

Mantis[®] Tiller/Cultivator

Motobêche-bineuse



MODEL 7940
MODÈLE 7940

**Operator's Manual and Safety Instructions for
Tiller/Cultivator**

**Manuel de l'utilisateur et consignes de
sécurité pour la motobêche-bineuse**

MAN 430131

Rev. A 12-29-15

**OPERATOR'S/PARTS MANUAL
MANUEL DE L'UTILISATEUR / PIÈCES DÉTACHÉES**



Welcome to the World of Mantis Gardening

Here's your new MANTIS Tiller . . . the lightweight wonder that's Changing the Way Americans Garden.®

Unlike big tillers, your MANTIS Tiller weighs only 24 lbs. (Model 7940). So it lifts easily, handles smoothly, and tills and weeds precisely. And unlike other small tillers, it features serpentine tines that churn soil to 10" deep, creating a soft, smooth seed bed, even in problem soil.

Once you know how to use your tiller correctly, we guarantee you'll love it. So first, please read this manual. It shows, step by step, how to use your tiller safely.

ATTENTION MANTIS PRODUCT OWNERS!

Get maintenance tips for your Mantis product on our web site at www.mantis.com

IMPORTANT MESSAGE

Thank you for purchasing this Schiller Grounds Care, Inc. product. You have purchased a world-class product, one of the best designed and built anywhere.

This machine comes with Operation and Safety instructions, Parts and Service instructions, and Engine instructions. The useful life and good service you receive from this machine depends to a large extent on how well you read and understand these manuals. Treat your machine properly, lubricate and adjust it as instructed, and it will give you many years of reliable service.

Your safe use of this Schiller Grounds Care, Inc. product is one of our prime design objectives. Many safety features are built in, but we also rely on your good sense and care to achieve accident-free operation. For best protection, study the manuals thoroughly. Learn the proper operation of all controls. Observe all safety precautions. Follow all instructions and warnings completely. Do not remove or defeat any safety features, and make sure those who operate this machine are as well informed and careful in its use as you are.

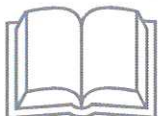
See a Schiller Grounds Care, Inc. dealer for any service or parts needed. Schiller Grounds Care, Inc. service ensures that you continue to receive the best results possible from Schiller Grounds Care, Inc. products. You can trust Schiller Grounds Care, Inc. replacement parts, because they are manufactured with the same high precision and quality as the original parts.

Schiller Grounds Care, Inc. designs and builds its equipment to serve many years in a safe and productive manner. For longest life, use this machine only as directed in the manuals, keep it in good repair, and follow all safety warnings and instructions. You'll always be glad you did.

Schiller Grounds Care, Inc.
1028 Street Road
Southampton, PA 18966-4217
PHONE (800) 366-6268 • FAX (215) 956-3855

TABLE OF CONTENTS

SAFETY RULES & WARNINGS	FUELING & STARTING
Special Safety Information..... 3	4-Cycle Fueling & Oil Only 10
Safety & Warnings 3	4-Cycle Corrective Action 10
Safety Decal Information 3	4-Cycle Starting Only..... 10
Warning Dos 4	OPERATION..... 11-12
Warning Don'ts 5	TRANSPORTATION 13
Engine/Fuel Warning Dos 5	STORAGE 13
Engine/Fuel Warning Don'ts 5	MAINTENANCE 14-16
ASSEMBLY 6	TROUBLESHOOTING 17
Lower Handle 7	MANTIS TILLER ASSEMBLY & PARTS LIST 18-19
Upper Handle Assembly 8	LIMITED WARRANTY INFORMATIONBACK PAGE
Tines 8-9	
Kickstand 9	



This Operator's/Parts Manual is part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.

Safety Rules & Warnings

You will notice Safety Rules and Important Notes throughout this Operator's Manual. Make sure you understand and obey these warnings for your own protection.

I. SPECIAL SAFETY INFORMATION

WARNING

Attention: This symbol points out our important safety instructions. When you see this symbol, heed it's warning!! Stay alert!!

WARNING

To reduce the potential for accidents, comply with the safety instructions in this manual. Failure to comply may result in serious personal injury, and/or equipment and property damage.

II. SAFETY & WARNINGS

WARNING

Improper use or care of this tiller or failure to wear proper protection can result in serious injury. Read and understand the rules for safe operation and all instructions in this manual. Wear hearing and eye protection.

WARNING

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

III. SAFETY DECAL INFORMATION

An important part of the safety system incorporated in this tiller is the warning and information decals found on various parts of the tiller. These decals can degrade in time due to abrasion, etc. It is your responsibility to replace these decals when they become hard to read. Please review and familiarize yourself with each of the following decals:



P/N 430057



Cutting hazard; keep feet and hands away from rotating tines.



Do not carry the tiller in this position.



Read owner's manual before using tiller, or performing any repair or maintenance. Keep owners manual in a safe place.



Don't operate indoors



Don't fuel, refuel, or check fuel while smoking, or near an open flame or other ignition source.



P/N 400631



Wear ear and eye Protection.



Caution: when assembling the handles, make sure fuel tank faces away from operator. This is the rear of the tiller, refer to assembly instruction on page 8-9.



Incorrect assembly.

WARNING

If the tiller is used improperly or safety precautions are not followed, the users risk serious injury to themselves and others.

Read and understand this manual before attempting to operate this tiller.

WARNING

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor is installed. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

IV. WARNINGS - DO

Read and understand the owner's manual. Pay particular attention to all sections regarding safety.

- 1. Always keep a firm grip** on both handles while the tines are moving and/or the engine is running. **BE AWARE!** The tines may continue to spin after throttle trigger is released and continue to pose a hazard. Make sure tines have come to a complete stop and engine is off before letting go of the tiller.
- 2. Always maintain a firm footing** and good balance. Do not overreach while operating the tiller. Before you start to use the tiller, check the work area and remove any obstacles that might cause you to lose your footing, balance, or control of the machine.
- 3. Thoroughly inspect the area** where equipment is to be used and remove all objects that can be thrown by the machine.
- 4. Always keep area clear** of children, pets, and bystanders.
- 5. Always stay alert.** Watch what you are doing and use common sense. Do not operate unit when fatigued.
- 6. Always dress properly.** Do not wear loose clothing or jewelry that could get caught in moving parts. Use sturdy gloves to reduce the transmission of vibration to your hands, as prolonged exposure to vibration can cause numbness and other ailments.
- 7. Always wear** substantial footwear and long trousers while working. Do not operate the equipment when barefoot or wearing open-toe sandals.
- 8. Always wear** ear and eye protection. Eye protection must meet applicable CE or ANSI standards. To avoid hearing damage, we recommend hearing protection be worn whenever using the equipment.
- 9. Keep** the engine and petrol/gas storage area free of vegetative material and excessive grease to reduce fire hazard.
- 10. Start the engine carefully,** according to all manufacturer's instructions and with feet well away from tool(s).
- 11. Keep** all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- 12. Use extreme caution** when reversing the tine direction or pulling the machine toward you.
- 13. Work only in daylight** or with good artificial light.
- 14. Always be sure** of your footing on slopes.
- 15. Exercise extreme caution** when changing direction on slopes.
- 16. Always keep a safe distance** between two or more people when working together.
- 17. Always inspect your tiller** before each use. Tighten all loose hardware to be sure the equipment is in safe working condition.
- 18. Always visually inspect** to ensure that the tools are not worn or damaged. Before using your tiller, replace worn or damaged elements and bolts in sets to preserve balance.
- 19. Always maintain and examine** your tiller with care. Follow maintenance instructions given in manual.
- 20. Always store tiller** in a sheltered area (a dry place) not accessible to children.
- 21. Always remember** the operator or user is responsible for accidents or hazards occurring to other people or their property.

Safety Rules & Warnings

V. WARNINGS - DON'T

Don't use tiller with one hand. While the tines are moving or engine is running, keep both hands on handles with fingers and thumbs encircling the handles.

Don't run with the machine, walk.

Don't work on steep slopes.

Never attempt to clear tines while they are moving, or the engine is running. Switch the engine off and make sure the tines have stopped completely before removing jammed material.

Don't allow children or people unfamiliar with these instructions to use the machine. Local regulations can restrict the age of operator.

Don't let others operate tiller without proper training.

Never store the tiller or its fuel in a house.

Don't operate while under the influence of alcohol or drugs.

Don't attempt to repair this tiller. Have repairs made by a qualified dealer or repairman. See that only original Mantis parts are used.

Don't overreach. Keep a good footing at all times.

Don't stand in front of tiller when tines are rotating or engine is running.

WARNING

Handle fuel with care, it is highly flammable. Fueling a hot engine or near an ignition source can cause a fire and result in serious personal injury and/or property damage.

VI. ENGINE/FUEL WARNINGS - DO

Always use fresh gasoline. Stale gasoline can cause damage.

Always store fuel in containers specifically designed for this purpose.

Always add fuel before starting the engine.

Always replace all fuel tank and container caps securely.

Always pull starter cord slowly until resistance is felt to avoid kickback and prevent arm or hand injury.

Always operate engine with spark arrestor installed and operating properly.

Stop the engine whenever you leave the machine and before refueling. Allow the engine to cool before storing in any

enclosure. Replace worn or damaged parts for safety.

Only drain the fuel tank outdoors. To reduce the potential of fire. Keep the engine and fuel storage area free of vegetative material and excessive grease.

VII. ENGINE/FUEL WARNINGS - DON'T

Never pick up or carry a machine while the engine is running or the tines are turning.

Don't fuel, refuel, or check fuel while smoking, or near an open flame or other ignition source. Stop engine and be sure it is cool before refueling.

Don't leave the engine running while the tiller is unattended. Stop the engine when carrying out maintenance and cleaning operations, when changing tools, or when being transported by any means other than under the tiller's own power.

Never remove the fuel cap or add fuel while the engine is running or when the engine is hot.

Don't refuel, start, or run this tiller indoors or in an improperly ventilated area.

Don't run engine if electrical system causes sparks outside the cylinder. During periodical checks of the spark plug, keep plug a safe distance from cylinder to avoid burning evaporated fuel from cylinder.

Don't check for spark with spark plug or plug wire removed. Use an approved tester.

Don't crank engine with spark plug removed unless spark plug wire is disconnected. Sparks can ignite fumes.

Don't run engine when the odor of gasoline is present or other explosive conditions exist.

Don't attempt to start the engine if fuel is spilled. Move the machine away from the area of spillage and avoid creating

any spark or source of ignition until fuel vapors have dissipated or spill has been cleared.

Don't operate your tiller if there is an accumulation of debris around the muffler or cooling fins.

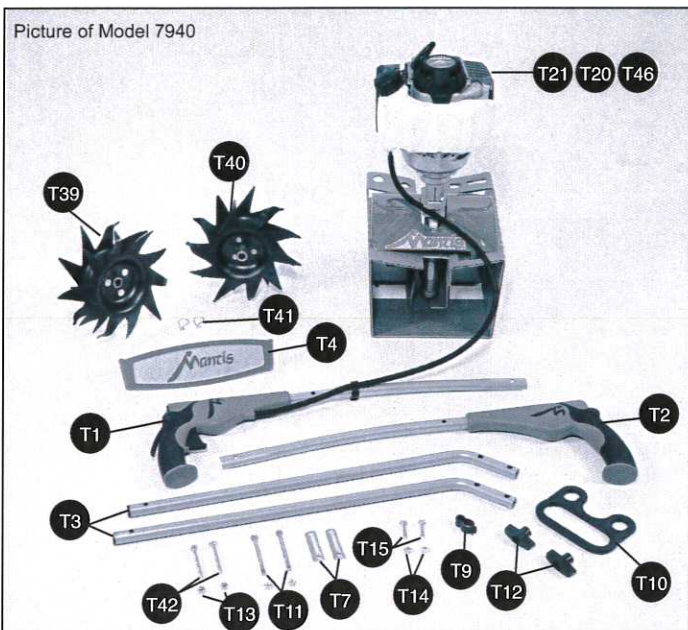
Don't touch hot mufflers, cylinders or cooling fins contact may cause serious burns.

Don't change the engine governor setting or over throttle the engine.

Don't attempt to remove spark plug while engine is hot. Removing a spark plug from a hot engine can cause irreparable damage to the engine and will void your warranty.

Don't use starter fluids they will cause permanent engine damage.

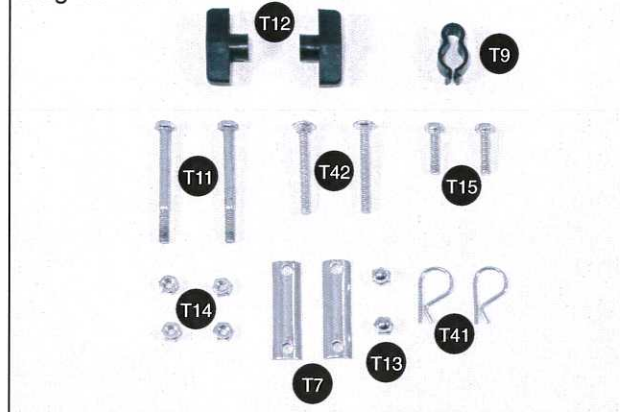
Assembly



⚠ WARNING

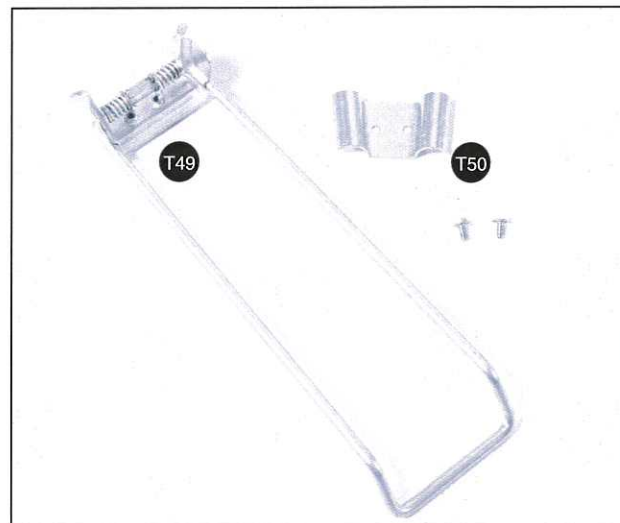
Improper assembly of this tiller can result in serious injury. Make sure to follow all instructions carefully. If you have any questions, contact our factory at 1-800-366-6268 or an authorized Mantis dealer.

Bag Contents



WHAT COMES IN THE BOX

Key	Qty.	Part No.	Description
T1	1		Upper Handle Throttle Side Assembly
T2	1		Upper Handle Assembly, Left
T3	2		Lower Handles W/Plug
T4	1		Handle Brace Assembly
T10	1		Plastic Carrying Handle
T21, T20, T46	1		Engine Assembly (includes Fender Guard & Worm Gear Transmission)
T39/T40	1		Pair Tiller/Cultivator Tines
	1		Bag of Hardware
T7	2		Handle Clamps
T9	1		Throttle Clip
T11	2		Bolts (3" long)
T12	2		Knobs
T13	2		Acorn Nuts
T14	4		Lock Nuts
T15	2		Cap Screws
T41	2		Tine Retaining Pins
T42	2		Carriage Bolts
T49	1		Kickstand, Stand Assembly
T50	1		Kickstand, Bracket and Hardware Bag
Not Shown	1	400206	4-Cycle Oil



WHAT YOU WILL NEED TO ASSEMBLE THE TILLER

Prior to removing the contents and assembling, it is important to:

- Have a clean work area
- Have two 7/16" wrenches
- Make sure all necessary tools are handy
- Have a 3/8" wrench for kickstand assembly

Assembly

LET'S BEGIN

- With the box upright, open the box and remove the tine box and the loose parts at the top of the tiller box. Do not remove any other parts from the box.
- Lay the box on one side and open the bottom flaps.
- Return the box to an upright position (as shown in Figure A) and pull the box straight up.
- Leave the engine and throttle handle in the cradle to assist in the assembly.
- Lay everything out so you can easily identify the parts (see parts image and list on page 6).

Figure A



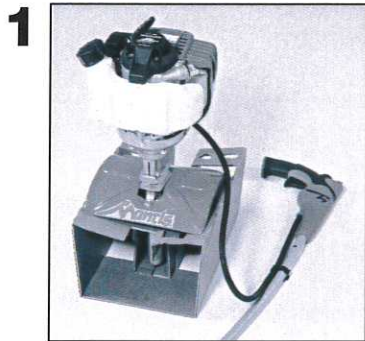
Figure B



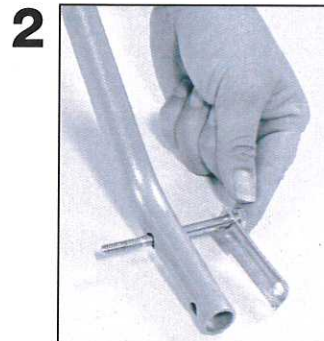
NOTE: Some of the photos in this manual do not represent your tiller engine. They are for assembly purposes only.

LOWER HANDLE ASSEMBLY

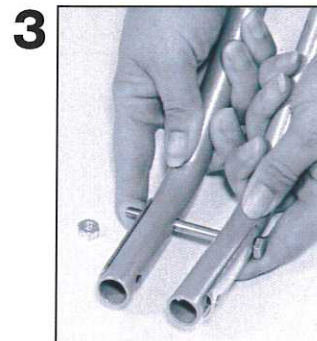
See page 6 to identify part numbers.



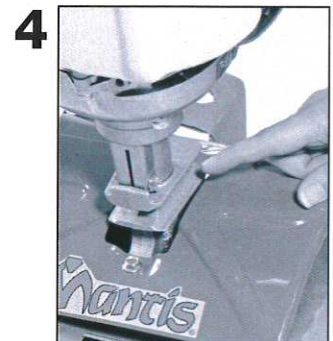
- For ease of assembly and stability, it is important that you keep the engine assembly in its cardboard cradle.



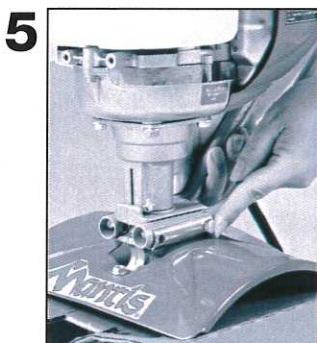
- Lay all handle parts within easy reach. You'll need one of the handle clamps (T7) and one of the lower handles (T3). Note that the lower handles have a short leg on one end.
- Fit the handle clamp along the outside of the short leg as shown. Line up the holes on the clamp and the leg.



- Choose one of the two 3-inch bolts (T11). Slide it through the first set of holes near the elbow where the lower handle curves. (Pictures 2 & 3)
- Now slide the other lower handle onto the 3-inch bolt. Fit the other clamp onto the other handle's short leg. Add a lock nut (T14) and tighten "finger tight" (as tight as you can make them without the use of a tool). (Picture 3)



- Locate recessed channels below the engine.



- Slide the lower handles that you've just put together into the two recessed channels.
- Make sure you insert them from the rear of the tiller (**gasoline tank faces away from the operator**) so the bolt fits along the back of the housing.

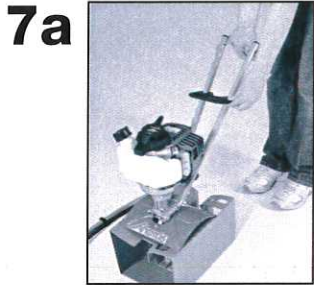


- Slide the second 3-inch bolt (T11) through the second set of holes in the short legs. Add a lock nut (T14) and tighten finger tight until you've completed assembly.

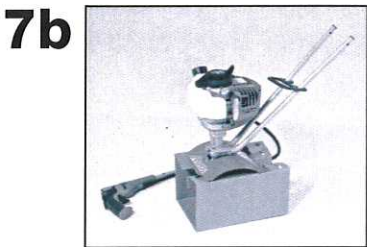
NOTE: THE LOCK NUTS ARE STAMPED. FINGER TIGHT IS APPROXIMATELY 1/2 TO 1-1/2 TURNS UNTIL YOU'VE COMPLETED ASSEMBLY.

Assembly (Continued)

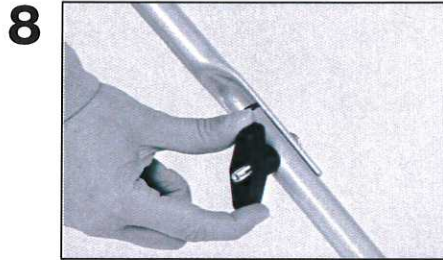
UPPER HANDLE ASSEMBLY



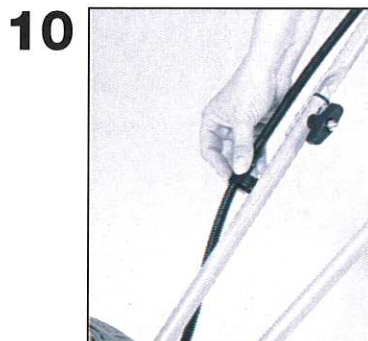
- Lightly squeeze the lower handles (T3) toward one another so they line up with the two smaller holes on the carrying handle (T10). Then slide the carrying handle over and down the lower handles. It will rest about four to six inches above the fender.
- Gently pull the lower handles out to their original position.



- Your Mantis tiller will look like this when the lower handle assembly is complete.



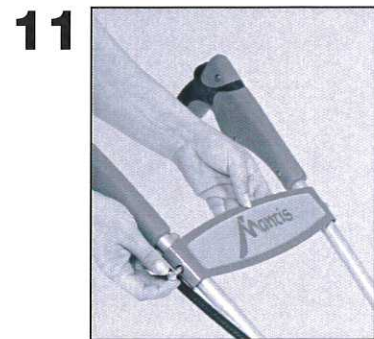
- Lift the upper handle until the holes line up with the lower handle.
- Insert carriage bolt (T42) from outside in.
- Screw on knob (T12) and fully tighten the knob at the pivot point.



- Repeat steps 8 and 9 to install the other upper handle onto the other lower handle.
- Use throttle clip (T9) to secure the throttle cable and wire in place on the lower handle.

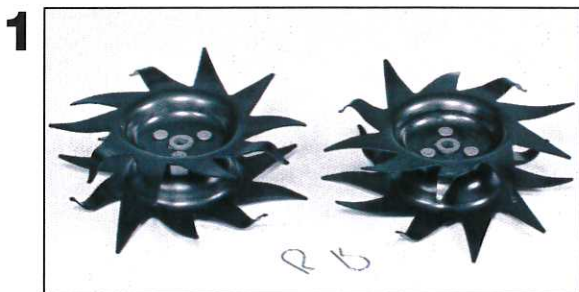


- Cap the exposed bolt with an acorn nut (T13) and tighten with your 7/16" wrench until snug. Do not over tighten.

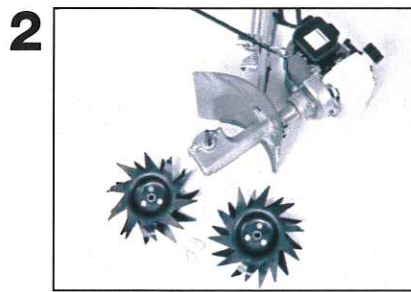


- Line it up holes on handle brace (T4) with the holes on the upper handles. Insert a cap screw (T15) and a lock nut (T14) on either side.
- Use a wrench to tighten cap screws and lock nuts.
- Use wrench to tighten all nuts and bolts firmly and securely.

TINE ASSEMBLY



- You will need the two tines and two retaining pins.

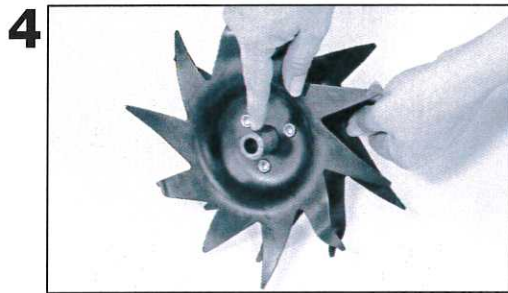


- Remove the unit from the cardboard cradle and lay the unit on its side.

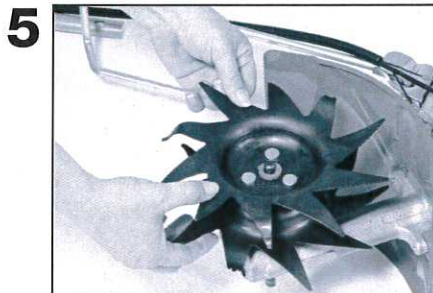


- You will notice that one side of the tine has a circular hole, while the other has a D-shaped hole.

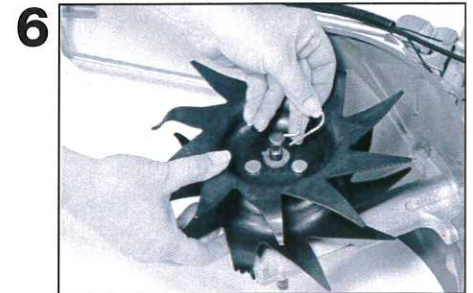
TINE ASSEMBLY (Continued)



- Attach the tine so that the circular hole slides onto the axle first.

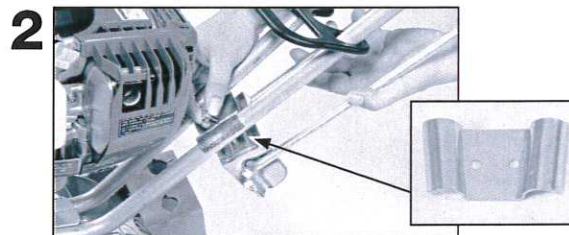
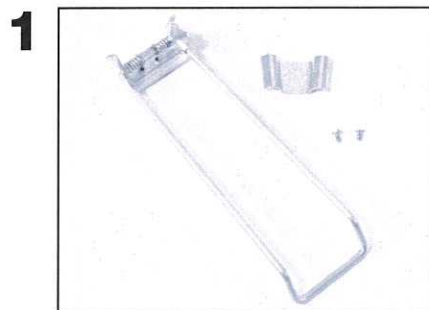


- When the axle protrudes from the other side it will line up perfectly with the D-shaped hole.



- Slide a tine retaining pin (T41) through the hole in the axle to secure the tine.
- Repeat steps for the other side.

KICKSTAND ASSEMBLY



- Position the kickstand brace just above the bend of the lower handles.
- Position the kickstand under the lower handles, line up the holes, and thread the kickstand brace bolts into the kickstand.
- Tighten with the 3/8" wrench.



- Your Mantis tiller will look like this when lower handle assembly and kickstand are complete.



WARNING

Improper Throttle installation can cause tines to rotate unexpectedly.

IMPORTANT NOTE:

Make sure you have installed the handles properly. When you stand behind your tiller, holding the handles, the fender warning label should face you.

IMPORTANT NOTE:

Before you use your MANTIS Tiller, read the Safety Rules & Warnings on pages 3-5

IMPORTANT NOTE:

Be sure you have proper throttle movements and that the throttle cable is not wrapped or twisted around the handle bar. Hold down the lockout lever, fully squeeze the throttle trigger and let go. The throttle triangle must click in both directions. If there is any doubt, remove air filter and visually check that the throttle triangle hits both the idle screw and the full open stop. THIS MUST BE DONE BEFORE STARTING THE ENGINE.

4-Cycle Tiller Fueling & Starting

4-CYCLE TILLER FUELING AND OIL ONLY

IMPORTANT!

It is normal for your 4 stroke engine to smoke for the first minute or two of operation. It is not necessary for this to occur every time. This is a result of the oil being pulled through the engine for lubrication.

- Rock the tiller forward so that it rests on the fuel tank.
- It is important to position the tiller as shown in **Figure 1** so the oil will properly fill the crankcase. Failure to do so will cause engine damage.
- Remove the oil plug.
- Pour in 2.7 fl. oz. of approved, 4-cycle engine oil.
- **Always check the oil level before each use.** The oil level should reach the inner first thread of the reservoir. Do not overfill.
- Replace the oil plug.
- Return the unit to the upright position and put the kickstand down.

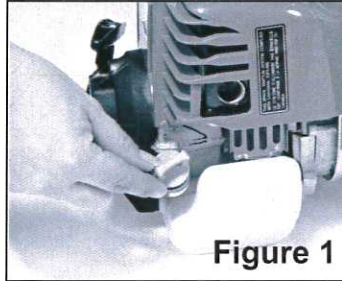
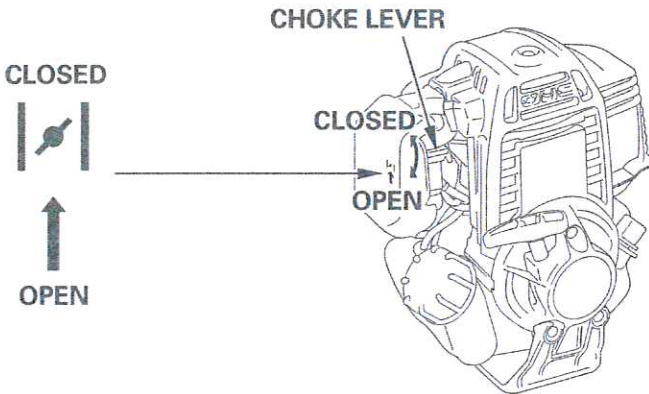


Figure 1

Fueling your tiller is easy. Unscrew the gas cap and fill the tank about four-fifths of the way with 89 octane unleaded gasoline. Remember to always drain the gas when transporting the unit from one location to another.



4-CYCLE TILLER STARTING ONLY

Starting the engine for the first time, or “cold starting”, is easy.

- Make sure the start/stop switch on the throttle handle is in the start position, which is indicated by the “I” symbol.
- Close the choke by moving the choke lever to the up (closed) position.
- Press the primer bulb approximately 6 times until the bulb is filled with gas. Once it is filled, press it two more times.
- Pull the starter cord lightly until you feel resistance, then give it a short, brisk pull. Your tiller should start immediately. Do not pull the cord all the way out, and do not let it snap back into the starter housing.
- Once it is running, move the choke to the down (open) position.
- To stop the engine, simply push the start/stop switch to the stop position, which is indicated by the “O” symbol.
- To start a warm engine, follow the same procedure, but leave the choke lever in the down position and do not pump the primer bulb.
- Before using the tiller, let the engine run for a minute to warm up. Before shutting it down, let the engine run idle briefly to cool down.



Switch

IMPORTANT NOTE:

Check the oil level in the engine before each use. If oil is low see your 4 Stroke Tiller Engine Manual and information at left for details.

Never use starting fluids, as they will cause permanent engine damage, and void the warranty. Before you use the tiller, read the Safety & Warning rules on pages 3-5.

⚠ WARNING • DANGER ⚠

ALTERNATIVE FUELS, SUCH AS E-15 (20% ETHANOL), E-85 (85% ETHANOL) OR ANY FUELS NOT MEETING HONDA REQUIREMENTS ARE NOT APPROVED FOR USE IN 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.

⚠ WARNING

Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.

⚠ WARNING

Fuel is extremely flammable. Handle it with care. Keep away from ignition sources. Do not smoke while fueling your equipment

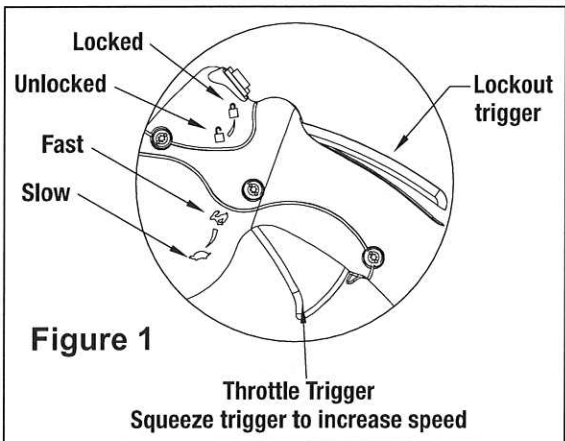
⚠ WARNING

Avoid accidental blade engagement. Do not squeeze the throttle trigger when starting. Maintain proper idle speed adjustment (2500-3100 rpm)

4-Cycle Tiller Operation

! WARNING

If engine does not stop when switch is put in the stop position, release the throttle and allow engine to idle. Put the tiller down and slide the choke lever to the cold start (closed) position. Do not use again before product is serviced.



A SPECIAL FEATURE

Note: With the idle set properly and the engine running

Even when the engine is running, the tines won't turn unless you squeeze the throttle trigger on the handlebars. When you release the throttle trigger, the tines will stop.

A TIP FOR EXTENDING YOUR ENGINE'S LIFE

After you start the engine, let your tiller warm up for two to three minutes before you use it. Then, before you put your

tiller away, let it idle for a minute to give the engine a chance to cool down.

OPERATION

With engine running, and both hands on the handles, hold down the throttle lockout trigger (**Figure 1**), then squeeze the throttle trigger gradually to increase the engine speed and engage the tines.

NOTE: This step must be repeated each time your tiller trigger is released.

! WARNING

Read the instructions carefully. Be familiar with the controls and the proper use of the equipment.

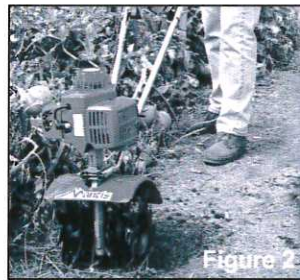
NOW YOU'RE READY TO USE YOUR MANTIS TILLER.

If you've used other tillers, your MANTIS Tiller may surprise you. It tills best when you pull it backward! When you pull your MANTIS Tiller backward, you give extra resistance to the tines, so they dig deeper. (**Figure 2**)

In addition, when you go backward, you erase your footprints, so your soil stays light and fluffy. With other tillers, by contrast, you walk right over the soil you've just tilled, packing it down, so it's less plantable.

RUN YOUR MANTIS TILLER LIKE A VACUUM CLEANER

Place your Tiller at the head of the row or area you want to till, and start it up. Begin with an easy rocking motion, and pull the Tiller backward. Then repeat rocking motion, and pull it backward again. Then, let it move forward just a little bit, before pulling it



backward again. This will help you till deeper. Keep repeating these steps until you've tilled an entire row, then start again on the next row. It's much like running a vacuum cleaner! (**Figure 3**)

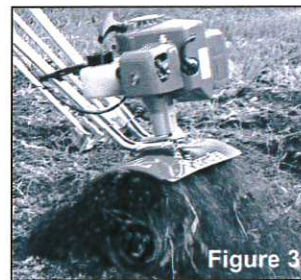
You can even control depth.

For deeper tilling:

Move your Tiller slowly back and forth, as you would a vacuum cleaner. Work the same area over and over until you've dug to your desired depth. (**Figure 4**)

For shallow tilling:

Switch the tines to the cultivating position (See page 12 to learn how). Then move your Tiller quickly over your soil surface.



For Big Weeds or Tough Roots:

Let your Tiller rock back and forth over the tough spot until the tines slice through the weed or root.

Your MANTIS Tiller Handles Special Tilling Projects:

Want to turn part of your lawn into a colorful flower border? Your MANTIS Tiller makes it easy! Just run your Tiller back and forth until the sod begins to break up. Then continue tilling. Your Tiller will chop the clumps of sod until they're fine then work them into the soil. Pretty soon, you'll have a soft, fresh planting bed.

! WARNING !

ALWAYS MAKE SURE THE HANDLE KNOBS ARE SECURE BEFORE STARTING YOUR MANTIS TILLER.

4-Cycle Tiller Operation (Continued)

WARNING

Never try to remove an obstruction while the engine is running. Serious injury can result. If your tines get jammed or entangled, shut off the engine at once. Remove the obstruction while the engine is off.

WARNING

The operator of this tiller is responsible for accidents or hazards occurring to himself, other people or their property.

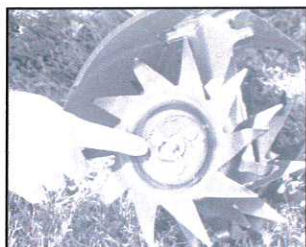


Figure 1

YOUR MANTIS TILLER MAKES WEEDING A PLEASURE!

As a tiller, your MANTIS Tiller works the soil down to 10" (25.4 cm) deep. But, as a cultivator it gently cultivates the surface to just 2" to 3" (5.09 cm to 7.62 cm) deep.

To change to cultivating mode, switch the tines to the weeding (or cultivating) position as described at right. This takes less than a minute.

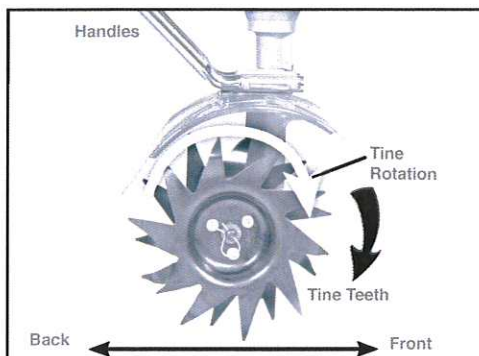
In this configuration, your MANTIS Tiller's sharp "tine teeth" will slice up those pesky weeds, burying them as you go along. And since the tines in this position won't dig too deep, they won't hurt your plants' precious root systems.

The result? Your Tiller will cut your weeding time in half and turn a tiresome chore into a pleasure.

HOW TO SWITCH FROM TILLING TO CULTIVATING POSITION

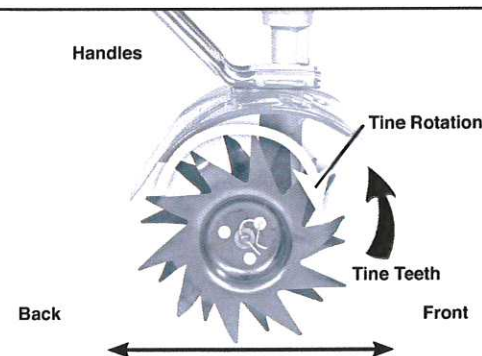
1. Make sure your Tiller is off.
2. Remove the retaining pins from the tines.
3. Remove the tines from the axle.
4. Place the right-side tine onto the left-side axle, then place the left side tine onto the right-side axle. The "D" hole should be to the outside when the tines are positioned correctly.
5. Reinsert the pins. (Figure 1)

Tilling Position



For tilling, attach the tines so the points face forward (away from the operator). In this position, the tines' points will contact the ground first.

Cultivating Position



For cultivating, reverse the tines so the points face backward (toward the operator). In this position, the long flat part of the tine's blade will contact the ground first.

Figure 1

4-Cycle Tiller Transportation & Storage



Figure 1

4-CYCLE TILLER TRANSPORTATION

Transporting your Tiller is easy. It's light and easy to carry using the carrying handle as shown in **Figure 1**.

Or with it running, you can walk it by gently squeezing the throttle until it moves at a comfortable pace. Your Tiller is also easily transported in the back of a car or truck. Be sure to empty the fuel tank (This is crucial)! Then stow your tiller in the trunk of your car or truck.

CAUTION: You must empty your Tiller's fuel tank before placing it in a car or truck.



Figure 2

TILLER STORAGE

! WARNING

Never store the equipment with fuel in the tank or in an area where fumes may accumulate and breach an open flame or spark

Before storing your Mantis Tiller for any long period, be sure to take these measures:

1. Do not store your Tiller with fuel still in it. Even under ideal conditions, stored fuel containing ethanol or MTBE can start to go stale in 30 days. Stale fuel has a high gum content and can clog the carburetor, restricting fuel flow. **When you're ready to store your Tiller, or will not be using it for more than two weeks, drain the fuel tank completely.**
2. To make sure no fuel is left in the carburetor, restart the engine. Then run the engine until it stops. This will prevent gum deposits from forming inside of the carburetor and possibly damaging the engine.
3. Disconnect spark plug wire and remove the spark plug. Apply a couple of drops of clean engine oil into the cylinder. Install the top cover temporarily. Pull the starter grip several times to distribute the oil in the cylinder.
4. Inspect the spark plug. If necessary,

clean it. Replace it with a NGK-CMR5H spark plug if damaged or badly fouled, if the sealing washer is in poor condition or if the electrode is worn.

5. Replace the spark plug, but leave the spark plug wire disconnected.
6. Wipe the tines with oil or spray them with WD-40 to prevent rusting.
7. Oil the throttle cable and all visible moving parts. (Do not remove the engine cover.)
8. Clean or replace the air filter.
9. Inspect the fuel filter. If the fuel filter is dirty, wash it gently with non-flammable or high flash point solvent. If the fuel filter is excessively dirty, replace it.
10. Check the grease level in the worm gear housing. Add grease if needed.
11. Store your Tiller in an upright position in a clean, dry place. You can hang it using the handle brace, or store with the handles in an extended position or folded down. To fold the handles down, loosen the lower two-pronged knobs until you can pivot the upper handles down. **(Figure 2)**
12. If you have fuel left over from last season, dispose of it properly. Buy fresh oil and gasoline next season.
13. Remove Tilling tines or attachments and lightly oil tine shaft at least once a year.

! WARNING !
NEVER CARRY YOUR TILLER AS THE PERSON IN FIGURE 2 IS DOING. IF YOU DO, YOU WILL SUFFER SERIOUS INJURY.

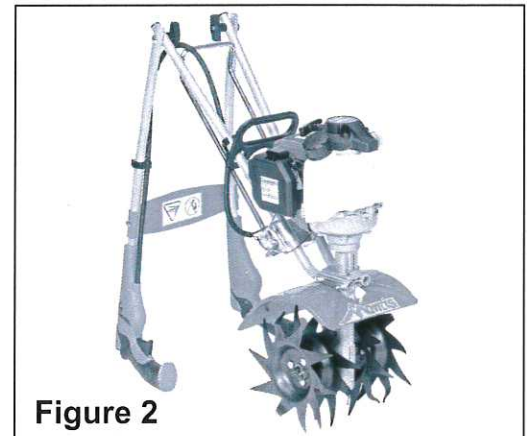


Figure 2

IMPORTANT:

It is important to store your 4-Cycle Mantis Tiller in an upright position. Laying the Tiller on its side will cause the oil to leak out of the engine through the air cleaner case.

IMPORTANT:

Avoid placing the Tiller with the top cover (engine head) down. This can allow oil from the crankcase to enter the combustion chamber and cause hard starting or a locked piston.

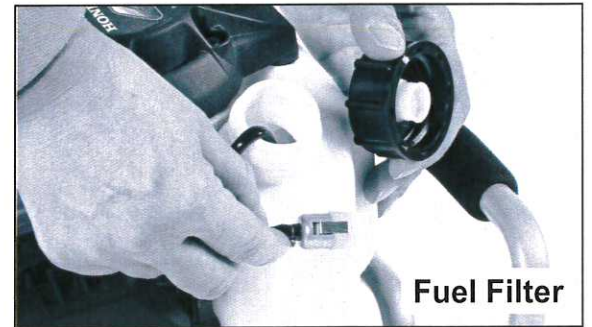
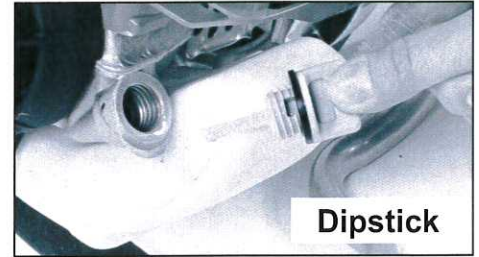
4-Cycle Tiller Maintenance

Your 4-Cycle Tiller will require some basic maintenance to keep it performing year after year.

If you are storing your Tiller for longer than 30 days, it is very important to empty the fuel tank to prevent engine damage.

Check engine oil level, air filter and fuel filter.

Refer to your Honda® engine manual for more details.



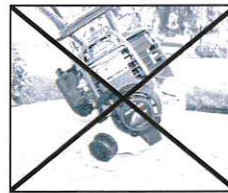
4-CYCLE CORRECTIVE ACTION: OVERFILLED ENGINE OIL

If the engine is overfilled, oil will enter the crankcase and will not simply pour out of the oil fill opening. The excessive oil must be pumped out as the engine runs. Check the oil level and drain any excess between multiple 30-second running intervals to bring the oil back to the proper level.

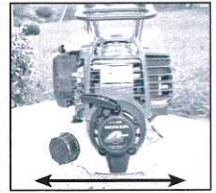
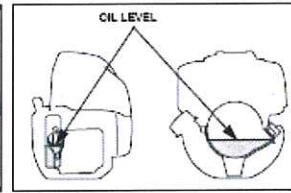
If you suspect the engine oil is overfilled, the following procedure should remove the excess oil from the crankcase and valve cover.

1. Place the engine on a level surface (resting flat on the fuel tank) and remove the oil fill cap/dipstick. Use a bucket to collect oil that overflows from the oil fill opening.
2. Replace the oil fill cap/dipstick and run the engine for approximately 30 seconds, then repeat step one.
3. Continue steps 1 & 2 until oil no longer overflows when the oil fill cap/dipstick is removed.
4. Once the overfilled oil is removed, continue to run the engine. It may continue to smoke for several minutes while the residual oil burns off.

4-CYCLE PROPER OIL FILL/ LEVEL CHECK POSITION



This position does not allow for a proper oil level reading and may cause overfilling.



Engine must be resting on the fuel tank on a flat surface

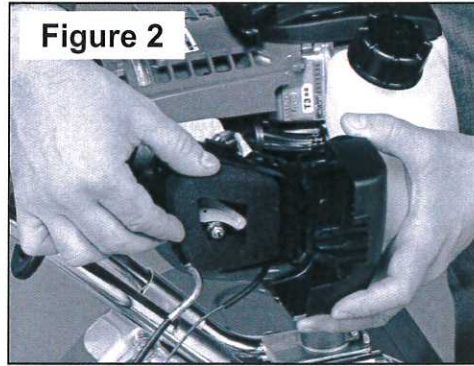
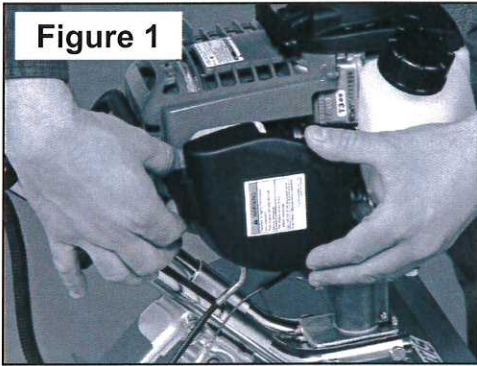
4-Cycle Tiller Maintenance (Continued)

AIR FILTER MAINTENANCE

A wet or dirty air filter can affect the way your engine starts, performs, and wears. Check your air filter once a month or after every 10 hours of use.

Note: If you work in dusty soil, check your filter more often (for instance, before each use). Be sure to replace it if its worn out or damaged.

How to Check, Clean, and Change the Air Filter



1. The air filter is held in the air cleaner in a black housing on the side of the Tiller, behind the gas tank cap.
2. Squeeze the two locking tabs at the rear of the air cleaner cover (**Figure 1**) and swing the cover toward the front of the engine to open it.
3. The air filter is the dark, sponge-like material on the inside of the air cleaner.
4. If the air filter needs to be cleaned (i.e. if it is soiled or moist), or no longer fits properly, simply remove it by carefully peeling it out of the air cleaner. (**Figure 2**)
5. To clean the air filter
 - a. Clean the filter element in warm, soapy water then rinse and allow to dry thoroughly. It also can be cleaned with a non-flammable solvent.
 - b. Dip the filter element in clean engine oil then squeeze out any excess oil. Note: The engine will smoke when started if too much oil is left in the element.
 - c. Wipe dirt from the air cleaner body and cover using a moist rag. Note: Be careful to prevent dirt from entering the carburetor.
6. Replace the clean filter inside the air cleaner.

IMPORTANT:

Make sure the filter is “seated” properly in the cover. The filter must fit snugly inside the opening that holds the filter in place. Installing the filter incorrectly will cause engine damage and void the warranty. Fit the cover back over the air cleaner and snap the two locking tabs.

IMPORTANT NOTE:

A dirty air cleaner will restrict air flow to the carburetor, reducing engine performance. If you operate the engine in very dusty areas, clean the air filter element more often than specified in the Maintenance section.

IMPORTANT NOTE:

Operating the engine without an air filter element, or with a damaged air filter element, will allow dirt to enter the engine, causing rapid engine wear. This type of damage is not covered by the Limited Warranty

IMPORTANT NOTE:

Check the lip on the Air Cleaner Cover. If the lip is chipped or cracked, it should be replaced. This will prevent dirt from being drawn through the carburetor into the inside of the engine.

4-Cycle Tiller Maintenance (Continued)

HOW TO RESEAT THE FLANGE

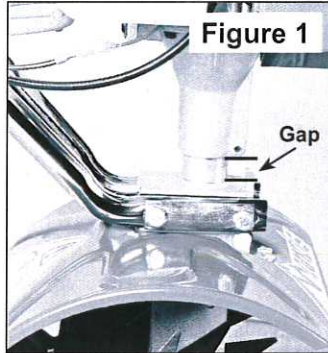
If the tines won't turn when you press the throttle, it may mean the engine isn't seated all the way down on the worm gear housing.

If you have been using your Tiller for several years or if you have removed the engine for use with our hedge trimmer attachment and then replaced it, the flange bolt may have come loose and lifted the engine up.

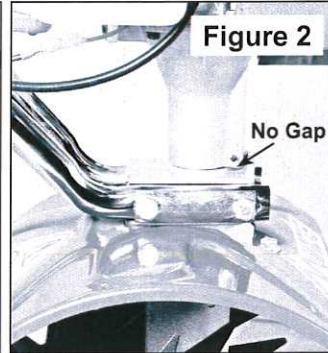
In this case you'll notice a gap between the bottom of the engine clutch case and the top of the worm gear housing. (**Figure 1**)

To eliminate the gap, loosen the flange bolt and take the engine off the worm gear housing. Notice the hex head on top of the drive shaft and locate the clutch drum inside the clutch case. Make sure the hex head lines up with the clutch drum inside the clutch case. (**Figure 5**)

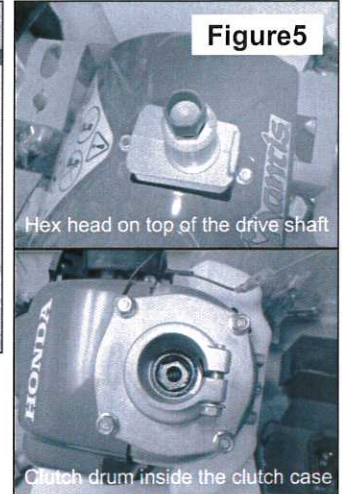
Next, put the engine back on the worm gear housing, making sure the plastic carrying handle is not under the fuel tank.



Note how the engine doesn't sit all the way down on the transmission.



Note how the engine sits all the way down on the transmission.



If you've followed these steps properly, there will be no gap between the clutch case and the worm gear housing. (**Figure 2**) Finally, make sure to tighten the flange bolt.

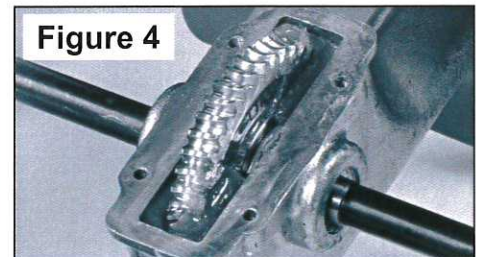
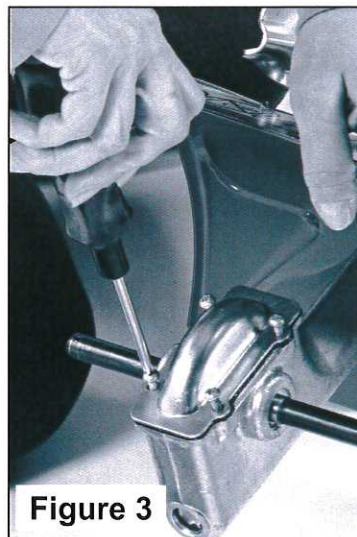
All other engine maintenance issues are addressed in the Honda® Engine Manual included in your Tiller package.

TRANSMISSION CARE

Note: Check the transmission grease level after the first 10 hours of use, then check yearly.

With the tines off, remove the transmission plate (**Figure 3**) and gasket to see if the grease level is up to the plate flange (**Figure 4**). If it is not, you will need to add lithium zero or lithium one grease.

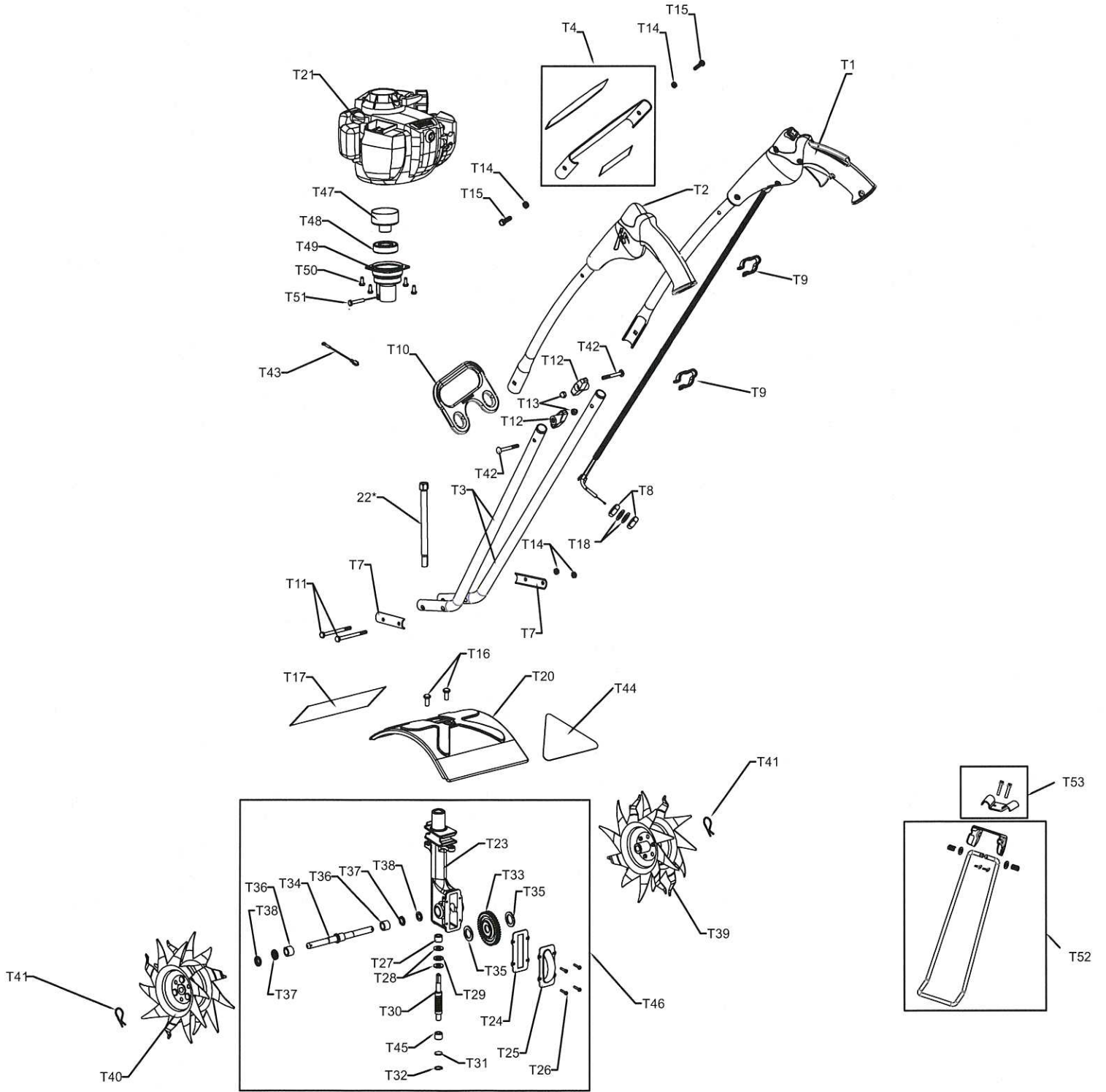
Wipe off any excess grease and replace the transmission gasket and plate.



Troubleshooting

Problem	Cause	Remedy
1. Tines don't turn when throttle is depressed	<ul style="list-style-type: none"> Engine is not seated properly on the gear housing. 	<ul style="list-style-type: none"> Re-install engine following the instructions on page 16 "How to reseat the flange."
2. Engine fails to start	<ul style="list-style-type: none"> O/I switch is in "O" position. No fuel in tank Fuel strainer clogged Fuel line clogged Spark plug shorted or fouled Spark plug is broken (cracked porcelain or electrodes broken). Ignition lead wire shorted, broken or disconnected from spark plug. Ignition inoperative 	<ul style="list-style-type: none"> Move switch to "I" Fill tank. Replace strainer. Clean fuel line. Install new spark plug. Replace spark plug. Replace lead wire or attach to spark plug. Contact your local authorized dealer.
3. Engine hard to start.	<ul style="list-style-type: none"> Water in gasoline Gasket leaks (carburetor or cylinder base gasket). Weak spark at spark plug 	<ul style="list-style-type: none"> Drain entire system and refill with fresh fuel. Replace gaskets. Contact your local authorized dealer.
4. There is black smoke coming from exhaust	<ul style="list-style-type: none"> The muffler screen is clogged. 	<ul style="list-style-type: none"> Clean carbon from muffler screen. See engine manual.
5. Engine misses.	<ul style="list-style-type: none"> Dirt in fuel line or carburetor Carburetor improperly adjusted Spark plug fouled, broken or incorrect gap setting Weak or intermittent spark at spark plug 	<ul style="list-style-type: none"> Remove and clean. See "Carburetor Adjustment" in engine manual. Clean or replace spark plug - set gap to .024-.028 in. (0.6-0.7 mm). Contact your local authorized dealer.
6. Engine lacks power.	<ul style="list-style-type: none"> Air filter clogged Muffler clogged Spark Arrestor Clogged Poor compression 	<ul style="list-style-type: none"> Clean or replace air filter (page 15). Clean carbon from muffler, see engine manual. Clean Spark Arrestor; see engine manual. Contact your local authorized dealer.
7. Engine overheats.	<ul style="list-style-type: none"> Air flow obstructed 	<ul style="list-style-type: none"> Clean flywheel cylinder fins and screen. See engine manual.
8. Engine noisy or knocking.	<ul style="list-style-type: none"> Spark plug in incorrect heat range Bearings, piston ring or cylinder walls are worn. 	<ul style="list-style-type: none"> Replace with plugs specified for engine. Contact your local authorized dealer.
9. Engine stalls under load.	<ul style="list-style-type: none"> Engine overheats. 	<ul style="list-style-type: none"> Remove dust and dirt from between fins.

4-Cycle Tiller Assembly



Parts List

Key	Qty.	Part No.	Description
T29	1	424	Worm Thrust Bearing
T30	1	422	Worm Shaft
T31	1	426	Worm Disk
T32	1	428	Retaining Ring
T33	1	429	Worm Gear
T34	1	431	Tine Shaft
T35	2	430	Worm Gear Thrust Washer
T36	2	432	Worm Gear Bearing
T37	2	434	Bearing Seal
T38	2	435	Bearing Seal Retainer
T39	1	438RA	Tine Assembly, Right
T40	1	438LA	Tine Assembly, Left
T41	2	418-1	Tine Retaining Pin
T42	2	430039	Carriage Bolt 1/4-20 X 2.25"
T43	1	430043	Ground Wire Jumper, 4 Cycle Engine
T44	1	400631	Triangle Warning Label (4 Cycle Engine)
T45	1	458	Roller Bearing
T46	1	400010	Transmission Assembly ¹
T47	1	400131	Clutch Drum
T48	1	400132	Bearing
T49	1	400130	Engine Flange
T50	4	400511	M6 X 12 Flange Bolt
T51	1	910502	10-32 X 3/4" Flange Bolt
T52	1	410158	Kickstand, Stand Assembly
T53	1	410113	Kickstand, Bracket And Hardware

Key	Qty.	Part No.	Description
T1	1	430070	Trigger Handle Assembly, 4 Cycle Engine, Right
T2	1	430071	Handle Assembly, Left
T3	2	430082	Lower Handle W/Plug
T4	1	430084	Handle Brace Assembly
T7	2	377	Handle Clamp
T8	2	4078	M6 Jam Nut
T9	2	478	Throttle Clip
T10	1	400315	Carry Handle
T11	2	470	Bolt 1/4-20 X 3"
T12	2	400523	Knob, Two Prongs, Female
T13	2	395	Acorn Nut
T14	4	972	1/4-20 Two-Way Lock Nut
T15	2	144-2	1/4-20 X 1.125 Hex Head Cap Screw
T16	2	140	Bolt 1/4-20 X 3/8" Long
T17	1	430058	Mantis Logo Label
T18	2	4079	M6 Internal Lock Washer
T20	1	465	Fender Guard
T21	1	400911	Engine Assembly-25Cc Honda ¹
T22*	1	468	Drive Shaft
T23	1	466	Worm Gear Housing
T24	1	436	Gasket
T25	1	437A	Gear Housing Cover
T26	4	651	#8 Self Tapping Screw
T27	1	423	Roller Bearing
T28	2	425	Worm Bearing Race

*Also in key T46



LIMITED WARRANTY

MANTIS extends this limited warranty against defects in material and workmanship for a period of five (5) years under normal usage for residential purposes and two (2) years under normal usage for commercial purposes, from the date of purchase by the original purchaser.

MANTIS will repair or replace, at its option, any part or parts of the product found to be defective in material or workmanship during the warranty period. Warranty repairs and replacements will be made without charge for parts or labor. All parts replaced under warranty will be considered as part of the original product, and any warranty on the replaced parts will expire coincident with the original product warranty. If you think your MANTIS TILLER is defective in material or workmanship, please contact customer service at 800-366-6268 for the location of an authorized servicing dealer or send it, along with your proof of purchase (sales receipt) to:

Mantis
1028 Street Road
Southampton, PA 18966

You are responsible for pickup and delivery charges; if shipping to factory the product must be returned to us postage paid. Engines are warranted separately by the engine manufacturer

MANTIS assumes no responsibility in the event that the product was not assembled or used in compliance with any assembly, care, safety, or operating instructions contained in the Operators Manual or accompanying the product. This limited warranty does not cover damages or defects due to normal wear and tear, lack of reasonable and proper maintenance, failure to follow operating instructions or operators manual, misuse, lack of proper storage or accidents. This limited warranty shall not be effective if your Mantis tiller has been subjected to negligence or has been repaired or altered by anyone other than an authorized dealer or authorized service center.

You must maintain your MANTIS TILLER by following the maintenance procedures described in the operators manual. Such routine maintenance, whether performed by you or a dealer, is at your expense.

MANTIS MAKES NO EXPRESS OR IMPLIED WARRANTIES, REPRESENTATIONS OR PROMISES EXCEPT THOSE CONTAINED HEREIN. THERE ARE NO OTHER WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALL WARRANTIES OTHER THAN THE EXPRESS WARRANTY SET FORTH ABOVE ARE SPECIFICALLY DISCLAIMED. THE DURATION OF ANY IMPLIED WARRANTY, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IS LIMITED TO THE DURATION OF THIS WRITTEN LIMITED WARRANTY. MANTIS DISCLAIMS ALL LIABILITY FOR INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE USE OF THE MANTIS PRODUCTS COVERED BY THIS WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS AND/OR DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THAT ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

MANTIS
1028 Street Road
Southampton, PA 18966
(215) 355-9700

Specifications, descriptions, and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice.