

Robin

Brush Cutter

NB2450

INSTRUCTION MANUAL

Important:

Read this instruction manual carefully before putting the Brush Cutter into operation and strictly observe the safety regulations!
Preserve instruction manual carefully!



FINI ROBIN INDUSTRIES LTD

Thank you very much for purchasing the ROBIN Brush Cutter. We are pleased to recommend to you the ROBIN Brush Cutter which is the result of a long development programme and many years of knowledge and experience.







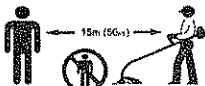
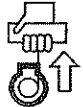










Please read this booklet which refers in detail to the various points that will demonstrate its outstanding performance. This will assist you to obtain the best possible result from your ROBIN Brush Cutter.



Table of Contents	Page
Symbols.....	2
Safety instructions.....	3-6
Technical data.....	7
Designation of parts	8
Assembly of engine and shaft.....	9
Mounting of handle.....	10
Mounting of protector	11
Mounting of cutter blade or nylon cutting head	12
Fuels/Refuelling	13
Correct handling of machine	14
Putting into operation	14-15
Idle adjustment.....	16
Resharpener the cutting tool.....	16
Nylon cutting head	16
Servicing instructions	17-18
Storage	19
Federal emission component defect warranty	20
Parts list.....	23

SYMBOLS

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

	Read instruction Manual		Wear protective helmet, eye and ear protection
	WARNING / DANGER / CAUTION		Top permissible tool speed
	Forbidden		Fuel and oil mixture
	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
	Kickback		
	Keep the area of operation clear of all persons and pets		

SAFETY INSTRUCTIONS

General Instructions

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

Intended use of the machine

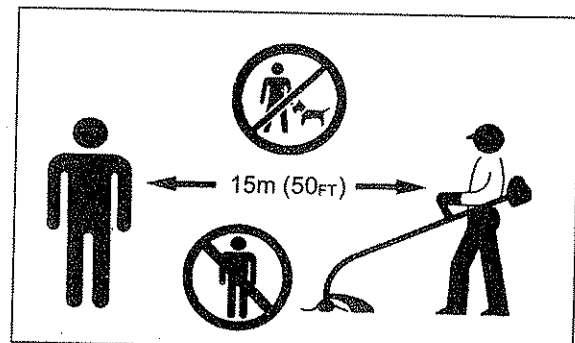
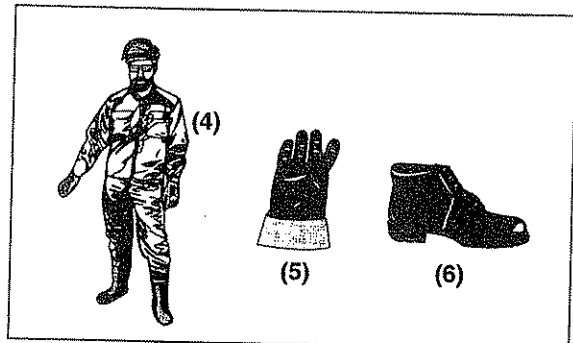
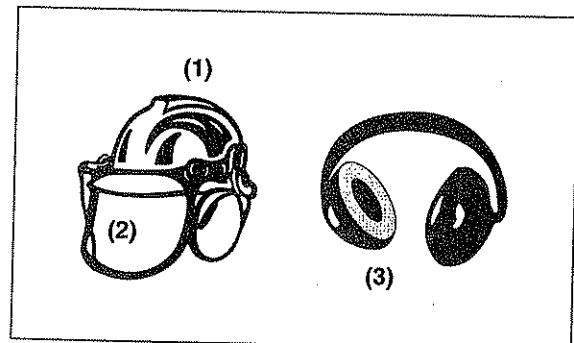
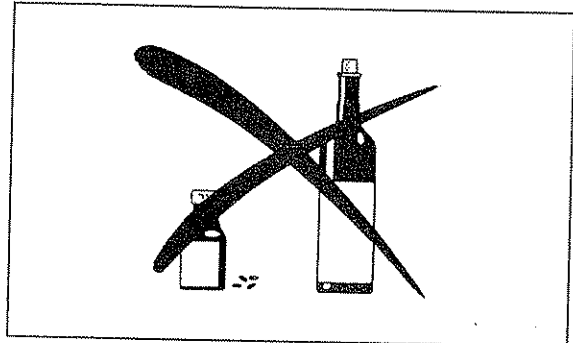
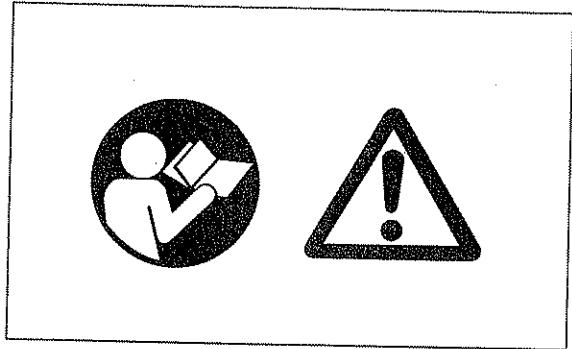
- The Brush cutter is only intended for cutter grass, weeds, Bushes, undergrowth it should not be used for any other purpose such as Edging or hedge cutting as this may cause injury.

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 to protect your hearing the following protective equipment and protective clothing must be used during operation of the brush cutter.
- 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 the approved protective helmets.
- The visor (2) of the helmet (or alternatively goggles) protects the face from flying debris and stones. During operation of the brush cutter 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.
- Special gloves (5) made of thick leather are part of the prescribed equipment and must always be worn during operation of the brush cutter.
- When using the brush cutter, always wear safety shoes (6) with a non-slip sole. This protects against injuries and ensures a good footing.

Starting up the brush cutter

- Please make sure that there are no children or other people within a working range of 15 meters (50ft), also pay attention to any animals in the working vicinity.
- Before use always check that the brush cutter is safe for operation: Check the security of the cutting tool, the control lever for easy action and check for proper functioning of the control lever lock.
- Rotation of the cutting tool 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.

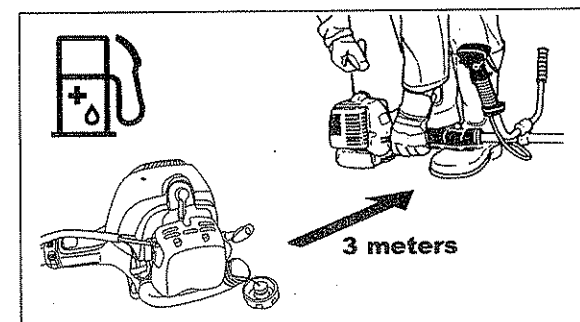
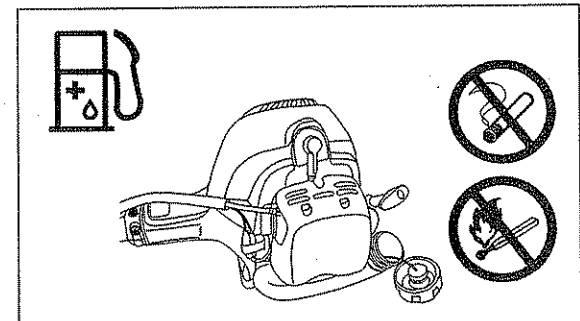
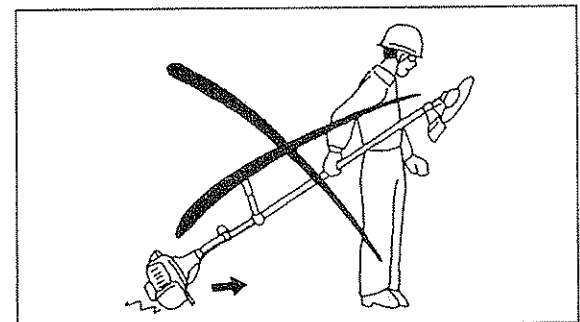
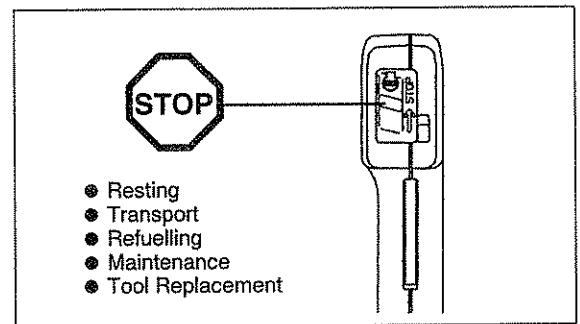
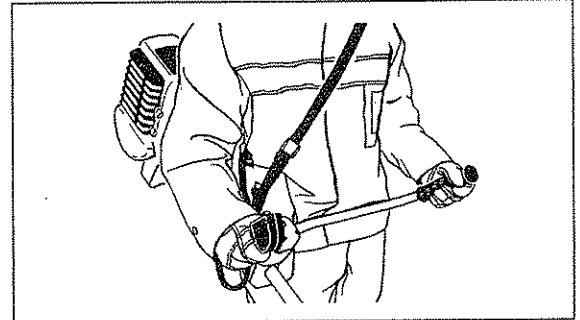
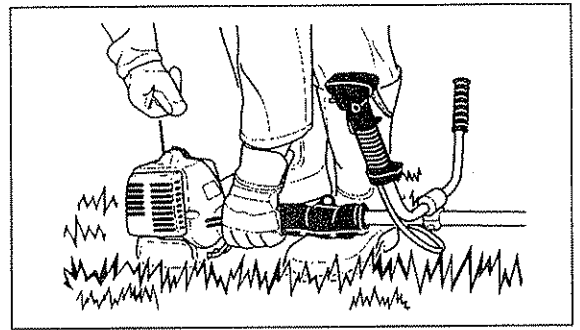


Start the brush cutter only in accordance with the instructions.
Do not use any other methods for starting the engine.

- Use the brush cutter and the tools only for such applications as specified.
- Only start the brush cutter 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 tool has no contact with hard objects such as branches, stones etc. as the cutting tool will revolve when starting.
- The engine is to be switched off immediately in case of any engine problems.
- Should the cutting tool hit stones or other hard objects, immediately switch off the engine and inspect the cutting tool.
- Inspect the cutting tool at short regular intervals for damage (detection of hairline cracks by means of tapping-noise test).
- Operate the brush cutter only with the shoulder strap attached, which is to be suitably adjusted before putting the brush cutter into operation. It is essential to adjust the shoulder strap according to the user's size to prevent fatigue occurring during use. Never hold the cutter with one hand during use.
- During operation always hold the brush cutter with both hands. Always ensure a safe footing.
- Operate the brush cutter in such a manner as to avoid inhalation of exhaust gas. 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 brush cutter unattended, and place it in a safe location to prevent danger to others or damage to the machine.
- Never put the hot brush cutter onto dry grass or onto any combustible materials.
- The cutting tool has to be equipped with it's appropriate guard. Never run the cutter without this guard.
- 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.
- During transport over long distances the tool protection included with the equipment must always be used.
- Ensure safe position of the brush cutter during car transportation to avoid fuel leakage.
- When transporting the brush cutter, ensure that the fuel tank is completely empty.
- When unloading the Brush Cutter 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 Brush Cutter to the ground or this may severely damage the Brush Cutter
- 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.

Refuelling

- Shut off the engine during refuelling, 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 refuelling. 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 brush cutter immediately after fuel has been spilt.
- 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 refuelling).
- Never refuel in closed rooms. Fuel vapors accumulate at ground level (risk of explosion).
- Only transport and store fuel in approved containers. Make sure the fuel stored is not accessible to children.



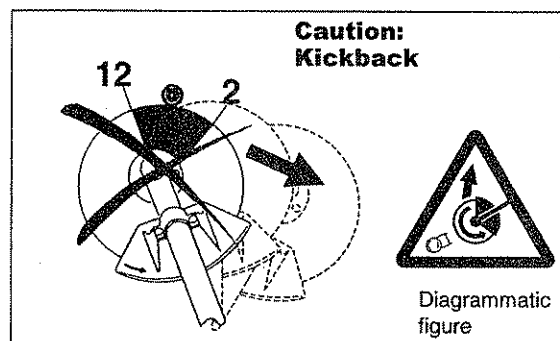
Method of operation

- Only use the brush cutter in good lighting 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 the shoulder height.
- Never stand on a ladder and run the brush cutter.
- Never climb up trees to perform cutting operation with the brush cutter.
- Never work on unstable surfaces.
- Remove sand, stones, nails etc. found within the working range. Foreign particles may damage the cutting tool and can cause dangerous kick-backs.
- Before commencing cutting, the cutting tool must have reached full working speed.



Kickback

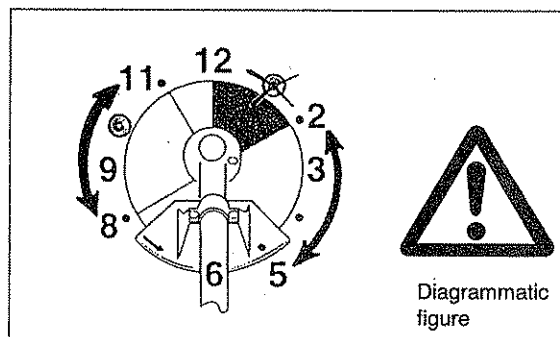
- When operating the brush cutter, uncontrolled kickback may occur.
- This is particularly the case when attempting to cut within a blade segment between 12 and 2 o'clock.
- Never apply the brush cutter within a segment between 12 and 2 o'clock.
- Never apply this segment of the brush cutter blade to solids, such as bushes and trees, etc., having a diameter in excess of 3 cm or the brush cutter will be deflected at great force with the risk of injuries.



Kickback prevention

To avoid kickbacks, observe the following:

- Operation within a blade segment between 12 and 2 o'clock presents positive hazards, especially when using metal cutting tools.
 - Cutting operations within a blade segment between 11 and 12 o'clock, and between 2 and 5 o'clock, must only be performed by trained and experienced operators, and then only at their own risk.
- Easy cutting with almost no kickback is possible within a blade segment between 8 and 11 o'clock.



Cutting Tools

Employ only the correct cutting tool for the job in hand.

Nylon cutting head:

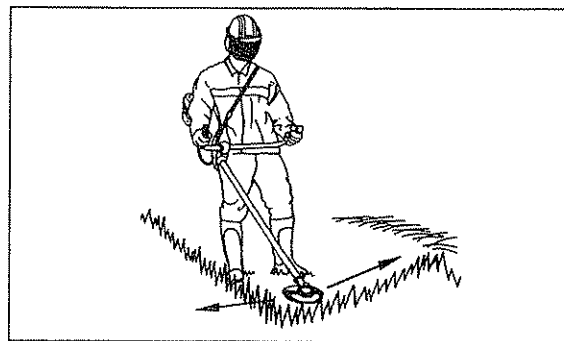
Exclusively designed for cutting along walls, fences, grass edges, trees, posts etc. (supplementing the grass mower). Perform this cutting work by swinging the grass trimmer evenly in half-circles from left to right.

Metal blade (Star Blade (4 teeth), Eddy Blade (8 teeth)):

For cutting thick materials, such as weed, high grass, bushes, shrubs, underwood, thicket etc. (max. 2 cm dia. thickness). Perform this cutting work by swinging the brush cutter evenly in half-circles from right to left (similar to using a scythe).

Saw blade:

Please use saw blade in case bamboo leaves, small tree, pampas etc. are mixed in weed.



Maintenance instructions

- The condition of the cutter, in particular of the cutting tool of the protective devices and also of the shoulder strap must be checked before commencing work. Particular attention is to be paid to the cutting blades which must be correctly sharpened.
- Turn off the engine and remove the spark plug connector when replacing or sharpening cutting tools, and also when cleaning the cutter or cutting tool.

Never straighten or weld damaged cutting tools.

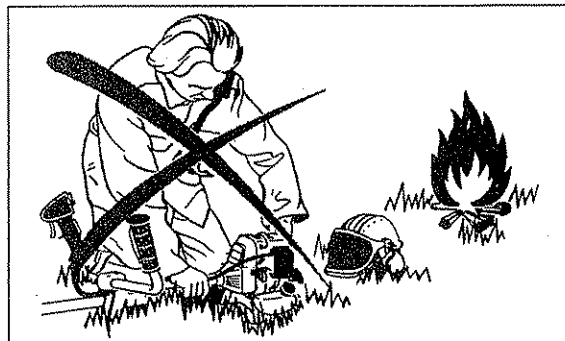
- Operate the brush cutter with as little noise and contamination as possible. In particular check the correct setting of the carburetor.
- Clean the brush cutter at regular intervals and check that all screws and nuts are well tightened.
- Never service or store the brush cutter in the vicinity of open flames.
- Always store the brush cutter 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 on the brush cutter 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 the other work is to be done by an Authorized Service Agent. Use only genuine spare parts and accessories released and supplied by ROBIN.

Use of non-approved accessories and tools means increased risk of accidents. ROBIN will not accept any liability for accidents or damage caused by the use of non-approved cutting tools and fixing devices of cutting tools, or accessories.

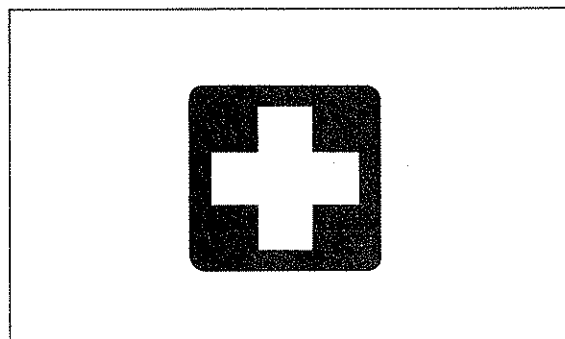


First Aid

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

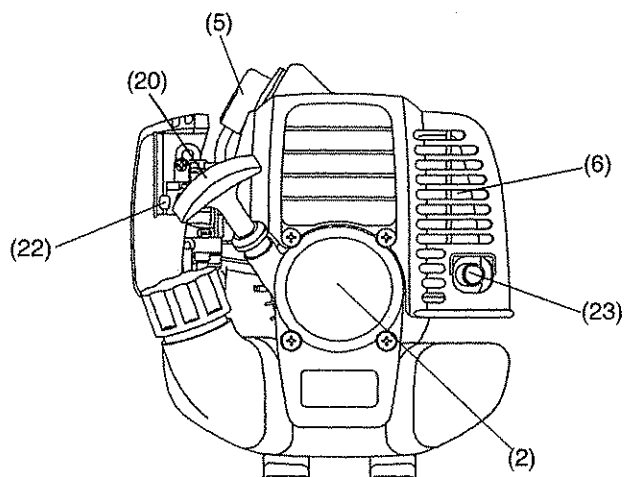
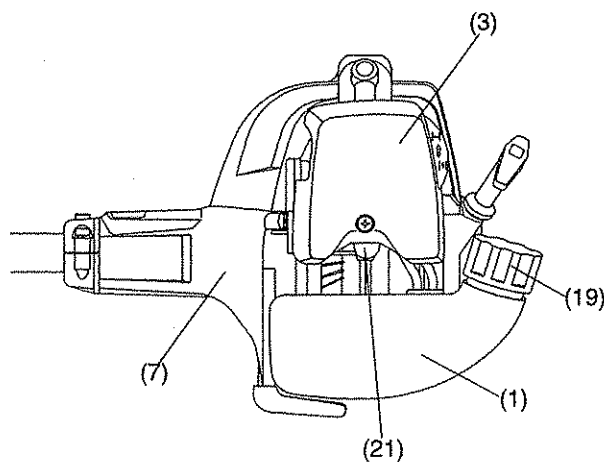
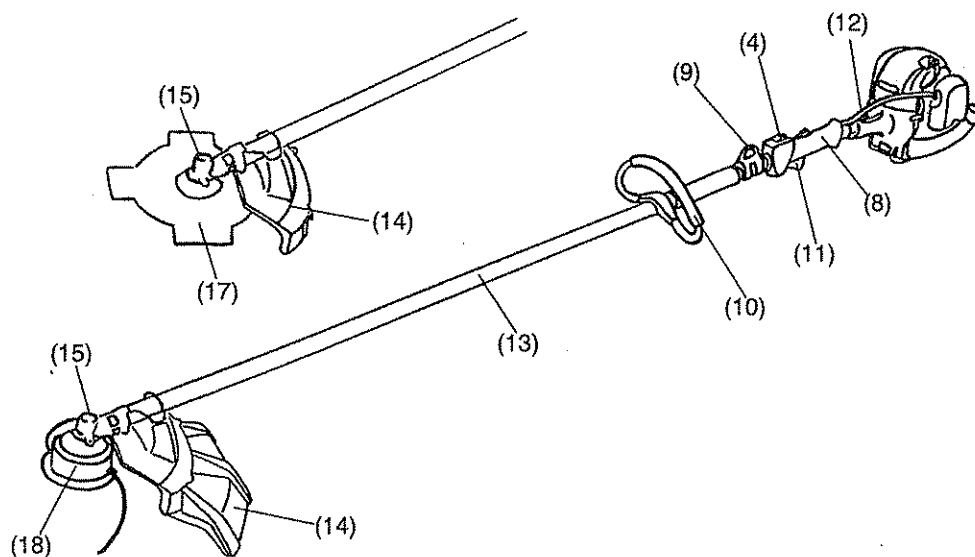


TECHNICAL DATA

Model	NB2450 A	
	Loop handle	
Dimensions : length x width x height (without cutting blade)	mm	1770 x 215 x 220 (69.7" x 23.6" x 14.8")
Mass (without plastic guard and cutting blade)	kg	4.4 (9.6 lb)
Volume (fuel tank)	L	0.65
Cutting attachments (cutter blade dia.)	mm	255 (Refer to the text P.11)
Engine displacement	cm ³	24.5
Maximum engine performance	kw	0.73 at 7000 min ⁻¹
Maximum rotational frequency of the spindle	min ⁻¹	7400
Engine speed at recommended max. spindle rotational frequency	min ⁻¹	10000
Fuel consumption at max. engine performance	kg/h	0.54
Specific fuel consumption at max. engine performance	g/kwh	735
Engine speed at idling	min ⁻¹	3000
Clutch engagement speed	min ⁻¹	4100
Carburetor (Diaphragm - carburetor)	type	WALBRO WYJ
Ignition system	type	Solid state ignition
Spark plug	type	NGK BM7A
Electrode gap	mm	0.6 - 0.7
Mixture ratio (Gasoline: Specified 2-stroke oil)		50 : 1
Gear ratio		14/19

WARNING: MODEL NB2450 must not be used with a saw blade.

DESIGNATION OF PARTS



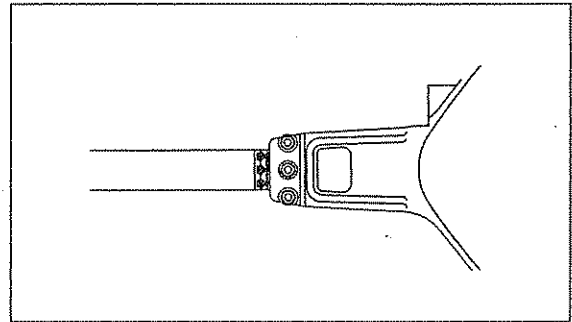
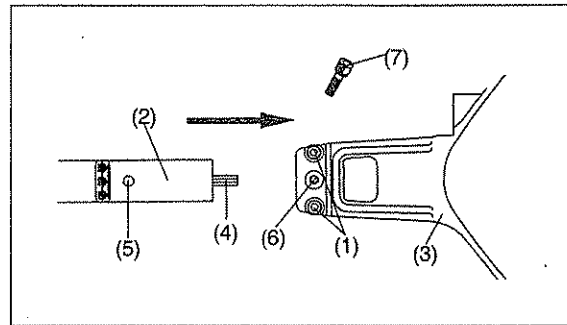
GB	DESIGNATION OF PARTS
1	Fuel Tank
2	Rewind Starter
3	Air Cleaner
4	I-O Switch (on/off)
5	Spark Plug
6	Exhaust Muffler
7	Clutch Case
8	Rear Grip
9	Hanger
10	Handle
11	Control Lever
12	Control Cable
13	Shaft
14	Protector
15	Gear Case
17	Cutter Blade
18	Nylon Cutting Head
19	Fuel Filler Cap
20	Starter Knob
21	Primer Pump
22	Choke Lever
23	Exhaust Pipe

ASSEMBLY OF ENGINE AND SHAFT

CAUTION: Before doing any work on the brush cutter, always switch off the motor and pull the spark plug connector off the spark plug.
Always wear protective gloves.

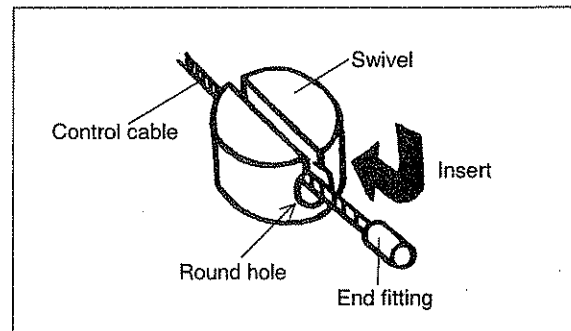
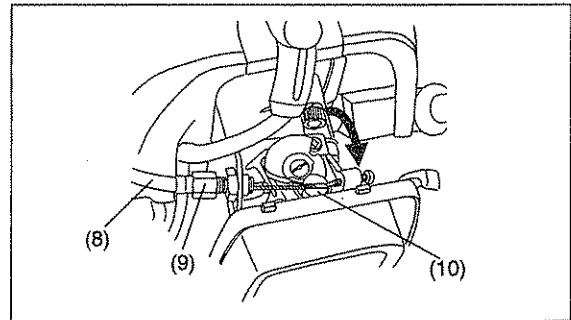
CAUTION: Start the brush cutter only after having assembled it completely.

- Loosen the two bolts (1) and insert the main pipe (2) into the case clutch (3).
- Insert it up to the arrow-mark position. (Refer to the sketch on the right.)
If it is difficult to insert, turn the spline (4) a little and re-insert.
- Match the hole (5) of the main pipe (2) with the bolt hole (6) of the case clutch (3), and tighten the attached bolts (7).
- Tighten the two bolts (1) uniformly on the right and left by Allen wrench supplied.



How to mount the control cable

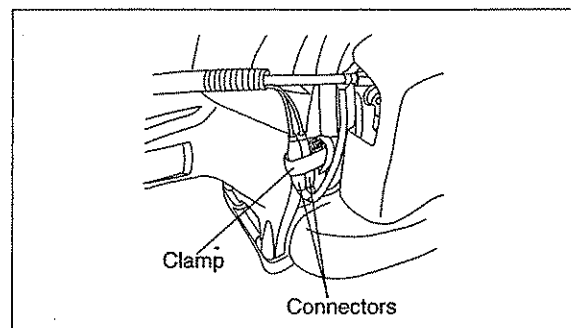
- Remove the air cleaner cover.
- Put the control cable (8) into the adjusting cable (9). Shift the swivel (10) and put the cable into the swivel. At this time, be careful that the round hole in the swivel is oriented toward the fitting at the inner wire end.
- Release the swivel and make sure that the inner wire fitting is placed in the hole.
- Mount the air cleaner cover.



Connection of the switch cord

Connect the switch cords to the two cords from the engine by inserting one into the other.

- Fix the cord connector by clamp.

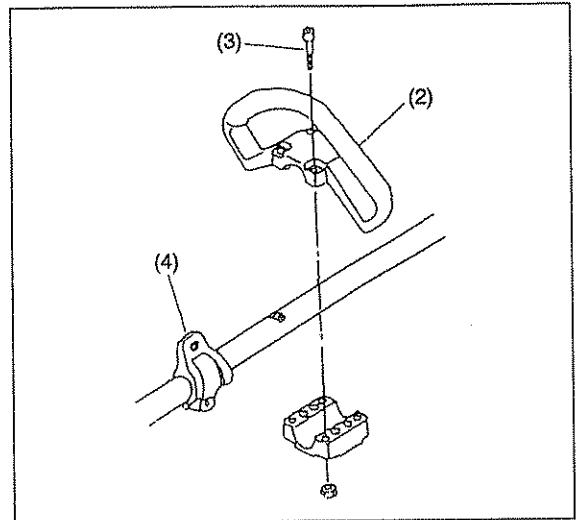


MOUNTING OF HANDLE



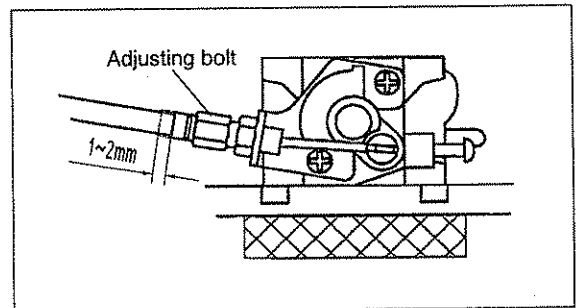
- Install the loop handle (2) over the shaft and install 4 screws (3) and nuts, tighten securely.
- The standard position of the handle is 8 " to 10 " from the hanger (4).

(Note) Position the handle according to a works stature and working conditions.



ADJUSTMENT OF CONTROL CABLE

Make adjustment so that the control cable will be provided with a play of 1 to 2 mm, when the throttle lever is set to low speed by carburetor adjusting bolt. (the blade or the nylon cutting head must not turn when the engine is on idle)



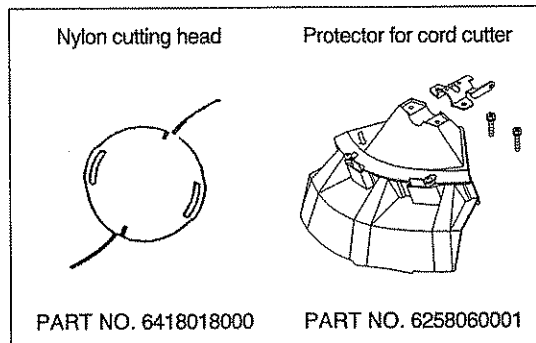
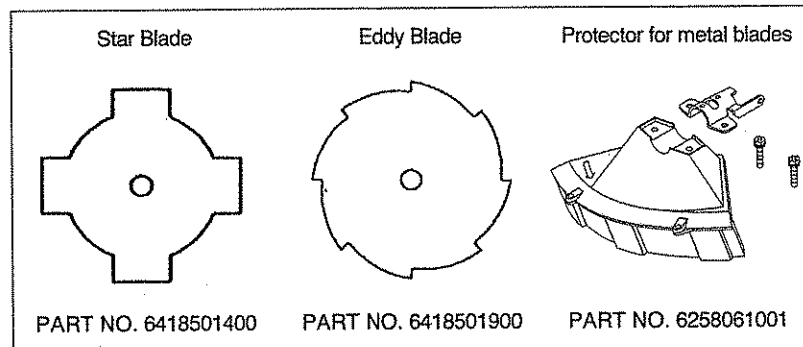
MOUNTING OF PROTECTOR

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



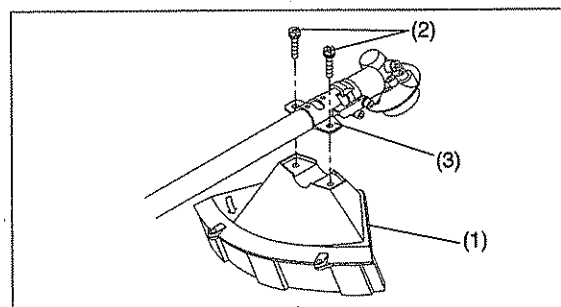
Be sure to use genuine ROBIN cutter blades or nylon cutting head.

- The cutter blade must be well polished, free of cracks or breakage. If the cutter blade hits against a stone during operation, stop the engine and check the blade immediately.
- Polish or replace the cutter blade every three hours of operation.
- The outside diameter of the cutter blade must be 255mm (10-1/32"). Never use any blades surpassing 255mm (10-1/32") in outside diameter.

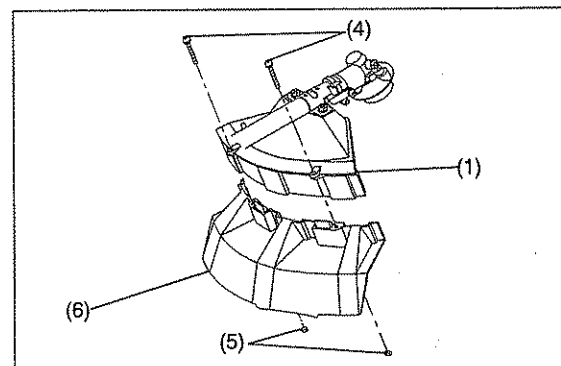


CAUTION: The appropriate protector must always be installed, for your own safety and in order to comply with accident-prevention regulations. Operation of the equipment without the guard being in place is not permitted.

- Fix the protector (1) to the clamp (3) with two bolts M6 x 30 (2).



- When using the string head, fit the protector (6) into the protector (1), and tighten them with two nuts (5) and two screws (4).

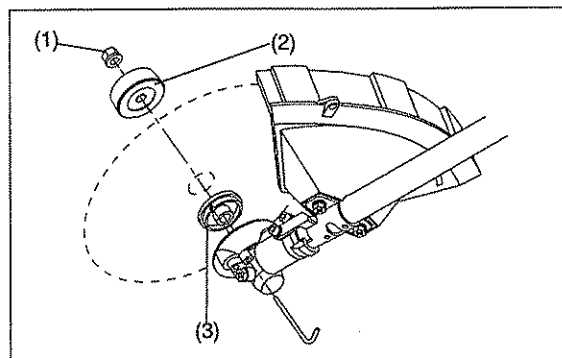


MOUNTING OF CUTTER BLADE OR NYLON CUTTING HEAD

Turn the machine upside down, and you can replace the cutter blade or the nylon cutting head easily.



- Insert the hex wrench through the hole in the gear case and rotate the receiver washer (3) until it is locked with the hex wrench.
- Loosen the nut (1) (left-hand thread) with the socket wrench and remove the nut (1), and clamp washer (2).

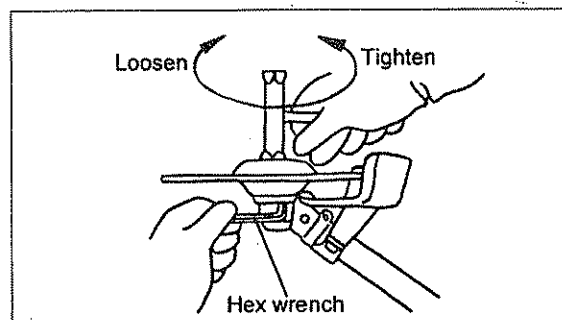


With the hex wrench still in place.

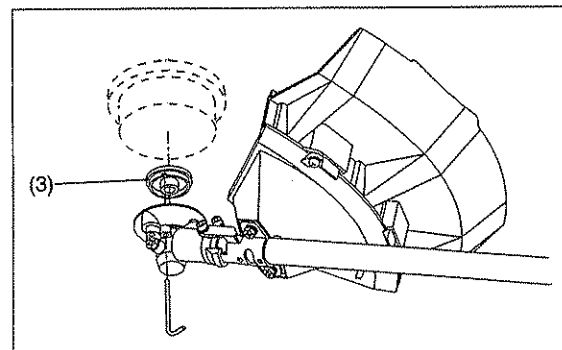
- Mount the cutter blade onto the shaft so that the guide of the receiver washer (3) fits in the arbor hole in the cutter blade. Install the clamp washer (2) and secure the cutter blade with the nut (1).
- [Tightening torque: 13 - 23 N·m]

NOTE: Always wear gloves when handling the cutter blade.

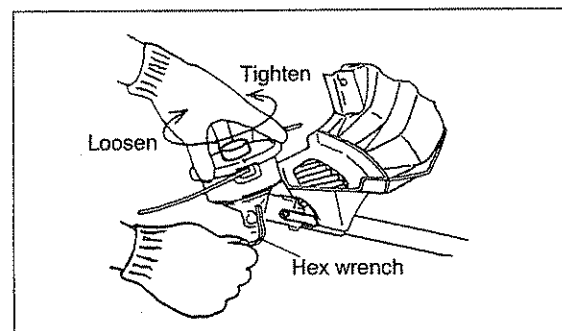
NOTE: The cutter blade-fastening nut (with spring washer) is a consumable part. If there appears any wear or deformation on the spring washer, replace the nut.



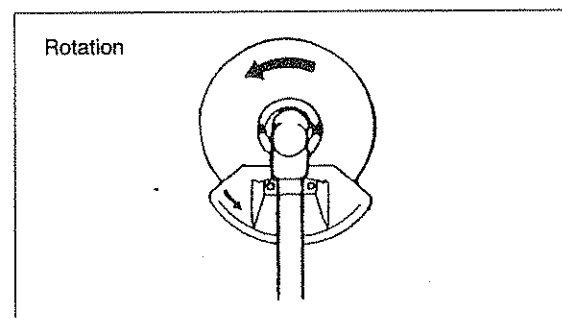
NOTE: The clamp washer (2), and nut (1) are not necessary for mounting the nylon cutting head. The nylon head should go on top of the receiver washer (3).



- Screw the nylon cutting head onto the shaft.



- Make sure that the blade is the left way up.



FUELS/REFUELING

Handling fuel

Utmost care is required when handling fuel. Fuel may contain substances similar to solvents. Refuel either in a well ventilated room or outdoors. Do not inhale fuel vapors, avoid any contact of fuel or oil with your skin. Mineral oil products degrease your skin. If your skin comes in contact with these substances repeatedly and for an extended period of time, it will desiccate. Various skin diseases may result. In addition, allergic reactions may occur. Eyes can be irritated by contact with oil. If oil comes into your eyes, immediately wash them with clear water. If your eyes are still irritated, see a doctor immediately.



Observe the Safety Instructions on page 4.

Fuel and oil mixture

Inspect the fuel tank and fill with clean, fresh fuel of the proper mixture to assume the longer life of the tool.

The correct mixture ratio

Gasoline: ROBIN genuine two-stroke oil = 50 : 1 or

Gasoline: Other manufacturer's two-stroke engine oil = 25 : 1 recommended

FOR CALIFORNIA REGULATION:

THIS EQUIPMENT IS CERTIFIED TO OPERATE ON GASOLINE + TWO STROKE OIL

When mixing gasoline with two-stroke engine oil. Use only unleaded gasoline which contains no ethanol, or methanol (type of alcohol).

This will help to avoid possible damage to engine fuel lines and other engine parts.

Do not mix gasoline and oil directly in the fuel tank.

IMPORTANT: Failure to follow proper fuel mix instructions may cause damage to the engine.

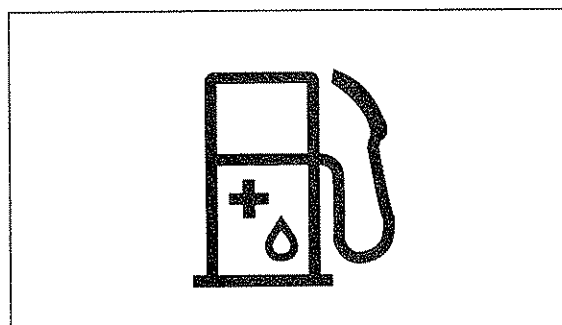
CAUTION: 1. When preparing fuel mixture, mix only the amount needed for the job you are to do.

Do not use fuel mixture that has been stored longer than two months.

Fuel mixture stored longer than two months will cause hard starting and poor performance.

If fuel mixture has been stored longer than this time, it should be removed and filled with a fresh mixture.

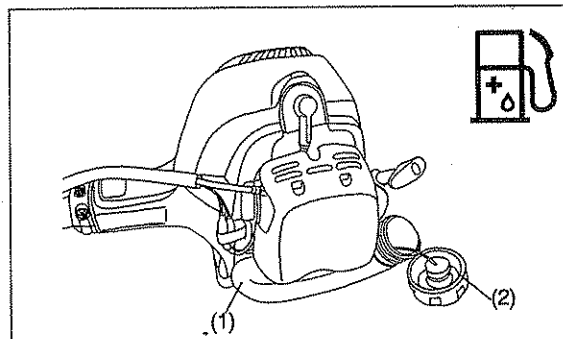
2. Never fill the fuel tank to the very top.
3. Never add the fuel to the tank in a closed unventilated area.
4. Do not add fuel to this unit close to an open fire or sparks.
5. Be sure to wipe off spilled fuel before attempting to start the engine.
6. Do not attempt to refuel a hot engine.



Refuelling

The engine must be switched off.

- Thoroughly clean the area around the fuel filler cap (2), to prevent dirt from getting into the fuel tank (1).
- Unscrew the fuel filler cap (2) and fill the tank with fuel.
- Tightly screw on the fuel filler cap (2).
- Clean screw fuel filler cap (2) and tank after refueling.



Storage of Fuel

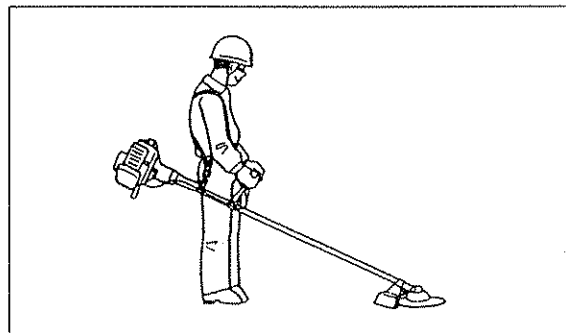
Fuel cannot be stored for an unlimited period of time.

Purchase only the quantity required for a 4 week operating period. Only use approved fuel storage containers.

CORRECT HANDLING OF MACHINE

Attachment of shoulder strap

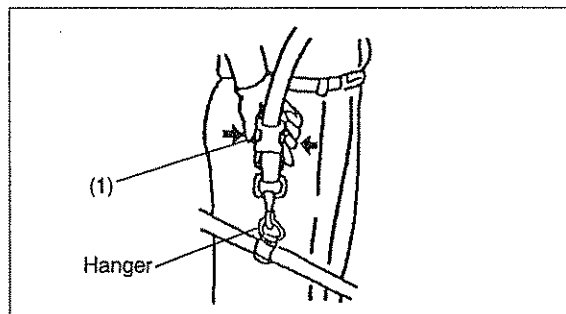
- Adjust the strap length so that the cutter blade will be kept parallel with the ground.



Detachment

- In an emergency, pull the notches (1) at both sides, and you can detach the machine from you.
- Be extremely careful to maintain control of the machine at this time. Do not allow the machine to be deflected toward you or anyone in the work vicinity.

WARNING: Failure to maintain complete control of the machine at all could result in serious bodily injury or DEATH.



PUTTING INTO OPERATION

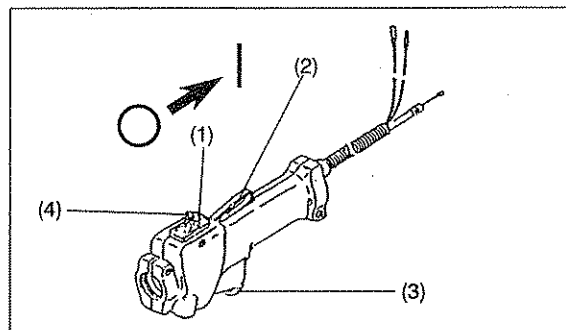
Observe the applicable accident prevention regulations.

Starting

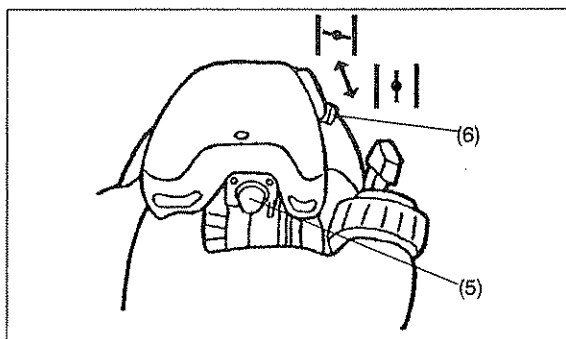
Move at least 3m away from the place of refuelling. Place the brush cutter on a clean piece of ground taking care that the cutting tool does not come into contact with the ground or any other objects.


Cold start

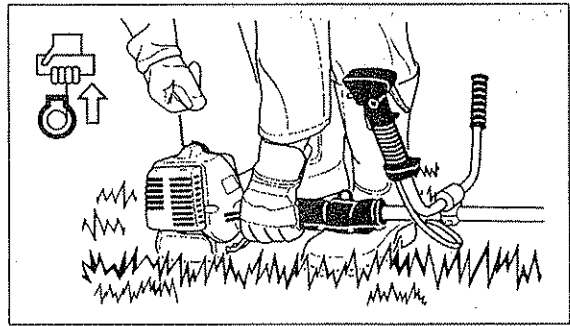
- Push the I-O switch (1) in the direction shown by the arrow.
- Grasp the handle (hand pressure activates the safety lock-off lever (2)).
- Press the throttle lever (3) and hold it down.
- Press the lock button (4) and release the control lever, and then release the lock button (the lock button holds the throttle lever in the start-up position).



- First place the machine on the ground.
- Give a gentle push on the primer pump (5) repeatedly (7-10 times) until fuel comes into the primer pump.
- Move the choke lever (6) to the top position (|—|).



- Firmly hold the clutch case by your left hand, as illustrated.
- Slowly pull the starter grip until resistance is felt and continue with a smart pull.
- Do not pull out the starter rope to its full extent and do not allow the starter handle to be retracted without control, but ensure that it is retracted slowly.
- Repeat the starting operation until initial ignitions are heard.
- Depress the choke lever () and pull the starter rope again until the engine starts.
- As soon as the engine starts, immediately tap and release the throttle, thus releasing the half-throttle lock so that the engine can run in idle.
- Run the engine for approximately one minute at a moderate speed before applying full throttle.




CAUTION: In NB2450, it may take some time before start-up of the engine.
Keep hold of the machine until the engine starts up.

Caution during operation:

If the throttle lever is opened fully in a no-load operation, the engine rotation is increased to 10,000 min⁻¹ or more. Never operate the engine at a higher speed than required and at an approximate speed of 6,000 - 8,000 min⁻¹.

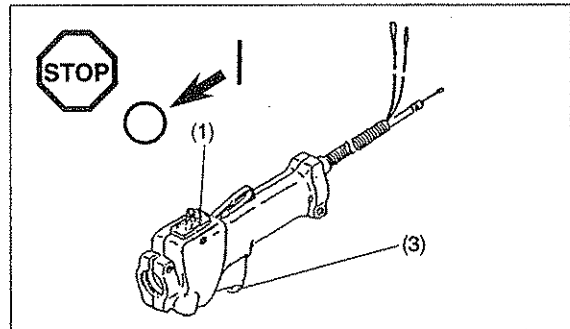
CAUTION: Be sure to reduce the engine rotational speed when the machine is not used for work.
No-load operation will lead to a shortened life of the machine.

Starting the warm engine

- Same as above, except without moving the choke lever (choke lever remains in the down position ()).

Stopping

- Release the throttle lever (3) fully, and when the engine rpm has lowered, push the I-O switch (1) to "O" position the engine will now stop.
- Be aware that the cutting head may not stop immediately and allow it to slow down fully.

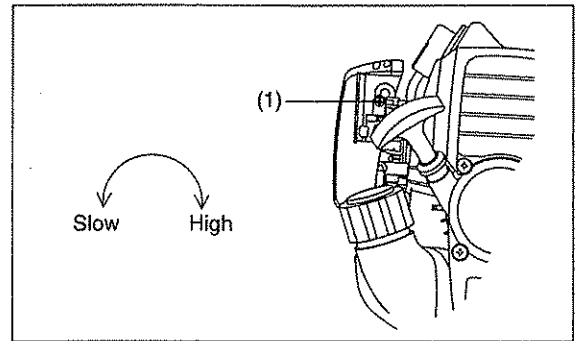


IDLE ADJUSTMENT

The cutter blade or the nylon cutting head should not run when the control lever is fully released. If necessary, adjust the idle rpm using the idle adjusting screw.

Checking the idling speed

- Idle speed should be set to 3,000 min⁻¹.
If necessary correct it by means of the idle screw (the blade or the nylon cutting head must not turn when the engine is on idle).
Screwing in the screw (1) will cause an increase in the engine speed, whereas backing off the screw will reduce the engine speed.



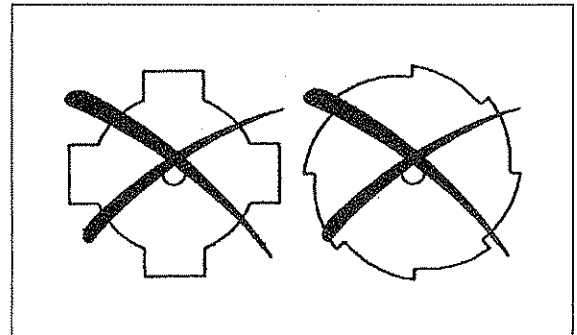
RESHARPENING THE CUTTING TOOL

CAUTION: The cutting tools mentioned below must only be resharpened by an authorized facility. Manual resharpening will result in imbalances of the cutting tool causing vibrations and damage to the equipment.

- cutter blade (star blade (4 teeth), eddy blade (8 teeth), saw blade)

An expert resharpening and balancing service is provided by Authorized Service Agents.

NOTE: To increase the service life of the cutter blade (star blade, eddy blade, saw blade) it may be turned over once, until both cutting edges have become blunt.



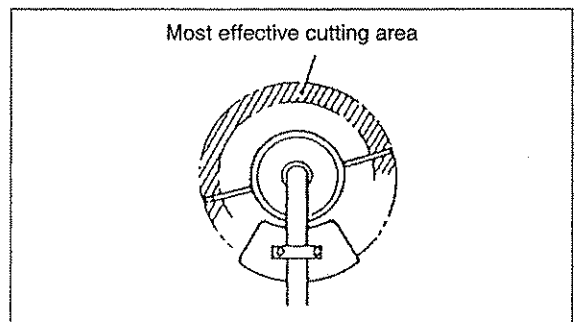
NYLON CUTTING HEAD

The nylon cutting head is a dual string trimmer head capable of bump & feed mechanisms.

The nylon cutting head will automatically feed out the proper length of nylon cord by the changes in centrifugal force caused by increasing or decreasing RPMS. However, to cut soft grass more efficiently, bump the nylon cutting head against the ground to feed out extra cord as indicated under operation section.

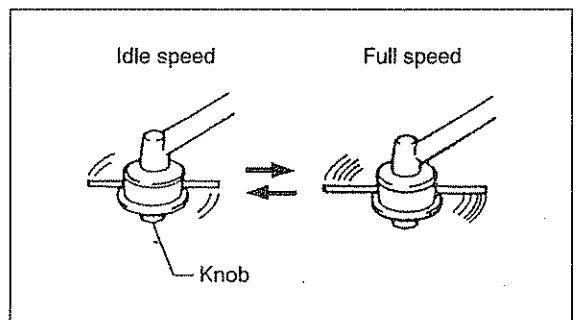
Operation

- Increase the nylon cutting head speed to approx. 6,000 min⁻¹.
Low speed (under 4,800 min⁻¹) is not suitable, the nylon cord will not feed out properly at low speed.
- The most effective cutting area is shown by the shaded area.



If the nylon cord does not feed out proceed as follows:

1. Release the throttle lever to run the engine idle and then squeeze the throttle lever fully. Repeat this procedure until the nylon cord feeds out to the proper length.
2. If the nylon cord is too short to feed out automatically with the above procedure, bump the knob of the nylon cutting head against the ground to feed out the nylon cord.
3. If the nylon cord does not feed out with procedure 2, rewind/replace the nylon cord by following the procedures described under "Replacing the nylon cord".



SERVICING INSTRUCTIONS



CAUTION: Before doing any work on the brush cutter, always switch off the motor and pull the plug cap off the spark plug (see "checking the spark plug").
Always wear protective gloves.

CAUTION: In NB2450, never remove the recoil starter for yourself, which may cause an accident. It should be asked to the Authorized Service Agent.

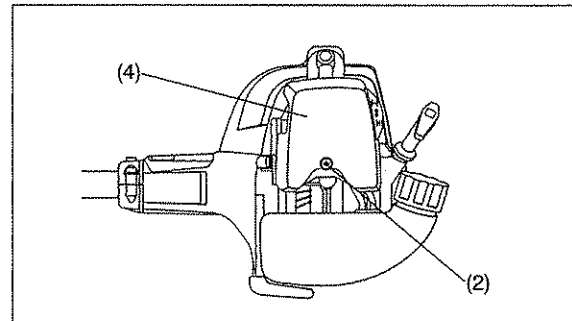
To ensure a long service life and to avoid any damage to the equipment, the following servicing operations should be performed at regular intervals.

Daily checkup and maintenance

- Before operation, check the machine for loose screws or missing parts. Pay particular attention to the tightness of the cutter blade or 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 brush cutter 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 blade or 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 tool 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 control lever, and the lock button.

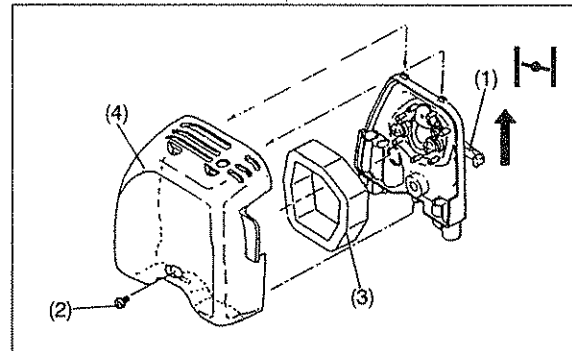
Cleaning of air cleaner

- Push the choke lever (1) up (arrow), to prevent dirt particles from entering the carburetor.
- Unscrew screw (2).
- Remove the air cleaner cover (4).



- Take out the sponge element (3), wash it in lukewarm water and dry it completely.
- After cleaning, put back the air cleaner cover (4) and fasten it with screw (2).

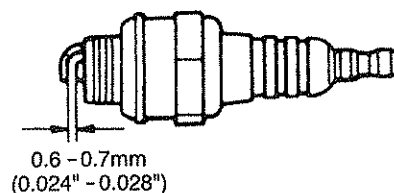
NOTE: If there is excessive dust or dirt adhering to the air cleaner, clean it every day. A clogged air cleaner may make it difficult or impossible to start the engine or increase the engine rotational speed.



Checking the spark plug

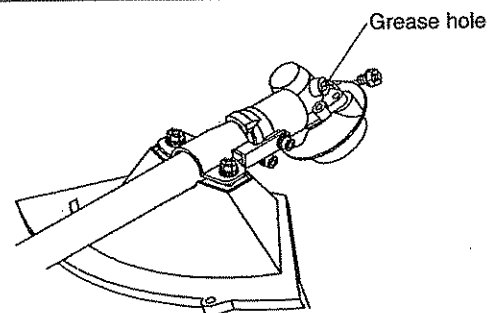
- Only use the supplied universal wrench to remove or to install the spark plug.
- The gap between the two electrodes of the spark plug should be 0.6 – 0.7mm (0.024" – 0.028"). If the gap is too wide or too narrow, adjust it. If the spark plug is clogged with carbon or fouled, clean it thoroughly or replace it.

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



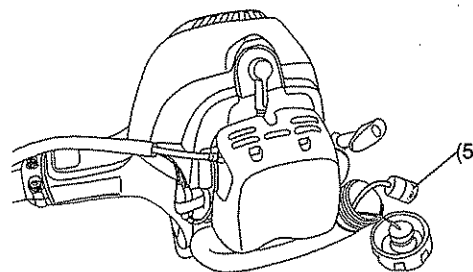
Supply of grease to gear case

- Supply grease (Shell Alvania 3 or equivalent) to the gear case through the grease hole every 30 hours. (Genuine ROBIN grease may be purchased from your ROBIN dealer.)



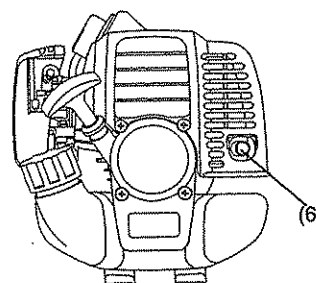
Suction head in the fuel tank

- The felt filler (5) of the suction head is used to filter the fuel required by the carburetor.
- A periodical visual inspection of the felt filter is to be conducted. For that purpose open the tank cap, use a wire hook and pull out the suction head through the tank opening. Filters found to have hardened, been polluted or clogged up are to be replaced.
- Insufficient fuel supply can result in the admissible maximum speed being exceeded. It is therefore important to replace the felt filter at least quarterly to ensure satisfactory fuel supply to the carburetor.



Cleaning of muffler exhaust port

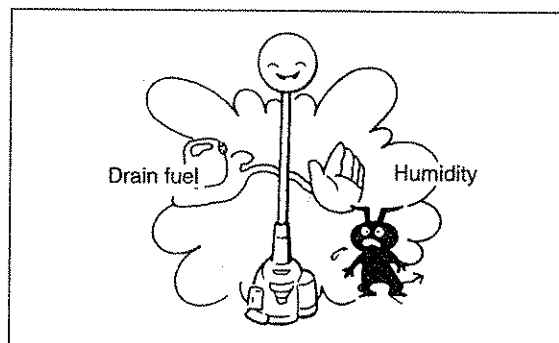
- Check of muffler exhaust port (6) regularly.
- If it is clogged by carbon deposits, carefully scratch the deposits out with a suitable tool.



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

STORAGE

- When the machine is in storage for a long time, drain fuel from the fuel tank and carburetor, as follows: Drain all fuel from the fuel tank. Dispose of properly and in accordance with all local laws.
- Remove the spark plug and a few drops of oil into the spark plug hole. Then, pull the starter gently, so that oil covers the engine inside and tighten the spark plug.
- Clear dirt or dust from the cutter blade and outside of engine, wipe them with a oil-immersed cloth and keep the machine in a place as dry as possible.



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	I-O 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, must be cleaned
Engine starts but dies	Fuel supply	Tank filled	Incorrect idling adjustment, carburetor contaminated Fuel tank vent defective, fuel supply line interrupted, cable or I-O 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

EMISSION COMPLIANCE PERIOD

For handheld engine : The Emissions

Compliance Period referred to on the Emissions

Compliance label indicates the number of operating hours for which the engine has been shown to meet Federal emission requirements.

Category C=50 hours, B=125 hours, and A=300 hours.

FEDERAL EMISSION COMPONENT DEFECT WARRANTY

EMISSION COMPONENT DEFECT WARRANTY COVERAGE - This emission warranty is applicable in all States, except the State of California

FUJI ROBIN INDUSTRIES LTD. and Carswell Import & Marketing Associates, Inc., Winston-Salem, North Carolina, (herein "CARSWELL") warrant to the initial retail purchaser and each subsequent owner, that this utility equipment engine (herein "engine") was designed, built, and equipped to conform at the time of initial sale to all applicable regulations of the U.S. Environmental Protection Agency (EPA), and that the engine is free of defects in materials and workmanship which would cause this engine to fail to conform with EPA regulations during its warranty period.

For the components listed under **PARTS COVERED**, the dealer or service center authorized by CARSWELL will, at no cost to you, make the necessary diagnosis, repair, or replacement necessary to ensure that the engine complies with applicable U.S. EPA regulations.

EMISSION COMPONENT DEFECT WARRANTY PERIOD

The warranty period for this engine begins on the date of sale to the initial purchaser and continues for a period of 2 years.

PARTS COVERED

Listed below are the parts covered by the Emission Component Defect Warranty. Some of the parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part.

- 1) Fuel Metering System
 - (i) Carburetor and internal parts
 - (ii) Fuel filter, if applicable
 - (iii) Throttle stopper, if applicable
 - (iv) Choke System, if applicable
- 2) Air Induction System
 - (i) Air cleaner plate
 - (ii) Air cleaner case
 - (iii) Air cleaner element

- 3) Ignition System
 - (i) Spark plug
 - (ii) Flywheel Magneto
 - (iii) Ignition Coil
- 4) Miscellaneous Items Used in Above Systems
 - (i) Fuel hoses clamps and sealing gaskets

OBTAINING WARRANTY SERVICE

To obtain warranty service, take your engine to the nearest Authorized CARSWELL, distributor or dealer. Bring your sales receipts indicating date of purchase for this engine. The dealer or service center authorized by CARSWELL will perform the necessary repairs or adjustments within a reasonable amount of time and furnish you with a copy of the repair order. All parts and accessories replaced under this warranty become the property of CARSWELL.

WHAT IS NOT COVERED

- * Conditions resulting from tampering, misuse, improper adjustment (unless they were made by the dealer or service center authorized by CARSWELL during a warranty repair), alteration, accident to recommended fuel and oil, or not performing required maintenance services.
- * The replacement parts used for required maintenance services.
- * Consequential damages such as loss of time, inconvenience, loss of use of the engine or equipment, etc.
- * Diagnosis and inspection charges that do not result in warranty-eligible service being performed.
- * Any non-authorized replacement part, or malfunction of authorized parts due to use of non-authorized parts.

OWNER'S WARRANTY RESPONSIBILITIES

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual, CARSWELL recommends that you retain all receipts covering maintenance on your engine, but CARSWELL can not deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should however be aware that the CARSWELL may deny your warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to the nearest dealer or service center authorized by CARSWELL when a problem exists.

If you have any questions regarding your warranty rights and responsibilities, you should contact the CARSWELL Warranty service department at 910-767-7700 (toll free from GA, NC, SC, TN & VA 1-800-929-1948) for the information.

THINGS YOU SHOULD KNOW ABOUT THE EMISSION CONTROL SYSTEM WARRANTY

MAINTENANCE AND REPAIRS

You are responsible for the proper use and maintenance of the engine. You should keep all receipts and maintenance records covering the performance of regular maintenance in the event questions arise. These receipts and maintenance records should be transferred to each subsequent owner of the engine. CARSWELL reserves the rights to deny warranty coverage if the engine has not been properly maintained.

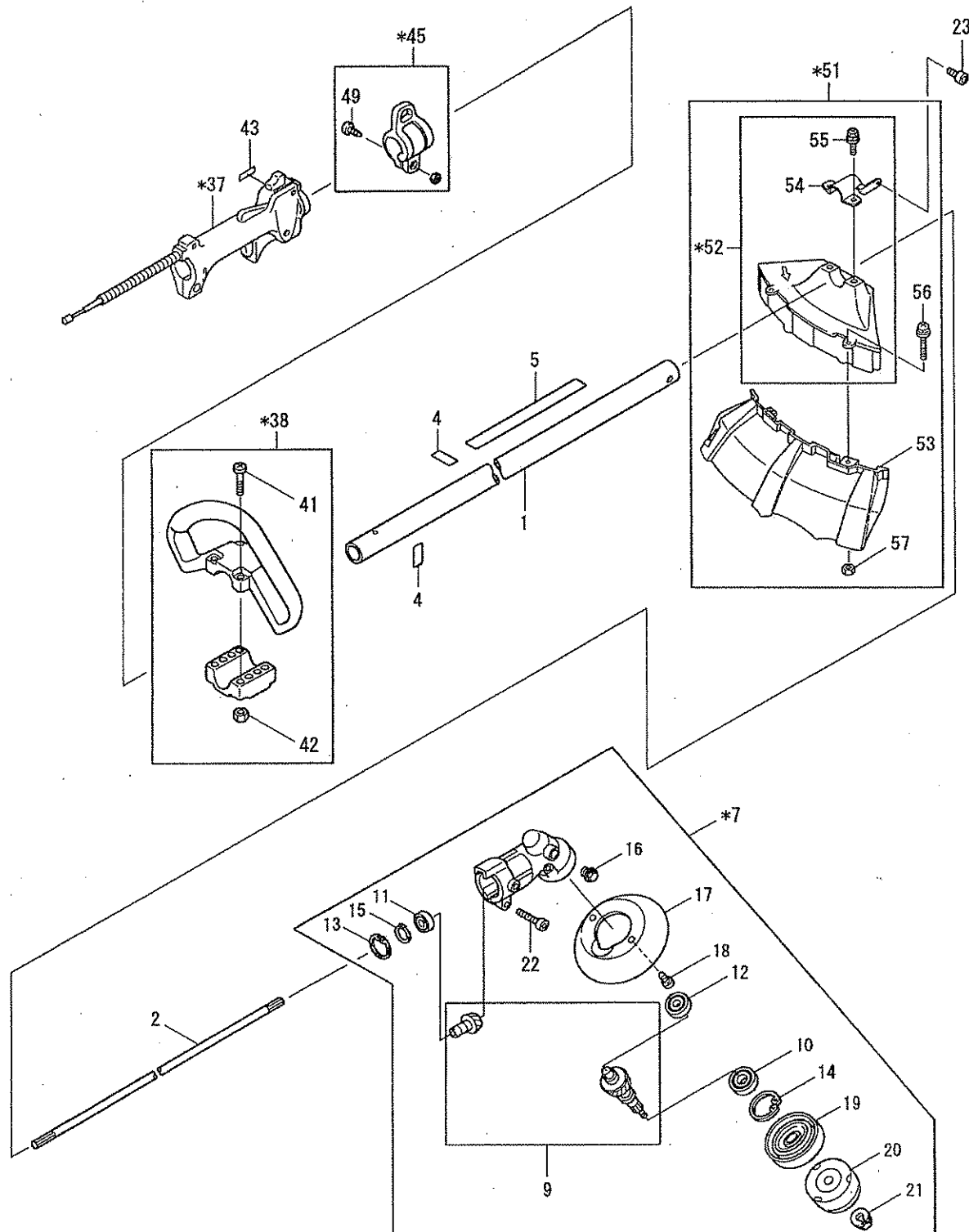
Warranty claims will not be denied, solely because of the lack of required maintenance or failure to keep maintenance records.

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A DEALER OR SERVICE CENTER AUTHORIZED BY CARSWELL. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

If other than the parts authorized by CARSWELL are used for maintenance replacements or for the repair of components affecting emission control, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to the parts authorized by CARSWELL in their performance and durability.

HOW TO MAKE A CLAIM

All repairs qualifying under this limited warranty must be performed by a dealer or service center authorized by CARSWELL. In the event that any emission-related part is found to be defective during the warranty period, you shall notify CARSWELL at 910-767-7700 (toll free from GA, NC, SC, TN & VA 1-800-929-1948) and you will be given the appropriate warranty service facilities where the repair can be performed.



MACHINE BODY

NB2450 A PARTS LIST

(U.S. SPEC.)

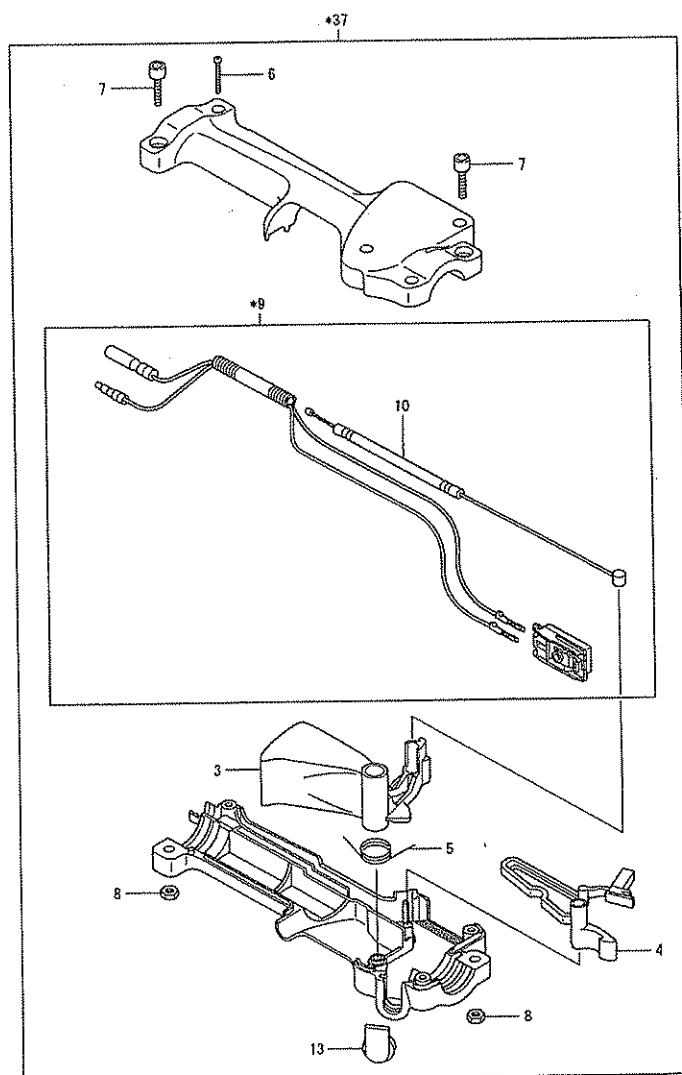
KEY NO.	OUR PART NO.	QUANTITY	DESCRIPTION	PART NO.
1	10314	1	PIPE,SHAFT COMPL	6211025000
2	5433	1	SHAFT	6191500401
4	1048	2	LABEL,CAUTION	6259514700
5	10315	1	LABEL,CAUTION	6259164010
* 7	10284	1	CASE,GEAR ASSY (INCL.9~22)	6243006001
9	10285	1	SHAFT,CUTTER SET	6243008002
10	6031	1	BALL BEARING (#6000DDU)	0600109910
11	6008	1	BALL BEARING (#609ZZ)	6212500300
12	5310	1	BALL BEARING (#626ZZ)	0600069990
13	2318	1	SNAPRING,INNER (ϕ 24)	0031424000
14	6129	1	SNAPRING,INNER (ϕ 26)	0031426000
15	6130	1	SNAPRING,OUTER (ϕ 9)	6193006120
16	9860	1	BOLT,OIL (M6×9 W)	6253011012
17	3519	1	GUARD	6218500200
18	10178	2	SCREW ASSEMBLY (M5×12 W,SW)	0140059390
19	5459	1	WASHER,RECEIVE	6218501601
20		1	WASHER,CLAMP COMPL	6218003001
21	7312	1	NUT (M8(C.CLOCK W) SW)	6258505001
22	6268	1	SOCKET HEAD BOLT (M5×25 SW)	0119059890
23	9816	1	SOCKET HEAD BOLT (M5×14 W,SW)	0119059490
* 37	10316	1	CONTROL LEVER ASSY	6215027001
* 38	10286	1	HANDLE SET (INCL.41,42)	6214017000
41	10181	4	SCREW (M5×25)	6214016030
42	1703	4	NUT (M5)	0022705000
43	5510	1	LABEL	0736259950
* 45	10317	1	HANGER ASSY (INCL.49)	6247002000
49	10184	1	SCREW ASSY (M5×20 W,SW)	0140059360
* 51	10318	1	PROTECTOR ASSY (INCL.*52~57)	6258060001
* 52	5540	1	PROTECTOR ASSY (INCL.54,55)	6258061001

MACHINE BODY

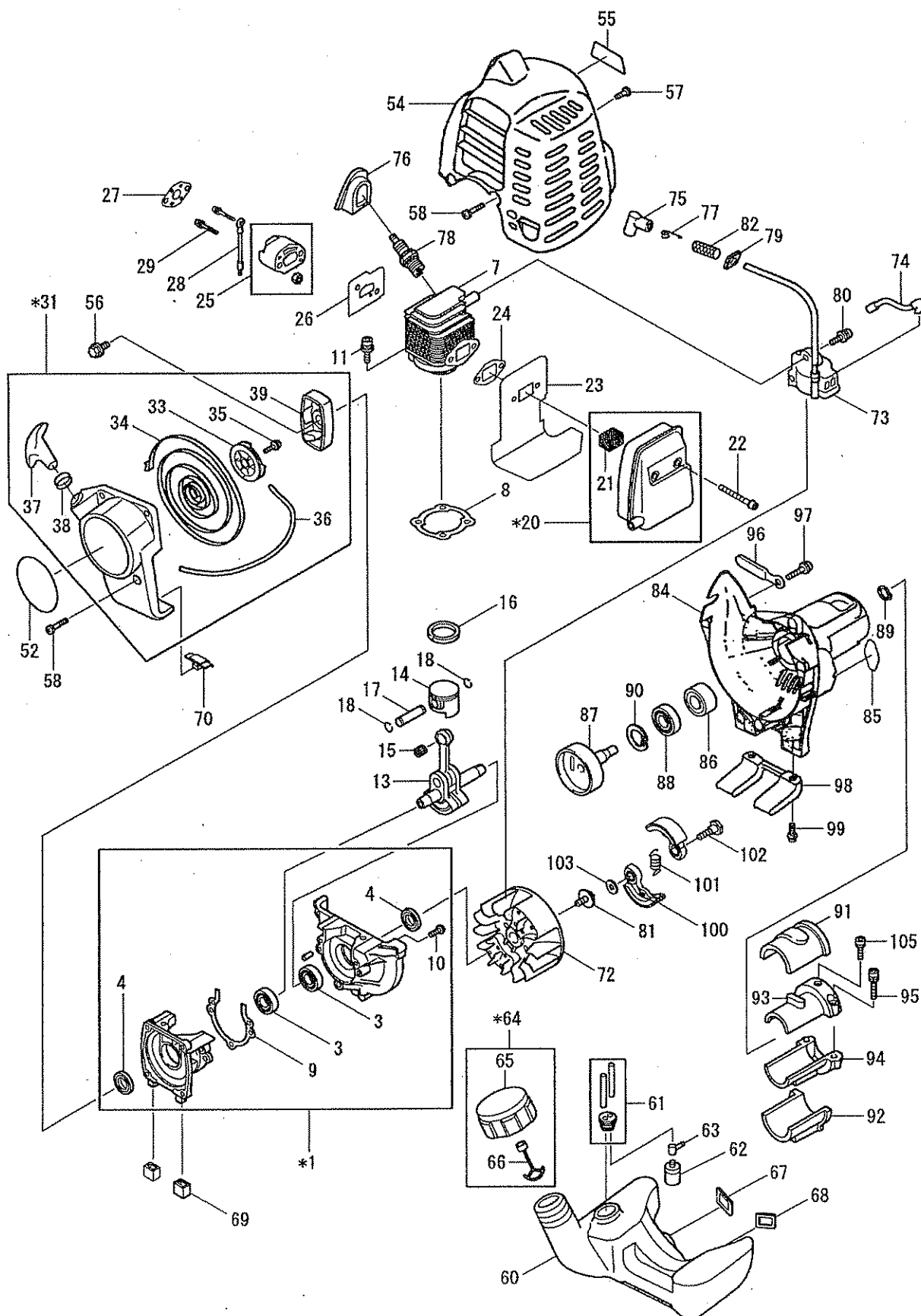
NB2450 A PARTS LIST

(U.S. SPEC.)

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KEY NO.	OUR PART NO.	QUANTITY	DESCRIPTION	PART NO.
3	9802	1	LEVER	6195006030
4	1070	1	LEVER	6195013010
5	9809	1	SPRING	6195006050
6	9819	4	TAPPING SCREW (4×20)	6195006060
7	9817	2	SOCKET HEAD BOLT (M5×20)	0119059720
8	9818	2	NUT (M5)	6415011160
* 9	10231	1	WIRE SET (INCL.10)	6215027011
10	10232	1	CONTROL CABLE	6215027021
13	9843	1	TOP	6195006150
* 37	10316	1	CONTROL LEVER ASSY (INCL.3~13)	6215027001



ENGINE BODY

NB2450 A PARTS LIST

(U.S. SPEC.)

KEY NO.	OUR PART NO.	QUANTITY	DESCRIPTION	PART NO.
* 1	5324	1	CRANKCASE COMPL (INCL.3,4,9,10)	5231014000
3	10079	2	BALL BEARING (#6001C3)	0600129850
4	5447	2	OIL SEAL	0440129970
7	7711	1	CYLINDER	5231501804
8	5405	1	GASKET,CYLINDER	5231502304
9	5325	1	GASKET,CRANKCASE	5231502202
10	5341	3	SCREW (M5×25 SW)	0140059520
11	5333	2	SOCKET HEAD BOLT (M5×20 W,SW)	0119059730
13	10320	1	CRANKSHAFT COMPL	5252007000
14	10321	1	PISTON	5252500800
15	1012	1	NEEDLE ROLLER BEARING	0610089990
16	5328	1	RING,PISTON	5242500701
17	5329	1	PIN,PISTON	5232502600
18	3105	2	CLIP	0565089980
* 20	10322	1	MUFFLER,EXHAUST (INCL.21)	5253057000
21	10323	1	SPARK ARRESTER	5253033010
22	5348	2	SOCKET HEAD BOLT (M5×45 W)	0119059600
23	10324	1	GASKET,MUFFLER	5253503500
24	5343	1	GASKET,MUFFLER	5233504302
25	10325	1	INSULATOR COMPL	5423006000
26	10326	1	GASKET,INSULATOR	5253503800
27	6686	1	GASKET,AIR CLEANER	5103502800
28	5342	1	WIRE	6165501200
29	5495	2	SOCKET HEAD BOLT (M5×25 W,SW)	0119059640
* 31	10327	1	STARTER,REWIND ASSY (INCL.33~39)	5255011000
33	5373	1	REEL	5235024012
34	5374	1	SPIRAL SPRING	5235024032
35	5376	1	SET SCREW	5425003010
36	5576	1	STARTER ROPE	5255016020
37	7614	1	STARTER KNOB	5225004020
38	5490	1	DAMPER	5255001040
39	5361	1	PULLEY	5235025001

ENGINE BODY

NB2450 A PARTS LIST

(U.S. SPEC.)

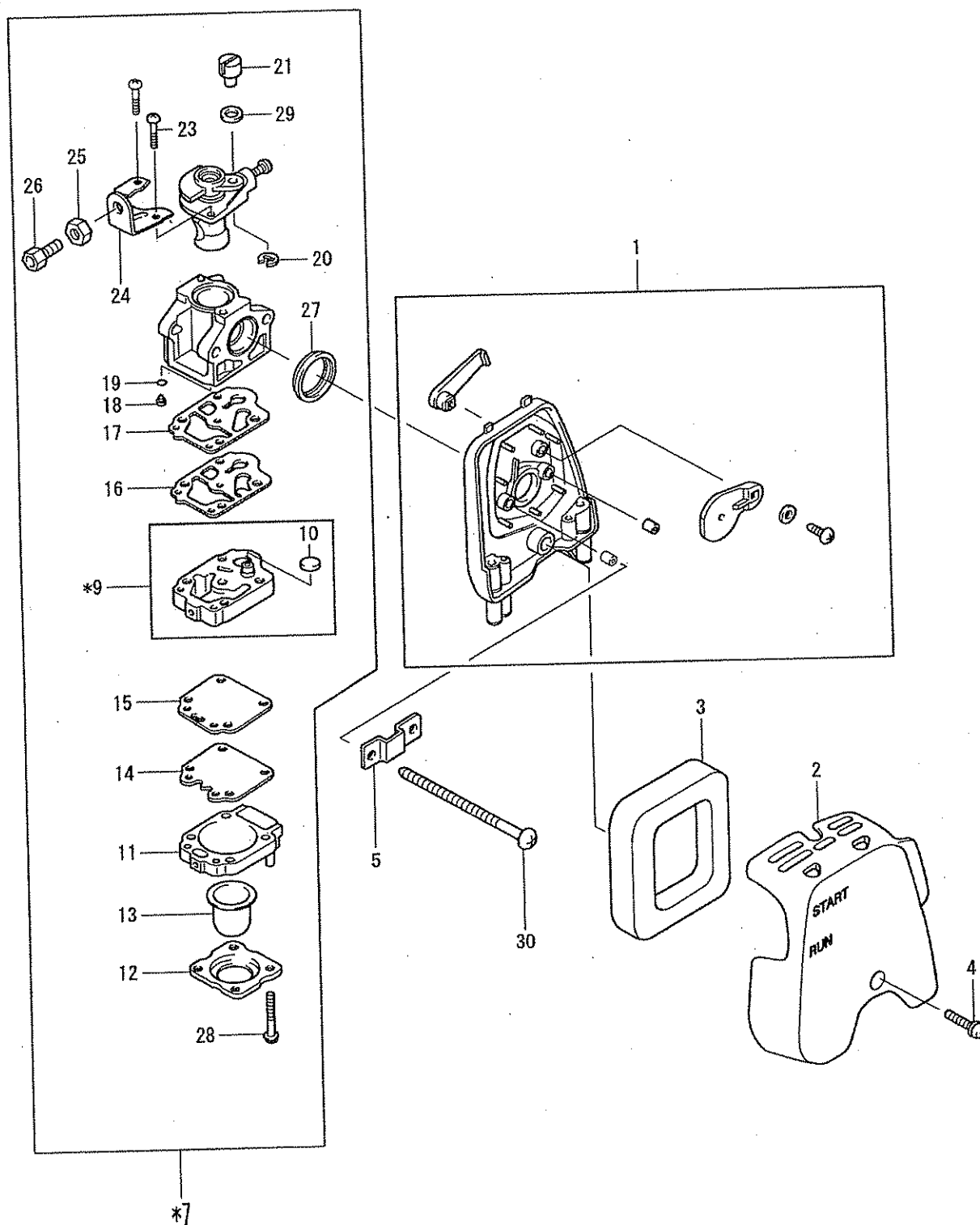
KEY NO.	OUR PART NO.	QUANTITY	DESCRIPTION	PART NO.
52		1	LABEL,MODEL	6259544400
54	10329	1	COVER,CYLINDER	5255504800
55	10207	1	LABEL,TRADE MARK	5219500701
56	5363	1	BOLT ASSEMBLY (M6×14 W)	5235504700
57	5498	1	SCREW ASSY (M5×14 W,SW)	0140059480
58	5497	4	SCREW (M5×18 W,SW)	0140059450
60	10330	1	TANK,FUEL	5256502900
61	10304	1	TUBE	0851159920
62	3112	1	FILTER	5236503900
63	3114	1	HOSE CLAMP	0561059990
* 64	9990	1	CAP,FUEL TANK ASSY (INCL.65,66)	5256059000
65	9000	1	CAP,FUEL TANK ASSY	5256058000
66	9010	1	STRAP ASSY	5256067000
67	6161	1	PLATE	5036500200
68	6162	1	PLATE	5036500300
69	6160	2	DAMPER	5216500200
70	10331	1	DAMPER	5256503000
72	7731	1	FLYWHEEL	5237034014
73	10332	1	COIL	5257037020
74	10250	1	WIRE COMPL	5257018001
75	10248	1	CAP,PLUG	0655009870
76	5526	1	COVER,PLUG CAP	5197500100
77	6169	1	SPRING,PLUG CAP	0654009931
78	MB6A	1	PLUG,SPARK (BM7A)	0650149810
79	10333	1	GROMMET	5257501100
80	10249	2	SCREW ASSEMBLY (M4×20 W,SW)	0043704200
81	10334	1	BOLT ASSEMBLY (M6×16 W,SW)	0130069940
82	10335	1	TUBE	0851139930
84	10336	1	CASE,CLUTCH	6211505500
85	10230	1	LABEL	6279516201
86	9836	1	SPACER	6241500300
87	5494	1	DRUM,CLUTCH COMPL	6212014000
88	8603	1	BALL BEARING (#6201DDU)	0600129810
89	1398	1	SNAPRING,OUTER (φ 12)	0031512000
90	1189	1	SNAPRING,INNER (φ 32)	0031432000
91	10222	1	DAMPER,PIPE 1	6241501200
92	10223	1	DAMPER,PIPE 2	6241501300
93	10337	1	BRACKET,PIPE 1	6241500601
94	10338	1	BRACKET,PIPE 2	6241500701
95	1223	2	SOCKET HEAD BOLT (M5×18 SW)	0119059950

ENGINE BODY

NB2450 A PARTS LIST

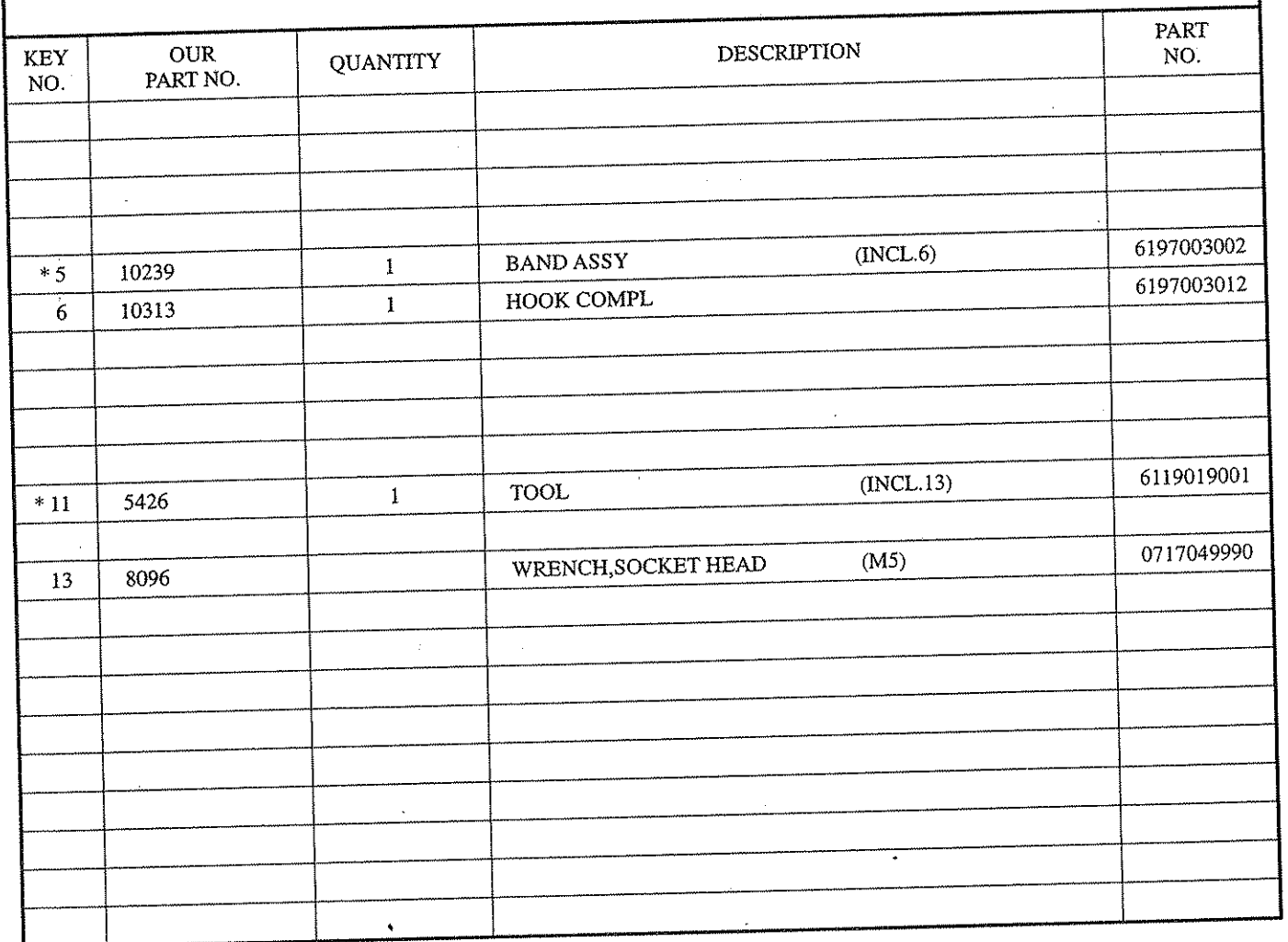
(U.S. SPEC.)

[illegible]



(U.S. SPEC.)

(U.S. SPEC.)



LIMITED TWO YEAR WARRANTY

Carswell Import & Marketing Associates, Inc. (hereafter CIMA), sales agent for Fuji Robin Industries, Ltd. warrants each new Robin brush cutter for twenty-four (24) months according to the following terms.

This warranty extends to the original retail purchaser only and commences on the date of original retail purchase.

Any part of Robin brush cutter supplied by CIMA and found in the reasonable judgment of an Authorized Robin Service Center to be defective in material or workmanship will be repaired by an Authorized Robin Service Dealer without charge for parts and labor.

The Robin brush cutter including any defective part must be returned to an Authorized Robin Service Dealer within the warranty period. The expense of delivering the Robin brush cutter to the dealer for warranty work and the expense of returning it back to the owner after repair or replacement will be paid for by the owner.

CIMA's responsibility in respect to claims is limited to making the required repairs or replacements and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Robin brush cutter. Proof of purchase will be required by the dealer to substantiate any warranty claim. All warranty work should be performed by an Authorized Robin Service Dealer.

This warranty is limited to ninety (90) days from the date of original retail purchase for any Robin brush cutter that is used for rental or commercial purposes, or any other income-producing purpose.

This warranty does not cover any Robin brush cutter that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Robin Operator's Manual. The warranty does not apply to any damage to the Robin brush cutter that is the result of improper maintenance or to any Robin brush cutter or parts that have not been assembled or installed as specified in the Robin Operator's Manual. The warranty does not cover any Robin brush cutter that has been altered or modified so as to adversely affect the product's operation, performance or durability or that has been altered or modified so as to change its intended use. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which are either incompatible with the Robin brush cutter or adversely affect its operation, performance or durability.

Robin reserves the right to change or improve the design of any Robin brush cutter without assuming any obligation to modify any brush cutter previously manufactured.

ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE TWENTY-FOUR (24) MONTHS WARRANTY PERIOD OR NINETY (90) DAYS FOR BRUSH CUTTERS USED FOR ANY INCOME PRODUCING PURPOSE. ACCORDINGLY, ANY SUCH IMPLIED WARRANTIES INCLUDING MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, ARE DISCLAIMED IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE APPROPRIATE TWENTY-FOUR (24) MONTHS OR NINETY (90) DAYS WARRANTY PERIOD.

CIMA'S OBLIGATION UNDER THIS WARRANTY, IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS, AND CIMA DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

CIMA ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO, EXPENSE FOR GASOLINE, EXPENSE OF RETURNING THE ROBIN BRUSH CUTTER TO AUTHORIZED SERVICE DEALER AND EXPENSE OF DELIVERING IT BACK TO THE OWNER, MECHANIC'S TRAVEL TIME, TELEPHONE OR, TELEGRAM CHARGES, RENTAL OF A LIKE PRODUCT DURING THE TIME WARRANTY SERVICE IS BEING PERFORMED, TRAVEL, LOSS OR DAMAGE TO PERSONAL PROPERTY, LOSS OF REVENUE, LOSS OF THE BRUSH CUTTER, LOSS OF TIME, OR INCONVENIENCE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This warranty applies to Robin brush cutter sold by CIMA in the United States. To validate this warranty original purchaser must complete the attached Warranty Registration Form and return it within ten (10) days of purchase.

CARSWELL IMPORT
AND MARKETING ASSOCIATES, INC.
WINSTON-SALEM, NORTH CAROLINA 27115

Fuji Robin Industries, Ltd.
Numazu, Shizuoka, Japan

WARRANTY SERVICE

Warranty service can be performed by an Authorized Robin Service Dealer regardless of whether the consumer purchased the Robin product originally from that dealer. However, we recommend you first contact the original dealer who sold you the product. Remember, it is your responsibility to deliver your Robin product along with proof of purchase to the dealer within the warranty period, and all work must be performed by an Authorized Robin Service Dealer.

Example of Parts and Service not covered by Warranty

Normal service requirements occurring during the warranty period such as carburetor or ignition adjustment.

Normal service over and above repair or replacement of defective parts.

Repair or maintenance service due to normal wear, improper maintenance, misuse, neglect, negligence, accident, also alternations or modifications which adversely affect product's performance, durability, or change their intended use.

Repairs or maintenance made necessary due to use of parts or accessories which are not compatible with Robin products or adversely affect its operation, performance, or durability.

Products not operated or maintained in accordance with the instruction Manual.

Normal cleaning, lubrication, adjustments, or replacement of such items as spark plugs, filters, ignition points, etc.

Expense of delivering the product to an Authorized Service Dealer or of returning such products, or mechanics travel time, or cost of any rental of a like product during the period warranty service is being performed.

Warranty applies only to original retail purchaser.

Owner's Obligation and Responsibility-

It is the responsibility of the owner to provide for normal maintenance service and replacement of service items and to maintain all components in proper adjustment. These are not considered defects in material or workmanship. Individual operation and application determine the need for normal maintenance service.

Robin Warranty Registration

Owner's Name _____

Address _____

City State Zip

Dealer's Name _____

Address _____

City State Zip

Date of Purchase _____

Model No. _____ Serial No. _____

This Registration Form must be completed and returned within ten (10) days of purchase.

(Detach and Mail)



WARNING: The Engine Exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

PLACE
STAMP
HERE

CMA CARSWELL IMPORT &
MARKETING ASSOCIATES, INC.
P.O. Box 4169, Winston-Salem, N.C. 27115



FUJIROBIN INDUSTRIES LTD.

From _____

