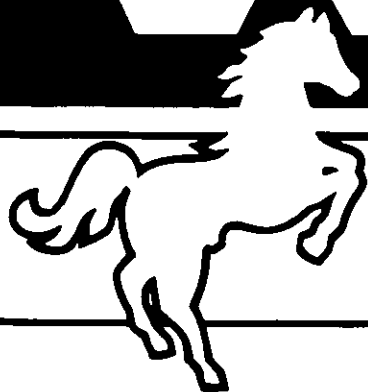


# WHITE



## OUTDOOR PRODUCTS OWNER'S GUIDE

### ROTO BOSS 510 Chain Drive Tiller



**Model No.  
210-310-190**

Thank you for purchasing  
an American-built product.

PRINTED IN U.S.A.

FORM NO. 770-5524E

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Dear Customer,

*So often throughout the year we are all in a rush to meet our daily obligations.*

*However, we at White Outdoor Products are taking a quick moment out to say . . .*

**"Thank you for your business."**

*Sincerely,*

**WHITE OUTDOOR PRODUCTS**



**INSTRUCTIONS GIVEN WITH THIS SYMBOL ARE FOR PERSONAL SAFETY. BE SURE TO FOLLOW THEM.**

## LIMITED WARRANTY

For two years from the date of original retail purchase, WHITE OUTDOOR PRODUCTS will either repair or replace, at its option, free of charge, F.O.B. factory or authorized service firm, any part or parts found to be defective in material or workmanship. Transportation charges for the movement of any power equipment unit or attachment are the responsibility of the purchaser. Transportation charges for any parts submitted for replacement under this warranty must be paid by the purchaser unless such return is requested by WHITE OUTDOOR PRODUCTS COMPANY.

This warranty will not apply to any part which has become inoperative due to misuse, excessive use, accident, neglect, improper maintenance, alterations, or if the unit has not been operated and maintained in accordance with the instructions furnished. This warranty does not apply to the engine, Peerless components, motor, battery (except as noted below) or component parts thereof. Please refer to the applicable manufacturer's warranty on these items.

A battery which proves defective within ninety (90) days will be replaced without charge. After 90 days but within one year from the date of purchase, WHITE OUTDOOR PRODUCTS will replace the defective battery for a charge of 1/12 of the current retail price of the battery for each full 30 day period between the date of purchase and the date of return.

Warranty on units used commercially is limited to sixty (60) days.

Warranty service is available through your local authorized service dealer or distributor. If you do not know the dealer or distributor in your area, please write to the Customer Service Department of WHITE OUTDOOR PRODUCTS.

The return of a complete unit will not be accepted by the factory unless prior written permission has been extended by WHITE OUTDOOR PRODUCTS.

This express limited warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability. The remedy of replacement is the sole and exclusive remedy for WHITE OUTDOOR PRODUCTS obligations arising from the sale of its products. In no case will WHITE OUTDOOR PRODUCTS COMPANY be liable for incidental or consequential loss or damage.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

**WARNING:** This unit is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrester meeting applicable local or state laws (if any). If a spark arrester is used, it should be maintained in effective working order by the operator.

In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. A spark arrester for the muffler is available through your nearest engine authorized service dealer.



To reduce the potential for any injury, comply with the following safety instructions. Failure to comply with the instructions may result in personal injury.

## SAFE OPERATION PRACTICES FOR TILLERS

1. It is suggested that this manual be read in its entirety before attempting to assemble or operate this unit. Keep this manual in a safe place for future and regular reference and for ordering replacement parts.
2. Your tiller is a precision piece of power equipment, not a plaything. Therefore, exercise extreme caution at all times.
3. Read this owner's guide carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
4. Never allow children to operate a power tiller. Only persons well acquainted with these rules of safe operation should be allowed to use your tiller.
5. No one should operate this unit while intoxicated or while taking medication that impairs the senses or reactions.
6. Keep the area of operation clear of all persons, particularly small children and pets.
7. Do not operate equipment when barefoot or wearing open sandals. Always wear substantial footwear.
8. Do not wear loose fitting clothing that could get caught on the tiller.
9. Do not start the engine unless the shift lever is in the neutral (N) position.
10. Do not stand in front of the tiller while starting the engine.
11. Do not place feet and hands on or near the tines when starting the engine or while the engine is running.
12. Never attempt to make a wheel or depth bar adjustment while the engine is running.
13. Do not leave the tiller unattended with the engine running.
14. Do not walk in front of the tiller while the engine is running.
15. Check the fuel before starting the engine. Gasoline is an extremely flammable fuel. Do not fill gasoline tank indoors, while the engine is running, or while the engine is still hot. Replace gasoline cap securely, and wipe off any spilled gasoline before starting the engine as it may cause a fire or explosion.
16. Do not run the engine while indoors. Exhaust gases are deadly poisonous.
17. Be careful not to touch the muffler after the engine has been running. It is hot.
18. Do not change the engine governor settings or overspeed the engine. Excessive engine speeds are dangerous.
19. Before any maintenance work is performed or adjustments are made, remove the spark plug wire and ground it on the engine block for added safety.
20. Use caution when tilling near buildings and fences. Rotating tines can cause damage or injury.
21. Before attempting to remove rocks, bricks and other objects from tines, stop the engine and be sure the tines have stopped completely. Disconnect the spark plug wire and ground to prevent accidental starting.
22. Check the tine and engine mounting bolts at frequent intervals for proper tightness.
23. Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
24. Never store the equipment with gasoline in the tank inside of a building where fumes may reach an open flame or spark. Allow the engine to cool before storing in any enclosure.

**NOTE**

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

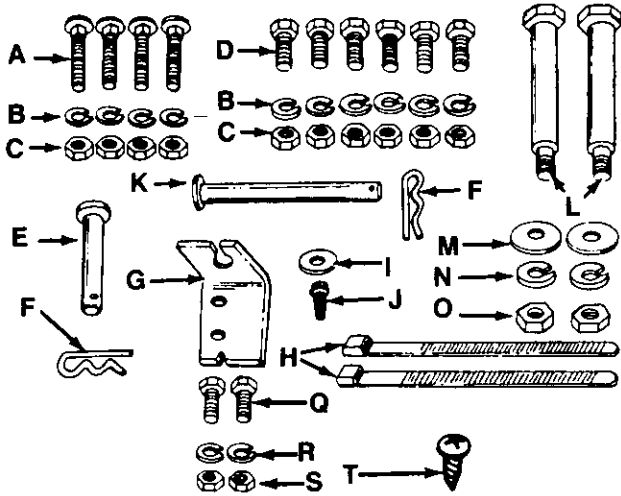


FIGURE 1.

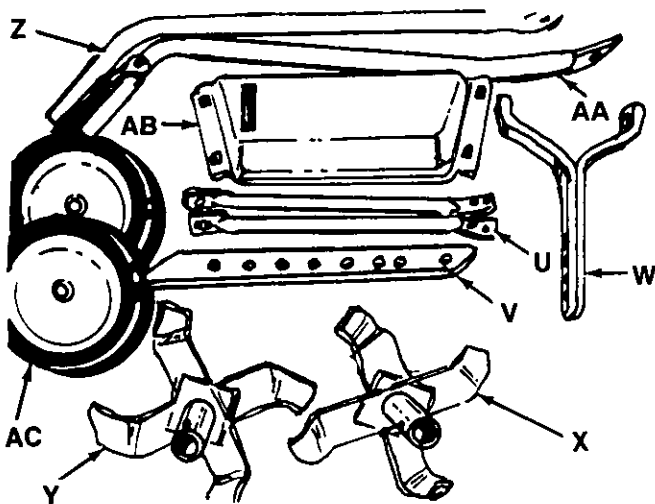


FIGURE 2.

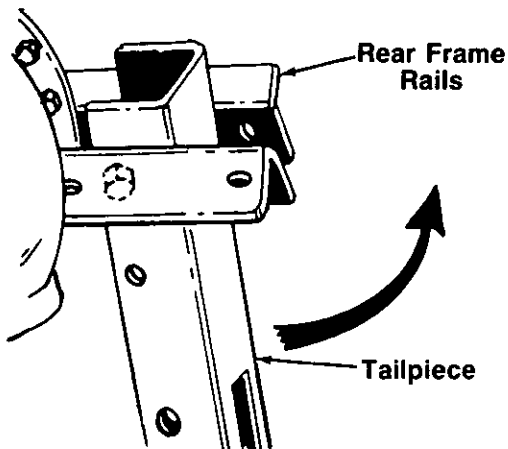


FIGURE 3.

# ASSEMBLY INSTRUCTIONS

**NOTE**

This unit is shipped WITHOUT GASOLINE or OIL. After assembly, see separate engine manual for proper fuel and engine oil recommendations.

**Tools Required:**

- (2) 1/2" Wrenches
- (2) 7/16" Wrenches
- (1) 3/4" Wrench
- (1) Adjustable Wrench
- (1) Phillips Screwdriver

**Contents of Hardware Pack: (See Figure 1)**

- A (4) Carriage Bolts 5/16-18 x 1 3/4" Long
  - B (10) Lock Washers 5/16" I.D.
  - C (10) Hex Nuts 5/16-18 Thread
  - D (6) Hex Bolts 5/16-18 x 3/4" Long
  - E (1) Clevis Pin 1/2" x 2 1/2" Long
  - F (2) Hairpin Clips
  - G (1) Clutch Cable Support Bracket\*
  - H (2) Cable Ties
  - J (1) Hex Washer Head Self-Tapping Screw 1/2" Long\*
  - K (1) Clevis Pin 3/8" x 2 1/2" Long
  - L (2) Shoulder Bolts (Axles)
  - M (2) Belleville Washers
  - N (2) Lock Washers 1/2" I.D.
  - O (2) Hex Nuts 1/2-20 Thread
  - P (2) Grips (Not Shown)
  - Q (2) Hex Bolt 1/4-20 x 5/8" Long
  - R (2) Lock Washers 1/4" I.D.
  - S (2) Hex Nuts 1/4-20 Thread
  - T (1) Phillips Head Self-Tapping Screw 1/2" Long
- \*May be already assembled.

**Loose Parts in Carton: (See Figure 2)**

- U (2) Handle Braces (Right & Left Hand)
- V (1) Depth Stake
- W (1) Wheel Yoke Assembly
- X (1) Right Hand Tine Assembly
- Y (1) Left Hand Tine Assembly
- Z (1) Right Hand Handle
- AA (1) Left Hand Handle
- AB (1) Handle Panel
- AC (2) Wheels
- AD (1) Tine Shield Extension (Not Shown)

1. Remove the tiller, all loose parts and literature from the carton before discarding carton.
2. Extend the throttle control and place on the floor. Be careful not to bend or kink control wire.
3. The tailpiece is partially assembled. Pivot the tailpiece upward until the holes line up with the rear frame rails. See figure 3.

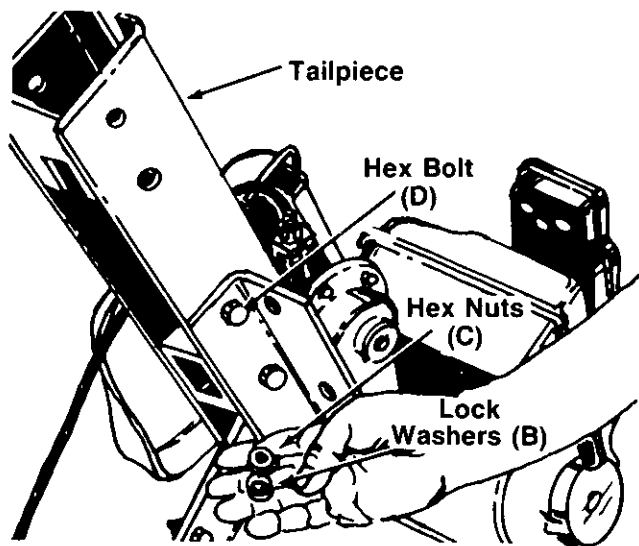


FIGURE 4.

- Secure the tailpiece to the rear frame rails with two hex bolts (D), lock washers (B) and hex nuts (C). See figure 4. Tighten all four hex bolts and nuts securely. Two 1/2" wrenches are required.

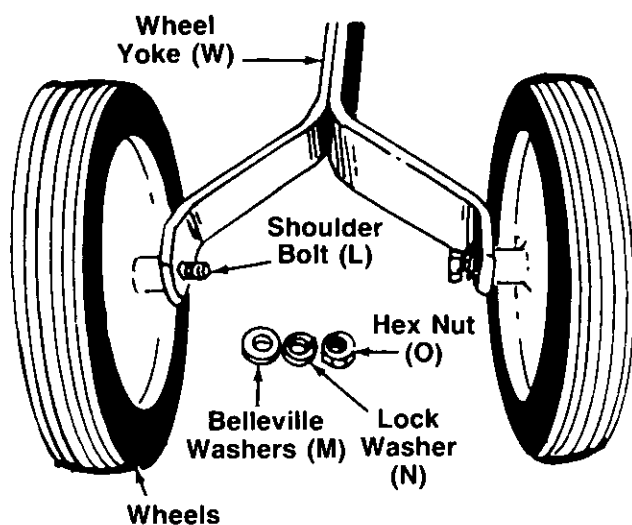


FIGURE 5.

- Assemble wheels (AC) to wheel yoke (W) with shoulder bolts (L), belleville washers (M) (cupped side of washer is against the wheel yoke), lock washers (N) and hex nuts (O) as shown in figure 5. A 3/4" wrench and an adjustable wrench is required.

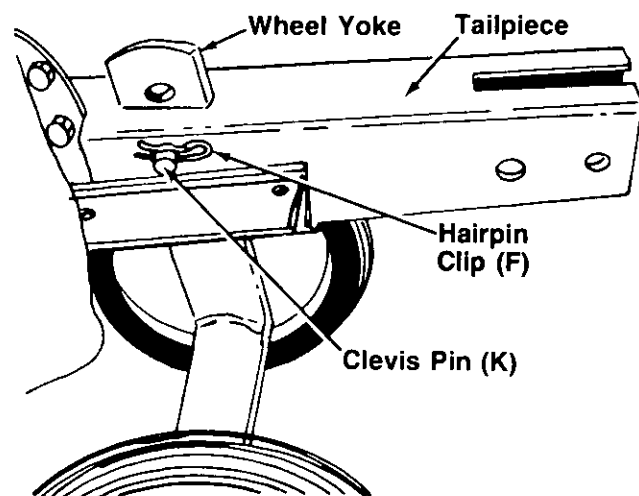
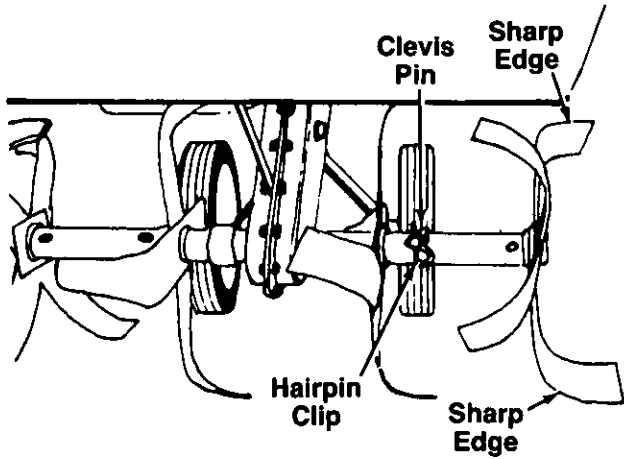


FIGURE 6.

- Place the end of the wheel yoke up through the rectangular hole in the tailpiece. Secure with clevis pin (K) and hairpin clip (F). See figure 6.

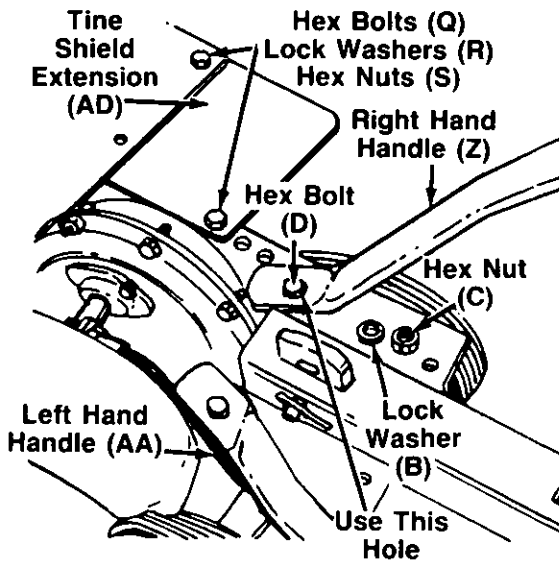


- Remove the clevis pin and hairpin clip from the inner tine assemblies as shown in figure 7. Place the right and left hand tine assemblies in position on tine shaft. Secure with clevis pins and hairpin clips.

**NOTE**

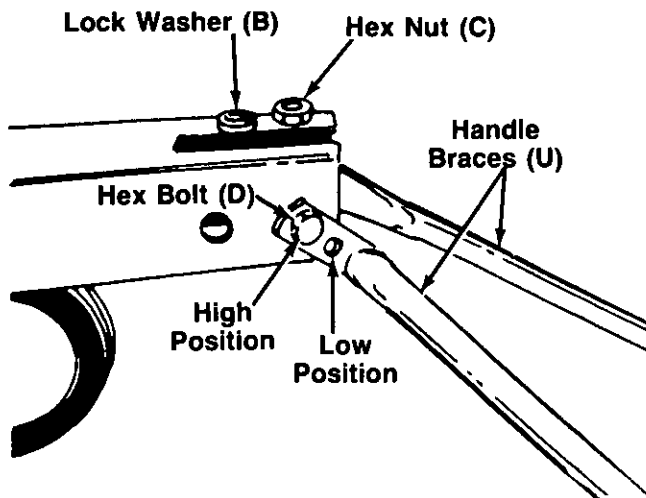
Be certain the tine assemblies are assembled on the tine shaft so that the sharp edge of the tines enter the soil first. See figure 7.

FIGURE 7.



- Attach the tine shield extension (AD) to the tine shield and frame on the right side of the unit as shown in figure 8. Secure with hex bolts (Q), lock washers (R) and hex nuts (S). Tighten securely.
- The left handle has a clutch lever already assembled to it. Assemble the left and right hand handles (AA and Z) to the rear tiller frame as shown in figure 8. Secure with hex bolts (D), lock washers (B) and hex nuts (C), finger tight only (do not tighten).

FIGURE 8.



- Attach the right and left hand braces (U) to the tailpiece. The braces have two holes to provide handle height adjustment. Select hole for either high or low position. Secure to tailpiece with hex bolts (D), lock washers (B) and hex nuts (C), finger tight only (do not tighten). See figure 9.

FIGURE 9.

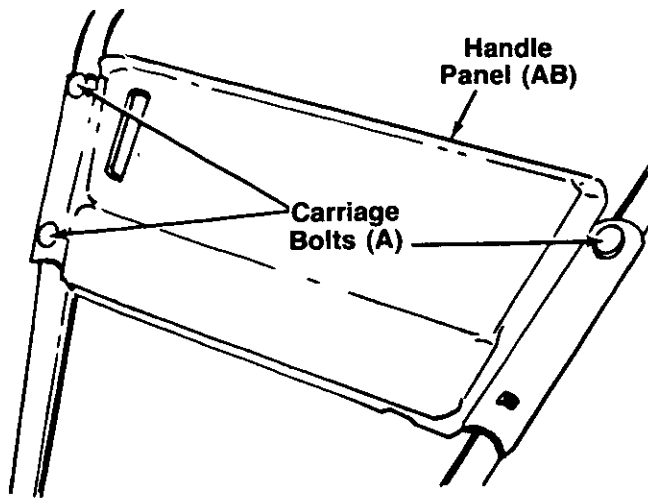


FIGURE 10.

11. Place the handle panel (AB) in position on the handles. Secure the upper holes in the panel to the handles with carriage bolts (A), lock washers (B) and hex nuts (C), finger tight only. See figure 10.

12. Place carriage bolt (A) through the handle panel, handle and handle brace on the lower right hand side of the handle panel, finger tight only. See figure 10.

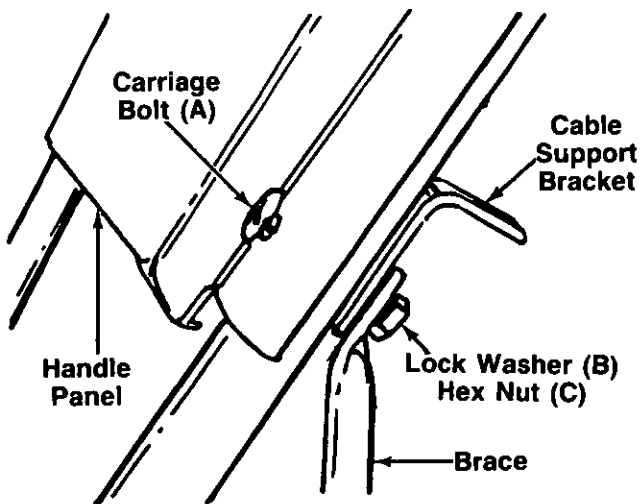


FIGURE 11.

13. Place carriage bolt (A) through the handle panel, handle, cable support bracket and handle brace on the lower left hand side of handle panel as shown in figure 11. Use the bottom hole in the cable support bracket. Secure with lock washer (B) and hex nut (C), finger tight only.

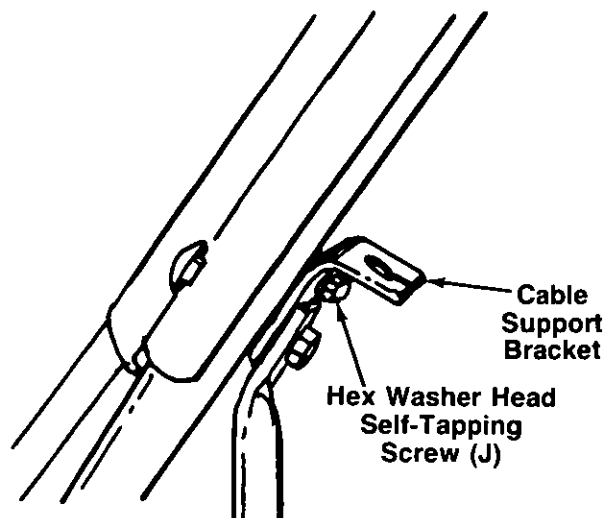


FIGURE 12.

14. If not already assembled, secure cable support bracket using hex washer head self-tapping screw (J). See figure 12.

15. Now tighten securely the self-tapping screw and all nuts and bolts on handles and braces.

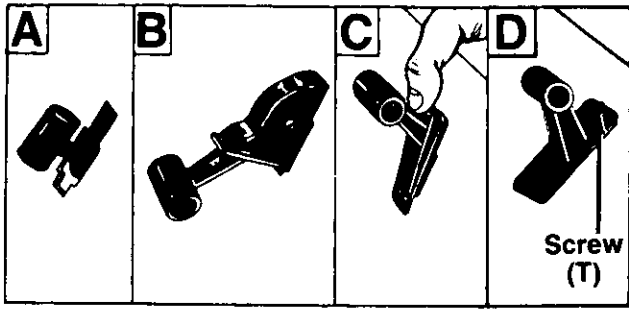


FIGURE 13.

16. Assemble the throttle control to the handle panel as follows.

- A. Hold the throttle control assembly beneath the handle panel. Turn the control sideways and insert the lever up through the wide portion of the slot on the handle panel. See figure 13A.
- B. After the end of the lever is through the slot, turn and then tip the control forward as shown in figure 13B to slide it through the slot.

**NOTE**

The lever must be all the way to the back of the control housing as shown in figure 13B.

- C. Push the control back into the slot in the handle panel and press in place. Be certain the control is locked securely into the slot. See figure 13C.
- D. Secure the throttle control to the handle panel using phillips head self-tapping screw (T). See figure 13D.

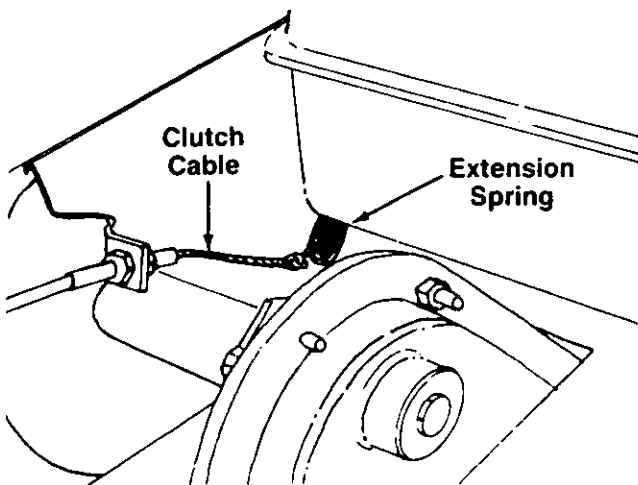


FIGURE 14.

17. Hook the end of the clutch cable (already attached to the tiller) over the extension spring as shown in figure 14.

**NOTE**

If spring has come loose, it must be reassembled to the weld pin on the idler bracket.

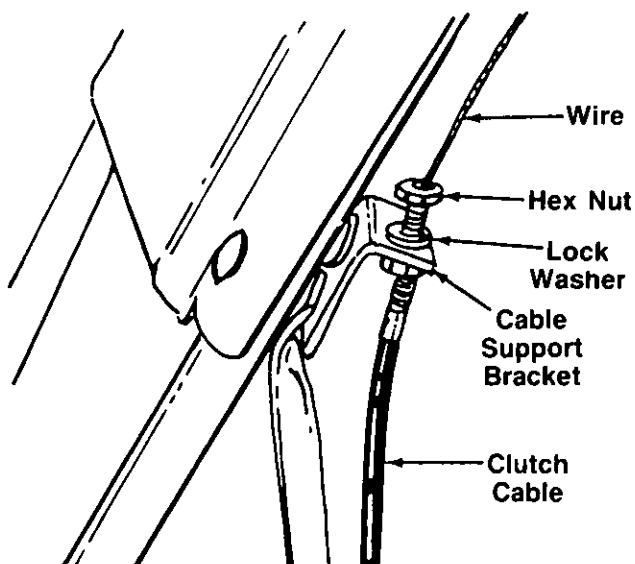


FIGURE 15.

18. Remove one nut and lock washer from other end of clutch cable. Slip the wire up through slot on cable support bracket. Start hex nut and lock washer back on end of clutch cable. See figure 15. Do not tighten at this time.



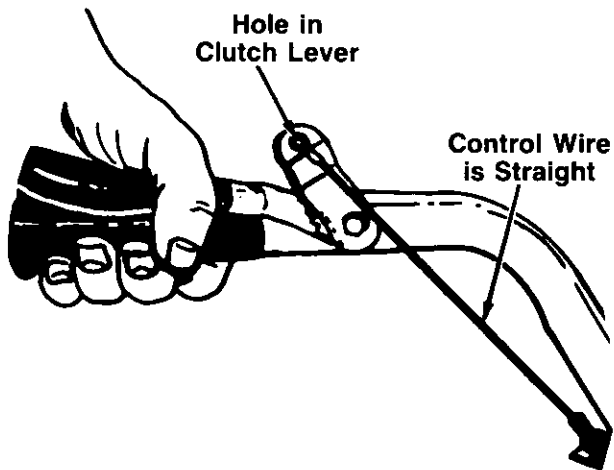


FIGURE 16.

19. Hook the "Z" end of clutch cable wire into clutch lever. See figure 16.

With the clutch lever released (in the "up" position), adjust the bottom nut at the cable bracket so there is only a slight amount of slack in the control wire. Tighten the upper nut against the bracket. Squeeze the clutch lever against the handle. The control wire should now be straight. See figure 16.

**NOTE**

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

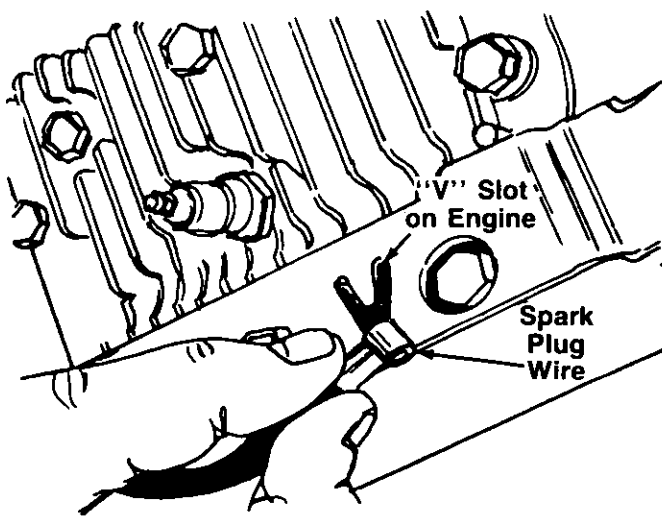


FIGURE 17.

20. To check the adjustment, disconnect the spark plug wire from spark plug to prevent accidental starting. Secure end of spark plug wire in the "V" slot on the engine. See figure 17. With the clutch lever released (neutral position), pull starter cord several times. **The tines should not turn.** If they do, adjust the hex nuts at the cable support bracket. Check again for correct adjustment.

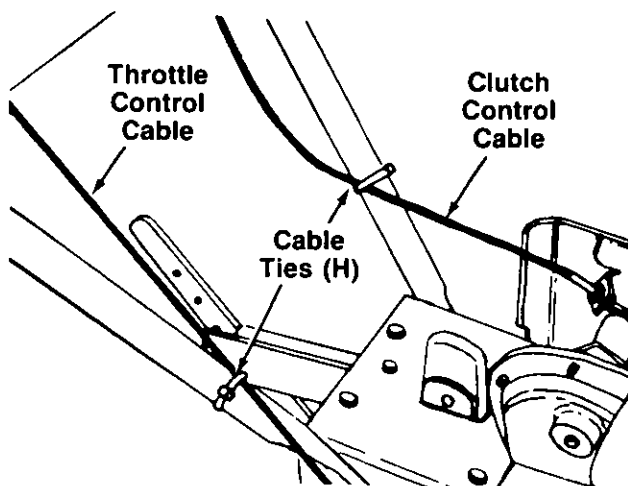


FIGURE 18.

21. Secure the throttle control cable and clutch control cable to the handle and brace with cable ties (H) provided. Cut off excess ends. See figure 18.

22. Assemble the grips to the ends of the upper handles. They will slip on more easily if they are first soaked in warm, soapy water.

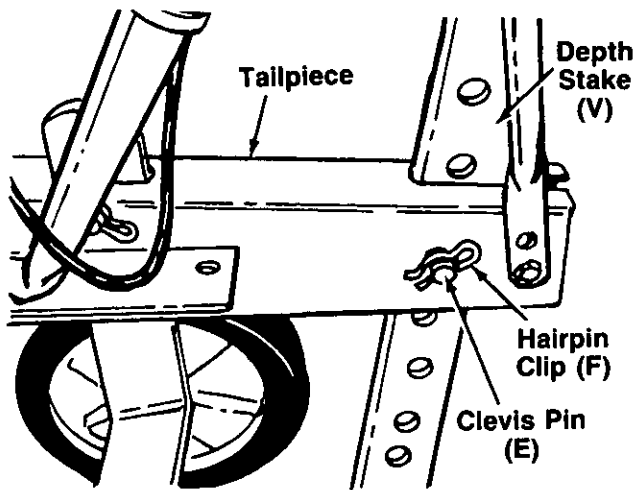


FIGURE 19.

23. Place the depth stake (V) in position on the tailpiece. Secure with clevis pin (E) and hairpin clip (F). See figure 19.

## CONTROLS

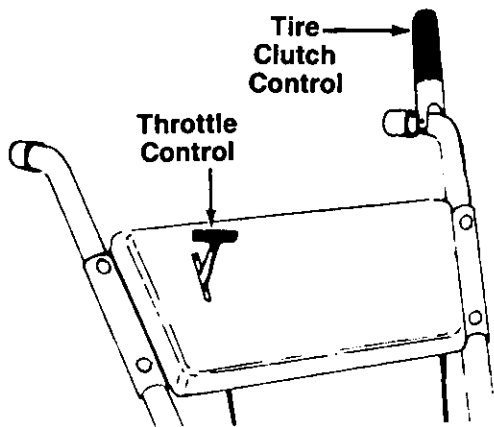


FIGURE 20.

### THROTTLE CONTROL

The throttle control lever is located on the handle panel. It controls the engine speed and stops the engine. See figure 20.

### TIRE CLUTCH CONTROL

The clutch control lever is located on the left handle. See figure 20. Squeezing the lever against the handle engages the tire drive. Release the lever to stop the tires from turning.

### DEPTH STAKE

The depth stake controls the tilling depth. Refer to "How to Use Your Tiller" section on page 11.

## OPERATION

### GAS AND OIL FILL-UP

Service the engine with gasoline and oil as instructed in the separate engine manual packed with your tiller. Read instructions carefully.

### NOTE

Your tiller is shipped without oil; however, a small amount of oil may be present from the factory.

### TO START ENGINE



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

1. Attach spark plug wire to spark plug.
2. Move the throttle control lever forward to FAST or START position. Make certain clutch lever is released. See figure 20.
3. Move choke lever to CHOKE position.

### NOTE

A warm engine may not require choking.

4. Grasp starter handle (see figure 21) and pull rope out slowly until engine reaches start of compression cycle (rope will pull slightly harder at this point). Let the rope rewind slowly.
5. Pull rope with a rapid, continuous, full arm stroke. Keep a firm grip on start handle. Let rope rewind slowly. Do not let starter handle snap back against starter.
6. Repeat preceding instructions 4 and 5 until engine fires. When engine starts, move choke lever on engine halfway between CHOKE and RUN.

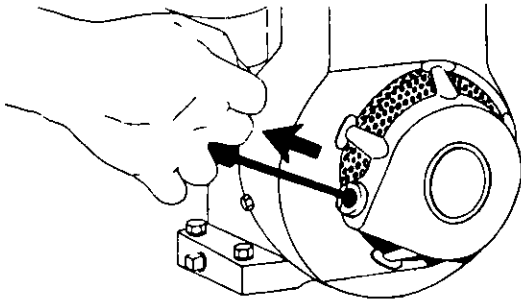


FIGURE 21.

7. Move throttle control to SLOW position for a few minutes warm-up. Move choke lever to RUN position as engine warms up.

**NOTE**

In order to idle smoothly, a new engine may require 3 to 5 minutes running above slow idle speed. Idle speed has been adjusted to be correct after this break-in period.

**TO STOP ENGINE**

1. Move throttle control lever to STOP position. See figure 20.
2. Disconnect spark plug wire from spark plug and ground against the engine to prevent accidental starting while equipment is unattended.

**HOW TO USE YOUR TILLER**

The tiller is a precision built machine designed for seed bed preparation, cultivating, furrowing and mulching. It is engineered to minimize the hardest work in the vegetable or flower garden, to till the soil for planting and cultivating, and to perform many other useful labor saving tasks in the garden. With the proper amount of care and maintenance, this machine will provide the owner with many years of service.

**WHEEL POSITION**

The tiller is shipped with the wheels adjusted such that the unit sits level. During digging as the tines enter the ground and the front of the tiller lowers, the wheels must be raised to level the unit, which is essential for proper engine operation. This adjustment is made by removing the clevis pin and hairpin clip from wheel yoke, raising the wheels to the desired height, and replacing the clevis pin and hairpin clip. See figure 22.

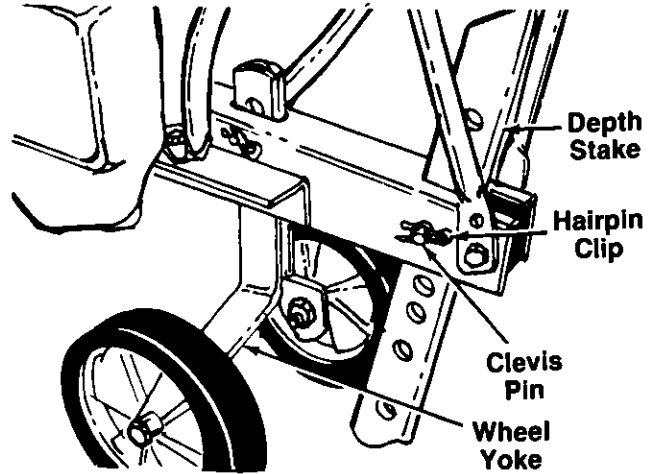


FIGURE 22.

**CONTROLLING SPEED AND TILLING DEPTH:**

1. **Wheel Yoke Adjustment:** Place wheel yoke so that the wheels are forward (nearest point between wheels and tines) for shallow tilling, cultivating and transport. The forward speed will increase. Turn yoke around (farthest point between wheels and tines) for deep tilling. Forward speed will decrease. See figure 23.

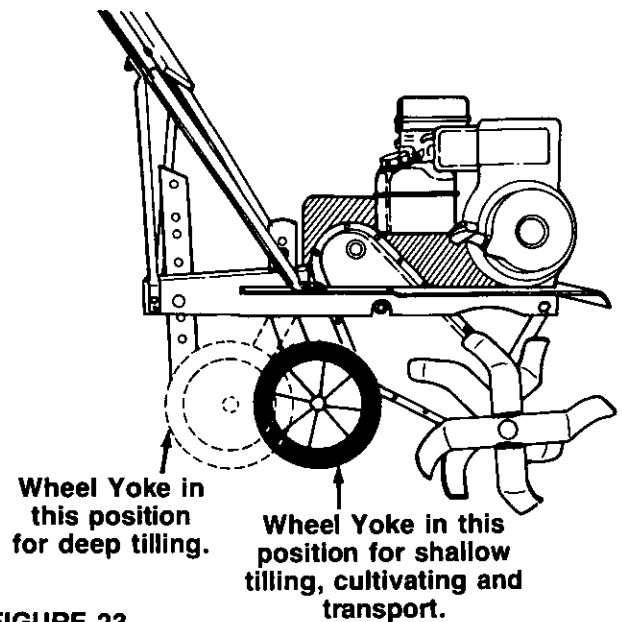


FIGURE 23.

2. **Depth Stake Adjustment:** The depth stake acts as a brake for the tiller and controls the depth and speed at which the machine will operate. Remove the clevis pin and hairpin clip to raise or lower depth stake. See figure 22.

By increasing the depth of the depth stake, the forward speed of the machine is reduced, and the working depth is increased. See figure 24. When the depth stake is raised, the working depth of the machine is reduced and the forward speed is increased. The working depth of the machine may

be predetermined by setting the depth stake and wheels so that the wheels are about four inches from the ground when the tines and depth stake are resting on the ground. This setting will permit a working depth of about four inches. When presetting the working depth, the handles should be adjusted so the hand grips are a little above waist height because the tiller will be lower when the tines and depth stake penetrate the ground.

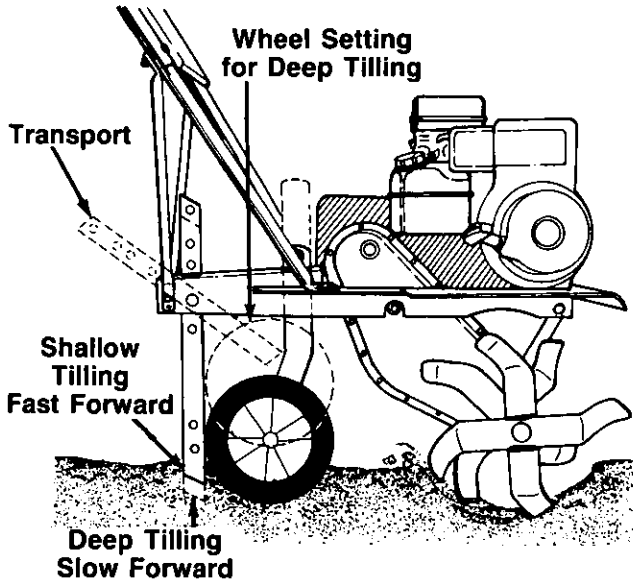


FIGURE 24.

When tilling, leave approximately 8 inches of untilled soil between the first and second tilling paths, then make the third path between the first and second as shown in figure 25. In some soils, the desired depth is obtained the first time over the garden. In other soils, the desired depth is obtained by going over the garden two or three times. In the latter case, the depth stake should be lowered before each succeeding pass over the garden. Passes should be made across the length and width of the garden alternately. Rocks which are turned up should be removed from the garden area.

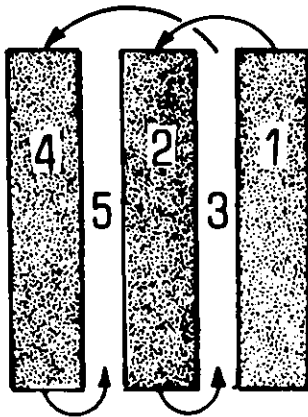


FIGURE 25.

3. **Handle Pressure:** Further control of tilling depth and travel speed can be obtained by variation of pressure on the handles. A downward pressure on the handles will reduce the working depth and increase the forward speed. An upward pressure on the handles will increase the working depth and reduce the forward speed. The type of soil and working conditions will determine the actual setting of the depth stake and the handle pressure required.

4. **Throttle Control:** The throttle control lever adjusts the engine speed and stops the engine. With the throttle control knob pushed completely forward, the carburetor is in FAST position. Pulling the throttle control back slightly adjusts the carburetor to START. Pulling the throttle back further reduces the engine speed to SLOW. Pull the throttle completely back to stop the engine.

Use maximum engine speed for deep tilling. Move the throttle control to SLOW when transporting the tiller.

#### TRANSPORTING THE TILLER

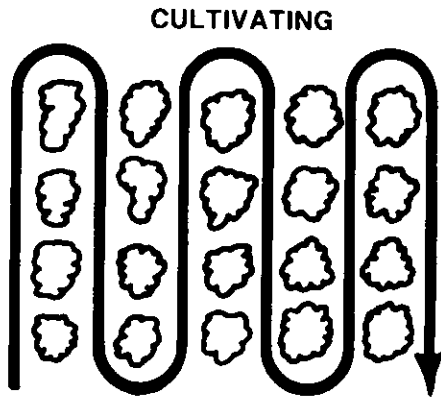
To transport the tiller to or from the garden, raise the depth stake to its highest position. See figure 24. With the throttle control in SLOW position, the unit will move under its own power, without damaging grass areas as long as it is allowed to move freely. If the operator holds back, it will start to dig.

#### CULTIVATING

For cultivating, a two to three inch depth is desirable. Setting the wheels and depth stake so that the wheels are about two inches above the ground while the tiller is resting on the tines and depth stake will allow the machine to work at cultivating depth. The throttle should be set to control forward movement to a slow walking speed. With the outer tines installed, the working width of the machine is 26 or 28 inches. For cultivation, this may be reduced to 13 inches by removing the outer tines.

Tilling width can be increased from 26 inches to 28 inches by removing the clevis pin and hairpin clip and sliding the outer tines out one inch, and replacing the clevis pin and hairpin clip.

When laying out plant rows, be sure to allow enough width to permit cultivation between the rows. In growing corn or similar crops, check-row planting will permit cross cultivation and practically eliminate hand hoeing. See figure 26.



**FIGURE 26.**

The tiller has many uses other than tilling and cultivating a garden. One of these is the preparation of lawn area for seeding. The tiller will prepare a deep seed bed which will be free of hard untilled spots, allowing a better stand of grass to grow. The tiller is very useful for loosening hard soil for excavation with a shovel. NO tedious hand pickwork will be necessary. Your tiller may be used for mixing compost in the pile, or for mixing it with the soil in your garden. This should be done after the soil has been broken to the full working depth. The compost should be worked in to a depth of six to eight inches. This may be done by working the length of the garden, and then by making separate passes across its width. The addition of decayed organic matter will substantially increase the fertility of your garden. For proper decaying action, fertilizer should be applied and worked in with the mulch materials. Breaking up leaves and straw and mixing it with several inches of soil causes the soil to hold moisture longer and allows proper aeration of the plant root system. This also retards the growth of weeds.

The U.S. Department of Agriculture and various state and local agencies offer published booklets and expert advice on all phases of gardening. They should be consulted regarding soil information, planting dates, and the most satisfactory varieties of crop for your particular area.

## ADJUSTMENTS



Disconnect the spark plug wire and ground against the engine before performing any adjustments, repairs, or maintenance.

### WHEEL ADJUSTMENTS

To adjust the wheel yoke and wheel position, refer to "How To Use Your Tiller," on page 11.

### DEPTH STAKE ADJUSTMENT

To adjust the depth stake, refer to "How To Use Your Tiller" on page 11.

### TINE WIDTH ADJUSTMENT

To adjust the tine width, refer to "Cultivating" on page 12.

### TINE CLUTCH CONTROL ADJUSTMENT

To adjust the tine clutch control refer to step numbers 19 and 20 under assembly instructions.

### CARBURETOR ADJUSTMENT



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

**Minor carburetor adjustment may be required to compensate for differences in fuel, temperature, altitude or load. If adjustments are needed, refer to the engine manual packed with the tiller.**



A dirty air cleaner will cause engine to run rough. Be certain air cleaner is clean and attached to the carburetor before adjusting carburetor. Do not make unnecessary adjustments. Factory settings are satisfactory for most applications and conditions.

### THROTTLE CONTROL ADJUSTMENT

To obtain satisfactory engine performance, the engine throttle control must be adjusted properly. If it is necessary to check the engine control adjustments, proceed as follows.

1. Loosen the cable clamp screw. See figure 27.
2. With the throttle control in FAST position (see figure 20) and the cable connected to the adaptor lever, push the cable through the cable clamp in the direction shown in figure 27 until the adaptor lever is as far up as it will go.
3. Tighten the cable clamp screw.
4. Check that the engine stops when throttle control is moved to STOP position. If engine does not stop, loosen cable clamp screw and readjust by pulling cable backward slightly until engine stops. Retighten cable clamp screw.

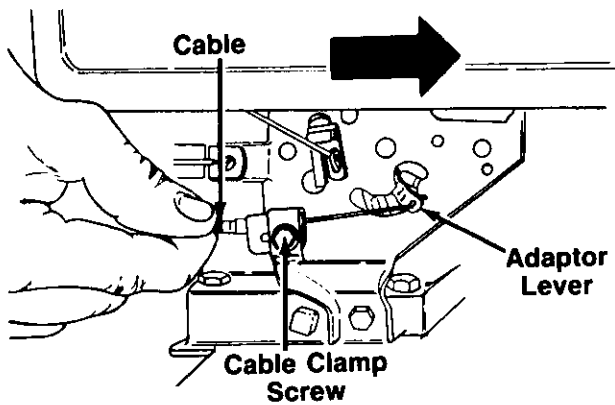


FIGURE 27.

## LUBRICATION



**WARNING**

Always stop engine and disconnect spark plug wire before cleaning, lubricating or doing any kind of work on tiller.

**Pivot Points**—Remove the belt cover and lubricate all moving parts and pivot points at least once a season using SAE 30 engine oil.

**Chain Case**—The chain case is pre-lubricated and sealed at the factory. It requires no checking unless the transmission is disassembled. To fill with grease, lay the left half of the chain case on its side, add 12 ounces of Plastilube #0 grease and assemble the right half to it. This grease can be obtained at your nearest authorized service dealer. Order part number 737-0133.

## MAINTENANCE



**WARNING**

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

### TROUBLE SHOOTING

Refer to page 20 of this manual for trouble shooting information.

### ENGINE

Refer to the separate engine manual for all engine maintenance instructions.

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

Service air cleaner every 25 hours under normal conditions. Clean every few hours under extremely dusty conditions. Poor engine performance and flooding usually indicates that the air cleaner should be serviced. To service the air cleaner, refer to the separate engine manual packed with your unit.

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

### CLEANING THE TINE AREA

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

### BELT REMOVAL AND REPLACEMENT

Your tiller has been engineered with a belt made of special material (Kevlar Tensile). It should not be replaced with an off-the-shelf belt.

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

1. Remove the belt cover by removing three self-tapping screws. A 3/8" wrench is required. See figure 28.

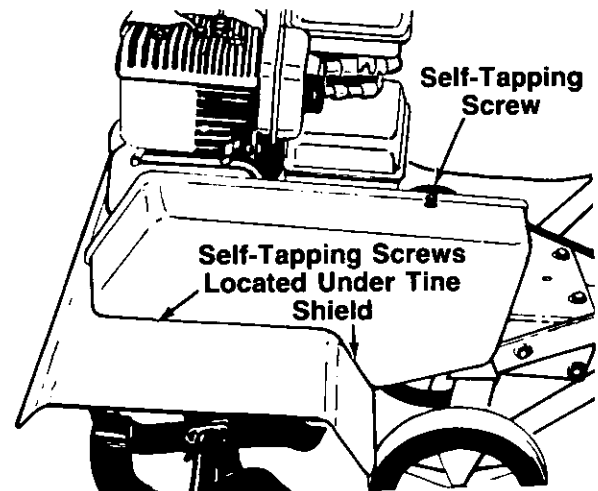


FIGURE 28.

2. After removing three screws, lift off belt cover. See figures 28 and 29.
3. Slip the belt off the chain case pulley first, then off idler pulley. Remove belt from engine pulley. See figure 30.
4. To reassemble the new belt, first place belt over engine pulley. Be sure belt is inside two pins at engine pulley. See figure 29.
5. Belt must be over top of idler pulley. See figure 29. Slip end of belt over the chain case pulley.
6. Reassemble the belt cover. See figure 28.
7. Adjust tine clutch control. Refer to step numbers 19 and 20 of assembly instructions.

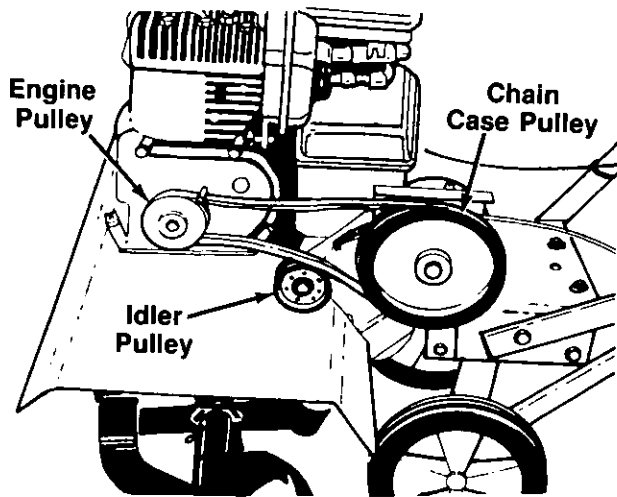


FIGURE 29.

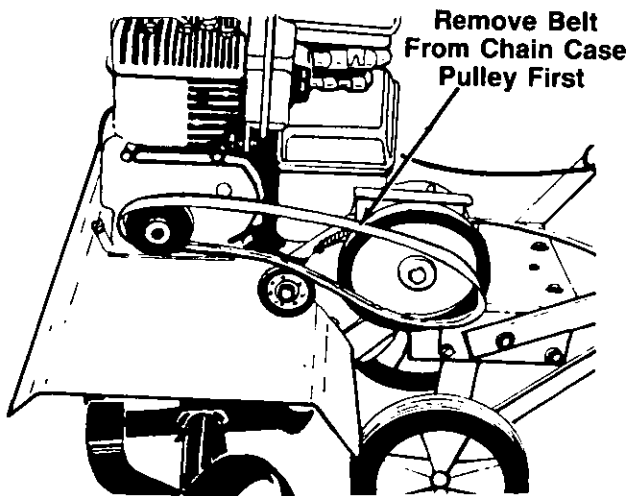


FIGURE 30.

## OFF-SEASON STORAGE

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

1. Working outdoors, drain all fuel from the fuel tank. Run the engine until it stops from lack of fuel.



**WARNING**

**DO NOT DRAIN FUEL WHILE SMOKING, OR IF NEAR AN OPEN FIRE.**

2. Drain all the oil from the crankcase (this should be done after the engine has been operated and is still warm) and refill the crankcase with fresh oil.
3. Protect the inside of the engine for storage as follows.

Remove spark plug, pour approximately ½ ounce (approximately one tablespoon) of engine oil into cylinder and crank slowly to distribute oil. Replace spark plug.

4. Clean the engine and the entire tiller thoroughly.
5. Wipe tines with oiled rag to prevent rust.

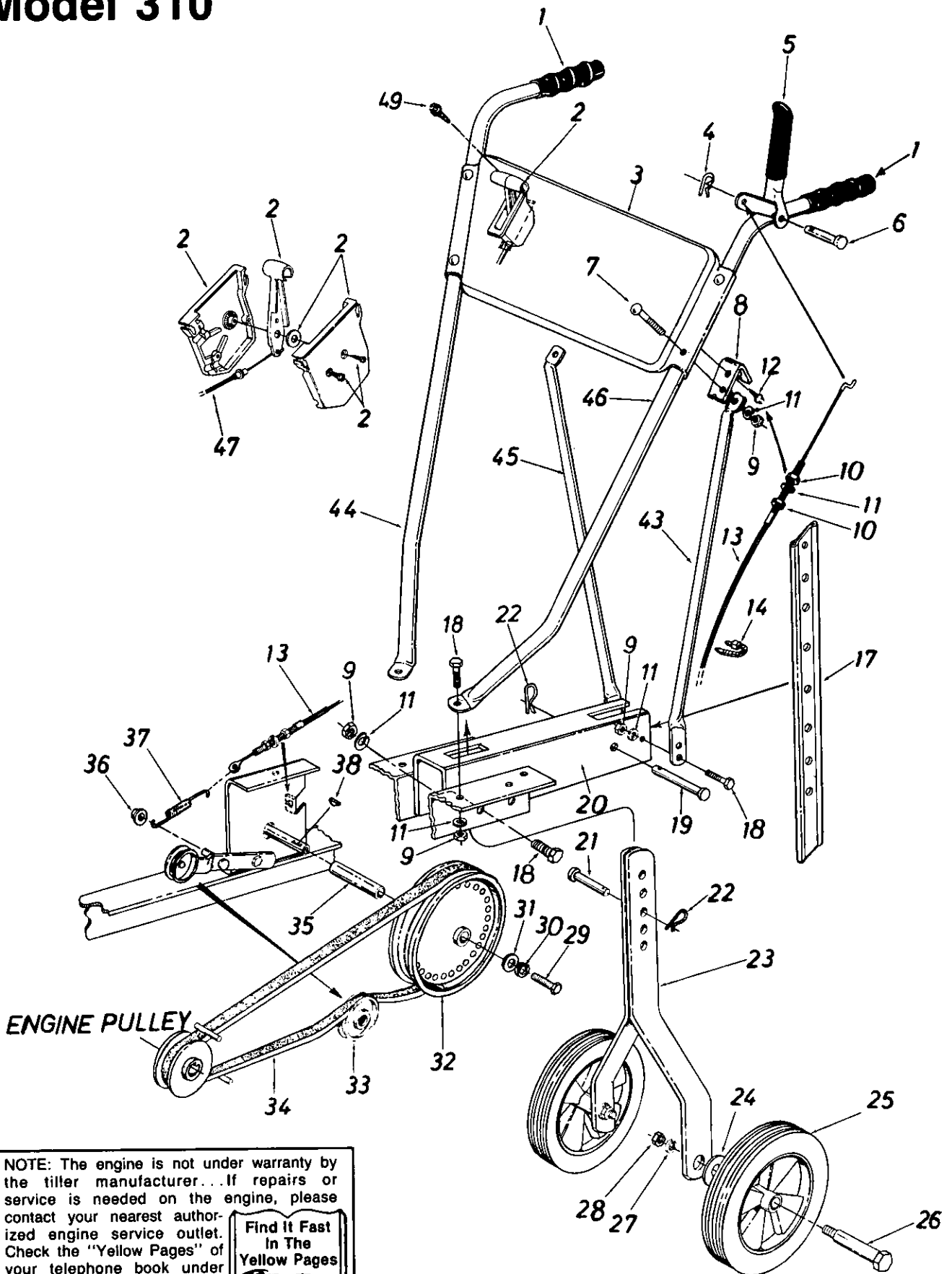


**NOTE**

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

6. Store in a clean, dry area.

# Model 310





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## PARTS LIST FOR MODEL 310 TILLER

REF. NO.	PART NO.	CODE	DESCRIPTION	REF. NO.	PART NO.	CODE	DESCRIPTION
1	720-0204	483	Grip	25	734-0585		Wheel Ass'y. Comp.—Steel
2	831-0823A		Throttle Control Box		741-0116		Wheel Bearing (Used w/Steel Wheel)
3	784-0036A		Handle Panel				Shoulder Bolt
4	714-0104		Int. Cotter Pin	26	738-0318		L-Wash. 1/2" I.D.*
5	784-0008		Clutch Grip Ass'y.	27	736-0921		Hex Nut 1/2-20 Thd.*
6	711-0415		Clevis Pin	28	712-0200A		Hex Bolt 1/4-28 x .75" Lg.
7	710-0458		Carriage Bolt 5/16-18 x 1.75" Lg.*	29	710-0412		L-Wash. 1/4" I.D.*
8	15093C		Cable Support Brkt.	30	736-0329		Fl-Wash. .25" I.D. x .930" O.D.
9	712-0267		Hex Nut 5/16-18 Thd.*	31	736-0176		Pulley 6.00" O.D.
10	712-0256		Hex Jam Nut 5/16-24 Thd.	32	756-0389A		Idler Pulley
11	736-0119		L-Wash. 5/16" I.D.*	33	756-0137		"V"-Belt 1/2" Pitch x 39" Lg.
12	710-0599		Hex Wash. Hd. Self-Tap Scr. 1/4-20 x .50" Lg.	34	754-0190		Spacer
13	746-0508	Clutch Control Cable	35	750-0472	Cap Speed Nut		
14	725-0157	Cable Tie	36	726-0106	Extension Spring		
17	04668	Depth Bar	37	732-0387	Hi-Pro Key		
18	710-0118	Hex Bolt 5/16-18 x .75" Lg.*	38	714-0388	Handle Support Bracket—L.H.		
19	711-0761	Clevis Pin 1/2" Dia. x 2.50" Lg.	43	749-0633	Handle Bar—R.H.		
20	784-0005	Tailpiece Ass'y.	44	749-0626	Handle Support Bracket—R.H.		
21	711-0755	Clevis Pin 3/8" Dia. x 2.50" Lg.	45	749-0632	Handle Bar—L.H.		
22	714-0149B	Hairpin Cotter	46	749-0627	Throttle Control Cable—35"		
23	06813	Wheel Bracket Ass'y.	47	746-0503	Self-Tap Scr. #10 x 1/2" Lg.		
24	736-0253	Belleville Wash. 1/2" I.D.	49	710-0779A			

\*For faster service obtain standard nuts, bolts, and washers locally. If these items cannot be obtained locally, order by part number and size as shown on parts list.

**CODE: N** notates a **new part** (not previously existing). A three digit number is the **color code**. Specify color code if color or finish is important when ordering parts as shown below. [i.e., 483 for Charcoal Gray Finish].

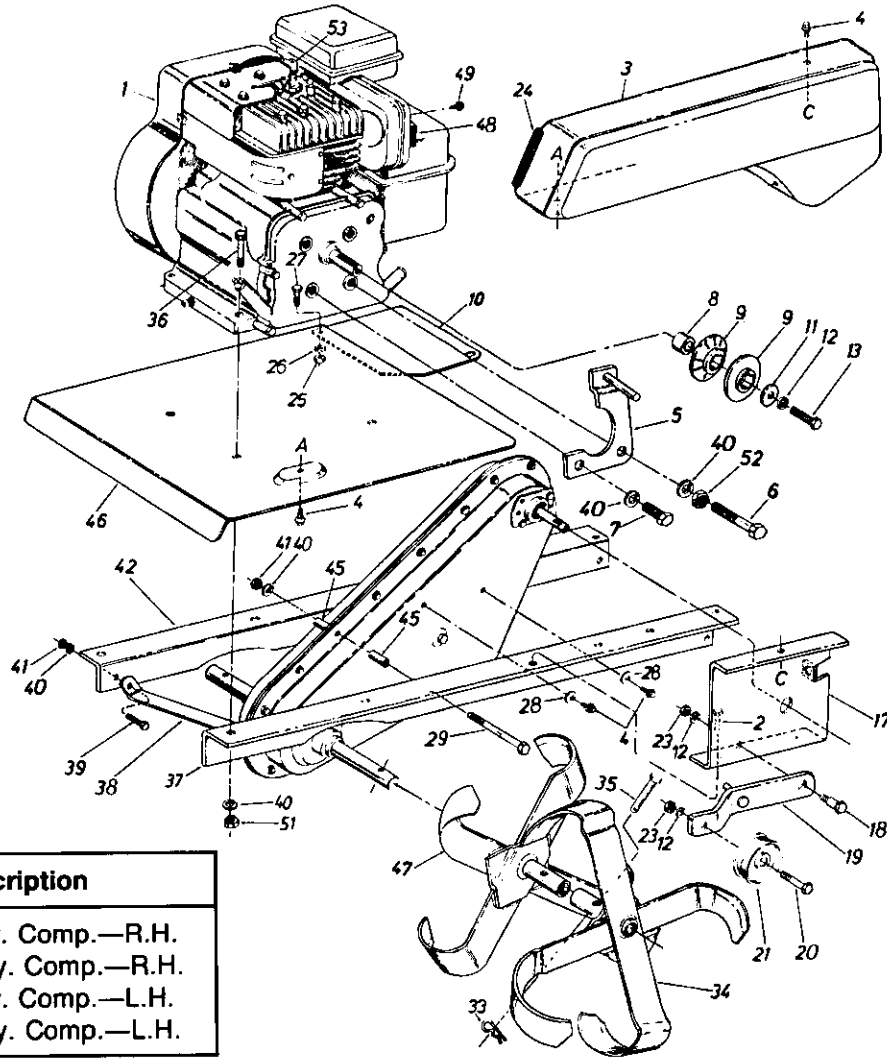
483—Charcoal Gray  
629—Silver Flake



Specifications subject to change without notice or obligation.

Part No.	Description
777-6649	Handle Panel Label
777-6650	"ROTO BOSS 510" Label
777-6503	Engine Label

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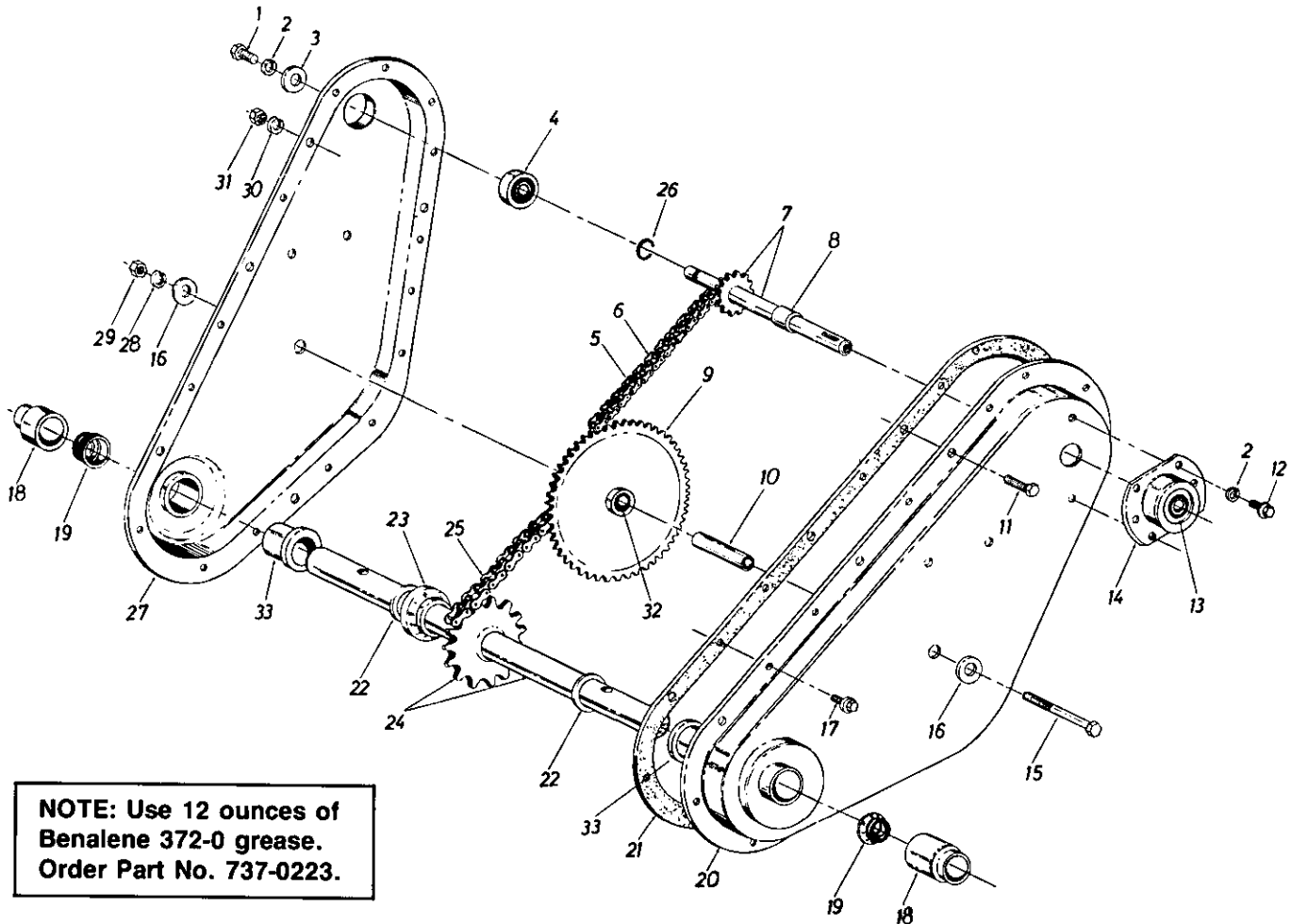
**TINE CHART**

Part No.	Description
784-0092	Inner Tine Ass'y. Comp.—R.H.
784-0094	Outer Tine Ass'y. Comp.—R.H.
784-0091	Inner Tine Ass'y. Comp.—L.H.
784-0093	Outer Tine Ass'y. Comp.—L.H.

## PARTS LIST FOR MODEL 310 TILLER

REF. NO.	PART NO.	CODE	DESCRIPTION	REF. NO.	PART NO.	CODE	DESCRIPTION
1	—		Engine	26	736-0329		L-Wash. 1/4" I.D.*
2	710-0600		Hex Self-Tap Scr. 5/16-24 x .5"	27	710-0258		Hex Bolt 1/4-20 x .62 Lg.*
3	04958	629	Belt Cover	28	736-0270		Bell-Wash. .26 I.D. x .75 O.D.
4	710-0599		Hex Self-Tap Scr. 1/4-20 x .5"	29	710-0189		Hex Bolt 5/16-18 x 3" Lg.*
5	784-0114		Belt Keeper Brkt. Ass'y.	33	714-0149B		Hairpin Cotter
6	710-0593		Hex Bolt 5/16-24 x 2.25" Lg. (Gr. 5)	34	—		See Tine Chart
7	710-0237		Hex Bolt 5/16-24 x .62" Lg. (Gr. 5)	35	1545-029		Clevis Pin
8	750-0345		Spacer	36	710-0442		Hex Bolt 5/16-18 x 1.5" Lg.*
9	748-0282		Pulley Half	37	04949B	483	Frame Rail—L.H.
10	784-0265		Tine Shield Extension	38	04933		Front Brace Brkt.
11	736-0258		FI-Wash. 3/8" I.D. x 1.25"	39	710-0118		Hex Bolt 5/16-18 x .75" Lg.*
12	736-0169		L-Wash. 3/8" I.D.*	40	736-0119		L-Wash. 5/16" I.D.*
13	710-0152		Hex Bolt 3/8-24 x 1.00" Lg.	41	712-0158		Hex Cent. L-Nut 5/16-18 Thd.
17	04934	483	Idler Mounting Brkt.	42	04948B	483	Frame Rail—R.H.
18	738-0322		Shld. Bolt	45	750-0470		Spacer
19	784-0027		Idler Bracket Ass'y.	46	784-0001A	629	Tine Shield
20	710-0344		Hex Bolt 3/8-16 x 1.5" Lg.	47	—		See Tine Chart
21	756-0137		Idler Pulley	48	751-0233		Deflector
23	712-0342		Hex Jam Nut 3/8-16 Thd.	49	710-0783		Hex Self-Tap Scr. #8-32 x .38"
24	731-0511		Trim Strip—3"	51	712-0267		Hex Nut 5/16-18 Thd.*
25	712-0287		Hex Nut 1/4-20 Thd.*	52	712-0123		Hex Nut 5/16-24 Thd.*
				53	735-0639		Spark Plug Boot (Optional)

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**NOTE: Use 12 ounces of Benalene 372-0 grease. Order Part No. 737-0223.**

## PARTS LIST FOR CHAIN CASE 784-0103

REF. NO.	PART NO.	CODE	DESCRIPTION	REF. NO.	PART NO.	CODE	DESCRIPTION
1	710-0513		Hex L-Scr. 1/4-28 x .625" Lg.	17	710-0599		Hex Wash. Hd. Self-Tap Scr. 1/4-20 x .50" Lg.
2	736-0329		L-Wash. 1/4" I.D.*	18	731-0487		Dust Cap
3	736-0176		Fl-Wash. .25" I.D. x .93" O.D. x .125" Thk.	19	721-0175		Seal
4	741-0155		Bearing .62" I.D. x 1.38" O.D. x .437" Thk.	20	14985		Tiller Housing—L.H.
5	713-0327		#35 Chain 3/8" Pitch x 52 Links—Endless	21	721-0170		Gasket
6	713-0139		Master Link (Service Only)	22	736-0163		Thrust Wash. 1.00" I.D. x .030" Thk.
7	04956		Input Shaft Assembly	23	750-0570		Step Spacer
8	750-0471		Spacer	24	784-0089		Tine Shaft Assembly
9	713-0331		Sprocket Assembly (Includes Ref. No. 32)	25	713-0328		#50 Chain 5/8" Pitch x 46 Links—Endless
10	750-0275		Sprocket Hub Tubing 3/8" I.D. x 5/8" O.D. x 1.9" Lg.	26	716-0131		Snap Ring
11	710-0118		Hex Scr. 5/16-18 x .625" Lg.*	27	14984		Tiller Housing—R.H.
12	710-0599		Hex Wash. Hd. Self-Tap Scr. 1/4-20 x .50" Lg.	28	736-0169		L-Wash. 3/8" I.D.*
13	741-0155		Bearing .625" I.D. x 1.38" O.D. x .437" Thk.	29	712-0711		Hex Nut 3/8-24 Thd.
14	05034		Bearing Housing	30	736-0119		L-Wash. 5/16" Scr.*
15	710-0629		Hex Scr. 3/8-24 x 2.75" Lg.	31	712-0267		Hex Nut 5/16-18 Thd.*
16	736-0258		Fl-Wash. 3/8" I.D. x 1.25" O.D. x .100 Thk.	32	741-0304		Bearing (For Service Only—Must be Press Fit)
				33	731-0374		Bearing

## Trouble Shooting Guide

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

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

## Heavy Duty Garden Tiller Attachments Available for All-Season Use

31-0106	Depth Gauge Wheels (Pair)	31-0123	Lawn Aerator (Use with 31-0114 Wheel Weights for added penetration)
31-0107	6-Tine Cultivator (Must be used with 31-0106 Depth Gauge Wheels)	31-0144	"V"-Bar Cultivating Kit Kit Includes: "V"-Bar Frame, 4-Point Cultivating Tines, Hiller/Furrower, Depth Gauge Wheels (Pair).
31-0110	8" Furrow Opener	31-0145	Depth Stake Cultivating Kit Kit Includes: 8" Furrow Opener, 15" Sweep Cultivator, 32" Leveling Rake, Extra Depth Stake.
31-0111	15" Sweep Cultivator		
31-0113	Pneumatic Tires, 13 x 5.00-6 (Pair)		
31-0114	Wheel Weights (Pair)		
31-0115	Tire Chains, 13 x 5.00 (2 Link) (Pair)		
31-0119	Tine Cultivating Shields w/Adapters (Pair)		

Note: Attachments are available through your local dealer or from the factory:  
Agri-Fab Inc., 303 W. Raymond Street, Sullivan, Illinois 61951 (217) 728-8388







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