

Standen

Turbo Four

Instruction Manual

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INTRODUCTION

This manual provides the information for the adjustment and maintenance of your Standen Four Row Harvester, to help you to obtain the best results from the machine. Before putting the machine to work, read this manual through carefully to obtain a full understanding of what the machine should do and how to obtain it.

Adjustments may have to be made singly or in combination according to crop and soil conditions. Allow the machine to settle to a new setting before making more adjustments.

Throughout this manual the term 'Front', 'Rear', 'Left Hand' and 'Right Hand' are derived from the tractor driver's position, facing forward and the normal forward directions of travel of the Four Row Harvester.

This manual is divided into two sections, the first dealing with the harvester and second with the topper.

Date Purchased

Date Started Work

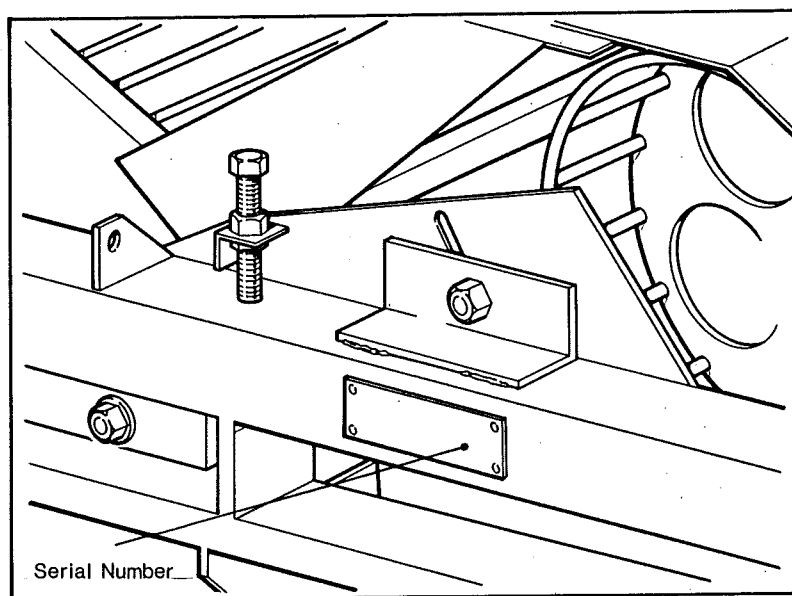
Serial Number

Agent's Name

Agent's Address

.....

Agent's Telephone No.



GENERAL DATA

Harvester

Overall Length	20' (6.1 m)
Overall Width in Transport	10' 6" (3.2 m)
Overall Width in Work	14' 10" (4.53 m)
Height in Transport	10' 6" (3.2 m)
Height in Work	12' 4" (3.76 m)
Hydraulic Tank Capacity	24 gallons
Hydraulic Tank Capacity (with Skew-Bar fitted)....	37 gallons
Hydraulic Pump Flow Rate to Turbo Topper	10.5 gallons/minute
Hydraulic Pump Flow Rate to Skew-Bar Topper	18 gallons/minute

Topper

Length Excluding Lift Frame	7' 3" (2.21 m)
Overall Width	8' (2.44 m)
Height excluding Lift Frame	3' 8" (1.12 m)

Standen's policy of continual improvements means that the specification may be altered without prior notice.

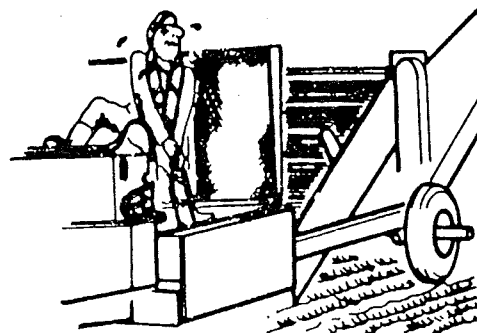
Dimensions are approximate.

CONTENTSPAGE NO.

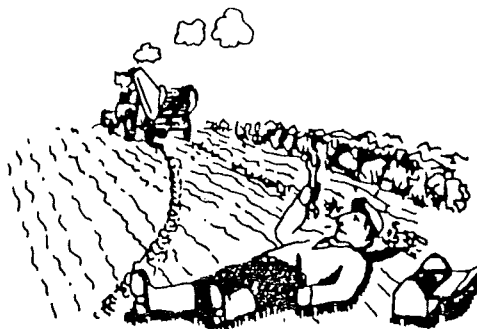
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Safety Precautions

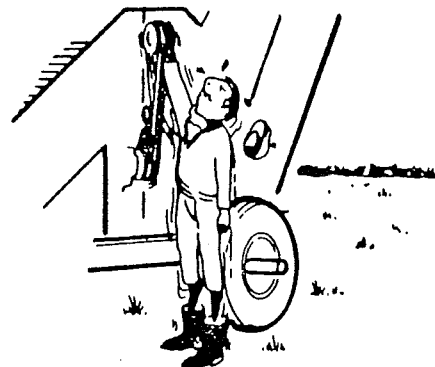
NEVER Operate the machine with any of the safety guards removed, remember they are fitted for two reasons — to keep dirt out, and more important to protect you and others from the various working parts. So, make sure they are always kept in good condition and they are fitted correctly when the machine is in work.



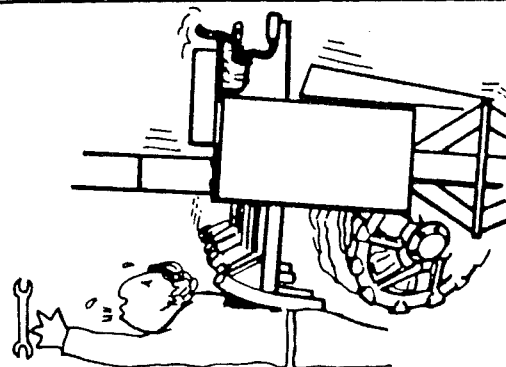
NEVER Attempt to adjust or clean any part of the machine with the tractor power take-off in motion and always stop the tractor engine.



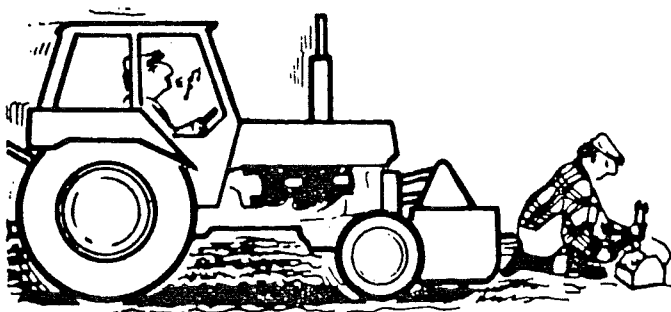
NEVER Fit drive chains or drive belts while the drive sprockets or drive pulleys are in motion.



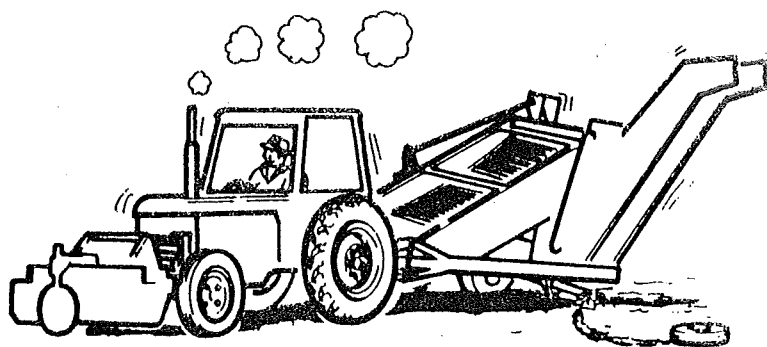
NEVER Work under the machine when it is in a raised position on the tractor hydraulic lift linkage.



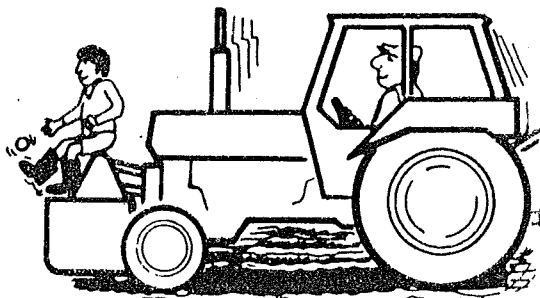
NEVER Set the machinery in motion before ensuring that every one in the vicinity is aware of your intention.



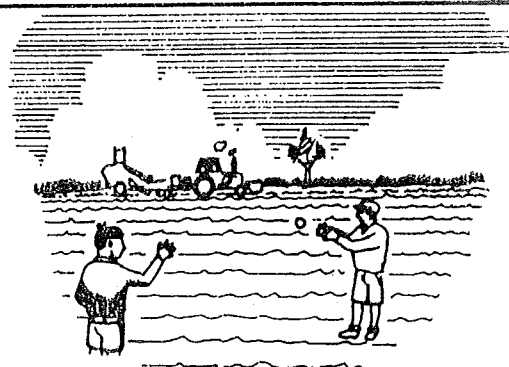
NEVER Operate the machine in a state of disrepair.



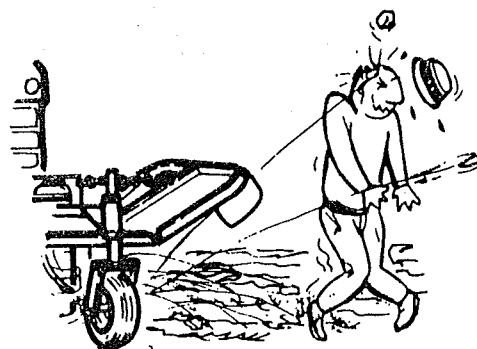
NEVER Allow any one *especially children* to ride on the machine.



NEVER Allow children to be in the vicinity where machines are working.



NEVER Stand near the discharge end of the topper while machine is running.



The above list of precautions is not exhaustive. All machinery is potentially dangerous and great care must be exercised by the operator(s) at all times.

Standen Engineering Limited will not accept liability for damage or injury caused by their products except when such liability is specifically imposed by English Statute.

INSTALLATION

The Standen Four Row is a four row sugar beet harvester to top, lift and load beet into a trailer running alongside the harvester. It is used in a single stage system by using it in conjunction with a four row Turbo Topper.

The tractor requirement for the Four Row harvester used in conjunction with a Turbo Topper is 90 H.P. - 540 R.P.M., with one double and two single acting spool valves and a three point linkage.

Check that the nuts, bolts and sprocket keys are tight, especially before starting off a new machine and during the first day or two of work.

Do not raise the machine to its fullest height with the P.T.O. engaged as serious damage could result to the P.T.O. shaft.

Do not reverse or turn unless the machine is in the raised position. Pay particular attention to the lubrication and maintenance of the machine.

Pay particular attention to the safety precautions, they are written as a warning to protect you and others.

TRACTOR WHEEL SETTING

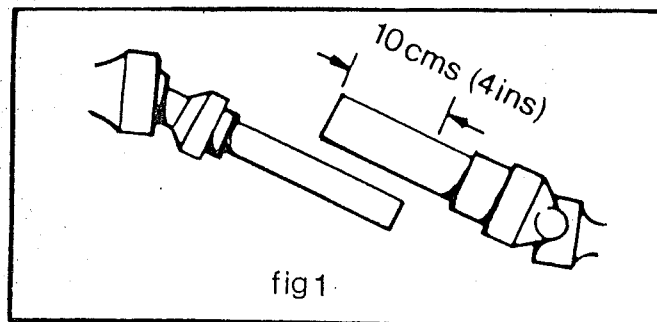
Both front and rear tractor wheels must be set to straddle the rows of beet. For example, if the crop is growing at 20" (50.80 cms.), this will then ensure that the wheels run in centre line between the rows of beet. The instructions for adjusting tractor wheels are given in the tractor manufacturer's handbook.

SAFETY FIRST

When carrying out wheel adjustments take care to place the jack on firm ground under a solid part of the tractor. Before removing the wheel, place stout support under the tractor frame in case the jack should become dislodged.

Attaching the Harvester to the Tractor

The drawbar supplied with the harvester has been made to fit category two and should be fitted between the two lower lift arms on the tractor and secured with a linch pin. The levelling lever, between the top lift arm and the lower lift arm should be fitted in the fixed position. Fit the stabilizer bar and adjust so the harvester is central to the centre of the tractor. The tractor top link is not required.



The P.T.O. coupling supplied with the harvester may require cutting to a correct length to suit individual tractors. To do this the coupling should be parted and the two ends fitted to the tractor and the harvester respectively. The male and female shafts can then be measured alongside each other and adjustments made by cutting the surplus bar from both male and female shafts. At least 4" (10 cms) overlap should be allowed (see fig 1). After the correct length of the coupling has been obtained the P.T.O. guard should then be cut to correspond with the coupling. Before engaging the R.T.O., secure the guard by fixing the chain to a convenient place on the harvester, and ensure that the rubber hood to protect the knuckles of the P.T.O. coupling is in place.

REAR AXLE

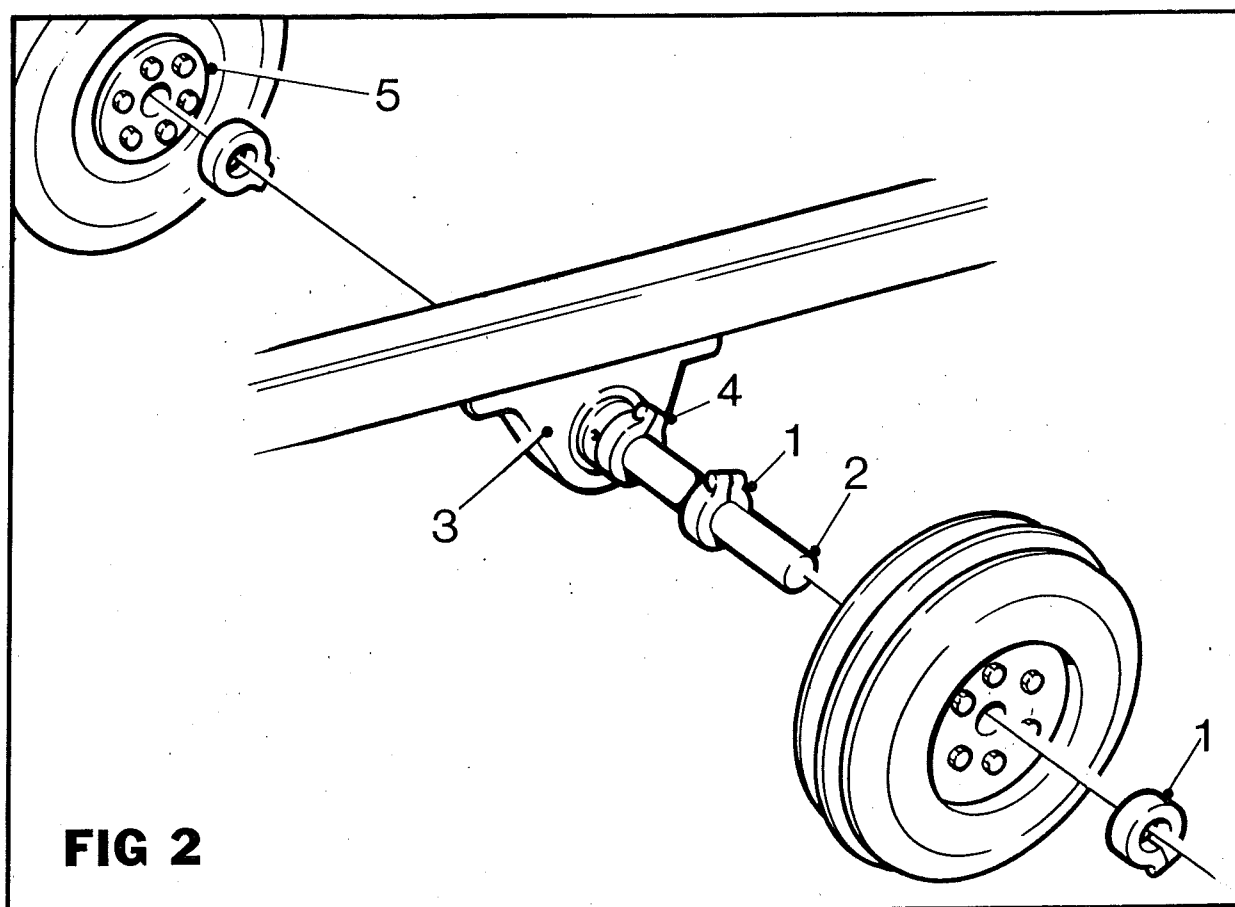
Both the LH and RH rear wheels are adjustable to suit individual row settings.

To adjust the LH wheel slacken the clamps (item 1 fig 2) either side of the wheel and slide the wheel along the axle (item 2 fig 2) to the required position. Once positioned push the clamps (item 1 fig 2) up against either side of the wheel and resecure.

To adjust the RH wheel slacken the two bolts (item 5 fig 2) clamping the hub to the axle and slide the wheel to the required position.

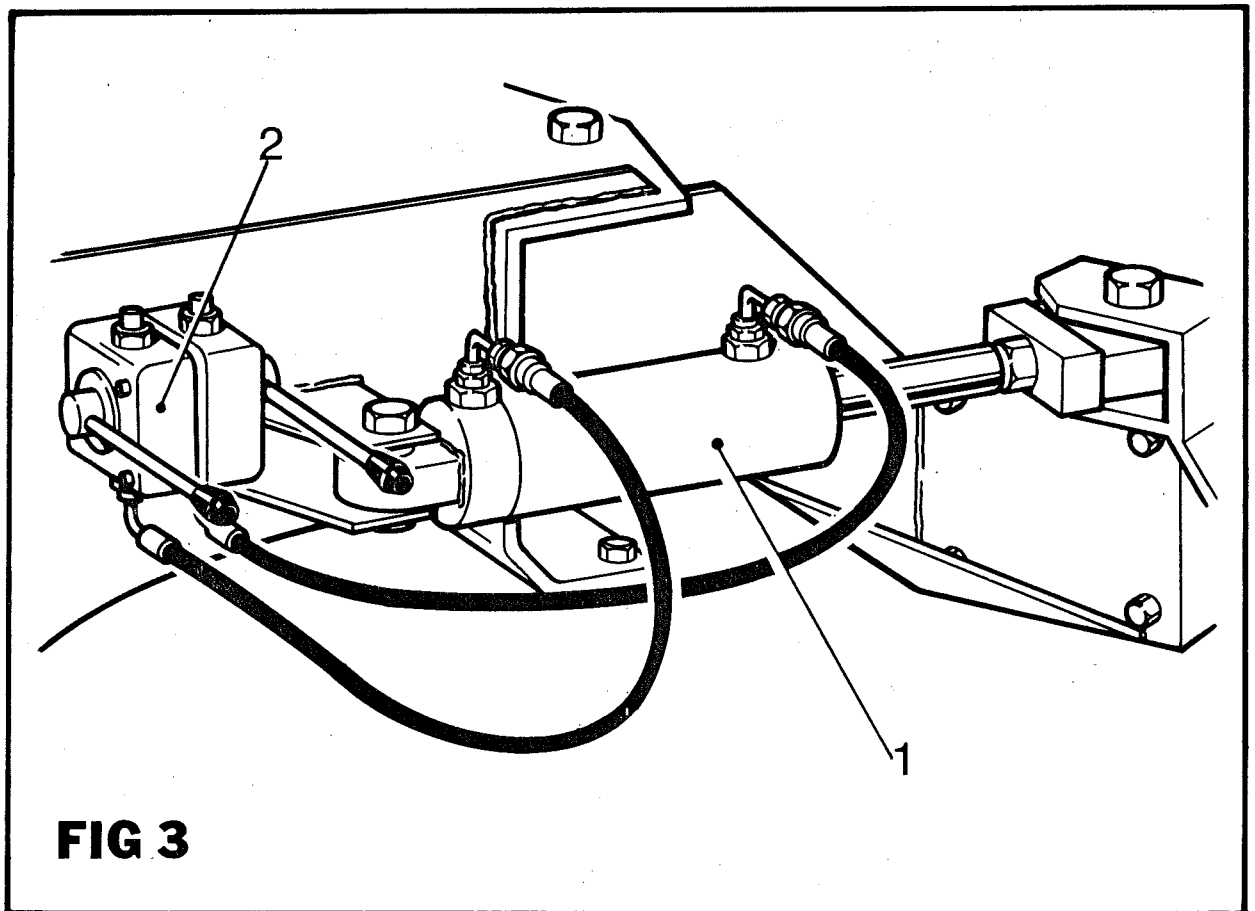
Occasionally it is found necessary to reposition the axle itself to obtain the adjustment for the LH wheel.

To adjust the axle slacken the two grub screws in the bearings (item 3 fig 2) and release the two clamps (item 4 fig 2) and release the two clamps (item 4 fig 2) adjacent to the bearings. Once the axle is free slide it through the bearings to the required position and resume.



ADJUSTABLE DRAWBAR

The adjustable drawbar is fixed to the machine by a pivot pin, thus enabling the drawbar to pivot. This provides easy manoeuvrability of the harvester to align it with the crop, also assisting when harvesting on hillsides. Adjustment to the drawbar is made by a double acting hydraulic ram (item 1 fig 3) which is fitted to the tractor external hydraulics. On some machines a diverter valve (item 2 fig 3) or (item 2 fig 23) is fitted to divert the oil to either the drawbar or another function of the machine such as the discharge elevator or stabilizer. Therefore the diverter valve must be set to divert the oil to the drawbar before the ram can be actuated.



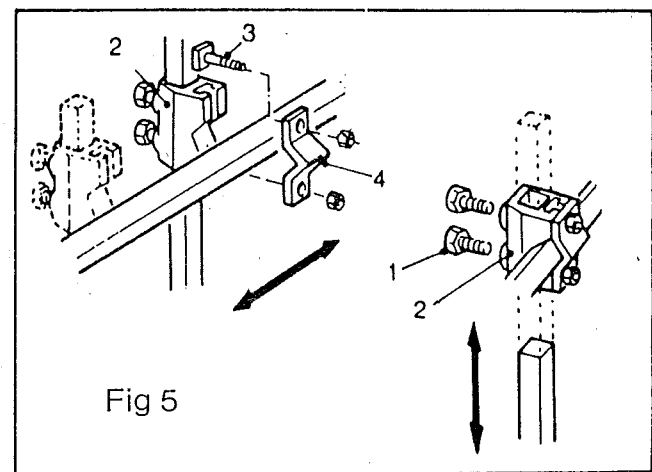
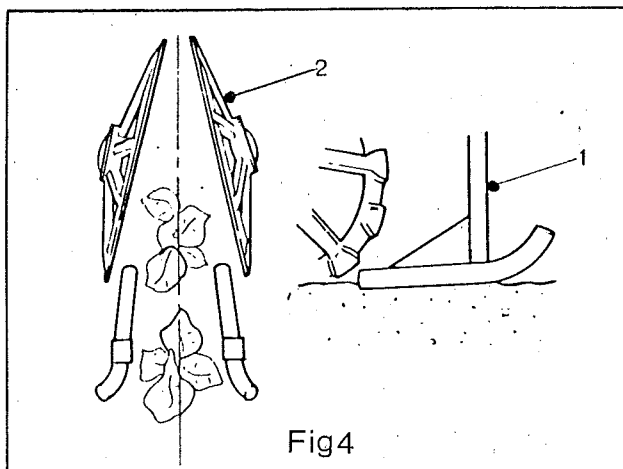
GUIDE SKIDS

The purpose of the guide skids (item 1 fig 4) is to follow the row of beet in front of the lifting wheels (item 2 fig 4) keeping the harvester in a straight line irrespective of the contours of the ground. To set the guide skids (item 1 fig 4) drive the harvester down the row of beet for a considerable distance until the required depth of the lifting wheels (item 2 fig 4) to lift the beet efficiently has been obtained by the setting of the tractor depth control.

Stop the harvester and switch the engine off the tractor. Do not alter the tractor depth control setting. Adjust the guide skids (item 1 fig 4), to sit on the ground without taking the weight of the harvester. The heels of the guide skids (item 1 fig 4) should be in line with the inside front edge of the lifting wheels (item 2 fig 4) and directed downwards with the leading curve directed upwards.

To adjust the guide skids (item 1 fig 4) to or from the ground, loosen the two adjusting studs (item 1 fig 5) in the guide skid bracket (item 2 fig 5) allowing the guide skid (item 1 fig 4) to be raised or lowered as required.

To adjust the width of the guide skids (item 1 fig 4) loosen the clamp bolts (item 3 fig 5) in the guide skid brackets (item 2 fig 5) and the cap (item 4 fig 5). Slide the complete guide skid assembly horizontally along the guide skid bar, to the required position, which is determined by the width of the rows of beet.



LIFTING WHEELS

The lifting wheels (item 1 fig 6) are designed to lift the beet from the ground and transfer them to the main digger web. The working depth of the lifting wheels is determined by the depth control on the tractor and according to the depth required to lift the beet from the ground without breaking off the root or lifting too much soil.

Further depth control can be effected by the angle of the lifting wheels (item 1 fig 6). This adjustment is made by loosening the nuts and bolts (item 1 fig 7) holding the lifting wheel mounting (item 2 fig 7) to the lifting wheel mounting bracket (item 3 fig 7) which is provided with slotted holes in either side to allow the lifting wheel mounting to be adjusted both up and down. At the top of the lifting wheel mounting bracket (item 3 fig 7) is fitted an adjusting set screw (item 5 fig 7) which is provided to push down on to the lifting wheel mounting (item 2 fig 7). The adjustment described allows the lifting wheels (item 1 fig 6) to be raised or lowered irrespective of the harvester. It will also alter the point of the lifting of the beet in relation to the width of the lifting wheels.

The working depth of the lifting wheels is approximately 2 inches (5.1 cm).

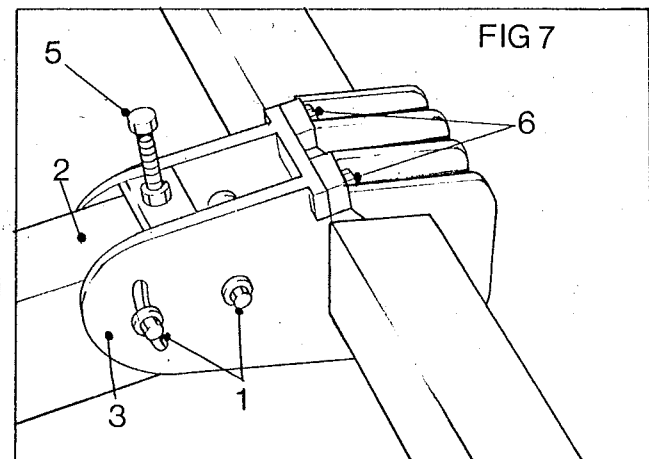
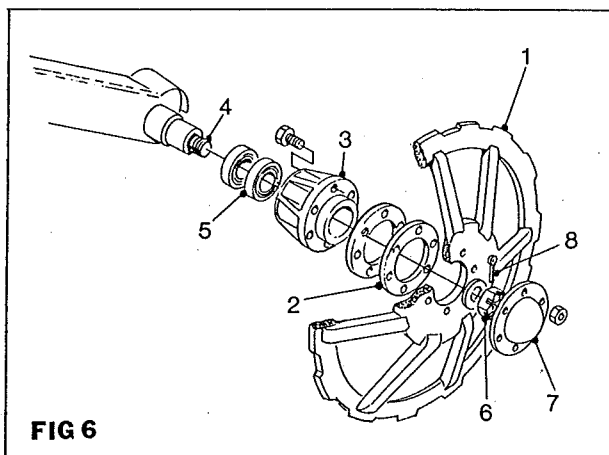
The width of the wheels at the narrowest point is from $1\frac{1}{2}$ inches (3.8 cm) to $1\frac{3}{4}$ inches (4.5 cm) and they can be adjusted by removing or adding spacers (item 2 fig 6) between the lifting wheels and the lifting wheel hubs (item 3 fig 6).

The lifting wheel spindles (item 4 fig 6) are fitted with tapered roller bearings (item 5 fig 6) and are adjusted by a castle nut (item 6 fig 6) after removing the hub cap (item 7 fig 6).

Care should be taken not to over tighten the bearings (item 5 fig 6), adjust by turning the castle nut (item 6 fig 6) as tight as possible while slowly rotating the lifting wheel, then slacken off one or two castlerations of the nut. Secure with a new split pin (item 8 fig 6).

The lifting wheels (item 1 fig 6) can be adjusted to follow rows of from 18 inches (46 cm) to 22 inches (56 cm).

To obtain these settings loosen the nuts and bolts (item 6 fig 7) in the lifting wheel mounting bracket and move the lifting wheel assembly horizontally along the beam of the main frame.



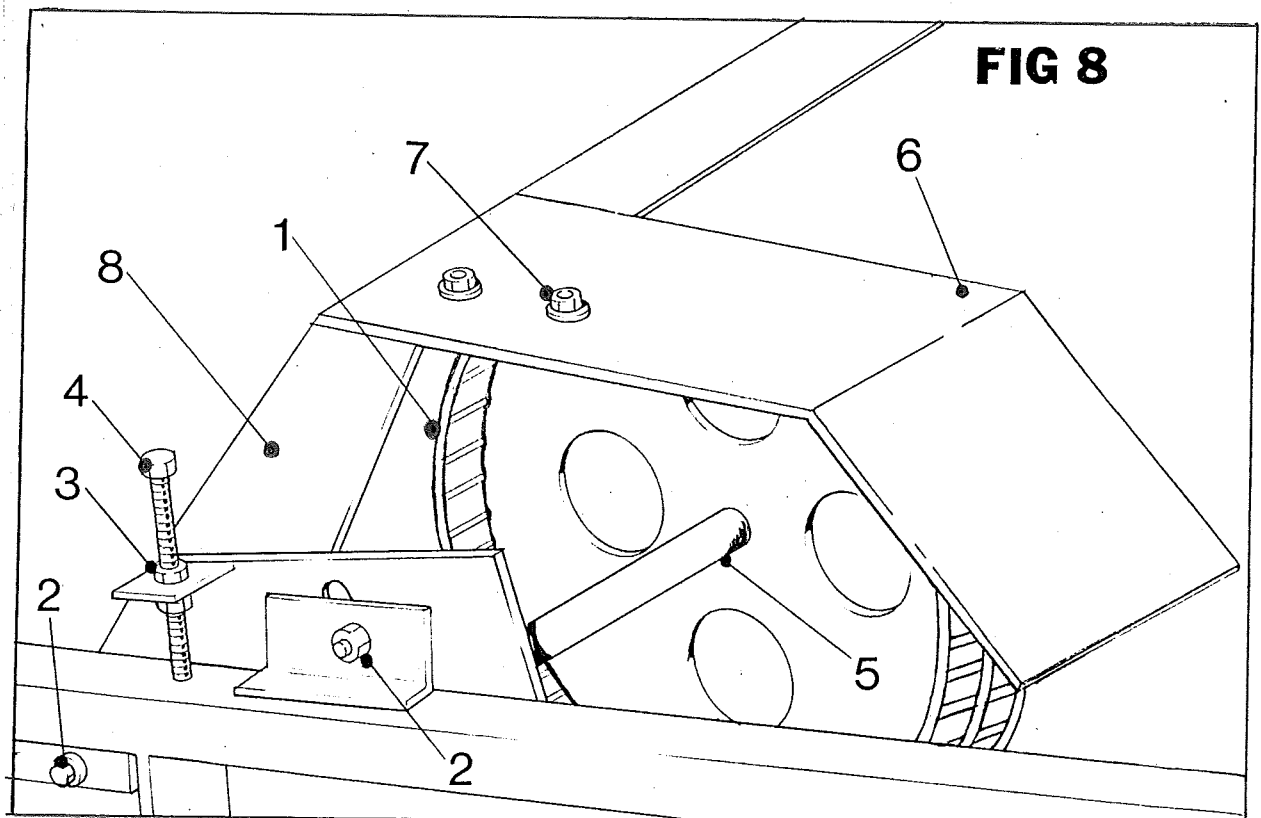
CAGE WHEELS

The cage wheels (item 1 fig 8) are fitted between the lifting wheels, to transfer the beet onto the main elevator. Provision is made to raise or lower the cage wheels, which generally should be higher when they are large and lower when the beet are small. To adjust loosen the bolts (item 2 fig 8) and the lock nut (item 3 fig 8). Also loosen the bolts (item 6 fig 8) securing the shafts centre support. Once all the bolts are loose turn the two adjusting screws (item 4 fig 8) until the cage wheels are in the correct position.

It is important when carrying out the above adjustment that the final position of the drive shaft (item 5 fig 8) is in a direct horizontal line across the machine. Once the cage wheels have been positioned, re-align the guards (item 6 fig 8) by simply removing the securing bolts (item 7 fig 8) and repositioning the guard in the most suitable holes in the cross frame (item 8 fig 8).

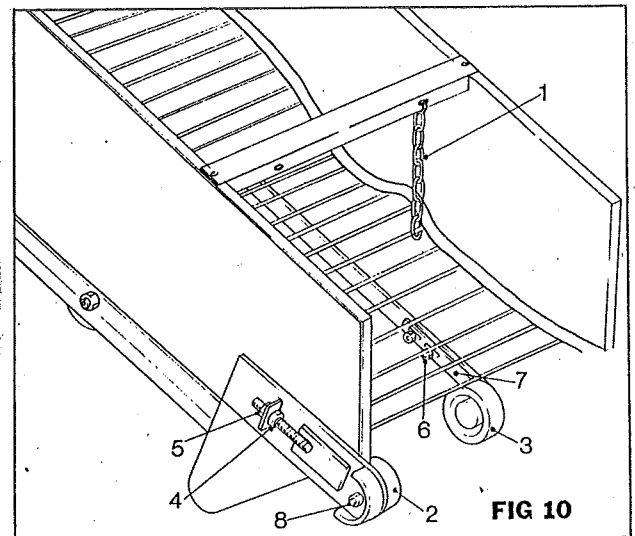
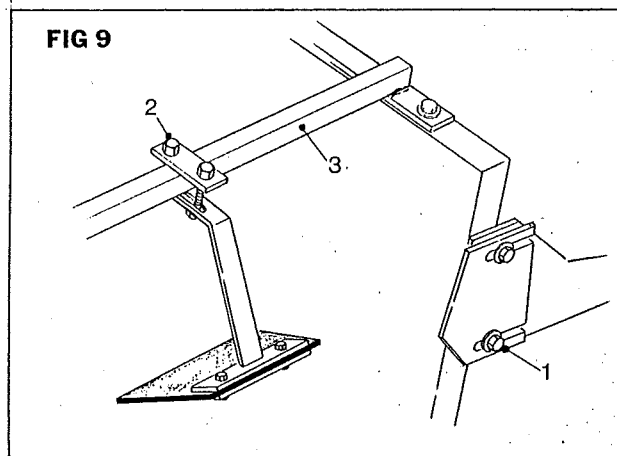
CAUTION

Before carrying out any adjustments, switch off engine and apply the parking brake.



BEET DEFLECTORS

Beet deflectors are fitted to the bottom end of the main elevator, the outer deflectors are located on either side of the main elevator and the inner deflectors are fitted between the lifting wheels (two on the Turbobeet Mk 3/TRH Mk 3 and three on the Turbo Four). The deflectors are fitted to trap any beet rolling down the web. All the deflectors are adjustable to facilitate different row centres. To adjust the outer deflectors loosen the retaining bolts (item 1 fig 9) and slide the deflectors to the required position. To adjust the inner deflectors slacken the securing bolts (item 2 fig 9) and slide the deflector assembly along the support bar (item 3 fig 9).



MAIN ELEVATOR

The main elevator consists of a main elevator web, to transfer the crop to the trash extractor. Suspended over the main web is a cleaning apron. This apron restricts the flow of beet and simultaneously rubs against the beet to give a cleaning action. Adjustment is provided for the apron to allow the operator to increase or decrease the gap between the apron and the web, so increasing or decreasing the cleaning. To adjust shorten or lengthen the support chains (item 1 fig 10).

The main elevator is fitted with split type web sprockets, to allow for easy removal. For instructions see paragraph headed "Split Sprockets".

The three bottom rollers (items 2 & 3 fig 10) are adjustable to allow the web to be tensioned. To adjust the two outer rollers (item 2 fig 10) slacken the retaining nut (item 8 fig 10) whilst holding the roller spindle with an allen key.

Once the retaining nut is loose, slacken the lock nut (item 4 fig 10) and adjust by turning the adjusting nut (item 5 fig 10). When carrying out this adjustment ensure both sides are adjusted equally. Once the outer rollers have been adjusted slacken the retaining bolts (item 6 fig 10) holding the centre roller and slide the support plate (item 7 fig 10) until the roller (item 3 fig 10) is touching the web.

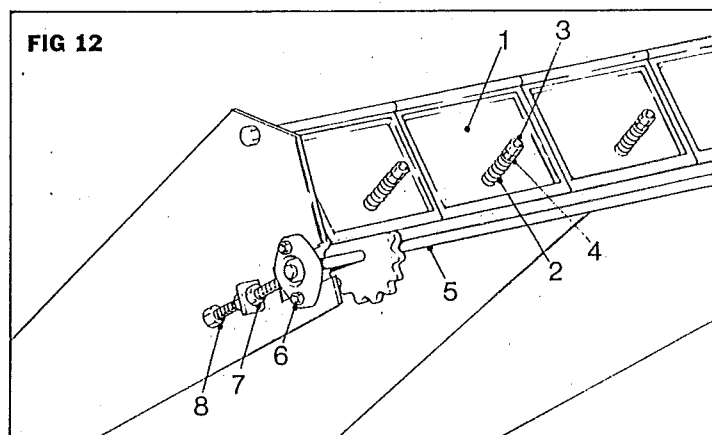
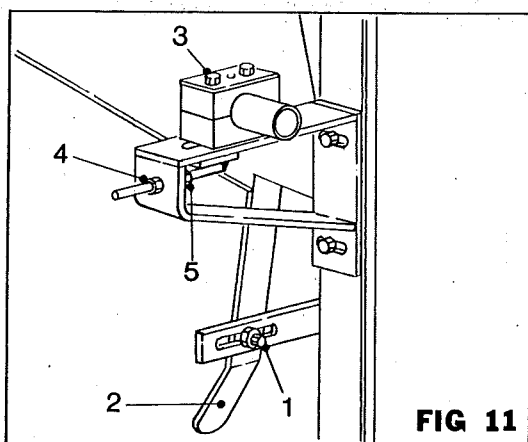
TRASH EXTRACTOR

The trash extractor consists of continental type web, on which the beet and trash are thrown onto, from the main elevator. The beet then roll down the trash extractor web and onto the cross web whilst the trash is taken out the rear of the machine. The angle at which the trash extractor operates is adjustable. When the trash is dense the trash extractor should operate at a shallow angle, whereas when a small amount of trash is evident then the trash extractor should operate at a steeper angle. To adjust slacken the two securing bolts (item 1 fig 11) and either push or pull the lever (item 2 fig 11) to obtain the desired angle. Once the trash extractor is correctly positioned, resecure with the bolts (item 1 fig 11).

The trash extractor can also be adjusted horizontally to allow for large beet. To adjust slacken the four retaining bolts (item 3 fig 11), the two securing bolts (item 1 fig 11) and the two lock nuts (item 4 fig 11). Turn the adjusting nut (item 5 fig 11) until the desired position is achieved. Beware the trash extractor can pivot once the two securing bolts (item 1 fig 11) are loose. After adjusting ensure the trash extractor is sitting square to the machine.

Situated above the trash extractor are some spring loaded flaps (item 1 fig 12). These flaps are positioned to stop beet from escaping out the rear of the machine and are hinged so simultaneously allowing trash and stones out. The flaps are fitted with springs (item 2 fig 12). These springs should be correctly tensioned so that once large stones have passed through, the spring will then close the flap so retaining the beet. To adjust the tension, slacken the lock nut (item 3 fig 12) and turn the adjusting nut (item 4 fig 12).

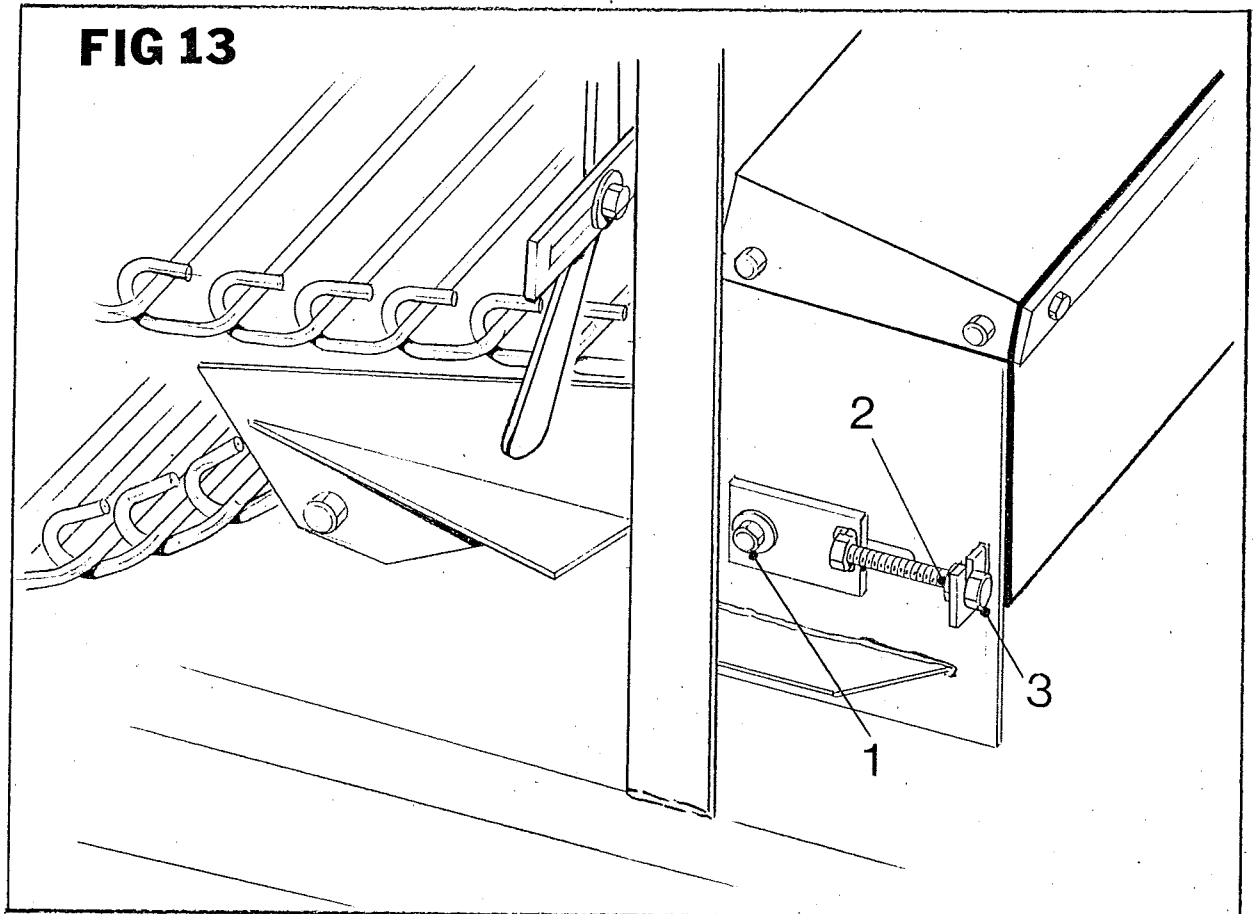
To ensure the web runs square in the trash extractor frame the top shaft (item 5 fig 12) can be adjusted. To adjust loosen the two bearing bolts (item 6 fig 12) and the lock nut (item 7 fig 12) and turn the adjusting screw (item 8 fig 12).



REAR CROSS WEB

The rear cross web is fitted to collect the sugar beet from the trash extractor and convey them onto the discharge elevator.

The only adjustment provided on the cross web is the adjustment for the tension of the web. To adjust slacken the roller retaining bolt (item 1 fig 13) and the lock nut (item 2 fig 13) and turn the adjusting nut (item 3 fig 13). Repeat for the opposite roller.



DISCHARGE ELEVATOR

The discharge elevator consists of a single web to which is fitted the discharge elevator lats. It is provided to transfer the beet into a trailer running alongside the harvester. The discharge elevator is driven by two 'V' belts and must always be in operation while the beet lifting is in progress. The discharge elevator can be engaged or disengaged by operating a hydraulic ram (item 1 fig 19).

The discharge elevator is fitted with a double acting hydraulic ram to facilitate the folding and unfolding of elevator before or after transporting on the road. The ram is coupled to the tractor external hydraulics and is operated from the tractor seat.

On some machines a diverter valve (item 2 fig 3) or (item 2 fig 23) is fitted to divert the oil to either the discharge elevator or another function on the machine, such as the stabilizer disc or drawbar. Therefore the diverter valve must be set to divert the oil to the discharge elevator before the ram can be actuated.

UNFOLDING THE ELEVATOR FOR WORK

1. Remove the two securing bolts (item 1 fig 14) from the discharge elevator bottom frame (item 2 fig 14).
2. Operate the ram to unfold the elevator.
3. Once the elevator is in the working position secure it by replacing the securing bolts (item 1 fig 14).
4. Position the elevator stay (item 4 fig 14) by locating the hook end of stay in the lug (item 3 fig 14) on the elevator and locate the bottom end of the stay over the pin (item 5 fig 14) on the main frame.
5. Swing the bottom roller support (item 6 fig 14) into the working position and secure with the latch (item 7 fig 14).

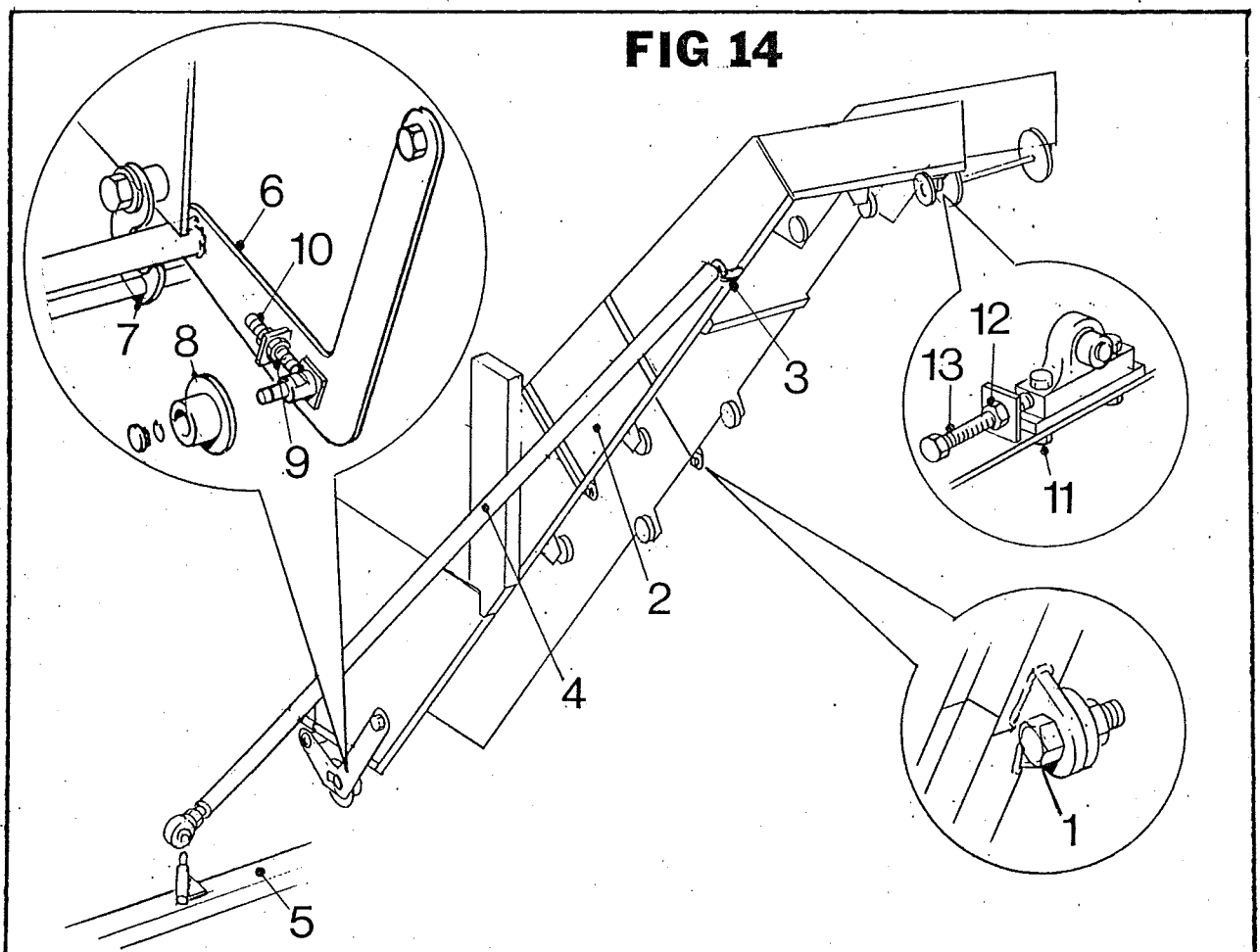
FOLDING THE ELEVATOR FOR TRANSPORT

1. Release the bottom roller support (item 6 fig 14) by pulling back the latch (item 7 fig 14).
2. Remove the elevator stay (item 4 fig 14).
3. Remove the two securing bolts (item 1 fig 14).
4. Operate the ram to fold the elevator.

If the hydraulic ram has been disconnected and reconnected again, then no attempt must be made to operate it until the ram has been bled to eliminate any air present in the system. Also the hydraulic ram must never be operated with the restrictors removed.

DISCHARGE ELEVATOR
(Web Tension Adjustment)

The discharge elevator web can be adjusted for tension. To tension the web loosen the bottom roller (item 8 fig 14) (a spanner can be located on the flats of the roller spindle), loosen the lock nut (item 9 fig 14) and turn the adjusting nut (item 10 fig 14) clockwise or anticlockwise to obtain the required tension. After the adjustment has been made tighten the lock nut (item 9 fig 14) and resecure the bottom roller. Ensure that both rollers are adjusted equally. A second web adjustor is situated at the top of the elevator. To adjust slacken the four bearing retaining bolts (item 11 fig 14) and the lock nut (item 12 fig 14) and turn the adjusting screw (item 13 fig 14) to give the correct tension. Ensure that both rollers are adjusted equally.



DRIVES

The various mechanical drives that are involved in the operation of the Standen beet harvester consists of clutches, chains, sprockets, pulleys and belts. Each drive chain or belt has its own tension adjustment, either manual or self-adjusting. The chains and belts should be correctly tensioned to ensure the efficient working of the machine. It is important that the drive chains and belts are not over tightened as this will cause excessive chain and sprocket wear.

CAUTION

All revolving drive machinery chains, shaft and sprockets etc. are potentially dangerous. Therefore before attempting any adjustment or maintenance of the drive equipment, switch off the engine of the tow vehicle, disconnect the power take-off shaft and set the hand-brake. Failure to observe the above caution could result in serious injury to personnel.

MAIN DRIVES

The main drive from the power take off of the tow vehicle is connected to a bearing housing, situated on the front of the drawbar. From this bearing housing the drive is transferred back to a gearbox (item 1 fig 15) by a universal coupling (item 2 fig 15). (This shaft and the P.T.O. drive shaft (item 3 fig 15) should be checked occasionally to ensure that the inner and outer tubes can slide freely. Binding of the tubes will cause premature failure of the input and gearbox bearings). From the gearbox the drive is transferred back again to a second gearbox (item 4 fig 15). From this gearbox the drive is split two ways to drive the various functions of the machine.

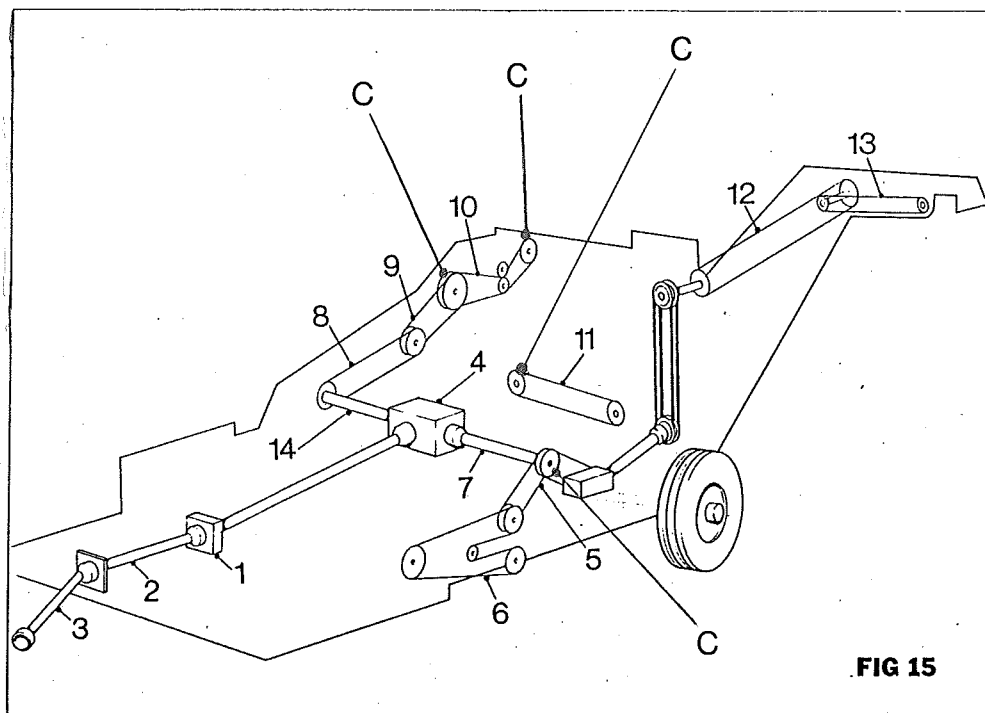
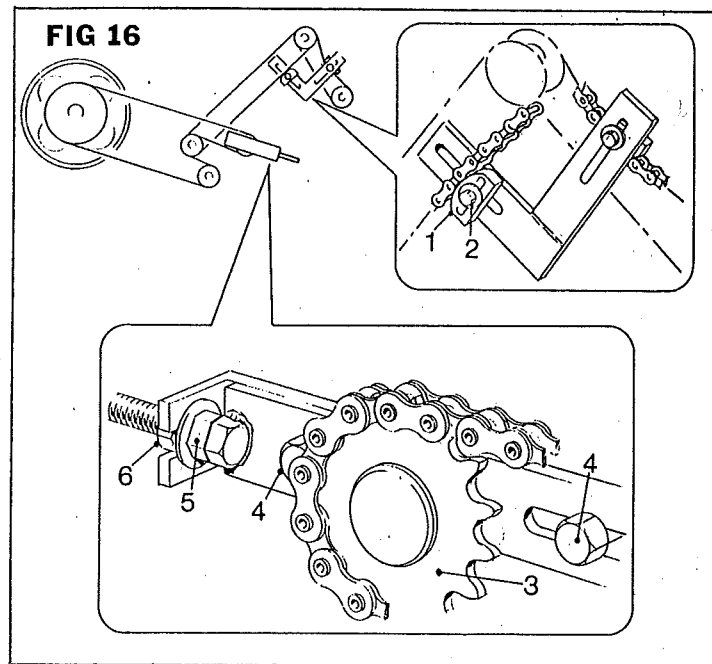


FIG 15

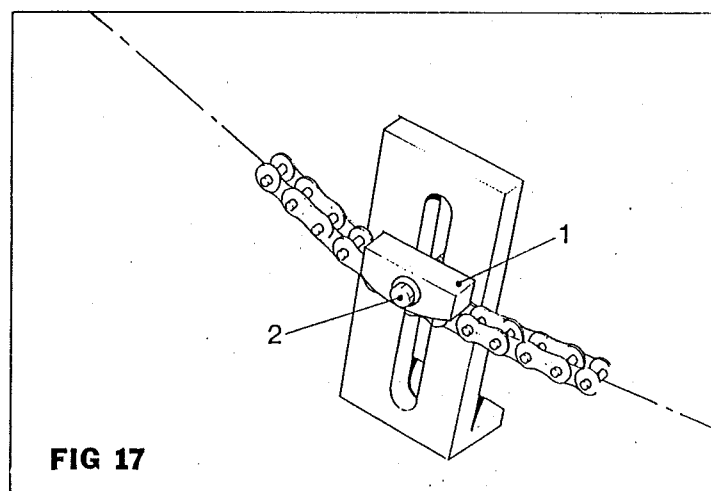
CAGE WHEEL DRIVE

The cage wheels are driven from the LH main drive shaft (item 7 fig 15) to the cage wheel drive shaft by means of various sprockets and two drive chains (items 5 and 6 fig 15). The first chain (item 5 fig 15) is tensioned by a tension block (item 1 fig 16). To adjust slacken the retaining bolt (item 2 fig 16) and slide the tension block to the required position. The second drive chain (item 6 fig 15) is tensioned by a sprocket (item 3 fig 16). To adjust loosen the two securing bolts (item 4 fig 16) and the lock nut (item 5 fig 16) and turn the adjusting nut (item 6 fig 16) until the required tension is achieved.



MAIN ELEVATOR DRIVE

The main elevator drive is taken from the RH main drive shaft (item 14 fig 15). Both drive chains are tensioned by a nylon tensioner (item 1 fig 17) to adjust either chain, loosen the retaining bolt (item 2 fig 17) and slide the tensioner to the required position.



TRASH EXTRACTOR DRIVE

The trash extractor drive chain (item 10 fig 15) is tensioned by self tensioner, therefore, no adjustment is required.

REAR CROSS WEB DRIVE

The rear cross web drive chain (item 11 fig 15) is tensioned by a nylon tensioner (item 1 fig 18) to adjust the tension of the chain, slacken the retaining bolt (item 2 fig 18) and slide the tensioner to the required position.

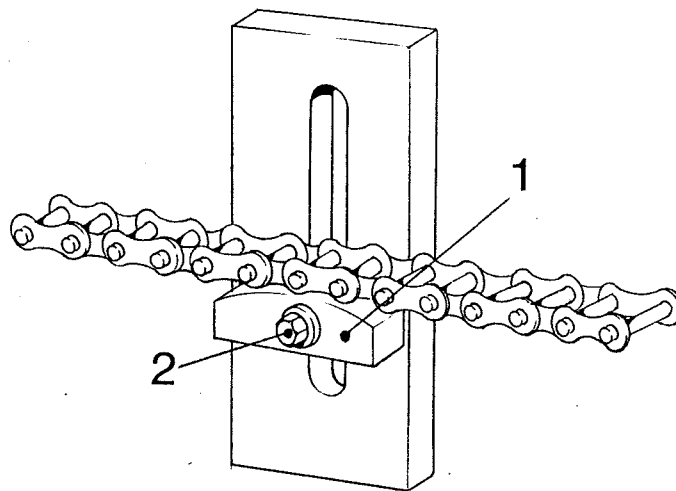
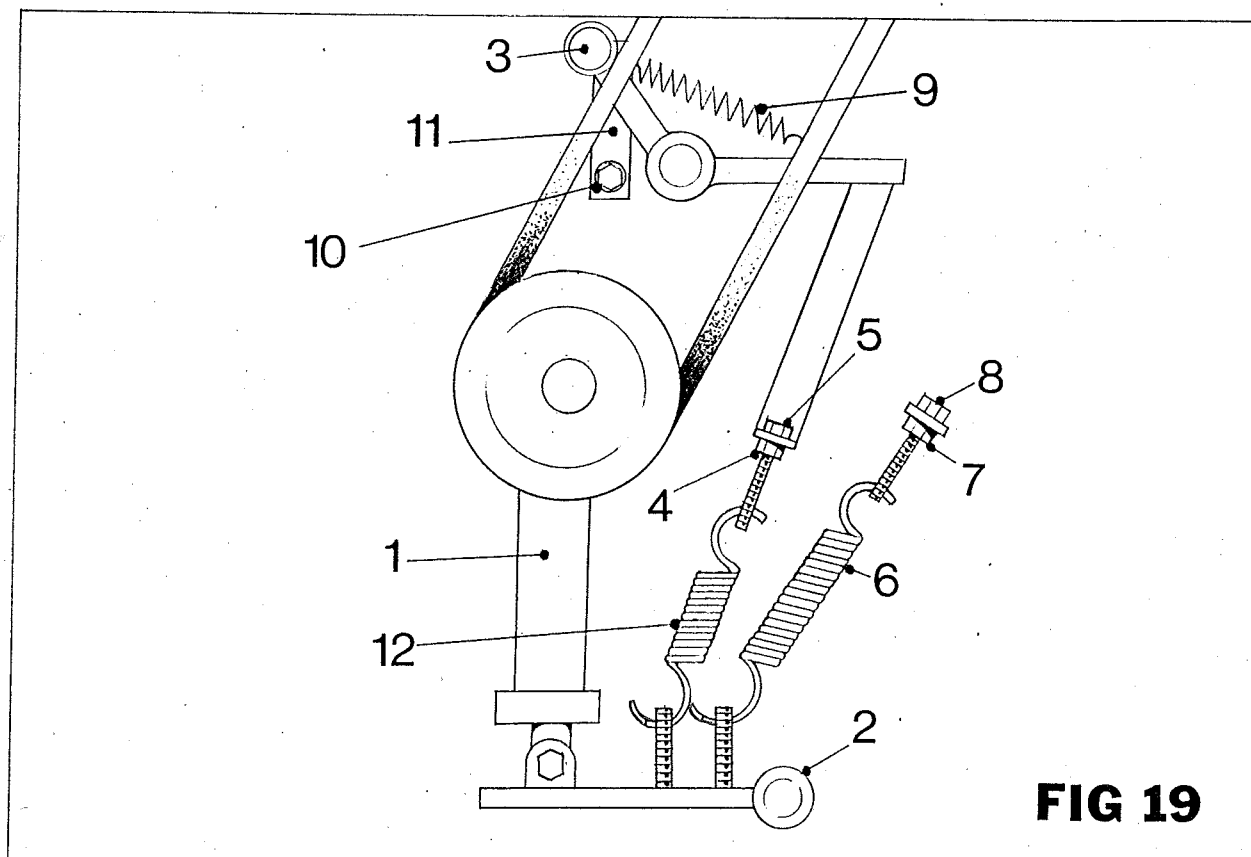


FIG 18

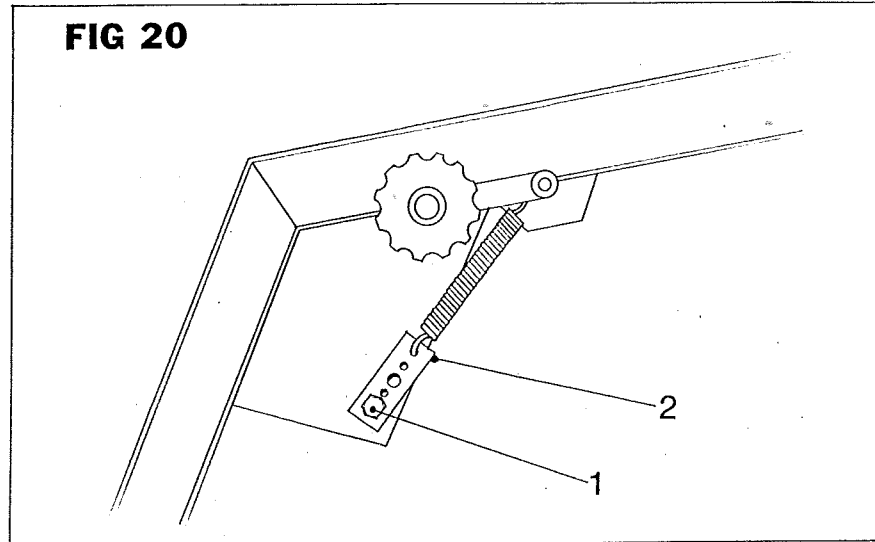
DISCHARGE ELEVATOR DRIVE

When the P.T.O. is engaged, the machine runs continuously except for the discharge elevator. The discharge elevator is set in motion by actuating a hydraulic ram (item 1 fig 19). The hydraulic ram is coupled into the tractor external hydraulics. Once the ram has been actuated it pushes an arm (item 2 fig 19) which in turn pulls a jockey roller (item 3 fig 19) onto the drive belt. Once the drive is engaged the pulley will act as a tensioner for the belt. To increase or decrease the tension, slacken off the lock nut (item 4 fig 19) and adjust by turning the adjusting nut (item 5 fig 19) clockwise or anticlockwise until the tension is correct.

Remember besides providing a drive a V-belt also acts as a slip clutch, therefore it is important that the belt tension is sufficient to drive normally without slip, but not so great that the belt cannot slip when the drive is obstructed. To ensure the roller (item 3 fig 19) will retract when it is needed the tension arm (item 2 fig 19) is fitted with a spring (item 6 fig 19). To tension the spring loosen the lock nut (item 7 fig 19) and turn the adjusting nut (item 8 fig 19) until the correct tension has been achieved. Once the jockey roller (item 3 fig 19) has been retracted and there is no more travel in the ram the discharge elevator should not continue to run. If the drive belt continues to drive then one of two things could be causing it. (1) Not enough tension in the top spring (item 9 fig 19), therefore increase the tension by loosening the retaining bolt (item 10 fig 19) and turning the anchor plate (item 11 fig 19) further round or (2), too much tension in the lower spring (item 12 fig 19).



From the top pulley the drive is taken up the side elevator by a drive chain (item 12 fig 15) to an intermediate sprocket. From this sprocket the drive is taken to the top sprocket by a second drive chain (item 13 fig 15). Both these chains have spring assisted tensioners. If adjustment is required loosen the retaining bolt (item 1 fig 20) and turn the spring anchor (item 2 fig 20). If extra adjustment is required remove the retaining bolt (item 1 fig 20) and replace it in any one of the adjusting holes in the spring anchor (item 2 fig 20)

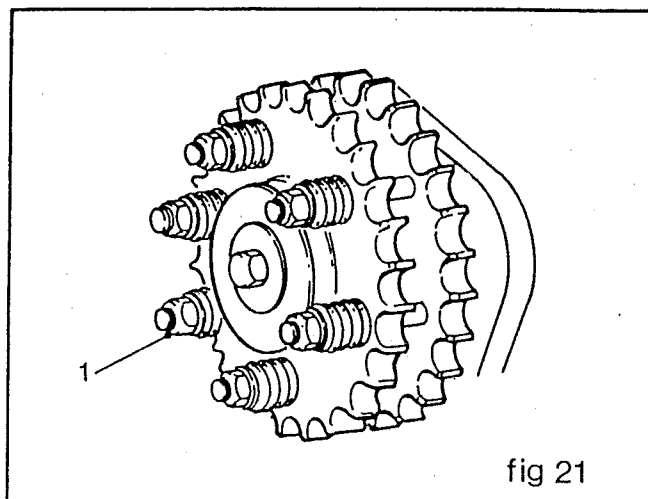


FRICTION CLUTCHES

All drive lines are protected by a slip clutch to prevent serious damage should the machine become overloaded or its elevators become jammed or obstructed. The amount of torque required to start the clutch slipping can be varied by turning the nuts (item 1 fig 21).

The clutch should be set to just drive without slipping under normal conditions. Over tightening on the adjustment nuts will render the clutch ineffective. Care should be exercised to ensure all six lock nuts are adjusted equally. This is easily achieved by adjusting each nut one flat at a time.

The location of each clutch is marked with 'C' on fig 15.



SPLIT SPROCKETS

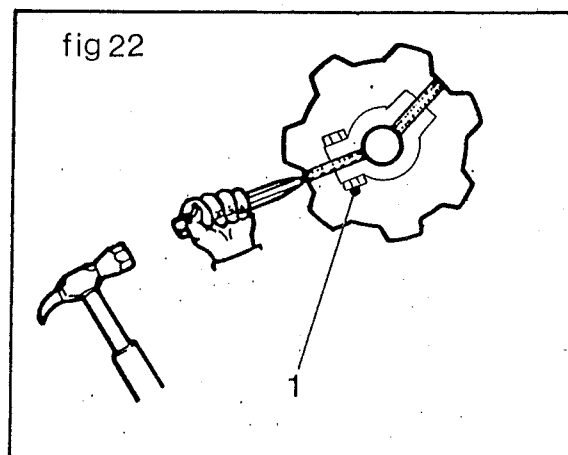
Various webs on the harvester are driven by split web sprockets. These sprockets have been designed to simplify the maintenance work. Rather than dismantling a complete drive assembly the sprocket can be individually split and removed from the shaft as described below.

SPROCKET REMOVAL

1. Loosen the fixing bolts (item 1 fig 22) and remove.
2. Using a hammer and chisel, split the sprocket along the groove provided (fig 22).
3. Remove both halves of the sprocket from the shaft.

SPROCKET REPLACEMENT

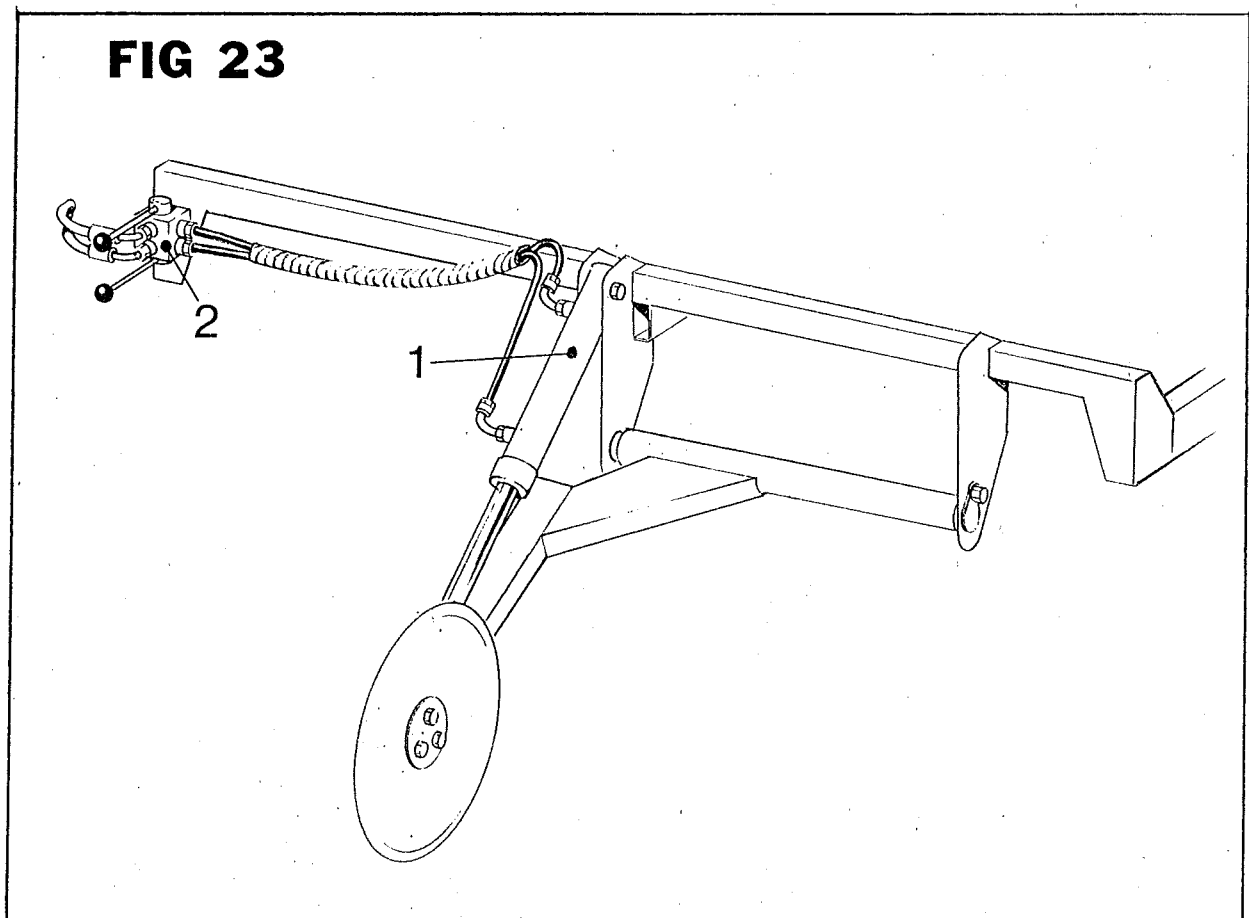
1. Mark each half of the sprocket clearly before splitting.
2. Split the sprocket with a hammer and chisel in the groove provided (fig 22).
3. Locate both halves on the shaft and secure using the fixing bolts (item 1 fig 22).



STABILIZER KIT (OPTIONAL)

A stabilizer kit is offered as an option to assist with hillside work. Once the machine is in work the stabilizer disc can be lowered by actuating a hydraulic ram (item 1 fig 23) from the external tractor hydraulics. On some machines a diverter valve (item 2 fig 23) is fitted to divert the oil to either the discharge elevator or stabilizer disc. Therefore this valve must be set so the oil will flow to the stabilizer disc before the ram can be actuated.

Do not reverse or turn unless the stabilizer is in its raised position.



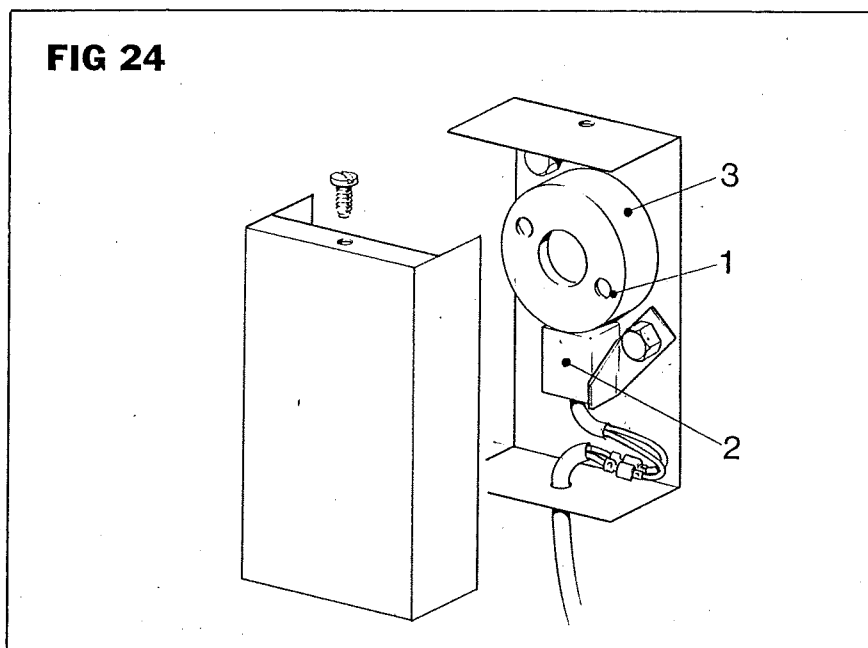
SHAFT MONITOR KIT (OPTIONAL)

A shaft monitor kit is fitted to indicate if a shaft slows down due to an obstruction on the elevator becoming overloaded.

Connect the seven pin plug into the monitor box. When the system is correctly installed it will operate as follows:-

When the tractor ignition is switched on, the monitor lights will come on and the buzzer will sound for approximately 10 to 20 seconds and then stop. The lights will remain on until the harvester is operated.

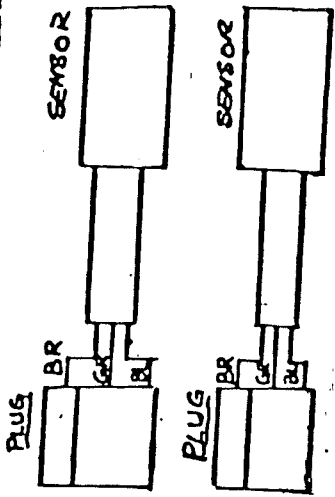
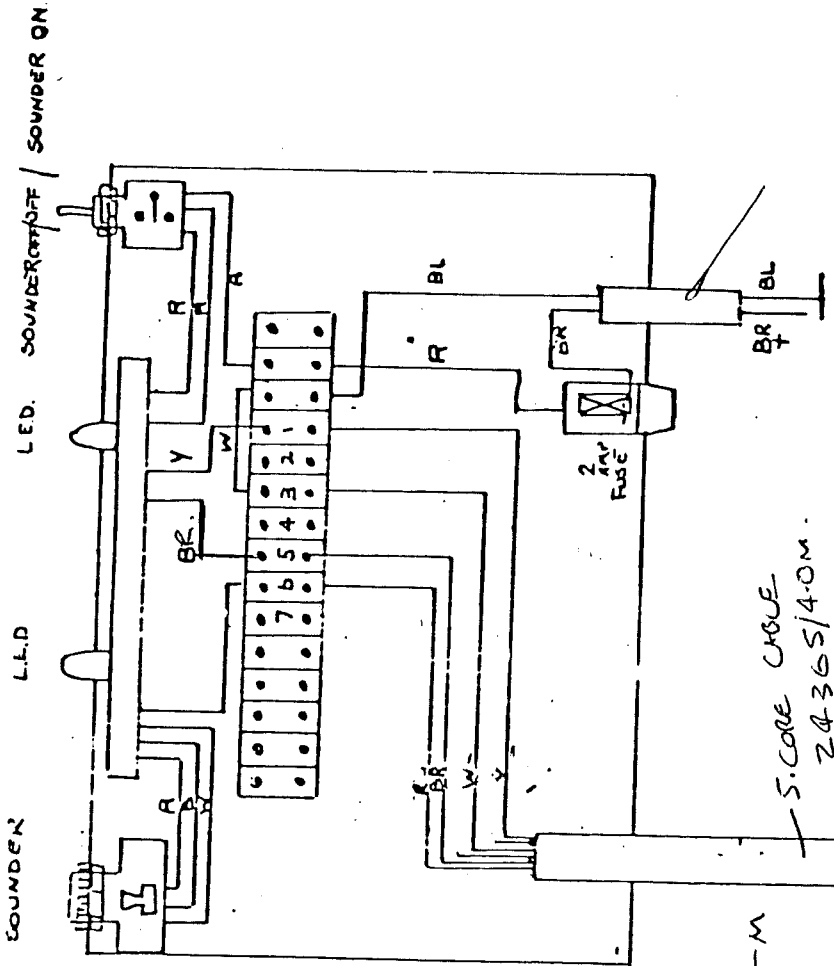
Once the harvester is in work if one of the shafts slows down, the relevant light will flash and the buzzer will sound intermittently. If the shaft stops rotating then the light will come on and the buzzer will sound for about 10 to 20 seconds and then stop. The light will remain on until the shaft rotates again.



In the event of the system not working, the following checks should be made:-

1. Check the fuse in the monitor box.
2. Check that there is a live supply at the terminals in the junction box.
3. Check that the brown lead at the censor is live by using a test light between the brown lead and the green earth lead.
4. Check that an earth exists back to the tractor.
5. If one monitor works and the other one does not, check the wiring first and secondly interchange one censor with another. Failure here will indicate a faulty censor.
6. Check that the magnets (item 1 fig 24) are in place and that the censor (item 2 fig 24) is in close proximity of the nylon roller (item 3 fig 24).

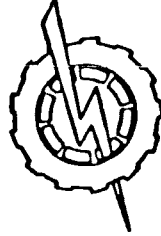
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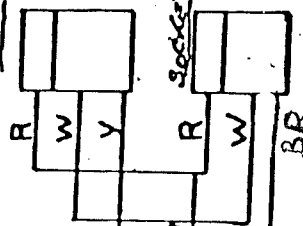


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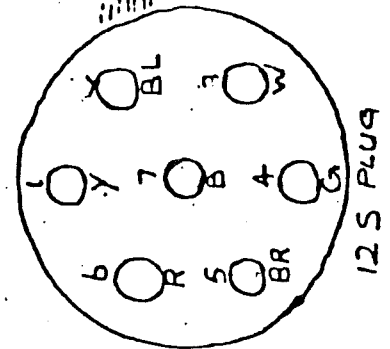
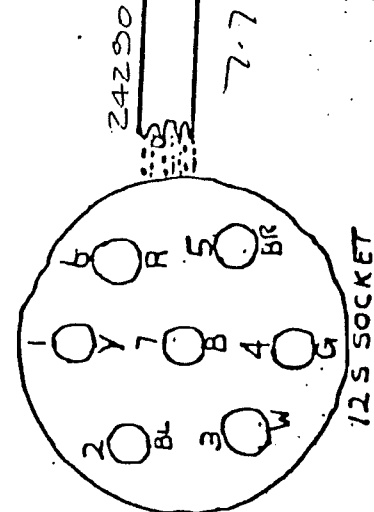
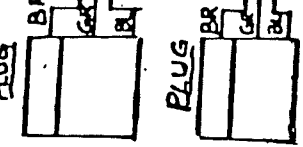
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MAINTENANCE

Regular maintenance will ensure that the Standen harvester provides a long and efficient service life. Depending on the soil and weather conditions the maintenance time schedule can vary. However, it is recommended that the machine be lubricated and gearbox oil levels checked once a week throughout the season.

LUBRICATION

Correct lubrication should be employed to ensure the full life of the various working parts and the efficient operation of the machine.

A general purpose grease should be used for the bearings and the universal coupling drives. All gearboxes should be filled with SAE 90 oil or equivalent (Ref 0 on fig 25).

NOTE:

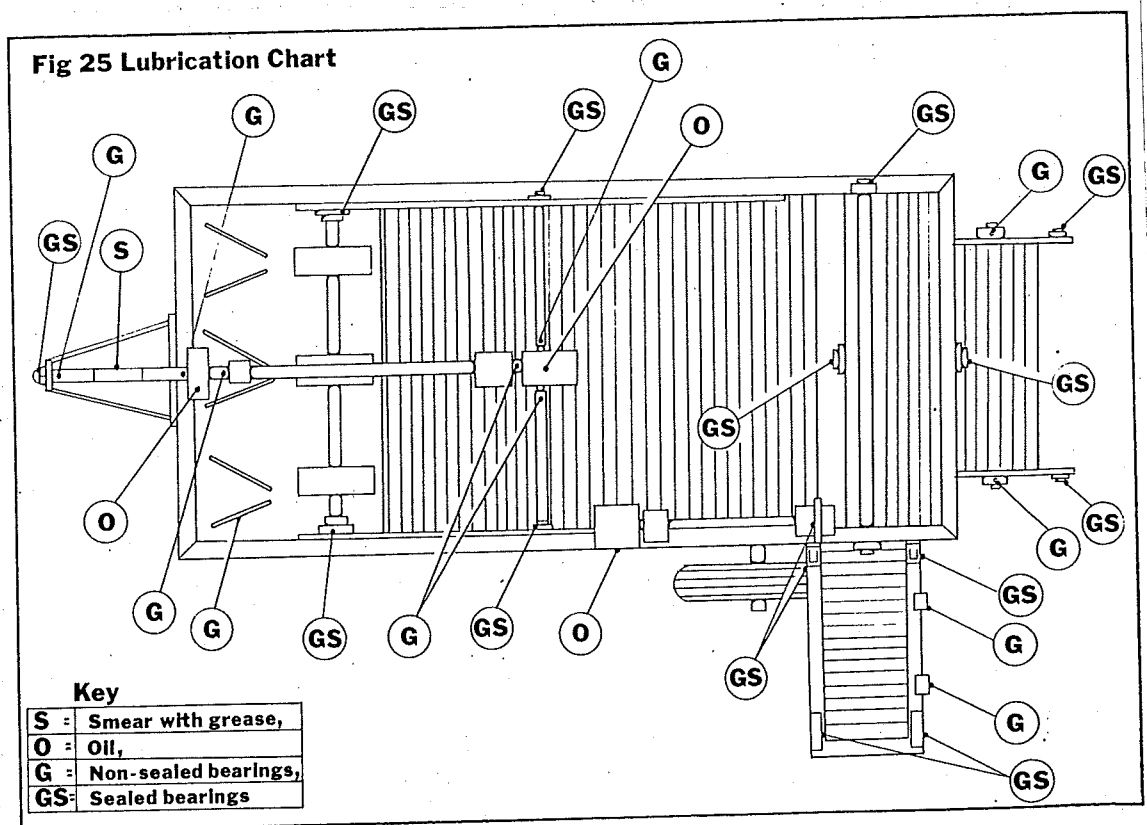
With reference to fig 25 that some of the bearings are sealed and pre-lubricated (Ref GS) and care should be taken not to flood these bearings with grease or the seals will burst allowing the grease to escape and dirt to get in. Should this happen, more frequent greasing will be required in order to keep the dirt at bay. When lubricating sealed bearings, only two or three strokes of the grease gun every twenty acres of work are required.

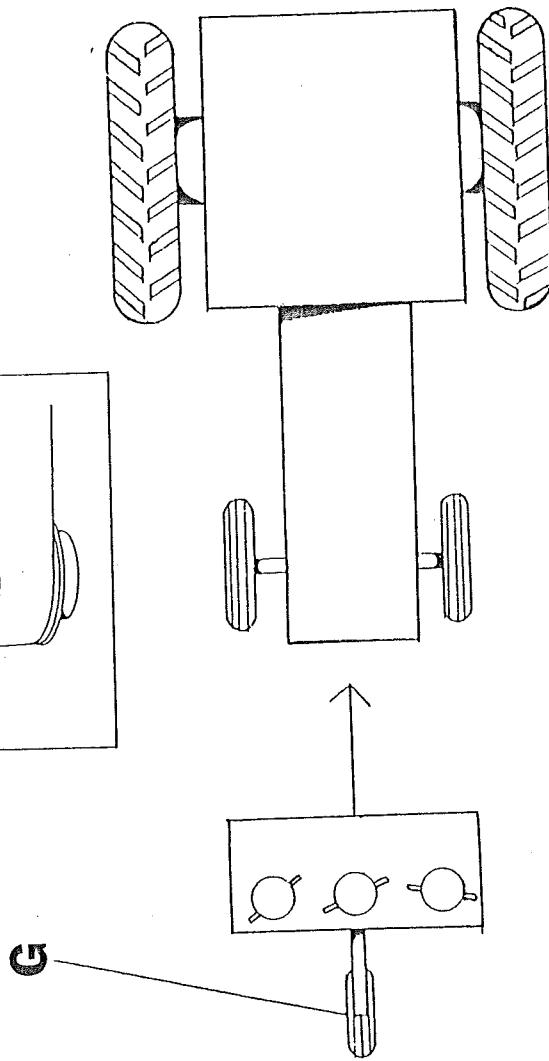
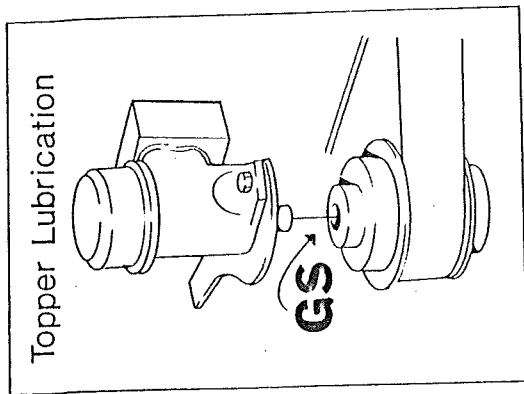
The non-sealed bearings (Ref G) should be greased at least once a day or every ten acres.

Particular care must be taken to ensure that grease or oil does not come into contact with the ferodo discs fitted to the clutches or the 'V' belts on some of the drives.

Grease points requiring individual quantities of lubrication will be found on the lubrication points chart fig 25.

We recommend that the universal couplings should be dismantled periodically and their shafts smeared with general purpose grease. Also all drive chains should be kept well greased.





Key

S	= Smear with grease,
O	= Oil,
G	= Non-sealed bearings,
GS	= Sealed bearings

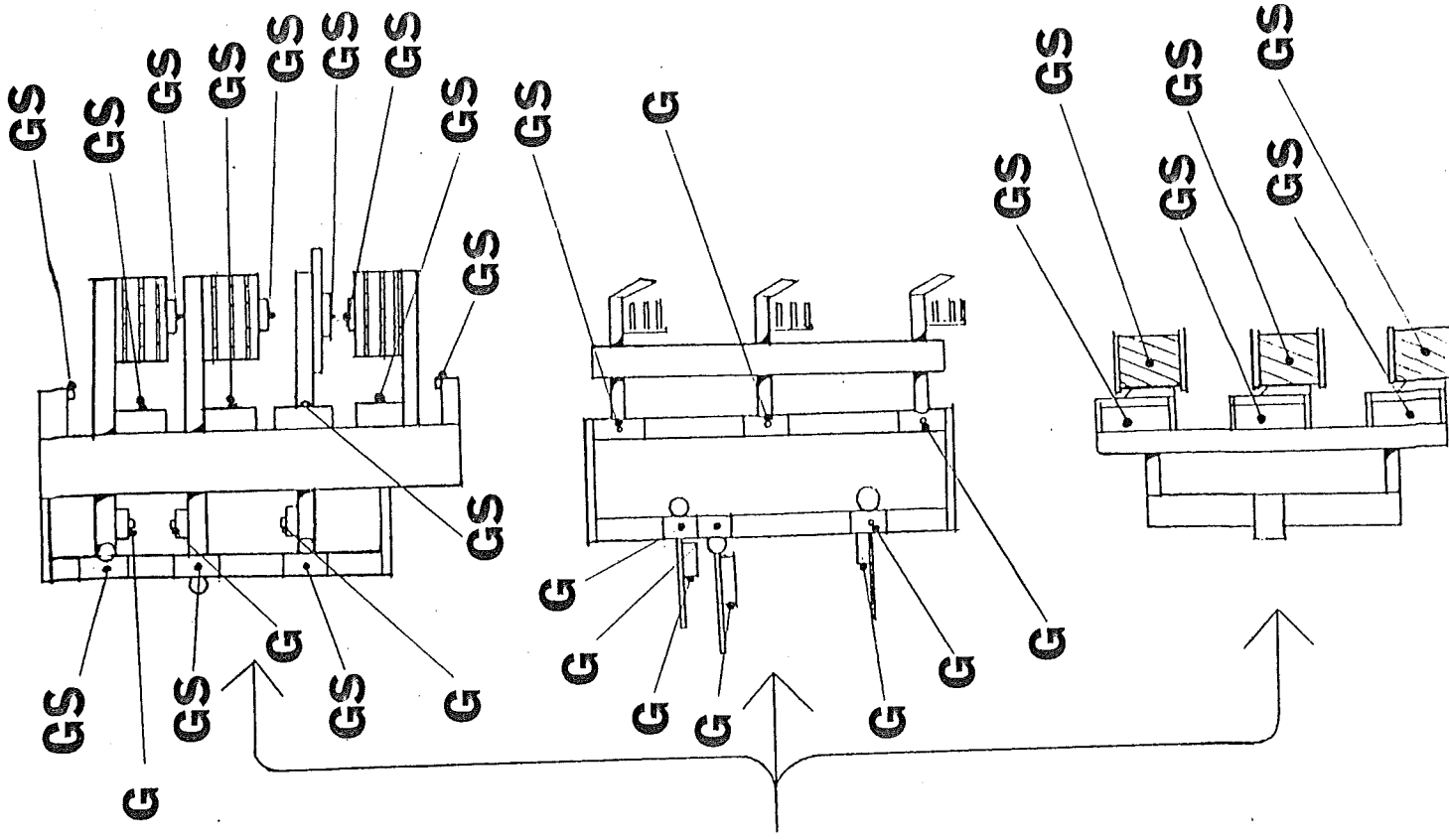


Fig 25A Topper Lubrication Chart

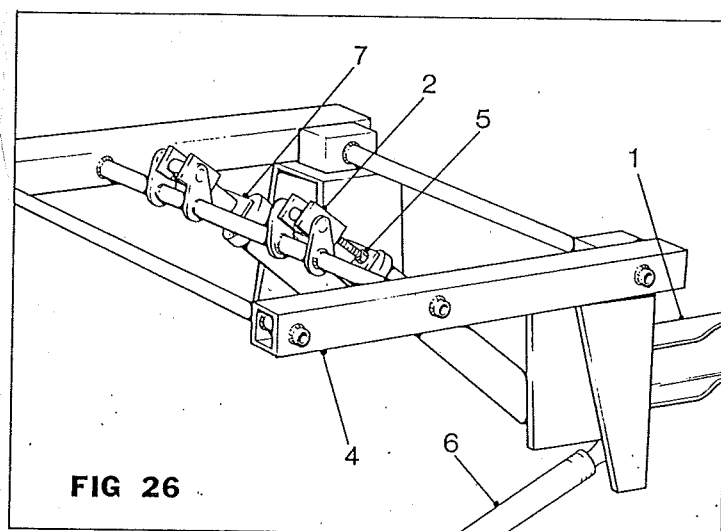
FITTING THE TOPPER TO THE TRACTOR

The Four Row Topper is mounted to the front of the tractor supported by mounting brackets (item 1 fig 26) fitted to the tractor. It is fully floating on pivoting linkage, and raised and lowered by two hydraulic rams, the rams being fed and operated by hydraulic hoses from the tractor's external control lever.

There are various types of tractor mounting brackets available to suit individual tractors and they should be fitted by bolting to the existing holes in the tractor chassis, with the bolts provided in the kit.

With the mounting brackets in place, fit the quick hitch unit (item 4 fig 26) to the brackets with the bolts provided and connect the two hydraulic rams to the tractor hydraulics.

To pick up the topper, lift the ram stops (item 2 fig 26) clear of the rams and locate the quick hitch arm into the large hooks on the topper and lift by actuating the ram. Finally fit the two stabilizer links, (item 6 fig 26) between the tractor and the topper. When the topper is in work the front should be lower than the rear. To achieve this, turn the stabilizer link clockwise or anticlockwise.



TURBO TOPPER

The Standen Four Row Topper is designed to remove the leaf from the beet by the use of rotating cutters, prior to the beet being topped by the scalpers.

Four rotary cutters are used and the loose leaf is thrown from one cutter to the other and finally out of the side. The surplus sugar beet crown is then removed by the scalpers, leaving a clean path of topped sugar beet for the lifter loader.

The cutting width of each individual rotor (item 1 fig 27) is 17 inches (43 cms). The overall cutting width of all four rotors is 74 inches (187 cms).

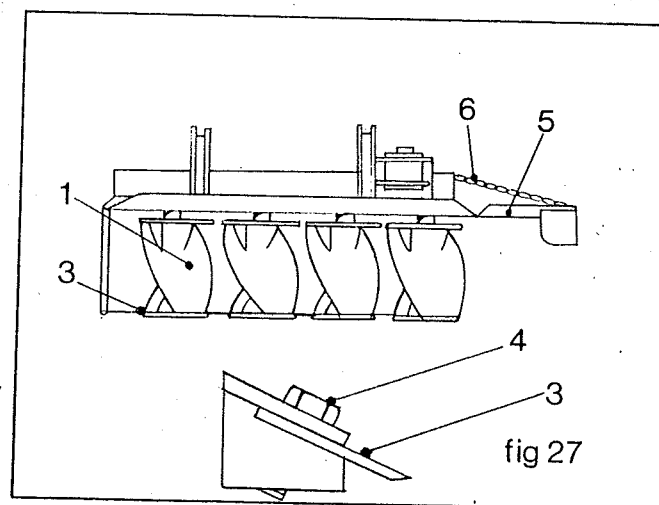
Row widths of from 18 inches (48 cms) to 21 inches (56 cms) can be obtained.

The amount of tops removed from the beet by the rotors is determined by the size of the crown that can be removed by the scalpers. As a guide to the amount of top to remove, prior to scalping, set the depth of cut of the rotor knives to just top the highest beet.

The depth of cut is determined by the depth wheel (item 1 fig 28) fitted at the front of the unit. To adjust the depth wheel, loosen the retaining screws in the depth wheel stop clamps (item 2 fig 28) and lift or lower the wheel according to the amount of topping required. Stop brackets (item 2 fig 26) fitted to the hydraulic ram are there to reduce the amount of float, should the depth wheel sink into the ground when travelling over undulating ground or soft soil patches. The size of gap between the stop plate (item 7 fig 26) and the hydraulic ram determines the amount the topper is allowed to drop. To adjust turn the lock nuts (item 5 fig 26) until the stop plate is in the correct position.

Steel knives (item 3 fig 27) are fitted to the rotors and can be removed or replaced by removing the retaining patch bolts (item 4 fig 27). When fitting or removing patch bolts, care should be taken not to overheat the nylon locking material fitted to the bolt. Always replace the bolts with new after they have been removed or fitted twice. Never set the topper so that the knives touch the soil as damage to the knives will ensue.

The sugar beet tops discharge end of the topper is fitted with a hinged tops deflector flap which can be adjusted to a high or low position, according to the amount of beet tops, to form a windrow or to spread the tops. Adjustment is made by lengthening or shortening the support chain (item 6 fig 27).



TOPPER DRIVES

CAUTION

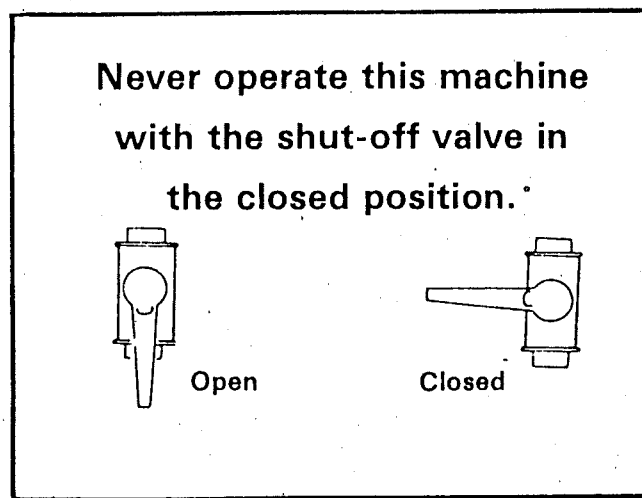
All revolving drive machinery chains, shafts, sprockets, etc., are potentially dangerous. Therefore before attempting any adjustment or maintenance of the drive equipment, switch off the engine of the tow vehicle, disconnect the power take-off shaft, and set the hand-brake. Failure to observe the above caution could result in serious injury to personnel.

The rotors are driven by a hydraulic motor (item 3 fig 28) being fed from a 10½ g.p.m. pump (item 1 fig 29) mounted on the harvester and driven from the tractor P.T.O. shaft, via a gear-box. The oil to the hydraulic pump is supplied from a tank mounted on the harvester. The tank should be filled with H68 nuto hydraulic oil or equivalent and should always be kept full, especially when storing the machine for long periods of time.

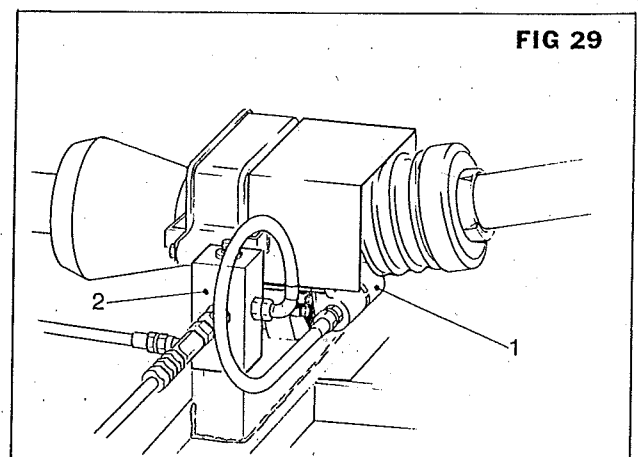
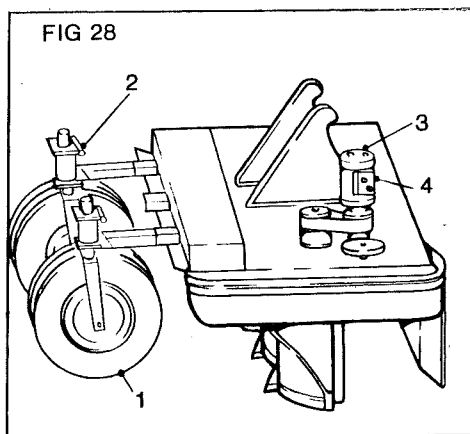
The tank has a removable lid for ease of maintenance to the strainer located inside the tank at the output port. This strainer should be dismantled and cleaned thoroughly at the end of every season.

The replacement filter situated at the top of the tank should be renewed at the completion of the first 100 hours of work and then at every 500 hours.

A shut off valve has been fitted to the hydraulic tank to allow the undertaking of any maintenance to the hydraulic system without draining the tank.



When carrying out any maintenance to the hydraulic system, cleanliness is of the utmost importance, so avoid any dirt entering the system.

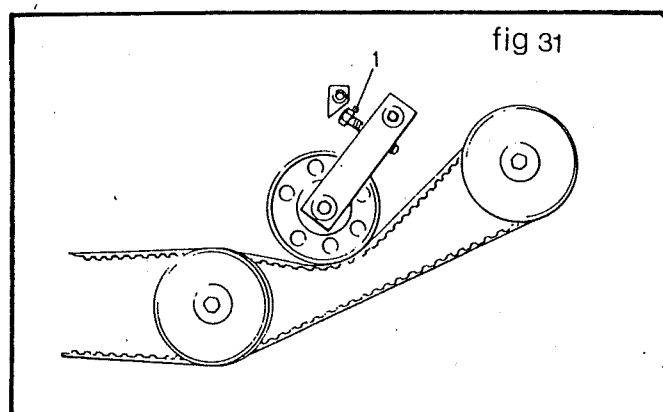
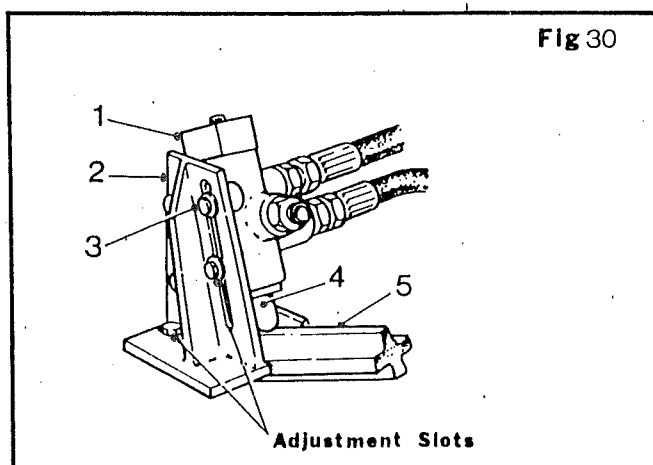


Situated on the RH side of the quick hitch unit is a diverter valve (item 1 fig 30) designed to cut off the flow of oil to the rotors when the machine is in the raised position, so stopping the rotors from turning.

The diverter valve must be fitted or adjusted with the topper in the raised position and the valve must be closed. Adjusting slots are provided in the diverter valve support bracket (item 2 fig 30).

To adjust, loosen the cap screws (item 3 fig 30) securing the valve and slide the valve until the spool touches centrally on the lift arm, (item 4 fig 30). If additional adjustment is required to the diverter valve, a spacer block supplied with the machine should be fitted.

At the top of the diverter valve is a return spring fitted to push down on the top of the spool when the machine is lowered. The spring is encased for cleanliness and does not require adjusting. A pressure relief valve (item 2 fig 29) is situated adjacent to the gearbox. It is fitted to protect the hydraulic system should any blocking occur and is preset at a pressure of 2000 P.S.I. **UNDER NO CIRCUMSTANCES SHOULD THIS VALVE BE TAMPERED WITH.**



An aluminium check valve block (item 4 fig 28) is fitted which enables the rotors to slow down when the oil supply is shut off. The motor must always be connected to the oil supply via the check valve. Failure to do so will cause severe damage to the motor.

From the hydraulic motor, the drive is by toothed belts to the individual pulleys, which in turn drive the topper rotors. These drives are situated beneath the guards.

To adjust the tension of the drive belts, turn the belt tensioner adjuster screw (item 1 fig 31) clockwise or anti-clockwise until the correct tension is achieved. The correct adjustment should allow 5 mm to 7 mm of movement of the belts at a point midway between the drive pulleys. After all the necessary adjustments have been made it is essential that the guards are securely replaced to avoid loose tops and trash blocking the pulley teeth and causing damage to the belts. Never allow the belts to run slack as this will result in severe damage and their subsequent failure.

CAUTION

Before engaging the P.T.O. drive ensure all guards are securely fixed to the machine.

AUTOMATIC LUBRICATION

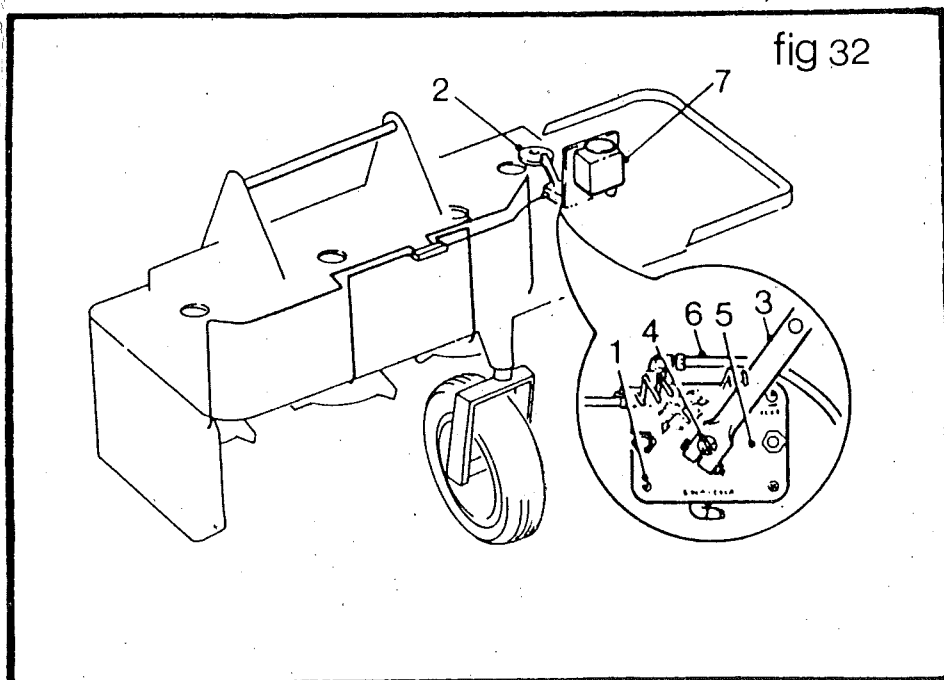
Automatic lubrication is fitted to feed eight bearings on the topper, fed by the lubrication pump (item 1 fig 32). A reaction wheel (item 2 fig 32) is fitted eccentric to the operating arm (item 3 fig 32) giving a feed pressure of 200 P.S.I. The stroke of the operating arm can be adjusted by loosening the clamp of the operating arm and turning the slotted spindle (item 4 fig 32) with a screwdriver. If more lubrication is required, turn the slotted spindle towards the '+' position, stamped on the top plate (item 5 fig 32) and whilst holding this position with the screwdriver, tighten the clamp bolt on the operating arm (item 3 fig 32).

When carrying out this operation, ensure that the reaction wheel (item 2 fig 32) is at its furthest stroke.

PRIMING THE SYSTEM

The system is self priming with the feed pipe (item 6 fig 32) being fitted from the top of the pump (item 1 fig 32) to the bottom of the oil reservoir and through to the top of the oil inside the reservoir, and through to the top of the oil inside the reservoir.

When filling the system with oil for the first time or in case the system has been allowed to become empty, the system must be primed. To prime the system, operate the operating arm (item 3 fig 32) manually until the oil is discharged from the bearing feeds. Top up the oil reservoir with oil as required. The oil reservoir is made of see-through plastic and should be filled with SAE 90 gear oil. The oil filter inside the reservoir should be changed annually.



SCALPERS

The scalper unit is fitted to the rear of the topper between the topper and the tractor. It is designed to crown the beet and remove the surplus leaf stubble left remaining on the beet by the Turbo Topper.

Before attempting to set up the scalpners drive the machine a short distance down the rows of beet to obtain the required pitch of the knives. When topping the beet the knife (item 2 fig 33) should be parallel with the ground. To adjust, slacken the two setscrews (item 14 fig 33) and turn the adjusting screw (item 15 fig 33) until the knife is in the required position and retighten the set-screws. Repeat for the remaining three scalper units.

The amount of beet crown removed by the knife is determined by adjusting the comb (item 1 fig 33) above the knife, (item 2 fig 33). Increasing the distance between the two will remove more beet crown and decreasing the distance will remove less beet crown.

A very important part of the scalping mechanism is the tension of the springs (item 3 fig 33) fitted to the tension rods (item 4 fig 33) designed to give a downward pressure to the knife. Enough pressure should be given to return the scalper arm (item 5 fig 33) and knife to successfully top a low beet after topping a high beet. At the same time, too much pressure will force the knife to dig into the highest beet causing too much beet crown to be removed or the beet to be pushed over.

To adjust the spring, either tighten up or loosen the lock nuts (item 6 fig 33) until the right amount of pressure is acquired.

Each scalper is individually mounted on a support bracket (item 7 fig 33) and by loosening the retaining bolt (item 8 fig 33) and sliding the scalper arm (item 5 fig 33) along the support bracket, adjustments can be made to suit row widths of between 18 inches (48 cms) and 21 inches (53 cms). When setting the scalper for row widths, ensure the knife is crowning the beet as close to the knife arm (item 9 fig 33) as possible.

The comb (item 1 fig 33) is adjustable, backwards and forwards. This setting is determined by the size of the beet. To adjust the combs (item 1 fig 33), slacken the two set-screws (item 10 fig 33) and slide the combs in the required direction to the correct position and retighten the set-screws. The comb should be forward for large beet and backwards for small beet.

Height adjustment is also provided for the scalper arm, depending on the working depth of the harvester. To adjust the height, loosen the two retaining bolts (item 16 fig 33) and slide the scalper leg either up or down until the required height is obtained.

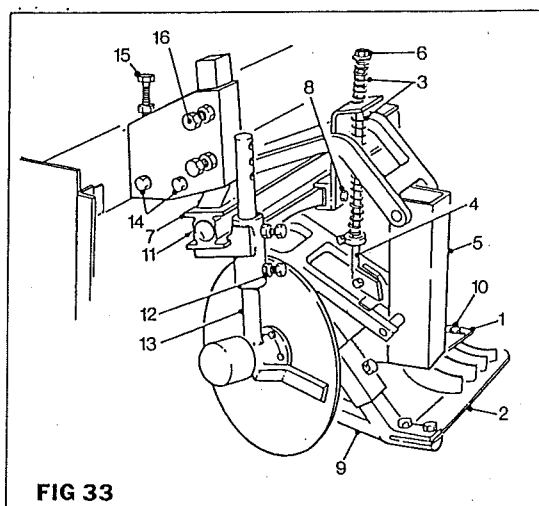


FIG 33

DISC COULTERS (FOR USE WITH SCALPERS)

The purpose of the disc coulters fitted at the side of the scalpors is to cut sugar beet leaves and trash to prevent them from building up and clogging on the knives.

As with the scalpors, the disc coulters can also be adjusted to suit varying row widths. To adjust slacken the securing bolt (item 11 fig 33) and slide the disc assembly along the support bracket (item 7 fig 33) to the required position and retighten. Adjustment is also provided to obtain different depths of cut. To adjust, loosen the two retaining bolts (item 12 fig 33) and slide the disc leg (item 13 fig 33) either up or down until the required depth has been obtained.

As well as varying the depth of cut, the same adjustment can also be used to alter the angle of the disc. The middle disc should be set square to the topper, whereas the two outer discs should have their leading edges slightly tracked inwards (see fig 33).

FEELER WHEEL TOPPING UNIT

The purpose of the topping unit is to crown the beet cleanly and squarely by the use of a feeler wheel which runs on top of the beet holding it steady while the knife crowns it. The feeler wheels (item 1 fig 34) should be well onto the beet when the knives start to cut. Allowance is provided to adjust the depth of the knives (item 2 fig 34) by loosening the two locking nuts (items 3 fig 34), and turning the bolts (item 4 fig 34) to the stop plates welded to the knife arm (item 5 fig 34). This adjustment allows the topping knives to be moved towards or away from the feeler wheels, which are then held firmly in position by their tension spring (item 6 fig 34).

The tension of the spring is determined by the spring tensioner (item 7 fig 34) and the tensioner adjusting nuts (items 8 fig 34). Tension should be applied to the spring sufficiently enough to bring the knife firmly back into position after releasing an obstruction such as a stone. The horizontal setting of the knife (item 2 fig 34) is obtained by loosening the two set screws in the two stop collars (item 9 fig 34) and sliding the knife arm (item 5 fig 34) through the knife arm bracket. Always set the knives to top the beet as close to the knife arm as possible as this is the most rigid part of the knife whereas the end is springy and not constant in pressure.

The forward and backward position of the knives is adjusted by loosening the two set screws (item 10 fig 34), and sliding the knife arm bracket (item 11 fig 34) in the adjusting slots provided in the topping unit frame.

As a guide to the most suitable position of the knife in relation to the feeler wheels, position the rear set screw (item 12 fig 34) approximately in line with the centre of the feeler wheel shafts (item 13 fig 34). The knives should be forward for small beet and backward for large beet.

Downward pressure can be applied to the feeler wheel (item 1 fig 34) by adjusting the tension of the topping unit spring (item 14 fig 34). To adjust the tension loosen the lower locking nut (item 15 fig 34) and adjust by turning the upper locking nut (item 16 fig 34) until the required tension is obtained. This adjustment will vary according to the number of high or low beet in the crop and to the firmness or looseness of the soil. The adjustments for the pitch of the topping units are provided at each end of the mounting frame (item 17 fig 34) and are determined according to the working depth of the harvester.

To loosen the bolts (item 18 fig 34) and raise or lower using the adjusting slots in the 'A' frame (item 19 fig 34) to the required position. If more adjustment is required, remove the bolts (item 18 fig 34) from the upper holes in the mounting frame (item 17 fig 34) and place them in the lower set of holes and reassemble in the slots in the 'A' frame (item 19 fig 34) and tighten up when the height is correctly set.

Downward pressure on the land wheel (item fig 35) is applied by three springs (item 2 fig 35). To adjust the pressure loosen the nearest lock nut (item 3 fig 35) to the spring and adjust by turning the other lock nut (item 4 fig 35).

Adjustment is provided for different row settings. To adjust, loosen the grub screws in the collar (item 20 fig 34) and the collar adjacent to the drive sprocket (item 21 fig 34) and slide the topping unit complete with the drive sprocket along the drive shaft.

DISC COULTERS (FOR USE WITH FEELER WHEELS)

The purpose of the disc coulters fitted in front of the topping unit is to cut sugar beet leaves and trash to prevent them from building up and clogging the knives. Also it cuts a $1\frac{1}{2}$ in (38 mm) deep furrow for the knife arms. This furrow enables the knife arms to drop down and top beet at ground level. The depth of which the disc cuts can be adjusted by slackening the clamp (item 1 fig 36) and turning it to alter the position of the stop bracket (item 2 fig 36).

The discs are adjustable for different row settings. To adjust, slacken off the setscrews in the clamps (items 1 & 3 fig 36) and slide the disc assembly to the required position, making sure the disc will pass the widest beet without cutting it, then slide the clamps back up against the disc arm (item 4 fig 36) and retighten.

Adjustment is provided for tensioning the disc coulters so that it will cut sufficiently. If the tension is insufficient the disc will not be held firmly in the ground and consequently it will ride over the tops or trash instead of cutting it. Adjustment is made by loosening the lock nut (item 5 fig 36) and turning the adjusting nut (item 6 fig 36).

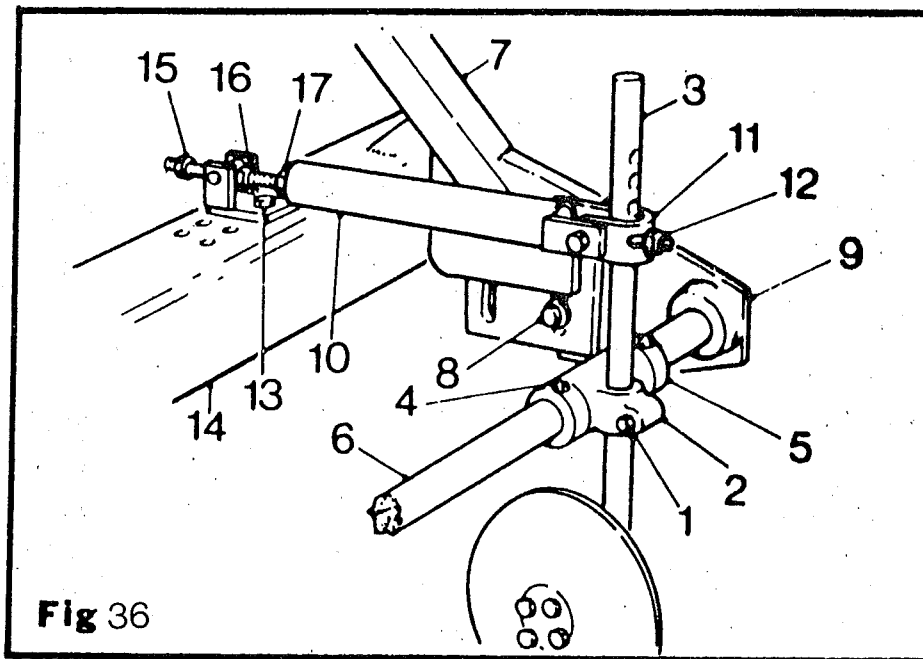


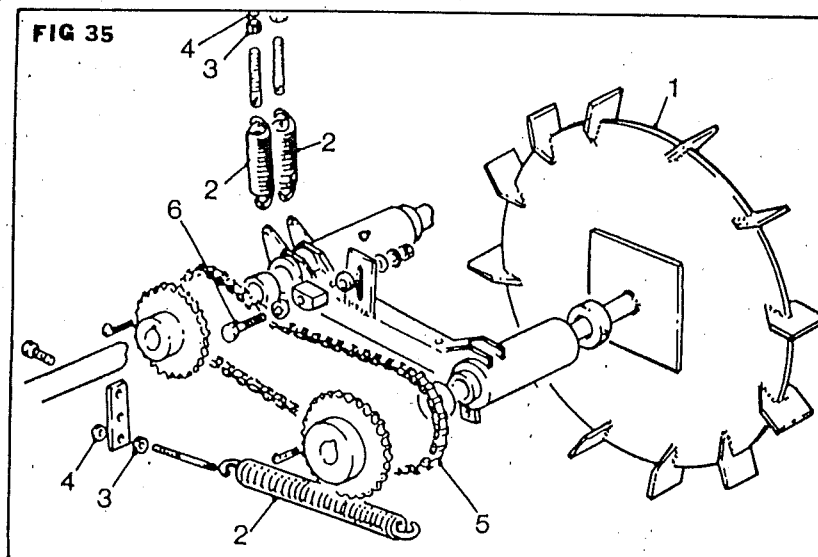
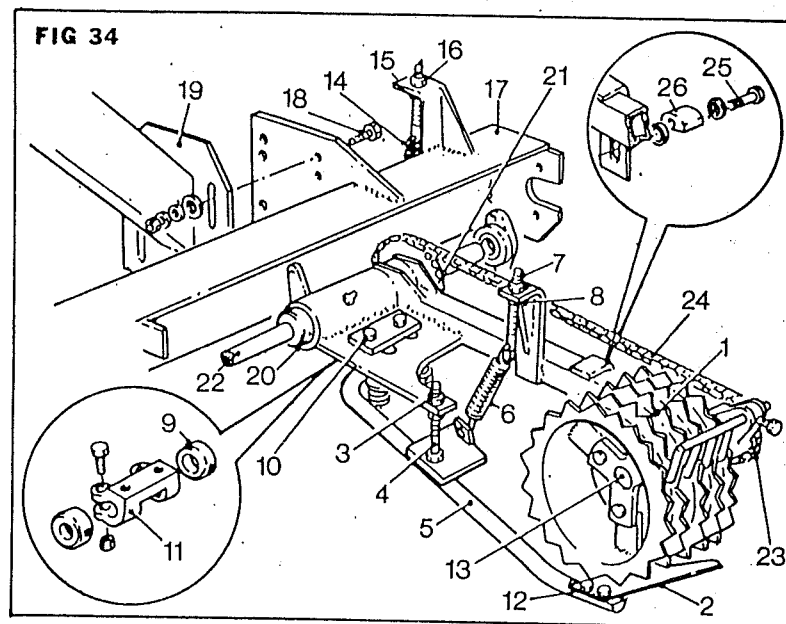
Fig 36

NOTE: The row width measurement should be made from the centre of the centre feeler wheel to the centre of the outside feeler wheel, not along the shaft (item 22 fig 34). When the correct row width has been obtained tighten the grub screws and align the drive sprocket with the drive sprocket (item 23 fig 34).

The procedure for adjusting the land wheel for different row settings is identical to that of the feeler wheels.

It is important that the topping unit drive chains are tensioned correctly or bad topping will occur. All chains are tensioned by a nylon block. To adjust the feeler wheel drive chain (item 24 fig 34) loosen the setscrew (item 25 fig 34) and pull the block (item 26 fig 34) upwards until the tension of the chain is correct and then tighten up the setscrew. To tension the topping unit main drive chain (item 5 fig 25) loosen the setscrew (item 6 fig 35) and push the block down onto the chain until the correct tension is gained and secure block.

ALWAYS ENSURE THAT THE TOPPING KNIFE IS KEPT REASONABLY SHARP.



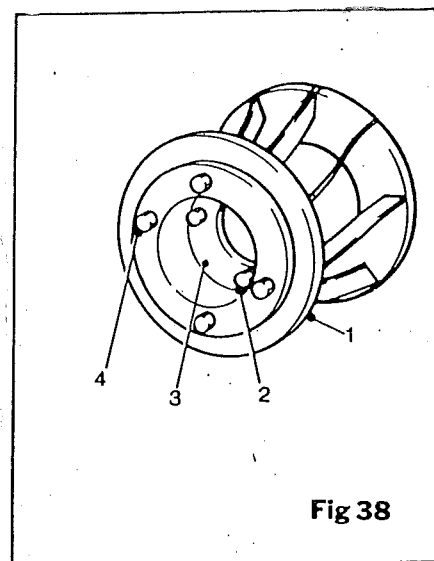
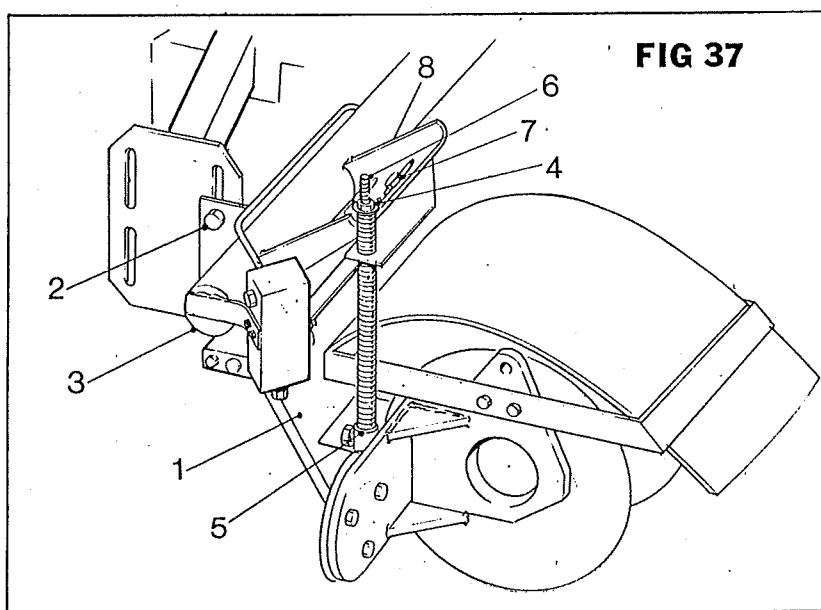
SKEWBAR TOPPER

The skewbar topper is designed to top beet with the use of a power driven barrel (skewbar). The skewbar barrel rubs off the remaining tops left by the Turbo Topper.

The amount of tops removed is determined by the height of the skewbar and the amount of pressure sent down on the skewbar.

To obtain good clean topping the pivot end of the pivot arm (item 1 fig 37) should be set to clear the tops of the pre-topped beet, to adjust slacken the four retaining bolts (item 2 fig 37) and slide the mounting frame (item 3 fig 37) up or down, to give the correct setting. Do not set too high.

The height of the skewbar can be adjusted by turning the adjusting nut (item 4 fig 37). As an initial setting the skewbar can be set so that a distance of 2 ins (5 cms) exists between the bottom of the skewbar and the ground, when the harvester is resting on its lifting wheels.



Another important feature to take into consideration to achieve good topping is the amount of pressure that is applied onto the skewbar. Increased pressure results in more of the tops being removed, conversely the less pressure the less tops removed.

To adjust the amount of pressure exerted onto the skewbar simply loosen the retaining collar (item 5 fig 37) and either slide it up or down the tension rod (item 6 fig 37) to give the required tension. Finally resecure the collar.

The skewbar is also adjustable for different row settings. To adjust slacken the four retaining bolts (item 7 fig 37) and slide the complete skewbar to the desired position. If additional adjustment is required then the centre slot in the mounting plate (item 8 fig 37) can be used.

It is worth noting that by turning the barrel (item 1 fig 38) through 180° will increase its life. To do this remove the four retaining bolts (item 2 fig 38) and remove the barrel complete with its inner section (item 3 fig 38). Once the barrel is removed, dismantle the inner section (item 3 fig 38) from the barrel by removing the securing bolts (item 4 fig 38). Turn the barrel and re-assemble the barrel with the inner section (item 3 fig 38). Finally bolt the barrel assembly back onto the spindle. The bolts used are a special patch type bolt and should be replaced after being removed twice or once the locking material on the bolt has become inefficient.

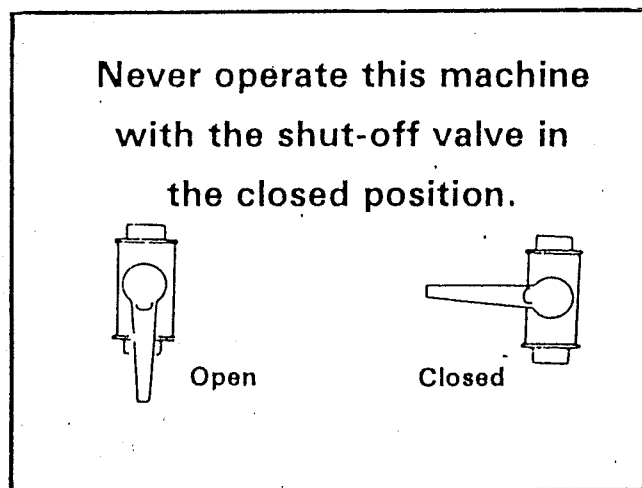
SKEWBAR HYDRAULIC SYSTEM

Each skewbar is driven by a hydraulic motor (item 1 fig 39) being fed from a 18 G.P.M. pump mounted on the rear of the front gearbox via a three way flow divider (item 2 fig 39). The oil to the hydraulic pump is supplied from an oil tank mounted on the harvester. The tank should be filled with H68 Nutro hydraulic oil or equivalent and should always be kept full, especially when storing the machine for long periods of time.

The tank has a removable lid for ease of maintenance to the two strainers located inside the tank at the two outputs. The strainer should be dismantled and cleaned thoroughly at the end of every season.

The replacement filter situated on top of the tank should be renewed at the completion of the first 100 hours of work and then at every 500 hours.

A shut off valve has been fitted to the hydraulic tank to allow the undertaking of any maintenance to the hydraulic system without draining the tank.



When undertaking any maintenance to the hydraulic system, every precaution must be taken to avoid any dirt entering the system.

A pressure relief valve (item 3 fig 39) is fitted to protect the hydraulic system should any blocking occur and is set at a pressure of 2200 P.S.I. Under no circumstances should this valve be tampered with.

