



Tiller/Cultivator

OWNER'S MANUAL



7222RM



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 20 pounds. So it lifts easily,
handles smoothly, tills and weeds precisely.
And, unlike other small tillers, it features
serpentine tines that churn soil up to ten
inches deep. It creates 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. Plus,
it shows how the MANTIS Border Edger
can make light work of your edging needs.

If you have questions about any topic in
this Manual, or for the name of your local
dealer, call 1-800-366-6268 toll free,
Monday - Friday, 8:00 a.m. to 5:30 p.m.,
Eastern Time, or ask for Customer Service.

If you wish to order Mantis Attachments,
call 1-800-366-6268 toll free and ask for
our sales department.



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SAFETY RULES & WARNINGS

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

I. Special Safety Information

⚠ WARNING • DANGER ⚠
**ATTENTION: THIS SYMBOL POINTS OUT
OUR IMPORTANT SAFETY INSTRUCTIONS.**

**WHEN YOU SEE THIS SYMBOL, ⚠
HEED IT'S WARNING!! STAY ALERT!!**

⚠ WARNING • DANGER ⚠
**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 • DANGER ⚠
**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



P/N 400608



P/N 400609



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 FUEL,
REFUEL, OR CHECK
FUEL WHILE
SMOKING, OR
NEAR AN OPEN
FLAME OR OTHER
IGNITION SOURCE.**



**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 7.**



**INCORRECT
ASSEMBLY.**

⚠ WARNING • DANGER ⚠

**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.

IV. Warnings - Do's

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 coast after throttle trigger is released. 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 for 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, which 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, they might get caught in moving parts. Use sturdy gloves. Gloves reduce the transmission of vibration to your hands. Prolonged exposure to vibration can cause numbness and other ailments.

7. **While** working, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.

8. **Always** wear ear and eye protection. Eye protection must meet ANSI Z 87.1. To avoid hearing damage, we recommend hearing protection be worn whenever using the equipment.

9. **To** reduce fire hazard, keep the engine, and petrol/gas storage area free of vegetative material and excessive grease.

10. **Start** the engine carefully, according to the 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 or pulling the machine towards you.

13. **Work** only in daylight or 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 unit before each use and ensure that all handles, guards and fasteners are secure, operating, and in place.

18. **Always** maintain and examine your Tiller with care. Follow maintenance instructions given in manual.

19. **Always** store tiller in a sheltered area (a dry place), not accessible to children. The tiller as well as fuel should not be stored in a house.

V. Warnings - Don'ts

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

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

Don't run with the machine, walk.

Don't work on excessively steep slopes.

Don't attempt to clear tines while they are moving. Never try to remove jammed material before switching the engine off and making sure the tines have stopped completely.

Don't allow children or incapable people to operate this tiller.

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.

▲ WARNING • DANGER ▲

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's

Always use fresh gasoline in the fuel mixture. Stale gasoline can cause damage.

Always store fuel in containers specifically designed for this purpose.

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

Always operate engine with spark arrestor installed and operating properly. The use of spark arrestor mufflers is required by law in the state of California (Section 4442 of the California Public Resources Code), as well as in other states or municipalities. Federal laws apply on federal lands.

Stop the engine whenever you leave the machine.

Allow the engine to cool before storing in any enclosure.

If the fuel tank needs to be drained, this should be done outdoors.

VII. Engine/Fuel Warnings - Don'ts

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 engine before putting the tiller down or while transporting from one place to another.

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

Don't run engine when electrical system causes spark outside the

cylinder. During periodical checks of the spark plug, keep plug a safe distance from cylinder to avoid burning of 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 operate the unit if gasoline is spilled. Clean up spill completely before starting engine.

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

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

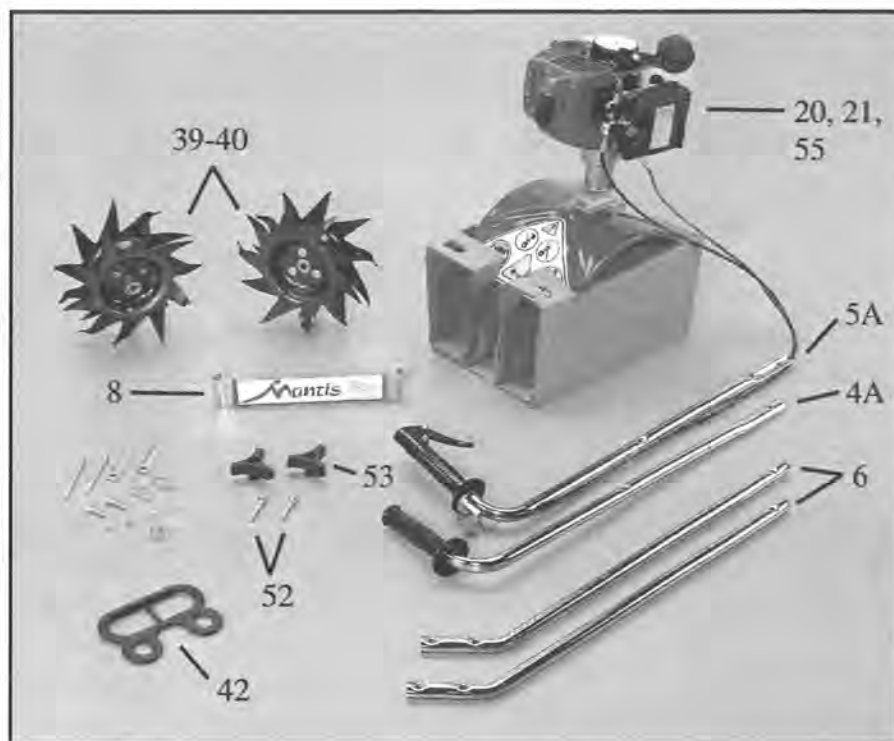
Don't change the engine governor setting or over speed the engine.

ASSEMBLY

⚠ WARNING • DANGER ⚠

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



Your MANTIS Tiller comes partially assembled. You must install only the handlebars, the carrying handle, and the tines. This will take just a few minutes if you follow the directions.

First, take all items out of the carton. But do not remove the cardboard from around the Tiller's base.

The list at the right, shows the parts that come with your tiller. Check to make sure you have them.

The bag of hardware is in the plastic bag containing the Owner's Manual and Video.

To assemble your MANTIS Tiller, you'll need two 7/16" wrenches or two adjustable wrenches. We suggest that you install all nuts and bolts only "finger tight" — that is, one-half to one full turn — until you've completed assembly. The nuts are self locking, but you must use a wrench to tighten them completely.

Quantity	Description	*Key #
1	Upper Handle Assembly	4A
1	Upper Handle Throttle Side Assembly	5A
2	Lower Handles	6
1	Pair Tiller/Cultivator Tines	39/40
1	Engine Assembly (includes Fender and Worm Gear Transmission)	20, 21, 55
1	Handle Brace	8
1	Plastic Carrying Handle	42
1	Bag of Hardware Containing:	
2	Cap Screws	47*
4	Lock Nuts	48*
2	Bolts (3" long)	49*
2	Tine Retaining Pins	41*
2	Handle Clamps	51*
1	Throttle Clips	13*
2	Bolts	52*
2	Knobs	53*

*These numbers are the same numbers shown on the Parts Layout on page 27.

ASSEMBLY *(continued)*

HOW TO ASSEMBLE LOWER HANDLES

To identify part numbers, see pages 6 and 27.

1. Use the protective cardboard sleeve to stabilize your tiller. Stand the engine assembly (#21) up.

2. Lay the handle parts within easy reach. You'll need one of the handle clamps (#51) and one of the lower handles (#6). Note that the lower handles have a short leg on one end. (Picture 1)

3. Fit the handle clamp along the outside of the short leg. Line up the holes on the clamp and the leg.

4. Choose one of the two 3-inch bolts (#49). Slide it through the first set of holes — near the elbow where the lower handle curves. (Picture 2)

5. Now slide the other lower handle onto the 3-inch bolt. (Picture 3.) Fit the other clamp

onto this other handle's short leg. Add a nut and tighten finger tight.

6. Locate the worm gear housing. It starts just above — and extends down through — the tiller's red fender guard. You'll notice that there's a recessed channel on either side of the housing's top. (Picture 4.)

7. Take the lower handles that you've just put together. Slide them into the two recessed channels.

⚠ Make sure you insert them from the rear of the tiller (gasoline tank faces away from the operator) . . . so that the bolt fits along the back of the housing. (Picture 5)

8. Slide the second 3-inch bolt through the second set of holes in the short legs. Add a nut and tighten finger tight. (Picture 6)



Picture 1



Picture 2

NOTE: THE LOCK NUTS ARE STAMPED. FINGER TIGHT IS APPROXIMATELY 1/2 TO 1-1/2 TURNS.



Picture 3



Picture 4



Picture 5



Picture 6

ASSEMBLY (continued)

HOW TO ASSEMBLE UPPER HANDLES & PLASTIC CARRYING HANDLE.

1. Lightly squeeze the lower handles (#6) toward one another so that they line up with the two smaller holes on the carrying handle (#42). Then slide the carrying handle over and down the lower handles. It will rest about four to six inches above the engine. (Picture 1)

2. Gently pull the lower handles out to their original position.

3. Attach the upper handle assembly (#5A) – the handle with the throttle cable and ground wire – onto either handle, and secure

with the handle knob (#53). You can attach this upper handle to whichever lower handle you prefer, depending on which hand you'd rather use to squeeze the throttle. (Picture #2)
Note: If throttle handle is mounted on the left, it will not fold down as completely as when mounted on the right.) **Be sure you have proper throttle movements and that the throttle cable is not wrapped or twisted around the handle bar.** Squeeze trigger and let go. The throttle actuator must click in both directions. If there is any doubt visually check that the throttle actuator hits both the idle screw and the full open stop. **THIS MUST BE DONE BEFORE STARTING THE ENGINE.**

4. Follow the same steps to install the other upper handle onto the other lower handle. (Picture 3)

5. Use the clip (#13) to secure the throttle cable and wire in place on the lower handle. (Picture 4)

6. Now install the Handle Brace. Line it up with the holes on the upper handles. Then insert a Cap Screw and a Lock Nut on either side (Picture 5)

7. Use a wrench to tighten Cap Screws and Lock Nuts.

8. Now use wrench to tighten all nuts and bolts firmly and securely.

IMPORTANT NOTE:

Make sure you have installed the handles properly. When you stand behind your tiller, holding the handles, **gas tank should be in front of the engine.**



Picture 1

⚠ WARNING: Improper throttle installation can cause tines to rotate unexpectedly.

⚠ WARNING • DANGER ⚠

REMOVE TINES BEFORE STARTING ENGINE AND MAKING ADJUSTMENTS.



Picture 2



Picture 3



Picture 4



Picture 5

ASSEMBLY (continued)

Assembling the Tines for Tilling

1. Remove the cardboard from around your Tiller's base.
2. Slide the tines onto the axle shafts. The "D" hole goes on the outside.
3. Make sure you've installed the tines properly for tilling. Liken the tines to your fingers. When your palm faces the ground, your fingers curl down. Stand behind the Tiller and hold your hand next to the tines. Do the tine blades curl down, as your fingers do? If so, they are in the tilling position. (To switch to the cultivating position, see page 15.)
4. To secure each tine to the axle, insert a tine retaining pin.

IMPORTANT NOTE:

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



Mixing Fuel

Your MANTIS Tiller is powered by a commercial two stroke, air cooled engine which requires a fuel mixture of gasoline and lubricating oil.

Use a mixture of 50 parts unleaded regular gasoline and 1 part two-stroke MANTIS oil (50:1.)



⚠ WARNING • DANGER ⚠
FUEL IS EXTREMELY FLAMMABLE. HANDLE IT WITH CARE. KEEP AWAY FROM IGNITION SOURCES. DO NOT SMOKE WHILE FUELING YOUR EQUIPMENT.

Your Mantis Tiller comes with a free pre-measured bottle of two-cycle engine oil. Here's how to mix the oil with the gas:

1. Pour 1/2 of the gasoline into a safe container. **Do not mix the fuel and oil in the engine fuel tank.**
2. Add 2.6 ounces of two-cycle engine oil to the gasoline and mix. Then add the rest of the gasoline.
3. Screw the cap onto the gasoline can. Then swirl the can to blend the oil and gas.
4. Carefully pour the fuel mix into the tiller's fuel tank. After putting the fuel tank's cap back on, wipe up any spilled fuel from tank and gasoline can.

IMPORTANT:

Two stroke fuel separates and ages. Do not mix more than you will use in a month. Using old fuel can cause difficult starting or engine damage. Shake fuel container to thoroughly mix fuel before each use. Do not attempt to run your engine on gasoline only, use proper fuel mixture. Need more pre-measured engine

oil? You can order it directly from Mantis. Just call toll free 1-800-366-6268 and ask for our Sales Dept.

Remember ...

- Always mix two-cycle oil with gasoline before fueling your tiller. Never, ever run your tiller on gasoline alone. This will ruin your engine and void all warranties.
- Always use a clean gas can and always use unleaded gas.
- Never try to mix the oil and gasoline in the engine fuel tank.
- Always mix oil and gas in the proper proportions: 2.6 ounces of two-cycle engine oil to one gallon of unleaded gasoline.

IMPORTANT NOTE:

Do Not use old or stale oil/gasoline mixture. Always use the proper oil/gasoline mixture. If you do not, your engine will suffer rapid, permanent damage. And you will void the engine warranty.

STARTING

To Start Your Tiller for the First Time:

1. Fill the fuel tank with the proper oil/gasoline mixture. (See previous section.)
2. Hand tighten the gasoline cap just until it's snug.
3. Move start/stop lever into the "start" position. (Picture 1)
4. Slide the choke lever away from the gas tank to close the engine choke. (Picture 2)
5. Locate the **purge bulb** on the upper right of the engine, in front of the fuel tank. (See **Picture 3**) It sends fuel into the carburetor, **for easy starting**. Press the **purge bulb** until you see fuel flow through the **clear fuel return line**. Since you're starting "cold," you may need to press six to eight times. As soon as fuel starts flowing through the clear fuel line, stop pressing! (Picture 3)
6. **Don't pull the throttle trigger during the starting of the engine.**
7. Pull the starter cord (Picture 4) slowly until resistance is

felt. Then give the recoil starter cord a few short, brisk pulls until the engine **fires**. **During cold starting**, you may need to pull at least three or four times before the engine **fires**.

NOTE: When the choke is closed, never pull the cord more than four or five times. Overpulling may cause flooding. Also, bear in mind that, when the engine **fires**, **it only coughs or sputters, and will not run on choke**.

8. Push the choke lever towards the gas tank to the Open (Choke) position. (Picture 5)
9. Then pull the starter cord again. The engine should start and run. Let the engine warm up two to three minutes before using.

Follow these steps whenever you are starting the engine "cold", or when the engine has run dry and you have just added fuel. Remember, always use short, brisk pulls. Don't give the cord a long, forceful yank. And, do not let the cord snap back into the starter housing.

⚠ WARNING ⚠

**AVOID ACCIDENTAL
BLADE ENGAGEMENT**

**DO NOT SQUEEZE THE
THROTTLE TRIGGER
WHEN STARTING.**

**MAINTAIN PROPER IDLE
SPEED ADJUSTMENT
(2500-3100 RPM)**



Picture 4



Picture 5

Never use starting fluids as they will cause permanent engine damage. Using them will void the warranty.

Before you use the tiller, read the Safety & Warning rules on pages 3-6.



Picture 1



Picture 2



Picture 3

STARTING (continued)

Starting a Warm Engine

1. Slide ignition switch to START position.
2. Move the choke lever to the Open (Run) position.
3. If there is no fuel in the clear return line, push primer bulb 3-4 times or until fuel is visible in the line.
4. Pull starter rope using short pulls, 1/2 to 2/3 of the rope length.
5. If engine fails to start in 4 pulls, use "First Time" starting procedure on page 10.
6. With engine running, and both hands on the handles, squeeze throttle trigger gradually to increase the engine speed and engage the tines

ADDITIONAL INFORMATION

⚠ WARNING • DANGER ⚠

IF ENGINE DOES NOT STOP WHEN SWITCH IS PUT IN THE STOP POSITION, RELEASE THE THROTTLE, ALLOW ENGINE TO IDLE.

PUT THE TILLER DOWN AND SLIDE THE CHOKE LEVER TO THE COLD START (CLOSED) POSITION.

CHECK AND RETURN IGNITION SWITCH TO ON POSITION BEFORE STARTING ENGINE AGAIN.

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.

How to Stop the Engine

Simply push the start/stop switch to "stop." (Picture 1) This will stop the engine instantly. If it should ever fail to do so, just pull out the choke button. The engine will stop at once.

About the Choke

The choke controls the amount of air drawn into the engine. Your tiller will run only if the choke is open — that is, if the choke lever is in the open position.

A Special Feature (with the idle set properly and the engine running)

Even when the engine is running, the tines won't turn unless you press the throttle lever on the handlebars. And, when you release the throttle lever, the tines will stop.



Picture 1

WHAT TO DO JUST IN CASE



Picture 1

If you follow the normal starting procedure, you should have no problem starting your tiller. But, just in case you do have problems, here's what to do.

Make sure the start/stop switch is on "start." You'd be surprised how many people forget to push the switch into the "start" position.

If the switch was on "stop" when you pulled the cord, you may have flooded the engine.



Picture 2



Picture 3

- First, examine the spark plug. Use the special wrench that comes with our optional MANTIS Handy Item Kit (Item #1422RM) or a 5/8 inch spark plug wrench. (Picture 1)
- Remove the cap over the spark plug. (Picture 2)
- Unscrew the spark plug. (Picture 3)



Picture 4



Picture 5

IMPORTANT NOTE:

To avoid possible damage to the threads, do not try to remove the plug from a hot aluminum cylinder head.

Starting a Flooded Engine

1. If the end of the spark plug is wet, the engine may be flooded. *Make sure the switch is in the stop position, disconnect spark plug wire and remove plug. Use a paper towel or a clean rag to dry the spark plug, then, with the spark plug out of the engine, pull the starter cord several times. Shake the fuel out of the inside of the plug and air dry.* (Picture 4) Next, replace the spark plug. Use the wrench to tighten it (87-104in. lbs. of torque) and replace the cap. Next, put the switch in the start position and pull the choke button out. Pull the starter cord three or four times until the engine coughs or sputters. Open the choke (push the choke button in) and pull the cord a few times. The engine should start and run.

2. If the end of the spark plug is dry, check to see if the fuel line is blocked. The fuel line runs from the fuel tank to the carburetor. Pull it off at the carburetor end. Fuel should drip slowly from the line. Wipe off any excess or spilled fuel.

If fuel does not drip from the line, check the line for any bends or pinches. (Picture 5). Kinks in the line restrict the flow of fuel to the engine. Just straighten out the line. Reconnect. Then follow the normal starting procedure.

If fuel drips too freely, the line may be disconnected from the fuel filter. You'll find the fuel filter inside the fuel tank. Just re-attach the line to the filter, and put the filter back in the tank. Then

WHAT TO DO JUST IN CASE (continued)

Here's Another Way to Start your MANTIS Tiller

If you follow the steps above and your engine still won't start, try this:

1. Push the switch to "start."
2. Slide the choke button to open the choke.
3. Press the plastic bubble a few times.
4. Give the starter cord a few short, quick pulls. The engine should start and run.
5. If the engine does not start, then slide the choke button to the

close position. Pull the starter cord four to five times. The engine should sputter or cough.

6. After the engine sputters, slide the choke to the open position. Then pull the starter cord. The engine should start and run.

7. If the engine still does not start, repeat steps 2 through 6.

8. *If the engine still does not start, call 1-800-366-6268 and ask for Customer Service or the name of your local MANTIS dealer.*

IMPORTANT NOTE:

Never use starting fluids. Starting fluids will cause permanent engine damage. Using them will void the warranty.

IMPORTANT NOTE:

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

GETTING YOUR TILLER TO YOUR GARDEN

Walk it.

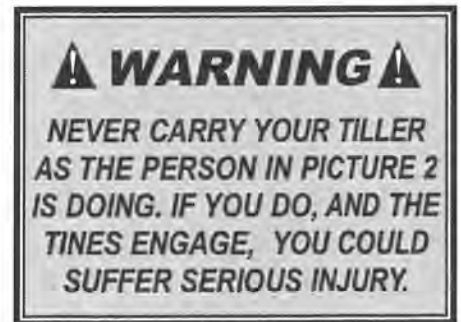
Once your tiller is running, you can "walk" it to your garden. Just press the throttle lever gently and let the tiller "tip-toe" across your yard on its tines. It won't hurt your lawn or driveway.

Carry It.

Make sure the engine is off. Then use one hand to grasp the convenient carrying handle. Use the other hand to hold the handlebars. (Picture 1) Then lift your tiller and carry it to your garden. Since it weighs only 20 pounds, it won't strain your muscles or tire you out!

Take It for a Ride.

You can easily transport your MANTIS Tiller to a friend's or relative's house. Just empty the fuel tank. (This is crucial.) Then stow your Tiller in the trunk of your car or truck. It fits easily. And you can put it in and take it out without straining your back.



Picture 1



Picture 2

⚠ WARNING • DANGER ⚠

THE OPERATOR OF THIS TILLER IS RESPONSIBLE FOR ACCIDENTS OR HAZARDS OCCURRING TO HIMSELF, OTHER PEOPLE OR THEIR PROPERTY.

Now You're Ready to Use Your MANTIS Tiller.

If you've seen other tillers, your MANTIS Tiller may surprise you. It tills best when you pull it backward! You see, when you pull your MANTIS Tiller backward, you give extra resistance to the tines, so they dig deeper.

What's more, 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. Start it up. Then use an easy rocking motion. First, pull your Tiller backward. Then use an easy rocking motion. Again, pull your Tiller backward. Then, let it move forward just a little bit.

Then pull it backward again. This will help you till deeper.

Keep repeating these steps until you've tilled an entire row. Start again on the next row. It's much like running a vacuum cleaner!

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.

For Shallow Tilling:

Switch the tines to the cultivating position. (See page 15 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, it will work them into the soil. Pretty soon, you'll have a soft, fresh planting bed.

TILLING/CULTIVATING

⚠ WARNING • DANGER ⚠

IF YOUR TINES GET JAMMED OR ENTANGLED, SHUT OFF THE ENGINE AT ONCE. REMOVE THE SPARK PLUG WIRE THEN REMOVE THE OBSTRUCTION WHILE THE ENGINE IS OFF. NEVER TRY TO REMOVE AN OBSTRUCTION WHILE THE ENGINE IS RUNNING. SERIOUS INJURY CAN RESULT.

How about a family-size vegetable garden?

Nowadays many gardeners prefer small gardens — especially in the suburbs, where space is at a premium. But, if you're fortunate enough to own a large lot, you can create a bigger garden — a half acre or more. Here's how:

1. First, hire someone with a tractor or big tiller to break ground for you. This is a one-time-only investment that's well worth the small cost.

2. Then, use your Tiller to break up any remaining clumps of soil or sod. Unlike a tractor or big tiller, your MANTIS Tiller is a precision tool. It will pulverize your soil into a smooth seed bed.

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, only 2" to 3" (5.09 cm to 7.62 cm) deep.

First, you must switch the tines to the weeding position. This takes less than a minute.

Then, 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.

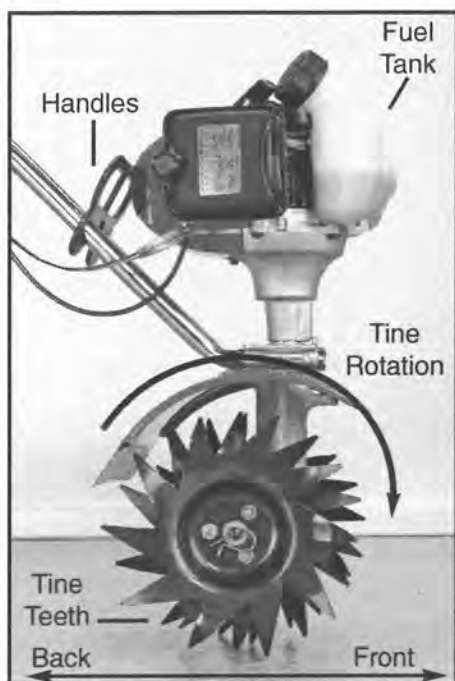
The result? Your Tiller will cut your weeding time in half, and turn a tiresome chore into a pleasure.

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. Place the left side tine onto the right-side axle. The "D" hole should be to the outside.
5. Here is how to make sure you've installed the tines properly. Stand behind the Tiller and hold your hand, palm up, next to the tines. Do the tine points curl up, as your fingers do? If so, they are in the correct cultivating position.
6. Reinsert the pins.

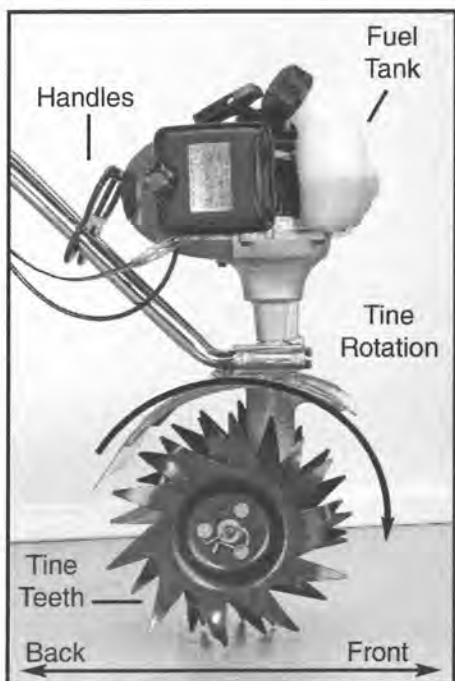


CULTIVATING



Tilling Position

Tine teeth point in the same direction as the rotation of the tine; or toward the front of the Tiller, away from the operator.



Cultivating Position

Tine teeth point in the opposite direction as the rotation of the tine. Tines point toward the back of the tiller, or toward the operator.

Now You're Ready to Cultivate or Weed.

Guide your Tiller where you want to weed and start it up. Pull your Tiller backward slowly, then let it move forward a bit, in a gentle rocking motion. Watch it slice, shred, and bury those weeds!

Got tough weeds? Lighten your pressure on the throttle to slow your Tiller down. Then work back and forth until your Tiller chops up the weeds. It's easy and effective!

Remember, any tiller will tangle in tall grass, stringy vines, or super-big weeds. So, if you have a "backyard jungle," first use a knife, pruner, or brush cutter to chop up the overgrowth. If the tines become tangled anyway, ***turn the engine off completely*** before trying to clear them.

The optional tine Detangler (Item #1322) will clear tines in a jiffy. Call 1-800-366-6268 for details. (Ask for the Sales Department.)

Your Mantis Tiller Will Weed Between Narrow Rows!

Your Mantis Tiller is a precision weeder that easily fits in tight places. So don't be afraid to weed anywhere: between plants and shrubs; in corners; against fences; on raised beds; in wide rows; even in very narrow rows. Your Mantis Tiller weeds six* to nine inches wide. So you can run it in a tightly planted garden without damaging your delicate plants. That's good news for suburban gardeners, who often have to plant rows close together!

*With optional Planter Furrower attachment (Item #6222.)

MAINTENANCE

Check the Air Filter Often

A wet or dirty air filter can affect the way your engine starts, performs, and wears. So, it's a good idea to check your air filter once a month.

If you work in dusty soil, or if you want to be on the safe side — then check your filter more often (for instance, before each use). But be sure to replace it at least once a year, in the spring or fall. Clean or change it as needed. It is recommended to change the air filter yearly.

How to Check, Clean and Change the Air Filter

1. Loosen the thumb screw on the side of the air-cleaner cover. (See Picture 1, or look up Key #101 in Parts Assembly on page 29.)

2. Take off the cover. Make sure to clear the choke button. (Picture 2)

3. The air filter is the black sponge on the inside of the air-cleaner cover. Check whether it is soiled or moist. (Picture 3)

4. If the air filter needs cleaning or no longer fits properly, remove it.

Note:

Please 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 ingested through the carburetor into the inside of the engine.

Just lift an edge carefully and “peel” it out. (Picture 3)

5. Use neutral detergent and warm water to clean the filter elements. After cleaning, air dry the element completely and moisten with a small amount of motor oil.

6. If the air filter is so dirty that it won't come clean, you must replace it or severe engine damage will occur. Order a new one directly from our Customer Service Dept. Call 1-800-366-6268.

7. Insert your clean filter inside the air-cleaner cover.

IMPORTANT! Make sure filter is “seated” properly in the cover. The filter must fit snugly inside the rim 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.

8. Tighten the wing nut to secure the cover.



Picture 1



Picture 2



Picture 3

MAINTENANCE (continued)

How to Check the Grease Level Inside the Worm Gear Housing

When we built your MANTIS Tiller, we lubricated the worm gear housing thoroughly.

It is imperative that you inspect the grease level once a year. Simply remove the cover plate on the worm gear housing. (Picture 1) Then check to make sure the grease comes almost to the top of the housing. If it doesn't, add lithium #0 grease (Item M9985.) This is the only way to add grease to the worm gear housing. (Picture 2) To purchase Mantis grease, call our sales Dept. - 1-800-366-6268.

Please do not overfill. Too much grease can create pressure, which could cause seals to fail or the clutch to slip.



Picture 1



Picture 2

Clear Blockages From the Fuel Line & Filter:

After you've used your Tiller for a few seasons, check for blockages in the fuel tank and fuel filter. Such blockages can keep your Tiller from starting.

Clear any blockages you see in the tank, fuel filter, or fuel line. Remember: The fuel filter is located inside the tank. (See Picture 3) Then use the normal starting procedure to start your Tiller.



Picture 3

MAINTENANCE *(continued)*

Idle Speed Adjustment

1. Warm up engine before adjusting idle speed.
2. The idle speed adjustment screw controls the throttle opening at idle position. (Picture 1)
3. When the engine tends to stop frequently at idling mode, turn the adjusting screw clock wise. (Picture 2)
4. If the tines continue to rotate after releasing the trigger, turn the adjusting screw counter-clockwise.



Picture 1



Picture 2

How to Reseat the Flange

At some point, you may find that the tines won't turn when you press the throttle. This may mean the engine isn't sitting all the way down on the worm gear housing.

Perhaps you've been using your Tiller for several years. The flange bolt (Key #36, page 29) may have come loose and lifted the engine up.

If this happened you'll notice a gap between the bottom of the engine housing (Key #67, page 29) and the top of the worm gear housing. (Picture 1)

To fix this, loosen the housing bolt. Take the engine off the worm gear housing. Notice the hex head on top of the drive shaft (Key #22, Page 27). Inside the housing, you'll find the clutch

drum (Key #68, Page 29). Make sure the hex head lines up with the clutch drum inside the flange housing.

Then put the engine back on the worm gear housing. Make sure the plastic carrying handle is not under the fuel tank.

If you've followed these steps properly, there will be no gap between the engine housing and the worm gear housing. (Picture 2) Make sure you tighten the flange bolt!



Picture 1 ... Note how the engine doesn't sit all the way down on the transmission.



Picture 2 ... Note how the engine sits all the way down on the transmission.

MAINTENANCE (continued)

Muffler

- Periodically inspect, the muffler for loose fasteners, any damage or corrosion. If any sign of exhaust leakage is found, stop using the machine and have it repaired immediately.
- Note that failing to do so may result in the engine catching on fire.

Spark Arrester

- The muffler is equipped with a spark arrester to prevent red hot carbon from flying out of the exhaust outlet. Periodically inspect and clean as necessary with a wire brush. In the State of California it is required by law (Section 4442 of the California Public Resources Code) to equip a spark arrester when a gas powered tool is used in any forest covered, brush covered, or grass covered unimproved land.

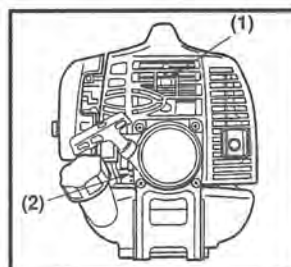
Intake Air Cooling Vent

- Never touch the cylinder, muffler, or spark plugs with your bare hands immediately after stopping the engine. The engine can become very hot when in operation, and doing so could result in severe burns.
- When checking the machine to make sure that it is okay before using it, check the area around the muffler and remove any debris. Failing to do so could cause the muffler to become overheated, and that this in turn could cause the engine to catch on fire. Always make sure that the muffler is clean and free of debris before use.
- Check the intake air cooling vent and the area around the cylinder cooling fins after every 25 hours of use for

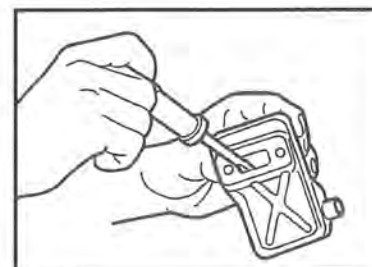
blockage. Note that it is necessary to remove the engine cover in order to view the upper part of the cylinder.

Procedures to be Performed After Every 100 Hours of Use

1. Remove the muffler, insert a screwdriver into the vent, and wipe away any carbon buildup. Wipe away any carbon buildup on the muffler exhaust vent and cylinder exhaust port at the same time.
2. Tighten all screws, bolts, and fittings.
3. Check to see if any oil or grease has worked its way in between the clutch lining and drum, and if it has, wipe it away using oil-free, lead-free gasoline.



Picture 1



Picture 2

⚠ WARNING ⚠ DANGER ⚠
IF WASTE GETS STUCK AND CAUSES BLOCKAGE AROUND THE INTAKE AIR COOLING VENT OR BETWEEN THE CYLINDER FINS, IT MAY CAUSE THE ENGINE TO OVERHEAT, AND THAT IN TURN MAY CAUSE MECHANICAL FAILURE ON THE PART OF THE TILLER/CULTIVATOR.

System/ Component	Procedure	Before Use	Every 25 Hours	Every 50 Hours	Every 100 Hours	Note
Fuel Leaks, Fuel Spillage	Wipe out	✓				
Fuel Tank, Air Filter, Fuel Filter	Inspect, clean	✓	✓			Replace if necessary
Idle Adjusting Screw	see Adjusting Idling Speed (pg. 9)	✓				Replace carburetor if necessary
Spark Plug	Clean and readjust plug gap			✓		GAP: .025" (0.6 - 0.7 mm) replace if necessary
Cylinder Fins, Intake Air Cooling Vent	Clean		✓			
Muffler, Spark Arrester, Cylinder Exhaust Port	Clean				✓	

STORAGE

WARNING • DANGER

**DO NOT STORE IN AN AREA
WHERE FUEL FUMES MAY
ACCUMULATE AND REACH A
FLAME OR SPARK.**

Each fall — or before you store 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. And, since stale fuel has a high gum content, it can clog the carburetor, this, in turn, will restrict fuel flow. *So, when you're ready to store your Tiller, or will not be using it for more than 2 weeks, drain the fuel tank completely.* (Picture 2)

2. Next, restart the engine to make sure no fuel is left in the carburetor. Then run the engine until it stops. This will prevent gum deposits forming inside of the carburetor and possible engine damage.

3. Disconnect spark plug wire and remove the spark plug. (Use the wrench that comes in our *optional* Handy item Kit, Item #1422RM. Or use a 5/8" spark-plug wrench.) Pour about a teaspoon of clean, air-cooled, two-cycle oil through the spark-plug hole into the combustion chamber. Leaving the spark plug out slowly pull the starter cord two or three times to coat the inside of the cylinder wall.



Picture 1

4. Inspect the spark plug, and, if necessary, clean it. If you need to replace it, buy a RZ7S by Champion. A replacement spark plug is included in the *optional* Handy Item Kit item # 1422RM.

5. Install the spark plug, but leave the spark plug wire disconnected.

6. Clean the air filter as described on Page 17.

7. Clean dirt, grass, and other materials from the entire machine.

8. Wipe the tines with oil or spray them with WD-40, to prevent rusting.

9. Oil the throttle cable and all visible moving parts. (Do not remove the engine cover.)



Picture 2



STORAGE (continued)

10. Check the grease level in the worm gear housing, as described on page 18.

11. Order new parts to replace any that are badly worn or broken. Just call 1-800-366-6268 and ask for a local authorized Mantis dealer.

12. Store your Tiller, in an upright position, in a clean, dry place. You can store with the handles in an extended position or folded down. (Picture #1, preceding page)

13. To fold the handles, follow these easy steps: Loosen the handle knobs (#53), fold the handles forward (see picture #1, inset, preceding page). Tighten knob securely. Your handles are now folded and ready to store in a smaller area.

14. Do you have fuel left over from last season? Dispose of it properly. Buy fresh oil and gasoline next season.

How to Prepare Your MANTIS Tiller for Restarting

Unfold the handles into an up right or extended position. Tighten the two handle knobs (#53)

In the Spring, when you take your

Wipe oil from the spark plug. Place the spark plug back into the cylinder. Re-connect the spark plug wire back on the spark plug. Then follow the steps on pages 9 & 10 to refuel and restart your Tiller.

Again, Check the Carburetor.

If your Tiller won't restart in the Spring — or if it lacks its usual power — the carburetor may need attention. Follow the steps on page 19 for adjusting the idle screw. (Picture 1)

Check the Spark Plug Too.

If your Tiller won't restart, or if it lacks full power, the spark plug may be at fault. Check to see if the plug is fouled with oily black deposits. Clean or replace it if it is. (Picture 2)

Also, check whether the center electrode is rounded at the end, or if the ground electrode is worn. If either is the case, you should replace it with a RZ7C spark plug. Use a 5/8" spark-plug wrench to install it. Adjust the plug gap .025 in. (0.6 to 0.7 mm)

Caution: Do not over tighten the plug. The correct torque is 87 to 104 in.-lbs.

IMPORTANT NOTE:

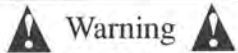
To avoid possible damage to the threads, do not try to remove the plug from a hot aluminum cylinder head.



Picture 1



Picture 2



Warning

Always make sure the handle knobs are secure before starting your Mantis Tiller.

Tiller out of storage, remove the spark plug. Pull the starter cord three or four times to clean oil from the combustion chamber.

TROUBLE SHOOTING

<i>Problem</i>	<i>Cause</i>	<i>Remedy</i>
1. Tines don't turn when throttle is depressed	Engine is not seated properly on the gear housing.	Re-install engine following the instructions on page 20 (How to re-seat the flange).
2. Engine fails to start - Check		
Fuel Tank	Incorrect fuel	Drain it and fill with correct fuel
Fuel Filter	Fuel filter is clogged	Clean
Carburetor Adjustment Screw	Out of normal range	Adjust to normal range
Sparking (no spark)	Spark plug is fouled/wet	Clean/dry
	Plug gap is incorrect	Correct (GAP: .025 in.)
Spark Plug	Disconnected	Retighten
3. Engine hard to start. - Check		
Fuel Tank	Incorrect fuel	Drain it and fill with correct fuel
Carburetor Adjustment Screw	Out of normal range	Adjust to normal range
Muffler, Cylinder (exhaust port)	Carbon is built up	Wipe away
Air Cleaner	Clogged with dust	Wash
Cylinder Fin, Fan Cover	Clogged with dust	Clean
4. Engine misses.	Dirt in fuel line or carburetor. Carburetor improperly adjusted. Spark plug fouled, broken or incorrect gap setting. Weak or intermittent spark at spark plug.	Remove and clean. See "Carburetor Adjustment". Clean or replace spark plug - set gap to .025 in.) Call Mantis Customer Service for nearest authorized dealer.

TROUBLE SHOOTING (continued)

<i>Problem</i>	<i>Cause</i>	<i>Remedy</i>
5. Engine lacks power.	Air filter clogged. Carburetor out of adjustment. Muffler clogged. Clogged exhaust ports. Spark Arrestor Clogged. Poor compression.	Clean or replace air filter. See "Carburetor Adjustment". Clean carbon from muffler. Remove muffler, rotate engine until the piston is at top of cylinder. With a wooden scraper or blunt tool, remove all carbon from exhaust ports. Be careful not to scratch or damage piston or cylinder walls. Blow out all loose carbon with compressed air. Install muffler and gasket. Clean Spark Arrestor Call Mantis Customer Service for nearest authorized dealer.
6. Engine overheats.	Insufficient oil in fuel mixture Air flow obstructed	Mix fuel as described in starting instructions. Clean flywheel cylinder fins and screen.
7. Engine noisy or knocking.	Spark plug in incorrect heat range. Bearings, piston ring or cylinder walls are worn.	Replace with plugs specified for engine. Call Mantis Customer Service for nearest authorized dealer.
8. Engine stalls under load.	Carburetor adjustment too "lean". Engine overheats.	See "Carburetor Adjustment". Remove dust and dirt from between fins.

ENGINE SPECIFICATIONS

Dry Weight	61 lbs 9oz
Type of Engine	Air Cooled, Two stroke, Single-Cylinder, Gasoline Engine
Rotation	Clockwise, viewed from TOP
Bore	34mm (1.339 in.)
Stroke	26 mm (1.024 in.)
Spark Plug	RZ75 - Champion
Fuel	Premixed two stroke fuel
Fuel Oil Ratio	50:1 ratio with MANTIS oil
Gasoline	Unleaded (see page 9)
Displacement	23.6 cc (1.5 cu. in.)
Exhaust System	Spark arrester muffler
Carburetor	WALBRO diaphragm
Ignition System	Flywheel magneto, capacitor discharge ignition type
Starter	Automatic rewind type
Oil	Designated, two-stroke, air-cooled engine oil
Fuel Tank Capacity	0.63 lit. (21.3 fl. oz.)
Starter System Clutch	Automatic rewind starter Centrifugal type

SERVICE MAINTENANCE GUIDE

<i>Area</i>	<i>Maintenance</i>	<i>Frequency</i>
Fuel Leaks, Fuel Spillage	Wipe out	Before Use
Fuel Tank, Air Filter, Fuel Filter	Inspect, clean	Before Use and after Every 25 hrs
Idle Adjusting Screw	see Adjusting Idling Speed (pg. 9)	Before Use
Spark Plug	Clean and readjust plug gap	Every 50 hrs
Cylinder Fins, Intake Air Cooling Vent	Clean	Every 25 hrs
Muffler, Spark Arrester, Cylinder Exhaust Port	Inspect / Clean	Every 100 hrs
Gear Housing	Check Grease	Yearly
Blades	Inspect / Clean / Lubricate	After Use
Fuel Leaks	Inspect / Repair	Before Use
Fasteners	Inspect / Tighten / Replace	Before Use
Labels	Inspect / Replace	Before Use
Handles	Inspect / Replace	Before Use
Guards / Safety Devices	Inspect / Replace	Before Use
Fuel Line	Inspect / Replace	Monthly
Starter Rope	Inspect / Replace	Monthly
Fuel Strainer	Replace	Every 3 mths. or 100 hrs. use
Choke	Check	With each re-fueling
Ignition System	Clean Replace	No maintenance For coil and flywheel

* Replacement will be required for commercial use after 600 hours. For Consumer use, cleaning every 6 months is required. Cleaning includes Rebuild Kits.

IMPORTANT: Time Intervals shown are maximum. Actual use and your experience will determine the frequency of required maintenance.

Notes:

[illegible]

USING THE BORDER EDGER ATTACHMENT

Your MANTIS Tiller has been designed and built to accept a wide range of MANTIS Tiller Attachments to increase its usefulness in your lawn and garden. And, all MANTIS Tiller Attachments have been designed for quick and easy attachment to the Tiller or Engine.

The Border Edger (Item #3222)

The most popular attachment, the Border Edger can be used to cut clean, neat edges along walkways, or around trees, shrubs, and garden beds.

The Border Edger has two parts: a wheel and a hardened steel blade, with pointed tines.

How to Install the Border Edger

The following instructions refer to "right" and "left" axles. Assume that you're standing behind your Tiller, as you would for tilling and cultivating.

Some areas of your yard may harbor roots and other underground obstructions. In

places like this you'll want to edge your borders shallowly (1" to 2" deep). Here's how to install the Border Edger for shallow edging:

1. First remove your tilling/cultivating tines.
2. Then slide the edger's wheel onto the right axle.
3. Now slide the Edger blade onto the left axle. The blade's angled face should hit the ground when you spin the blade forward.

4. Insert retaining pins on both left and right axles.

Around walkways and garden beds, you'll want to edge more deeply (3" to 4" deep). Here's how to install the Border Edger for that purpose:

1. Remove the tilling/cultivating tines.
2. Slide the Edger's blade onto the right axle. The blade's pointed face should hit the ground when you spin the blade forward.
3. Slide the wheel onto the left axle.
4. Insert retaining pins on both sides.

How to Use the Border Edger

1. Position your MANTIS Tiller so that the Edger blade is right along the garden edge and the wheel is outside (on the lawn, on the sidewalk, wherever). (Picture 1)
2. Start your Tiller and pull your MANTIS backward along the garden edge.

The Border Edger Can Handle Special Projects!

1. Install the Edger for deep edging, as directed above. Then use it to cut sod strips.

2. Edge and weed at the same time! Just attach the Edger blade on one axle and a Tiller tine on the other axle, "Mix and match" blades; don't be afraid to experiment.

IMPORTANT NOTE:

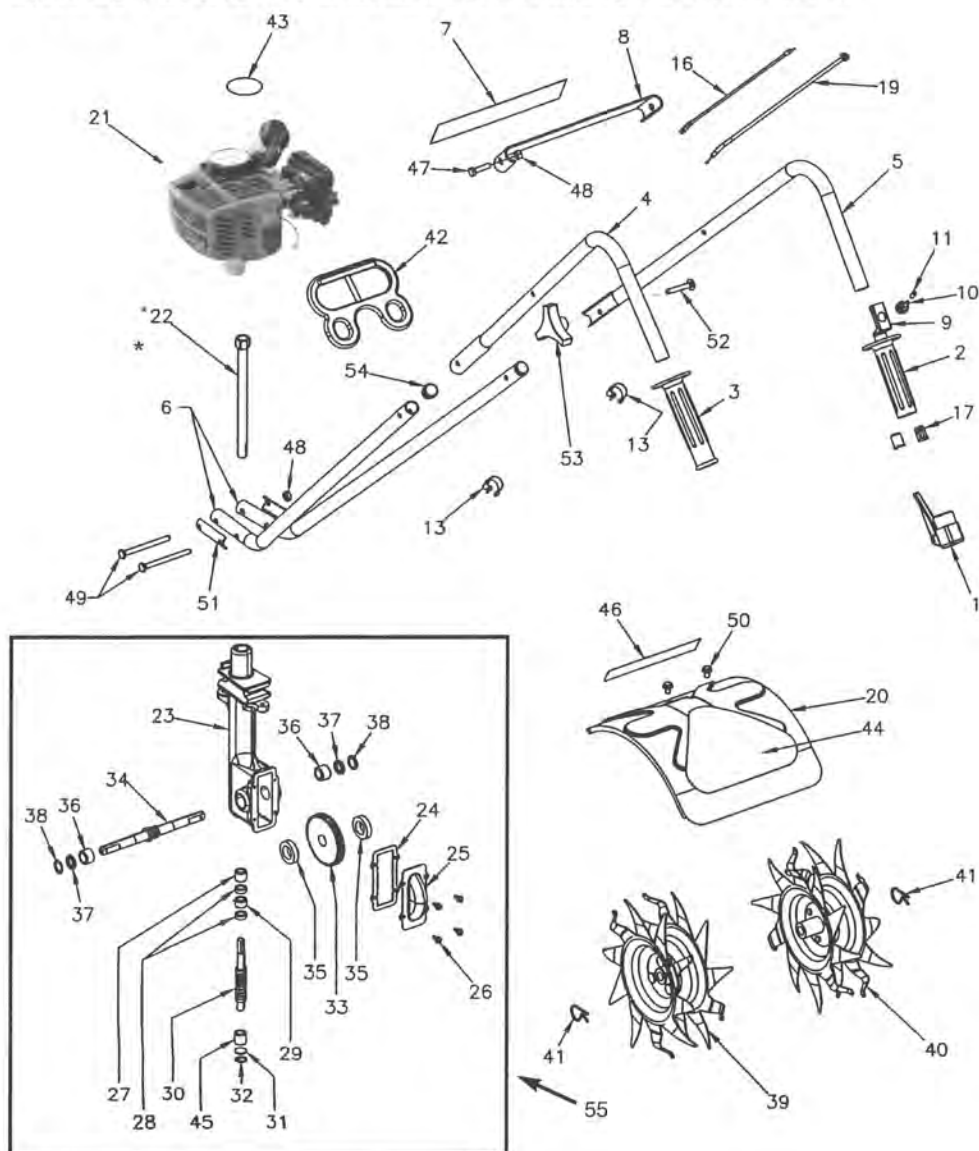
If you do a lot of edging, you'll appreciate the MANTIS Wheel Set (Item#9222.) It gives you added stability, for even easier handling.

To order the Wheel Set, or any Mantis Attachment, call 1-800-366-6268, Monday through Friday, 8 am to 5:30 pm, Eastern Time. Ask for the Sales Department.

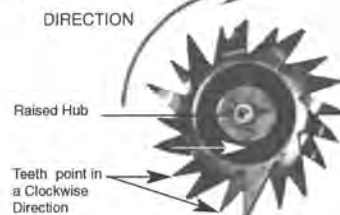


Picture 1

MANTIS TILLER ASSEMBLY

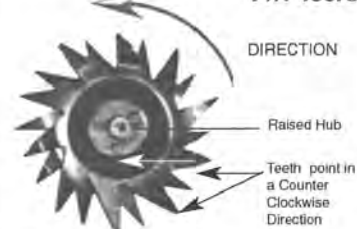


P/N 438LA



When you look at a Tine with the raised hub facing you and the teeth are pointing in a **CLOCKWISE** rotation, you have a **LEFT HAND TINE**.

P/N 438RA



When you look at Tine with the raised hub facing you and the teeth are pointing in a **COUNTER CLOCKWISE** rotation, you have a **RIGHT HAND TINE**.

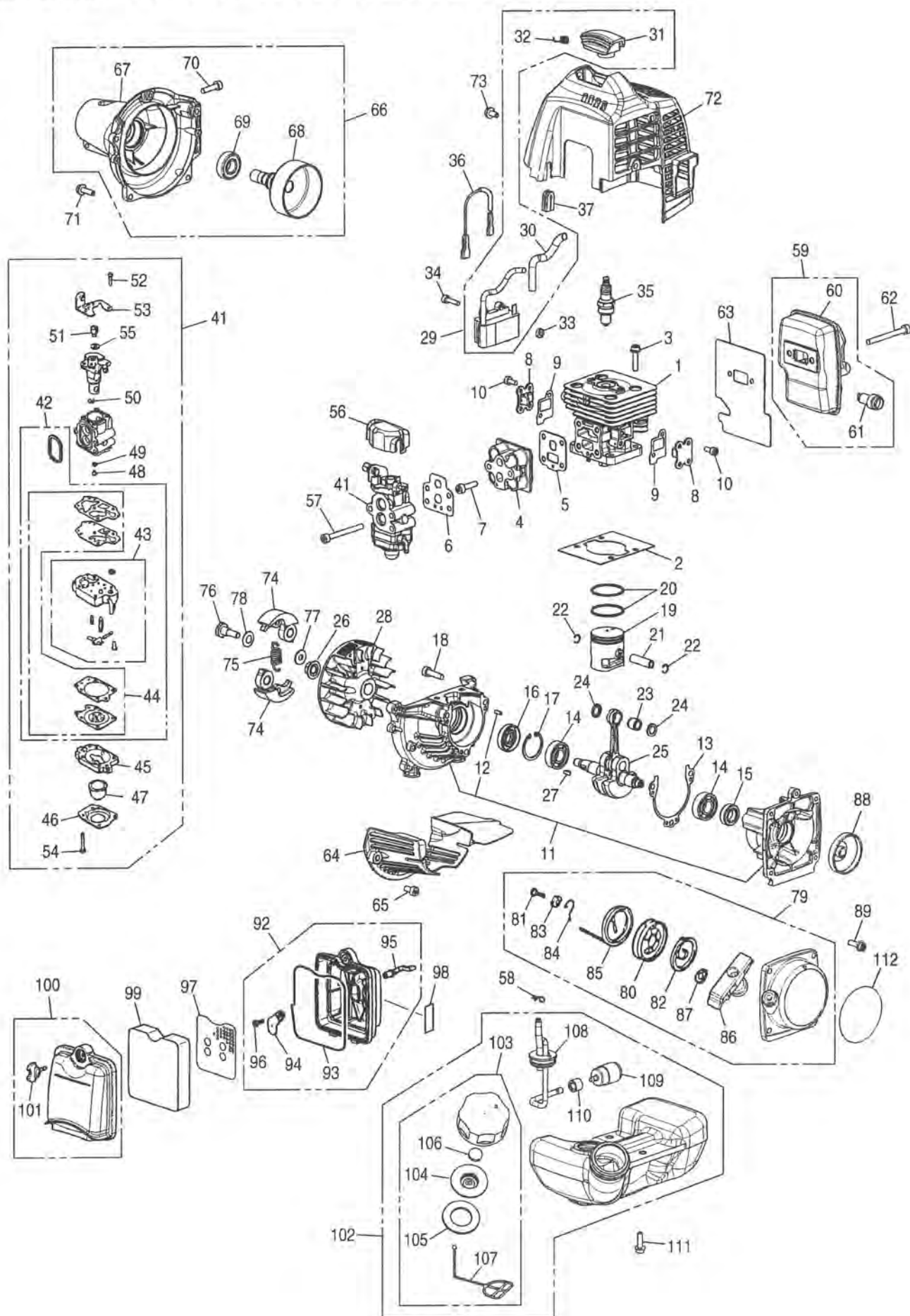
ITEM	NAME	QTY	MATERIAL
1	400215	1	Throttle Lever
2	400220	1	Grip-Thru
3	400214	1	Grip
4	400226	1	Upper Handle - Tube Left
4A	400236	1	Upper Handle Assembly Includes Item #s 3 & 4.
5	400225	1	Upper Handle - Tube Right
5A	400235	1	Upper handle Throttle Side Assembly. Includes Item #s 1,2,5,9,10,11,13,16,17,18,19.
6	400224	2	Lower Handle - Fold Down
7	488M	1	Label
8	148	1	Handle Brace
9	464	1	Switch Bracket
10	479	1	Switch
11	1612-70A	1	Switch Cover
13	478	2	Throttle Clip
16	400239	1	Connector Wire
17	400229	2	Cable Retainer

ITEM	NAME	QTY	MATERIAL
19	400240	1	Throttle Cable Assy.
20	465	1	Fender Guard
21	330900	1	Engine Assembly
*22	468	1	Drive Shaft
23	466	1	Worm Gear Housing
24	436	1	Gasket
25	437A	1	Housing Cover
26	651	4	Rd. Hd. Self Tapping Screw
27	423	1	Roller Bearing
28	425	2	Worm Bearing Race
29	424	1	Worm Thrust Bearing
30	422	1	Worm Shaft
31	426	1	Worm Disk
32	428	1	Retaining Ring
33	429	1	Worm Gear
34	431	1	Tine Shaft
35	430	2	Worm Gear Thrust Washer
36	432	2	Worm Gear Bearing
37	434	2	Bearing Seal

ITEM	NAME	QTY	MATERIAL
38	435	2	Bearing Seal Retainer
39	438LA	1	Tine Assembly (LT)
40	438RA	1	Tine Assembly (RT)
41	418-1	2	Tine Retaining Hair Pin
42	400218	1	Carrying Handle
43	487MA	1	Engine Label
44	4043	1	Tine Label
45	458	1	Roller Bearing
46	4058	1	Mantis Label
47	410	2	Cap Screw 1/4-20 x 1" LG.
48	972	4	Lock Nut 1/4 - 20
49	470	2	1/4 - 20 x 3" Bolt
50	140	2	Bolt 1/4-20 x 3/8" Lg.
51	377	2	Handle Clamp
52	400509	2	Bolt
53	400510	2	Knob
54	400230	2	Plug
55	400010	1	Transmission Assembly

* Also in Key #55

28



MANTIS PARTS LIST

Key#	PART NUMBER	DESCRIPTION	Q'TY /UNIT	NOTE	Key#	PART NUMBER	DESCRIPTION	Q'TY /UNIT	NOTE
1	T1551-12110	CYLINDER	1		69	06034-06205	• BEARING	1	
2	T1551-12211	GASKET, base	1		70	84884-52000	• BOLT TORX	1	
3	4820-12130	BOLT TORX M5xL22 T27	4		71	4820-85510	BOLT TORX M5xL16 T27	4	
4	848F0014A2	INSULATOR	1		72	T1551-32111	COVER, engine	1	
5	T1551-13121	GASKET, insulator	1		73	T4950-51011	BOLT TORX M5xL10 T27	2	
6	T1551-13131	GASKET, carburetor	1		74	T1551-51111	SHOE	2	
7	T4950-52001	BOLT TORX M5xL20 T27	4		75	4820-51220	SPRING	1	
8	T1551-16110	COVER, tr	2		76	1140-51250	SCREW	2	
9	T1551-16142	GASKET, tr	2		77	1140-51230	WASHER	2	
10	4820-16310	BOLT TORX M4xL10 T27	4		78	1140-51242	WASHER	2	
11	T1551-21101	CRANKCASE COMP.	1		79	T1551-75100	RECOIL ASSY	1	
12	2629-21130	• PIN	3		80	4500-75120	• REEL	1	
13	T1551-21141	GASKET, case	1		81	4500-75150	• SCREW	1	
14	06030-06001	BEARING	2		82	1850-75130	• SPRING	1	
15	4810-21210	SEAL	1		83	4500-75180	• COLLAR	1	
16	1850-21220	SEAL	1		84	4500-75190	• ARM	1	
17	04065-02812	RING	1		85	4810-75160	• ROPE	1	
18	4820-13180	BOLT TORX M5xL20 T27	3		86	3330-75421	• KNOB	1	
19	848F0041A0	PISTON	1		87	4810-75170	• PLATE	1	
20	5910-41210	PISTON RING	2		88	4500-75210	PULLEY	1	
21	1600-41310	PISTON PIN	1		89	4820-32120	BOLT TORX M5xL16 T27	4	
22	1260-41320	RING	2						
23	T1551-41410	BEARING	1		92	848F028310	BODY ASSY	1	
24	1101-41340	WASHER	2		93	T1513-82120	• PACKING	1	
25	T1551-42000	CRANKSHAFT COMP.	1		94	T1512-82130	• PLATE, choke	1	
26	1650-43230	NUT	1		95	T1600-82140	• LEVER	1	
27	1000-43240	KEY	1		96	T1108-82190	• SCREW	1	
28	4810-71110	ROTOR	1		97	848F0283K0	PLATE	1	
29	T1551-71200	COIL ASSY	1		98	1133-82060	LABEL, choke	1	
30	2850-71320	• TUBE, coil	1		99	T1513-82170	ELEMENT	1	
31	4810-72111	• CAP, plug	1		100	T1513-82200	COVER ASSY	1	
32	1900-72120	• SPRING, plug	1		101	T1108-82220	• KNOB	1	
33	1260-71261	SPACER, coil	2		102	T1551-85001	TANK ASSY	1	
34	4820-72150	BOLT TORX M4xL16 T27	2		103	T1015-85202	• CAP ASSY	1	
35	3699-91809	SPARKPLUG Champion	1	RZ-7C	104	4500-85300	•• HOLDER ASSY	1	
36	848F027210	CORD COMP.	1		105	4500-85220	•• PACKING	1	
37	4810-72120	GROMMET	1		106	5601-85260	•• FILTER	1	
					107	4820-85260	•• STOPPER	1	
41	848F028100	CARBURETOR ASSY	1	WYA-35	108	T1551-85300	• PIPE COMP	1	
42	T1551-06030	• REBUILD KIT	1		109	3302-85400	• FILTER	1	
43	T1551-81450	•• BODY ASSY	1		110	2841-31280	• COLLAR	1	
44	4810-06021	•• GASKET KIT	1		111	4820-85510	BOLT TORX	3	
45	1850-81490	• BODY	1		112	848F0290C0	LABEL, recoil	1	
46	1850-81520	• COVER	1						
47	1751-81510	• PUMP	1						
48	T1505-81250	• JET #38	1						
49	1751-81240	• O-RING	1						
50	1751-81130	• RING	1						
51	1881-81140	• SWIVEL	1						
52	1752-81110	• SCREW	2						
53	5500-81120	• BRACKET	1						
54	1850-81530	• SCREW	4						
55	5500-81160	• WASHER	1						
56	4500-81910	COVER, carburetor	1						
57	4820-15310	BOLT TORX M5xL50 T27	2						
58	1950-86120	CLIP	1						
59	4810-15100	MUFFLER ASSY	1						
60	4810-15111	• MUFFLER	1						
61	4810-15140	• ARRESTER	1						
62	4820-15310	BOLT TORX	2						
63	T1551-15210	GASKET, muffler	1						
64	T1551-15220	PLATE	1						
65	4820-12350	BOLT TORX M5xL10 T27	2						
66	848F025300	HOUSING ASSY	1						
67	848F0253A0	• HOUSING	1						
68	848F0251A1	• DRUM	1						

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS

THE CALIFORNIA AIR RESOURCES BOARD AND KOMATSU ZENOAH Co. ARE PLEASED TO EXPLAIN THE EMISSION CONTROL SYSTEM WARRANTY ON YOUR 1995 AND LATER LAWN AND GARDEN EQUIPMENT ENGINE. IN CALIFORNIA, NEW UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES MUST BE DESIGNED, BUILT AND EQUIPPED TO MEET THE STATE'S STRINGENT ANTI-SMOG STANDARDS. KOMATSU ZENOAH Co. MUST WARRANT THE EMISSION CONTROL SYSTEM ON YOUR LAWN AND GARDEN EQUIPMENT ENGINE FOR THE PERIODS OF TIME LISTED BELOW PROVIDED THERE HAS BEEN NO ABUSE, NEGLIGENCE OR IMPROPER MAINTENANCE OF YOUR LAWN AND GARDEN EQUIPMENT ENGINE. YOUR EMISSION CONTROL SYSTEM MAY INCLUDE PARTS SUCH AS THE CARBURETOR, THE IGNITION SYSTEM, AND CATALYTIC CONVERTER. ALSO INCLUDED MAY BE THE HOSES, BELTS, CONNECTORS AND OTHER EMISSION-RELATED ASSEMBLIES. WHERE A WARRANTABLE CONDITION EXISTS, KOMATSU ZENOAH Co. WILL REPAIR YOUR LAWN AND GARDEN EQUIPMENT ENGINE AT NO COST TO YOU INCLUDING DIAGNOSIS, PARTS AND LABOR.

MANUFACTURER'S WARRANTY COVERAGE:

THE 1995 AND LATER UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES ARE WARRANTED FOR TWO YEARS. IF ANY EMISSION-RELATED PART ON YOUR ENGINE IS DEFECTIVE, THE PART WILL BE REPAIRED OR REPLACED BY KOMATSU ZENOAH Co.

OWNER'S WARRANTY RESPONSIBILITIES:

- AS THE LAWN AND GARDEN EQUIPMENT ENGINE OWNER, YOU ARE RESPONSIBLE FOR THE PERFORMANCE OF THE REQUIRED MAINTENANCE LISTED IN YOUR OWNER'S MANUAL. KOMATSU ZENOAH Co. RECOMMENDS THAT YOU RETAIN ALL RECEIPTS COVERING MAINTENANCE ON YOUR LAWN AND GARDEN ENGINE, BUT KOMATSU ZENOAH Co. CAN NOT DENY WARRANTY SOLELY FOR THE LACK OF RECEIPTS OR FOR YOUR FAILURE TO ENSURE THE PERFORMANCE OF ALL SCHEDULED MAINTENANCE.
- AS THE LAWN AND GARDEN EQUIPMENT ENGINE OWNER, YOU SHOULD HOWEVER BE AWARE THAT KOMATSU ZENOAH Co. MAY DENY YOU WARRANTY COVERAGE IF YOUR LAWN AND GARDEN EQUIPMENT ENGINE OR A PART HAS FAILED DUE TO ABUSE, NEGLIGENCE, IMPROPER MAINTENANCE OR UNAPPROVED MODIFICATION.
- YOU ARE RESPONSIBLE FOR PRESENTING YOUR LAWN AND GARDEN EQUIPMENT ENGINE TO A KOMATSU ZENOAH Co. DISTRIBUTION CENTER AS SOON AS A PROBLEM EXISTS. THE WARRANTY REPAIRS SHOULD BE COMPLETED IN A REASONABLE AMOUNT OF TIME, NOT TO EXCEED 30 DAYS.

IF YOU HAVE ANY QUESTIONS REGARDING YOUR WARRANTY RIGHTS AND RESPONSIBILITIES, YOU SHOULD CONTACT KOMATSU ZENOAH AMERICA INC. AT (770)-381-5147. CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS