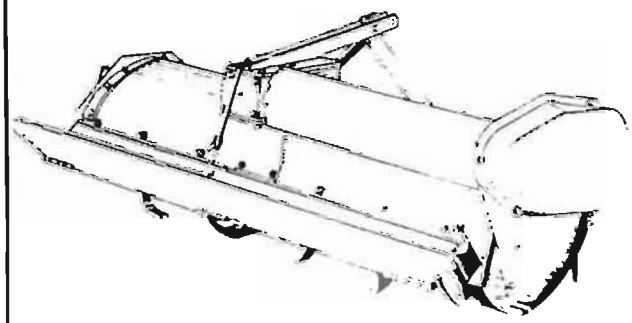
Cub Cadet

Owner's Manual

48" TILLER ATTACHMENTS



Model Number

190-356-100

Important:

Read Safety Rules and Instructions Carefully

Thank you for purchasing an American built product.

CUB CADET CORPORATION • P.O. BOX 36930 • CLEVELAND, OHIO 44136

PRINTED IN U.S.A

FORM NO. 772-3036

CONTENTS

CAUTION: This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury, and carefully read the message that follows.

It is very important that each operator fully understand the entire contents of this manual for safe, dependable operation and to prolong the life of the equipment.

SPECIFICATIONS

Cutting Width	48"
Overall Width	58"
Number of Tines	24
Tilling Depth	Up to 8"
Drive	Tractor Rear PTO (ASAE — 2000 RPM)
Hitch Required	ASAE, Category "0" 3-point
Tine Retaining Bolt Torque	50-55 Foot Pounds
Tine Material	High Carbon, heat treated steel
Tine Speed	200 rpm at 2000 PTO speed
Weight	355 lbs.
Shipping Weight	400 lbs.

SAFETY PRECAUTIONS

CAUTION: Improper assembly, installation and operation of the rotary tiller can result in personal injury or tiller damage. Please read and understand all safe operation rules before using the tiller.

CAUTION: PRIOR TO USE, YOUR TILLER GEAR BOX MUST BE FILLED WITH OIL. SEE PAGE 5.

1. Thoroughly familiarize yourself with the operation of the tiller. Study this operator's manual and the manual provided with your tractor.

2. Be prepared to stop the tractor/tiller in an emergency.

3. Never allow persons unfamiliar with the tiller to operate it. Do not allow children to operate tiller.

   Keep everyone, including animals, at a safe distance while operating the tiller.

5. Do not allow anyone other than the operator to ride on the tractor/tiller.

6. Clean all debris from the area to be tilled. Foreign objects thrown may cause personal injury, property damage, or equipment damage.

7. Never run engine indoors. Exhaust gases contain odorless and deadly carbon monoxide. If engine must be run indoors, open all windows and doors to provide maximum ventilation.

8. Do not adjust or service the tractor/tiller until the engine has stopped and all parts have stopped moving. Remove the ignition key.

9. Keep all guards and shields in place. Replace tractor PTO shaft cover when tiller is removed.

10. Keep hands, feet and clothing away from tines. Loose clothing can become tangled in moving parts and/or controls, resulting in personal injury.

11. Keep all screws, nuts and bolts and other hardware properly adjusted at all times.

12. Stop the tractor after striking a solid object. Inspect the tractor, tiller or other equipment for damage. Make necessary repairs prior to restarting and operating.

13. Avoid steep hillside operations which could cause the tractor/tiller to overturn. Drive slowly over rough ground and on slopes.

14. Always bring tiller to transport position before backing up or turning at the ends of furrows.

15. Always give complete and undivided attention to the job at hand so complete control of tractor and tiller is maintained at all times.

16. Observe and obey all "CAUTION" and "WARNING" signs on tractor/tiller.

ASSEMBLY

Except for servicing of oil in the gearbox and sliding the telescoping Power Take-Off (PTO) into tiller, the Rotary Tiller is completely factory assembled and ready for use. Refer to the tractor manufacturer's instructions for installation of tractor PTO, PTO shield, 3-point hitch, and front and/or rear mounted weights (if required).

CAUTION: Make sure tractor PTO shield has been installed on your tractor.

ATTACH TILLER TO TRACTOR

FIG I After opening top of tiller box, determine which side is front and then cut front panel to the floor. Remove corner supports.

CAUTION: Use care in removing staples. Staples and corner posts should be discarded in proper refuse container.

FIG II With the front panel of the box flat on the floor, remove lower link pins (1) and hairpin cotters (2) from tiller.

CAUTION: Do not back tractor while persons are behind tiller or between tractor and tiller. While backing tractor, do not reach back to align hitch points.

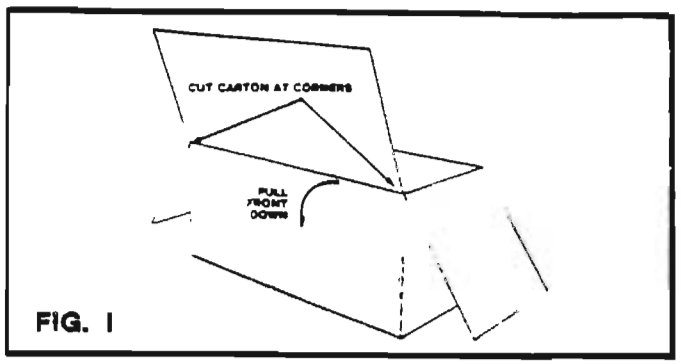


FIG. I

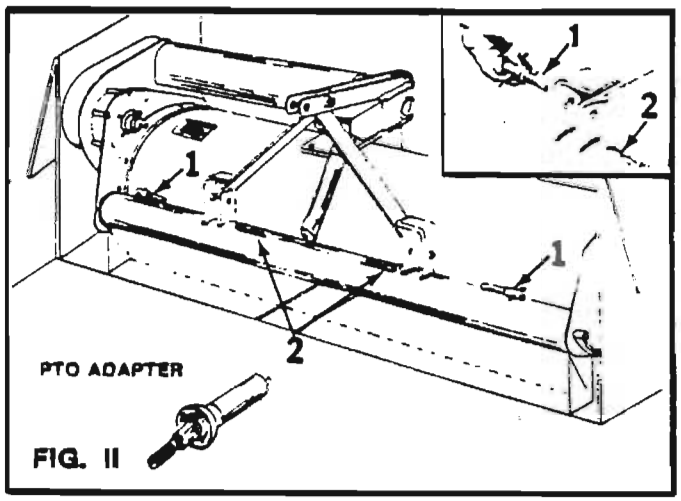


FIG. II

FIG III Back slowly toward tiller (1) until 3-point hitch lower link arms (2) are in line with the tiller lower hitch points (3). Minor height adjustment may be necessary, refer to the tractor manufacturer's instructions on use of hydraulic lift and adjustment of hitch.

CAUTION: Before attaching tiller to 3-point hitch on tractor, place tractor controls in "Neutral" or in "Off" set parking brake, disengage PTO, shut off engine and remove ignition key.

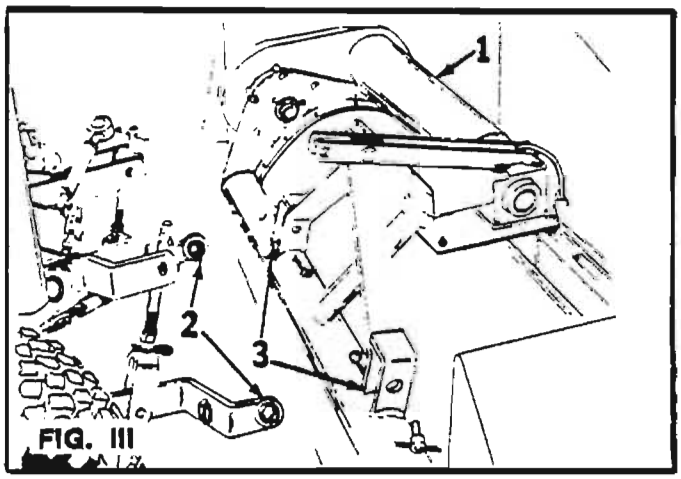


FIG. III

FIG IV Attach lower link arms (1) to tiller lower attaching points (2) with the lower link pins (3) and hairpin cotters (4) which were removed from tiller in Fig. II. Using the top link pin and cotter (5) supplied with the tractor 3-point hitch, attach top link (6) to top hitch point on tiller. Adjust top link so that top surface of tiller gear box (7) is parallel with ground. Be sure to lock upper link jam nut (8) against threaded tube of upper link arm to prevent rotation of upper link.

Now, start tractor, raise tiller with hydraulic lift to highest position and slowly drive forward to clear entire box. Stop tractor, lower tiller, set tractor controls in "Neutral" or "Off", set parking brake, shut off engine and remove ignition key.

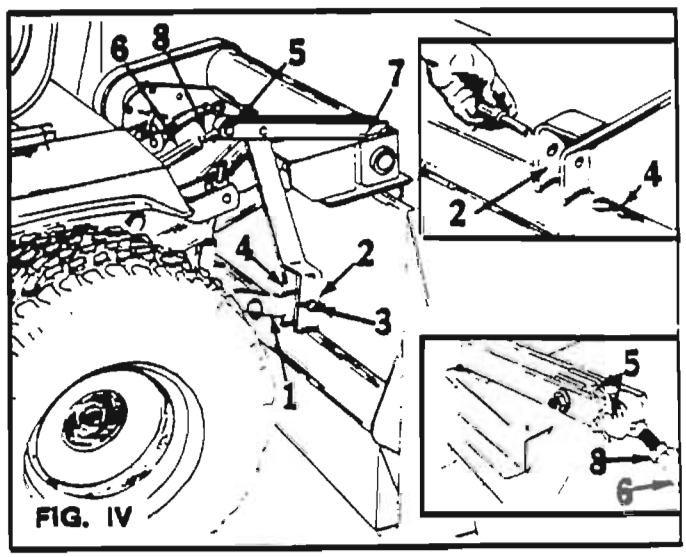


FIG. IV

FIG V Take the PTO adapter from the bottom of the box and discard the box in the proper refuse container. Slide the adapter (1) onto PTO arm (2) on tiller — this is a free-moving connection fore and aft (grease now and periodically as necessary. Note — it may be necessary to remove protective paint from sliding portion of PTO before assembly.) With the actor PTO locking collar (3) held forward (toward front of tractor) slide adapter (1) into splined hole until "ball" in PTO locking collar (4) engages fully into groove of splined shaft. Release locking collar. Locking collar must engage fully over PTO shaft. Adjust and tighten stabilizer chains (5) on hitch to eliminate "side-sway" of tiller.

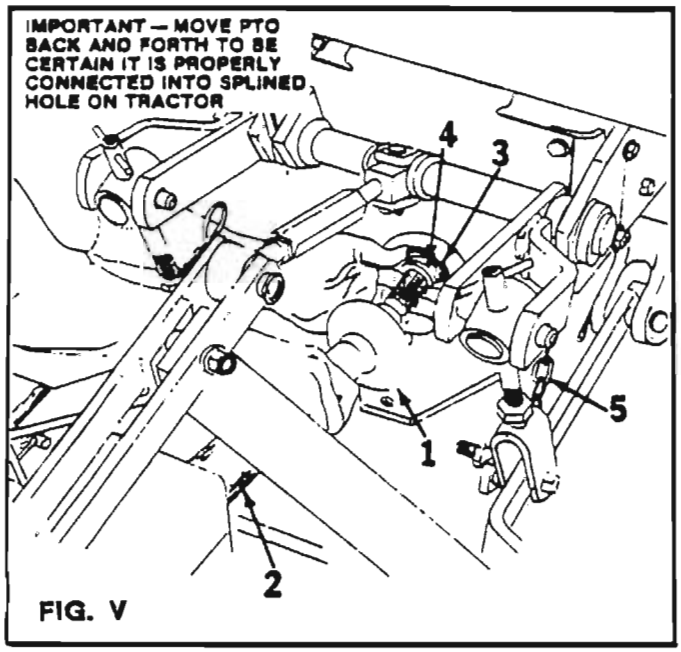


FIG. V

FIG VI IMPORTANT! Prior to use, your tiller must be filled with gear and axle oil (EP 90 or equivalent). Tiller should be level. Remove breather plug (1) and oil level plug (2). Fill with oil through breather plug hole (1) until oil seeps out level plug hole (2). Reinstall both plugs securely.

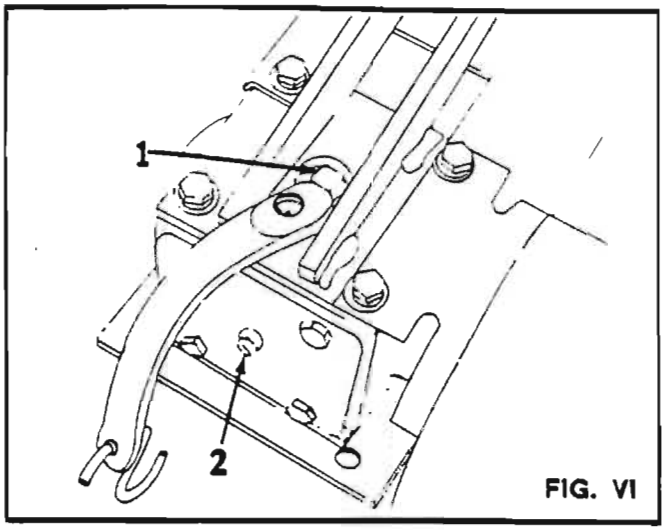


FIG. VI

LUBRICATION

CAUTION: Before lubricating tiller, place tractor controls in "Neutral", set parking brake, disengage PTO, stop engine and remove ignition key. Lower tiller to ground. Tiller should be level.

Oil leveler blade hinges and outer chain drive daily. Periodically grease telescoping PTO and check the gear box oil level. Fill gearbox by removing breather plug and oil level plug (Items 1 & 2, Fig VI). Fill with gear and axle oil (EP 90 or equivalent) until it seeps out level hole. Reinstall both plug securely.

Annually or at the end of each working season, remove outer chain drive (See Maintenance Section) and clean thoroughly with cleaning solvent or diesel fuel. Submerge chain in clean oil, allow it to drain completely, and then reinstall on tiller.

OPERATION

When to Till

For seed bed preparation, till the soil once in the fall. Decaying vegetation adds valuable nutrients to the soil by spring. However, if the terrain is extremely hilly or uneven, waiting until spring may reduce soil erosion. Erosion of soil by early spring rains will increase if soil is fall-tilled. The area, climate, and type of terrain will dictate the best time to till.

Moisture content of the soil will affect the quality of seedbed prepared when using the rotary tiller. It is not advisable to till soil which is too moist and forms large clods or balls of mud when tilled. Heavy clay soils tend to stay wet longer and form larger, harder clods when tilled too wet than lighter textured sandy or well-developed dark soils which are high in organic material. For this reason, it is more important not to till clay soils too early in the spring or after a rain.

NOTE: Test soil by compressing it in your hand. If the soil is easily compressed into a ball, it is too wet to till. If soil does not compress easily or falls apart, it is ready to till.

Tilling Tips

The following tips are offered as a guide to good tilling.

1. Do not till when soil is wet. Wet soil will stick to the shroud, tines, and tine shaft. Wet soil will dry out and become hard. This makes it difficult to maintain during the growing season.

2. Mow tall weeds or grass before tilling. Prevent them from wrapping on tines or tine shaft.

3. Pick up rocks, branches and other foreign material.

4. Check tines before tilling. Loose, bent, or broken tines reduce operating efficiency.

5. When tilling rocky areas, operate the tractor engine at ¼ throttle.

6. If soil is extremely hard, adjust tiller for shallow operating depth the first time over. Increase depth on the second pass over the area.

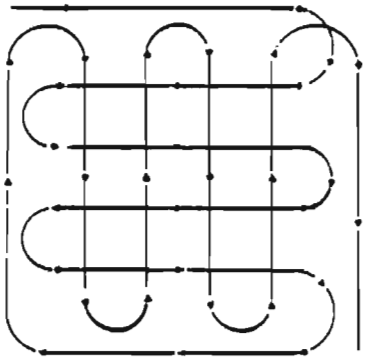
Note — In most conditions, two or more passes with tiller may be required to obtain the desired seed bed.

7. When tilling in virgin sod (ground not tilled for several years), it is advisable to have the area plowed the first time using your tiller for subsequent seasons. (Cont. on pg. 9)

Determining Tilling Pattern

Before beginning to till any area, the operator should determine the best tilling pattern. The size, shape, terrain and obstructions of the area to be tilled should be considered. Usually it is best to till the longest direction of the area to minimize turning. Typical patterns are shown in Fig VII.

CAUTION: Always raise the tiller before turning or backing to prevent damage to the tractor and tiller.



Cross-tilling for square garden area

Pattern for rectangular garden area

FIG. VII

Tilling Depth

The most desirable tilling depth for an area will vary according to its intended use. If seeds are to be planted, consideration should be given to the depth required to kill competing plant life, mix fertilizer, and prepare a good seedbed. In general, larger seeds should be planted deeper than smaller seeds. For example, corn is often planted two to three inches deep, whereas, the much smaller grass seed may be planted within the top ½ inch of soil. A good seedbed for grass seed can often be made by tilling only two to three inches deep. When planting larger seeds such as corn, a tilling depth of five or more inches may be desirable.

NOTE — The Tiller is designed for a depth of cut between 7"-8". Under some conditions, if the tiller is allowed to seek out this depth, the tiller could stall the tractor. The two skid shoes (1) on each side of the tiller can be held in any of five positions by placing the pin and spring clip (2) in various adjustment holes. Raise the skid shoes to provide greater tilling depth; lower them to give less depth. Both skid shoes should be positioned in the same adjustment hole to give uniform tilling depth. (See Fig. IX.) The seedbed must be fine enough to insure that the planted seed makes good enough contact with the soil to germinate. Smaller seeds usually require a finer seedbed than larger ones. In many cases, more than one pass of the tiller will be required to prepare a seedbed of proper depth and texture. For fine seedbed preparation, lower level blade to ground surface (See Fig. VIII.)

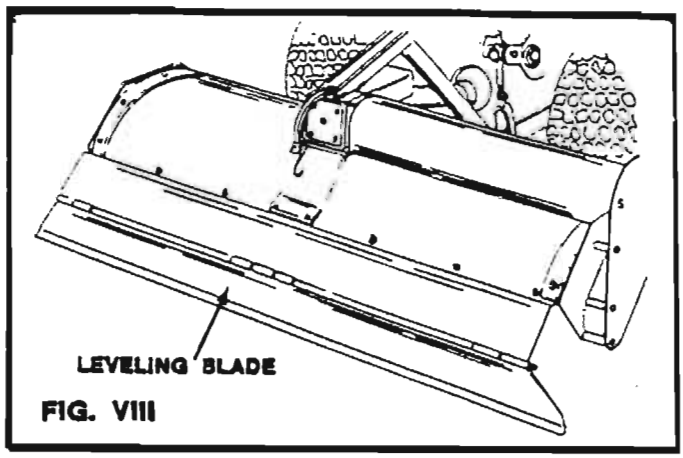


FIG. VIII

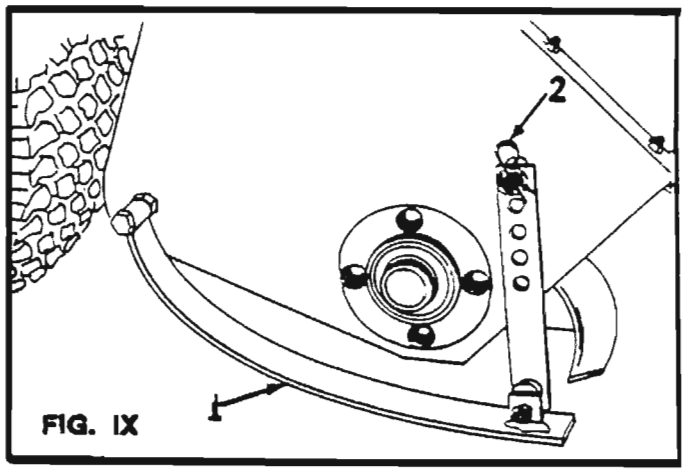


FIG. IX

Operating Tractor & Tiller

On tractors equipped with a hydrostatic transmission, throttle lever should operate the engine at full throttle while tilling. A two-speed axle should be in the "Low" range and the speed control lever should maintain a ground speed of ½ to 1 MPH for most conditions. The best ground speed will vary with the type of terrain, tilling depth and condition of soil. Prior to start of tilling, engage PTO clutch on tractor, slowly lower the tiller to the "FLOAT" position, and ease the speed control lever forward to desired ground speed; recommended is ½ MPH for tilling, 1 MPH for cultivating.

CAUTION If the tractor cannot till while in the "FLOAT" position (tractor stalls), the hydraulic lift control lever should be adjusted for a more shallow cut.

On tractors equipped with manual transmissions, place a two-speed axle into the "LOW" range, choose first or second gear and vary the throttle from ¼ full to full as necessary to achieve the desired ground speed; recommended is ½ MPH for tilling, 1 MPH for cultivating.

CAUTION: During tiller operation, if obstructions are hit or an emergency situation arises, STOP all movement: put tractor controls to "NEUTRAL", apply foot brakes, disengage PTO, shut off tractor engine and remove ignition key. Repair damage prior to resuming operation.

DETACHING TILLER

FIG X With tractor engine stopped and ignition key removed, place wood blocks (1) under frame assembly as shown to prevent tiller from tipping over when disconnected from tractor 3-point hitch (2). Remove top link pin (3) and hairpin cotter (4) and reinstall on tractor 3-point hitch. Disconnect telescoping PTO (5) by pushing locking collar forward and pulling PTO aft. Next, disconnect lower link pins (6) and hairpin cotters (7) and reinstall on tiller for future use. Drive slowly away from tiller.

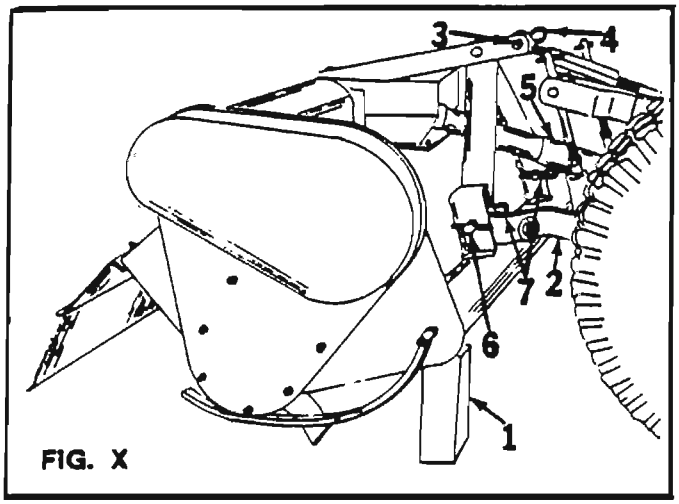


FIG. X

STORAGE

The following storage tips should be performed at the end of each tilling season to provide longer and most efficient service from the tiller.

1. Remove tiller from tractor using procedure in this manual (See Detaching Tiller Section).

2. Thoroughly clean the tiller and remove all material that may have built up under the shroud and on the tines.

3. Remove the external drive chain and clean thoroughly with cleaning solvent or diesel fuel. Submerge chain in clean oil, allow it to drain completely, then re-install on tiller.

4. Remove rust from any exposed metal and cover the areas with paint as necessary. Replace any damaged or lost "CAUTION" decals.

5. Lubricate tiller as recommended in the lubrication section of this manual.

6. Lightly oil moving parts, including tines to prevent rusting.

7. Tighten all loose bolts. Tine retaining bolts should be torqued to 50-55 foot pounds.

8. Store tiller in a dry place.

MAINTENANCE

CAUTION: Before making any adjustments, disengage PTO, shut off engine, lower tiller to ground, (make sure tines have stopped), and remove ignition key.

FIG. XI — Outer Chain Drive Adjustment
Remove the 5/16" x ½" hex bolts (1) holding the outer shield (2) in place. Loosen the chain idler adjusting bolt (3) and move the idler (4) toward the chain until the chain has approximately ¼" movement at center. Retighten adjusting bolt and check chain tension. **IMPORTANT — Do not overtighten bolt.** Reinstall outer shield.

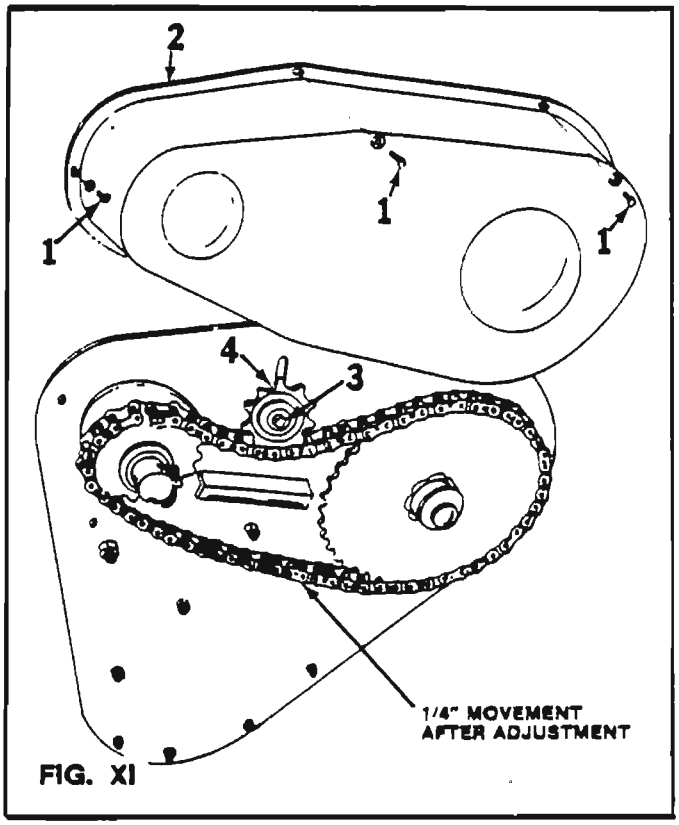


FIG. XI

FIG. XII — Replacing Outer Chain Drive
Remove the 5/16" x ½" hex bolts holding the outer chain drive shield (**Refer to Fig. XI**). Loosen chain idler adjusting bolt (1) and move idler (2) away from chain. Detach master link (3) and remove chain. Replace with new Roller Chain, adjust tension as in **Fig. XI**, and replace shield.

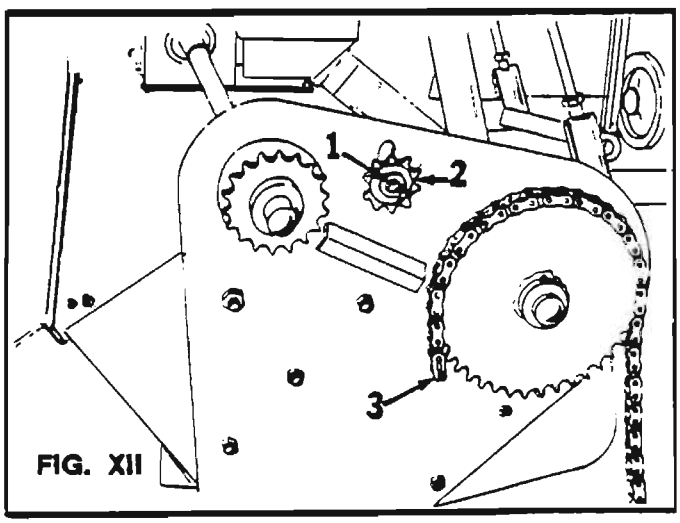


FIG. XII

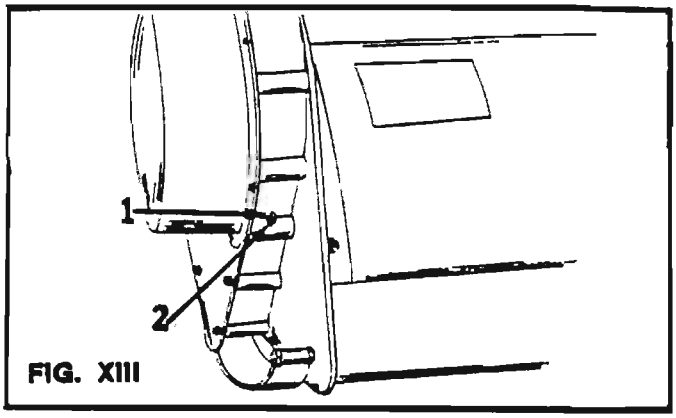


FIG. XIII

FIG XIII — Enclosed Chain Drive Adjustment
Raise tiller to clear tines from ground. Disengage PTO, shut off engine and remove ignition key. Loosen jam nut (1) and turn adjusting screw (2) "In" until a slight drag is felt on chain. Move tines back and forth by hand until chain slack or "backlash" is felt. Continue to turn adjusting screw (2) "in" while moving tines until backlash is removed and a slight drag is felt on chain. Turn adjusting screw (2) "out" approximately ½ turn or as necessary until tines turn freely. Tighten jam nut (1).

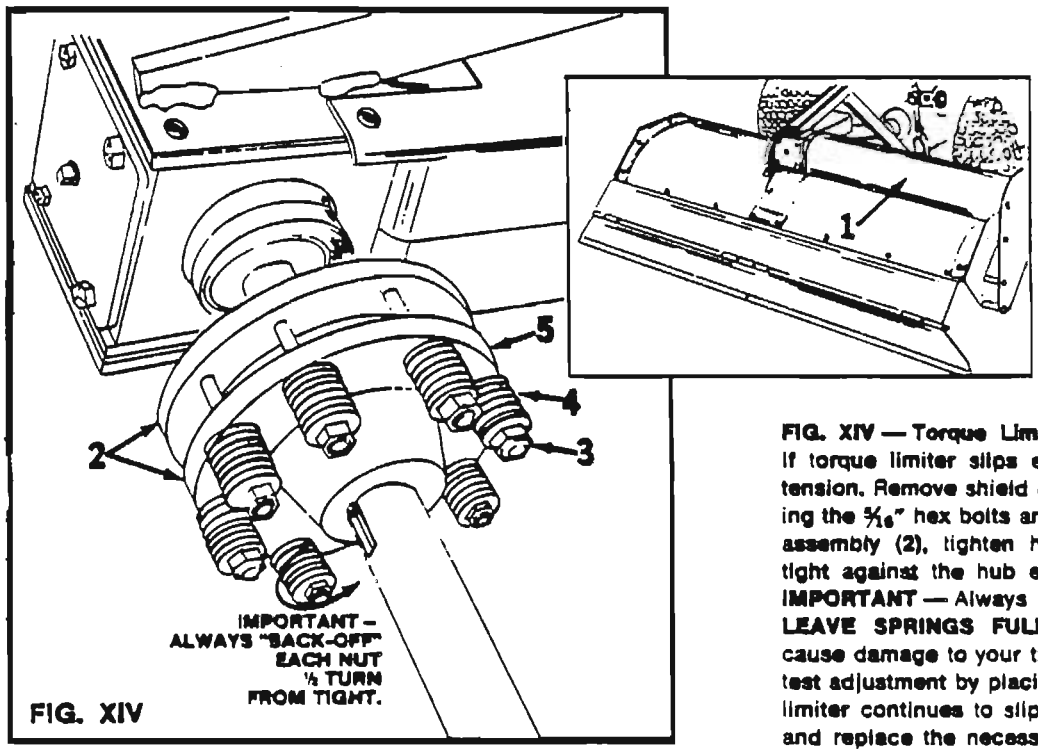


FIG. XIV

FIG. XIV — Torque Limiter Adjustment
If torque limiter slips excessively, check and adjust spring tension. Remove shield (1) from top of tiller shroud by removing the 5/16" hex bolts and lock washers. On the torque limiter assembly (2), tighten hex lock nuts (3) until spring (4) is tight against the hub end plate (5), then back off ½ turn. **IMPORTANT** — Always adjust in this manner — **DO NOT LEAVE SPRINGS FULLY COMPRESSED.** Doing so could cause damage to your tiller or tractor. Replace shield (1) and test adjustment by placing tiller under normal load. If torque limiter continues to slip excessively, have your dealer check and replace the necessary parts if worn.

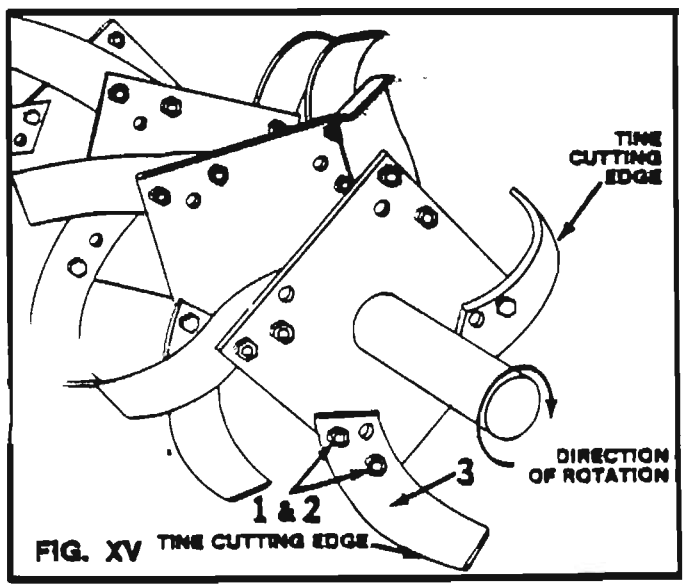


FIG. XV

FIG XV — Tine Replacement
If tine replacement should become necessary, detach tiller (See Detaching Tiller Section) from tractor, hook leveler blade in up position, and place tiller upside down. Remove flanged hex bolts (1) and flanged hex lock nuts (2) and replace broken or worn tine (3) with tine marked "BR" (right-hand) or marked "BL" (left-hand). Tighten flanged hex bolts and nuts. They should be torqued to 50-55 foot pounds. **IMPORTANT:** Always install tine with cutting edge facing direction of rotation and positioned as shown in **Fig XV.** When all tines are assembled properly, the four rows of tines should appear to be in a "spiral" pattern around the tine shaft. Refer to imprint stamp on tine when ordering replacement tines. Always tighten hardware to specified torque.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Insufficient traction (wheels skid).	Wheel weights and/or cleat tread tires not installed.	Install one or two wheel weights to each rear wheel and use cleat tread tires or chains on turf tires.
Tines do not rotate.	PTO drive belt(s) slipping.	Adjust belt tension (See adjustment section in your tractor manual).
	Torque Limiter slipping excessively.	Adjust (See page 11).
	Material wrapped around tine shaft (Rock or stump wedged between tine and housing).	Remove material wrapped or wedged around shaft.
Tines rotate but tiller does not till.	Chains climb sprocket teeth.	Adjust chain tension (See page 10/11).
	Ground too hard.	Set tiller depth for shallow penetration, then deepen progressively.
	Ground too wet (Dirt and weeds on tine shaft).	Postpone tilling (See page 5 for proper soil condition).
	Tines do not dig.	Cutting edge of tines must be installed toward direction of rotation (See page 11).
	Tall grass or weeds wind on tines.	Cut, burn or defoliate long material prior to tilling.
	Tiller climbs out of ground and propels tractor forward.	Till at a shallower depth — add wheel weights to tractor. Tractor Lift should be in "Float" position.
Erratic operation of tiller.	Tine shaft rotates with clutch disengaged —	PTO belt clutch improperly adjusted. (See adjustment section for your tractor).
	Material wrapped on tines/shaft.	Remove foreign materials from the tine shaft.
	Tine shaft jerks (rotates erratically).	Tine shaft out of balance. Replace any broken tines. (See page 11).
		Torque limiter discs worn out. See your dealer for service.
		Torque limiter spring pressure incorrect (See page 11)
Tiller noisy/vibrates excessively in transport position.	Tractor hitch adjusted for excessive transport height — PTO shaft at undesirable angle.	Readjust lower link arms on tractor hitch for not more than 16" of clearance. (Measured from ground to center of lower link pins with hitch in "UP" position).