

**ROY-BILT®**

# Owner/Operator Manual

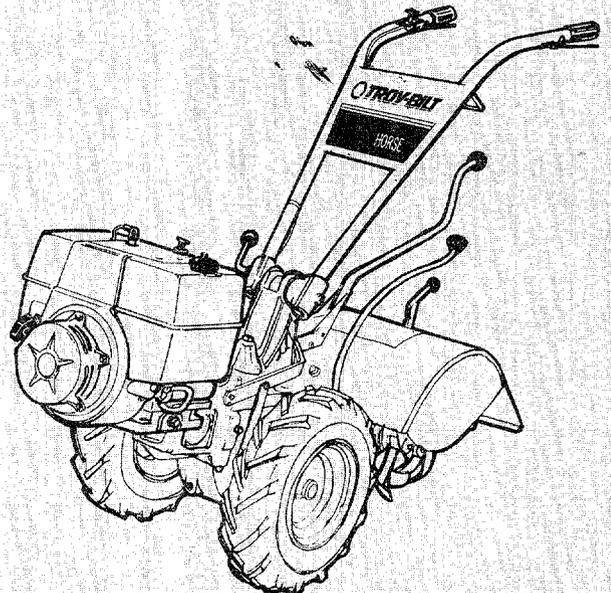
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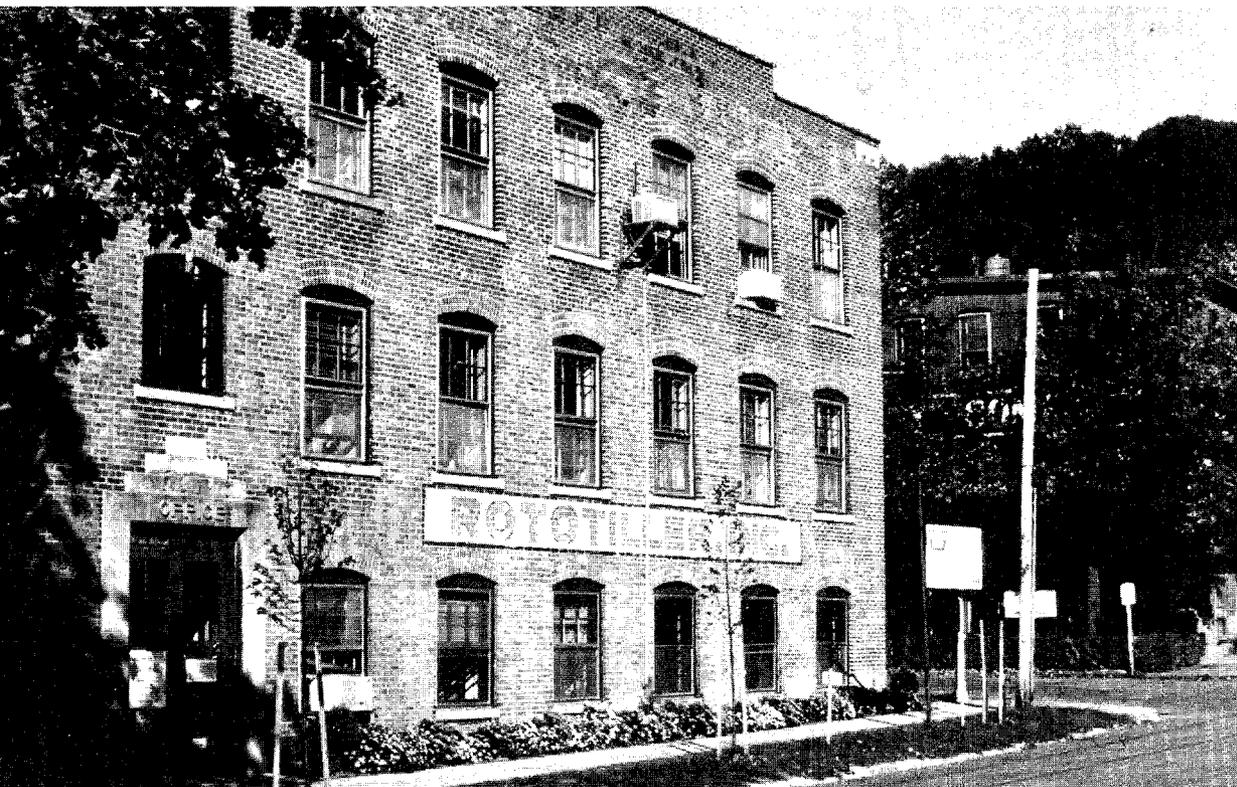
## PTO HORSE Tiller

- Safety
- Controls
- Operation
- Maintenance

Models

- 7 HP
- 8 HP





factory in Troy, N.Y., where tillers have been made since 1937. Please come and visit us.

## **we call your machine the PTO HORSE Model -BILT® Roto Tiller-Power Composter**

hout this Owner/Operator Manual and in  
r literature, we refer to your machine as the  
RSE Model". The name aptly describes its  
se ruggedness, and it distinguishes this  
m the smaller ECONO-HORSE, PONY® and  
models, as well as from other models that  
n available in the past or that might be  
l in the future.

story dates back to the old Rototiller Corpo-  
e company that introduced rear-tine rotary

tillage to America in 1930. The first rear-tine tillers  
Rototiller, Inc. built in Troy were manufactured in 1937,  
in the same building where Garden Way built its first  
HORSE Model in 1961. We're still building our tillers  
at the same location.

Over the years, the PTO HORSE Model has been  
continually refined and improved. Its performance  
and reliability have long been recognized by many  
thousands of serious vegetable gardeners as being  
unmatched by any other tiller of its size or design.

### **WARNING TO ALL CALIFORNIA AND OTHER POWER EQUIPMENT OPERATORS**

California law, and under the laws of several other states, you are not permitted to operate an  
l combustion engine using hydrocarbon fuels on any forest covered, brush covered, or grass  
d land, or on land covered with grain, hay, or other flammable agricultural crop, without an  
spark arrester in continuous effective working order.

ngine on your power equipment, like most outdoor power equipment, is an internal combustion  
that burns gasoline, a hydrocarbon fuel. Therefore, your power equipment must be equipped  
spark arrester muffler in continuous effective working order. The spark arrester must be  
ed to the engine exhaust system in such a manner that flames or heat from the system will not  
flammable material. Failure of the owner / operator of the equipment to comply with this  
ion is a misdemeanor under California law, and may also be a violation of other state and / or  
regulations, laws, ordinances, or codes. Contact your local fire marshal or forest service for  
c information about what regulations apply in your area.

# Off to a Safe Start!

The PTO HORSE Model TROY-BILT® Tiller meets voluntary safety standard B71.8-1986, which is sponsored by the Outdoor Power Equipment Institute, Inc. and is published by the American National Standards Institute, Inc.

Your new tiller is basically a simple machine to operate. However, as with all new and unfamiliar powered equipment, you should thoroughly read and understand this Owner/Operator Manual and any other literature you received with your tiller before you attempt to start the engine. *Please carefully follow recommended operating instructions and safety practices closely at all times. Failure to do so could result in injury or property damage.*

**ASSEMBLY INSTRUCTIONS NOTICE!**

Included in your literature package is an Assembly Instructions Manual that provides step-by-step instructions on how to assemble your new tiller. If you purchased your tiller un-assembled, then be sure to read and follow the assembly instructions carefully.

Call our Technical Service Department immediately (see page 4) if the Assembly Instructions Manual is missing from your literature package, or if you have any questions about assembly. *Please don't attempt to assemble your tiller without proper instructions.*

**CAUTION**

TO AVOID INJURY:

- Read the Owner/Operator Manual.
- Know location and function of all controls.
- Keep all safety devices and shields in place.
- Never allow children or uninstructed adults to operate tiller.
- Shut off engine and disconnect spark plug wire before unclogging tines or making repairs.
- Keep bystanders away from machine.
- Keep away from rotating parts.

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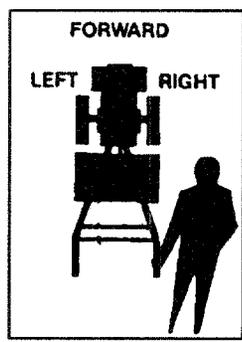
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**"OPERATOR'S POSITION"**

All references to **LEFT** and **RIGHT** sides of the tiller are given from the operator's position behind the handlebars (unless specified otherwise).

# Introduction

Welcome to "Power gardening the TROY-BILT® Tiller way." Your new PTO HORSE Model Tiller is a useful, productive gardening tool that, with proper care, should last for many years.

Your tiller was designed to easily chop up, shred and bury all sorts of vegetation and organic matter in the garden in addition to preparing seedbeds and cultivating. With optional tiller attachments it can also be used for furrowing and hilling, as well as light earthmoving and snow removal chores.

The PTO HORSE Model's design, with powered wheels ahead of the



separately geared Bolo Tines in the rear, gives it an outstanding combination of tilling and composting capabilities that allows you to enrich your soil far beyond your abilities to do so by hand. This soil enhancement is gained by tilling in

and burying organic materials such as leaves, mulches, crop residues, sod, green manure cover crops and even standing cornstalks! By using this method, you will soon experience better yields in your garden than ever before. This is said to be the greatest single benefit of power gardening "the different, better, and so much more enjoyable TROY-BILT® Tiller way."

We have tried our best to build your tiller as strong and trouble-free as we know how. This, of course, is to our mutual benefit. We have fewer service problems and you have a truly reliable machine.

## VERY IMPORTANT!

Before trying to operate your tiller or PTO Power Unit for the first time, please make sure that you:

- 1** Complete all of the tiller assembly steps that are described in the separate Assembly Instructions Manual that came packaged with this Manual.
- 2** Read and understand all of the Safety Instructions in Section 1 of this Manual.
- 3** Completely familiarize yourself with all of the operating controls as described in Section 2 of this Manual.
- 4** Read and understand all of the operating procedures for the tiller and the PTO Power Unit, as described in Sections 3, 4 and 5 of this Manual.

**REMEMBER . . . PRACTICE SAFETY AT ALL TIMES!**

## You also have a versatile PTO Power Unit . . .

In addition to being an incredibly efficient tiller, your machine can be quickly converted into a self-contained PTO (Power Take-Off) Power Unit that is capable of towing or powering various TROY-BILT PTO attachments (see Figure 2).

This ability to convert the tiller into a PTO Power Unit is made possible by the unique design of the Horse Model's transmission. As shown in Figure 3, the transmission is made up of two separate cast-iron housings that are held together by a locking collar, a dowel pin and two swing-bolts.

Each housing has separate drive shafts that are joined by a tine clutch. This clutch can be engaged or disengaged by moving the Tines/PTO Clutch Lever that is located on the left side of the PTO Power Unit transmission.

When the tine attachment is in place, the lever allows you to operate the tiller with the tines disengaged, even when the wheels are in motion. This tine disconnect feature provides added convenience when transporting, loading, or unloading the tiller. When the lever is in the engaged position,

the tine clutch connects the two drive shafts together, transmitting power to the tines.

If the tine attachment is removed (by loosening the two swing-bolts and sliding the attachment off), the PTO Power Unit can be used to tow moderate loads or drag-behind implements, or to provide engine power to powered stationary attachments such as the TROY-BILT® Generator, TROY-BILT® PTO Log Splitter and TROY-BILT® PTO Chipper/Shredder. This PTO capability truly makes your tiller an all-around, all-season work horse.

For detailed instructions on how to convert your tiller into a PTO Power Unit please refer to Section 5 in this Manual.

## A word about maintenance . . .

You can help ensure long-lasting and proper performance from your PTO HORSE Model by always remembering to perform the scheduled maintenance services that are presented in Section 6 of this Manual, and in the accompanying engine manufacturer's Owner's Manual.

By treating your machine with good care in the manner described in those pages, your efforts will be returned many times over in the form of a more satisfying and easier operating machine, and with much more bountiful gardening results.

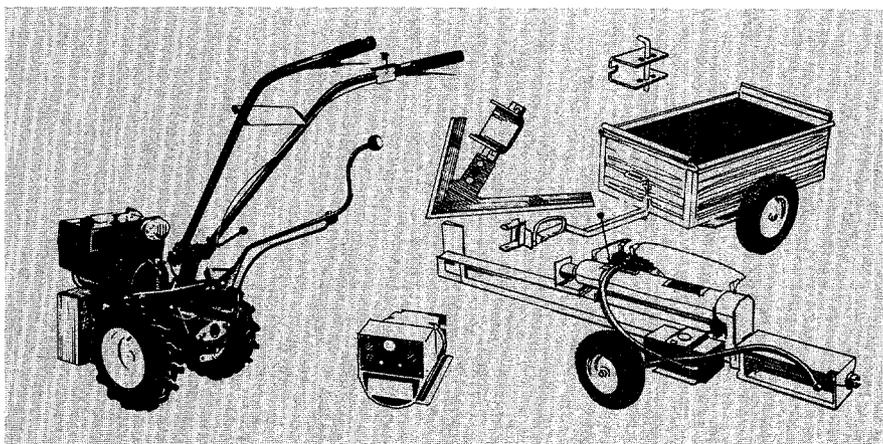


Figure 2: The tine attachment can be removed and various powered or non-powered attachments can be connected to the Power Unit.

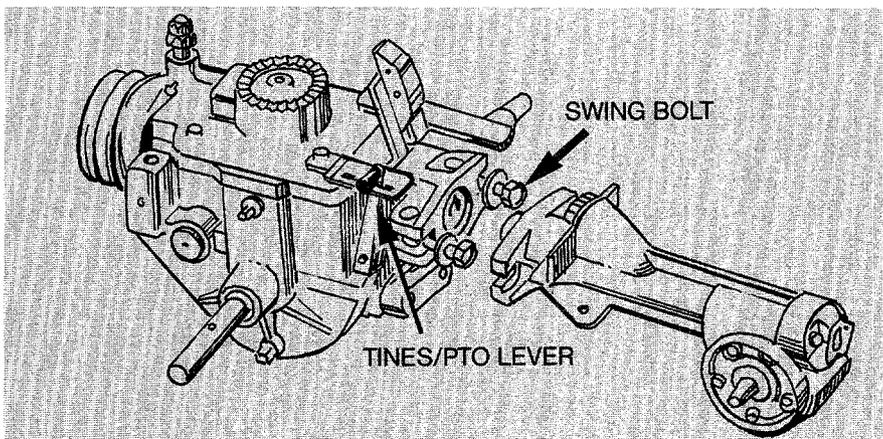
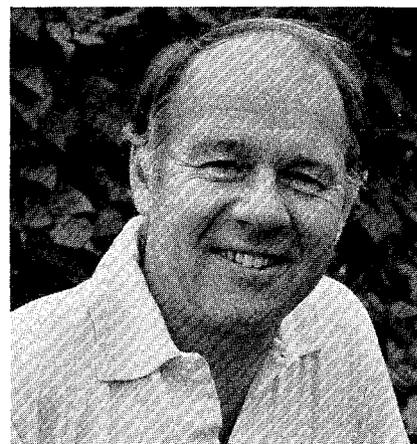


Figure 3: The transmission consists of two housings, held together by swing-bolts. Separate "dog" clutches on each drive shaft are engaged and disengaged with the Tines/PTO Clutch Lever.

## We're here to serve you!

The whole idea behind TROY-BILT® Tiller Factory Service is to get parts, attachments and service advice out to you just as quickly as possible and to answer any questions you may have about tilling or gardening, by phone or by letter, depending upon what is needed.

Nothing is more important to all of us here at the factory than making sure that every owner is completely satisfied 100-percent of the time. You're always entitled to first-rate service. Please be assured that we will do our very best to see that you get it at all times.



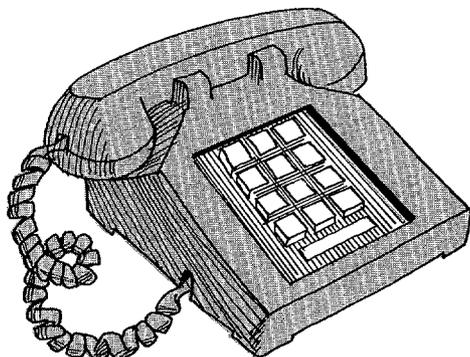
Thank you,

*Dean Leith, Jr.*

Dean Leith, Jr., Sales Manager

### If you have a question or problem . . .

If you have a question or problem that is not answered in this Manual, then please get in touch with our Technical Service Department by phone or by letter. One of our friendly, helpful tiller experts will gladly help you out.



### If you need a tiller part . . .

If you need to order a part for your tiller, please refer to the separate Parts Catalog that came with this Manual. There, you will find detailed instructions on how to identify parts and how to place your order.

### If you need engine service or parts . . .

For engine service or parts, contact your nearest engine service dealer who is authorized to service the particular make of engine that is on your tiller. Look in the Yellow Pages of your telephone directory under "Engines—Gasoline" for the name of your nearest service dealer. The service dealer can handle all parts, repairs and warranty service concerning the engine alone.

It is important to remember that your engine is covered by the en-

gine manufacturer's Limited Warranty and any unauthorized work done on the engine during the warranty period may void your engine warranty. For full details on the engine's Limited Warranty, please see the separate engine manufacturer's Owner's Manual that came with this Manual.

If you have any difficulty in finding an authorized service dealer or in obtaining warranty service, please contact our Technical Service Department for assistance.

#### For the fastest service, DIAL FREE from:

In the U.S.A. . . . . (Toll-Free) 1-800-833-6990  
In Canada (Garden Way Canada) . . . . (Toll-Free) 1-800-225-3585

#### Our business hours are (Eastern Time):

In the U.S.A.: M-F 8 a.m. to 7 p.m.; Sat. 9 a.m. to 4 p.m.  
In Canada: M-F 8 a.m. to 5 p.m.

#### Our mailing address is:

##### In the U.S.A.

Troy-Bilt Mfg. Co.  
102nd St. & 9th Ave.  
Troy, New York 12180

##### In Canada

Garden Way Canada  
1515 Matheson Blvd. E.  
Mississauga, Ontario L4W 2P5

NOTE: When calling or writing, please provide us with your Tiller Serial Number (See page 5).

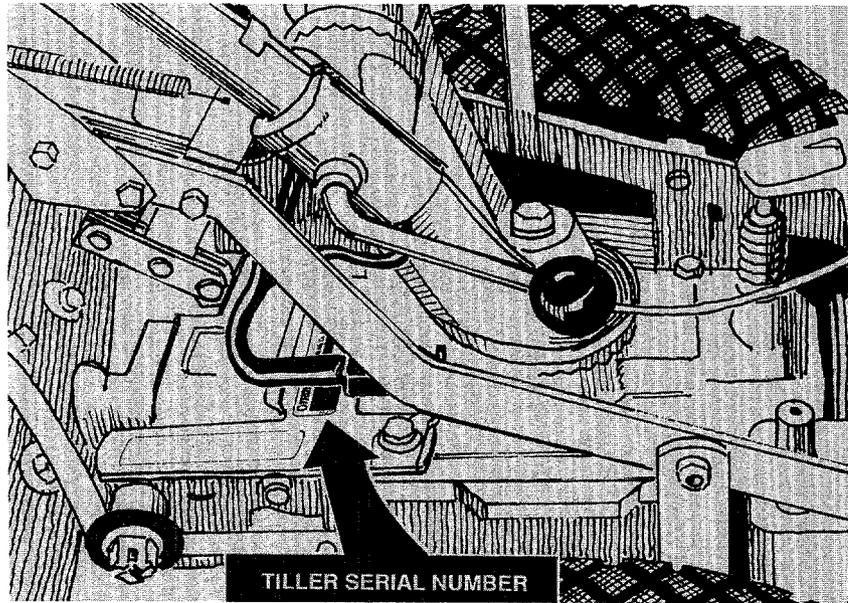
## RECORD YOUR TILLER SERIAL NUMBER

To help you as quickly as possible when you write or call for service or parts, we will need to know your Tiller Serial Number.

The arrow in the Figure at the right points to a location on the transmission where the serial number is located. For ready reference, please record this number, along with the delivery date of your tiller, in the spaces provided below.

Serial Number: \_\_\_\_\_

Date of Delivery: \_\_\_\_\_



## RECORD YOUR ENGINE MODEL NUMBER

Should you ever need engine service or parts, you may be asked for the engine model code number.

On the 7HP Briggs & Stratton engine, the number is stamped on the top of the blower housing cover, as shown in Photo 6.

On the 8HP Kohler engine, the number is located on the right side of the blower housing cover, behind the air cleaner cover (remove wing nut to remove air cleaner cover). See Photo 7.

Engine Code: \_\_\_\_\_



PHOTO 6: Code number location on 7HP Briggs & Stratton engine.

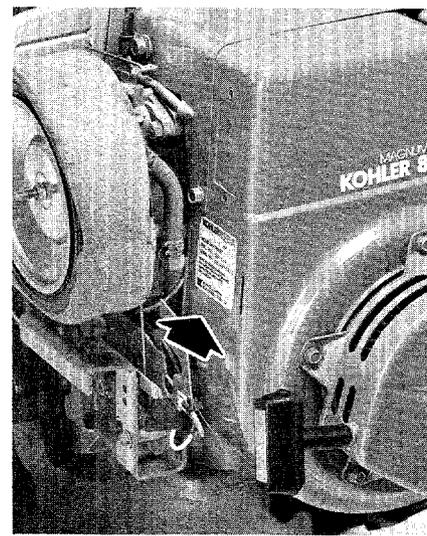


PHOTO 7: Code number location on 8HP Kohler engine.

# SECTION 1: Safety Instructions

The PTO HORSE Model Tiller has been designed with many safety features to help protect individuals from harm and property from being damaged. However, as with any type of power equipment, it is necessary for you and any

operator to follow safe operating practices at all times. *Failure to do so can result in personal injury or damage to equipment or property.*

Before operating or servicing the tiller or the PTO Power Unit, carefully read and follow all of the

Safety Instructions found in this Owner/Operator Manual and in the separate Owner's Manual provided by the engine manufacturer. If you have any questions, please call or write us.

## TRAINING

1. Read both this Owner/Operator Manual and the separate engine Owner's Manual carefully. Be thoroughly familiar with the controls and the proper use of the tiller and its engine. Know how to stop the unit and disengage the controls quickly.
2. Read the Owner/Operator Man-



### SAFETY ALERT SYMBOL

This symbol is used to alert you to important safety messages in this Manual and on your tiller. When you see this symbol, carefully read and follow its safety message.

uals provided with any optional accessories or attachments before operating. The manuals provide a detailed description of proper use

and operation, and point out other important Safety Instructions.

3. Never allow children to operate the tiller. Never allow adults to operate the tiller without proper instruction.
4. Keep the area of operation clear of all persons (particularly small children), and pets.

## PREPARATION

1. Thoroughly inspect the area where the tiller is to be used and remove all foreign objects before tilling.
2. Put the Wheels/Tines/PTO Drive Lever in "NEUTRAL" before starting the engine.
3. Do not operate the tiller without wearing suitable outer garments. Avoid loose garments or jewelry that could get caught in moving parts of the tiller or its engine.
4. Do not operate the tiller when barefoot or wearing sandals, sneakers, or similar lightweight

footwear. Wear footwear which will improve footing on slippery surfaces.

5. Do not till near underground electric cables, telephone lines, pipes, or hoses. If in doubt, contact your telephone or utility company to locate underground services.

6. Handle fuel with care; it is highly flammable and its vapors are explosive.

- (a) Use an approved fuel container.
- (b) Never remove gas cap or add fuel to a running engine or to a hot engine. Engine shall be allowed to cool before refueling.

- (c) Keep matches, cigarettes, cigars, pipes, open flames, or sparks away from the fuel tank and fuel container.

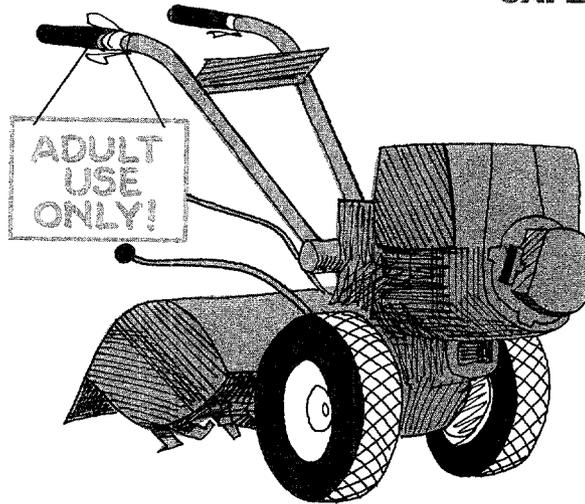
- (d) Fill fuel tank outdoors with extreme care. Never fill fuel tank indoors. Use a funnel or spout to prevent spilling.

- (e) Replace fuel cap securely and clean up spilled fuel before restarting.

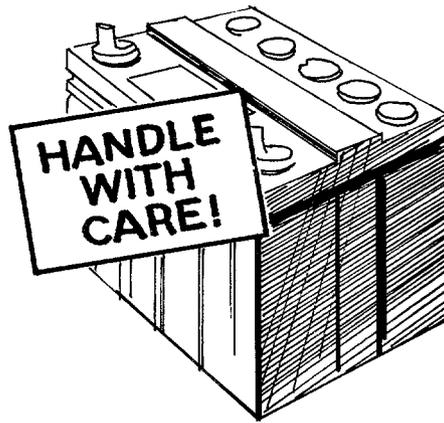
7. Never attempt to make any adjustments while the engine is running or the spark plug wire is connected, except where specifically instructed to do so.

## OPERATION

1. Do not put hands or feet near or under rotating parts.
2. Exercise extreme caution when operating on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards or traffic.
3. After striking a foreign object, stop the engine, remove the key on electric start models, disconnect the spark plug wire, and thoroughly inspect the tiller for any damage. Repair the damage before restarting and operating the tiller.
4. Exercise caution to avoid slipping or falling.
5. If the machine should start to vibrate abnormally, stop the engine, remove the wire from the spark plug, and check immediately for the cause. Vibration is generally a warning of trouble.
6. Stop the engine, remove the key on electric start models, and disconnect the spark plug whenever you leave the operating position, before unclogging the tines, and when making any repairs, adjustments, or inspections.
7. Take all possible precautions when leaving the tiller unattended. Shift into "NEUTRAL", stop the engine, remove the key on electric start models, and disconnect the spark plug wire to prevent accidental starting.
8. Before cleaning, repairing, or inspecting, stop the engine, remove the key on electric start models, and make certain all moving parts have stopped. Disconnect the spark plug wire and keep the wire away from the plug to prevent accidental starting. For electrical safety, always remove the cable from the negative (-) side of the battery (on electric start models) before attempting any repairs or maintenance.
9. Always keep the flap on the tine hood down when operating the tiller, except when using the hiller/furrower attachment.



10. Never operate the tiller without proper guards, shields, plates, or other safety protective devices in place.
11. Do not run the engine in an enclosed area; exhaust fumes contain carbon monoxide gas, a deadly poison that is odorless, colorless and tasteless. Always make sure there is adequate ventilation when the engine is running.
12. Keep children and pets away.
13. Never operate the tiller under engine power if the Wheel Speed Lever is in the "FREE WHEEL" position. In "FREE WHEEL", the wheels will not hold the tiller back and the revolving tines could propel the tiller rapidly, possibly causing loss of control. Always engage the Wheel Speed Lever in either the "FAST" or "SLOW" wheel speed position before starting the engine or engaging the tines with the Wheels/Tines/PTO Drive Lever.
14. Be aware that the tiller may unexpectedly bounce upward or jump forward and be propelled away from you if the tines should strike or catch extremely hard-packed soil, sod, frozen ground, or buried obstacles such as large stones, roots, or stumps. If you are in doubt about the tilling conditions, always use the following operating precautions to assist you in maintaining control of the tiller.
  - (a) Walk behind and to one side of the tiller, using just one hand on the handlebars. Relax your arm, but use a secure hand grip.
  - (b) Use shallower depth regulator settings, gradually working down deeper with each tilling pass.
  - (c) Use slower wheel, tine and engine throttle speeds.
  - (d) Clear the tilling area of all large stones, roots, and other debris.
  - (e) Avoid applying downward pressure on the handlebars. If necessary, apply slight upward pressure to prevent the tines from digging too deeply.
  - (f) Always avoid contacting hard-packed soil or sod at the end of a row by reducing the engine speed and lifting the handlebars to raise the tines out of the soil.
  - (g) In an emergency, stop the tines and wheels by shifting the Wheels/Tines/PTO Drive Lever into "NEUTRAL". If you cannot reach the lever or have lost control of the tiller, LET GO of the handlebars and all controls and do not attempt to restrain the tiller.
15. Do not overload the machine capacity by attempting to till too deeply at too fast a rate.
16. Never operate the tiller at high transport speeds on slippery surfaces.
17. Do not operate tiller on a slope that is too steep for safety. When on slopes, slow down and make sure you have good footing. Never permit the tiller to free-wheel down slopes.
18. Clear the area of bystanders before tilling.



19. Use only attachments and accessories that are approved by Garden Way Manufacturing Company.

20. Use tiller attachments and accessories when recommended.

21. Never operate the tiller without good visibility or light.

22. Never operate the tiller when fatigued, or while under the influence of alcohol, drugs, or medication.

23. Do not change the engine governor settings or overspeed the engine.

24. Do not touch engine parts that may be hot from operation. Allow parts to cool before inspecting, cleaning, or repairing.

25. **POISON/DANGER—CAUSES SEVERE BURNS.** The battery on electric start models contains sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL—Flush immediately with lots of water.

INTERNAL—Drink large quantities of water or milk. Follow with milk of magnesia, beaten eggs or vegetable oil. Call physician immediately.

EYES—Flush with water for 15 minutes and get prompt medical attention. Keep out of reach of children.

26. **DANGER—BATTERIES PRODUCE EXPLOSIVE GASES.** Keep sparks, flame, or smoking materials away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries.

27. Please Remember: You can always stop the tines and wheels by putting the Wheels/Tines/PTO Drive Lever in "NEUTRAL", or by moving the Throttle Lever to the "STOP" position. If you have lost control of the tiller, and cannot reach the levers, LET GO of the handlebars and all controls and do not attempt to restrain the tiller. The Forward Interlock Safety System will stop the engine.

28. Look behind and use care when backing. For added safety,

put Wheel Speed Lever in "SLOW" before reversing.

29. When loading or unloading unit, always disengage the tines and use slower wheel and engine throttle speeds. Use sturdy ramps that are wide and strong enough to support both the tiller and operator (tiller weighs between 280 and 325 lbs.). Never go down ramps in "FORWARD" drive as the tiller could tip forward, exposing you to the tines (which should be disengaged). Always use "REVERSE" drive and back down ramps. To go up ramps, use "FORWARD" drive and follow tiller up ramps.

30. The Forward Interlock Safety System should first be tested for proper functioning every time the tiller or PTO Power Unit is used. See Section 3 in this Manual for the testing procedure to follow.

31. When snowplowing with the optional dozer blade, either remove the tines completely, or disengage the tines with the Tines/PTO Clutch Lever. Revolving tines could be dangerous on slippery sidewalks or driveways.

## MAINTENANCE AND STORAGE

1. Never perform any maintenance while the engine is running or the spark plug wire is connected, except where specifically instructed to do so.

2. Keep machine, attachments and accessories in safe working condition.

3. Check all nuts, bolts, and screws at frequent intervals for proper tightness and to be sure the equipment is in safe working condition.

4. Never store the machine with fuel in the fuel tank inside a building where fumes may reach an open flame or spark, or where igni-

tion sources are present (such as hot water and space heaters, furnaces, clothes dryers, stoves, electric motors, etc.).

5. Allow the engine to cool before storing in any enclosure.

6. To reduce fire hazard, keep the engine free of grass, leaves or excessive grease.

7. Store gasoline in a cool, well-ventilated area, safely away from any spark or flame-producing equipment. Store gasoline in an approved container, safely out of the reach of children.

8. Refer to the Maintenance and Service Section of this Manual if the tiller is to be stored for an extended period.

## DECALS

Safety decals and operating instruction decals are located on the handlebars, the operator control panel, the tine hood, the engine, and the transmission. Contact us immediately for replacement decals if any are missing, illegible, or damaged. See your Parts Catalog for the exact location and part number of each decal. Do not attempt to operate machine if any decals are illegible or missing.

# SECTION 2: Controls and Functions

Before using your tiller or PTO Power Unit for the first time, become thoroughly familiar with the operation of the controls by moving them to their various positions

while the engine is not running. Taking the time now to fully understand the location, function, and operation of these controls will greatly add to the productive use,

safe operation, and full enjoyment of your new machine. The proper operation of each control is discussed in detail in this Section.

## Tiller and PTO Power Unit Controls

### 1. Wheels/Tines/ PTO Drive Lever

This lever engages power from the engine to the transmission (see Photos 2-1, 2-2, and 2-3). There are three positions of this lever: "FORWARD", "NEUTRAL" and "REVERSE":

When you move the lever down to the "FORWARD" position, it raises the engine upward and tightens the drive belt located between the engine pulley and the transmission pulley. The transmission then

drives the wheels and tines in a forward direction. (If the tines are removed and replaced with a PTO driven attachment, the lever will apply power to the attachment.) The lever will remain in "FORWARD" until you tap or lift it upward and let it go.

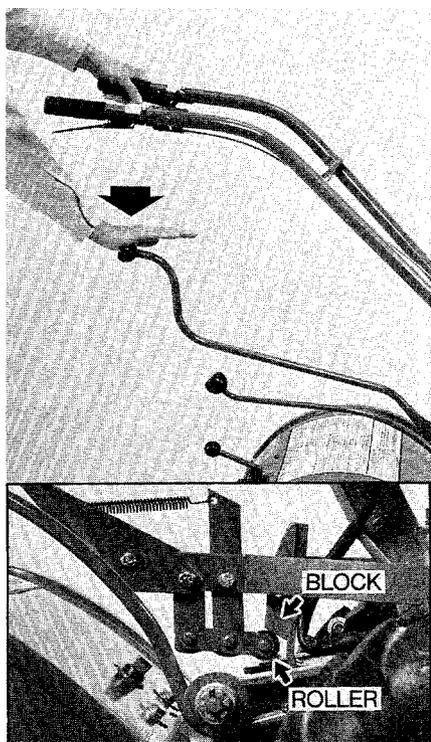
When you move the lever all the way up to the "REVERSE" position, it lowers the engine and causes the drive belt to go slack. At the same time, the rubber reverse disc on the engine pulley comes into contact with the transmission pulley, causing the transmission to rotate the wheels and tines (or any PTO driven attachment) in a reverse direction. The reverse operation will continue as long as you hold the lever up. When you release the lever, it will automatically return to "NEUTRAL". This is a safety feature for your protection.

When the lever is in "NEUTRAL", the engine will continue to run, but power will not be transferred to the transmission.

### To operate the Wheels/Tines/ PTO Drive Lever:

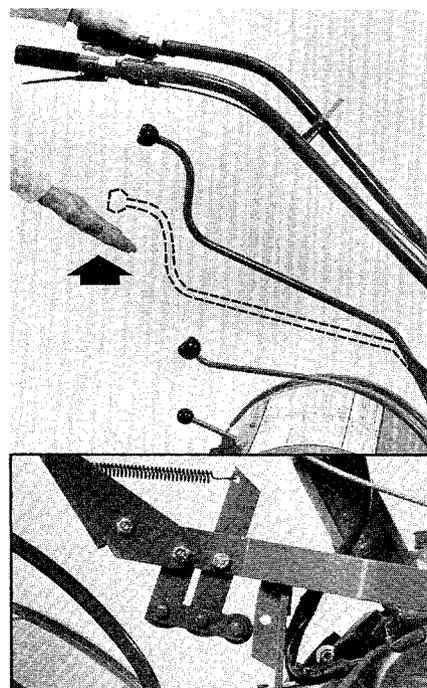
**A.** Practice shifting the lever as described next. As you do, note in the accompanying photos the various positions that the clutch roller takes on the belt adjustment block. Your roller should be similarly positioned when you shift the lever.

**B.** For forward motion of the wheels and tines (or to apply power to any PTO driven attachment), push the lever all the way down and release it. See Photo 2-1. To return to "NEUTRAL", tap or lift the lever up and let it go (Photo 2-2).



2-1: Push lever down for "FORWARD". The clutch roller (lower photo) will be engaged below the adjustment block.

**IMPORTANT**  
Moving the lever to the "NEUTRAL" position will stop all wheel and tine motion, or power to any PTO driven attachment.

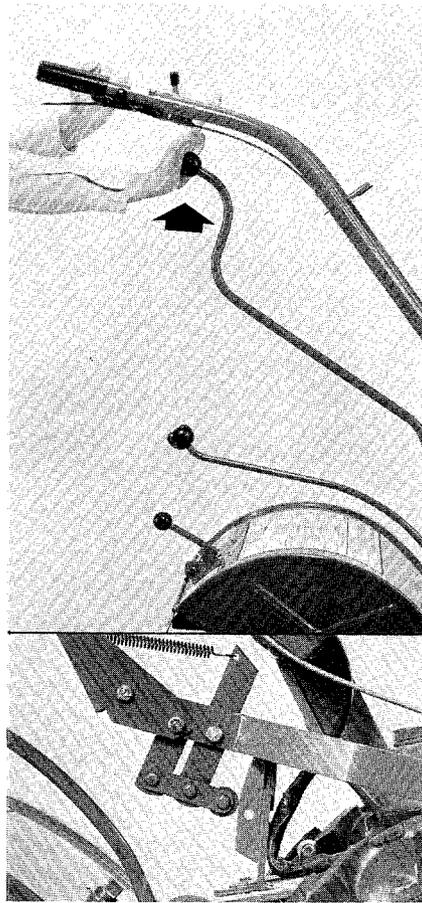


2-2: Tap or lift lever up to return to "NEUTRAL". The clutch roller (lower photo) will rest anywhere on the face of the adjustment block, depending upon drive belt length and tension.

**C.** Before shifting into “REVERSE”, always look behind you to make sure there are no obstacles in the way. Then raise the tines out of the soil by lifting up on the handlebars, and *slowly lift* the lever all the way up. See Photo 2-3. To return to “NEUTRAL”, simply let go of the lever.

Please remember that you should *never till* when in “REVERSE” (always disengage the tines with the separate Tines/PTO Clutch Lever before reversing). You should also avoid using “REVERSE” with any PTO driven attachments as they are not designed for reverse operation.

Until you are completely comfortable with handling the machine when it is moving backward, it is a good idea to use “REVERSE” only at slower wheel and engine throttle speeds. Many people never shift into “REVERSE” when the separate Wheel Speed Lever is in the “FAST” wheel speed position. This is a good rule to follow.



**2-3:** Lift handlebars, then lift and hold lever up to go in reverse. Let go of lever to stop reverse motion. (Note that the clutch roller doesn't move very far from “NEUTRAL” to “REVERSE”.)

## CAUTION

TO AVOID PERSONAL INJURY OR DAMAGE TO EQUIPMENT:

- Always place the Wheels/Tines/PTO Drive Lever in “NEUTRAL” before starting the engine, and before engaging the wheels, tines or other PTO driven attachments.
- Always make sure there are no obstacles behind you before operating in “REVERSE”.
- The Wheels/Tines/PTO Drive Lever should automatically return to “NEUTRAL” when you release it from the “REVERSE” position. If it fails to do so, push it down into “NEUTRAL”. Then, immediately refer to Section 6 of this Manual for adjustment instructions.
- There should not be any reverse motion if the Wheels/Tines/PTO Drive Lever is not held in the “REVERSE” position. If there is, the machine is badly out of adjustment and it should not be operated until the condition is corrected. See Section 6 for adjustment instructions.
- Always return to “NEUTRAL” and allow all motion to stop before shifting into “FORWARD” or “REVERSE”. This pause between shifting will protect the drive belt, reverse disc, and other transmission components from undue wear and damage.

## 2. Forward Interlock Levers

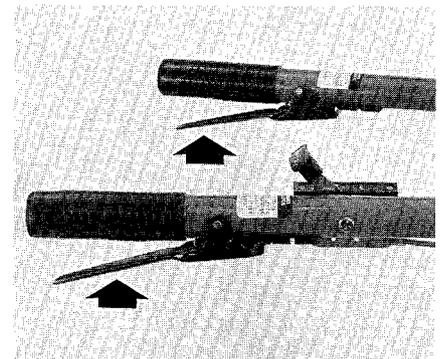
There are two Forward Interlock Levers, one located directly below each handlebar grip. See Photo 2-4. One or both of the interlock levers must be kept squeezed against the handlebar grip(s) whenever the Wheels/Tines/PTO Drive Lever is engaged in “FORWARD”.

If you release both interlock levers before first returning the Wheels/Tines/PTO Drive Lever to “NEUTRAL”, the engine will shut off. *This is a safety feature for your protection should you ever lose control of the machine and cannot stop forward motion by moving the Wheels/Tines/PTO Drive Lever into “NEUTRAL”.*

NOTE: The interlock levers do not affect operation when the Wheels/Tines/PTO Drive Lever is in “REVERSE”.

### To operate the Forward Interlock Levers:

- Squeeze one of the interlock levers against the handlebar grip before engaging the Wheels/Tines/PTO Drive Lever in “FORWARD”. Continue to squeeze one or both of the interlock levers during all forward operation.
- To stop forward operation in normal use, first shift the Wheels/Tines/PTO Drive Lever into “NEUTRAL” and then release BOTH interlock levers. All forward motion will stop, but the engine will continue to run.
- To stop forward motion in an emergency, release BOTH interlock levers. This will cause the engine to shut off, stopping all forward motion.



**2-4:** The Forward Interlock Levers.

## WARNING

To help avoid personal injury, the Forward Interlock Safety System should first be tested for proper functioning every time the tiller or PTO Power Unit is used. See Section 3 in this Manual for the easy testing procedure to follow.

### 3. Wheel Speed Lever

This lever allows you to choose between two different wheel ground speeds: “SLOW” or “FAST”. It also has a “FREE WHEEL” position, in which the wheels are free to turn without the engine running. See Photo 2-5.

When the lever is engaged in either “SLOW” or “FAST” and the Wheels/Tines/PTO Drive Lever is in either “FORWARD” or “REVERSE”, the wheels will turn under engine power.

When the lever is in the “FREE WHEEL” position and the Wheels/Tines/PTO Drive Lever is in “NEUTRAL”, the machine can be moved (on level ground) by pushing or pulling on the handlebars. The “FREE WHEEL” position is also used when you are operating a PTO driven stationary attachment, in which case you would not want the wheels to move when the Wheels/Tines/PTO Drive Lever is engaged in “FORWARD”.

#### IMPORTANT

By moving the forward drive belt (see “Changing Belt Speeds” in Section 3) into one of two different belt ranges, you can obtain a total of four different forward wheel ground speeds. There are, however, only two reverse wheel ground speeds (“SLOW” or “FAST”), because the rubber reverse disc, not the drive belt, drives the wheels in the reverse direction.

When you shift the lever into “SLOW” or “FAST”, it moves a sliding clutch inside the transmission to the left or right to engage the slow speed wheel gear or the fast speed wheel gear. When engaging the clutch, you should roll the wheels forward or backward a few inches to help align the clutch with

the selected wheel gear. When the clutch goes into gear, you will no longer be able to roll the wheels.

When you shift the lever into “FREE WHEEL”, the sliding clutch is disengaged from both wheel gears and the wheels will roll freely. Note that there should not be any “clicking” noise when you’re in “FREE WHEEL”. If there is, shift the lever a little more (either up or down) to eliminate the noise—and the rubbing of the clutch and gear that causes it.

#### To operate the Wheel Speed Lever:

**A.** With the Wheels/Tines/PTO Drive Lever in “NEUTRAL”, roll the wheels a few inches in either direction while you push the Wheel

Speed Lever down to the “SLOW” position, or up to the “FAST” position. See Photo 2-5. When the lever is in gear, you will no longer be able to roll the wheels.

**B.** With the Wheels/Tines/PTO Drive Lever in “NEUTRAL”, move the Wheel Speed Lever in between the “SLOW” and “FAST” wheel speed positions to place the wheels in “FREE WHEEL”.

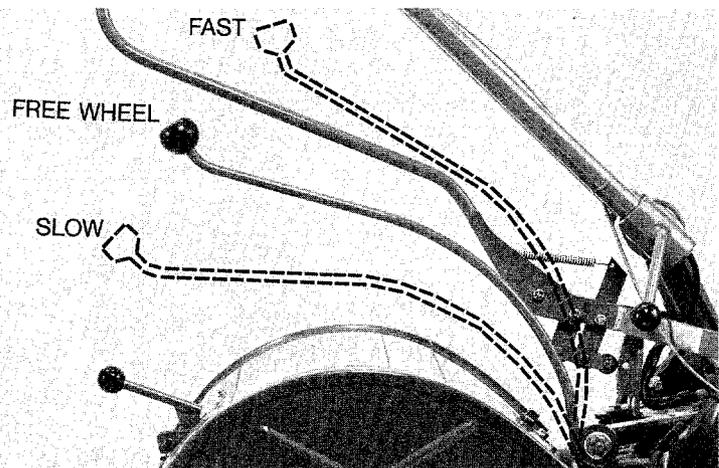
#### CAUTION

TO AVOID PERSONAL INJURY OR DAMAGE TO EQUIPMENT:

- Use the “SLOW” wheel speed position when first learning to operate the machine and whenever you operate in “REVERSE”.
- Do not shift the Wheel Speed Lever when heading up or down a slope. If the lever is accidentally placed in “FREE WHEEL”, the machine could roll out of control.
- Place the Wheels/Tines/PTO Drive Lever in “NEUTRAL” before shifting into “SLOW” or “FAST”. This will prevent damage to the clutch or wheel speed gears.
- Do not attempt to stop the wheels by shifting the Wheel Speed Lever. Always put the Wheels/Tines/PTO Drive Lever in “NEUTRAL” to stop the wheels.

#### WARNING

Never put revolving tines in the soil when the Wheel Speed Lever is in “FREE WHEEL”. Doing so can cause the tiller to be propelled rapidly by the tines, possibly causing loss of control and serious personal injury. Always engage the Wheel Speed Lever in either “SLOW” or “FAST” wheel speed before putting the tines in the soil.



2-5: The Wheel Speed Lever.

## 4. Tines/PTO Clutch Lever

This lever is located on the left side of the transmission, just forward of the tiller tine hood. There are two operating positions: “ENGAGE” and “DISENGAGE”. See Photo 2-6.

When you move the lever to the “ENGAGE” position, it moves the “dog” clutch on the PTO Power Unit drive shaft backward until it engages the “dog” clutch on the tine attachment drive shaft. (If the tines are removed and replaced with a PTO driven attachment, the “dog” clutch on the power unit will engage with the “dog” clutch on the PTO driven attachment). Engine power will then be applied to the tines or PTO driven attachment when the separate Wheels/Tines/PTO Drive Lever is engaged in “FORWARD” or “REVERSE”.

In the “DISENGAGE” position, the “dog” clutches are disengaged, and power will not be applied to the tines or PTO attachment.

When operating the tiller, the “DISENGAGE” position allows you to stop the tines while the separately controlled wheels continue to rotate. You should use this feature whenever you are transporting, loading or unloading, turning around, or backing the tiller up. You should also disengage the lever before towing or transporting any attachment.

When the tines are removed and a PTO driven attachment that operates from a stationary position is installed, the “ENGAGE” position allows you to power the attachment while the wheels on the PTO Power Unit are not moving.

Always place the Wheels/Tines/PTO Drive Lever in “NEUTRAL” before shifting the Tines/PTO Clutch Lever. Doing so will help prevent damage to the transmission that could occur if you try to engage or disengage the separate drive shaft clutches while they are turning under power.

### To operate the Tines/PTO Clutch Lever:

- A.** Put the Wheels/Tines/PTO Drive Lever in “NEUTRAL”.
- B.** Pull the Tines/PTO Clutch Lever out and then slide it into the “ENGAGE” or the “DISENGAGE” slot.
- C.** After selecting the “ENGAGE” position, do not immediately shift the Wheels/Tines/PTO Drive Lever into “REVERSE”. Always use “FORWARD” first, to help align the drive shaft clutches inside the transmission. **NOTE:** The lever should move easily. If it doesn't, then the “dog” clutch inside the PTO Power Unit transmission may need to be lubricated. See “Tiller Lubrication” in Section 6 of this Manual.



### CAUTION

#### TO AVOID PERSONAL INJURY OR DAMAGE TO EQUIPMENT:

- Always disengage the Tines/PTO Clutch Lever before reversing, transporting, turning around, or loading or unloading the tiller or PTO Power Unit.
- Do not attempt to stop the tines or any PTO driven attachment by disengaging the Tines/PTO Clutch Lever. Always put the Wheels/Tines/PTO Drive Lever in “NEUTRAL” to stop all motion.
- Read the Owner/Operator Manual provided with any attachment before attempting to operate the attachment.



2-6: The Tines/PTO Clutch Lever.

## 5. Depth Regulator Lever

This lever is located at the rear of the tine hood—see Photo 2-7. It is used to regulate the tilling depth of the tines.

To operate the lever, pull it straight back and then slide it up or down to any of eight different notched settings.

When the lever is moved all the way down until it engages the highest notch in the lever, it places the tines in the “TRAVEL” position. In this position the tines will clear the ground by approximately 2-inches, allowing you to transport the tiller without the tines—which should be disengaged—scraping your lawn or driveway.

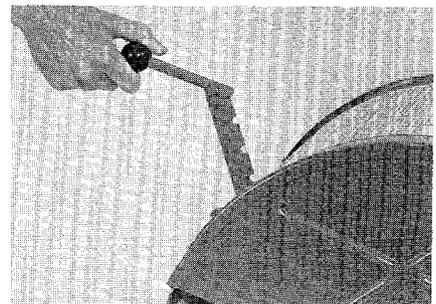
For shallow tilling and cultivating, you should place the lever in the second or third notch from the top. These positions will allow the tines to dig just a few inches into the soil. The remaining notches are used for deeper tilling (up to 8-inches deep, depending on the soil conditions), and for turning under organic matter.

Further details regarding the proper use of this lever will be found in Section 4 of this Manual (see “Tilling Depths”).



### WARNING

To help avoid personal injury, always place the tines in the “TRAVEL” position before starting the engine. This prevents the tines from touching the ground until you are ready to begin tilling.

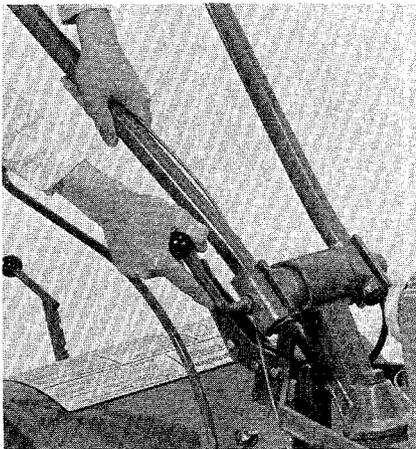


2-7: The Depth Regulator Lever.

## 6. Handlebar Height Adjustment Lever

This lever is located near the bottom of the handlebars, on the right side of the tiller. See Photo 2-8. It allows you to adjust the handlebars up or down to any of four different settings.

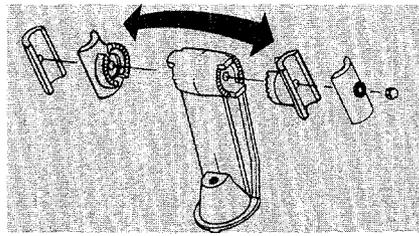
As a general rule, the handlebars should be adjusted to approximately waist level when the tines are 3 to 4-inches in the soil, but you should try different settings to find the one that is most comfortable for you.



2-8: Handlebar Height Adjustment Lever.

### To operate the Height Adjustment Lever:

- A. Stop the engine before adjusting the handlebars.
- B. Support the handlebars with one hand while unwinding the lever enough so that the teeth in the ratchets are disengaged.
- C. Move the handlebars up or down to either of two preset height adjustment settings and then re-tighten the lever securely.
- D. Two additional height settings can be obtained by switching the inside handlebar ratchets, as shown in Figure 2-9. This will change the handlebar height a few inches higher or lower than the lowest setting obtained in Step C.



2-9: Switch ratchets to obtain two more height settings.

### WARNING

For use with the PTO Chipper/Shredder Attachment only, the handlebars can be swung 30° to the right side by loosening the mounting bolt at the bottom of the handlebar base. NEVER OPERATE THE TILLER OR OTHER ATTACHMENTS WITH THE HANDLEBARS SWUNG OUT TO THE RIGHT SIDE. Doing so could result in unsafe handling and personal injury.

## ENGINE CONTROLS

The following are descriptions of the controls on your 7 HP Briggs & Stratton Engine or 8 HP Kohler Engine. Additional information on the safe, efficient operation of your engine is given in the engine manufacturer's Owner's Manual which was included in your literature package. Please read that literature carefully and save it for future reference.

### WARNING

To avoid personal injury or damage to equipment, do not attempt to start your engine at this time. Complete starting instructions for the engine are given in Section 3, "Operation of Tiller."

### 1. Engine Throttle Lever

This lever is located on the right side handlebar (see Photo 2-10). It is used to regulate engine speeds

as well as to start and stop the engine.

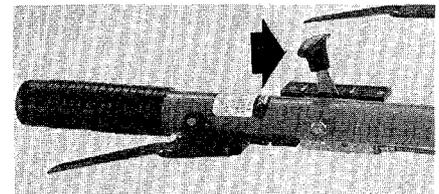
In general, faster engine speeds will be required when breaking new ground or tilling under heavy crop residues, but remember to use only as fast an engine speed as is needed to do the job. Try to judge when the engine is providing the proper amount of power—not too little, but not too much. The sound of the engine running will be your best guide.

### IMPORTANT

Factory settings of the throttle cable should be satisfactory for most conditions. If adjustments are needed, refer to Section 6 of this Manual.

### To operate the Engine Throttle Lever:

- A. When starting the engine, first make certain that the Wheels/Tines/PTO Drive Lever is in "NEUTRAL". Then, place the lever approximately halfway between the "SLOW" and "FAST" throttle settings. This position should provide the carburetor with sufficient gasoline flow to start the engine. However, you may need to experiment the first few times to find that "just right" starting position.
- B. For faster engine speeds move the lever forward toward the "FAST" setting; for slower speeds



2-10: The Engine Throttle Lever.

move it backward toward the "SLOW" setting.

- C. To stop the engine, move the lever all the way back to the "STOP" position (during normal operation you would first place the Wheels/Tines/PTO Drive Lever in "NEUTRAL" and then release both Forward Interlock Levers before stopping the engine).

## 2. Engine Choke Control

Your engine is equipped with a manually operated choke control as shown in Photo 2-11 or 2-12. The choke makes starting a cold engine easier by decreasing the amount of air in the carburetor's air-fuel ratio, thus creating a richer fuel mixture. The use of the choke for starting will vary, depending on air temperature and altitude.

### To operate the Choke Control:

**A.** Before starting a cold engine, set the choke in the "FULL CHOKE"

position. On the 7 HP Briggs & Stratton Engine, move the lever all the way down. On the 8 HP Kohler Engine, move the lever all the way up.

**B.** When the engine starts, slowly move the lever to the "CHOKE OFF" position (all the way up for the 7 HP Briggs & Stratton Engine; all the way down for the 8 HP Kohler Engine).

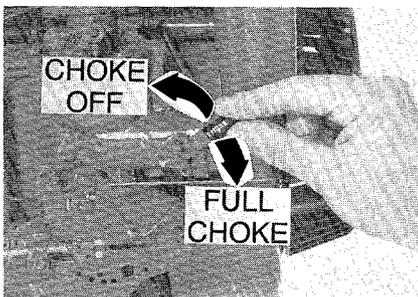
**C.** If the engine should falter with the choke at "CHOKE OFF", return

the lever to a position halfway between "FULL CHOKE" and "CHOKE OFF". As soon as the engine runs smoothly, return the lever to "CHOKE OFF".

**D.** When restarting an already warm engine, you may not have to use the choke at all. However, if the engine falters or hesitates, try using a "HALF CHOKE" position until it runs smoothly, and then return the lever to "CHOKE OFF".

### CAUTION

Never operate the engine under a load (tines, wheels, or PTO attachments engaged) without first returning the choke control to "CHOKE OFF". Failure to do so can quickly build up carbon deposits that can harm the engine.



2-11: Choke control on 7 HP Engine.



2-12: Choke control on 8 HP Engine.

## 3. Engine Recoil Starter

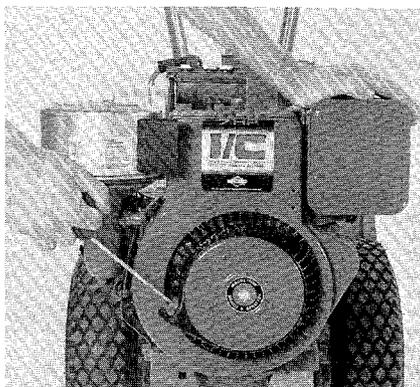
The recoil starter is located at the front of the engine, as shown in Photo 2-13 or 2-14. It is used to start engines that are not equipped with the optional key switch starting feature.

### To operate the Engine Recoil Starter:

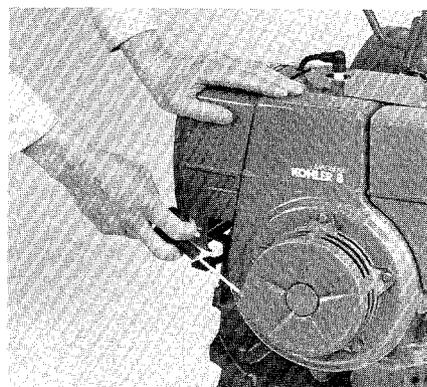
**A.** When starting the engine, first make certain that the Wheels/Tines/PTO Drive Lever is in "NEUTRAL".

**B.** Place your free hand in the location shown in Photo 2-13 or 2-14 to help stabilize the machine.

**C.** Grasp the starter rope handle with your other hand and pull the



2-13: Starting the 7 HP Briggs & Stratton Engine.



2-14: Starting the 8 HP Kohler Engine.

handle out slowly until it is harder to pull because of engine compression. Then pull the handle with a rapid, continuous, full-arm stroke. Let the starter rope rewind slowly after each start attempt.

### WARNING

To help avoid personal injury, be sure that the area behind you is clear before pulling the starter rope.

#### 4. Key Switch Starter

The key switch starter for the optional electric start engine is located on the right side of the battery hold-down clamp, as shown in Photo 2-15. There are three operating positions identified on the switch: "OFF", "RUN" and "START".

When the key is turned to the "START" position, the battery supplies an electrical current to the engine's starter motor which then cranks the engine over at a fast enough speed for starting.

During engine operation, the battery is recharged automatically via a small recharging current that the engine sends back to the battery through the electrical system's recharging line.

If the electrical system should ever fail to start or stop the engine,

refer to the "Electric Start Troubleshooting" instructions found in Section 6 of this Manual.

**To operate the Key Switch Starter:**

**A.** When starting the engine, first make certain that the Wheels/Tines/PTO Drive Lever is in "NEUTRAL". Also remember to set the Engine Throttle Lever in the starting position and the Choke Control in the "FULL CHOKE" position (for cold starts).

**B.** Insert the key firmly into the key switch slot and turn it all the way to the right, to the "START" position. When the engine starts, release the key and it will automatically return to the "RUN" position. *Do not hold the key in the "START" position for longer than a*

*few seconds.* Prolonged cranking can damage the starter motor if it is cranked more than 15 seconds per minute.

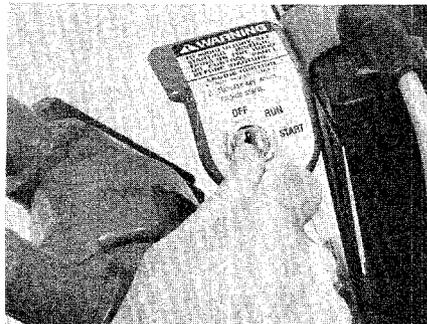
**C.** There are two ways to stop the engine:

- (1) Put the Wheels/Tines/PTO Drive Lever in "NEUTRAL", release both Forward Interlock Levers, and then pull the throttle lever all the way back to the "STOP" position. Turn the key to "OFF" and remove the key.
- (2) Put the Wheels/Tines/PTO Drive Lever in "NEUTRAL", release both Forward Interlock Levers, and then turn the key to "OFF". Put the throttle lever in the "STOP" position and remove the key.

**NOTE:** To stop forward motion in an emergency, release both Forward Interlock Levers. This will cause the engine to shut off.

**IMPORTANT**

If the battery will not be used for extended periods of time, it should be fully charged before placing it in storage. Before reinstalling the battery after storage, give it a thorough recharge. See "Battery Care and Maintenance" in Section 6 for charging instructions.



2-15: The Key Switch Starter.

**WARNING**

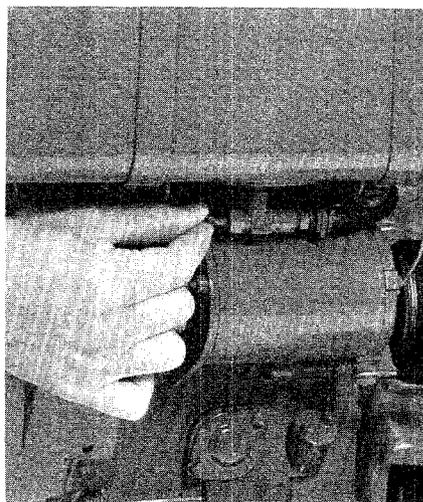
To avoid injury due to accidental or unauthorized engine starting, always remove the key from the switch when leaving the machine unattended.

#### 5. Fuel Tank Shut-Off Valve

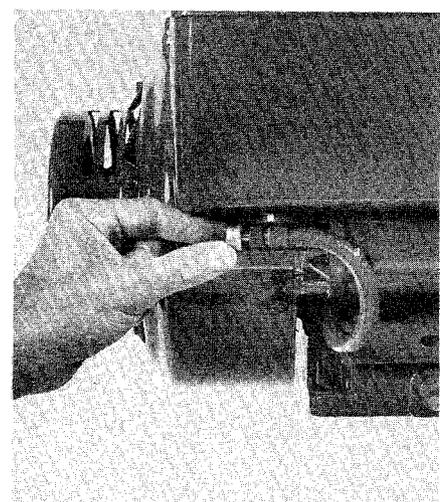
Your engine is equipped with a fuel tank shut-off valve. It is located underneath the gasoline tank. See Photo 2-16 or 2-17.

This valve stops the flow of gasoline from the fuel tank to the carburetor. Before starting, make sure that the valve is in its OPEN position (rotate counterclockwise several turns) or the engine will quit from lack of fuel shortly after you start it.

**NOTE:** Close fuel shut-off valve when engine is transported to prevent fuel leakage from carburetor.



2-16: Fuel shut-off valve on 7 HP Briggs & Stratton Engine.



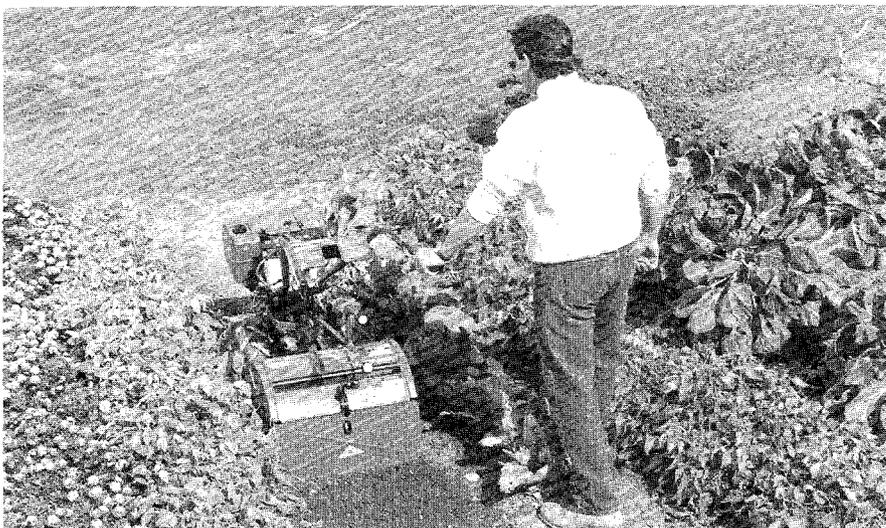
2-17: Fuel Shut-off valve on 8 HP Kohler Engine.

# SECTION 3: Operation of Tiller

Before you attempt to operate your tiller make sure that you've read and fully understand all of the Safety instructions in Section 1 and the Controls information in Section 2. You should also read this Section carefully before starting your engine.

You should practice with your tiller in an open, level area before you use it in your garden. While practicing, do so without the tines revolving (disengage the tines with the Tines/PTO Clutch Lever).

When you've become completely familiar with your tiller, you can begin using it in your garden.



## WARNING

To avoid personal injury or damage to equipment, read the Owner/Operator Manuals provided with any optional accessories or attachments before operating the tiller or PTO Power Unit. The Manuals provide a detailed description of proper use and operation, and point out other important Safety Instructions.

### Break-in operation

During the first few hours of new machine operation, you must perform the following maintenance. For subsequent required maintenance, and the procedures to follow, please refer to Section 6 in this Manual.

- 1. CHANGE ENGINE OIL.** The engine oil must be changed after the first 5 hours of new engine operation. Thereafter, change the oil after each 10 operating hours. Change the oil more frequently when operating in extremely dusty or dirty conditions.
- 2. CHECK TRANSMISSION GEAR OIL LEVEL.** The gear oil levels must be checked after the first 2 hours of new tiller operation. Thereafter, check the oil levels after every 30 operating hours.

- 3. CHECK DRIVE BELT TENSION.** The tension on the drive belt may need to be adjusted after the first 2 or 3 hours of new operation due to initial belt wear and seating of the belt with its pulleys. Thereafter, check the tension after every 10 operating hours.
- 4. CHECK BOLTS AND NUTS.** Check for loose bolts and nuts after the first 2 hours of new tiller operation. Thereafter, check after every 10 operating hours.

### Preparation before starting

Make the following checks and perform the services as required before starting the engine.

- 1. CHECK ENGINE OIL LEVEL.** Check the oil level in the engine crankcase. Do not run the engine unless the proper oil level is maintained.
- 2. SERVICE AIR CLEANER.** Make sure that the air cleaner elements are not dirty.
- 3. CHECK SAFETY GUARDS.** Make sure that all safety guards and covers are securely in place.
- 4. ATTACH SPARK PLUG WIRE.** Be sure that the spark plug wire is securely attached to the spark plug.
- 5. CHECK ENGINE COOLING SYSTEM.** The cooling fins and air intake screen must be clean to ensure adequate cooling.
- 6. ADJUST HANDLEBARS.** Set the handlebars to a comfortable operating height.
- 7. CHECK BATTERY (Electric Start Models).** Make sure that the battery is properly filled and that all electrical connections are clean and tight.
- 8. FILL FUEL TANK WITH GASOLINE.** Avoid using gasoline that is not fresh, as stale fuel can cause gum deposits to form in the carburetor and fuel lines. Fuel should not be stored for more than six months. The use of unleaded gasoline is recommended as it results in fewer combustion deposits and longer engine life. **DO NOT MIX OIL WITH THE GASOLINE.**
  - (a)** Clean the fuel cap and its surrounding area before removing the cap.
  - (b)** Use a clean funnel to add fuel to the fuel tank.
  - (c)** Do not fill the tank to the point of overflowing. Fill to within  $\frac{1}{2}$ -inch of the top of the tank to prevent spills and to allow for fuel expansion.
  - (d)** For 7 HP Briggs & Stratton Engines: use clean, fresh, lead-free automotive gasoline (leaded gasoline may be used if unleaded is unavailable). Use gasoline that has a minimum octane rating of 77. Do not use gasoline containing Methanol. The use of gasoline which contains alcohol (such as gasohol) is not recommended. If you are

using gasohol, refer to the Briggs & Stratton Operating and Maintenance Instructions booklet for specific cautions and recommendations for this type of fuel.

(e) For 8 HP Kohler Engines: use fresh, clean, unleaded regular automotive gasoline with a pump sticker octane rating of 87 or higher.

(Leaded "Regular" grade gasoline is an acceptable substitute). The fuel tank capacity is 1¼ gallons.

(f) Replace the fuel cap securely before starting the engine.



## DANGER

GASOLINE IS HIGHLY FLAMMABLE AND ITS VAPORS ARE EXPLOSIVE. FOLLOW THESE SAFETY PRACTICES TO PREVENT INJURY FROM FIRE OR EXPLOSION!

- Never fill tank when engine is running or still hot from operation. Allow engine and muffler to cool at least 2 minutes before refueling.
- Do not allow open flames, sparks, matches or smoking in the area.
- Fill fuel tank outdoors in a well-ventilated area. Wipe up any spills and move tiller away from gasoline fumes before starting engine.
- Use only an approved gasoline container and store safely out of reach of children.
- Store gasoline and tiller in a well-ventilated area. Do not store where vapors may reach an open flame or spark, or where ignition sources are present (such as hot water and space heaters, furnaces, clothes dryers, stoves, electric motors, etc.)
- Allow engine to cool before storing in any enclosures.
- Never bring a gasoline can near the battery posts on electric start model tillers. A short circuit caused by touching the positive (+) post and any metal could cause an explosion of the gasoline or of battery gases.

## Test operation of Forward Interlock Safety System

The Forward Interlock Safety System consists of an electrical grounding system that connects the two Forward Interlock Levers on the handlebars to the ignition system of the engine. One or both of the Forward Interlock Levers must be kept squeezed against the handlebar grip(s) whenever the Wheels/Tines/PTO Drive Lever is engaged in "FORWARD". If you release BOTH interlock levers before first moving the Wheels/Tines/PTO Drive Lever to "NEUTRAL", the interlock system will ground out the engine's ignition system and stop the engine. The interlock system also prevents the engine from starting if the Wheels/Tines/PTO Drive Lever is engaged in "FORWARD".

Because the interlock system is an electrical/mechanical device, it is subject to wear or possible failure. Therefore, the interlock system should be checked for proper operation each time the tiller or PTO Power Unit is used.



## DANGER

The Forward Interlock Safety System is designed for your safety. Never attempt to disconnect or to otherwise defeat the purpose of this system. If the interlock system fails to operate properly, immediately contact the TROY-BILT Tiller Technical Service Department. Do not operate the tiller or PTO Power Unit until the system has been repaired and is functioning properly. Always test the system prior to each use.

### How to check the interlock system:

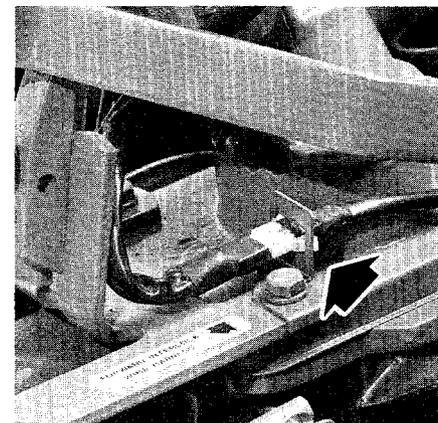
1. Move the machine outdoors and park it on level ground. Make sure the area around you is clear of any obstacles.
2. Check to make sure that the Forward Interlock Wire Harness

plug at the bottom of the handlebars is firmly connected to the wire harness receptacle located on the top, right side of the transmission. See Photo 3-2.

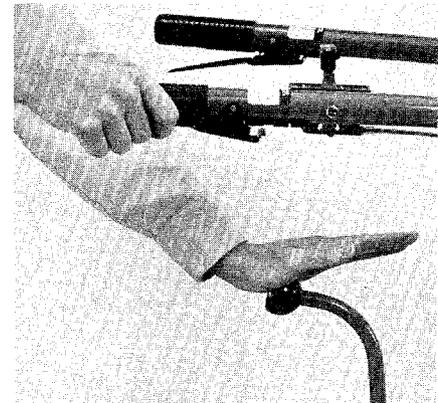
3. Place the Wheel Speed Lever in "SLOW" and the Tines/PTO Clutch Lever in "DISENGAGE".

4. Start the engine as described on Pages 18-19. Set the throttle lever in a "SLOW" running position and allow the engine to warm up.

5. Squeeze one of the Forward Interlock Levers against the handlebar grip and then push the Wheels/Tines/PTO Drive Lever all the way down to "FORWARD". See Photo 3-3. As the tiller starts to move



3-2: Check for good connection between plug and receptacle of Forward Interlock Safety System.



3-3: Squeeze one Forward Interlock Lever and then move Wheels/Tines/PTO Drive Lever down to "FORWARD".

forward, release the Forward Interlock Lever briefly. If the system is working properly, the engine should start to shut off when you release the lever. If it does, quickly squeeze the lever against the handlebar grip and then return the Wheels/Tines/PTO Drive Lever to the "NEUTRAL" position (tap or lift the lever up and release it). Repeat this test using the other Forward Interlock Lever.

6. If the engine does not start to shut off when the Forward Interlock Levers are released, the system is not functioning correctly, and you should stop the engine,

remove the key (on electric start models) and disconnect the spark plug wire from the spark plug. *Do not operate the tiller or PTO Power Unit again until the system is again functioning properly.* See Section 6 in this Manual for some simple troubleshooting checks you can do to correct a faulty interlock system.

### IMPORTANT

To avoid possible damage to the Forward Interlock Safety System, do not use high-pressure sprays around the wire harness receptacle or neutral plunger assembly.

## Starting and stopping the engine



### DANGER

To avoid personal injury, do not run engine in an enclosed or poorly vented area. Engine exhaust contains carbon monoxide, an odorless and deadly gas.

### To start the engine:

### IMPORTANT

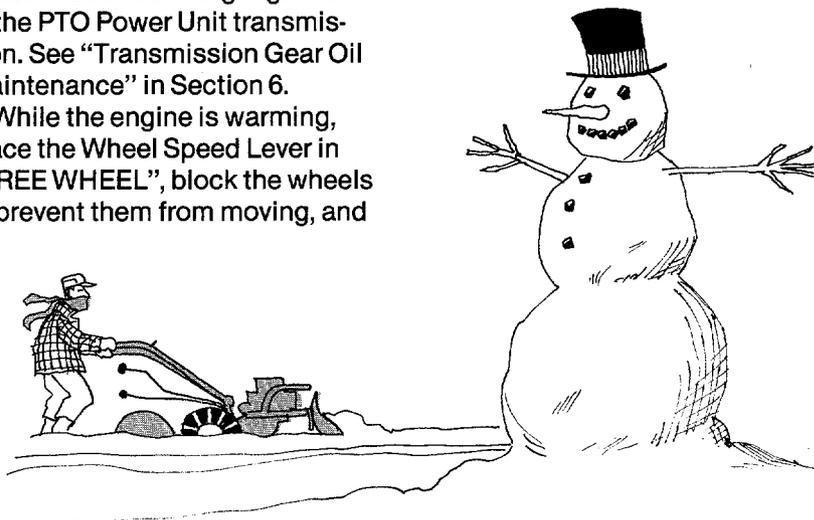
Use the following steps to practice starting and stopping the engine **ONLY**. Do not attempt to drive the tiller or PTO Power Unit until you have read **ALL** of the operating instructions in this Section and in Section 5.

## Cold weather operation

Before operating the machine in cold weather (below 40°F) you should take the following steps to protect your engine and transmission from possible damage.

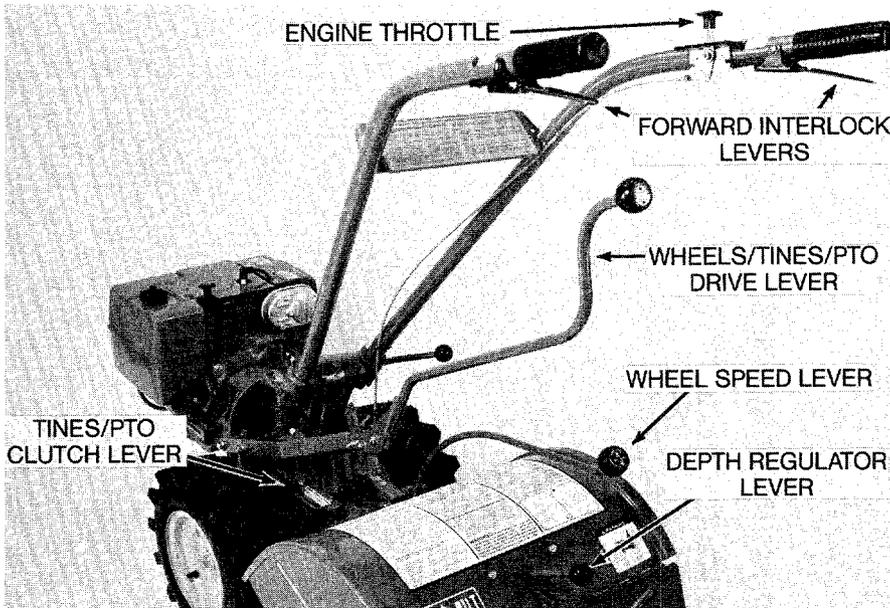
1. Use a lighter weight oil in the engine crankcase. See "Engine Oil Maintenance" in Section 6.
2. Allow the engine to warm up thoroughly before putting it under a load.
3. Use fresh, winter grade fuel (gasoline suppliers change the fuel blend seasonally).
4. Use the correct weight gear oil in the PTO Power Unit transmission. See "Transmission Gear Oil Maintenance" in Section 6.
5. While the engine is warming, place the Wheel Speed Lever in "FREE WHEEL", block the wheels to prevent them from moving, and

- put the Tines/PTO Clutch Lever in "DISENGAGE". Then squeeze one of the Forward Interlock Levers against the handlebar grip and shift the Wheels/Tines/PTO Drive Lever into "FORWARD". This will rotate the drive shaft inside the transmission and help to warm the transmission gear oil.
6. Do not try to move the machine if the wheels are frozen to the ground. First melt the ice with warm water.



1. Place the Wheels/Tines/PTO Drive Lever in "NEUTRAL" (Photo 3-4). To find "NEUTRAL" (while the engine is not running), push the lever down until it engages in "FORWARD". Then tap or lift the lever up and release it.
2. Lower the Depth Regulator Lever until the tines are off the ground (Photo 3-4).
3. Put the Wheel Speed Lever in either "SLOW" or "FAST" (Photo 3-4). *Be sure to roll the wheels while shifting the lever until the wheels are engaged.*

- NOTE: If using a PTO driven stationary attachment, put lever in "FREE WHEEL" and place blocks around all wheels to prevent equipment from moving.
4. Move the engine throttle lever forward, away from the "STOP" position (Photo 3-4).
  5. Put the Tines/PTO Clutch Lever in the "DISENGAGE" position—Photo 3-4. (Use the "ENGAGE" position if you want the tines to turn or if you want to apply power to a PTO driven stationary attachment).
  6. Move the choke control to the "FULL CHOKE" position (Photo 3-5 or 3-6). NOTE: A warm engine may start without choking.



**3-4: Tiller and engine controls.**

NOTE: Be sure that fuel tank shut-off valve (see Page 15) is in "OPEN" position.

**7. For recoil start engines:**

- (a) Stabilize machine by placing your free hand on the fuel tank of the Briggs & Stratton Engine or on the air cleaner cover of the Kohler Engine.
- (b) Use your other hand to slowly pull the starter rope until you feel resistance. Then rapidly pull the rope. (Look behind you before pulling rope out.) Let the rope rewind slowly after each start attempt.

**8. For electric start engines:**

- (a) Turn the key to the "START" position. Do not hold the key at "START" for longer than a few seconds as prolonged cranking can damage the starter

motor if cranked more than 15 seconds per minute.

- (b) When the engine starts, release the key and it will return to the "RUN" position.

**9.** If the engine fails to start in four or five tries, let the engine set for 10 minutes and repeat the starting procedure.

**10.** When the engine starts, slowly move the choke control (if used) to the "HALF CHOKE" and then to the "CHOKE OFF" positions.

**11.** Move the throttle lever to the "SLOW" position and let the engine warm up.

**STOPPING THE ENGINE:**

- 1.** To stop the wheels and tines at any time, move the Wheels/Tines/PTO Drive Lever into the "NEUTRAL" position and then release both Forward Interlock Levers.

- 2.** Move the engine throttle lever to the "STOP" position (and turn the key to "OFF" on electric start models). *Remove the key for safekeeping.*

**IMPORTANT**

If turning the key to "OFF" or moving the throttle lever to "STOP" does not shut the engine off, you can move the choke control to the "FULL CHOKE" position. This will flood the engine and cause it to stall. Use this procedure only in emergencies, as continued use can be harmful to your engine.

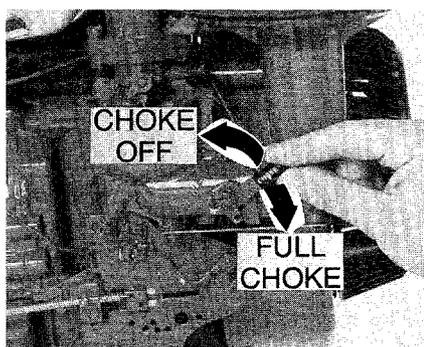
**Starting the Electric Start Engine with the recoil starter rope**

If necessary, the electric start engine can be started with the recoil rope. However, before doing so be sure to follow the procedure below that applies to your particular situation.

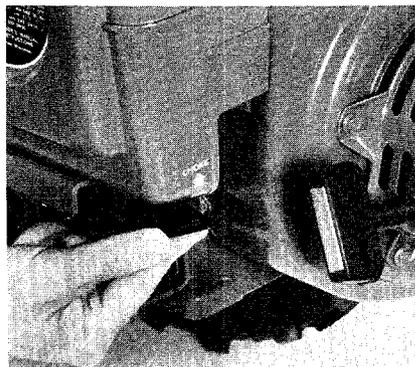
- 1.** If the battery is in good condition (not "dead" or damaged), you can leave it on the tiller which allows it to be recharged during engine operation. But, before starting the engine with the recoil rope, make sure that the battery is filled to the correct level with electrolyte and that all of the cables and wires are properly connected.

- 2.** If the battery is "dead" or damaged, then it should be removed from the tiller and tested by a qualified battery mechanic. While the battery is removed, keep the loose terminal on the positive (+) battery cable (if cable is still attached to solenoid) covered with a wrapping of electrical tape and secure the cable to the frame of the battery bracket. This will prevent any possibility of sparking from the cable terminal.

- 3.** Before starting the engine with the recoil starter rope, place the key switch in the "RUN" position, the engine throttle lever in the "START" position, and the choke control in the "FULL CHOKE" position (for cold starts).



**3-5: Choke control on 7 HP Engine.**



**3-6: Choke control on 8 HP Engine.**

## To operate the tiller

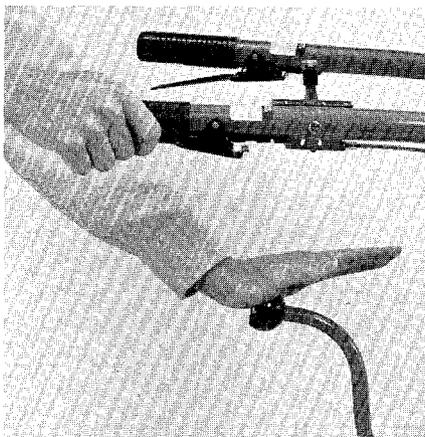
Now that you are familiar with the operation of your engine, follow these steps for operating your tiller. When first practicing with your tiller, please leave the Tines/PTO Clutch Lever in the "DISENGAGE" position and put the Wheel Speed Lever in the "SLOW" wheel speed position.

### WARNING

To avoid personal injury, keep hands, feet, legs and clothing away from the revolving tines.

#### To begin tilling:

1. Start the engine by following the previous engine starting instructions. Be certain that the Wheels/Tines/PTO Drive Lever is in "NEUTRAL" before starting the engine.
2. Test operation of Forward Interlock Safety System. See page 17.
3. Set the Depth Regulator Lever to the desired digging depth and increase the engine throttle speed (when practicing with the tiller leave the tines in the "TRAVEL" position).
4. Move the Tines/PTO Clutch Lever to the "ENGAGE" position (when practicing with the tiller leave the tines in the "DISEN-



3-7: Squeeze one Forward Interlock Lever before engaging Wheels/Tines/PTO Drive Lever in "FORWARD".

GAGE" position).

5. For FORWARD MOTION of the wheels and tines, squeeze and hold one of the Forward Interlock Levers (see Photo 3-7) against the handlebar grip and then move the Wheels/Tines/PTO Drive Lever down into "FORWARD".
6. As the tiller moves forward, relax and let the wheels pull the tiller along while the tines do the digging. Walk behind and to one side of the tiller (walk on the side that is not yet tilled to avoid making footprints in the freshly tilled soil), and lightly, but securely, grip the handlebars with one hand. See Photo 3-8.

Allow the machine to work at its own pace. Pushing it forward in an attempt to make it go faster will only make the tiller harder to control. Also, please do not push down on the handlebars in an attempt to force the tiller to dig deeper. Doing so takes the weight off the wheels, reduces traction, and causes the tines to attempt to propel the tiller instead of just digging. This can



3-8: Guide tiller with one hand.

cause the tiller to hop and skip rapidly across the garden.

7. TO STOP FORWARD MOTION: Tap or lift the Wheels/Tines/PTO Drive Lever up to "NEUTRAL" and then release BOTH Forward Interlock Levers.
8. TO STOP FORWARD MOTION IN AN EMERGENCY: Let go of ALL handlebar control levers (this will shut off the engine).
9. For REVERSE MOTION:
  - (a) Do not till while in "REVERSE".
  - (b) Put the Wheels/Tines/PTO Drive Lever in "NEUTRAL" and reduce the engine throttle speed. Make sure the area behind you is clear.
  - (c) Put the Wheel Speed Lever in the "SLOW" position.
  - (d) Put the Tines/PTO Clutch Lever in "DISENGAGE".
  - (e) Lift the handlebars until the tines clear the ground and then lift and hold the Wheels/Tines/PTO Drive Lever all the way up (you do not need to squeeze a Forward Interlock Lever while in "REVERSE").

**CAUTION**

TO HELP AVOID PERSONAL INJURY OR DAMAGE TO EQUIPMENT:

- Always make sure there are no obstacles behind you before operating in "REVERSE".
- Disengage the tines, reduce the engine throttle speed and move the Wheel Speed Lever into the "SLOW" position before operating in "REVERSE". Avoid using "FAST" wheel speed until you are sure you can control the machine at this faster speed.

**10. TO STOP REVERSE MOTION:** Release the Wheels/Tines/PTO Drive Lever and it will automatically return to the "NEUTRAL" position. (The Forward Interlock Levers will not stop "REVERSE" motion.)

**TO STOP THE ENGINE:**

Move the engine throttle lever to the "STOP" position (and turn the key to "OFF" on electric start models). *Remove the key for safe-keeping.*

**Turning around**

It's easy to turn your tiller around. All you have to do is find the balance point between the engine and the tines and then let the power driven wheels do the work as you push sideways on the handlebars in the direction of your turn.

Practice the following maneuver in a large open area before taking your tiller into the garden.

**WARNING**

To help avoid personal injury, always put the Tines/PTO Clutch Lever in the "DISENGAGE" position before turning the tiller around.

1. At the end of a row, put the Wheels/Tines/PTO Drive Lever in "NEUTRAL" and reduce the engine throttle speed.

2. Put the Tines/PTO Clutch Lever in "DISENGAGE".

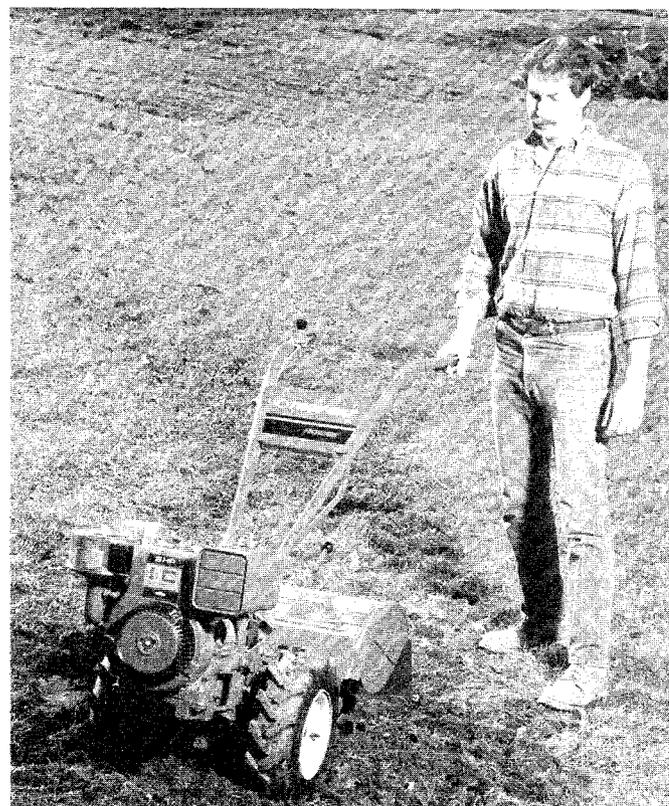
3. Resume forward operation and lift the handlebars until the tines are out of the ground. Then, using the wheels as a pivot point to balance the engine and tines, PUSH the handlebars to swing the tiller around. *At all times, be careful to keep your feet and legs away from the tines (which should be disengaged).* Let the powered wheels do the work . . . the inside wheel will pivot in place while the outside wheel drives the machine around. See Photos 3-9 and 3-10.

NOTE: Use "REVERSE" if necessary, to turn in a limited space.

4. When the turn is completed, shift into "NEUTRAL" and lower the handlebars. When you are ready to begin a new row, put the Tines/PTO Clutch Lever in the "ENGAGE" position and resume "FORWARD" operation.



3-9: Lift the handlebars and find balance point. Then PUSH handlebars to swing tiller around.



3-10: Starting a new row.

## Transporting your tiller

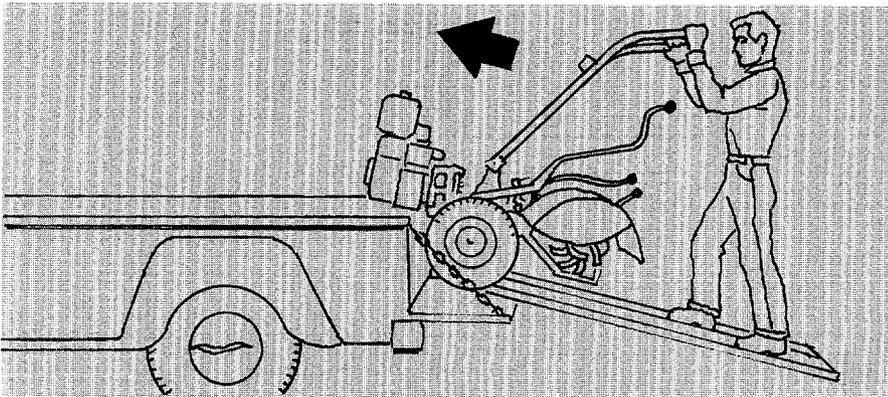
The power driven wheels allow you to easily move your tiller to and from your garden when the engine is running. Or, you can move the tiller (on level ground) without the engine running by using the "FREE WHEEL" position on the Wheel Speed Lever.

### WARNING

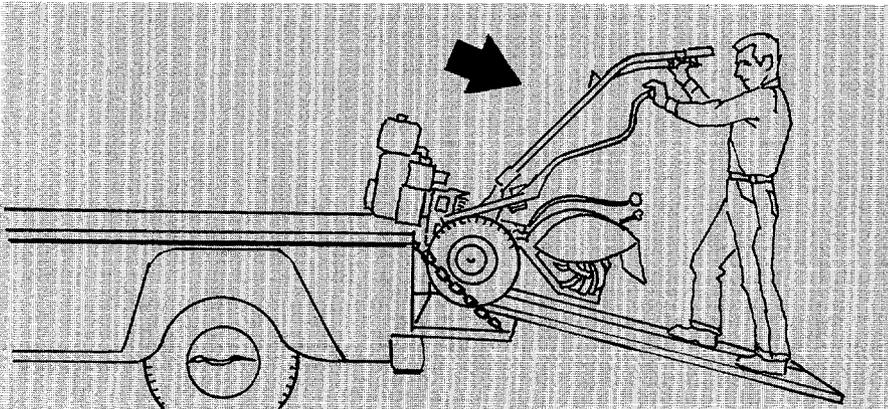
To help avoid personal injury, always put the Tines/PTO Clutch Lever in the "DISENGAGE" position before transporting, loading or unloading the tiller.

#### To transport tiller:

1. Place the Tines/PTO Clutch Lever in the "DISENGAGE" position.
2. Move the Depth Regulator Lever all the way down to the "TRAVEL" setting.
3. If using *engine power*, select the "SLOW" or "FAST" wheel speed position on the Wheel Speed Lever and use the Wheels/Tines/PTO



3-11: To go up ramps use "FORWARD" drive.



3-12: To go down ramps use "REVERSE" drive.

Drive Lever to drive the wheels.

4. If the *engine is stopped*, put the Wheel Speed Lever in "FREE WHEEL" and manually move the machine.

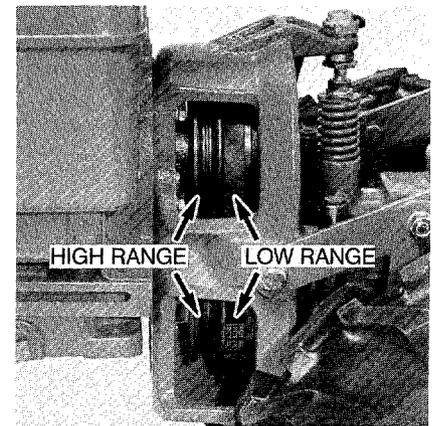
#### To load or unload tiller:

1. Use loading ramps that are wide and strong enough to support both the machine and the operator (machine weighs between 280 and 325 pounds).
2. Place the Tines/PTO Clutch Lever in the "DISENGAGE" position.
3. Put the Wheel Speed Lever in the "SLOW" wheel speed position and reduce the engine throttle speed.
4. TO GO UP RAMPS, use "FORWARD" drive and follow the tiller up the ramps (Figure 3-11).
5. TO GO DOWN RAMPS, use "REVERSE" drive and back down the ramps. Never go down the ramps in "FORWARD" drive as the tiller could tip forward, exposing you to the tines (which should be disengaged). See Figure 3-12.

## Changing belt speeds

Your Tiller has both "LOW" and "HIGH" speed belt ranges. By moving the belt from one range to the other you can obtain a total of four different forward wheel speeds and two different tine speeds. These extra wheel and tine speeds permit you to tailor your tiller's action to your specific needs in the garden, with less strain on the engine.

Changing from one belt range to the other is simply a matter of moving the belt from one set of grooves on the engine and transmission pulleys to the other set of grooves. See Photo 3-13. This change can be made very quickly in the field and without any tools.



3-13: Belt range positions.

By combining the use of the "LOW" and "HIGH" speed belt ranges with the "SLOW" and "FAST" speed positions on the Wheel Speed Lever, you can obtain four different forward wheel speeds (Figure 3-14). The two different tine speeds (Figure 3-14) are determined by the belt range position alone.

At 3000 RPM (Revolutions Per Minute) engine speed, the wheel and tine speeds are:

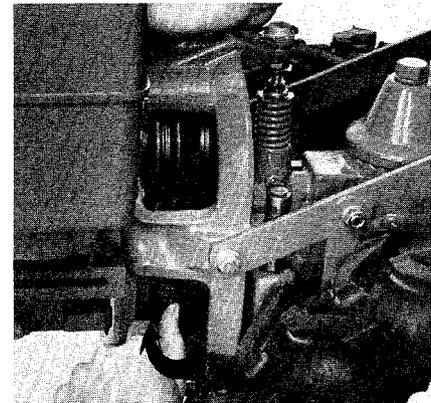
BELT POSITION	WHEEL SPEED LEVER POSITION	WHEEL SPEED	TINE SPEED
Low Range	Slow	5 MPH	146 RPM
Low Range	Fast	1.2 MPH	146 RPM
High Range	Slow	7 MPH	200 RPM
High Range	Fast	1.72 MPH	200 RPM

3-14: Wheel and tine speeds.

When the tiller is operating in "REVERSE", the wheels and tines are powered by the rubber reverse disc and not the belt. Therefore, you have only two reverse speeds as determined by the "SLOW" and "FAST" positions of the Wheel Speed Lever.

**IMPORTANT**

Proper belt tension is critical to good performance. Check the tension after the first 2 hours of new operation and every 10 hours thereafter. See "Drive Belt Maintenance" in Section 6.



**3-15: Move belt on transmission pulley into forward groove.**

**To change from "LOW" range to "HIGH" range:**

**! WARNING**

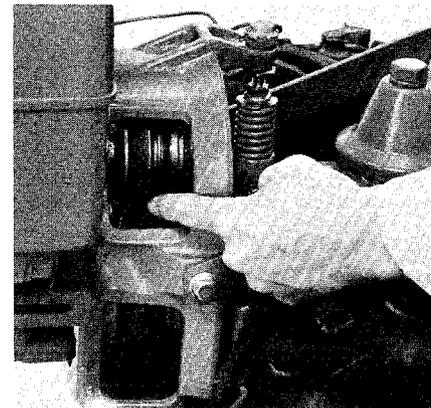
To help avoid personal injury, stop the engine, remove the electric start key, disconnect the spark plug wire, and let the engine and muffler cool before changing belt speeds.

1. Place the Wheels/Tines/PTO Drive Lever in "NEUTRAL".
2. While kneeling on the left side of the tiller, create slack in the belt by reaching over to the right side of the pulleys and pushing in on the center of the belt with your finger. Then use your left hand to work the belt part way into the forward groove of the transmission

(lower) pulley. See Photo 3-15. Now go to the other side of the tiller and finish seating the belt in the groove.

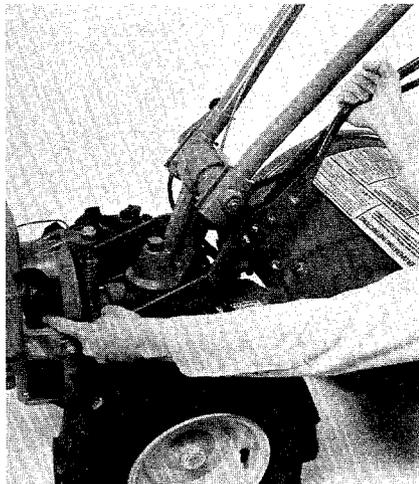
3. On the left side of the tiller, work the belt part way into the forward groove of the engine (upper) pulley. See Photo 3-16. Then go to the other side and finish seating the belt. NOTE: If additional clearance is needed to fit the belt over the engine pulley, simply raise the Wheels/Tines/PTO Drive Lever into the "REVERSE" position. This will lower the engine pulley.

4. Check *both sides* of the pulleys to make sure that the belt is fully seated in the "HIGH" range grooves of each pulley.



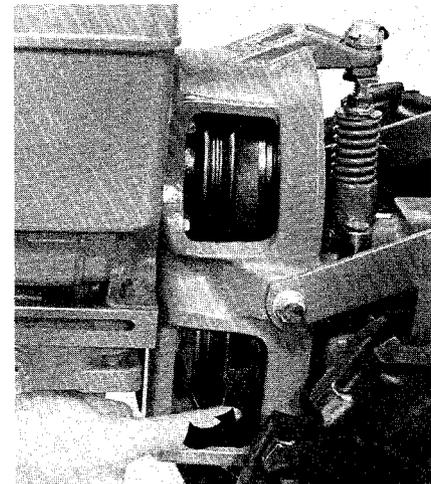
**3-16: Move belt on engine pulley into forward groove.**

**To change from "HIGH" range to "LOW" range:**



**3-17: With drive lever held in "REVERSE", move belt on engine pulley into rear groove.**

1. Place the Wheels/Tines/PTO Drive Lever in "NEUTRAL".
2. Stand on the left side of the tiller and use your right hand to hold the Wheels/Tines/PTO Drive Lever up in the "REVERSE" position. Then use your left hand to move the belt part way into the rear groove of the engine (upper) pulley. See Photo 3-17. Now go to the other side of the tiller and finish seating the belt in the groove.
3. While still holding the drive lever in "REVERSE", move the belt into the rear groove of the transmission (lower) pulley. Do this on both sides of the tiller. See Photo 3-18.
4. Check *both sides* of the pulleys to make sure that the belt is fully seated in the "LOW" range groove of each pulley.



**3-18: Move belt on transmission pulley into rear groove.**

## Choosing wheel and tine speeds

Your tiller offers a wheel and tine speed combination for every tilling task and situation in the garden. With a little experimenting, you can soon find the proper tilling depth, engine throttle setting, and wheel and tine speeds that are just right for the piece of soil you are working on. What this means is:

1. You advance the throttle lever to keep the engine running at a sufficient power level to do the job.
2. You have the depth regulator set in a notch which is not so deep

that it causes the engine to labor or causes the tiller to jump.

3. You have the tines turning over fast enough to really break up the soil with a minimum number of passes. When your tiller is working properly, you can hear that the engine is not laboring very hard and see that the tines are breaking up the soil into small, thoroughly tilled bits. At the proper match of wheel and tine speeds, you will get the job done quickly, and achieve results which are better and more satisfying.

To help guide you in your selections of wheel and tine speeds, please refer to the following chart.

### **WARNING**

The "HIGH" belt range and "FAST" wheel speed combination will propel the tiller at a fast pace. To help avoid personal injury when first using this belt range/wheel speed combination, reduce the engine throttle speed setting to a slower setting.

## WHEEL SPEED AND BELT RANGE SELECTION GUIDE

**IMPORTANT:** For correct wheel speed and belt range choices when using attachments or accessories other than the tines, read the Owner/Operator Manual provided with the attachment or accessory.

### **SLOW GEAR, LOW RANGE**

Till in sod  
Till hard clay  
Till in cornstalks  
Till in cover crops  
Prepare very deep seedbed  
Till in stony soil  
Till in residues and organic matter  
Mix in fertilizers and manures

### **SLOW GEAR, HIGH RANGE**

Till in sod  
Till hard clay  
Till in cornstalks (in most cases, much faster)  
Till in cover crops (faster, better job in most soils)  
Prepare seedbeds (in most soils better and faster)  
Till in stony soils  
Make raised beds  
Mix in fertilizer  
Pull hiller in hard clay soil  
Mix fertilizer and manure  
Till in residues and organic matter

### **FAST GEAR, LOW RANGE**

Prepare last time over seedbed for planting vegetables and cover crop  
Cover seed in wide row or plot planting. (In some soil, handlebars must be held up to keep from going too deep)  
Hill and furrow very well  
Raise beds easily  
Cultivate (In some soil, you may have to hold up on handlebars to avoid going too deep)  
Handy in keeping large areas tilled and prepared for a season to improve soil  
Till in some organic matter in good soil  
Mix in lime  
Cultivating between raised beds with hiller/furrower

### **FAST GEAR, HIGH RANGE**

Prepare seedbeds for planting cover crops  
Mixing in lime  
Cover seeds with less holding up on handlebars (faster than low range)  
Cultivate (excellent, saves engine because you don't have to run it wide open, nor hold up handlebars—with rare exception—because it travels faster and stays on top)  
Keep large areas tilled and ready through summer (saves a lot of time)  
Till in some organic matter.  
Moving tiller from one place to another  
Cultivating between raised beds with hiller/furrower.

# SECTION 4: Tilling in the Garden

In this Section you will find tips and suggestions to help you get the greatest possible satisfaction from your new tiller.

## Tilling depths

When you start to till in the garden, remember to take it easy. Do not try to take too deep a cut on the first pass through sod or hard ground that has not been tilled for several months or years. It is almost impossible to dig down four or five inches on the first pass through untilled soil. So, you should start tilling at a *very shallow* depth regulator setting, perhaps only an inch or two deep the first time.

In each succeeding pass, you can go down a few more inches, gradually working down to the depth you want (watering your garden a few days prior to tilling will make the going much easier). At any time, if you have difficulty getting down really deep, let the newly worked soil set for a day or two. When you return to it, the tilling will be easier.

It is best not to work the soil when it is too wet. Doing so will produce large soil clumps that will later dry out and become hard. Test the soil by squeezing it in your hand. If it compresses easily into a ball, it is too wet to till. If time will permit, always wait for the ground to dry before tilling.



4-1: Use shallow depth regulator settings when first starting out.

## ⚠ WARNING

To help avoid personal injury, be aware that the tiller may unexpectedly bounce upward or jump forward and be propelled away from you if the tines should strike extremely hardpacked soil, sod, frozen ground, or buried obstacles such as large stones, roots or stumps. If you are in doubt about the tilling conditions, always use the following operating precautions to assist you in maintaining control of the tiller:

- Walk behind and to one side of the tiller, using just one hand on the handlebars. Relax your arm, but use a secure hand grip.
- Use shallower depth regulator settings, working down gradually deeper with each tilling pass.
- Use slower wheel, tine and engine speeds.
- Clear the tilling area of all large stones, roots and other debris.
- Avoid applying downward pressure on the handlebars. If necessary, apply slight upward pressure to prevent the tines from digging too deeply.
- Always avoid contacting hard-packed soil or sod at the end of a row by reducing the engine speed and lifting the handlebars to raise the tines out of the soil.
- **IN AN EMERGENCY**, stop the tines and wheels by placing the Wheels/Tines/PTO Drive Lever in "NEUTRAL". If you cannot reach the lever or have lost control of the tiller, **LET GO** of the handlebars and all controls and do not attempt to restrain the machine. The Forward Interlock Safety System will stop the engine.

## Seedbed preparation

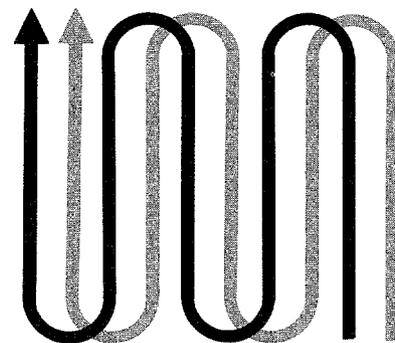
In a well-prepared seedbed, the soil should be as loose and finely textured as possible. Ideally, the soil should be tilled a few weeks prior to the planting date. Then, after a few days, it should be tilled again. Finally, till the area one more time on the day you are going to plant. This procedure will not only produce a finely textured, well-

aerated soil, it will also help to prevent many weed seeds from germinating.

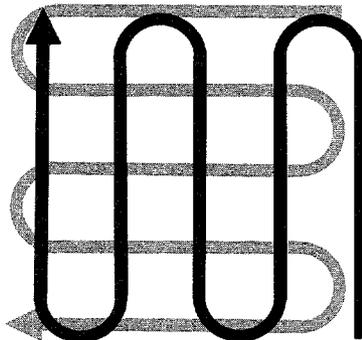
When preparing the soil, go over the same path twice in the first row, then overlap one-half the tiller's width on each succeeding pass. See Figure 4-2. After going up and down the rows in one direction, make a second pass at a right angle across your earlier rows (Figure 4-3). Again, overlap each pass to really pulverize the soil. (In very hard ground, it might take three or four passes before you make much headway.)

If your garden is not wide enough to till lengthwise and then crosswise, then you should first overlap each pass by one-half a tiller width, followed by successive passes of one-quarter width. This overlapping method will assure you of thoroughly breaking up the soil.

If you have plans to expand your garden for next season, then the best time to bust up sod is in the



4-2: Use overlapping technique on first pass.



4-3: Make a second pass at a right angle to first pass.

fall. Doing so will allow the sod or tough surface growth to be completely broken down by the time spring rolls around. (Sod busting can be done even in late fall—as long as the ground isn't frozen.) If there is some growing season left, then you should plant a cover crop (see "Power Composting" in this Section), which will help protect the soil over the winter.

### Avoid making footprints

When making final tilling or cultivating passes through the garden, always try to walk on the side that is not yet finished. This will avoid leaving footprints in the freshly tilled soil. See Photo 4-4.

Eliminating footprints contributes much more than just good appearance to your garden. It aids in preventing soil erosion and avoids "planting" unwanted weed seeds right back in your newly tilled ground. It also leaves your soil nice and loose, so that vegetable and flower roots can penetrate it easily.

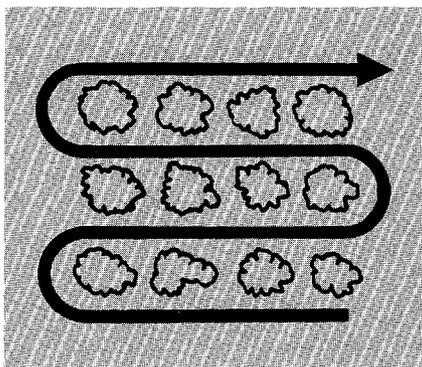


4-4: Try to avoid leaving footprints.

### Cultivating

If you plan carefully before planting, you can leave enough room between the plant rows for later cultivating with the tiller . . . all but eliminating most hand-weeding and hoeing chores.

The tiller hood measures 22½" across, so leave that much distance between the rows, plus enough extra for plant growing



4-5: Leave room between rows for cultivating.

room (especially for bushy crops such as beans, tomatoes and peas). See Figure 4-5.

Cultivating can begin as soon as your seedlings appear above the ground; then cultivate as often as once a week. The day following a rain shower is an excellent time to cultivate, as long as the plants are dry. You should avoid working in the garden when the plants are wet since diseases, blights and rusts can easily be spread among the wet plants with your hands, clothes, or even the tiller.

Shallow cultivation is very important! Do not till deeper than one or two inches, to avoid injuring the roots of nearby plants. If you notice that the tines are digging too deeply even though the Depth Regulator Lever is in one of the top notches, then you may have to lift up on the handlebars slightly (running your tiller in the "HIGH" belt range will help to prevent the tines from going too deep).

### Power composting

It is essential that a garden be fed something if it is to be bountiful year after year in the same location. You must replenish the plant nutrients—primarily nitrogen, phosphorous and potassium—that you remove from the soil in the form of harvested vegetables and fruits.

A simple and very effective way to do this is to use your tiller to chop, blend, and turn under all kinds of organic matter including crop residues, leaves, grass clippings and "green manure" cover

### SOIL ENRICHMENT IDEA

**MULCH**—If you use an organic mulch during the growing season, it can be tilled under with your crop residues at the end of the growing season. Popular mulches include hay, old straw, grass clippings, and other dense organic materials. Till this matter under to a depth of 4 to 6 inches.

crops (clover, annual rye, grains, alfalfa, buckwheat, etc.). This organic matter will decompose during the non-growing season and add important nutrients to the soil. See Photo 4-6.

When power composting, set the depth regulator at the deepest setting possible, without making the engine labor too hard or causing the tiller to jump. Crop residues should be tilled into the soil as soon as possible after harvesting, since tender, moist green matter is tilled more easily. We recommend that you use the "HIGH" belt range and "SLOW" wheel speed gear when power composting. If you find the tines aren't working effectively in the "HIGH" belt range setting, then try tilling in the "LOW" range.

After all power composting has been completed, you should plant a cover crop to protect your soil during the non-growing season. Then in the spring, the cover crop can be tilled under a few weeks prior to planting, providing more organic matter to help feed the soil.



4-6: After harvest, till under crop residues to add nutrients to the soil.

## SPECIAL TROY-BILT GARDENING TECHNIQUE

### How to till under standing cornstalks

As soon as your corn has been harvested, the stalks should be turned into the soil while they are still green. Don't wait until the stalks are dried out, they are tougher to handle and the roots pull out more easily. **YOU DON'T WANT TO PULL THE ROOTS OUT BY HAND, OR CUT THE STALKS, BEFORE TILLING.** It is the action of the stalk (held in place by its root structure), being chopped against the soil that makes it so easy for your tiller to cut it down and chop it up, partially burying much of the cornstalk material in the first pass.

Knocking down cornstalks and

tilling them under is not difficult once you understand three basic principles. First, the stalks should go in between the left wheel and the transmission case, as shown in Photo 2. (The right wheel will not work because the stalks might interfere with the carburetor, air cleaner, or throttle linkage.)

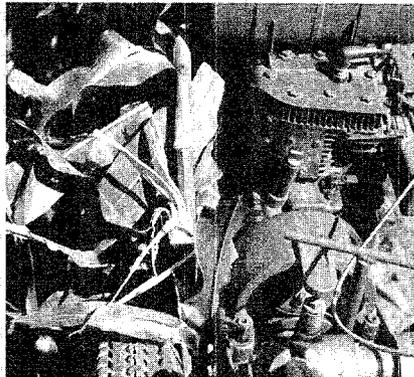
Second, each pass should overlap one-half a tiller width over the ground tilled on the previous pass. And third, till just as deeply as you did when preparing the ground for planting. This usually means that the depth regulator is pulled all the way UP to the deepest setting possible, depending upon the condition of the soil. Generally, the "LOW"

or "HIGH" belt range and "SLOW" wheel speed gear will be best for tilling under cornstalks. However, some folks will even be able to use the "LOW" belt range and "FAST" wheel speed gear, depending upon the size of the stalks and the condition of the soil.

Allow the tilled-in cornstalks to lay in the ground undisturbed for a week to give the active soil life a chance to start decomposition and digestion of the stalks. Then, till in the residue as deeply as possible. This will probably take only one overlapping pass through the garden. Four or five days after this final tilling, you can sow a cover crop, such as annual rye grass.



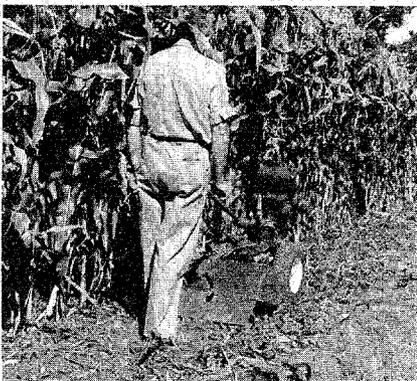
(1) Make first pass alongside first row with RIGHT wheel up close to, but not touching any cornstalk. The purpose of this pass is to loosen up soil in preparation for next pass.



(2) Make second pass with stalks in between LEFT wheel and transmission case (overlap first pass by one-half tiller width). This pass will knock down stalks and cut some into one or two-foot lengths, partially burying them.



(3) On third pass, go back over stalks that are lying down, but this time from opposite direction. This will bury much of the residue 3 or 4 inches under the soil.



(4) The fourth pass will be back down between rows, overlapping one-half the No. 3 pass.



(5) Make fifth pass alongside next row of cornstalks, with right wheel up close to, but not touching stalks.



(6) The sixth pass will start to knock down the next row of stalks. Repeat previous steps until all rows are down and buried.

## Clearing the tines of debris

Your Bolo Tines feature a self-cleaning action which eliminates most tangling in the tines. But occasionally, dried out grass, stringy stalks, or tough vines may become tangled. It isn't necessary to remove all the residue, but don't let it build up to a point where it chokes off the action of the tines.

You can avoid most tangling problems by setting the depth regulator deep enough to get maxi-

mum chopping action as the tines chop the material against the ground, and by tilling under crop residues or cover crops while they are still green, moist and tender. Also, you might try swaying the handlebars laterally from side to side about 6 to 12 inches while continuing to power compost. This "fishtailing" action will often clear the debris out of the tines.

If the tines become tangled,

STOP the engine and remove the tangled material by hand. A small pocket knife or linoleum knife will help you to cut away the material.

### WARNING

To help avoid personal injury, stop the engine, remove the electric start key and disconnect the spark plug wire before attempting to clean the tines by hand.

## Tilling up and down slopes

If you must garden on a moderate slope, then the best way to do so is by planting rows up and down the slope. Tilling vertically on a slope permits you to use the entire area for your seedbed, as well as to provide enough room between rows so that you can cultivate between them (you lose these valuable benefits when you terrace garden, which is discussed further on). See Photo 4-7.

Growing a garden vertically on a slope does not involve much of a soil erosion problem, as long as you put in enough organic matter to improve the moisture holding ability of your soil and you do not leave footprints or wheelmarks. Soil in this condition is loose enough to prevent packing, and is held together well enough by those organic materials so that it readily absorbs water.

When tilling vertically on a slope, try to make the first pass in an uphill direction. The tines dig in much more deeply going uphill than when going downhill. In soft soil or weeds, you may have to lift the handlebars up slightly as you go uphill. When going back down the slope, overlap your first pass by about half the width of the tiller. For best results, use the "HIGH" belt range and "SLOW" wheel speed setting while tilling up and down slopes.

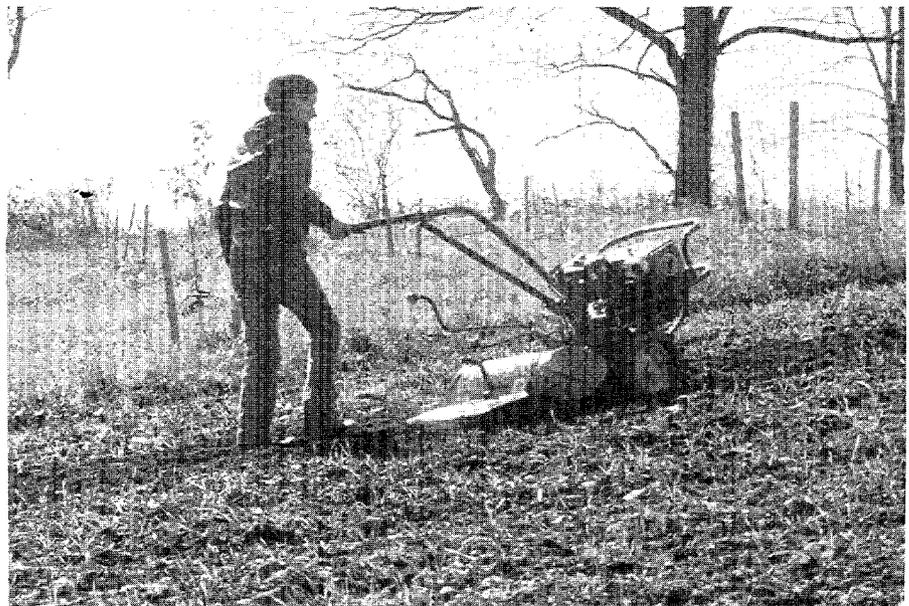
### CAUTION

#### TO AVOID PERSONAL INJURY OR DAMAGE TO EQUIPMENT:

- Do not operate the tiller on a slope that is too steep for safe operation. Go slowly and make sure you have good footing.
- Wear footwear that will increase stability and reduce slippage.
- Do not use the "FAST" wheel speed position while on sloping ground.
- Do not shift the Wheel Speed

Lever when heading up or down a slope. If the lever is accidentally placed in "FREE WHEEL", the machine could roll out of control.

- To prevent engine damage due to oil starvation, make sure that the proper oil level is maintained during all uphill tilling operations. Check the oil level after every one-half hour of operation.



4-7: Tilling on a moderate slope.

### Terrace gardening

If a slope is too steep or too short for vertical tilling, it may be necessary to till across the slope in a lateral direction. The best way to achieve good results tilling across a slope is to create terraces for your garden (first, make sure that the slope is not too steep for safe tilling).

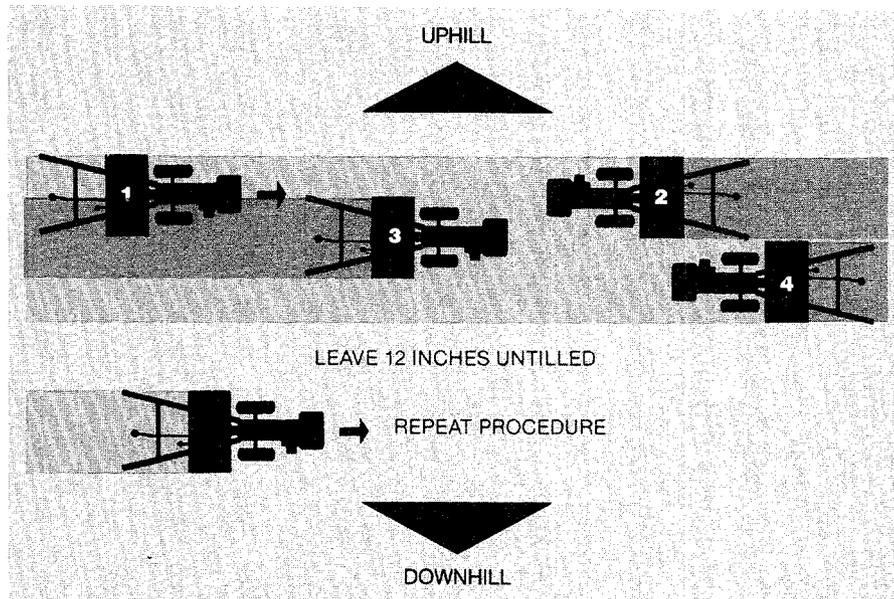
Terraces should be about two or three feet wide. This means you will be able to plant one or two rows of plants and later till under the crop residues, but there may not be room enough for cultivating with your tiller. (If you make the terraces too wide, you would be digging as much as a foot into the uphill side of the terrace and you would end up trying to grow plants in poor subsoil).

Using the “LOW” belt range and “SLOW” wheel speed gear, start to terrace on the top of the slope and work down, always keeping the uphill wheel in the soft, newly tilled soil. Each succeeding terrace is started by walking below the terrace you are preparing. In four or five passes, your tiller can carve out a flat and wide enough terrace for planting. See Figure 4-8 and Photo 4-9.

Make sure that you don’t till the last 12-inches or more of the downhill outside edge of each terrace. Keeping this strip untilled will help to prevent the terraces from breaking apart and washing downhill. It also gives you a walking path between the terraces.



4-9: Terraces 2 or 3-feet wide are ideal.



4-8: How to make terraces in 4 or 5 passes.

### Tilling across slopes without terraces

Tilling across a slope without forming terraces is not recommended, but it can be done. However, please think it over carefully and see if it isn’t possible to till vertically up and down the slope,

or to create terraces.

First, make sure that the slope is not too steep to till safely at all. Then, begin at the top of the slope and overlap half of each tilled path, always keeping the uphill wheel in

the soft, newly tilled soil. Doing so will help you keep the tiller more stable. For best results, use the “LOW” belt range and “SLOW” wheel speed gear.

### SOIL ENRICHMENT IDEA

**TRENCH COMPOSTING**—Trench composting is easy with the optional Hiller/Furrower attachment (see Section 9). Just dig a trench, put in all manner of organic matter and biodegradable household garbage and cover it up with soil. The earthworms and microbial life in the soil will consume it faster than you might imagine.

# SPECIAL TROY-BILT GARDENING TECHNIQUE

## How to make raised beds for planting

It's easy to make raised beds with the optional Hiller/ Furrower Attachment. Most crops can't grow in wet soil or heavy clay conditions because they can't get the air or nutrients they need for growth. Raised beds can solve this problem.

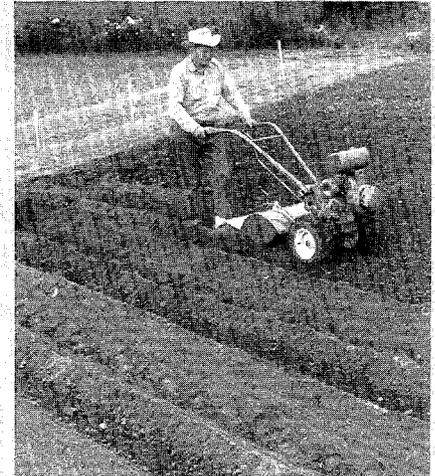
In addition, raised beds provide a good irrigation system, discourage soil compaction (from walking near the plants), give your soil earlier and greater exposure to the sun, increase the amount of topsoil around the crops, and provide looser soil conditions for root crops to grow in.

You can even try wide row planting on raised beds. Rows can be anywhere from 30 inches to 3 feet apart, and 8 to 10 inches high.

### Easy Steps to Raised Beds:



(1) Till under sod or crop residues and work soil into a deep, smooth, loose seedbed.



(2) Place row-marker stakes at proper intervals; attach hillier/furrower and make your rows.



(3) Hold the handlebars with both hands and use faster tiller and engine speeds.



(4) After planting seeds in ridges, rake loose soil over top and firm soil according to seed directions.



(5) Use furrower to make irrigation trench at ends of rows.

### SOIL ENRICHMENT IDEA

**LEAVES**—Leaves are an excellent (and free) natural fertilizer that will do wonders for your soil's fertility and texture. In the fall, spread 6 to 8 inches of leaves on the ground and till them under. If enough growing season is left, you can till once again after a few days, and then sow a cover crop.

### SOIL ENRICHMENT IDEA

**SHEET COMPOSTING**—All manner of organic material including weed-free manure and mulches, leaves, straw, hay and grass clippings can be "sheet composted" directly into the soil. Just spread the material around and till it under—it's a lot quicker than the lengthy compost-pile process.

## SPECIAL TROY-BILT GARDENING TECHNIQUE

### Try wide-row planting

Wide-row planting is a highly productive gardening technique that is worth trying. As the name implies, it involves broadcasting seed in bands anywhere from 10 inches to 2 or more feet wide, rather than in traditional single-file rows.

The greatest advantage to this gardening method is that you have more plants per area in your garden, which results in much higher yields from the same amount of space (see Photo 4-10). Typically, you can grow anywhere from 3 to 4 (or more) times produce in the same space normally set aside for a single row.

In addition, when you plant crops in wide rows, you automatically

shade the ground. Shading prevents most weeds from growing and also holds moisture in the ground. Wide rows also protect the soil from temperature fluctuations and makes harvesting easy, since you can sit and pick so much produce from one spot.

It's simple to plant and grow wide-row crops. First prepare a loose, smooth, fertile seedbed and mark off your row with strings—Photo 4-11. Hand broadcast the seeds over the raked area as if you were seeding a lawn (remember to plant vegetable seeds a little thinner than grass seed). Cover them with soil from outside the row, tamping it down firmly with a hoe. If you're planting larger seeds such

as peas or lima beans in wide rows, you can run your tiller over them, planting about 2 or 3 inches deep. If you use your tiller for planting, sow your seeds a little thicker as some of them won't get deep enough to germinate. After tilling, firm the soil.

Plant the larger-seeded crops, such as beans or peas, with a little care so you won't have to thin later on. For small-seeded crops, such as lettuce and carrots, you can easily thin as soon as they come up by lightly dragging a steel garden rake across the row about  $\frac{1}{4}$ -inch deep. You will also disturb and kill many tiny weed seeds that have begun to sprout near the soil surface.



4-10: Wide-row planting on the right compared to single row on the left.



4-11: After preparing seedbed, mark off row area as wide as you want, even up to 4-feet across.



4-12: Wide-row planting really works, as evidenced by this lush growth of peas.

**HERE'S ANOTHER SPACE SAVING METHOD:** Planting in double (or even triple) rows is another space saving idea that many Troy-Bilt Tiller owners use. Beans, for example, can be planted in two rows spaced 6 to 8 inches apart. On either side of the double row, leave enough room for sidegrowth and later cultivating with your tiller. It is still necessary to thin seedlings according to the seed company's directions on the packet.

# SECTION 5: The PTO Power Unit

As explained on Page 2 of this Manual, your tiller can be converted into a self-contained PTO Power Unit that is capable of powering or towing other attachments besides the tine attachment that came with your tiller. The instructions given here will help you become familiar with your PTO Power Unit. Please read this Section thoroughly.

## VERY IMPORTANT

Before trying to operate your PTO Power Unit for the first time, make sure that you have:

- Read and understand all of the Safety Instructions in Section 1 of this Manual and in the Owner/Operator Manual that is supplied with any attachment.
- Read and understand all of the controls information and operating procedures for the tiller and engine as described in Sections 2 and 3 of this Manual.
- Read and understand all of the assembly instructions, controls information, and operating procedures for the attachment as described in the Owner/Operator Manual that is supplied with the attachment.

## Removing and replacing the tine attachment

The following steps explain how to remove and replace the tine attachment. The only tool you'll need is a  $\frac{3}{4}$ -inch wrench (at least 12-inches long for adequate leverage).

There are two optional accessories available that make the following steps easier. One is the

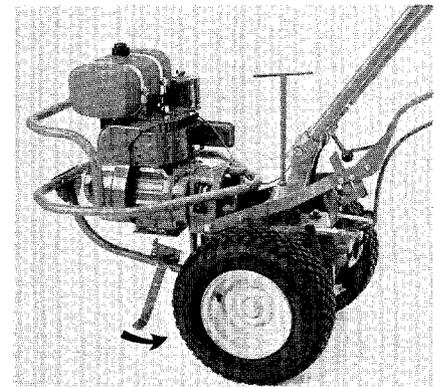
Kickstand Attachment which prevents the PTO Power Unit (engine end) from falling forward when attachments are removed (Photo 5-2). The other is the Tine Attachment Cradle which provides a handy support for the tine attachment when it is removed from the tiller (Photo 5-3). For more information about these two accessories, please refer to Section 9 of this Manual.



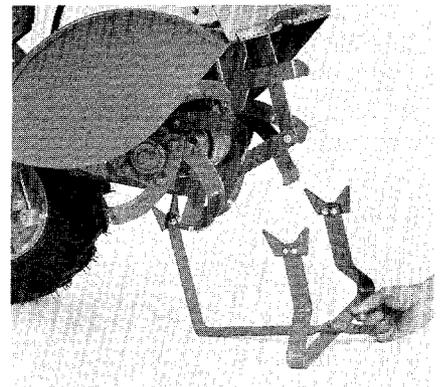
## CAUTION

TO AVOID PERSONAL INJURY OR DAMAGE TO EQUIPMENT:

- Stop the engine, remove the electric start key, disconnect the spark plug wire and let the engine and muffler cool before removing or installing any attachment.
- Do not place hands, tools, or any object near or inside the PTO access hole when the engine is running.
- When removing and replacing the tine attachment, be careful not to cut yourself on the edges of the tiller hood. Wear thick gloves for maximum protection.
- When the tine attachment is removed, always place the optional tine cradle or a wood block or other sturdy support beneath its coupling point to prevent the attachment from falling forward.



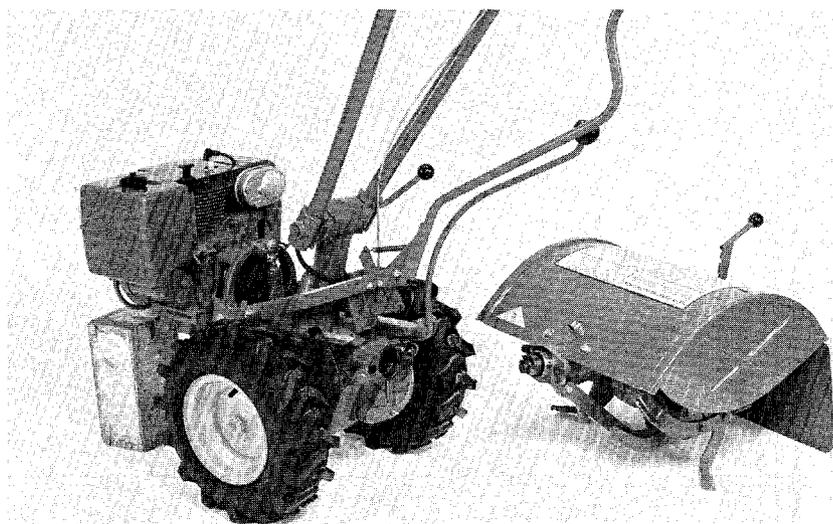
5-2: Kickstand prevents engine from tipping forward.



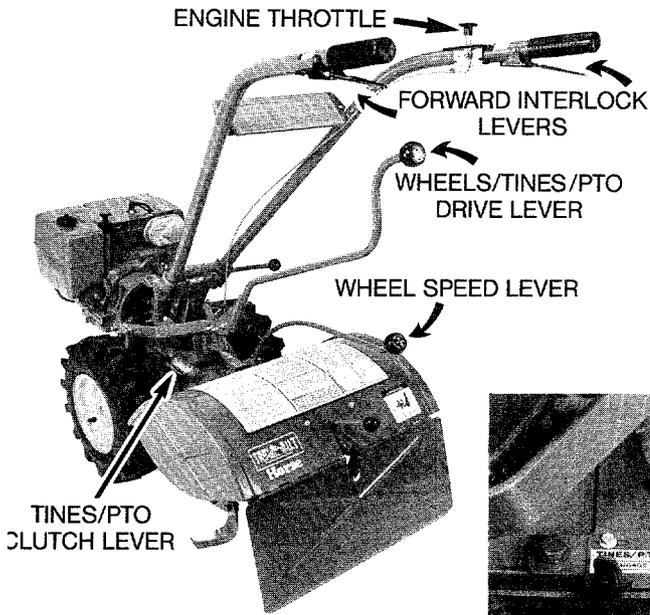
5-3: Tine Attachment Cradle.

### To remove the tine attachment:

1. Make sure that the engine is stopped, the electric start key is removed, and the spark plug wire is disconnected.
2. The equipment must be on level ground.
3. Place the Wheels/Tines/PTO Drive Lever in "NEUTRAL" (Photo 5-4).

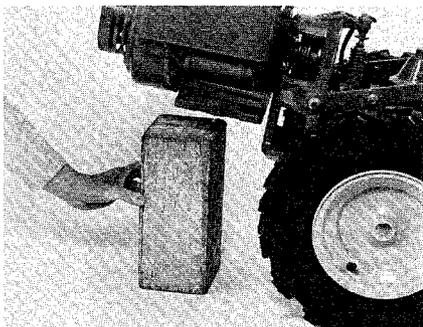


5-1: PTO Power Unit with tine attachment removed.

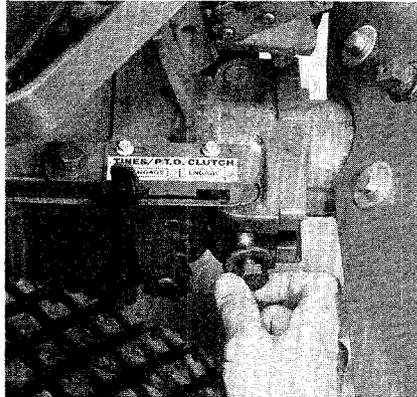


**5-4: PTO Power Unit controls.**

4. Place the Tines/PTO Clutch Lever in "DISENGAGE" (Photo 5-4).
5. Place the Wheel Speed Lever in "FREE WHEEL" (Photo 5-4).
6. Place a sturdy support under the engine, or use the Kickstand on your bumper (if so equipped) to prevent the engine from tipping down when the tine attachment is removed. See Photo 5-5.
7. Using a 3/4-inch wrench, loosen the two swing-bolts that connect the power unit transmission to the tine attachment and swing the bolts outward. See Photo 5-6. NOTE: An extra-long (13") PTO Wrench is available from our Parts Department. This heavy-duty wrench (Part No. 2005) makes it quick and easy to remove and replace the tine attachment.



**5-5: Block up engine.**

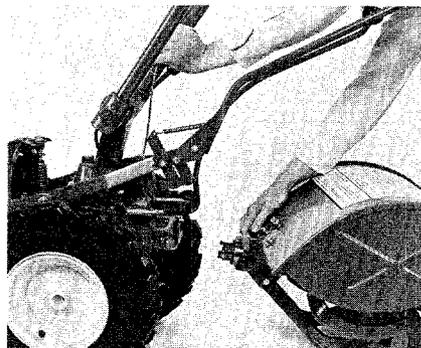


**5-6: Move swing-bolts outward.**

8. With one hand on the handlebars of the power unit, tip the unit forward about an inch while you pull the tine attachment back a short distance. This releases the guide pin on the power unit from the guide pin mounting hole in the tine attachment. See Photos 5-7 and 5-8.

**IMPORTANT**

Always store your tine attachment in a level position to avoid losing oil from the breather vent, located in the top of the dipstick.

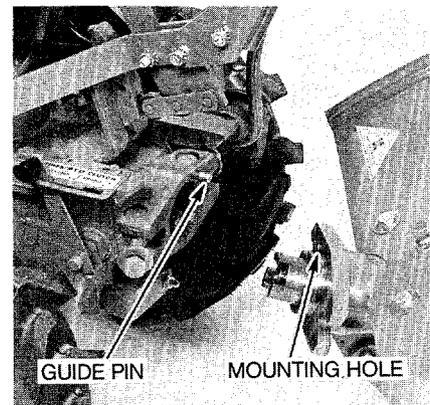


**5-7: Lift handlebars while pulling attachment away from power unit.**

9. Place the dust cap (supplied with certain attachments), or some plastic wrapping over the "dog" clutch coupling of the tine attachment to prevent dirt and grime from accumulating on the coupling.
10. The power unit is now ready to accept other powered or non-powered attachments. Refer to the Owner/Operator Manual supplied with each attachment for specific instructions on how to install and operate the attachment.

**To replace the tine attachment:**

1. Follow Steps 1-5 of the previous tine attachment removal instructions.
2. Place the two swing-bolts on the power unit in the outward position, making sure that the washers on the bolts are next to the bolt heads.
3. Roll the power unit back to the tine attachment and either put down the optional Kickstand or place a sturdy support under the engine.
4. Remove the dust cap or protective wrapping from the clutch coupling on the tine attachment.
5. Carefully align the alignment pin on the power unit with the alignment hole on the tine attachment and bring the two units together (Photo 5-8).



**5-8: Align guide pin with mounting hole.**

## PTO Power Unit operating instructions

6. Place the two swing-bolts in the slots of the tine attachment. Alternating between the two bolts, tighten each securely until the concave washers on the bolts are flat. The bolts must be very tight. If using a torque wrench, tighten each to 70-80 ft. lbs. See Photo 5-9.

### IMPORTANT

The swing-bolts must be kept very tight at all times to prevent undue wear on the "dog" clutch couplings, or on the alignment pin and hole. Check bolts for tightness after every 2-½ hours of operation.

7. Remove the engine support before attempting to drive the unit in a forward direction.



5-9: Tighten both swing-bolts.

### WARNING

To help avoid personal injury or damage to equipment, read the Owner/Operator Manual provided with each attachment before attempting to install or operate the attachment. The Manual provides a detailed description of proper use and operation, and points out other important Safety Instructions.

The following instructions describe how to operate the PTO Power Unit ONLY. Read the separate Owner/Operator Manual for each attachment carefully before attempting to assemble, attach, transport or operate the attachment. If you do not have a Manual, call or write us for a replacement copy (be sure to supply us with the serial number of your attachment).

Some attachments have a drive shaft or a hydraulic pump that is powered by the engine on the PTO Power Unit. These attachments are called "Stationary Attachments", because they must remain in a stationary position when being operated (they can be towed to the work site by the power unit, as described in "To Operate Non-Powered Attachments").

Other attachments are simply

pulled or towed behind the PTO Power Unit. These attachments are called "Non-Powered Attachments".

### WARNING

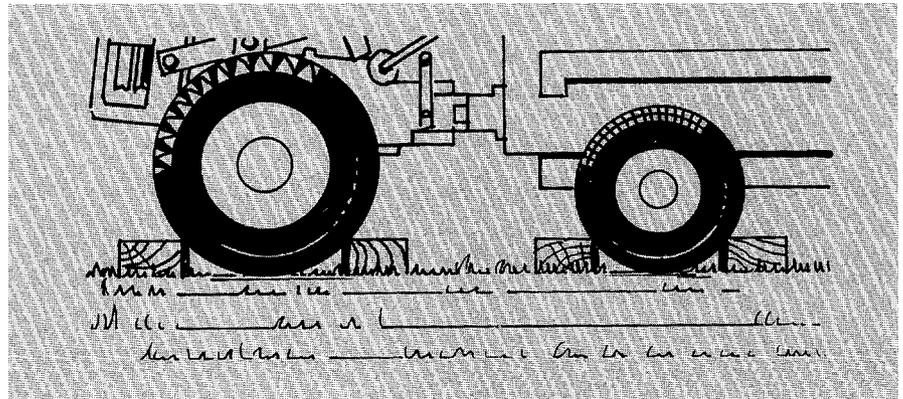
To help avoid personal injury, always disengage the Tines/PTO Clutch Lever before towing any attachment.

**Before starting engine:**

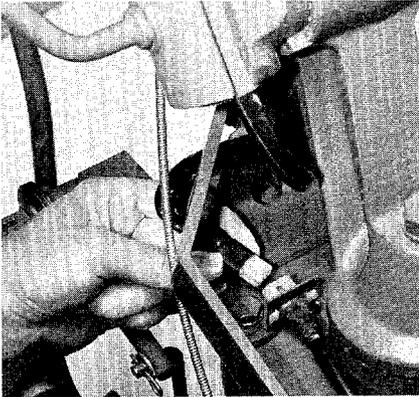
### IMPORTANT

Before operating in temperatures below 40°F, refer to the "Cold Weather Operation" instructions in Section 3 of this Manual.

1. Put the Wheels/Tines/PTO Drive Lever in "NEUTRAL". To find "NEUTRAL" (while engine is not running), push the lever down until it engages in "FORWARD". Then tap or lift the lever up and release it. (Photo 5-4).
2. Put the Tines/PTO Clutch in "DISENGAGE".
3. FOR STATIONARY ATTACHMENTS ONLY:
  - (a) Put the Wheel Speed Lever in "FREE WHEEL" and block ALL wheels to prevent rolling of equipment. (See Photo 5-4 and Figure 5-10).

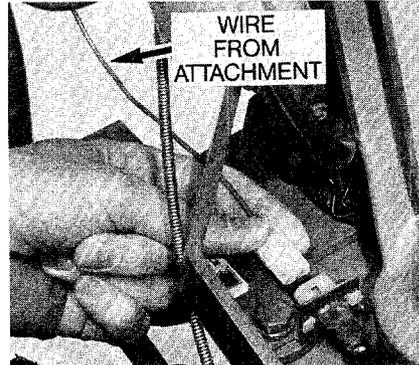


5-10: Block wheels on power unit and stationary attachment.



5-11: Disconnect the Forward Interlock Wire Harness.

- (b) On the Power Unit, unplug the Forward Interlock Wire Harness that leads from the bottom of the handlebars to the receptacle located on the top, right side of the transmission cover. See Photo 5-11).
  - (c) On the Stationary Attachment, locate the interlock wire and make sure that the surface of the plug is clean.
  - (d) Connect the plug from the Stationary Attachment to the receptacle on the Power Unit. See Photo 5-12. Make sure that the connection is tight. This connection allows you to operate the Wheels/Tines/PTO Drive Lever in "FORWARD" without having to simultaneously squeeze and hold one of the Forward Interlock Levers.
- 4. FOR NON-POWERED ATTACHMENTS ONLY:**
- (a) Put the Wheel Speed Lever in either "SLOW" or "FAST" (roll power unit while shifting until wheels are engaged). See Photo 5-4.
  - (b) Make certain that the Forward Interlock Wire Harness plug at the bottom of the power unit handlebars is connected to the Forward Interlock Wire Harness receptacle on the top, right side of the transmission (Photo 5-13).



5-12: Connect wire from Stationary Attachment to receptacle on Power Unit.

- 5. Move the Engine Throttle Lever away from the "STOP" position and use the Choke Control if the engine is cold. Pull the Recoil Rope or use the Key Switch (on Electric Start models). When the engine starts, move the Choke Control (if used) to "CHOKE OFF" and let the engine warm up. (See Section 3, "Operation of Tiller" for more detailed engine starting steps.)
- 6. For non-powered attachments only, test Forward Interlock Safety System. See page 17.

**! WARNING**

To avoid injury, do not run the engine in an enclosed or poorly vented area. Engine exhaust contains carbon monoxide, an odorless and deadly gas.

**To operate Stationary Attachments:**

- 1. Put the Tines/PTO Clutch in "ENGAGE".
- 2. To apply power to PTO driven attachments, move the Wheels/Tines/PTO Drive Lever down to "FORWARD" (do not use "REVERSE" with Stationary Attachments).
- 3. TO STOP PTO POWER: Tap or lift the Wheels/Tines/PTO Drive Lever up to "NEUTRAL".



5-13: Forward Interlock Wire Harness.

**To Operate Non-Powered Attachments (or to tow Stationary Attachments):**

- 1. To go forward, squeeze and hold one Forward Interlock Lever (Photo 5-4) and then move the Wheels/Tines/PTO Drive Lever down to "FORWARD".
- 2. TO STOP FORWARD MOTION: Tap or lift the Wheels/Tines/PTO Drive Lever up to "NEUTRAL" and then release BOTH Forward Interlock Levers.
- 3. TO STOP FORWARD MOTION IN AN EMERGENCY: Let go of ALL power unit controls (this will stop the engine).
- 4. For reverse motion, first reduce the engine speed and put the Wheel Speed Lever in "SLOW". Then hold the Wheels/Tines/PTO Drive Lever up. (Make sure the area behind you is clear before reversing.)
- 5. TO STOP REVERSE MOTION: Release the Wheels/Tines/PTO Drive Lever.

**To stop engine:**

Move the Engine Throttle Lever to "STOP" (and turn Key to "OFF" on Electric Start models).