FORD

REAR TINE TILLER

MODEL: 09GN-1134

40113410

REPAIR MANUAL

Reprinted

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5 H.P. REAR TINE TILLER (Model 09GN-1134/1183)

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.

REAR TINE

INTRODUCTION

This manual contains service and maintenance instructions for a Rear Tine Tiller. It has been prepared to provide the serviceman with the information needed to correctly service and maintain a rear tine 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, when handle is located in the TILLING 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 just below the handle pivot point and above the tine shield on the rear of tunnel assembly. (Fig. 1)

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

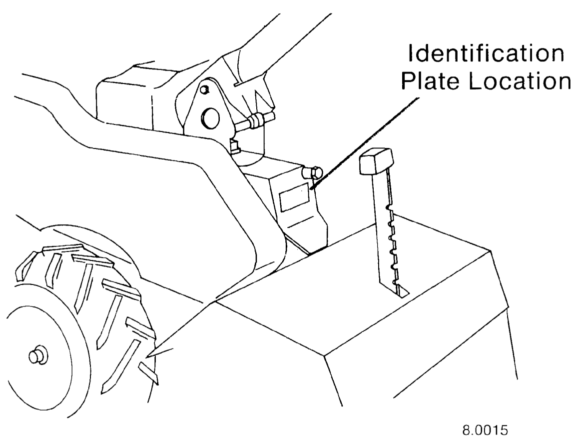

FIG. 1

LUBRICATION AND MAINTENANCE

ENGINE:

1. Refer to engine operating manual for all engine maintenance or adjustment requirements.

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

CHAIN CASES:

1. Wheel Drive Case Level Check —

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

A. Set depth control lever down to the shallowest setting. (Fig. 2)

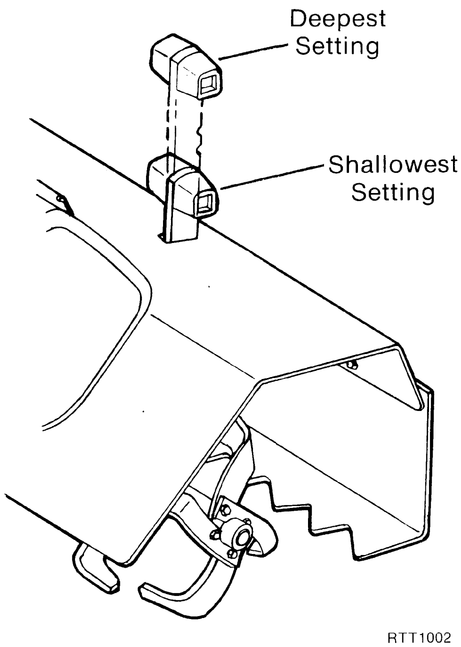

FIG. 2

B. Brace or block under front of counterweights so that right wheel can be removed. (approx. 5¼") (Fig. 3) Remove klik pin and slide wheel off shaft.

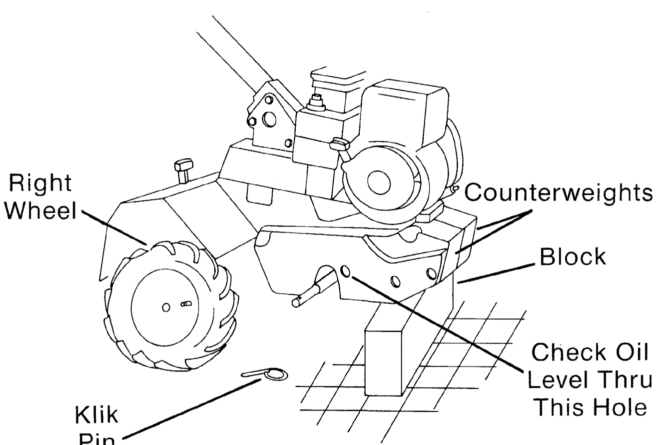

FIG. 3

C. Remove oil level plug through hole in counterweight and check that oil level is up to bottom of level plug hole. (Fig. 3) Oil level check should be performed after every 25 hours of operation.

D. If oil level is correct, replace level plug, wheel and klik pin.

E. If oil level is low, remove right counterweight and tip tiller to its left side. Add sufficient SAE (EP) 140 wt. heavy duty gear lubricant (G.B. 4890) to bring oil level up to bottom of level hole.

F. Tip tiller back down to check oil level and replace level plug, counterweight, right wheel and klik pin.

2. Tine Drive Case Level Check —

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

A. Pull depth control up and set at its deepest setting. (Fig. 2)

B. Place tiller on a level surface so that tines and wheels are setting on ground. (Fig. 4)

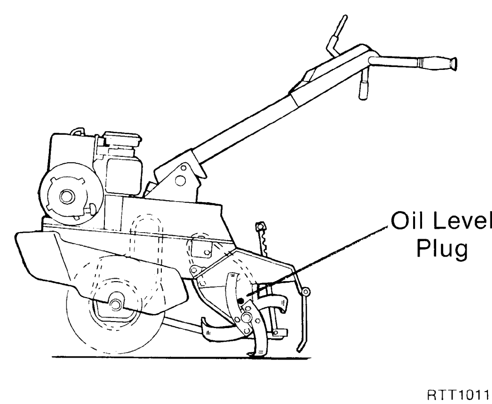

FIG. 4

C. Wipe dirt away from oil level plug on left side of tine drive case and remove plug. Check that oil level is up to bottom of level plug hole. (Fig. 4) Level check should be performed after every 25 hours of operation.

D. If level is correct, replace level plug.

Form No. 620-164
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E. If level is low, replace level plug, and tip tiller to its left side. Remove oil level fill plug from right side of gear case. (Fig. 5) Add sufficient SAE (EP) 140 wt. heavy duty gear lubricant (G.B. 4890) to bring level up to bottom of oil level hole.

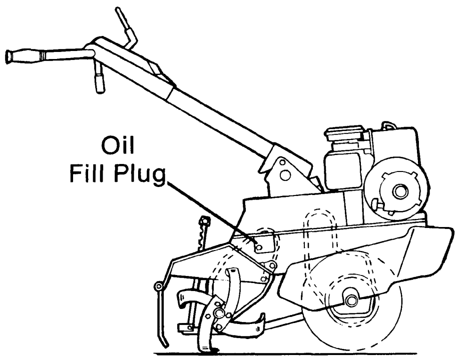

FIG. 5

F. Tip tiller back down to check oil level and replace, fill and level plugs when oil level is correct.

GENERAL LUBRICATION POINTS:

1. The following points should be lubricated with engine oil every 8 hours. (Fig. 6) Before oiling, clean off area to be lubricated.
   - A. Handle plunger shaft and disc.
   - B. Control rod swivel points.
   - C. Handle rotating surface.
   - D. Cam and detent ball and shaft.
   - E. Handle control lever.
   - F. Tine drive bell crank pivot points.

TIRE PRESSURE:

Recommended tire pressure is 20 lbs. in both tires.

ADJUSTMENTS AND SERVICING

ENGINE:

1. See Engine Manufacturer's Owner's Manual for adjustments and servicing information.
2. Maximum engine RPM high speed operating no load range is 3500 RPM to 3700 RPM.
3. **Engine Removal and Replacment —**

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. 7)

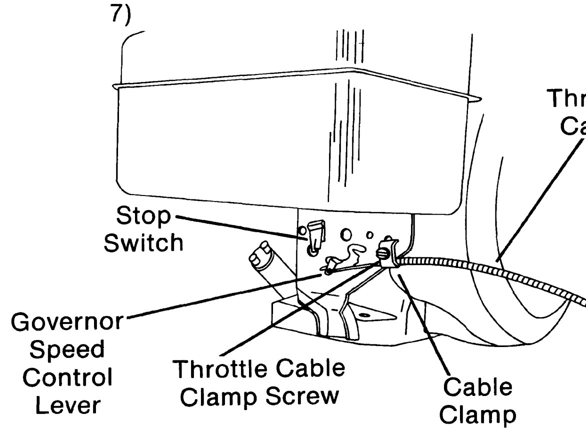

FIG. 7

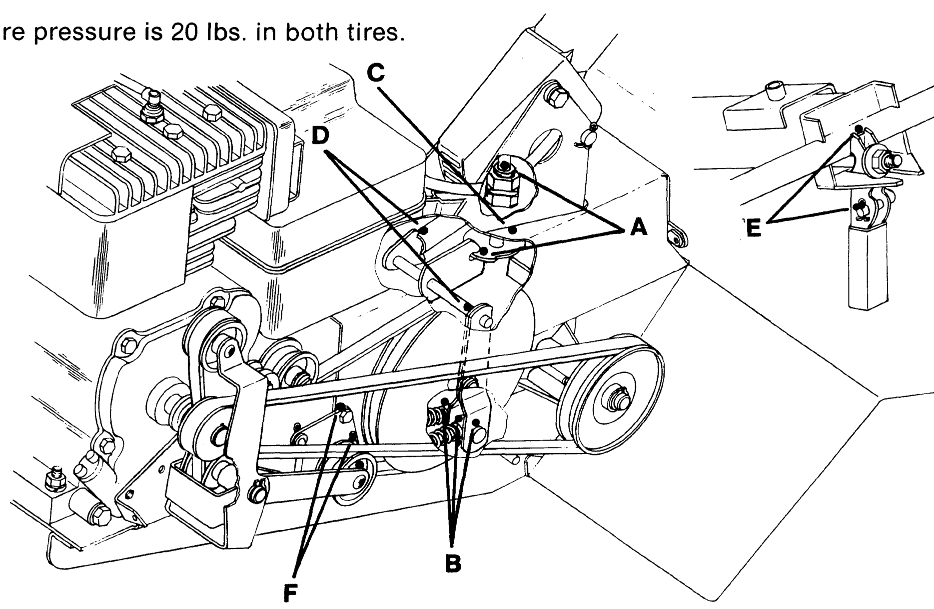

FIG. 6

C. Remove belt guard and place clutch control lever in "NEUTRAL" position.

D. Remove capscrew holding front tine belt guide and pivot belt guide forward.(Fig. 8)

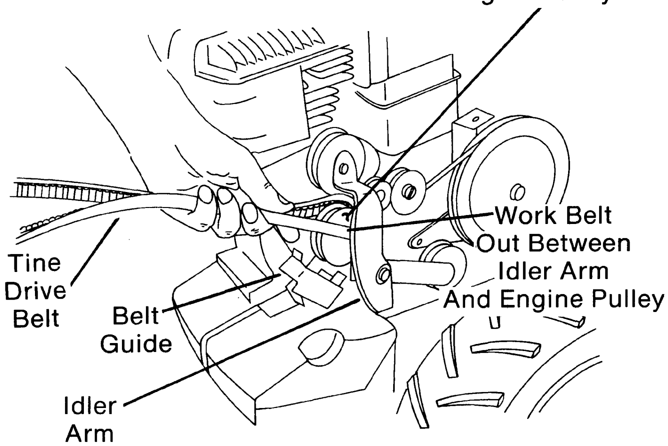

FIG. 8

NOTE: Set belt guides so there is 1/16" to 1/8" clearance with belt ENGAGED when reassembled.

E. Loosen tine drive case clamping capscrews (Fig. 9) and slip tine drive belt off rear tine drive case pulley.

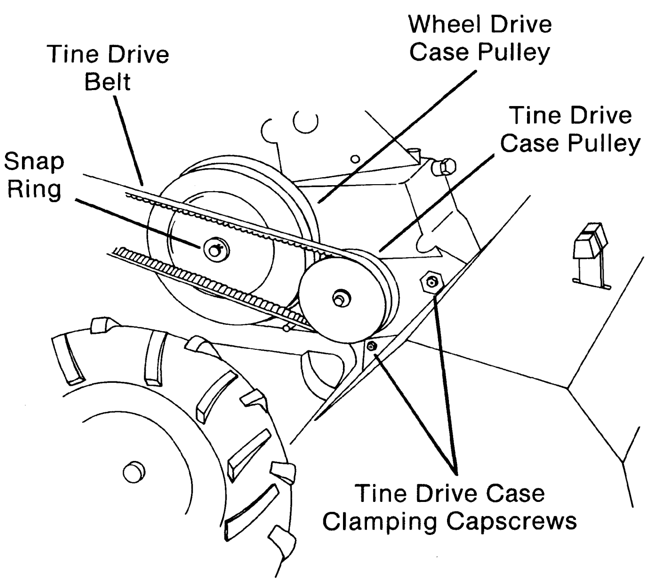

FIG. 9

F. Remove belt from engine pulley and slip belt out between engine pulley and idler arm. (Fig. 8)

G. Slip wheel drive belt off rear wheel drive case pulley and unwrap belt from front idler pulley. Pull belt away from engine pulleys.

H. Remove snap ring from rear wheel drive case pulley and remove pulley. (Fig. 9)

I. Remove four engine mounting capscrews, nuts and lockwashers. Lift engine from frame.

J. Loosen two setscrews in each engine pulley (camshaft and engine pulleys) and remove pulleys and keys from engine shafts. (Fig. 10)

NOTE: Realign engine and camshaft pulleys with wheel drive case pulley when pulleys are reassembled onto engine shafts.

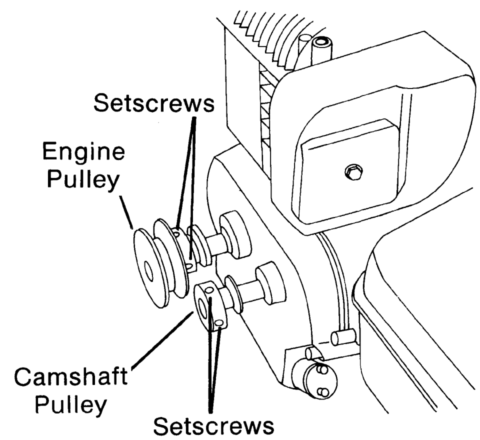

FIG. 10

K. To replace engine, reverse above procedure until you reach the point of connecting the throttle control cable. Then follow this adjustment procedure: (Fig. 7) Pull throttle control handle all the way back to the STOP position (past rear detent). Attach end of throttle cable to governor speed control lever and slip cable under cable clamp. Push cable all the way to the left until governor speed control lever contacts stop switch. Tighten cable clamp screw.

NOTE: Also check both belt adjustments per procedures under "BELTS".

L. Add gas and oil as prescribed in engine manufacturer's manual. Check and test operation.

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3/84

BELTS:

The belts on this tiller are specifically designed and engineered to provide long, trouble-free service. If belt replacement is necessary, order the part number shown in the owner's guide to be sure you have the belts that will provide the life and service required.

1. Tine Drive Belt Adjustment —

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

A. Remove belt guard.

B. The tine drive belt, which is the outer belt, is adjusted by loosening the clamp capscrews (Fig. 9) and rotating the entire tine case and tine assembly. Rotate case forward to slacken belt and back to tighten belt. With the clutch control lever in the "FORWARD DRIVE" position, the distance between the insides of the belt should be approximately ¾" ± ⅛" as shown in (Fig. 11) Tighten the clamp capscrews securely after adjustment. Place depth control in shallowest setting and start engine. With control lever in "NEUTRAL" position, tines should not rotate. If tines rotate, readjust to increase belt slack until tines do not drive in "NEUTRAL."

NOTE: If unit jumps out of gear, decrease setting above to ⅝" or ½". Check belt clearance.

C. Replace belt guard.

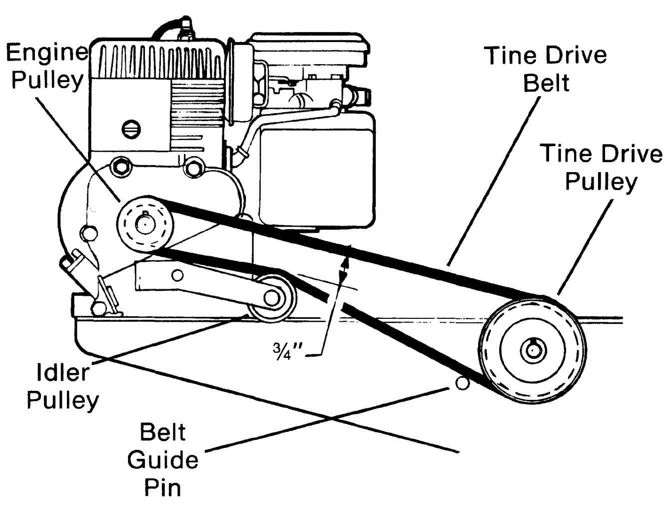

FIG. 11

2. Tine Drive Belt Replacement —

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

A. Place clutch lever in "NEUTRAL" position and remove belt guard.

B. Remove capscrew holding front tine belt guide and pivot belt guide forward. (Fig. 8)

NOTE: Set belt guides so there is $1/16$" to ⅛" clearance with belt engaged when reassembled.

C. Loosen tine drive case clamping capscrews and slip tine drive belt off rear tine drive case pulley. (Fig. 9)

D. Remove belt from engine pulley and slip belt out between engine pulley and idler arm. (Fig. 8)

E. IMPORTANT — Powder new belt! (talcum or soap stone powder). After new belt is installed set depth control lever down to the shallowest setting. Place wheel klik pins in the free-wheel (outer hole on wheel drive shaft) position. Start unit and engage in "FORWARD DRIVE" position for approximately 10 min. to break new belt in.

To replace new belt, reverse above procedure. Be sure belt is on top of tine drive idler pulley and rear belt guide pin near tine drive case pulley. (Fig. 11)

F. Adjust belt with control lever "ENGAGED" to ¾" as described in "Belt Adjustment". (Fig. 11)

G. Replace belt guard.

3. Wheel Drive Belt Adjustment —

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

A. Remove belt guard.

B. The wheel drive belt, which is the inner belt, is adjusted by moving the adjustment idler pulley (idler pulley closest to engine camshaft pulley). (Fig. 12) With clutch control lever in the "NEUTRAL" position pull belt up on both sides of upper idler pulley and check for an approximate ¼" gap between upper idler pulley and belt. The adjustment idler pulley should be repositioned to obtain this ¼". Moving pulley up will increase dimension and down will decrease dimension.

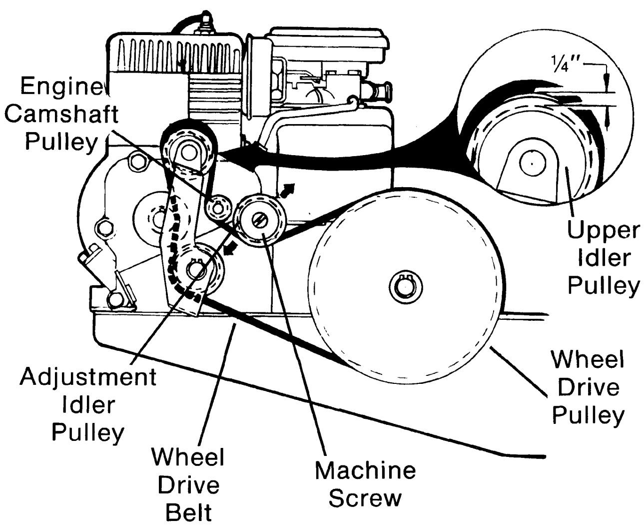

FIG. 12

NOTE: With clutch control lever in "FORWARD DRIVE" position belt should run true on all pulleys. If it does not, pulleys must be aligned or their mounting plates or arms bent slightly to align.

NOTE: Adjustment idler pulley has four locations and is not slot mounted. The machine screw must be removed completely from mounting frame when repositioning this pulley.

C. Replace belt guard.

4. Wheel Drive Belt Replacement —

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

A. Remove tine drive belt per instructions under "TINE DRIVE BELT REPLACEMENT".

B. Remove wheel drive belt from rear wheel drive case pulley.

C. Remove snap ring from rear wheel drive case pulley and remove pulley: (Fig. 13) Do not lose woodruff key in drive pulley shaft.

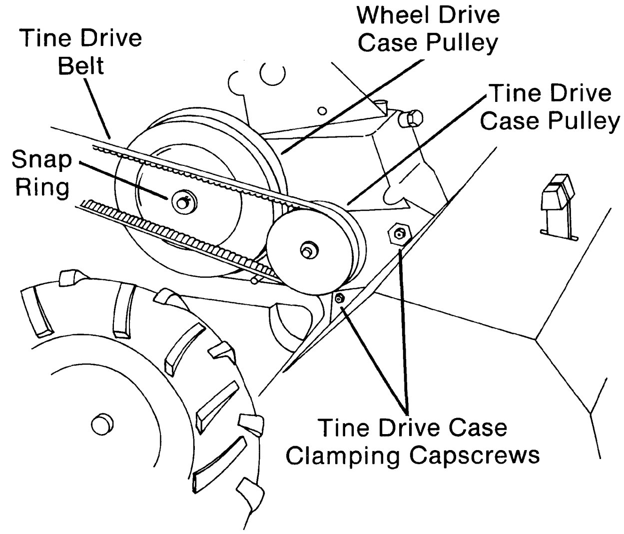

FIG. 13

D. Remove snap ring from idler arm shaft.

E. Remove bellcrank capscrew, pivot bushing and washers from bellcrank, and slide idler arm assemblies out just far enough to remove outer control rod cotter pin. (Fig. 14) At this point, front tine belt guide and wave washer will fall out. Note position of these parts.

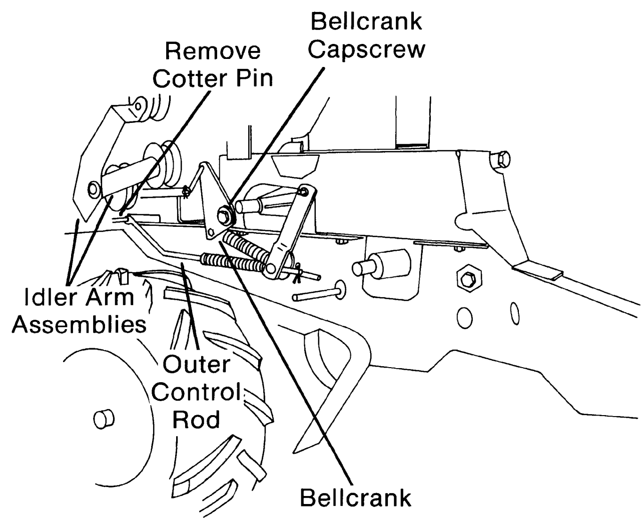

FIG. 14

F. Slide idler arm assemblies out further until long idler spacer can be slipped between idler pulley and idler arm. (Fig. 15) Remove belt.

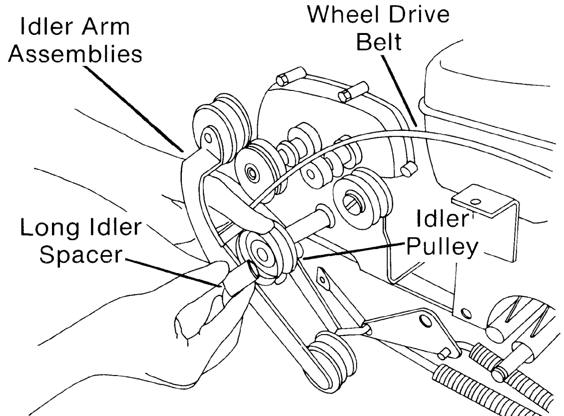

FIG. 15

G. To install new belt, reverse above procedure. Be sure belt is turned inside out (wide side on input pulley) before installing. (Fig. 16)

NOTE: Pay special attention to belt routing as shown in (Fig. 12).

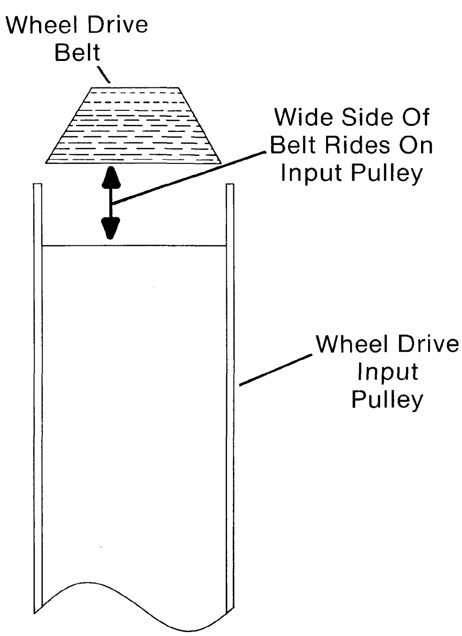

FIG. 16

H. Readjust tine drive belt to ¾″ gap (in FORWARD DRIVE), and wheel drive belt to ¼″ gap (in NEUTRAL) as outlined under belt adjustments.

I. Replace belt guard.

WHEEL DRIVE CHAIN CASE:

1. Removal and Replacement —

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

A. Place handle in TRANSPORT position and raise handle to highest setting.

B. Remove belt guard.

C. (For Models 09GN1134 **only**).

a. Push depth control lever down as far as possible and remove handle knobs. Remove top and rear tine shield capscrews along with capscrew through tabs in front corners of tine shield. (Fig. 17) Pull tine shield up and back to remove.

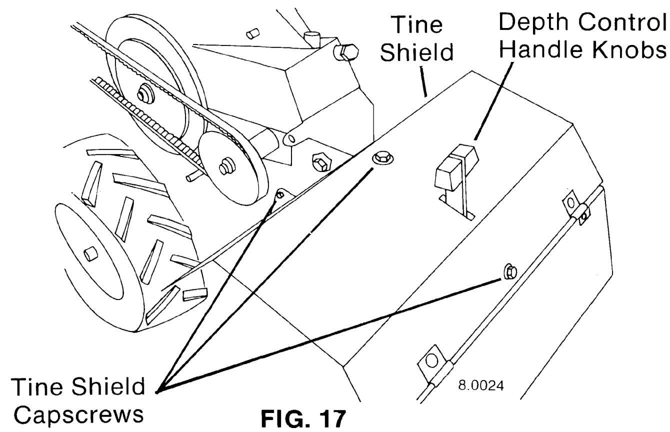

FIG. 17

WARNING: Depth control rod is under spring tension, so hold control rod securely when performing the following disassembly:

b. Remove two capscrews securing mount support assembly for depth control between frame halves. (Fig. 18) Carefully pull assembly down and to the rear to remove. Remove skid bar capscrew at wheel drive chain case and remove depth control assembly.

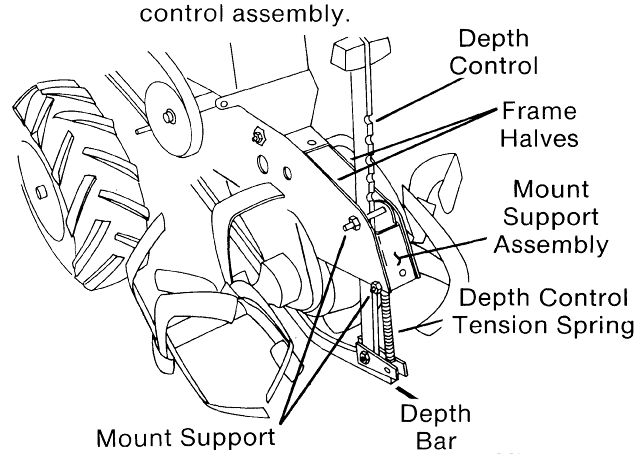

FIG. 18

IMPORTANT: Depth control has spring tension against support. When installing, hook both ends of spring to depth bar before mount support assembly is bolted in place. Also **do not** over-tighten the two support assembly capscrews. Over-tightening will cause mount support assembly to pinch depth control lever and impair proper movement of lever.

D. (For Models 09GN1183 **only**);

a. Remove top and rear tine shield capscrews along with capscrew through tabs in front corners of tine shield (Fig. 17).

b. Remove one capscrew at the bottom of the depth control attaching the skid bar to the depth control (Fig. 18A)

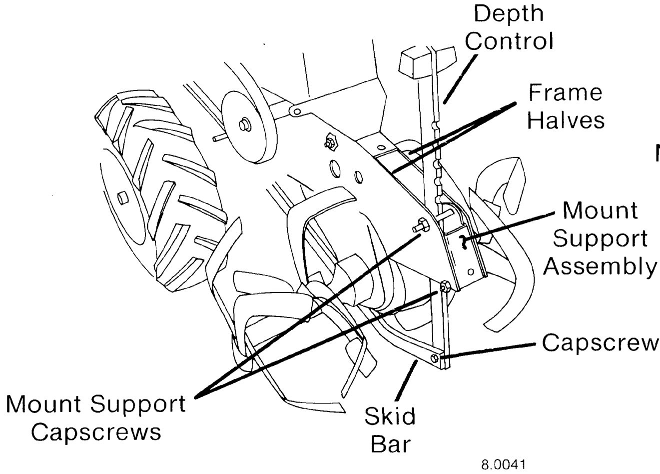

FIG. 18A

c. Remove two capscrews securing mount support assembly for depth control between frame halves (Fig. 18A). Remove depth control out hole in top of tine shield. Mount support assembly can now be removed.

IMPORTANT: During reassembly; **Do Not** over-tighten the two support assembly capscrews. Over-tightening will cause mount support assembly to pinch depth control lever and impair proper movement of lever.

d. Pull tine shield up and back to remove.

e. Remove skid bar capscrew at wheel drive chain case and remove skid bar.

E. Remove snap rings from both main drive input shafts and slide pulleys off shafts.

NOTE: Do not lose woodruff keys, one on each shaft.

F. 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. 7)

G. Remove capscrew holding front tine belt guide and pivot belt guide forward. Remove four nuts and lockwashers holding engine in place. Only three capscrews can be removed at this time, the fourth capscrew will be removed later. Remove engine, tine drive belt should come along when engine is removed. (Fig. 19)

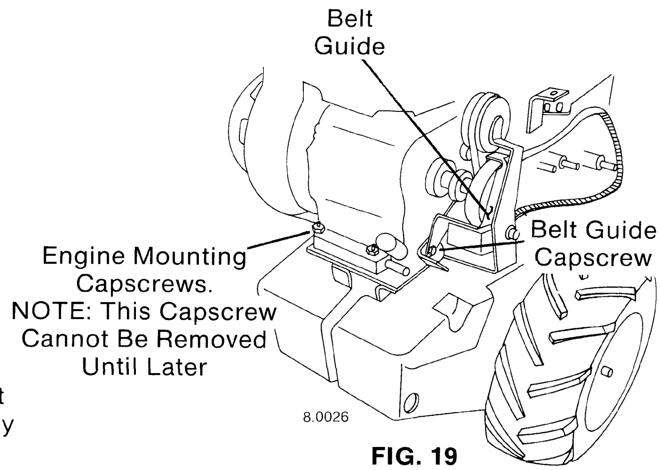

FIG. 19

NOTE: Position tine belt around engine pulley as shown in (Fig. 20) when remounting engine on tiller.

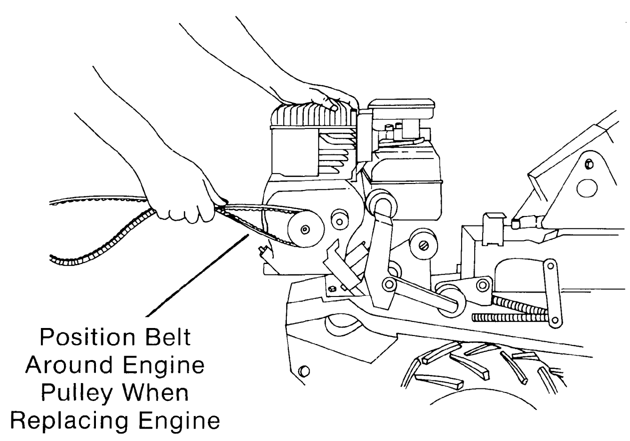

FIG. 20

H. Engage clutch lever to DRIVE position and remove cotter pin from outer control rod. (Fig. 21) Remove capscrew and washers securing bellcrank assembly in place.

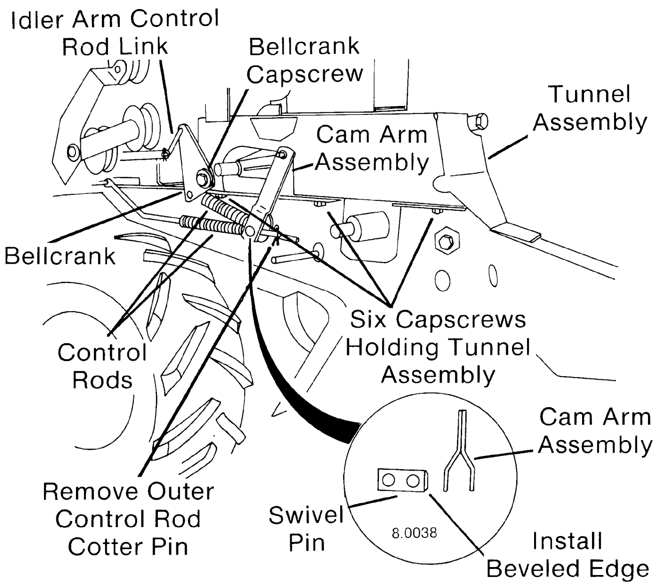

FIG. 21

NOTE: Note position of bellcrank and idler arm control rod link for proper installation.

I. Remove six capscrews mounting handle/tunnel assembly to top flanges of frame halves. (Fig. 21) Lift tunnel up and pull back to slip control rods out of swivel in cam arm assembly and lift tunnel assembly forward and up to remove.

NOTE: Beveled edge of swivel is installed first into cam arm assembly when reassembled. (Fig. 21)

J. Block or support front of left counterweight and remove right wheel klik pin, right wheel, wheel spacer and washer. (Fig. 22)

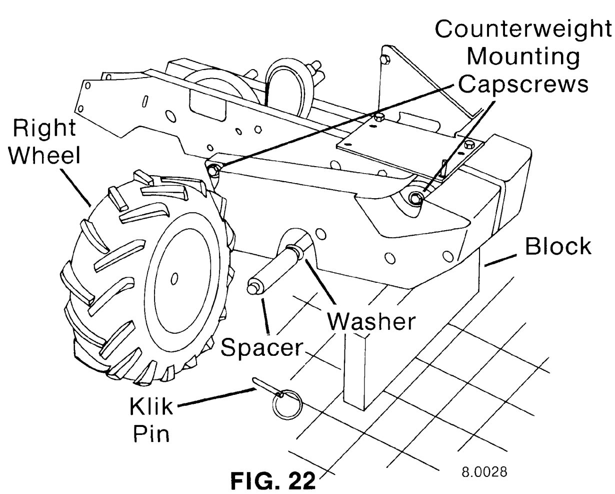

FIG. 22

K. Remove two hex nuts securing right counterweight in place and slide counterweight off mounting studs. Remove rear counterweight hanger.

NOTE: Last engine mounting capscrew will fall out at this point

L. Remove the following:

a. The remaining capscrew securing tine drive case between frame halves. (Fig. 23 A)

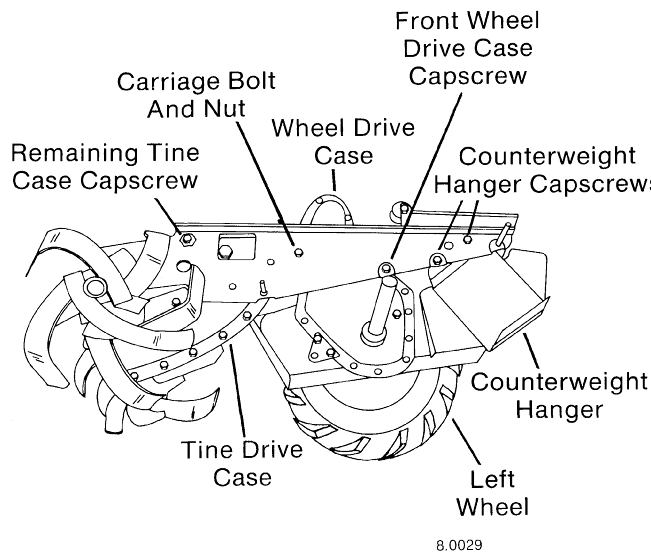

FIG. 23 A

NOTE: **Do not** lose tine belt adjustment capscrew spacers located between main frame halves. (Fig. 23 B)

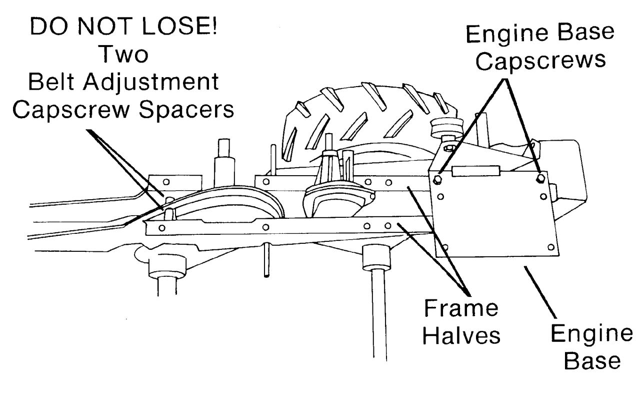

FIG. 23 B

b. The carriage bolt and nut holding wheel drive case in place. (Fig. 23 A)

c. Two remaining bolts on engine base plate assembly attached to left side frame half. (Fig. 23 B)

d. Remove capscrew and nut holding front of wheel drive chain case between frame halves. (Fig. 23 A)

M. Remove left wheel klik pin and lay remainder of unit on left wheel. (Fig. 23 A)

N. Remove two capscrews holding right side frame to front counterweight hanger. (Fig. 23 A) Hold tine drive chain case and remove right side frame and tine case.

O. Lift wheel drive chain case out of left wheel and remove wheel spacer and washer.

P. Remove two screws and both skid assembly lugs attached to rear of wheel drive chain case.

Q. Before installing new chain case add one can (8 oz.) of SAE (EP) 140 wt. heavy duty gear lubricant (G.B. 4890) through fill hole on right side of chain case.

R. Reassemble chain case into tiller by reversing procedure above. Pay attention to the various "Notes" called out in disassembly procedure when reassembling.

2. **Rebuild -** Reference (Fig. 24) for parts identification for both disassembly and assembly procedures.

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

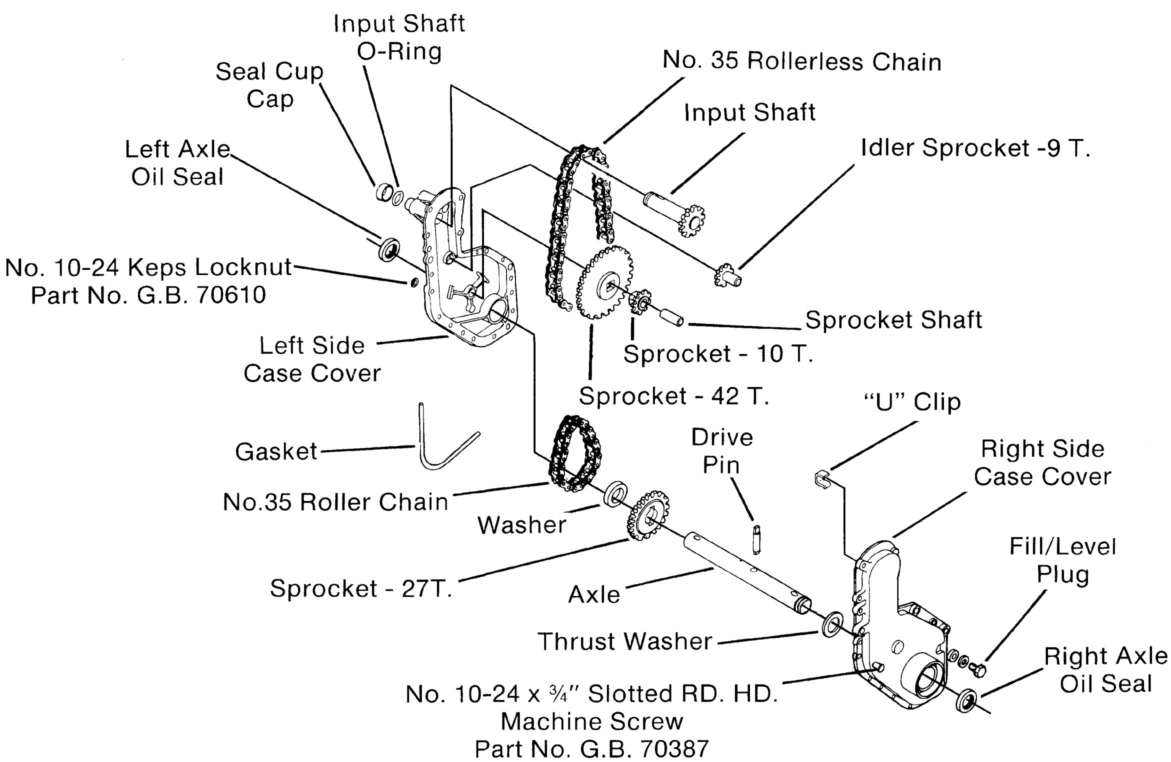

FIG. 24

DISASSEMBLY:

A. Remove chain case as described above.

B. Clean chain case. Remove any burrs or sharp edges from input and axle 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. For ease of disassembly, remove remainder of chain case parts in this order. (Fig. 24)

   a. Remove axle thrust washer and drive pin.

   b. Remove No. 35 roller chain, 27 tooth sprocket and washer.

   c. Remove sprocket shaft and 10 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.

G. 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 axle oil seals should be replaced **only** as new parts.

H. Axle oil seals can be removed by punching seals out from inside of chain case. Remove both right case and left case oil seals.

ASSEMBLY:

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

B. Install both new axle 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 axle 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 10 tooth sprocket onto shaft The squared end of 10 tooth sprocket must fit into 42 tooth sprocket.

G. Wrap No. 35 roller chain around 27 tooth sprocket. Position axle washer on axle mounting hole. Wind chain around 10 tooth sprocket and position 27 tooth sprocket with chain onto axle washer.

H. Insert drive pin into axle. Slip thrust washer onto axle.

   IMPORTANT: Thrust washer must be installed on the proper side of drive pin. One end of axle has a "V" groove. Install thrust washer onto axle from end with "V" groove.

I. **IMPORTANT:** Before installing axle check both ends of axle for any burrs. Burrs may cause damage to axle oil seals.

   Carefully slide axle from end opposite "V" groove, thru 27 tooth sprocket, axle washer and oil seal. Align drive pin so it drops into drive slots on 27 tooth sprocket.