

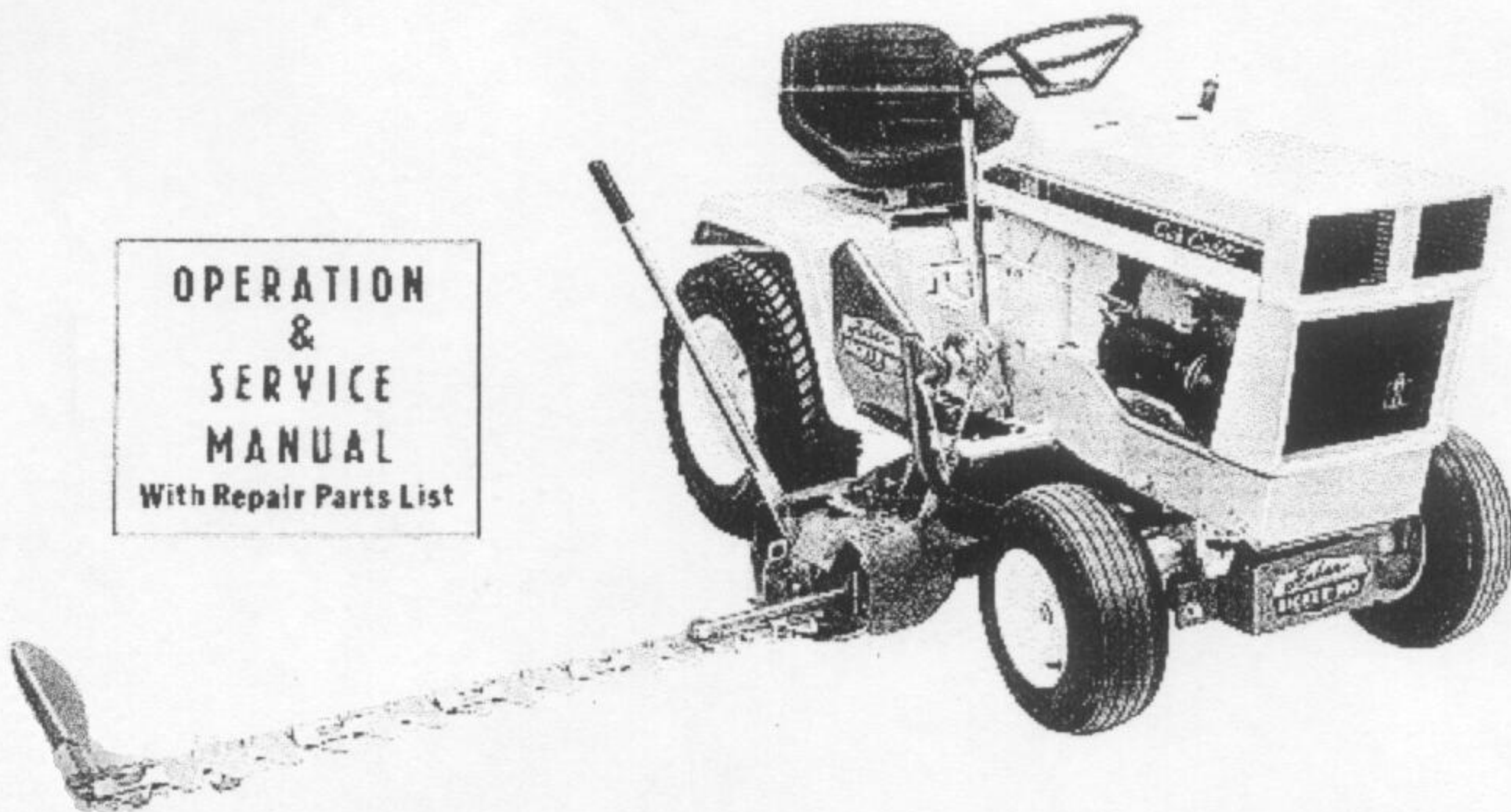


MODEL 402-E
SICKLE BAR MOWER
ATTACHMENT

for

 **H. CUB CADET**
TRACTOR

**OPERATION
&
SERVICE
MANUAL**
With Repair Parts List



**HABAN MANUFACTURING
COMPANY**

Racine, Wisconsin

Form 8512

(Ser. No. (Serial #204, 241 & up)

Revised 6/9/75



GENERAL INFORMATION

HABAN SICKLE BAR MOWER ATTACHMENT

Your Haban Sickle Bar Mower is the finest sickle bar mower available anywhere for your compact tractor. Here's why: First of all, it is designed specifically to match your Lawn and Garden Tractor. Rugged, long-life construction assures you of highest performance with limited horsepower. It is equipped with anti-friction, heavy duty bearings in all important areas. The Haban Sickle Bar Mower provides more machine for your money, and following the points of service as listed below will give you years of successful operation and satisfaction.

OPERATING SUGGESTIONS

This manual will help you get the most value from your Haban Sickle Bar Mower. Read carefully all assembly, operating, adjusting and service information. You will find many helpful points which will not only save time but will help you operate the mower most efficiently.

Every effort has been made to incorporate all of the safety devices for operator protection. However, careless and negligent operation can still result in serious injury to persons and property. Be sure to read and follow all safety precautions listed in this manual. When in need of parts and major service, see index. Right-hand (R.H.) and left-hand (L.H.) reference is determined by standing at the rear of the tractor or mower and facing the direction of travel. When in need of parts, be prepared to give your dealer the serial number shown on the mower nameplate, located on the Pitman head housing of the mower near the lift handle. Locate the number and write it in the blank space below.

HABAN MODEL _____ SICKLE BAR MOWER
SERIAL NO. _____

The Haban Sickle Bar Mower was designed for mowing areas which include tall weeds, grass, light brush, etc., but should not be used on very short grass. Sickle Bar Mowers are not effective in short grass. It is important that the appropriate ground speed be maintained when mowing with a Sickle Bar Mower.

OPERATING TRACTOR WITH HYDROSTATIC TRANSMISSION

The hydrostatic transmission of your tractor allows a complete range of speeds at full engine throttle. Simply adjust speed of tractor to meet existing conditions through the lever control of the hydrostatic transmission. The sickle knife assembly should maintain approximately 1050 to 1200 strokes per minute.

WITH GEAR TYPE TRANSMISSION

The tractor engine should be operated at full-throttle, and usually operating in second or third gear would give you the best results. Speed should be regulated by selecting the proper gear ratio instead of reducing engine speed. The sickle knife assembly should maintain approximately 1050 strokes per minute.

When mowing in extremely rough areas, reduce speed of tractor to meet existing conditions -- keeping tractor engine at full throttle. When cutting brush which is larger than 1/2" diameter, slow forward travel of tractor prior to cutting brush. It may be necessary to stop the tractor when the sickle bar makes contact with samplings or heavy brush and allow the sickle knife to cut its way through the brush material. It is not recommended to attempt to cut material exceeding 1-1/2 to 2" in diameter.

Performance of the sickle knife depends on the following points, all of which are important: (1) sharpness of sickle knife; (2) wear blade adjustment; (3) straightness of knife bar; (4) hold-down clip clearance; (5) speed of sickle knife (approximately 1050 strokes per minute); (6) lead adjustment of sickle bar; (7) cutting pitch of shear fingers.

TRANSPORT POSITION:

The sickle bar mower can be transported from one location to another by raising the unit with the lift handle and locking it into position (as illustrated on page 5) BE SURE TO ALWAYS INSTALL KNIFE GUARD ON MOWER BAR WHEN TRANSPORTING. ALWAYS OPERATE AT CAREFUL SPEEDS IN TRANSPORTING AND AVOID MAKING SUDDEN OR SHARP TURNS WITH THE MOWER IN RAISED POSITION.

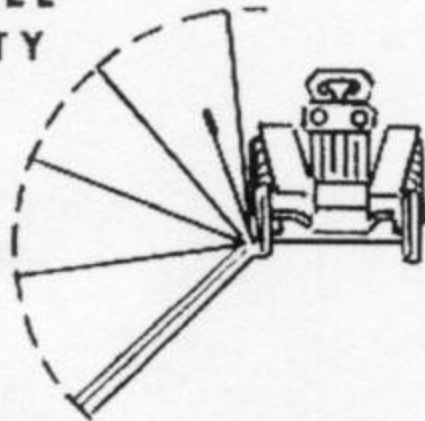


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WIDE ANGLE FLEXIBILITY

Sickle bar can be elevated to upright position for hedge trimming or to 45° below horizontal for ditches, hillsides. Locks in vertical position for transport.



Your Haban Sickle Bar Mower attachment is designed specifically for your tractor and is designed with all controls convenient to the operator. It cuts an effective 48" swath and operates from the tractor P.T.O. The tractor should be equipped with a wheel weight on the left rear wheel of the tractor. These can be obtained from your dealer.

BE SURE TO FOLLOW ALL SAFETY HINTS AND SUGGESTIONS.

SPECIFICATIONS

Length	73"
Clearance Required	3"
Cutting Width	Mows 48" Swath
Overall Depth	24"
Drive	Belt Driven from Tractor P.T.O.
Clutch	Belt Type
Suspension	Free-Floating, Spring Suspended
Mounting	Swivel, Vibration-Dampening
Cutting Speed	900-1100 strokes per minute
Stroke	Full 3" width
Shear Knives	High Carbon Steel
Guards	non-clogging
Vertical Adjustment	135°—45° below horizontal 90° vertical—lever controlled
Transport Position	Pin-Locked for Transport Automatic Spring-Loaded "Swing Back" device protects against damage from solid objects
Construction	All-Steel, with Anti-Friction bearings



The tractor should be operated at full engine throttle for best results, with the sickle knife cutting approximately 1050 to 1200 strokes per minute.

The sickle bar mower can be operated through a complete arc of 135 degrees (from vertical position to 45 degrees below horizontal—see instructions). Settings are available to change the lead and angle of pitch of the cutter bar and features the spring-controlled safety release swingback cutter bar.

SAFETY SUGGESTIONS

CAUTION: Always disengage tractor and/or sickle bar attachment clutch, shut off tractor engine and set tractor parking brake before dismounting from tractor.

CAUTION: Keep hands and feet away from the sickle

CAUTION: Do not allow anyone to walk alongside, in front of, or behind the machine during operation.

CAUTION: The machine should not be lubricated or any adjustment made while it is running.

CAUTION: Avoid excessive road speed.



OPERATION

SICKLE BAR MOWER FOR I-H CUB CADET TRACTOR

Your Haban Sickle Bar Mower can be stopped or started by using I-H Cub Cadet P.T.O. attachment clutch on the side of the tractor. (Refer to tractor instruction manual on proper method of clutching and de-clutching attachments used with tractor.)

NEVER leave the tractor engine running when dismounting from the tractor. De-clutch tractor P.T.O. clutch as well.

Always stop tractor engine when dismounting from tractor - set tractor in "park" position - transmission should be in neutral. Always de-clutch tractor PTO whenever stopping tractor engine, or tractor operation.

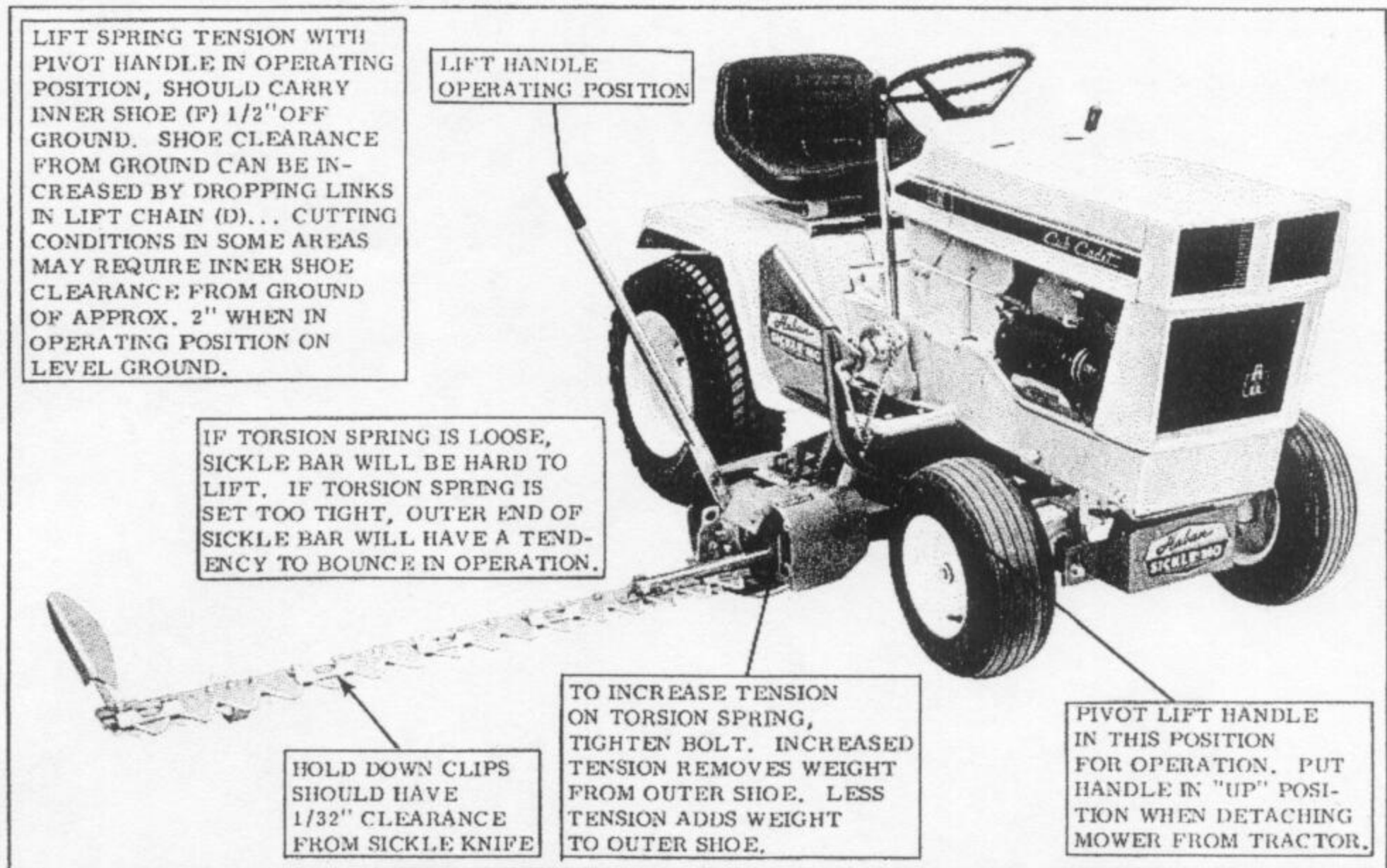


Fig. 1

▲ Keep lock strap (H) in place.

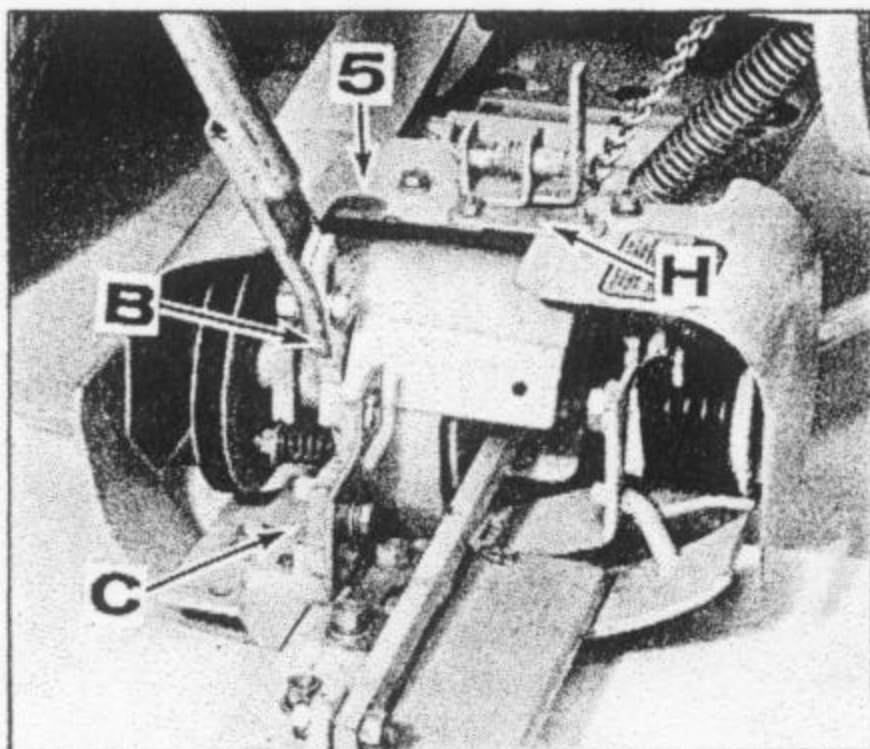


Fig. 2

4

LIMIT STOP (Figure NORMAL CUTTING: The limit stop (5) should be set with LOCK OUT STRAP (H) in place on slot. This will limit the travel of the Cutter Bar in cutting position to approximately 70° above ground level and allow it to function to its maximum below ground level. The lift arm must always be set in operating position (B) when cutting.

VERTICAL CUTTING (90° only) The lockout strap (H) must be removed to cut 90° above ground level or vertical. When finished with vertical cutting, bolt strap (H) back in place. The lift arm must always be set in operating position (C) when vertical cutting.

CAUTION: Make sure lock out strap (H) is bolted securely in place when finished with vertical cuttings.

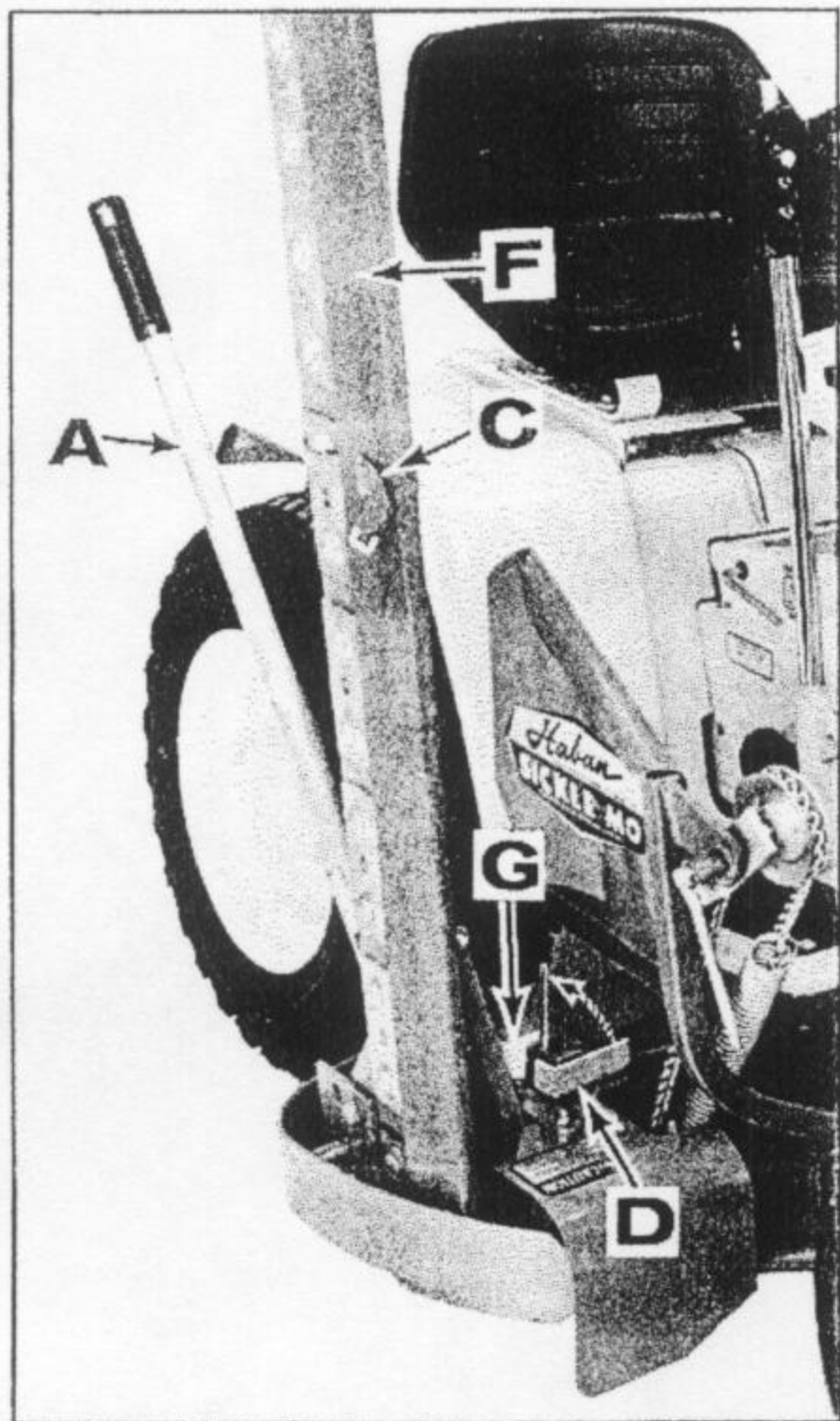


Fig. 3

TRANSPORTING MOWER:

Shut off tractor engine and disengage tractor P. T. O. clutch. Install sickle knife cover (F) using retaining strap to secure cover to bar. Set lift handle in transport position (A). Stand in back of mower, raising mower bar with right hand to vertical position. Insert transport pin (D) as illustrated by sliding pin down from vertical to horizontal position as shown by arrow. Let pin slide through hole in strap (G) to lock in place. Avoid sudden or sharp turns with mower in transport position (Fig. 3).

TO CHANGE SICKLE BAR MOWER FROM TRANSPORT POSITION TO MOWING POSITION:

Shut off tractor engine. Standing behind mower push inward on mower bar, slide transport pin (D) out of strap (G) and turn strap to vertical position to lock out. Lower sickle bar to ground. Loosen retaining strap (C) and remove sickle knife guard. Always install sickle knife guard when mower is not in use or when transporting unit.

CUTTING:

Before operation, check complete unit for any looseness which may have occurred in shipping. Unit should then be operated a short period to check for proper assembly and adjustments before actual cutting begins. Stop and recheck all parts after 30 minutes of operation and retighten loose parts. Also follow lubricating instructions found on page 12. Operate tractor at full throttle. It will be necessary to regulate tractor forward travel to meet existing cutting conditions, which can vary greatly, depending on material that is being cut. RUN INNER SHOE APPROXIMATELY 4" AWAY FROM PREVIOUS SWATH EDGE FOR BEST PERFORMANCE. Cutter bar has additional width of cut to compensate for overlay. Care must be exercised not to operate tractor at excessive ground speed when cutting rough terrain. The lift arm must always be set in operating position (B) when cutting.

Under severe conditions the sickle knives should be sharpened after every four hours of operation. Additional knives and rivets are available for repairs, which makes it possible to always have a sickle knife assembly in good repair if one becomes damaged or worn.

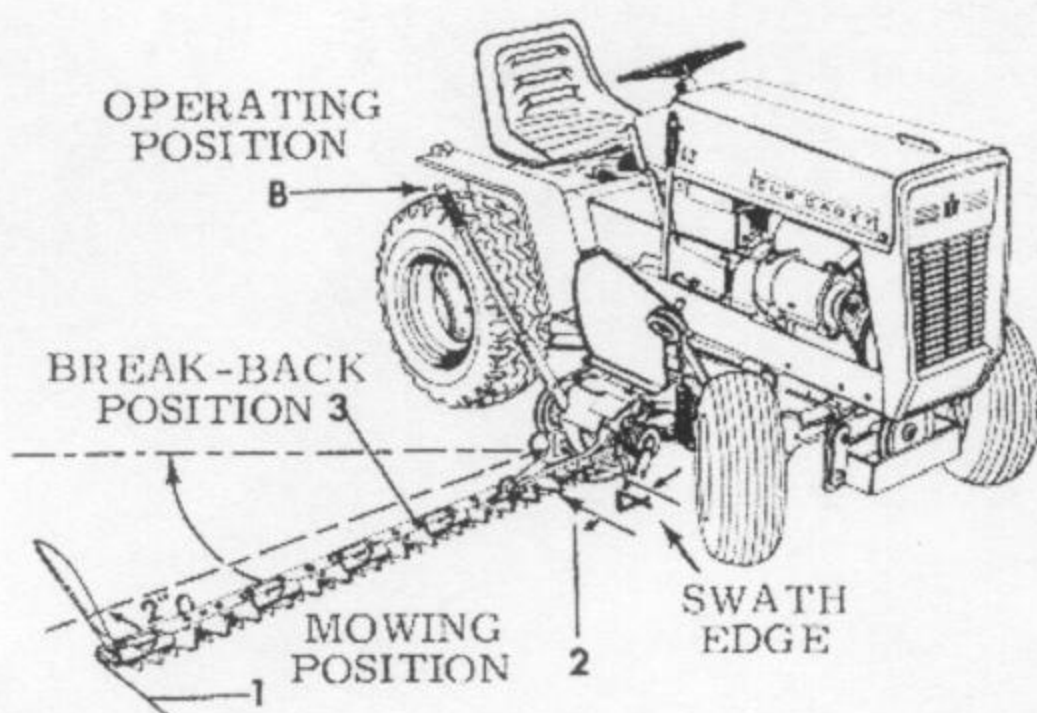


Fig. 4

OPERATION

CUTTING (90° Vertical to 45° above level)

Cutting should be done with engine throttle set approximately 1/8 throttle. The lift handle must be set in transport position. (A).

NOTE: This should be done by an experienced operator only, using extreme caution.

Fig. 5

VERTICAL CUTTING
OR
TRANSPORT POSITION

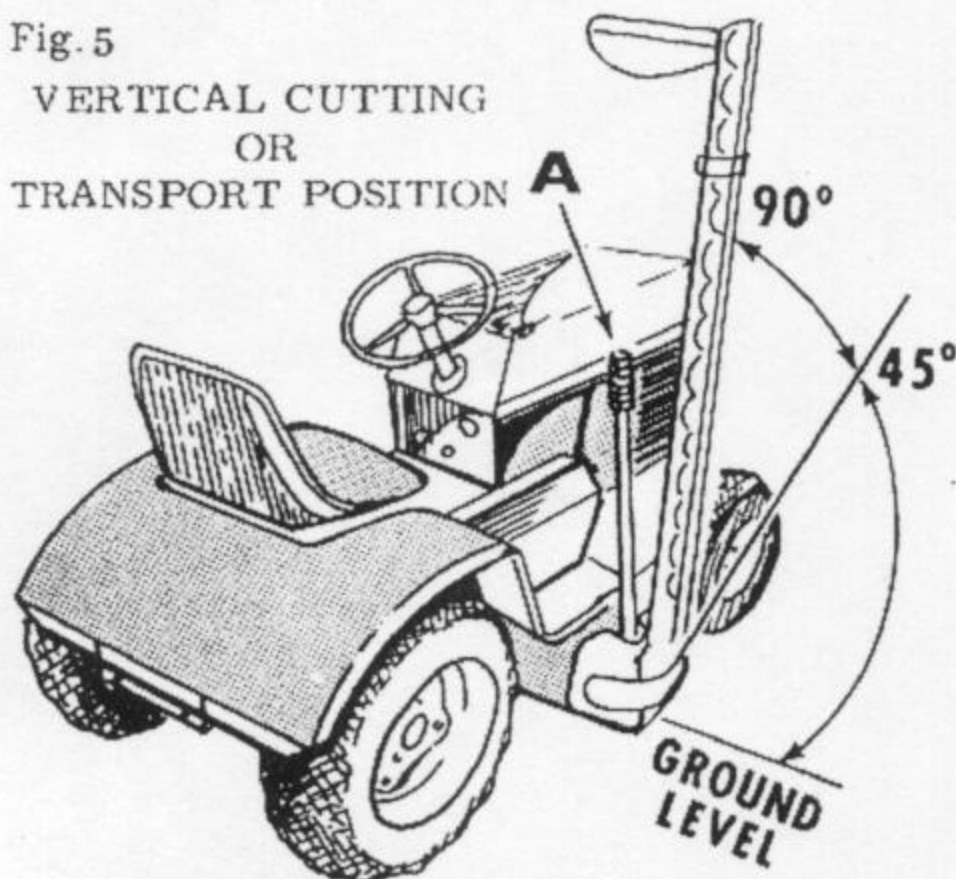
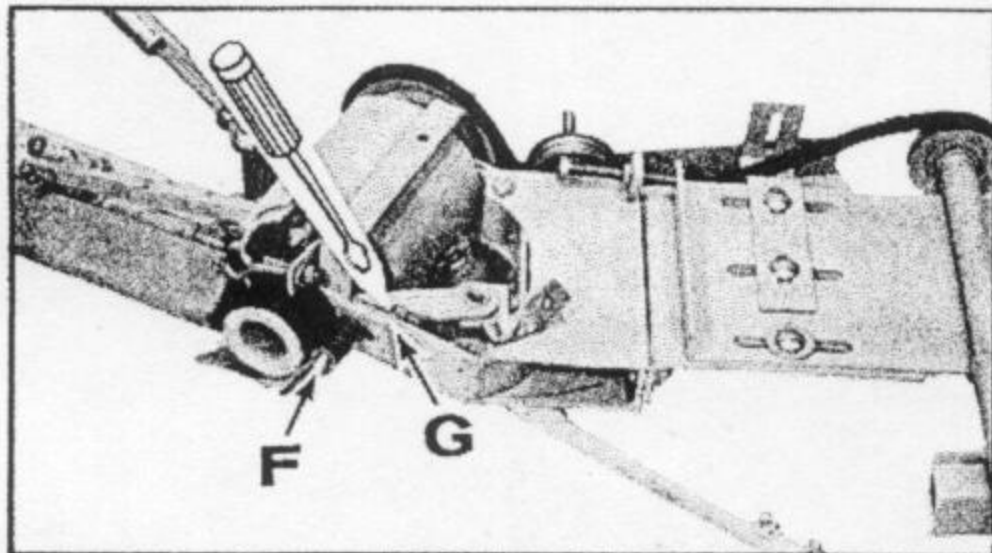


Fig. 6



AUTOMATIC BREAK-BACK (Figure 6)

The break-back automatically releases sickle bar into break-back position when hitting obstruction. The sickle-mower unit should be immediately DE-CLUTCHED. Return sickle bar to normal cutting position, engaging break-back. This may be done by reversing tractor with sickle bar on ground, or manually. Unwarranted or frequent break-back releases indicate tension on the spring (F) should be increased. It is suggested an extra sickle knife assembly be kept on hand for easy replacement.

To disengage safety break-back manually, insert screw driver at (G) and pry break-back pivot open-at same time push sickle bar back to release catch. Fig. 6.

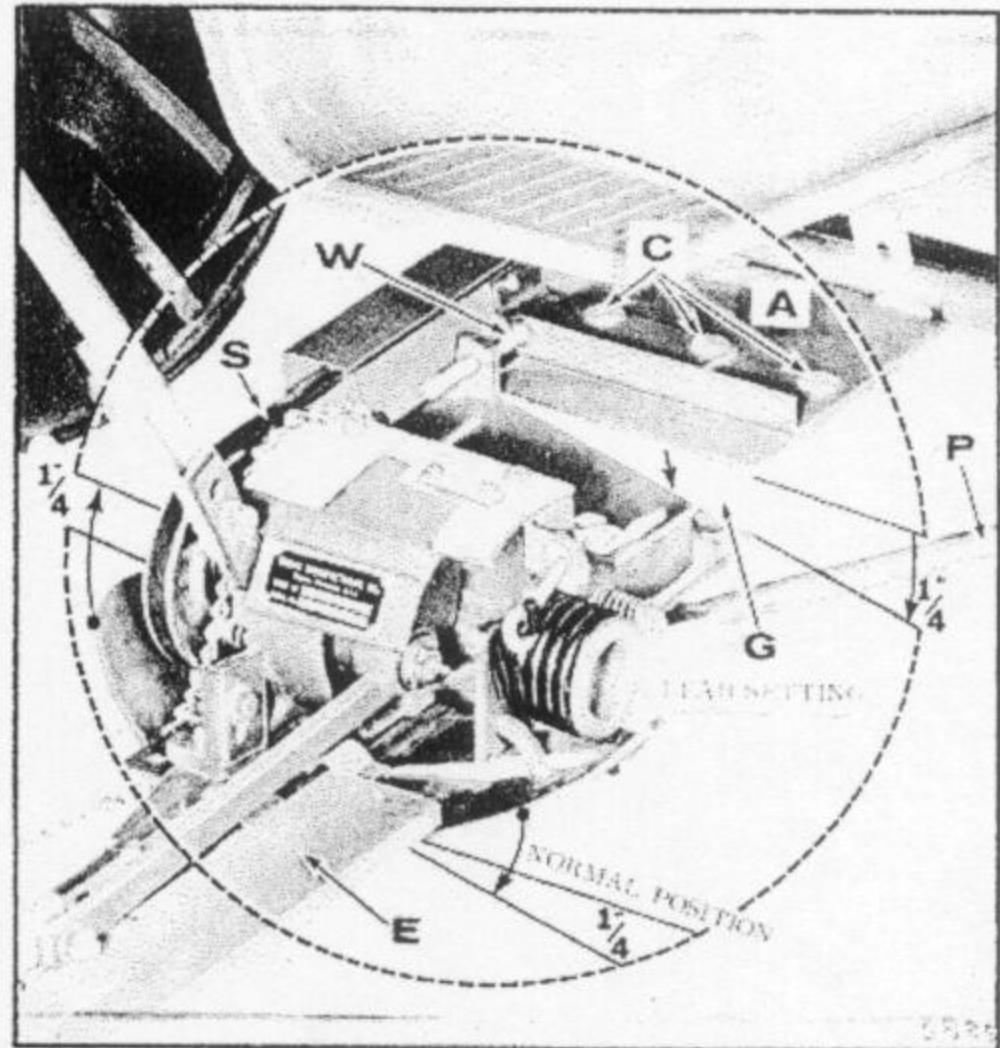
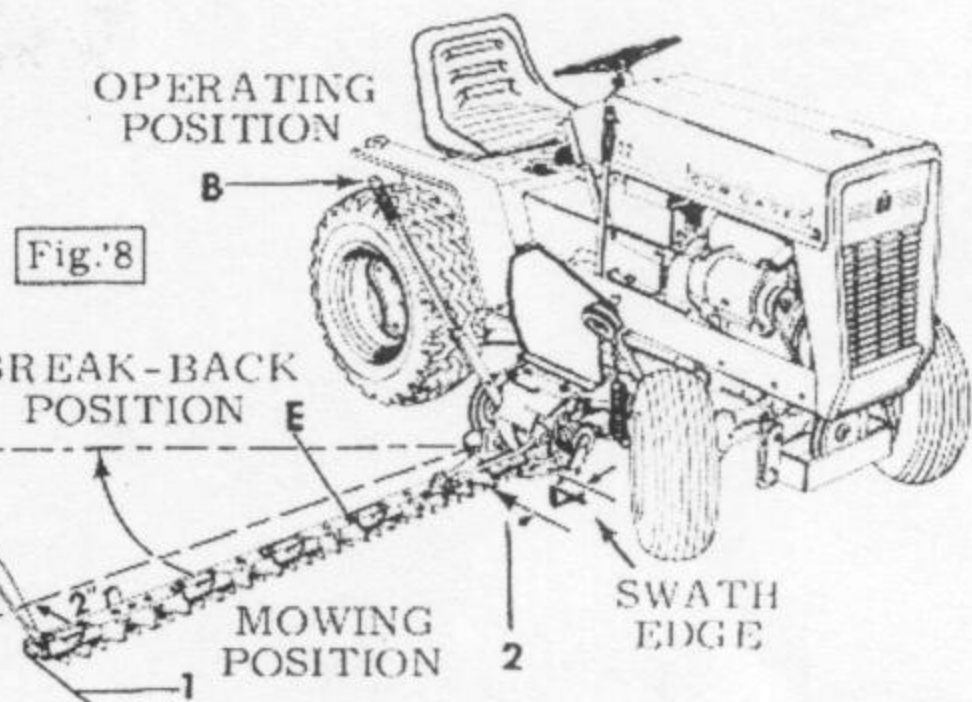
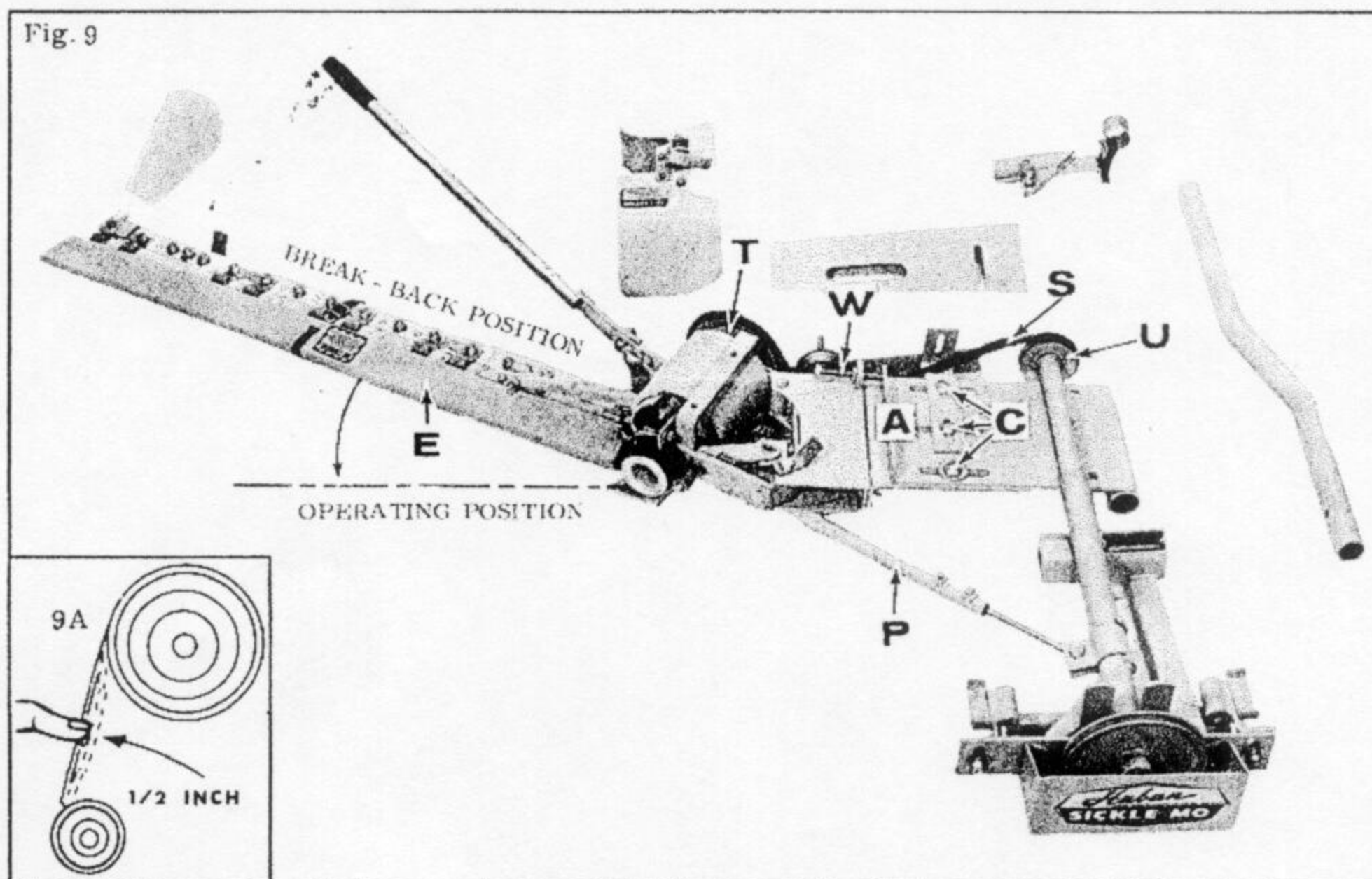


Fig. 7

ADJUSTMENT OF PITMAN DRIVE BELT:

If additional tension is needed, loosen bolts (C) in plate (A) and loosen two set screws in tie rod (P). Turn adjusting bolt (W) until V-belt (S) is tightened. (Proper tension will allow approximately 1/2" deflection of V-belt when applying firm finger pressure midway between pulleys.) (Fig. 9a) Retighten bolts (C) in plate (A) and set screws in tie rod (P). Check lead setting to make sure that it has not been changed during final belt adjustment (Fig. 7).





KNIFE POINT POSITION (Pitch Angle)

The pitch of the sickle bar (E) can be adjusted by loosening bolts (G) and two set screws in tie rod (P). ▲ With sickle knife cover in place; raise mower to vertical position and push forward to increase downward pitch of cutter fingers. For normal cutting, the sickle bar (E) should be positioned with a downward pitch of approximately 1/4" from carriage plate (A) as shown (Fig. 7). It may be necessary to increase downward pitch of shear fingers when cutting extremely heavy, tangled, or matted grass, or if green undergrowth is intermingled heavily with dry grass and weeds from previous seasons. After desired setting is reached, lower mower to ground. Retighten bolts (G) in breakaway housing and set screws in tie rod (P).

Note: Mis-alignment of pitman drive belt may be noticed, however special grooved pulleys allow for this to compensate for pulleys position changes when setting lead and pitch. To install Pitman drive belt, open safety break-back release, manually, and slide belt over carriage pipe. Install belt (S) on jack-shaft pulley (U) and Pitman Pulley (T). Push sickle bar back into operating position

SETTING LEAD OF MOWER BAR

(Fig. 8) Improper lead adjustment of sickle bar assembly will create excessive side draft on tractor and poor cutting action, as well as possibly plugging sickle knife. Outer end of sickle bar at (1) should lead inner end (2) by two inches as illustrated in (Fig. 8). To adjust lead, loosen three vertical bolts (C) in plate (A) and two set screws in tie rod (P) (Fig. 9). Adjust cutter bar (E) to lead setting as illustrated in (Fig. 8), by pushing outer end of bar forward. Slots in carriage plate (A) will adjust accordingly to allow for change in lead setting. (Fig. 9). When proper setting is obtained tighten vertical bolts (C) and two set screws in tie rod (P). **IMPORTANT:** Proper V-belt tension will allow approximately 1/2" deflection of V-belt when applying firm finger pressure midway between pulleys (Fig. 9a). (See adjustment of drive belt, page 6).

OPERATION

Sickle Knife Adjustment

Check the position of the forward ends of the live knife sections (B) to make sure that they protrude past the forward ends of the shear finger plates (E). For cutting loose pre-cut hay, dense, fine and loose under growths, etc., without clogging, the live moving knives must contact the material ahead of any stationary shear-plate. $1/32''$ to $1/16''$ protrusion of the knife is sufficient. If your "wear-plates" (A) are worn half way thru on the front edge, moving the wear plate forward will place the sickle in the proper position. If the wear plate is worn too much for making the proper adjustment they should be replaced.

KNIFE ASSEMBLY REMOVAL

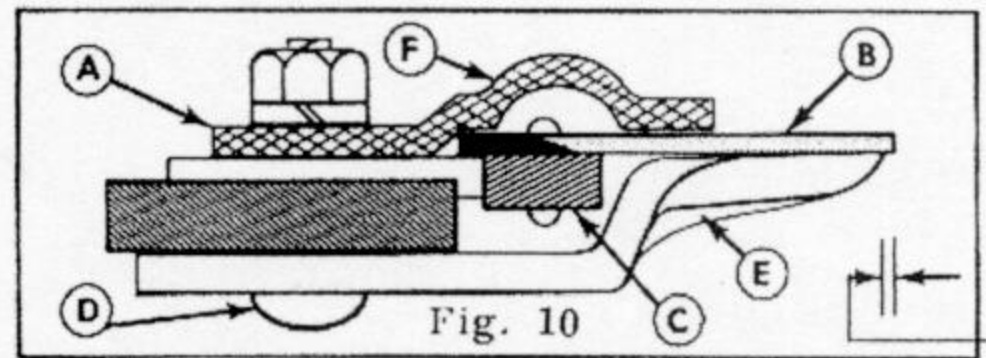
When it becomes necessary to remove the knife for sharpening, section replacement or complete knife replacement, remove the bolts holding the knife head to bar and slide knife out of guard assembly.

ALIGNMENT OF LEDGER PLATE SURFACES

Remove the knife assembly and check all shear fingers for alignment of surfaces. The alignment may be checked by using a straight edge or drawing a string tightly across these surfaces. Any shear finger being too high will create excess clearance between the shear finger and the knife sections. Misalignment can be corrected by bending shear fingers up or down, as required. Hammer only on solid portion of guard beyond the lip.

WEAR PLATE ADJUSTMENT (Fig. 10)

The wear plates (A) support the back of the knife sections (B) and guide the knife bar in the shear finger recess. Wear plates have elongated holes for adjustment against the knife bar (C) to prevent it from drifting forward and backward. Adjust by loosening the guard bolts (D) and sliding the wear plate forward against the knife bar. Avoid a tight fit. Check the top surface of the wear plate with the shear finger surface (E). These two surfaces must be even. A low wear plate should be shimmed.



LIVE SICKLE SECTIONS TO PROTRUDE $1/32''$ to $1/16''$ OVER SHEAR PLATE.

KNIFE CLEARANCE (Fig. 10)

If the knife fits too loosely, in most cases clearance can be obtained by hammering down or prying up the front end of the hold down clips (F). The suggested method is to remove the knife assembly. Reinsert the knife and adjust each clip as it is reached, for the entire length of the bar. Bend each clip up or down as required. The approximate clearance to be maintained should not exceed $1/32''$. Fitting these clips too tightly will cause binding or scoring, excessive vibration and chatter. Lubricate freely.

CUTTING FAILURE

A. Check sharpness of knife sections.

1. If sharpening is necessary a sickle grinder with a holder should be used for this operation to maintain correct grinding angle. (Same as original)
2. Replace damaged sections.

B. Check fit of knife sections to shear fingers and wear plates. If the knife sections are sharp, clean cutting is entirely dependent upon the following:

1. Alignment of shear finger surfaces.
2. Wear plate adjustment.
3. Straightness of knife bar.
4. Pitch of shear fingers.
5. Hold down clip clearance.
6. Proper lead setting of mower.
7. Improper speed of sickle knife in relation to forward travel of tractor.

Be sure the sickle sections are sharp at all times and held close to the shear fingers by the sickle slips. Be careful, however, of having them too tight as this will cause binding. Always lubricate well with oil at the point on the bar and shear finger assembly where the clips contact the knife assembly.

OPERATION

OPERATING THE MOWER:

Follow tractor break-in instructions as explained in your Tractor Operator's manual. Do not operate mower or any other attachments during this period. Check all other tractor and engine operating adjustments before starting to mow.

PRE-STARTING INSPECTION:

1. Be sure mower has been properly assembled to tractor. Assembly instructions start on page 16.
2. Be sure mower is adjusted.
3. Check condition of mower blades. Keep blades sharp.

STARTING THE MOWER

1. Start tractor engine at half throttle. Always advance throttle lever to full position when moving.
2. Engage mower clutch.

NOTE: Prolong the life of mower drive belt by engaging mower slowly.

STOPPING THE MOWER:

To stop sickle bar mower.)
Use tractor P.T.O. clutch on dash of tractor

MOWING

METHOD OF MOWING:

Before mowing a new plot of grass, always stop to analyze the area of field for best mowing procedure. Consider also the height of grass to be mowed, type of terrain (level, hilly or pitted), as well as the presence of rock or trash. Each condition will require certain adjustments or precautions, as outlined in the following pages.

CAUTION: Pick up all rocks, stones and other debris you can find before mowing in a new area. Enter the area cautiously.

CAUTION: Before servicing machine, disengage power, shut off engine, and disconnect engine spark plug cable.

Sickle bar mower can operate from 90 vertical to 45 below horizontal. It may be necessary to release some tension on the torsion spring to allow mower bar to drop to lowest angle

of cutting. Sickle knife should have a clearance of 1/32" from hold down clips. If hold-down clips are too tight, excessive vibration will occur and sickle knife assembly will run hot.

If several years of dead grass has accumulated in areas being cut, particularly on hills or slopes, it may be necessary to cut against the slope due to dead material leaning forward, thereby not allowing the sickle knife to cut cleanly.

Test pattern cutting will soon show you the most appropriate way to approach the task. Remember, proper settings, sharp sickles, correct forward speed, and attention to general maintenance will enable you to cut any reasonable patch of ground with satisfaction. Overlooking any one of the above points may deter from the machine's performance. A few points are listed below:

OPERATING SICKLE BAR MOWER ON TRACTORS WITH HYDROSTATIC DRIVE:

Proper ground speed for mowing depends upon (1) the height, density, and type of grass to be cut and (2) field or yard conditions.

When mowing, always operate engine at full throttle. This is necessary to maintain proper blade speed and to cause maximum flow of air to cool engine.

Operation of hydrostatic drive tractors enable you to easily obtain the proper ground speed needed for best mowing performance with the Sickle Bar Mower. A short amount of testing when starting to mow in the various conditions that you find, will enable you to determine the most appropriate speed for that particular condition. Too fast a forward ground speed will cause problems as outlined under paragraph three as listed above and can be corrected as indicated in the solution.

OPERATION

Exceptionally tall grass or weeds, uneven terrain, may require you to operate your tractor at a much slower speed than you would normally use. On the other hand sparse weeds etc., may enable you to operate at a higher rate of forward speed that would normally be used under regular cutting conditions.

Always slow down the forward speed of the tractor at the time of making a sharp turn, cutting on a radius, on banks or slopes or other uneven terrain.



REMEMBER SAFETY PAYS.

CAUTION: When mowing over rough ground or on hillsides, the hydrostatic transmission allows selection of safe ground speed at full engine throttle.

<u>PROBLEM</u>	<u>SOLUTION</u>
1. Cutter bar outer shoes bounce or digs into ground surface.	Adjust torsion spring as indicated in figure 1, (Page 4).
2. Inner shoe dragging on ground.	Raise inner shoe assembly by adjustment of lift spring (Figure 1). Make sure lift chain is properly assembled.
3. Mower does not cut cleanly drags hay under shear knife cutting pattern shows blank or skipping points.	Adjust forward travel of speed to coincide with sickle knife action. Check setting of hold down clips Page 8. Check lead setting (See pg. 7)
4. Bunching of cut material in front of inner shoe after adjustment of lift spring.	Inner shoe is being run too close to edge of previous swath. Allow approx. 4" overlap. (Fig 4 - Pg. 5)
5. Failure to cut grass and weeds.	Check clearance of sickle knife to shear finger - fit should be snug; 1/32" clearance. Tap metal hold-down plates with hammer to adjust. Sharpen sickle knives if dull. Check pitch of shear fingers and lead of sickle bar.

OPERATION

TROUBLE SHOOTING HINTS FOR SICKLE BAR MOWER OPERATION WITH HYDROSTATIC DRIVE TRACTORS:

Operation of hydrastatic drive tractors enables a wide variance of forward speed at a single throttle setting without necessarily taking into consideration the type of material that is being cut. Listed below are some of the tell-tale signs which will indicate when you are operating your tractor in excess of reasonable performing speeds:

1. Jagged or uneven cutting indicates too fast a forward ground speed.
2. Plugging knife assembly could be created by either excess forward speed, improper lead adjustments, improperly installed hold down clips, dull sickle knife or incorrect pitch angle setting of sickle bar.

Cutting of heavy, short undergrowth, intermingled with tall weeds may require a slower forward speed than would normally be used for weed mowing. Be certain that your sickle knife assembly is always kept sharp.

SPECIAL CAUTION: Never attempt to force the sickle bar mower to raise, if the outer end of the bar is lodged or caught in foreign debris, dirt or heavy underbrush. Give your tractor and the equipment every possible opportunity to operate efficiently. Attempt to reverse tractor or move forward carefully until mower bar is released from entanglement or -- stop engine -- set parking brake - disengage PTO clutch, dismount from tractor and release mower bar from entanglement manually, then proceed.

Remember, always keep engine running at full throttle when mowing - regulate forward speed through hydrostatic transmission travel control.

SAFETY IS NO ACCIDENT !!

Read Carefully



1. Make sure lift operates smoothly
2. Check knife clearances
3. Check bolts that hold main cylinder to the base of the machine
4. Check all other bolts to make sure they are tight

SAFETY SUGGESTIONS

CAUTION: Keep hands and feet away from the knives until the machine has come to a complete stop. Never open the inspection panels when the machine is running.

CAUTION: Always disengage the PTO shaft before dismounting from the tractor.

Do not allow anyone to walk alongside or behind the machine during operation.

Before mowing, check and remove sticks, stones or any other debris from area to be mowed. This will prevent possible mower damage as well as eliminate the possibility of blades picking up and throwing debris.

Always use wide rear wheel tread when mowing on sidehills.

Always drive slowly over rough ground and on hillsides. Drive at speeds slow enough to insure your safety.

Always wear relatively tight and belted clothing when operating tractor. Loose jackets, shirts, sleeves or other loose clothing should not be permitted because of the danger of catching them in moving parts or controls.

Refuel your tractor only when the engine has been shut off. Never smoke while filling the fuel tank.

Never operate the tractor engine in a closed building.

Before leaving tractor seat, always disengage mower drive clutch and stop tractor engine

AVOID ACCIDENTS

BE A SAFE OPERATOR

No accident prevention program can be successful without the whole-hearted cooperation of the person who is directly responsible for the operation of equipment.

To read accident reports from all over the Country is to be convinced that a large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it be on the highway, in the harvest field, or in the industrial plant, can be safer than the man who is at the controls. If farm accidents are to be prevented--and they can be prevented--it will be done by the operators who accept a full measure of their responsibility.

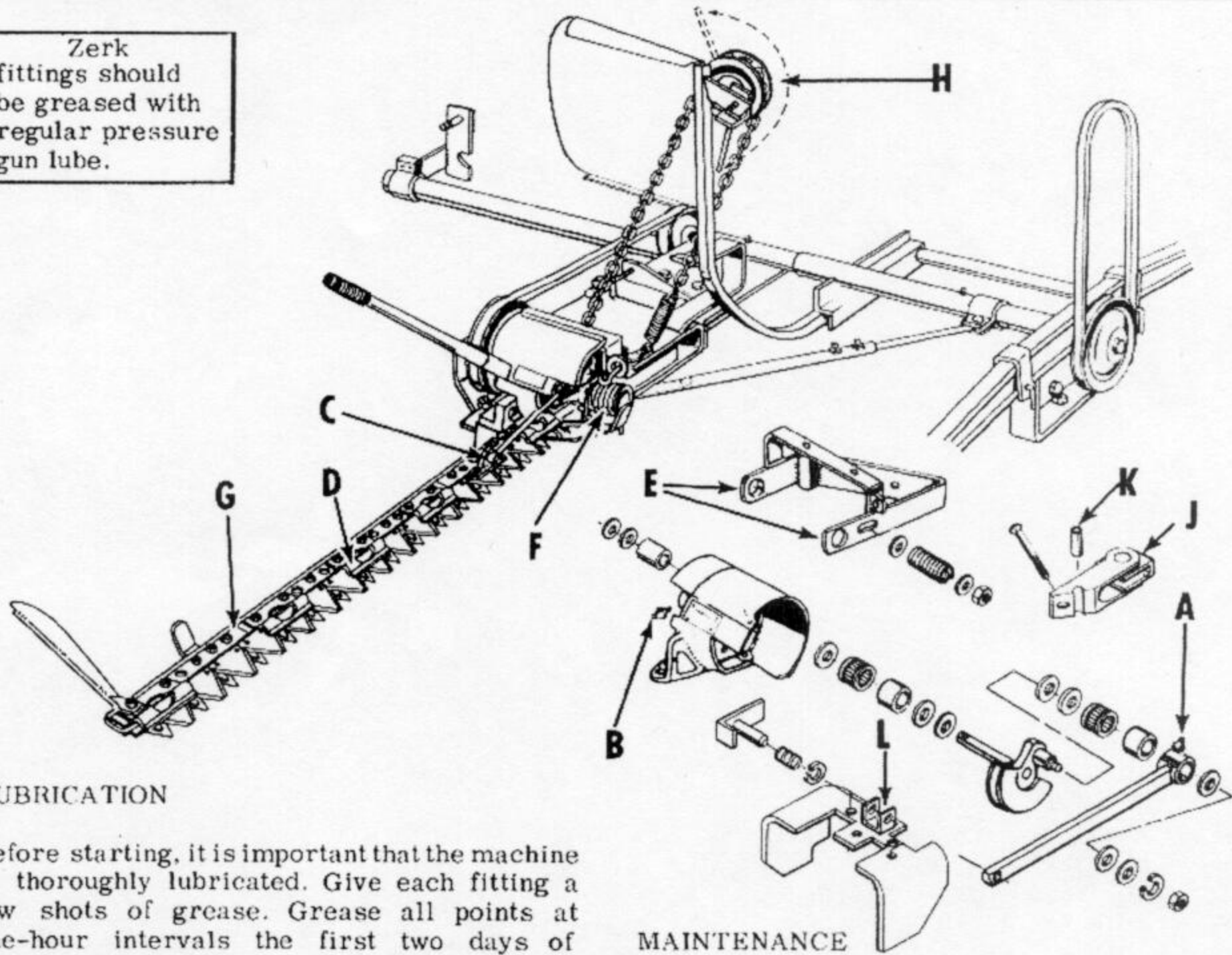
It is true that the designer, the manufacturer, the safety engineer can help; and they will help, but their combined efforts can be wiped out by a single careless act of the operator.

It is said that "the best kind of a safety device is a careful operator." We ask you to be that kind of an operator.

NATIONAL SAFETY COUNCIL

MAINTENANCE

Zerk fittings should be greased with regular pressure gun lube.



LUBRICATION

Before starting, it is important that the machine is thoroughly lubricated. Give each fitting a few shots of grease. Grease all points at one-hour intervals the first two days of operation and then twice each day thereafter. Entire unit should be greased at least once each four hours during continuous operation.

The following fittings require grease every two hours of machine operation:

- (A) Pitman crank pin
- (B) Crankshaft

REMEMBER: Too much oil and grease will do no harm, but lack of it means excessive wear and machine failure.

The following points require oil can lubrication every two hours of machine operation:

- C. Pitman head
- D. Sickle clips
- E. Two inner shoe pivots
- F. Torsional lift spring
- G. Wear plate and moving points
- H. Transport spring pulley
- J. Spring release pivot assembly
- K. Spacer break away housing
- L. Quick pin assembly

MAINTENANCE

Adjust the belt tension described under "Belt Adjusting" on pages 6. Proper tension allows for approximately one-half inch deflection when fingers pressure is applied midway between pulleys. Check V-belt for wear. Replace worn belts, using belts only supplied by the manufacturer.

CLEANING

Do not attempt to clean the machine while it is operating. **STOP MACHINE.** For best and lasting results, the machine should have all dirt accumulations removed from sickle bar. Do not allow machine to stand for long periods without cleaning. Inside storage will also prolong its operating expectations.



SAFETY SUGGESTIONS



Do not allow anyone to walk in front of, alongside, or behind machine during operation. Keep hands and feet away from knives until machine has come to a complete stop and the engine has been stopped.

SET UP

Your sickle bar attachment and all necessary parts and hardware are packed in two cartons. Unpack cartons carefully to insure that all parts are accounted for. Lay out all assemblies in the position as shown (Fig. 11).

The Sickle Bar Mower consists of the following:

MOWER CARTON

- 1 (1)-Basic Mower Assembly

CARTON OF MOUNTING PARTS

- 2 (1)-Main Frame
- 3 (1)-Extension Pipe
- 4 (1)-Carriage Plate Assembly
- 5 (1)-Carrier Arm Assembly
- 6 ()-V-Belt Guard
- 7 (1)-Lift Lever Extension
- 8 *(1)-Bag of Parts
- 9 (1)-Grass Divider Board
- 10 (1)-Drawbar Hitch Assembly

*(SEE PAGE 18 FOR LIST OF CONTENTS)

SICKLE BAR ASSEMBLY (Fig. 11)

Set the anchor bolt (A) to a general setting of 1 1/4"; finger tighten hex. nut to hold this temporary setting as shown on breakaway housing (B) (Fig. 12).

Place the breakaway housing plate (B) beneath the main frame support plate (C). Slide support plate (C) up to anchor bolt (A) and align the slotted holes in both frames (Fig. 11). Thread two 1/2" x 1 1/4" carriage bolts (D) through top of guard mounting bracket (E) in slotted holes down through support brace (F). Slide washer (G) 1 3/4" over slotted hole (C1) threading bolt 1/2" x 1 1/4" down through support brace (F). Finger tighten three carriage bolts with lock washer and nut (Fig. 12).

To attach the sickle bar breakaway latch frame assembly (H) to the breakaway housing (B), insert spacer (J) into breakaway latch frame hole (K). With the spacer in place, align hole (K) with hole (L) in breakaway housing plate (B) and insert 1/2" x 3" hex. head bolt. Secure with lock washer and nut in (Fig. 12).

Fig. 12

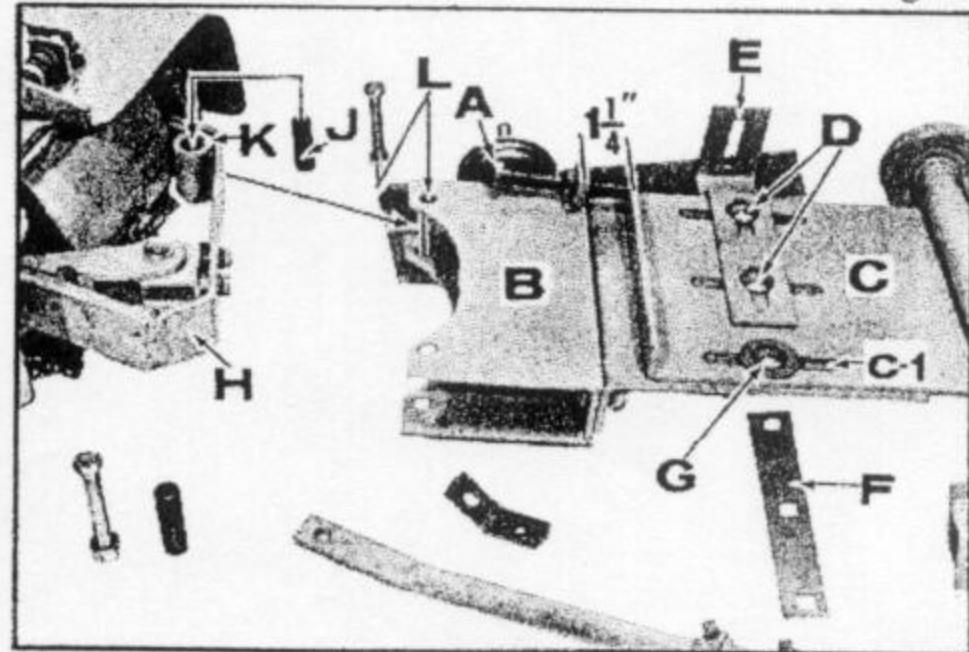
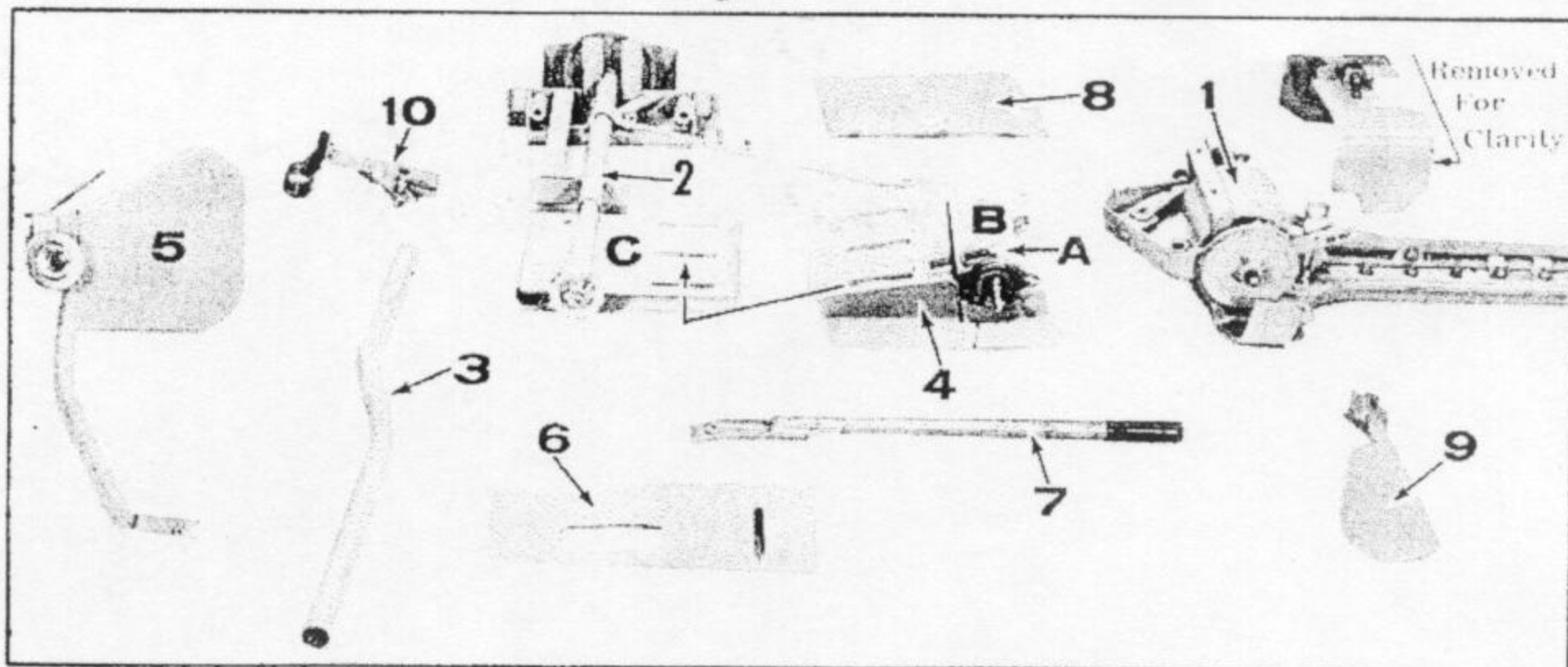


Fig. 11



SET UP

Fig. 13

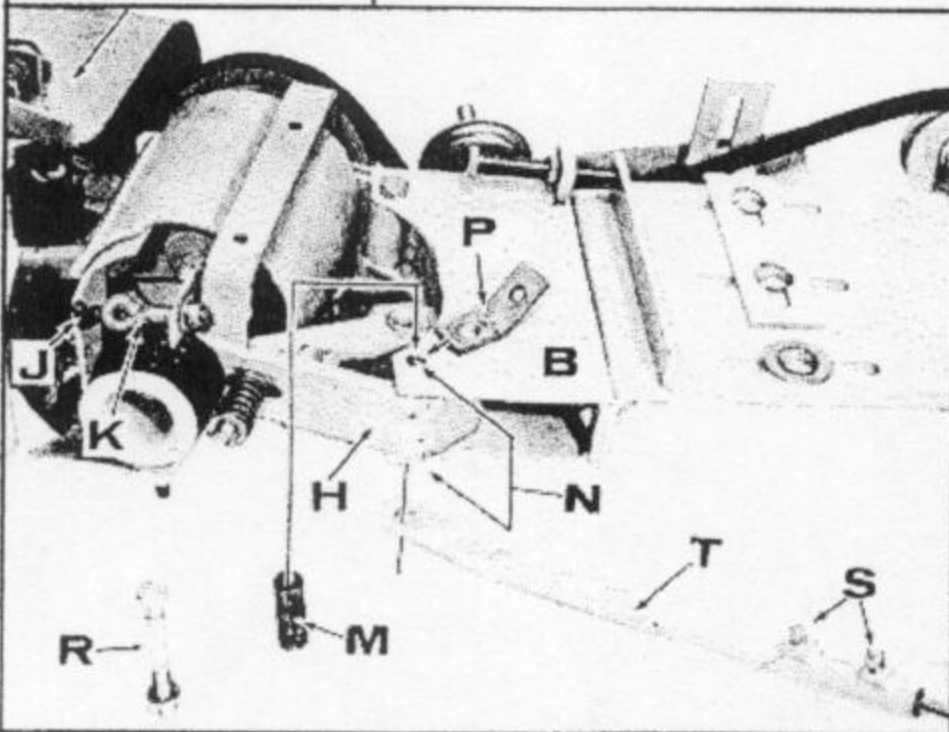
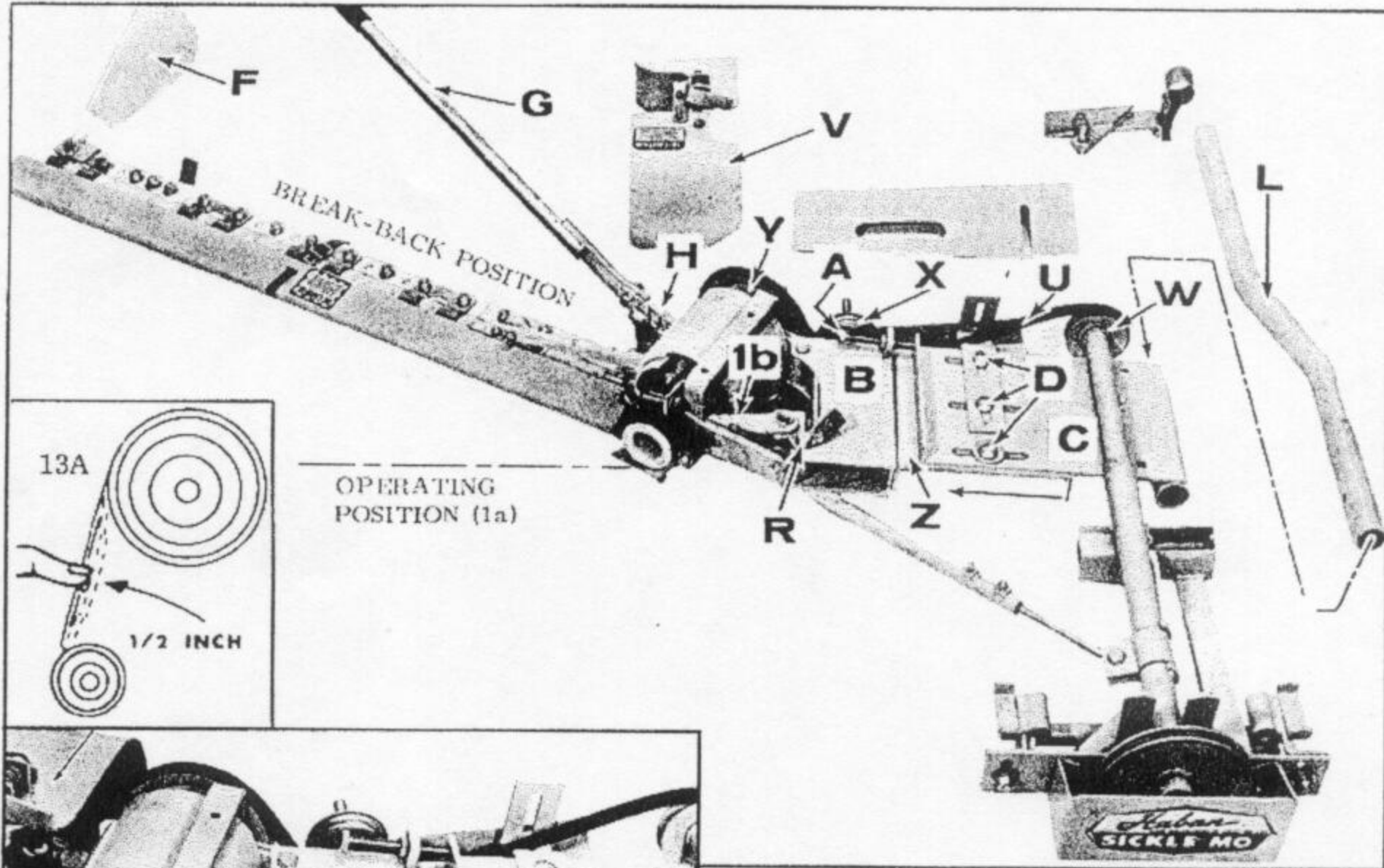


Fig. 14

Swing latch frame (H) into breakaway housing (B) as shown (Fig. 14). Place and align spacer (M) between two holes (N) in breakaway housing. Place angle clip (P) over hole (N). Keep angle clip in the position as shown (Fig. 14). Thread $1/2'' \times 3 1/2''$ hex. bolt (R) down through hole (N). Loosen set screws (S) in tie rod (T); adjust tie rod to align with bolt. Keep lock washer and hex. nut loose at this point.

GRASS DIVIDER BOARD (F) goes on the end of sickle mower. Remove hex. nut and place grass divider (F) over carriage bolt and secure with hex. nut (Fig. 13).

V-BELT INSTALLATION

Leaving mower assembly in break-back position, install V-belt (U) as follows: Remove housing stop cover (V). Slide V-belt onto pulleys (W) under idler pulley (X) and around crank-shaft pulley (Y) as shown. Move carriage plate (Z) in the direction of arrow until all the slack is removed from the V-belt (U). Align assemblies (B) and (C) so they are evenly together, then tighten bolts (D) and reset anchor bolt (A) to touch end of carriage plate as shown (Fig. 13). Retighten set screws (Q) in tie rod.

FINAL ADJUSTMENT OF PITMAN DRIVE BELT

Standing in back of sickle bar, push sickle mower into operating position (1a) (Fig. 13). Use firm hand pressure on back side of sickle mower, engaging breakaway latch at point (1b). Tighten securely hex. bolt (R) in breakaway housing (B).

With sickle bar mower in operating position, check V-belt (U) tension at this point. Proper tension will allow $1/2''$ deflection when firm finger pressure is applied midway between pulleys (Fig. 13a).

SET UP

If additional tension is needed, loosen bolts (D) (Fig. 13) and complete tightening of pitman drive belt with adjustment bolt (A). Then tighten bolts (D) securely and check lead setting (see page 7) to make sure that this has not been changed during final belt adjustment.

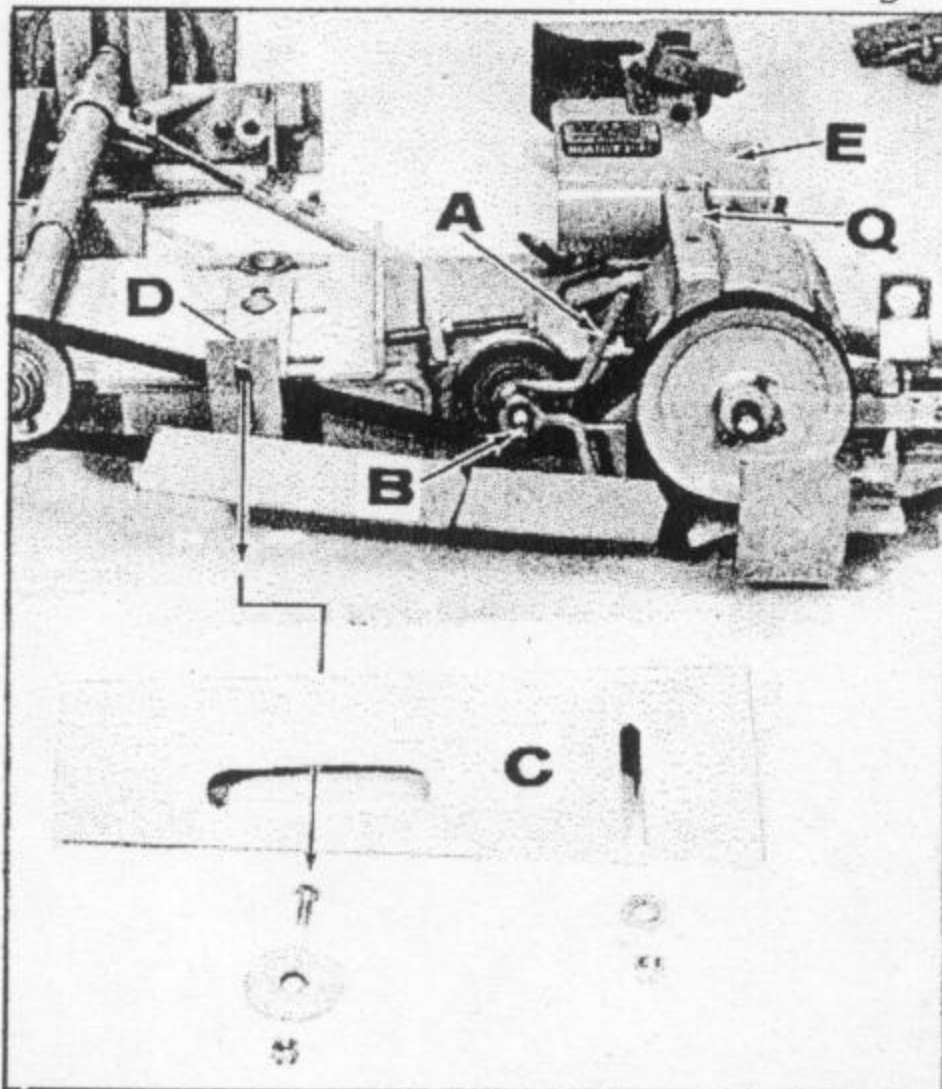
INSTALLATION OF LIFT HANDLE

Align hole in lift handle (G) with second hole in lift arm (H). Secure in place with $1/2''$ x $1 1/4''$ hex. bolt and hex. nut (Fig. 13).

INSTALLATION OF BELT RETAINER

To attach belt retainer (A), thread $1 1/4''$ washer onto stud (B); place belt retainer (A) into place as shown (Fig. 15). Thread one more $1 1/4''$ washer onto stud and secure into place with half hex. nut.

Fig. 15



INSTALLATION OF V-BELT GUARD (Fig. 15)

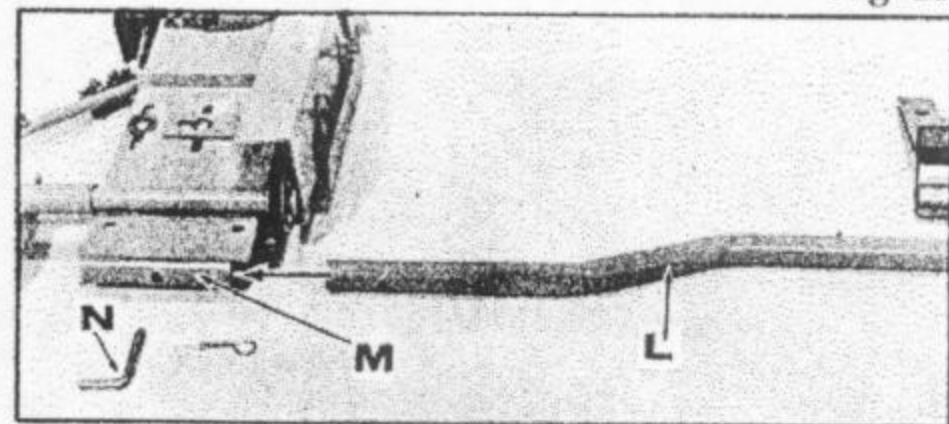
Install $1 1/4''$ washer onto stud (B); mount guard (C) with $3/8''$ x $1''$ carriage bolt through slot in mounting bracket (D) in direction of arrow. Place guard over carriage bolt and stud (B); secure guard into place with $2 3/8''$ flat washer and hex. nut onto carriage bolt. Thread a $1 1/4''$ flat washer over stud (B) and secure with hex. nut. Place assembly housing stop (E) up over flywheel housing and secure with $3/8''$ x $3/4''$ hex. bolt. Note: through two holes in strap (Q).

INSTALLATION OF SICKLE BAR MOWER ON TRACTOR

NOTE: Torsion spring (J) should not be attached to torsion adjusting bolt (K) at this point (Fig. 14).

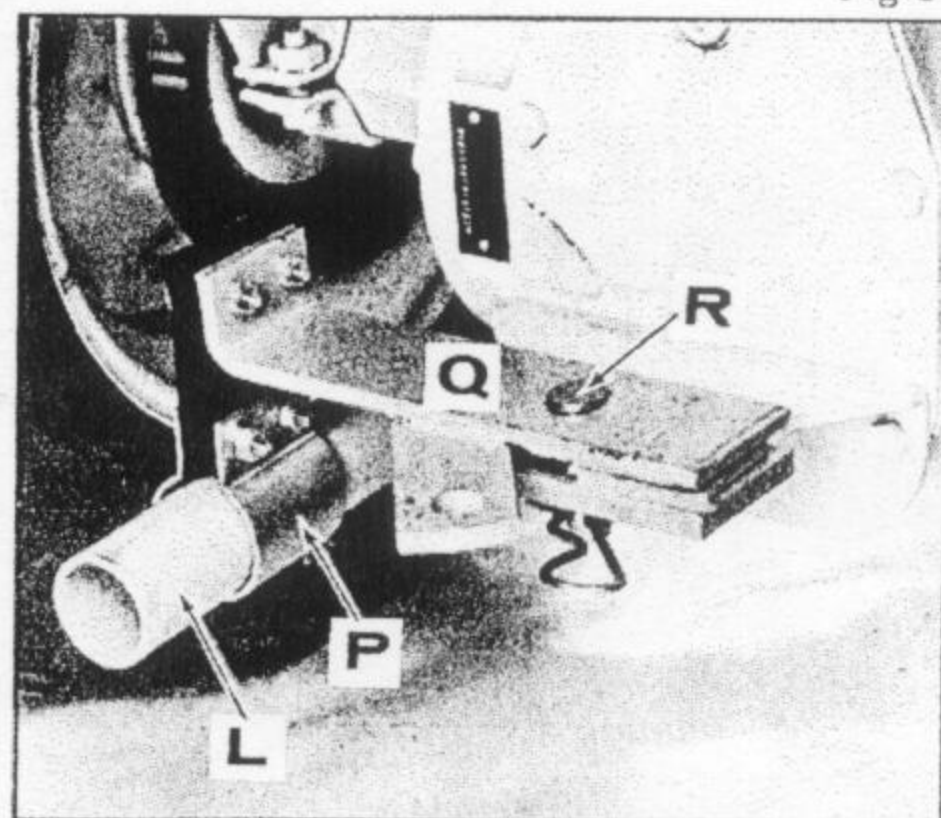
Rear tube assembly (L) is placed under tractor as illustrated in Figure 16. (Tractor is not pictured here to give unobstructed view).

Fig. 16



Slide mower bar assembly under tractor. Position frame assembly to be centered under front axle. Insert rear tube (L) into frame holder tube (M) and align holes. Insert angle pin (N) into tube and secure with hair cotter pin (Fig. 16). Next slide clamp shock absorber (P) onto tube (L). Attach hitch clamp (Q) onto tractor draw bar plate. Insert clevis pin (R) through two aligned holes and secure with cotter pin as illustrated (Fig. 17).

Fig. 17

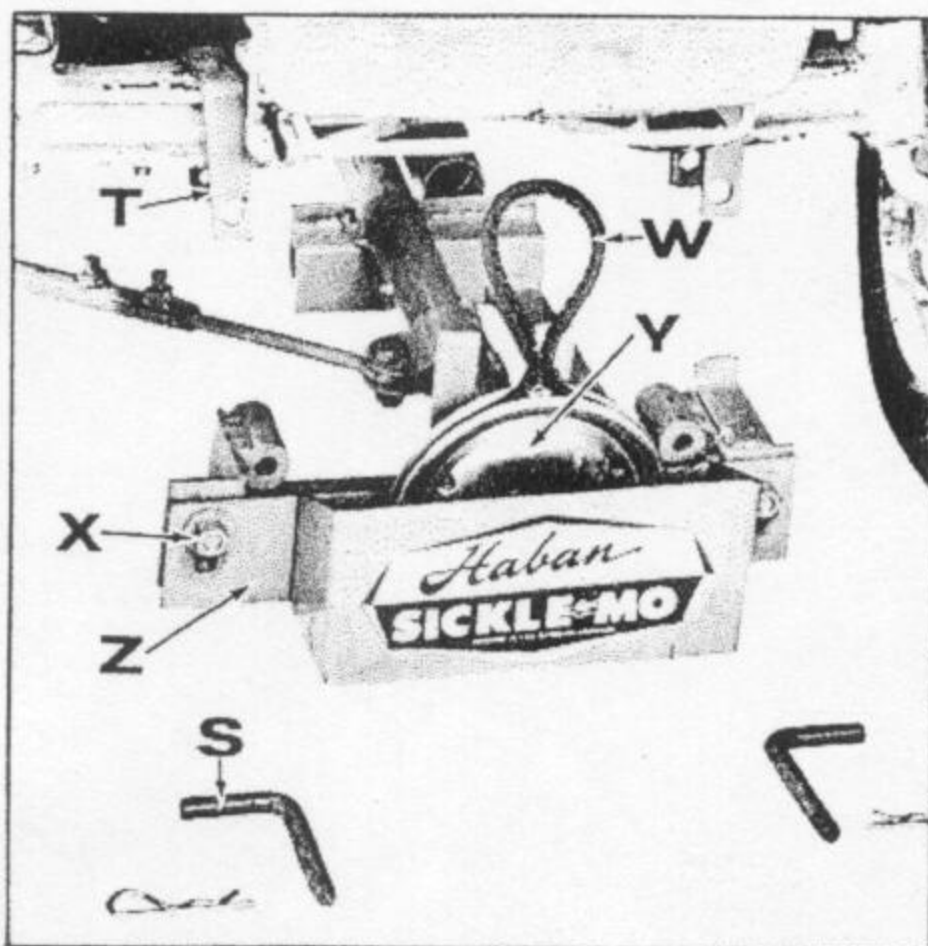


SET UP

INSTALLATION OF MOWER TO TRACTOR AXLE ASSEMBLY: (Fig. 18)

To install sickle bar mower assembly to front axle of tractor, make certain that front end of mower assembly is in alignment with tractor axle and is centered from side to side. Next, raise mower assembly on the underside of axle frame. Insert angle mounting pins (S) through axle clamps (T) securing pins (S) in place with hair cotter pins.

Fig. 18



INSTALLATION OF JACKSHAFT V-BELT TO TRACTOR ENGINE DRIVE PULLEY

To install drive belt (W) to tractor engine drive pulley, loosen bracket mounting bolts (X). Thread V-belt over tractor engine pulley first, then install belt on sickle bar mower

Fig. 19



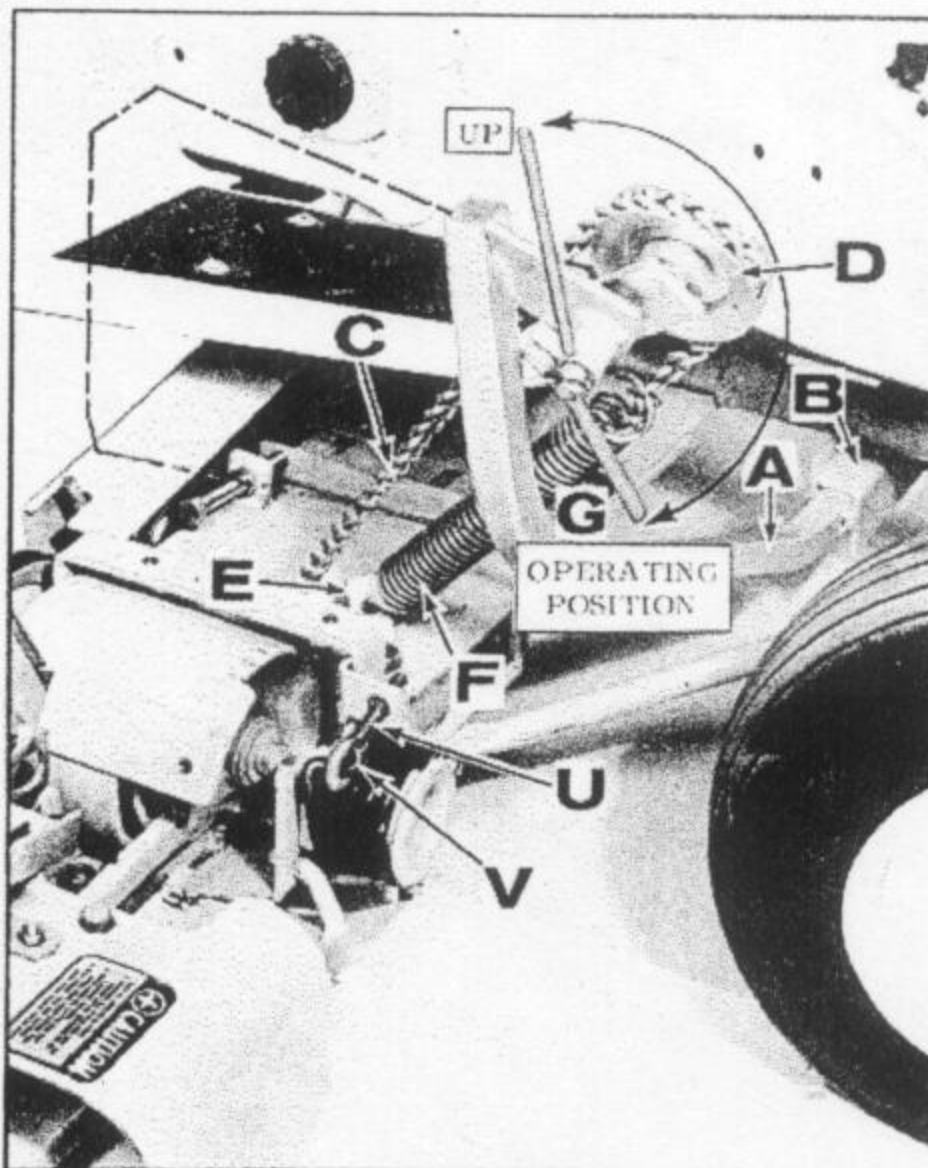
pulley (Y) (Fig. 18). If it is necessary to increase or decrease tension on drive belt (W), raise bracket (Z) to decrease tension and lower bracket (Z) to increase tension on drive belt (W). As soon as proper tension is obtained, secure mounting bolts (X) (Fig. 19).

NOTE: Proper tension of V-belt will allow approximately 1/2" deflection of belt when exerting firm finger pressure midway between tractor drive pulley and sickle bar mower pulley (Y) (Fig. 18).

TORSION SPRING HOOK-UP

Raise mower bar into vertical position and install torsion spring adjusting bolt (U) to torsion spring spur (V) as illustrated (Fig. 20).

Fig. 20

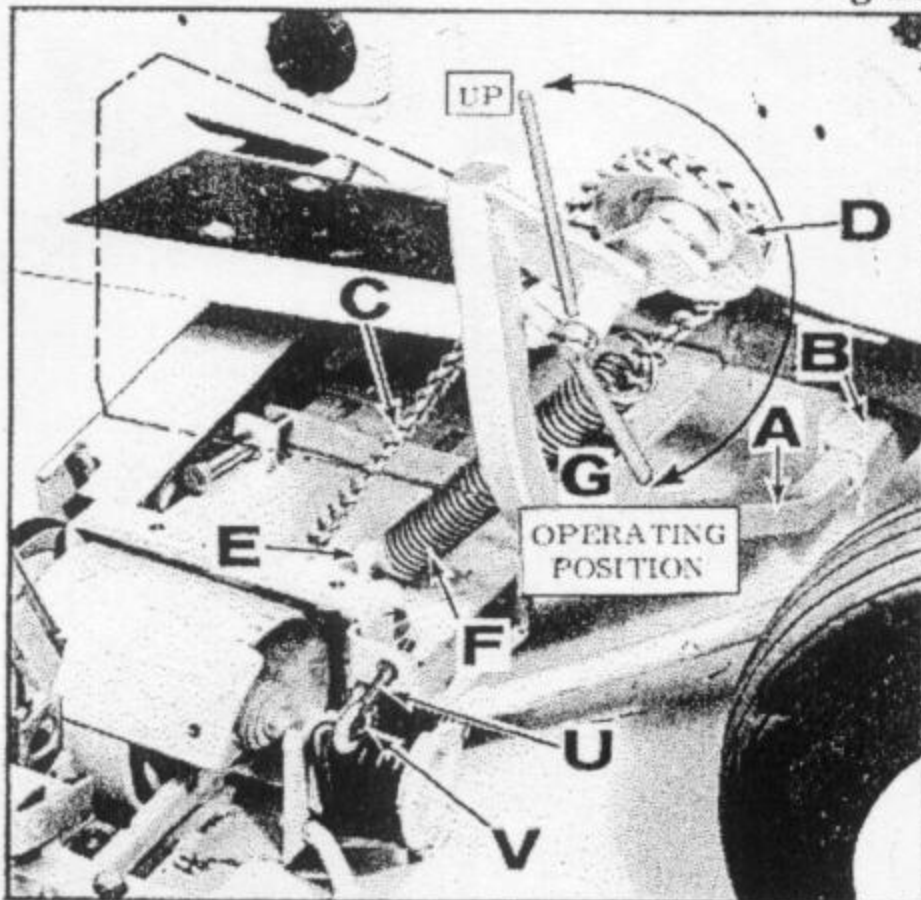


Next, install carrier arm assembly (A) (Fig. 20) by inserting carrier arm into mounting pocket (B). Push carrier arm into pocket (B) until carrier arm button stop rests against end of pocket mounting tube.

INSTALLATION OF LIFT CHAIN AND SPRING ASSEMBLY TO CARRIER ARM (Fig. 21).

Lift chain (C) should be threaded over carrier arm pulley (D). NOTE: Be certain that eccentric arm on carrier pulley is in "up" position at this point. Anchor clip (E) is positioned at angle shown. Lift spring (F) is attached to angle clip (E). To connect lift spring to lift chain, remove all slack from chain, then connect lift spring (F) to lift chain (C) so the chain is snug. Then push pivot arm assembly into operating position (G) as illustrated in (Fig. 21).

Fig. 21

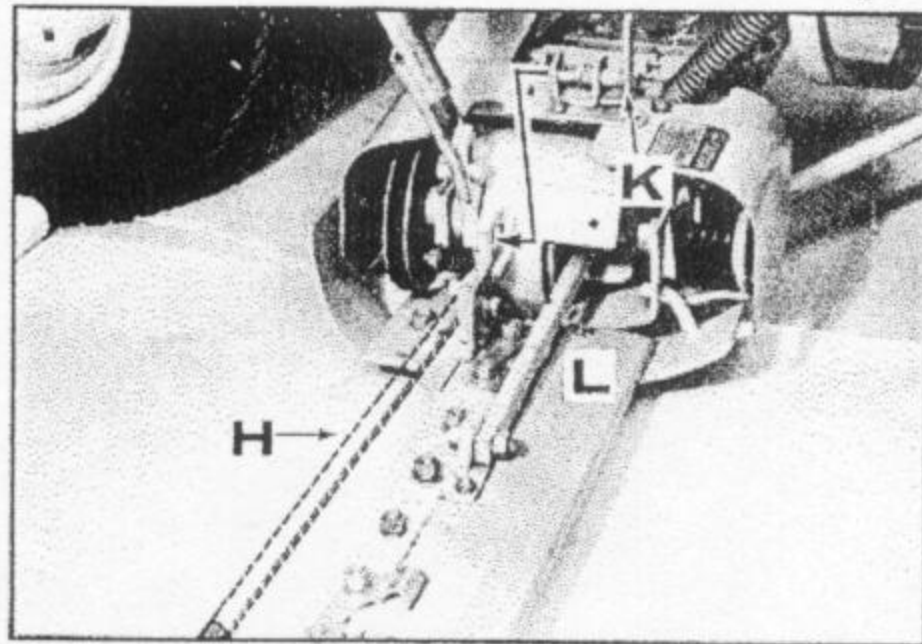


Inner shoe of mower should then be approximately 1/2" off from floor at this point. For added clearance, drop additional links of chain. Having inner shoe approximately 1/2" off from floor or ground level when mower is not operating will allow inner shoe to float more easily over uneven terrain, pre-cut material, and other obstructions.

LIFT HANDLE POSITIONS:

Lift handle should be set in top notch as illustrated for operating mower. Setting (H) is for transport position. Shut off tractor engine, and disengage tractor PTO clutch when ever dismounting from tractor (Fig. 22)

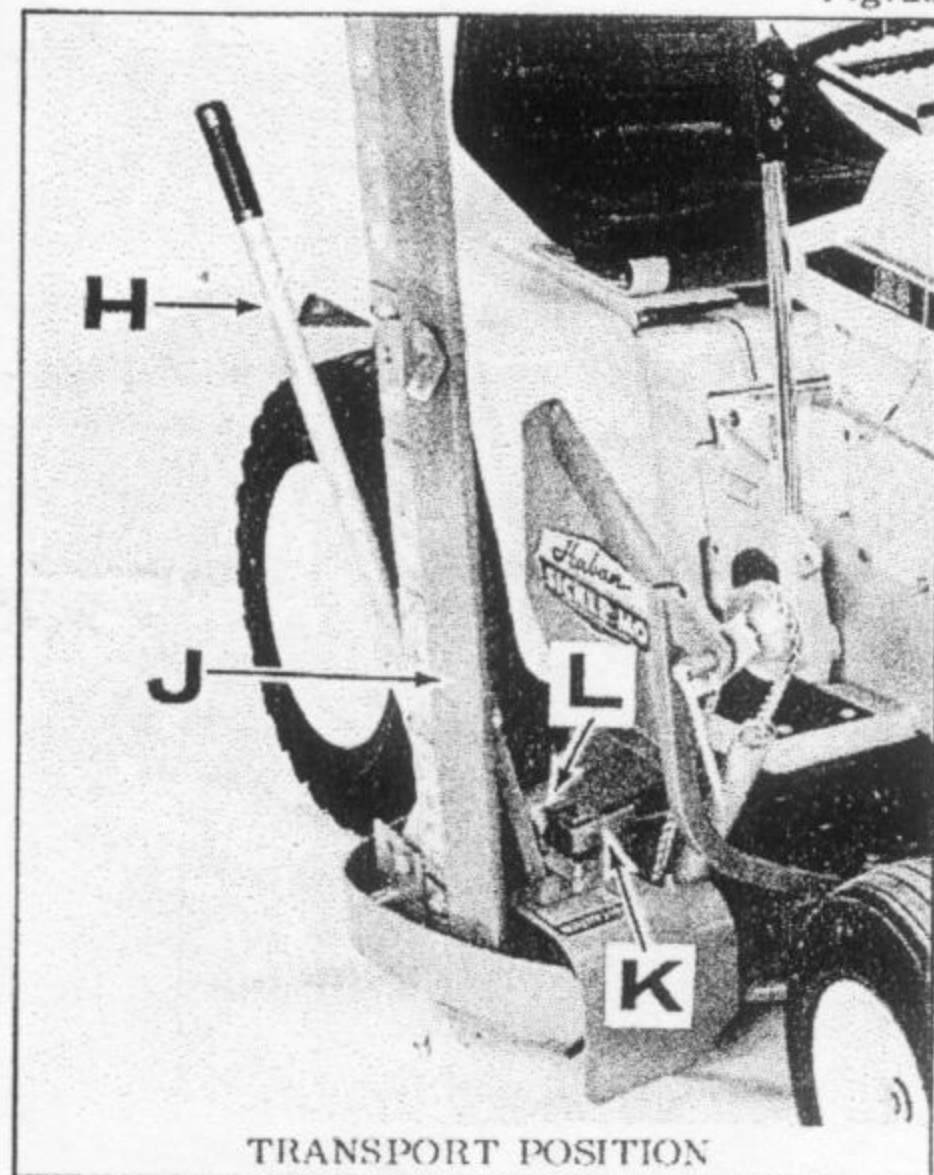
Fig. 22



TRANSPORTING MOWER:

Install sickle knife cover (J) using retaining strap to secure cover to bar. Set lift handle into transport position (H). Stand in back of mower, raising mower bar with right hand to vertical position. Insert transport pin (K) as illustrated by sliding pin lever down from vertical to horizontal position as shown by arrow. Let pin slide through hole in strap (L) to lock in place. Avoid sudden or sharp turns with mower in transport position (Fig. 22-23).

Fig. 23



CONTENTS OF BAG OF PARTS FOR INSTALLATION
OF SICKLE BAR MOWER ON IHC TRACTOR

NOTE: THE FOLLOWING PARTS ARE FOR THE SMALL BAG # 8511

4333	Bag	Shipping (Small).....	1
6073	Anchor	Spring.....	1
8243	Strap	Locator.....	1
GM120917	Bolt	1/2-13 x 1-1/2 Carriage.....	3
GM120384	Washer	1/2 Med. Lock.....	5
GM120378	Nut	1/2-13 Lt. Hex.....	6
3554	Spacer	Breakaway Housing.....	2
GM180190	Bolt	1/2-13 x 3 Hex. Head.....	1
GM180192	Bolt	1/2-13 x 3-1/2 Hex. Head.....	1
GM120396	Washer	1/2 Flat (17/32 x 1-1/16 x .095)..	2
GM120915	Bolt	3/8-16 x 1 Carriage.....	1
GM-271190	Nut &	Lock Washer Assy. (3/8-16 Hex.)...	1
6515	Washer	Flat (13/32 x 2-3/8 x 7 ga.).....	1
GM130999	Washer	11/16 x 1-3/4 x .134.....	1

THE SMALL BAG IS STAPLED AND PUT INTO THE LARGE BAG ALONG WITH THE FOLLOWING PARTS:

4418	Bag	Shipping (Large).....	1
6097	Assy.	Drawbar Hitch (Comp.).....	1
3434	Spring	Lift and Transport.....	1
6104	Bracket	Guard Mounting.....	1
6106	V-Belt	3V 33.5 OC.....	1
4616	V-Belt	B-56 58.8 OC.....	1



REPAIR PARTS LIST

MODEL 402-E SICKLE BAR MOWER

The following pages contain a parts list and views of the various units so that parts desired may be easily located.

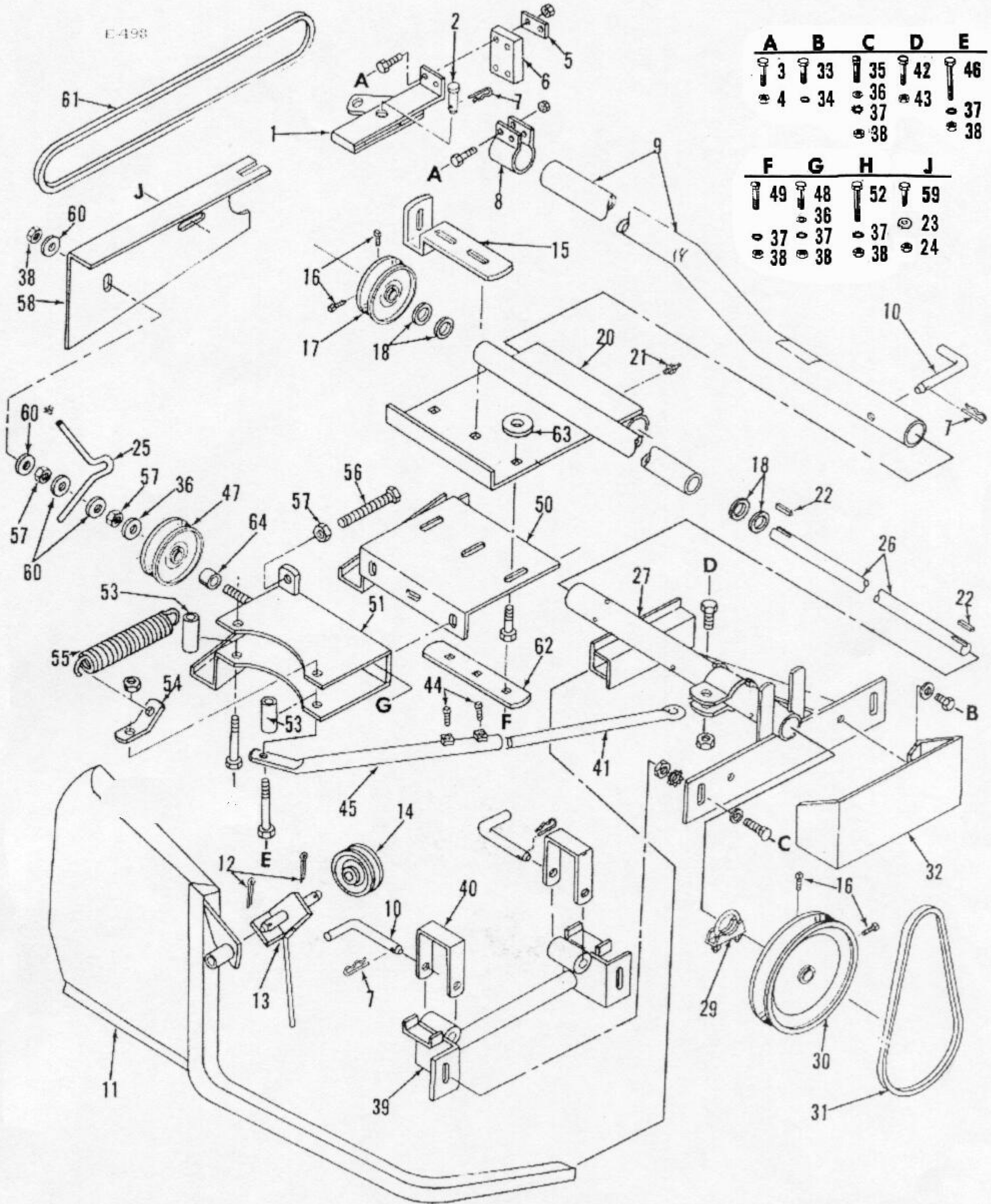
DO NOT ORDER REPAIR PARTS FROM ILLUSTRATIONS ONLY,
ALSO REFER TO THE DESCRIPTION OF THE PART.

Standard bolts, nuts, and rivets having no number, should be ordered by size. Always order repairs by number and give the description of the part, where used and whether it is a right or left hand part. Right or left parts can be determined by standing back of the machine looking in the direction of travel and then parts on the right are right hand parts and those on the left are left hand parts. Also give the model and serial number. The model and serial number plate will be found on the right front corner of the main frame angle. Always order repairs from the HABAN Dealer from whom you purchased this machine and be assured of getting genuine HABAN repairs. In order to keep your HABAN machine performing at its highest efficiency, always insist on genuine repairs. HABAN repairs are made from the same patterns and are of the same high quality material and workmanship as the original part and are guaranteed to fit. Specify shipping instructions. Where more than 1 part is used (in each group) it is so indicated in the description of the part.

We reserve the right to change specifications on design at any time without incurring the obligation to install such changes on machines previously manufactured.

DESCRIPTION	INDEX TO UNITS	PAGE NO.
Mounting Frame - Model 402-E Sickle Bar.....		20-21
Basic Sickle Bar Unit For No. 402-E,.....		22-23

E-498



A	B	C	D	E
3	33	35	42	46
4	34	36	43	37
		37		38
		38		

F	G	H	J
49	48	52	59
	36		
37	37	37	23
38	38	38	24

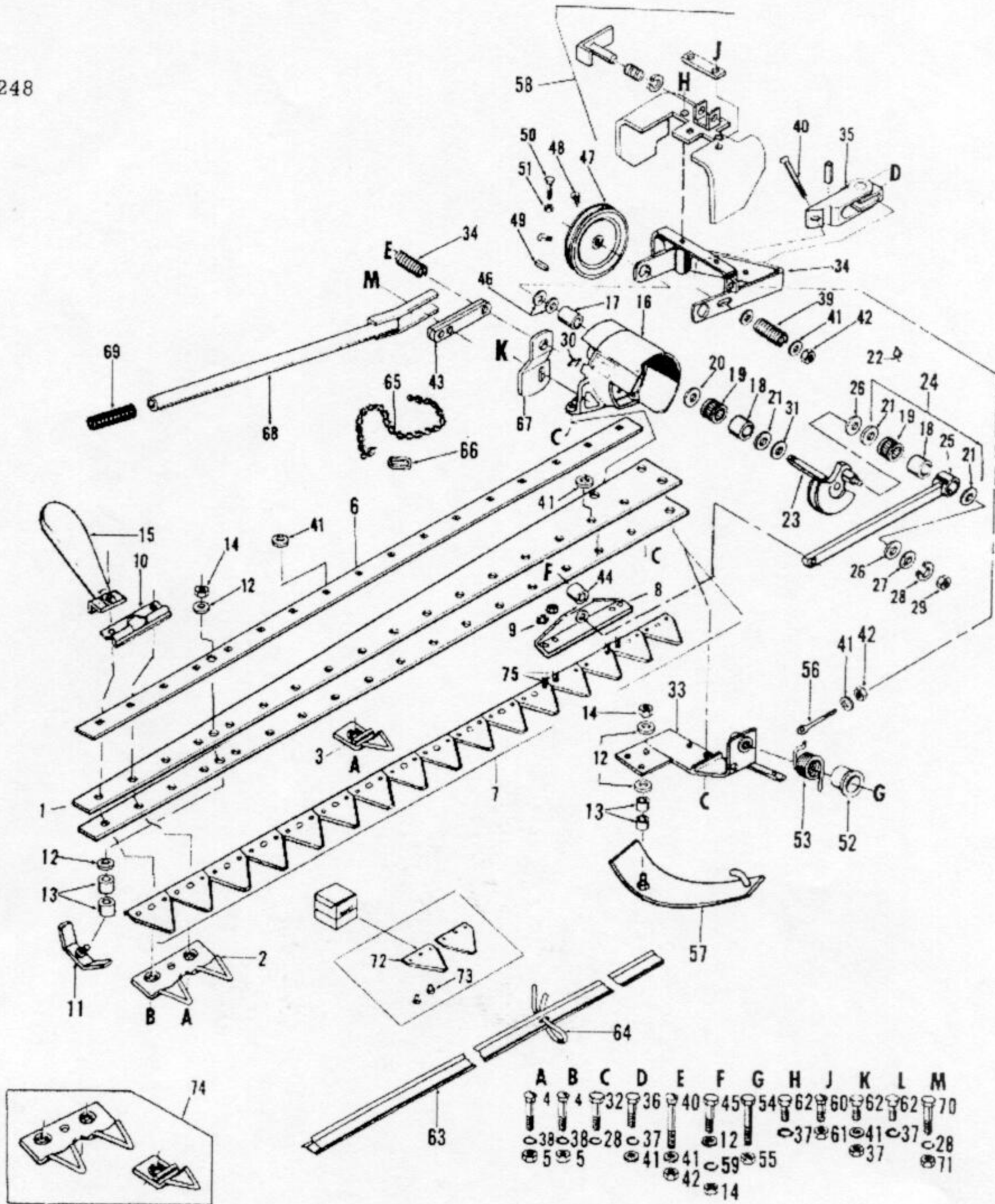
HABAN MODEL 402-E SICKLE BAR MOWER ATTACHMENT

(Serial #204, 241 & up)

Ref. No.	Part No.	Description	No. Req.	Ref. No.	Part No.	Description	No. Req.
1	6098	Assembly, Draw Bar Hitch	1	32	6094	Assembly, Front Pulley Guard	1
2	3980	Pin, Clevis	1	33	GM-180122	Bolt, 3/8-16 x 1" Hex Hd.	2
3	GM-180024	Bolt, 1/4-20 x 1-1/4 Hex Hd.	4	34	GM-120382	Washer, 3/8" Med. Lock.	2
4	4119	Nut, 1/4-20 Hex Lock	4	35	GM-126485	Bolt, 1/2-13 x 1-1/4 Carr.	5
5	3978	Clamp, Absorber	1	36	GM-120396	Washer, 17/32 x 1-1/16 x .095 Flat	6
6	3977	Absorber, Shock (Rubber)	1	37	GM-120384	Washer, 1/2 Med. Lock.	10
7	3341	Pin, Hair Cotter	3	38	GM-120378	Nut, 1/2-13 Lt. Hex	11
8	3976	Clamp, Main Frame	1	39	6089	Assembly, Hanger Mtg. Bracket	1
9	5235	Pipe, Pivot	1	40	6096	Bracket, Axle Mounting	2
10	5236	Pin, Pivot Bracket	3	41	3431	Rod, Stabilizer	1
11	5660	Assembly, Carrier	1	42	GM-180175	Bolt, 1/2 x 1-1/4 Hex Hd.	1
12	GM-120123	Pin, Cotter (1/8 x 1-1/4)	2	43	GM-9414074	Nut, 1/2-13 Hex Lock.	1
13	5663	Assembly, Pulley Mtg. Bracket	1	44	GM-128228	Screw, Set (3/8"-16 x 3/4 Sq. Hd. Cup Pt.)	2
14	4676	Pulley, Lift	1	45	6075	Assembly, Stabilizer Rod Extension Pipe	1
15	6104	Bracket, Guard Mounting	1	46	GM-180192	Bolt, 1/2-13 x 3-1/2 Hex Hd.	1
16	GM-142671	Screw, Set (5/16-18 x 1/2 Sq. Hd. Cup Pt.)	4	47	3042	Pulley, Flat	1
17	3970	Pulley (Jackshaft Output) 3-1/2" O.D.	1	48	GM-126485	Bolt, 1/2-13 x 1-1/4 Carr.	5
18	3396	Washer, 3/4" Flat	4	49	GM-120917	Bolt, 1/2-13 x 1-1/2 Carr.	3
20	6080	Assembly, Pivot Bracket	1	50	4016	Assembly, Carrier Adjusting Plate	1
21	5074	Fitting, Grease, 1/4-28 Str (Self Tap)	1	51	4020	Assembly, Breakaway Housing	1
22	3259	Key, 3/16" Square x 1"	2	52	GM-180190	Bolt, 1/2-13 x 3 Hex Hd.	1
23	6515	Washer 2-3/8" Flat	1	53	3554	Spacer, Breakaway Housing	2
24	GM-271190	Nut, 3/8" Hex.	1	54	6073	Anchor, Spring	1
25	8984	Belt Retainer	1	55	3434	Spring, Lift and Transport	1
26	4301	Jackshaft, Main Drive	1	56	5790	Bolt, (Anchor) 1/2-13 x 4 Hex Hd.	1
27	6082	Assembly, Front Hanger	1	57	GM-120238	Nut, (Anchor) 1/2-13 Half Hex	3
29	5339	U Clamp	1	58	8981	Guard, V-Belt	1
30	6346	Pulley (Jackshaft Input)	1	59	GM-120915	Bolt, 3/8-16 x 3/4 Hex Hd.	1
31	4335	V-Belt (Engine To Jackshaft)	1	60	GM-120389	Washer, 1/2 x 1-1/4	4
				61	4616	V-Belt (Jackshaft To Sickle)	1
				62	8243	Strap	1
				63	GM-130999	Washer, 1-3/4 Flat	1
				64	3346	Spacer	1

Revised 6/9/75

E248



E249

Ref. No.	Part No.	Description	No. Req.	Ref. No.	Part No.	Description	No. Req.
1	9514	Bar - Sickle	2	39	3411	Spring	2
2	6732	Finger - Shear	8	40	8133	Bolt	2
3	7188	Assy - Shear Finger	1	41	GM120388	Washer - 3/8 Flat (7/16 x 1)	11
4	GM126452	Bolt - 7/16-14 x 1-1/2 Carr.	17	42	GM9413534	Nut - 3/8-16 Hex Lock	3
5	GM271501	Nut - 7/16-14 Lt. Hex.	17	43	5626	Strap - Lift	2
6	8996	Plate - Wear	1	44	1094	Bushing	1
7	8913	Assy - Sickle Knife	1	45	GM180179	Bolt - 1/2-13 x 1-3/4 Hex	1
8	8916	Assy - Knife Head	1	46	3396	Washer - 3/4 Flat (49/64 x 1-1/2)	2
9	8928	Nut	4	47	4638	Assy - Pulley & Hub	1
10	3598-A	Clip	5	48	GM142671	Screw - Set (5/16-18x1/2)	2
11	5571	Assy - Outer Shoe	1	49	3259	Key	1
12	GM120396	Washer - 1/2 Flat (17/32 x 1-1/16)	7	50	GM180042	Bolt - 1/4-20 x 1-3/4 Hex	1
13	3346	Spacer	4	51	4119	Nut - 1/4-20 Hex Lock	1
14	GM9414074	Nut - 1/2-13 Hex Lock	3	52	4645	Retainer - Torsion Spring	1
15	4648	Assy - Grass Divider Brd.	1	53	4655	Spring - Torsion	1
16	4707	Assy - Flywheel Housing	1	54	GM271724	Bolt - 5/8-11 x 2-1/4 Hex	1
17	3034	Bushing	1	55	GM124847	Nut - 5/8-11 Half Hex	1
18	4683	Race	2	56	3058	Eye Bolt	1
19	4684	Bearing	2	57	3604-A	Assy - Inner Skid Shoe	1
20	4653	Washer - 15/16 x 1-5/16	1	58	7823	Assy - Stop Housing	1
21	4656	Seal	3	59	GM138549	Washer	1
22	4123	Fitting - Grease	1	60	7090	Bolt	2
23	4641	Assy - Crankshaft	1	61	GM271178	Nut & Lock Washer Assy - 1/4-20 Hex Head	2
24	4685	Assy - Pitman & Bearings	1	62	GM180120	Bolt - 3/8-16 x 3/4 Hex	3
25	4629	Assy - Pitman	1	63	4690	Guard	1
26	4654	Washer - 15/16 x 1-1/2 Flat	2	64	4686	Assy - Guard Strap	1
27	GM120390	Washer - 1/2 Flat (9/16 x 1-3/8)	1	65	4716	Chain	1
28	GM120384	Washer - 1/2 Med. Lock	4	66	3436	Anchor	1
29	GM124934	Nut - 1/2-20 Half Hex	1	67	6850	Assy - Vertical Position Stop	1
30	5074	Fitting - Grease	1	68	6077	Assy - Lift Handle	1
31	4719	Washer - 15/16 x 2 Flat	1	69	3339	Grip - Handle	1
32	GM180177	Bolt - 1/2-13 x 1-1/2 Hex.	3	70	GM180175	Bolt - 1/2-13 x 1-1/4 Hex	1
33	3570	Assy - Sickle Mtg. Bracket	1	71	GM120378	Nut - 1/2-13 Lt. Hex	1
34	3555-A	Assy - Breakaway Pivot	1	72	8030	Knife Kit - Box of 25	1
35	5602	Assy - Latch	1	73	8163	Box of Rivets	1
36	GM180122	Bolt - 3/8-16 x 1 Hex Hd.	2	74	9281	Shear Finger Kit (8 dbl. 1 single)	1
37	GM120382	Washer - 3/8 Med. Lock	5	75	8904	Bolt	4
38	GM120383	Washer - 7/16 Med. Lock	15				

5/13/74

SERVICE BULLETIN

Haban Manufacturing Company

MOUND & MARQUETTE ST., RACINE, WIS. 53404 U.S.A.

TELEPHONE: (Area Code 414) 637-8389

CABLE ADDRESS: HABAN, RACINE, WIS., U.S.A.

REVISED ASSEMBLY AND OPERATING INSTRUCTION FOR MODEL 402-E SICKLE BAR MOWER (Late Production-1973)

Special instruction for belt retainer and V-belt guard installation.

Remove V-belt retainer (A) (Fig. 1). Cut off top half of rod on belt retainer as shown in (Fig. 2). Resecure belt retainer in place.

Fig.1

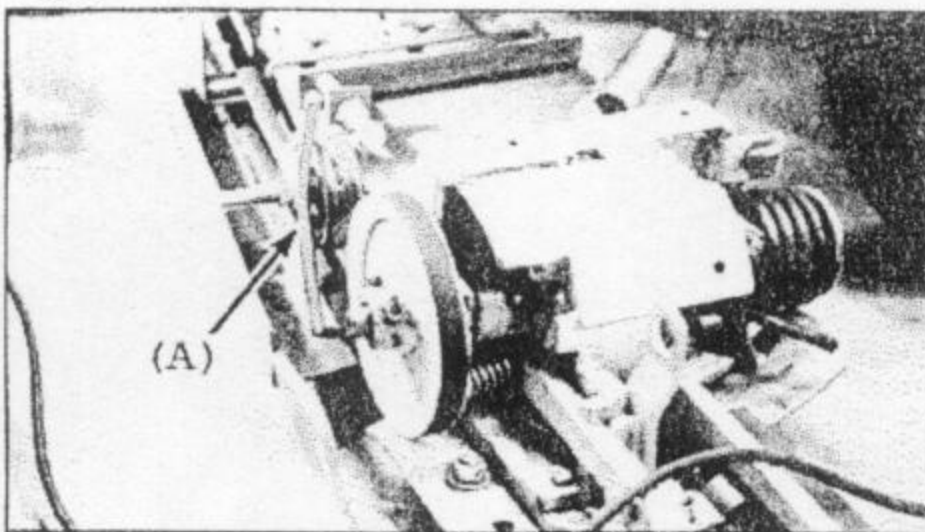
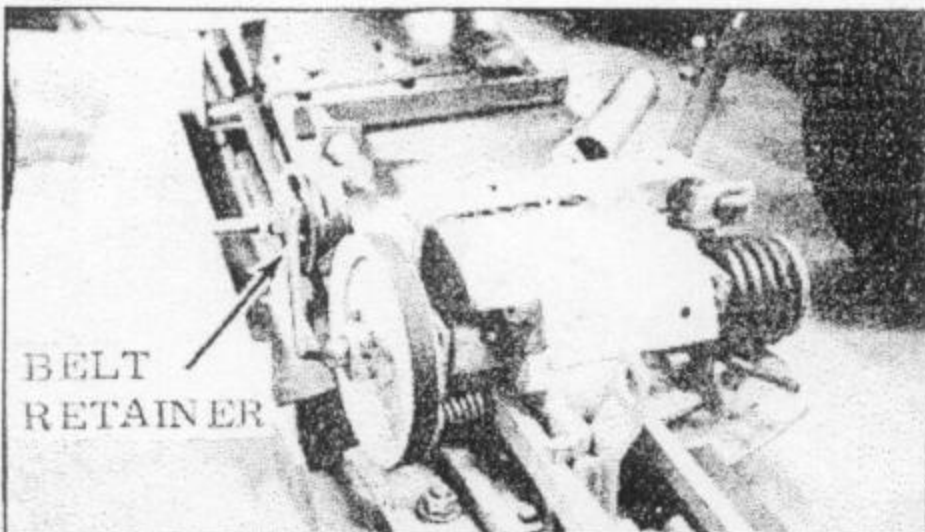


Fig.2

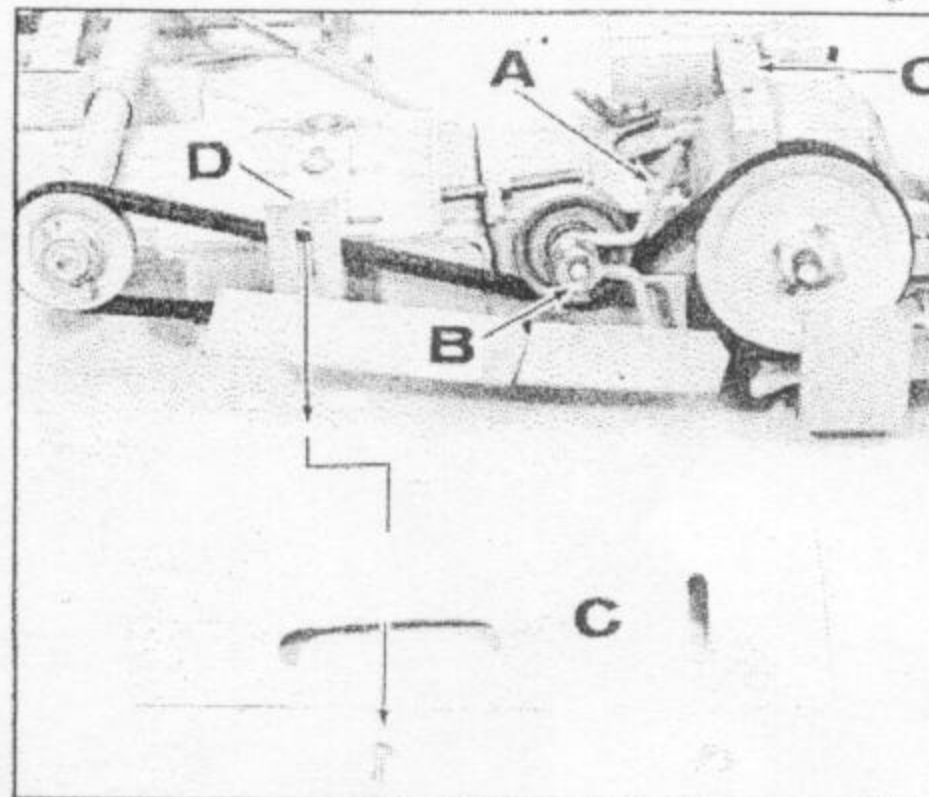


INSTALLATION OF V-BELT GUARD (Fig.3)

Place guard down as low as possible. Install 1 1/4" washer onto stud (B); mount guard (C) with 3/8" x 1" carriage bolt through slot in mounting bracket (D) in direction of arrow. Place guard over carriage bolt and stud (B); secure guard into place with 2 3/8" flat

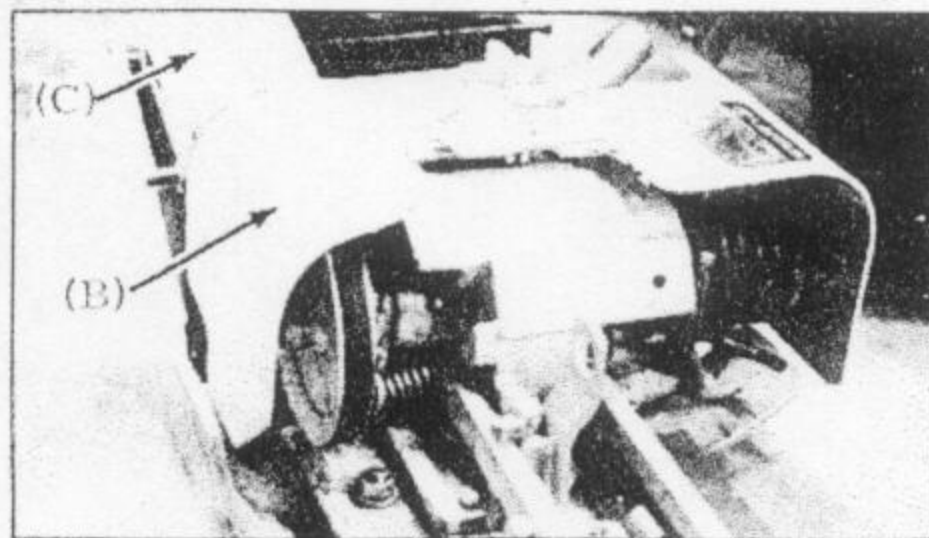
washer and hex. nut onto carriage bolt. Thread a 1 1/4" flat washer over stud (B) and secure with hex. nut. Place assembly housing stop (E) up over flywheel housing and secure with 3/8" x 3/4" hex. bolt. Note: through two holes in strap (Q).

Fig.3



Place housing stop cover (B) (Fig. 4) over flywheel housing and over the top of side V-belt guard (C). Secure cover with two 3/8 x 3/4" Hex. head bolts.

Fig. 4



SERVICE BULLETIN

Haban Manufacturing Company

2100 NORTHWESTERN AVE., RACINE, WISC. 53404 U.S.A.

TELEPHONE: (Area Code 414) 837-8388

CABLE ADDRESS: HABAN, RACINE, WIS. U.S.A.

SPECIAL INSTRUCTIONS FOR INSTALLING HABAN MODEL 402-E SICKLE-MO ON 1974 AND PRIOR MODEL IHC CUB CADET TRACTORS

This instruction manual covers installation instructions on all IHC CUB CADET tractors, 1975 and later. The sickle bar mower attachment is assembled at the factory for use on all models 1975 and up.

To install the unit on 1974 (and prior) models, the front jackshaft input pulley must be repositioned.

NOTE: All other settings and instructions remain unchanged.

Proceed as follows:

- (1) Remove front pulley guard assembly (A) by removing the two hex head bolts (B).
- (2) Remove jackshaft pulley retaining bolt (E) and lock washer (F) and flat washer (G)
- (3) Loosen jackshaft input pulley set screws (C) and remove pulley from jackshaft. The two washers (D) and one washer (G) remain on the shaft.

- (4) Next reverse jackshaft input pulley so that hub for set screws face out. Replace set screws (C) and jackshaft retaining bolt (E) with washers (F) and (G) as shown.

This change will reposition the jackshaft input pulley rearward approximately 1", to align pulley with tractor PTO pulley on Models 1974 and prior. Replace drive belt 4335 with drive belt 5771 provided in kit.

V-belt part 5771 is not used on 1975 or later models.

V-belt part 5771 is used on tractor models 1964-1974.

Extra parts included with sickle bar mower for use only with 1964-1974 model tractors consist of:

5771 V-belt (engine to jackshaft).....1

