

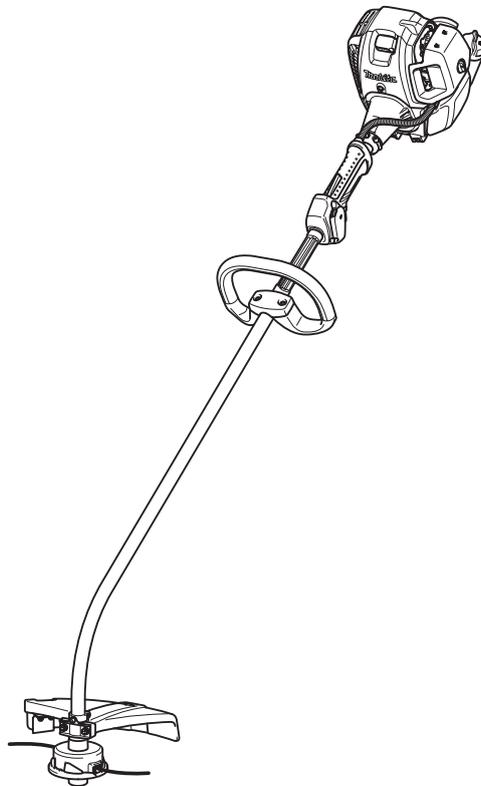


Petrol String Trimmer

ER2650LH

INSTRUCTION MANUAL

Original Instruction Manual



ER2650LH

Important:

Read this instruction manual carefully before putting the Petrol String Trimmer into operation and strictly observe the safety regulations!
Preserve instruction manual carefully!

Thank you very much for purchasing the MAKITA Outdoor Power Equipment. We are pleased to recommend to you the MAKITA product which is the result of a long development program and many years of knowledge and experience. Please read this booklet which refers in detail to the various points that will demonstrate its outstanding performance. This will assist you to obtain the best possible result from your MAKITA product.



Table of Contents	Page
Symbols.....	2
Safety instructions.....	3
Technical data.....	6
Designation of parts.....	7
Mounting of handle.....	8
Mounting of protector.....	8
Mounting of nylon cutting head.....	8
Before start of operation.....	9
Points in operation and how to stop.....	11
The nylon cutting head.....	12
Servicing instructions.....	14
Storage.....	17

SYMBOLS

You will note the following symbols when reading the instructions manual.

	Read instruction manual and follow the warnings and safety precautions!		Wear protective helmet, eye and ear protection.
	Take Particular care and attention!		Top permissible tool speed
	Forbidden!		Fuel (Gasoline)
	Keep distance!		Engine-manual start
	Flying object hazard!		Emergency stop
	No smoking!		First Aid
	No open flame!		ON/START
	Protective gloves must be worn!		OFF/STOP
	Wear sturdy boots with nonslip soles. Steeltomed safety boots are recommended!		Never use metal blades
	Keep the area of operation clear of all persons and pets!		

SAFETY INSTRUCTIONS

General Instructions

- Read this instruction manual to become familiar with handling of the equipment. Users insufficiently informed will risk danger to themselves as well as others due to improper handling.
- It is recommended only to lend the equipment to people who have proven to be experienced. Always hand over the instruction manual.
- First users should ask the dealer for basic instructions to familiarize oneself with the handling of string trimmers.
- Children and young persons aged under 18 years must not be allowed to operate this equipment. Persons over the age of 16 years may however use the device for the purpose of being trained while under supervision of a qualified trainer.
- Use with the utmost care and attention.
- Operate only if you are in good physical condition. Perform all work calmly and carefully. The user has to accept liability for others.
- Never use this equipment after consumption of alcohol or drugs, or if feeling tired or ill.
- National regulation can restrict the use of the machine.

Intended use of the machine

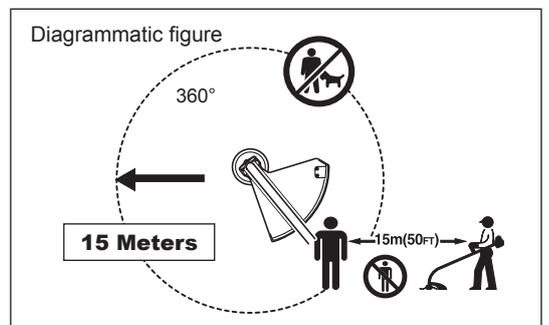
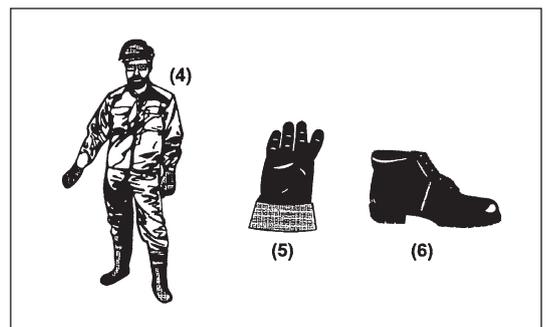
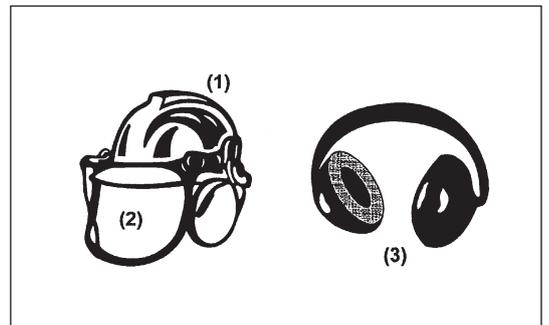
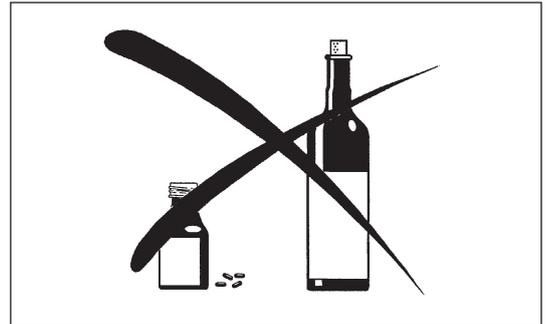
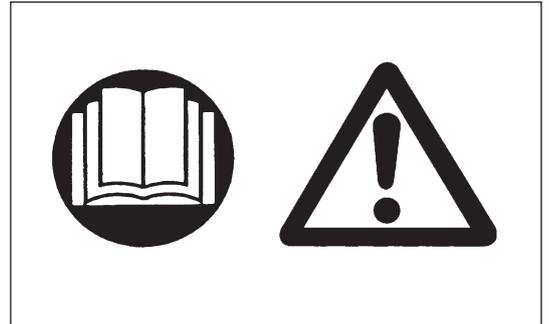
- This equipment is only intended for cutting grass and light weeds. It should not be used for any other purpose such as edging or hedge cutting as this may cause injury.

Personal protective equipment

- The clothing worn should be functional and appropriate, i.e. it should be tight-fitting but not cause hindrance. Do not wear either jewelry or clothing which could become entangled with bushes or shrubs.
- In order to avoid either head-, eye-, hand- or foot injuries as well as to protect your hearing the following protective equipment and protective clothing must be used during operation.
- Always wear a helmet where there is a risk of falling objects. The protective helmet (1) is to be checked at regular intervals for damage and is to be replaced at the latest after 5 years. Use only approved protective helmets.
- The visor (2) of the helmet (or alternatively goggles) protects the face from flying debris and stones. During operation always wear goggles, or a visor to prevent eye injuries.
- Wear adequate noise protection equipment to avoid hearing impairment (ear muffs (3), ear plugs etc.).
- The work overalls (4) protect against flying stones and debris. We strongly recommend that the user wears work overalls.
- Gloves (5) are part of the prescribed equipment and must always be worn during operation.
- When using the equipment, always wear sturdy shoes (6) with a non-slip sole. This protects against injuries and ensures a good footing.

Starting up the Petrol String Trimmer

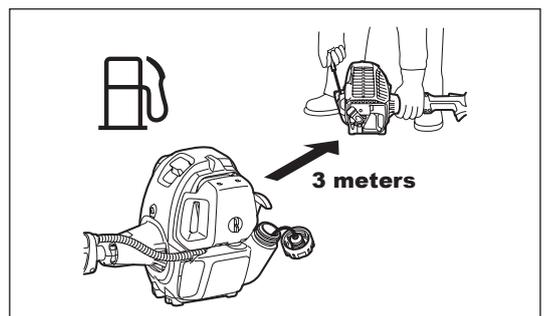
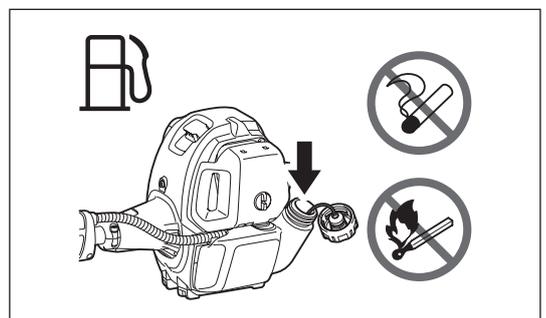
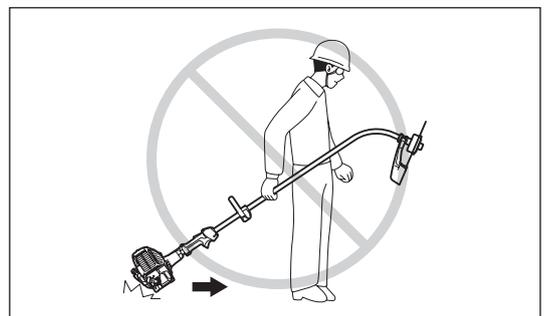
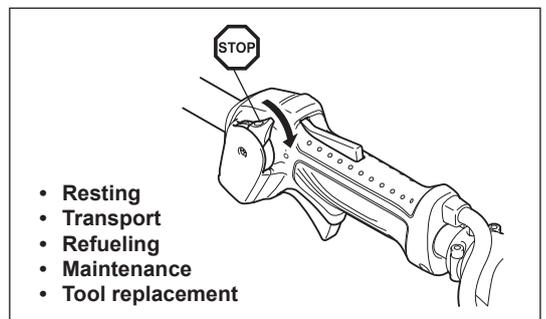
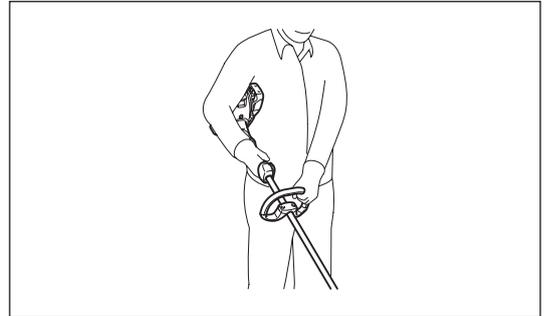
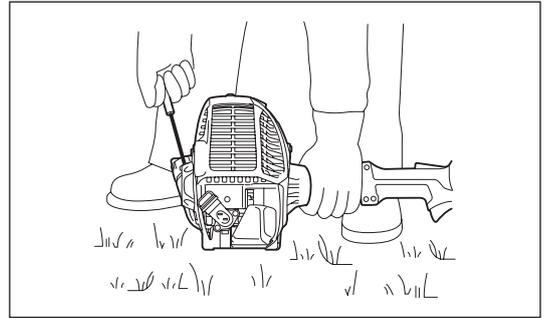
- Please make sure that there are no children or other people within a working range of 15 meters (50 ft), also pay attention to any animals in the working vicinity.
- Before use always check the equipment is safe for operation: Check the security of the cutting attachment, the throttle lever for easy action and check for proper functioning of the throttle lever lock.
- Rotation of the cutting attachment during idling speed is not allowed. Check with your dealer for adjustment if in doubt. Check for clean and dry handles and test the function of the start/stop switch.



- Start the Petrol String Trimmer only in accordance with the instructions.
- Do not use any other methods for starting the engine!
- Use the Petrol String Trimmer and the tools only for such applications as specified.
- Only start the engine, after the entire assembly is done. Operation of the device is only permitted after all the appropriate accessories are attached!
- Before starting make sure that the cutting attachment has no contact with hard objects such as branches, stones etc. as the cutting attachment will revolve when starting.
- The engine is to be switched off immediately in case of any engine problems.
- Should the cutting attachment hit stones or other hard objects, immediately switch off the engine and inspect the cutting attachment.
- Inspect the cutting attachment at short regular intervals for damage (detection of hairline cracks by means of tapping-noise test).
- If the equipment gets heavy impact or fall, check the condition before continuing work. Check the fuel system for fuel leakage and the controls and safety devices for malfunction. If there is any damage or doubt, ask our authorized service center for the inspection and repair.
- During operation always hold the Petrol String Trimmer with both hands. Never hold the Petrol String Trimmer with one hand during use. Always ensure a safe footing.
- Operate the equipment in such a manner as to avoid inhalation of the exhaust gases. Never run the engine in enclosed rooms (risk of gas poisoning). Carbon monoxide is an odorless gas.
- Switch off the engine when resting and when leaving the equipment unattended, and place it in a safe location to prevent danger to others or damage to the machine.
- Never put the hot Petrol String Trimmer onto dry grass or onto any combustible materials.
- Always install the approved cutting attachment guard onto the equipment before starting the engine. Otherwise contact with the cutting attachment may cause serious injury.
- All protective installations and guards supplied with the machine must be used during operation.
- Never operate the engine with faulty exhaust muffler.
- Shut off the engine during transport.
- Ensure safe position of the equipment during car transportation to avoid fuel leakage.
- When transporting, ensure that the fuel tank is completely empty.
- When unloading the equipment from the truck, never drop the Engine to the ground or this may severely damage the fuel tank.
- Except in case of emergency, never drop or cast the equipment to the ground or this may severely damage the equipment.
- Remember to lift the entire equipment from the ground when moving the equipment. Dragging the fuel tank is highly dangerous and will cause damage and leakage of fuel, possibly causing fire.

Refueling

- Shut off the engine during refueling, keep away from open flames and do not smoke.
- Avoid skin contact with mineral oil products. Do not inhale fuel vapor. Always wear protective gloves during refueling. Change and clean protective clothing at regular intervals.
- Take care not to spill either fuel or oil in order to prevent soil contamination (environmental protection). Clean the Petrol String Trimmer immediately after fuel has been spilled.
- Avoid any fuel contact with your clothing. Change your clothing instantly if fuel has been spilt on it (to prevent clothing catching fire).
- Inspect the fuel cap at regular intervals making sure that it can be securely fastened and does not leak.
- Carefully tighten the fuel tank cap. Change location to start the engine (at least 3 meters away from the place of refueling).
- Never refuel in closed rooms. Fuel vapors accumulate at ground level (risk of explosions).
- Only transport and store fuel in approved containers. Make sure the fuel stored is not accessible to children.



Method of operation

- Only use in good light and visibility. During the winter season beware of slippery or wet areas, ice and snow (risk of slipping). Always ensure a safe footing.
- Never cut above waist height.
- Never stand on a ladder.
- Never climb up into trees to perform cutting operation.
- Never work on unstable surfaces.
- Remove sand, stones, nails etc. found within the working range.
- Before commencing cutting, the cutting attachment must have reached full working speed.
- Swing the Petrol String Trimmer evenly.
If grass or branches get caught between the cutting attachment and guard, always stop the engine before cleaning. Otherwise unintentional attachment rotation may cause serious injury.
- Take a rest to prevent loss of control caused by fatigue. We recommend to take a 10 to 20-minute rest every hour.



Cutting attachments

- Never use metal blades including metal multi-piece pivoting chains and flail blades. Otherwise blade contact may cause serious injury.

Vibration

- People with poor circulation who are exposed to excessive vibration may experience injury to blood vessels or the nervous system. Vibration may cause the following symptoms to occur in the fingers, hands or wrists: "Falling asleep" (numbness), tingling, pain, stabbing sensation, alteration of skin color or of the skin. If any of these symptoms occur, see a physician!
- To reduce the risk of "white finger disease", keep your hands warm during operation and well maintain the equipment and accessories.



Maintenance instructions

- Have your equipment serviced by our authorized service center, always using only genuine replacement parts. Incorrect repair and poor maintenance can shorten the life of the equipment and increase the risk of accidents.
- The condition of the equipment, in particular of the cutting attachment of the protective devices must be checked before commencing work.
- Turn off the engine and remove spark plug connector when replacing cutting attachments, and also when cleaning the cutter or cutting attachment.
- Pay attention to the environment. Avoid unnecessary throttle operation for less pollution and noise emissions. Adjust the carburetor correctly.
- Clean the equipment at regular intervals and check that all screws and nuts are well tightened.
- Never service or store the equipment in the vicinity of naked flames.
- Always store the equipment in locked rooms and with an emptied fuel tank.



Observe the relevant accident prevention instructions issued by the relevant trade associations and by the insurance companies. Do not perform any modifications to the equipment as this will endanger your safety.

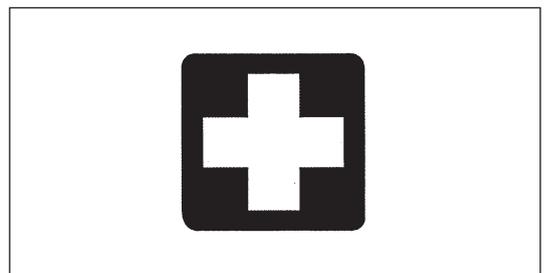
The performance of maintenance or repair work by the user is limited to those activities as described in the instruction manual. All other work is to be done by an Authorized Service Agent. Use only genuine spare parts and accessories released and supplied by MAKITA. Use of non-approved accessories and tools means increased risk of accidents. MAKITA will not accept any liability for accidents or damage caused by the use of non-approved cutting attachments and fixing devices of cutting attachments, or accessories.

First Aid

In case of accident make sure that a first-aid box is available in the vicinity of the cutting operations. Immediately replace any item taken from the first aid box.

When asking for help, please give the following information:

- Place of accident
- What happened
- Number of injured persons
- Kind of injuries
- Your name



TECHNICAL DATA ER2650LH

Model		ER2650LH		
Handle type		Loop handle		
Dimensions: length x width x height (without cutting attachment)		mm	1,621 x 310 x 479	
Cutting diameter		mm	412	
Mass (without plastic guard and cutting attachment)		kg	4.8	
Volume (fuel tank)		L	0.6	
Volume (oil reservoir)		L	0.08	
Engine displacement		cm ³	25.4	
Maximum engine performance		kw	0.77 at 7,000 min ⁻¹	
Engine speed at recommended max. spindle speed		min ⁻¹	10,000	
Maximum rotational frequency of the spindle		min ⁻¹	7,900	
Idling speed		min ⁻¹	3,000	
Clutch engagement speed		min ⁻¹	3,900	
Carburetor		Diaphragm type		
Ignition system		Non-contact, magnet type		
Spark plug		type	NGK CMR4A	
Electrode gap		mm	0.7 - 0.8	
Vibration per ISO 22867	Right handle (Rear grip)	$a_{hv\ eq}$	m/s ²	8.2
		Uncertainty K	m/s ²	0.9
	Left handle (Front grip)	$a_{hv\ eq}$	m/s ²	5.0
		Uncertainty K	m/s ²	1.7
Sound pressure level average to ISO 22868	$L_{PA\ eq}$	dBA	97.5	
	Uncertainty K	dBA	1.8	
Sound power level average to ISO 22868	$L_{WA\ eq}$	dBA	107.3	
	Uncertainty K	dBA	2.5	
Fuel		Automobile gasoline (petrol)		
Engine Oil		API grade SF class or higher, SAE 10W-30 oil (automobile 4-stroke engine oil)		

For European countries only

EC Declaration of Conformity

We Makita Corporation as the responsible manufacturer declare that the following Makita machine(s):

Designation of Machine:

Petrol String Trimmer

Model No./ Type: ER2650LH

Specifications: see "TECHNICAL DATA" table

are of series production and

Conforms to the following European Directives:

2000/14/EC, 2006/42/EC

And are manufactured in accordance with the following standards or standardized documents:

EN ISO11806-1

The technical documentation is kept by:

Makita International Europe Ltd., Technical Department,

Michigan Drive, Tongwell,

Milton Keynes, Bucks MK15 8JD, England

The conformity assessment procedure required by Directive 2000/14/EC was in Accordance with annex V.

Measured Sound Power Level: 107.3 dB

Guaranteed Sound Power Level: 110 dB

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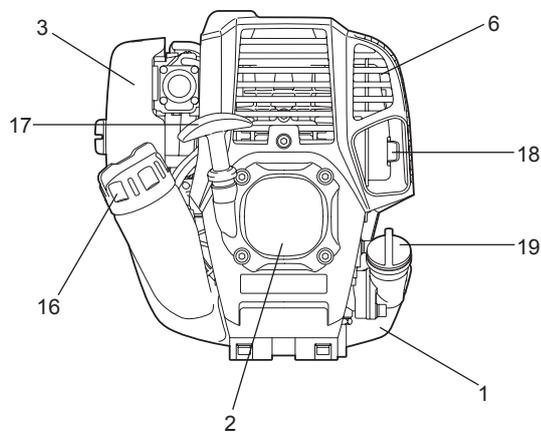
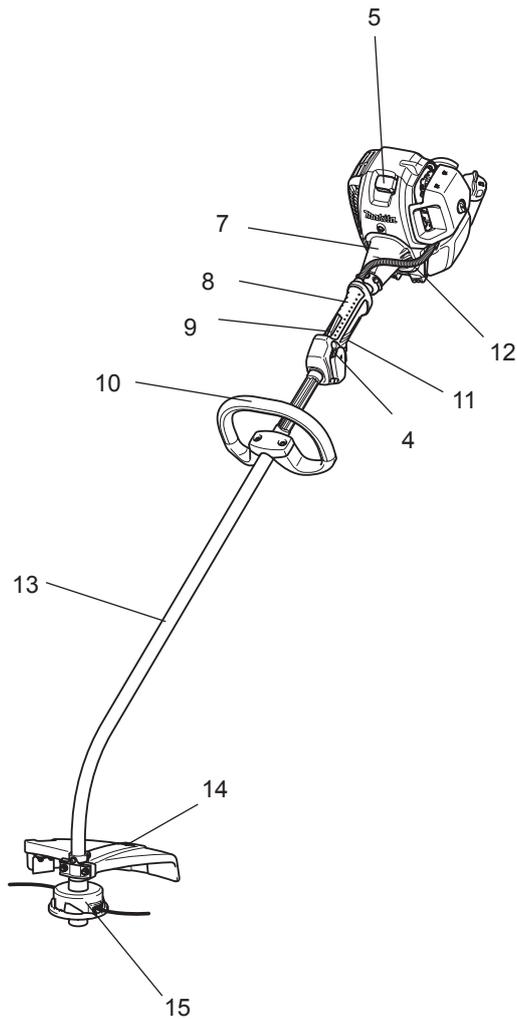


Tomoyasu Kato
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Anjo, Aichi, JAPAN

DESIGNATION OF PARTS

ER2650LH



GB	DESIGNATION OF PARTS
1	Fuel tank
2	Rewind starter
3	Air cleaner
4	I-O switch (on/off)
5	Spark plug
6	Exhaust muffler
7	Clutch case
8	Rear grip
9	Lock-off lever
10	Handle
11	Throttle lever
12	Control cable
13	Shaft
14	Protector (Cutting attachment guard)
15	Nylon cutting head
16	Fuel filler cap
17	Starter knob
18	Exhaust pipe
19	Oil cap

MOUNTING OF HANDLE

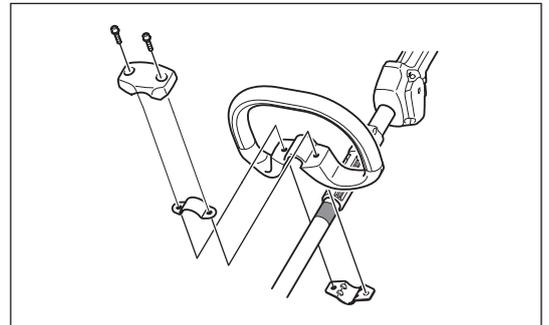
⚠ CAUTION: Before doing any work on the equipment, always stop the engine and pull the spark plug connector off the spark plug. Always wear protective gloves!

⚠ CAUTION: Start the engine only after having assembled it completely.

For machines with loop handle

- Fix the loop handle on the shaft as shown.
- Make sure that the spacer on the shaft pipe is located between the grip assembly and the other grip. Do not remove or shrink the spacer.

NOTE: In some countries, the spacer is not provided with the tool. In that case, align the handle to further side of the line which is indicated by the arrow marks.



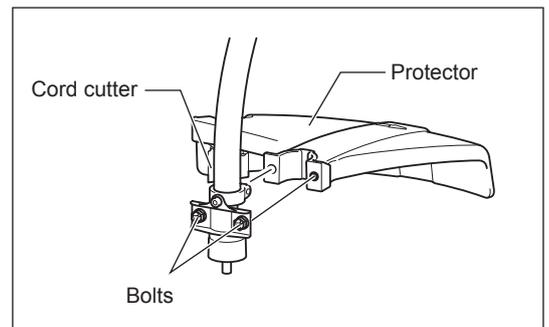
MOUNTING OF PROTECTOR

To meet the applicable safety provisions, only the tool/protector combinations as indicated in the table must be used.

⚠ CAUTION: Do not touch the cord cutter on the protector. Touching the cord cutter with bare hands may result in injury.

The protector must be installed to maintain the nylon-cutting-cord length and protect the operator from thrown stones and debris. Install the protector as the following steps.

1. Set the protector so that the rib on the shaft fits into the groove on the protector.
2. Tighten two bolts.



MOUNTING OF NYLON CUTTING HEAD

⚠ WARNING: Never use cutting blades.

Be sure to use genuine MAKITA nylon cutting head.

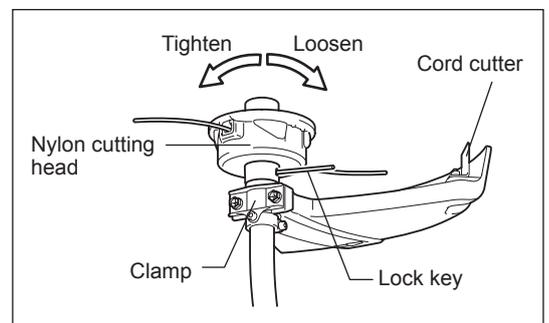
- If the nylon cutting head hits against a stone during operation, stop the engine and check the nylon cutting head immediately.

⚠ CAUTION: Do not touch the cord cutter on the protector. Touching the cord cutter with bare hands may result in injury.

Mount a nylon cutting head as the following steps.

1. Insert the lock key through the hole on the clamp. Rotate them with pushing the lock key in until they are locked.
2. Screw a nylon cutting head onto the shaft by turning it clockwise. Make sure that it is mounted securely.
3. Remove the lock key.

To remove the nylon cutting head, turn it counterclockwise.



BEFORE START OF OPERATION

Inspection and refill of engine oil

- Perform the following procedure, with the engine cooled down.
- Set the engine level, remove oil cap (Fig. 1), and check to see whether or not there is oil in the range between the upper limit and lower limit marks of the oil pipe (Fig. 2).
- Fill with oil to upper limit mark if oil is insufficient (oil level is close to lower limit mark) (Fig. 3).
- The area surrounding the external marks is transparent, so the amount of oil inside can be checked without having to remove the oil cap. However, if oil pipe becomes extremely dirty, visibility may be lost, and oil level will have to be checked against stepped section on inside of oil pipe.
- For reference, the oil refill time is about 10h (10 times or 10 reservoirs of gas before oil needs to be refilled). If the oil changes in color or mixes with dirt, replace it with new one. (For the interval and method of replacement, refer to P 14)

Recommended oil: SAE 10W-30 oil of API Classification, Class SF or higher (4-stroke engine for automobile)

Oil volume: Approx. 0.08L

NOTE: If the engine is not kept upright, oil may pool in other parts of the engine. The oil level gauge may give an incorrect reading for oil level. Do not fill with oil if engine is not upright. If the oil is filled above the limit, the oil may be contaminated or may catch fire with white smoke.

Point 1 in Replacement of oil: “Oil cap”

- Remove dust or dirt near the oil refill port, and detach the oil cap.
- Keep the detached oil cap free of sand or dust. Otherwise, any sand or dust adhering to the oil cap may cause irregular oil circulation or wear on the engine parts, which will result in troubles.

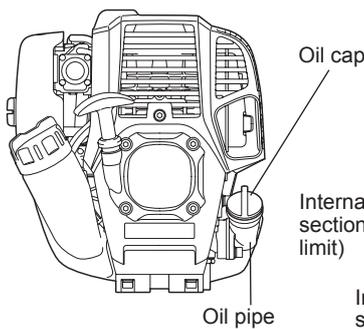


Fig. 1

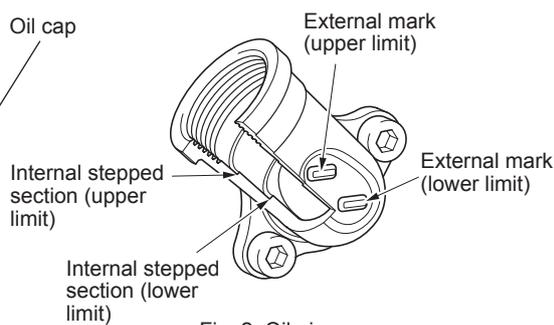


Fig. 2 Oil pipe

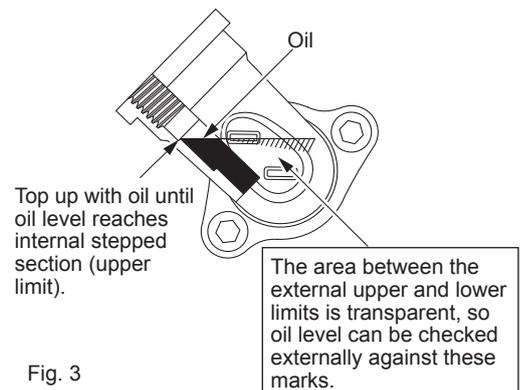
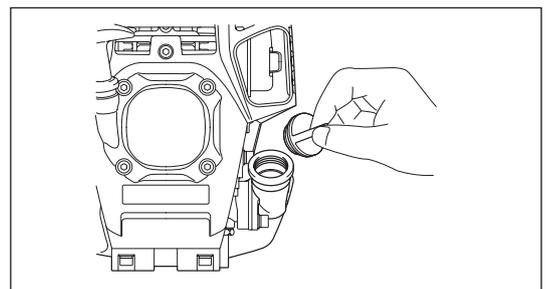
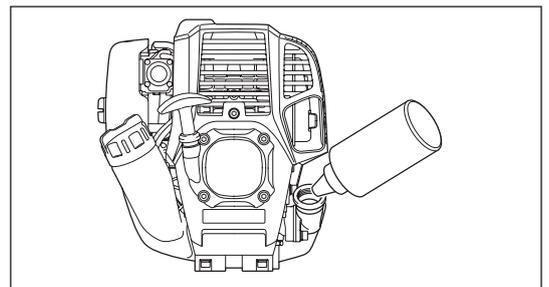


Fig. 3

(1) Keep the engine level, and detach the oil cap.



(2) Fill with oil to upper limit mark. (see Fig. 3)
Use oil bottle when filling.



(3) Securely tighten the oil cap. Insufficient tightening may cause oil leakage.

Note

- Do not replace oil with the engine in a tilted position.
- Filling with oil while engine is tilted leads to overfilling which causes oil contamination and/or white smoke.

Point 2 in Replacement of oil: "If oil spills out"

- If oil spills out between the fuel tank and engine main unit, the oil is sucked into through the cooling air intake port, which will contaminate the engine. Be sure to wipe out spilt oil before start of operation.

REFUELING

Handling of fuel

It is necessary to handle fuel with utmost care. Fuel may contain substances similar to solvents. Refueling must be performed in a sufficiently ventilated room or in the open air. Never inhale fuel vapor, and keep fuel away from you. If you touch fuel repeatedly or for a long time, the skin becomes dry, which may cause skin disease or allergy. If fuel enters into the eye, clean the eye with fresh water. If your eye remains still irritated, consult your doctor.

Storage period of fuel

Fuel should be used within a period of 4 weeks, even if it is kept in a special container in a well-ventilated and shaded area. Otherwise, fuel may deteriorate in one day.

STORAGE OF MACHINE AND REFILL TANK

- Keep the machine and tank at a cool place free from direct sunshine.
- Never keep the fuel in a car.

Fuel

The engine is a four-stroke engine. Be sure to use an unleaded automobile gasoline 87 or higher octane ((R+M)/2). It may contain no more than 10% alcohol (E-10).

Points for fuel

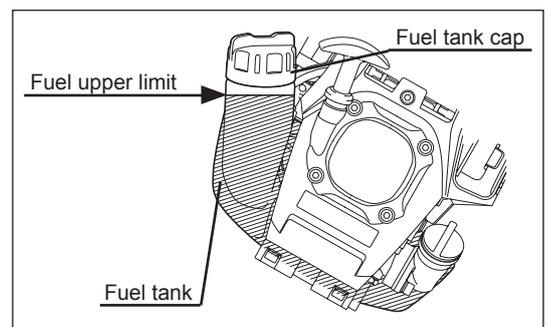
- Never use a gasoline mixture which contains engine oil. Otherwise, it will cause excessive carbon accumulation or mechanical troubles.
- Use of deteriorated oil will cause irregular start-up.

Refueling

⚠ WARNING: Shut off the engine before refueling, keep away from open flames and do not smoke.

Gasoline used: Unleaded automobile gasoline, 87 or higher octane. No more than 10% alcohol (E-10).

- Loosen the tank cap a little to release the tank pressure.
 - Detach the tank cap, and refuel, discharging air by tilting the fuel tank so that the refuel port will be oriented upward. DO NOT fill fuel up to the top of the tank.
 - Wipe the outside of the tank cap to prevent debris from entering into the fuel tank.
 - After refueling, securely tighten the tank cap.
- If there is any flaw or damage on the tank cap, replace it.
 - The tank cap wears out in course of time. Replace it every two to three years.
 - DO NOT put fuel in the oil fill port.



POINTS IN OPERATION AND HOW TO STOP

Observe the applicable accident prevention regulations!

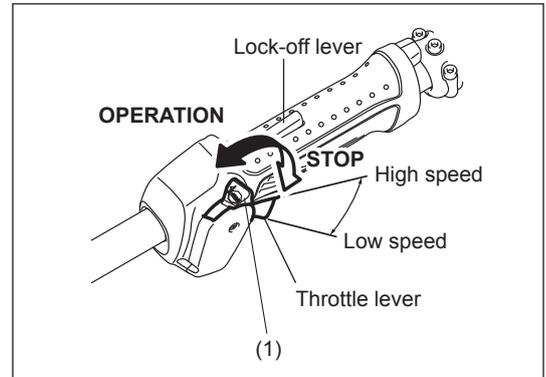


STARTING

Move at least 3 m away from the place of refueling. Place the unit on the ground taking care that the cutting attachment does not come into contact with the ground or any other objects.

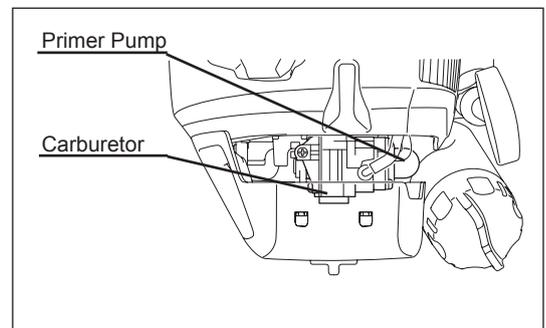
A: Cold start

- 1) Set this machine on a flat space.
- 2) Set the I-O switch (1) to OPERATION.



- 3) Primer pump

Continue to push the primer pump until fuel enters into the primer pump. (In general, fuel enters into the primer pump by 7 to 10 pushes.) If the primer pump is pushed excessively, an excess of gasoline returns to the fuel tank.



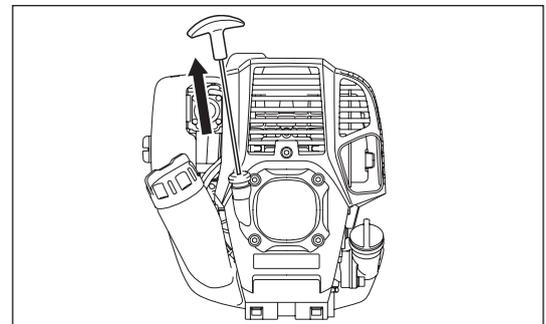
- 4) Recoil starter

Pull the start knob gently until it is hard to pull (compression point). Then, return the start knob, and pull it strongly.

Never pull the rope to the full. Once the start knob is pulled, never release your hand immediately. Hold the start knob until it returns to its original point.

- 5) Warm-up operation

Continue warm-up operation for 2 to 3 minutes.



NOTE: In case of excessive fuel intake (flooding), remove the spark plug and pull the starter handle slowly to remove excess fuel. Also, dry the electrode section of the spark plug.

B: Startup after warm-up operation

- 1) Push the primer pump repeatedly.
- 2) Keep the throttle lever at the idling position.
- 3) Pull the recoil starter strongly.
- 4) If it is difficult to start the engine, open the throttle by about 1/3.

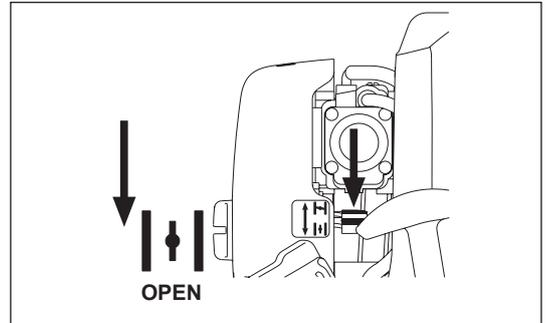
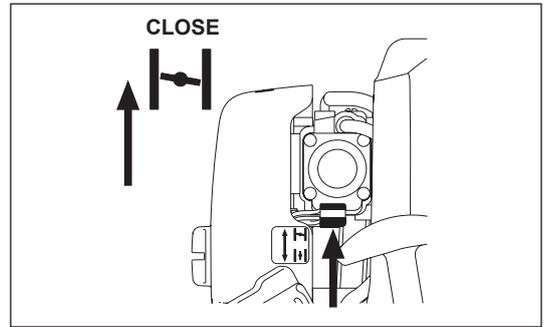
At times, such as winter, when starting the engine is difficult

Operate choke lever with the following procedure when starting engine.

- After implementing startup steps 1) to 3), set choke lever to the CLOSE position.
- Implement startup step 4) and start engine.
- Once engine starts, set choke lever to the OPEN position.
- Implement startup step 5) and complete warm up.

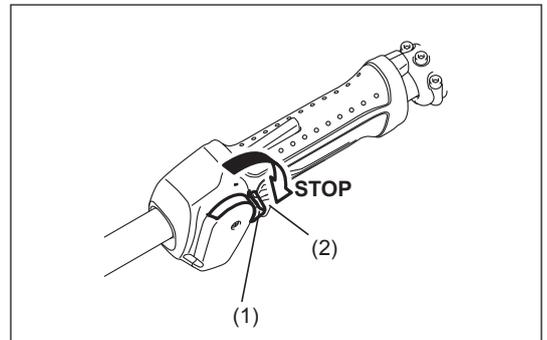
⚠ CAUTION: If a bang (explosive sound) is heard and the engine stops, or the just-started engine stalls before the choke lever is operated, return the choke lever to the OPEN position, and pull the starter knob a few times again to start the engine.

⚠ CAUTION: If the choke lever is left in the CLOSE position, and the starter knob merely pulled repeatedly, too much fuel will be sucked in, and the engine will become difficult to start.



STOPPING

- 1) Release the throttle lever (2) fully, and when the engine rpm has lowered, set the I-O switch to STOP the engine will now stop.
- 2) Be aware that the cutting head may not stop immediately and allow it to slow down fully.

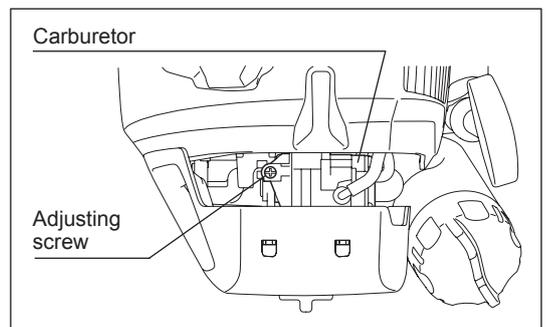


ADJUSTMENT OF LOW-SPEED ROTATION (IDLING)

When it is necessary to adjust the low-speed rotation (idling), perform it by the carburetor adjusting screw.

CHECKUP OF LOW-SPEED ROTATION

- Set the low-speed rotation to 3,000 min⁻¹.
If it is necessary to change the low speed rotation (idle) speed, use a phillips head screw driver on the screw illustrated on the right.
- Turn the adjusting screw to the right, and the engine rotation will increase.
Turn the adjusting screw to the left, and the engine rotation will drop.
- The carburetor is generally adjusted before shipment. After several tanks of gasoline the idle rpm may need to be readjusted.



THE NYLON CUTTING HEAD

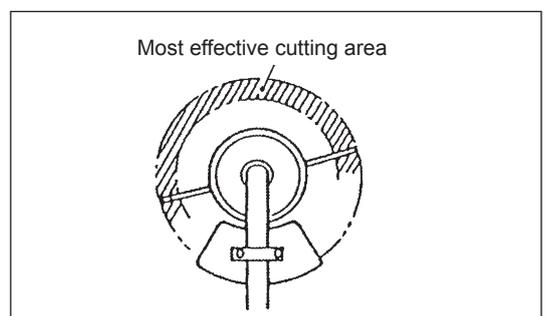
During operation, use the tip of the nylon cutting cord for cut.

Feeding the nylon cutting cord

As the nylon cutting cord is worn and shortened with the cutting operation, the operator needs to feed it manually.

To feed the nylon cutting cord, tap the nylon cutting head on the ground while it rotates around 6,000 min⁻¹.

NOTE: If the nylon cutting cord does not feed out, rewind it.



Replacing the nylon cord

⚠ WARNING: Make sure that the cover of the nylon cutting head is secured to the housing properly as described below. Failure to properly secure the cover may cause the nylon cutting head to fly apart resulting in serious personal injury.

Press inward on the housing latches and lift upward to remove the cover. Discard any of the remaining nylon cord.

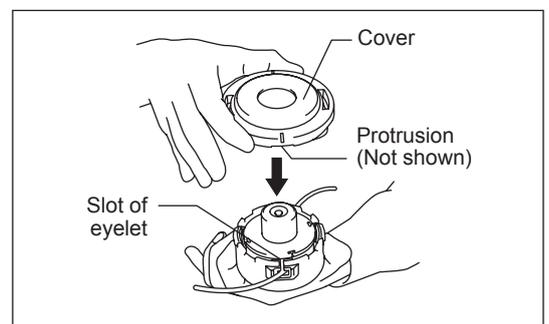
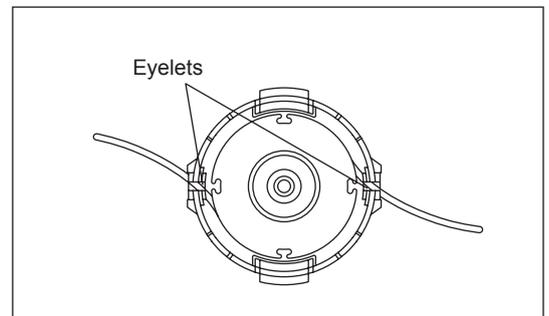
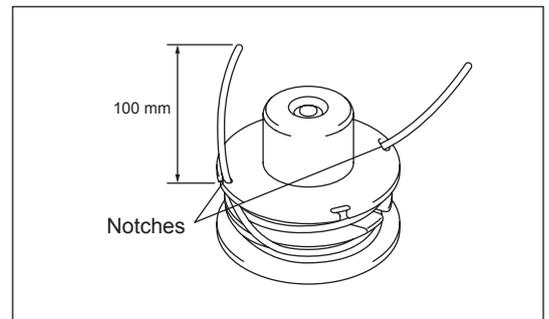
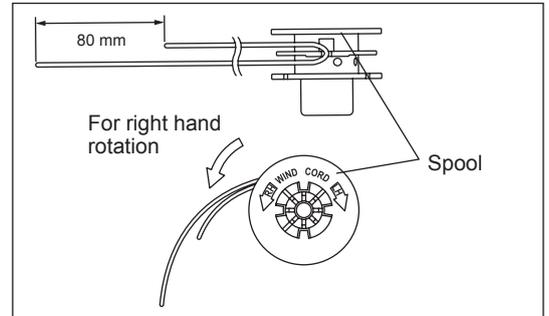
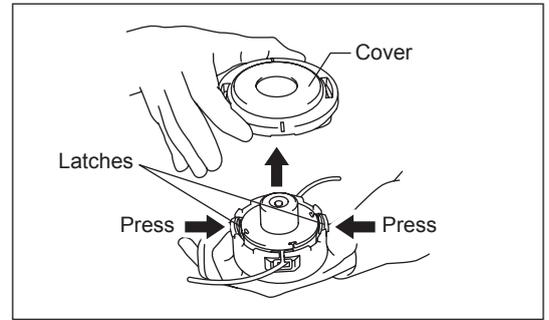
Hook the middle of the new nylon cord to the notch located at the center of the spool between the 2 channels provided for the nylon cord. One side of the cord should be about 80 mm longer than the other side.

Wind both ends firmly around the spool in the direction marked on the head for right hand direction indicated by RH.

Wind all but about 100 mm of the cords, leaving the ends temporarily hooked through a notch on the side of the spool.

Mount the spool in the housing so that the grooves and protrusions on the spool match up with those in the housing. Now, unhook the ends of the cord from their temporary position and feed the cords through the eyelets to come out of the housing.

Align the protrusion on the underside of the cover with the slots of the eyelets. Then push cover firmly onto the housing to secure it. Make sure the latches fully spread in the cover.



SERVICING INSTRUCTIONS

CAUTION: Before doing any work on the equipment, always stop the engine and pull the plug cap off the spark plug (see “checking the spark plug”).
Always wear protective gloves!

To ensure a long service life and to avoid any damage to the equipment, the following servicing operations should be performed at regular intervals.

Daily checkup and maintenance

- Before operation, check the machine for loose screws or missing parts. Pay particular attention to the tightness of the nylon cutting head.
- Before operation, always check for clogging of the cooling air passage and the cylinder fins.
Clean them if necessary.
- Perform the following work daily after use:
 - Clean the equipment externally and inspect for damage.
 - Clean the air filter. When working under extremely dusty conditions, clean the filter the several times a day.
 - Check the nylon cutting head for damage and make sure it is firmly mounted.
 - Check that there is sufficient difference between idling and engagement speed to ensure that the cutting attachment is at a standstill while the engine is idling (if necessary reduce idling speed).
If under idling conditions the tool should still continue to run, consult your nearest Authorized Service Agent.
- Check the functioning of the I-O switch, the lock-off lever, the throttle lever, and the lock button.

REPLACEMENT OF ENGINE OIL

Deteriorated engine oil will shorten the life of the engine. Be sure to check the oil and level regularly.



ATTENTION: In general, the engine main unit and engine oil still remain hot just after the engine is stopped. In replacement of oil, make sure that the engine main unit and engine oil are sufficiently cooled down. Otherwise, there may remain a risk of scald.

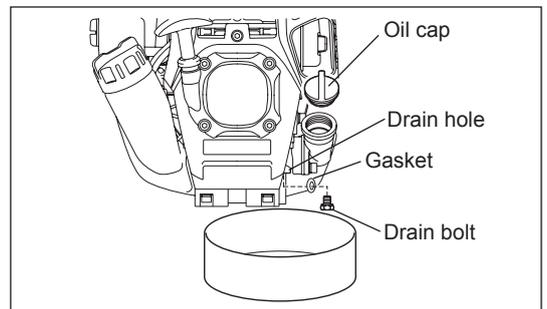
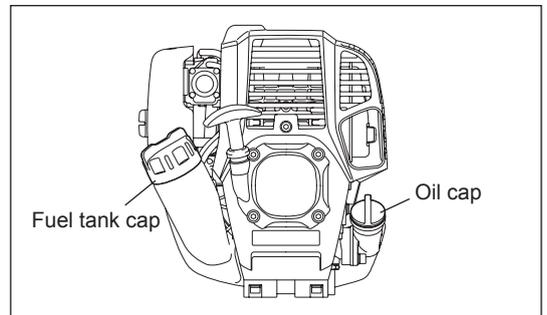
NOTE: If the oil filled above the limit, it may be contaminated or may catch fire with white smoke.

Interval of replacement: After first 20 operating hours, followed by every 50 operating hours.

Recommended oil: SAE10W-30 oil of API Classification SF Class or higher (4-stroke engine oil for automobile)

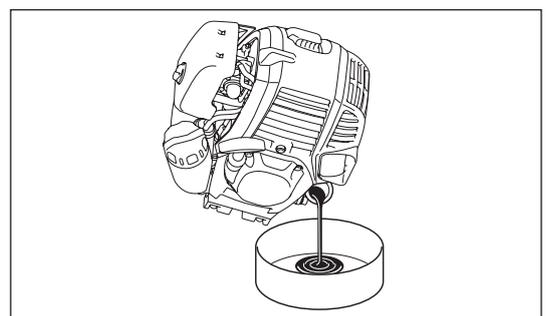
In replacement, perform the following procedure.

- 1) Make sure that the fuel tank cap is tightened securely.
- 2) Place large container (pan, etc.) under drain hole.
- 3) Remove drain bolt and then remove oil cap to drain out oil from drain hole.
At this time, be sure not to lose drain bolt's gasket, or get dirty any of the removed components.
- 4) Once all the oil has been drained, install gasket and drain bolt, and tightly secure drain bolt, so that it will not loosen and cause leaks.
* Use cloth to fully wipe off any oil attached to bolt and equipment.

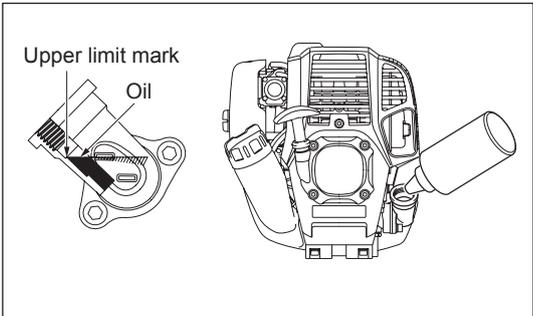
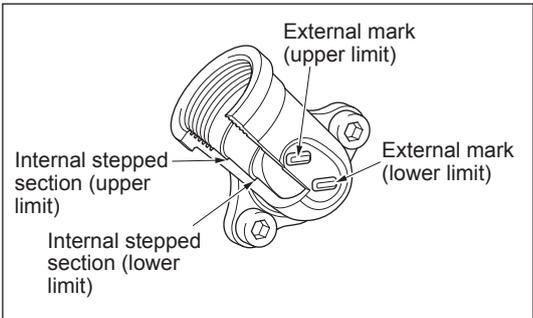


Alternative draining method

Remove oil cap, tilt the equipment toward oil filler hole, and drain out oil.
Collect oil in container.



- 5) Set the engine level, and gradually fill up to upper limit mark with new oil.
- 6) After filling, tightly secure oil cap, so that it will not loosen and cause leaks. If oil cap is not tightly secured, it may leak.



POINTS ON OIL

- Never discard replaced engine oil in garbage, earth or sewage ditch. Disposal of oil is regulated by law. In disposal, always follow the relevant laws and regulations. For any points remaining unknown, contact Authorized Service Agent.
- Oil will deteriorate even when it is kept unused. Perform inspection and replacement at regular intervals (replace with new oil every 6 months).

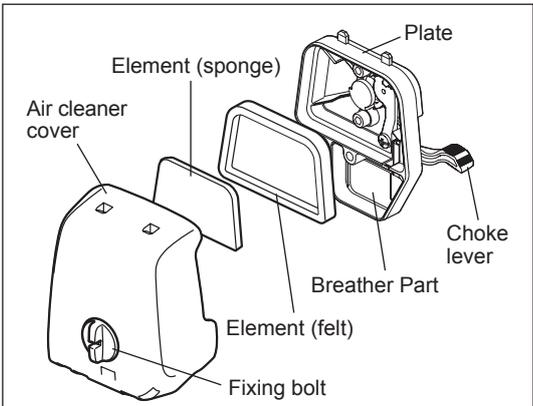
CLEANING OF AIR CLEANER



WARNING: Shut off the engine, keep away from open flames and do not smoke.

Interval of Cleaning and Inspection: Daily (every 10 operating hours)

- Turn the choke lever to the full close side, and keep the carburetor off from dust or dirt.
- Loosen the fixing bolt.
- Remove the air cleaner cover by pulling its bottom side.
- Remove the elements and tap them to remove dirt.
- If the elements are heavily contaminated:
Remove the elements, immerse them in warm water or in water-diluted neutral detergent, and dry them completely. Do not squeeze or rub them when washing.
- Before attaching the elements, be sure to dry them completely. Insufficient drying of the elements may lead to difficult startup.
- Wipe out oil adhering around the air cleaner cover and the breather part with waste cloth.
- Fit the element (sponge) into the element (felt).
Fit the elements into the plate so that the sponge faces the air cleaner cover.
- Immediately attach the cleaner cover and tighten it with fixing bolts. (In remounting, first place the upper claw, and then the lower claw.)



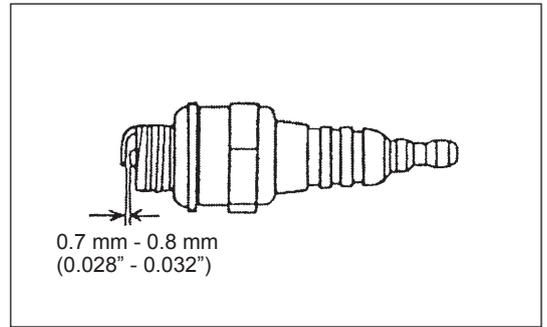
NOTICE:

- Clean the elements several times a day, if excessive dust adheres to it. Dirty elements reduce engine power and make starting engine difficult.
- Remove oil on the elements. If operation continues with the elements remaining not cleared of oil, oil in the air cleaner may fall outside, resulting in contamination of the environment.
- Do not put the elements on the ground or dirty place. Otherwise they pick up dirt or debris and it may damage the engine.
- Never use fuel for cleaning the elements. Fuel may damage them.

CHECKING THE SPARK PLUG

- Only use the supplied universal wrench to remove or to install the spark plug.
- The gap between the two electrodes of the spark plug should be 0.7 - 0.8 mm (0.028" - 0.032"). If the gap is too wide or too narrow, adjust it. If the spark plug is clogged or contaminated, clean it thoroughly or replace it.

⚠ CAUTION: Never touch the spark plug connector while the engine is running (danger of high voltage electric shock).



CLEANING OF FUEL FILTER

⚠ WARNING: INFLAMMABLES STRICTLY PROHIBITED

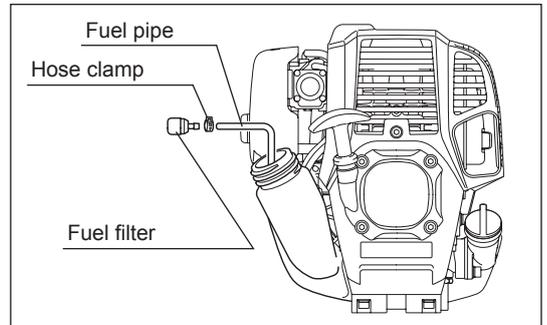
Interval of Cleaning and Inspection: Monthly (every 50 operating hours)

Suction head in the fuel tank

Check the fuel filter periodically. To check the fuel filter, follow the steps below.

- (1) Remove the fuel tank cap, drain the fuel to empty the tank. Check the tank inside for any foreign materials. If any, remove them.
- (2) Pull out the suction head by using a wire hook through the tank opening.
- (3) If the fuel filter clogged slightly, clean it. To clean it, gently shake and tap it in fuel. To avoid damage, do not squeeze or rub it. The fuel used for the cleaning must be disposed in accordance with the method specified by regulations in your country.
If the fuel filter became hard or heavily clogged up, replace it.
- (4) After checking, cleaning or replacing, push the fuel filter in all the way to the bottom of the fuel tank.

Clogged or damaged fuel filter can cause insufficient fuel supply and reduce engine power. Replace the fuel filter at least quarterly to ensure satisfactory fuel supply to the carburetor.



REPLACEMENT OF FUEL PIPE

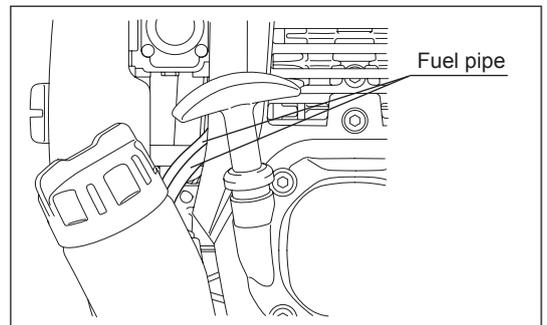
⚠ CAUTION: INFLAMMABLES STRICTLY PROHIBITED

Interval of Cleaning and Inspection: Daily (every 10 operating hours)

Replacement: Annually (every 200 operating hours)

Replace the fuel pipe every year, regardless of operating frequency. Fuel leakage may lead to fire.

If any leakage is detected during inspection, replace the fuel pipe immediately.



INSPECTION OF BOLTS, NUTS AND SCREWS

- Retighten loose bolts, nuts, etc.
- Check the fuel cap and oil cap for tightness. Check for fuel and oil leakage.
- Replace damaged parts with new ones for safety operation.

CLEANING OF PARTS

- Always keep the engine clean.
- Keep the cylinder fins and air inlet free of dust or dirt. Dust or dirt adhering to the fins will cause piston seizure.

REPLACEMENT OF GASKETS AND PACKINGS

In reassembling the engine, be sure to replace the gaskets and packings with new ones.

Any maintenance or adjustment work that is not included and described in this manual is only to be performed by Authorized Service Agents.

STORAGE



WARNING: When draining the fuel, be sure to stop the engine and make sure that the engine cools down. Just after stopping the engine, it may still be hot with possibility of burns, inflammability and fire.



ATTENTION: When the machine is kept out of operation for a long time, drain up all fuel from the fuel tank and carburetor, and keep it at a dry and clean place.

- Drain fuel from the fuel tank and carburetor according to the following procedure:
 - 1) Remove the fuel tank cap, and drain fuel completely.
If there is any foreign matter remaining in the fuel tank, remove it completely.
 - 2) Pull out the fuel filter from the refill port using a wire.
 - 3) Push the primer pump until fuel is drained from there, and drain fuel coming into the fuel tank.
 - 4) Put the filter to the fuel tank, and securely tighten the fuel tank cap.
 - 5) Then, continue to operate the engine until it stops.
- Remove the spark plug, and drip several drops of engine oil through the spark plug hole.
- Gently pull the starter handle so that engine oil will spread over the engine, and attach the spark plug.
- In general, store the machine in horizontal position, or if it is not possible, place the machine as the engine comes below the cutting tool. Otherwise engine oil may leak from inside. Pay full attention how to store the machine to prevent the machine from falling. Otherwise it may result in personal injury.
- Keep the drained fuel in a special container in a well-ventilated shade.

Attention after long-time storage

- Before startup after long-time shutdown, be sure to replace oil (refer to P 14). Oil will deteriorate while the machine is kept out of operation.

Fault location

Fault	System	Observation	Cause
Engine not starting or with difficulty	Ignition system	Ignition spark O.K.	Fault in fuel supply or compression system, mechanical defect
		No ignition spark	STOP-switch operated, wiring fault or short circuit, spark plug or connector defective, ignition module faulty
	Fuel supply	Fuel tank filled	Incorrect choke position, carburetor defective, fuel supply line bent or blocked, fuel dirty
	Compression	No compression when pulled over	Cylinder bottom gasket defective, crankshaft seals damaged, cylinder or piston rings defective or improper sealing of spark plug
Warm start problems	Mechanical fault	Starter not engaging	Broken starter spring, broken parts inside of the engine
		Tank filled ignition spark existing	Carburetor contaminated, have it cleaned
Engine starts but dies	Fuel supply	Tank filled	Incorrect idling adjustment, carburetor contaminated Fuel tank vent defective, fuel supply line interrupted, cable or STOP-switch faulty
Insufficient performance	Several systems may simultaneously be affected	Engine idling poor	Air filter contaminated, carburetor contaminated, muffler clogged, exhaust duct in the cylinder clogged

Item	Operating time	Before operation	After lubrication	Daily (10h)	30h	50h	200h	Shutdown/rest	Corresponding P
Engine oil	Inspect/clean	○							9
	Replace					○*1			14
Tightening parts (bolt, nut)	Inspect	○							16
Fuel tank	Clean/inspect	○							—
	Drain fuel							○*3	17
Throttle lever	Check function		○						—
Stop switch	Check function		○						12
Cutting attachment	Inspect	○		○					8
Low-speed rotation	Inspect/adjust			○					12
Air cleaner	Clean			○					15
Ignition plug	Inspect			○					16
Cooling air inlet	Clean/inspect			○					16
Fuel pipe	Inspect			○					16
	Replace						◎*2		—
Fuel filter	Clean/replace					○			16
Clearance between air intake valve and air discharge valve	Adjust						◎*2		—
Engine overhaul							◎*2		—
Carburetor	Drain fuel							○*3	17

*1 Perform initial replacement after 20h operation.

*2 For the 200 operating hour inspection, request Authorized Service Agent or a machine shop.

*3 After emptying the fuel tank, continue to run the engine and drain fuel in the carburetor.

TROUBLESHOOTING

Before making a request for repairs, check for trouble by yourself. If any abnormality is found, control your machine according to the description of this manual. Never tamper or dismount any part contrary to the description. For repairs, contact Authorized Service Agent or local dealership.

State of abnormality	Probable cause (malfunction)	Remedy
Engine does not start	Failure to operate primer pump	Push 7 to 10 times
	Low pulling speed of starter rope	Pull strongly
	Lack of fuel	Feed fuel
	Clogged fuel filter	Clean
	Broken fuel tube	Straighten fuel tube
	Deteriorated fuel	Deteriorated fuel makes starting more difficult. Replace with new fuel. (Recommended replacement: 1 month)
	Detached plug cap	Attach securely
	Contaminated spark plug	Clean
	Abnormal clearance of spark plug	Adjust clearance
	Other abnormality of spark plug	Replace
	Abnormal carburetor	Make request for inspection and maintenance.
	Starter rope cannot be pulled	Make request for inspection and maintenance.
	Abnormal drive system	Make request for inspection and maintenance.
Engine stops soon Engine speed does not increase	Insufficient warm-up	Perform warm-up operation
	Choke lever is set to "CLOSE" although engine is warmed up.	Set to "OPEN"
	Clogged fuel filter	Clean or replace
	Contaminated or clogged air cleaner	Clean
	Abnormal carburetor	Make request for inspection and maintenance.
	Abnormal drive system	Make request for inspection and maintenance.
The cutting attachment does not rotate. ↓ Stop engine immediately!	The cutting attachment is not tightened securely.	Tighten the cutting attachment securely.
	A twig is caught between the cutting attachment and the protector.	Remove the foreign matter.
	The drive system does not work properly.	Ask Makita authorized service center to inspect and repair it.
The unit vibrates abnormally. ↓ Stop engine immediately!	The cutting attachment is broken.	Replace the cutting attachment with new one.
	The cutting attachment is not tightened securely.	Tighten the cutting attachment securely.
	One end of nylon cutting cord has been broken and the nylon cutting head got unbalanced.	Feed the nylon cutting cord with tapping the nylon cutting head on the ground.
	The drive system does not work properly.	Ask Makita authorized service center to inspect and repair it.
The cutting attachment does not stop. ↓ Stop engine immediately!	The power unit does not work properly.	Refer to the instruction manual of the power unit.
Engine does not stop ↓ Run engine at idling, and set choke lever to CLOSE	Detached connector	Attach securely
	Abnormal electric system	Make request for inspection and maintenance.
The nylon cutting cord does not feed.	The cord is used up or tangled in the spool.	Rewind the cord.
	The nylon cutting cord is not cut off at the correct length.	The cord cutter on the protector is damaged or missing. The cord extends past the protector.

When the engine does not start after warm-up operation:

If there is no abnormality found for the check items, open the throttle by about 1/3 and start the engine.

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885077C220

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