

## SHINDAIWA OWNER'S/ OPERATOR'S MANUAL

# TILLER/CULTIVATOR ATTACHMENT



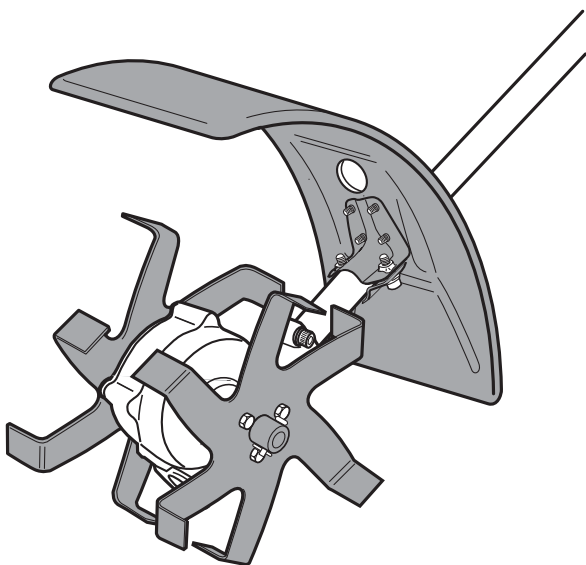
### WARNING!

Always wear eye and ear protection when operating this unit!



### WARNING!

To minimize the risk of injury to yourself and others, read this manual and familiarize yourself with its contents.



# shindaiwa®

Part Number 80465

## Introduction

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The Shindaiwa Tiller/Cultivator Attachment kits have been designed and built to deliver superior performance and reliability without compromise to quality, comfort, safety or durability.

As an owner/operator, you'll soon discover for yourself why Shindaiwa is simply in a class by itself!

### **IMPORTANT!**

The information contained in these instructions describe units available at the time of publication.

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

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## Attention Statements

Throughout this manual are special “attention statements”.



### **WARNING!**

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

### **CAUTION!**

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

### **IMPORTANT!**

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

### **NOTE:**

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



Read and follow this 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 unit if you are tired, ill or under the influence of alcohol, drugs or medication.

### **IMPORTANT!**

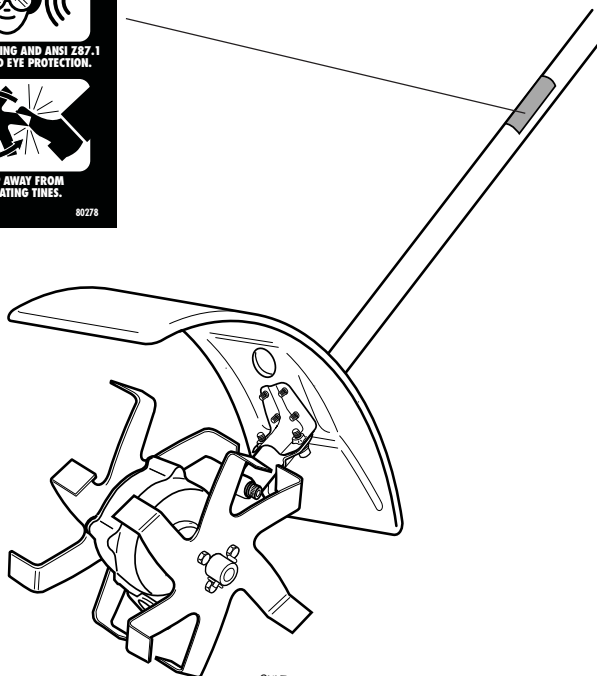
The operational procedures described in this manual are intended to help you get the most from your machine as well as to protect you and others from harm. These procedures are guidelines for safe operation under most conditions, and are not intended to replace any safety rules and/or laws that may be in force in your area. If you have questions regarding your 230-series power tool, or if you do not understand something in this manual, your Shindaiwa dealer will be glad to assist you. You may also contact Shindaiwa, Inc. at the address printed on the back of this manual.

## Safety 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.



**Figure 1**

CULT01

## Operating Precautions



### WARNING!

- This Shindaiwa tiller/cultivator attachment is specifically designed for use on Shindaiwa PowerBroom and Trimmers. Installation and/or use on any other model, brand or type of power tool is not approved by Shindaiwa. Attempts to use on non-approved models can damage the equipment and cause accidents, serious injury or death.
- Always make sure the Tiller/Cultivator attachment is properly installed and firmly tightened before operation.
- Never use a cracked or warped tine; replace it with a serviceable one and make sure it fits properly.
- Never smoke or light fires near the engine. Fuel is very flammable and fire could lead to serious personal injury or property damage.
- Make sure there are no missing or loose fasteners, and that the stop switch and throttle controls are working properly.
- Make sure there is always good ventilation when operating this unit. Fumes from engine exhaust can cause serious injury or death. **Never run the engine indoors!**
- Before starting the engine, make sure the tines are not contacting anything.
- 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.
- Stop the engine immediately if the unit suddenly begins to vibrate or shake. Inspect for broken, missing or improperly installed parts or attachments.
- Never transport the unit or set it down with the engine running. An engine that's running could be accidentally accelerated causing the tines to rotate.

### CAUTION!

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

## The Properly Equipped Operator

*Always wear appropriate hearing protection.*

*Always wear eye protection such as goggles or safety glasses.*

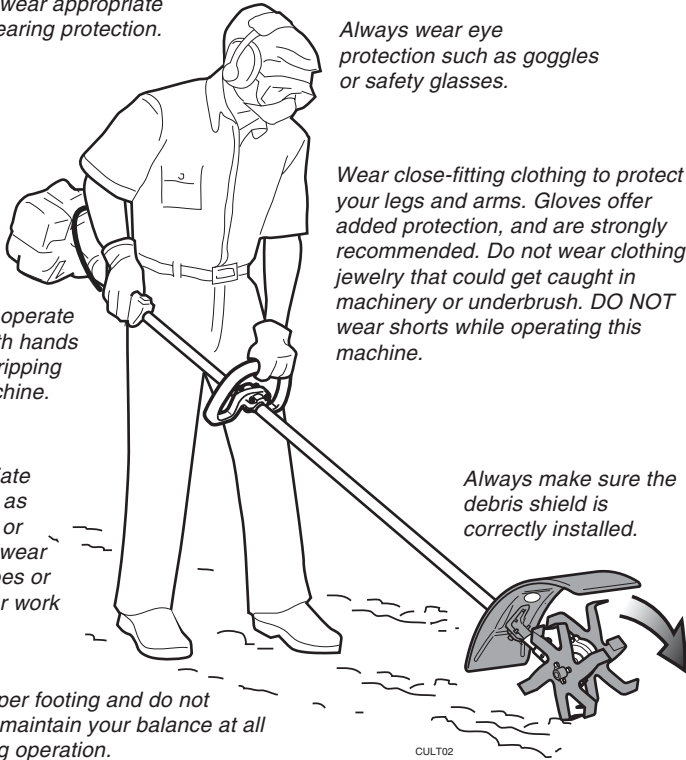
*Always operate with both hands firmly gripping the machine.*

*Wear close-fitting clothing to protect your 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. **DO NOT** wear shorts while operating this machine.*

*Wear appropriate footwear such as nonskid boots or shoes: do not wear open-toed shoes or sandals. Never work barefooted!*

*Always make sure the debris shield is correctly installed.*

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



**Figure 2**

### Work Safely: Be Aware of the Working Environment

- Be careful when operating on a slope or on slippery terrain, especially during rainy weather.
- If the tines jam or strike a hard object, switch the engine OFF, disconnect the spark plug lead, and inspect the tines and gearcase for damage.
- Never operate the tiller/cultivator around vines or roots that could tangle in the tines and cause loss of control.
- **Do not** operate the tiller/cultivator in standing water.
- **Never operate this unit around buried electrical cables!**
- **Maintain** a shallow working angle, and **avoid** steep angles of operation. A steep working angle risks loss of control of the unit.
- **Transport** the unit with the engine OFF.

## General Safety Instructions



### **WARNING!**

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



### **WARNING! Minimize the Risk of Fire**

**Never** smoke or light fires near the unit.

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

**Always** move the unit to a place well away from a fuel storage area or other readily flammable materials before starting the engine. Use caution when handling fuel. Move the unit at least 10 feet (3 meters) from the fueling point before starting the engine.

**Never** place flammable material close to the engine muffler.

**Never** run the engine without the spark arrester screen in place. Do not operate the unit with the muffler removed.



### **WARNING!**

#### **Use Good Judgment**

**Always** wear eye protection to shield against thrown objects.

**Always** protect yourself from hazards such as thorny brush and flying debris by wearing gloves and close fitting clothing that covers arms and legs. Never wear shorts. Don't wear loose clothing or items such as jewelry that could get caught in machinery or underbrush. Secure long hair so it is above shoulder level.

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

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

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

**Always** hold the unit firmly with both hands when tilling or cultivating, and maintain control at all times.

**Always** keep the handles clean.

**Always** disconnect the spark plug wire before performing any maintenance work.

## Product Description and Specifications

### Tiller/Cultivator Attachment

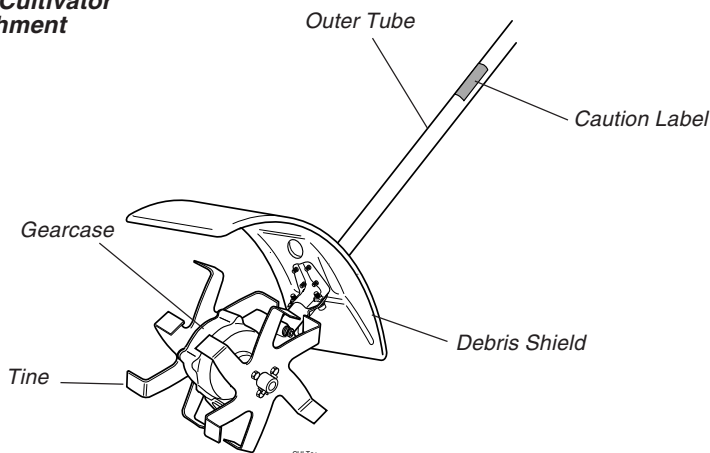


Figure 3

Using the accompanying illustrations as a guide, familiarize yourself with the unit and its various components. Understanding this unit helps ensure top performance, long service life, and safer operation. See Figure 3.



#### **WARNING!**

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

## Multipurpose Tiller/Cultivator Tool Specifications

Tiller/Cultivator Attachment (w/gearcase & tines) .....	5.9 lbs. (2.7 kg)
Gearcase Lubrication .....	Mobil SCH 634 synthetic gear lubricant
Gear Reduction .....	40:1

\*Specifications are subject to change without notice.

### Prior to Assembly

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

- Gearcase Assembly (If applicable)
- Debris Shield Assembly
- Tines and attaching hardware
- Kit containing this owner's/operator's manual and a 5 mm hex key.

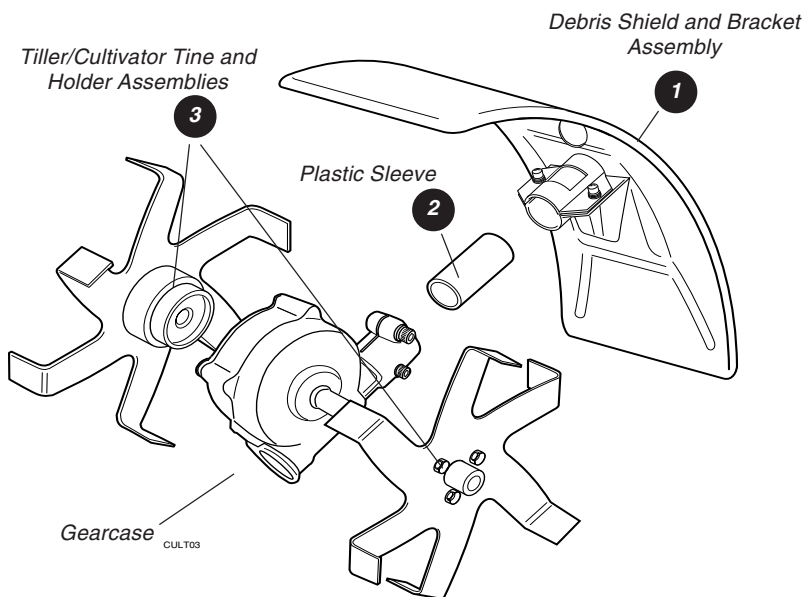
Carefully inspect all components for damage.

#### **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.



# Tiller/Cultivator Kit Contents



Item No.	Qty.	Description
1	1	Debris Shield and Bracket Assembly
2	1	Plastic Sleeve
3	2	Tiller/Cultivator Tine and Holder Assembly
4	2	Clevis Pins
5	2	Hitch Pins
6	1	Caution Label

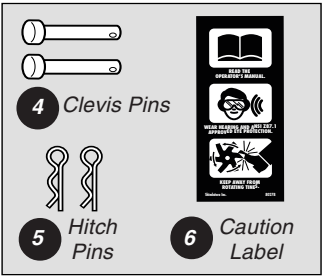


Figure 4

## Required Tools

- 4mm hex wrench
- 5mm hex wrench
- Pliers
- 7/16" wrench (socket wrench recommended)

## Kit Contents

**80275** (All PowerBrooms) Includes Tines, Debris Shield, mounting hardware and caution label.

**99909-44000** (T230 T231 Trimmers) Includes Gearcase, Tines, Debris Shield, mounting hardware and caution label.

**99909-55000** (T270 T272 Trimmers) Includes Gearcase, Tines, Debris Shield, mounting hardware and caution label.

## Removing the PowerBroom Drum Assemblies

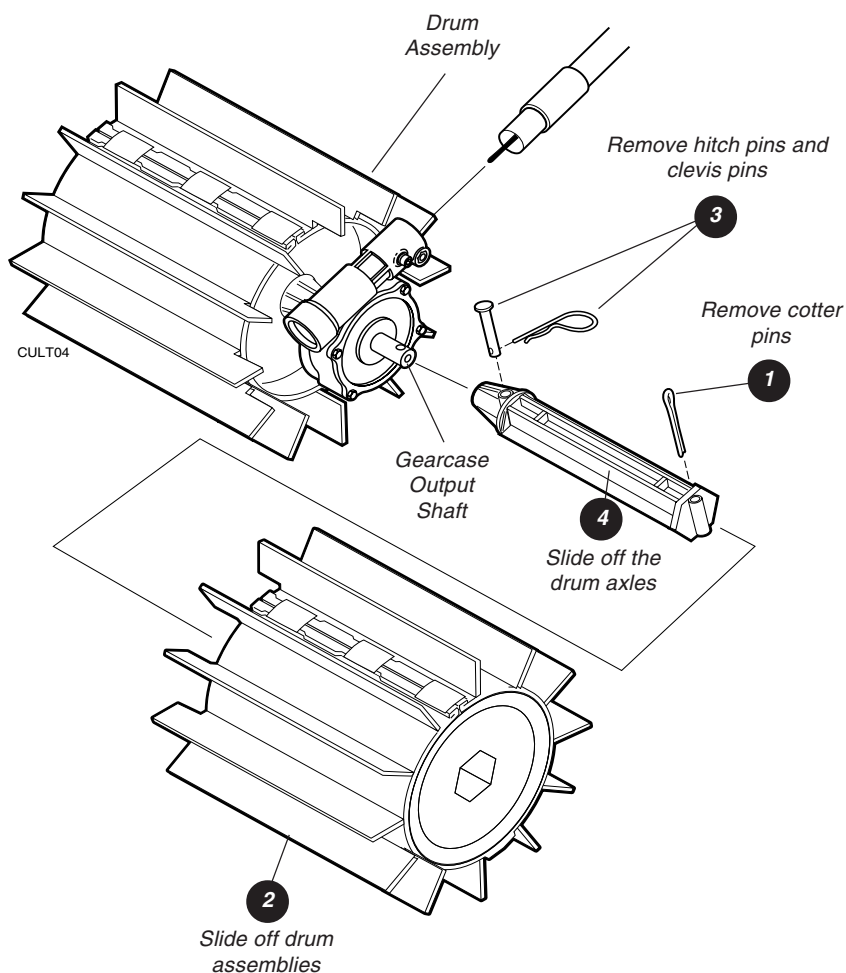


Figure 5

Prior to installing a Tiller/Cultivator Kit, the PowerBroom drum (if so equipped) and axle assemblies must be removed as follows:

1. Use a pair of pliers to remove the cotter pins from the drum axles.
2. Slide the drum assemblies from the axles.
3. Remove the hitch pins, and withdraw the clevis pins from the drum axles.
4. Slide the drum axles from the gearcase output shafts.
5. Remove gearcase.
6. Remove optional debris shield if installed.

## Removing the PowerBroom Brush Assemblies

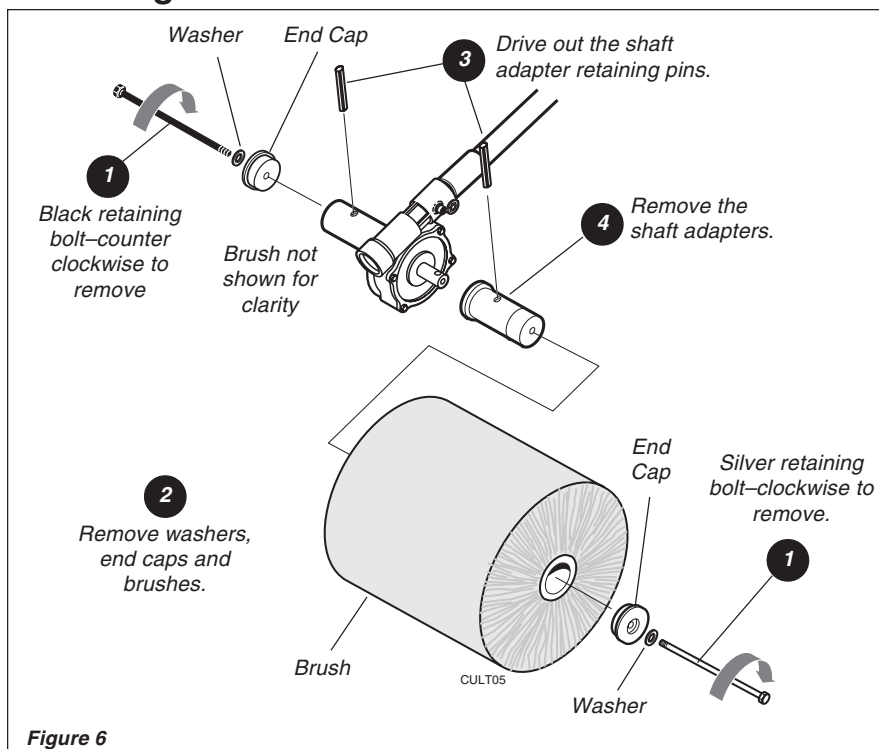


Figure 6

When installing a Tiller/Cultivator Kit onto a PowerBroom with the nylon brush attachment, the brushes must be first removed as follows:

### CAUTION!

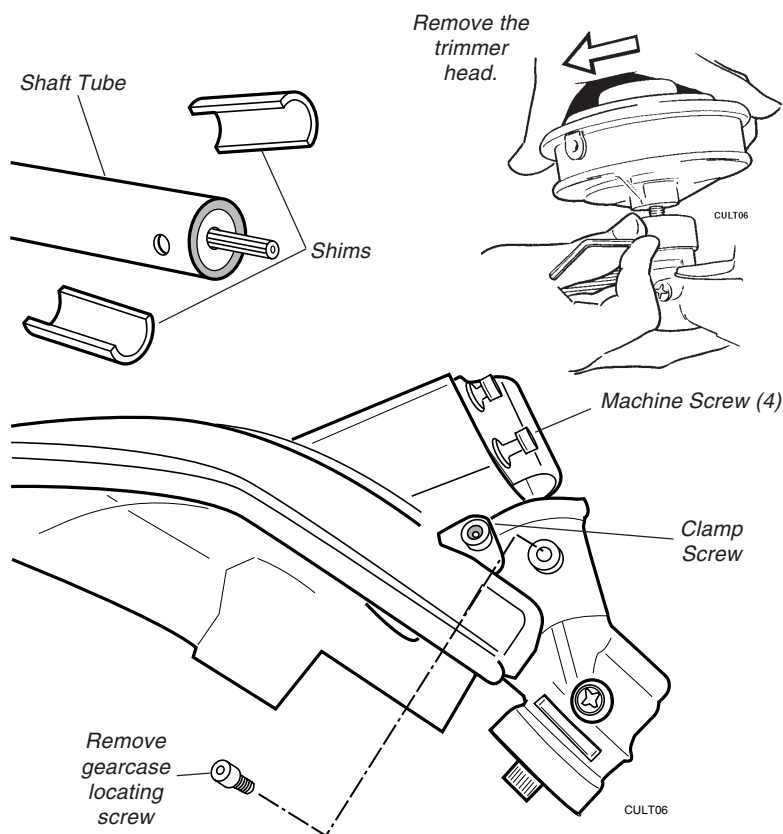
The brush retaining bolts and gearcase shaft adapters are color-coded:

- **Silver** for left-hand threads (turn **clockwise** to loosen),
- **Black** for right-hand threads (turn **counterclockwise** to loosen).

The bolts **must** be turned the appropriate direction during removal and installation. Failure to do so could result in permanent damage to the bolt and/or shaft adapter.

1. Using a 7/16" combination wrench or socket wrench, remove the brush retaining bolts (silver bolts clockwise to loosen, black bolts counterclockwise).
2. Remove the washers, end caps, and bristle brushes from the shaft adapters.
3. While supporting the shaft adapter, use a 3/16" punch to drive the retaining pins from the shaft adapter.
4. Remove the shaft adapters.
5. Remove gearcase.
6. Remove optional debris shield if installed.

## Removing the Gearcase from a Grass Trimmer



**Figure 7**

When converting a Shindaiwa grass trimmer, the gearcase must first be removed.

1. Using a hex wrench to secure the holder, remove the trimmer head. The trimmer head has a left-hand thread, so turn clockwise to remove.
2. Clean dirt and debris from the gearcase and shaft tube.

3. Remove the debris shield and gearcase as an assembly by removing the gearcase locating screw, then loosen the clamp screw and the four machine screws.
4. Slide the gearcase from the shaft using a twisting and pulling motion as required. If necessary, the main shaft can be removed from the shaft tube with gearcase for servicing.

### NOTE:

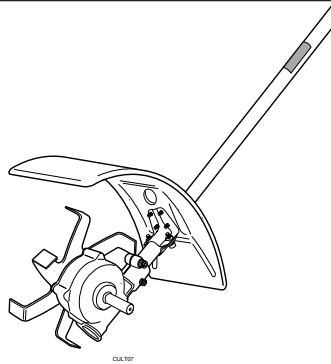
Do not lose the the two shims. They will be needed if the unit is converted back to a grass trimmer.

# Installing the Gearcase



## WARNING!

When used with tiller/cultivator tines, the PowerBroom gearcase **MUST** be oriented with the gearcase as shown. Failure to correctly orient the gearcase on the shaft tube could cause the tiller/cultivator to be uncontrollable during operation, risking serious injury to the operator or bystanders!



1. Push the plastic sleeve over the outer tube, and position the sleeve approx. 4-1/2 inches from the end of the tube. See Figure 8.
2. Slide the tiller/cultivator debris shield onto the outer tube and over the plastic sleeve. Orient the shield so that its mounting bracket faces upward as viewed while in operation. Use a 5mm hex wrench to tighten the shield clamp securely in place over the plastic sleeve. See Figure 9.
3. If the mainshaft was removed during disassembly, wipe the shaft clean, lubricate shaft and spines with a moly type grease and slide the shaft into the outer tube until the splines engage with the clutch drum at the power head.

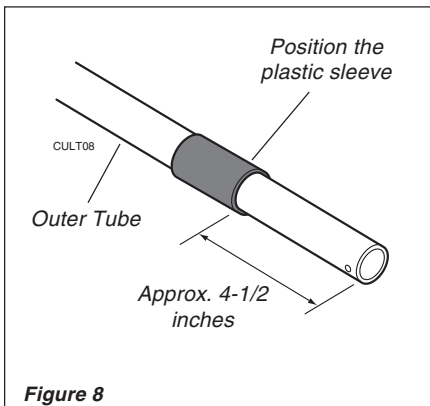


Figure 8

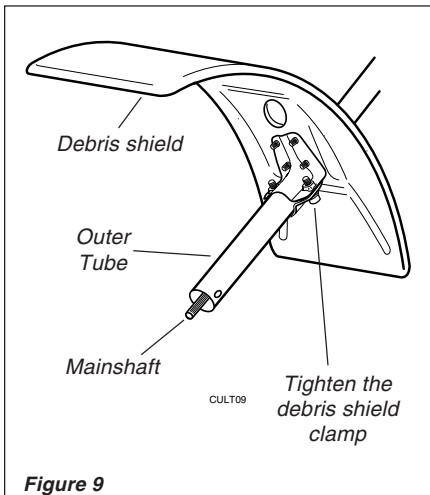
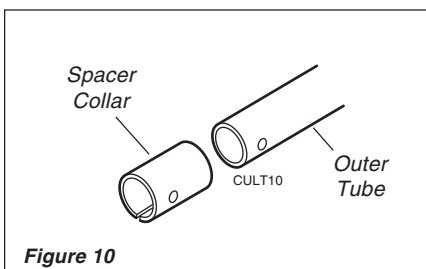


Figure 9

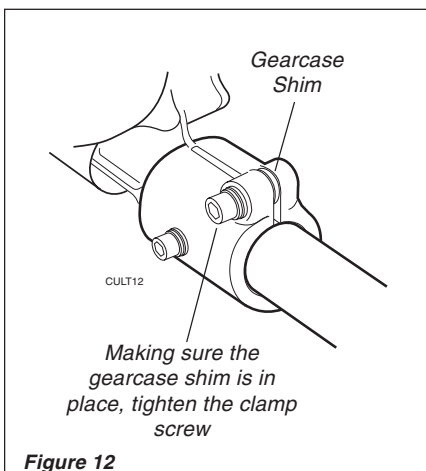
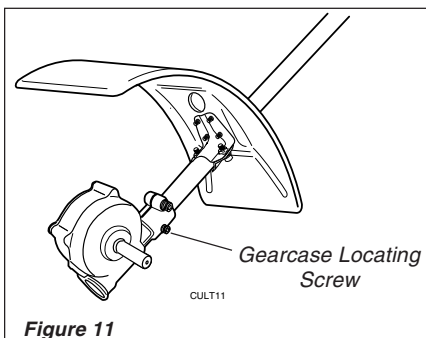
## Installing the Gearcase (continued)

### IMPORTANT!

T260 GRASS TRIMMERS ONLY:  
Tiller/Cultivator kits with a gearcase (p/n 99909-55000) include a metal spacer collar that must be installed onto the outer tube before installing the gearcase. Make sure the holes for the locating screw align properly. See Figure 10.



4. Orient the gearcase on the shaft tube with the output axles above the tube clamp. See Figure 11.
5. Hand-thread the original gearcase locating screw into the gearcase and through the gearcase locating screw hole in the outer tube. See Figure 11. Tighten the screw firmly.
6. Install the short screw on opposite side.
7. Make sure the gearcase shim is correctly installed in the gearcase clamp then tighten the gearcase clamp screw firmly. See Figure 12.



# Tine Orientation

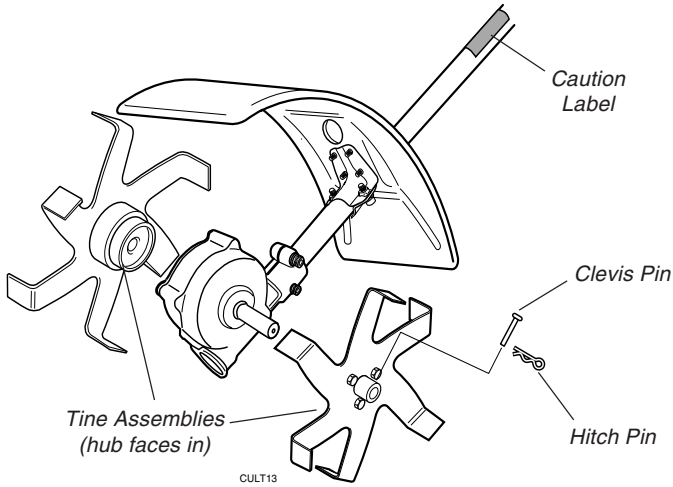


Figure 13

Tine installation directly affects the tiller/cultivator's ability to break new ground. Using Figures 14 and 15 as a guide, determine the correct tine orientation for the tilling/cultivating job at hand:

1. Install the tine assemblies to the gearcase output shafts.
2. Secure each tine assembly with one clevis pin and one hitch pin as shown in Figure 13.
3. Apply the caution label to the outer tube as shown in Figure 13.



## WARNING!

Always switch the engine OFF before working on the gearcase or tines!

### Tilling/Digging in Hard Soil

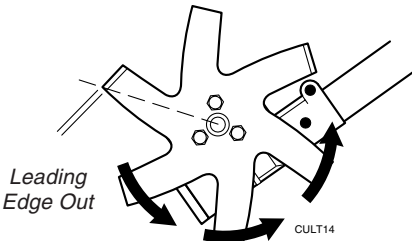


Figure 14

**Tiller** Leading edge **out** for aggressive action in hard soils.

### Weeding/Cultivating in Softer Soil

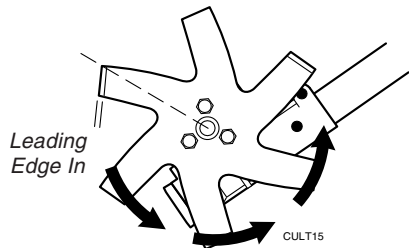


Figure 15

**Cultivator** Leading edge **in** for weeding or turning softer soils.

# Operation

## Starting and Fueling

For detailed instructions on general safety procedures, fueling, starting, and stopping the Shindaiwa PowerBroom or Trimmer, refer to the appropriate Owner's Manual for your model.



### **WARNING!**

**KEEP CLEAR** of tines during starting operations! The tines may rotate during startup.

## General Operation

Your Shindaiwa Tiller/Cultivator's reversible tines allow you to quickly change from operation as a cultivator-weeder to an aggressive tiller for quickly digging a new garden or landscaping plot. For best operation in either mode:

**WATER** the area to be tilled at least 24 hours before your planned tilling operation; then water again about 3 hours before the actual tilling.

**PULL** the tiller slowly toward you when tilling or cultivating.

**FOR DEEP TILLING** (up to 10" depth) use full throttle while slowly rocking the tiller back and forth over the work area.

**SHALLOW WEEDING** in soft soils is easiest when the tines are installed in the cultivating configuration, with additional depth available by using a gentle rocking motion as described above.

**HEAVY WEEDS** or weeding in harder soils may require reversing the tines to the more aggressive tiller configuration.



### **WARNING!**

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



## Checking Unit Condition

**NEVER** operate the unit with the debris shield or other protective devices (ignition switch, etc.) removed!



### **WARNING!**

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

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

**NEVER** use a cracked or warped tine: replace it with a serviceable 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 attachment holders.

## Shoulder Strap

### **NOTE:**

Although a shoulder strap accessory is not required for use with a Tiller/Cultivator, a shoulder strap can increase operator comfort during extended periods of operation. See Figure 16.



## Maintenance



### **WARNING!**

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



### **WARNING!**

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

### **NOTE:**

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

## Daily Maintenance

Prior to each work day, perform the following:

- Check for loose or missing screws or components.
- Make sure that nuts, bolts, and screws (except carburetor adjusting screws) are tight.

## Engine Maintenance

### **IMPORTANT!**

For detailed engine maintenance information, consult the owner's manual that was provided with the unit. If it has been lost or misplaced, contact Shindaiwa for a replacement.

# 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!**

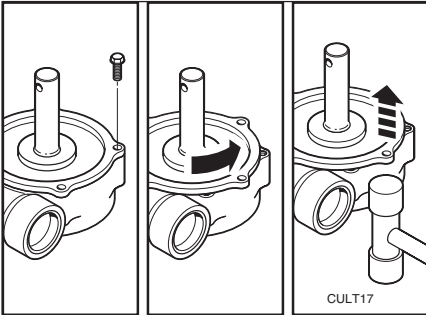


Figure 17

## 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 RH tine and holder 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 17.

### NOTE:

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

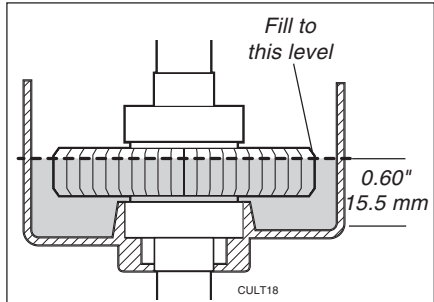


Figure 18

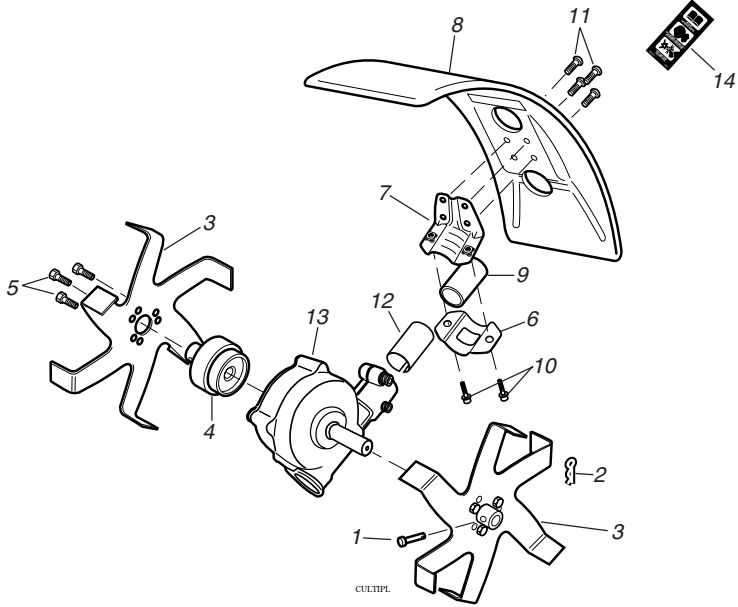
4. Turn the gearcase to the RH side and allow all used gearcase oil to drain into a small container.
5. Place the gearcase on the LH side and supported so the outer tube is parallel to the ground. Refill the gearcase with 60 cc (2.0 fl.oz.) of Mobil SHC634 Synthetic Gear Oil to the bottom of the chamfer on the output gear. The correct oil depth is 0.60" (15.5 mm). See Figure 18. **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 Threebond No. 1104 Liquid Gasket.
7. Replace the cover and install the four sideplate screws. Tighten securely.
8. Reinstall the tine and holder assembly with the clevis pin. Secure with hitch pin.

# Troubleshooting Guide

## ADDITIONAL PROBLEMS

Symptom	Possible Cause	Remedy
Excessive vibration.	Warped or damaged tines.	Inspect and replace tines as required.
	Loose gearcase.	Tighten gearcase securely.
	Bent main shaft/worn or damaged bushings.	Inspect and replace as necessary.
Tines 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.
Tines rotate at engine idle.	Engine idle too high.	Adjust engine idle speed 2,750 RPM. ( ± 250 ) RPM (min <sup>-1</sup> )
	Broken clutch spring or worn clutch spring boss.	Replace clutch spring and shoes as required.

# Illustrated Parts List



Index	Part Number	Part Name	Qty.
1	78822-01110	LOCK PIN	2
2	12400-16088	SNAP PIN	2
3	78822-01120	TINE	2
4	78822-01130	TINE HOLDER	2
5	01011-06128	TINE HOLDER SCREW	6
6	78822-01140	DEBRIS SHIELD BRACKET	1
7	78822-01150	DEBRIS SHIELD HOLDER	1
8	78822-01160	DEBRIS SHIELD	1
9	78822-01170	COLLAR	1
10	78822-01180	SHIELD BRACKET SCREW	2
11	78822-01190	SHIELD HOLDER SCREW	4
12	72959-13330	SPACER COLLAR (T230, T231, T2500, T260, T261)	1
13	22222	GEARCASE (T230, T231, T2500)	1
13	33333	GEARCASE (T260, T261, T270, T272)	1
14	80278	CAUTION LABEL	1

## NOTES

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Part Number 80465  
Revision 8/02

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