FORD

SNOW THROWERS

MODELS: 09GN-5203/5239/5241

REPAIR MANUAL

Reprinted

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SNOW THROWER ST320 (Model 09GN-5203)

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.

INTRODUCTION AND SAFETY

This manual contains service and maintenance instructions for a ST320 Snow Thrower. It has been prepared to provide the instructions the serviceman needs to correctly service and maintain a snow thrower. All sections of this manual should be carefully studied by the serviceman before beginning to work on the snow thrower.

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 serviceman to avoid accidents.

When you see this symbol —  **HEED ITS WARNING!**

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

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 snow thrower.
3. DO NOT wear loose fitting clothing that might get caught in moving parts. Also keep hands and feet away from moving parts. Keep clear of discharge opening at all times.
4. Never direct discharge at bystanders or allow anyone in front of the snow thrower.

EQUIPMENT CONSIDERATIONS:

1. Always turn ignition switch OFF and remove ignition key from switch. This **must** be performed every time any servicing is done and will prevent accidental starting of engine.

SNOW THROWER ST320

(09GN-5203)

2. Always store gasoline or flammable solvents used for cleaning in closed containers specifically designed for that purpose.
3. Before cleaning, servicing inspecting or unclogging auger housing on snow thrower; shut engine off and remove key from ignition switch. Make certain all moving parts have stopped.
4. Never operate snow thrower without proper guards, plates or other safety protective devices in place.
5. Never store snow thrower with fuel in the tank, inside a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.
6. Do not change governor setting or over speed the engine.
7. Never add fuel to a running or hot engine.

OPERATIONAL CONSIDERATIONS:

1. Do not start or run engine indoors. Fumes from engine exhaust can kill.
2. Be sure that all parts are securely fastened before starting snow thrower.
3. Be sure all tools and cleaning materials are removed before starting snow thrower.
4. If the equipment should start to vibrate abnormally, stop engine and check immediately for the cause. Vibration is generally a warning of trouble.
5. If test running is required, make sure you are thoroughly familiar with the complete operation of the snow thrower. Know how to stop the snow thrower.
6. Exercise extreme caution when operating on or crossing a gravel drive, walks or roads. Stay alert for hidden hazards or traffic.
7. Never operate snow thrower near glass enclosure, automobiles, window wells, etc., without proper adjustment of snow discharge angle. Keep children or pets away.
8. Do not overload machine capacity by attempting to clear snow at too fast a rate.
9. Never operate without good visibility or light.

IDENTIFICATION PLATE LOCATION

The snow thrower model and serial number identification plate is located on the right frame tube just above the body shroud. (Fig. 1)

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

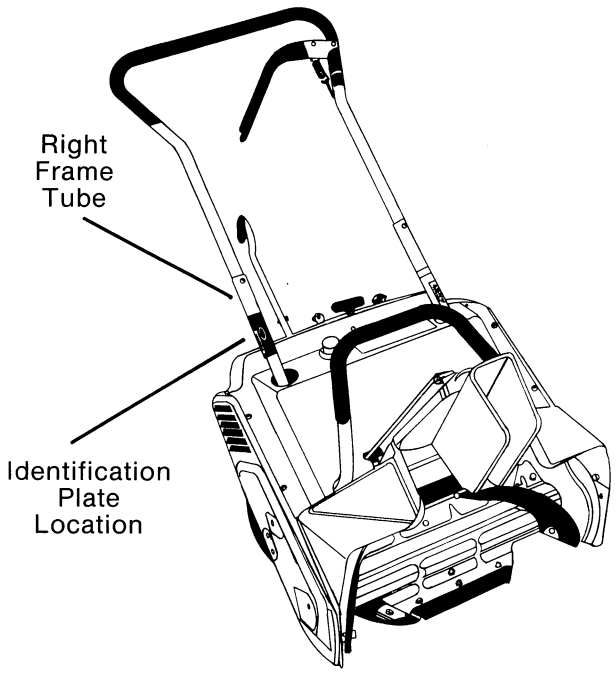

FIG. 1

SET-UP INSTRUCTIONS

1. INITIAL SNOW THROWER ASSEMBLY—

A. Position handle above frame tube making sure the clutch lever is on the left side when standing in the operator's position.

B. Push both ends of the the handle into the frame tube at the same time until the holes in the handle line up with the holes in the frame tube. If it sticks, bump it with the heel of your hand.

C. Secure handle in place with the handle screws and locknuts. Install screws from top down. (Fig. 2) Tighten locknuts until snug against tube. DO NOT overtighten and collapse tube.

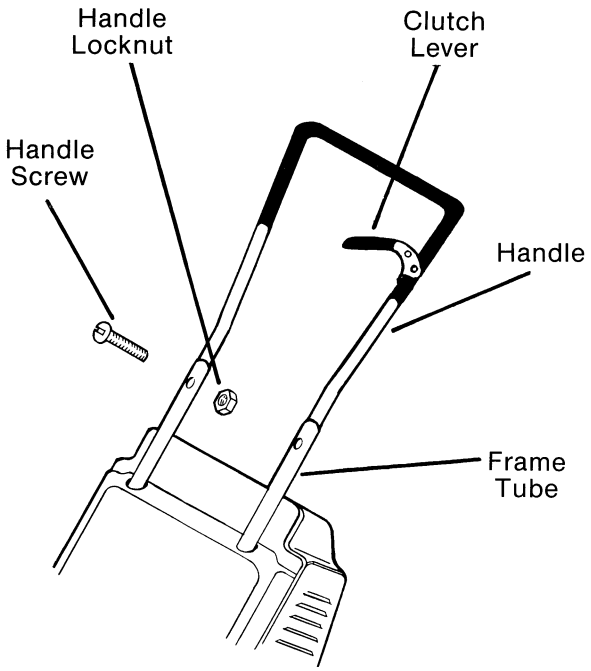

FIG. 2

D. Insert clevis pin through hole in clutch handle from top down, (front to rear). (Fig. 3)

E. Hook one end of clutch spring through the hole in clevis pin. (Fig. 3)

F. Thread the looped part of clutch adjustment clip through the end link of the chain. (Fig. 3) Place chain over the lower hook of the clutch spring. (Fig. 3)

G. With clutch lever in the released position, pull down on the clutch adjustment clip until all slack is out of cable. Be certain cable is not pulled up.

H. Hook the open end of clutch adjustment clip into the link of the chain it is closest to. (Fig. 3)

I. Check clutch lever adjustment as follows:

a. With key off and clutch handle released pull engine starter handle. Auger should not turn.

b. If the auger turns, move the open end of the clutch adjustment clip to the next link toward the clutch handle. (Loosen).

c. Proper belt tension is achieved when clutch cable has all the slack removed when clutch handle is released.

NOTE: Cable may sag on some units when adjustment is properly set. Periodically check belt tension by following above method to prevent belt slippage.

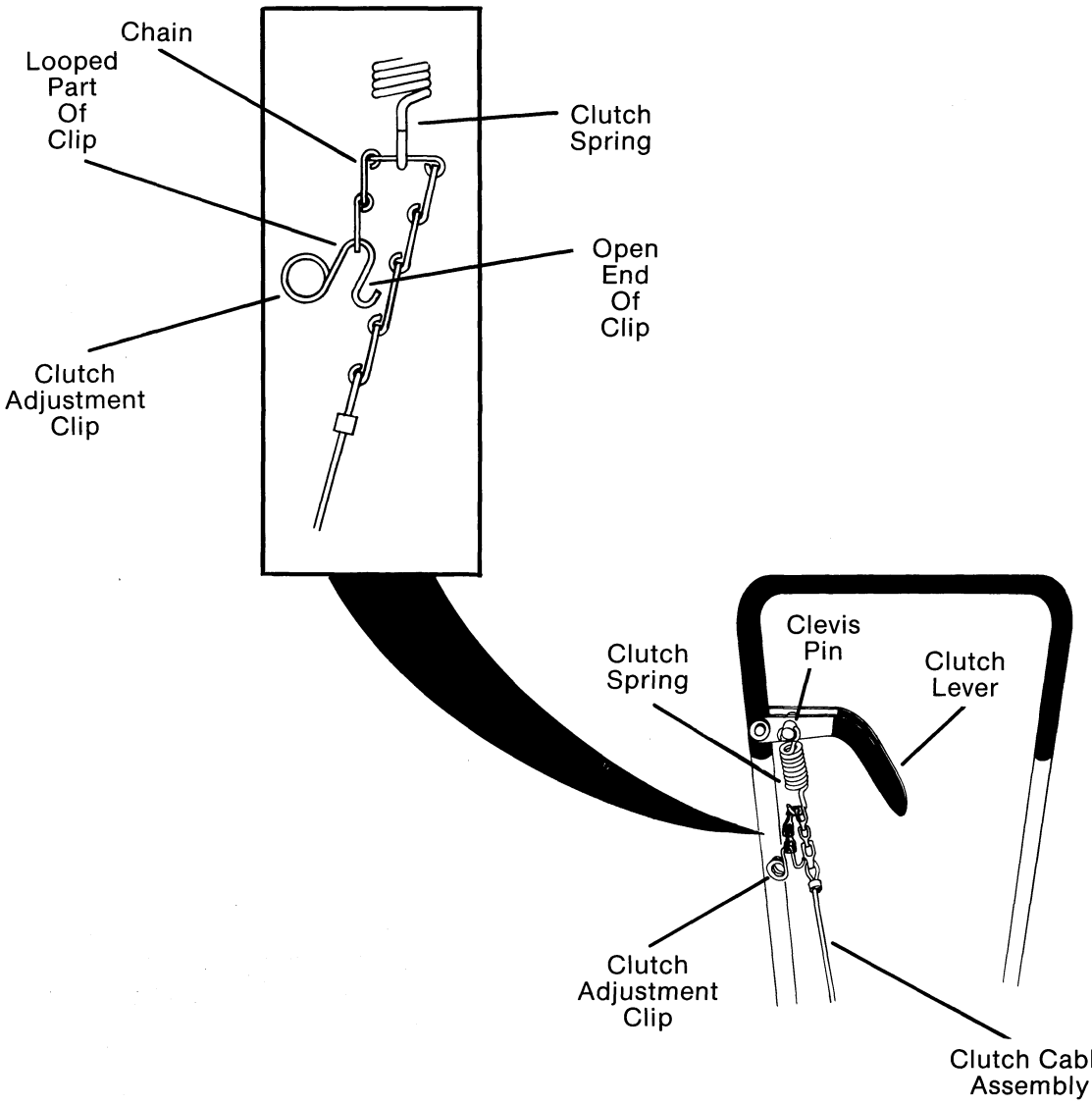

FIG. 3

J. Remove pivot assembly from snow deflector. With the long end of the snow deflector pointing down, insert snow deflector pivot boss into hole in front-top of auger housing. See (Fig. 4)

K. With flat leaf of pivot assembly pointing down from rear of auger housing (Fig. 4), insert the square shaft of pivot assembly through the square hole in the snow deflector. Push through to the front.

L. Slide flat washer on end of pivot assembly shaft and secure in place with a hex nut. (Fig. 4)

IMPORTANT: Tighten hex nut until deflector is snug against housing. DO NOT overtighten nut to the point where deflector binds against housing. Move pivot assembly from side to side to be sure deflector is not binding.

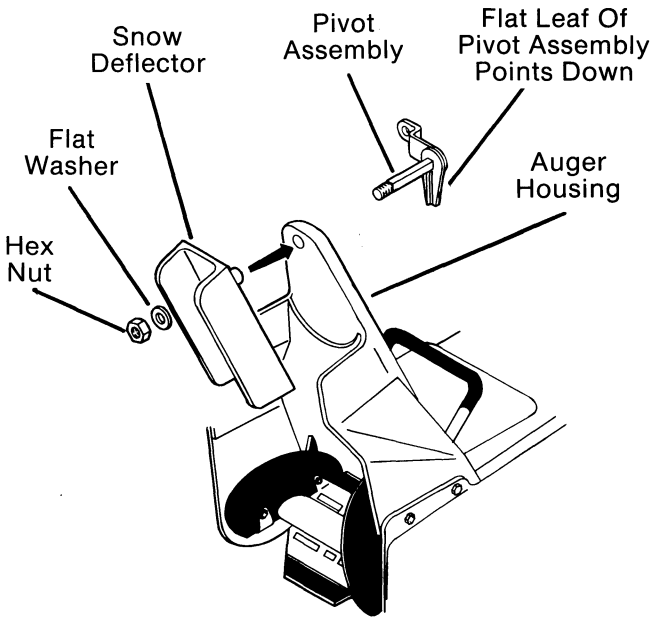

FIG. 4

M. Place control link into hole in arm attached to pivot assembly. (Fig. 5)

N. Slide washer on end of link and secure link in place with a cotter pin. (Fig. 5)

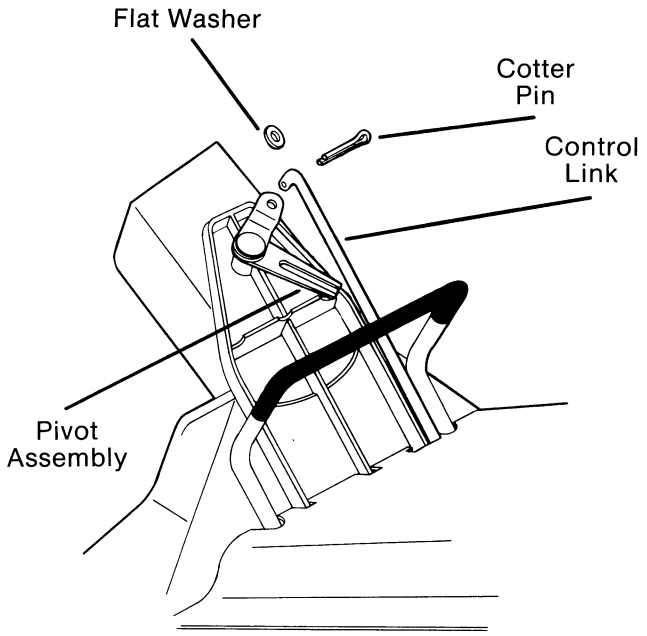

FIG. 5

O. Slide snow deflector control handle over the rod next to ignition switch. (Fig. 6) Line up holes in handle and rod and secure handle in place with the screw and locknut. (Fig. 6)

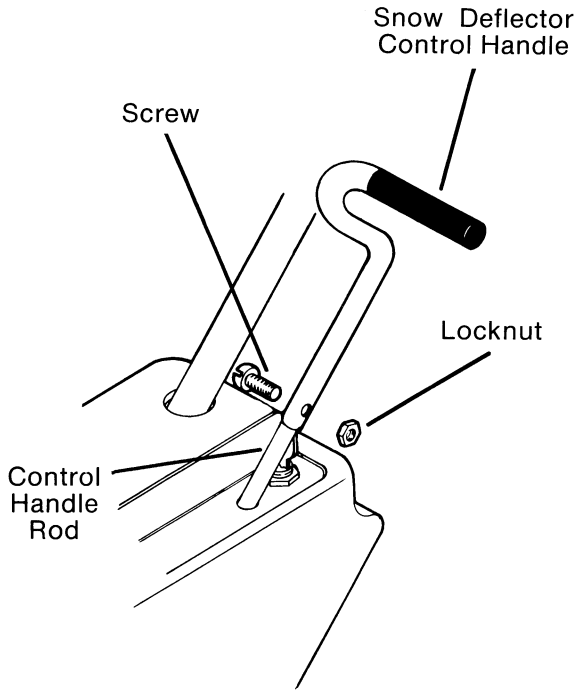

FIG. 6

LUBRICATION AND MAINTENANCE

WARNING: To avoid injury, and accidental starting, turn ignition switch OFF, wait for all movement to stop and remove ignition key before attempting to lubricate or maintain snow thrower.

LUBRICATION

1. Engine —

IMPORTANT: To avoid serious damage to the engine, use only the gas - oil mixture recommended by the engine manufacturer.

A. THIS IS A 2-CYCLE ENGINE AND ALL GASOLINE USED IN THIS ENGINE **MUST** HAVE OIL MIXED WITH IT.

IMPORTANT: 32:1 MIXTURE

Mix oil with regular grade gasoline. Use SAE 30 or 40 wt. outboard oil or 2 cycle oil. Disregard instructions on oil containers. DO NOT mix oil and gasoline directly in the engine fuel tank, as this will allow oil to enter carburetor which may cause engine to be inoperative. DO NOT use multi-viscosity oils. Such oils may not provide adequate lubrication and due to additives may cause excessive plug fouling. Use clean, fresh "regular" or "low lead" winter grade gasoline. DO NOT use gasoline left from summer operation. Measure oil mixture carefully. Excessive oil in fuel may cause hard starting, no start or excessive smoke and plug fouling.

See engine manual for mixing instructions and for all engine servicing and operating instructions.

2. Auger Support Bearing —

A. Lubricate auger support bearing every 10 operating hours with SAE 30 wt. oil. Squirt oil through hole shown in (Fig. 7) until oil appears on the outer surface. Wipe off any excess oil.

3. Idler Pulley Shaft —

A. Lubricate idler pulley shaft every 10 operating hours with SAE 30 wt. oil. (Fig. 8) Turn idler pulley while oiling to distribute oil evenly.

NOTE: Be careful not to get oil onto the belt.

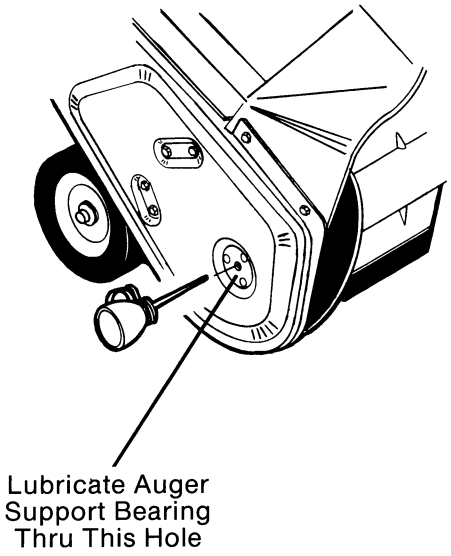
Lubricate Auger
Support Bearing
Thru This Hole

FIG. 7

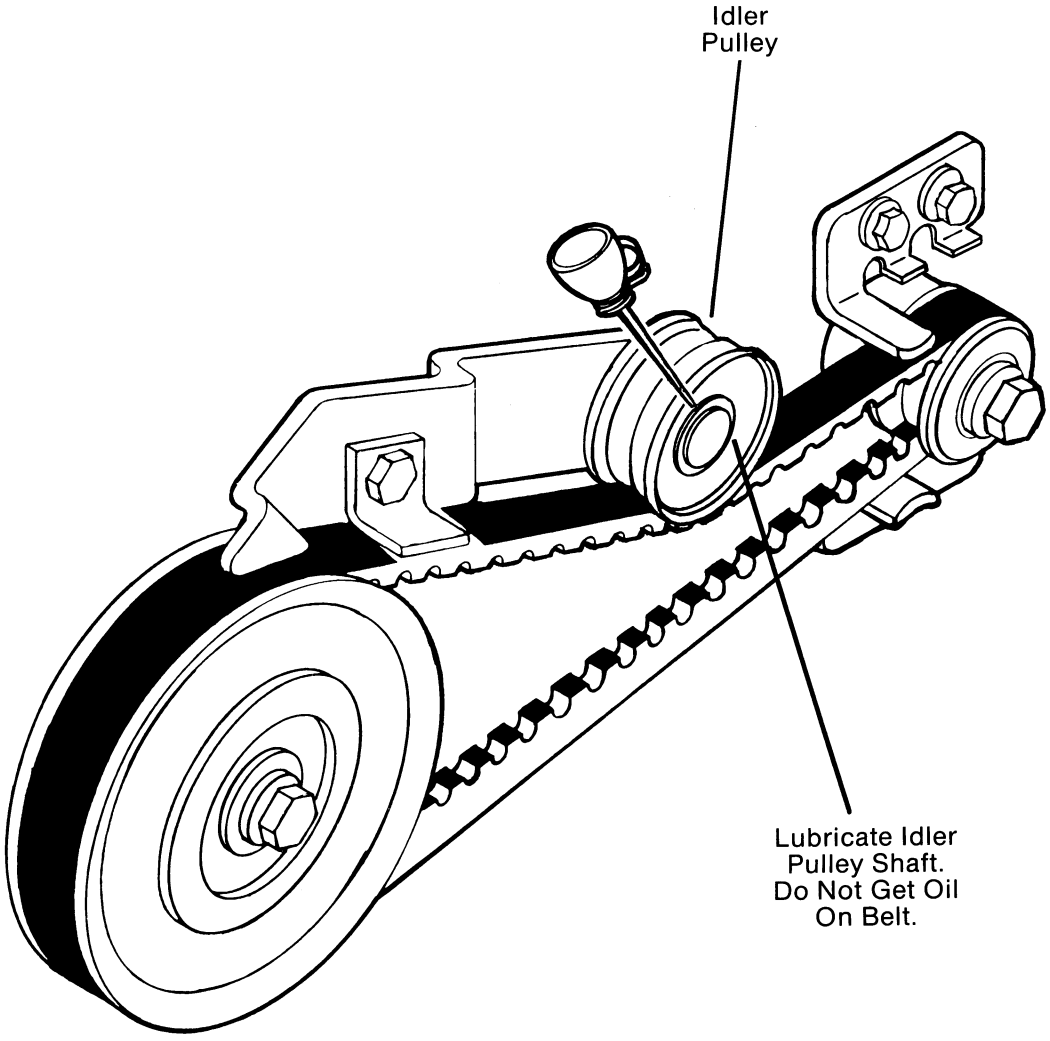
Idler
Pulley
Lubricate Idler
Pulley Shaft.
Do Not Get Oil
On Belt.

FIG. 8

MAINTENANCE

1. **Hardware —**

   A. Check nuts and bolts every 2 hours of operation to insure against looseness caused by vibration or rough handling.

2. **Auger Drive Belt —**

   A. After the first 3 hours of operation belt tension should be checked. Periodic checks should be made thereafter. Reference "AUGER DRIVE BELT ADJUSTMENT".

ADJUSTMENTS AND SERVICING

WARNING: To avoid injury, never attempt to make adjustments on the snow thrower while it is in operation or while the engine is running. Always turn engine off and remove ignition key before attempting to make any adjustment.

1. **ENGINE —**

   A. See Engine Manufacturer's Instruction Manual for all adjustments and servicing information.

   B. Maximum engine RPM high speed, no load range is 3900 to 4100 RPM.

2. **ENGINE REMOVAL AND REPLACEMENT —**

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

WARNING: To avoid severe burns, DO NOT attempt this procedure when engine is hot. Wait for engine and muffler to cool down before proceeding.

   A. Remove gas cap from fuel tank. Tip snow thrower upside-down and drain **all** fuel from tank into an appropriate container.

   B. Remove screws securing top panel in place. Pull panel up and position as high as possible. (Fig. 9)

   C. Remove the belt cover by removing the three thread forming screws along with the bottom two machine screws and locknuts. (Fig. 10)

   NOTE: The machine screws also attach a wear strip to the inside of the auger housing. (Fig. 10)

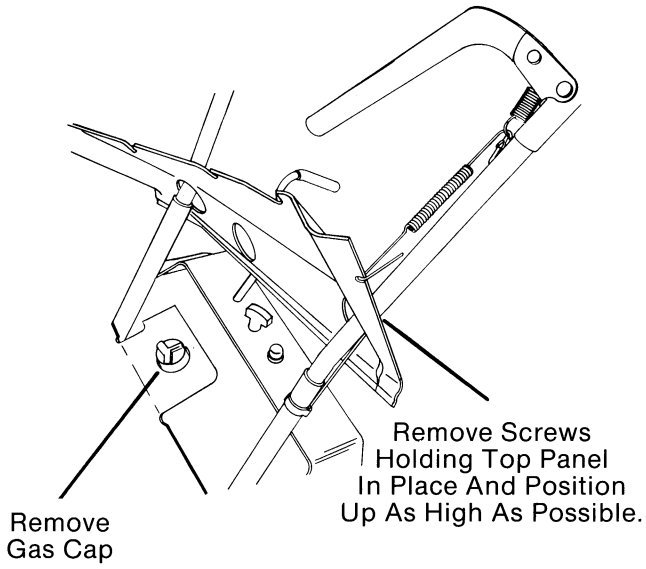

FIG. 9

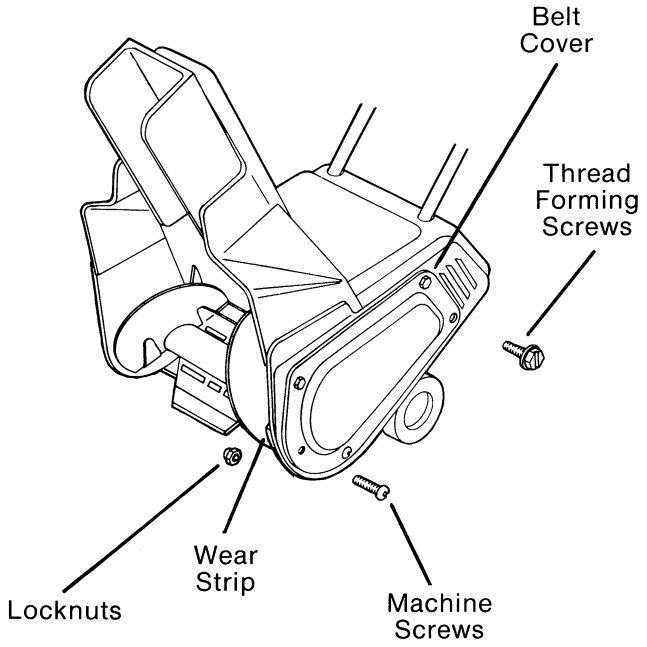

FIG. 10

D. Unplug ignition wire connector from back of ignition switch. (Fig. 11) Pull primer hose off bottom of primer button. (Fig. 11)

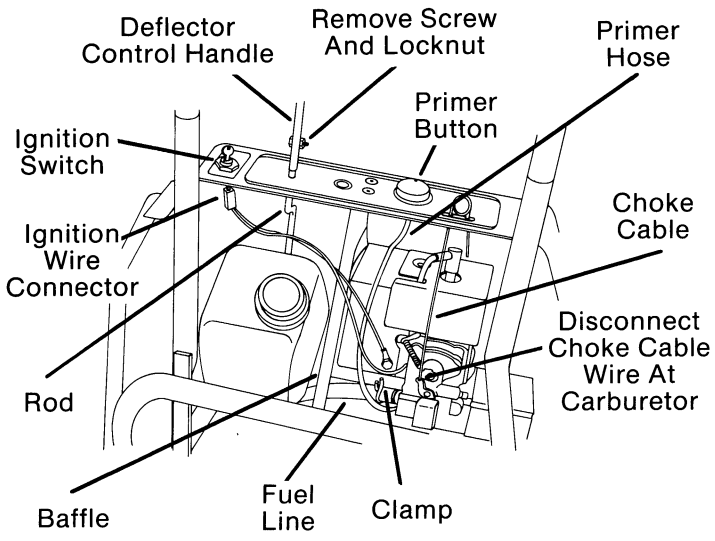

FIG. 11

E. Disconnect choke cable wire where attached at the carburetor (Fig. 11) and pull choke cable wire out of holes in panel.

F. Disconnect recoil rope handle from rope. Let rope retract through hole in panel.

IMPORTANT: Be sure to hold onto recoil rope so it does not retract into engine. Knot end of rope after it has passed through hole in panel.

G. Remove screw and locknut holding deflector control handle (Fig. 11). Pull control handle off of rod.

H. Squeeze fuel line clamp together and remove fuel line from where it attaches at the carburetor. (Fig. 11) Remove clamp from fuel line and pull fuel line through hole in baffle.

I. Remove snap ring from one end of axle shaft. Slide off flat washer, wheel assembly and another flat washer. Pull axle shaft out through wheel braces and supports. (Fig. 12)

J. Remove eleven screws securing back cover panel in place. (Fig. 12) Remove back cover panel over wheel supports and off over deflector control rod.

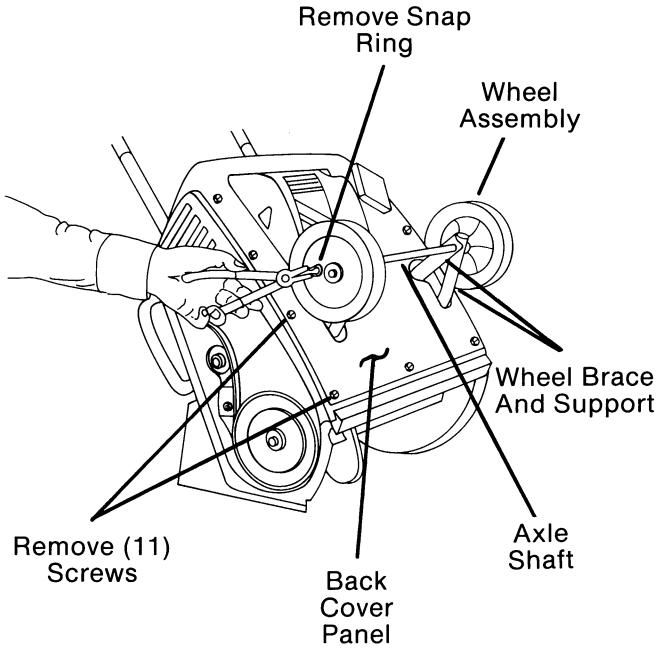

FIG. 12

K. Slip belt off of engine pulley. (Fig. 13) Depress idler arm by hand and slip belt off of auger drive pulley. Remove belt.

L. Remove engine pulley by following one of the following two procedures **only**:

a. Use an air or electric impact wrench to remove center capscrew and lockwasher.

OR

b. Use a box end wrench on the head of the capscrew. Sharply rap opposite end of wrench with a hammer to break the capscrew loose. Remove capscrew and lockwasher.

IMPORTANT: Any methods other than what are discribed above are not recommended by the engine manufacturer and damages resulting from non-approved factory procedures are not warranted.

Pull engine pulley off of engine crankshaft and remove woodruff key.

NOTE: Torque engine pulley capscrew to 10-14 ft./lbs. using a hand torque wrench. While capscrew is being torqued, crankshaft rotation can be stopped by pulling recoil rope enough to engage pinion and hold securely in this position.

M. Bend tabs on belt guides away from heads of capscrews. (Fig. 13) Remove two capscrews that hold each belt guide in place. Note location of belt guides for reassembly.

NOTE: The belt guides must be parallel to and clear the back of the belt when the clutch is in the engaged position.

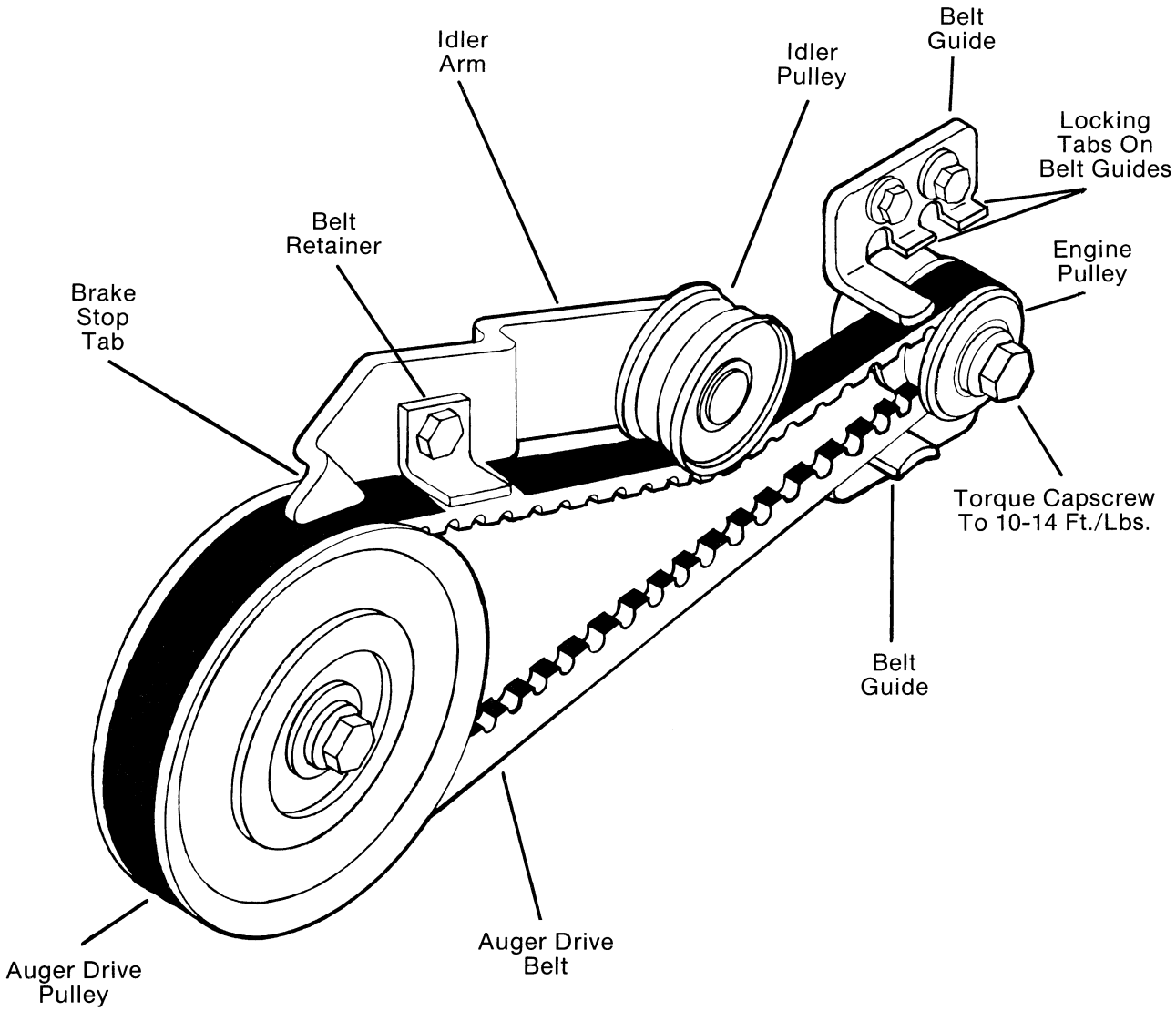

FIG. 13

N. Remove locknut from weld stud through center of engine brace. (Fig. 14) Remove bottom capscrew and locknut through engine brace and frame tube. (Fig. 14) Pull engine brace away from around frame tube and pivot away from engine.

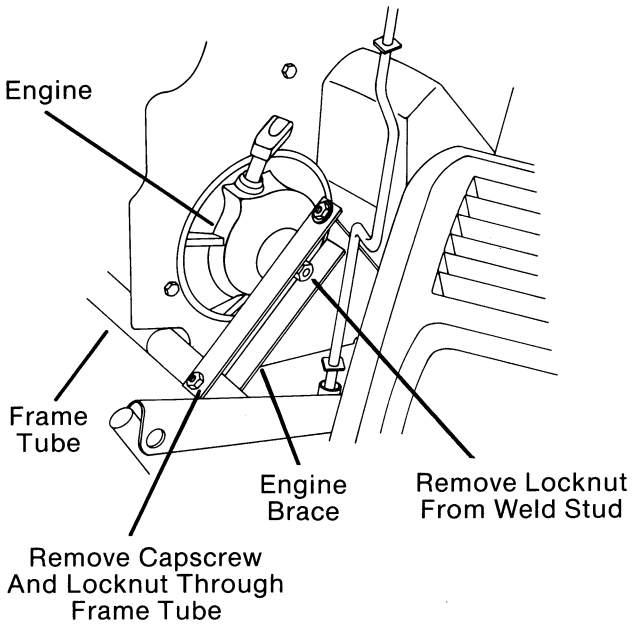

FIG. 14

O. Engine is now loose and can be removed.

NOTE: If engine is being replaced; detach the following items (Fig. 15) from engine (a new engine will not be supplied with these items):

a. baffle
b. primer tube
c. muffler
d. engine spacer
e. recoil rope "T" handle.

(Ignition wiring is supplied with a new engine.)

P. Reverse above procedures to install new engine; pay special attention to all "NOTES" made during the disassembly. Refer to engine manufacturer's manual for all lubrication and fuel requirements.

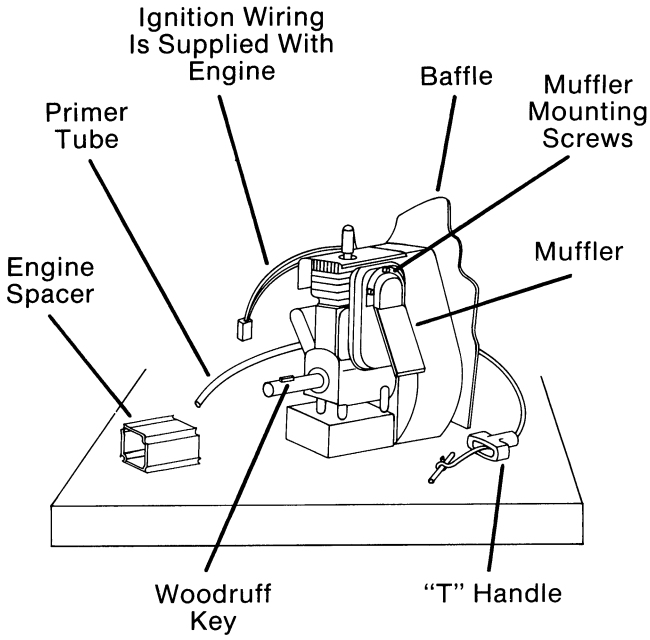

FIG. 15

3. ENGINE PULLEY REPLACEMENT —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove the belt cover by removing the three thread forming screws along with the bottom two machine screws and locknuts. (Fig. 10)

NOTE: The machine screws also attach a wear strip to the inside of the auger housing. (Fig. 10)

B. Slip belt off of engine pulley. (Fig. 13) Depress idler arm by hand and slip belt off of auger drive pulley. Remove belt.

C. Remove engine pulley by following one of the following two procedures **only**:

a. Use an air or electric impact wrench to remove center capscrew and lockwasher.

OR

b. Use a box end wrench on the head of the capscrew. Sharply rap opposite end of wrench with a hammer to break the capscrew loose. Remove capscrew and lockwasher.

IMPORTANT: Any methods other than what are described above are not recommended by the engine manufacturer and damages resulting from non-approved factory procedures are not warranted.

D. Pull engine pulley off of engine crankshaft. Check condition of woodruff key on engine crankshaft.

E. Reverse above procedures to reassemble engine pulley.

NOTE: Torque engine pulley capscrew to 10-14 ft./lbs. using a hand torque wrench. While capscrew is being torqued, crankshaft rotation can be stopped by pulling recoil rope enough to engage pinion and hold securely in this position.

4. ENGINE MUFFLER REPLACEMENT —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

WARNING: To avoid severe burns, DO NOT attempt this procedure when engine is hot. Wait for engine and muffler to cool down before proceeding.

A. Remove gas cap and remove screws securing top panel in place. Pull panel up and position as high as possible. (Fig. 9) Reinstall gas cap.

B. Disconnect choke cable wire where attached at the carburetor (Fig. 11) and pull choke cable out of holes in panel.

C. Pull primer hose off bottom of primer button. (Fig. 11)

D. Remove eleven screws securing back cover panel in place. (Fig. 12)

E. Bend back cover panel back far enough to gain access to the three muffler mounting screws. (Fig. 15)

F. Remove the three muffler mounting screws and remove muffler.

G. Reverse above procedures to replace muffler.

5. FUEL TANK REPLACEMENT —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove gas cap from fuel tank. Tip snow thrower upside-down and drain **all** fuel from tank into an appropriate container.

B. Remove screws securing top panel in place. Pull panel up and position as high as possible. (Fig. 9)

C. Squeeze fuel line clamp together at fuel tank and disconnect fuel line from tank. (Fig. 16)

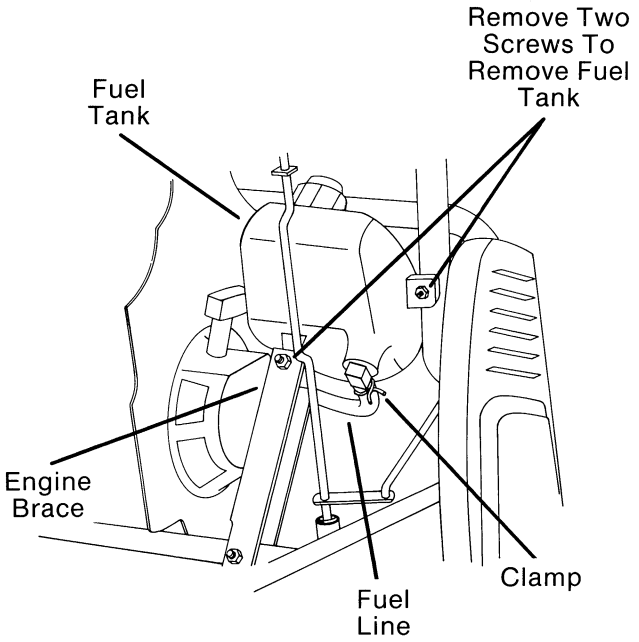

FIG. 16

D. Remove two screws and locknuts, one on the right side and one on the bottom of the fuel tank, to remove the tank. (Fig. 16)

E. Reverse above procedures to install new fuel tank. Check for any leaks.

6. PRIMER BUTTON REPLACEMENT —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove gas cap and remove screws securing top panel in place. Pull panel up and position as high as possible. (Fig. 9) Reinstall gas cap.

B. Pull primer hose off bottom of primer button. (Fig. 11)

C. Remove locknut from bottom of primer button and remove button out the top.

D. Reverse above procedures to install new button.

7. IGNITION SWITCH CHECK —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove gas cap and remove screws securing top panel in place. Pull panel up and position as high as possible. (Fig. 9) Reinstall gas cap.

B. Unplug ignition wire connector from back of ignition switch. (Fig. 11)

C. Remove jam nut securing ignition switch to back panel. Switch can now be removed out bottom of panel and tested.

D. Replace key into ignition switch and begin continuity test with the switch in "OFF" position.

E. Using continuity tester or ohmmeter, attach one lead to one switch terminal and other lead to other terminal. (Fig. 17) Continuity **should** exist with switch in the "OFF" position.

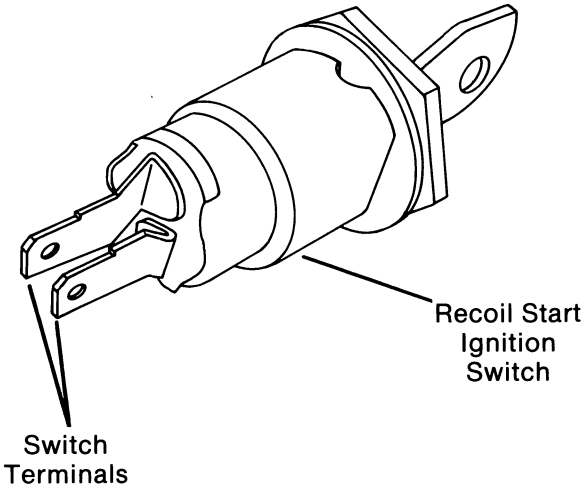

FIG. 17

F. Turn key to the "RUN" position with leads still connected to switch terminals, continuity **should not** exist.

G. If ignition switch fails to perform these tests, switch is defective, replace switch.

H. To reassemble switch back into panel, reverse procedures "A" thru "C" above.

8. AUGER DRIVE BELT REPLACEMENT —

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

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove the belt cover by removing the three thread forming screws along with the bottom two machine screws and locknuts. (Fig. 10)

NOTE: The machine screws also attach a wear strip to the inside of the auger housing. (Fig. 10)

B. Slip belt off of engine pulley. (Fig. 13) Depress idler arm by hand and slip belt off of auger drive pulley. Remove belt.

C. Reverse above procedures to install new belt.

NOTE: Engage clutch control lever and check that all sections of the belt are to the inside, and do not touch belt guides or belt retainer. Belt guides and belt retainer should be parallel to belt (when belt is engaged.)

9. AUGER DRIVE BELT ADJUSTMENT —

Proper belt tension should be checked after the first 3 hours of operation and periodically thereafter. Proper belt tension is when all slack has been removed from the clutch cable when clutch handle is released.

When belt begins to slip, adjust as follows:

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. **To increase belt tension -** move the open end of the clutch adjustment clip to the next link down on the chain. (Fig. 18) If the clip is in the last link of chain and additional tension is required, it is necessary to move the looped part of the clip to the next link up in the chain. This makes the cable shorter.

B. **To decrease belt tension -** move the open end of the clutch adjustment clip to the next link up the chain, thus making the cable longer.

C. All slack should be removed from the cable but cable should not be pulled up.

D. Check this adjustment by following procedures below:

   a. With ignition key off and clutch lever released, pull recoil rope, auger should not turn.

   b. If auger turns, move the open end of the clutch adjustment clip to the next link toward the clutch handle.

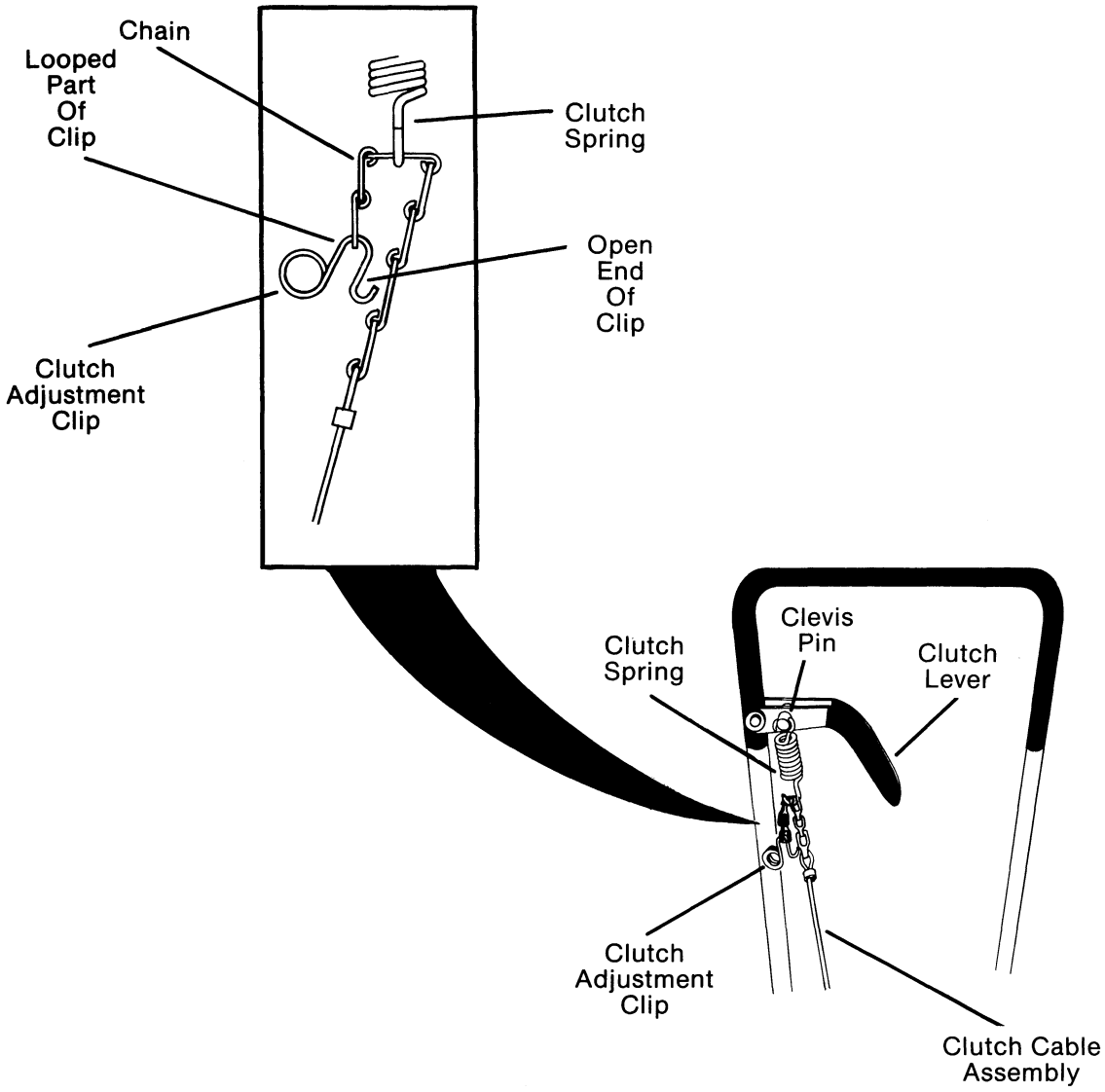

FIG. 18

10. IDLER PULLEY ARM REPLACEMENT —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove the belt cover by removing the three thread forming screws along with the bottom two machine screws and locknuts. (Fig. 19)

NOTE: The machine screws also attach a wear strip to the inside of the auger housing. (Fig. 19).

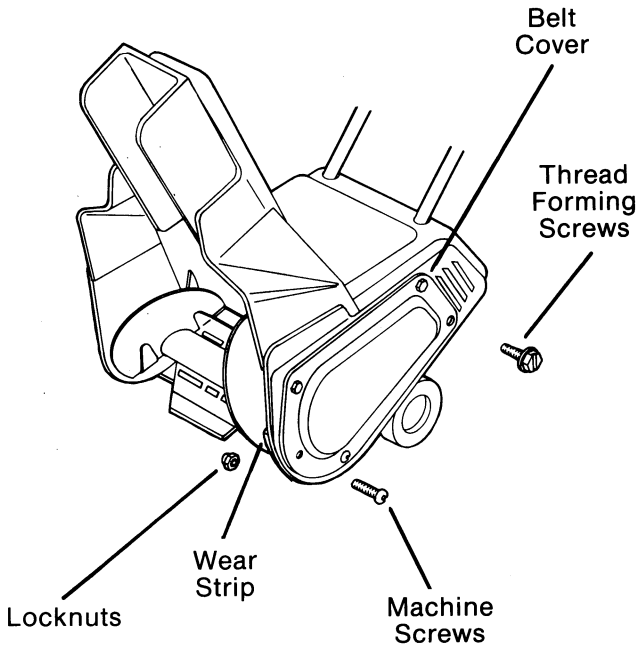

FIG. 19

B. Remove locknut securing idler pulley arm in place. (Fig. 20)

C. Pull belt retainer and idler arm off of capscrew. (Fig. 20) Disconnect brake spring and clutch cable from pin on back side of idler arm.

NOTE: Do not over stretch brake spring when removing.

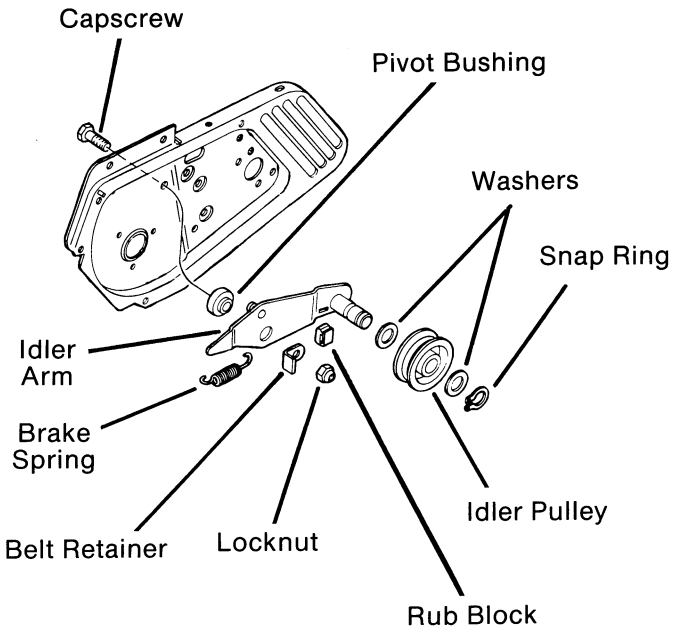

FIG. 20

D. Remove snap ring, washers and idler pulley from idler arm. (Fig. 20) Remove rub block from idler arm. (Fig. 20)

E. Install parts on new arm and reverse above procedures to install.

NOTE: Lightly grease pivot bushing and back side of belt retainer while reassembling with No. 2 wheel bearing grease or Ford 1T-M1C137-A grease so idler arm will pivot freely.

NOTE: Belt retainer must be parallel to and clear the back of the belt when the clutch is in the engaged position.

11. AUGER FIN REPLACEMENT —

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. If excessive wear of the rubber auger fins is evident, remove the capscrews and locknuts holding the fins between the two halves of the auger plates. (Fig. 21) Auger fins should be replaced as **complete** sets.

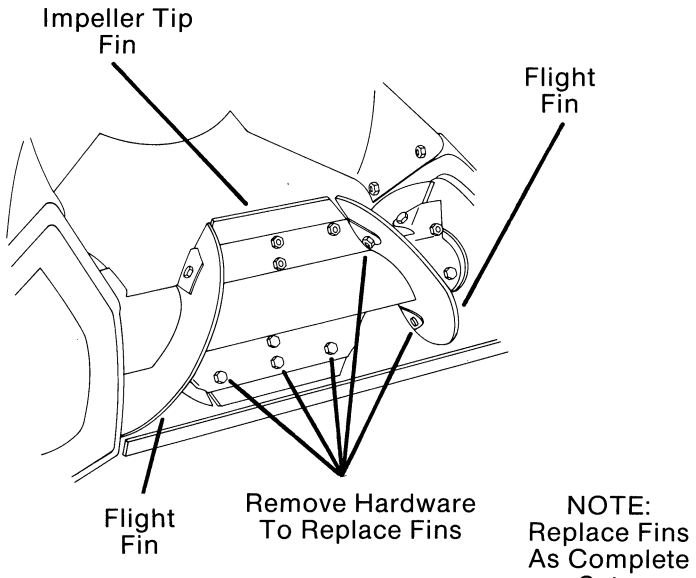

FIG. 21

12. DEFLECTOR VANE REPLACEMENT:

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove locknut and flat washer holding deflector vane to the auger housing. (Fig. 22)

B. Pull deflector vane out of auger housing and vane pivot assembly.

C. Reverse above procedures to install.

NOTE: Tighten locknut until deflector is snug against housing. DO NOT tighten locknut to the point where the deflector is binding against housing. Move deflector control handle to be sure deflector is not binding.

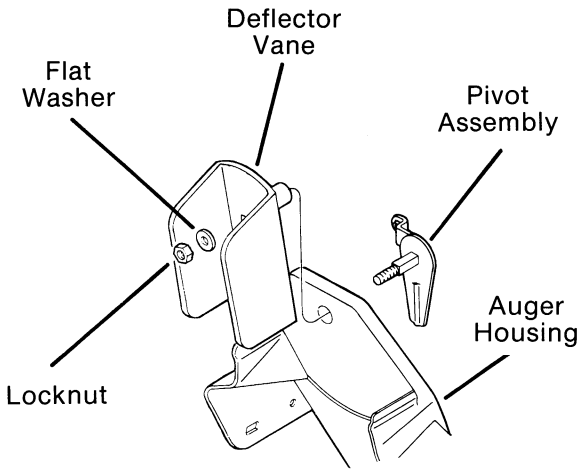

FIG. 22

13. DEFLECTOR CONTROL RODS REPLACEMENT—

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove gas cap and remove screws securing top panel in place. Pull panel up and position as high as possible. (Fig. 23) Reinstall gas cap.

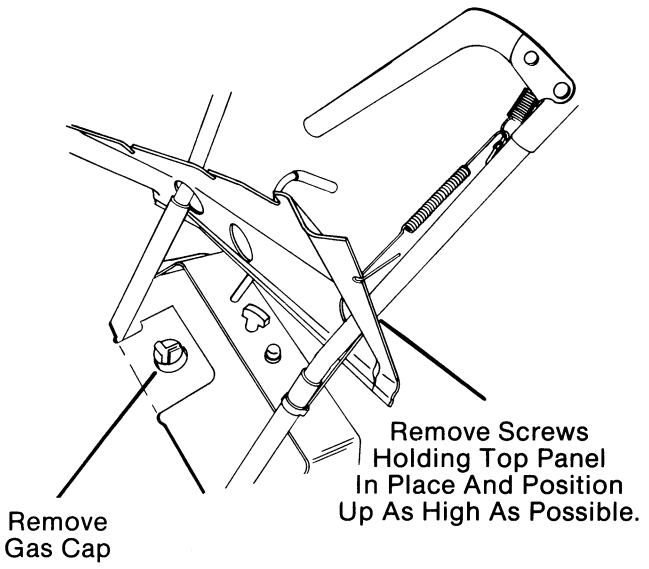

FIG. 23

B. Remove cotter pin and flat washer from top end of control link connected at the vane pivot assembly. (Fig. 24) Pull control link out of hole.

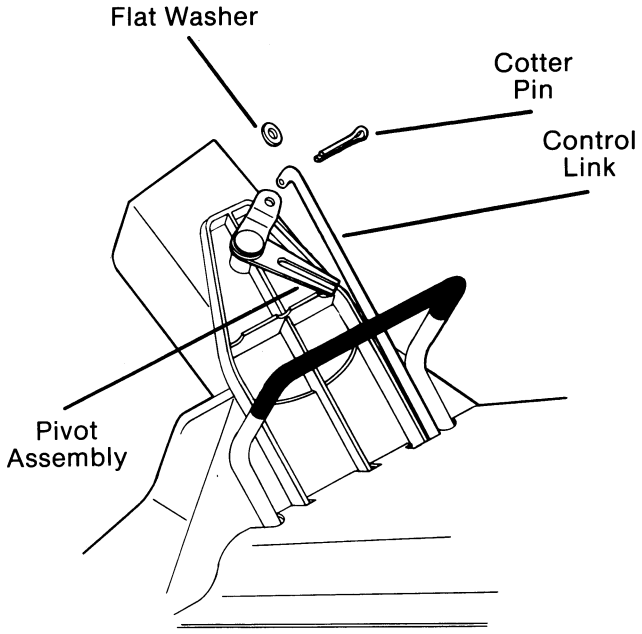

FIG. 24

C. Remove screw and locknut holding deflector control handle to control rod. (Fig. 25) Remove control handle from rod.

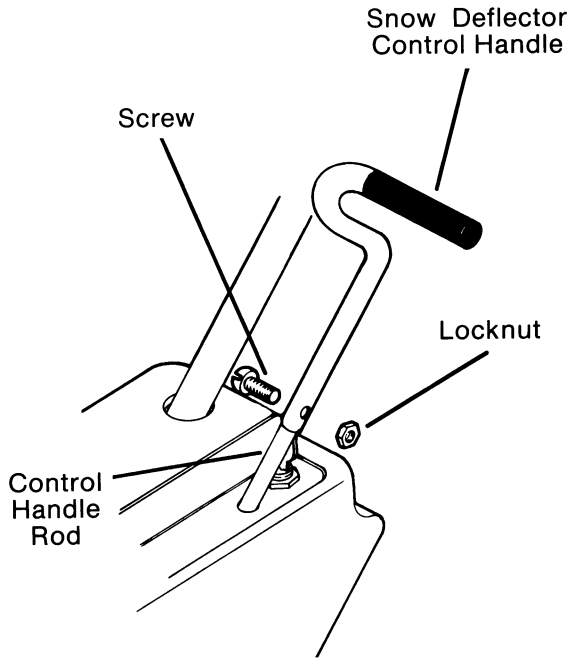

FIG. 25

D. Remove top two screws on each side of back cover panel. Slightly pull top of panel up enough to dislodge bottom of control rod from housing.

E. Remove cotter pin and flat washer connecting both control rods to each other. Remove control rods from snow thrower.

F. Reverse above procedures to install.

14. SCRAPER BAR REPLACEMENT—

WARNING: To avoid injury, shut off engine, wait for all movement to stop and remove ignition key.

A. Remove three flat head socket machine screws and locknuts that hold scraper bar to bottom of auger housing. (Fig. 26) Remove scraper bar.

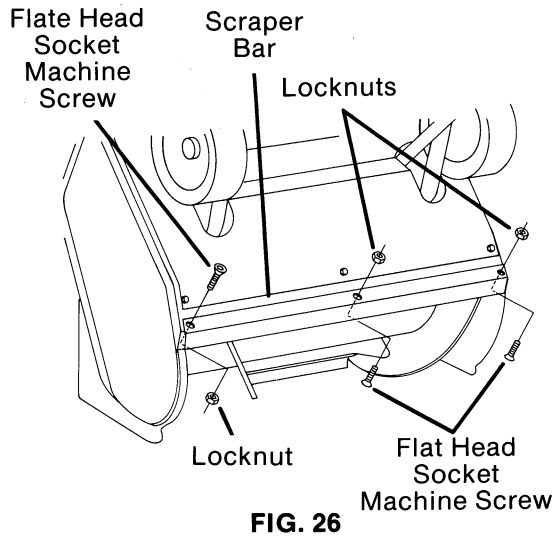

FIG. 26

IMPORTANT: Be certain to replace the screws in the same direction as originally installed. (Fig. 26)

B. Reverse above procedures to install scraper bar.

C. Adjust scraper bar so that it is 0 to 1/32" above the ground line, with the auger fins and wheels resting on the ground. (Fig. 27)

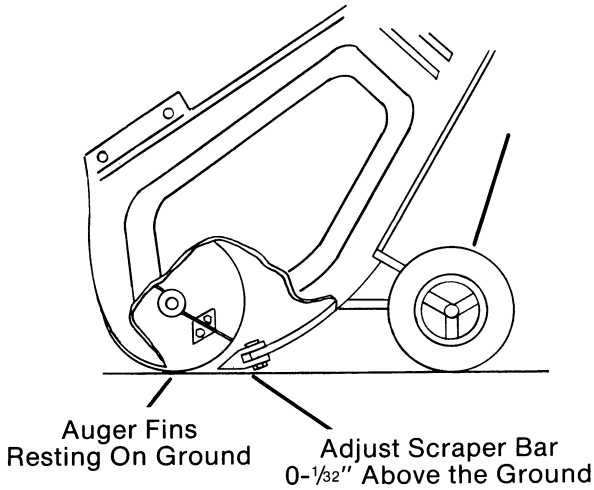

FIG. 27

TROUBLE-SHOOTING

PROBLEM	REMEDY	REFERENCE
Auger will not turn.	1. Check for ice build-up.	
	2. Remove debris jamming auger.	
	3. Worn or wrong belt being used, replace belt.	3. AUGER DRIVE BELT — REPLACEMENT
	4. Readjust belt tension.	4. AUGER DRIVE BELT — ADJUSTMENT
	5. Check and replace **all** sheared woodruff drive keys.	
	6. Clutch cable needs adjustment.	6. AUGER DRIVE BELT — ADJUSTMENT
Belt jumps off.	1. Belt retainers need realignment.	1. AUGER DRIVE BELT — REPLACEMENT
	2. Worn or wrong belt being used, replace belt.	2. AUGER DRIVE BELT — REPLACEMENT
	3. Realign idler pulley with idler arm.	6. AUGER PULLEY ARM — REPLACEMENT
Deflector control lever hard to turn.	1. Deflector vane is binding.	1. DEFLECTOR VANE REPLACEMENT

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

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SNOW THROWER ST524 (Model 09GN-5239)

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.

INTRODUCTION AND SAFETY

This manual contains service and maintenance instructions for a ST524 Snow Thrower. It has been prepared to provide the instructions the serviceman needs to correctly service and maintain a snow thrower. All sections of this manual should be carefully studied by the serviceman before beginning to work on the snow thrower.

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 serviceman to avoid accidents.

When you see this symbol —  **HEED ITS WARNING!**

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

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 snow thrower.
3. DO NOT wear loose fitting clothing that might get caught in moving parts. Also, keep hands and feet away from moving parts. Keep clear of discharge opening at all times.
4. Never direct discharge at bystanders or allow anyone in front of the snow thrower.
5. DO NOT lubricate or make any mechanical adjustments to the snow thrower while the unit is in motion or when the engine is running.

EQUIPMENT CONSIDERATIONS:

1. Always turn ignition switch OFF and remove ignition key from switch. This **must** be performed every time any servicing is done and will prevent accidental starting of engine.
2. Always store gasoline or flammable solvents used for cleaning in closed containers specifically designed for that purpose.

SNOW THROWER ST524

(09GN-5239)

3. Before cleaning; servicing inspecting or unclogging auger housing on snow thrower; shut engine off and remove key from ignition switch. Make certain all moving parts have stopped.
4. Never operate snow thrower without proper guards, plates or other safety protective devices in place.
5. Never store snow thrower with fuel in the tank, inside a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.
6. Do not change governor setting or over speed the engine.
7. Never add fuel to a running or hot engine.
8. Check shear pins, engine mounting bolts, etc. at frequent intervals for proper tightness to be sure equipment is in safe working condition.

OPERATIONAL CONSIDERATIONS:

1. Do not start or run engine indoors. Fumes from engine exhaust can kill.
2. Be sure that all parts are securely fastened before starting snow thrower.
3. Be sure all tools and cleaning materials are removed before starting snow thrower.
4. If the equipment should start to vibrate abnormally, stop engine and check immediately for the cause. Vibration is generally a warning of trouble.
5. If test running is required, make sure you are thoroughly familiar with the complete operation of the snow thrower. Know how to stop the snow thrower.
6. Never operate snow thrower at high transport speeds on slippery surfaces. Use care when backing.
7. Exercise extreme caution when operating on or crossing a gravel drive, walks or roads. Stay alert for hidden hazards or traffic.
8. Never operate snow thrower near glass enclosure, automobiles, window wells, etc., without proper adjustment of snow discharge angle. Keep children or pets away.
9. Do not overload machine capacity by attempting to clear snow at too fast a rate.
10. Never operate without good visibility or light.
11. Disengage power to auger when transporting or not in use.

IDENTIFICATION PLATE LOCATION

The snow thrower model and serial number identification plate is located in the lower left corner at the rear of the snow thrower box frame. (Fig. 1)

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

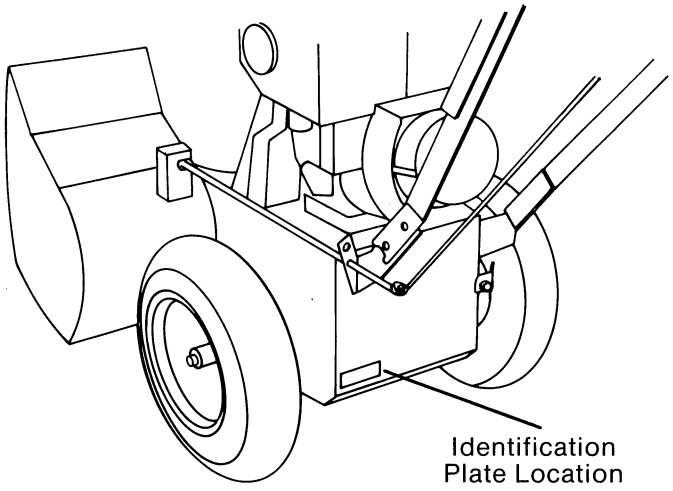

FIG. 1

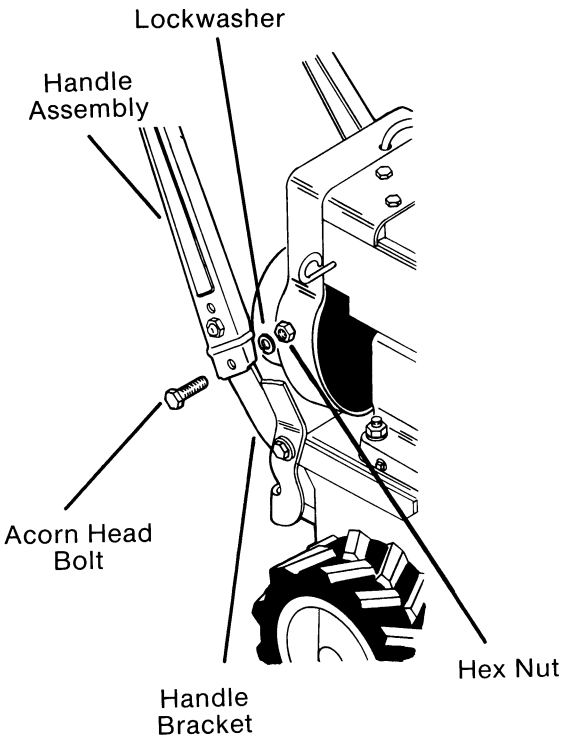

FIG. 2

SET-UP INSTRUCTIONS

This procedure is provided for the serviceman to determine if the original set-up and assembly of this snow thrower was performed properly. For a more detailed account of the original set-up procedures see the OPERATOR'S MANUAL.

A. Attach snow thrower handle assembly; position handle tubes on the outside of the handle brackets. (Fig. 2) Line up holes and secure handle assembly in place with four acorn head bolts, lockwashers and hex nuts. (Fig. 2)

   IMPORTANT: Push handle assembly forward as far as possible while tightening bolts. Tighten bolts securely.

B. Slide handle grips over end of handle tubes. Use a rubber mallet to tap grips into place only if necessary.

C. For correct adjustment of shift rods, check backside of handle panel to be sure that the factory installed cotter pin is still in the correct position. (Fig. 3) This cotter pin locks the speed selector and shift lever in the 2nd (outer) reverse position. DO NOT REMOVE COTTER PIN AT THIS TIME.

   IMPORTANT: If cotter pin has been removed, place shift lever in the 2nd (outer) reverse position (circled illustration Fig. 3). Line up **bottom** hole in locator plate with **bottom** hole in speed selector (circled illustration) (Fig. 3).

D. Loosen DO NOT REMOVE cone locknut on bellcrank. (Fig. 4)

   Turn lower shift rod and bellcrank until lower shift rod fits squarely into upper shift rod, as shown in (Fig. 5).

E. Align upper shift rod over lower shift rod. Use hardware as shown in (Fig. 5); to attach rods together. DO NOT tighten cone locknut until both upper and lower rods are as closely in-line with each other as possible; as viewed from the front and the side. Tighten cone locknut securely.

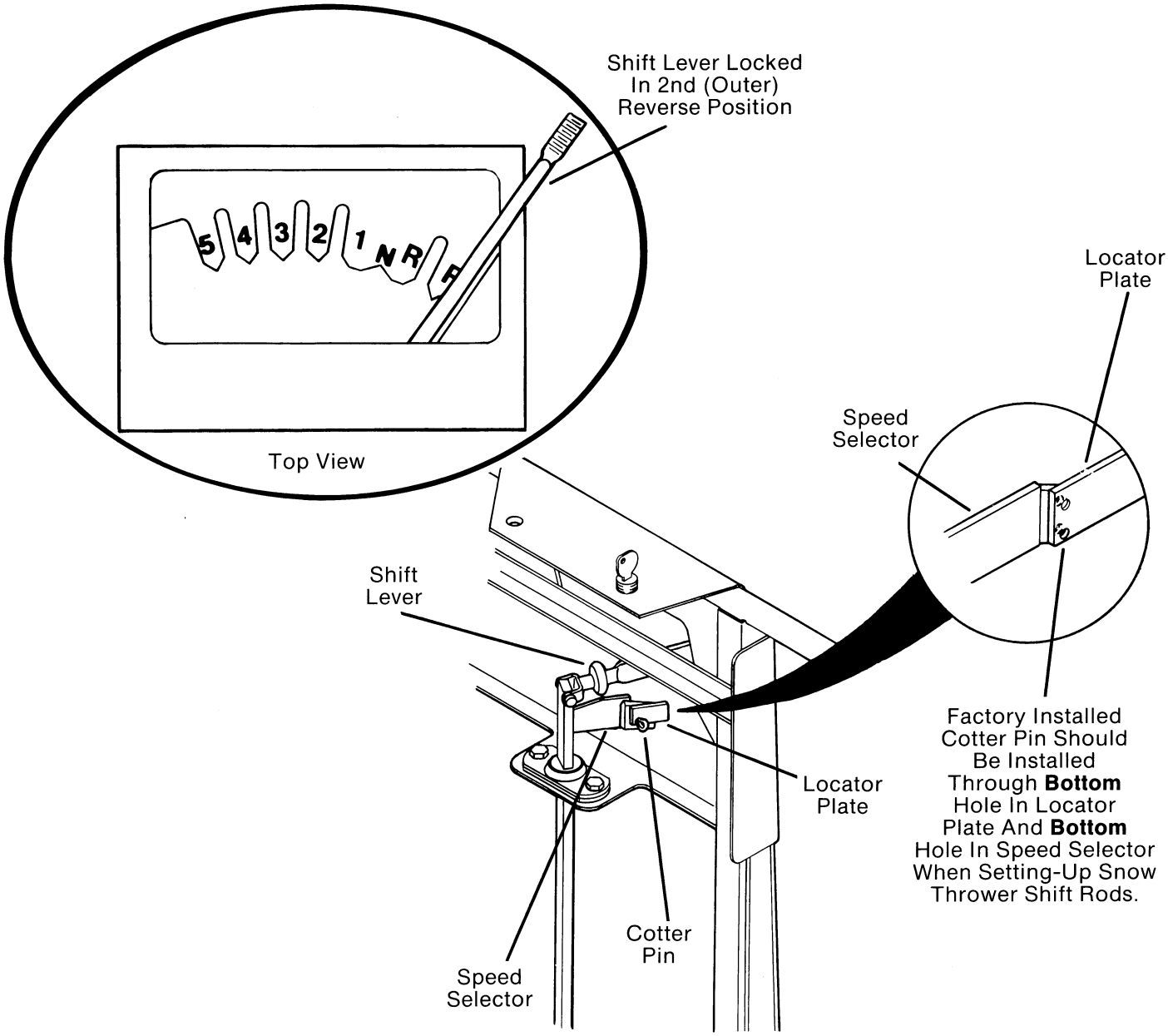

FIG. 3

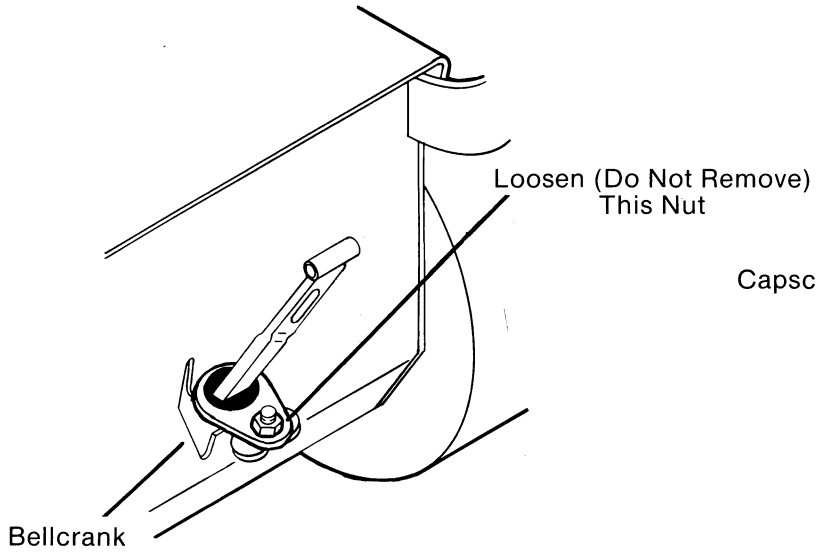

FIG. 4

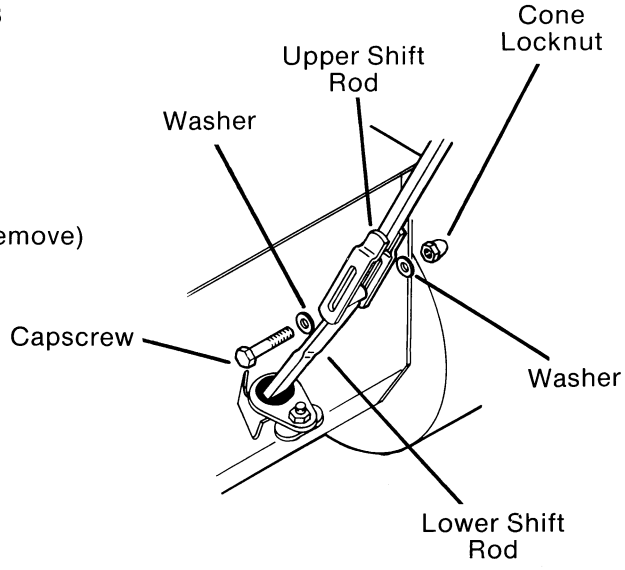

FIG. 5

F. Retighten the bellcrank cone locknut shown in (Fig. 4).

G. At this time remove the cotter pin shown in (Fig. 3). Keep this cotter pin for possible future readjustment of traction speed control.

H. Screw control knob onto shift lever. (Fig. 6)

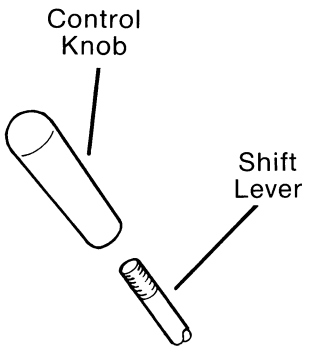

FIG. 6

I. Slide upper chute control rod through the hole in the handle panel marked "SNOW DISCHARGE". Secure chute control rod to the universal joint on the lower chute control rod with a cotter pin. (Fig. 7)

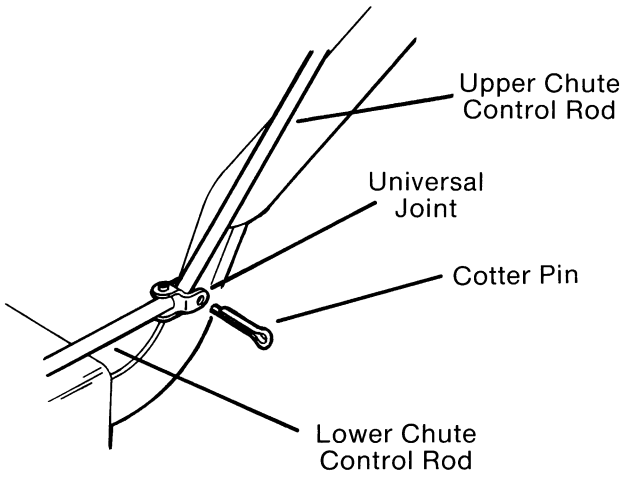

FIG. 7

J. Turn a ¼" hex nut all the way onto the end of clutch lever adjustment rod; (Fig. 8) hook other end of rod into clutch lever.

NOTE: Hook rod through hole from **outside -in.**

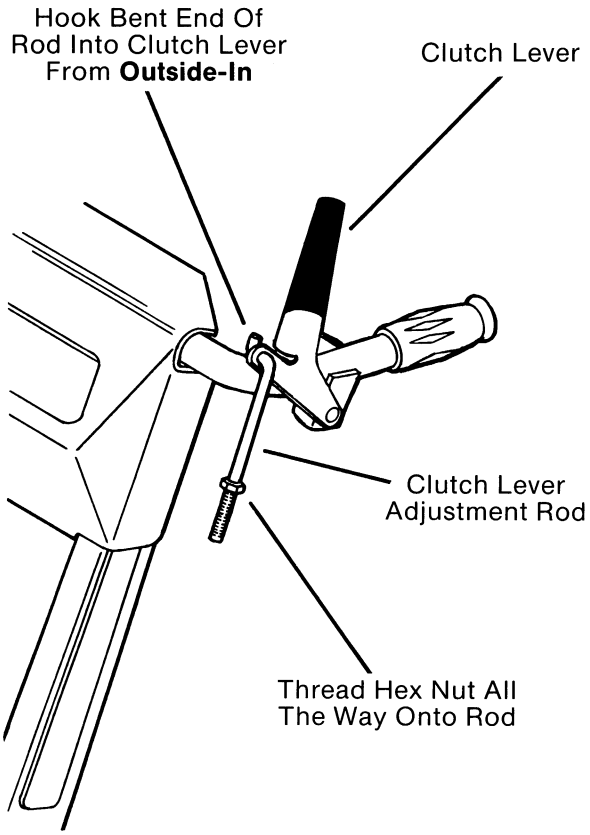

FIG. 8

K. Insert "T" type weldnut into spring on end of clutch cable assembly as shown in (Fig. 9).

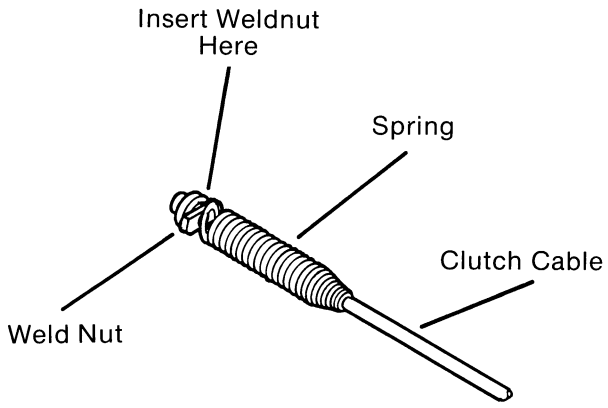

FIG. 9

L. Hook small end of clutch cable into eyelet of cable coming out of rear of snow thrower. (Fig. 10) Route cable through "U" bracket on inside of handle. (Fig. 10)

M. With clutch lever all the way up (Fig. 10). Screw weldnut and spring onto clutch lever adjustment rod.

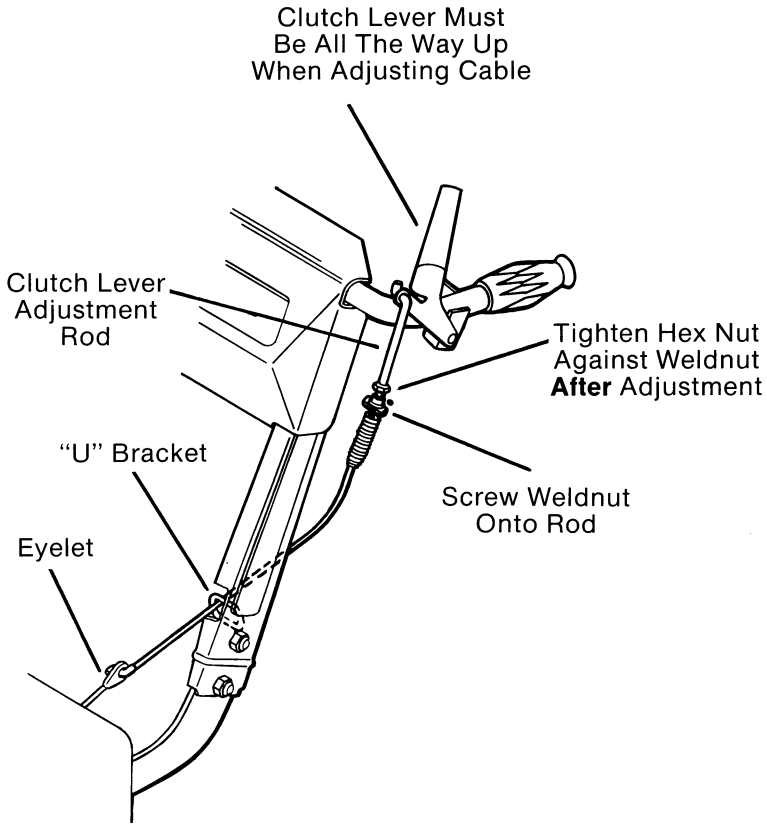

FIG. 10

IMPORTANT: While turning weldnut onto rod; watch the hex shaft. (Fig. 11) IF HEX SHAFT STARTS TO TURN, THE CABLE IS TOO TIGHT.

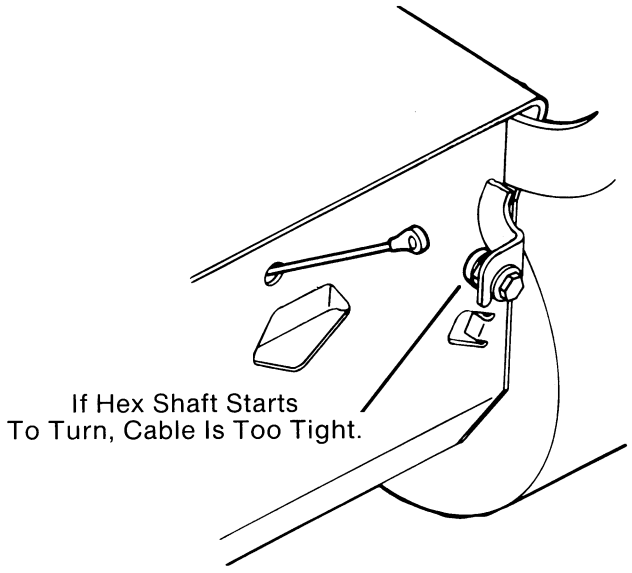

FIG. 11

Screw weldnut on rod to a point **just before hex shaft starts to turn.** Hold weldnut in this position and tighten the ¼" hex nut against weldnut. (Fig. 10)

N. Raise deflector up over discharge guide. Secure deflector to discharge guide using hardware shown in (Fig. 12).

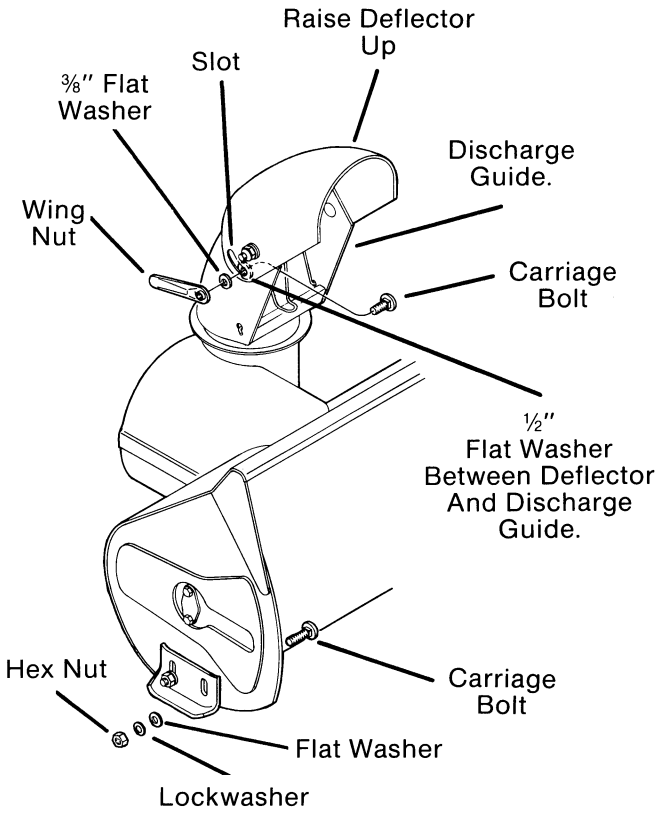

FIG. 12

IMPORTANT: Be sure ½" flat washer is positioned **between** the deflector and discharge guide, then insert the carriage bolt through discharge guide, ½" flat washer and slot in deflector (square neck of bolt must fit into square hole inside discharge guide). Install ⅜" flat washer onto end of bolt and turn wing nut on and tighten to hold deflector in desired position.

O. Block the front end of snow thrower up off the ground a few inches. Secure skids to collector housing using hardware shown in (Fig. 12).

NOTE: Carriage bolts must be installed from the inside of the collector housing out. Adjust both skids to the same height to keep collector level.

Remove the outside hex nut from the engine terminal block screw. (Fig. 13) Attach the ring terminal end of the black wire, from the key switch, onto the screw. Secure in place with the hex nut removed earlier.

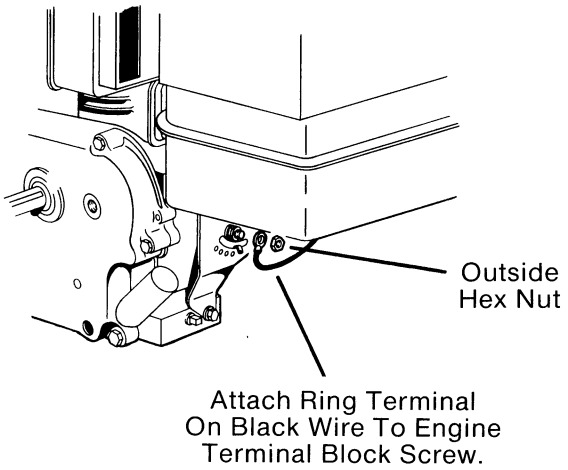

FIG. 13

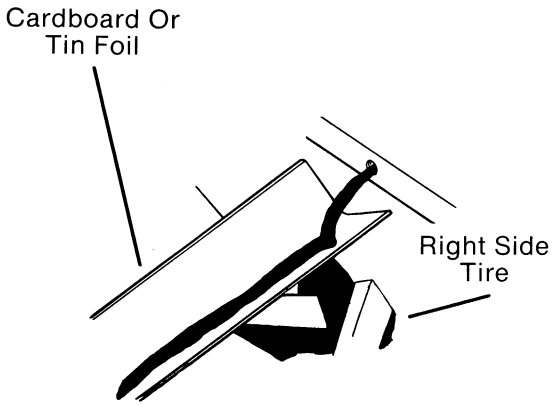

FIG. 14

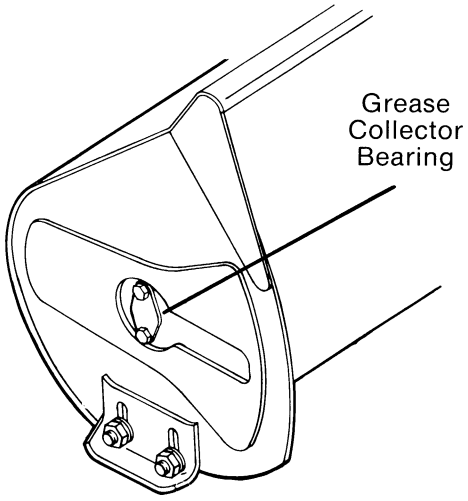

FIG. 15

LUBRICATION AND MAINTENANCE

WARNING: To avoid injury and accidental starting, turn ignition switch OFF, wait for all movement to stop and remove ignition key before attempting to lubricate or maintain snow thrower.

LUBRICATION

1. **Engine —**

   A. 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 to use.

   B. When changing oil, take a piece of cardboard or tin foil and fold into a "V" shape. (Fig. 14) (piece should be long enough to extend over the right tire). Remove oil drain plug, and channel oil over the right tire and into an oil pan.

2. **Collector (Auger) Bearing —**

   *Grease two bearings, one on each end of the collector shaft. (Fig. 15) Remove once a season and pack with grease.

3. **Discharge Guide —**

   Wipe *grease evenly over the teeth of the discharge guide every 10 hours. (Fig. 16)

4. **Wheel Assemblies —**

   Remove the wheels and *grease the axle shafts at the end of each snow throwing season.

5. **Auger Gear Case —**

   The auger gear case contains approximately ½ pint (8 ounces) of *grease. It is not necessary to refill unless grease is noticeably leaking from the gear case. Pump grease into grease fitting shown in (Fig. 17).

*Use No. 2 roller bearing grease or Ford ESN-M1C187-A grease.
Grease with hand pump grease gun when required.

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