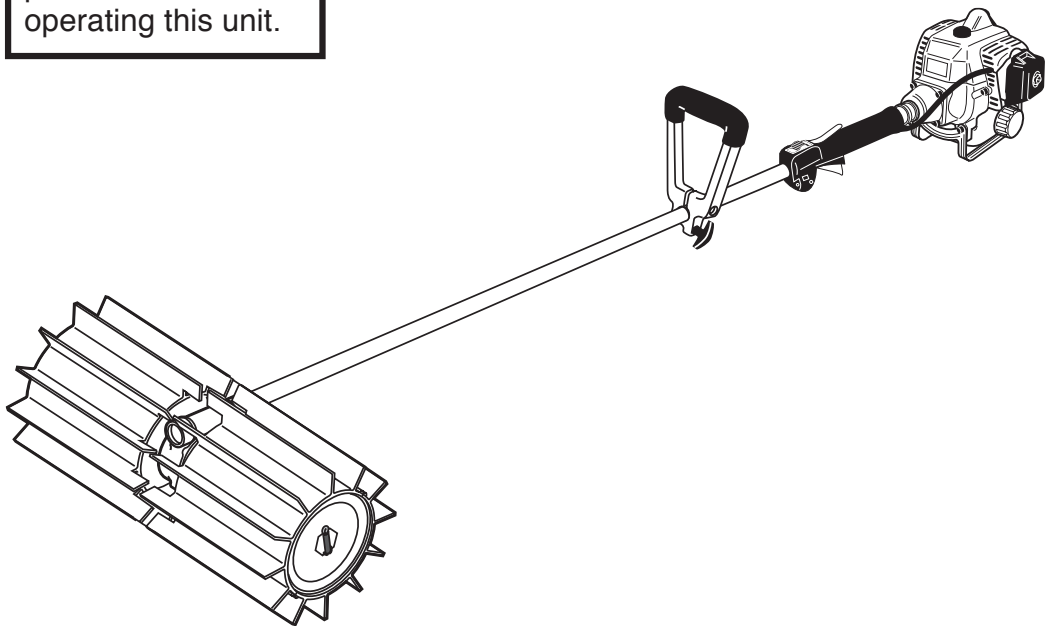




WARNING!

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

**SHINDAIWA OWNER'S/
OPERATOR'S MANUAL**
PB230 PowerBroom™



Introduction

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

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

IMPORTANT!

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

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

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.

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Attention Statements

Throughout this manual are special attention statements.



WARNING!

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

CAUTION!

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

IMPORTANT!

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

NOTE:

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



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



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



Beware of thrown objects. Keep bystanders at least 50 feet (15 m) away during operation.



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

IMPORTANT!

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

General Safety Instructions

Work Safely

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



WARNING!

Never make unauthorized attachment installations.



WARNING!

Use Good Judgment

NEVER run the engine when transporting the unit.

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

ALWAYS use the proper tool for the job.

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

NEVER operate this unit on elevated surfaces or roofs.

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

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

ALWAYS keep the handles clean.

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

Stay Alert

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



WARNING!



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



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.

The Properly Equipped Operator

Wear close-fitting clothing to protect legs and arms. Gloves offer added protection and are strongly recommended. Do not wear clothing or jewelry that could get caught in machinery or underbrush. Secure long hair so that it is above shoulder level. NEVER wear shorts!

Wear hearing protection devices at all times while operating the unit.

Always wear eye protection such as goggles or safety glasses to shield against thrown objects.

Always wear respiratory protection to avoid breathing airborne debris.

Always operate with both hands firmly gripping the unit.

*Keep a proper footing and **do not overreach**. Maintain your balance at all times during operation.*

Keep away from the rotating sweeper belts or bristles at all times, and never lift a moving attachment above waist-high.



*Wear appropriate footwear (non-skid boots or shoes): do not wear open-toed shoes or sandals. **Never work barefooted!***

Figure 1

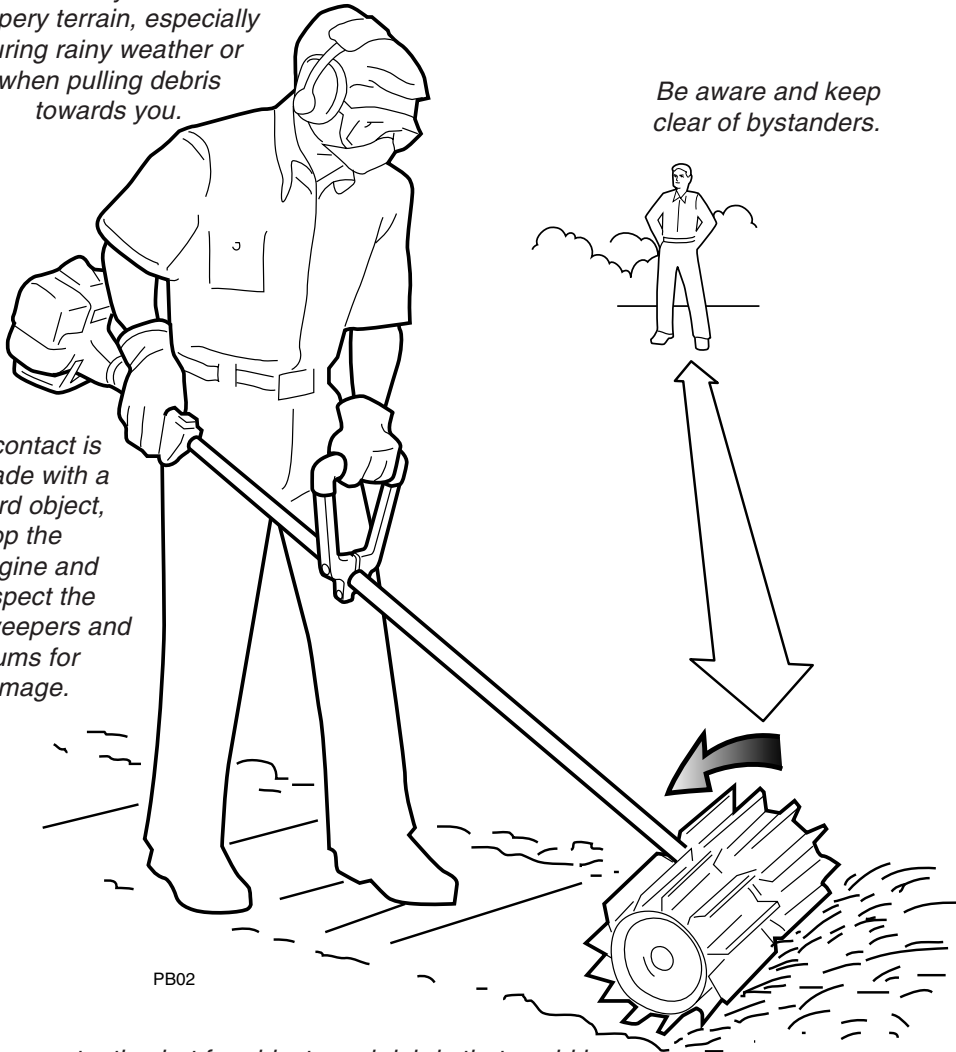
Be Aware of the Working Environment

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

Be extremely careful of slippery terrain, especially during rainy weather or when pulling debris towards you.

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

Be aware and keep clear of bystanders.



PB02

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

ALWAYS clear your work area of trash or hidden debris that could be thrown back at you or toward a bystander. When operating in rocky terrain or near electric wires or fences, use extreme caution to avoid contacting such items with the sweeper belts.

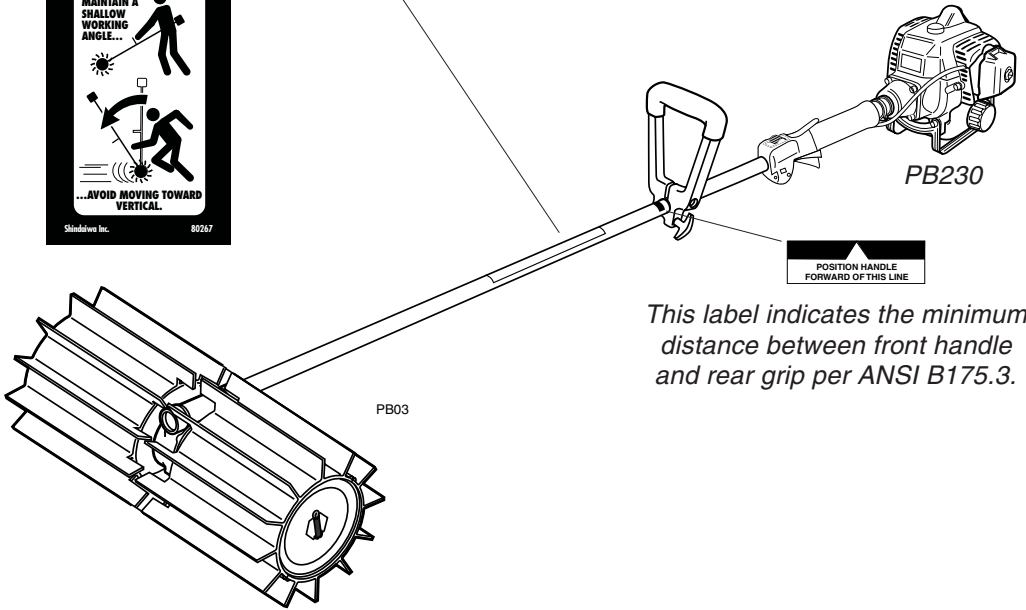
Figure 2

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.



This label indicates the minimum distance between front handle and rear grip per ANSI B175.3.

Figure 3

Checking Unit Condition

NEVER operate the unit with the protective devices (ignition switch, etc.) removed!

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

ALWAYS make sure the sweeper drums are properly installed before operation.

NEVER use a cracked or warped PowerBroom drum or axle: replace it with a servicable one.

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

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

NEVER operate a unit with worn or damaged fasteners or attachments.

Unit Description

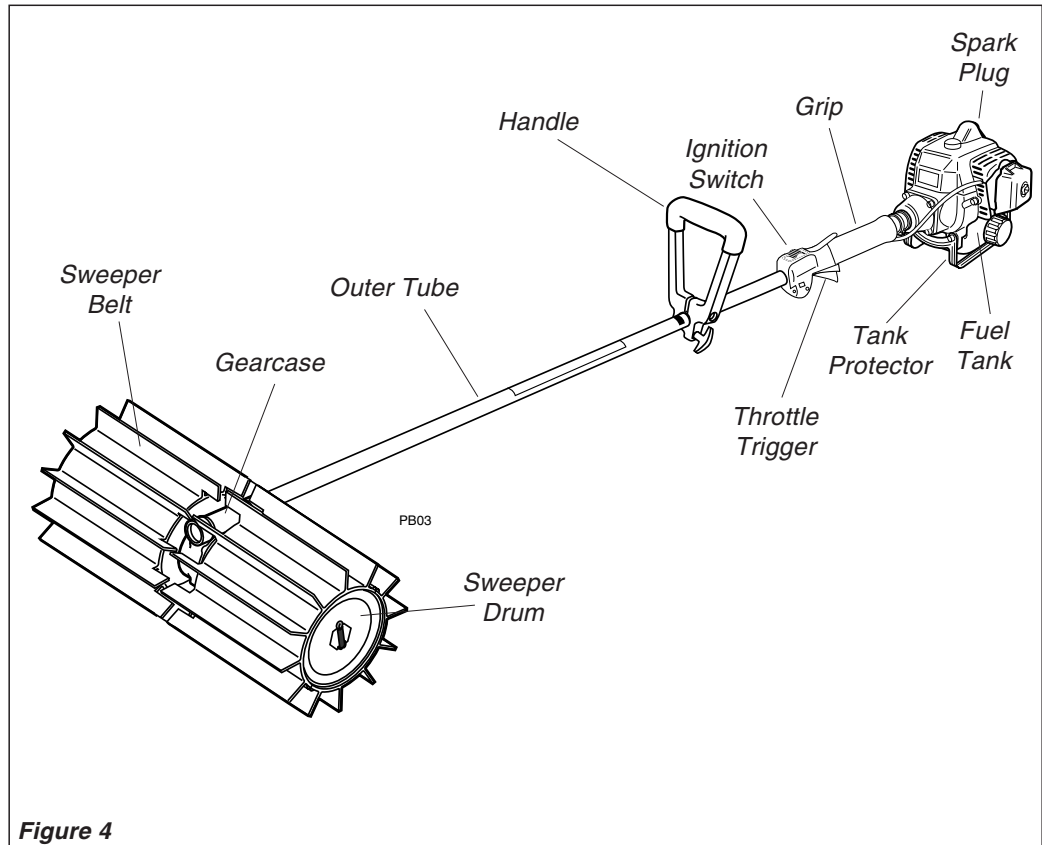


Figure 4

Using the accompanying illustrations as a guide, familiarize yourself with this unit and its various components. Understanding the product helps ensure top performance, long service life, and safer operation. See Figure 4.



WARNING!

Do not make unauthorized modifications or alterations to this unit or components.

Specifications

PB230 Dry Weight (less sweepers)	5.6 kg/12.3 lb.
PB230 Dry Weight (Including sweepers)	9.2 kg/20.3 lb.
Engine Model	Shindaiwa S230
Engine Type	2-cycle, vertical-cylinder, air-cooled
Bore x Stroke	32 x 28 mm/1.26 x 1.10 in.
Displacement	22.5 cc/1.4 cu. in.
Maximum Power Output	1.1 HP (0.8 kW) @ 7500 rpm (min ⁻¹)
Fuel/Oil Ratio	50:1 with Shindaiwa Premium 2-cycle mixing oil
Fuel Tank Capacity	554 ml/18.7 oz.
Carburetor Type	Walbro WYL, diaphragm-type
Ignition	One-piece electronic, transistor-controlled
Spark Plug	Champion CJ8 (for EMC compliance use NGK BMR6A)
Air Cleaner Type	Non-reversible flocked filter element
Starting Method	Recoil
Stopping Method	Slide switch
Transmission Type	Automatic, centrifugal clutch w/worm gear
EPA Emission Compliance Period*	Category A

*The EPA emission compliance period referred to on the emission compliance label located on the engine, indicates the number of operating hours for which the engine has been shown to meet Federal emission requirements. Category C = 50 hours (Moderate), B = 125 hours (Intermediate) and A = 300 hours (Extended)

*Specifications are subject to change without notice.

Prior to Assembly

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

- Engine assembly
- Outer tube assembly
- Drum kit w/gearcase
- Correct operators handle (see preceding page)

- Kit containing operator's handle mounting bracket and hardware, this manual and tool kit for routine maintenance. Tool kits vary by model and may include a hex wrench, spanner and a combination spark plug wrench/screwdriver.

Carefully inspect all components for damage.

IMPORTANT!

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

Assembly

Driveshaft/Powerhead

PB230 PowerBroom

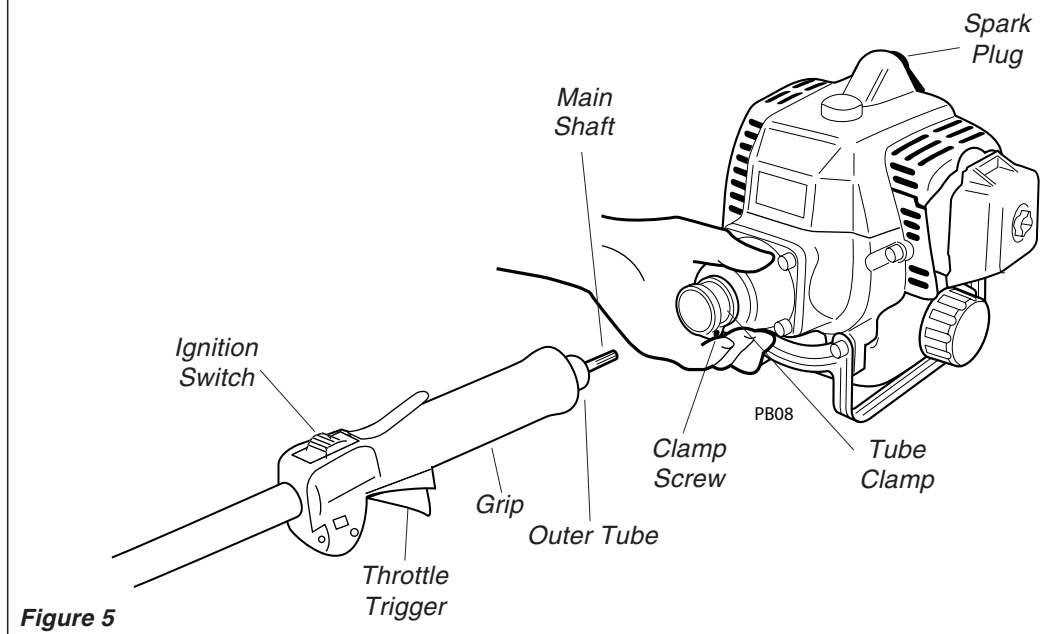


Figure 5

Connect the Outer Tube to the Powerhead

1. Place the powerhead on a clean, flat surface, spark plug facing up. See Figure 5.
2. Use the 4mm hex wrench to loosen the tube clamp screw. Verify that the D-shaped shim washer is positioned as shown in Figure 6.

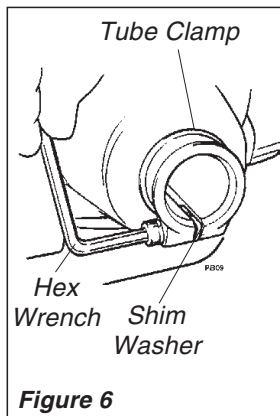


Figure 6

4. Slide the outer tube into the tube clamp until the tube bottoms. If installation is difficult, rotate the outer tube or mainshaft slightly until you feel the mainshaft splines engage with the powerhead.
5. Position the outer tube so that the ignition switch is facing up and the throttle trigger is down.
6. Slide the outer tube into the powerhead until the throttle grip just contacts the tube clamp.
7. Tighten the clamp screw firmly.

CAUTION!

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

CAUTION!

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

3. Add some moly-type EP grease to the splines on the end of the mainshaft.

Assembly

Handle

ASSEMBLY

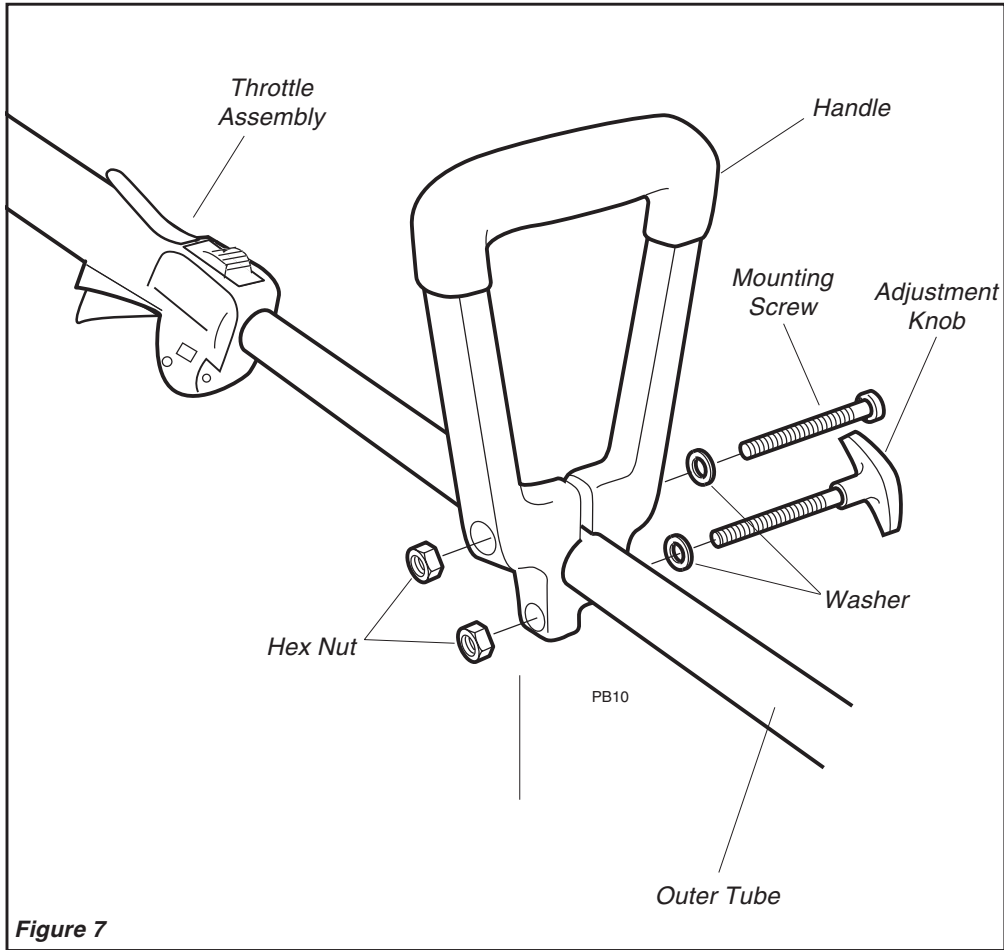


Figure 7

Connect the Handle to the Outer Tube

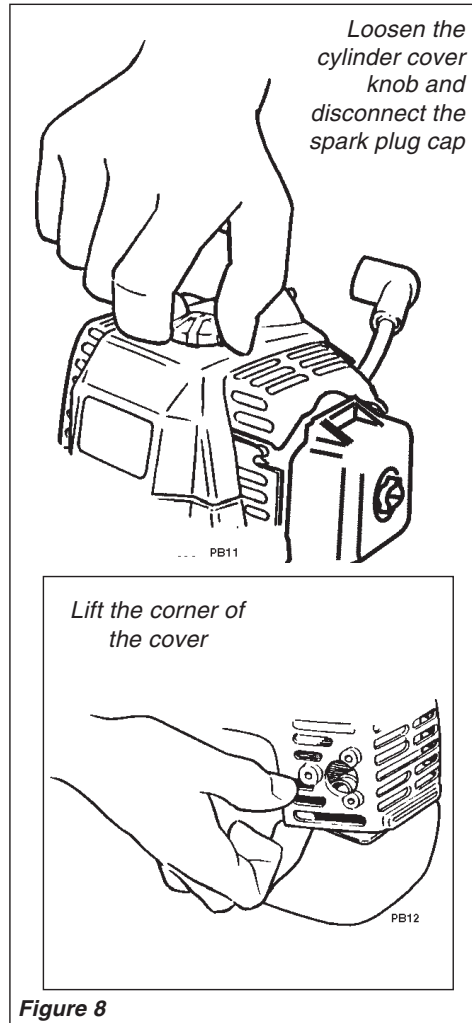
1. Remove both screws from the handle.
2. While spreading the handle at the mounting hole, position the handle on the outer tube as shown.
3. Reinstall the two mounting screws in the handle, but do not tighten them at this time.
4. Locate the handle at the best position for operator comfort (usually about 10 inches ahead of the throttle lever), and secure it by tightening the knob at the handle base.

IMPORTANT!

One side of the handle is recessed to receive the hex nuts.

Assembly

Throttle Linkage and Ignition Leads

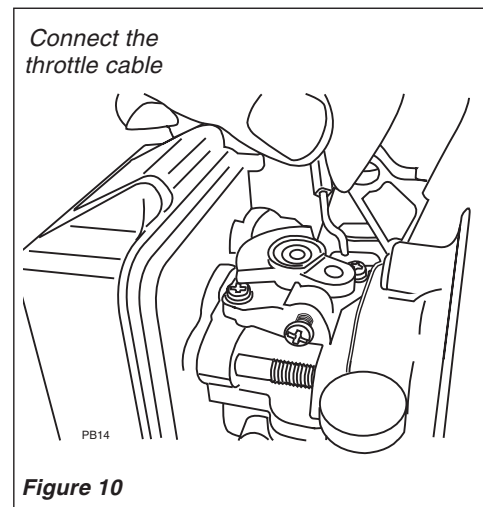
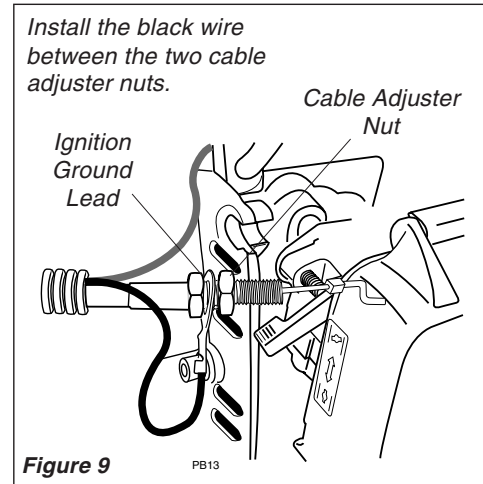


Remove the Cylinder Cover.

1. Remove the cap from the spark plug.
2. Loosen the black cylinder cover knob (about a dozen full turns are required), and then lift off the cylinder cover.

NOTE:

If the cover binds on the muffler outlet tube, pull gently on the corner of the cover as shown (see inset).



Connect the Throttle Cable.

1. Route the ribbed cable over the tube clamp to the top left side of the engine.
2. Install the black wire between the two cable adjuster nuts as shown. See Figure 9.
3. Connect the S-shaped end of the throttle cable to the throttle lever on top of the carburetor. See Figure 10.

Assembly

Throttle Linkage and Ignition Leads

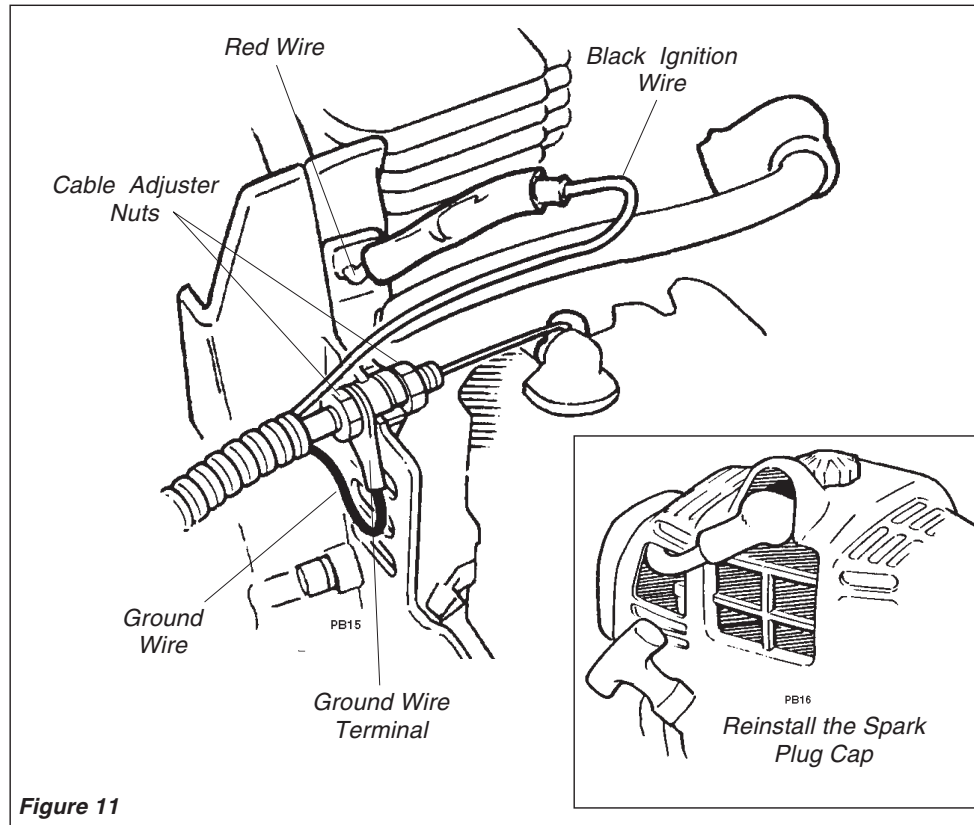


Figure 11

Assemble and Adjust the Throttle Cable.

1. Insert the throttle-cable housing into the notch on the fan cover, and clamp the ground wire terminal between the fan cover and the outer cable adjuster nut. See Figure 11.
2. Tighten the two throttle cable adjuster nuts.
3. Using finger pressure only, connect the black ignition wire from the cable tube to the red ignition wire on the powerhead. Wire routing must be as shown in the illustration with the black wire located away from the throttle cable and carburetor linkage.
4. Reinstall the engine cover and tighten the captive engine cover screw.
5. Reinstall the spark plug boot.

IMPORTANT!

Adjust and tighten the cable nuts to allow approximately 1/4-inch freeplay at the throttle trigger.

CAUTION!

Routing of wiring must not interfere with throttle operation.

Assembly

Gearcase and Sweeper Assembly

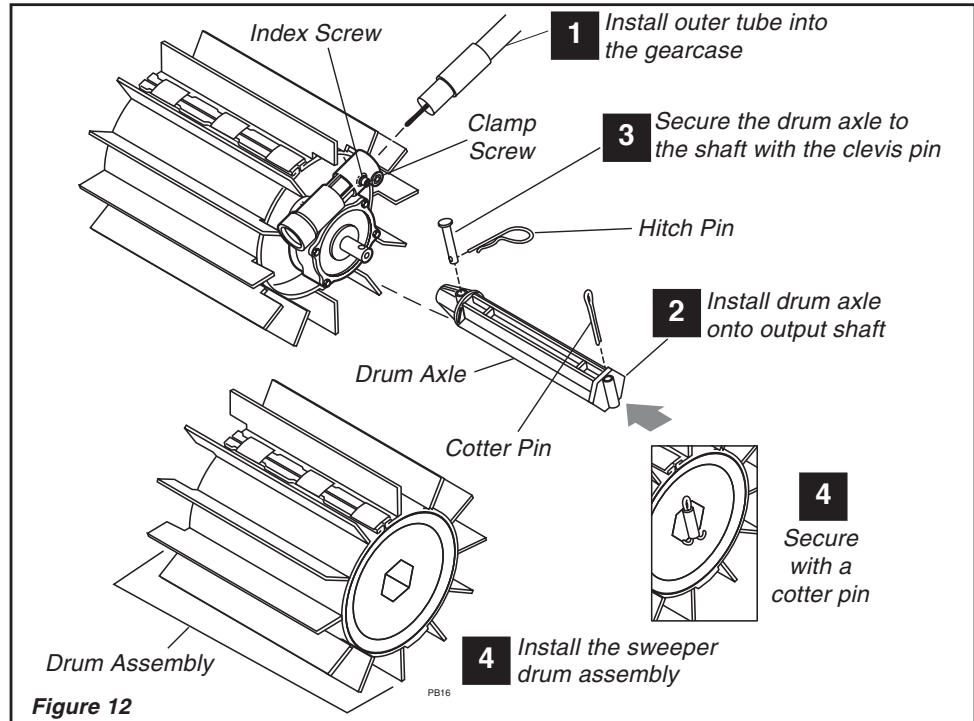


Figure 12

1. Insert the end of the outer tube into the gearcase and push until it bottoms. The outer tube should go into the gearcase about 1-1/2 in. (38 mm). If the outer tube stops before bottoming, rotate it until you feel the inner mainshaft (driveshaft) splines engage the gearcase. Then push the outer tube all the way in. See Figure 12.
2. Rotate the gearcase assembly so that the index screw aligns with hole in the outer tube.
3. Use a 4 mm hex (Allen) wrench to tighten the gearcase index screw first, then the gearcase clamp screw.
4. Push one of the drum axles onto either of the two gearcase output shafts. If necessary, rotate the drum axle until the clevis pin hole in the axle aligns with the matching hole in the gearcase output shaft.
5. Use a clevis pin and hitch pin to secure the drum axle to the shaft.
6. Slide the recessed end of a sweeper drum assembly over the installed axle, and then push the drum down the axle until the cotter pin hole in the axle extends above the drum surface.
7. Use a cotter pin to secure the drum assembly on the axle (see inset). The cotter pin is designed to fit tightly against the outboard end of the drum, so you may need to compress the drum face slightly during installation. Spread the ends of the cotter pin to secure.
8. Repeat Steps 4-7 to install the remaining axle and drum assembly.

CAUTION!

The two drum assemblies are identical, but each drum must be installed with its recessed end facing toward the gearcase.

The PB230 PowerBroom should now be completely assembled.

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.

2 Stroke Mixture Oil - A 2-stroke engine oil meeting ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345/FD standards must be used. Shindaiwa One™ 2-Stroke Oil is strongly recommended as it meets this standard and is specifically formulated for use in all Shindaiwa 2-stroke engines. 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.

For increased engine protection, Shindaiwa recommends using Shindaiwa Red Armor™ engine oil 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.

IMPORTANT!

Shindaiwa One™ 2-Stroke oil or 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

OPERATION



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.

Filling the fuel tank



WARNING! Minimize the Risk of Fire

- **NEVER** smoke or light fires near the engine.
- **ALWAYS** stop the engine and allow it to cool before refueling.
- **ALWAYS** Wipe all spilled fuel and move at least 3 meters (10 feet) from the fueling point and source before starting.
- **NEVER** place flammable material close to the engine muffler.
- **NEVER** operate the engine without the muffler and spark arrester screen in place and in good working condition.
- **FUEL IS HIGHLY FLAMMABLE.**
- **ALWAYS** store gasoline in a container approved for flammable liquids.
- **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 at least 3 meters (10 feet) away from a fuel storage area or other readily flammable materials before starting the engine.

1. Place the unit on a flat, level surface.
2. Clear any dirt or other debris from around the fuel filler cap.

CAUTION!

Slowly remove the fuel cap only after stopping the engine

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 engine.

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.

Strap and Hanger

p/n 22410-17201 and 60840-98020 (optional)

Although a strap and hanger is not required for use with a Shindaiwa PB230 PowerBroom, it is recommended to reduce operator fatigue during extended periods of operation.

Make sure all hooks and adjusting devices are secure. Adjust the harness shoulder strap so the shoulder pad rests comfortably on the off-side shoulder. See Figure 13.

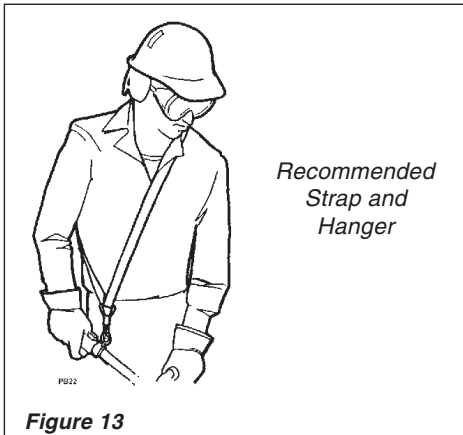


Figure 13

Debris Shield

p/n 99909-33021 (optional)

A plastic debris shield is available from your Shindaiwa dealer as a useful option to your PowerBroom. The shield helps prevent broadcasting debris when large volumes of material are forced over the top of the drum during operation. See Figure 14.

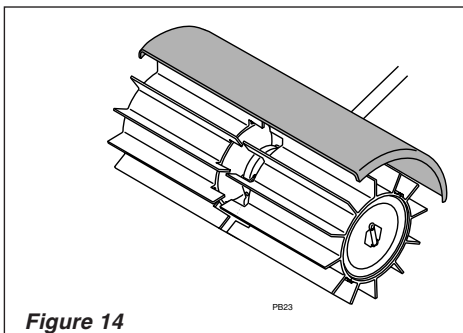


Figure 14

Break-in and Operation

The PowerBroom works best when its rubber fins can quickly slide or “skim” over the surface being swept.

New or replacement sweeper belts tend to grip or drag on hard surfaces, and should be thoroughly broken in or “scuffed” before the broom is actually put to work.

Break-in is easily accomplished by operating the PowerBroom at full throttle for 3 to 5 minutes in loose gravel or similar abrasive material. Once broken in, a PowerBroom will effortlessly move an amazing variety of materials, ranging from snow or standing water to heavier objects such as gravel or wood chips.

Experience will help you understand the operating principles of the PowerBroom, but safe operation must be practiced from the start.



WARNING!

BURN DANGER! The gearcase will become very hot during normal operation.

Starting the Engine

IMPORTANT!

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

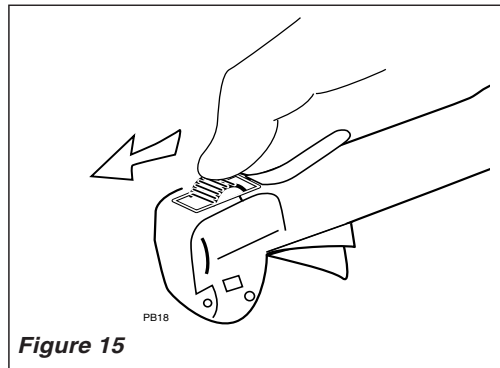


Figure 15

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

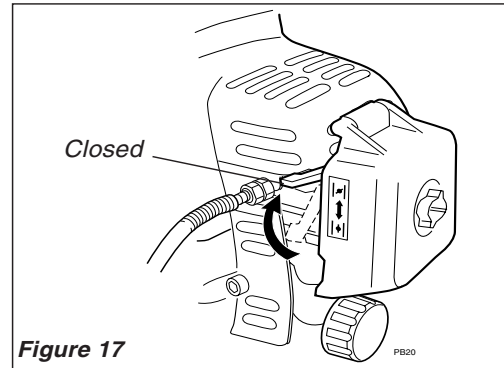


Figure 17

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

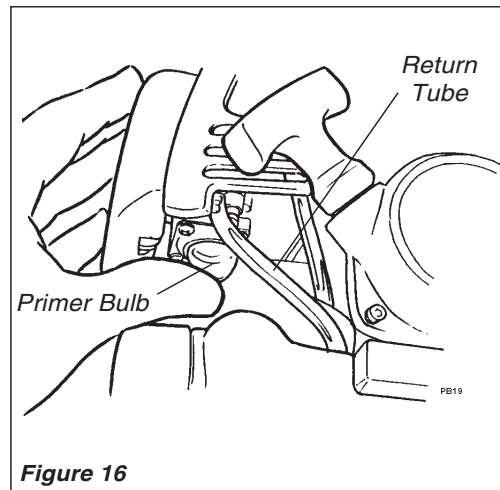


Figure 16

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

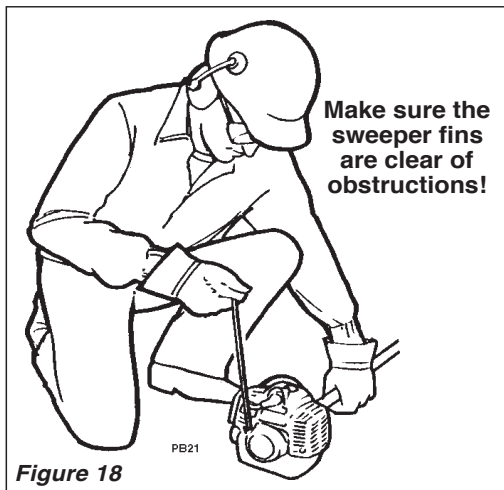


Figure 18

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

IMPORTANT!

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

CAUTION!

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

Starting the Engine (continued)



WARNING!

The sweeper belts may rotate when the engine is started!

5. When the engine starts, slowly move the choke lever to the "OPEN" position. See Figure 19. (If the engine stops after the initial start, close the choke and restart.)

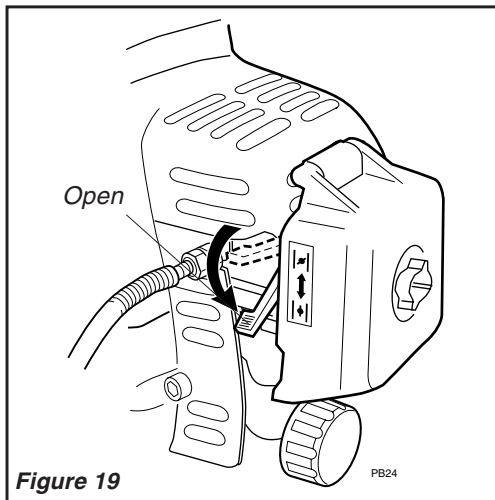


Figure 19



WARNING!

Never start the engine from the operating position.

IMPORTANT!

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

When the Engine Starts...

- After the engine starts, allow the engine to warm up at idle 2 or 3 minutes before operating the unit.
- After the engine is warm, pick up the unit and clip on the harness if so equipped. See page 16.
- Advancing the throttle makes the sweeper belts turn faster; releasing the throttle permits the attachment to stop turning. If the sweeper belts continue to rotate when the engine returns to idle, carburetor idle speed should be adjusted (see the next page).

Stopping the Engine

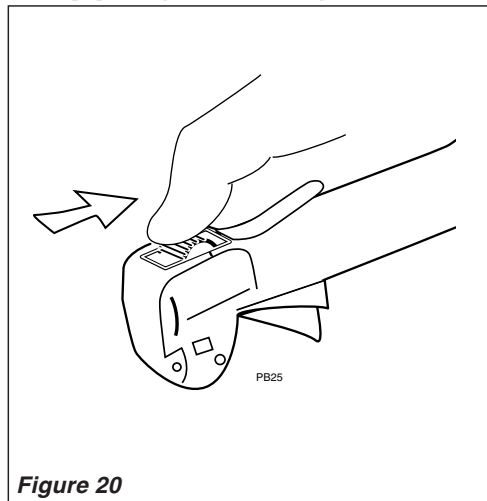
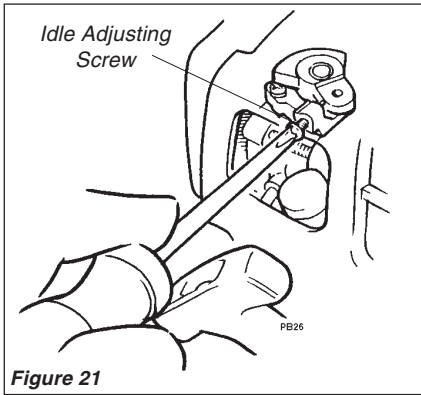


Figure 20

Idle the engine briefly before stopping (about 2 minutes), then slide the ignition switch to the "O" (Engine OFF) position.

Adjusting Engine Idle



The engine must return to idle speed whenever the throttle lever is released. Idle speed is adjustable, and must be set low enough to permit the engine clutch to disengage the gearcase.

Idle Speed Adjustment



WARNING!

The sweeper belts must NEVER rotate at engine idle! If the idle speed cannot be adjusted by the procedure described here, return the unit to your Shindaiwa dealer for inspection.

1. Place the unit on the ground, then start the engine, and then allow it to idle 2-3 minutes until warm.
2. If the attachment rotates when the engine is at idle, reduce the idle speed by turning the idle adjustment screw counter-clockwise. See Figure 21.
3. If a tachometer is available, the engine idle speed should be final adjusted to 2,750 (± 250) rpm (min^{-1}).

NOTE:

Carburetor fuel mixture adjustments are preset at factory on units with emission control systems and cannot be serviced in the field.

Operating Techniques

Operate the PowerBroom at or near full throttle with its sweeper fins resting on the work surface.

IMPORTANT!

It is both tiring and unnecessary to lift or hold the fins from the work surface during sweeping.

When sweeping narrow areas such as sidewalks, the PowerBroom can be used to throw material directly ahead of the operator. Clearing wider areas may require sweeping at an angle to create windrows to one side of the path being cleared.

Windrows of lighter materials often can be combined into one main row or pile for eventual pickup, while heavy or bulky material may need to be collected row-by-row. See Figure 22.

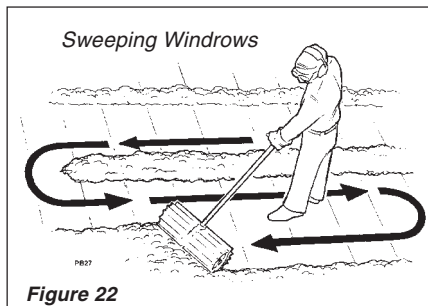


Figure 22

To pull debris from corners, reverse sweeper drum rotation by turning the powerhead over (throttle facing "up"). See Figures 23 and 24.



WARNING!

Reversing the PowerBroom will cause debris to be thrown back toward the operator. When reversing the PowerBroom, use lower throttle settings and be aware that thrown debris may also affect your footing!

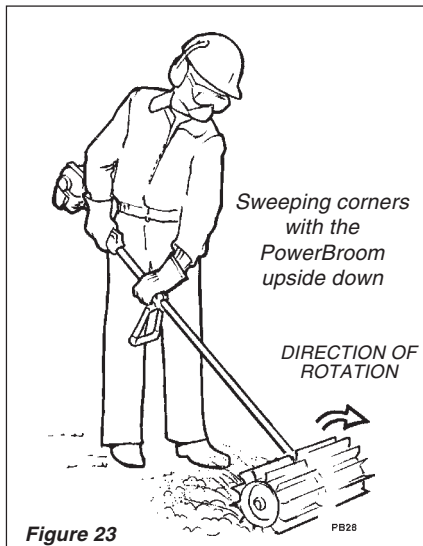


Figure 23

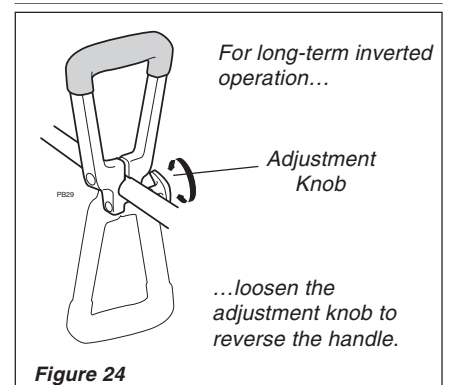


Figure 24

Maintenance

General 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.

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 and cutting attachment are completely stopped. Disconnect the spark plug wire before performing service or maintenance.



WARNING!

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

Muffler

This unit must never be operated with a faulty or missing spark arrester or muffler. Make sure the muffler is well secured and in good condition. A worn or damaged muffler is a fire hazard and may also cause hearing loss.

Spark Plug

Keep the spark plug and wire connections tight and clean.

Fasteners

Make sure nuts, bolts, and screws (except carburetor adjusting screws) are tight.

Daily Maintenance

Prior to each work day, perform the following:

- Remove all dirt and debris from the engine, check the cooling fins and air cleaner for clogging, and clean as necessary.
- Carefully remove any accumulations of dirt or debris from the muffler and fuel tank. Dirt build-up in these areas can lead to engine overheating, fire, or premature wear.
- Check for loose or missing screws or components. Make sure the Sweeper drums are securely fastened.
- Check the entire unit for leaking fuel or grease.

10-Hour Maintenance

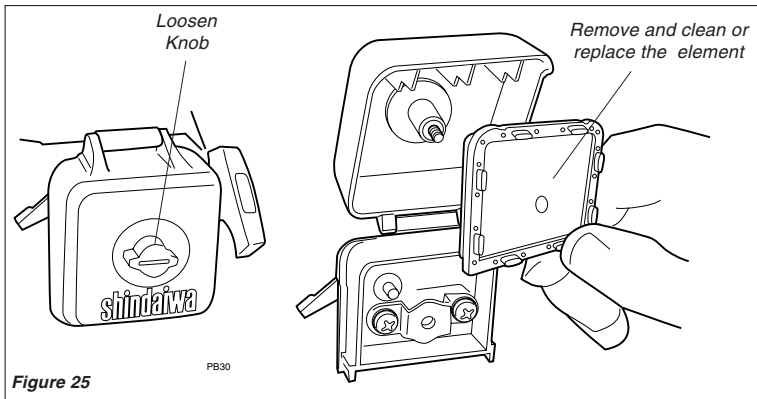


Figure 25

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

Remove the air cleaner element from the carburetor and clean it thoroughly with soap and water or compressed air, let dry before reinstalling the element.

CAUTION!

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

10/15-Hour Maintenance

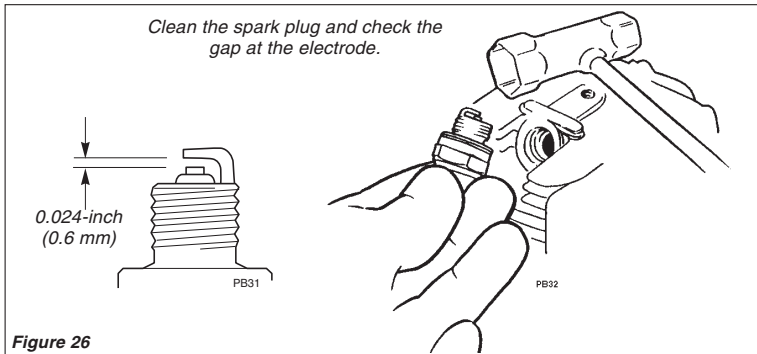


Figure 26

Every 10 to 15 hours of operation:

Remove and clean the spark plug. Adjust the spark plug electrode gap to 0.024-inch (0.6 mm). If the plug must be replaced, use only a Champion CJ8 or equivalent spark plug of the correct heat range. For electromagnetic compliance (EMC), use NGK BMR6A.

CAUTION!

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

50-hour Maintenance

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

- Remove and clean the cylinder cover and clean grass and dirt from the cylinder fins.
- Use a hooked wire to extract the fuel filter from inside the fuel tank. Remove and replace the filter element. Before reinstalling the filter, inspect the condition of the fuel line. If damage or deterioration are noted, the unit should be removed from service until it can be inspected by a Shindaiwa-trained service technician. See Figure 27.

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.

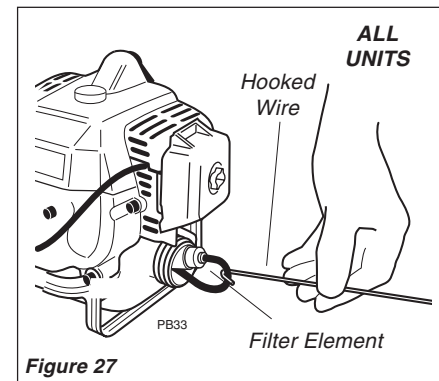


Figure 27

135-hour Maintenance

After every 135 hours of operation or if engine becomes hard to start and has low power, the spark arrester screen should be inspected and cleaned.



WARNING!

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

1. Remove the spark plug boot.
2. Remove the engine cover by loosening the engine cover knob (the knob is captive) and lifting the cover from the engine.
3. Remove the spark arrester screen screw.
4. Remove the spark arrester screen and clean with a stiff bristle brush.

IMPORTANT!

If carbon deposits are severe or if no performance improvement is noted, this unit should be inspected by an authorized Shindaiwa servicing dealer.

5. Reassemble the spark arrester screen and engine cover in reverse order.

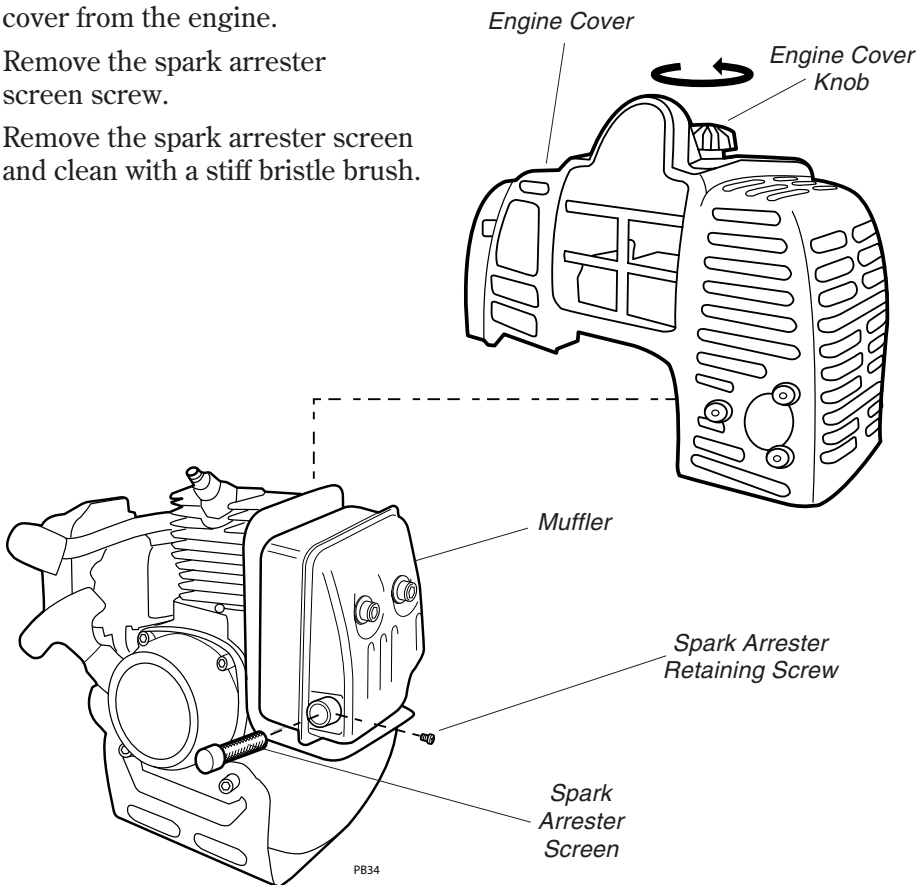


Figure 28

300-hour Maintenance

Gearcase Lubrication

The gearcase should be filled with 60 cc (2.0 fl.oz.) of Mobil SHC634 Synthetic Gear Oil. A maximum of 75-80 cc can be used, but never to exceed 80 cc. Operation with excessive oil level will result in high operating temperatures. **Do not overfill!**

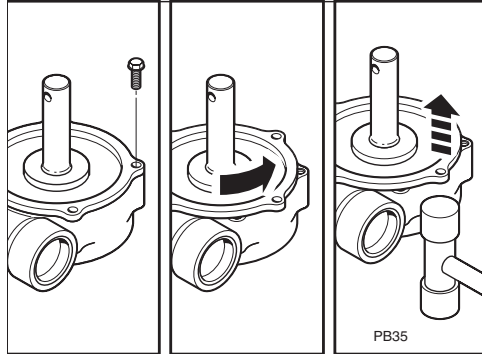


Figure 29

Replacing the gearcase oil



WARNING!

BURN DANGER! The gearcase will be extremely hot after use!

1. Disconnect spark plug wire at engine.
2. Remove the LH Drum and axle assembly (as viewed from the operating position). Wipe the sideplate clean and remove four screws (it is not necessary to remove the gearcase from the outer tube).
3. Turn gearcase side plate to break the seal and lift the plate from the gearcase. See Figure 29.

NOTE:

It may be necessary to use a heat gun to soften the sealer material.

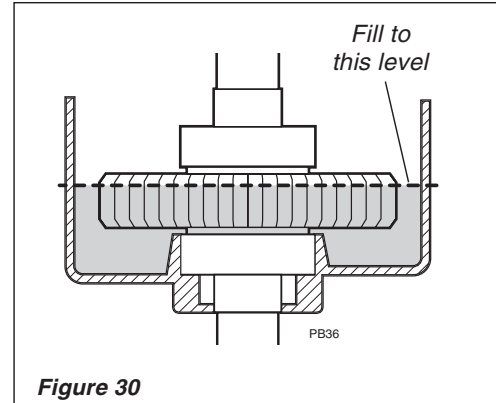


Figure 30

4. Turn the gearcase to the LH side and allow all used gearcase oil to drain into a small container.
5. Place the gearcase on the RH side and supported so the outer tube is parallel to the ground. Refill the gearcase with 60 cc (2.0 fl.oz) of Mobil SHC634 Synthetic Gear Oil to the bottom of the chamfer on the output gear. The correct oil depth is 5/8" (15.5 mm). See Figure 30. **DO NOT OVERFILL!**
6. Inspect the sideplate for damage and clean off all remaining liquid gasket material with brake cleaner or acetone. Coat the outer sealing flange of the sideplate with Loctite Ultragrey Silicon Sealant or Threabond No. 1104 Liquid Gasket.
7. Replace the cover and install the four sideplate screws. Tighten securely.
8. Reinstall the drum and axle assembly per the sweeper assembly instructions. See page 15.

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

Troubleshooting Guide

ENGINE DOES NOT START

What To Check	Possible Cause	Remedy
<p>Does the engine crank?</p> <p>NO</p> <p>YES</p>	<p>Faulty recoil starter.</p> <p>Fluid in the crankcase.</p> <p>Internal damage.</p>	<p>Consult with an authorized servicing dealer.</p>
<p>Good compression?</p> <p>NO</p> <p>YES</p>	<p>Loose spark plug.</p> <p>Excess wear on cylinder, piston, rings.</p>	<p>Tighten and re-test.</p> <p>Consult with an authorized servicing dealer.</p>
<p>Does the tank contain fresh fuel of the proper grade?</p> <p>NO</p> <p>YES</p>	<p>Fuel incorrect, stale, or contaminated; mixture incorrect.</p>	<p>Refill with clean, fresh unleaded gasoline with a pump octane of 89 or higher, mixed with a 2-stroke air cooled engine oil that meets or exceeds ISO-L-EGD and/or JASO FD classified oils at 50:1 gasoline/oil ratio.</p>
<p>Is fuel visible and moving in the return line when priming?</p> <p>NO</p> <p>YES</p>	<p>Check for clogged fuel filter and/or vent.</p> <p>Priming pump not functioning properly.</p>	<p>Replace fuel filter or vent as required. Re-start.</p> <p>Consult with an authorized servicing dealer.</p>
<p>Is there spark at the spark plug wire terminal?</p> <p>NO</p> <p>YES</p>	<p>The ignition switch is in "O" (OFF) position.</p> <p>Shorted ignition ground.</p> <p>Faulty ignition unit.</p>	<p>Move switch to "I" (ON) position and re-start.</p> <p>Consult with an authorized servicing dealer.</p>
<p>Check the spark plug.</p>	<p>If the plug is wet, excess fuel may be in the cylinder.</p> <p>The plug is fouled or improperly gapped.</p> <p>The plug is damaged internally or of the wrong size.</p>	<p>Crank the engine with the plug removed, re-install the plug and re-start.</p> <p>Clean and re-gap the plug to 0.6 mm (0.024 in.). Re-start.</p> <p>Replace the plug with a NGK CMR5H or equivalent resistor type spark plug of the correct heat range. Set spark plug electrode gap to 0.6mm (0.024 in.).</p>

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 servicing dealer.
	Improper fuel ratio.	Refill with clean, fresh unleaded gasoline with a pump octane of 87 or higher, mixed with a 2-stroke 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 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. See page 11.
	Air leakage or clogged fuel line.	Repair or replace fuel filter and/or fuel line.
	Water in the fuel.	Replace the fuel. See page 7.
	Piston seizure.	Consult with an authorized servicing dealer.
	Faulty carburetor and/or diaphragm.	
<p>Engine is knocking.</p>	Overheating condition.	See above.
	Improper fuel.	Check fuel octane rating; check for presence of alcohol in the fuel. See page 7. Refuel as necessary.
	Carbon deposits in the combustion chamber.	Consult with an authorized servicing dealer.

Troubleshooting Guide (continued)

ADDITIONAL PROBLEMS

Symptom	Possible Cause	Remedy
<div style="border: 1px solid black; padding: 5px; 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 servicing dealer.
	Idle speed set too low.	Adjust: 2750-3000 (rpm).
<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.	Refuel. See page 7.
	Clogged fuel filter.	Replace fuel filter.
	Water in the fuel.	Drain; replace with clean fuel. See page 8.
	Shorted spark plug or loose terminal.	Clean or replace spark plug, tighten the terminal.
	Ignition failure.	Replace the ignition unit.
	Piston seizure.	Consult with an authorized servicing dealer.
<div style="border: 1px solid black; padding: 5px; 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.	Idle engine until cool. Clean and regap the plug to 0.65 mm (0.026 in.). Correct plug: NGK BPMR6A or equivalent resistor type spark plug of the correct range.
	Overheated engine.	Idle engine until cool.
<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 servicing dealer.
<div style="border: 1px solid black; padding: 5px; width: fit-content;">Sweeper drums rotate at engine idle.</div>	Engine idle too high.	Set idle: 2,750 (<?>250) rpm (min-1)
	Broken clutch spring or worn clutch spring boss.	Replace spring/shoes as required, check idle speed.

Troubleshooting Guide (continued)

ADDITIONAL PROBLEMS

Symptom	Possible Cause	Remedy
Excessive vibration.	Warped or damaged drums or belts.	Inspect and replace drum or belt as required.
	Loose gearcase.	Tighten gearcase securely.
	Bent main shaft/worn or damaged bushings.	Inspect and replace as necessary.
Drums will not rotate.	Shaft not installed in coupler or gearcase.	Inspect and reinstall as required.
	Broken shaft.	Consult with an authorized servicing dealer.
	Damaged gearcase.	Consult with an authorized 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, Power Broom™, 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, Power Broom™, 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 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 operators 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.

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02/05/2010

**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.

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Service 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. _____ Type _____ 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