

SHINDAIWA OWNER'S/OPERATOR'S MANUAL

EB254 BLOWER



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.

X7501920502
03/12

shindaiwa[®]

Introduction

The Shindaiwa EB254 has been designed and built to deliver superior performance and reliability without compromise to quality, comfort, safety, or durability.

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 EB254 blower, there may be some differences between your EB254 blower and what is described here. Shindaiwa reserves the right to make changes in production without prior notice, and without obligation to make alterations to units previously manufactured.



WARNING!

The engine exhaust from this unit contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

CAUTION!

This blower is equipped with a spark-arresting muffler! Never operate this unit without both the muffler and spark arrester installed and properly functioning!

IMPORTANT!

Before using this unit, consult local regulations concerning noise restrictions and hours of operation!

Attention Statements

Throughout this manual are special "Attention Statements".



WARNING!

A statement preceded by the triangular Attention Symbol and the word "WARNING" indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

CAUTION!

A statement preceded by the word "CAUTION" contains information that should be acted upon to avoid damaging the unit.

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.

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 safety rules/laws that may be in force in your area. If you have any questions regarding your EB254 blower, 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 at the address printed on the back of this manual.



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



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



This unit is intended for outdoor use only and should be used only in well ventilated areas.



WARNING! Surface can be hot. Always wear gloves when handling this unit.

Table of Contents

| | PAGE | | PAGE |
|-----------------------------------|------|-----------------------------|------|
| Attention Statements | 2 | Starting Engine | 9 |
| General Safety Instructions | 3 | Stopping Engine | 11 |
| Unit Description | 5 | Using the Blower | 11 |
| Specifications | 6 | Maintenance | 13 |
| Emission Control | 6 | Long Term Storage | 18 |
| Assembling the Blower | 7 | Troubleshooting Guide | 19 |
| Mixing Fuel | 8 | Warranty Statement..... | 22 |
| Filling the Fuel Tank..... | 9 | | |

General Safety Instructions

Work Safely

Blowers operate at a very high speed and can do serious damage or injury if they are misused or abused. *Never allow a person without training or instruction to operate your EB254 Blower!*

Stay Alert

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



WARNING!

Never make unauthorized modifications or attachment installations. Never use attachments not approved by Shindaiwa for use on this unit.



WARNING!



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



WARNING!

Use Good Judgment

ALWAYS wear eye protection that complies with ANSI Z 87.1 or your applicable national standard to shield against thrown objects.

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

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

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

ALWAYS keep the handles clean.

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

ALWAYS turn off the engine before putting the unit down. When transporting the unit in a vehicle, properly secure it to prevent the unit from overturning, fuel spillage and damage to the unit.

NEVER insert any foreign objects into the air intake or outlet opening of the blower while in operation.



WARNING!

Engine exhaust IS HOT, and contains Carbon Monoxide (CO), a poison gas. Breathing CO can cause unconsciousness, serious injury, or death. Exhaust can cause serious burns. **ALWAYS** position unit so that exhaust is directed away from your face and body.



WARNING!

Minimize the Risk of Fire

NEVER smoke or light fires near the unit.

ALWAYS stop the engine and allow it to cool before refueling. Avoid overfilling and wipe off any fuel that may have spilled.

ALWAYS inspect the unit for fuel leaks before each use. During each refill, check that no fuel leaks from around the fuel cap and/or fuel tank. If fuel leaks are evident, stop using the unit immediately. Fuel leaks must be repaired before using the unit.

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.

NEVER run the engine without the spark arrester screen in place.



WARNING!

The ignition components of this machine generate an electromagnetic field during operation which may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemakers should consult with their physician and the pacemaker manufacturer before operating this machine. In the absence of such information, ECHO does not recommend the use of ECHO products by anyone who has a pacemaker.



WARNING!

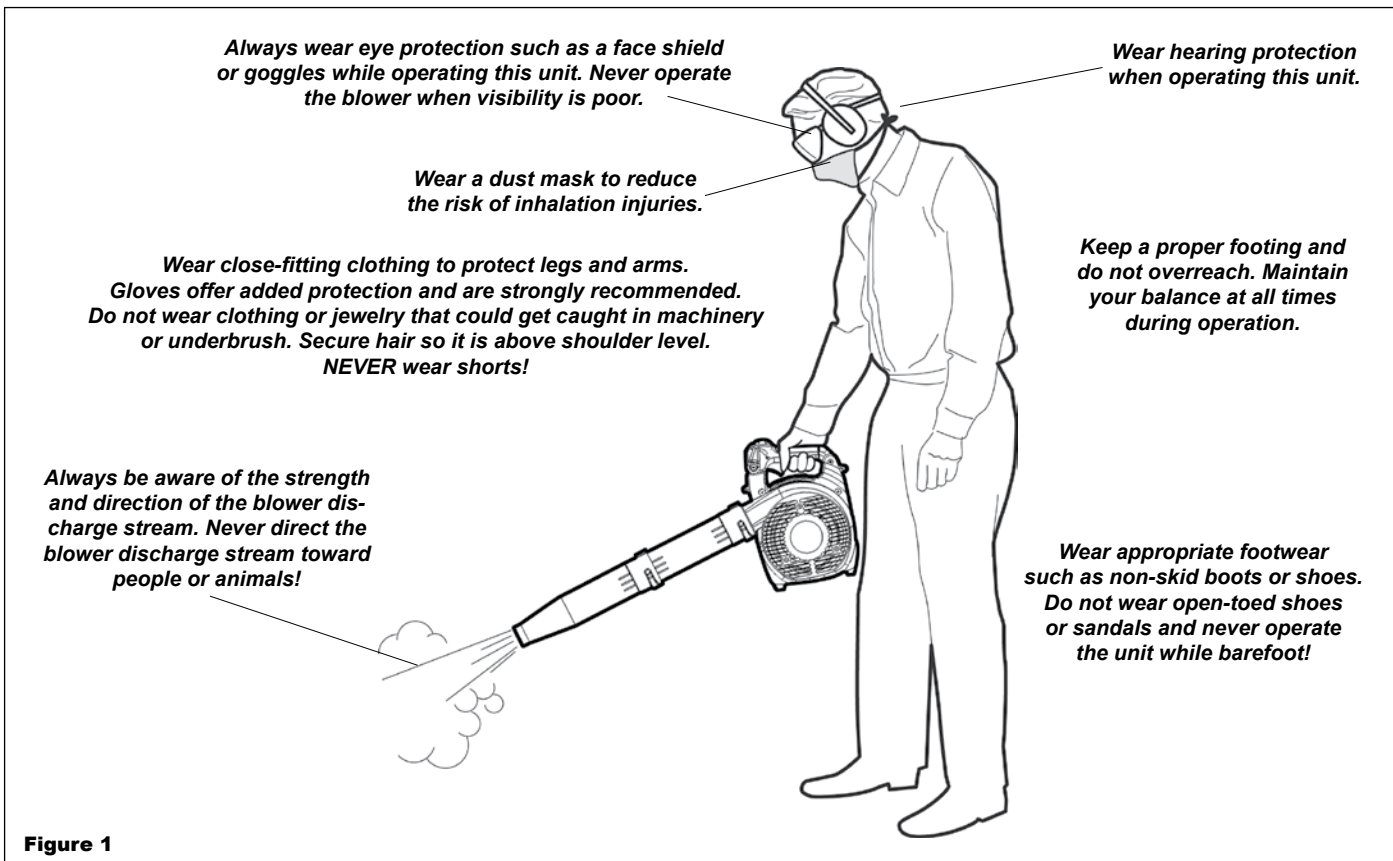
Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings.

- **ALWAYS** stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit.

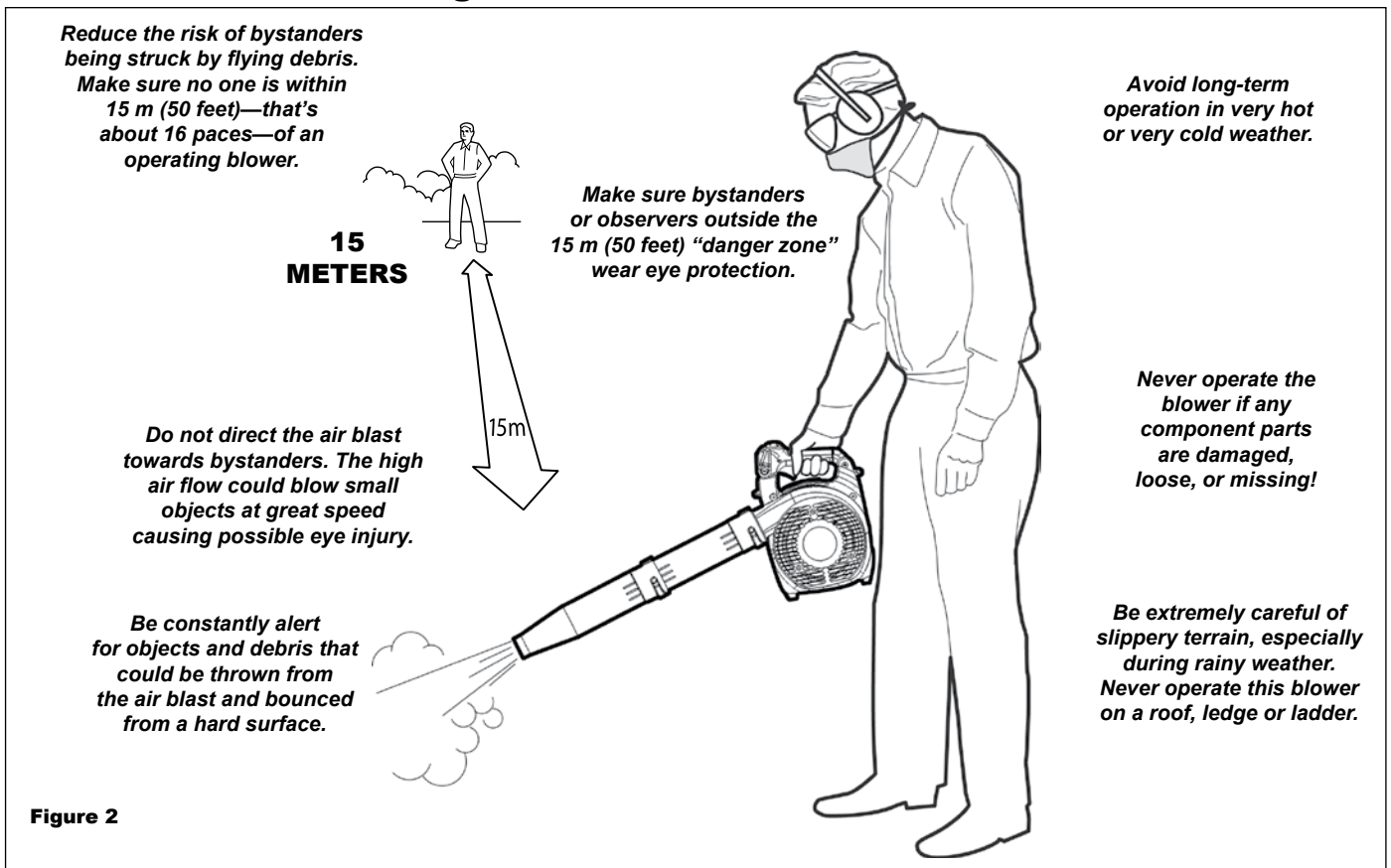
- **DO NOT** start or operate unit unless all guards and protective covers are properly assembled to unit.

- **NEVER** reach into any opening while the engine is running. Moving parts may not be visible through openings.

The Properly Equipped Operator



Be Aware of the Working Environment



Unit Description

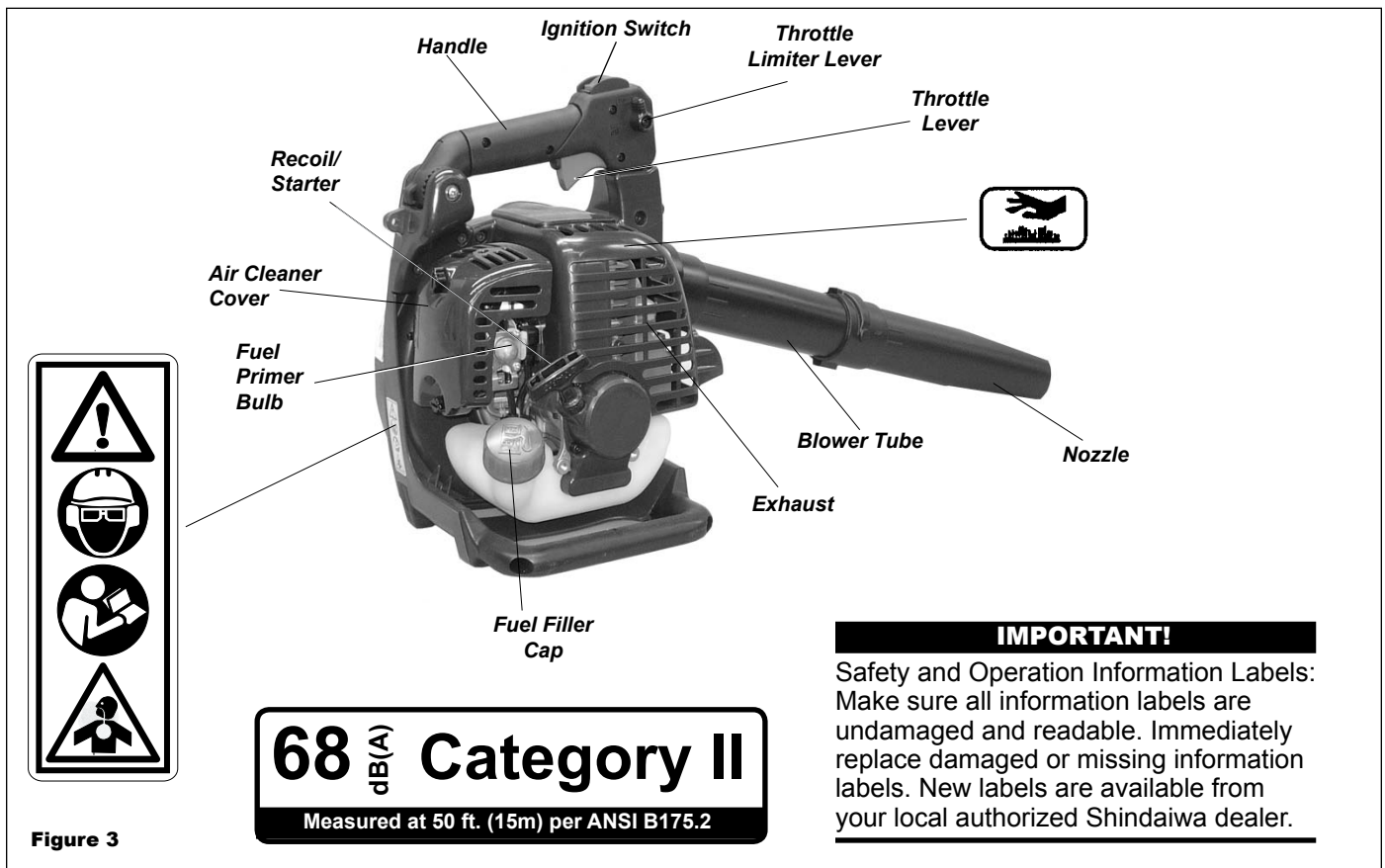


Figure 3

Contents

Before assembling the blower, make sure you have all required components.

- Power unit and blower assembly.
- Owner's/Operator's Manual
- Blower tube
- Blower nozzle
- Assembly Tool (s)

Carefully inspect all components for damage.

IMPORTANT!

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

Specifications

| Model | EB254 |
|--|--|
| Engine Type | 4-cycle air cooled gasoline engine, vertical cylinder |
| Engine Bore x Stroke | 34 mm x 27 mm (1.3 in x 1.1 in.) |
| Engine Displacement | 24.5cc (1.5 in ³) |
| Unit Weight (without blower tube) Less Fuel | 4.9 kg (10.8 lb) |
| Unit Dimensions (LxWxH) | 897 x 255 x 375 mm (35 x 10 x 15 in) |
| Fuel Tank Capacity | 0.6 liter/20.4 oz. |
| Fuel/oil ratio | 50:1 with *ISO-L-EGD or JASO FD class engine oil |
| Carburetor | Diaphragm type |
| Ignition | CDI (Capacitor Discharge Ignition) |
| Spark Plug | NGK CMR5H |
| <i>Electrode Gap</i> | 0.6 mm (.024 in) |
| <i>Torque</i> | 16.7 - 18.6 Nm / 148-165 in • lbs |
| Air Cleaner | Dry Element |
| Muffler Type | Spark arrestor muffler or spark arrestor muffler with catalyst |
| Starting Method | Recoil Starter |
| Stopping Method | Slide Switch (grounding type) |
| Average Air Speed | 76 m/sec. (170 MPH) |
| Maximum Air Speed | 91.64 m/sec. (205 MPH) |
| Air Volume | 8.78 m ³ /min. (310 cu. ft./min.) |
| Sound Level @ 50 ft. dB(A) scale per ANSI B175.2 | 68 dB(A) |
| Idle Speed (RPM) | 3,000 |
| Wide Open Throttle (RPM) | 8,600 |

Specifications are subject to change without notice.

Emission Control (Exhaust & Evaporative)

EPA 2010 and Later

The emission control system for the engine is EM (engine modification) and, if the second to last character of the Engine Family on the Emission Control Information label (sample below) is "C", "K", or "T", the emission control system is EM and TWC (3-way catalyst). The fuel tank/fuel line emission control system is EVAP (evaporative emissions). Evaporative emissions for California models may only be applicable to fuel tanks.



An Emission Control Label is located on the engine. (This is an EXAMPLE ONLY; information on label varies by engine FAMILY).

PRODUCT EMISSION DURABILITY (EMISSION COMPLIANCE PERIOD)

The 300 hour emission compliance period is the time span selected by the manufacturer certifying the engine emissions output meets applicable emissions regulations, provided that approved maintenance procedures are followed as listed in the Maintenance Section of this manual.

Assembling the Blower



WARNING!

Danger from rotating impeller!

Stop the engine before installing or removing the blower tubes! Never perform any maintenance or assembly procedures on this unit while the engine is running!

Place the blower upright on the ground or on a sturdy work surface.

1. Grasp the blower tube as shown, and push the tube over the blower discharge port and locking pins.

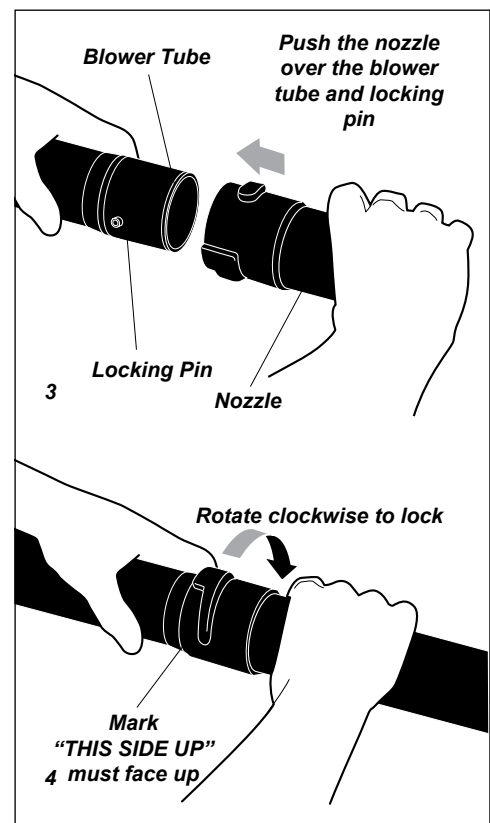
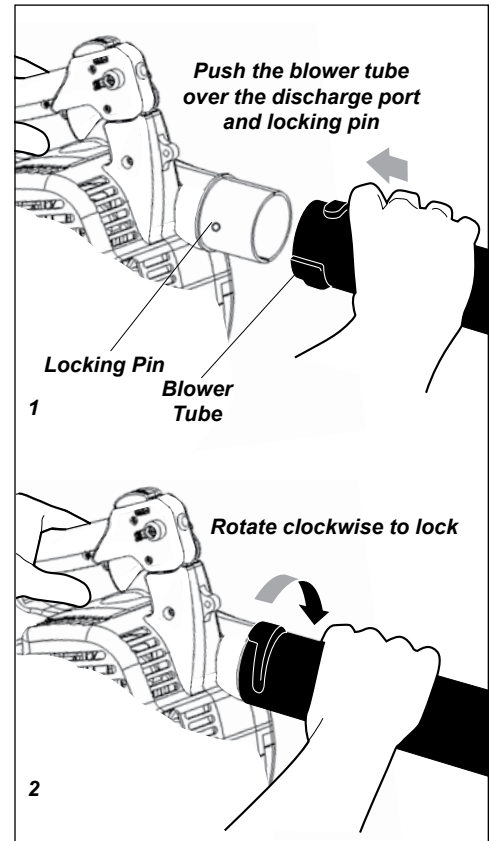
2. Lock the blower tube to the blower discharge port by rotating the tube as shown.

3. Grasp the nozzle and then push the nozzle over the straight tube and locking pins.

4. Lock the nozzle to the straight tube by rotating the nozzle as shown.

IMPORTANT!

Blower tube installation affects both blower balance and performance! The tube and nozzle are correctly installed when the mark "THIS SIDE UP" is visible to the operator during normal operation.



Mixing Fuel



WARNING!

Alternative fuels, such as E15 (15% ethanol), E-85 (85% ethanol) or any fuels not meeting Shindaiwa requirements are NOT approved for use in Shindaiwa gasoline engines. Use of alternative fuels may cause performance problems, loss of power, overheating, fuel vapor lock, and unintended machine operation, including, but not limited to, improper clutch engagement. Alternative fuels may also cause premature deterioration of fuel lines, gaskets, carburetors and other engine components.

Fuel Requirements

Gasoline - Use 89 Octane [R+M/2] (mid grade or higher) gasoline known to be good quality. Gasoline may contain up to 10% Ethanol (grain alcohol) or 15% MTBE (methyl tertiary-butyl ether). Gasoline containing methanol (wood alcohol) is **NOT** approved.

Hybrid 4™ Mixture Oil - Engine oil meeting ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345/FD standards must be used. Shindaiwa highly recommends using Shindaiwa Red Armor™ engine oil in all Shindaiwa Hybrid 4™ engines to protect the engine from harmful carbon build up, maintain engine performance, and increase engine life. Shindaiwa Red Armor™ engine oil exceeds ISO-L-EGD and J.A.S.O. M345/FD performance requirements. Engine problems due to inadequate lubrication caused by failure to use an ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345/FD certified oil will void the engine warranty.

IMPORTANT!

Shindaiwa Red Armor™ engine oil may be mixed at 50:1 ratio for application in all Shindaiwa engines sold in the past, regardless of ratio specified in those manuals.

IMPORTANT!

Stored fuel ages. Do not mix more fuel than you expect to use in thirty (30) days, ninety (90) days when a fuel stabilizer is added. Use of unmixed, improperly mixed, or stale fuel, may cause hard starting, poor performance, or severe engine damage and void the product warranty. Read and follow instructions in the Long Term Storage section of this manual.

Examples of 50:1 mixing quantities

| Fuel to Oil Mix - 50:1 Ratio | | | |
|------------------------------|---------|--------|-----|
| U.S. | | METRIC | |
| GAS | OIL | GAS | OIL |
| Gallons | Fl. oz. | Liter | cc. |
| 1 | 2.6 | 4 | 80 |
| 2 | 5.2 | 8 | 160 |
| 5 | 13 | 20 | 400 |

Handling Fuel



DANGER

Fuel is **VERY** flammable. Use extreme care when mixing, storing or handling or serious personal injury may result.

- Use an approved fuel container.
- DO NOT smoke near fuel.
- DO NOT allow flames or sparks near fuel.
- Fuel tanks/cans may be under pressure. Always loosen fuel caps slowly allowing pressure to equalize.
- NEVER refuel a unit when the engine is HOT or RUNNING!
- DO NOT fill fuel tanks indoors. ALWAYS fill fuel tanks outdoors over bare ground.
- DO NOT overfill fuel tank. Wipe up spills immediately.
- Securely tighten fuel tank cap and close fuel container after refueling.
- Inspect for fuel leakage. If fuel leakage is found, do not start or operate unit until leakage is repaired.
- Move at least 3m (10 ft.) from refueling location before starting the engine.

Mixing Instructions

1. Fill an approved fuel container with half of the required amount of gasoline.
2. Add the proper amount of engine oil to gasoline.
3. Close container and shake to mix oil with gasoline.
4. Add remaining gasoline, close fuel container, and remix.

IMPORTANT!

Spilled fuel is a leading cause of hydrocarbon emissions. Some states may require the use of automatic fuel shut-off containers to reduce fuel spillage.

After use

- DO NOT store a unit with fuel in its tank. Leaks can occur. Return unused fuel to an approved fuel storage container.

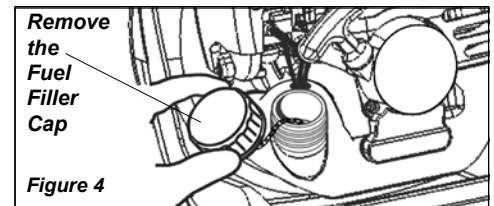
Storage - Fuel storage laws vary by locality. Contact your local government for the laws affecting your area. As a precaution, store fuel in an approved, airtight container. Store in a well-ventilated, unoccupied building, away from sparks and flames.

IMPORTANT!

Stored fuel may separate. ALWAYS shake fuel container thoroughly before each use.

Filling the Fuel Tank

1. Place the blower on a flat, level surface.
2. Clear any dirt or other debris from around the fuel filler cap.
3. Remove the fuel cap, and fill the tank with clean, fresh fuel.
4. Reinstall the fuel filler cap and tighten firmly.
5. Wipe away any spilled fuel before starting the blower.



Starting the Engine



WARNING!

Danger from rotating impeller!

The impeller will rotate whenever the blower is operated! Never operate this blower unless the intake cover and blower tubes are properly installed and in good working order!



WARNING!

Danger from thrown dust or debris!

Always wear eye protection when operating this machine! Never direct the blower stream toward people or animals! Never operate this blower unless all controls are properly installed and in good working order.

CAUTION!

The recoil starter can be damaged by abuse!

- Never pull the starter cord to its full length!
- Always engage the starter before cranking the engine!
- Always rewind the starter cord slowly!

Never operate the blower if blower tubes are missing or damaged!

Starting the Engine (continued)

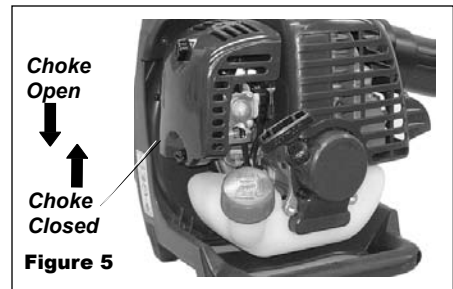
Starting Procedure

1. Place the blower on the ground.
2. Prime the fuel system by repeatedly depressing the fuel primer bulb until no air bubbles are visible in the fuel discharge line.

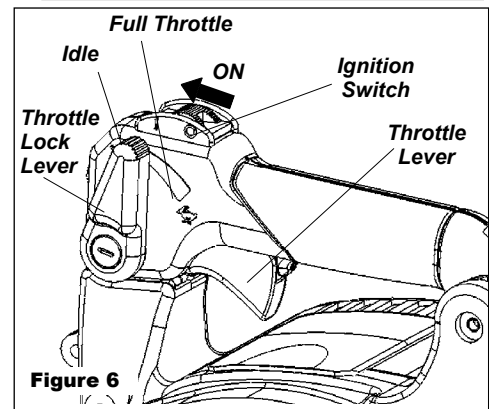
IMPORTANT!

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

3. **Cold Engine Only.** Choke the engine by moving the choke lever up (choke is closed). See Figure 5.
4. Slide the ignition switch to the "I" (ON) position, then depress the throttle lever half way and lock throttle by moving throttle lock lever halfway down. See Figure 6.

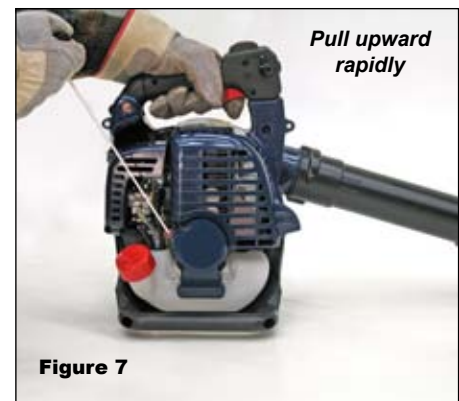


5. Hold the blower firmly with your left hand on the handle.
6. Using your right hand, pull the starter handle slowly until you feel the starter engage. See Figure 7.
7. As the starter engages, pull the starter handle upward rapidly.
8. If necessary, repeat Steps 6 and 7 until the engine starts.



When The Engine Starts–

1. Open the choke (if it is not already open) by moving the choke lever down.
2. If the engine does not continue to run, repeat the appropriate starting procedures for a cold or warm engine.
3. Reduce engine to idle speed until operating temperature is reached (2–3 minutes).



The blower should now be ready for use.

If The Engine Does Not Start–

Repeat the appropriate starting procedures for warm or cold engine. If the engine still will not start, follow the "Starting a Flooded Engine" procedure.



WARNING!

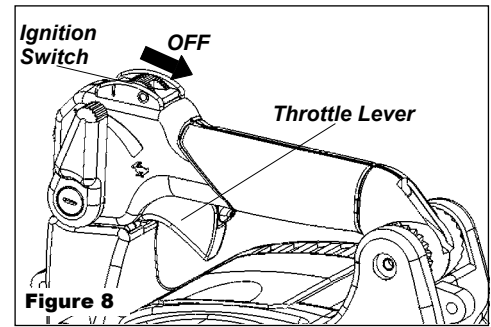
Never operate the blower unless all controls are properly installed and in good working order. Never operate the blower if the cylinder cover is missing or damaged!

Starting A Flooded Engine

1. Slide the ignition switch to the "I" (ON) position.
2. Open the choke, put the throttle lever in the full throttle position, then clear excess fuel from the combustion chamber by cranking the engine several times.
3. If the engine still fails to start or fire, refer to the troubleshooting flow chart at the end of this manual.

Stopping The Engine

1. Cool the engine by allowing it to run at idle for 2–3 minutes.
2. Slide the ignition switch towards the rear to “O” (OFF). See Figure 8.



Operating Blower



WARNING!

Always wear safety glasses, hearing protection and a face filter mask or serious personal injury may result. Do not point the blower pipe in the direction of people or pets.

IMPORTANT!

Use reduced speed only when performing light-duty tasks or to comply with local noise regulations. Continuous low speed operation may allow fuel/oil residue to build-up on the piston and cause rapid build-up of carbon on the spark arrestor screen, resulting in overheating and engine damage. To reduce harmful build-up, run engine at wide open throttle for at least 5 minutes every hour, and inspect/clean the spark arrestor screen after approximately 40 hours of operation.

Read the Safety Section carefully.



WARNING!

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings. Always stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit.



WARNING!

Engine exhaust IS HOT, and contains Carbon Monoxide (CO), a poison gas. Breathing CO can cause unconsciousness, serious injury, or death. Exhaust can cause serious burns. ALWAYS position unit so that exhaust is directed away from your face and body.



WARNING!

Operation of this equipment may create sparks that can start fires. This unit is equipped with a spark arrestor to prevent discharge of hot particles from the engine. Metal blade use also can create sparks if the blade strikes rocks, metal, or other hard objects. Contact local fire authorities for laws or regulations regarding fire prevention requirements.

Throttle Control

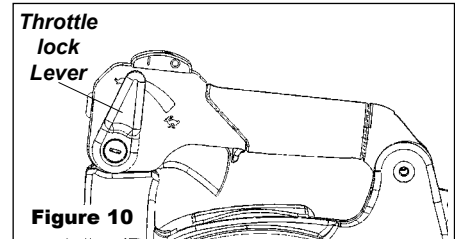
The EB254 is equipped with a multi-function throttle control. The “Cruise” function allows the operator to use a thumb controlled lever for constant speed use without using the throttle trigger. This is useful for limiting the fatigue caused from holding the throttle for extended periods of time.

On the opposite side, a two position “Limiter” control allows full engine speed when set for “Turbo” or limits the throttle to a pre-set engine speed when set to low noise (dB) setting.

Cruise Function

Using the right thumb, push the throttle lock lever down until the desired min^{-1} (rpm) setting is reached. See Figure 10.

To bring RPM down to idle, push lever back up into original position.

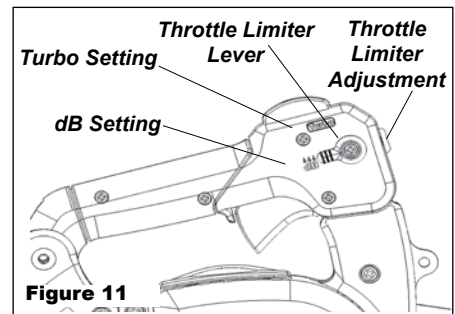


Throttle Limiter

The EB254 has a throttle limiter function that allows the operator to pre-set the maximum engine speed. This is useful for reducing the noise emitted by the blower in noise sensitive areas.

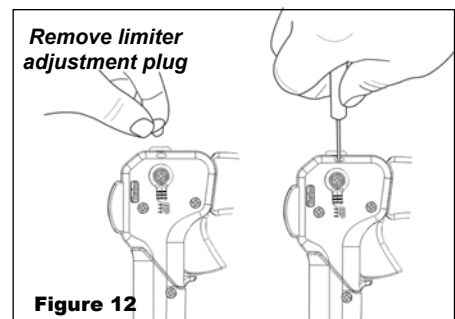
Setting Throttle Limiter:

For reduced noise setting, move the throttle limiter located on the right side of the throttle control to the dB setting. See Figure 11.



Adjusting Throttle Limiter:

1. Remove the plug located at the top of the throttle assembly. See Figure 12.
2. Move the throttle limiter lever to the “dB” setting. See Figure 12.
3. With the engine running and while depressing the throttle trigger, use a small cross head screw driver to turn the adjustment screw clockwise to decrease min^{-1} (rpm) and counter-clockwise to increase until desired limited min^{-1} (rpm) is achieved.
4. Reinstall limiter adjustment plug.



IMPORTANT!

To avoid engine damage due to over-revving do not block blower pipe.

1. Use only during appropriate hours.
2. Control engine speed with throttle lever, or for continuous use, set engine speed with throttle lock lever.
3. Use lower speed to blow debris from hard surfaces. Additional speed may be necessary to clean debris, snow, etc. from lawns and flowerbeds.

NOTE:

Never use a higher speed setting than necessary to perform a task. Remember, the higher the engine speed, the louder the blower noise. Minimize dust by using blower at lower speeds. Keep debris on your property.
Be Smart - be a good neighbor.

Two-hand Operation

For added comfort and control, grip throttle control handle with left hand, and lower handle/stand with right hand.

Maintenance

IMPORTANT!

Maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual. However, warranty repairs must be performed by a dealer or service center authorized by Echo, Inc. The use of parts that are not equivalent in performance and durability to authorized parts may impair the effectiveness of the emission control system and may have a bearing on the outcome of a warranty claim.

IMPORTANT!

Inspect the entire blower for loose, damaged, or missing components, and repair as necessary.

NOTE:

Using non-standard replacement parts could invalidate your Shindaiwa warranty.



WARNING!

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



WARNING!

Non-standard parts may not operate properly with your unit and may cause damage and lead to personal injury.

Maintenance Intervals

| COMPONENT / SYSTEM | MAINTENANCE PROCEDURE | DAILY OR BEFORE USE | EVERY REFUEL | 3 MONTHS OR 135 HOURS | YEARLY 600 HOURS |
|------------------------|-------------------------|---------------------|--------------|-----------------------|------------------|
| Air Filter | Inspect/Clean | I / C * | | R * | |
| Choke Shutter | Inspect/Clean | I / C | | | |
| Fuel Filter | Inspect/Replace | | | I * | I / R * |
| Fuel Cap Gasket | Inspect/Replace | | | I * | R * |
| Fuel System | Inspect/Replace | I (1) * | I (1) * | | |
| Spark Plug | Inspect/Clean/Replace | | | I / C / R * | |
| Cooling System | Inspect/Clean | I / C | | | |
| Valve Adjustment | Inspect/Adjust | | | (2) | |
| Muffler Spark Arrestor | Inspect/Clean/Replace | | | I / C / R * | |
| Recoil Starter Rope | Inspect/Clean | I / C * | | | |
| Screws/Nuts/Bolts | Inspect/Tighten/Replace | I * | | | |

MAINTENANCE PROCEDURE LETTER CODES: I = INSPECT, R = REPLACE, C = CLEAN

IMPORTANT NOTE - Time intervals shown are maximum. Actual use and your experience will determine the frequency of required maintenance.

MAINTENANCE PROCEDURE NOTES:

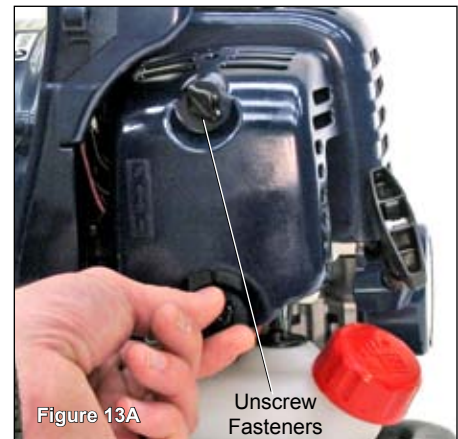
(1) Low evaporative fuel tanks DO NOT require regular maintenance to maintain emission integrity.

(2) Adjust every 135 hours.

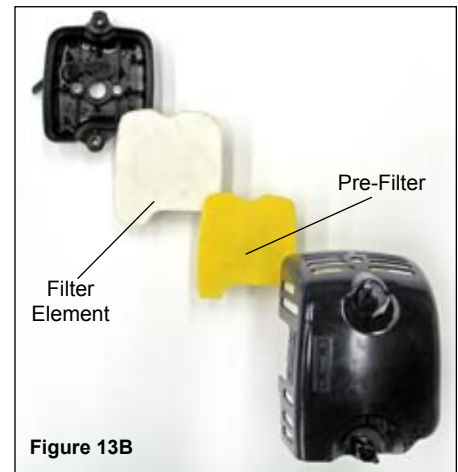
* All recommendations to replace are based on the finding of damage or wear during inspection.

Air Filter

1. Remove the air cleaner cover by loosening the thumb screw and lifting up. See Figure 13A.



2. Remove and inspect the pre-filter. If the pre-filter is torn or otherwise damaged, replace it with a new one. See Figure 13B.
3. Clean the pre-filter with soap and water. Let dry before reinstalling.
4. Inspect the air cleaner element. If the element is damaged or distorted, replace it with a new one. See Figure 13B.
5. Tap filter gently on a hard surface to dislodge debris from element or use compressed air from the inside to blow debris out and away from the air filter element.



IMPORTANT!

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

6. Install the filter element, pre-filter and cover in the reverse order of removal.

CAUTION!

Never operate the blower if the air cleaner assembly is damaged or missing!

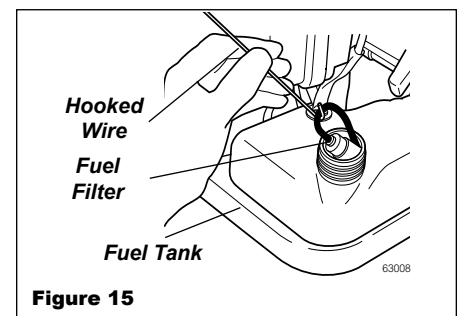
Fuel Filter

- **FUEL FILTER** Use a hooked wire to extract the fuel filter from inside the fuel tank. See Figure 15.

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.

- Inspect the filter element for signs of contamination from debris. A contaminated fuel filter should be replaced with a new Shindaiwa replacement element. Before reinstalling the filter, inspect the condition of the fuel line. If you note damage or deterioration, the blower should be removed from service until it can be inspected by a Shindaiwa-trained service technician.



NOTE:

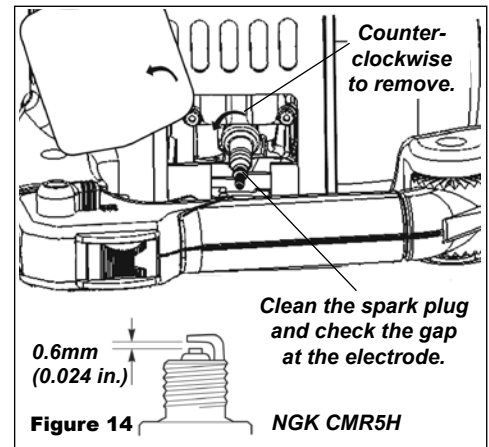
Federal EPA regulations require all model year 2012 and later gasoline powered engines produced for sale in the United States to be equipped with a special low permeation fuel supply hose between the carburetor and fuel tank. When servicing model year 2012 and later equipment, only fuel supply hoses certified by EPA can be used to replace the original equipment supply hose. Fines up to \$37,500 may be enforced for using an un-certified replacement part.

Spark Plug

CAUTION!

Never allow dirt or debris to enter the cylinder bore! Before removing the spark plug, thoroughly clean the spark plug and cylinder head area! Allow the engine to cool before servicing the spark plug! Cylinder threads can be damaged by tightening or loosening the spark plug while the engine is hot!

1. Use the spark plug wrench to remove the spark plug. See Figure 14.
2. Clean and adjust the spark plug gap to 0.6mm (0.024 in.). If the plug must be replaced, use a NGK CMR5H or equivalent type plug of the correct heat range.
3. Install the spark plug finger-tight in the cylinder head, then tighten it firmly with the spark plug wrench. If a torque wrench is available, torque the spark plug to 16.7-18.6 Nm (148-165 inch-pounds)



Cooling System

CAUTION!

The engine is cooled by air drawn into the air intake cover on the blower housing. The blower fan then pushes the cooling air through an opening in the fan housing, forcing it past the cylinder cooling fins. Failure to keep the cooling system and its passages clear of debris will likely result in engine overheating, a major cause of serious engine problems that can lead to failure.

- Remove all dirt and debris from blower exterior and the engine.
1. Remove engine cover.
 2. Clean cylinder fins to allow cooling air to pass freely.
 3. Carefully remove any accumulations of dirt or debris from the muffler and fuel tank. Dirt build-up in these areas can lead to engine overheating, fire or premature wear.

Valve Adjustment

- Combustion chamber should be decarbonized, and the valve clearance should be adjusted. It is highly recommended that this is done by a Shindaiwa-trained service technician.

IMPORTANT!

The valve clearance should be adjusted. It is highly recommended that this is done by a Shindaiwa-trained service technician.

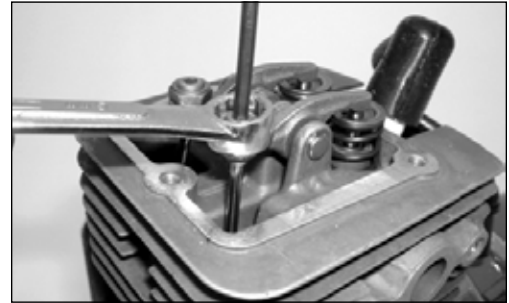
CAUTION!

- Performing a valve adjustment incorrectly may cause hard starting and/or can damage the unit.
- If you are unfamiliar with this engine or uncomfortable with this procedure, consult with an authorized Shindaiwa servicing dealer.

1. Remove cylinder cover, rocker arm cover, and set piston at TDC-compression.
2. Loosen adjuster locknut so that the 2.5 mm Allen socket head adjustment screw can turn freely.
3. Insert 0.10 mm (0.004 in.) feeler gauge between valve stem tip and rocker arm.
4. Turn adjustment screw (clockwise = tighter, counter-clockwise = looser) until feeler gauge is almost snug. Back off just enough to allow gauge to slip out with limited resistance.
5. While holding adjustment screw in place with Allen driver, tighten locknut with wrench.
6. Turn engine over several times, and return to TDC-compression. Re-check with proper feeler gauge to make sure clearance adjustment did not change as a result of tightening locknut. Readjust as necessary.
7. Replace rocker arm cover gasket to assure proper sealing and install cover.

IMPORTANT!

If new gasket is not available and/or old gasket is not damaged, old gasket may be reused. Never use cracked or damaged gaskets!



Exhaust System

Spark Arrester Maintenance



WARNING!

Never operate this blower with a damaged or missing muffler or spark arrester! Operating with missing or damaged exhaust components is a fire hazard, and can also damage your hearing!

Hard starting or a gradual loss of performance can be caused by carbon deposits lodged in the spark arrester screen. For maximum performance, the spark arrester screen should be periodically cleaned as follows. See Figure 16.

1. Remove engine cover to expose muffler. Remove the spark arrester from the muffler. The screen is press-fit in place.
2. Remove screen from cover.
3. Use a plastic scraper or wire brush to remove carbon deposits from the arrester screen and wipe clean exhaust base.
4. Inspect the screen carefully, and replace any screen that has been perforated, distorted, or is otherwise unserviceable.
5. Press the spark arrester screen into the arrester cover.

If carbon accumulation in the muffler or cylinder are severe, or if you do not notice an improvement in performance after servicing, have the unit inspected by an authorized servicing Shindaiwa dealer.

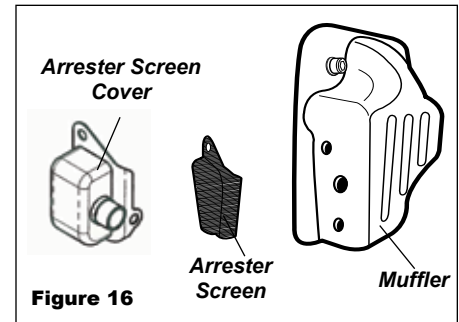


Figure 16

Carburetor Adjustment

Engine Break-In

New engines must be operated a minimum duration of two tanks of fuel break-in before carburetor adjustments can be made. During the break-in period your engine performance will increase and exhaust emissions will stabilize. Idle speed can be adjusted as required.

High Altitude Operation

This engine has been factory adjusted to maintain satisfactory starting, emission, and durability performance up to 1,100 feet above sea level (ASL) (96.0 kPa). To maintain proper engine operation and emission compliance above 1,100 feet ASL the carburetor may need to be adjusted by an authorized Shindaiwa service dealer.

IMPORTANT!

If the engine is adjusted for operation *above* 1,100 feet ASL, the carburetor must be re-adjusted when operating the engine *below* 1,100 feet ASL, otherwise severe engine damage may result.

NOTE:

Every unit is run at the factory and the carburetor is set in compliance with emission regulations. Carburetor adjustments, other than idle speed, must be performed by an authorized Shindaiwa dealer.

Idle Adjustment

Before adjustment make sure that:

- Air filter is clean and properly installed.
- Spark arrestor screen is free of carbon.
- Blower pipes are installed.

1. Start engine, run at idle for 2-3 minutes.

2. Check idle speed and reset if necessary. If a tachometer is available, idle speed screw should be set to the specifications found on Page 6 “Specifications” of this manual. Turn idle screw clockwise to increase idle speed; counter clockwise to decrease idle speed.

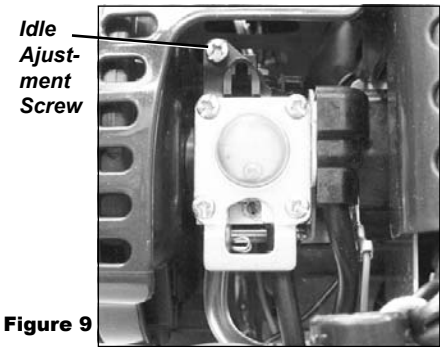


Figure 9

Long Term Storage

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

- Clean external parts thoroughly.
- Drain all the fuel from the fuel tank.

IMPORTANT!

Stored fuel ages. Do not mix more fuel than you expect to use in thirty (30) days, ninety (90) days when a fuel stabilizer is added.

CAUTION!

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

- Remove the remaining fuel from the fuel lines and carburetor.
 1. Prime the primer bulb until no more fuel is passing through.
 2. Start and run the engine until it stops running.
 3. Repeat steps 1 and 2 until the engine will no longer start.
- Remove the spark plug and pour about 1/4 ounce of engine oil into the cylinder through the spark plug hole. Slowly pull the recoil starter 2 or 3 times so oil will evenly coat the interior of the engine. Reinstall the spark plug.
- Before storing the unit, repair or replace any worn or damaged parts.
- Remove the air cleaner element from the carburetor and clean it thoroughly with soap and water. Let dry and reassemble the element.
- Store the unit in a clean, dust-free area.

Troubleshooting Guide

ENGINE DOES NOT START OR HARD TO START

| What To Check | Possible Cause | Remedy |
|-------------------|--|--|
| Vaporlock. | Engine hot/heat soaked. Low fuel quality. | Let cool completely and restart. Refill with fresh, clean unleaded gasoline with a pump octane of 89 or higher mixed with an air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio. |
| Valve adjustment. | Valve clearance too tight. Valve clearance too loose. | Consult with an authorized Shindaiwa servicing dealer. Adjust valves. |

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 Shindaiwa servicing dealer. |
| Good compression? YES | NO Loose spark plug. Excess wear on cylinder, piston, rings. | Tighten and re-test. Consult with an authorized Shindaiwa servicing dealer. |
| Does the tank contain fresh fuel of the proper grade? YES | NO Fuel incorrect, stale, or contaminated; mixture incorrect. | Refill with fresh, clean unleaded gasoline with a pump octane of 89 or higher mixed with an air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio. |
| Is fuel visible and moving in the return line when priming? YES | NO Check for clogged fuel filter and/or vent. Priming pump not functioning properly. | Replace fuel filter or vent as required. Re-start. Consult with an authorized Shindaiwa servicing dealer. |
| Is there spark at the spark plug wire terminal? YES | NO The ignition switch is in "O" (OFF) position. Shorted ignition ground. Faulty ignition unit. | Move switch to "I" (ON) position and re-start. Consult with an authorized Shindaiwa servicing dealer. |
| Check the spark plug. | If the plug is wet, excess fuel may be in the cylinder. The plug is fouled or improperly gapped. The plug is damaged internally or of the wrong size. | See "Starting a Flooded Engine" Clean and gap the spark plug. Check the Specifications section for the correct plug and gap for your unit. Restart. Replace the spark plug. Check the Specifications section for the correct plug and gap for your unit. Restart. |

Troubleshooting Guide (continued)

LOW POWER OUTPUT

| What To Check | Possible Cause | Remedy |
|--|--|--|
| <p>Is the engine overheating?</p> | Operator is overworking the unit. | Use a lower throttle setting. |
| | Carburetor mixture is too lean. | Consult with an authorized Shindaiwa servicing dealer. |
| | Improper fuel ratio. | Refill with fresh, clean unleaded gasoline with a pump octane of 89 or higher mixed with an air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio. |
| | Fallen leaves or debris on intake cover. | Clean the intake cover. |
| | 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 Shindaiwa servicing dealer. |
| <p>Engine is rough at all speeds. May also have black smoke and/or unburned fuel at the exhaust.</p> | Clogged air cleaner element. | Service the air cleaner element. |
| | Loose or damaged spark plug. | Tighten or replace the spark plug. Check the <i>Specifications</i> section for the correct plug and gap for your unit. |
| | Air leakage or clogged fuel line. | Repair or replace fuel filter and/or fuel line. |
| | Water in the fuel. | Refill with fresh, clean unleaded gasoline with a pump octane of 89 or higher mixed with an air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio. |
| | Piston seizure. | Consult with an authorized Shindaiwa servicing dealer. |
| | Faulty carburetor and/or diaphragm. | |
| <p>Engine is knocking.</p> | Overheating condition. | Consult with an authorized Shindaiwa servicing dealer. |
| | Improper fuel. | Refill with fresh, clean unleaded gasoline with a pump octane of 89 or higher mixed with an air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio. |
| | Carbon deposits in the combustion chamber. | Consult with an authorized Shindaiwa servicing dealer. |

Troubleshooting Guide (continued)

ADDITIONAL PROBLEMS

| Symptom | Possible Cause | Remedy |
|--|---|--|
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Poor acceleration.</div> | Clogged air filter. | Clean the air filter. |
| | Clogged fuel filter. | Replace the fuel filter. |
| | Lean fuel/air mixture. | Consult with an authorized Shindaiwa servicing dealer. |
| | Idle speed set too low. | Adjust idle. Check <i>Specifications</i> page for correct idle speed. |
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Engine stops abruptly.</div> | Ignition switch turned off. | Reset the switch and re-start. |
| | Fuel tank empty. | Refill with fresh, clean unleaded gasoline with a pump octane of 89 or higher mixed with an air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio. |
| | Water in the fuel. | |
| | Clogged fuel filter. | Replace fuel filter. |
| | Shorted spark plug or loose terminal. | Clean or replace spark plug. Check the <i>Specifications</i> section for the correct plug and gap for your unit. Tighten the terminal. |
| | Ignition failure. | Replace the ignition unit. |
| | Piston seizure. | Consult with an authorized Shindaiwa servicing dealer. |
| | Heat sensor is activated, due to restricted air flow at intake cover. (EB854 ONLY) | Clean debris blocking intake cover. Restart. Idle more than 1 minute. If engine stops again, consult with an authorized Shindaiwa servicing dealer. |
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Engine difficult to shut off.</div> | Ground (stop) wire is disconnected, or switch is defective. | Test and replace as required. |
| | Overheating due to incorrect spark plug. | Replace the spark plug. Check the <i>Specifications</i> section for the correct plug and gap for your unit. Restart. |
| | Overheated engine. | Idle engine until cool. |
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Top of engine is getting dirty and oily.</div> | Valve cover is leaking. | Consult with an authorized Shindaiwa servicing dealer. |
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Engine will not idle down.</div> | Idle set too high. | Adjust idle. Check <i>Specifications</i> page for correct idle speed. |
| | Engine has an air leak. | Consult with an authorized Shindaiwa servicing dealer. |
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Excessive vibration.</div> | Debris build-up in impeller. | Clean debris from impeller as required. |
| | Loose or damaged impeller. | Inspect and replace impeller as required. |
| | Loose or damaged engine mounts. | Tighten or replace engine mounts as required. |
| <div style="border: 1px solid black; padding: 5px; width: fit-content;">Engine overspeeding.</div> | Blower intake or discharge ports or tubes are clogged with debris. | Inspect and remove debris. |
| | Impeller blades are missing or damaged. | Consult with an authorized Shindaiwa servicing dealer. |

**SHINDAIWA LIMITED WARRANTY STATEMENT FOR
PRODUCT SOLD IN USA AND CANADA BEGINNING 01/01/2010**

ECHO, INC'S RESPONSIBILITY

ECHO Incorporated's (ECHO, INC.) Limited Warranty, provides to the original purchaser that this Shindaiwa product is free from defects in material and workmanship. Under normal use and maintenance from date of purchase, ECHO, INC. agrees to repair or replace at it's discretion, any defective product free of charge at any authorized Shindaiwa servicing dealer within listed below application time periods, limitations and exclusions. **THIS LIMITED WARRANTY IS ONLY APPLICABLE TO SHINDAIWA PRODUCTS SOLD BY AUTHORIZED SHINDAIWA DEALERS. IT IS EXTENDED TO THE ORIGINAL PURCHASER ONLY, AND IS NOT TRANSFERABLE TO SUBSEQUENT OWNERS EXCEPT FOR EMISSION RELATED PARTS.** Repair parts and accessories replaced under this warranty are warranted only for the balance of the original unit or accessory warranty period. Any damage caused by improper installation or improper maintenance is not covered by this warranty. All parts or products replaced under warranty become the property of ECHO, INC. This warranty is separate from the Emission control warranty statement supplied with your new product. Please consult the Emission Control Warranty Statement for details regarding emission related parts. For a list of Authorized Shindaiwa Dealers refer to WWW.SHINDAIWA.COM or call **1-877-986-7783**.

OWNER'S RESPONSIBILITY

To ensure trouble free warranty coverage it is important that you register your Shindaiwa equipment on-line at WWW.SHINDAIWA.COM or by filling out the warranty registration card supplied with your unit. Registering your product confirms your warranty coverage and provides a direct link if we find it necessary to contact you.

The owner shall demonstrate reasonable care and use, and follow preventative maintenance, storage, fuel and oil usage as prescribed in the operator's manual. Should a product difficulty occur, you must, at your expense, deliver or ship your Shindaiwa unit to an authorized Shindaiwa servicing dealer for warranty repairs (within the applicable warranty period), and arrange for pick-up or return of your unit after the repairs have been made. For your nearest authorized Shindaiwa servicing dealer, call Shindaiwa's Dealer Referral Center, at 1-877-986-7783 or you can locate a Shindaiwa servicing dealer at WWW.SHINDAIWA.COM. Should you require assistance or have questions concerning Shindaiwa's Warranty Statement, you can contact our Consumer Product Support Department at 1-800-673-1558 or contact us through the web at WWW.SHINDAIWA.COM.

PRODUCT WARRANTY PERIOD

RESIDENTIAL APPLICATION

- **2 YEAR WARRANTY** - Units for residential, or non-income producing use will be covered by this limited warranty for two (2) years from date of purchase.

EXCEPTIONS:

- For engine powered products, the electronic ignition module, flexible drive cable, and solid drive shaft are warranted for the life* of the product on parts only.
- Cutting attachments such as, but not limited to, bars, chains, sprockets, tines, blades, PowerBroom™, belts, and nylon trimmer heads for residential or non-income producing use will be covered for failures due to defects in material or workmanship for a period of 60 days from original product purchase date. Any misuse from contact with concrete, rocks, or other structures is not covered by this warranty.
- Multipurpose Tool Attachments carry the same warranty duration as the units they are designed to fit.

COMMERCIAL APPLICATION

- **90 DAY WARRANTY** - All Chain Saws and Cut-Off Saws for commercial, institutional, agricultural, industrial, or income producing use will be covered by this limited warranty for 90 Days from the date of purchase.
- **2 YEAR WARRANTY** - Units for commercial, institutional, agricultural, industrial, or income producing use will be covered by this limited warranty for two (2) years from the date of purchase.

EXCEPTIONS:

- For engine powered products, the electronic ignition module, flexible drive cables, and solid drive shafts are warranted for the life* of the product on parts only.
- Cutting attachments such as, but not limited to, bars, chains, sprockets, tines, blades, PowerBroom™, belts, and nylon trimmer heads for commercial, institutional, agricultural, industrial, rental, or income producing will be covered for failures due to defects in material or workmanship for a period of 30 days from original product purchase date. Any misuse from contact with concrete, rocks, or other structures is not covered by this warranty.
- Multipurpose Tool Attachments carry the same warranty duration as the units they are designed to fit.

RENTAL APPLICATION - 90 DAYS WARRANTY

- Units for rental use will be covered against defects in material and workmanship for a period of 90 days from the date of purchase.

* ECHO INC's liability under the "Lifetime" coverage is limited to furnishing parts specified under the PRODUCT WARRANTY PERIOD section of this warranty statement for "Life" free of charge for a period of ten (10) years after the date of the complete unit's final production.

PURCHASED REPAIR PARTS AND ACCESSORIES

- 90-day all applications

ATTENTION ENGINE POWERED PRODUCT OWNERS

This Shindaiwa engine powered product is a quality-engineered unit which has been manufactured to exact tolerances to provide superior performance. To help ensure the performance of the unit, it is required to use engine oil which meets the ISO-L-EGD Standard per ISO/CD 13738 and JASO M345/FD Standards. Shindaiwa Red Armor™ and Shindaiwa One™ are a premium engine oil specifically formulated to meet ISO-L-EGD (ISO/CD 13738) and JASO M345/FD Standards. The use of engine oils designed for other applications, such as for outboard motors or lawnmowers can result in severe engine damage, and will void your engine limited warranty.

THIS WARRANTY DOES NOT COVER DAMAGE CAUSED BY:

- Lack of lubrication or engine failure, due to the use of engine oils that do not meet the ISO-L-EGD (ISO/CD 13738) and JASO M345/FD Standards. Shindaiwa Red Armor™ and Shindaiwa One™ Engine Oil meets the ISO-L-EGD and JASO M345/FD Standard. Emission related parts are covered for 2 years regardless of engine oil used, per the statement listed in the EPA or California Emission Control Warranty Explanation.
- Damage caused by use of gasohol, containing methanol (wood alcohol), or gasoline containing less than 89 octane. Only use gasoline which contains 89 octane or higher. Gasohol which contains a maximum 10% ethanol (grain alcohol) or 15% MTBE (methyl/tertiary/butyl/ether) is also approved. The prescribed mixing ratio of gasoline to oil is listed on the Shindaiwa oil label and covered in your operator's manual.
- Engine damage caused by use of ether or any starting fluids.
- Damage caused by tampering with engine speed governor or emission components, or running engines above specified and recommended engine speeds as listed in your operator's manual.
- Operation of the unit with improperly maintained/removed cutting shield or removed/damaged air filter.
- Damage caused by dirt, pressure or steam cleaning the unit, salt water, corrosion, rust, varnish, abrasives, and moisture.
- Defects, malfunctions or failures resulting from abuse, misuse, neglect, modifications, alterations, normal wear, improper servicing, or use of unauthorized attachments.
- Incorrect storage procedures, stale fuel, including failure to provide or perform required maintenance services as prescribed in the operator's manual. Preventative maintenance as outlined in the operator's manual is the customer's responsibility.
- Failures due to improper set-up, pre-delivery service or repair service by anyone other than authorized Shindaiwa servicing dealer during the warranty period.
- Certain parts and other items are not warranted, including but not limited to: lubricants, starter cords, and engine tune-ups.
- Use of spark plugs other than those meeting performance and durability requirements of the OEM spark plug listed in the Operator's Manuals.
- Overheating or carbon scoring failures due to restricted, clogged exhaust port or combustion chamber, including damage to spark arrester screen.
- Adjustments after the first (30) thirty days and beyond, such as carburetor adjustment and throttle cable adjustment.
- Damage to gears or gear cases caused by contaminated grease or oil, use of incorrect type or viscosity of lubricants, and/or failure to comply with recommended grease or oil change intervals.
- Damage caused by pump or sprayer running dry, pumping or spraying caustic or flammable materials, or lack of or broken strainers.
- Additional damage to parts or components due to continued use after operational problem or failure occurs. Should operational problem or failure occur, the product should not be used, but delivered as is to an authorized Shindaiwa servicing dealer.

It is a dealer's and/or customer's responsibility to complete and return the warranty registration card supplied with your Shindaiwa product or by visiting WWW.SHINDAIWA.COM. Your receipt of purchase including date, model and serial number must be maintained and presented to an authorized Shindaiwa servicing dealer for warranty service. Proof of purchase rests solely with the customer. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so you may also have other specific legal rights which vary from state to state. This limited warranty is given by ECHO Incorporated, 400 Oakwood Rd., Lake Zurich, IL 60047.

DISCLAIMER OF IMPLIED WARRANTIES

This limited warranty is in lieu of all other expressed or implied warranties, including any warranty of FITNESS FOR A PARTICULAR PURPOSE OR USE and any implied warranty of **MERCHANTABILITY** otherwise applicable to this product. ECHO, INC. and its affiliated companies shall not be liable for any special incidental or consequential damage, including lost profits. There are no warranties extended other than as provided herein. This limited warranty may be modified only by ECHO, INC.

**99922201031
06/2010**

**ECHO INCORPORATED EMISSION CONTROL WARRANTY STATEMENT
FOR ECHO AND SHINDAIWA BRANDS**

The Environmental Protection Agency (EPA) and the California Air Resources Board (C.A.R.B.) and ECHO Incorporated (ECHO Inc.) are pleased to explain the emission control system warranty on your 2010 and later equipment/small off-road engine (SORE). New equipment/SORE must be designed, built and equipped to meet stringent EPA and C.A.R.B. anti-smog standards. ECHO Inc. must warrant the emission control system on your equipment/SORE for the periods of time listed below, provided there has been no abuse, neglect or improper maintenance of your equipment/SORE. Your emission control system may include parts such as: carburetor, fuel-injection system, ignition system, catalytic converter/muffler, fuel tank, fuel feed lines, fuel cap assembly, spark plug, air filters, and other associated components. Where a warrantable condition exists, ECHO Inc will repair your equipment/SORE at no cost to you including diagnosis, parts and labor. The Emission Control System warranty is extended to the original owner including all subsequent owners.

MANUFACTURER'S WARRANTY COVERAGE:

The emission control system is warranted for 2 years or the length of the ECHO Inc. warranty, whichever is longer. If any emission-related part on your equipment is defective, the part will be repaired or replaced by ECHO Inc. or its Authorized Service Representative.

OWNER'S WARRANTY RESPONSIBILITIES:

As the equipment/SORE owner, you are responsible for the performance of the required maintenance listed in your Operator's Manual. ECHO Inc. recommends that you retain all receipts covering maintenance on your equipment/SORE however, ECHO Inc. cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance. As the equipment/SORE owner, you should be aware that ECHO Inc. may deny you warranty coverage if your equipment/SORE or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your equipment/SORE to an ECHO Inc. authorized service representative as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If a warrantable condition exists and there is no Authorized Dealer within 100 miles, ECHO Inc. will pay to ship the unit to the nearest authorized dealer. If you have questions regarding your warranty coverage, you should contact ECHO Inc. at 1-800-673-1558, web site WWW.ECHO-USA.COM or contact Shindaiwa at 1-877-986-7783, web site WWW.SHINDAIWA.COM.

WHAT DOES THIS WARRANTY COVER?

ECHO Inc. warrants that your equipment/SORE was designed, built and equipped to conform with applicable EPA and C.A.R.B. emissions standards and that your equipment/SORE is free from defects in material and workmanship that would cause it to fail to conform with applicable requirements for 2 years or the length of the ECHO Inc. warranty, whichever is longer. The warranty period begins on the date the product is purchased by an end user.

HOW WILL A COVERED PART BE CORRECTED?

If there is a defect in a part covered by this warranty, any ECHO Inc. Authorized Service Dealer will correct the defect. You will not have to pay anything to have the part adjusted, repaired or replaced. This includes any labor and diagnosis for warranted repairs performed by the dealer. In addition, engine parts not expressly covered under this warranty but whose failure is a result of a failure of a covered part will be warranted.

WHAT PARTS ARE COVERED?

Any applicable emission related part not scheduled for "required maintenance" will be repaired or replaced within the warranty period. The repaired or replaced part will be warranted for the remaining ECHO Inc. warranty period.

Any warranted part that is scheduled only for regular inspection in the written instructions supplied is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining ECHO Inc. warranty period.

Any emission related part scheduled for replacement during "required maintenance" is warranted for the period of time prior to the first scheduled replacement point for that part. Any such part repaired or replaced under warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for that part.

Any manufacturer-approved replacement part may be used in the performance of any warranty maintenance or repairs on emission related parts, and must be provided without charge if the part is still under warranty.

Any replacement part that is equivalent in performance and durability may be used in non-warranty maintenance or repairs, and shall not reduce the warranty obligations of the manufacturer.

Throughout the equipment/SORE warranty period, ECHO Inc. will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.

SPECIFIC EMISSION RELATED WARRANTED PARTS:

- Electronic Ignition System
- Catalytic Converter / Muffler Assembly
- Choke
- Fuel Tank
- Air Filter
- Spark Plug
- Carburetor (complete assembly or replaceable components)
- Fuel-Injection Assembly (or replaceable components)
- Fuel Cap Assembly
- Fuel Feed Line (and associated clamps/connectors as applicable)

WHAT IS NOT COVERED?

Any failure caused by abuse, neglect, improper maintenance, unapproved modifications, use of unapproved add-on parts/modified parts or unapproved accessories.

This Emission Control Warranty is valid only for the U.S.A., it's Territories, and Canada.

**99922201033
01/2010**

Servicing Information

Parts/Serial Number

Genuine Shindaiwa Parts and Assemblies for your Shindaiwa products are available only from an Authorized Shindaiwa Dealer. When you do need to buy parts **always** have the Model Number, Type and Serial Number of the unit with you. You can find these numbers on the engine. For future reference, write them in the space provided below.

Model No. _____ SN. _____

Service

Service of this product during the warranty period must be performed by an Authorized Shindaiwa Service Dealer. For the name and address of the Authorized Shindaiwa Service Dealer nearest you, ask your retailer or call: 1-877-986-7783. Dealer information is also available on WWW.SHINDAIWA.COM. When presenting your unit for Warranty service/repairs, proof of purchase is required.

Consumer Product Support

If you require assistance or have questions concerning the application, operation or maintenance of this product you may call the Shindaiwa Consumer Product Support Department at 1-877-986-7783 from 8:30 am to 4:30 pm (Central Standard Time) Monday through Friday. Before calling, please know the model and serial number of your unit.

Warranty Registration

To ensure trouble free warranty coverage it is important that you register your Shindaiwa equipment by filling out the warranty registration card supplied with your unit. Registering your product confirms your warranty coverage and provides a direct link if we find it necessary to contact you.

Additional or Replacement Manuals

Replacement Operator and Parts Catalogs are available from your Shindaiwa dealer or at WWW.SHINDAIWA.COM or by contacting the Consumer Product Support Department (1-877-986-7783). Always check WWW.SHINDAIWA.COM for updated information.

shindaiwa[®]

ECHO Incorporated.
400 Oakwood Road
Lake Zurich, IL 60047-1564 U.S.A.
Telephone: 1-877-986-7783
Fax: 1-847-540-8416
www.shindaiwa.com

Yamabiko Corporation
7-2 Suehirocho 1-Chome, Ohme,
Tokyo, 198-8760, Japan
Phone: 81-428-32-6118
Fax: 81-428-32-6145