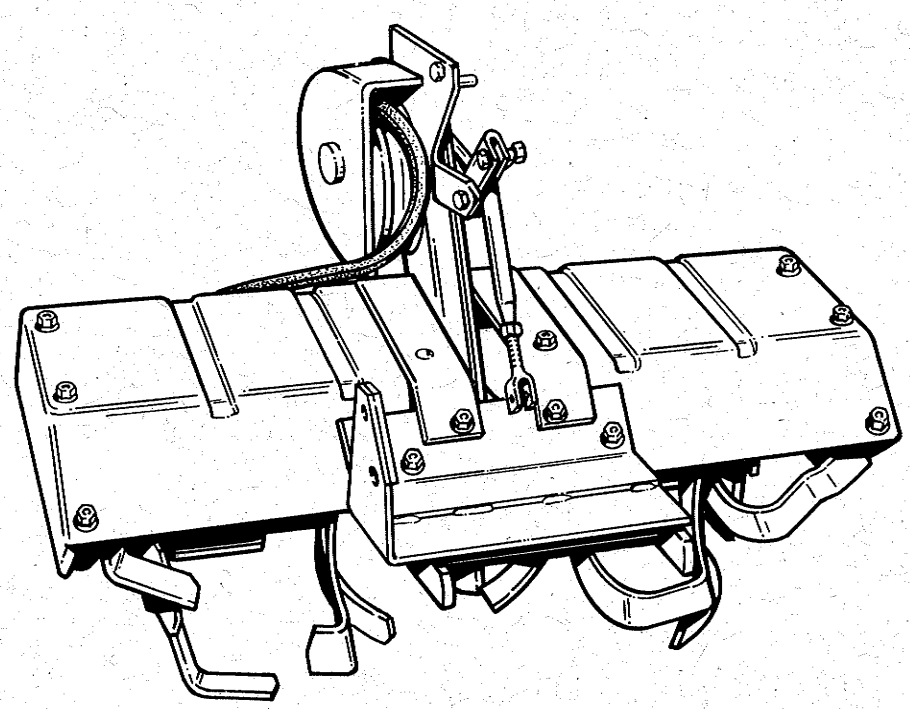
OPERATOR'S MANUAL

30″ ROTARY TILLER



30″ ROTARY TILLER
MFG. NO. 1690393

FORM - 1665877
PRINTED IN U.S.A.
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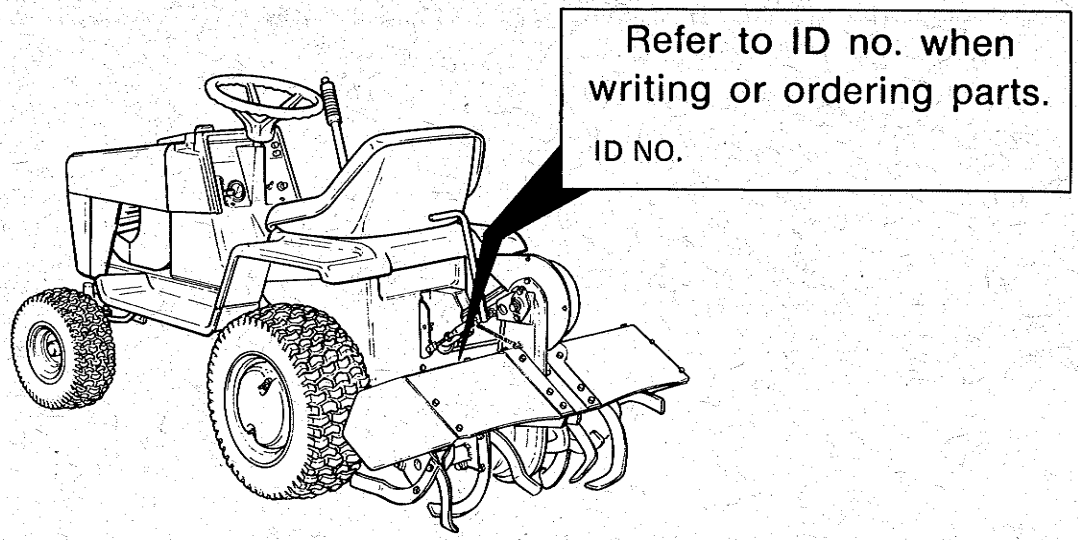
Contents

Identification

When ordering replacement parts for your rotary tiller, be prepared to give your dealer the identification number found on the identification plate shown below. We suggest that you locate the number and record it below for easy reference.



Accessories

Rear wheel weights and front counterweights are recommended. For operation on slopes greater than 15 percent (8.5°), front counterweights are required.

A lift lever is required.

Safety Rules

Read these safety rules and follow them closely. Failure to obey these rules can result in loss of control of machine, severe personal injury to yourself or bystanders, or damage to property or equipment. The triangle ⚠ in the text signifies important cautions or warnings which must be followed.

GENERAL

- Read the operator's manual carefully. Be thoroughly familiar with the controls and proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
- Never allow children to operate equipment. Never allow adults to operate equipment without proper instruction.
- Keep the area of operation clear of all persons, especially small children, and pets.

PREPARATION

- Never attempt to make any adjustments while engine is running.
- Thoroughly inspect the area where the rotary tiller is to be used and remove wires and other foreign objects which might get tangled on tines.
- Disengage all clutches and shift into neutral before starting engine.
- Handle gasoline with care, it is highly flammable.
  a. Use approved fuel container.
  b. Never add fuel to a running engine or hot engine.
  c. Fill fuel tank outdoors with extreme care. Never fill fuel tank indoors.
  d. Replace gasoline cap securely and wipe up spilled fuel.

OPERATION

- Stay alert for hidden hazards or traffic. Do not carry passengers.
- After striking a foreign object, stop the engine, disengage tiller clutch, and remove ignition key. Thoroughly inspect the rotary tiller for any damage before restarting and operating the rotary tiller.
- Do not till across the face of slopes. Exercise extreme caution when changing direction on slopes. Do not attempt to till steep slopes.
- Never operate rotary tiller without guards, plates, or other safety protective devices in place.
- Stop engine, disengage tiller clutch, and remove ignition key whenever you leave the operating position and before making repairs, adjustments, or inspections.
- Take all possible precautions when leaving the vehicle unattended. Disengage the tiller clutch, lower the attachment, shift into neutral, set the parking brake, stop the engine, and remove the key.
- When cleaning, repairing, or inspecting make certain rotary tiller and all moving parts have stopped. Remove ignition key to prevent accidental starting.
- Never allow anyone in back of unit.
- Disengage power to rotary tiller when transporting or not in use.
- Use only attachments and accessories approved by manufacturer of rotary tiller (such as wheel weights, chains, etc.).
- Never operate the rotary tiller without good visibility or light. Always be sure your feet are properly placed on the footrests and keep a firm hold on the steering wheel.

MAINTENANCE & STORAGE

- Check bolts, nuts, spring clips, etc. at frequent intervals for proper tightness to be sure equipment is in safe working condition.
- Always refer to operator's manual for important details if rotary tiller is to be stored for an extended period.

Installation & Removal

INSTALLATION

1. Back the tractor up to the front of the tiller. The tiller mounting points (figure 1) should be lined up with the hitch mounting points (figure 2).
2. Stop engine, remove key, and set the parking brake.
3. Attach the tiller to the hitch with two pins and spring clips thru the mounting points shown in fiugres 1 and 2.

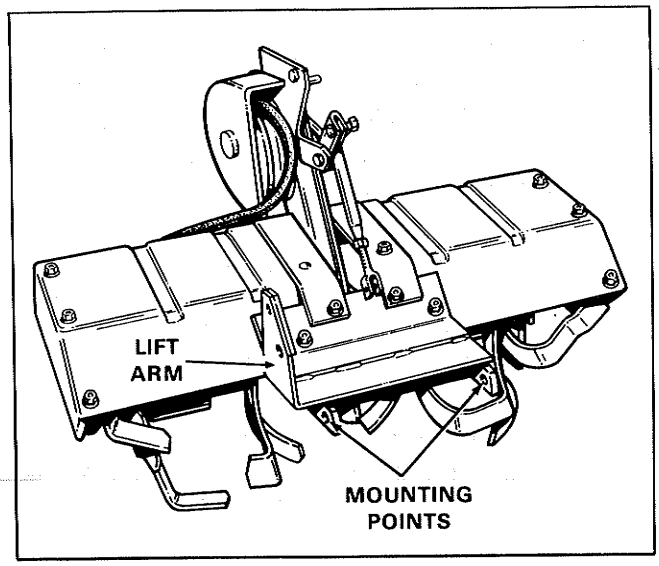


Figure 1. Tiller Mounting Points

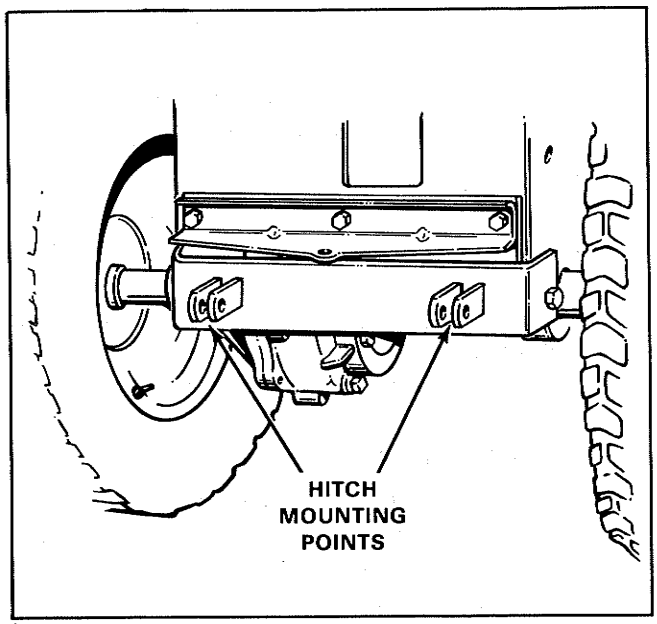


Figure 2. Tractor Mounting Points

4. Attach the lift rod to the tractor lift lever with spring clip. See figure 3.

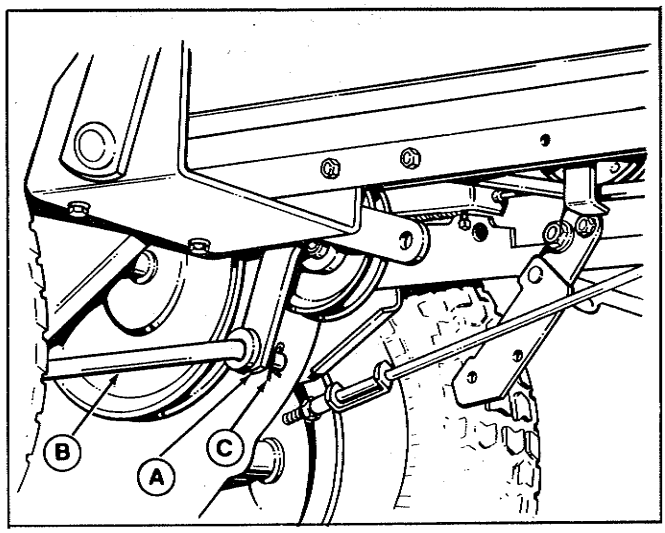


Figure 3. Lift Lever

A. Lift Lever
B. Lift Rod
C. Spring Clip

5. Attach the rod guide on the lift rod (item B, figure 4) to the tiller lift arm (item C) with spring clip.

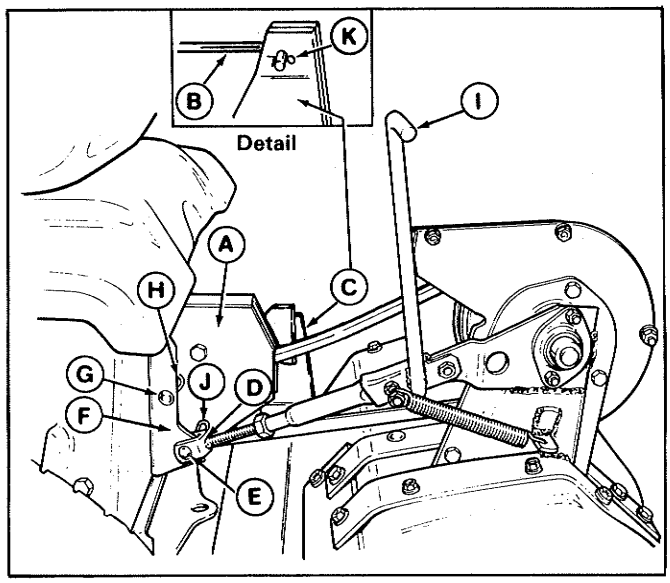


Figure 4. Tiller Installation

A. Pulley Support
B. Rod Guide
C. Lift Arm
D. Clutch Link Clevis
E. Pin
F. Bracket
G. Pin
H. Spring Clip
I. Tiller Clutch Lever
J. Spring Clip
K. Spring Clip

6. Push the tiller clutch lever fully rearward.
7. Use pin (item G) with hole near head and a spring clip (item H) to attach pulley support (item A) to bracket (item F) on tractor. Fit holes in pulley support over nuts on bracket and thread tiller drive belt through hole in rear of tractor.
9. Attach tiller clutch link clevis (item D) to ear on bracket (item F) using a pin (item E) and spring clip (item J).
10. Loosen, but do not remove, nut that secures belt stop (item A, figure 5) for tractor power take-off pulley (item B). This pulley is located under tractor near right rear wheel.

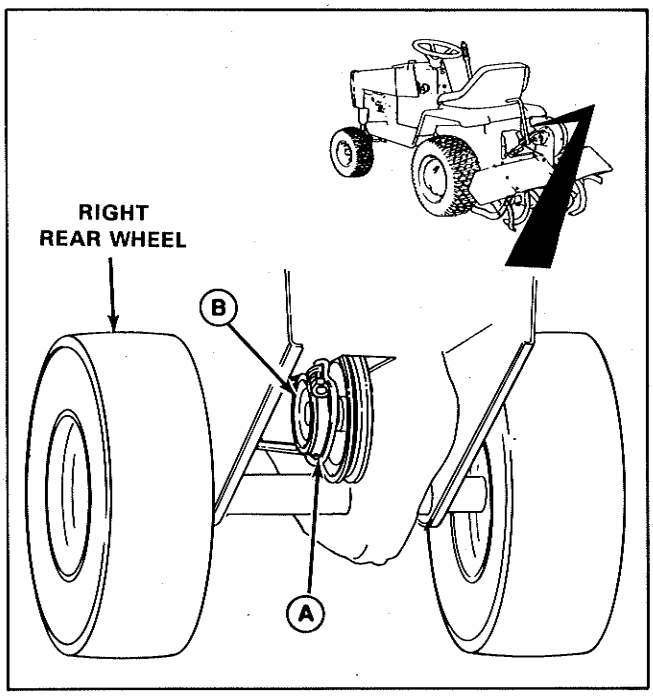


Figure 5. Install Drive Belt on Tractor Pulley

A. Belt Stop **B. Power Take Off Pulley**

11. Pull rotary tiller drive belt forward and over the tractor power take-off pulley. Be sure belt is not twisted and that it is positioned on pulleys as shown in figure 6.
12. Hold belt stop over groove of tractor power take-off pulley while retightening nut to secure belt stop in place.
13. Check and, if needed, adjust belt tension and lift rod. Refer to Adjustment Section of this manual for details.

REMOVAL

To remove the rotary tiller from the tractor proceed as follows:

1. Disengage tiller clutch by pushing clutch lever on tiller fully rearward. Use tractor lift lever to lower tiller to the ground.

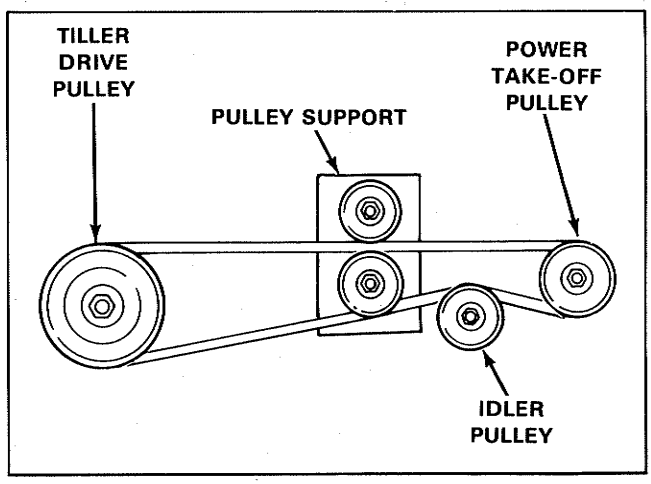


Figure 6. Belt Threading Diagram

⚠WARNING

Stop engine, remove ignition key and set tractor parking brake before working on or near rotary tiller.

2. Loosen nut that secures belt stop (item A, figure 5). Pull tiller drive belt off tractor power take-off pulley. Then retighten nut to secure belt stop.
3. Remove spring clips (items H and J, figure 4) and pins (items E and G) to detach clutch link clevis (item D) and pulley support (item A) from tractor. To prevent loss, install pins and spring clips in removed tiller parts.
4. Remove two spring clips to detach lift rod from tractor. Reinstall spring clips in holes of lift rod to prevent loss.
5. Remove two spring clips and two pins from hitch. Then detach tiller hitch from tractor hitch. To prevent loss, install hitch pin and spring clip on tiller hitch.
6. Before moving tractor, be sure that tiller drive belt is pulled completed away from tractor.

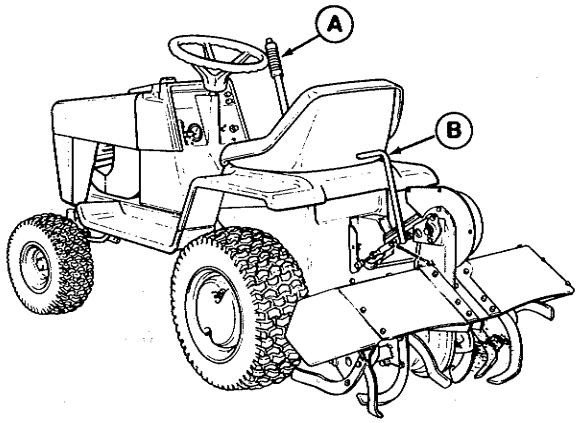
NOTE

Leave other items, including pulley support bracket (item F, figure 4), installed on tractor.

Operation

CONTROLS

Figure 5 shows the location, name, and operation of the tiller controls.



Item	Name	Operation
A	Lift Lever	To raise tiller to transport position, press button (on top), pull lever all the way back & release button. To lower, press button & allow lever to go forward slowly. To till at different depths, set the lift lever at different notches.
B	Tiller Clutch Lever	To engage the tiller, pull lever fully forward. To disengage the tiller, push lever to the rear.

Figure 5. Controls

> **⚠ CAUTION**
>
> **After striking a foreign object, stop the engine, disengage the PTO, and remove the key. Inspect the tiller for damage before starting.**

CHECKS BEFORE STARTING

1. Make sure all covers and guards are in place. Make sure all nuts, bolts, pins, and clips are secure.
2. The tiller must be lubricated before first use and every four hours of operation. If required, see instructions in Normal Care section.
3. Clear the work area of any items that could be caught in the tiller.

TRANSPORTING

When transporting the tiller to and from the work area, the tiller should be fully raised and the tiller clutch lever should be fully rearward (disengaged). Adjust ground speed according to condition of the ground surface.

TURNING OR BACKING WHEN TILLING

Before backing up or turning, raise the tiller untill it clears the ground. Otherwise, the tiller can be damaged.

The weight of the tiller will reduce the weight on the front tires. Front counterweights are recommended to restore normal turning ability.

ENGINE SPEED & GEAR SELECTION

Most tilling is done in first gear with engine speed set between 3/4 to full speed. Ground speed can be increased by increasing engine speed or selecting second gear. The tiller drive speed is determined by engine speed.

Since the tiller drive speed is directly related to engine speed, it is not desirable to adjust engine speed to control ground speed. Set the engine speed according to the desired tiller drive speed and control ground speed by selecting the approximate gear.

OPERATION ON SLOPES

For your personal safety, always operate up and down the face of slopes, never across the face. Use slow ground speed. Use extreme caution when changing direction. Do not start or stop suddenly.

On slopes greater than 15 percent (8.5°) use a front counterweight. Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet in ten feet forward.

STARTING & STOPPING

To start tilling, engage the tiller clutch then lower the tiller. Slowly release the tractor clutch to move forward. The tiller will work into the soil. Engage the tiller clutch only when it is out of the ground.

To stop tilling, push the clutch lever rearward. Raise the tiller into transport position. The tiller will also stop when the tractor clutch is disengaged.

TILLING SUGGESTIONS

Plan the pattern before beginning. When the land contour permits, it is best to travel in the longest direction to minimize turning.

The tiller will dig deeper with slow ground speed. It is best to alter the depth on succeeding passes until the desired depth is reached. Making passes crossways to the previous pass usually helps break sod into fine particles.

In soft, loose soil, it may be possible to till to desired depth in one pass.

Adjust engine speed according to soil conditions.

In sod or hard soil, use a high engine speed. If the tiller does not have enough power to bite into the soil, it may propel the tractor forward.

Normal Care

LUBRICATION

Before first use and every four hours, lubricate the tiller as shown in figure 6.

CHAIN ADJUSTMENT

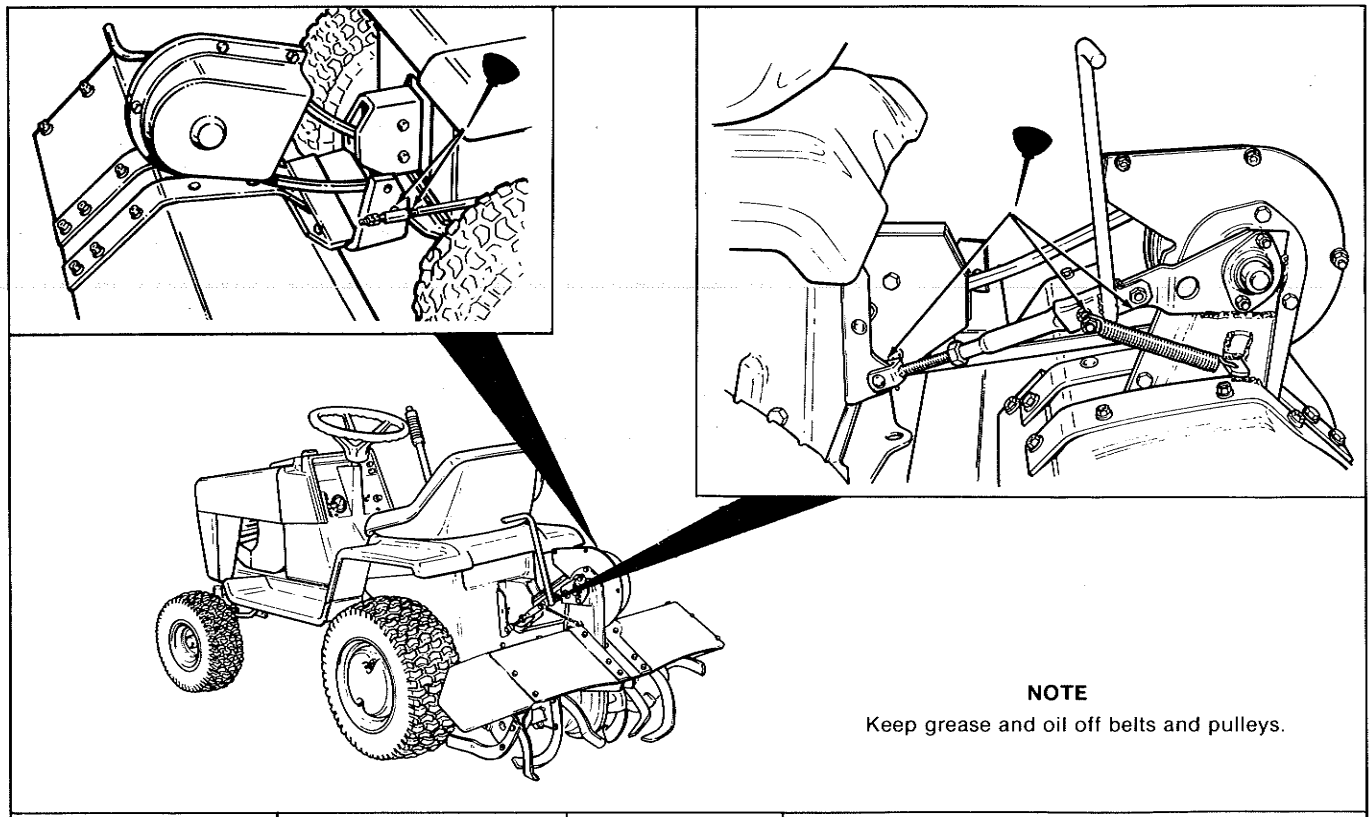
Every 25 hours of operation or yearly, remove slack from the chain as described in Adjustments section.

NORMAL STORAGE

Remove excess dirt and plant matter from the tiller and body. (This can be done with a hose.) Store the tiller in an enclosed, dry area.

OFF-SEASON STORAGE (30 days or more)

1. Clean the entire tiller, including the tines.
2. Coat the tines with a light film of grease or oil. Coat all other bare metal surfaces with a good quality paint (obtainable from your dealer) or a light film of grease or oil.
3. Lubricate the tiller as shown in figure 6.



NOTE
Keep grease and oil off belts and pulleys.

Symbol	Use	Apply With	Procedure
	SAE 30 Oil	Oil Can	Clean indicated area and apply 2 or 3 drops of oil.

Figure 6. Lubricate Rotary Tiller (Every 4 Hours)

Troubleshooting

⚠ WARNING

For your safety, do not try to adjust or repair the tractor or rotary tiller while the engine is running. Also, always remove the key from the ignition switch before beginning the maintenance to prevent accidental starting of the engine.

Troubleshooting procedures are provided in the following chart. Locate your problem and check the possible causes in the order listed. After correcting the problem, try operating the tiller to see if you have eliminated the trouble.

Also see the troubleshooting chart in your tractor Operator's Manual. For problems not covered in either manual, contact your dealer.

Problem	Cause/Remedy
1. Rotary tiller tines do not rotate.	**A.** Tiller clutch not engaged. Pull clutch fully forward.
	B. Tiller or tractor drive belts too loose. Adjust belt tension.
	C. Rock jammed in tiller. Remove it.
	D. Rotary tiller drive belt or chain broken. Replace as needed.
	E. Drive belt or pulleys oily. Clean as required.
2. Tills too shallow.	**A.** Tiller raised too high. Lower it using tractor lift.
	B. Engine speed too low. Set engine for 3/4 to full speed.
	C. Tractor speed too high. Set transmission gear shift for slower speed.
	D. Ground too hard. Make several passes, tilling deeper on each pass.
3. Tiller leaves ground rough with large clods.	**A.** Ground too wet. Wait until soil does not ball up.
	B. Tilling too deep at one pass.
	C. Tractor speed too high. Set transmission gear shift for slower speed.
4. Tractor handles poorly.	**A.** Tractor speed too fast. Use slower speed, especially when running on rough or sloping surfaces.
	B. Front wheels lifting. Use front counterweight.
	C. Rear wheels slip. Use rear wheel weights.

Adjustments

⚠ WARNING

To avoid serious injury, perform adjustment only with tractor engine stopped. Remove the ignition key to prevent accidental starting.

BELT TENSION

1. Engage the tiller clutch.
2. Press downward with your thumb on the exposed part of the belt (item A, figure 7). Thumb pressure should deflect the belt downward about 1/4 inch (6 mm). If not, proceed with the following steps.

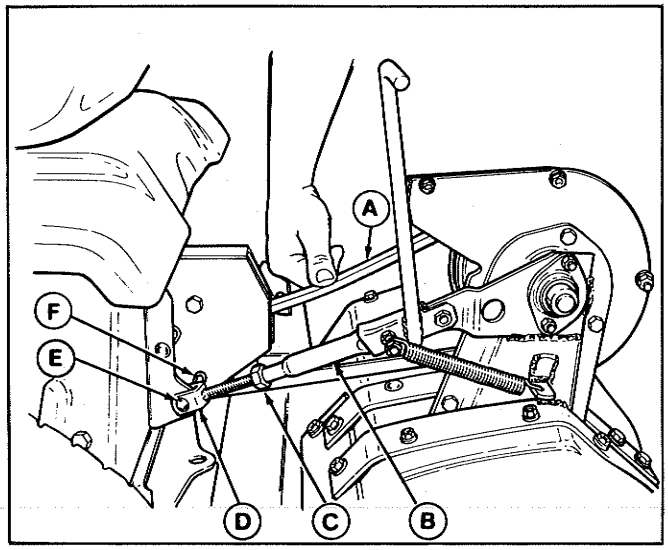


Figure 7. Belt Tension Adjustment

A. Belt	**D. Clevis**
B. Clutch Link	**E. Pin**
C. Jam Nut	**F. Spring Clip**

3. Disengage the tiller clutch.
4. Loosen the jam nut (item C).
5. Remove the spring clip (item F) and pin (item E).
6. Turn the clevis (item D) in or out of clutch link (item B). Increasing exposed thread of clevis increases belt tension; decreasing exposed thread decreases belt tension.
7. Reattach clevis (item D) with pin (item E) and spring clip (item F).
8. Engage the clutch and recheck the measurement (step 2). Readjust if necessary then tighten jam nut (item C) firmly against the clutch link (item B).
9. Operate the tiller for a short period then recheck the adjustment.

CHAIN ADJUSTMENT

1. Locate the screw and nut in the slotted holes on either side of the chain drive housing underneath the cover.
2. Place a wrench on the nut and another wrench on the screw head. Loosen, but do not remove.
3. Push the wrenches toward the rear while tightening the screw and nut. This will remove slack from the chain. Do not overtighten.

LIFT ROD ADJUSTMENT - Tilling Depth and Ground Clearance

Moving the jam nuts (B & C, figure 8) affects the tilling depth and ground clearance. Moving the jam nuts toward the rear increases the tilling depth and decreases ground clearance. Moving the jam nuts toward the front decreases the tilling depth and increases the ground clearance. Initially, position the two nuts so that the lift arm (E) nearly touches the back of the tractor when the tiller is fully raised. If operation shows that greater tilling depth is needed, move the nuts toward the rear. To move the nuts, proceed as follows.

1. Use tractor lift lever to lower tiller to ground.
2. Hold forward jam nut (C) while loosening rear jam nut (B).
3. Move nuts to desired position on lift rod.
4. Hold forward jam nut (C) while tightening rear jam nut (B). The two nuts must be jammed tightely together.
5. Use tractor lift lever to fully raise tiller. Check to be sure that there is reasonable clearance between the ground and the tines.

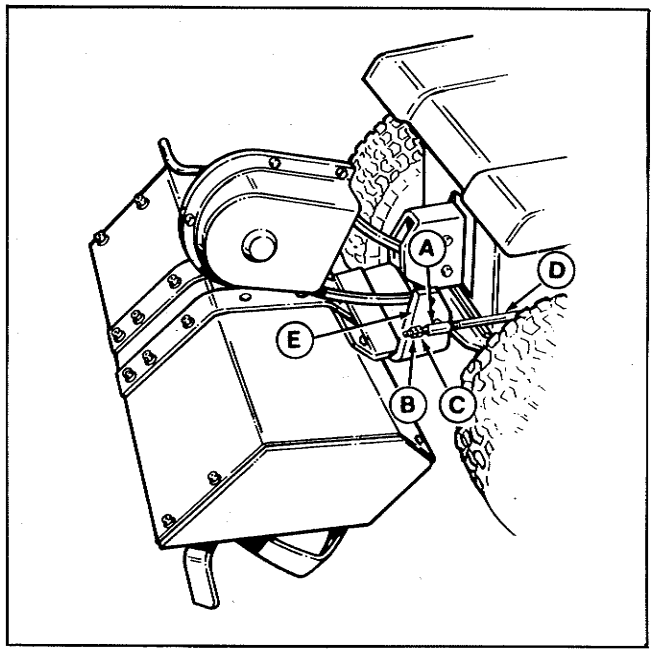


Figure 8. Lift Lever Adjustment

A. Rod Guide	**C. Jam Nut**	**E. Lift Arm**
B. Jam Nut	**D. Lift Arm**	

Assembly

ATTENTION SETUP PERSONNNEL:

As setup personnel you have an obligation to know the product better than the customer. This includes safety related items. Prior to actual setup, thoroughly familiarize yourself with the Operator's Manual. Pay special attention to all safety warnings. It is possible during setup to place yourself in a position which is more hazardous than when the unit is in operation. Remember, it is your responsibility to set up the product safely and to know it well enough to be able to instruct a customer in the safe use of his power unit.

Safety is a matter of common sense . . . A matter of thinking before acting. Most shops have specific safety practices. Follow them. The precautions listed in the Operator's Manual should not supersede existing practices but should be considered as supplemental information.

Use the following procedure to install the parts shipped loose.

PULLEY & BELT STOP

Install power take-off pulley (item F, figure 9) and belt stop (item B) on tractor as follows:

1. Install a key in keyway of transmission input shaft (item E). Slip power take-off pulley (item F) over key and shaft with setscrew in pulley hub on inboard side. Be sure pulley and key are flush with the end of the shaft. Then tighten setscrew in pulley hub.
2. Reach up through slot above pulleys and insert clip (item A) into hole in tractor frame above power take-off pulley.

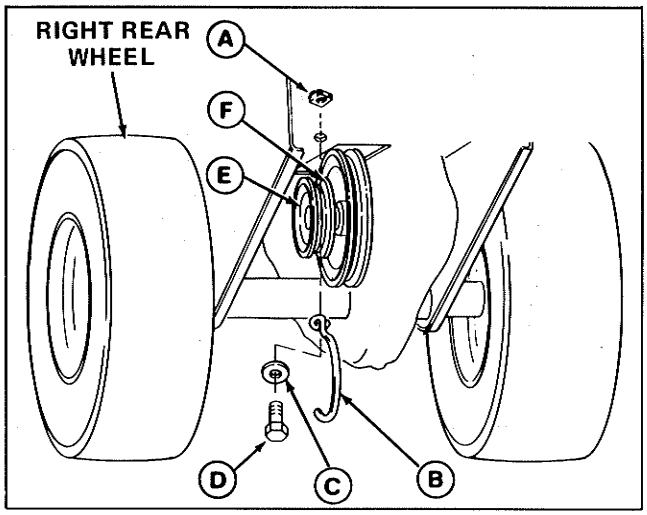


Figure 9. Install Belt Stop

A. Clip, Tinnerman
B. Belt Stop
C. Flat Washer
D. Capscrew
E. Shaft
F. Power Take-Off Pulley

3. Install belt stop (item B), washer (item C) and capscrew (item D) so that belt stop curves over front of power take-off pulley. Tighten capscrew at this time only if you intend to run tractor without installing tiller.

INSTALL PULLEY ITEMS

Install pulley items (figure 10) at rear of tractor as follows:

1. Raise seat deck and remove tractor battery. (Refer to tractor manual.)
2. Install capscrew (item C) through hole in back of battery compartment and upper hole of pulley support bracket (item I). Then loosely install lockwasher (item M) and nut (item L) on this capscrew.
3. Install idler pulley (item F) on pulley bracket (item H). Use a capscrew (item G), spacer (item E), two washers (item N), lockwasher (item B) and nut (item A) to secure pulley.
4. Reach through hole in rear of tractor and place pulley bracket (item H) on inside wall. Insert capscrews (item D) through holes in pulley bracket, wall and pulley support bracket (item I). Then install lockwashers (item J) and nuts (item K).
5. Tighten all three nuts (items K and L) to secure pulley support bracket (item I).
6. Reinstall battery and lower seat deck.

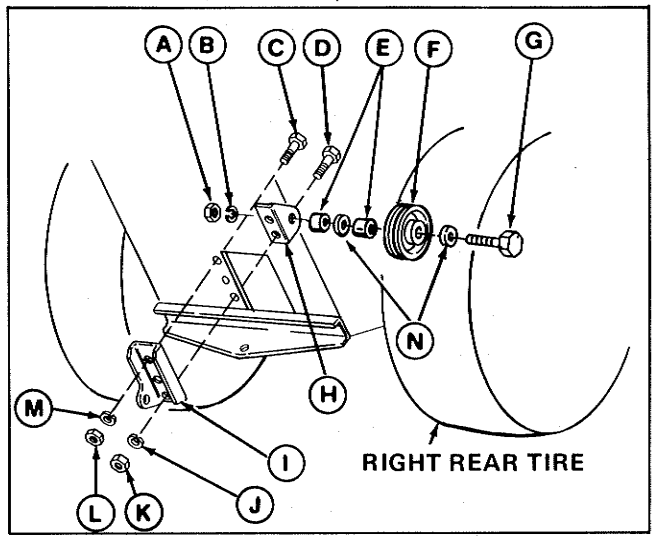


Figure 10. Install Pulley Items

A. Nut
B. Lockwasher
C. Capscrew
D. Capscrews (two)
E. Spacer
F. Pulley
G. Capscrew
H. Pulley Bracket
I. Pulley Support Bracket
J. Lockwashers (two)
K. Nuts (two)
L. Nut
M. Lockwasher
N. Washer

Specifications

DIMENSIONS

Tilling Depth: 6 Inches (152 mm) Maximum
Effective Width: 30 Inches (762 mm)
Overall Width: 32 Inches (813 mm)
Overall Length: 24 Inches (610 mm)
Overall Height: 26 (660 mm)
Transport Ground Clearance: 3-3/4 Inches (95 mm) Maximum
Approximate Weight: 112 Pounds (50 kg)

CONTROLS

Tine Drive: Clutch on Tiller
Raise and Lower: Tractor Lift Lever

DRIVE TRAIN

Clutch: V-Belt Tensioner
Input Drive: Cushioning V-Belt from Tractor
Final Drive: Roller Chains

CHASSIS

Hitch: Welded Steel
Bearings: Rolling Contact
Housing: Stamped Steel
Number of Tines: 16 Replaceable Tines