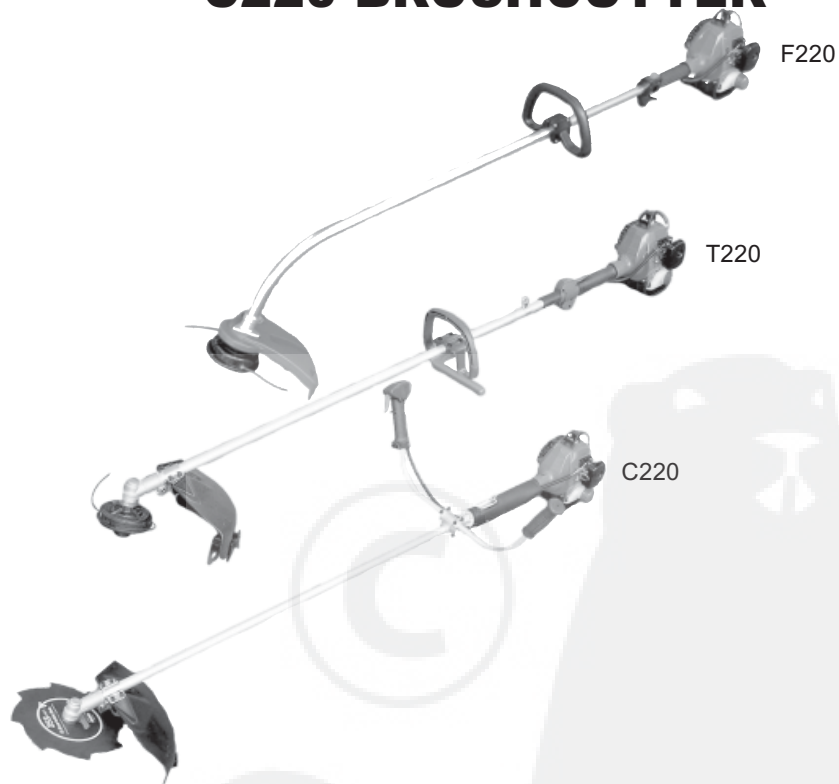




SHINDAIWA OWNER'S/OPERATOR'S MANUAL
F220 GRASS TRIMMER
T220 GRASS TRIMMER
C220 BRUSHCUTTER



WARNING! Read this manual and familiarize yourself with its contents.



This machine is designed for cutting grass, weed, and bushes. Do not use this machine for other purposes.

Minimize the risk of injury to yourself and others.

Do not operate or service this machine unless you clearly understand this manual.

Keep this manual at a particular place so that you can reread it whenever you have a question about its use.


shindaiwa

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1 Attention Statements

Throughout this manual are special “attention statements” surrounded by boxes and preceded by the triangular Attention Symbol.



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.

2 Warning Labels

Warning labels affixed to the machine are as follows:

READ AND FOLLOW THE OPERATOR’S MANUAL. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY.

WEAR HEAD, EYE AND HEARING PROTECTION DURING THE OPERATION OF THIS MACHINE.

WEAR NONSLIP GLOVES, LONG TROUSERS AND NONSKID BOOTS DURING THE OPERATION OF THIS MACHINE.

MAKE SURE NO ONE IS WITHIN 15 METERS (50 FEET) OF AN OPERATING ATTACHMENT.

BEWARE OF THROWN OBJECTS.

THE MAXIMUM SPEED OF THE CUTTING ATTACHMENT SHAFT IN min^{-1} .

SOUND POWER LEVEL (MEASURED IN ACCORDANCE WITH 2000/14/EC)

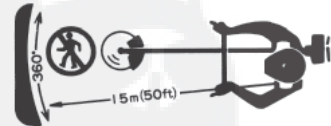
DO NOT USE METAL BLADES (F220 ONLY)

IMPORTANT!

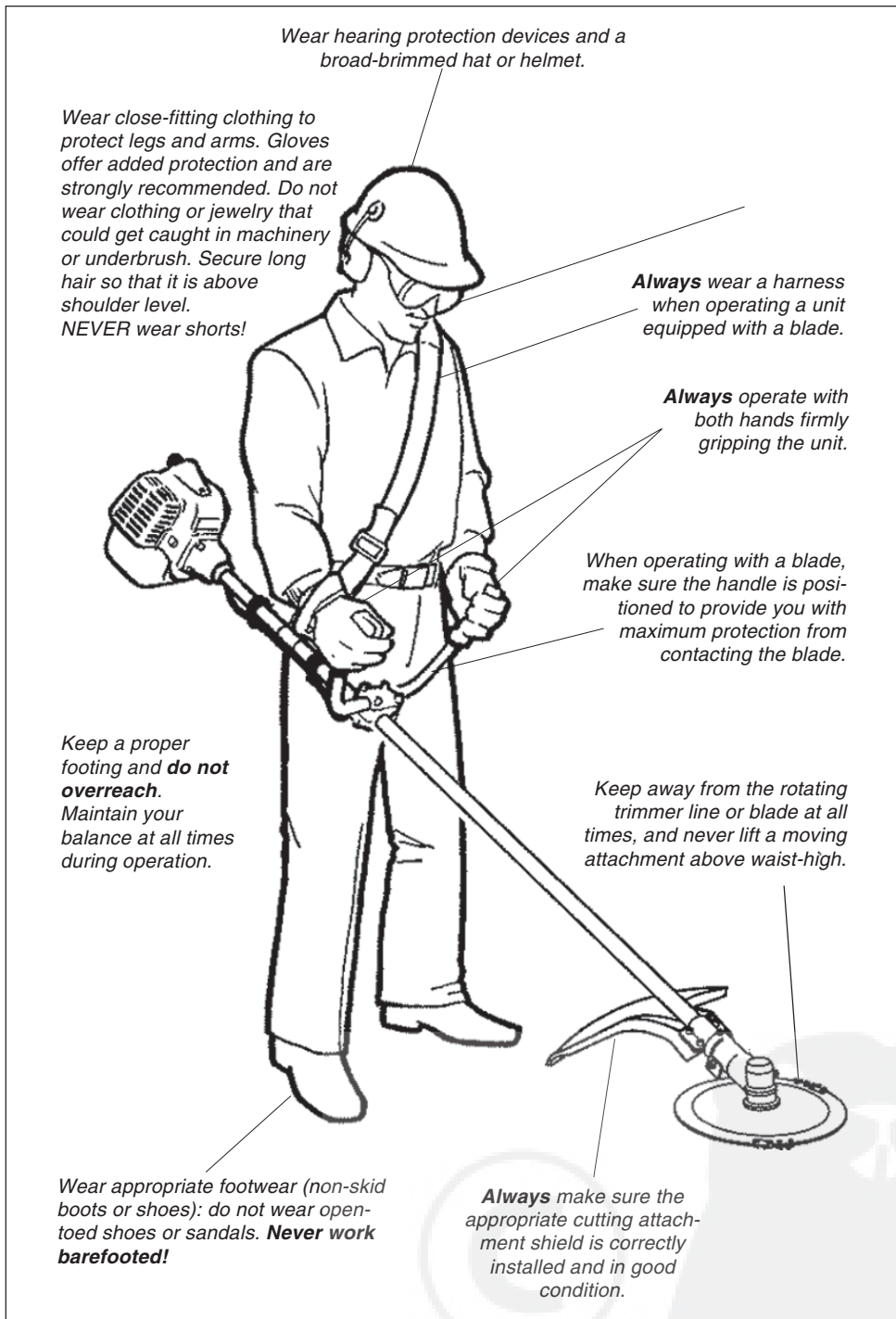
A statement preceded by the word “IMPORTANT” is one that possesses special significance.

NOTE:

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



2-1 The Properly Equipped Operator



WARNING!

Use Good Judgment

ALWAYS wear eye protection to shield against thrown objects.

NEVER run the engine when transporting the machine.

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

ALWAYS clear your work area of trash or hidden debris that could be thrown back at you or toward a bystander.

ALWAYS use the proper cutting tool for the job.

ALWAYS stop the machine 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 machine 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.

2-3 Working Environment Warning

2-2 General Safety Instructions

Work Safely

Trimmers and brushcutters run 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 your machine.



WARNING!

Never make unauthorized attachment installations.

Stay Alert

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



WARNING!

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



WARNING!

Minimize the Risk of Fire
NEVER smoke or light fires near the trimmer or brushcutter. **ALWAYS** stop the engine and let it cool before refueling. Avoid overfilling and wipe off any fuel that may have spilled. **ALWAYS** move the unit to a place well away from a fuel storage area or other readily flammable materials before starting the engine. **NEVER** place flammable material close to the engine muffler.

Avoid long-term operation in very hot or very cold weather.

Make sure bystanders or observers outside the 15 meters "danger zone" wear eye protection.



Reduce the risk of bystanders being struck by flying debris. Make sure no one is within 15 meters—that's about 16 paces—of an operating attachment.

Be extremely careful of slippery terrain, especially during rainy weather.

Always make sure the appropriate cutting attachment shield is correctly installed.

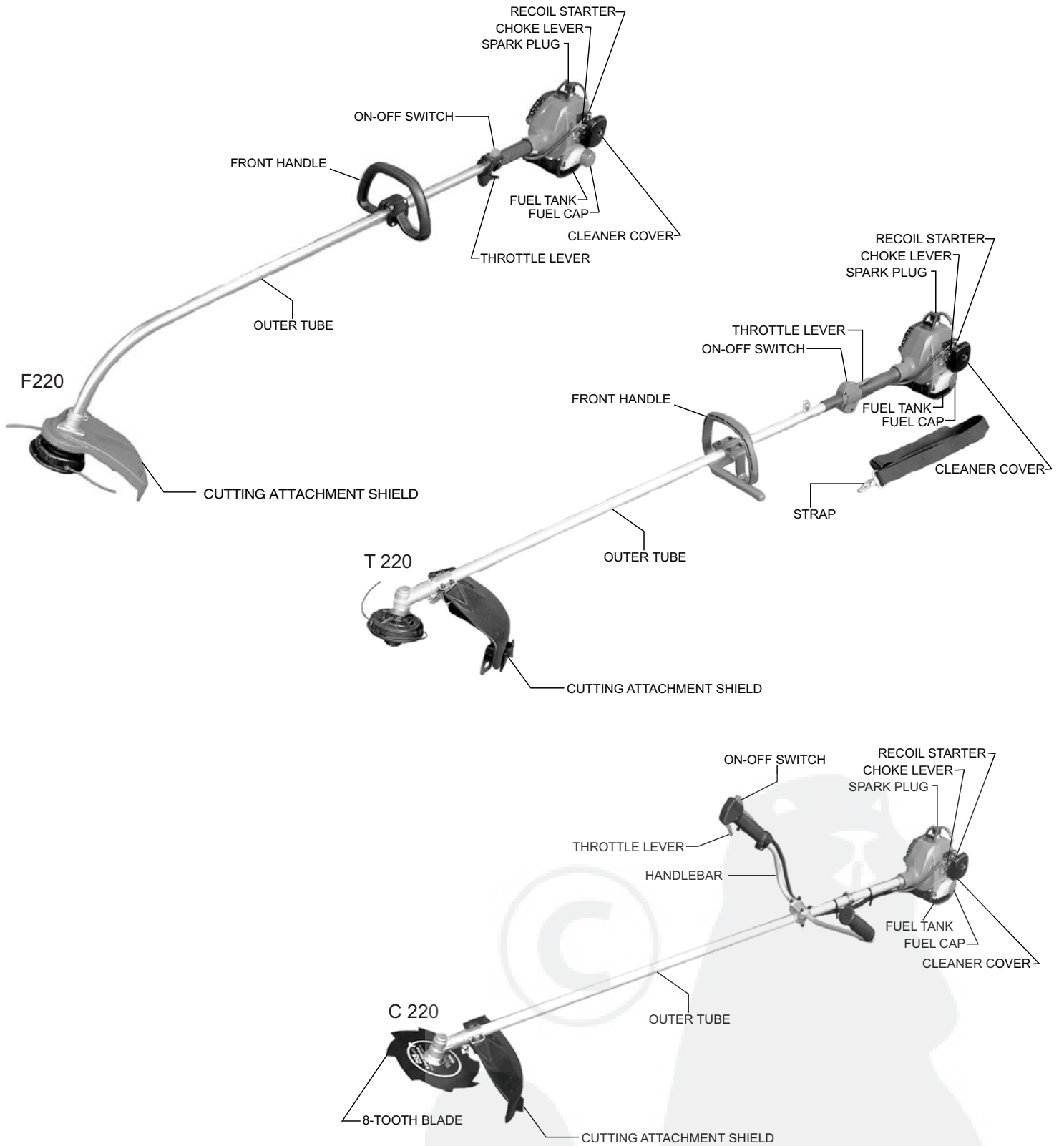
Beware of a coasting blade when brushcutting. A coasting blade can injure while it continues to spin after the throttle trigger is released or after the engine is stopped.

If contact is made with a hard object, stop the engine and inspect the cutting attachment for damage.

When operating in rocky terrain or near electric wires or fences, use extreme caution to avoid contacting such items with the cutting attachment.

Be constantly alert for objects and debris that could be thrown either from the rotating cutting attachment or bounced from a hard surface.

3 Product Description



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



WARNING!

The engine exhaust from this product contains chemicals which may cause cancer, birth defects, or other reproductive harm.



WARNING!

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

4 Technical Specifications

Model Name	F220/EC1	T220/EC1	C220/EC1
Engine Model		S220EC	
Engine Type	2-cycle, vertical cylinder, air cooled		
Dry Weight	4.3kg	4.4kg	4.7kg
Bore x Stroke	31mm x 28mm		
Displacement	21.1 cm ³		
Engine Speed at Maximum Power Output	7,500 rpm (min ⁻¹)		
Maximum Power Output	0.65 kW		
Engine Speed at Idling	2,900 rpm (min ⁻¹)		
Maximum Engine Speed	9,750 (min ⁻¹)	10,000 (min ⁻¹)	10,000 (min ⁻¹)
Fuel/Oil Ratio	50:1		
Fuel Tank Capacity	430 cm ³		
Carburetor	Walbro WYL, Diaphragm		
Ignition System	Fully Electronic, transistor controlled		
Spark Plug	NGK BMR6A		
Air Cleaner	Foam Element		
Starting Method	Recoil Starter		
Stopping Method	Slide Switch		
Handle	Loop Type	Loop Type	Bicycle Type
Dimensions (LxWxH=mm)	1,555x255x435	1,690x365x335	1,715x605x450
Sound Pressure Level * (average data between at Idling and at Racing) note.1 .	N/A	91 dB (A)	90dB (A)
Sound Power Level * (average data between at Idling and at Racing) note.1	N/A	102 dB (A)	102 dB (A)
Vibration Level *, note.1	N/A	2.8/2.0m/s ²	1.6/2.0m/s ²
Vibration Level *, note.1	N/A	6.1/7.3m/s ²	2.4/1.8m/s ²
Sound Pressure Level * (average data between at Idling and at WOT) note.2 ...	95dB (A)	95dB (A)	95dB (A)
Sound Power Level * (average data between at Idling and at WOT) note.2	105dB (A)	106dB (A)	106dB (A)
Vibration Level *, note.2	2.6/2.1m/s ²	3.2/1.7m/s ²	1.4/2.2m/s ²
Vibration Level *, note 2	11.9/10.6m/s ²	6.7/5.1m/s ²	4.2/4.6m/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

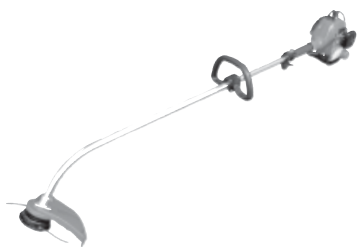
5 Assembly Procedure

5-1 Prior to Assembly

Before assembling, make sure you have all the components required for a complete unit. This machine consists of the following components and accessories. Carefully inspect all components for damage. If you find any damaged or missing items, ask your Shindaiwa dealer for support.

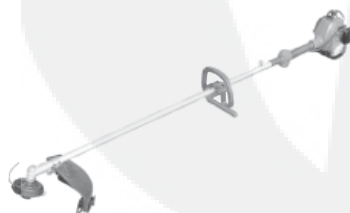
(F220)

- Engine Assembly (Powerhead)
- Outer Tube Assembly
- Debris Shield
- Front Handle (Loop Type)
- Tool Set



(T220)

- Engine Assembly (Powerhead)
- Outer Tube Assembly
- Debris Shield
- Front Handle (Loop Type / Barrier Bar)
- Tool Set
- Shoulder Strap



(C220)

- Engine Assembly (Powerhead)
- Outer Tube Assembly
- Debris Shield
- Front Handle (Bicycle Type)
- Tool Set
- Shoulder Strap

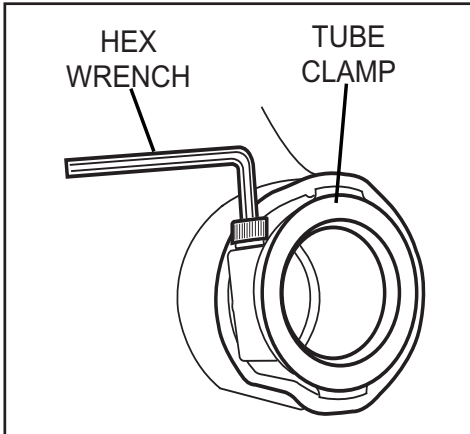


IMPORTANT!

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 of this product.

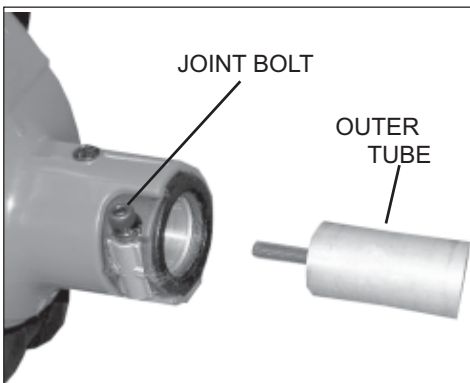
5-2 Before Assembling the Outer Tube

- (1) Using the hex wrench, Loosen the joint bolt.



5-3 Assembly of the Outer Tube

- (1). Slip the outer tube into the joint until the tube bottoms. The outer tube or gear case shaft may have to be rotated slightly for the splines on the main shaft to fully engage to the engine.
- (2). Tighten the joint bolt securely using the hex wrench.



5-4 Assembly of the Handle

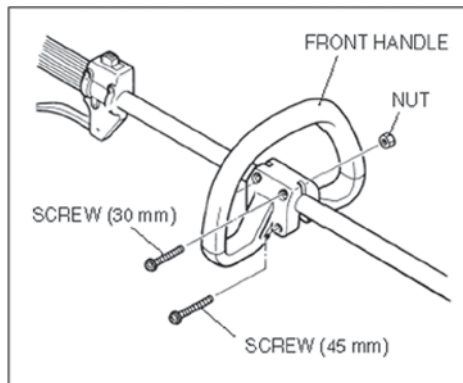


WARNING!

NEVER operate this machine without the front handle. Operating without the front handle may result in serious injury.

(A) F220

- (1) Position the front handle on the outer pipe where the "Handle Label" is placed.
- (2) Press the handle on the outer pipe gently so that the handle stays as shown.
- (3) Tighten two 30mm screws on upper and two 45mm screws on lower on the handle with nuts.



NOTE:

The screws and nuts are packed in the tool bag.

(B) T220

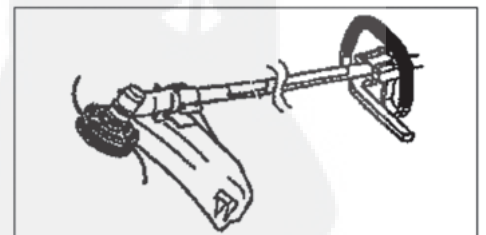
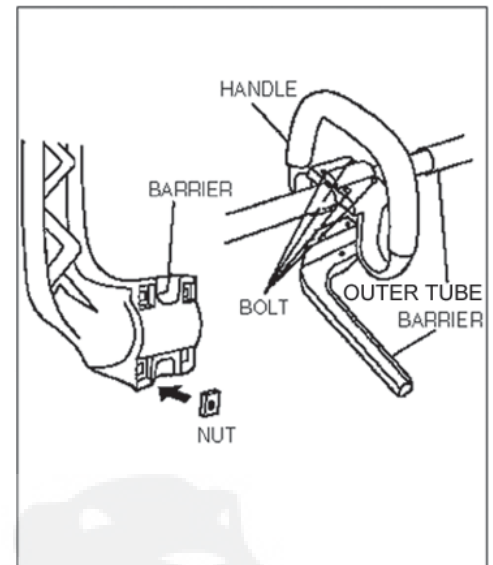
- (1) Put 4 square nuts in the frame of barrier.
- (2) Fit the handle and barrier over the outer tube and tighten four bolts.

NOTE:

Tighten four bolts in diagonal fashion for protection of the handle.

NOTE:

Adjust the handle to the best position for operator comfort.



5-5 Throttle Cable Adjustment

(C) C220

(1) Position the handle over the handle lable on the outer tube. Make sure the throttle lever is on the right-hand side of the outer tube.

(2) Attach the handle mounting bracket using the two socket-head cap screws, washers, and lock washers. At this time, ONLY finger tighten the screws.

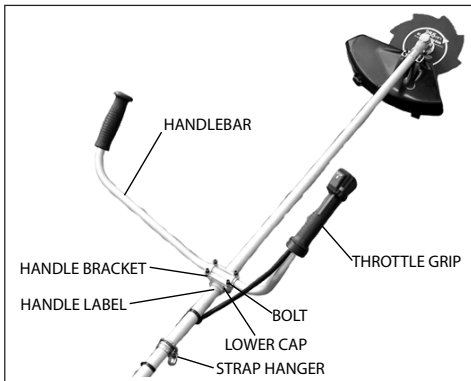
(3) Locate the handle about 5 inches ahead of the shoulder strap hanger or at the best position for operator comfort.

IMPORTANT!

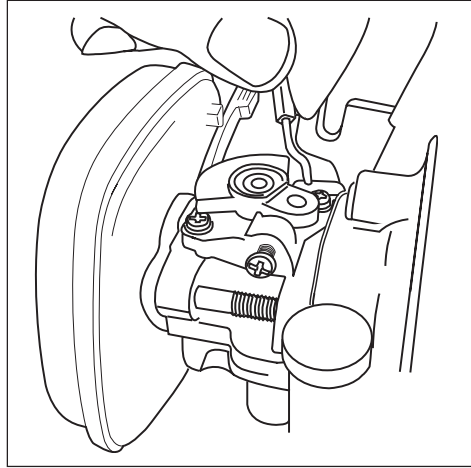
Regardless of handlebar location, the aluminum collar must remain in position between the handlebar and the outer tube. If the collar is omitted or is improperly installed, the handlebar bracket can not be properly secured.

(4) Using the hex wrench, securely tighten the two handlebar cap screws.

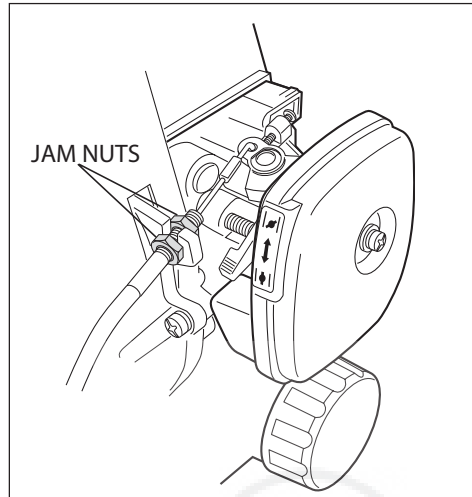
(5) Route the ribbed throttle cable tube along the handlebar and outer tube. Install the protector sleeve on the outer tube.



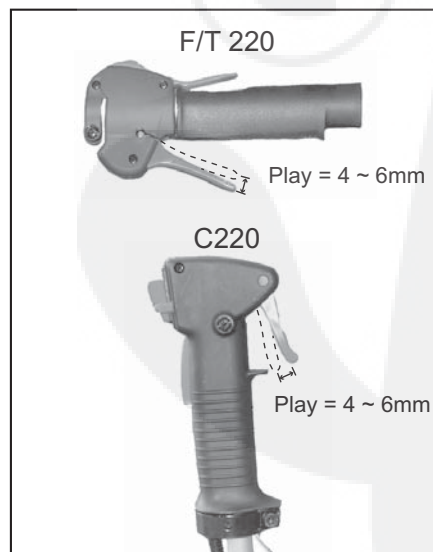
(1) Hook the end of the throttle cable to the carburetor.



(2) Place the throttle cable in the fan cover slot and tighten (finger tight only) the nuts so that the nuts are on either side of the slot.

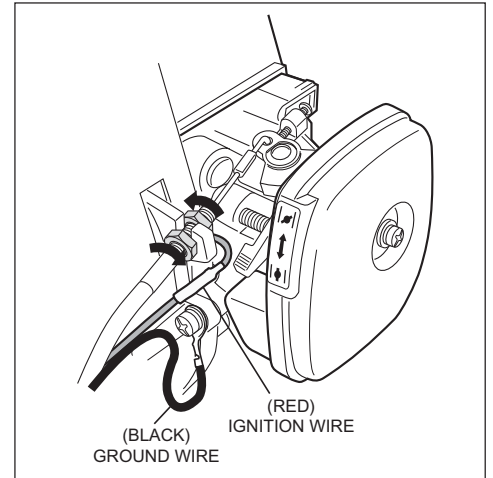


(3) Adjust the nuts so that the free play of trigger lever becomes 4~6mm and then tighten the nuts securely.



(4) Fix the earth wire (black) to the fan cover using the bolt below the fan cover platform which holds the throttle cable.

(5) Connect the switch and wire to the red wire from the engine.



5-6 Cutting Attachment Shield Assembly



WARNING!

NEVER operate this machine without the cutting attachment shield. Operating without the cutting attachment shield may result in serious injury.



WARNING!

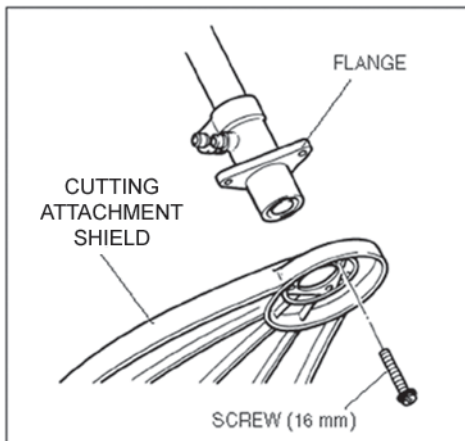
Carefully inspect the cutting attachment shield assembly to make sure it is tightened securely and does not wobble.

(A) F220

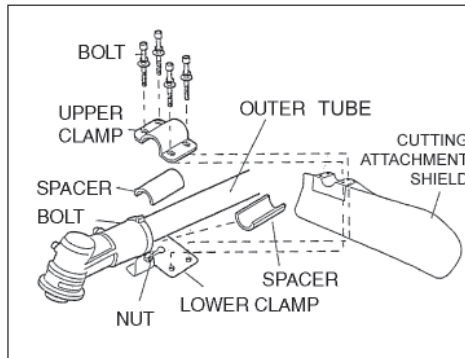
- Place the cutting attachment shield under the triangular flange.
- Tighten 3 screws (16 mm).

NOTE:

The 3 screws (16 mm) are in the tool bag.



(B) T220/C220



Cutting Attachment Shield

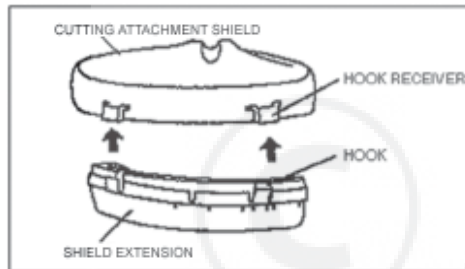
- Insert the cutting attachment shield between the outer tube and the lower clamp. Loosen the nut and bolt which are tightening the lower clamp if the cutting attachment shield does not fit with the lower clamp.
- Fit the two spacers and the upper clamp over the outer tube and tighten with four bolts.

NOTE:

Tighten four bolts in diagonal fashion.

- Securely tighten the nut and bolt that secure the lower clamp.

Shield Extension



- Attach the shield extension in the cutting attachment shield. Shield extension is required when using a trimmer head.

NOTE:

Make sure the shield extension is completely hooked at the hook receiver.

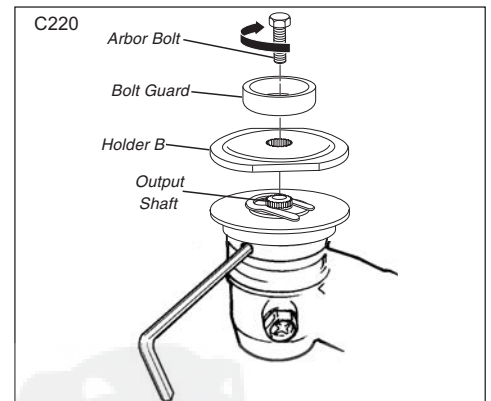
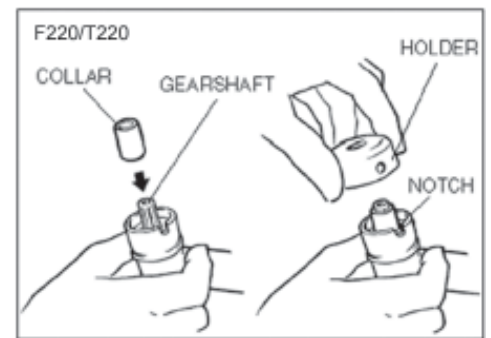
5-7 Installing a Trimmer Head

- Make sure the switch is turned off and the engine is stopped.
- Turn the unit over so the shaft from the gearcase faces up.

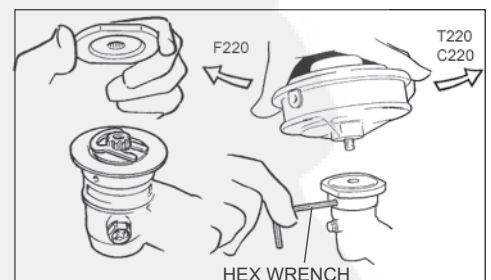
- Install the collar to the gear-shaft and place the holder onto the gear-shaft.

NOTE:

The collar and the holder are in the tool bag.



- Rotate the holder until the hole in the holder aligns with the notch on the gearcase flange. Using the hex wrench, lock the gearcase as shown.



- While holding the holder with the hex wrench, thread the trimmer head onto the gear-shaft and install securely using hand pressure.

(A) F220

Turn clockwise to install.

(B) T220/C220

Turn counter clockwise to install.

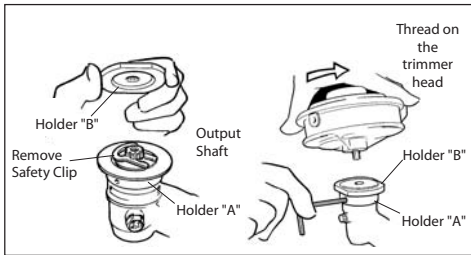
- Remove the hex wrench.

C220 Installing a Trimmer Head

- (1) Turn the brushcutter over so that the gearcase output shaft faces UP.
- (2) Remove the safety clip and slide holder B onto the output shaft.
- (3) Rotate the tool holder and shaft until the notch 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.
- (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 gear-shaft.
- (6) Remove the hex wrench.

IMPORTANT!

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



5-8 Mounting a Blade (T220/C220)



WARNING!

Never operate the F220 with a saw blade. This may result in serious injury.

NOTE:

Consult with your Shindaiwa dealer for necessary items for blade-use. (T220)

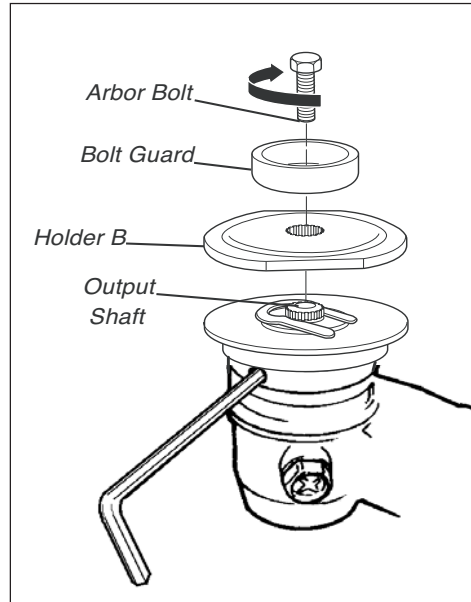
NOTE:

The collar and the holder for trimmer head use, are not to be used. (T220)

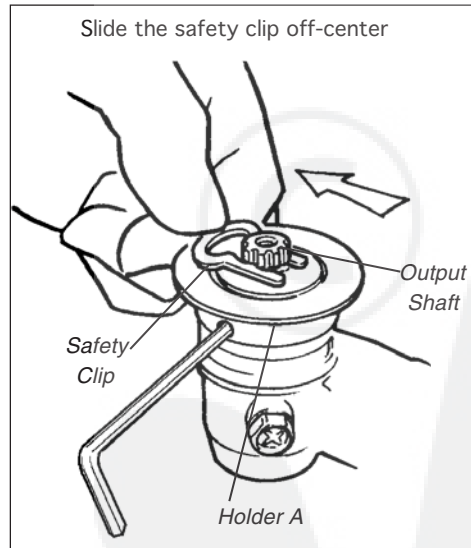
- (1) Make sure the switch is off and the engine is stopped.
- (2) Wear gloves to protect your hands.

C220/T220 Cutting Attachment Installation and Assembly

- (1) Turn the brushcutter upside down so the gearcase output shaft is facing UP. Align the hole in blade holder "A" with the matching hole in the gearcase flange and temporarily lock the output shaft by inserting a hex wrench through both holes.
- (2) Using the spark plug wrench, remove the arbor bolt, bolt guard and holder B from the gearcase shaft.



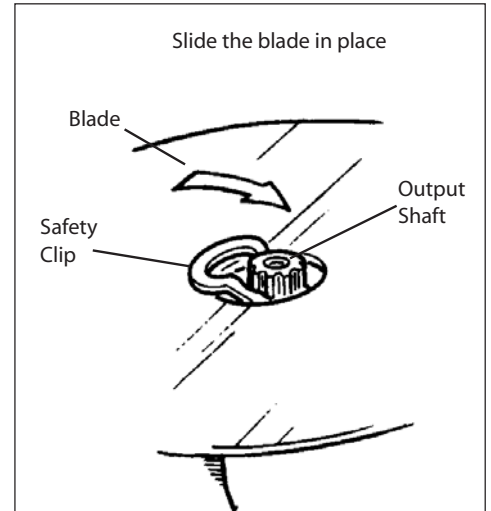
- (3) Next, slide the safety clip off-center.



IMPORTANT!

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

- (4) Fit the blade over the safety clip and then center it over the flange on holder "A".



WARNING!

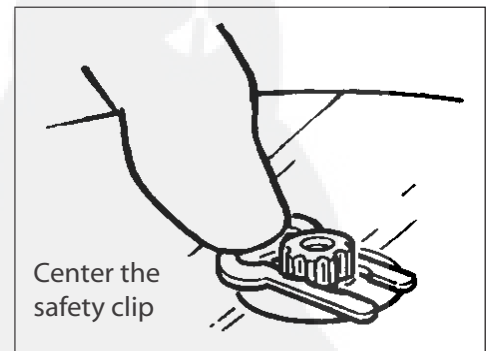
The blade must fit flat against the holder flange. The blade mounting hole must be centered over the raised boss on blade holder A.



WARNING!

Never operate the brushcutter without the safety clip in place!

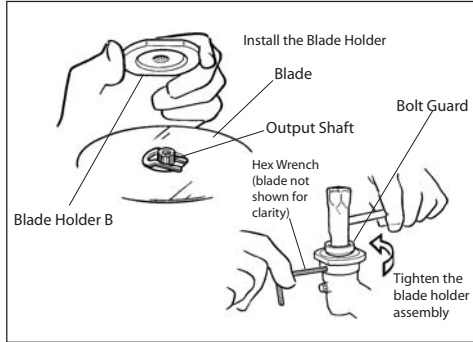
- (5) Lock the blade in place by centering the safety clip on the output shaft.



(6) 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.

(7) Install the bolt guard and then the blade retaining bolt. Using the spark plug wrench, tighten the bolt firmly in a counter-clockwise direction.

(8) Remove the hex wrench.



6 Starting/Stopping Adjusting the Engine

6-1 Filling the Fuel Tank



WARNING!

When adding fuel, make sure the engine is stopped and cooled-down. Filling or mixing fuel and oil must be done away from any fires or other ignition sources. When any fuel leakage is found, take the machine to a Shindaiwa dealer for repair. Never use the machine with fuel leaking. This may result in serious injury.

CAUTION!

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

(1) Turn the fuel cap counterclockwise and take it off.

(2) With the fuel cap hanging down from the filler opening, fill the fuel tank with fresh, clean fuel (mixture of fuel and oil) and tighten the fuel cap securely.

(3) If there is any fuel spilt on the machine, make sure it is wiped off completely.

6-2 Starting the Engine



WARNING!

MAKE SURE THE BLADE IS WELL CLEAR OF ANY INTERFERENCE. Before starting the engine, place unit on clean, level surface. Make sure you have good secure footing and always keep a firm grip on the machine. THE CUTTING ATTACHMENT MAY ROTATE WHEN THE ENGINE STARTS.



WARNING!

Move at least three meters away from the fuel site before starting the engine.

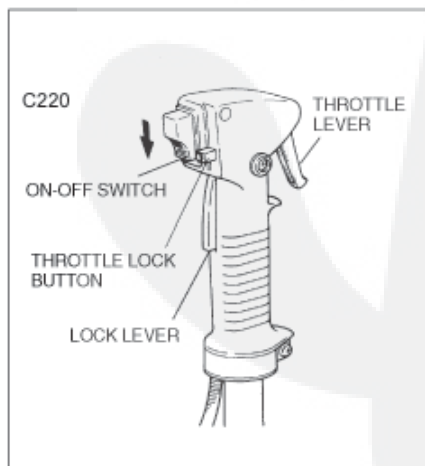
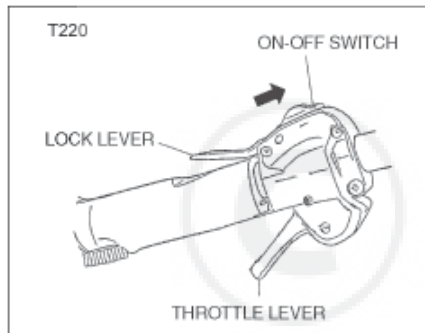
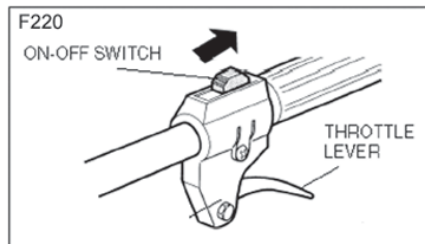


WARNING!

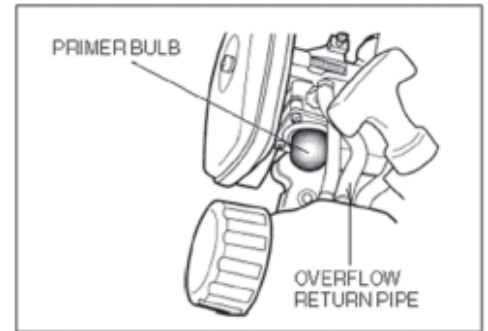
Never operate the engine without the cutting attachment installed.

(1) Starting a Cold Engine and/or Restarting After Refueling.

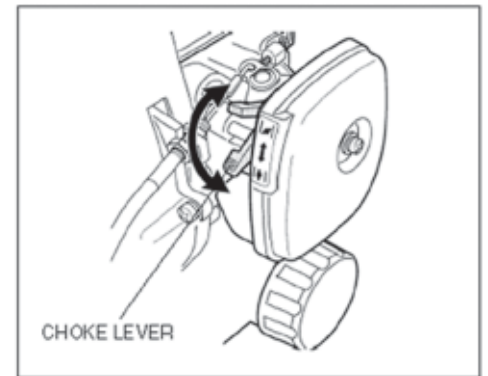
(a) Slide the ON-OFF switch to the “I” position.



(b) Prime the engine by repeatedly depressing the carburetor primer bulb until fuel can be seen flowing through the transparent overflow return tube:



(c) Push the choke lever upward (“I” position).

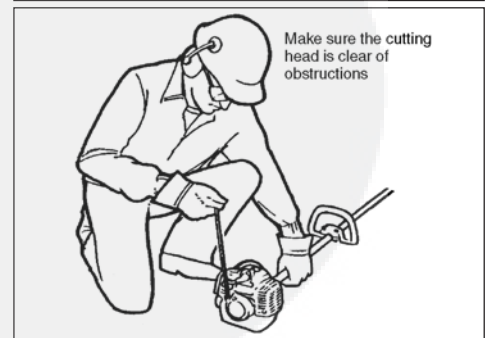


(d) (C220) Depressing the lock lever, pull the throttle lever fully and depress the throttle lock button. While depressing the throttle lock button, release the throttle lever and the lock lever. Now the throttle stays at high idle (starting speed).


(e) While firmly holding the outer tube with one hand, pull the coil starter handle upward with your other hand. Pull slowly at first until you feel the starter engage, then pull quickly to start the engine. Do not pull the starter rope to the end of its travel.


CAUTION!

Pulling the starter rope to the end of its travel may damage the starter mechanism.



IMPORTANT!

Repeated cranking of the engine with the choke CLOSED (“”) will lead to engine flooding. If the engine fails to start after several attempts, move the choke lever to the OPEN position and continue cranking.

(f) When the engine first fires, gradually return the choke to OPEN (“”) position if you have not already done so.

- If the engine stops before the choke is fully open, restart with the choke closed.
- If the engine stops after the initial firing, restart with choke closed.

(g) [C220] When the engine starts and is running, set the engine to idle by tapping the throttle lever to release the throttle lock.



WARNING!

Never start the engine from the operating position.

(2) Starting a Warm Engine

Starting a warm engine involves all of the steps of starting a cold engine. EXCEPT:

- Do not press the primer bulb, and
- The choke should be in the OPEN position.

If the engine does not start, follow the cold engine starting procedure.

(3) When the engine starts:

- After the engine starts, disengage the throttle lock and allow the engine to warm-up at idle for 2 or 3 minutes before operating the machine.
- After the engine is warm, pick-up the machine and clip on the strap.
- Advancing the throttle allows the cutting attachment to rotate faster; releasing the throttle allows the attachment to stop. If the cutting attachment continues to rotate, carburetor idle speed should be adjusted.

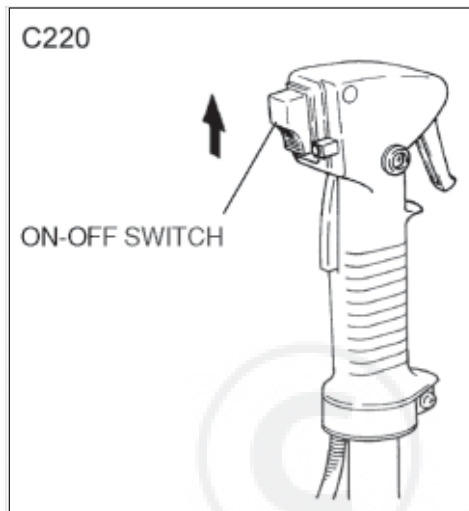
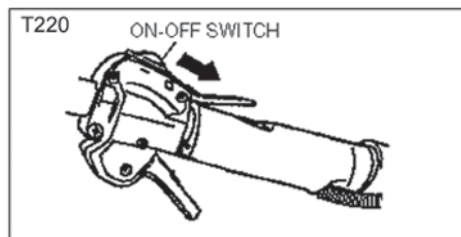
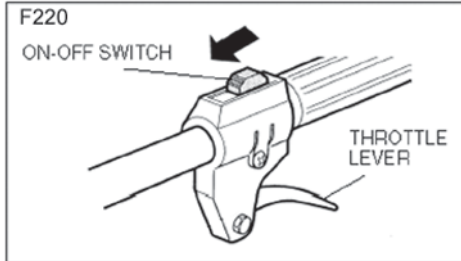
6-3 Stopping the Engine

Idle the engine briefly before stopping, then slide the ON-OFF switch to the “O” (for STOP) position.



WARNING!

The cutting attachment continues rotating for a while after the switch is turned off.



6-4 Engine Idle Adjustment

Start the engine and allow it to warm up at low rpm. If the cutting attachment rotates at engine idle, reduce idle adjust screw counter-clockwise.



WARNING!

The cutting attachment should NEVER rotate at engine idle.

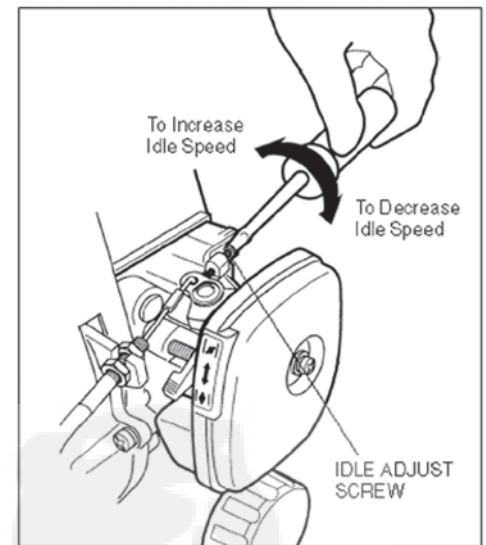
NOTE:

Standard idle speed is 2,900(min⁻¹)RPM.



WARNING!

When adjusting the engine, the cutting attachment may rotate. Make sure the cutting attachment is well clear of any interference.



7 Unit Condition Check

NEVER operate the unit with the cutting attachment shield or other protection devices (strap, blade retention clip, etc.) removed.



WARNING!

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



WARNING!

NEVER use any cutting attachments which are not recommended in this manual. Using non-recommended cutting attachment may result in serious injury.



WARNING!

When using a trimmer head, make sure each of the line lengths are no longer than 15 cm. Using a trimmer head with lines longer than 15 cm may damage the machine.

Use only authorized Shindaiwa parts and accessories with this machine. Do not make modifications to the machine without the written approval of Shindaiwa.

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

NEVER use a cracked or warped cutting attachment: replace it with a serviceable one.

ALWAYS make sure the cutting attachment fits properly into the appropriate cutter holder. If a properly installed attachment vibrates, replace the attachment with new one and recheck.

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

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

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

8 Operation

8-1 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 trimmer or 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 attachment.

8-2 Standard Shoulder Strap

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



Optional

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.

IMPORTANT!

When operating a brushcutter, make sure both the handle and harness are adjusted to the size of the operator using the machine.



WARNING!

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

NOTE:

Although a shoulder strap accessory is not required for use with a grass trimmer, a shoulder strap can increase operator comfort during extended periods of operation.

NOTE:

Using a shoulder strap when operating this unit with a blade allows you to maintain proper control of the unit and reduces fatigue during extended operation.

8-3 Units Equipped with Trimmer Heads

Your Shindaiwa F220/T220/C220 grass trimmer is equipped with a semiautomatic nylon trimmer head.

Engine Operating Speeds

Operate the unit at full throttle while cutting grass.

CAUTION!

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

CAUTION!

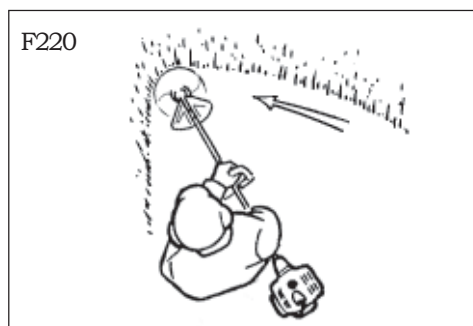
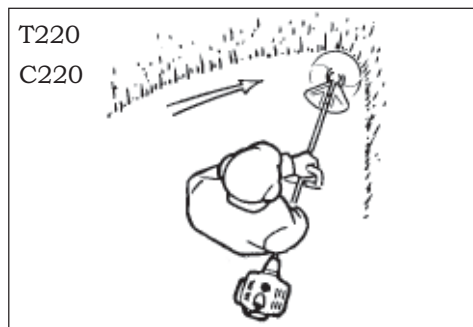
Operation of trimmer without a cutting attachment shield and using excessive line length can lead to premature clutch failure.

CAUTION!

Operation at low rpm can lead to premature clutch failure.

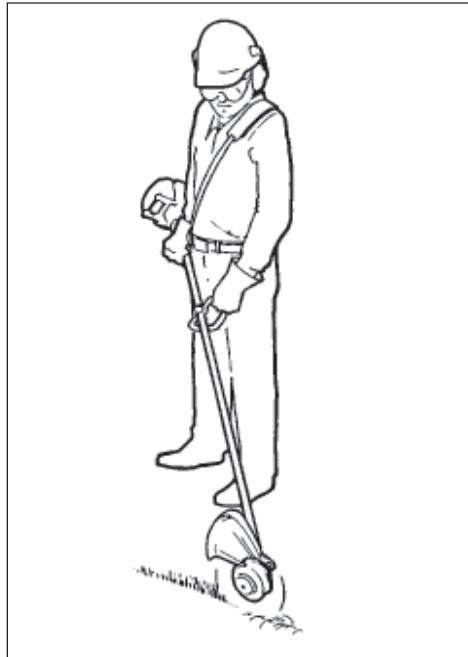
Trimming and Mowing Grass

Hold the grass trimmer as shown in the illustrations. The trimmer head should be angled slightly into the area to be cut. To ensure maximum trimmer-line service life, cut only with the tip of the trimmer line. Sweep the trimmer head left to right (T220-C220), and right to left (F220) to trim the grass. During cutting operations, the trimmer head should be kept horizontal to the ground at all times.



Edging

Tilt the handle approximately 100 degrees to the right (from horizontal) and move forward while holding the trimmer vertical.



9 Blades



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 shoulder strap.
- Always make sure the cutting attachment shield is properly installed before operating this unit.

9-1 Using a Blade

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 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 OR BARRIER BAR SECURELY IN PLACE ON THE UNIT!**

Brushcutter Shoulder Strap

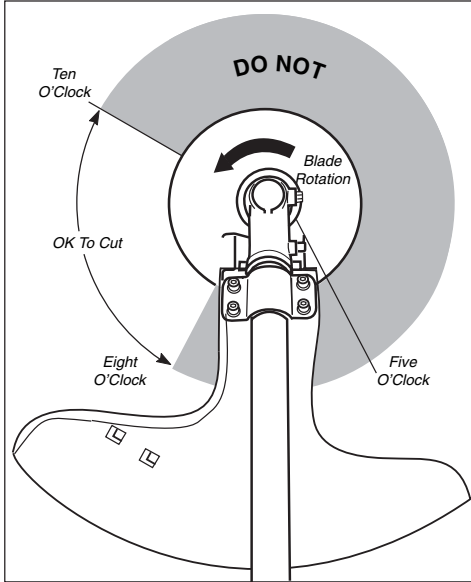
A shoulder strap provides additional protection against blade thrust. In addition, a shoulder strap gives significant support and comfort to help ensure safe and efficient operation.

When operating a unit with a blade, make sure both the handle and shoulder strap are adjusted to the size of the operator using the unit.

9-1 Using a Blade (Cont.)

The blade rotates counter-clockwise. For best performance and to minimize being stuck 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.



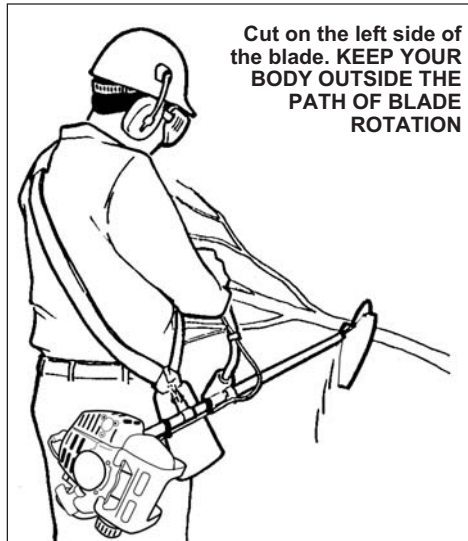
Vertical Cuts

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.



WARNING!

When cutting wood with a saw, 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 trimmers and brushcutters.

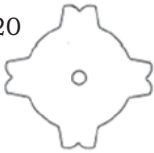
10 Recommended Cutting Attachment

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

(A) T220, C220
PART NUMBER 67000-65010
UN-34-7L
TAP & FEED TRIMMER HEAD
BOLT DIAMETER: 7mm
THREAD: LEFT, 1.0mm PITCH



PART NUMBER 60903-98320
4-TOOTH BLADE
INNER BORE: 25.4mm
DIAMETER: 255.0mm
THICKNESS: 2.0mm



PART NUMBER 60903-98310
8-TOOTH BLADE
INNER BORE: 25.4mm
DIAMETER: 255.0mm
THICKNESS: 2.0mm



(B) F220
PART NUMBER 67001-65010
TAP & FEED TRIMMER HEAD
BOLT DIAMETER: 8mm
THREAD: RIGHT, 1.25mm PITCH



11 Maintenance



WARNING!

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



WARNING!

Never repair a damaged blade by welding, straightening, or by modifying its shape. An altered blade may break during operation, resulting in serious personal injury.

11-1 Daily Maintenance

Prior to each work day, perform the following:

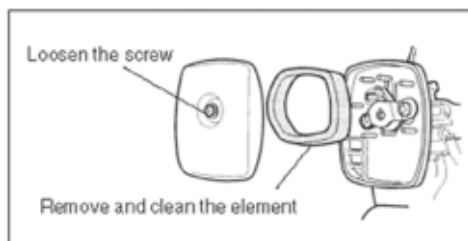
- Remove the dirt and debris from the engine, check the cooling fins and air cleaner for clogging, and clean them as necessary.
- Carefully remove any accumulations of dirt or debris from the muffler and fuel tank. Dirt buildup in these areas can lead to engine overheating, fire, or premature wear.
- Check for loose or missing screws or components. Make sure the cutting attachment is securely fastened.
- Check the machine for leaking fuel or grease.

11-2 10 Hour Maintenance

Remove the air cleaner element from the carburetor and clean it thoroughly with soap and water. Squeeze out the fuel and reassemble the element.

CAUTION!

Do not operate the machine if the air cleaner or element is damaged, or if the element is wet or water-soaked.

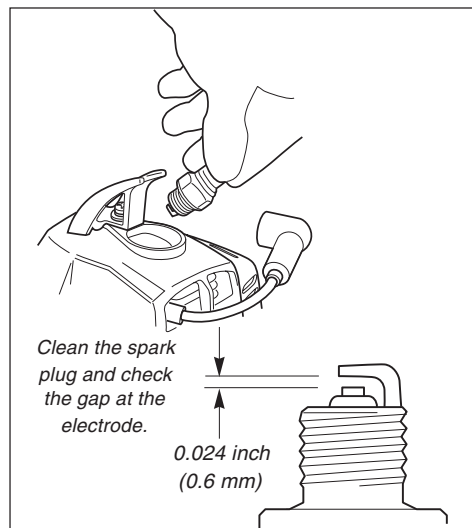


11-3 10/15 Hour Maintenance

Remove and clean the spark plug. Adjust the spark plug electrode gap to 0.6mm. 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 dust from getting into the engine's internal parts.



11-4 50 Hour Maintenance

Cleaning

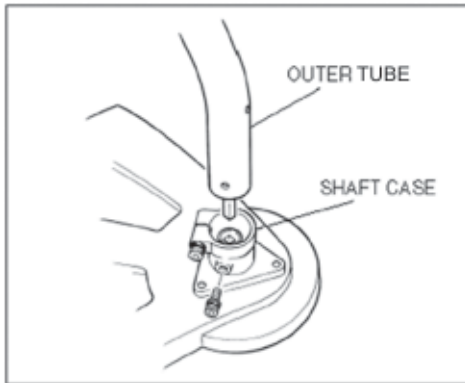
Remove and clean the cylinder cover and clean grass and dirt from the cylinder fins.

11-5 Gearcase Lubrication

F220

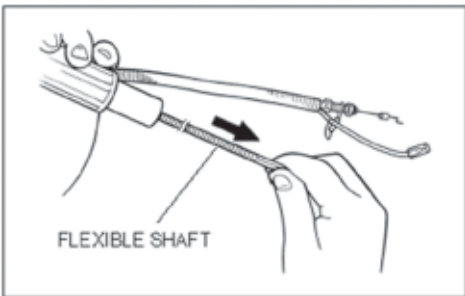
Apply new grease to the flexible shaft.

- (1) Disassemble the shaft case from the outer tube.



- (2) Disconnect the throttle wire and the other wires, and disassemble the outer pipe from the engine.

- (3) Take the flexible shaft out and apply new grease evenly on the shaft.



- (4) Reassemble.

T220/C220

1. To perform this operation, first remove the gearcase and debris shield from the outer tube as follows.

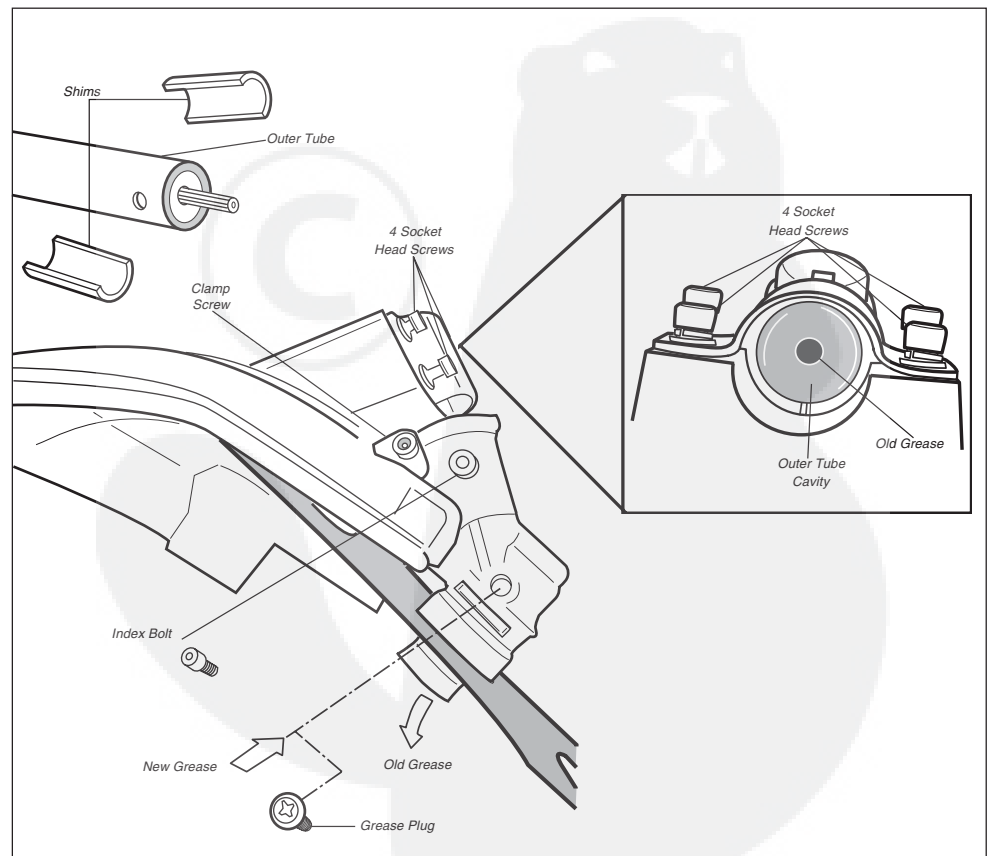
CAUTION!

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

- Remove the index bolt from the gearcase.
- Loosen the gearcase clamp screw.
- Loosen the four socket head cap screws that secure the cutting attachment shield.
- Slide the gearcase and cutting attachment shield off the tube. (Do not lose the two shims).

2. Remove the filler plug and press new grease into the gearcase until old grease is purged from the gearcase, which can be seen in the outer tube cavity.

3. Clean up the excess grease and reinstall the cutting attachment shield, two shims and the gearcase.

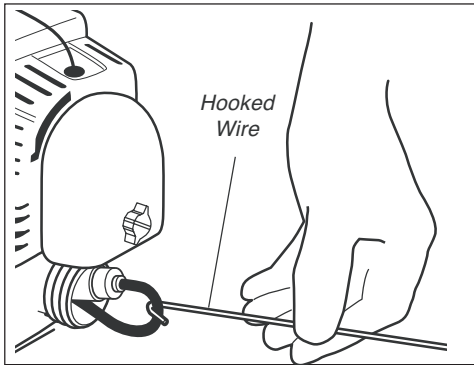


11-6 Fuel Filter Maintenance

Use a hooked wire to extract the fuel filter from inside the fuel tank. Remove and replace the filter element. Before reinstalling the filter, inspect the condition of the fuel line. If damage or deterioration are noted, the 220 unit should be removed from service until you can consult with an authorized servicing dealer.

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.

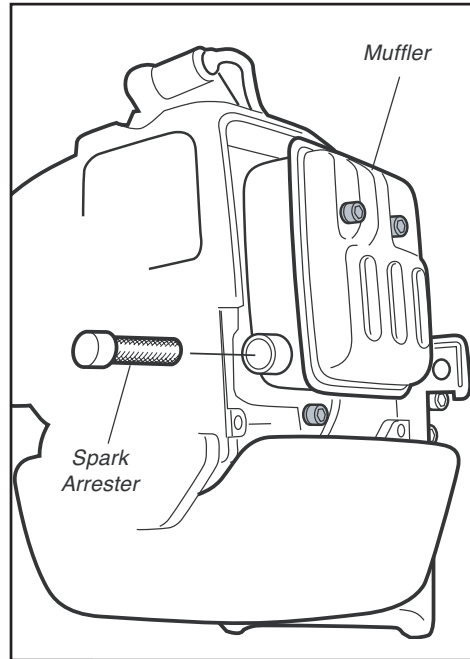


11-7 Muffler Maintenance

Hard starting or a gradual loss of performance can be caused by carbon deposits lodged in the muffler's spark arrester screen.

In such cases, performance can usually be restored by removing the spark arrester screen and giving it a thorough cleaning with a stiff bristle brush.

If carbon deposits are severe or if no performance improvement is noted, your 220 unit should be returned to your Shindaiwa dealer for inspection.



WARNING!

Never operate this unit with a damaged or missing muffler or spark arrester! Operating with missing or damaged exhaust components is a fire hazard and may also damage your hearing.

11-8 Long Term Storage

Whenever the machine 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 carburetor and the fuel tank.

IMPORTANT!

All stored fuels should be stabilized with a fuel stabilizer such as STABIL®.

CAUTION!

Gasoline stored in the carburetor for a long time will likely cause hard starting and could lead to increased service and maintenance costs.

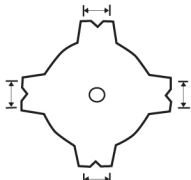
- Remove the spark plug and pour about 1/4 ounce of oil into the cylinder through the spark plug hole. Slowly pull the recoil starter 2 or 3 times so oil will evenly coat the interior of the engine. Reinstall the spark plug.
- Before storing the machine, repair or replace any worn or damaged parts.
- Remove the air cleaner element from the carburetor and clean it thoroughly with mixed fuel. Squeeze out the fuel and reassemble the element.
- Store the machine in a clean, dust free area.

12 Blade Sharpening

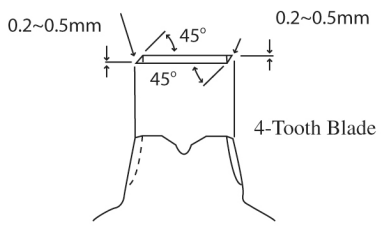
With the file or a grinder, sharpen a blade as follows:

WARNING! Sharpen only the cutting teeth of a blade. DO NOT alter the contour of the blade in any way. In order to keep the blade in balance, all cutting edges must be sharpened equally. DO NOT file the tips of the teeth too sharp.

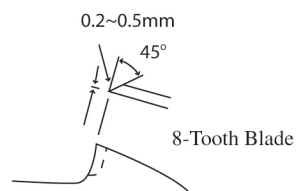
Make sure the width of the 4 sides is all the same.



The sharpening angle should be approximately 45°. Do not file the tips of the blade too sharp. Leave 0.2~0.5mm unsharpened.

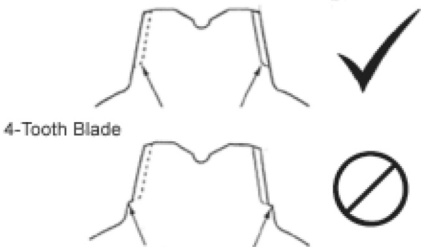


4-Tooth Blade

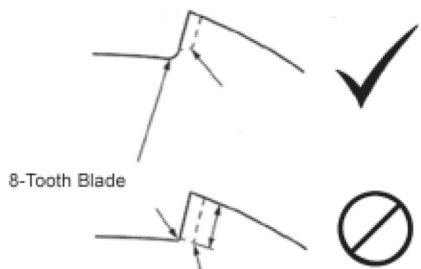


8-Tooth Blade

The bottom of each tooth must remain unsharpened. (Blade as viewed from bottom.)



4-Tooth Blade



8-Tooth Blade

13 Troubleshooting Guide

ENGINE DOES NOT START

What To Check	Possible Cause	Remedy
Does the engine crank? YES	NO Faulty recoil starter. Fluid in the crankcase. Internal damage.	Consult with an authorized servicing dealer.
Good compression? YES	NO Loose spark plug. Excess wear on cylinder, piston, rings.	Tighten and re-test. Consult with an authorized servicing dealer.
Does the tank contain fresh fuel of the proper grade? YES	NO Re-fill with fresh fuel of the correct mixture (Shindaiwa Premium 2-cycle Engine Oil and gasoline, 50:1 ratio; other brands-25:1)	Re-start.
Is fuel visible and moving in the return line when priming? YES	NO Check for clogged fuel filter and/or vent. Clean as required.	Re-start.
Is there spark at the spark plug wire terminal? YES	NO Is the ignition switch "ON"? Faulty ignition ground. Faulty transistor unit.	Move switch to "ON" and re-start. Consult with an authorized servicing dealer.
Check the spark plug	If the plug is wet, excess fuel may be in the cylinder. The plug may be fouled or improperly gapped. The plug may be damaged internally or 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 an NGK, BMR6A. Re-start.



13 Troubleshooting Guide

Low Power Output

What To Check	Possible Cause	Remedy
Is the engine overheating?	Operator is overworking the machine.	Shorten trimmer line. Cut at a slower rate.
	Carburetor mixture is too lean.	Consult with an authorized servicing dealer.
	Improper fuel ratio.	Re-fill with fresh fuel of the correct mixture (gasoline and Shindaiwa Premium 2-cycle Engine Oil (50 : 1 ratio)).
	Fan, fan cover, or cylinder fins dirty or damaged.	Clean, repair or replace as necessary.
	Carbon deposits on piston or in the muffler.	Consult with an authorized servicing dealer.
Engine is rough at all speeds. May also have black smoke and/or unburned fuel at the exhaust.	Clogged air filter.	Service the filter.
	Loose or damaged spark plug.	Tighten or replace.
	Air leakage or clogged fuel line.	Repair or replace filter and/or fuel line.
	Water in the fuel.	Replace the fuel.
	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.

13 Troubleshooting Guide

Additional Problems

Symptom	Possible Cause	Remedy
Poor acceleration.	Clogged air filter.	Clean the air filter.
	Clogged fuel filter.	Replace the fuel filter.
	Carburetor mixture too lean.	Consult with an authorized servicing dealer.
	Idle speed set too low.	Adjust: 2,900 (min ⁻¹)
Engine stops abruptly.	Switch turned off.	Reset the switch and re-start.
	Fuel tank empty.	Refuel.
	Clogged fuel strainer.	Replace strainer.
	Water in the fuel.	Drain; replace with clean fuel.
	Shorted spark plug or loose terminal.	Clean and replace spark plug, tighten the terminal.
	Ignition failure.	Consult with an authorized servicing dealer.
	Piston seizure.	Consult with an authorized servicing dealer.
Engine difficult to shut off.	Ground (stop) wire is disconnected, or switch is defective.	Test and replace as required.
	Overheating due to incorrect spark plug.	Clean and regap to 0.024" (0.6mm). Correct plug: NGK BMR6A)
	Overheated engine.	Idle engine until cool.
Cutting attachment rotates at engine idle.	Engine idle too high.	Set idle: 2,900 (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.
Excessive vibration.	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.

DECLARATION OF CONFORMITY

We hereby declare the Shindaiwa Engine Brushcutter,
Model R220 (C220/EC1, T220/EC1, F220/EC1)

meets the following respective requirements.

Council Directives:

89/336/EEC as amended
98/37/EC as amended
2000/14/EC as amended
2002/88/EC as amended

Standard taken:

EN 292 parts 1&2
ISO 11806
CISPR 12

Measured sound power level: 109dB(A)

Guaranteed sound power level: 110dB(A)

Technical documentation is kept by:

K. Maeda DIV. Manager
Engineering Research and Development DIV.

Shindaiwa Kogyo Co.,Ltd.

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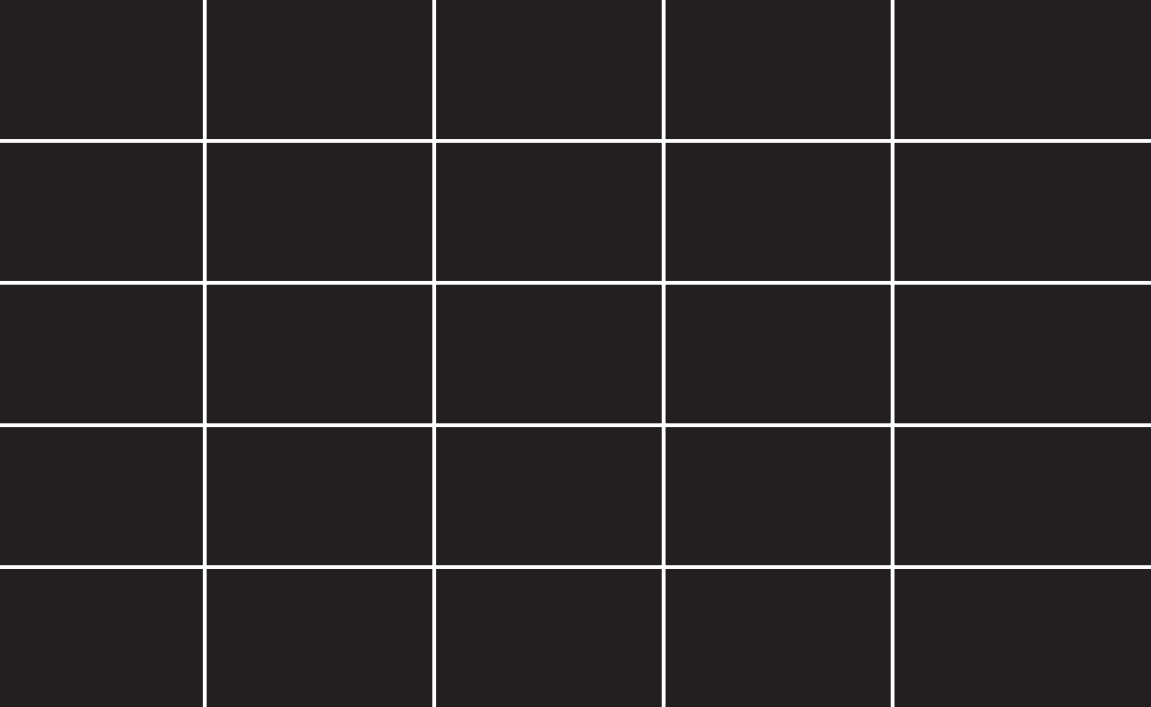
19th August, 2004



T. Yoshitomi
DIV. Manager
Quality Assurance DIV.

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