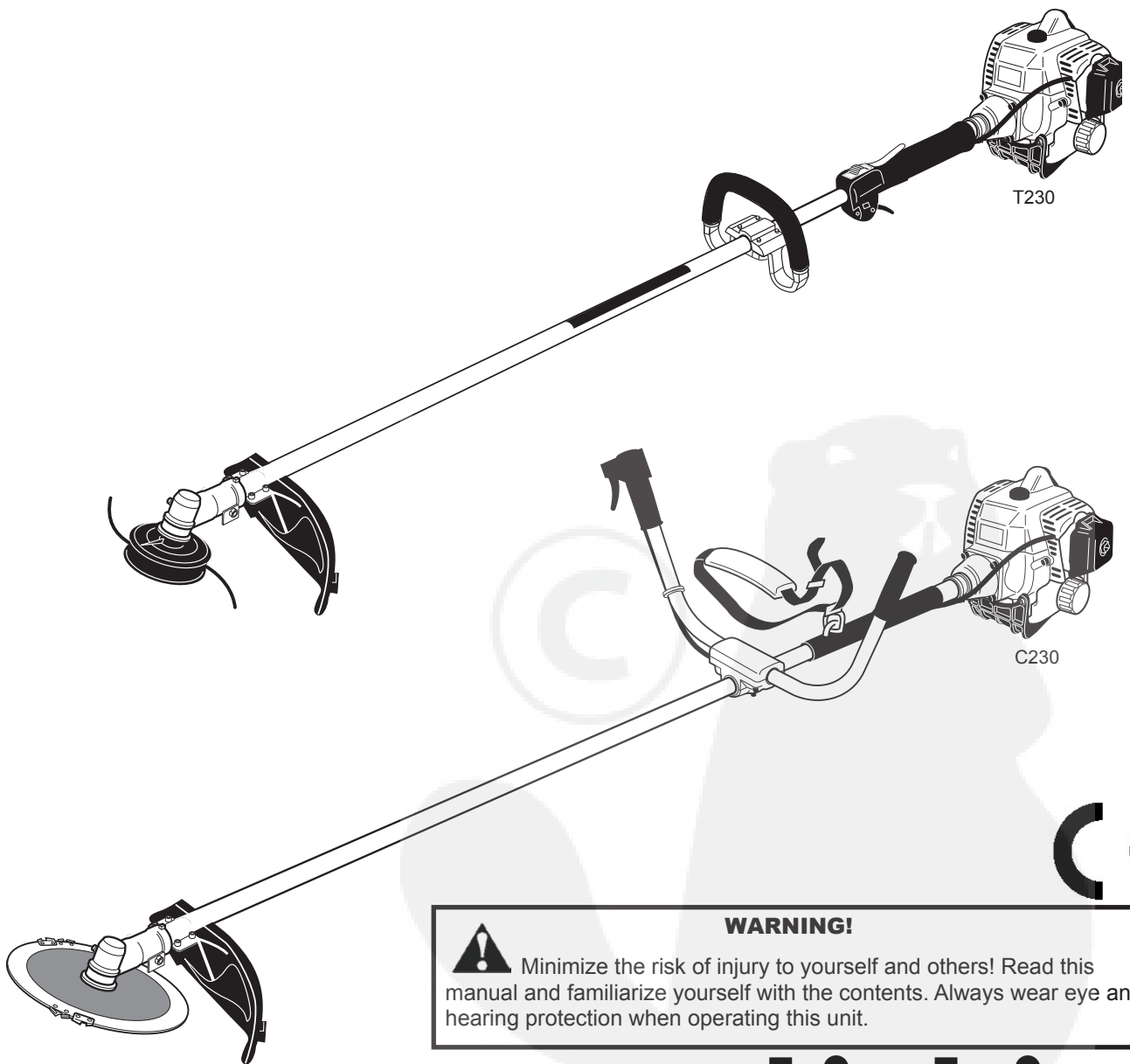


SHINDAIWA OWNER'S/OPERTOR'S MANUAL

T230 GRASS TRIMMER C230 BRUSHCUTTER



WARNING!
⚠ Minimize the risk of injury to yourself and others! Read this manual and familiarize yourself with the contents. Always wear eye and hearing protection when operating this unit.



shindaiwa

Introduction

Shindaiwa 230-series hand held power equipment has been designed and built to deliver superior performance and reliability without compromise to quality, comfort, safety or durability.

Shindaiwa's high-performance engines represent the leading edge of 2-cycle engine technology, delivering exceptionally high power with remarkably low displacement and weight. As an owner/operator, you'll soon discover for yourself why Shindaiwa is simply in a class by itself!

IMPORTANT!

The information contained in this owner's/operator's manual describes units available at the time of publication.

Shindaiwa Inc. reserves the right to make changes to products without prior notice, and without obligation to make alterations to units previously manufactured.

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Attention Statements

Throughout this manual are special attention statements.



WARNING!

A statement preceded by the triangular attention symbol and the word "WARNING" contains information that should be acted upon to prevent serious bodily injury.

CAUTION!

A statement preceded by the word "CAUTION" contains information that should be acted upon to prevent mechanical damage.

IMPORTANT!

A statement preceded by the word "IMPORTANT" is one that possesses special significance.

NOTE:

A statement preceded by the word "NOTE" contains information that is handy to know and may make your job easier.



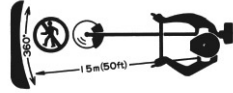
Read and follow this operator's manual. Failure to do so could result in serious injury.



Wear eye and hearing protection at all times during operation of this unit.



Wear non-slip gloves, long trousers and non-skid boots during the operation of this machine.



Make sure no one is within 15 meters of an operating machine.



Beware of thrown objects.



MAX

8500min⁻¹

The maximum speed of the cutting attachment shaft in min⁻¹.



Sound Power Level (measured in accordance with 2000/14/EC).

IMPORTANT!

The operational procedures described in this manual are intended to help you get the most from unit as well as to protect you and others from harm. These procedures are guidelines for safe operation under most conditions, and are not intended to replace any safety rules and/or laws that may be in force in your area. If you have questions regarding your Shindaiwa power tool, or if you do not understand something in this manual, your Shindaiwa dealer will be glad to assist you. You may also contact Shindaiwa, Inc. at the address printed on the back of this manual.

Safety Information

Work Safely

Trimmers and brushcutters operate at very high speeds and can do serious damage or injury if they are misused or abused. *Never allow a person without training or instruction to operate this unit!*



WARNING!

Never make unauthorized attachment installations.



WARNING!

Use Good Judgment

NEVER run the engine when transporting the unit.

NEVER run the engine indoors! Make sure there is always good ventilation. Fumes from engine exhaust can cause serious injury or death.

ALWAYS use the proper cutting tool for the job.

ALWAYS stop the unit immediately if it suddenly begins to vibrate or shake. Inspect for broken, missing or improperly installed parts or attachments.

NEVER extend trimming line beyond the length specified for your unit.

ALWAYS keep the unit as clean as practical. Keep it free of loose vegetation, mud, etc.

ALWAYS hold the unit firmly with both hands when cutting or trimming, and maintain control at all times.

ALWAYS keep the handles clean.

ALWAYS disconnect the spark plug wire before performing any maintenance work.

ALWAYS, if a saw blade should bind fast in a cut, shut off the engine immediately. Push the branch or tree to ease the bind and free the blade.

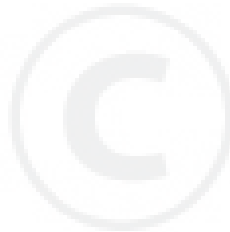
Stay Alert

You must be physically and mentally fit to operate this unit safely.

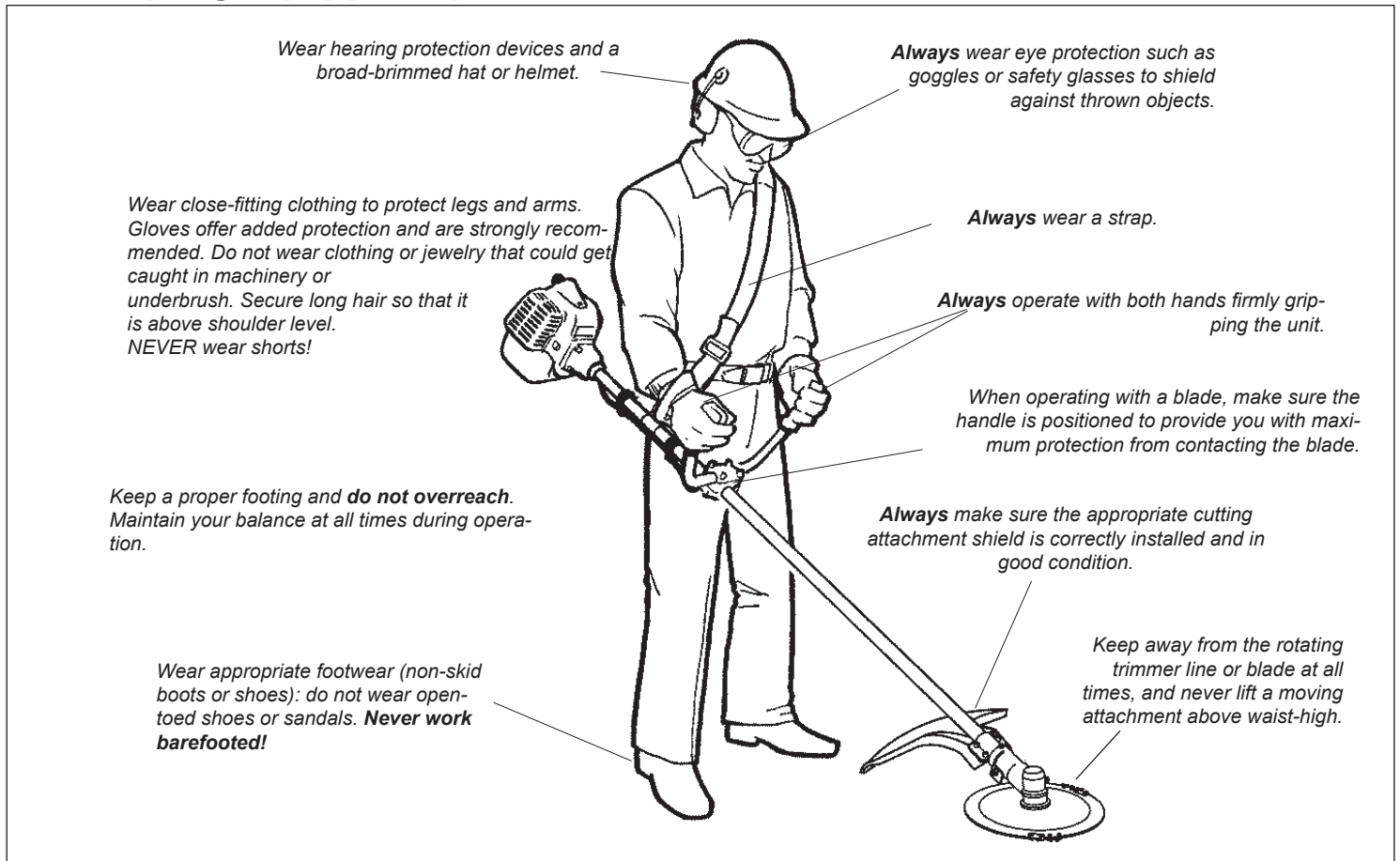


WARNING!

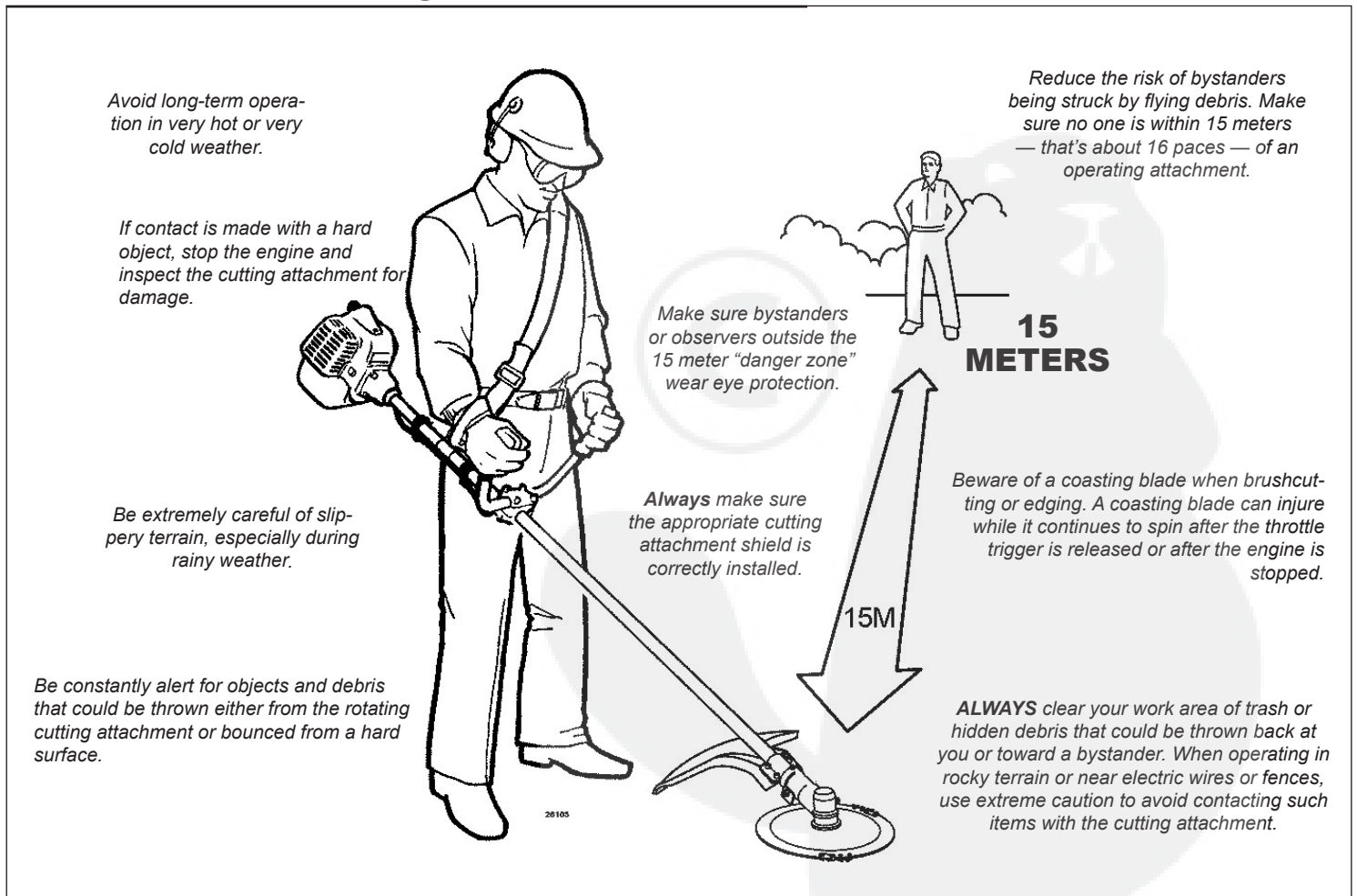
Never operate power equipment of any kind if you are tired or if you are under the influence of alcohol, drugs, medication or any other substance that could affect your ability or judgement.



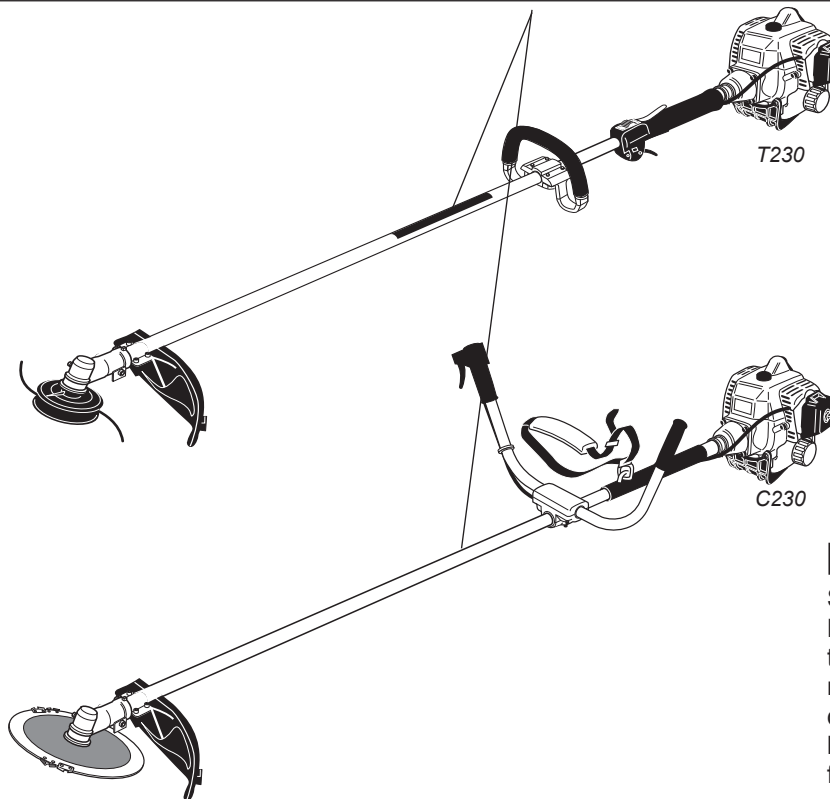
The Properly Equipped Operator



Be Aware of the Working Environment



Safety Labels



IMPORTANT!

Safety and Operation Information Labels: Make sure all information labels are undamaged and readable. Immediately replace damaged or missing information labels. New labels are available from your local authorized Shindaiwa dealer.

Checking Unit Condition



WARNING!

A cutting attachment shield or other protective device is no guarantee of protection against ricochet. **YOU MUST ALWAYS GUARD AGAINST FLYING DEBRIS!**

Use only authorized Shindaiwa parts and accessories with your Shindaiwa trimmer or brushcutter. Do not make modifications to this unit without the written approval of Shindaiwa, Inc.

NEVER operate the unit with the cutting attachment shield or other protective devices (harness, ignition switch, blade retention clip, etc.) removed!

ALWAYS make sure the cutting attachment is properly installed and firmly tightened before operation.

NEVER use a cracked or warped cutting attachment: If a properly installed attachment vibrates, replace the attachment with a new one and re-check.

ALWAYS stop the engine immediately and check for damage if you strike a foreign object or if the unit becomes tangled. Do not operate with broken or damaged equipment.

NEVER allow the engine to run at high RPM without a load. Doing so could damage the engine.

NEVER operate a unit with worn or damaged fasteners or attachment holders.

NEVER cut with a dull blade. Doing so will increase the risk of blade thrust and may also cause equipment damage.

Prior to Assembly

Before assembling, make sure you have all the components required for a complete unit:

- Engine assembly
- Outer tube assembly
- Guard
- Strap
- Handlebar (C230)/Front Handle (T230)
- Kit containing cutting attachment shield mounting bracket and hardware, operator's handle mounting bracket and hardware, gearcase tool holder, this manual and tool kit for routine maintenance. Tool kits vary by model and may include a hex wrench, spanner and a combination spark plug wrench/screwdriver.

Carefully inspect all components for damage.

IMPORTANT!

The terms "left", "left-hand", and "LH"; "right", "right-hand", and "RH"; "front" and "rear" refer to directions as viewed by the operator during normal operation.

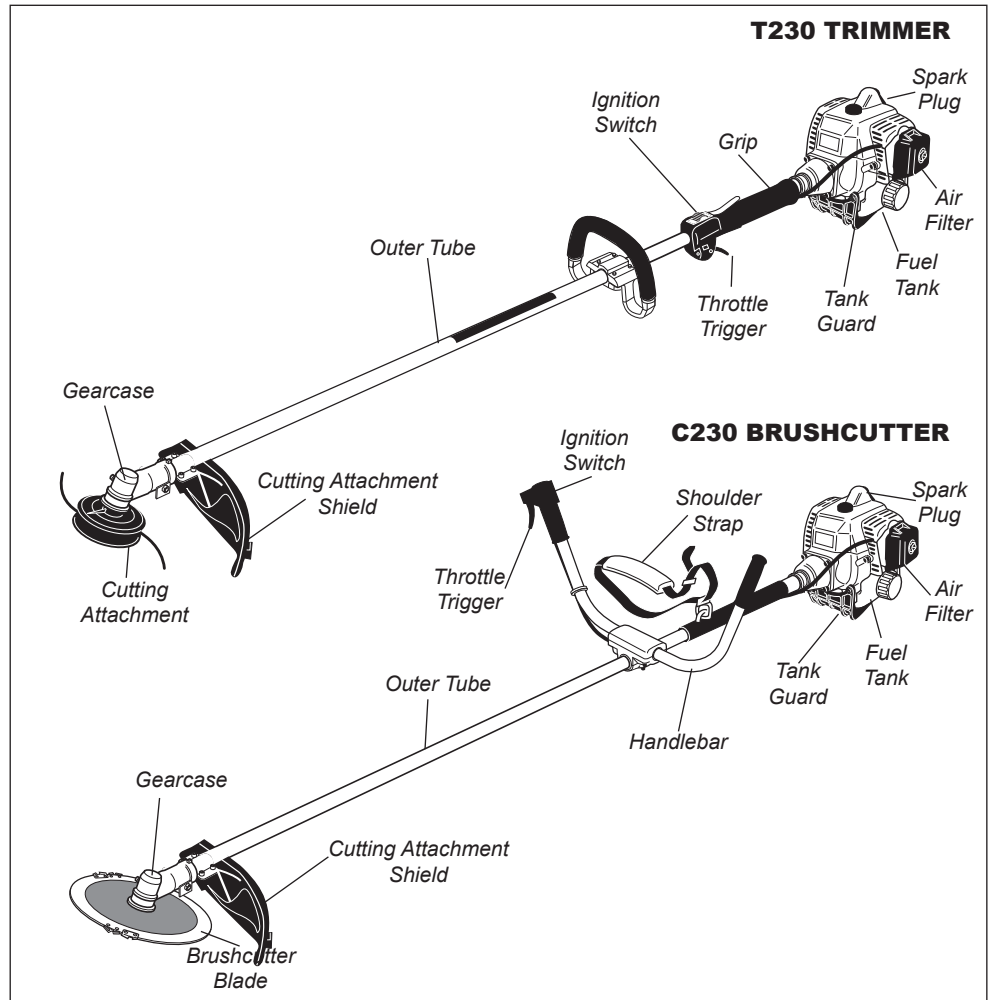
Unit Description

Using the accompanying illustrations as a guide, familiarize yourself with this unit and its various components. Understanding the product helps ensure top performance, long service life, and safer operation.



WARNING!

Do not make unauthorized modifications or alterations to any of these units or their components.



Specifications

| | T230/EC1 C230/EC1 |
|---|---|
| Model Name | S230/EC1 |
| Engine Model | 2-cycle, vertical cylinder, air cooled |
| Engine Type | 22.5 cm ³ |
| Displacement | 32 x 28 mm |
| Bore and Stroke | 0.8 kW |
| Maximum Power Output | 2,750 min ⁻¹ |
| Engine Speed at Idling | 10,000 min ⁻¹ |
| Maximum Engine Speed | 7,500 min ⁻¹ |
| Engine Speed at Maximum Power Output | 4.7 kg 4.9 kg |
| Dry Weight | 1710 x 365 x 285 1725 x 605 x 450 |
| Dimensions (L x H x H) mm | 600 cm ³ |
| Fuel Tank Capacity | 50:1 |
| Fuel/Oil Ratio | Walbro WYL, diaphragm-type |
| Carburetor Type | One piece electronic, transistor controlled |
| Ignition | NGK BMR6A |
| Spark Plug | Non-reversible flocked filter element |
| Air Cleaner Type | Recoil Starter |
| Starting Method | Slide Switch |
| Stopping Method | 94 dB (A) 92 dB (A) |
| Sound Pressure Level* (average data between at Idling and at Racing) Note 1 | 104 dB (A) |
| Sound Power Level** (average data between at Idling and at Racing) Note 1 | 3.9/2.1 m/s ² 1.9/2.0 m/s ² |
| Vibration Level*** Note 1 | 2.7/7.8 m/s ² 3.1/2.8 m/s ² |
| | 98 dB (A) 96 dB (A) |
| Sound Pressure Level* (average data between at Idling and at WOT) Note 2 | 107 dB (A) |
| Sound Power Level** (average data between at Idling and at WOT) Note 2 | 2.4/2.4 m/s ² 1.9/1.7 m/s ² |
| Vibration Level*** Note 2 | 8.1/7.8 m/s ² 5.0/6.3 m/s ² |

* Sound Pressure Level: In accordance with EN ISO 11806 and ISO 7917

** Sound Power Level In accordance with EN ISO 11806 and ISO 10884

*** Vibration Level: In accordance with EN ISO 11806 and ISO 7916

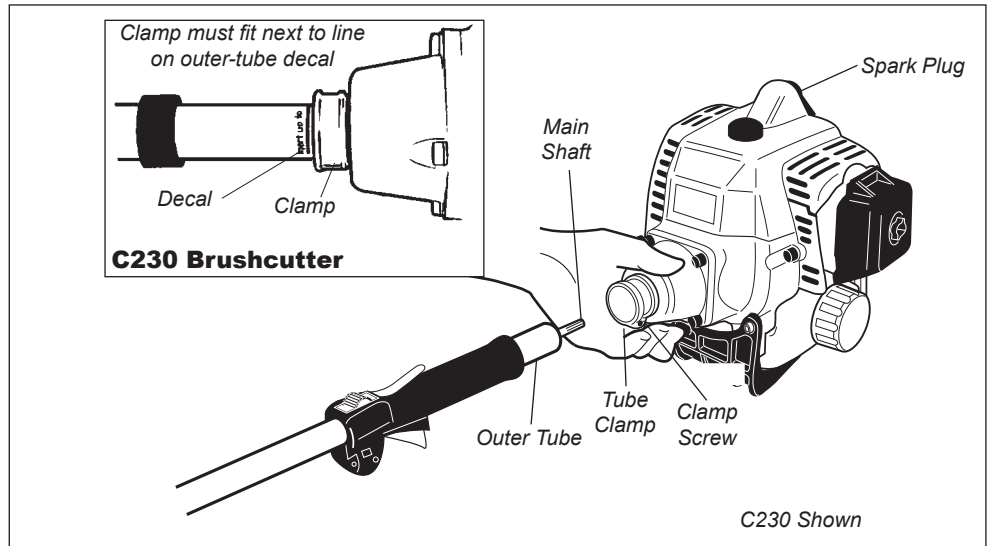
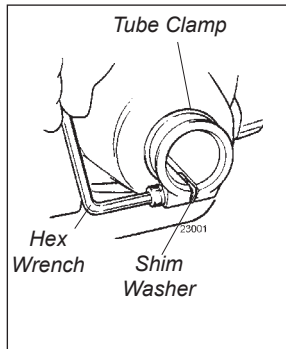
Note 1: 8-tooth blade equipped.

Note 2: Trimmer head equipped.

Assembly Driveshaft/Powerhead

Connect the Outer Tube to the Powerhead

1. Place the powerhead on a clean, flat surface, spark plug facing up.
2. Use the 4mm hex wrench to loosen the tube clamp screw. Verify that the D-shaped shim washer is positioned as shown.



CAUTION!

Do not remove the D-shaped shim washer! The shim washer prevents damage from overtightening the tube clamp screw.

CAUTION!

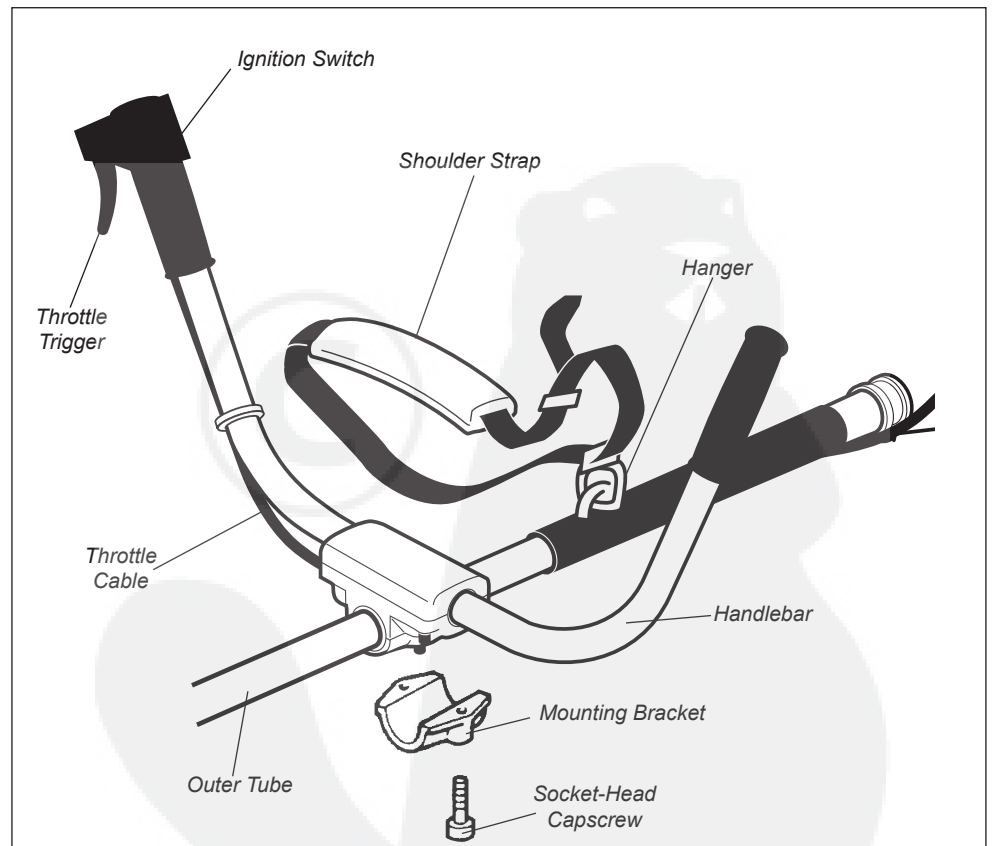
Do not force the shaft tube into the powerhead! Excessive force can damage the shaft tube and mainshaft.

3. Add some moly-type EP grease to the splines on the end of the mainshaft.
4. Slide the outer tube into the tube clamp until the tube bottoms and the installation decal aligns with the tube clamp. If installation is difficult, rotate the outer tube or mainshaft slightly until you feel the mainshaft splines engage with the powerhead.
5. Position the outer tube so that the gearcase output shaft is facing down.
6. Tighten the clamp screw firmly.

Assembly Handlebar (C230)

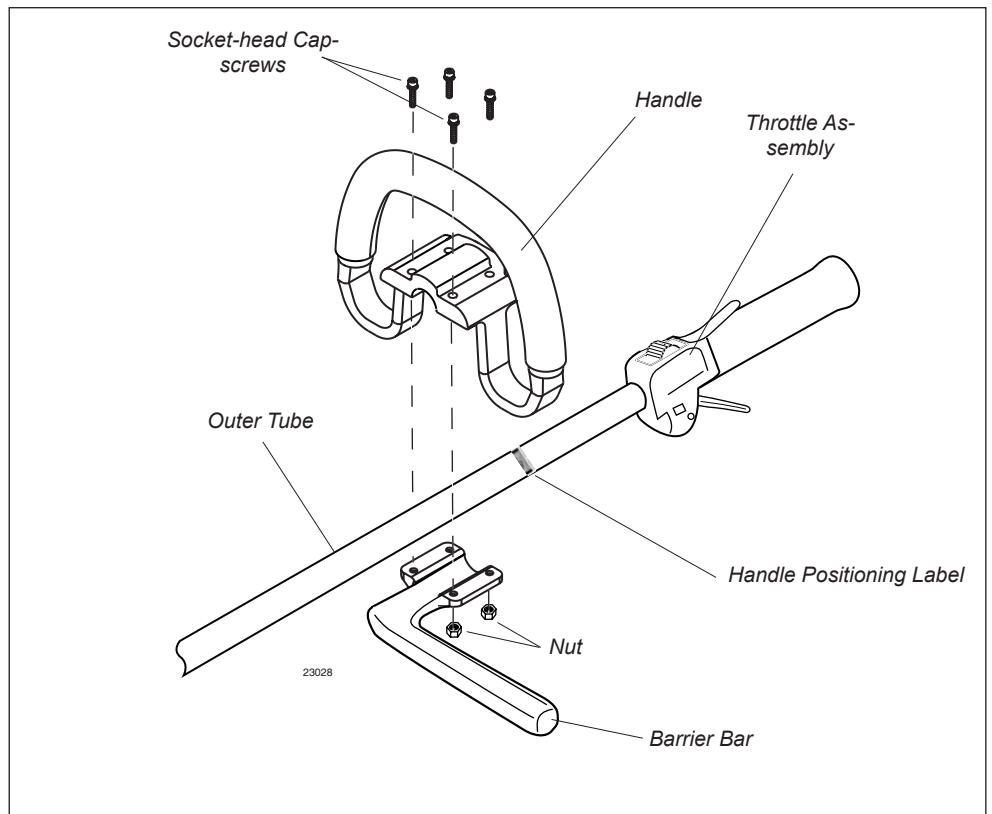
Assemble the Handlebar

1. Position the handle bracket against the handle label located on the outer tube.
2. Attach the handle mounting bracket using the two socket-head cap screws. Tighten the screws finger-tight ONLY at this time.
3. Locate the handle forward of the Handle Positioning Label at the best position for operator comfort.
4. Using the hex wrench, securely tighten the two handlebar cap screws.
5. Route the ribbed throttle cable tube along the handlebar and outer tube. Install the protector sleeve on the outer tube.



Assembly Handle T230

1. Position the handle on the outer tube forward of Handle Positioning Label as shown.
2. Install the barrier bar with the socket head cap screws and nuts. Tighten the screws finger-tight ONLY at this time.
3. Locate the handle in the best position for operator comfort (usually about 10 inches ahead of the throttle housing).
4. Secure the handle by alternately tightening the four socket-head screws in a diagonal or "criss-cross" fashion.



Assembly Cutting Attachment Shield

Assemble the Cutting Attachment Shield to the Outer Tube.

(A) Cutting Attachment Shield

1. Insert the cutting attachment shield between the outer tube and the cutting attachment mounting plate.

NOTE:

It may be necessary to loosen the retaining nut and clamp screw to adjust cutting attachment shield mounting plate.

2. Fit the two shims and the bracket over the outer tube and loosely install the four socket-head screws.

CAUTION!

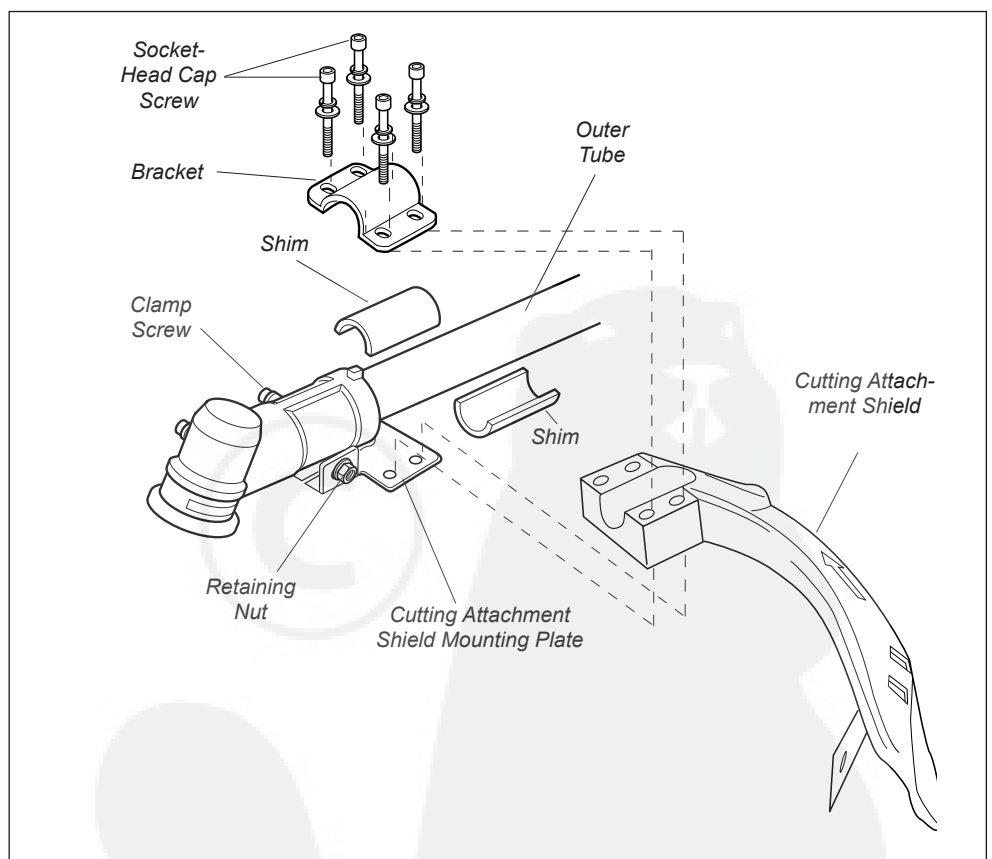
Make sure the clamp screw and retaining nut is securely tightened before tightening the four socket head screws.

3. Tighten the four socket-head cap screws to secure the cutting attachment shield.



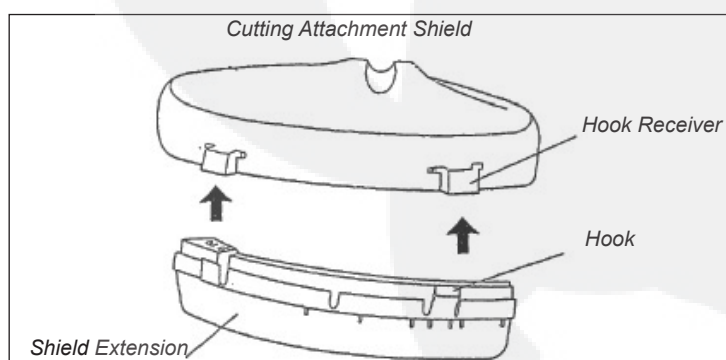
WARNING!

NEVER operate a trimmer or brushcutter without the cutting attachment shield installed and tightly secured!



(B) Shield Extension (when trimmer head is in use)

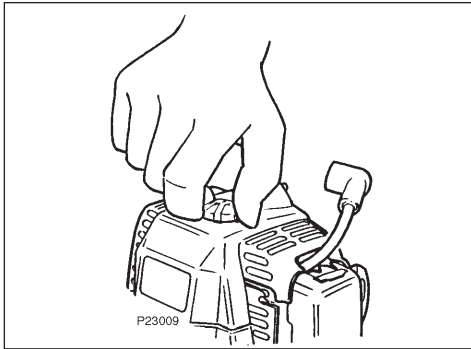
- (1) Attach the shield extension to the cutting attachment shield.



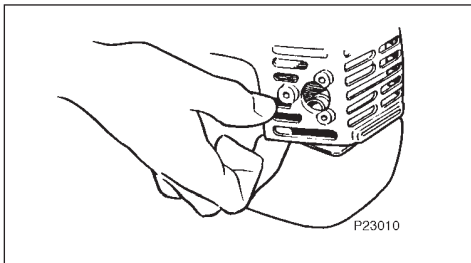
Connecting The Throttle Cable

Remove The Cylinder Cover

1. Remove the spark plug cap, then loosen the cylinder cover knob (about a dozen turns needed).

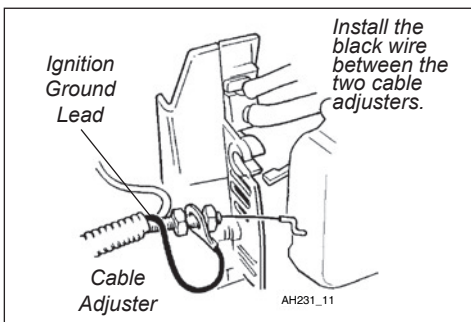


2. Lift the corner of the cylinder cover just below the muffler as shown, and lift off the cylinder cover.

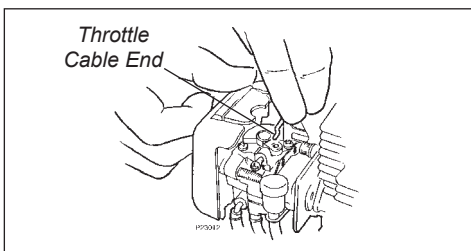


Connect The Throttle Cable

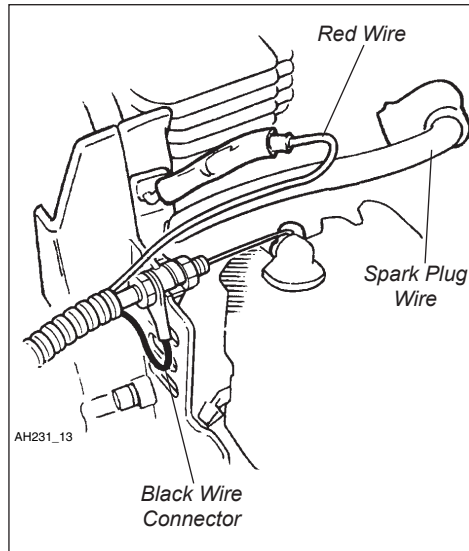
1. Loop the ribbed cable assembly to the top left side of the engine. Notice that the black ground wire (with a ring fitting on the end) is located between the two cable adjuster nuts as shown below.



2. Connect the S-shaped end of the throttle cable to the throttle lever on top of the carburetor as shown below.

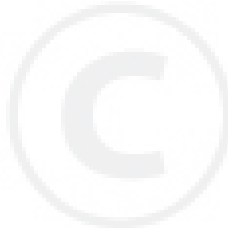


3. Turn the cable adjuster nuts sufficiently for the throttle cable to fit in the notch on the fan cover. Make sure the ignition ground lead is located on the rearward side of the notch. Then, connect the male fitting of the black ignition wire into the female fitting of the red wire attached to the engine.



CAUTION!

Adjust and tighten the cable nuts to allow approximately 4 ~ 6 mm free play at the throttle trigger.



Assembly Trimmer Head

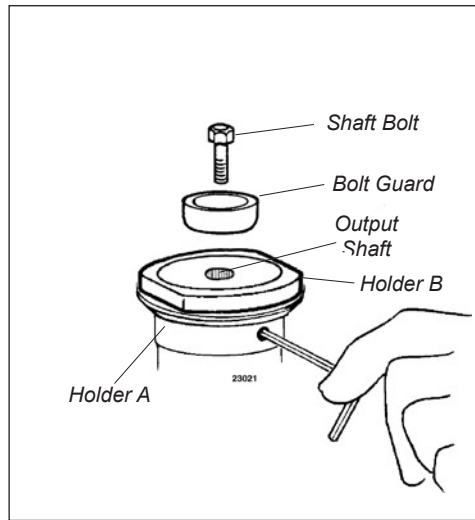
Install the Trimmer Head.

1. Turn the unit over so that the gearcase output shaft faces UP.
2. Remove the shaft bolt and bolt guard using the combination spark plug wrench/screwdriver.
3. Rotate the holder until the hole in the holder aligns with the notch on the gearcase flange. Use the long end of the hex wrench to lock the output shaft in position.

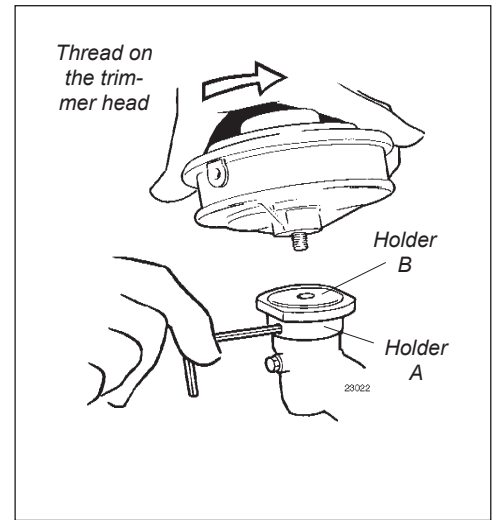
IMPORTANT!

The trimmer head has a left-hand thread. Turn the trimmer head counter-clockwise to install and clockwise to remove.

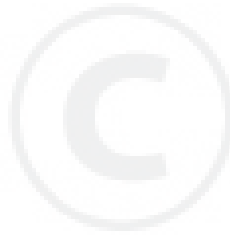
4. While holding the hex wrench, thread the trimmer head onto the output shaft, turning counter-clockwise.



5. Using hand pressure only, tighten the trimmer head firmly on the gearshaft.
6. Remove the hex wrench.



7. Adjust the trimmer line length to reach no further than the line cutter on the cutting attachment shield. Trim to the correct length if necessary.



Assembly

Blade

Mount the Blade.

Turn the brushcutter upside down so the gearcase output shaft is facing UP, and remove the shaft bolt, bolt guard and holder "B" from the gearcase shaft.

1. Align the hole in blade holder "A" with the matching hole in the gearcase flange, and then temporarily lock the output shaft by inserting a hex wrench through both holes.
2. Slide the safety clip off-center.
3. Fit the blade over the safety clip and then center it over the flange on holder "A".

CAUTION!

Install the blade so its printed surface is visible to the operator when the brushcutter is in the normal operating position.

WARNING!

The blade must fit flat against the holder flange. The blade mounting hole must be centered over the raised boss on blade holder A.

NOTE:

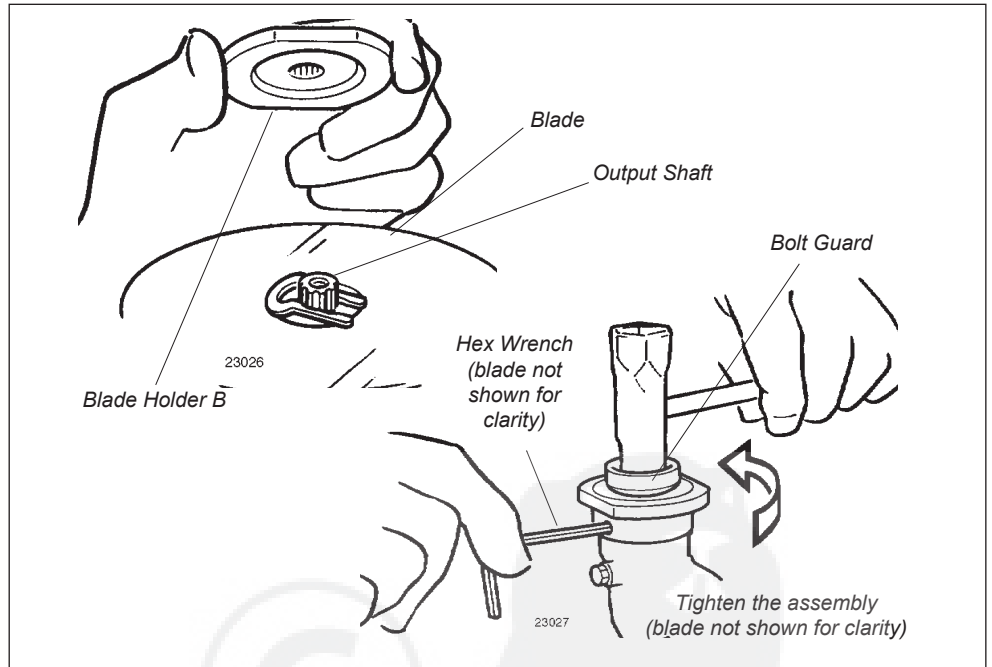
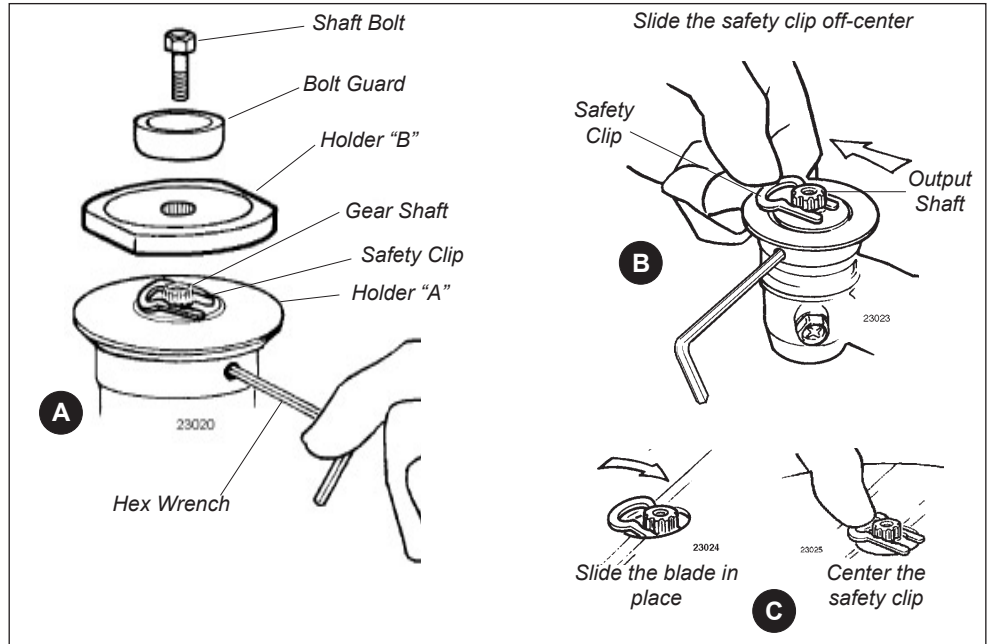
When installing certain blades, it may be necessary to temporarily remove the safety clip.

4. Lock the blade in place by centering the safety clip on the output shaft.

WARNING!

Never operate the brushcutter without the safety clip in place!

5. Install blade holder "B" on the output shaft. The recess in the holder must completely cover the safety clip, and must fit tightly against the blade.
6. Install the bolt guard and then the blade retaining bolt. Using the combination spark plug wrench/screwdriver, tighten the bolt firmly in a counter-clockwise direction.
7. Remove the hex wrench.



Mixing Fuel



WARNING!

Minimize the risk of fire, burns, and personal injury!

- **STOP** engine before refueling.
- **ALWAYS** allow the engine to cool before refueling
- **ALWAYS** open the fuel cap slowly to allow any pressure build-up in the tank to release fuel vapor slowly.
- **ALWAYS** transport and store fuels in an approved container.
- Avoid overfilling and wipe-up all spilled fuel. Move the engine at least 3 meters from the fueling point, storage area, and other readily flammable materials before restarting.
- **ALWAYS** inspect the unit for fuel leaks before each use. During each refill, make sure there are no fuel leaks around the fuel cap and/or tank. If a fuel leak is evident, stop using the unit immediately. Fuel leaks must be repaired before using the unit.
- **NEVER** smoke or light any fires near the engine or fuel source.
- **NEVER** place any flammable material near the engine or muffler.
- **NEVER** operate the engine without the muffler in good working condition.
- **ALWAYS** move the unit to a place well away from a fuel storage area or other readily flammable materials before starting the engine.

CAUTION!

This engine is designed to operate on a 50:1 mixture consisting of unleaded gasoline and a premium 2-cycle mixing oil only. Use of Non-approved mixing oils can lead to excessive maintenance costs and/or engine damage.

CAUTION!

Some gasolines contain alcohol as an oxygenate! Oxygenated fuels may cause increased operating temperatures. Under certain conditions, alcohol-based fuels may also reduce the lubricating qualities of some mixing oils. Never use any fuel containing more than 10% alcohol by volume! Generic oils and some outboard motor oils may not be intended for use in high-performance air cooled 2-cycle engines, and should never be used in your Shindaiwa engine!

Filling The Fuel Tank

IMPORTANT!

Mix only enough fuel for your immediate needs! If fuel must be stored longer than 30-days, it should first be treated with a stabilizer such as StaBil™ or equivalent product!

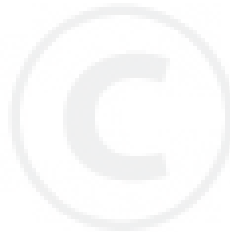
- Use only fresh, clean unleaded gasoline with a pump octane rating of 87 or higher.
- Mixing fuel with a Premium 2-cycle mixing oil designed for use with high-performance 2-cycle air-cooled engines.
- Refer to the following examples of 50:1 fuel to oil mix quantities:

| Gasoline liters | 2-cycle mixing oil milliliters |
|--------------------|-----------------------------------|
| 2.5 l | 50 ml |
| 5 l | 100 ml |
| 10 l | 200 ml |
| 20 l | 400 ml |

CAUTION!

Never attempt to mix fuel in the unit's fuel tank. Always mix all fuels in a clean approved container.

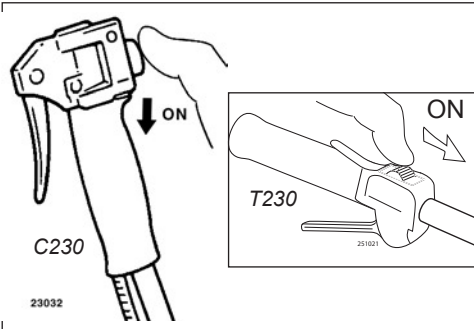
1. Place the unit on a flat, level surface, and wipe any debris from around the fuel cap.
2. Remove the fuel cap.
3. Fill the tank with clean, fresh fuel.
4. Replace the cap, and wipe away any spilled fuel before starting the engine.



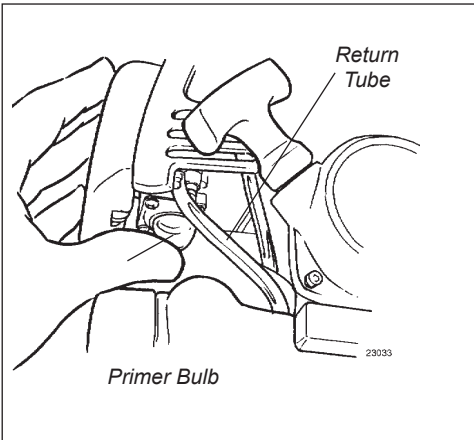
Starting the Engine

IMPORTANT!

Engine ignition is controlled by a two position switch mounted on the throttle housing labeled, "I" for ON or START and "O" for OFF or STOP.



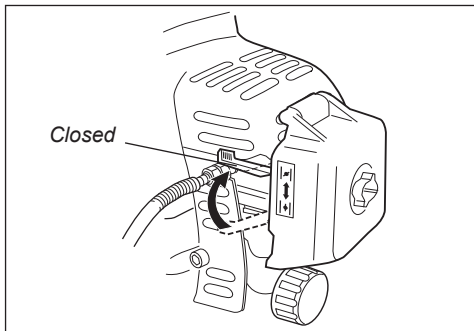
1. Slide the ignition switch to the "I" position (engine ON).



2. Press the primer bulb until fuel can be seen flowing in the transparent return tube.

IMPORTANT!

The primer system only pushes fuel through the carburetor. Repeatedly pressing the primer bulb will not flood the engine with fuel.



3. **(Cold Engine Only)** Set the choke lever to the CLOSED position.



4. While holding the outer tube firmly with one hand, slowly pull the recoil starter handle until resistance is felt, then pull quickly to start the engine.

CAUTION!

Do not pull the recoil starter to the end of the rope travel. Pulling the recoil starter to the end of the rope travel can damage the starter.

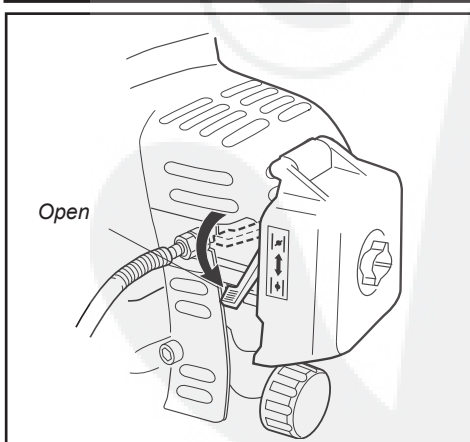
WARNING!

The cutting attachment may rotate when the engine is started!

5. When the engine starts, slowly move the choke lever to the "OPEN" position. (If the engine stops after the initial start, close the choke and restart.)

IMPORTANT!

If the engine fails to start after several attempts with the choke in the closed position, the engine may be flooded with fuel. If flooding is suspected, move the choke lever to the open position and repeatedly pull the recoil starter to remove excess fuel and start the engine. If the engine still fails to start, refer to the troubleshooting section of this manual.



WARNING!

Never start the engine from the operating position.

When the Engine Starts...

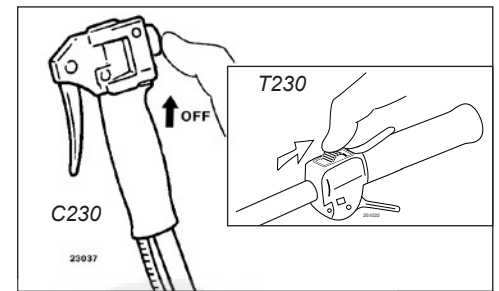
- After the engine starts, allow the engine to warm up at idle 2 or 3 minutes before operating the unit.
- After the engine is warm, pick up the unit and clip on the harness if so equipped.
- Advancing the throttle makes the cutting attachment turn faster; releasing the throttle permits the attachment to stop turning. If the cutting attachment continues to rotate when the engine returns to idle, carburetor idle speed should be adjusted (see the next page).

Stopping the Engine

WARNING!

The cutter attachment can continue moving after the engine is stopped!

1. Cool the engine by allowing it to idle for two or three minutes.
2. Slide the ignition switch to the "O" or STOP position.



WARNING!

Know how to stop the machine quickly in an emergency.

Adjusting Engine Idle



WARNING!

The cutter attachment must never rotate at engine idle speed. If the idle speed cannot be adjusted by the procedures described here, return the trimmer to your Shindaiwa dealer for inspection.

NOTE:

The mixture of the carburetor on this unit cannot be adjusted.

The engine must return to idle speed whenever the throttle trigger is released. Idle speed is adjustable and must be set low enough to permit the engine clutch to disengage the cutter attachment when throttle trigger is released.

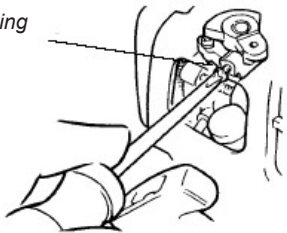
Check and Adjust Idle Speed

1. Start the engine and allow it to idle two or three minutes, or until it warms up.
2. If the cutter attachment rotates at engine idle, reduce idle speed by turning the idle adjusting screw counter-clockwise as necessary.

IMPORTANT!

Use a tachometer, if one is available, to set engine idle. Standard idle speed is: 2,750 (± 250) min⁻¹.

Idle Adjusting Screw

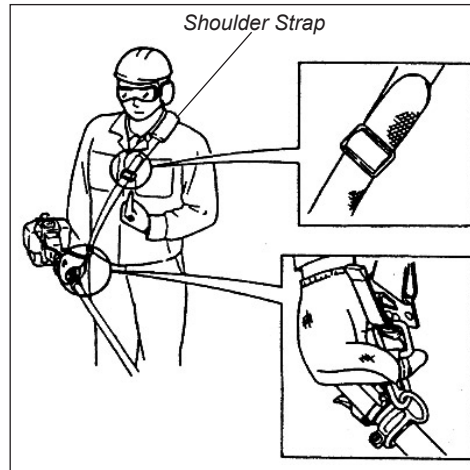


3. If the engine is stalling and won't idle, increase idle speed by turning the idle adjustment screw clockwise.

Attaching The Shoulder Strap

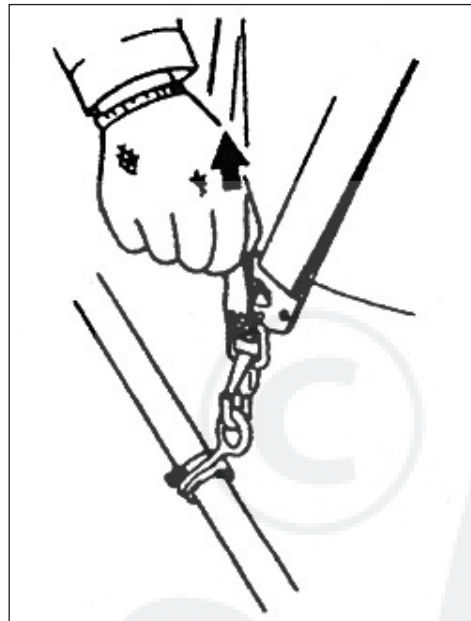
To Wear the Shoulder Strap

1. Hook the strap hook to the hanger on the outer tube.
2. Wear the shoulder strap so that the hook stays at your right hand side.
3. Adjust the length of the shoulder strap so that you can hold and operate the machine comfortably.



Emergency Release

In case of emergency, strongly pull the white tab at the hook. The machine will be released from the strap.



IMPORTANT!

Adjust the shoulder strap or harness so the shoulder pad rests comfortably on the off-side shoulder and the cutting path of the cutting attachment is parallel to the ground. Make sure all hooks and adjustment devices are secure.



WARNING!

Always wear a shoulder strap when operating this unit with a blade. A shoulder strap is also recommended when using trimmer line.



NOTE:

Using a shoulder strap with a brush-cutter allows you to maintain proper control of the unit and reduces fatigue during extended operation.

Using A Brushcutter with a Blade



WARNING!

- Before working with a blade-equipped unit, always inspect and clean the area of objects that could interfere with or damage the blade.
- Never use a blade near sidewalks, fence posts, buildings or other objects that could cause injury or damage.
- Never use a blade for purposes other than those for which it was designed.
- Whenever you strike a hard object with a blade, always stop the brushcutter and carefully inspect the blade for damage. **NEVER OPERATE THE BRUSHCUTTER WITH A DAMAGED BLADE!**
- A blade-equipped unit **must** be equipped with a bicycle-type handlebar or barrier bar as well as a harness or strap.
- Always make sure the cutting attachment shield is properly installed before operating the unit.

Blade Thrust

'Blade thrust' is a sudden sideways or backward motion of the brushcutter. Such motion may occur when the blade jams or catches on an object such as a sapling tree or tree stump. **BE CONSTANTLY ALERT FOR BLADE THRUST AND GUARD AGAINST ITS EFFECTS!**

Brushcutter Handlebar

A brushcutter's handlebar or barrier bar helps prevent the operator from moving forward, or the unit moving rearward, thus preventing inadvertent bodily contact with the blade. **ALWAYS KEEP THE HANDLEBAR SECURELY IN PLACE ON THE UNIT!**

Brushcutter Harness

A harness provides additional protection against blade thrust. In addition, a harness gives significant support and comfort to help ensure safe and efficient operation. When operating a brushcutter, make sure both the handle and harness are adjusted to the size of the operator using the unit.

Engine Operating Speeds

Operate the engine at full throttle while cutting. Best fuel efficiency is obtained by releasing the throttle when swinging back after a cut.

- To prevent possible engine damage, do not allow the brushcutter to run at high speeds without a load.
- Avoid operating the attachment at low speeds. Doing so can lead to rapid clutch wear. In addition, slow-speed operation tends to cause grass and debris to wrap around the cutting head.

The blade rotates counter-clockwise. For best performance and to minimize being struck by debris, move the blade from right to left while advancing on your work.

Position the blade so cuts are made between the blade's 8 o'clock and 10 o'clock positions (as viewed from above). **DO NOT** cut between the 10 o'clock and 5 o'clock positions (shaded area).



WARNING!

When cutting wood with a blade, feed the blade slowly. *Never strike or "slam" a spinning blade against the wood.*



WARNING!

DO NOT use 2-tooth or NON-Shindaiwa approved 4-tooth cutting blades with Shindaiwa brushcutters.

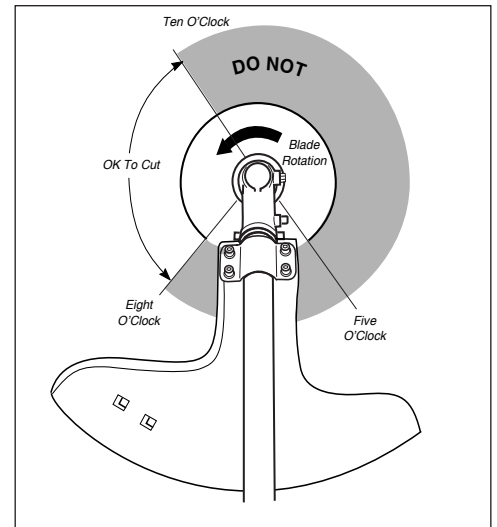
Vertical cuts

Hold the brushcutter with the blade at a 90° angle to the ground so the blade's bottom edge rotates toward the operator. Move the blade from top to bottom through the cut, and cut *only* with the bottom edge of the blade.



WARNING!

When making vertical cuts, never allow the blade to exceed waist height.



Cut on the left side of the blade. KEEP YOUR BODY OUTSIDE THE PATH OF BLADE ROTATION



Using a Brushcutter with a Trimmer Head

You may install one of several types of Shindaiwa trimmer heads on your T230/ C230 trimmer or brushcutter, each with features for specific applications and/or operational requirements.

For proper operation, always refer to the instructions accompanying the trimmer head being used. Available trimmer head styles include:

- **Semi-automatic.** Trimmer line is indexed when the operator taps the trimmer head on the ground during operation.
- **Manual.** The operator indexes line manually with the grass trimmer stopped.
- **Fixed.** The operator must stop the unit and add new lengths of trimmer line manually.
- **Flail.** This device, designed for clearing weeds and light brush, features three nylon blades attached to the head by pivots.

CAUTION!

Do not push the rotating line into trees, wire fences or any material that could tangle or break line ends.

Engine Operating Speeds

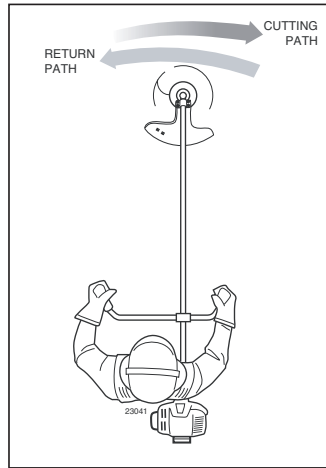
Operate at full throttle while cutting grass.

CAUTION!

Operation at low rpm can lead to premature clutch failure.

Trimming and Mowing Grass

Hold the grass trimmer so the trimmer head is angled slightly into the area to be cut. To ensure maximum trimmer-line service life, cut only with the tip of the trimmer line. Cut grass by swinging the unit's trimmer head from left to right. Keep the trimmer head horizontal.



Edging

Tilt the handle about 100° to the left (from horizontal) and move forward, holding the trimmer or brushcutter vertically as shown.



Recommended Cutting Attachments

Make sure to use the following recommended Shindaiwa cutting attachment with this machine.

PART NUMBER 60903-

8-TOOTH BLADE

INNER BORE: 25.4mm

DIAMETER: 255.0mm

THICKNESS: 2.0mm



PART NUMBER 72430-

3-TOOTH BLADE

INNER BORE: 25.4mm

DIAMETER: 255.0mm

THICKNESS: 2.2mm



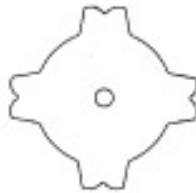
PART NUMBER 60903-

4-TOOTH BLADE

INNER BORE: 25.4mm

DIAMETER: 255.0mm

THICKNESS: 2.0mm



PART NUMBER 78820-04000

TAP & FEED TRIMMER HEAD

BOLT DIAMETER: 8mm

THREAD: LEFT, 1.25mm PITCH



General Maintenance



WARNING!

Before performing any maintenance, repair, or cleaning work on the unit, make sure the engine and cutting attachment are completely stopped. Disconnect the spark plug wire before performing service or maintenance work.



WARNING!

Non-standard accessories, cutting attachment, or replacement parts may not operate properly with your unit and may cause damage and lead to personal injury.

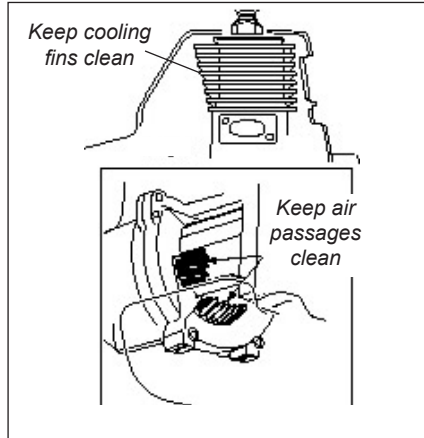
Spark Plug

Keep the spark plug and wire connections tight and clean.

Daily Maintenance

Prior to each work day, perform the following:

- Remove all dirt and debris from the engine, check the cooling fins and air cleaner for clogging, and clean as necessary.



- Carefully remove any accumulations of dirt or debris from the muffler and fuel tank. Check cooling air intake area at base of crankcase. Remove all debris. Dirt build-up in these areas can lead to engine overheating, fire, or premature wear.
- Clean any debris or dirt from the cutting attachment.
- Check for loose or missing screws or components. Make sure the cutting attachment is securely fastened.
- Check the entire unit for leaking fuel or grease.
- Make sure nuts, bolts, and screws (except carburetor idle speed adjusting screws) are tight.

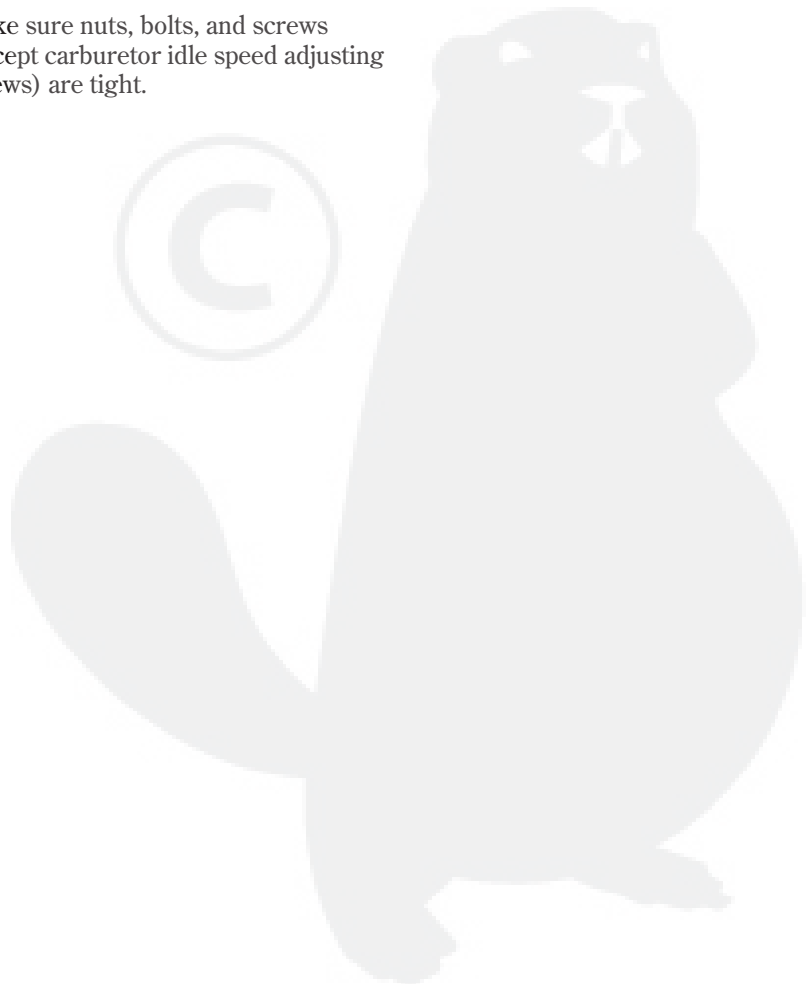
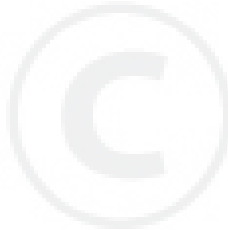
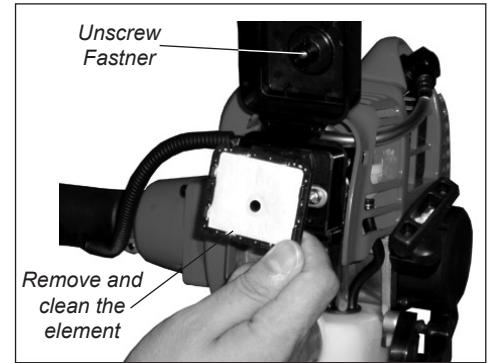
10-Hour Maintenance

Every 10 hours of operation (more frequently in dusty or dirty conditions):

Remove the air cleaner element from the air cleaner housing and clean it thoroughly with soap and water. Let it dry before reinstalling the element.

CAUTION!

Do not operate the unit if the air cleaner or element is damaged, or if the element is wet.



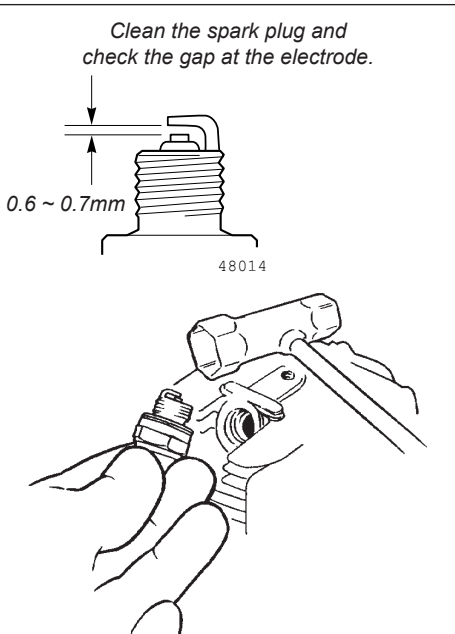
10/15-Hour Maintenance

Every 10 to 15 hours of operation:

- Remove and clean the spark plug. Adjust the spark plug electrode gap to 0.6 ~ .07 mm. If the plug must be replaced, use only a NGK BMR6A.

CAUTION!

Before removing the spark plug, clean the area around the plug to prevent dirt and debris from getting into the engine's internal parts



50-hour Maintenance

Every 50 hours of operation (more frequently in dusty or dirty conditions):

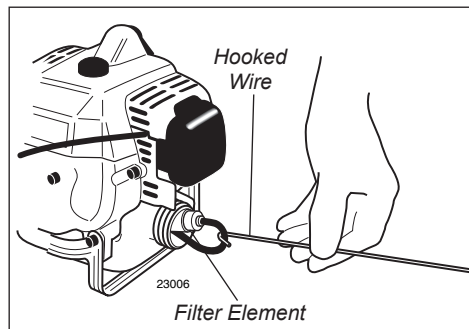
- Remove and clean the cylinder cover and clean dirt and debris from the cylinder cooling fins.

Servicing The Fuel Filter

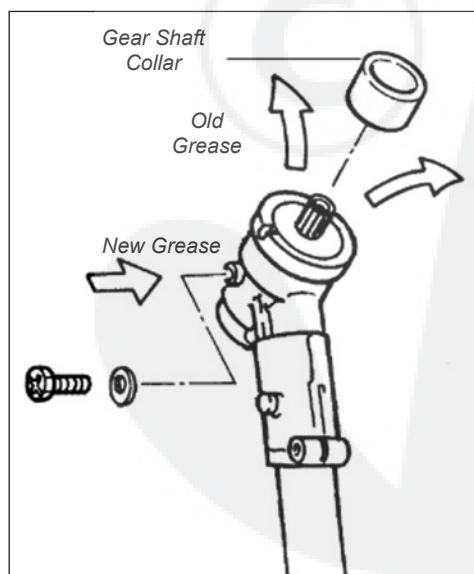
- Use a hooked wire to extract the fuel filter from inside the fuel tank. Inspect the fuel filter element for signs of contamination. Replace it with a new one if required. Before reinstalling the filter, inspect the fuel line. If you find damage or deterioration, remove the unit from service until it can be inspected by a Shindaiwa-trained service technician.

CAUTION!

Make sure you do not pierce the fuel line with the end of the hooked wire. The line is delicate and can be damaged easily.



Remove the cutting attachment and the gear shaft collar, and press new grease into the gear case until the old grease has been pushed out. Use only lithium base grease (such as Shindaiwa Gear Case Lubricant).



Long Term Storage

Whenever the unit will not be used for 30 days or longer, use the following procedures to prepare it for storage:

- Clean external parts thoroughly and apply a light coating of oil to all metal surfaces.
- Drain all the fuel from the fuel tank.

IMPORTANT!

All stored fuels should be stabilized with a fuel stabilizer such as STA-BIL™.

To remove the remaining fuel from the fuel lines and carburetor and with the fuel drained from the fuel tank.

1. Prime the primer bulb until no more fuel is passing through.
2. Start and run the engine until stops running.
3. Repeat steps 1 and 2 until the engine will no longer start.

CAUTION!

Gasoline stored in the carburetor for extended periods can cause hard starting, and could also lead to increased service and maintenance costs.

- Remove the spark plug and pour about 7 grams of 2-cycle mixing oil into the cylinder through the spark plug hole. Slowly pull the recoil starter 2 or 3 times so oil will evenly coat the interior of the engine. Reinstall the spark plug.
- Before storing the unit, repair or replace any worn or damaged parts.
- Remove the air cleaner element from the carburetor and clean it thoroughly with soap and water. Let dry and reassemble the element.
- Store the unit in a clean, dust-free area.

Troubleshooting Guide

Engine Does Not Start

| What To Check | Possible Cause | Remedy |
|---|---|---|
| Does the engine crank? | NO → Faulty recoil starter. Fluid in the crankcase. Internal damage. | Consult with an authorized servicing dealer. |
| YES ↓ | | |
| Good compression? | NO → Loose spark plug. Excess wear on cylinder, piston, rings. | Tighten and re-test. Consult with an authorized servicing dealer. |
| YES ↓ | | |
| Does the tank contain fresh fuel of the proper grade? | NO → Fuel incorrect, stale, or contaminated; mixture incorrect. | Refill with clean fresh unleaded gasoline with a pump octane of 87 or higher, mixed with Premium 2-cycle mixing oil at a 50:1 gasoline/oil ratio. |
| YES ↓ | | |
| Is fuel visible and moving in the return line when priming? | NO → Check for clogged fuel filter and/or vent. | Replace fuel filter or vent as required. Restart. |
| YES ↓ | | |
| Is there spark at the spark plug wire terminal? | NO → The ignition switch is in "O" (OFF) position. Shorted ignition ground. Faulty ignition unit. | Move switch to "I" (ON) position and re-start. Consult with an authorized servicing dealer. |
| YES ↓ | | |
| Check the spark plug. | NO → If the plug is wet, excess fuel may be in the cylinder. The plug is fouled or improperly gapped. The plug is damaged internally or of the wrong size. | Crank the engine with the plug removed, replace the plug, and re-start. Clean and re-gap the plug to 0.6 ~ 0.7 mm. Re-start. Replace the plug with a NGK BMR6A. Re-start. |

Troubleshooting Guide (Continued)

Low Power Output

| What To Check | Possible Cause | Remedy |
|---|--|---|
| Is the engine overheating? | Operator is overworking the unit. | Cut at a slower rate. |
| | Carburetor mixture is too lean. | Consult with an authorized servicing dealer. |
| | Improper fuel ratio. | Refill with clean fresh unleaded gasoline with a pump octane of 87 or higher, mixed with Premium 2-cycle mixing oil at a 50:1 gasoline/oil ratio. |
| | Fan, fan cover, cylinder fins dirty or damaged. | Clean, repair or replace as necessary. |
| Engine is rough at all speeds. May also have black smoke and/or unburned fuel at the exhaust. | Carbon deposits on the piston or in the muffler. | Consult with an authorized servicing dealer. |
| | Clogged air cleaner element. | Clean or replace the air filter. |
| | Loose or damaged spark plug. | Tighten or replace the plug with a NGK BMR6A. Re-start. |
| | Air leakage or clogged fuel line. | Repair or replace fuel filter and/or fuel line. |
| | Water in the fuel. | Refill with fresh fuel/oil mixture. |
| | Piston seizure. | Consult with an authorized servicing dealer. |
| Faulty carburetor and/or diaphragm. | Consult with an authorized servicing dealer. | |
| Engine is knocking. | Overheating condition. | See above. |
| | Improper fuel. | Check fuel octane rating; check for presence of alcohol in the fuel. Refuel as necessary. |
| | Carbon deposits in the combustion chamber. | Consult with an authorized servicing dealer. |

Troubleshooting Guide (Continued)

Additional Problems

| Symptom | Possible Cause | Remedy |
|---|---|---|
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Poor acceleration.</div> | Clogged air filter. | Clean or replace the air filter. |
| | Clogged fuel filter. | Replace the fuel filter. |
| | Lean fuel/air mixture. | Consult with an authorized servicing dealer. |
| | Idle speed set too low. | Adjust: 2,750 (± 250) min^{-1} |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Engine stops abruptly.</div> | Switch turned off. | Reset the switch and re-start. |
| | Fuel tank empty. | Refuel. See page 12. |
| | Clogged fuel filter. | Replace fuel filter. |
| | Water in the fuel. | Drain; replace with clean fuel. See page 12. |
| | Shorted spark plug or loose terminal. | Clean or replace spark plug with a NGK BMR6A. Tighten the terminal. |
| | Ignition failure. | Replace the ignition unit. |
| | Piston seizure. | Consult with an authorized servicing dealer. |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Engine difficult to shut off.</div> | Ground (stop) wire is disconnected, or switch is defective. | Test and replace as required. |
| | Overheating due to incorrect spark plug. | Replace spark plug with a NGK BMR6A. |
| | Overheated engine. | Idle engine until cool. |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Cutting attachment moves at engine idle.</div> | Engine idle too high. | Set idle: 2,750 (± 250) min^{-1} |
| | Broken clutch spring or worn clutch spring boss. | Replace spring/shoes as required, check idle speed. |
| | Loose attachment holder. | Inspect and re-tighten holders securely. |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Excessive vibration</div> | Warped or damaged attachment. | Inspect and replace attachment as required. |
| | Loose gearcase. | Tighten gearcase securely. |
| | Bent main shaft/worn or damaged bushings. | Inspect and replace as necessary. |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Attachment will not rotate</div> | Shaft not installed in powerhead or gearcase. | Inspect and reinstall as required. |
| | Broken shaft. | Consult with an authorized servicing dealer. |
| | Damaged gearcase. | Consult with an authorized servicing dealer. |

DECLARATION OF CONFORMITY

We hereby declare the Shindaiwa Engine Brushcutter,
Model R230 (T230/EC1, C230/EC1),

meets the following respective requirements.

Council Directives:

89/336/EEC as amended
98/37/EC as amended
2000/14/EC as amended
2004/26/EC as amended

Standard taken:

EN 292 parts 1&2
ISO 11806
CISPR 12

Measured sound power level: 110dB(A)

Guaranteed sound power level: 111dB(A)

Technical documentation is kept by:

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Engineering Research and Development DIV.

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13 December, 2004



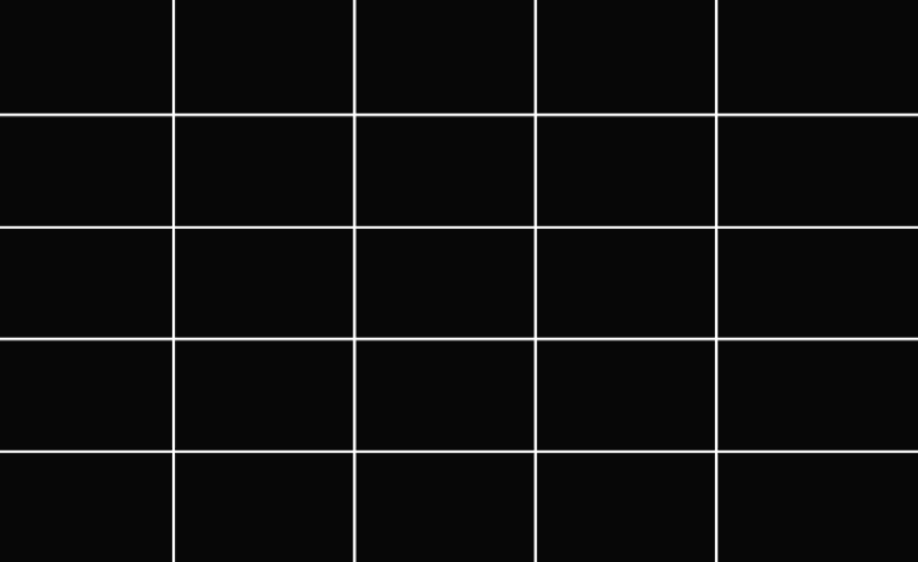
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