# FORD

# ROTARY TILLERS

**MODELS: 09GN-1200/1023**

# REPAIR MANUAL



**Reprinted**

# TABLE OF CONTENTS

**3 H.P. CHAIN DRIVE ROTARY TILLER**
(Model 09GN-1200)



IMPORTANT: The replacement of any part on this product by other than the manufacturers' authorized replacement part may adversely affect the performance, durability or safety of this product.

The manufacturer reserves the right to make changes on and to add improvements upon its products at any time without notice or obligation. The manufacturer also reserves the right to discontinue manufacture of any product at its discretion at any time.

Notice to Serviceman in the State of California — The engine on this unit is NOT equipped with a spark arresting muffler.

IMPORTANT: USE OR OPERATION OF THIS ENGINE ON ANY FOREST COVERED, BRUSH COVERED, OR GRASS COVERED LAND WITHOUT A STATE APPROVED SPARK ARRESTOR IN EFFECTIVE WORKING ORDER CONSTITUTES A VIOLATION OF THE LAW OF THE STATE OF CALIFORNIA.

# 3-H.P. (09GN-1200)

# INTRODUCTION

This manual contains service and maintenance instructions for a 3 H.P. Chain Drive Rotary Tiller. It has been prepared to provide the serviceman with the information needed to correctly service and maintain a rotary tiller. All sections of this manual should be carefully studied by the serviceman before beginning to work on the tiller.

ALL WARNINGS used throughout this manual should be heeded and followed very closely. Failure to obey these rules could result in personal injury or death to yourself or others.

All references made to the left side, right side, front and rear are given from the operator's position.

# SAFETY

**Safety is No Accident . . . . . Be Alert!**

**This symbol is used to attract your attention to the safety precautions that should be understood by the servicemen to avoid accidents.**

Please read and follow these instructions on safety procedures before servicing the tiller.

### PERSONAL CONSIDERATIONS:

1. Never let shop rags, used for cleaning, lay around to become fire hazards.
2. Always use safety glasses when servicing or inspecting the tiller.

### EQUIPMENT CONSIDERATIONS:

1. Always disconnect spark plug wire and ground wire in "V" Groove provided on top of engine. This must be performed every time any servicing is done. This will prevent accidental starting of engine.
2. Always store gasoline or flammable solvents used for cleaning in closed containers specifically designed for that purpose.
3. Before cleaning, servicing or inspecting tiller, make certain all moving parts have stopped and engine and exhaust assemblies have cooled down.
4. Be sure all tools and cleaning materials are removed before starting tiller.
5. Never operate tiller without proper guards, plates or other safety protective devices in place.

### OPERATIONAL CONSIDERATIONS:

1. Do not start or run the engine indoors. Fumes from engine exhaust can kill.
2. If equipment should start to vibrate abnormally, stop engine and check immediately for the cause. Vibration is generally a warning of trouble.
3. If test running is required, make sure you are thoroughly familiar with the complete operation of the tiller. Know how to stop the tiller.
4. Be sure that all parts are securely fastened before starting tiller.
5. Disengage clutch before starting engine. Keep hands, feet and clothing away from power-driven parts.
6. Never store tiller with gasoline in the tank inside a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.

## IDENTIFICATION PLATE LOCATION

The tiller model and serial number identification plate is located on the inside surface of the lower right handle bracket (Fig. 1)

Refer to engine manufacturer's service literature for location of engine model and serial numbers.

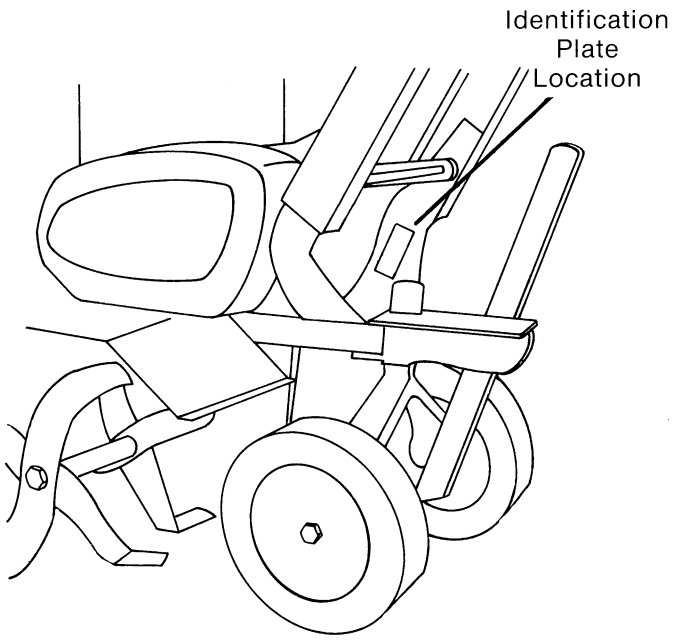


**FIG. 1**

**Whenever you see this symbol it means:**
**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

# SET-UP INSTRUCTIONS

## HANDLE

Mount handle assembly to handle support bracket using four acorn head bolts. Install the lower bolts first, the middle and upper mounting holes on handle will determine at which height the handle will be positioned. Insert upper bolts and secure with nuts and lockwashers. (Fig. 2)

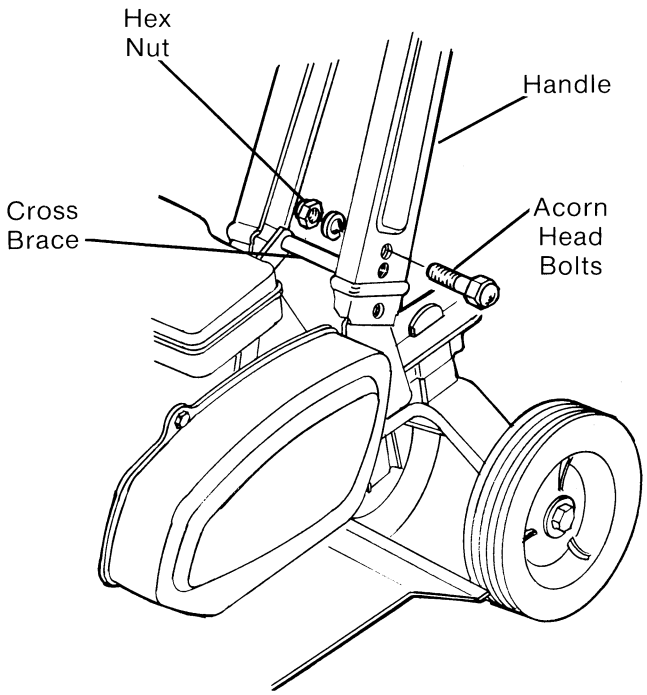


**FIG. 2**

Slide handle grips over end of handle tubes. Use a rubber mallet to tap grips into place only if necessary. (Fig. 3)

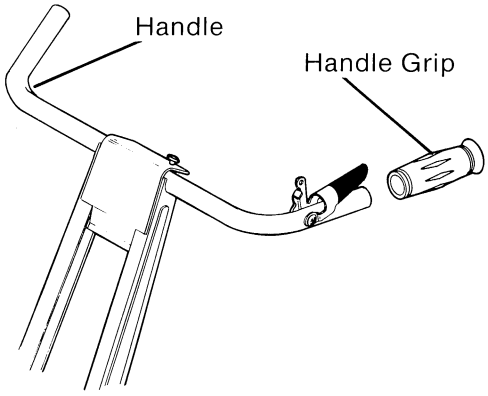


**FIG. 3**

## THROTTLE CONTROL CABLE

Route throttle cable between handle and above cross brace. Back nut off the threaded area of throttle cable. Slide threaded portion of cable into slot on back of handle (Fig. 4) Slide lockwasher and nut up and secure throttle cable to control handle.

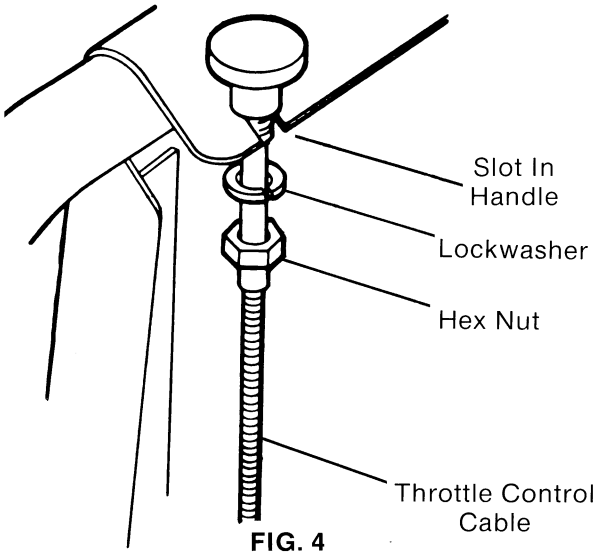


**FIG. 4**

## CLUTCH CONTROL CABLE

Hook open end of spring in hole on clutch lever, (Fig. 5) NOTE: Hook spring through right side of hole first or it will bind under handle when connected to cable.

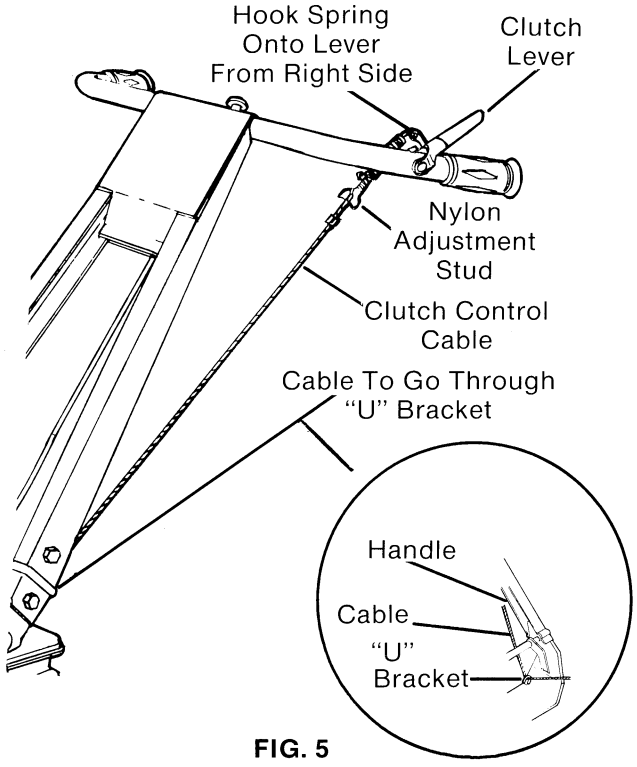


**FIG. 5**

Nylon adjustment stud is turned 10 full turns into end of adjuster spring, as shown in (Fig. 6). (Note: If readjustment becomes necessary follow instructions in Fig. 6 to turn stud easily.)

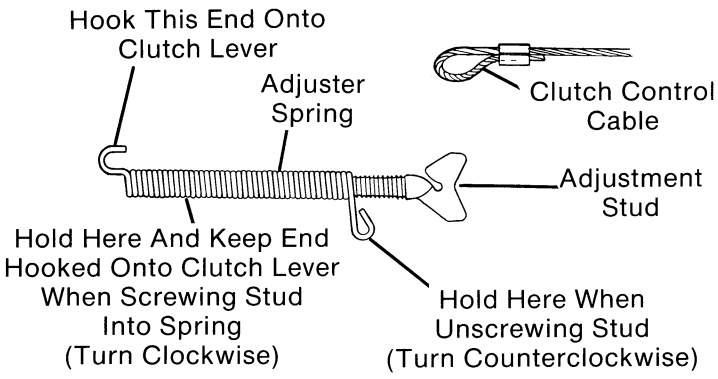


**FIG. 6**

Hook one side of "S" hook onto cable, hook other side of "S" hook onto idler arm, (Fig. 7)

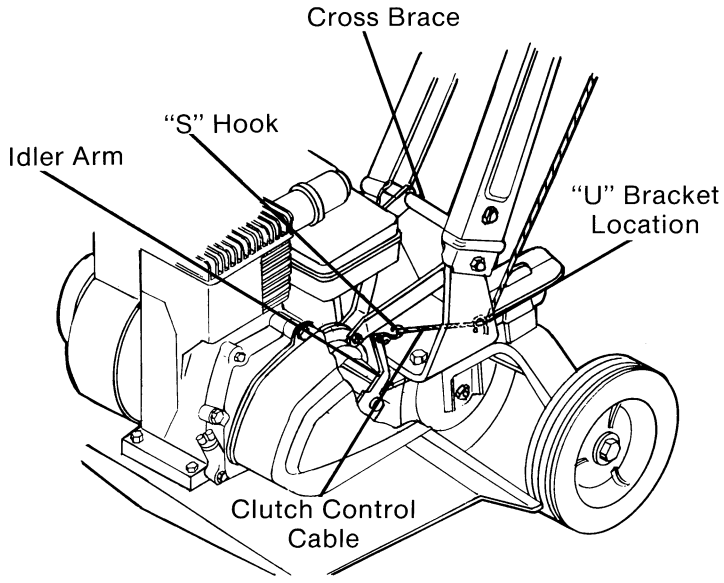


**FIG. 7**

With clutch lever up and spring under handle, slide other end of cable onto hook on nylon adjustment stud, (Fig. 5). Note: Be sure cable runs straight from idler arm to "U" bracket (BELOW cross brace shown in Fig. 7) then to adjustment stud.

Follow procedure in "Adjustment and Servicing" to adjust clutch control lever.

# LUBRICATION AND MAINTENANCE

**WARNING: To avoid injury, stop engine, wait for all movement to stop. Disconnect spark plug wire from spark plug and ground to engine before lubricating or servicing tiller.**

1. Engine - Engine oil level must be checked periodically to insure proper oil level is maintained. See engine manufacturer's maintenance instructions for the proper type and quantity of oil to use.

   IMPORTANT — If engine is run without oil, engine damage will result.

2. WHEELS - Remove, clean and lubricate wheels once a season for average home use using SAE 30 wt. oil.

3. IDLER PULLEY SHAFT - Oil shaft (Fig. 8) once a season for average home use using SAE 30 wt. oil. Turn idler pulley while oiling to distribute oil evenly. NOTE: Be careful not to get any oil onto the belt.

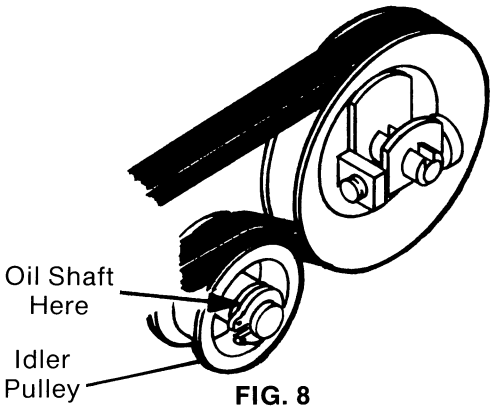


**FIG. 8**

4. CHAIN CASE - To check oil level of tiller chain case raise handle until it is approximately straight up and down. Wipe dirt from around oil fill screw and remove, (Fig. 9).

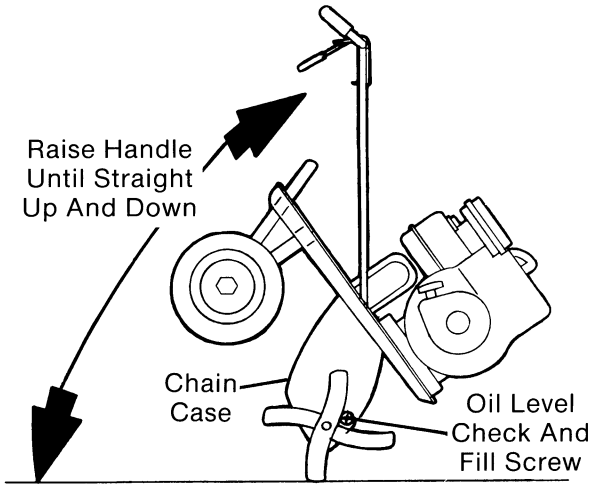


**FIG. 9**

Oil should be level with the bottom of oil fill screw hole in this position. If it isn't, add SAE (EP) 140 wt. heavy duty oil to bring oil up to proper level. Replace oil fill screw after oil is at proper level. The oil level should be checked after every 25 hours of operation, or if there are signs of continuous leakage.

# ADJUSTMENT AND SERVICING

**WARNING: To avoid injury, never attempt to make adjustments on the tiller while it is in operation or while the engine is running. Always turn engine off before attempting to make any adjustment and disconnect spark plug wire and ground to engine.**

## ENGINE

1. See Engine Manufacturer's Instruction Manual for all adjustments and servicing information.
2. Maximum engine RPM high speed operating no load range is, 3100 RPM to 3300 RPM.
3. **ENGINE REMOVAL AND REPLACEMENT —**

**WARNING: To avoid accidental starting, disconnect spark plug wire and ground to engine.**

A. Drain gas and oil from engine.

B. Disconnect throttle cable at engine, by loosening throttle cable clamp screw enough so that cable can be removed. Disconnect cable end from governor speed control lever. (Fig. 10)

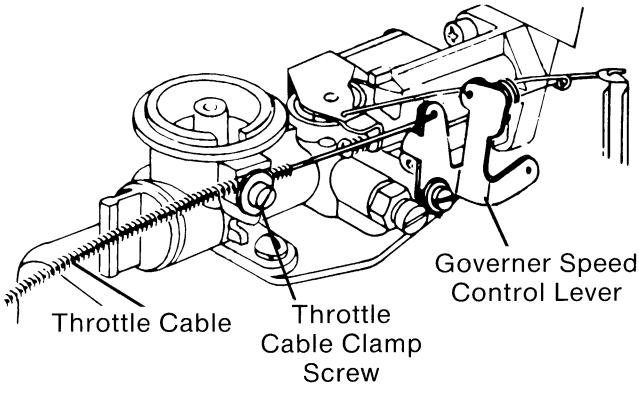


**FIG. 10**

C. Remove belt guard from tiller by removing capscrew at top of belt guard and screw under belt guard. (Fig. 11)

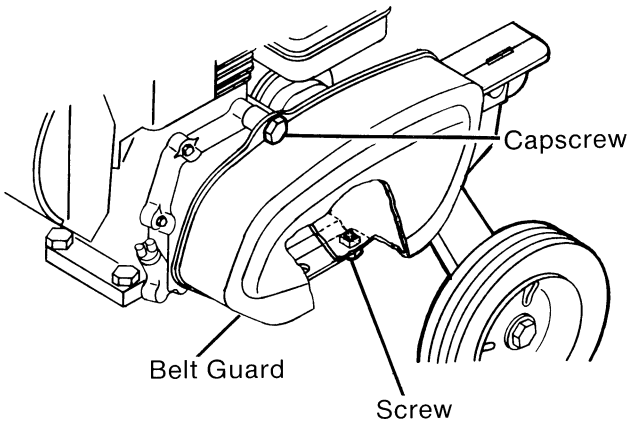


**FIG. 11**

D. Remove belt by slipping belt over front of engine pulley and turn pulley until belt comes off. Remove from rear input pulley. (Fig. 12)

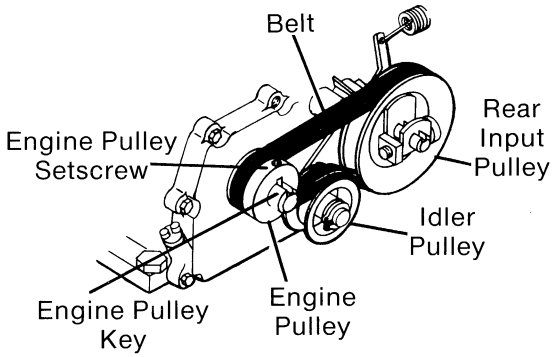


**FIG. 12**

E. Remove engine pulley and engine pulley keys from engine crankshaft by loosening two setscrews on engine pulley (Fig. 12)

F. Remove four engine mounting capscrews, lockwashers and nuts at base of engine. Engine is now loose and can be removed from tiller frame.

G. To replace engine reverse above procedure until you reach the point of connecting the throttle control cable. Then follow this adjustment procedure: Push throttle control knob in all the way to the STOP position. Attach end of throttle cable to governor speed control lever and slip cable under cable clamp. Move cable forward until governor speed control lever has reached its forward most point. Tighten cable clamp screw.

H. Refer to engine manufacturer's manual for all lubrication and fuel requirements.

**4. BELT ADJUSTMENT**

No adjustment required.

**5. BELT REPLACEMENT**

The belt on this tiller was specifically designed and engineered to provide long, trouble-free service. If belt replacement is required, use **only** the belt recommended by manufacturer to be sure you have a belt that will provide the life and service required.

**TO REPLACE BELT:**

A. Remove belt guard from tiller by removing cap screw at top of belt guard and screw under belt guard. (Fig. 11)

B. Remove old belt by slipping belt over front of engine pulley, (Fig. 12), and turning pulley until belt comes off. Remove from rear input pulley.

C. Replace with new belt. When replacing belt, fit belt around rear input pulley first and then around front of the engine pulley,(Fig. 12).

D. Replace belt guard. THE BELT GUARD MUST ALWAYS BE SECURED TO TILLER BEFORE OPERATING.

## THROTTLE CONTROL REPLACEMENT:

The throttle control assembly is a complete assembly and should be serviced as a unit only. To replace throttle control assembly, proceed as follows:

1. Disconnect throttle cable at engine, by loosening throttle cable clamp screw enough so that cable can be removed. Remove cable end from governor speed control lever. (Fig. 10)
2. Remove nut and lockwasher from threaded end of throttle cable. Slide cable out of slot on handle. (Fig. 13)
3. To replace throttle control assembly, slide new cable into slot on handle and secure with lockwasher and nut.(Fig. 13)
4. Push throttle control knob in all the way to the STOP position.
5. Attach end of throttle cable to governor speed control lever and loosen throttle cable clamp screw so that throttle cable can be slipped into place. (Fig. 10)
6. Move cable forward until governor speed control lever has reached its forward most point.
7. Secure throttle cable by tightening cable clamp screw. (Fig. 10)

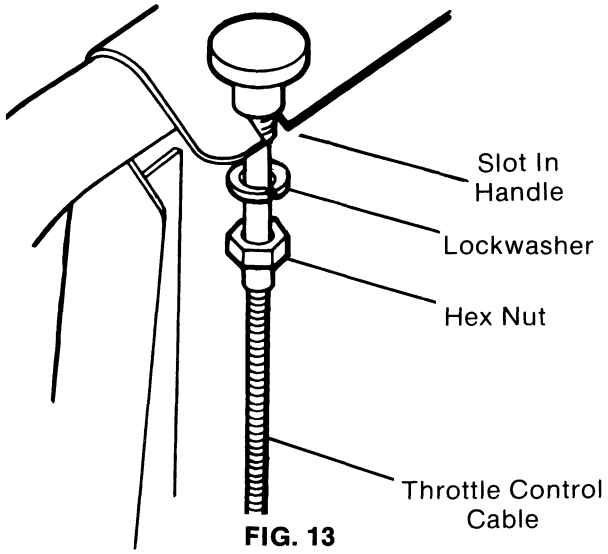


**FIG. 13**

## CLUTCH CONTROL ADJUSTMENT:

If the clutch cable is too loose during assembly or as a result of belt wear it may cause slippage and poor performance. If the cable is too tight it will cause tines to turn and tiller to move even when the clutch lever is in the neutral (up) Position.

**⚠ WARNING: To avoid accidental starting while adjusting clutch cable disconnect spark plug wire from top of plug and ground to engine. Push throttle control all the way in..**

The correct adjustment is made by slightly overtightening then loosening the clutch cable as follows:

IMPORTANT: When adjusting and operating tiller clutch cable must run through "U" shaped bracket. (Fig. 14)

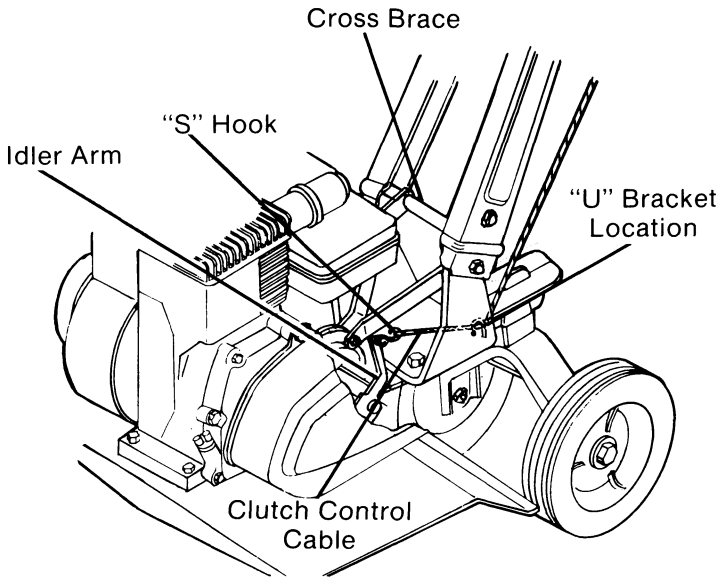


**FIG. 14**

1. Push down on handle to raise tines off of ground and pull engine starter rope slowly with clutch lever released (up).

   A. If tines move when rope is pulled, go to step 2.

   B. If tines do not move tighten cable by turning nylon adjustment stud one full turn clockwise into spring (Fig. 15) and again pull starter rope with tines off the ground and clutch lever up (released). Repeat tightening procedure until tines move, then go to step 2.

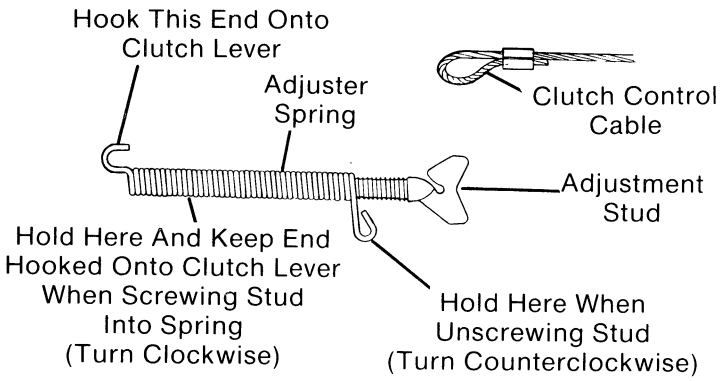


**FIG. 15**

2. Now loosen cable (turn stud counterclockwise) just enough so there is no movement of the tines when starter rope is pulled with tines off the ground and the clutch lever up (released). Be certain cable still runs through "U" bracket on bottom of handle support. (Fig. 14)

3. When cable is adjusted correctly reattach spark plug wire to spark plug.

## CHAIN CASE

NOTE: The chain case used in this style tiller is die cast and riveted together. Under warranty it is replaced as a complete assembly. Out of warranty repairs or rebuilding may be performed at the customer's discretion.

### 1. REMOVAL AND REPLACEMENT

**WARNING: To avoid accidental starting, disconnect spark plug wire and ground to engine.**

A. Remove belt guard cover, which is secured with two screws.(Fig. 16)

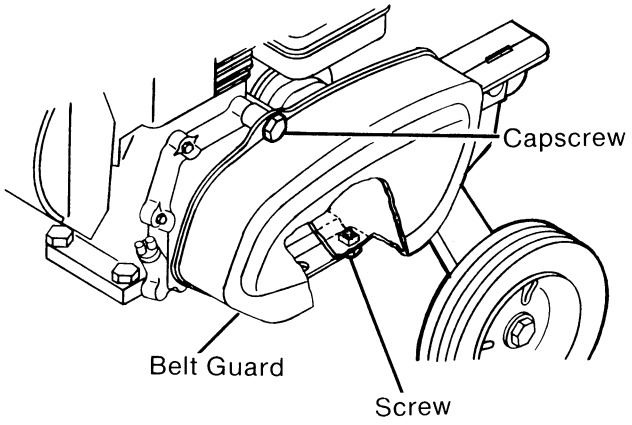


**FIG. 16**

B. Remove belt from pulleys

C. Disconnect throttle cable at handle by removing lockwasher and nut and sliding cable from its slot on handle. (Fig. 13)

D. Remove clutch cable from"S" hook and remove "S" hook from idler arm. (Fig.14)

E. Remove four bolts securing engine to frame and lift engine from unit. Then remove tine shield.

F. Remove three bolts securing chain case to the unit. (One on cross brace support bracket and two holding chain case between the frame.) (Fig. 17)

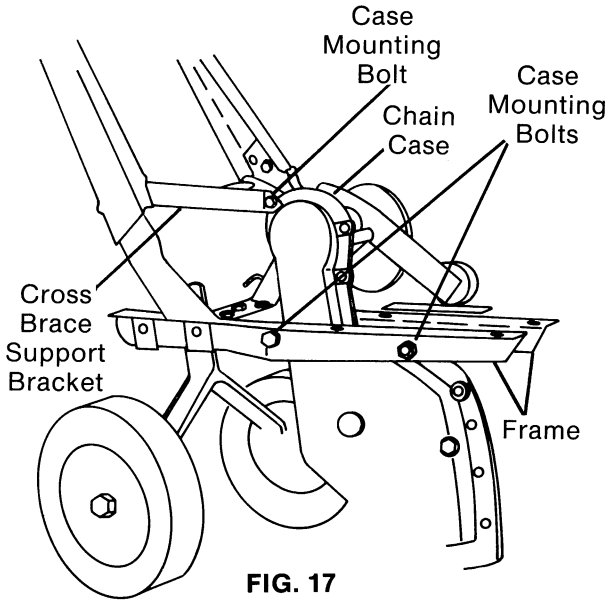


**FIG. 17**

G. The frame will have to be spread apart slightly so that chain case can be removed. A simple frame spreader can be made by using a 5/16"x4" bolt full thread or a similar piece of threaded rod, two nuts and two washers.

Remove two front capscrews, lockwashers and nuts holding handle support bracket to frame and loosen the two rear capscrews (do not remove) (Fig. 18). Insert threaded rod thru second hole from front of frame. (Fig. 17) Install a washer, nut another nut and the second washer. Continue threading the first nut until bolt becomes tight. Using wrenches, turn nuts in opposite directions so frame spreads (Fig. 19). Separate frame just enough to allow chain case to be removed from frame.

Note: When pulley is reinstalled the clamp bolt must be torqued to 60 to 84 in./lbs.

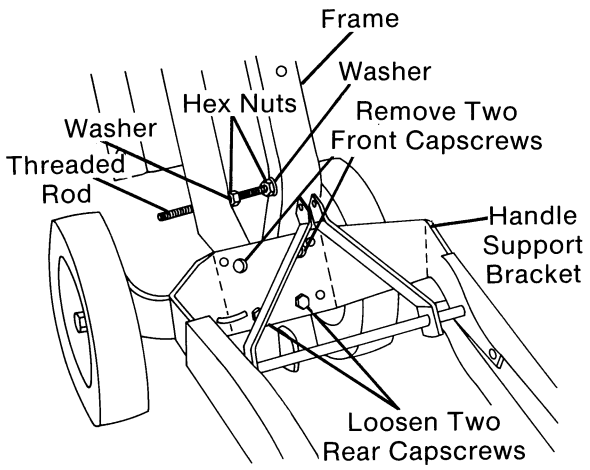


**FIG. 18**

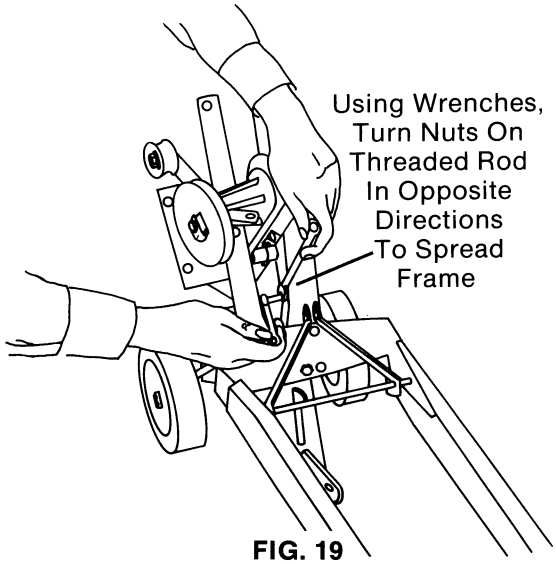


**FIG. 19**

H. Remove input pulley by loosening bolt clamping pulley to shaft. (Fig. 20)

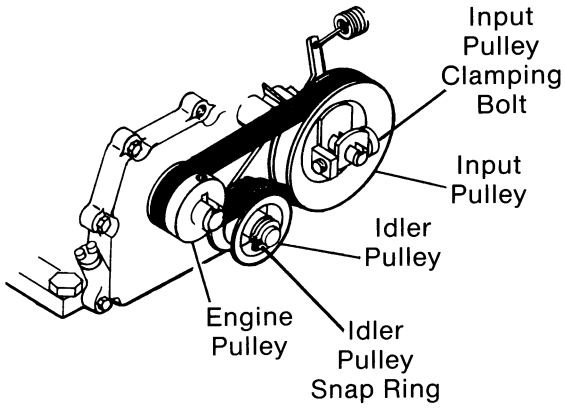


**FIG. 20**

I. Remove idler pulley by removing snap ring from idler shaft. (Fig. 20) Idler shaft and arm is a part of the chain case and cannot be replaced as an individual component under warranty.

NOTE: Lubricate new shaft and idler when reassembling, with No. 2 wheel bearing grease or Ford 1T-M1C137-A grease.

J. Remove tine bolts, tine washers, tines, bushings, tine extensions, seal collar assembly, felt seals and backup washers. (Fig. 21)

K. Reverse procedure to install new chain case.

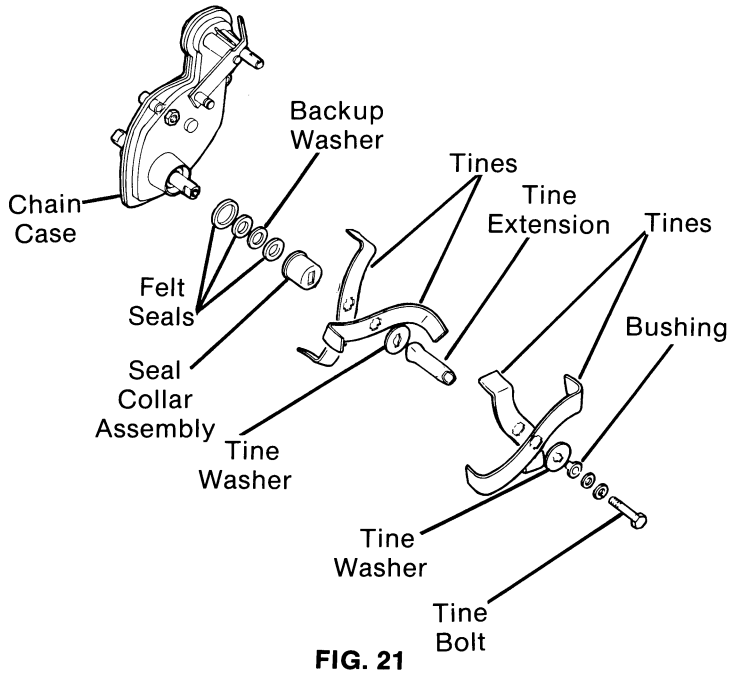


**FIG. 21**

**2. CHAIN CASE REBUILD** (This procedure is **not** covered under warranty)

**DISASSEMBLY:** (Fig. 23)

A. Remove chain case as described in step 1.

B. Clean chain case. Remove any burrs or sharp edges from input and output shafts with file or emery paper.

C. Lightly clamp chain case in a vice and drill off the peened over end of rivets with a ⅜" drill bit. Then punch out the remainder of rivet with a ⅛" pin punch.

D. Tip chain case on its left side and lift right side cover from left side and drain lubricant.

E. Check and inspect for broken chain links, chipped or worn sprocket teeth and excessive radial play in input shaft. Replace any worn parts.

F. Idler arm assembly can be removed by removing snap ring on inside of chain case. (Fig.22) Remove idler washer under snap ring and pull shaft out. NOTE: Replace shaft O-ring with a new o-ring when reinstalling idler arm assembly.

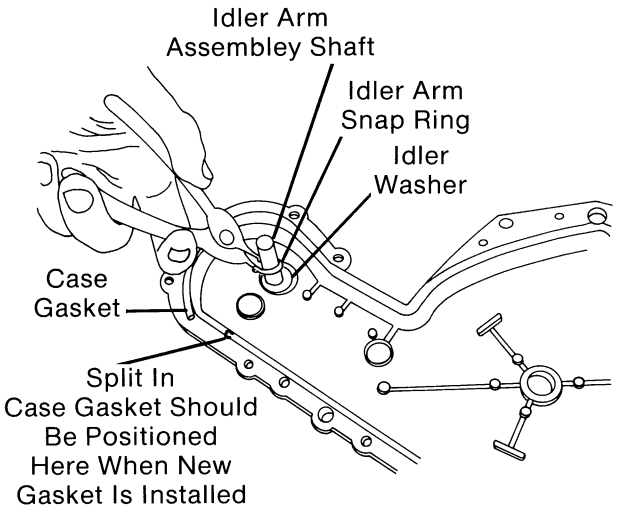


**FIG. 22**

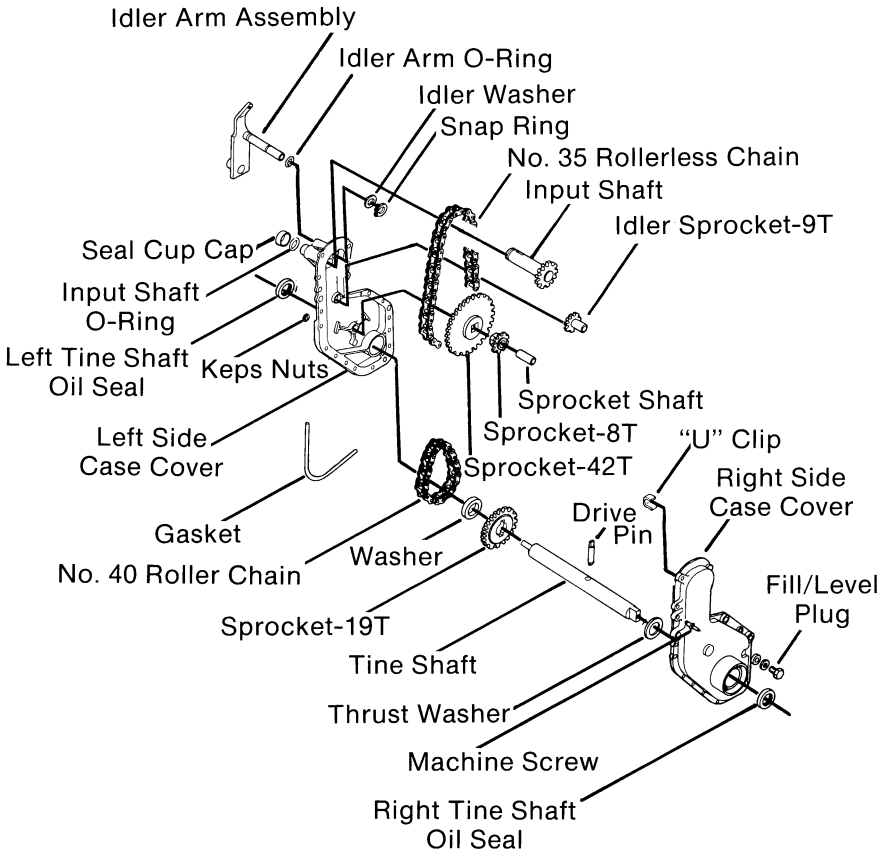


**FIG. 23**

G. For ease of disassembly, remove remainder of chain case parts in this order: (Fig. 23)

   a. Remove tine shaft, thrust washer and drive pin.

   b. Remove No. 40 roller chain, 19 tooth sprocket and washer.

   c. Remove sprocket shaft and 8 tooth sprocket.

   d. Remove No. 35 rollerless chain, 42 tooth sprocket and 9 tooth idler sprocket.

   e. Remove input shaft. NOTE: Input shaft bushings, pressed into left side housing, can **only** be serviced by ordering a new left housing with bushings.

H. Input shaft O-ring can be removed by prying off seal cup cap. NOTE: once seal cup has been removed, it should have been damaged enough that it cannot be used over. Replace **only** with a new seal cup.

   IMPORTANT — Both input shaft O-ring and tine shaft oil seals should be replaced **only** as new parts.

I. Tine shaft oil seals can be removed by punching seals out from inside of chain case, Remove both right case and left case oil seals.

**ASSEMBLY:** (Fig. 23)

A. Place left and right side chain case on bench with inside of cases down.

B. Install both new tine shaft oil seals into left and right side of chain case.

C. Lightly grease and install new input shaft O-ring into left side chain case. Install a new seal cup cap by tapping into place using a hammer.

D. Turn left side chain case over to install sprockets and chains.

   IMPORTANT: Input shaft and tine shaft should be checked for any burrs or sharp edges before inserting into chain case. Remove burrs or sharp edges with file or emery paper. Seal may be damaged if burrs or sharp edges are not removed.

E. Wrap No. 35 rollerless chain around 42 tooth sprocket. Insert input shaft and 9 tooth idler sprocket into chain case. Wind chain around input shaft sprocket and under idler sprocket.

F. Insert sprocket shaft and slip 8 tooth sprocket onto shaft. The squared end of 8 tooth sprocket must fit into 42 tooth sprocket.

G. Wrap No. 40 roller chain around 19 tooth sprocket. Position tine shaft washer on tine shaft mounting hole. Wind chain around 8 tooth sprocket and position 19 tooth sprocket with chain onto tine shaft washer.

H. Insert drive pin into tine shaft. Slip thrust washer onto tine shaft.

   IMPORTANT — Thrust washer must be installed on the proper side of drive pin. Measure from center of drive pin hole to end of shaft. One side measures approximately 3¾" the other approximately 4¼". Thrust washer must go onto shaft from the side that measures 3¾".

I. Carefully slide tine shaft, from end opposite thrust washer, thru 19 tooth sprocket, tine shaft washer and oil seal. Align drive pin so it drops into drive slots on 19 tooth sprocket.

   IMPORTANT: Before installing tine shaft check both ends of shaft for any burrs. Any burrs may cause damage to tine shaft oil seals.

J. Install idler arm assembly and on inside of case slip idler washer over end of idler shaft and secure shaft with snap ring.

   IMPORTANT — Idler shaft O-ring should be replaced before reinstalling idler arm assembly.

K. Grease perimeter chain case gasket groove with No.2 wheel bearing grease or Ford 1T-M1C137-A grease and install gasket. DO NOT stretch gasket.

   IMPORTANT: Case gasket is a split type gasket. When gasket is properly installed the split should be at the top of chain case (idler end). (Fig. 22)

L. Holding chain case level, pour in 8 oz. of special SAE (EP) 140 wt. gear lubricant (Part no. GB-4890 8 oz. can)

M. Finish assembly by installing right side chain case onto left.

   Fasten case halves together with seventeen No. 10-24 x ¾" slotted round head machine screws (Part No. GB-70387) and No. 10-24 keps locknuts (Part No. GB-70610)

N. Reinstall chain case into tiller frame.

## TINE REPLACEMENT AND TILLING WIDTHS

### TILLING WIDTHS

This tiller is equipped so that four different tilling widths can be selected (7", 12", 17" and 22") by interchanging tines or removing outer tines and extensions altogether, as shown below. (Fig. 24)

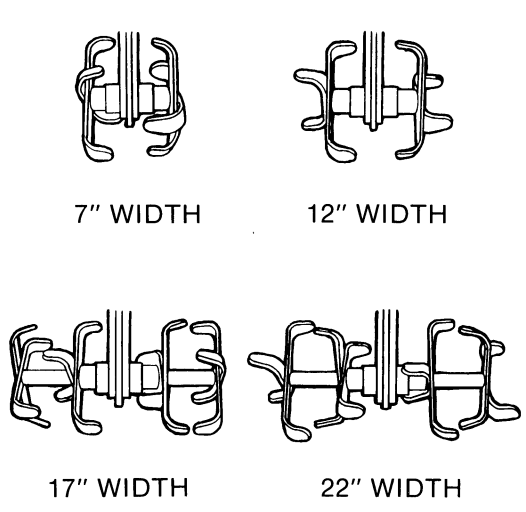


**FIG. 24**

### TINE REPLACEMENT

**WARNING: To avoid accidental starting while making adjustments or removing tines always turn engine off push throttle control all the way in and disconnect spark plug wire and ground to engine.**

1. Drain gas from tank.
2. Tilt tiller backwards until handle rests on the ground.
3. Loosen and remove tine bolt. Once tine bolt is removed all tines, extension and washers will be loose. Make sure proper sequence of parts are followed when reassembling. The proper sequence is as follows starting from chain case tine shaft. (Fig. 25)
   - A. two tines
   - B. one tine washer
   - C. one tine extension
   - D. two tines
   - E. one tine washer
   - F. one bushing, flat washer, lockwasher and fasten with tine bolt.

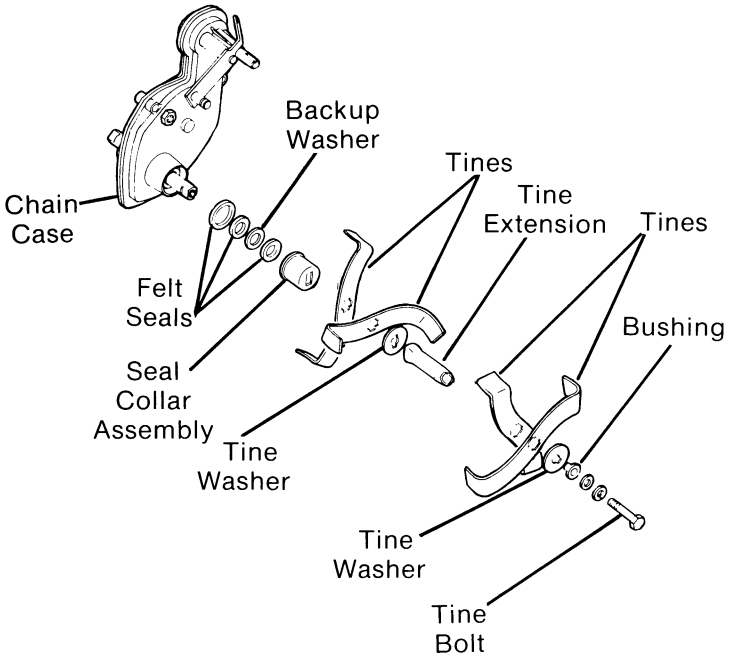


**FIG. 25**

4. When reassembling tines, be certain **all** tines, right and left side are facing the same forward direction as illustrated in (Fig. 26). The rotation of tines is indicated by arrows, as viewed from the right side of tiller.

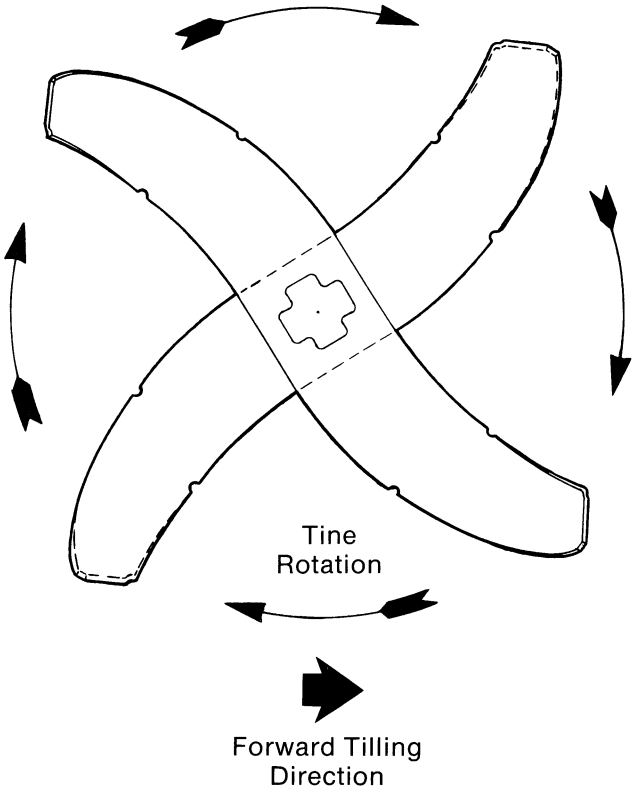


**FIG. 26**



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### 7" AND 12" WIDTH SET-UP

The 7" and 12" tilling width requires a special set-up. Follow procedure below for proper set-up:

IMPORTANT — Additional hardware may be required for this set-up. These parts may be obtained from original owner's hardware bag or from your parts supplier. Hardware required are two ⅜"-16 x ¾" hex hd. heat treated capscrews and two tine washers.

1. Remove outer tines and tine extensions by removing tine bolt.
2. The inner tines can now be secured to the tine shaft. See (Fig. 27) for the correct sequence of parts. NOTE: Use the hardware removed from the outer tines along with the additional tine washers and capscrews mentioned above. Be sure capscrews are tightened securely.

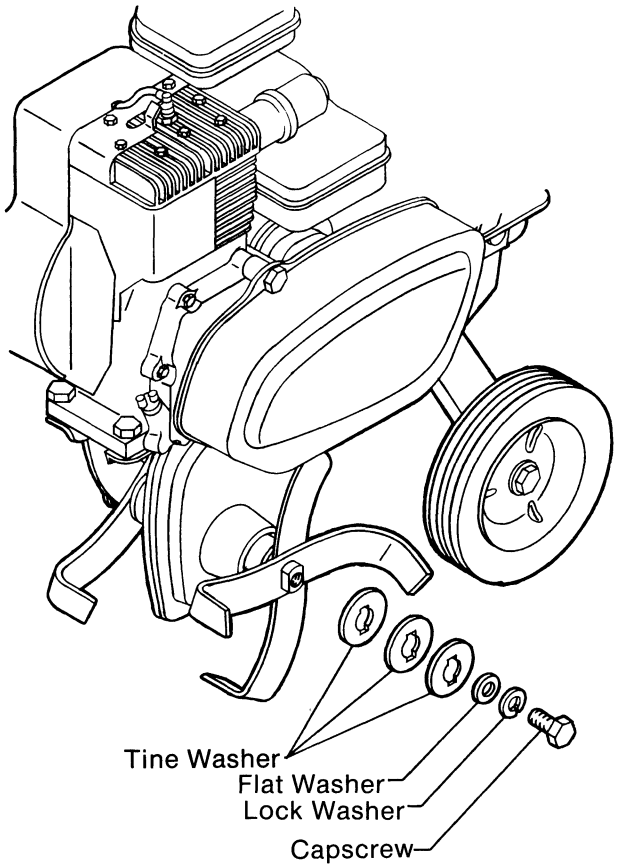


**FIG. 27**

IMPORTANT — Store the outer tines, tine bolts, bushings and tine extensions with the unit until needed again.

## TINE SHAFT SEALS

There are a series of three felt seals located on tine shaft on both sides of chain case. The purpose of these seals are to prevent dirt from reaching and damaging tine shaft oil seals. Replace these seals when conditions dictate or when replacing or servicing chain case. Follow procedure below:

### 1. FELT SEAL REPLACEMENT

A. Remove tines and tine extensions as described under "Tine Replacement".

B. Pull off seal collar assembly. (Fig. 25)

C. Remove three felt washers and one metal washer. (Fig. 25)

D. Clean area around tine shaft oil seals and check condition of oil seals. If seals appear to be damaged replace seals by following procedure below for tine shaft seal replacement.

E. Replace new felt seals in the proper sequence as shown in (Fig.25)

F. Replace seal collar assembly and tines and tine extensions.

G. Repeat procedure for opposite side.

### 2. TINE SHAFT OIL SEAL REPLACEMENT

A. Follow procedure above for removal of felt seals.

IMPORTANT: Do not damage chain case housing or scratch or gouge tine shaft when removing oil seals. Chain case housing is die cast aluminum.

B. Pierce oil seal with an awl in two places opposite each other and pry seal off. **Or** Punch one edge of metal oil seal case in until opposite side pops out. Then pry seal out.

C. Clean oil seal seat in housing. Wrap sharp edges on end of tine shaft with cellophane tape. Lightly grease tine shaft and **carefully** slide new oil seal onto shaft.

D. With an appropriate piece of 1" I.D. tubing or pipe, with a clean flat edge, gently tap on metal oil seal case until oil seal bottoms out in chain case housing.

E. Repeat procedure for other oil seal and reassemble felt seals and tines onto tine shaft.

## DEPTH STICK CONTROL

The depth control controls the depth and speed (acting as a brake) at which the tiller will operate. It is located in the rear of the tiller frame, (Fig. 28)

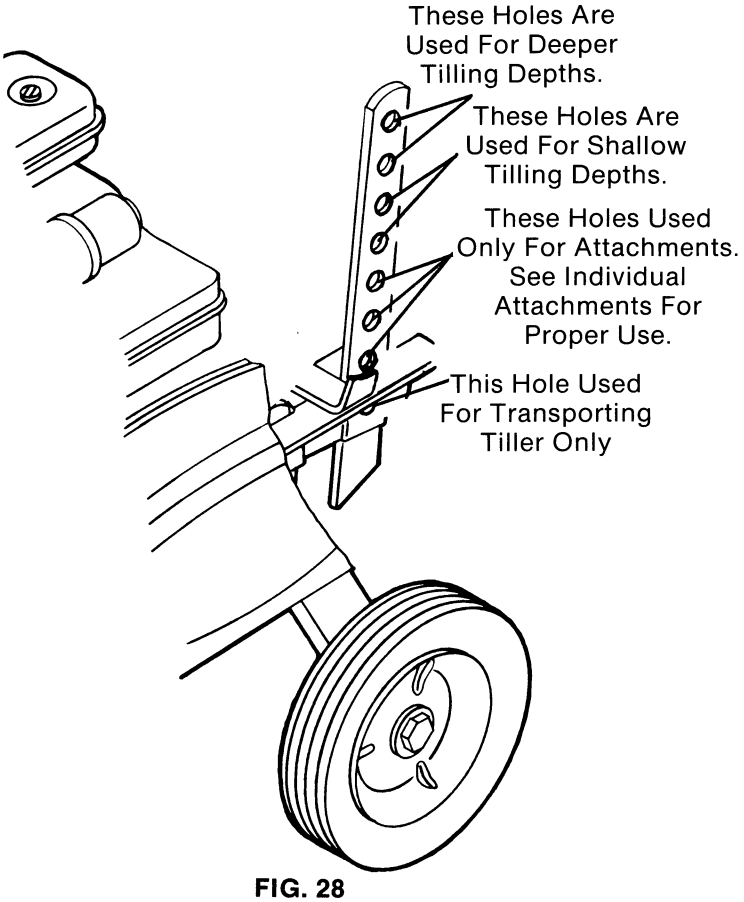


**FIG. 28**

By lowering the setting of the depth control, the forward speed of the tiller is reduced and the working depth of the tines is increased. Raising the setting of the depth control increases the forward speed and reduces the working depth. Refer to (Fig. 28) for an explanation of the different hole settings in the depth control.

## WHEEL HEIGHT ADJUSTMENT

To provide a comfortable handle bar height at various tilling depths, the wheel hanger can be adjusted in either of two positions. (Fig. 29)

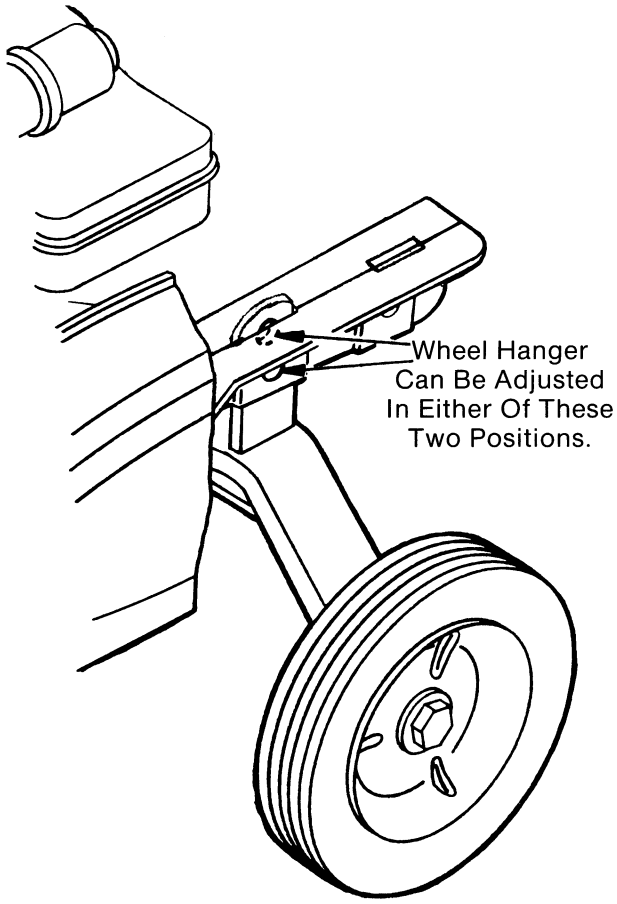


**FIG. 29**

**TO ADJUST:**

1. Remove spring clip and clevis pin.
2. Move wheel hanger to either hole position to raise or lower handle to position most comfortable to you.
3. Insert clevis pin and secure with spring clip.

# TROUBLE-SHOOTING

| PROBLEM | REMEDY | REFERENCE |
|---|---|---|
| Chain case leaking. | 1. Tine shaft seal needs replacement. | 1. Chain Case — Rebuild Tine Shaft Seals |
| | 2. Input shaft seal needs replacement. | 2. Chain Case — Rebuild |
| | 3. Housing gasket needs replacement. | 3. Chain Case — Replacement |
| Tines do not turn. | 1. Clutch cable needs adjustment. | 1. Adjustments — Clutch Control |
| | 2. Belt broken, needs replacement. | 2. Engine — Belt Replacement |
| | 3. Chain case needs servicing. | 3. Chain Case — Rebuild Replacement |
| Tiller Bounces. | 1. Tines installed improperly. | 1. Adjustments — Tine Replacement |
| | 2. Depth stick set incorrectly. | 2. Adjustments — Depth Stick Control |

# BOLT TORQUE SPECIFICATIONS

The following chart lists the standard torque specifications for all capscrews and thread forming screws used in this unit. Unless **special** torques are called for, all torque values must meet these specifications.

| | TYPE OF CAPSCREW | SAE GRADE 2 | | SAE GRADE 5 | | SAE GRADE 5 | | SAE GRADE 2 OR 5 ALSO THREAD FORMING SCREWS | |
|---|---|---|---|---|---|---|---|---|---|
| | TYPE OF FASTENER USED | STANDARD HEX NUT | | STANDARD HEX NUT | | CONE LOCKNUT | | INTO TAPPED HOLE | |
| | TORQUE FACTOR | FT./LBS. MIN. | MAX. | FT./LBS. MIN. | MAX. | FT./LBS. MIN. | MAX. | FT./LBS. MIN. | MAX. |
| SCREW SIZE | 1/4 | 5 | 7 | 9 | 11 | 5 | 7 | 5 | 7 |
| | 5/16 | 9 | 14 | 18 | 22 | 9 | 14 | 9 | 14 |
| | 3/8 | 16 | 24 | 30 | 40 | 16 | 24 | 16 | 24 |
| | 7/16 | 25 | 37 | 50 | 60 | 25 | 37 | 25 | 37 |
| | 1/2 | 38 | 57 | 75 | 95 | 38 | 57 | 38 | 57 |
| | 5/8 | 73 | 110 | 150 | 185 | 73 | 110 | 73 | 110 |