

# COLUMBIA

by **MTD**



## Owner's Manual

- SET-UP
- OPERATION
- MAINTENANCE

**Model: 447  
Rear Tine Tiller**

### IMPORTANT

Read Safety Rules and  
Instructions Carefully

#### IMPORTANT !

Record the Model No. and Mfg. Code which appear on your unit in the space provided. You must have these numbers, along with the date of purchase, in order to receive warranty or service.



DATE PURCHASED: -

PRINTED IN CANADA


COPY DIRECTLY FROM THE UNIT.

772C0497 (7)

## IMPORTANT

## SAFE OPERATION PRACTICES



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH, IF NOT FOLLOWED, COULD ENDANGER THE PERSONAL SAFETY AND/OR PROPERTY OF YOURSELF AND OTHERS, READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO OPERATE YOUR TILLER. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY. WHEN YOU SEE THIS SYMBOL -  **HEED ITS WARNING.**



### **DANGER:**

**DANGER:** Your tiller was built to be operated according to the rules for safe operation in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. This tiller is capable of amputating hands and feet. Failure to observe the following safety instructions could result in serious injury or death.

### **I. GENERAL OPERATION**

1. Read this owner's guide carefully in its entirety before attempting to assemble this machine. Read, understand, and follow all instructions on the machine and in the manual(s) before operation. Be completely familiar with the controls and the proper use of the machine before operating it. Keep this manual in a safe place for future and regular reference and for re-ordering replacement parts.
2. Your tiller is a powerful tool, not a plaything. Therefore, exercise extreme caution at all times. Your unit has been designed to perform one job: to till soil. Do not use it for any other purpose.
3. Never allow children under age 14 to operate the unit. Children 14 years and older should only operate the unit under close parental supervision. Only responsible individuals who are familiar with these rules of safe operation should be allowed to use your unit.
4. Do not operate tiller while under the influence of alcohol or drugs.
5. Keep the area of operation clear of all persons, particularly small children and pets. Stop the engine when they are in the vicinity of your tiller.
6. Wear sturdy, rough-soled work shoes and close fitting slacks and shirt. Shirt and slacks that cover the arms and legs and steel-toed shoes are recommended. Do not wear loose fitting clothes or jewelry and secure hair so it is above shoulder length. They can be caught in moving parts. Never gloves when feeding material in the chipper chute or shredder hopper.
7. Operate tiller only in daylight or good artificial light.
8. Do not start tiller unless the shift lever (if provided) is in the neutral (N) position.
9. Do not allow anyone to stand or walk in front of tiller when starting or running engine.
10. Do not place feet or hands on or near the tines when starting the engine or while the engine is running.
11. Never attempt to make depth bar, tine width, cable, handle, or wheel adjustments while the engine is running.
12. Do not leave the tiller unattended with the engine running.
13. Before attempting to remove rocks, bricks and other objects from tines, stop the engine and be sure the tines have stopped completely. Disconnect the spark plug wire and move it away from the spark plug.
14. If your machine should start making an unusual noise or vibration, immediately stop the engine and allow the machine to come to a complete stop. Disconnect the spark plug wire and move it away from the spark plug. Take the following steps:
  - Inspect for damage.
  - Repair or replace any damaged parts.
  - Check for any loose parts and tighten to assure continued safe operation.
15. Muffler and engine become hot and can cause a burn. Do not touch.
16. Keep all shields, guards and safety devices in place and operating properly.
17. Use caution when tilling near fences, buildings and underground utilities. Rotating tines can cause damage or injury.
18. Do not operate engine if air cleaner or cover over carburetor air-intake is removed, except for adjustment. Removal of such parts could create a fire hazard.

19. Only use accessories approved for this machine by the manufacturer. Read, understand and follow all instructions provided with the approved accessory.
20. If situations occur which are not covered by this manual, use care and good judgment. Contact your dealer for assistance.

## II. CHILDREN



Tragic accidents can occur if the operator is not alert to the presence of small children. Children are often attracted to the tilling activity. Never assume that children will remain where you last saw them.

1. Keep children out of the work area and under the watchful eye of a responsible adult other than the operator.
2. Be alert and turn the unit off if a child enters the area.
3. Never allow children under the age of 14 to operate the tiller.

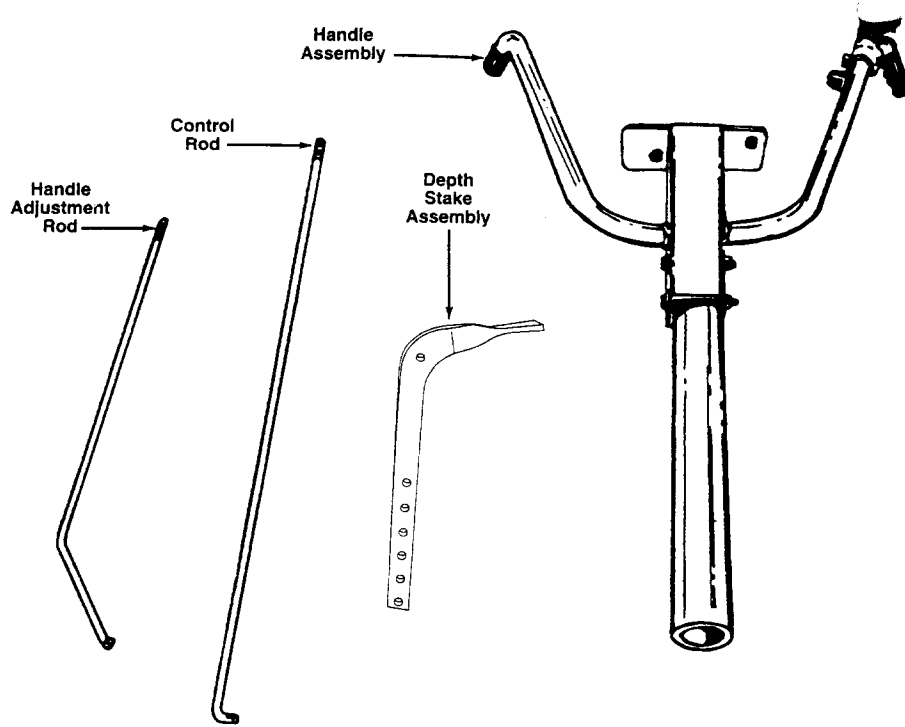
## III. SERVICE

1. Use extreme care in handling gasoline and other fuels. They are extremely flammable and the vapors are explosive.
  - a. Store fuel and oil in approved containers, away from heat and open flame, and out of the reach of children. Check and add fuel before starting the engine. Never remove gas cap or add fuel while the engine is running. Allow engine to cool at least two minutes before refueling.
  - b. Replace gasoline cap securely and wipe off any spilled gasoline before starting the engine as it may cause a fire or explosion.

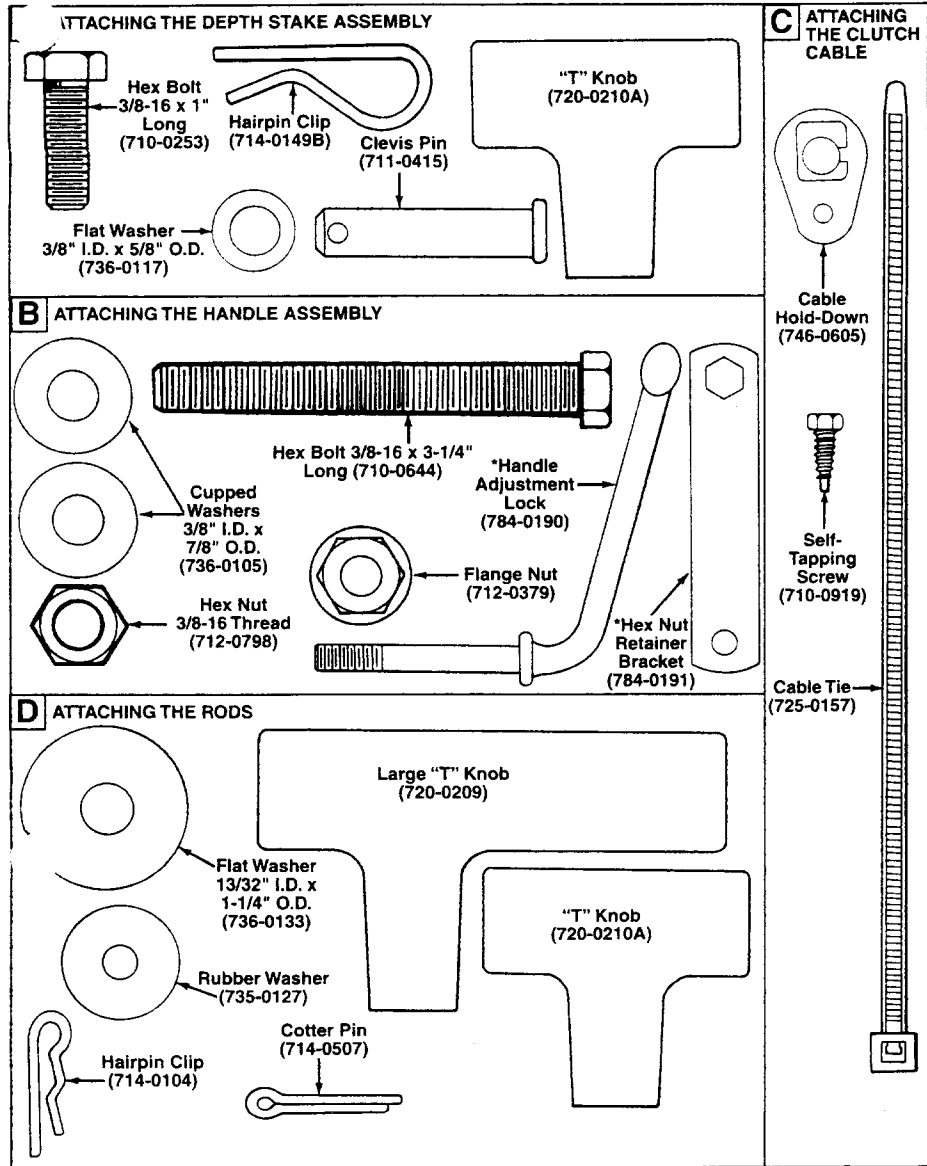
- c. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
  - d. Never refuel unit indoors because flammable vapors will accumulate in the area.
  - e. Never store the machine or fuel container inside where there is an open flame or spark such as a gas hot water heater, space heater, clothes dryer or furnace.
2. Never run your machine in an enclosed area as the exhaust from the engine contains carbon monoxide, which is a odorless, tasteless and deadly poisonous gas.
  3. To reduce fire hazard, keep engine and muffler free of leaves, grass, and other debris build-up. Clean up fuel and oil spillage. Allow unit to cool at least 5 minutes before storing.
  4. Before cleaning, repairing, or inspecting, make certain the tines and all moving parts have stopped. Disconnect the spark plug wire and keep wire away from spark plug to prevent accidental starting. Do not use flammable solutions to clean air filter.
  5. Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
  6. Never tamper with safety devices. Check their proper operation regularly.
  7. Do not alter or tamper with the engine's governor setting. The governor controls the maximum safe operating speed of the engine. Over-speeding the engine is dangerous and will cause damage to the engine and to other moving parts of the machine.

<p><b>OWNER'S MANUAL</b></p> 	<p><b>SAFETY LABEL</b></p>  <p><b>WARNING - YOUR RESPONSIBILITY</b></p> <p>Restrict the use of this power machine to persons who read, understand and follow the warnings and instructions in this manual and on the machine.</p>
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LOOSE PARTS IN CARTON



**CONTENTS OF HARDWARE PACK**



## ASSEMBLY INSTRUCTIONS

**IMPORTANT:** This unit is shipped WITHOUT GASOLINE or OIL. After assembly, service engine with gasoline and oil as instructed in the separate engine manual packed with your unit.

**NOTE:** Reference to left or right side of the tiller is determined from behind the unit in the operating position.

This owner's guide covers three different model tillers. Follow only the instructions which pertain to your model tiller.

### TOOLS REQUIRED FOR ASSEMBLY

(2) 9/16" Wrenches\*

(2) Adjustable Wrenches

(1) Flat Blade Screwdriver

(1) Pair of Pliers

\* Two adjustable wrenches may be used.

### TO REMOVE UNIT FROM CARTON

1. Remove staples, break glue on top flaps, or cut tape at carton end and peel along top flap to open carton.
2. Remove loose parts included with unit (i.e., owner's manual, etc.)
3. Cut along dotted lines and lay carton down flat.
4. Remove packing material.
5. Roll or slide unit out of carton. Check carton thoroughly for loose parts.

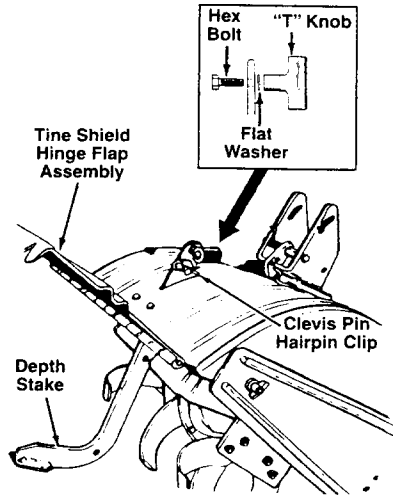


FIGURE 1

6. Extend control cable(s) and lay on the floor. Be careful not to bend or kink control cable(s).
7. Lay out the hardware according to the illustration for identification.

### ATTACHING THE DEPTH STAKE ASSEMBLY (Hardware A)

1. Tip the tiller forward so it rests on front counterweight. See figure 3.
2. Raise the tine shield hinge flap assembly. Insert the depth bar assembly between the two shoulder bolts and up through the tine shield assembly as shown in figure 1.
3. Insert clevis pin through the tine shield and depth bar assemblies. Secure with hairpin clip.
4. Insert hex bolt into the upper hole of the depth bar assembly. Place flat washer onto the hex bolt and thread small "T" knob (A) onto the hex bolt. See figure 1. Tighten securely.
5. Tip the tiller back down so it rests on the tines.

### ATTACHING THE HANDLE ASSEMBLY (Hardware B)

1. Place cupped washer onto hex bolt (crowned side of washer goes against the bolt). Place hex nut retainer bracket on hex bolt, using the round hole in retainer bracket.
2. Place handle assembly in position in the handle pivot bracket. Line up the holes in handle assembly with the holes (and slots) in the pivot bracket. See figure 2.

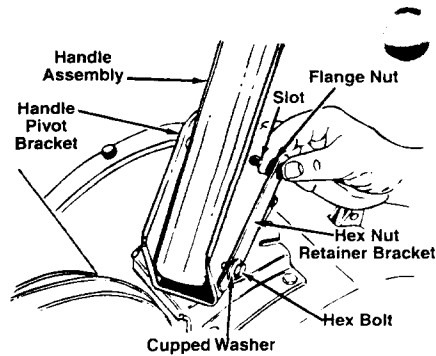


FIGURE 2

3. Insert hex bolt (with washer and hex nut retainer attached) through the bottom holes on the handle pivot bracket and handle assembly. Head of the hex bolt should be to the left hand side of the unit. See figure 2.

Place flange nut between hex nut retainer bracket and pivot bracket. See figure 2.

5. Secure bottom of handle by placing cupped washer (cupped side against the pivot bracket) and hex nut on hex bolt. Do not tighten at this time. See figure 3.

6. Line up holes in handle with slots in handle pivot bracket. Insert handle adjustment lock through handle pivot bracket and handle assembly. See figure 3. Thread end of handle adjustment crank into the flange nut.

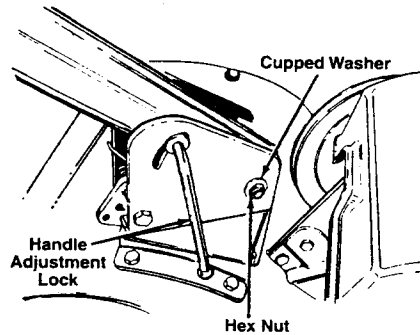


FIGURE 3

7. Pivot handle assembly into position desired. Tighten securely the bottom bolt and nut. Tighten the handle adjustment lock.

#### Attaching The Clutch Cable Hardware C)

Attach the clutch cable to the left handle as follows (be careful not to kink the cable).

1. Route the clutch cable to the left side of the tiller, and underneath the handle. Remove one hex nut from the end of the casing on the clutch cable. Thread the other nut all the way onto the threading casing, as far as it will go.
2. Slip the wire through the slot on the cable bracket on the left handle. Push the end of the casing up through the cable bracket. Rethread the hex nut on the end of the cable. Do not tighten at this time. See figure 4.

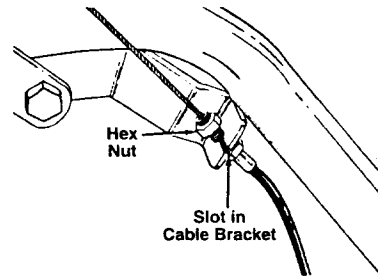


FIGURE 4

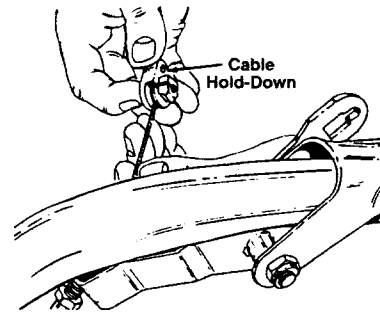


FIGURE 5

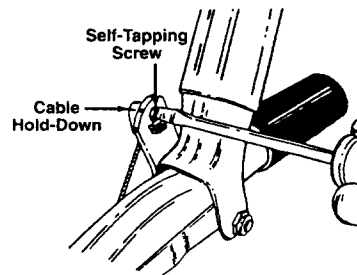


FIGURE 6

3. Hook the barrel end of the cable into the cable hold-down. Slide the cable around in the slot as shown in figure 5.
4. Pull the cable upwards to obtain slack, lift the clutch grip, and insert the cable hold-down into the clutch grip. Secure with self-tapping screw. See figure 6.

- With the clutch lever released (in the "up" position), adjust the bottom nut at the cable bracket so there is 1/2" of slack in the control wire as shown in figure 7. Tighten the upper nut against the bracket. Squeeze the clutch lever against the handle. The control wire should now be straight.

**NOTE:** Do not overtighten control wire. Too much tension may cause it to break.

**WARNING:** Be certain to check the clutch cable adjustment as instructed on page 6 of your owner's guide before operating the tiller.

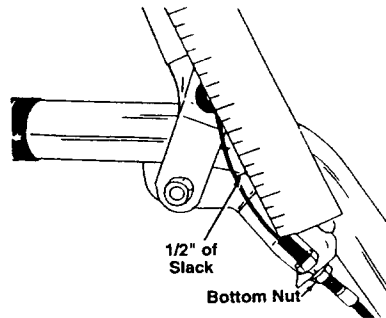


FIGURE 7

- Secure the drive cable to the left handle using cable tie. Refer to figure 8. Cut off excess end of cable tie.

#### ATTACHING THE RODS (Hardware D)

- Insert the threaded end of control rod **up** through the plastic bushing on the left side of handle assembly. See figure 8. Thread the large "T" knob on the end of control rod.
- Insert the threaded end of handle adjustment rod **up** through the plastic bushing on the right side of handle assembly. Thread the small "T" knob on the end of handle adjustment rod.
- Place flat washer the rubber washer over the hooked end of control rod. Insert end of control rod into the indicator bracket on top of the shift cover, and secure with hairpin clip. See figure 9.
- With the handle adjustment rod beneath the handle assembly, insert the hooked end of handle adjustment rod into the positioner bracket as shown in figure 10.

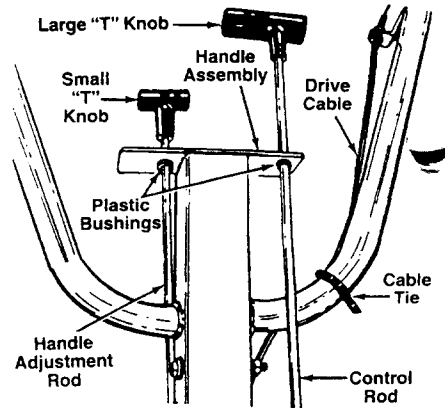


FIGURE 8

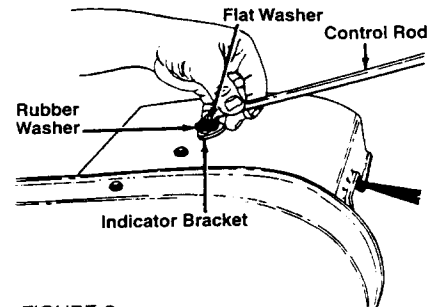


FIGURE 9

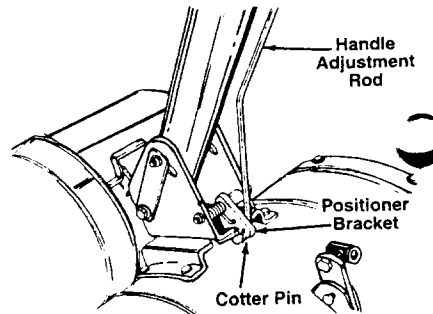


FIGURE 10

Secure with cotter pin, bending ends of pin in opposite directions.

#### CHECK THE CLUTCH ADJUSTMENT

**IMPORTANT:** Service the engine with oil and gasoline before checking this adjustment. Refer to the separate engine manual packed with your tiller.



- a. Position the tiller so the front counterweight is against a solid object, such as a wall. With the gear selection lever in NEUTRAL, start the engine. Refer to the separate engine manual.
- i. Standing on the right side of the tiller, examine the belt (inside the belt cover). It should not be turning.

**NOTE:** Do not put fingers under the belt cover.

**If the belt turns with the unit in neutral,** adjust by moving the hex nut below the cable bracket **down** two full turns. See figure 11. Tighten the upper hex nut against the bracket.

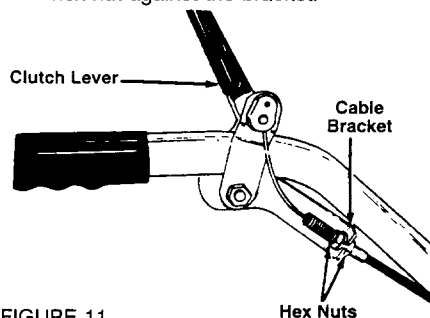


FIGURE 11

- c. Now move the shift lever to FORWARD (Wheels Forward) position. Carefully engage the clutch by squeezing the clutch lever against the left handle. The wheels should spin.

**If the wheels do not spin with the unit in forward,** adjust by moving the hex nut which is above the cable bracket **up** a few turns. Tighten the bottom hex nut against the bracket.

Recheck both adjustments, and readjust as necessary.

**NOTE:** A secondary cable adjustment is available if you reach the point that additional adjustment is needed, remove the belt cover and move the hex nuts at the other end of the cable towards the end of the casing. Then readjust the hex nuts at the handle.

#### TIRE PRESSURE

The tires on your unit may be over-inflated for shipping purposes. Reduce the tire pressure before operating the unit. Recommended operating tire pressure is approximately 12 p.s.i. (check sidewall of tire for tire manufacturer's recommended pressure).

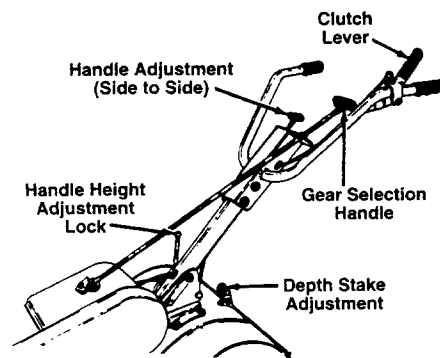


FIGURE 12

**WARNING:** Maximum tire pressure under any circumstances is 30 p.s.i. Equal tire pressure should be maintained on both tires.

## CONTROLS

### THROTTLE CONTROL

The throttle control lever is located on the engine. It controls the engine speed and stops the engine. See figure 13.

### GEAR SELECTION HANDLE

The selection handle is located on the left of the handle assembly. It is used to select NEUTRAL, REVERSE, or one of the FORWARD modes (see below). Pull or push the handle so that the indicator on top of shift cover points to the operating mode desired. See figure 12.

**NOTE:** If difficulty is encountered in moving the gear selection handle, move the tiller forward or backward slightly to allow the gears to synchronize.

NEUTRAL - Transmission is in neutral.

REVERSE - Reverse wheel drive.

FORWARD Modes:

Wheels Forward - Forward wheel drive only.

Tines Reverse - Forward wheel drive and reverse tine drive.

Tines Forward - Forward wheel and tine drive.

**WARNING:** Make certain unit is in NEUTRAL when starting the engine.

### CLUTCH LEVER

The clutch lever is located on the left handle. See figure 12. Squeezing the clutch lever against the handle engages the wheel and tine drive mechanisms.

*NOTE: Never engage clutch lever while shifting.*

### DEPTH BAR

The depth bar controls the tilling depth. Refer to "How to Use Your Tiller" section on page 10.

### HANDLE ADJUSTMENT (See Figure 12)

The handle may be adjusted to be in line with the tiller, or swung to the left or right so the operator is not walking in the freshly tilled soil.

To adjust the handle position from side to side, pull the handle adjustment lever back, pivot the tiller handle to desired position and release the lever.

The handle may also be adjusted to the height desired. Loosen the handle height adjustment lock a few turns. Pivot handle up or down to desired position. Tighten lock.

## OPERATION

*NOTE: Engine is shipped without oil.*



**WARNING: Before operating the tiller, be certain to read "How to Use Your Tiller" on page 12. Use the reverse tine drive when tilling virgin ground, sod or hard soil. Use the forward tine drive when cultivating or tilling soft ground.**

### BEFORE STARTING

1. Service engine with oil and gasoline as instructed in the separate engine manual packed with your unit.
2. Be certain to check clutch adjustment as described in the Assembly Instructions.

### TO START ENGINE



**WARNING: BE SURE NO ONE IS STANDING IN FRONT OF THE TILLER WHILE THE ENGINE IS RUNNING OR BEING STARTED.**

### MODEL 430 ONLY:

1. Place gear selection lever in NEUTRAL.
2. Place the throttle control lever in START position. See figure 13A.

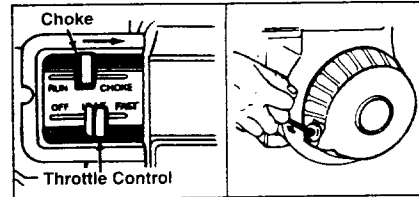


FIGURE 13A-MODEL 430

3. Move choke lever to CHOKE position.  
*NOTE: A warm engine may not require choking.*
4. Stand at side of tiller. Grasp the starter handle and pull out slowly, until it pulls slightly harder. Let rope rewind slowly.
5. Pull starter handle rapidly. Do not allow handle to snap back. Allow it to rewind slowly while keeping a firm hold on the starter handle.
6. Repeat steps 4 and 5 until engine starts.
7. As engine warms up and begins to operate evenly, move choke lever gradually to RUN position. If engine falters, return to choke position, then slowly move to RUN position.
8. Refer to engine manual for additional engine information.

### MODEL 447 ONLY:

1. Place gear selection lever in NEUTRAL.
2. Turn fuel shut-off to ON position. See figure 13B.
3. Place the engine shut-off switch in ON position.
4. Place the throttle control lever in FAST position.
5. Move choke lever to CHOKE position.  
*NOTE: A warm engine may not require choking.*
6. Stand at side of tiller. Grasp the starter handle and pull out slowly, until it pulls slightly harder. Let rope rewind slowly.

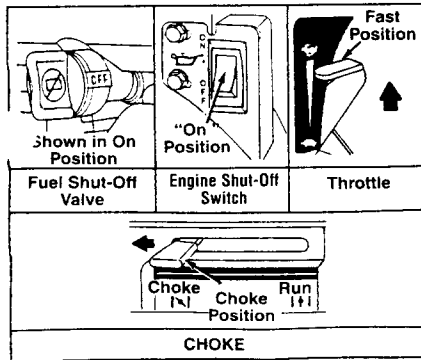


FIGURE 13B-MODEL 447

7. Pull starter handle rapidly. Do not allow handle to snap back. Allow it to rewind slowly while keeping a firm hold on the starter handle.
8. Repeat steps 6 and 7 until engine starts.
9. As engine warms up and begins to operate evenly, move choke lever gradually to RUN position. If engine falters, return to choke position, then slowly move to RUN position.
10. Refer to engine manual for additional engine information

#### MODEL 448 ONLY:

1. Place gear selection lever in NEUTRAL.
2. Place the engine speed control in the START position.
3. Push primer two (2) or three (3) times (see figure 13C). Wait about two (2) seconds between each push.  
*NOTE: Primer may be needed to restart a warm engine after a short shutdown.*
4. Stand at side of tiller. Grasp the starter handle and pull out slowly, until it pulls slightly harder. Let rope rewind slowly.
5. Pull starter handle rapidly. Do not allow handle to snap back. Allow it to rewind slowly while keeping a firm hold on the starter handle.

*NOTE: If engine fails to start after three (3) pulls, push primer two (2) times and pull starter rope again.*

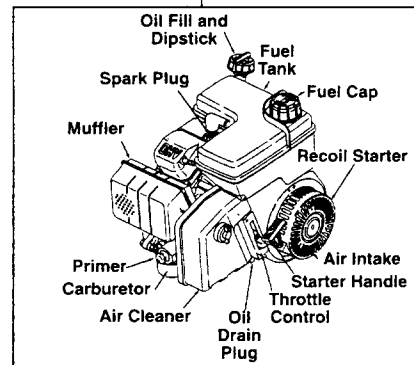
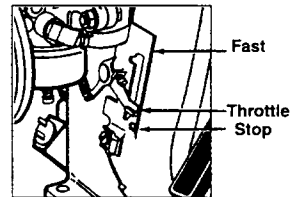


FIGURE 13C-MODEL 448

6. Repeat steps 4 and 5 until engine starts.
7. Refer to engine manual for additional engine information.

#### ALL MODELS:

*NOTE: After starting engine and prior to using the tiller, be certain to check the clutch adjustment as described in "Checking the Clutch Adjustment" section of the assembly instructions.*

#### TO STOP ENGINE (MODELS 430 and 447)

1. Move throttle control to STOP position.
2. Disconnect spark plug wire and ground to prevent accidentally starting while equipment is unattended.

*NOTE: After the first ten hours of operation, recheck the clutch adjustment. Refer to the Assembly Instructions.*

#### TO STOP ENGINE (MODEL 448)

1. Move throttle control to SLOW position.
2. Move the engine shut-off switch to the OFF position.

3. Disconnect spark plug wire and ground to prevent accidentally starting while equipment is unattended.
4. Close fuel shut-off valve when not operating tiller to prevent fuel leakage.

*NOTE: After the first ten hours of operation, recheck the clutch adjustment. Refer to Assembly Instructions.*

## HOW TO USE YOUR TILLER

**WARNING:** When operating the tiller for the first time, use the depth bar setting that gives 1-1/2 inches of tilling depth (second hole from the top). Refer to figure 14.

Tilling depth is controlled by the depth bar which can be adjusted to five different settings. See figure 14. Adjust the side shields as shown in figure 15, as you adjust the depth bar. Be certain spark plug wire is disconnected and grounded against the engine.

1. When using the tiller for the first time, use the second adjustment hole from the top (1-1/2" of tilling depth). See figure 14.
2. When breaking up sod and for shallow cultivation, use the setting which gives 1-1/2" of tilling depth (second hole from the top). Place the side shields in their lowest position. For further depth, raise the depth bar and side shields and make one or two more passes over the area.
3. When tilling loose soil, depth bar may be raised to its highest position (use bottom adjustment hole) to give the deepest tilling depth. Raise the side shields to their highest position.
4. To transport tiller, lower the depth bar (use top adjustment hole).

To adjust the depth bar, remove the clevis pin and hairpin clip. See figure 14. Move the depth bar to the desired setting.

To adjust the side shields, remove the hex nut and Belleville washer from the front and loosen the rear nut. See figure 15. Pivot the side shield to the desired position. Replace hex nut and Belleville washer. Tighten securely.

### To operate the tiller:

1. Select the depth bar setting.
2. Start engine as instructed on page 8.

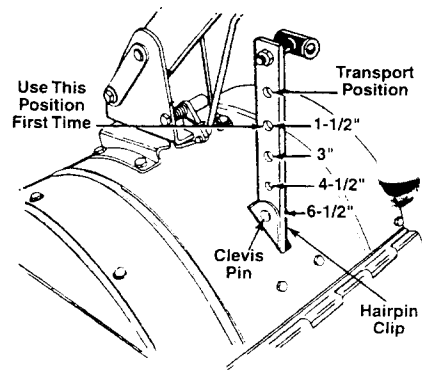


FIGURE 14

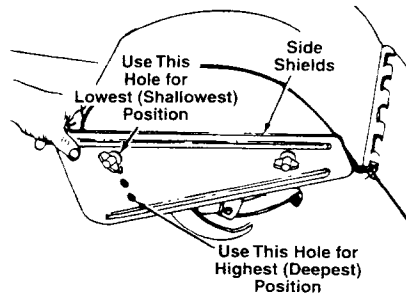


FIGURE 15

3. Move gear selection handle to one of the forward modes or reverse. **Use the reverse tine drive when tilling virgin ground, sod or hard soil. Use the forward tine drive when cultivating or tilling soft ground.**

**IMPORTANT:** When using the forward drive, lower the depth bar (use a shallow tilling depth) to make certain the tines do not run across the ground.

**WARNING:** Do not move the gear selection handle with the wheels or tines engaged. Make certain the unit is stopped completely before changing the gear selection.

4. Squeeze the clutch lever against the handle to engage the wheels and tines.

*NOTE: Make certain the gear selection indicator is correctly positioned before engaging the clutch handle. If it is between gears, the engine will stall.*

To transport tiller, **do not** engage the tine clutch lever. Engage the wheels only.



**WARNING: Do not push down on the handles so that the wheels are lifted off the ground while the tine clutch is engaged, or the tiller could move backward and cause personal injury.**

For best results, it is recommended the garden be tilled twice (lengthwise, then widthwise) to pulverize the soil.

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## ADJUSTMENTS

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### HANDLE ADJUSTMENT

The handle may be adjusted to be in line with the tiller, or swung to the left or right. The handle height may also be adjusted. Refer to the Control section for details of handle adjustment.

### BELT TENSION ADJUSTMENT

Periodic adjustment of the belt tension may be required due to normal stretch and wear on the belt. Adjustment is needed if the tines or wheels seem to hesitate while turning, but the engine maintains the same speed.

To adjust to the tension on the belt, refer to clutch adjustment information in step number 29 of the Assembly Instructions.

### CARBURETOR ADJUSTMENT



**WARNING: If any adjustments are made to the engine while the engine is running, (e.g. carburetor), disengage all clutches and tines. Keep clear of all moving parts. Be careful of heated surfaces and muffler.**

Never make unnecessary adjustments. The factory settings are correct for most applications. If adjustments are needed, refer to the separate engine manual packed with your tiller.

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## LUBRICATION

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**Transmission**—The transmission is pre-lubricated and sealed at the factory. It requires no checking unless the transmission is disassembled. To fill with grease, lay the right half of the transmission on its side. Add 27 ounces of Benalene #920 grease. Assemble the left half to it. This grease can be obtained at your nearest authorized dealer. Order part number 737-0030.

**Clutch Lever**—Lubricate the pivot point on the clutch lever and the cable at least once a

season with light oil. The control must operate freely in both directions.

**Pivot Points**—Lubricate all pivot points and linkages at least once a season with light oil.

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## MAINTENANCE

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**WARNING: Disconnect the spark plug wire and ground it against the engine before performing any repairs or maintenance.**

### ENGINE

Refer to the separate engine manual for engine maintenance instructions.

Maintain **engine oil** as instructed in the separate engine manual packed with your unit. Read and follow instructions carefully.

Service **air cleaner** as per separate engine manual under normal conditions. Clean every few hours under extremely dusty conditions. Poor engine performance and flooding usually indicates that the air cleaner should be serviced. To service the air cleaner, refer to the separate engine manual packed with your unit.

**IMPORTANT:** Never run your engine without air cleaner completely assembled.

The **spark plug** should be cleaned and the gap reset once a season. Spark plug replacement is recommended at the start of each mowing season; check engine manual for correct plug type and gap specifications.

Clean the engine regularly with a cloth or brush. Keep the cooling system (blower housing area) clean to permit proper air circulation which is essential to engine performance and life. Be certain to remove all dirt and combustible debris from muffler area.

### CLEANING THE TINE AREA

Clean the underside of the tine shield after each use. The dirt washes off the tines easier if washed immediately instead of after it dries.

### TIRES

Recommended operating tire pressure is approximately 12 p.s.i. (check sidewall of tire for tire manufacturer's recommended pressure). Maximum tire pressure under any circumstances is 30 p.s.i. Equal pressure under any circumstances is 30 p.s.i. Equal tire pressure should be maintained on both tires.

When installing a tire to the rim, be certain rim is clean and free of rust. Lubricate both the tire and rim generously. Never inflate to over 30 p.s.i. to seat beads.



**WARNING:** Excessive pressure (over 30 p.s.i.) when seating beads may cause tire/rim assembly to burst with force sufficient to cause serious injury.

#### BELT REPLACEMENT

**CAUTION:** Do not use an off-the-shelf belt.

Your tiller has been equipped with belts made of special material (Kevlar Tensile) for longer life and better performance. They should not be replaced with an off-the-shelf belt.

If belt replacement is required, order belt or belts by part number from your nearest authorized dealer.

Part No. 754-0267 - "V" Belt

1. Disconnect and ground the spark plug wire against the engine.
2. Remove the belt cover from the left side of the tiller as follows. Refer to figure 16.

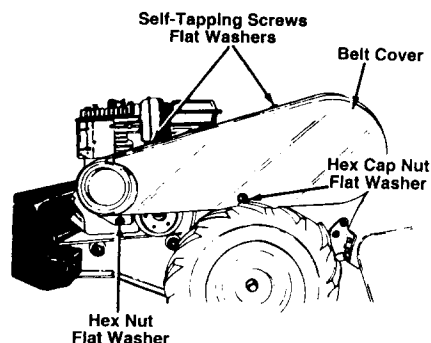


FIGURE 16

- a. Remove two self-tapping screws and flat washers from the top of belt cover.
  - b. Remove the hex cap nut and flat washer from the side of the belt cover. Remove the hex nut and flat washer at the bottom of the front of the cover.
3. Remove the hex bolt (belt keeper) located beneath the engine pulley. See figure 17.
  4. Remove belt. Reassemble new belt, following instructions in reverse order.

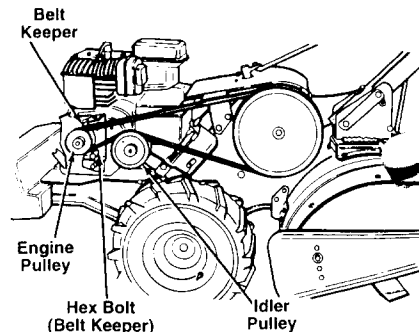


FIGURE 17

**NOTE:** Upon reassembly, make certain the belt is routed over the idler pulley and inside of belt keepers by engine pulley. See figure 17.

#### OFF-SEASON STORAGE

If the tiller is to be inoperative for a period longer than 30 days, the following precautions are recommended.

1. Clean the exterior of engine and the entire tiller thoroughly.
2. Refer to the engine manual for correct engine storage instructions.
3. Wipe tines with oiled rag to prevent rust.
4. Store tiller in a clean, dry area. Do not store next to corrosive materials, such as fertilizer.

**NOTE:** When storing any type of power equipment in an unventilated or metal storage shed, care should be taken, rustproof the equipment. Using a light oil or silicone, coat the equipment, especially any springs, bearings and cables.

## TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES(S)	CORRECTIVE ACTION
Engine fails to start	<ol style="list-style-type: none"> <li>1. Fuel tank empty, or stale fuel.</li> <li>2. Throttle control lever not in start position.</li> <li>3. Blocked fuel line.</li> <li>4. Spark plug wire disconnected.</li> <li>5. Faulty spark plug</li> <li>6. Engine flooded.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill tank with clean, fresh fuel.</li> <li>2. Move throttle lever to start position.</li> <li>3. Clean fuel line.</li> <li>4. Connect wire to spark plug.</li> <li>5. Clean, adjust gap or replace.</li> <li>6. Remove spark plug, dry the plug, and crank engine with plug removed and throttle in off position. Replace spark plug, connect wire and resume starting procedures</li> </ol>
Engine runs erratic	<ol style="list-style-type: none"> <li>1. Unit running on CHOKE.</li> <li>2. Spark plug wire loose.</li> <li>3. Blocked fuel line or stale fuel.</li> <li>4. Vent in gas cap lugged.</li> <li>5. Water or dirt in fuel system.</li> <li>6. Dirty air cleaner.</li> <li>7. Carburetor out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Move choke lever to OFF position.</li> <li>2. Connect and tighten spark plug wire.</li> <li>3. Clean fuel line; fill tank with clean, fresh gasoline.</li> <li>4. Clear vent.</li> <li>5. Drain fuel tank. Refill with fresh fuel.</li> <li>6. Clean air cleaner as instructed in separated engine manual.</li> <li>7. Adjust carburetor as instructed in separate engine manual.</li> </ol>
Engine overheats	<ol style="list-style-type: none"> <li>1. Engine oil level low.</li> <li>2. Air flow restricted.</li> <li>3. Carburetor not adjusted properly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill crankcase with proper oil.</li> <li>2. Remove blower housing and clean as instructed in separate engine manual.</li> <li>3. Adjust carburetor as instructed in separate engine manual.</li> </ol>
Tines do not engage	<ol style="list-style-type: none"> <li>1. Foreign object lodged in tines.</li> <li>2. Tine clevis pin (s) missing.</li> <li>3. Control cable not adjusted properly.</li> <li>4. Belt worn and/or stretched.</li> </ol>	<ol style="list-style-type: none"> <li>1. Dislodge foreign object.</li> <li>2. Replace tine clevis pin(s).</li> <li>3. Adjust control cable (see assembly instructions).</li> <li>4. Replace belt.</li> </ol>

NOTE: For repairs beyond the minor adjustments listed above, please contact your local service dealer.