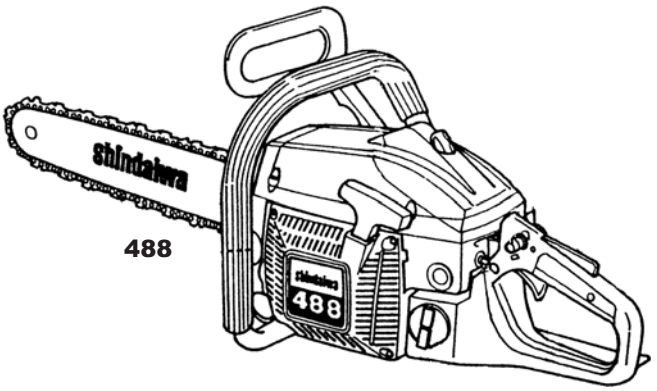
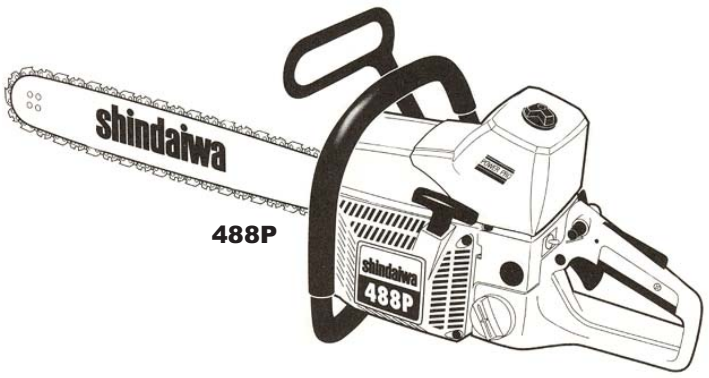
SHINDAIWA OWNER'S/ OPERATOR'S MANUAL

MODEL 488EMC, 488PEMC CHAIN SAW





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.

Part Number 69008-94310 Rev. 8/04

shindaiwa

Introductions

The Shindaiwa 488 saw was designed and built to deliver superior performance and reliability without compromise to quality, comfort, safety, or durability.
Shindaiwa high performance engines represent the leading edge of 2-cycle engine technology, and deliver exceptionally high power at remarkably low displacement and weight. As a professional owner/operator, you'll soon discover why Shindaiwa is simply in a class by itself!

IMPORTANT!

The information contained in this manual describes units available at the time of production. While every attempt has been made to give you the very latest information about your Shindaiwa 488-series chain saw, there may be some differences between your saw and what is described here. Shindaiwa Inc. reserves the right to make changes in production without prior notice, and without obligation to make alterations to units previously manufactured.

Contents

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.

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.

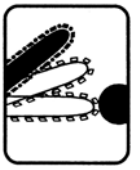
Warning Labels

Warning labels affixed to the machine mean as follows:

Read and follow the Operator's Manual. Failure to do so could result in serious injury.

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

Do not operate this tool if you are tired, ill or under the influence of alcohol, drugs, or medicine.

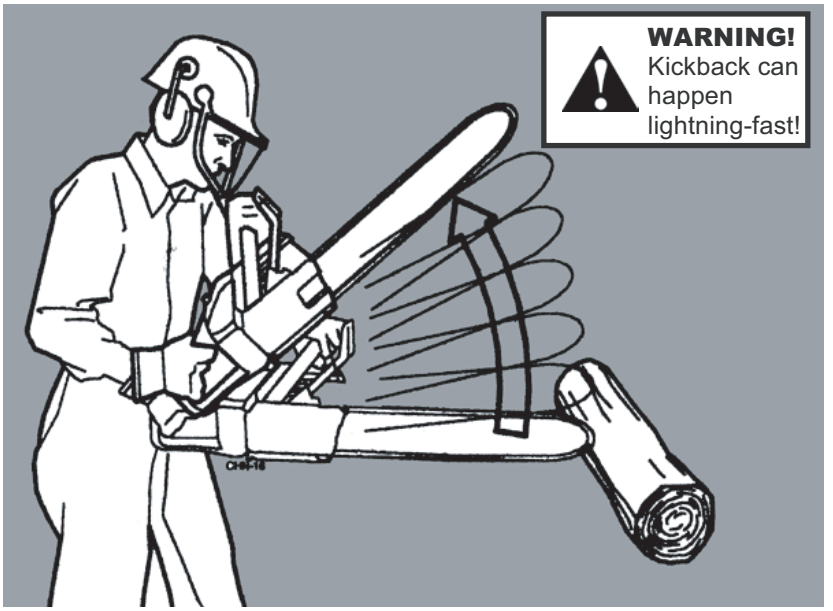


Beware of Kickback! Kickback can occur whenever the tip of the guide bar touches an object while the saw is operating. Kickback may force the bar up and back toward the operator with a lightning-fast reaction!

Pinching the saw along the top of the guide bar may force the bar rapidly back toward the operator. Pinching can occur whenever wood closes in around the moving chain.

IMPORTANT!

All chain saw service, other than the items listed in the owner's manual maintenance instructions, should be performed by trained Shindaiwa chain saw service personnel. (For example, if improper tools are used to remove the flywheel , or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur and could subsequently cause the flywheel to burst.)



Kickback Safety Precautions

This saw is equipped with the following safety equipment:

1. Inertia chain brake.

2. Low kick chain.

- Activating the chain brake tightens a brake band around the chain drive mechanism, stopping all chain rotation. When sudden kickback occurs, the chain break is automatically actuated and the chain stops instantly. Also, the chain break can be activated manually.
- Low-kick chain can significantly reduce the rotational force of kickback.
- Some bars are manufactured with a reduced-radius (smaller) nose. This special guide bar can reduce kickback by placing fewer cutters in the kickback zone.

WARNING!
To reduce the risk of kickback, all of the above devices must be properly installed and in good repair! Use of other than ANSI B175.1- 2000 combinations may result in reduced kickback protection!

WARNING!
Brake engagement and operation depend upon proper adjustment! For proper chain brake testing and adjustment procedures, see page 12.

WARNING!

Either of the following reactions could cause you to lose control of your saw while cutting, possibly resulting in serious injury!

1. Kickback can occur whenever the guide bar nose or tip contact an object while the saw is running. Tip contact may cause the guide bar to kick upward and back toward the operator, with a lightning-fast reaction!
2. Pinching the saw along the top of the guide bar may push the guide bar rapidly back toward the operator! Pinching can occur whenever wood closes in around the moving chain!

Do not rely exclusively on the safety devices incorporated with your saw. As a chain saw user, observing the following steps will also help you to avoid accident or injury on the job:

- Sudden surprise can contribute to accidents! With a basic understanding of kickback, you can reduce or eliminate the element of surprise.
- Clear obstructions from the work area before cutting. Remove any log, branch, or other obstruction that might contact the guide bar tip during cutting operations.

WARNING!

- Grip the saw firmly with your right hand on the rear handle and your left hand on the front handle, thumbs and fingers encircling the handles, whenever the saw is running. Don't let go: A firm grip will help you to reduce kickback while maintaining control of the saw.
- Accelerate the saw before the chain contacts the work area, and always maintain high engine speeds throughout the cut.
- Do not overreach or attempt to cut above shoulder height.
- Follow the manufacturer's instructions for sharpening and maintenance of the saw chain.
- Use only the replacement bar and chain combinations specified by the manufacturer.
- Never stand directly over the saw while cutting!
- Use low-kickback chain, chain brakes, or special guide bars to reduce the risk of kickback. Low kickback chain is chain that has met the kickback performance requirements of ANSI B175.1-2000 (American National Standard for Power Tools-Gasoline Powered Chain Saws-Safety requirements) when tested on the representative sample of chain saws below 3.8 c.i.d. specified in ANSI B175.1-2000.

Additional Safety Precautions

NOTE:

These safety precautions are intended primarily for consumers or occasional users. When using this chain saw for logging purposes, refer to: CFR Section 1910. 266 (5); 2.5.1 of the American National Safety Standard; Requirements for Pulpwood Logging ANSI 03.1-1978; and any applicable state safety codes.

- Never operate this chain saw with one hand! One-handed operation could cause you to lose control, causing serious injury to yourself or others! A chain saw is intended for two-handed use.
- Wear safety footwear, snug-fitting clothing, protective gloves, and eye, hearing, and head-protection devices while working with this chain saw.
- Do not allow other persons to be near the chain saw when starting or running the chain saw. Keep bystanders and animals out of the work area.
- Never allow young children or any person unfamiliar with chain saws to operate this saw!
- Clear the work area before using the saw. Never start cutting until you are sure you have a secure footing and have planned a retreat path from the falling tree.

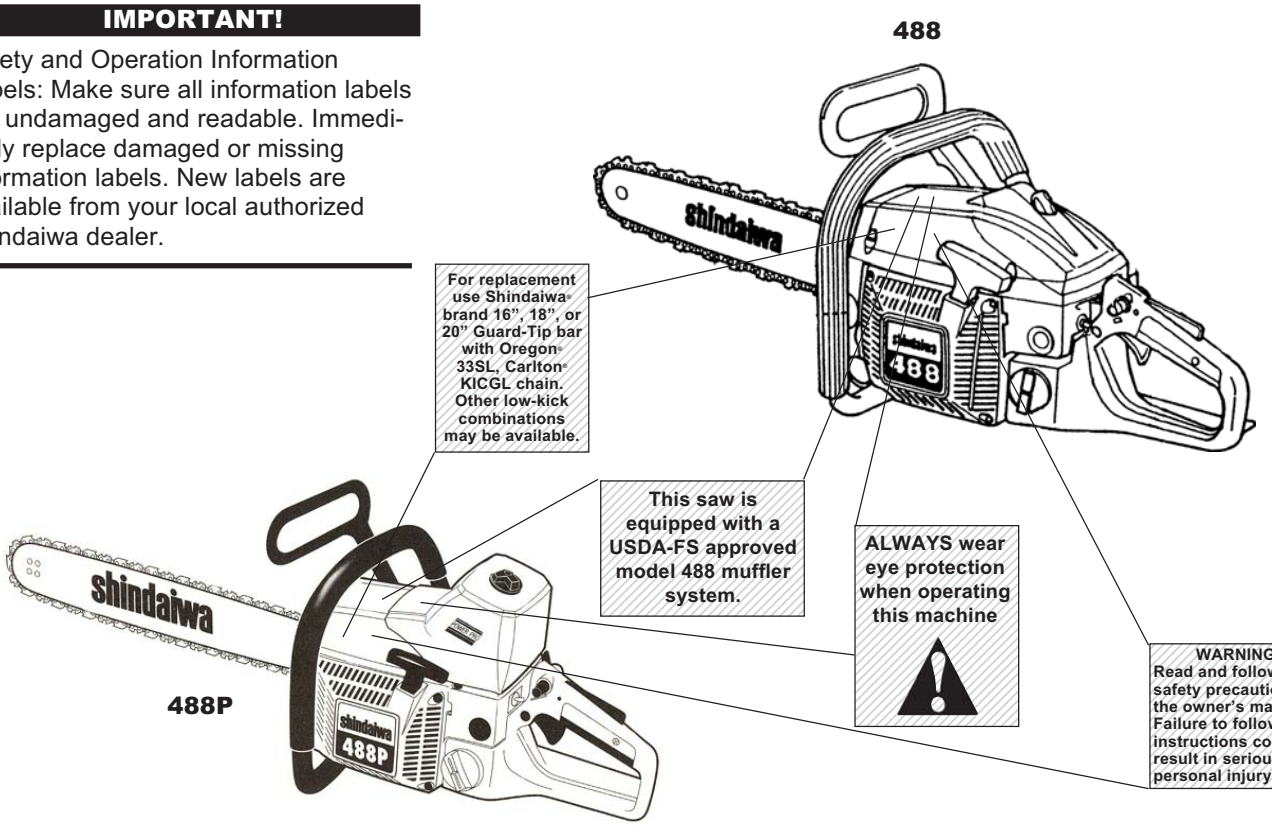
WARNING!

- Before starting the saw engine, make sure nothing is touching the saw chain.
- Keep all parts of your body away from the saw chain whenever the engine is running!
- Stop the engine before carrying the saw. Carry the saw with the engine stopped, the guide bar and saw chain pointing to the rear, and the engine muffler away from your body.
- Never operate this chain saw if you are fatigued.
- Stop the engine before setting the chain saw down.
- Install the appropriate guide-bar scabbard before transporting the saw.
- Never operate a saw that is damaged, improperly adjusted, or not completely and securely assembled.
- Use only Shindaiwa-recommended parts when repairing or servicing this saw.
- Do not use this saw if the saw chain continues to move after the throttle control trigger is released.
- Use extra care when cutting a limb that is under tension! A limb under tension could spring back suddenly, causing you to lose control of the saw!
- Use extreme caution when cutting smaller brush and saplings! Small-diameter material may catch in the chain and be whipped toward you or pull you off balance, causing you to lose control of the saw!
- Operate the saw only in a well ventilated area.
- Keep the saw handles dry, clean and free of oil or fuel mixture.
- Never operate any saw while in a tree unless you have been specifically trained to do so!
- Never perform service or repairs to this saw unless you are specifically trained and equipped to do so!
- Improper maintenance, use of nonconforming replacement components, or the removal of safety devices, such as the chain brake or any of the chain brake components, could result in serious injury.
- Never allow any part of your body near the clutch cover of an operating saw.
- Never operate a saw with damaged or missing anti-vibration cushions. Long-term exposure to vibration can damage your hands.
- Always maintain a firm footing while operating this saw! Ladders and other temporary platforms can shift unexpectedly, and are not recommended!

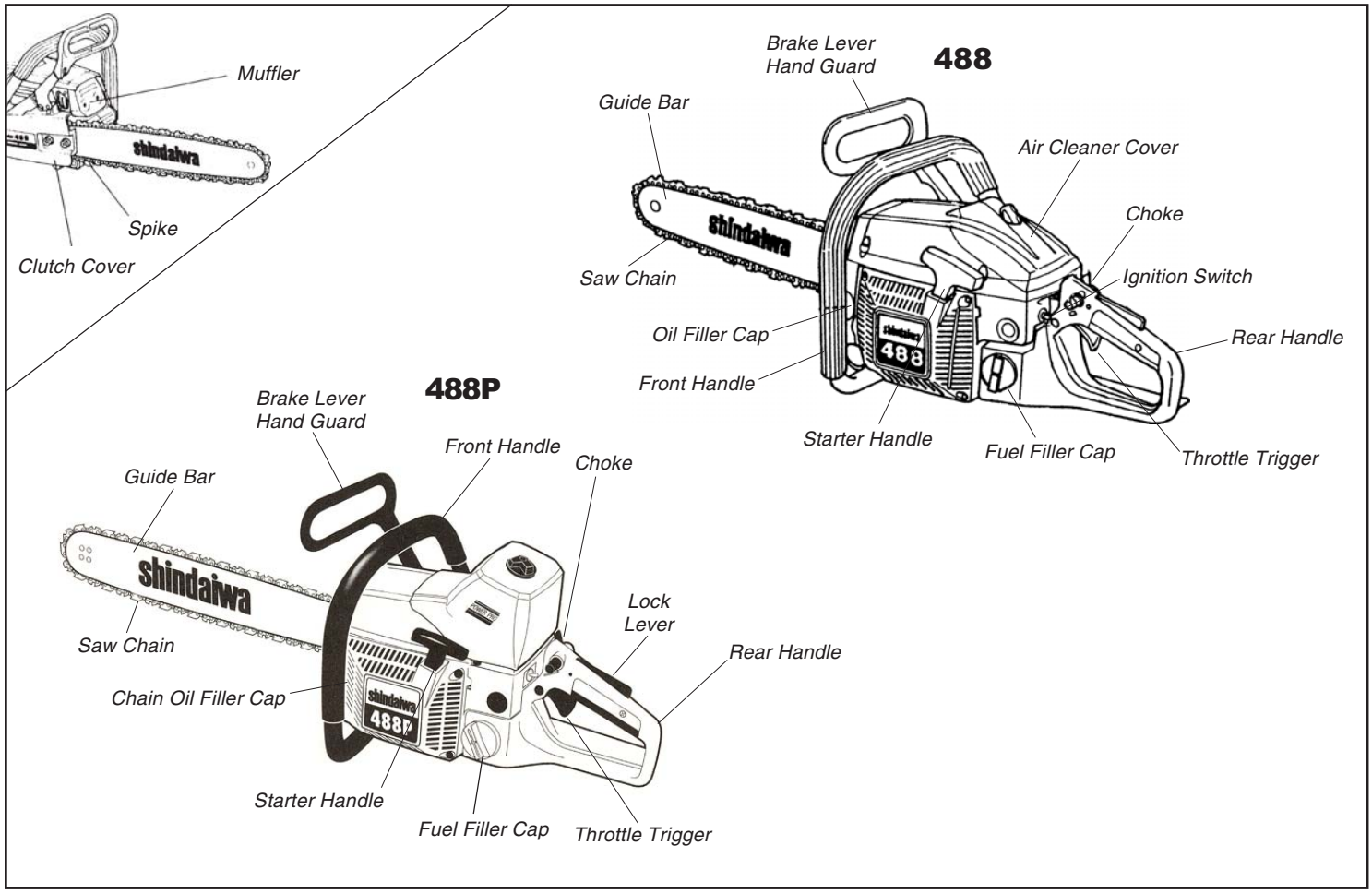
Safety Labels

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.



Unit Description



Technical Specifications

	488EMC	488PEMC
Model Name		
Engine Type	2-cycle gas engine, vertical cylinder	
Displacement	47.9cc (2.92 cu.in.)	
Weight (less bar & chain)	4.6 kg (10.2 lbs)	
Fuel/Oil Ratio	50:1 with Shindaiwa 2-Cycle Engine Oil	
Fuel Tank Capacity	600ml (20.2 oz)	
Oil Tank Capacity	300ml (10.1 oz)	
Carburetor	Walbro HDA165	
Ignition System	CDI (Capacitor Discharge Ignition)	
Cooling System	Forced Air	
Spark Plug	NGK BPMR7A	
Power Transmission	Automatic centrifugal clutch	
Starting Method	Recoil Starter	
Stopping Method	Toggle Switch	
Handle	Anti-vibration, independently vibration dampened front and rear handles.	
Safety Devices	Front hand guard, rear hand guard, throttle lock, chain brake and chain catcher	
Chain Lubrication	Automatic Adjustable Oiler	

Specifications subject to change without notice.

Tools Included

- Screwdriver
- Spark plug/13mm socket wrench (Scrench)

Recommended Bar and Chain Combinations

WARNING!

Do not make unauthorized modifications to this saw, guide bar, or chain!

WARNING!

Replacement chain for this saw must meet applicable ANSI B175.1 kickback performance requirements and/or be designated as "low kickback chain" per ANSI B175.1-2000 standards.

Chain Type: Oregon ® 33SL (16”) Guide Bar 16" Double-Guard Sprocket Nose Bar
Chain Type: Oregon ® 33SL (18”) Guide Bar 18" Double-Guard Sprocket Nose Bar
Chain Type: Oregon ® 33SL (20”) Guide Bar 20" Double-Guard Sprocket Nose Bar

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.

IMPORTANT!

The operational procedures described in this manual are intended to help you get the most from this unit and also to protect you and others from harm. These procedures are general guidelines only, and are not intended to replace any additional safety rules or laws that may be in force in your area. If you have any questions regarding your Shindaiwa chain saw, or if you do not understand something in this manual, your Shindaiwa dealer will be glad to assist you. For additional information, you may also contact Shindaiwa Inc. at the address printed on the back of this manual.

Installing and Adjusting the Guide Bar and Saw Chain

NOTE:

For longest chain life, place new or replacement chain loops in oil and soak overnight before installation.

IMPORTANT!

The chain brake must be completely disengaged before removing or installing the clutch cover.

1. Use the socket wrench to remove the clutch cover nut(s) in a counter-clockwise rotation.
2. Remove the clutch cover.
3. Remove and discard the packing spacer.

CAUTION!

Failure to align the guide bar and chain tensioner pin can cause serious damage to the clutch cover, guide bar, tensioner pin, and/or engine crankcase!

4. Place the guide bar over the guide bar stud(s) and chain tensioner pin.

WARNING!

The cutters on the saw chain are very sharp! Always wear gloves when handling.

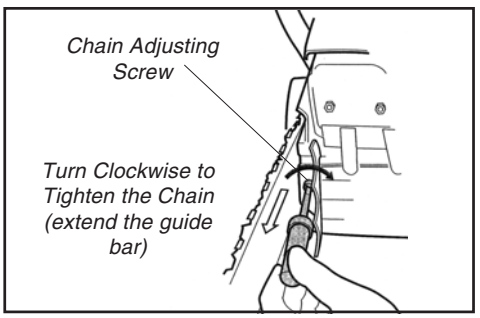
5. Install the chain loop over the drive sprocket, and then align the chain drive links within the guide bar groove. Verify that the cutters are properly oriented as shown. (inset to above). If chain installation is difficult or if the chain appears too tight, refer to "Adjusting the Saw chain,".
6. Install the clutch cover over the bar stud(s) and install the bar nut(s) finger tight.

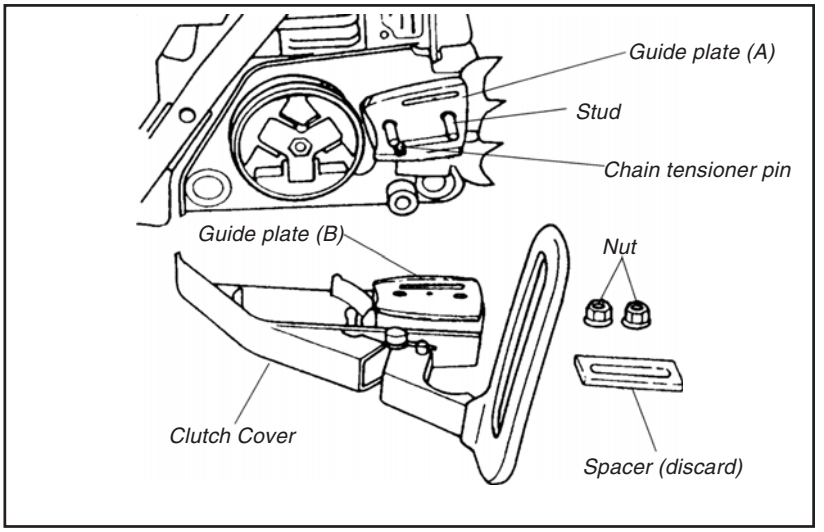
WARNING!

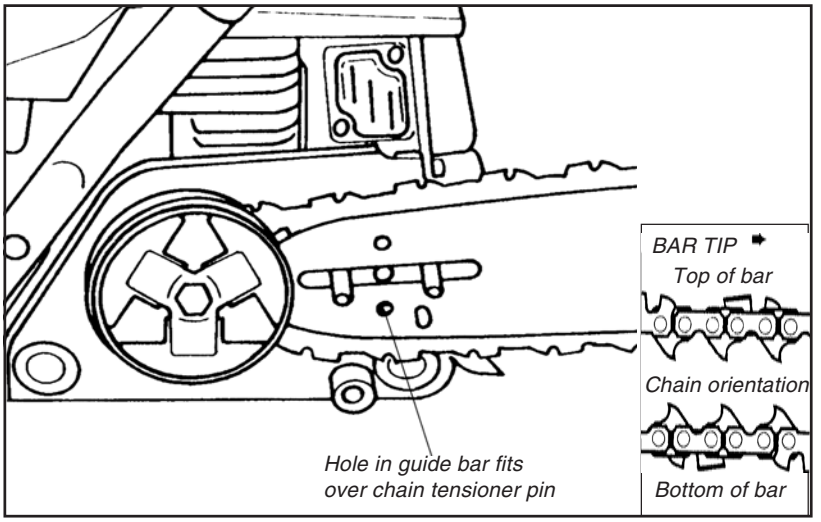
Never operate this saw without the clutch cover installed.

7. Place the saw on a flat surface and lift the bar nose slightly.
8. To adjust chain tension:

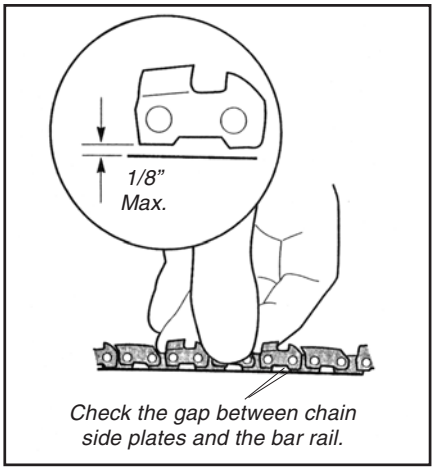
- Turn the chain tension screw clockwise to tighten the chain.
- Turn the chain tension screw counter-clockwise to loosen the chain.







- While lifting the bar nose, tighten or loosen the adjusting screw until the chain at mid-bar on the bottom of the bar just contacts the guide bar rails.



9. Tighten the bar nut(s). The saw chain tension is correct when there is not any slack on the bottom of the guide bar but the saw chain can move freely.

Re-Adjusting the Saw Chain

WARNING!

Inspect chain tension often during operation, especially when breaking in a new chain. A loose saw chain can jump from the guide bar, possibly causing serious personal injury!

1. To adjust chain tension in the field: Stop the saw and allow the guide bar and chain to cool. Loosen both bar nuts approx. 1-turn each, and then perform steps 7-9 above. Never operate the saw with a loose chain!

Mixing Fuel/Filling With 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 buildup in the tank to release fuel vapor slowly.
- Wipe all spilled fuel and move the engine at least 10 feet (3 meters) from the fueling point and source before restarting!
- NEVER start or operate this unit if there is a fuel leak.
- NEVER start or operate this unit if the carburetor, fuel lines, fuel tank and/or fuel tank cap are damaged.
- NEVER smoke or light any fires near the engine or fuel source!
- NEVER place any flammable material near the engine muffler!
- NEVER operate the engine without the muffler and spark arrester in good working condition.

IMPORTANT!

Shindaiwa high-performance 2-cycle engines are designed to operate on a 50:1 mixture of unleaded gasoline and 2-cycle engine oil. Using a fuel mixture less than 50:1 ratio (such as 80:1 or 100:1) can cause catastrophic engine failure!

1. Use only fresh, clean unleaded gasoline with a pump octane rating of 87 or higher.
2. Mix fuel with a 2-cycle engine oil designed for use in high-performance 2-cycle air-cooled engines.

CAUTION!

- Some types of gasoline contain alcohol. Never use any type of gasoline containing more than 10% alcohol by volume! More than 10% alcohol by volume may affect the lubricating qualities of 2-cycle engine oils reducing engine life and/or causing engine failure.
- Generic engine oil and marine engine oil may not be intended for use in high-performance 2-cycle engines and should never be used in Shindaiwa engines. Engine oils not intended for use high-performance air-cooled 2-cycle engines can cause excessive carbon deposits, reduce engine life and/or cause engine failure.

NOTE:

Shindaiwa offers two performance levels of 2-cycle air-cooled engine oils, Shindaiwa Premium 2-Cycle Engine Oil and Shindaiwa ONE High Performance 2-Cycle Engine Oil. Shindaiwa Premium 2-Cycle Engine Oil is designed to meet the lubrication demands of most 2-cycle air-cooled engines. Shindaiwa ONE High Performance 2-Cycle Engine Oil is recommended when superior lubrication is needed to help protect engines used in severe operating conditions. Shindaiwa ONE also contains a fuel stabilizer to help maintain fuel quality when fuel is stored longer than 30 days.

3. Refer to following chart for examples of 50:1 fuel to oil mix quantities.

Gasoline liters	2-Cycle Oil milliliters
2.5 l	50 ml
5 l	100 ml
10 l	200 ml
20 l	400 ml
Gasoline U.S. Gal.	**2-cycle oil U.S. fl. oz.**
1 gal.	2.6 oz.
2 gal.	5.2 oz.
2.5 gal.	6.4 oz.
5 gal.	12.8 oz.

4. Place the saw on a hard surface with the fuel cap up and wipe any chips or debris from around the fuel cap.
5. Remove the fuel cap and fill the tank with clean, fresh 2-cycle fuel mix. Avoid overfilling and fuel spillage.
6. Wipe any spilled fuel and move the saw at least 10 feet (3 meters) from the fueling point before starting the engine.

Bar Oil/Filling With Oil

Oil Requirements

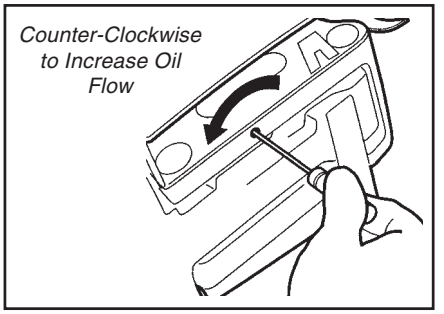
- When available, use Shindaiwa Premium bar & chain oil.
- When Shindaiwa oil is not available, use a premium 30-weight oil specifically blended for bar & chain lubrication.
- For cold weather operation, bar oil may be thinned by mixing with clean kerosene at a ratio of 1:1.

Filling the Oil Reservoir

- Place the saw on its side (clutch cover down), and wipe any chips or debris from around the oil cap.
- Remove the oil cap at the front of the saw.
- Fill the oil reservoir with bar & chain oil, and replace the cap.
- Wipe spilled oil from handles and controls before starting the saw.

CAUTION!

Proper lubrication is critical to the performance and service life of your saw's oil pump, guide bar, and saw chain! Always use a high quality lubricating oil designed for saw chain lubrication! Never use dirty or reclaimed oil!



Oil Pump Adjustment

Guide bar and saw chain lubrication is automatically provided by an adjustable-rate oil pump designed to operate whenever the clutch drum rotates. A temporary increase in oil flow rate is often desirable when cutting hardwoods or large-diameter softwoods, and can be provided as follows:

1. Stop the engine and verify that the engine stop switch is in the "OFF" position.
2. Place the saw on its side, with the clutch cover facing up.
3. Use a screwdriver to push down and turn the oil flow rate adjustment screw.

- Clockwise to decrease bar & chain lubrication.
- Counter-clockwise to increase bar & chain lubrication.

Engine Start

WARNING!
This chain saw is equipped with a fast idle feature for ease of engine starting. When the fast idle is set, the saw chain will rotate when the engine starts! Rotating saw chain can cause serious injury. Clear a safe work area before starting the engine.

NOTE:

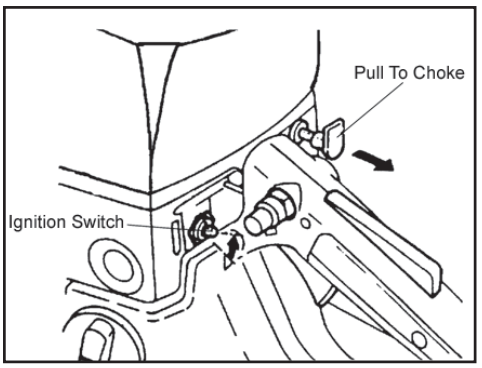
This engine ignition system is controlled by a two-position "ON-OFF" switch labeled "I" for ON and "O" for OFF located near the rear handle.

1. Move the ignition ON-OFF switch to the ON position.

Cold Engine:

Completely close the choke by pulling the choke control out to the fully extended position.

Warm Engine: Completely open the choke by pushing the choke control in.



IMPORTANT!

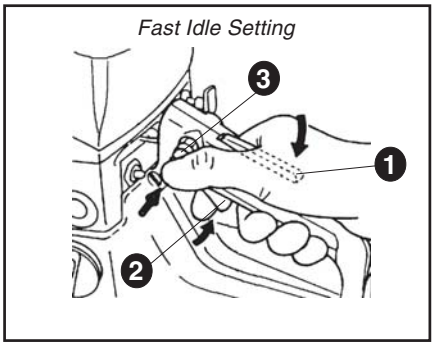
This chain saw is equipped with a throttle trigger lock out system designed to prevent unintended throttle activation. This system requires the operator to first depress the throttle lock out lever on top of the rear handle to release the trigger from the engine idle position.

2. Set the throttle to "fast idle". To set the throttle to "fast idle" position:

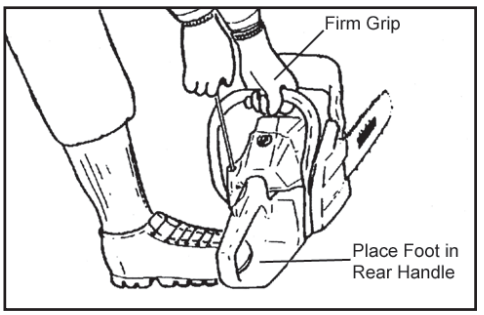
❶ Grip the rear handle to depress the throttle lock out lever.

❷ Depress the throttle trigger.

❸ Slide the fast idle lock against the throttle lockout lever then release the lockout lever and trigger. Depress and release the throttle trigger to automatically release the fast idle lock and return the throttle to idle position.



3. Place the saw upright on the ground.
4. Secure the saw by stepping on the inside of the rear handle with the right foot and firmly grasping the front handle with the left hand.



5. Grip the starter handle with the right hand and pull slowly until starter engagement is felt.

CAUTION!

The recoil starter can be damaged by abuse!

- Never pull the starter completely to the end of the starter cord. Fully extending the starter cord can damage the starter spring, cord and/or starter assembly.
- Never release the starter grip with the starter rope extended. Always hold on to the grip during engine start and return the starter grip back to the starter housing slowly as the starter spring retracts the rope.

6. With the starter engaged, pull the starter upward rapidly. Repeat until the engine either attempts to start or starts.
7. When the engine attempts to start or starts, push the choke control in if previously set. If the engine did not continue to run, pull the starter until the engine restarts then rapidly accelerate the engine several times.

NOTE:

If the engine fails to start, repeat the starting procedure setting the choke control appropriately for either a cold or warm engine. If the engine still fails to start, refer to the section, "Starting a Flooded Engine."

Engine Stop

1. Move the "ON/OFF" ignition control switch to the off position. If the saw has just been used, allow the engine to idle for 1 to 2 minutes to stabilize engine operating temperature before stopping the engine.

Starting a Flooded Engine

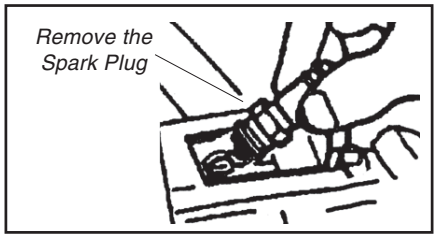
If the carburetor choke is closed (choke control fully extended) and after repeated attempts, the engine fails to start, the engine may be flooded with fuel. The following steps are recommended to clear a flooded engine.

1. Move the “ON/OFF” ignition control switch to the “OFF” position.

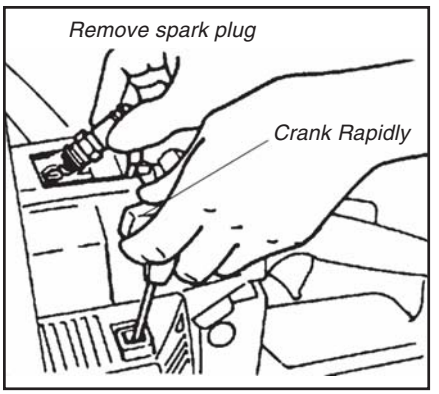
WARNING!

The ignition switch must be in the “OFF” position to prevent the chance of igniting fuel and/or fuel vapors escaping from the engine during this procedure.

2. Push the choke control completely in to open the choke.



3. Remove the spark plug access cover and disconnect the plug wire. Remove the spark plug using the scrench supplied with the chain saw or other suitable tool.
4. Inspect the spark plug for damage or excessive wear and replace if necessary. If the spark plug electrode is fuel soaked, or coated with carbon deposits, clean and set the plug gap. Refer to page 16 of this manual in the maintenance section for spark plug information.



WARNING!

Keep clear of the spark plug opening! Any excess fuel in the engine will be ejected through the spark plug opening during starter operation.

5. With the spark plug removed, the choke control pushed in and the ignition control in the “OFF” position, clear any excess fuel in the engine by rapidly and repeatedly pulling the starter until no evidence of fuel is seen escaping from the spark plug opening.
6. Replace the spark plug and install the spark plug lead and access cover.
7. Refer to the Engine Start and Stop section and follow the instructions for starting a warm engine.
8. If the engine still fails to start, refer to the Troubleshooting Section.

Carburetor Adjustments

IMPORTANT!

A clean and unrestricted airflow is essential to your saw engine's performance and durability! Before attempting any carburetor adjustments, inspect and clean the engine air filter as required! Procedures for maintaining your saw's air filter are described on page 16 in this manual.

Before starting the saw

I. Inspect saw chain tension, and adjust if necessary.

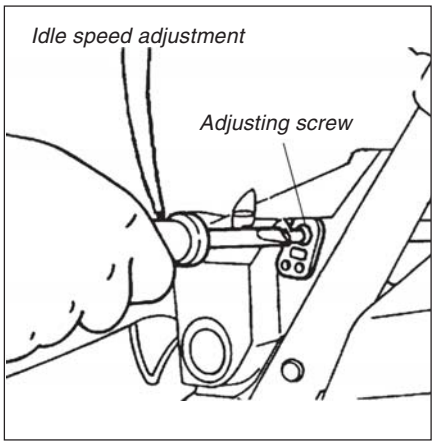
2. Verify that the chain brake is disengaged, and that the saw chain is free to rotate.

Start the saw

Start the saw and warm the engine to operating temperature. Place the saw on the ground, and adjust the carburetor as follows:

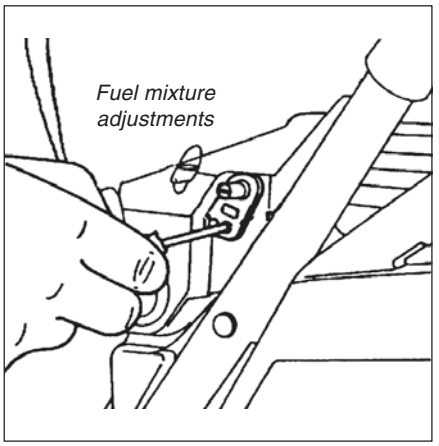
Idle speed adjustment

Use a screwdriver to slowly turn the idle speed adjusting screw in or out until the engine idles smoothly at 2,600 - 3,000 rpm (min^{-1}).



WARNING!

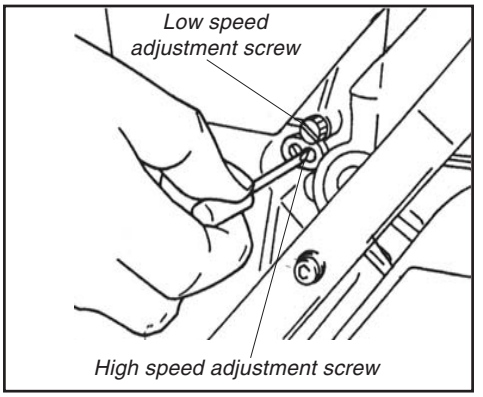
The saw chain must never rotate at engine idle speed.



Low and High Mixture Adjustments.

Low-speed mixture (engine idling at operating temperature)

1. Using a small screwdriver, slowly turn the low speed mixture screw clockwise (lean mixture), and note any changes in engine rpm.
2. Next, turn the low speed mixing screw counter-clockwise (rich mixture) and note any changes in engine rpm.
3. Adjust the low speed mixture screw to provide the smoothest possible idle with no sacrifice in acceleration.
4. If necessary, readjust the idle speed screw for an engine idle speed of 2,600 - 3,000 rpm (min^{-1}).



High speed mixture

1. No adjustment is necessary when the saw is new.
2. After approximately 10 hours running, readjust the H-needle to 1.0 turn (5 1/4 turns).

Low and High speed adjustment.
Standard opening.
L ..... 1 ± 1/4 turns
H ..... 1 ± 1/4 turns

"Standard opening" means number of turns from the fully closed position by turning needle gently counter-clockwise

CAUTION!

Do not run saw at full throttle with no load. If run in this condition, seizure can occur.

CAUTION!

Do not adjust H-speed needle to less than 3/4 turn. If run at less than 3/4 turn, seizure can occur.

Chain Brake Operation and Service

Chain Brake Operation

This saw is equipped with a dual function chain brake designed to stop the saw chain from rotating whenever kickback occurs.

IMPORTANT!

The chain brake system for models 285s and 352s is not adjustable! If the chain brake fails to stop the chain in any of the following steps, DO NOT USE THE SAW! Return the saw to your dealer for repairs.

- Engaging the brake lever causes a brake band to tighten around the clutch drum, stopping the saw chain.
- The chain brake is designed to engage whenever the brake lever strikes the operator's hand or from the inertial effects of kickback.
- The chain brake can also be activated by pushing the brake lever forward manually.

To release (disengage) the chain brake, pull the brake lever rearward, towards the front handle until a positive stop is felt. (Position 1).

WARNING!

The chain brake is installed only to reduce the risk from kickback! The chain brake is not a substitute for careful operation!

IMPORTANT!

Release the throttle whenever the chain brake is activated!

Chain Brake Testing

Step 1: Inertia Chain Brake Function (engine "off")

Use the following procedure to test for proper operation:

1. Turn the engine "off," and verify that the ignition switch is in the "O" or "off" position.
2. Hold the chain saw normally gripping the rear handle with the right hand and the front handle with the left hand. While keeping the chain saw level, hold the nose of the guide bar approximately 14 inches above a solid wood block. Release the front handle only and allow the guide bar nose to drop onto the wood. The chain brake lever should move forward to position 2 and activate the brake as soon as the nose strikes the wood block. Wearing gloves, make sure that the saw chain cannot be pulled around the guide bar.

Step 2: Manual Chain Brake Function (engine running)

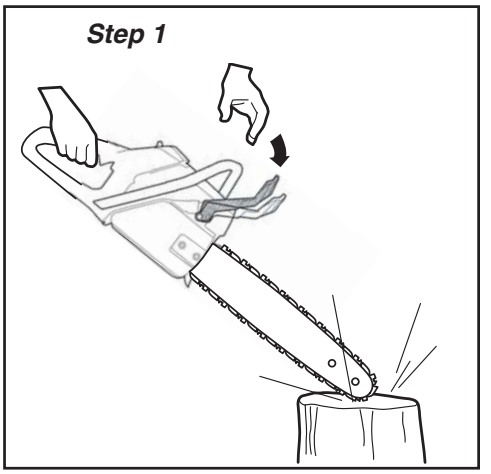
Use the following procedure to test for proper operation:

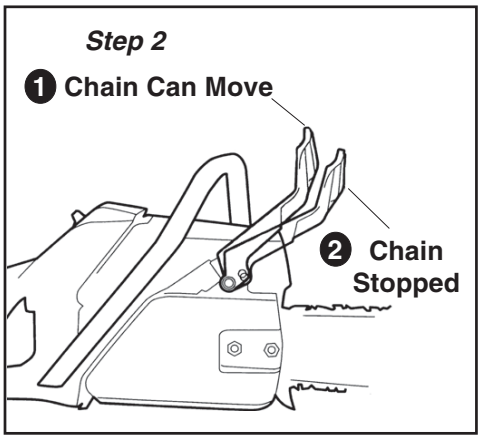
1. Start the saw and warm the engine to operating temperature.
2. With the saw on a flat stable surface, maintain a firm grip on the rear handle with the right hand and the top of the front handle with the left hand. The left hand should be centered with the front hand guard.

CAUTION!

Operating the saw at wide open throttle for longer than 5 seconds without a load could result in engine damage.

3. Accelerate engine to full throttle, then, without releasing the front handle, roll the left wrist forward against the front hand guard/chain brake lever to push the brake lever forward until the chain brake activates (position 2). The saw chain must stop immediately. If either of step 1 or step 2 tests fail, contact an authorized shindaiwa dealer for repairs.





WARNING!

Both of the above testing procedures must cause the chain brake to engage and prevent the saw chain from moving! If the chain brake does not fully engage and prevent the saw chain from moving during either test, **DO NOT OPERATE THE SAW!** Return the saw to your dealer for repairs!

Chain Brake Maintenance

- Periodically clean the brake mechanism of sawdust or debris.
- If the chain brake becomes damaged or worn, or fails to completely engage or release the clutch drum, return the saw to your dealer for repairs.

CAUTION!

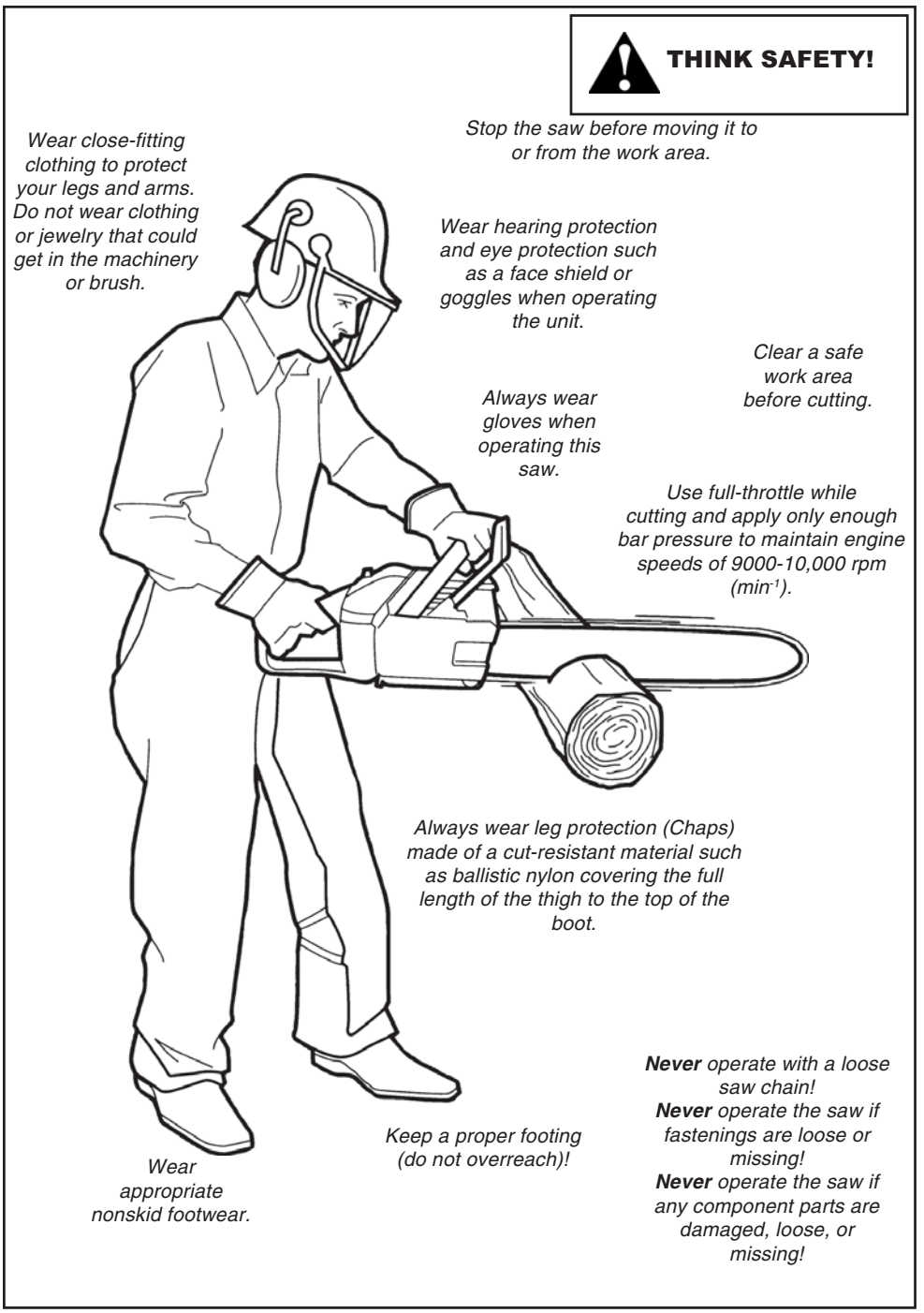
Never start or operate this saw while the chain brake is activated!

- Never carry the saw by the brake lever! Carry the saw by the front handle.
- Always stop the saw and disengage the chain brake before removing or replacing the clutch cover!
- Never make carburetor adjustments while the chain brake is engaged!

Cutting with the Saw

IMPORTANT!

Always use full throttle while cutting! Keep the chain sharp and let the saw do the work! Forcing the saw into the work reduces cutting performance, and can damage the saw through overheating!

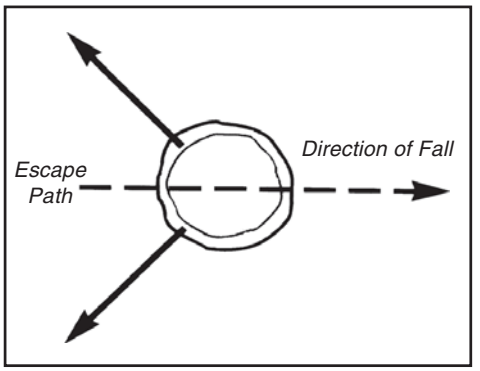


Before Felling a Tree

1. Determine the direction of fall by inspecting:

- Tree shape and angle of lean.
- Size and shape/placement of limbs.
- Location of nearby trees or other obstacles.
- Condition of tree (damage, disease, etc.).
- Prevailing wind direction.

2. Clear a safe work area around the tree. Be alert for loose or dead limbs overhead. Clear an appropriate escape path approx. 45' from the direction of fall.



3. Notify nearby workers of your intentions!

Felling Small Trees (Under 6” diameter)

1. Determine the direction of fall. If uncertain as to direction of fall, use the procedure "Felling Large Trees" as outlined on the following page.
2. Start cutting on the side of the tree away from the fall, and make a single felling cut all the way through the tree.
3. Stop the saw, and put it down on the ground.
4. Use your retreat path to exit the area quickly.

WARNING!

Diseased, damaged, or otherwise unbalanced trees can fall unpredictably during felling, and should be left to an experienced timber faller!

Felling Larger Trees (Over 6” diameter)

If a tree is otherwise healthy and not seriously out of balance, its direction of fall can often be encouraged by first "notching" the tree on the side facing the desired direction of fall.

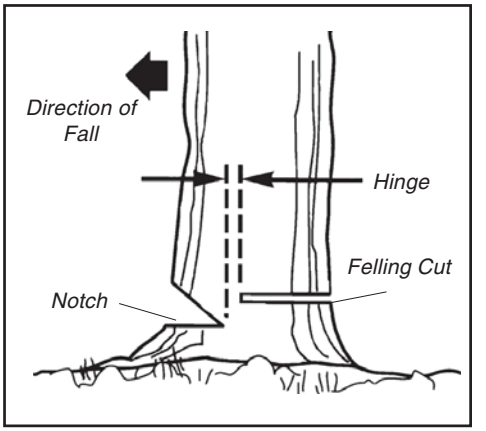
After the notch is completed, start the felling cut slightly higher and on the opposite side of the tree, away from the direction of fall.

The goal of the method is to leave a sturdy wooden "hinge" for the tree to pivot on while falling.

1. Determine the direction of fall.
2. On the side of the tree facing the direction of fall, make a single 90' cut through approx. 1/3 of the tree's diameter.
3. Working from the same side of the tree and at a 45' angle to the first cut, make your second cut in an upward direction to remove a notch from the tree as shown.
4. Working on the opposite side of the tree and starting approximately 2" higher than the bottom of the notch created in steps 1-3, make the final felling cut as shown.
5. Stop the saw, and put it down.
6. Use your retreat path to exit the area quickly.

NOTE:

If the cut appears to be closing on the bar, use a mallet to drive one or two plastic or wooden wedges into the cut behind the bar.



WARNING!

Failure to leave a proper wooden hinge during the falling or "back cut" can cause the tree to pinch the saw's guide bar, and may also change the direction of fall!

WARNING!

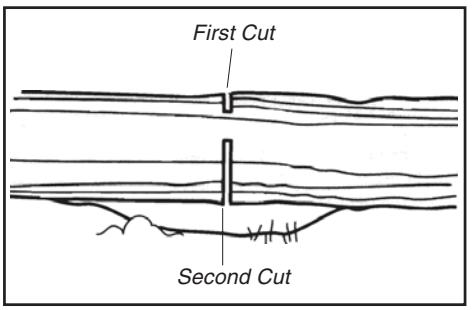
Always make your falling cut parallel to the bottom cut! An angled falling cut may cause the tree to split, possibly changing the direction of fall!

Bucking

Techniques

- If the log is well supported, start your cut from the top of the log. Keeping the guide bar parallel to the ground, cut straight down but do not allow the saw to cut into the ground.
- Cutting downed timber, or "bucking," increases the possibility of the wood settling and pinching the guide bar. Driving one or more soft plastic or wooden bucking wedges can help prevent bar-pinching during a cut.
- Use two cuts when bucking near the inboard end of an unsupported log.

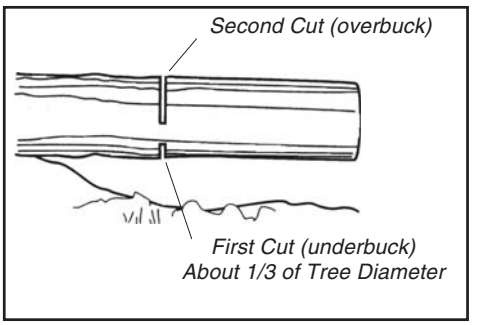
1. Make the first cut as an overbuck approx. 1/3 the diameter of the log.
2. Finish the job with an underbuck coming up from beneath and joining the first cut.



WARNING!

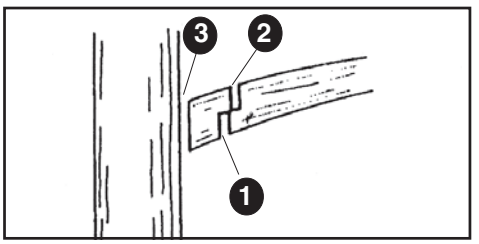
Always cut downed timber from the uphill side of the wood! Be alert for potential injury from rolling or shifting logs! Downed timber may shift or roll unpredictably during cutting or handling operations!

- Use two cuts when bucking the outboard end of an unsupported log. Your first cut should be an underbuck, cutting upward through approximately 1/3 the diameter of the tree. Finally, move to the top of the log and finish the cut by bucking down (overbucking) to your first cut.



Limbing

Limbing a standing tree is usually accomplished in the same manner as bucking, with a third and final cut used to remove the remaining stub of the limb.



WARNING!

Kickback danger increases in over-height or out of position cutting! Do not overreach, or attempt to cut above shoulder height!

NOTE:

When cutting unsupported logs or limbs, starting with an underbuck cut will minimize the possibility of the wood splitting during the bucking cut.

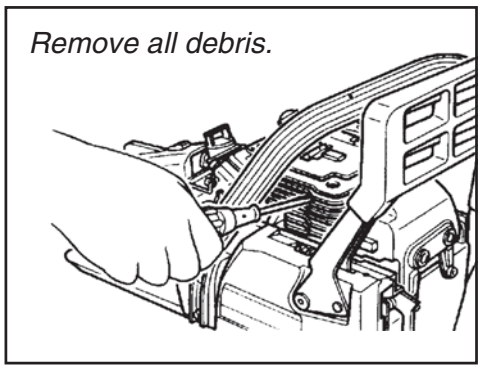
Maintenance

WARNING!

Before performing any maintenance on this saw, stop the engine and disconnect the spark plug wire!

Daily Maintenance

1. Remove dirt and debris from the saw exterior, cylinder fins, and cooling air intake.



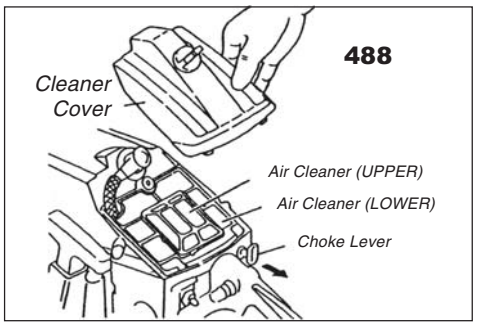
2. Inspect the saw for fuel and oil leaks. Repair as necessary.
3. Service the air filter.

(488)

- Remove the air cleaner, being careful not to drop dust in the carburetor.

  Make sure the choke lever is pulled when removing the air cleaner. Dust tends to accumulate on the bottom surface.

  Rinse the air cleaner with soap and water, allow the element to dry before reinstalling.
- Working in reverse order of disassembly reassemble the air filter elements and cover to the saw.



(488P)

- *(Pre-filter)* Remove the air cleaner element from the carburetor and wash it with soap and water. Rinse the element thoroughly with clean water. Squeeze out the water and allow the element to dry before reinstalling.
- *(Dry type filter)* Inspect the filter. If the element is damaged or distorted, replace it with a new one.

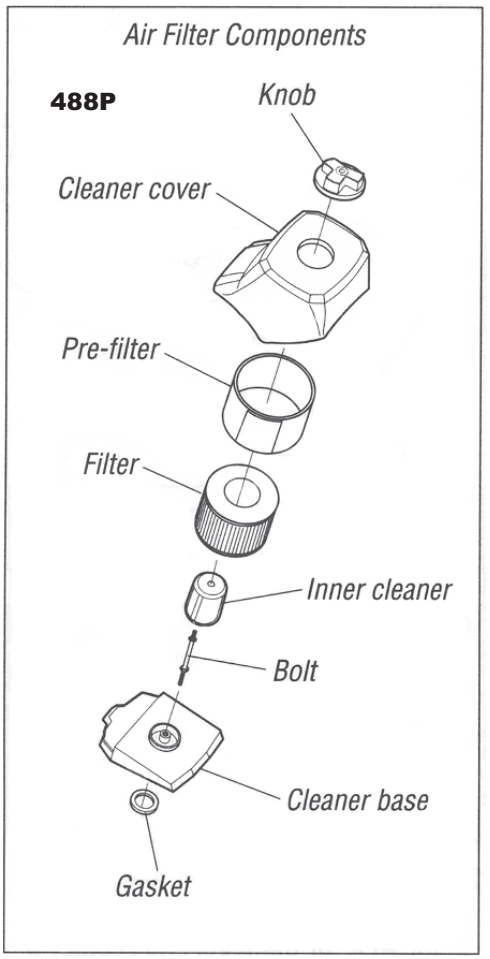
IMPORTANT!

The 488P uses a high capacity dry-type air filter element. The filter should not be cleaned with a liquid cleaner and must NEVER be oiled.

IMPORTANT!

Direct the air stream only at the inside face of the filter.

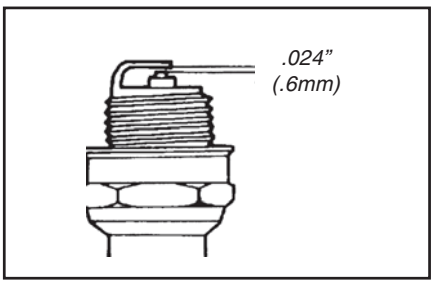
- Gently, tap filter on a hard surface to dislodge debris from element or use compressed air to blow debris from the air filter element.
- Working in reverse order of disassembly reassemble the air filter elements and cover to the saw.



4. Sharpen and adjust the saw chains as required.
5. Clean the guide bar groove and oil hole, and inspect the bar groove and tip for damage or unusual wear. Repair or replace worn or damage components as necessary.
6. Inspect the entire saw for damaged, loose or missing components or fastenings. Repair as necessary.

10/15 Hour Maintenance

1. Remove and clean the spark plug. Adjust the spark plug gap to 0.024" (0.6mm), and reinstall. Replace any damaged or visibly worn plug with a NGK BPMR7A or equivalent spark plug.



CAUTION!

Never allow chips or other debris to enter the cylinder bore! Before removing the spark plug, thoroughly clean the spark plug and cylinder head area!

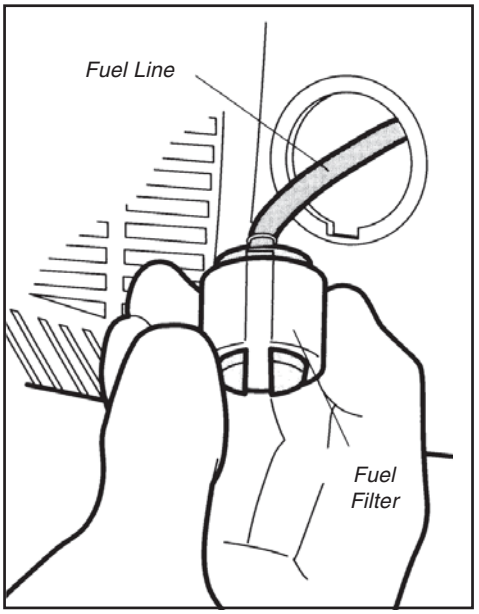
2. Remove the guide bar and chain. Carefully inspect the drive sprocket for wear or damage, and replace if noted. Inspect the guide bar grooves and tip for wear or damage, and repair or replace components as required.

IMPORTANT!

The drive sprocket and saw chain loop should always be replaced as a set! For economy, rotate the same 2-3 chains daily. When these chains are worn out, replace both the chains and drive sprocket at the same time.

40/50 Hour Maintenance

1. Replace the spark plug with a NGK BPMR7A (or equivalent), gapped to 0.024" (0.6mm).
2. Extract the fuel filter from inside the fuel tank, and then remove and replace the filter element. Before replacing the filter, inspect the condition of the fuel line. If damage or deterioration are noted, the saw must be removed from service until it can be inspected by a Shindaiwa-trained service technician.



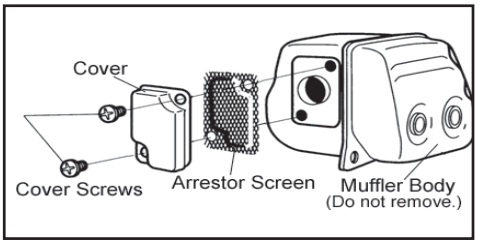
3. Extract the oil filter from inside the oil tank, and then wash the filter element in an approved solvent. If damage or deterioration are noted on the oil suction line, the saw must be removed from service until it can be inspected by a Shindaiwa-trained service technician.

Spark Arrester Maintenance

Hard starting or a gradual loss of performance can be caused by carbon deposits lodged in the muffler's spark arrester screen. For maximum performance, the arrester screen should be periodically removed and cleaned with a small wire brush.

CAUTION!

Carbon deposits in the combustion chamber or exhaust port cannot be removed in the field. For further decarbonization, return the 488 to your Shindaiwa dealer.



Long Term Storage
(over 30 days)

- Thoroughly clean the saw exterior. Remove all chips and other debris from the cylinder fins and cooling passages.
- Drain the fuel tank, and then clear the carburetor and lines by running the saw until it stops from lack of fuel.

CAUTION!

Never store the saw with any fuel remaining in the tank, fuel lines, or carburetor! Your Shindaiwa warranty does not include coverage for damage caused by "stale" or contaminated fuels!

- Drain any remaining bar oil from the oil reservoir.
- Remove the spark plug, and then pour 1/4-oz of 2-cycle engine oil into the cylinder through the spark plug hole. Before reinstalling the spark plug, slowly pull the recoil starter 2-3 times to distribute the oil over the cylinder walls.
- Remove, clean, and reinstall the air filter element as described under "daily maintenance."
- Repair or replace any damaged components as required, and then store the unit in a clean, dry, dust-free area.

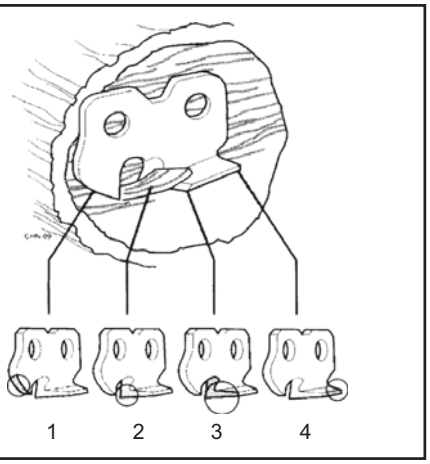
Saw Chain Performance

Your saw's performance on the job depends heavily on the condition of its saw chain.

How the Saw Chain Works

As the saw chain is pulled through the wood:

1. The depth gauge setting determines the depth of cut for each cutter.
2. The cutter's leading edge enters the wood, causing the entire cutter to "rock back" and lift away from the bar.
3. The top plate peels the severed wood chip away.
4. The chip is discharged out the rear of the cutter.



IMPORTANT!

Most of the actual cutting is done by the sides and corners of the individual cutters!

Sharpening Technique

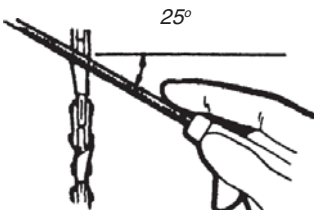
IMPORTANT!

File all cutters to the same angle and depth! Unequal filing may cause the saw to vibrate or cut erratically!

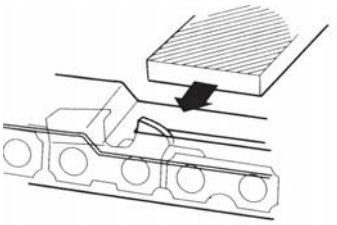
NOTE:

For consistent filing angles, use a filing guide.

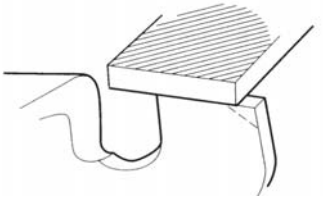
1. Using the appropriate round file, sharpen all cutters to a 25° angle as shown.
2. After all cutters are sharpened, use a depth gauge joiner to measure the height of each depth gauge.
3. As required, use a flat file to lower depth gauges to the appropriate .025" (0.635 mm) height.
4. After all depth gauges have been adjusted, use a flat file to round each depth gauge leading edge to original curvature and angle.



Use a Filing Gauge

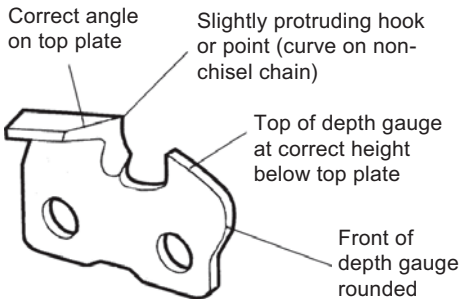


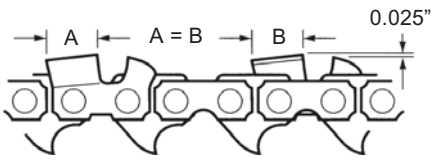
Using a Depth gauge joiner



Using a Flat File to Round the Front Corner on a Depth Gauge

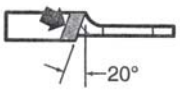
Correct Filing Technique





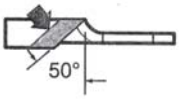
Filing Problems

Top plate angle less than recommended



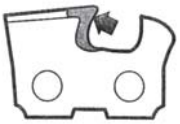
Cause
File held at less than recommended angle.
Result
Slow cutting. Requires extra effort to cut.
Remedy
File cutters to recommended angle.

Top plate angle more than recommended



Cause
File held at more than recommended angle.
Result
Cutting angle is very sharp but will dull fast. Cutting action rough and erratic.
Remedy
File cutters to recommended angle.

Hook in side plate cutting edge

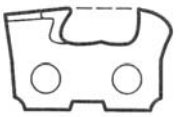


Cause
File held too low or the file was too small.
Result
Rough cutting. Chain grabs. Cutters dull quickly or won't hold a cutting edge.
Remedy
Check file size. File cutters to recommended angle.

Backslope on side plate cutting edge

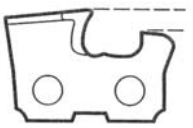
Cause
File held too high or the file was too large.
Result
Cutters won't feed into wood. Slow cutting. Must force chain to cut. Causes excessive bottom wear.
Remedy
File cutters at recommended angle. Check file size.

High depth gauge



Cause
Depth gauge never filed.
Result
Slow cutting. Must force chain to cut. Will cause excessive wear on the cutter heel.
Remedy
Lower gauges to recommended setting.

Low depth gauge



Cause
Wrong gauge setting or no gauge used.
Result
Rough cutting. Chain grabs. Saw won't pull chain through wood. Excessive wear on the cutter heel.
Remedy
If depth gauges are too low, the chain is no longer serviceable.

Troubleshooting

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 retest.
YES ↓ Does the tank contain fresh fuel of the proper grade? **NO**	Stale or contaminated fuel mixture.	Drain and refill with fresh, clean unleaded gasoline with a pump octane of 87 or higher mixed with Shindaiwa 2-cycle Engine Oil and gasoline at a 50:1 ratio).
YES ↓ Is fuel reaching the cylinder and combustion chamber **NO**	Check for clogged fuel filter and/or vent.	Clean and replace as required and restart.
YES ↓ Is there spark at the spark plug wire terminal? **NO**	Is the ignition switch ON? Faulty ignition ground. Faulty transistor unit.	Move switch to ON and restart. Consult with an authorized servicing dealer.
YES ↓ 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 may be the wrong size.	Crank the engine with the plug removed, replace the plug, and restart. See pg. 10 (Starting a flooded engine). Clean and re-gap the plug to 0.24 inch (0.6mm). Restart. Replace the plug with a NGK BMR7A.

Troubleshooting

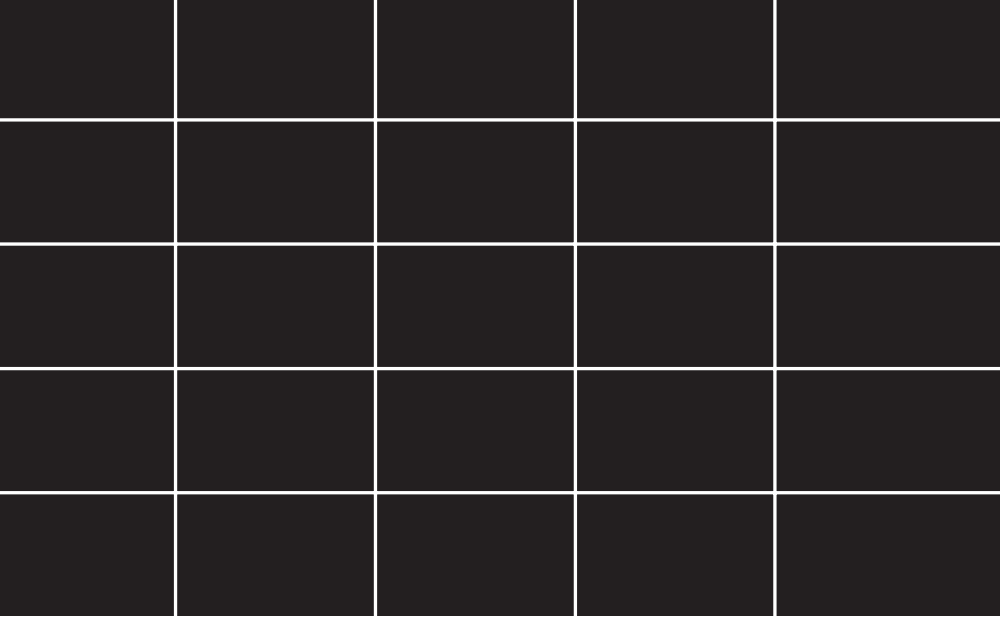
LOW POWER OUTPUT

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

Troubleshooting

ADDITIONAL PROBLEMS

Symptom	Possible Cause	Remedy
Poor acceleration.	Clogged air filter.	Clean the air cleaner element.
	Clogged fuel filter.	Replace the fuel filter.
	Chain brake engaged.	Inspect and/or test brake. Return to dealer as required.
	Carburetor mixture too rich or too lean.	Consult with an authorized servicing dealer.
	Idle speed set too low.	Adjust: 2,600-3,000 rpm (min^{-1}).
	Switch turned off.	Set the switch to (“ON”) and restart.
Engine stops abruptly.	Fuel tank empty.	Refuel.
	Clogged fuel filter.	Clean or replace filter as required.
	Water in the fuel.	Drain; replace with clean fuel.
	Shorted spark plug or loose terminal.	Clean or replace spark plug. Tighten the terminal.
	Ignition coil faulty.	Replace the ignition unit.
	Piston seizure.	Consult with an authorized servicing dealer.
Engine difficult to stop or will not stop.	Ground (ignition switch) wire is disconnected, or switch is defective.	Consult with an authorized servicing dealer.
	Overheating due to incorrect spark plug.	Correct plug: NGK BMR7A.
	Overheated engine.	Idle engine until cool.
Chain rotates at idle speed.	Engine idle to fast.	Set idle: 2,600-3,000 rpm (min^{-1}).
	Broken clutch spring or shoe.	Replace spring/shoes as required.
Excessive vibration	Worn or damaged sprocket, chain, or bar.	Inspect and replace chain components as required.
	Bent crankshaft	Consult with an authorized servicing dealer.



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