CAUTION

When starting the engine, do not keep ignition key more than 5 seconds at "⊗" position because big amount of electricity runs into cell motor.

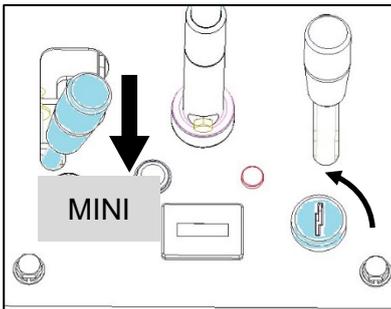
If engine cannot be started within 5 seconds, turn the key to "O" and wait more than 10 seconds, then try again.

While engine is running, do not turn the key to "⊗" position. This may lead to trouble of cell motor. If engine is warm enough, start the engine with throttle lever at intermediate position.

TIP :

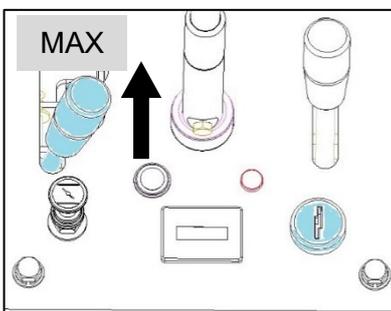
Warming up the engine can circulate the oil inside the engine, and it is better for engine lifetime.

STOPPING THE ENGINE

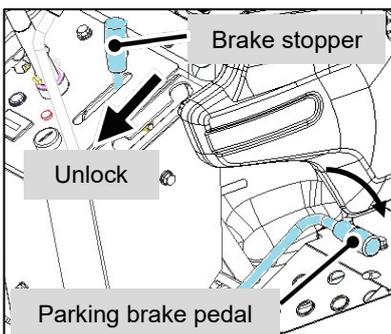


- 1) Move the throttle lever to MINI.
- 2) After 2-3 seconds at MINI position, turn the key to "O" position to stop engine.
- 3) Remove key from engine switch.
- 4) Close the fuel cock.

DRIVING



- 1) Start the engine.
- 2) Move the throttle lever to MAX to increase the engine rpm.
- 3) Press the parking brake pedal to unlock the brake stopper. Do not change speed while parking brake pedal is locked. Driving the machine with parking brake locked will bring overload on brake and transmission and cause the breakdown.
- 4) Slowly shift the speed control lever forward and start driving.



TIP :

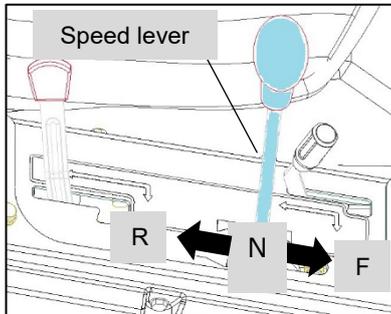
Driving speed is adjusted following the tilt angle of speed control lever. For your safety, start driving in low speed.

STOPPING(PARKING)



CAUTION

In case parking brake pedal is pressed during the driving, speed control lever quickly comes back to N position and machine stops. Normally use speed control lever to stop the machine. Especially in high speed, sudden stop may give physical shock on operator and overload on machine body.



- 1) Place the speed control lever to N position and stop the machine.
- 2) Move the throttle lever to MINI and decrease engine rpm.
- 3) After 2-3 seconds at MINI position, turn the key to "O" position to stop engine.
- 4) Press the parking brake pedal, and lock it with brake stopper.



CAUTION

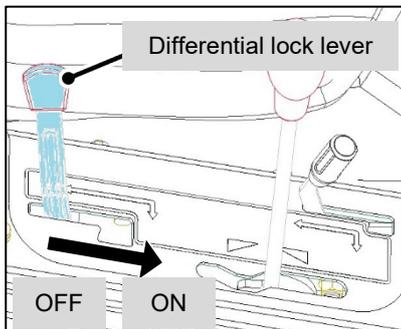
Machine should be parked on a flat and spacious area, without obstacles around the machine. If there is need to park on slope, make sure to use car stopper. Remove key to avoid theft.

TIP :

Be sure to use engine switch to stop the engine. In case parking brake pedal is locked and height of cut lever is in transport position, engine does not stop when operator leave the seat. However, if the pedal and lever is in other position, engine stops when operator leave the seat (pilot lamp remains ON and engine switch is in I position). If the machine is left in such status, battery will get empty. Remember to lock the parking brake pedal, return the height of cut lever to transport position and turn the key to O position.

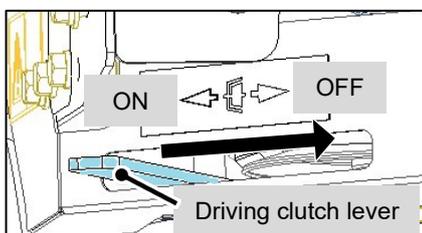
After engine is started, engine does not stop if operator is seated regardless of parking brake and height of cut lever positions.

DIFFERENTIAL LOCK LEVER CONTROL



- 1) Normally operate the machine with differential lock lever in OFF position. In case of wet ground or steep slope, move the differential lock lever to ON and lock it.
- 2) After the machine get out of wet place or steep slope, move back the lever to OFF position.

PUSH MODE



On a flat ground, it is possible to push machine without engine power when driving clutch lever is in OFF position. This is called "PUSH MODE" and it is recommended in case of engine trouble.



WARNING

- 1) Except the use in PUSH MODE, always place the driving clutch lever in ON position.
- 2) For safety, PUSH MODE is recommended for two person or more.
- 3) On the slope, do not place the driving clutch lever to OFF, because it may cause slipping accident.

LOADING/UNLOADING/TRANSPORTING

⚠ DANGER

- 1) Stop the engine and close the fuel cock while transporting this machine. Otherwise, fuel may leak and may cause fire accident.
- 2) Do not lean the machine more than necessary, because fuel may spill over.

⚠ WARNING

- 1) Always use the bridge for loading/unloading. In case of loading/unloading by hook, there is a risk of falling and is very dangerous. Never use hook for loading/unloading.
- 2) Do not stop on the bridge. If the machine balance is heavier in the back, front of the machine may be lifted up when driving is started again. Load/unload the machine only in slow speed.
- 3) Place the height of cut lever to transport position during loading/unloading. Otherwise blade may touch the bridge and it may cause tipping over.
- 4) Keep the differential lock lever to ON, and do not move it on the bridge.
- 5) On the truck, keep the engine off and fuel cock closed, and remove the key. Fix the machine with rope/belt which is strong enough.

LOADING/UNLOADING



- 1) Move forward for loading and move backward for unloading.
- 2) Use the bridge certified in safety.
- 3) Place differential lock lever to ON, height of cut lever in transport position, and do not place into other positions.

TIP :

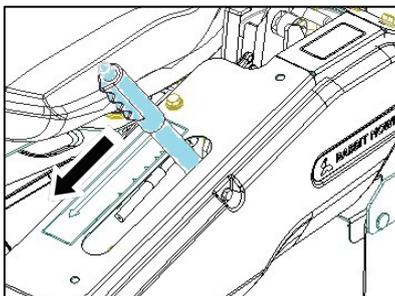
Recommended bridge : Use only certified bridge, which is strong enough.

Length : to be more than 3.5 times longer than height of truck.

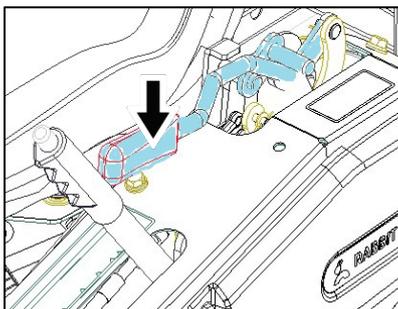
Width : to be suitable for width of this machine.

Strength : to be strong enough against total weight of machine and operator.

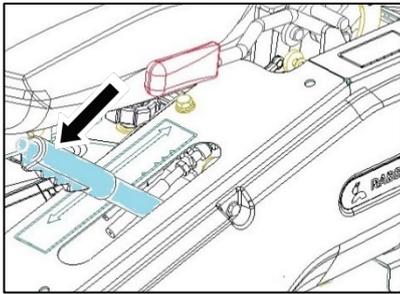
MOWING



- 1) Start the engine.
- 2) Move the throttle lever to MAX and increase engine rpm.
- 3) Place height of cut lever at 100mm.



- 4) Push down the blade clutch lever forward.



- 5) Adjust the height of cut lever as needed.
- 6) Start mowing.
- 7) Take reverse procedure to stop mowing.
- 8) Stop the engine.

WARNING

- 1) Regularly clean the grass around the engine and muffler, because it may cause fire or overheat. It is also good to clean inside of engine bonnet.
- 2) It is possible to get damaged by thrown object such as stone, wire, can and so on. Pay attention to remove them before mowing. Also keep neighbors away from the machine.
- 3) Mud and dust near the cooling system may raise oil temperature in the engine and in the HST unit. Regularly clean the mud and dust away.
- 4) Do not mow toward building, river, cliff and person for the purpose to avoid fall or collision accident.
- 5) When mowing on slope, do not stand up in the mountain side, because there is risk of slipping down into the mowing deck. It may lead to serious injury.
- 6) In case of removing grass or wire from the blade, make sure to stop engine first and check if blade is completely stopped.
- 7) Before to start mowing, make sure that defective part in previous work is already repaired.
- 8) For your safety, inspect blade and blade disc rotary.
- 9) In case of hitting obstacle during mowing, stop the engine and repair if necessary. If mowing is started without proper repair, it may lead to accident.
- 10) There is risk of slipping when grass is wet or it is rainy day. And grass may be stuck inside the mowing deck, leaving the engine overworked. In such case, stop the work and wait until grass get dry.
- 11) Do not kick the grass into mowing deck because blade is rotating inside of blade cover. Do not use hand or foot to let grass into mowing deck.
- 12) This machine is specially designed to cut grass around the tree. Do not use it in a field with stone or uneven field to avoid thrown object. Check the field condition prior to the mowing work.

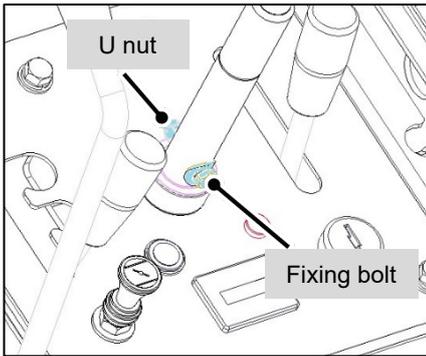
CAUTION

- 1) Wear protective cloth, boots, hat/helmet, protective glasses and gloves.
- 2) Check the field in advance, and remove stone, stamp, wire or cans away.
- 3) Use a bridge against the gap of more than 70mm. Crossing the gap in high speed may lead to tipping over or machine damage. Cross the gap only in low speed.
- 4) In case front wheel stuck into the hole or ditch, do not try to turn the steering wheel. Stop the engine and move up the machine to get away.
- 5) Pay attention to avoid accident to be pinched between tree and machine.
- 6) Pay attention to the blade that is rotating in high speed.
- 7) Pay attention to activate the blade clutch lever slowly.
- 8) Do not start mowing in lowest cutting height, because it may cause quick wear of blade belt.
- 9) When mowing is finished, move the blade clutch lever to OFF position, wait 2-3 seconds then move the height of cut lever to transport position. This is to avoid thrown object before blade stops.
- 10) In case of too much grass to cut or in case engine frequently stops, slow down the speed or mow twice in high and low position.

TIP :

- 1) When this machine is used for the first time, use it in a field without stone, and mow straight slightly overlapped.
- 2) In case of work on slope, it is recommended that RH of machine looks toward the hillside so that engine plug is heading up. Otherwise, engine oil may be burned and white smoke may appear.
- 3) In case height of cut lever is moved back to transport position, blade clutch lever also returns back. However, this way of use is not recommended because it may damage the lifetime of blade belt.
- 4) Blade clutch cannot be activated when height of cut lever is in transport position.
- 5) Basically use speed lever to stop the machine. In case of emergency situation, machine stops when parking brake pedal is pressed. At same time, speed lever goes back to N position.
- 6) Remember to remove key and keep it when operator leave the machine.

HANDLE/SEAT ADJUSTMENT



It is possible to adjust the handle in 3 position. And it is possible to adjust the seat slide back and force.

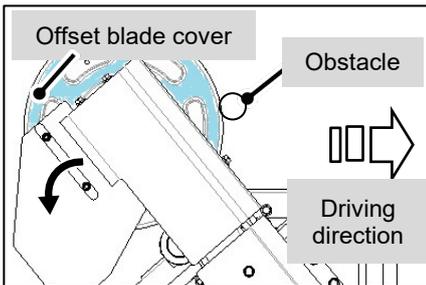
Seat position(back and force)

Pull up the lever and select the seat position suitable for operator.

Handle position(up and down)

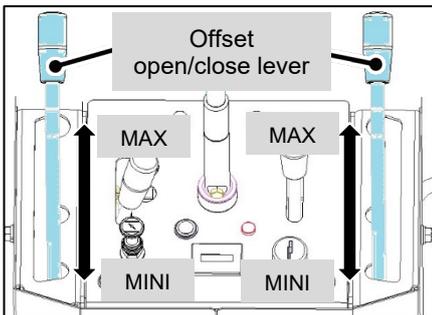
Loosen the bolt, adjust the handle position, and fix it with bolt and U nut.

OFFSET DECK OPEN/CLOSE



Offset cover is closed when it contacts obstacle(tree, etc.). In case of mowing along the obstacles, keep the offset cover contacted with obstacles and drive straight. Figure in left side shows offset L, and it is same way for offset R.

OFFSET DECK OPEN/CLOSE MANUALLY



Offset lever enables to manually open/close the offset deck. Left lever operate offset L, and right lever operate offset R. When lever is pulled, offset will be closed. Offset lever is adjustable in 3 position(closed, half open, and full open). Choose offset deck position suitable for the field.



CAUTION

- 1) Make sure if there is nobody between machine and offset deck, when offset deck is operated.
- 2) In case of mowing around the tree with offset blade cover(=option), do not drive faster than 2.0km/h, because contacting point may be broken.
- 3) Pay attention not to place offset wing on the hill part to be lifted up, because blade belt may slip. When blade belt slips with offset wing lifted up, disengage the blade clutch lever.

TIP :

Offset wing can mow up to 10 degree from main cutting deck. It is convenient for mowing around the tree, which is slightly hilly. Pay special attention for risk of thrown object while offset wing is lifted up.

MAINTENANCE OPERATIONS TO BE CARRIED OUT BY THE USER

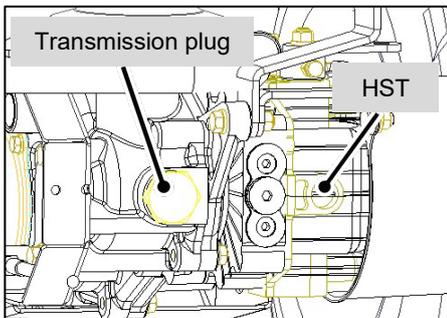
OIL MAINTENANCE

CAUTION

- 1) Refer the hour meter on the control panel, to know the period for inspection, replacement and filling up the oil.
- 2) Oil is filled up when it is shipped from factory. Before the first use of this machine, make sure if oil level is OK.
- 3) Regularly replace the oil in order to keep the machine in best condition.
- 4) Before to inspect/replace the oil, place the machine on flat and spacious area. Stop the engine to leave the machine to be cooled down for more than 5 minutes to be able to touch by hand.
In case maintenance is started just after engine is stopped,
-Engine is still too hot and it may cause burn.
-Correct oil volume is not indicated just after engine is stopped, because oil still remain in each part of machine
- 5) For safety, remove the key during the maintenance operation.

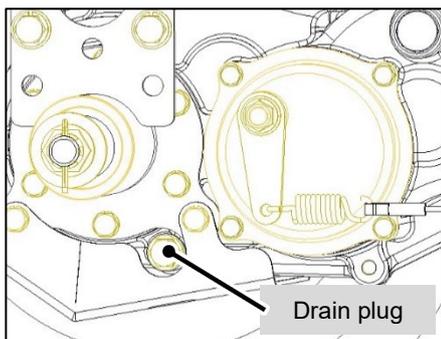
TRANSMISSION (GEAR) OIL

Inspection and filling up



It is possible to inspect the oil by removing the transmission plug behind the transmission. If oil reach the lowest level of the plug, proper volume is filled.

Replacement



- 1) Oil should be replaced at first 20 hours, and later at each 100 hours or every year whichever comes first. Prepare oil container and remove the drain plug located in left side of transmission case.

■ Replacement guideline

First : at 20 hours

Later : at each 100 hours or 1 year whichever comes first

- 2) Place the drain plug in original position. Remove the transmission plug and then put transmission oil.

Recommended oil : "SAE 90 "or "API GL-5".

Oil quantity : 1.00L.

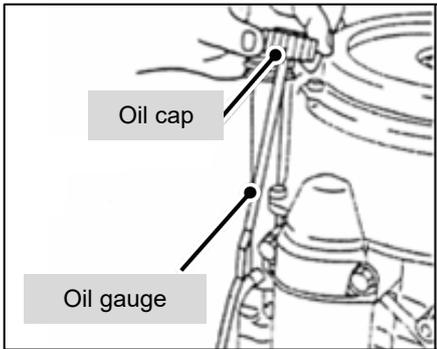
After the oil is filled, tighten the transmission plug securely to avoid the leak. Pay attention not to tighten the plug too much. When the gasket(O ring) contact the position, turn the plug in 3/4 rotation to fix it.

ENGINE OIL

CAUTION

Excess or deficiency of engine oil will cause engine trouble. Add engine oil in case of deficiency and reduce it in case of excess to maintain proper volume.

Inspection and filling up



- 1) Use the oil gauge to inspect the volume and quality of engine oil prior to every use.
- 2) Maintain the engine oil to be on maximum level on the indicator.

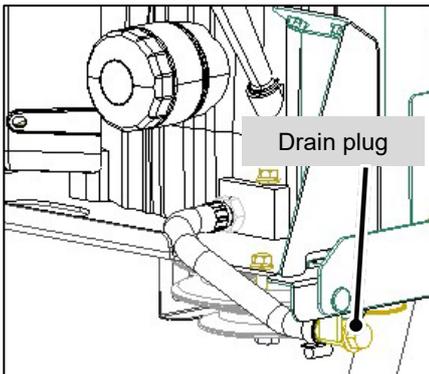
■ Replacement guideline

First : at 8 hours

Later : at each 100 hours or 1 year whichever comes first

In case of use in very hard or hot condition, it is recommended to replace the engine oil earlier at 50 hours and to replace oil filter at 100 hours.

Replacement



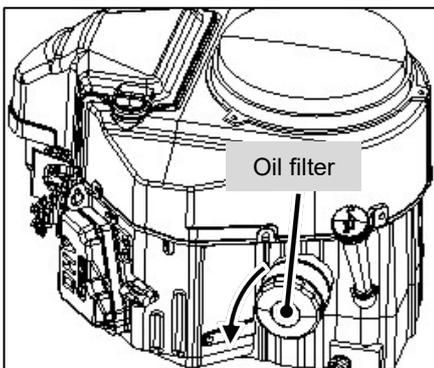
- 1) Prepare oil container and loosen the oil cap. Then remove the drain plug located in left front side of engine. Oil is drained smoothly when oil cap is loosened.
- 2) When the oil is completely drained, place the drain plug and fix it. Then remove the oil cap.
- 3) Put 1 liter of engine oil and run the engine for 30 seconds in low engine rpm. Stop the engine and wait for 30 seconds, then add oil up to FULL level.
- 4) After the engine oil is filled, make sure that oil cap is securely fixed.

OIL FILTER REPLACEMENT

⚠ CAUTION

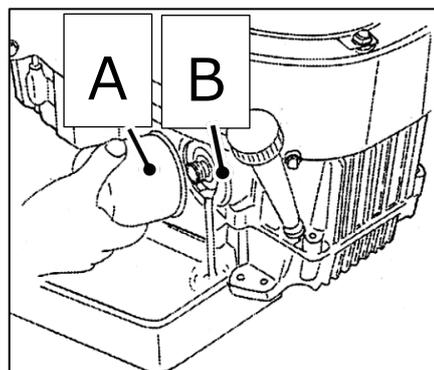
Do not use tool to fit oil filter, and fit it by hand.

Replace the oil filter one time against two replacement of engine oil, or replace oil filter every year.



After the engine oil is drained, follow the instruction below to replace the oil filter.

- 1) Turn the filter A counterclockwise and remove it.
- 2) In order to avoid twisting, place new engine oil by finger around the gasket(O ring) of new filter.
- 3) Turn the filter clockwise and screw it until the gasket touches part B. And screw it in 3/4 rotation.
- 4) Put the requested amount of oil from oil cap.
- 5) Check the oil volume by level gauge, and securely tighten the oil cap.
- 6) Run the engine for 2 minutes in low rpm, to check the leaking of oil around the filter.
- 7) Stop the engine and check the oil volume again. Add oil in case of deficiency.

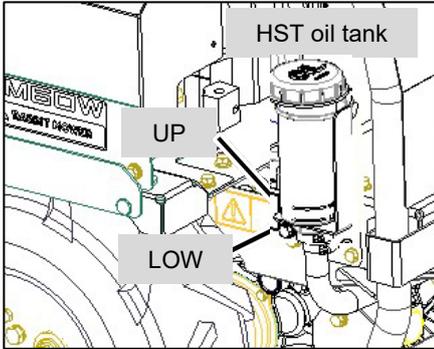


HST OIL

Inspection and filling up

CAUTION

HST oil is clean in the beginning, however, after the hours of operation dust inside the HST unit is accumulated and oil gets dirty, causing problem for smooth work of HST unit. For the safe and comfortable use of machine, regularly replace the HST oil. Especially in the hard condition, first replacement is recommended in less than 20 hours. Otherwise, metal powder inside the HST unit will choke the oil filter and cause trouble in driving (especially reverse driving).

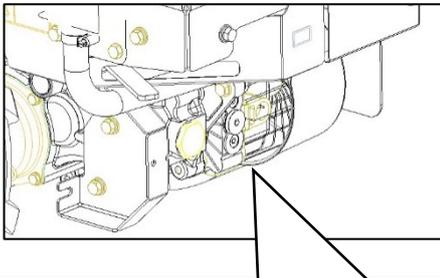


- 1) Check HST oil tank and level of oil. If the level is not in between the UP and LOW, open the oil cap and add oil as needed.
- 2) Moisture adsorption sheet is placed inside the HST oil tank, in order to avoid HST trouble and also to adsorb the water caused by condensation.

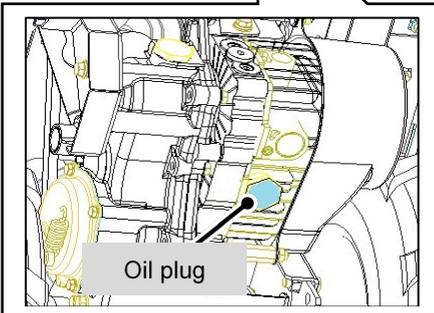
Replacement

CAUTION

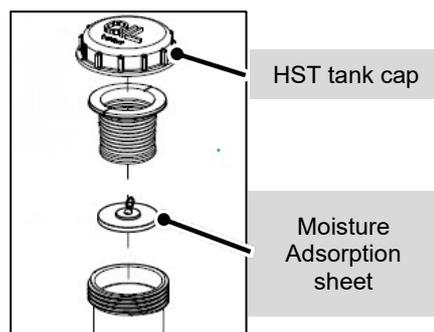
- 1) In case of HST oil replacement, wait until HST oil tank and HST unit is cooled down. They are still very hot just after the engine is stopped, and it may lead to burn.
- 2) HST oil is also called as hydraulic oil, which transmits the engine rotation into driving. It also helps to lubrication, anti-rust effect, and cooling down. However, if oil is not properly maintained, it gives problem for driving. Always use recommended oil for replacement and adding.



- 1) Prepare oil container. Loosen the HST oil tank cap, and remove the oil plug (Hexagonal, M22) located in under the HST unit.



- 2) When the oil is completely drained, place the oil plug and fix it. Then remove the HST oil tank cap.
- 3) Put 500ml of HST oil and also replace the moisture adsorption sheet at same time.



- 4) After the HST oil is filled, make sure that HST oil tank cap is securely fixed.

TIP :

HST oil replacement

First : at 20 hours

Later : at each 200 hours or 1 year whichever comes first

References: (The color of HST oil)

Color	Smell	Status	To do
Clean and no changing color.	Good	No foreign object	Use as usual
Clean, but there are some black points.	Good	Some foreign object	Use after filtering
Milky white	Good	Some water.	Change the oil
Black	Bad	Oxidated and degrade.	Change the oil

Recommended oil : "VG46" or "SAE10W30".

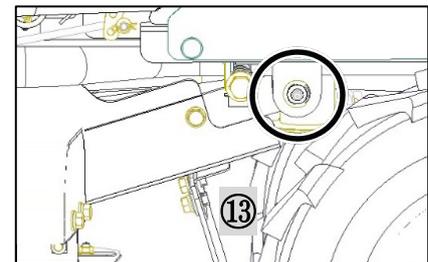
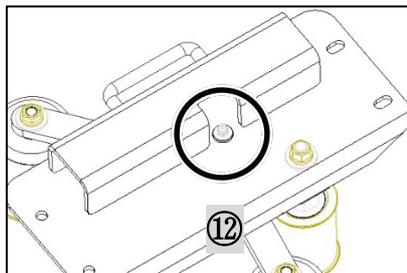
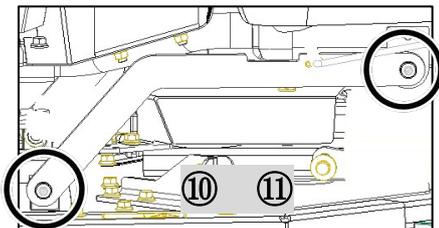
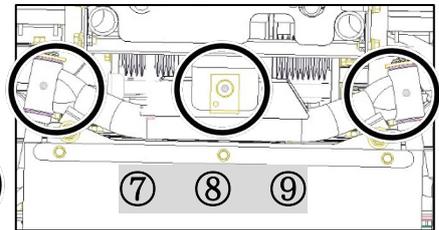
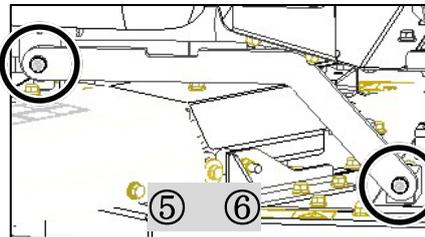
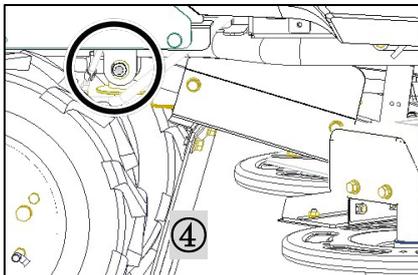
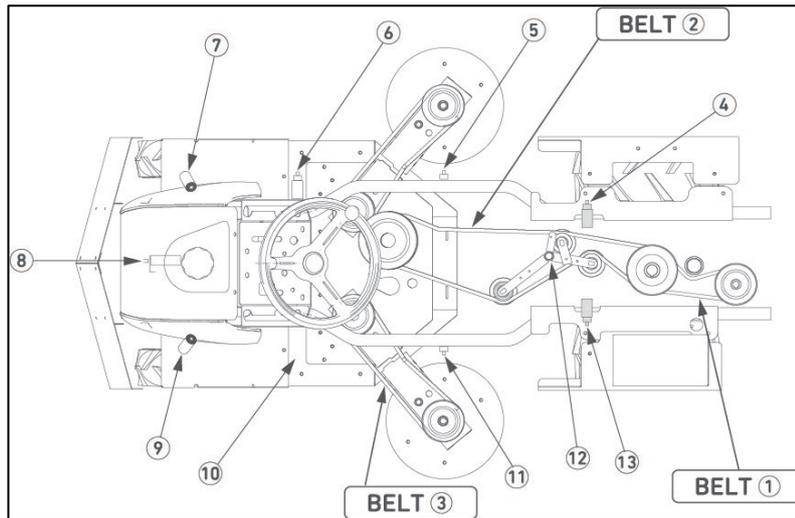
Oil quantity : 500 ml.

VG46 oil is used when it is shipped from factory. Refill the same type of oil. Never mix different type of oil.

GREASE LUBRICATION

⚠ CAUTION

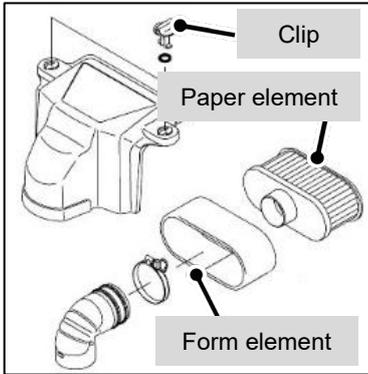
Refer to position of grease nipple in the figure here below, and grease up at every 30 hours of use. In other part of machine, lubricate with engine oil(#30). If grease is not properly lubricated, it leads to poor movement of machine and cause damages. Grease nipple is located in each axle part. Use grease gun to lubricate.



AIR CLEANER

WARNING

- 1) In case machine works with air cleaner and recoil starter both choked with grass or dust, it leads to lack of power and loss of fuel. It may also lead to fire accident caused by heated exhaust gas. Regularly check them and clean if necessary.
- 2) Do not operate the machine with air cleaner removed. Dust will come inside the engine and cause engine trouble and extraordinary wear.



Twist the clip and remove air cleaner cover.
Remove form element and paper element. Pay attention not to let the dusts to go into the carburetor.
Wash the form element with detergent, squeeze and dry it.
Clean the cartridge (paper element) by hitting, or by blowing air from inside to take the dust away.
Wipe inside the hose and put it in original position.

Cleaning and replacement of air cleaner		
	Cleaning	Replacement
Form element	Before every use	At each 100 hours
Paper element	Before every use	At each 100 hours

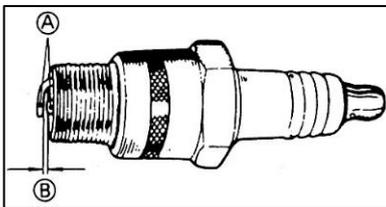
TIP :

- 1) In case paper element is too dirty, replace it or shake with liquid soap then dry it. When shaking, do not pull it strongly to avoid damage of element.
- 2) When hitting paper element, pay attention not to damage the paper.
- 3) When drying, paper element may be damaged if it is blown by hot air. Blow with light warm air or take natural drying.
- 4) In case of use in dusty condition, pay attention to clean more frequently than above recommendation.

IGNITION PLUG

DANGER

Do not test ignition plug near the plug hole on cylinder, because it may cause fire and is very dangerous.



- 1) Use plug wrench to remove the ignition plug. If the carbon is covering the terminal A, use wire brush to remove it. Wipe it if it is wet.
- 2) Replace the ignition plug in case crack is found on the central ceramic part or terminal is damaged.
- 3) Adjust the gap of terminal B to be between 0.7mm and 0.8mm.

FUEL HOSE

DANGER

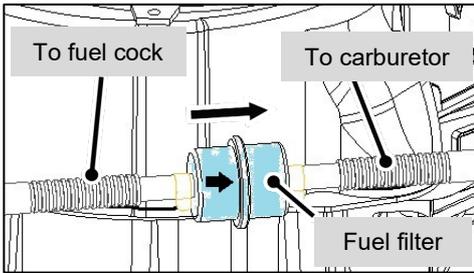
The fuel of this product is gasoline. It is dangerous if fuel leaks during operation. Smoking or making fire near the machine may lead to catch fire and dangerous.

CAUTION

Fuel hose and rubber items degrade even if machine is not used. Remember to replace them together with clips every 3 year of when they are damaged. Pay attention not to let dust to go into the hose.

Before every use, check if fuel hose or fixing band are damaged or loosened.

FUEL FILTER

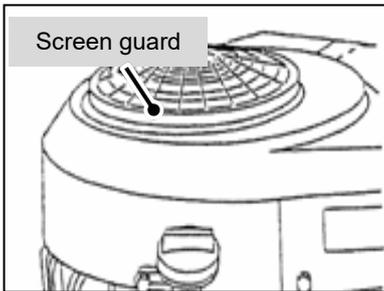


It is not possible to disassemble or clean the fuel filter. Replace it every season or when it is necessary. Pay attention to direction to insert the filter. For more information, contact your nearest dealer.

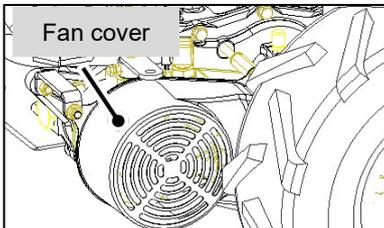
ENGINE COOLING SYSTEM

⚠ WARNING

- 1) Disassemble each parts after engine is well cooled. After cleaning, do not start engine before all parts are assembled in original position.
- 2) Using the machine with engine cooling system covered by grass leads to cause of overheat. Engine temperature may rise up and cause fire accident.
- 3) Do not place hand over the rotating screen. It leads to injury.
- 4) Remove the mad and grass on the screen guard before every use.



1) It is recommended to move up the seat to blow the air to remove grass and dust. Use of high pressure washer is not recommended which may cause engine trouble by water.

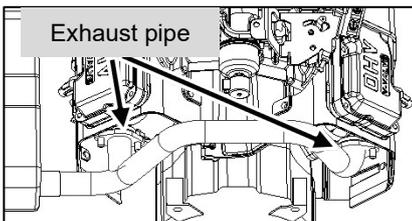


2) Also remove grass inside and outside the HST fan cover. If not, HST oil can be heated up and HST performance cannot be as good as expected.

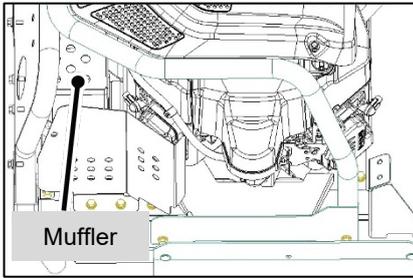
ENGINE EXHAUST SYSTEM

⚠ WARNING

- 1) Disassemble each parts after engine is well cooled. After cleaning, do not start engine before all parts are assembled in original position.
- 2) Using the machine with engine exhaust system covered by grass leads to cause of overheat. Engine temperature may rise up and cause fire accident.
- 3) Remove the mad and grass from exhaust pipe and muffler cover before every use.



1) Remove dust and grass around engine exhaust pipe by air blow.



- 2) Remove grass around the muffler.

MACHINE INSPECTION AND ADJUSTMENT

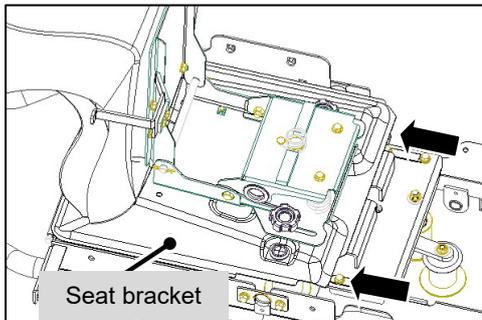
⚠ CAUTION

- 1) Place the machine on flat and spacious area without obstacles before to realize inspection, maintenance and adjustment. Do not forget to stop engine and remove key. Wait until engine is cool enough to start the work.
- 2) Check if all levers work properly (before every use).
- 3) Wire and belt get loose after the first period. Adjust them at every 2-3 hours.
- 4) Wire and belt are consumable goods. Replace them in case of abnormal condition.
- 5) Operate the machine for short time, and check if abnormal noise or temperature is found or not.
- 6) Check if each bolt and nut are properly fixed and in place. Tighten them if necessary.
- 7) In case covers are removed for adjustment, place them in original position.
- 8) Do not overwork during the first 2-3 hours in order to make each part in good condition.
- 9) Remember to realize maintenance after each use regular inspection.
- 10) Check the machine thoroughly to see if there is no oil leak in each part.
 - If there is oil leak, contact your nearest dealer.
 - To continue using with oil leak is dangerous and may lead to damage of machine.

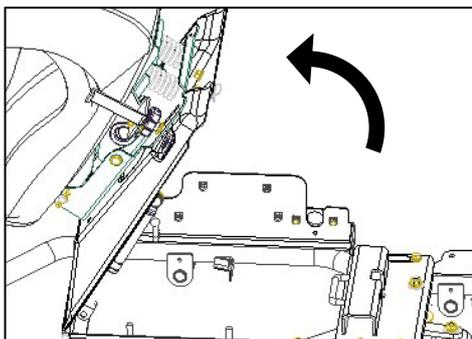
WIRE AND BELT ADJUSTMENT

⚠ CAUTION

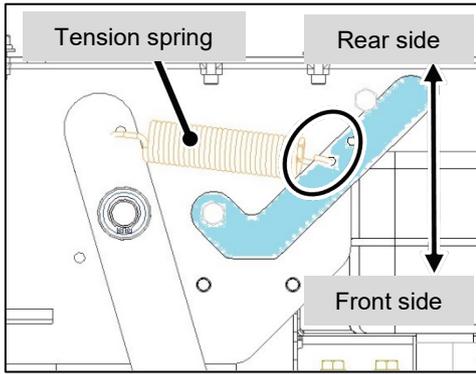
Before to adjust belt, wire and rod, place the machine in a flat and spacious area and stop engine. To ensure safety, lock the parking brake and remove key.



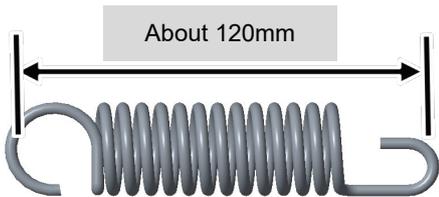
- 1) Before to adjust the belt and blade brake, grip the points marked in arrow and pull them up to open the seat bracket upward. Seat remain fixed when seat bracket is maximum opened.
- 2) Remove the side covers to adjust wire and rod.
- 3) Contact your nearest dealer to replace driving belt and blade belt.



DRIVING BELT ADJUSTMENT(UNDER THE ENGINE)

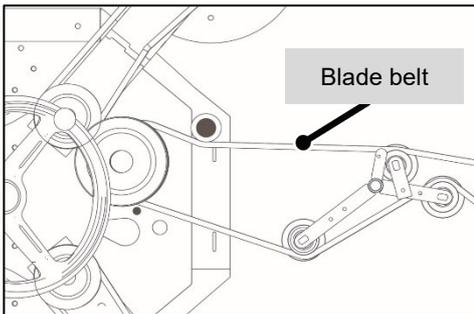


Driving belt is always tensioned. In case this belt slips while driving, adjust the tension by changing the tension spring position. Normally tension spring is in second hole from rear side. In case tension needs to be stronger, place the spring in first hole from rear side.



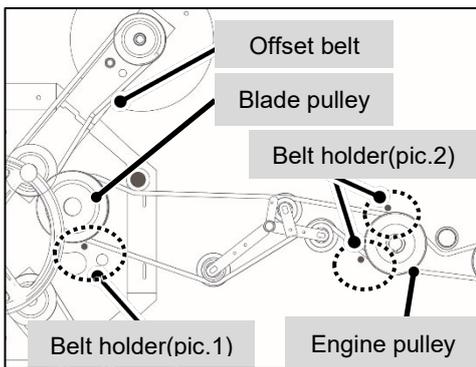
Normally, length of tension spring is about 120mm(free length of spring is 80mm).

BLADE BELT ADJUSTMENT(UNDER SEAT BRACKET)



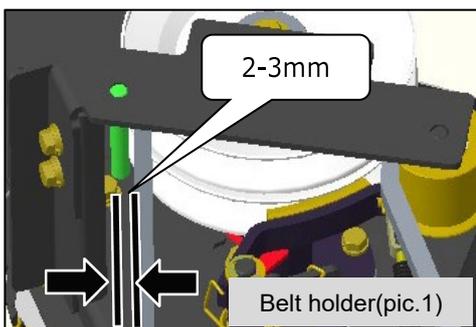
Visually inspect the damage on blade belt. If there is crack of wear, replace the belt to new one.

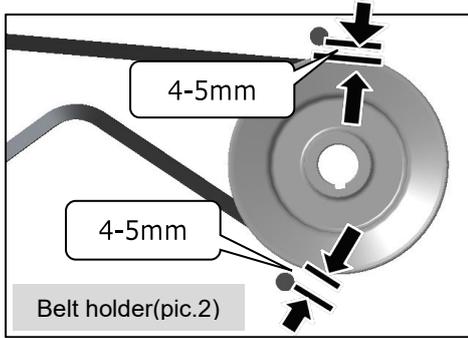
BLADE HOLDER ADJUSTMENT



- 1) Adjust the height of cut lever to 90mm.
- 2) Place the blade clutch lever to ON (ON .

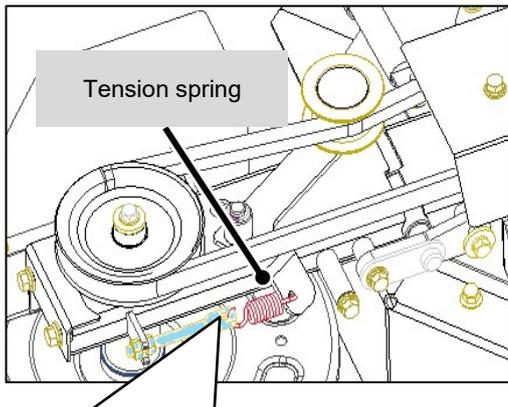
- 3) As shown in figure(left), adjust the gap between belt holder of blade pulley and back of belt to be 2-3mm.





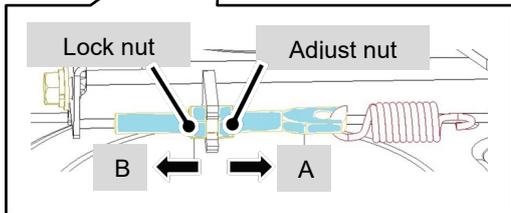
Adjust the gap between belt holder of engine pulley and back of belt to be 4-5mm.

OFFSET BELT ADJUSTMENT



Refer to figure(left) and adjust the nut.

- 1) If tension is not enough,
-adjust the nut toward A.
- 2) If tension is too much,
-Adjust the nut toward B.

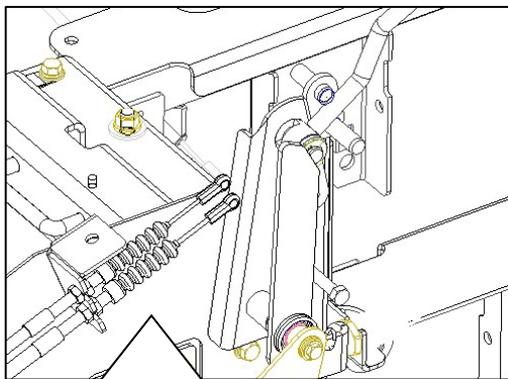


Normally, length of tension spring is about 60mm(free length of spring is 52mm).

Take same way to adjust offset belt in right and left.

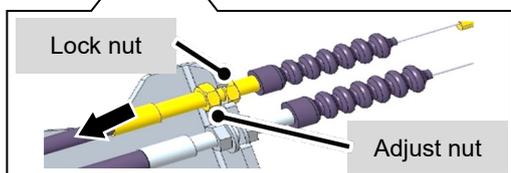


BLADE BRAKE ADJUSTMENT

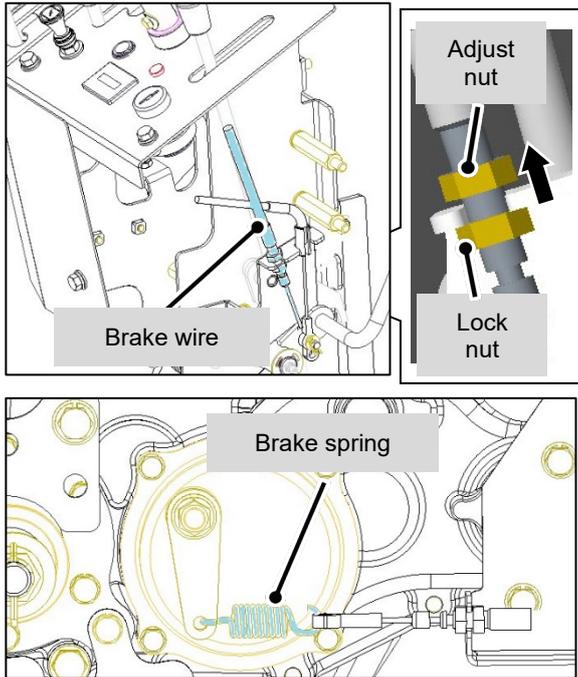


1) Blade stops in 5 seconds when the brake clutch lever is moved to OFF (OFF) position. If not, loosen the lock nut and adjust it by moving the adjust nut of brake wire in direction of arrow. Wrong adjustment may lead to machine trouble. After the adjustment, securely tighten the lock nut.

2) If it is not possible to make adjustment, brake shoe may be worn out. Contact your nearest dealer for inspection and replacement.



PARKING BRAKE ADJUSTMENT



Parking brake is located in rear left side of transmission. Parking brake can be adjusted by adjust nut of brake wire. Adjust nut is located in parking brake pedal side in figure(left).

For adjustment, loosen the lock nut so that rear wheel is locked when parking brake pedal is fully pressed(=when pedal is locked by stopper). Then move the adjust nut in direction of arrow. Normally, length of brake spring is about 60mm. After adjustment, securely tighten with lock nut.

⚠ WARNING

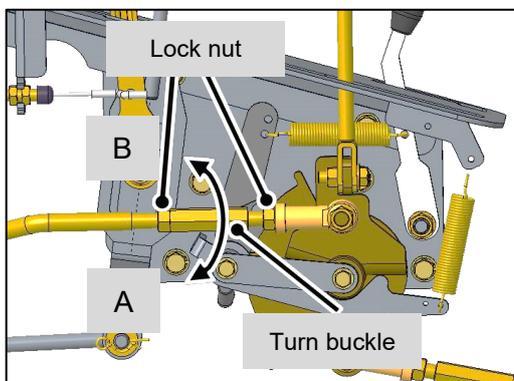
- 1) Regular inspection is recommended not only for keeping the performance, but also for keeping the safety. In order to avoid serious accident on ride-on type machine, follow the maintenance chart to inspect at every use and every month, and ask your dealer to inspect at least once a year.
- 2) After the adjustment, lock the parking brake pedal and place driving clutch lever at OFF position, and push the machine forward/backward to make sure if machine does not start moving on slope.

⚠ CAUTION

Contact your dealer for following service.

- 1) Brake is a consumable part. If parking brake cannot be adjusted as per this instruction, it is possible that brake shoe is worn out. For safety, replace the brake shoe in less than 100 hours of use.
- 2) Driving belt and blade belt are consumable parts. If something is wrong, replace to new one. Make adjustment at first 10 hours and later at each 50 hours of use.

SPEED LEVER ADJUSTMENT

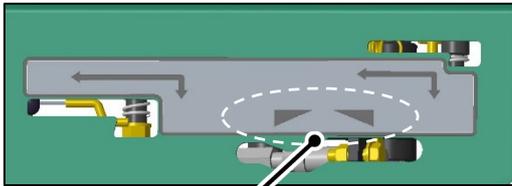


- 1) Move the speed lever to N position.
- 2) Loosen the lock nut on turn buckle linked with speed lever, then turn it to adjust.

If machine slightly moves forward,
-Move the turn buckle toward A.

If machine slightly moves backward,
-Move the turn buckle toward B.

- 3) After this adjustment, securely tighten the lock nut.

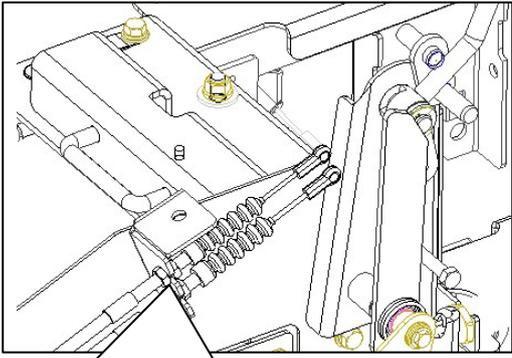


Guide indication

TIP :

Speed lever adjustment is necessary only when transmission is dis-assembled. In case neutral position does not match to label indication, make this adjustment.

BLADE CLUTCH WIRE ADJUSTMENT



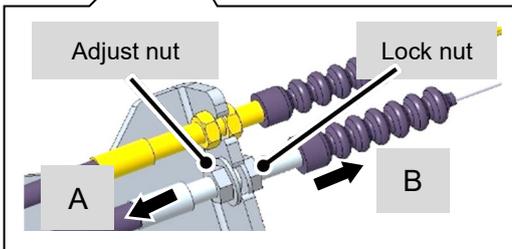
Place the height of cut lever to forward and also place the blade

clutch lever to ON (ON) position.

Refer to figure(left), loosen the lock nut of blade clutch wire and adjust with adjust nut.

If blade belt is not tensioned enough,
-Move the adjust nut toward B.

If blade belt is tensioned too much,
-Move the adjust nut toward A.

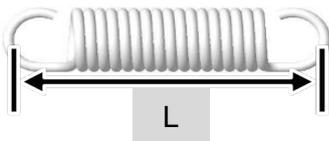


After the adjustment, securely tighten the lock nut.

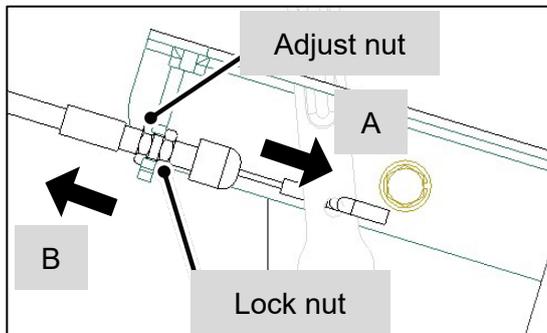
TIP :

Length of spring :

- Cutting height at maximum : L = about 120mm
- Cutting height at lowest : L = about 135mm



DIFFERENTIAL LOCK WIRE ADJUSTMENT



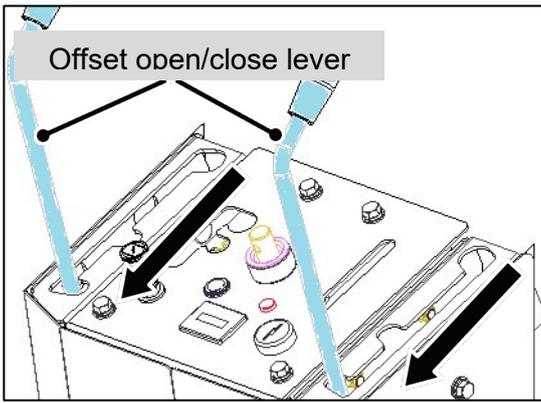
1) Refer to figure(left), loosen the lock nut of differential lock wire and adjust with adjust nut. After this adjustment, make sure if it works properly.

If differential lock is not activated,
-Move the adjust nut toward A.

If differential lock is not cancelled,
-Move the adjust nut toward B.

2) After this adjustment, securely tighten the lock nut.

OFFSET PULL WIRE ADJUSTMENT

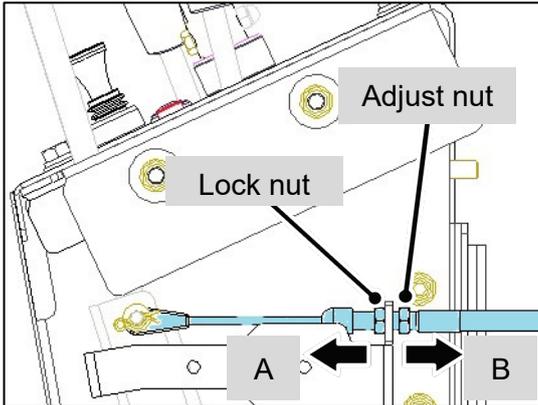


- 1) Refer to figure(left), and fix the offset open/close lever fully toward operator(=offset at fully closed position).
- 2) Loosen the lock nut of offset pull wire and adjust with adjust nut. Take same way for both right and left side.

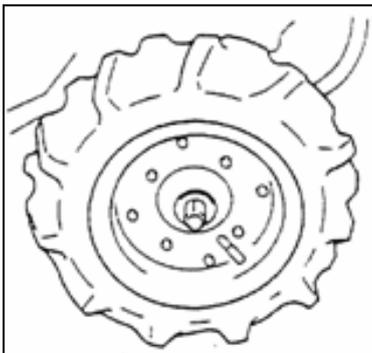
In order to close the offset,
-Move the adjust nut toward A.

In order to open the offset,
-Move the adjust nut toward B.

- 3) After this adjustment, securely tighten the lock nut.



TIRE PRESSURE ADJUSTMENT



Refer to table below to check the pressure of tires.

	Tire size	Pressure(kPa)
Front wheel	3.50-7	120
Rear wheel	16x7.00-8	140

⚠ CAUTION

Pay attention to equal the pressure of R & L tires. If not, handle control may be lost during operation.

FRONT TIRE INSPECTION

⚠ CAUTION

Do not forget to remove the soil or grass which comes into tires. If they remain around the tire for a long time, tire wheel, oil seal or bearing on the front wheel may be damaged.

Remove the mud and grass inside the tire wheel.

BLADE INSPECTION, REPLACEMENT AND SETTING

For safety, inspect the blades before the use.

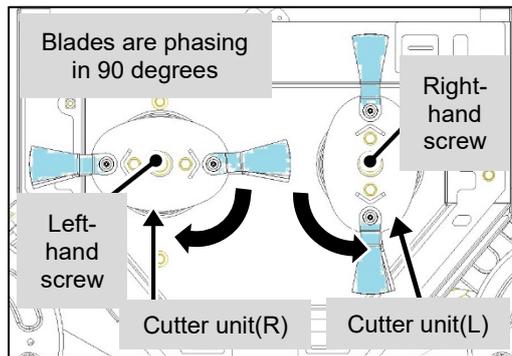
⚠ WARNING

- 1) This machine is equipped with sharp blades. Wear protective glove for blade inspection and replacement, and never touch the blades by hand. It may cause injury.
- 2) For blade replacement, use only genuine parts recommended by manufacturer. Manufacturer is not responsible for the trouble and accident with non-genuine parts, and it is not covered by warranty.
- 3) In case of impact caused by hitting the stone block or stumps, stop the use and check if blade or blade disc is bent, cracked or damaged. Replace them if necessary. Before each use, make sure if damaged parts in previous use are properly repaired or adjusted.
- 4) Blades rotate in very high speed. Even with small lack of part or small bend, it leads to big vibration. To continue operation with big vibration is dangerous and can be cause of clack on each part of machine. Machine's service life may be much shorter in this case.
- 5) Leaving the wear, bend, and lack of blades without maintenance may lead to serious accident such as thrown object of broken blade, or to damage of machine itself.
- 6) Blades must be replaced at full set at same time. Replacing only the particular blade may cause vibration.

⚠ CAUTION

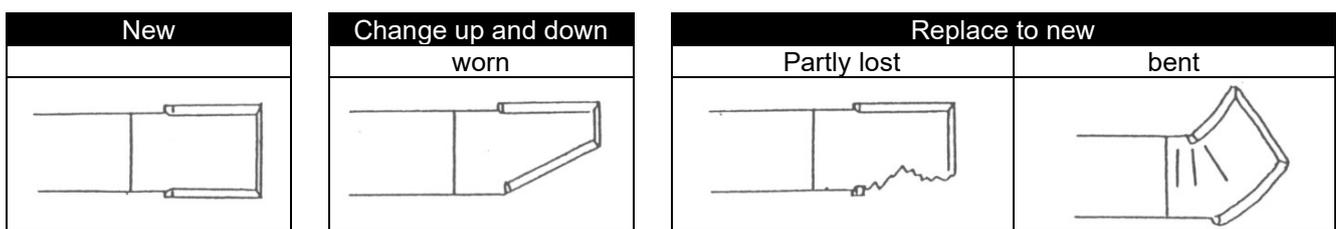
- 1) Ask skilled person with proper tool to replace the blades.
- 2) Bag nut is consumable parts. In case of sharpening the blades, replace the bag nut to new one. Do not replace with other type of nut.

BLADE INSPECTION AND REPLACEMENT



Stop the engine and remove key from engine switch. Remove blade covers in right and left. Inspect the clack, bend and wear on free blade disc. Inspect the fixing status of nut on free blade disc.

In case blades are in following condition, change the blades between up and down or replace them to one.



TIP :

- 1) When the machine is used in a place with sand or dry soil, blades can wear in shorter time. Check them frequently.
- 2) It is recommended to stock the spare blades to prepare for replacement.

BLADE SETTING

Pay attention to following instruction for blade setting.

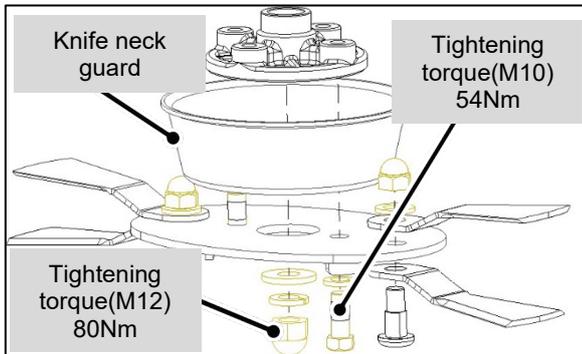
⚠ CAUTION

- 1) In each blade replacement, bolts and nuts must be replaced to new one.
- 2) Blade rotates left on cutter unit(L) and rotates right in cutter unit(R). Therefore, on M12 bag nut on cutter unit(R), left-hand screw is used to avoid loosening. And on M12 bag nut on cutter unit(L), right-hand screw is used in same reason.
- 3) Pay special attention on desorption or replacement of knife neck guard.

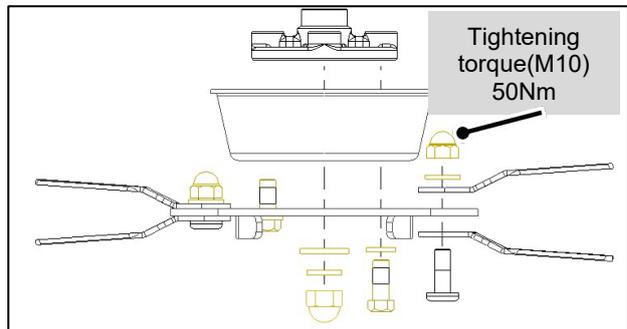
- 4) Refer to figure(below) for setting up the 8 blades. If they are placed in wrong position, they hit each other while mowing and lead to loss, clack, damage and vibration of blades.
- 5) Securely tighten the bolt and nut after the blade setting.

Turn the M10 bolt on free blade disc toward left and loosen it.
After free blade disc is removed, replace the blades.

Disassembling of the blades



View from side



*Make sure about upper side and lower side.
**It is possible to reuse the blade when turned upside down.

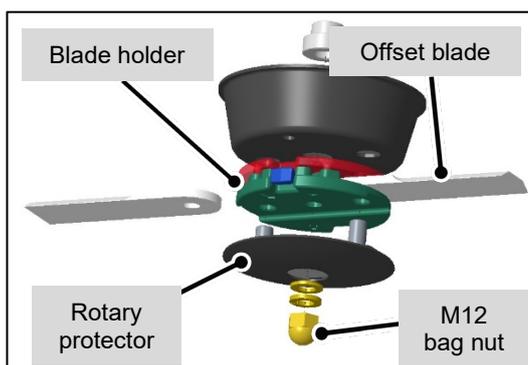
OFFSET BLADE REPLACEMENT

TIP :

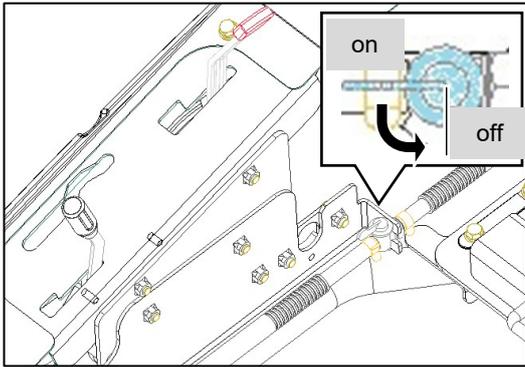
Blade rotates left on cutter unit(L) and rotates right in cutter unit(R). Therefore, on M12 bag nut on cutter unit(R), left-hand screw is used to avoid loosening. And on M12 bag nut on cutter unit(L), right-hand screw is used in same reason.



- 1) Refer to figure(left). Use box wrench and remove nut from the rotary protector hole.
- 2) Set the offset blade on blade holder and fix them by rotary protector.
- 3) Place the removed nut in original position and securely fix it. Pay attention to right-hand screw and left-hand screw.



STRAGE PREPARATION



- 1) In case the machine is not in use for more than 30 days, remove the gasoline from fuel tank to prevent fuel from degrading. Then start the engine and keep it running until the rest of gasoline is burned out.
- 2) Turn the engine switch key to O position and close the fuel cock.
- 3) Clean the outside of machine and engine.
- 4) Replace the engine oil.
- 5) Clean each part of machine. With air blower, clean the grass and dust around the rotating screen, exhaust system, air cleaner, muffler, HST fan cover, carburetor and inside the belt cover. If there is rusty part, remove the rust and spray the anti-rust

paint.

- 6) Put grease and oil where required.
- 7) Lock the parking brake and store the machine in a flat place under the roof, well ventilated and well dry.
- 8) In case of placing the cover on the machine, do it only after muffler and engine are cooled. While storing, regularly check the tire pressure and add air if necessary.



DANGER

- 1) This product works with gasoline. Fuel leak, smoking near the machine, and making fire may lead to fire accident.
- 2) Service the machine in well ventilated place, and store the machine on solid and flat place.
- 3) Wait more than 5 minutes after stopping the engine and muffler is cooled, to drain the gasoline from fuel tank or place the cover on the machine.
- 4) Make sure if there is no flammable item around the machine when running the engine to finish the remaining gasoline. Keep the place well ventilated.



WARNING

Servicing the machine with grass or dust remaining on the machine, they might be choked and cause engine overheat.



CAUTION

- 1) Storing the machine with fuel remaining in the fuel tank or in the carburetor may cause engine starting trouble or loss of power.
- 2) For safety, remove the key and keep it at owner.
- 3) Use of drained fuel in polyethylene tank or use of gasoline kept for more than 3 months may cause engine trouble. Do not use such fuel.
- 4) Place the hose, clip or drain bolt in original position if they are removed for service.
- 5) In case of cleaning the machine with pressure water, pay attention to avoid putting water on electric parts, carburetor, air cleaner and muffler. Otherwise, it leads to engine starting trouble.

TIP :

It is easy to remove grass inside the blade cover, if they are washed with pressure water before grass get dry.

-Storing in cold region-

- 1) During winter, clean the machine and remove mud and obstacles after the use. Park the machine on flat and dry surface. Otherwise, they might be frozen on the machine and cause machine trouble.
- 2) In case machine is parked on flat surface, do not lock the parking brake pedal, and use tire stopper to avoid sticking of brake shoe.
- 3) In case machine is frozen and it is impossible to drive, do not attempt driving and put hot water on frozen part and wait until it melts.

NOTICE FOR NEXT USE



CAUTION

- 1) Use fresh fuel.
- 2) Execute pre-use inspection.
- 3) Make sure if each control levers work properly(before every use).
- 4) Make sure if all bolts and nuts are not loose and in place.

- 5) Operate the machine for short time, and check if abnormal sound and abnormal temperature are found or not.
- 6) For warming up each part of machine, operate the machine lightly for first 2-3 hours.

MAINTENANCE CHART

Lack of inspection or maintenance leads to accident or trouble of machine. In order to ensure the good performance and safe condition of machine, make inspection referring the table below.

About the frequency of maintenance, refer the indication D(daily), M(monthly), and Y(yearly).

Reference		Where to check	Check point	Parts	D	M	Y	
Braking device	Brake	Effect of parking brake	Scratch or weakness	Brake shoe	○	○	○	
		Brake rod joint	Deformation or	Rod	○	○	○	
		U nut W nut	Looseness or loss	U nut	○	○	○	
				W nut	○	○	○	
		Split pin	Loss or damage	Split pin	○	○	○	
Cutting part	Cover	Condition of cover	Bend, clack or corrosion. Setting of flapper rubber.	Cover	○	○	○	
				Flapper		○	○	
	Rotating part	Blade, stay and setting	Curve or wear	Blade	○	○	○	
				Blade stay	○	○	○	
	Blade brake	Performance of brake (to stop in 5 seconds)	Looseness, wear, and loss of bolt and nut	Bolt / nut	○	○	○	
					○	○	○	
Engine	Engine body	Accelaration, exhaust, choke	Smoothness of accelataion, color of exhaust gas, smell, smoothness of clogging	Accelaration		○	○	
				Exhaust		○	○	
				Choke	○	○	○	
		Muffler, battery	Setting looseness, corrosion, charging status of battery	Muffler		○	○	
				Battery		○	○	
	Engine body	Engine setting looseness or clack	Setting		○	○		
			Air cleaner	Dirt, choke, damage	Air cleaner	○	○	○
	Oil	Engine oil Oil filter	Quantity, quality, leak or mixing of obstacle, replacing period	Oil	○	○	○	
				Filter	○	○	○	
		Engine oil : First 5h, later at every 50h, Filter : at every 100h						
	Fuel	Fuel hose, filter	Leak, deformation, and clogging	Fuel route	○	○	○	
	Ingition	Spark plug	Clack on insulator, carbon between terminal	Plug		○	○	
		High voltage cord, plug cap	Degradation, clack and split on cap	Cord		○	○	
	Cooling	Engine housing	Grass remain inside the housing or not	Inside cover	○	○	○	
	Wire	Harness	Looseness or damage	Harness		○	○	
Transmission	Belt	Driving, blade belt	Tension, clack, damage or dirt	Driving	○	○	○	
				Blade	○	○	○	
	Transmission, HST	Transmission oil	Quantity, quality, leak mixing of obstacle(water, air)	Transmission oil	○	○	○	
		Transmission oil : first 20h and later each 100h						
		HST oil	Quantity, quality, leak mixing of obstacle(water, air)	HST oil	○	○	○	
HST oil(VG46) : First→refere to instruction manual, later at each 200h including replacement of oil filter.								
Moving part	Movement of lever and wire	Movement is smooth or not.	Diff-lock	○	○	○		
			Blade	○	○	○		
Speed change	Speed lever	Proper movement, N position, and looseness	Lever	○	○	○		
Driving part	Tire	Proper air pressure, damage or wear	Tire	○	○	○		
	Setting	Looseness, wear, and loss of bolt and nut	Setting	○	○	○		
Handle	Setting	Looseness, wear, and loss of bolt and nut	Handle	○	○	○		
Meter	Hour meter	Indication of correct hour, proper displaying	Hour meter	○	○	○		
Label	Warning label/plate	Attachment of label, damage or dirt	Label	○	○	○		

ENGINE TROUBLESHOOTING

In case of engine trouble, refer to table below and take proper countermeasure.

Problem	Cause	Solution
Starter does not work	Parking brake is not pressed.	Press parking brake pedal and lock it.
	Height of cut lever is not in transport position.	Move the lever to transport position.
	Operator is not seated.	Stay on the seat.
	Safety switch is not in good condition.	Adjust the switch within 3-5mm allowance.
	Battery is empty.	Charge the battery.
	Battery cord is not connected.	Connect the battery.
	Coupler wiring is not connected.	Connect the wiring.
	Magnet switch is not good.	Replace the magnet switch.
	Harness is cut or damaged	Replace the harness.
Battery is not charged	Charge coil is not good.	Replace the charge coil.
	Fuse is broken.	Replace the fuse(charge : 20A)
	Regulator is not good.	Replace the regulator.
	Battery is out of life.	Replace the battery.
Engine cannot be started	Throttle lever is not in MINI position.	Move the throttle lever in MINI position.
	Choke lever is not in "start" or "close" position.	Tighten the choke lever when engine is cooled.
	Fuel does not run.	Check the fuel tank and remove the sinking stuff and water.
		Place the fuel cock to "open".
	Fuel filter is clogged.	Replace the fuel filter.
	Air or water is mixed in fuel running system.	Remove the stuff, check the hose band, and replace if necessary.
	Oil is sticky in cold weather and engine rotation is not smooth.	Select proper oil depending on weather.
	Ignition coil or unit is not good.	Replace ignition coil or unit.
	Spark plug is not good.	Check the gap between terminal and adjust.
		Replace the spark plug.
	Battery is empty.	Disconnect the battery when machine is not in use. Keep battery fully charged and put it on machine before use.
	Fuel quality is bad.	Replace to good quality fuel.
	Fuel is not enough.	Add the fuel.
Power is poor	Fuel is not enough.	Add the fuel.
	Air cleaner is clogged.	Clean the element.
	Fuel quality is bad.	Replace the fuel to new.
	Choke is not fully open.	Push down the choke lever completely to open it.
	Cooling system is clogged.	Clean around the screen guard.
Engine stops	Fuel is not enough.	Add the fuel.
	Fuel cock is closed.	Open the fuel cock.
Exhaust gas is too black	Fuel quality is bad.	Replace to good quality fuel.
	Air cleaner is clogged.	Clean the element.
Black smoke comes out and power is lost	Air cleaner element is clogged.	Clean the element.
	Choke is not fully open.	Push down the choke lever completely to open it.
Blue-white smoke comes out from muffler	Engine oil is too much.	Reduce the engine oil to required level.
	Cylinder and piston ring is are worn	Replace the ring.
Engine rpm is not stable	Choke is not fully open.	Push down the choke lever completely to open it.
	Fuel quality is bad.	Replace to good quality fuel.
Engine stops later	Ignition coil is not good.	Replace the ignition coil.
	Fuel filter is clogged.	Replace the fuel filter.
Exhaust gas badly smells	Fuel quality is bad.	Replace to good quality fuel.

BREAKDOWNS AND SOLUTIONS

Problem	Cause	Solution
Cut grass is not discharged well.	Grass is wet.	Wait until grass get dry.
	Grass is tall.	Mow higher and cut twice.
	Cutting height is too low.	Raise the cutting height.
	Engine power is too low.	Increase the power to the max.
	Mowing speed is too fast.	Decrease the speed.
Grass is not fully cut	Mowing speed is too fast.	Decrease the speed.
	Engine power is too low.	Increase the power to the max.
	Blade is blunt, worn out or broken.	Replace the blade with a new one.
	Some grass is stuck inside of rotary cover.	Clean up and take out grass inside of the cover.
	Grass is tall.	Mow with higher cutting height first.
	Mowing the pushed grass.	Mow against grass.
Cut into the ground	Cutting height is too low.	Raise the cutting height.
	Turning speed is too fast.	Turn slowly.
	The ground is wavy-shaped.	Change the direction of mowing.
	The ground is bumpy and has many ups and downs.	Raise the cutting height.
	Blade stay is bent or deformed.	Replace the blade to new one.
Blade slips	Belt tension is not enough.	Adjust the belt tension.
	Obstacle remains inside blade cover	Clean inside the blade cover.
	Grass remains on pulley	Clean the pulley.
	Belt is worn.	Replace the belt.
Blade does not stop in 5 seconds	Blade brake shoe is worn.	Replace the brake shoe.
	Blade brake is poorly adjusted.	Adjust the blade brake.
There is big vibration	Blades are poorly balanced.	Replace all blades.
	Blade is damaged.	Replace the blade to new one.
	Grass remains around knife neck guard	Clean around the knife neck guard.
	Blade shaft is bent.	Replace the blade shaft.
	Blade belt is broken.	Replace the belt to new one.
	Blade stay is bent.	Replace the blade stay.
	New and old blades are installed.	Do not install new and old blades together.
Mowing workload is heavy	Engine power is too low.	Increase the power to the max.
	Mowing speed is too fast.	Decrease the speed.
	Some grass is stuck on/around blade shaft.	Clean up the blade.
	Grass is tall.	Mow with higher cutting height first.
	Cutting height is too low.	Raise cutting height.
Tires are slipping.	Differential lock is OFF.	Move the differential lock lever to ON.
	Ground is soft.	Wait until the ground get dry.
Machine does not stop with speed lever in N position	N position is not properly adjusted.	Adjust the turn buckle to modify N position.
Poor power to drive the slope	Driving belt is not well tensioned.	Give more tension on the driving belt or replace the belt.
	HST oil is in short, degraded or air/water is mixed.	Add or replace the HST oil or remove the air.
Speed lever does not move the machine	HST oil is not enough.	Add HST oil.
	HST hose is getting off or broken	Set the HST hose or replace it if it is damaged
	Driving clutch lever is in OFF position.	Move the driving clutch lever to ON position.
Parking brake does not work well	Brake shoe is worn.	Replace the brake shoe.
	Oil is coming into brake drum.	Remove the oil and replace the oil seal.
	Water is coming into brake drum.	Press and release the brake and dry inside.
	Tire is worn.	Replace the tire.

* If you have any questions or do not understand any points, please contact your dealer.

TIGHTENING TORQUES (Nm)

Diameter of the screw(mm)	Marks on the screw head				
	4 or without mark	7	8	9	11
3	0,3 to 0,5	---	---	---	---
4	0,8 to 1,0	---	---	---	---
5	2,5 to 3,4	5,4 to 6,4	6,4 to 7,4	6,4 to 7,4	8,8 to 9,8
6	4,9 to 6,9	9,8 to 11,8	11,8 to 13,7	11,8 to 13,7	14,7 to 16,7
8	11,8 to 16,7	24,5 to 29,4	29,4 to 34,3	34,3 to 36,2	36,3 to 41,2
10	20,6 to 29,4	39,2 to 44,1	49 to 53,9	49 to 53,9	72,6 to 82,4
12	44,1 to 53,9	83,4 to 93,2	93,2 to 107,9	93,2 to 107,9	122,6 to 137,3
14	63,7 to 78,5	117,7 to 132,4	132,4 to 147,1	147,1 to 166,7	205,9 to 225,6
16	88,3 to 107,9	152 to 171,6	176,5 to 196,1	215,8 to 245,2	313,8 to 343,2
18	117,7 to 137,3	205,9 to 235,4	245,2 to 274,6	313,8 to 343,2	441,3 to 470,7
20	147,1 to 166,71	235,4 to 274,6	313,8 to 353	441,3 to 480,5	617,8 to 657,1
22	176,5 to 205,9	421,7 to 451,1	539,4 to 578,6	608 to 647,2	843,4 to 882,6
24	235,4 to 264,8	539,4 to 568,8	706,1 to 745,3	784,5 to 823,8	1098,4 to 1137,6

EC CONFORMITY DECLARATION

Business name and full address of the manufacturer:

OREC CO LTD
548-22 HIYOSHI HIROKAWA-MACHI
YAME-GUN FUKUOKA JAPAN
S.A.T. sarl - Force 7 – ZA –
38110 ROCHETOIRIN France
owner of the technical documents

Designation : Ride-on brush cutter
Mark : OREC
Type : RM60W
Serial Identification :
Engine :
- Manufacturer : Kawasaki
- type : FS541V
- Power : 13,4 kW
Width of cut : 705-1155 mm
Conforms to directives: 2000/14/EC, 2006/42/EC, 2014/30/EU
Conformity assesment : 2006/42/EC Annex VIII
Measured acoustic power level : 105,18 dB(A)
Granted acoustic power level : 106 dB(A)
Conformity assesment : 2000/14/EC Annex V
Notified body n°0088: Lloyd's Register Quality Assurance
71 Fenchurch street, London EC3S 4BS UK
Acoustic pressure level at operator's ears : 92,1 dB(A)
Harmonized standards used : EN 12733:2018, EN ISO 14982-2009,
EN ISO 3744-2010, EN ISO 3746-2010,
EN1032-2003+A1-2008, EN ISO 20643:2008+A1:2012

made at : Fukuoka, 31 March 2021

Signed : Haruhiko Imamura
Function : Managing director



MEASUREMENT OF VIBRATIONS

Mark : OREC
Type : RM60W
Engine : FS541V

Pick up location	Awp
Right side 60° from the axle of the steering wheel	3,12 m/s ²
Left 60° from the axle of the steering wheel	3,40 m/s ²
On the operator's seat	4,14 m/s ²

