

Standen



STATESMAN
1992 ONWARDS

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INTRODUCTION

This manual provides the information for the adjustment and maintenance of your Standen Statesman, to help you obtain the best results from the machine. Before putting the machine to work, read the 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 terms 'front', 'rear', 'left hand' (LH) and 'right hand' (RH) are derived from the tractor driver's position facing forward and the normal forward direction of travel of the Statesman.

Record below details of your machine in the space provided. Always quote the serial number when ordering spare parts. The serial number of the machine is found on the harvester as shown in fig. 1.

Date Purchased:

Date Started Work:

Serial Number:

Agent's Name:

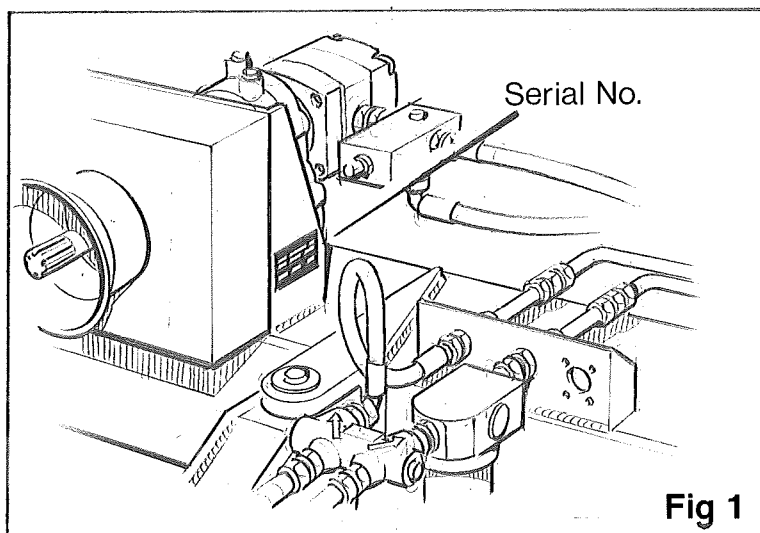
Agent's Address:

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Agent's Telephone No:



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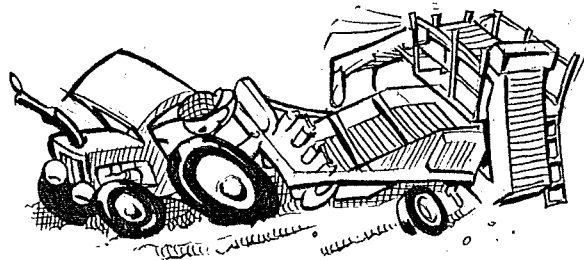
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SAFETY PRECAUTIONS

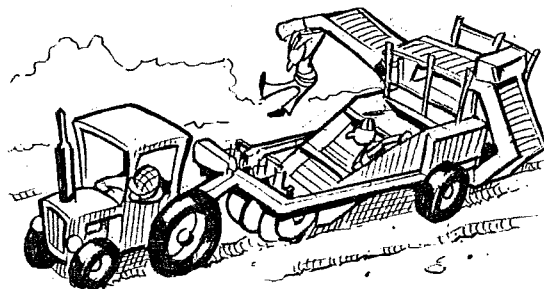
NEVER

Operate the machine in a state of disrepair



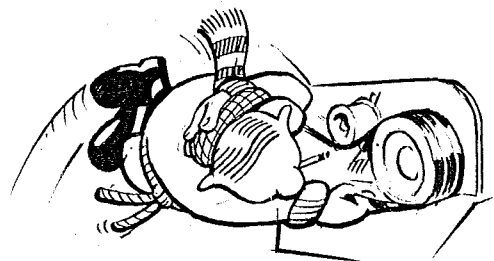
NEVER

Allow anyone especially children to ride on the machine (except on the manned machine where platforms are provided).



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.



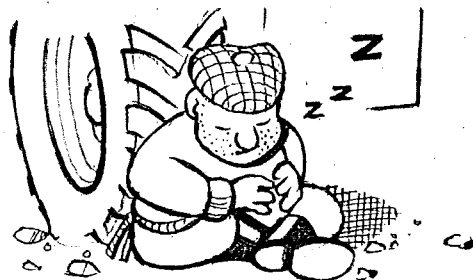
NEVER

Allow children to be in the vicinity where machines are working.



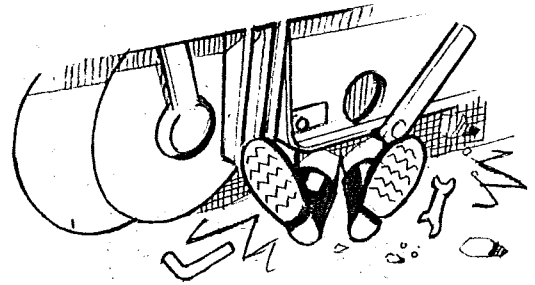
NEVER

Set the machinery in motion before ensuring that every one in the vicinity is aware of your intention.



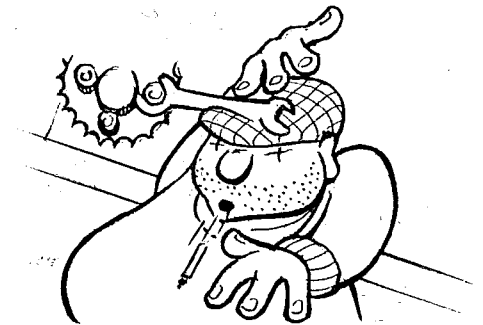
NEVER

Work under the machine when it is in a raised position on the tractor hydraulic lift linkage.



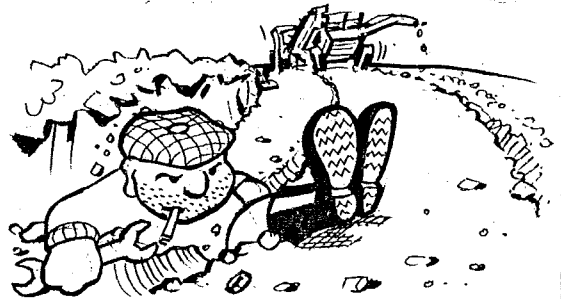
NEVER

Fit drive chains or drive belts while the drive sprockets or drive pulleys are in motion.



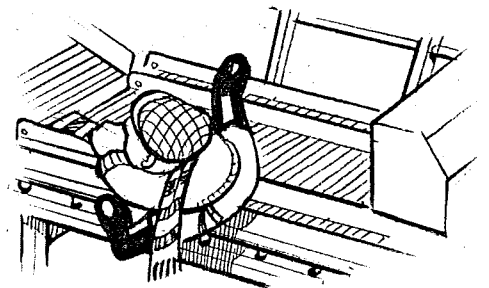
NEVER

Attempt to adjust or clean any part of the machine with the tractor power take-off in motion and always stop the tractor engine.



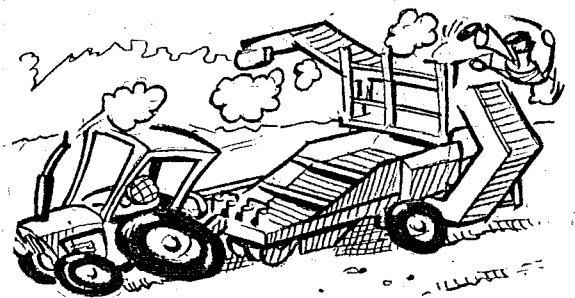
NEVER

Wear loose clothing and always tie back long hair whilst working on the picking area of the machine.



NEVER

Operate machine without giving prior notice to the pickers.



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 specially imposed by English Statute.

INSTALLATION

The Standen Statesman is a two row potato harvester, designed to lift clean and load the potatoes into a trailer running alongside the harvester. The machine basically comes in two forms, a manned machine and an unmanned machine. The manned machine is fully equipped with two platforms giving adequate room for six pickers to work in comfort.

The tractor requirement for the Statesman is 75 HP (unmanned machine) and 90 HP (manned machine) with four wheel drive. In addition the Statesman requires a constant flow (6 gals/min) and return from the tractor hydraulics. All hydraulic rams, with exception of one, operate from the electrical control box. The only hydraulic ram that does not operate from the control box is the drawbar steer ram which is optional. This ram is operated from the tractor hydraulics, therefore the tractor requires a double acting spool valve.

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

Do not reverse or turn at the end of a row unless the digger assembly is in its raised position.

Pay particular attention to the lubrication and maintenance and also pay 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 potatoes. For example, if the crop is grown at 30" row centres, then the distance measured between the tractor tyre centres must be 60" (152.4 cms). This will ensure that the wheels run in the centre line between the rows of potatoes. The instructions for adjusting the 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 WHEELS, PLACE A STOUT SUPPORT UNDER THE TRACTOR FRAME IN CASE THE JACK SHOULD BECOME DISLODGED.

CONNECTING THE HARVESTER TO THE TRACTOR

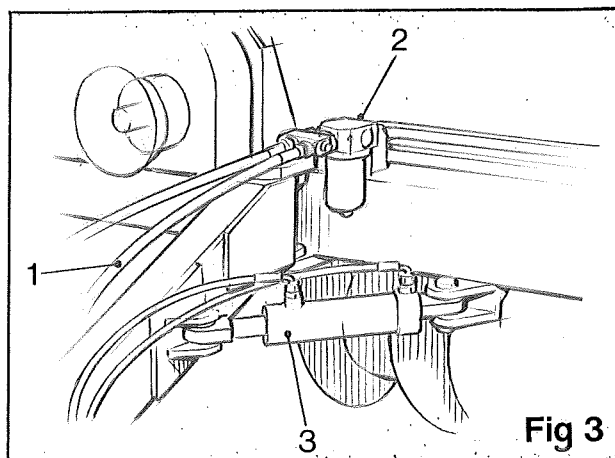
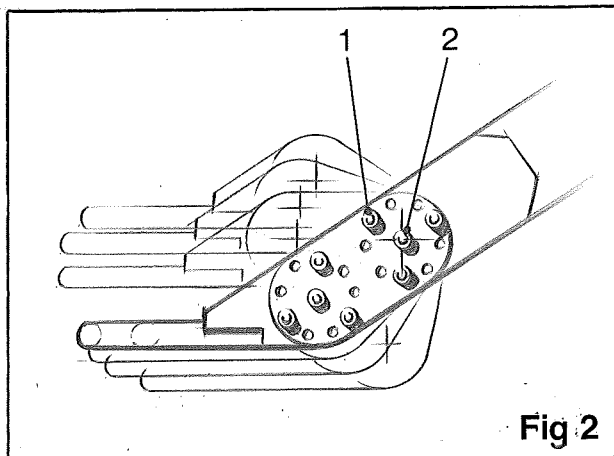
Level the harvester whilst standing it on a firm piece of ground and reverse the tractor up to it. Adjust the drawbar to align with the tractor pick-up hitch ensuring that the towing eye is parallel with the ground.

To adjust the towing eye:-

1. Remove the 12 securing bolts (item 1, fig 2).
2. Slacken the 4 pivot bolts (item 2, fig 2).
3. Adjust the towing eye into one of the seven positions in fig. 2 so that it approximately aligns with the tractor pick-up hitch.

4. Retighten the 4 pivot bolts (item 2, fig 2).
5. Refit the 12 securing bolts (item 1, fig 2).
6. Pick up the harvester on the tractor pick-up hitch.

Once the harvester is attached to the tractor, the electrics and hydraulics have to be connected.



1. Connect the pressure line (item 1, fig 3) (the pipe within line filter (item 2, fig 3)) into the tractor supply line. The tractor must be set up to give a constant oil flow of 6 gals/min.
2. Connect the harvester return line into the tractor return port.
3. Connect the two pipes from the drawbar ram (item 3, fig 3), if fitted, into the double acting spool on the tractor.
4. Situate the control box in a convenient place in the tractor; two magnetic feet are supplied to secure it.
5. With tractor battery disconnected, connect the black lead (-) from the control box to the negative side of the battery and connect the red lead (+) to a positive terminal on the tractor.

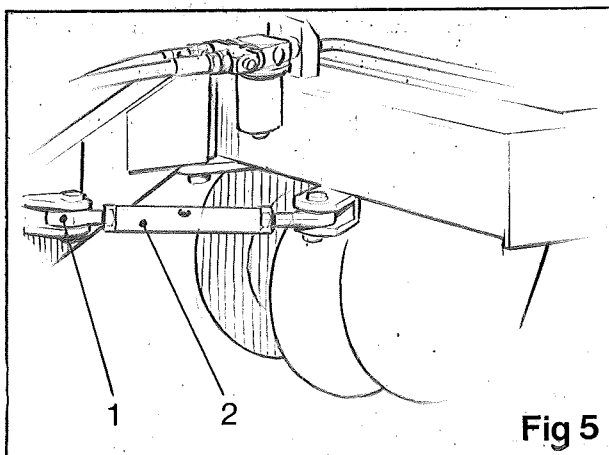
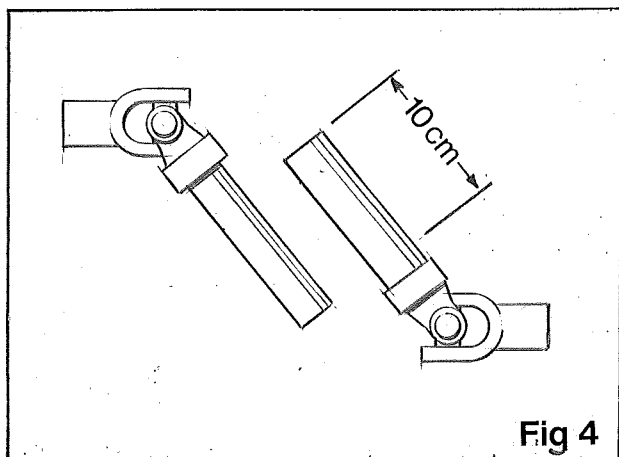
PTO COUPLING TO TRACTOR AND HARVESTER

The PTO 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 harvester respectively.

The male and female shafts can be measured alongside each other and an adjustment made by cutting the surplus bar from both the male and female shafts. At least 4" (10 cms) overlap should be allowed, see fig. 4. After the correct length of the coupling has been obtained, the PTO coupling guard should be cut to correspond with the coupling. Finally, before engaging the PTO, secure the guard by fixing the chain to a convenient place on the harvester.

DRAWBAR

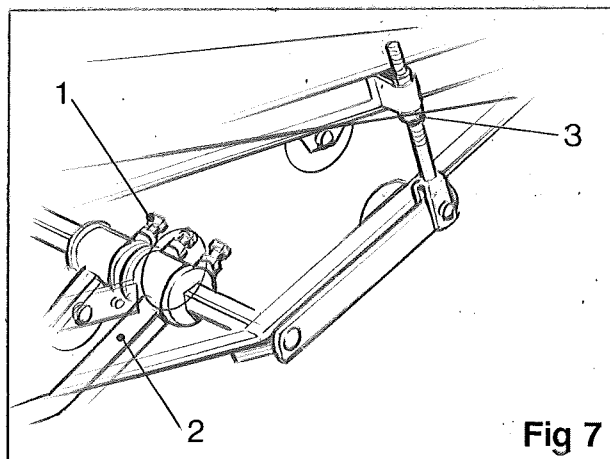
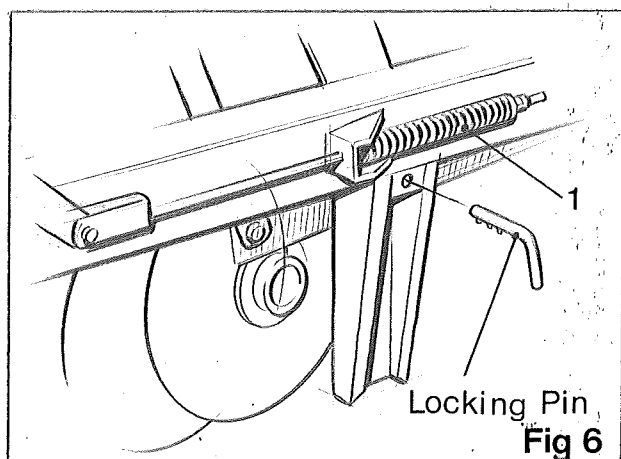
The drawbar is fixed to the machine by a pivot pin, thus enabling the drawbar to pivot. This provides easy manoeuvrability of the harvester to align it with the crop. The adjustment is provided by an adjusting stay (item 1, fig 5) or an optional hydraulic ram. To adjust the drawbar manually, simply turn the bar (item 2, fig 5). To adjust the drawbar hydraulically, actuate the double acting spool on the tractor.



FRONT ASSEMBLY

The front assembly, which includes the main (1st) digger web, digger share, diablo rollers and disc coulters, is hydraulically adjustable for height. To raise or lower the front assembly, move the switch on the control box marked 'Digger shares raise/lower' in the required position.

The front assembly is retained in its raised (transport) position by two locking pins. The locking pins can be removed by turning them through 90°, see fig. 6. Ensure the locking pins are relocated for transport.



SHARES

The digging shares are individually adjustable for 28" (70 cms) to 36" (90 cms) row spacing, with single or triple blade options. To adjust for different row spacing, loosen the securing bolts (item 1, fig 7) and slide the share arms

(item 2, fig 7) along the mounting bar. Once positioned, ensure all securing bolts are retightened. This adjustment is also used to set the width of the three piece shares.

The digging angle of the shares is also adjustable by turning the adjusting nut (item 3, fig 7) on either side of the harvester in the direction required.

DISC COULTERS

The Statesman is fitted with four 64 cms disc coulters, one either side of the digger shares. The discs are designed to cut down and part haulm and weed, whilst simultaneously feeding the ridge onto the 1st sieving web. The discs are adjustable for depth of work and for different row settings. To adjust the discs for depth, loosen the locking bolt (item 1, fig 8) and turn the adjusting screw (item 2, fig 8). Once the required position is obtained, resecure with the locking bolt if required. The locking bolt is fitted so that, if necessary, the disc coulters can be fixed, to stop them from swivelling. To adjust for different row centres, slacken the four retaining bolts (item 3, fig 8) and slide the complete assembly along the support beam (item 4, fig 8) to the required position. The disc coulters can also be adjusted for different row widths by slackening the four retaining bolts (item 3, fig 8) and removing the adjustable tie bar (item 5, fig 8) from the disc arm (item 6, fig 8). Slide the disc assembly to the required position and tighten the retaining bolts (item 3, fig 8). Finally re-assemble the tie bar (item 5, fig 8) with the disc arm. Once assembled, ensure the discs are tracked correctly, ensuring they are parallel with each other. The discs are fitted with scrapers (item 7, fig 8). These must be kept as close to the disc as possible to enable efficient operation.

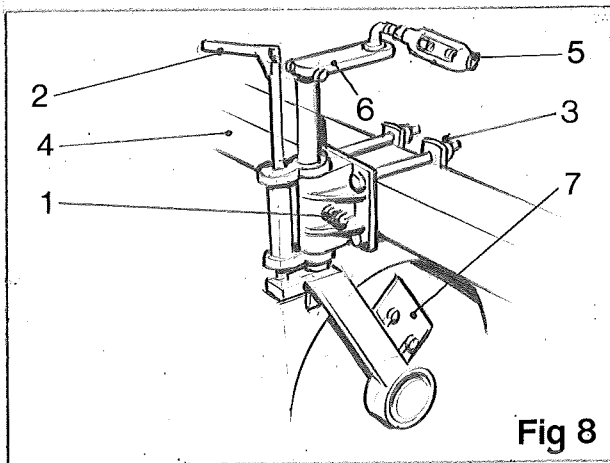


Fig 8

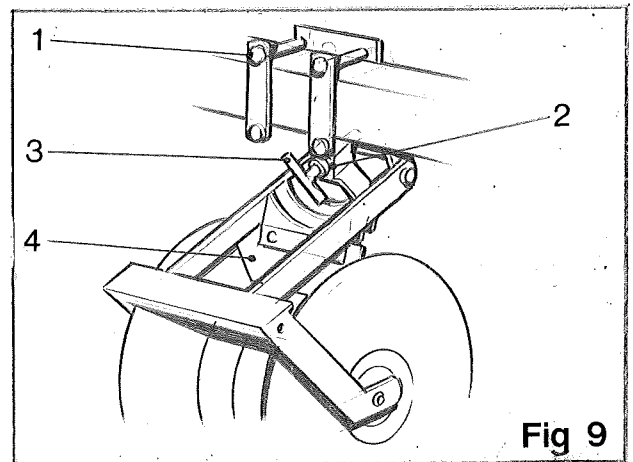


Fig 9

DIABLO ROLLERS

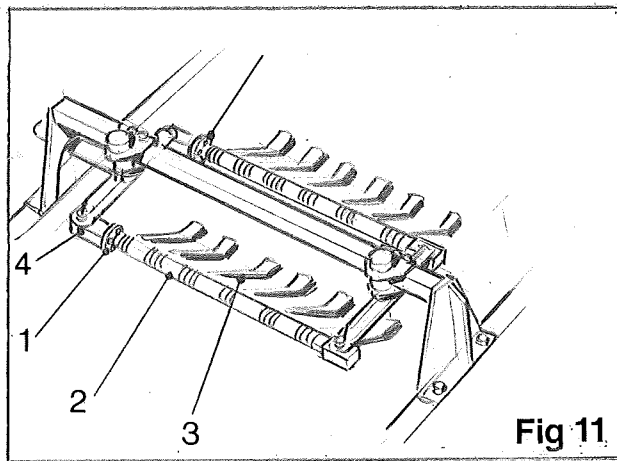
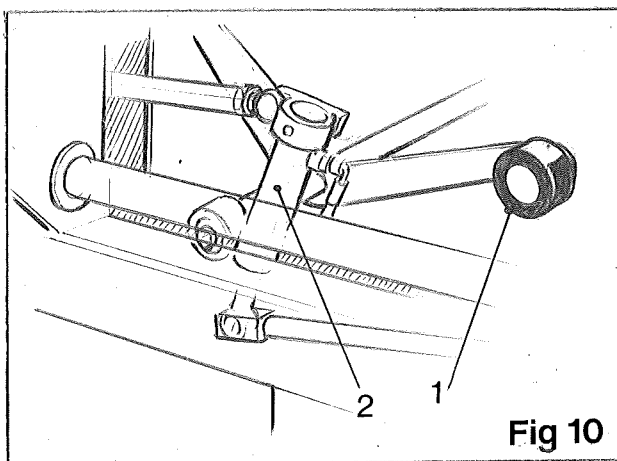
The diablo rollers control the digging depth whilst at the same time ensuring even digging with the help of compensator springs (item 1, fig 6), fitted either side of the harvester. The diablo rollers are adjustable for different row settings and for depth. The row setting adjustment is the same as the disc coulter, by loosening the four retaining bolts (item 1, fig 9). To adjust the depth of the diablo rollers, slacken the lock nut (item 2, fig 9) and turn the adjusting screw (item 3, fig 9) until the rollers are correctly adjusted. Again as the disc coulters, the diablo rollers are fitted with scrapers (item 4, fig 9) and these should be kept as close to the roller as possible.

FRONT ASSEMBLY SETTINGS

As a general rule, heavy and/or stony conditions require shallow digging with the disc coulters set at minimum possible width and depth. The compensator springs should be slackened off enough to allow share penetration. Lighter soil requires deeper and wider width settings of shares and disc coulters to retain the soil. The compensator springs should be adjusted to allow them to transfer the weight of the digger assembly to the main frame.

DIGGER WEB

The digger web is 1,520 mm wide and is available in 28 mm, 32 mm, 36 mm, 40 mm, 45 mm and 50 mm pitches. The separation of soil from the crop can be increased or decreased by altering the movement of the agitator rollers (item 1, fig 10) on both the agitator systems. This adjustment is carried out by actuating a hydraulic ram (item 2, fig 10). To adjust, move the switch on the control box marked 'Agitator' in the required position.



The fitting of a clod sweeping finger kit (optional) will assist in separation. The sweeping clod fingers are fully adjustable for height so enabling the operator to vary the amount of separation. To adjust, remove the four retaining bolts (item 1, fig 11) and pivot the support beam (item 2, fig 11) until the clod fingers (item 3, fig 11) are at the required height to give the desired separation. Once set, re-align two of the holes in the support beam with the two holes in the pivot bracket (item 4, fig 11). Finally, replace all four retaining bolts. Care must be taken not to over separate, as this causes potatoes to roll back down the digger web.

The digger web is driven by two sprockets and a drive chain. The chain is tensioned by a tensioner block (item 1, fig 12). To adjust, loosen the securing bolt (item 2, fig 12) and slide the block to increase or decrease the tension. Once the correct tension has been achieved, resecure the block. Additional adjustment can be obtained by repositioning the securing bolt (item 2, fig 12) into the alternative hole in the tension block (item 1, fig 12).

SAFETY FIRST

BEFORE CARRYING OUT ANY ADJUSTMENTS OR REMOVING ANY GUARDS, SWITCH OFF THE ENGINE OF THE TOW VEHICLE AND APPLY THE HANDBRAKE.

HAULM ROLLER

A haulm removal roller is located behind the digger web.

The roller is adjustable for height and tension. To adjust the height of the roller, turn the handle (item 1, fig 13) in the required directions. A spring (item 2, fig 13) is used to tension the roller. The tension should be such that the roller is pulled back into position after a stone etc., has passed through. Too much tension makes the roller ineffective. To increase or decrease the tension, turn the adjusting nuts (item 3, fig 13).

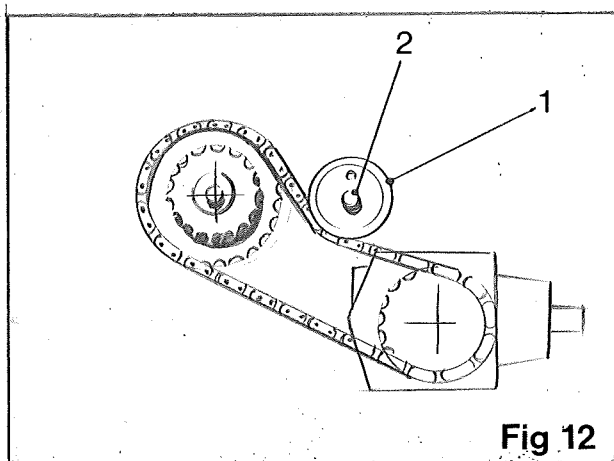


Fig 12

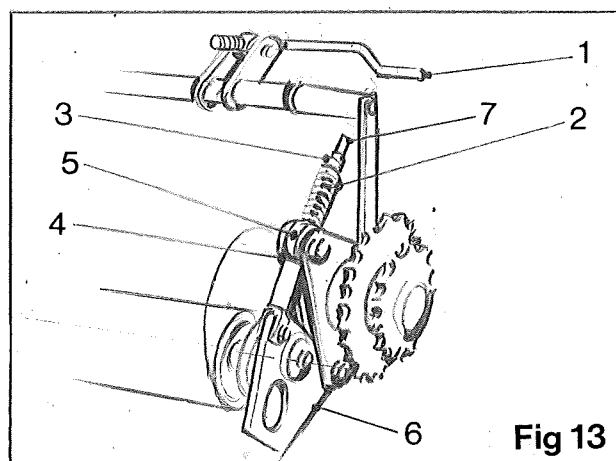


Fig 13

The gap between the roller and the web can be increased or decreased to allow for different field conditions.

The roller is factory set to be as close to the web as possible. If any adjustment is required, add shims between the stop (item 4, fig 13) and the spring boss (item 5, fig 13).

To add shims, remove the two adjusting nuts (item 3, fig 13) and the spring (item 2, fig 13) whilst simultaneously supporting the bottom of the mounting plate (item 6, fig 13). This operation is necessary on both ends of the haulm roller. Once the lock nuts and springs are removed, allow the mounting plate to swing down thus pulling the spring rod (item 7, fig 13) from the spring boss (item 5, fig 13). Add the shims and re-assemble. The position of the roller in relation to the webs is dependant on the crop conditions. The higher or further away the roller is positioned determines how much haulm and clod is taken out. If the roller is set too high or a too larger gap exists, then there is a possibility that small potatoes will be lost.

Weighted haulm guides (item 1, fig 14) are fitted to guide haulm into the haulm roller. They can be adjusted by slackening the retaining bolt (item 2, fig 14) and pivoting the adjusting bar (item 3, fig 14) to the required position.

CLEANER FEED WEB

The cleaner feed web has rubber covered web bars to protect the crop and is fitted with a drop-away link to allow out any unwanted stones and clods etc. The function of the feed web is to transfer the crop from the digger web onto the cleaner unit.

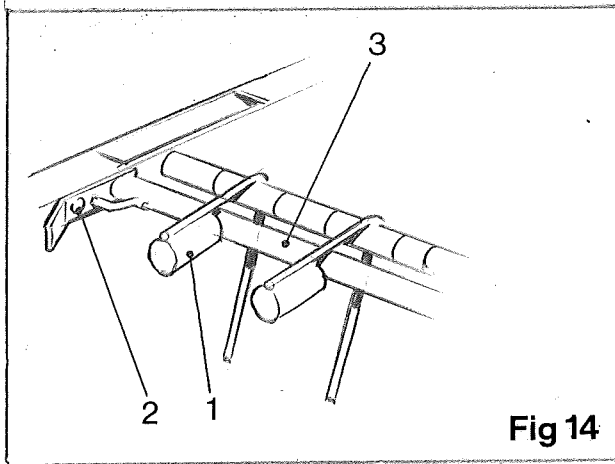


Fig 14

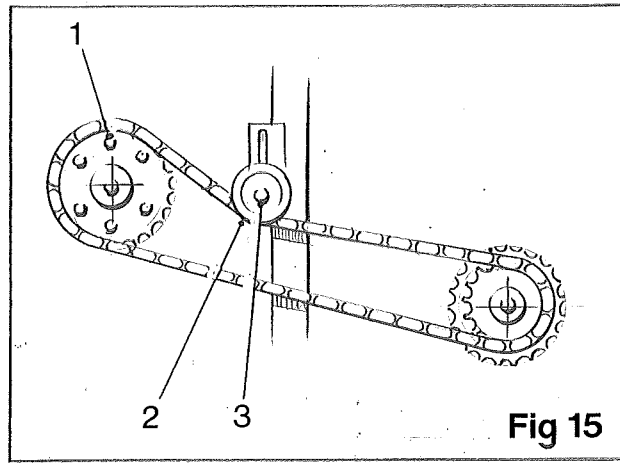


Fig 15

The feed web is chain driven via a slip clutch, which is fitted to prevent serious damage should any blockage occur. The amount of torque required to start the clutch slipping can be varied by turning the nuts (item 1, fig 15). The clutch should be set to just drive without slipping under normal conditions. Over-tightening of the adjustment nuts will render the clutch ineffective. Care should be exercised to ensure all six locknuts are adjusted equally. This is easily achieved by adjusting each nut one flat at a time. The feed web drive is taken from the digger web drive shaft via two sprockets and a drive chain. The chain is tensioned by a roller (item 2, fig 15). To tension the chain, slacken the bolt (item 3, fig 15) and slide the roller as required.

ROLLER CLEANER UNIT

The roller cleaner unit consists of sixteen rubber rollers mounted on solid steel shafts which are supported on taper roller bearings within the gear casing. They are unrestricted at the discharge end to eliminate the possibility of blockage from loose top and stone. The rollers are driven by a gear train, each pair of rollers contra-rotating to trap loose clod, stone and trash, and eliminate them from the sample.

The gear train is driven by two hydraulic motors powered by an independent hydraulic pump mounted on the harvester and PTO driven. The unit is designed to automatically reverse the roller direction for a few revolutions to release any object which cannot pass between the rollers, and then return the drive to the normal contra-rotating direction.

CLEANER ROLLERS SPEED CONTROL

The hydraulic pump (item 1, fig 16) produces 21 imperial gallons/minutes flow at 540 rpm PTO speed. This flow ^{allows} for a maximum speed of the rollers of 420 rpm.

By rotating the dial knob on the flow divider (item 2, fig 16) mounted on the front frame beam, this speed can be varied; the lower the number on the dial relative to the marker, the slower the speed of the rollers.

In general, the slower the roller speed, the longer the crop is on the table and the greater the separation. However, especially with very small potatoes, if the rollers are slowed too much then it is possible that potatoes will also be taken out with the trash. The speed setting is therefore very much determined by the crop and field conditions.

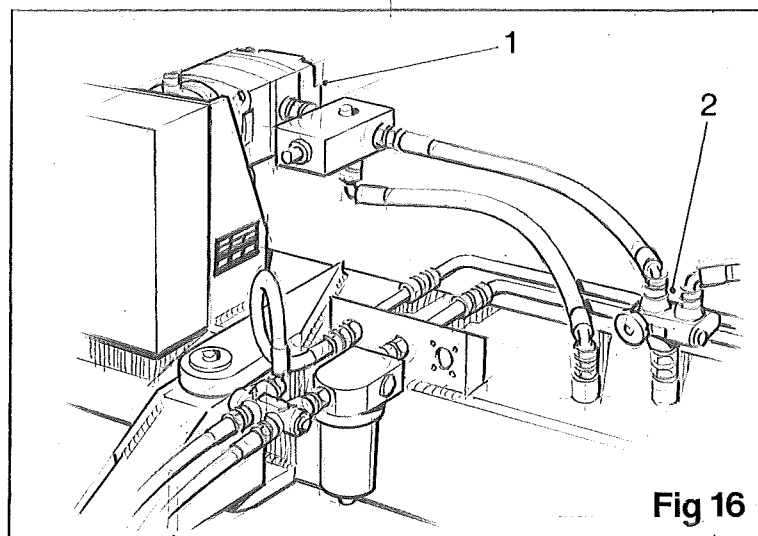


Fig 16

CLEANER ANGLE

The angle of the cleaner can be adjusted hydraulically from the cab control box using the switch marked 'Cleaner'. The shallower the angle of the cleaner, the more separation takes place. By combining the speed control and the cleaner angle adjustments, suitable settings for optimum results in all field conditions can be achieved.

GUARDS

WHEN IN OPERATION, IT IS VERY IMPORTANT TO ENSURE ALL GUARD ARE IN PLACE. THESE ROLLERS CAN CAUSE SERIOUS OR FATAL INJURY IF IN CONTACT WITH LIMBS.

ROLLER CHANGING

The cleaner is fitted with two types of roller, a 3 3/4" dia. roller with a 6" pitch spiral and a plain rubber roller. The plain rubber roller can be supplied in two sizes, 3 1/4" dia. where very small tubers need to be retained, or 2 15/16" dia. where maximum cleaning on heavy, wet soils is required with mature crops.

The rollers are retained on the steel shafts by a single bolt (item 1, fig 17) at the discharge end, and located on a spigot at the gearbox end. To remove a roller, remove the bolt (item 1, fig 17) and slide the roller off the discharge end of the shaft. The rollers are a close fit on the spigot and may need to be prised off the spigot in some cases. Replacement is the reversal of removal.

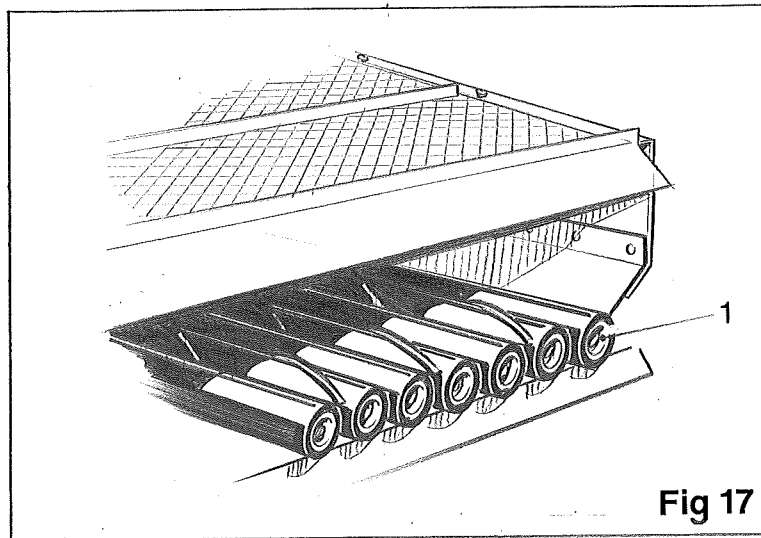


Fig 17

DISCHARGE ELEVATOR/'C' ELEVATOR FEED WEB

The elevator feed web transfers the crop from the roller cleaner unit to the discharge elevator (unmanned machines)/'C' elevator (manned machines). The feed web drive is taken from the discharge elevator/'C' elevator lower drive shaft via two sprockets and a drive chain. To adjust the tension of the drive chain (item 1, fig 18), slacken the securing bolt (item 2, fig 18) and slide the nylon tensioner block (item 3, fig 18) in the required direction. Finally, retighten the securing bolt.

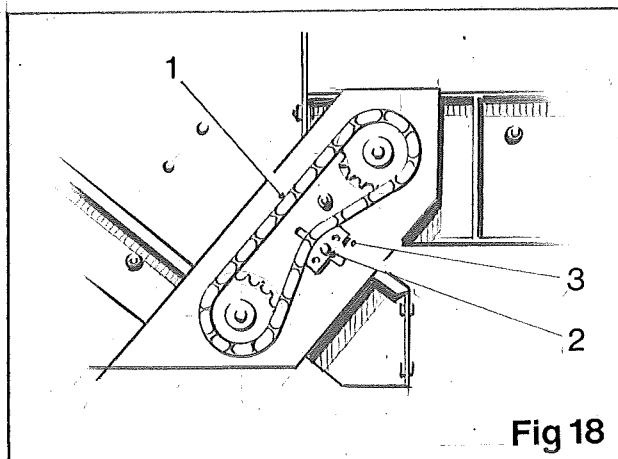


Fig 18

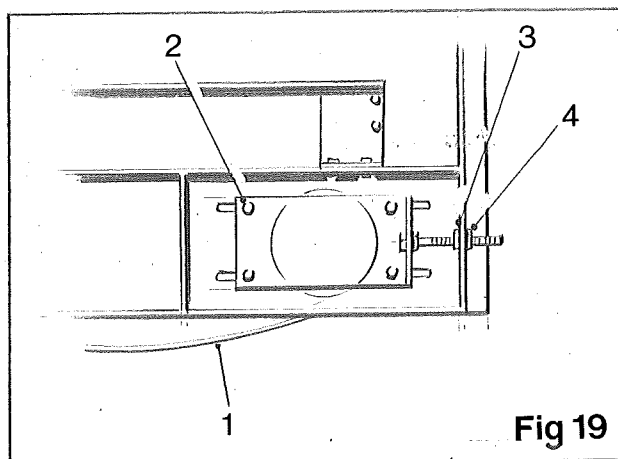


Fig 19

Adjustments in tension and tracking of the elevator feed web (item 1, fig 19) can be made by loosening the retaining bolts (item 2, fig 19) and the lock nut (item 3, fig 19) and then turning the adjusting nut (item 4, fig 19). Adjust both sides equally to ensure the web runs centrally in the frame.

DISCHARGE ELEVATOR

The discharge elevator is designed to provide easy folding from the working position to the transport position and vice-versa.

To operate the discharge elevator, move the switch on the control box marked 'Discharge elevator in/out' in the required direction. The swan neck can also be adjusted hydraulically to provide even filling of the trailer and keep the drop of the potatoes to a minimum. To adjust, move the switch on the control box marked 'Discharge elevator raise/lower' in the required direction.

The discharge elevator web is driven by a hydraulic motor and is equipped with soft rubber flights to minimise potato damage. To engage or disengage the discharge elevator drive, push the switch on the control box marked 'Discharge elevator engage/disengage' in the required direction.

The discharge elevator drive chain can be adjusted for tension by loosening the retaining bolt (item 1, fig 20) and sliding the wooden tensioner block (item 2, fig 20) in the required direction.

On the Unmanned machine, the speed of the feed and discharge elevator webs can be varied to suit crop conditions. To adjust the speed of the webs, turn the control knob on the flow divider situated at the rear left hand side of the machine. The higher the number, the faster the webs will travel.

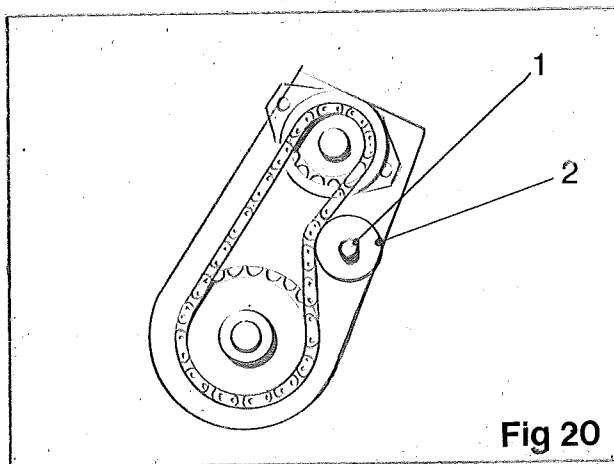


Fig 20

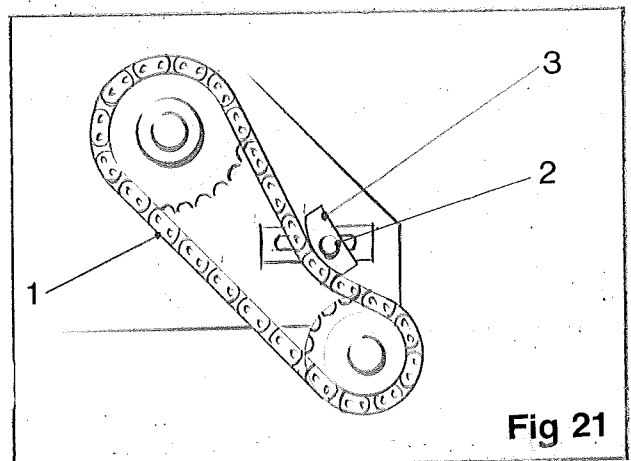


Fig 21

'C' ELEVATOR (MANNED MACHINES ONLY)

The 'C' elevator is designed to transfer the potatoes from the elevator feed web to the picking table. The 'C' elevator, like the discharge elevator, is hydraulically driven and has soft rubber flights to minimise potato damage.

The 'C' elevator drive chain (item 1, fig 21) can be adjusted for tension by loosening the retaining bolt (item 2, fig 21) and sliding the nylon tensioner block (item 3, fig 21) in the required direction. Finally, retighten the retaining bolt.

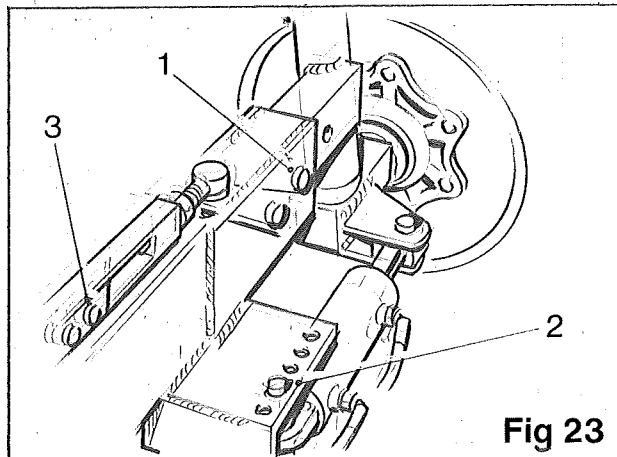
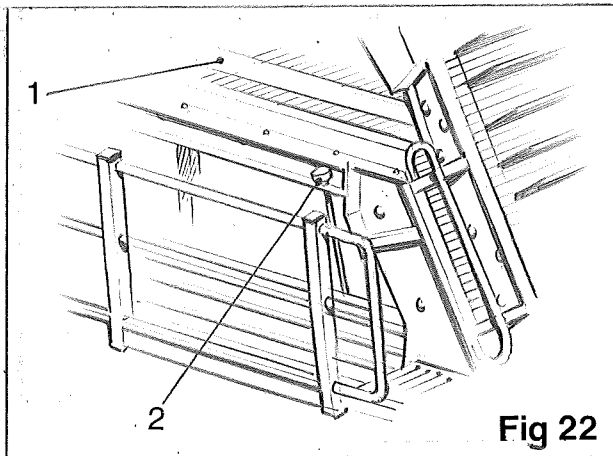
PICKING TABLE

A double platform allows up to six pickers to work in comfort; three either side of the picking table. Two wooden rails (item 1, fig 22) are positioned above the picking web so providing the pickers with two moving reject belts. On the manned machine, the 'C' elevator, picking table and discharge elevator are all hydraulically driven and can be varied in speed to suit the crop conditions. To adjust the speed of the elevators, turn the control knob (item 2, fig 22) situated on the front platform near the steps. The higher the number, the faster the web will travel. Picking table drive chain adjustment is identical to 'C' elevator drive adjustment.

WARNING

CARE MUST BE TAKEN AT ALL TIMES WHEN WORKING ON MOVING MACHINERY.

NEVER WEAR LOOSE CLOTHING AND ALWAYS ENSURE THAT LONG HAIR IS TIED BACK. PEOPLE WORKING ON THE HARVESTER MUST BE AWARE OF THE TRACTOR DRIVERS INTENTIONS.



REAR AXLE

The rear wheels are steerable to assist with hillside work and also enable easier headland turning. Operation of the rear wheels is controlled from the tractor mounted control box. To steer the rear wheels, simply move the switch on the control box marked 'Axle steering' in the direction required. The switch marked 'Centre steering' enables the operator to centralize the rear wheels automatically.

The rear wheels are adjustable for different row settings varying from 71 cm (28") to 91 cm (36").

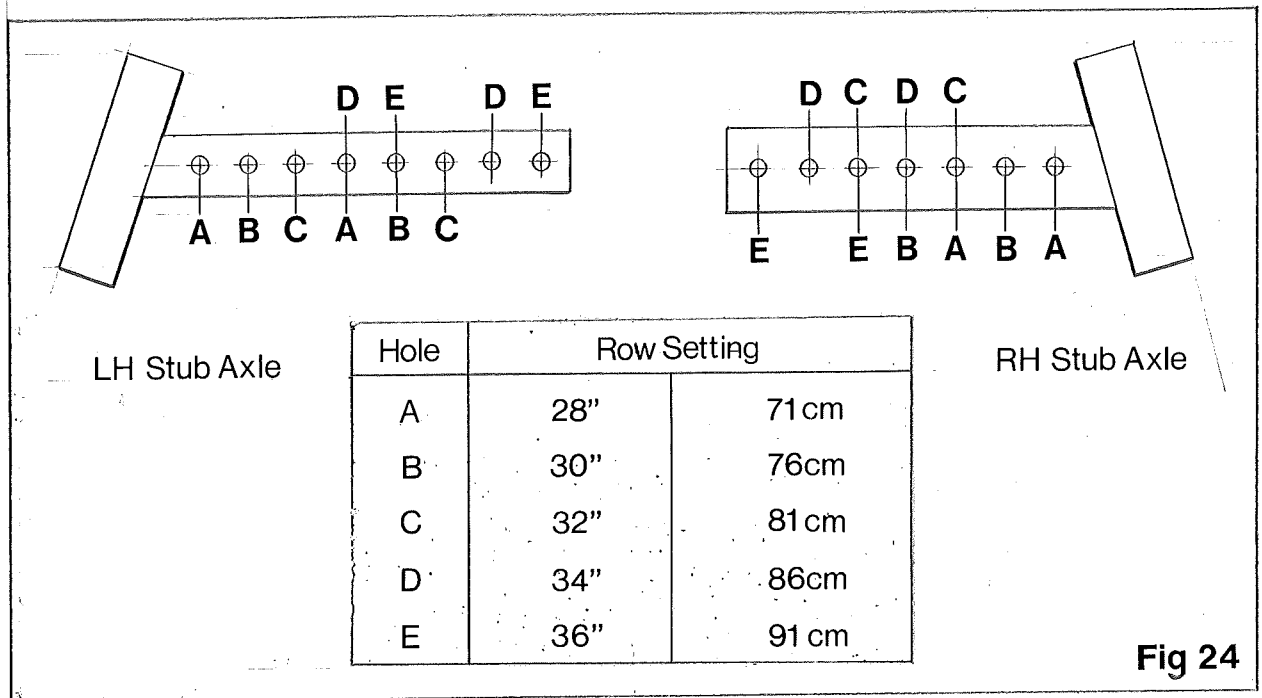
SAFETY FIRST

WHEN CARRYING OUT WHEEL ADJUSTMENTS TAKE CARE TO PLACE THE JACK ON FIRM GROUND UNDER A SOLID PART OF THE HARVESTER. BEFORE REMOVING A WHEEL, PLACE A STOUT SUPPORT UNDER THE HARVESTER FRAME IN CASE THE JACK SHOULD BECOME DISLODGED.

To adjust:-

1. Jack up machine.
2. Remove axle bolt (item 1, fig 23).
3. Remove ram bolt (item 2, fig 23).
4. Remove retaining bolt (item 3, fig 23).
5. Slide stub axles to required position (see fig. 24).
6. Reposition all bolts in correct holes (see fig. 24) and retighten.

The rear axle has been designed so that the angle of the machine can be altered in relation to the axle by a hydraulic ram. To adjust, move the switch on the control box marked 'Machine levelling' in the required direction.



MECHANICAL DRIVES

The various mechanical drives involved in the operation of the Standen Statesman consist of chains, sprockets, pulleys and belts. Each drive belt or chain has its own tension adjustment. The belts and chains should be tensioned correctly to ensure efficient working of the machine. It is important that the drive chains and belts are not overtightened, as this will cause excessive chain and sprocket wear. Instructions for the adjustment of each individual drive chain is explained in the paragraph relating to that assembly.

CAUTION

ALL REVOLVING DRIVE MACHINERY, CHAINS, SHAFTS 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 PTO SHAFT AND SET THE HANDBRAKE. FAILURE TO OBSERVE THE ABOVE PRECAUTION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

MAIN DRIVES

The main drive is taken from the tractor PTO to a centrally mounted gearbox (item 1, fig 25) by a universal coupling shaft. (This shaft should be checked occasionally to ensure that the inner and outer tubes can slide freely. Binding up the tubes will cause premature failure of the gearbox input bearings). A hydraulic pump (item 2, fig 25) driven from the 1:3 ratio gearbox (item 1, fig 25) provides the necessary hydraulic oil pressure to drive the roller cleaner unit (see Roller Cleaner Hydraulic System). The drive is then taken from the gearbox input shaft by two triple pulleys and triple vee belt to the main drive shaft. Besides providing a drive, vee belts also act as a slip clutch. It is therefore 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 adjust the vee belt, loosen the retaining bolt (item 3, fig 25). Once the correct tension has been achieved, resecure by tightening the bolt.

The main drive shaft transfers the drive to a gearbox mounted on the RH side of the machine. The gearbox should be checked regularly and topped up if necessary with EP90 gear oil. From the gearbox the drives are transferred both forwards to drive the agitators, and backwards to drive the digger web and cleaner feed web.

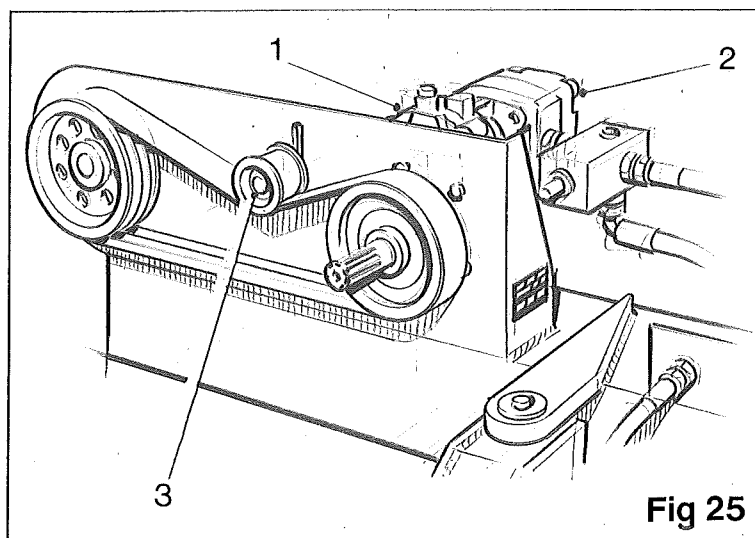


Fig 25

SPLIT SPROCKETS

Split sprockets are used on the Statesman digger web drive shaft (standard web drive only). These sprockets have been designed to simplify maintenance work. Rather than dismantling a complete drive assembly, the sprockets can be split and removed from the shaft as described:-

Sprocket Removal

1. Loosen the fixing bolts (item 1, fig 26) and remove.
2. Using a hammer and chisel, split the sprocket along the groove provided (fig. 26).
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 26).
3. Locate both halves on the shaft and secure using the fixing bolts (item 1, fig 26).

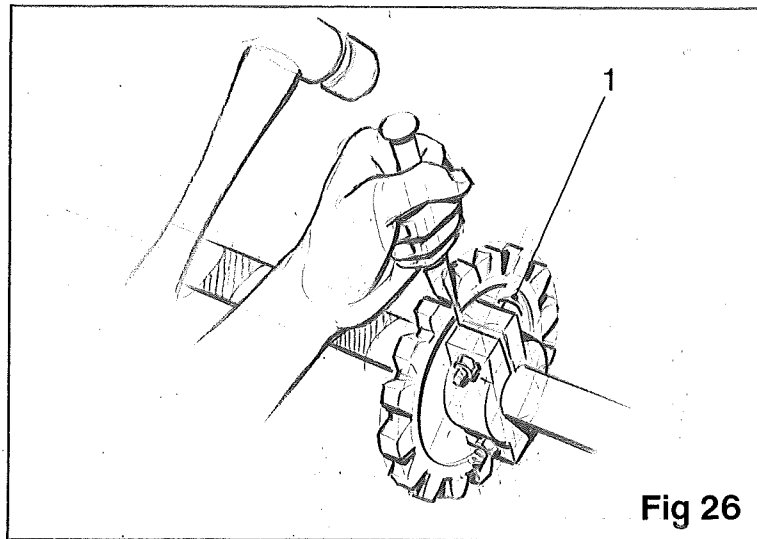


Fig 26

ELECTRICAL CONTROL SYSTEM

Control for the eight major functions of the Statesman is provided by the switches mounted on top of the remote control box (fig. 27). Seven of these functions are operated by actuating individual hydraulic rams; the rams being actuated by a bank of solenoid valves (item 1, fig 28). The remaining function operated from the control box is the engagement of the various hydraulic drives. These drives are controlled by the switch marked 'Discharge elevator engage/disengage'. This switch energises an on/off valve (item 2, fig 28) which in turn permits a flow of oil to the motors.

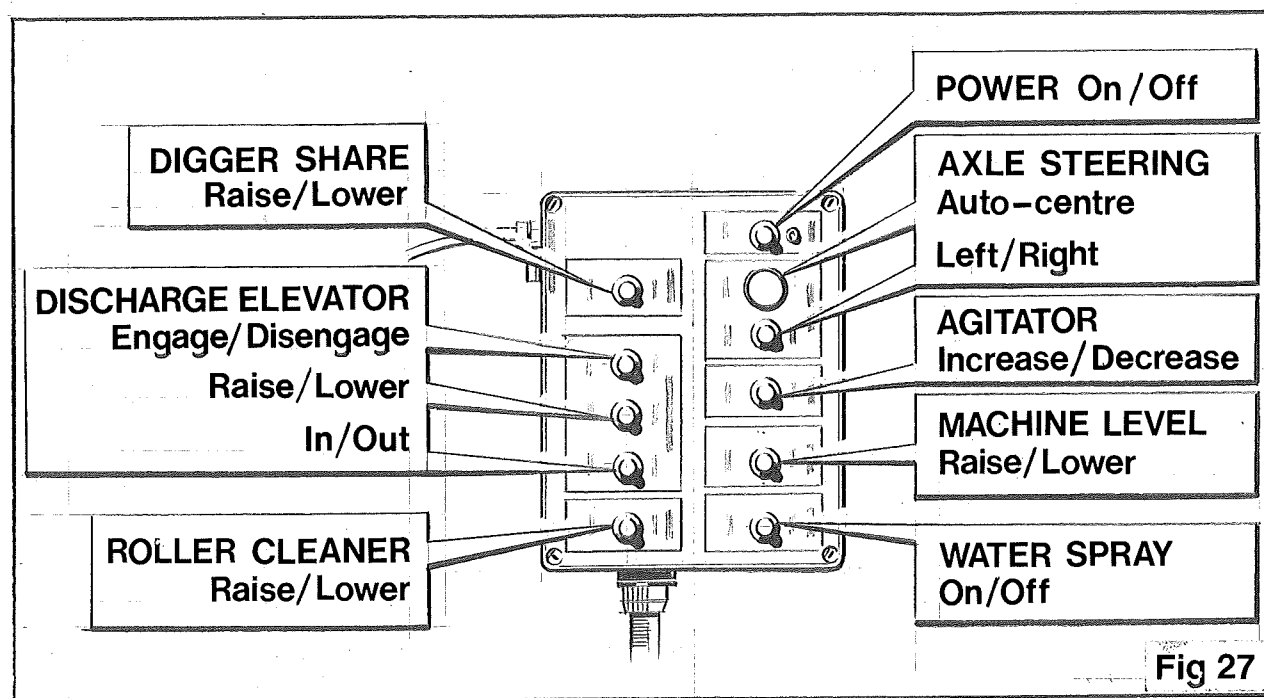
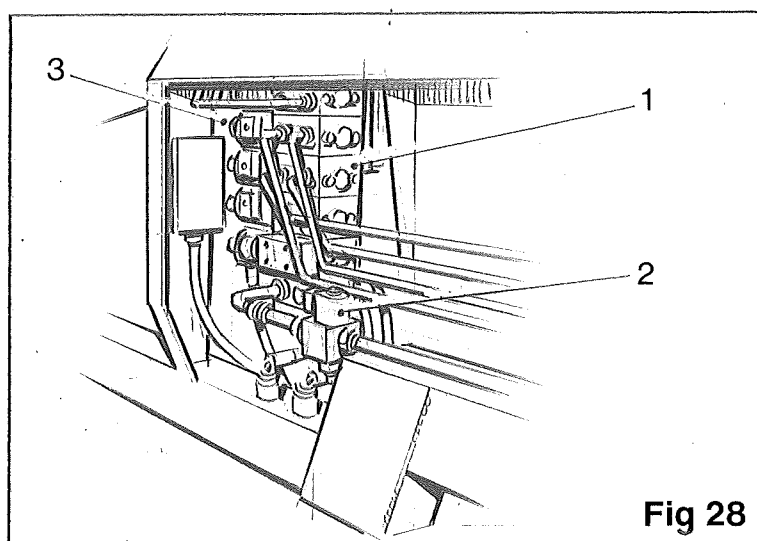


Figure 27 shows the remote control box and the functions its operates. An electrical circuit diagram is shown in fig 33.



ALWAYS DISCONNECT THE CONTROL BOX FROM THE TRACTOR WHEN NOT IN USE, SO AVOIDING THE POSSIBILITY OF DRAINING THE BATTERY.

For installation of the control box see section headed 'Connecting the Harvester to the Tractor'.

HYDRAULIC SYSTEM

The hydraulic oil to operate the rams, and the discharge elevator, picking table and 'C' elevator motors is supplied directly from the tractor (for Roller Cleaner Motor Circuit see 'Cleaner Hydraulic System'). A schematic hydraulic layout is shown in fig. 34 depicting the main items of the hydraulic system. Control for the hydraulic system is provided electrically from the tractor mounted control box and is described separately. The only item requiring any maintenance is the pressure line filter (item 1, fig 29). When the indicator (item 2, fig 29) is pointing to the red segment, then the element (item 3, fig 29) will need replacing. To replace the element, simply unscrew it from the bottom of the filter assembly.

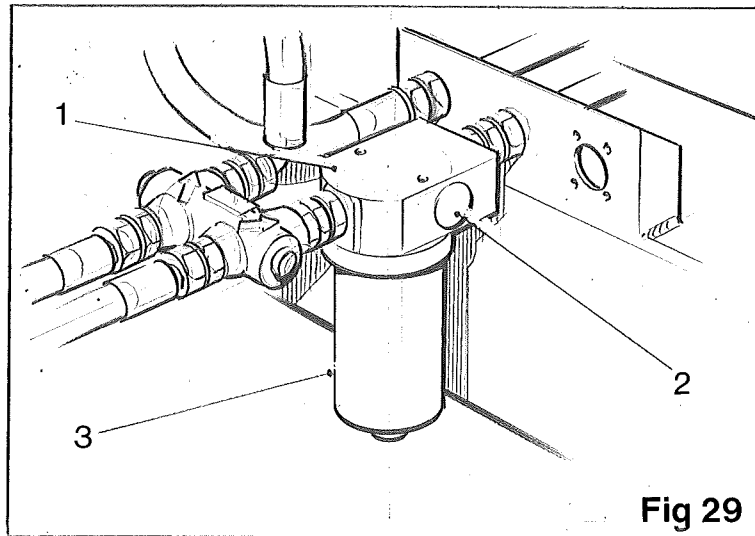


Fig 29



WARNING:

HYDRAULIC PIPES AND FITTINGS MAY BE UNDER PRESSURE WITH THE MACHINE AT REST. ENSURE THAT ALL RESIDUAL PRESSURE IS RELEASED BEFORE DISCONNECTING ANY PIPEWORK.

CLEANER HYDRAULIC SYSTEM

The hydraulic pump (item 1, fig 30) produces 21 imperial gallons/minute flow at 540 rpm PTO speed. The pump is mounted on the front beam of the main frame and is driven directly from the PTO shaft from the tractor. The oil reservoir is integral within the front and LH side frame members of the main frame and contains 32 gallons of hydraulic oil (Nuto 46 Centistroke oil). The level is checked by a dipstick fitted within the filler/breather unit (item 2, fig 30) mounted on the front frame beam. THIS MUST NEVER BE ALLOWED TO DROP BELOW THE RED MARK.

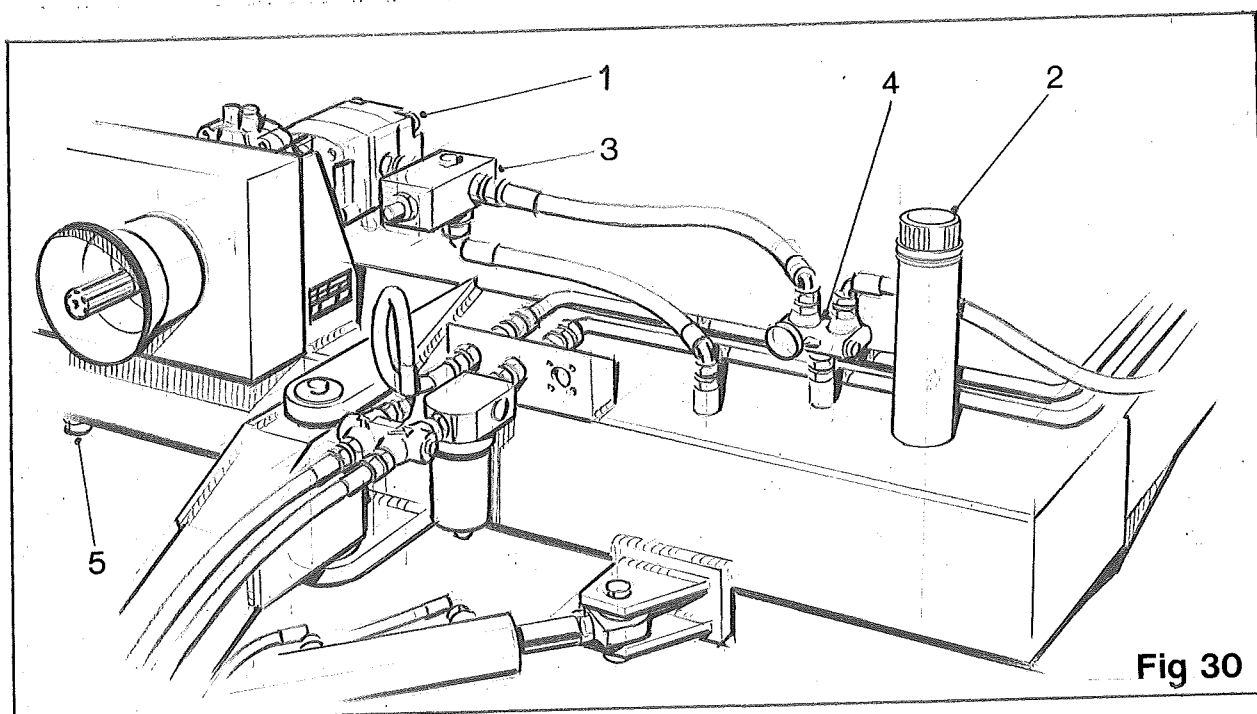
Pressurised oil passes through the system relief valve (item 3, fig 30) mounted on the pump to a variable flow divider (item 4, fig 30) which controls the speed of the cleaning motors. The use of this control is described in the section titled 'Cleaner Rollers Speed Control'.

The pressurised oil then passes through the reversing valve unit (item 1, fig 31). This unit is designed to automatically reverse the roller direction for a few revolutions to release any object which cannot pass between the rollers, and then return the drive to the normal contra-rotating direction. The return oil from the motors passes back

through the reversing valve unit and is filtered through a 25 micron in-line filter (item 2, fig 31) mounted under the main frame beam, before returning into the main frame reservoir. This filter is fitted with a gauge, and should be changed if the red mark shows. A schematic hydraulic layout is shown in fig. 35.

REVERSING VALVE UNIT

The reversing valve unit (item 1, fig 31) is mounted on a bracket to the side of the main web side and is fully automatic in its operation. The reversing is actuated by a sequence valve (item 3, fig 31) which is mounted on the top of the reversing valve block. When an object starts to block the rollers, the operating pressure increases to the preset pressure of the sequence valve. Once this pressure is reached, the valve reverses the motors for a preset time; this time being controlled by a small bleed screw (item 4, fig 31) mounted beneath the valve block. This is factory set and should not need altering.



To increase the delay period, the bleed screw (item 4, fig 31) is screwed in, but care should be taken not to screw in fully as this will cause the rollers to stay in reverse.

The sequence valve is preset at the factory to operate at 1450 psi. In exceptionally stony or trash conditions, this setting may need to be increased to avoid the cleaner reversing too often. The pressure is increased by slackening the locknut (item 5, fig 31) screwing the top screw (item 6, fig 31). This MUST be done with a pressure gauge and throttle valve fitted between the pressure port of the reversing valve and the tee connection which separates the oil flow to the two motors. Should this equipment not be available, then consult your dealer.
THE SEQUENCE VALVE SETTING MUST NEVER EXCEED 1800 PSI.

Should the occasion arise that a blockage occurs where the object jams the rollers such that the motors cannot reverse, then the PTO MUST be disconnected from the drive to the pump and then the object removed manually from the cleaner.

PRESSURE RELIEF VALVE

CAUTION

THE PRESSURE RELIEF VALVE (ITEM 3, FIG 30) IS FITTED TO PROTECT THE HYDRAULIC SYSTEM SHOULD ANY MAJOR BLOCKAGE OCCUR. IT IS AN ESSENTIAL SAFETY FEATURE PRESET AT THE FACTORY AND SHOULD NEVER BE TAMPERED WITH.

MAINTENANCE

The components utilized in the design of the hydraulic systems have been chosen for their maintenance-free characteristics. The only components requiring maintenance are the following:-

FILTERS (item 1, fig 29 and item 2, fig 31):

When the indicator is pointing to the red, the filter elements will need replacing.

AFTER THE FIRST 50 HOURS RUNNING:

Replace filter elements.

EVERY 500 HOURS/END OF EVERY SEASON:

Replace filter elements.

Drain the hydraulic oil reservoir and clean magnetic plug (item 5, fig 30). Refill with Nuto 46 Centistroke oil (32 gallons).

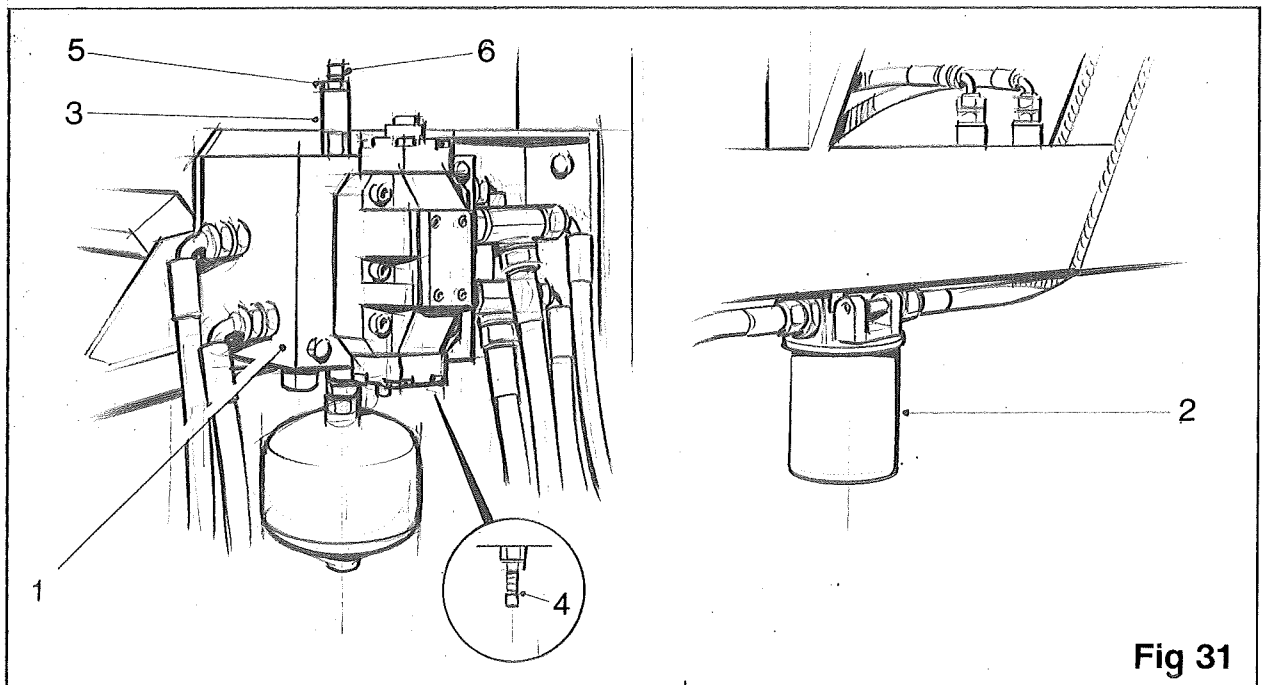


Fig 31

WARNING

WHEN CARRYING OUT ANY MAINTENANCE ON THE HYDRAULIC SYSTEM, CLEANLINESS IS OF THE UTMOST IMPORTANCE. AVOID ANY DIRT ENTERING THE SYSTEM.

MAINTENANCE AND LUBRICATION

Regular maintenance will ensure that the Standen Statesman 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.

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

A general purpose grease should be used for the bearings and the universal coupling drives.

NOTE: With reference to fig. 32 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 is required.

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

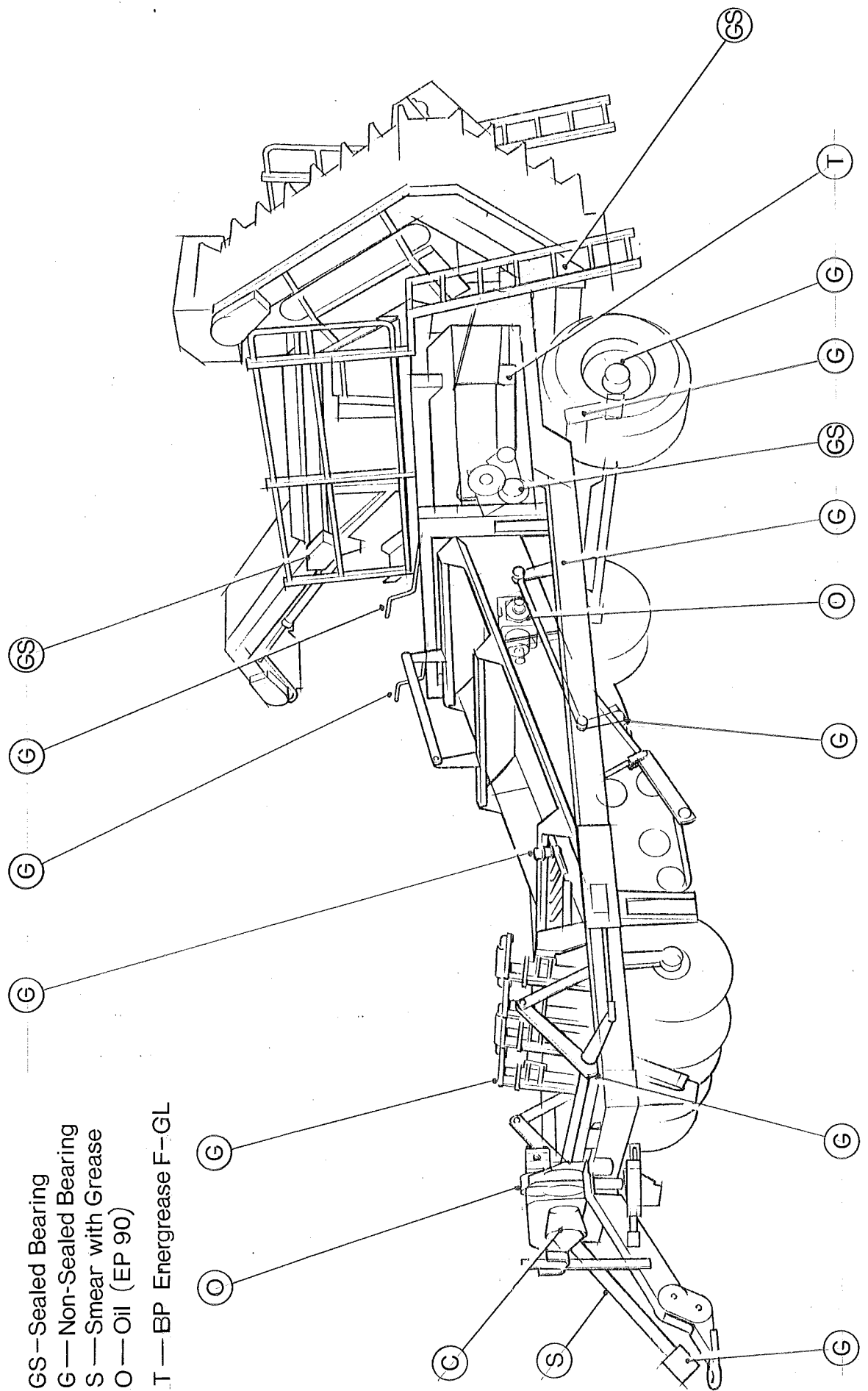
Particular care must be taken to ensure that the grease or oil does not come into contact with the vee belts.

Grease points requiring individual quantities of lubrication will be found on the lubrication point chart, fig. 32.

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

The gearbox (Ref. O) should be checked regularly and topped up with EP90 gear oil as necessary.

The cleaner unit gearbox (Ref. T) should be checked regularly and topped up with BP Energrease F-GL as necessary.



GS—Sealed Bearing
 G—Non-Sealed Bearing
 S—Smear with Grease
 O—Oil (EP 90)
 T—BP Energrease F-GL

Fig 32

ELECTRICAL CIRCUIT

(MACHINES PRIOR TO SERIAL No WSU/M 118)

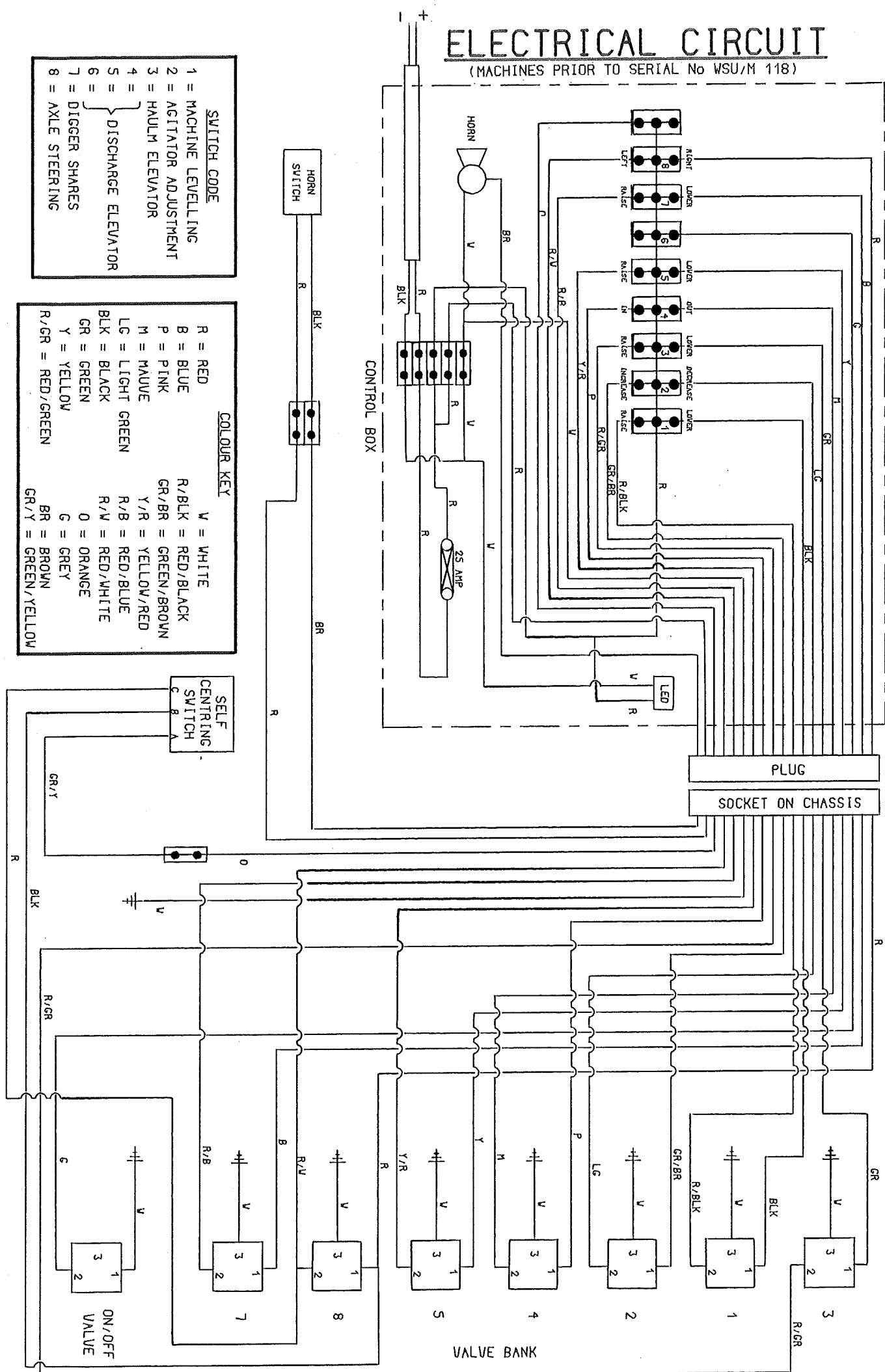


Fig 33A

ELECTRICAL CIRCUIT

(MACHINES FROM SERIAL No WSU/M 118)

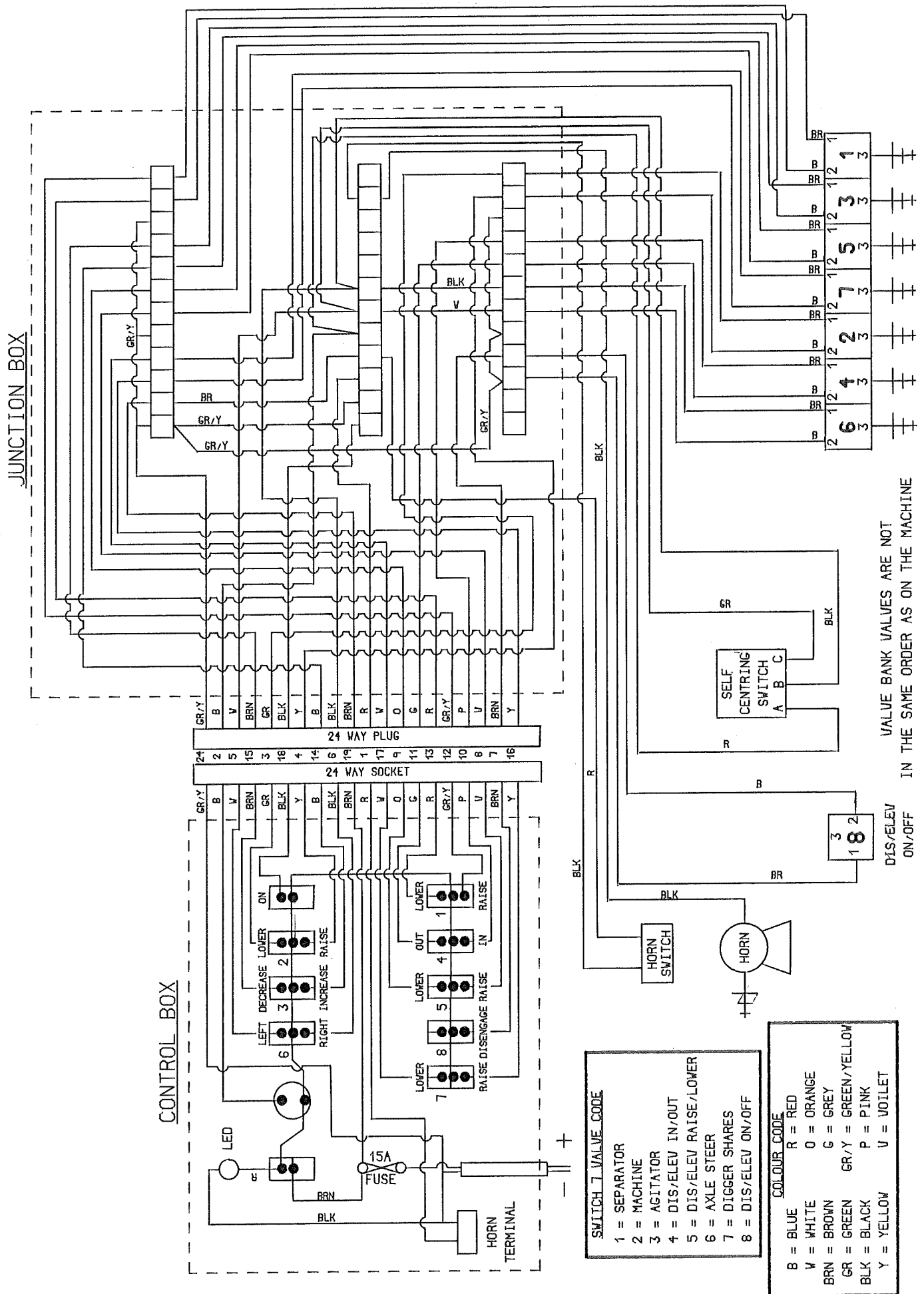


Fig 33B

HYDRAULIC CIRCUIT

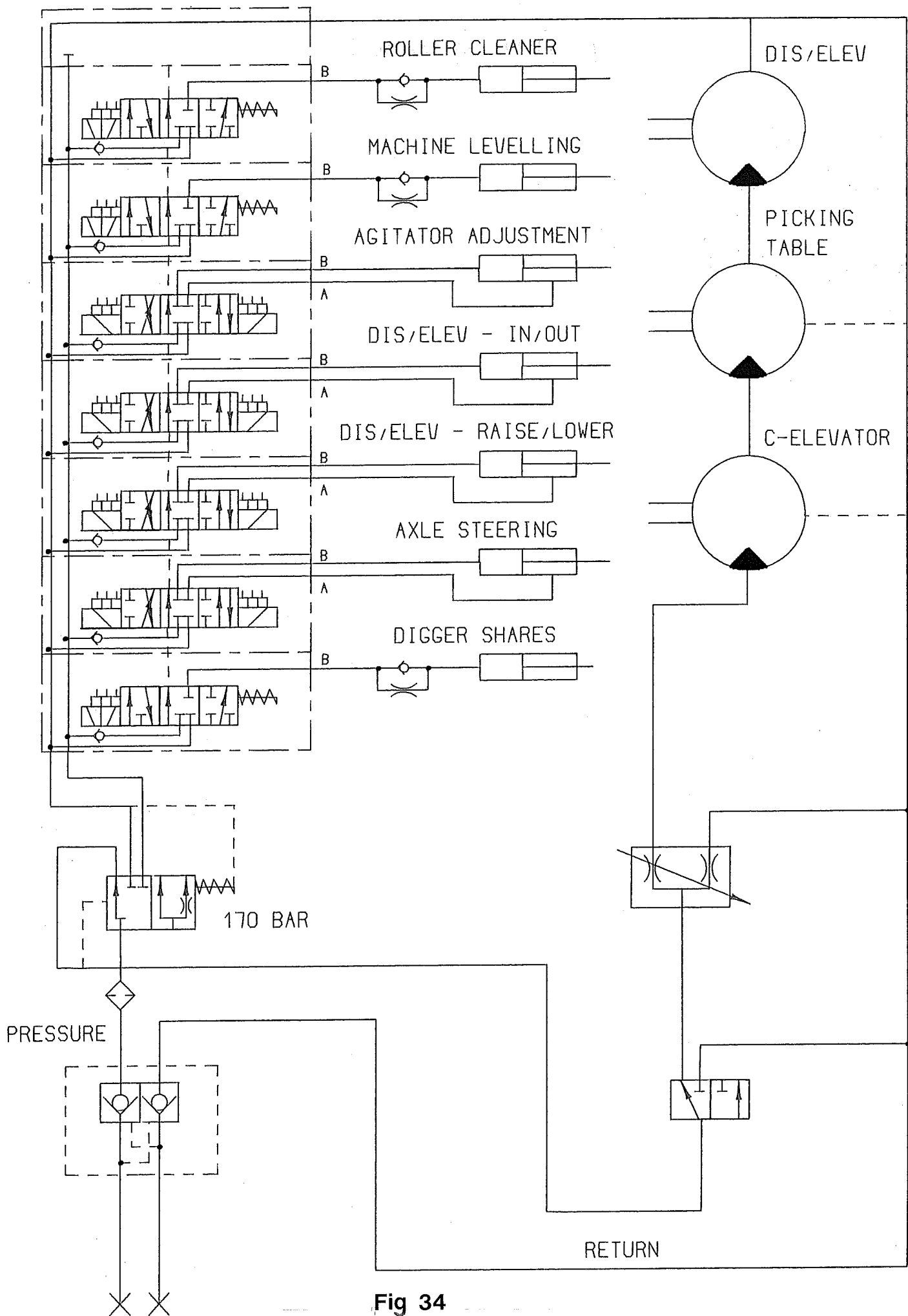


Fig 34

CLEANER UNIT HYDRAULIC CIRCUIT

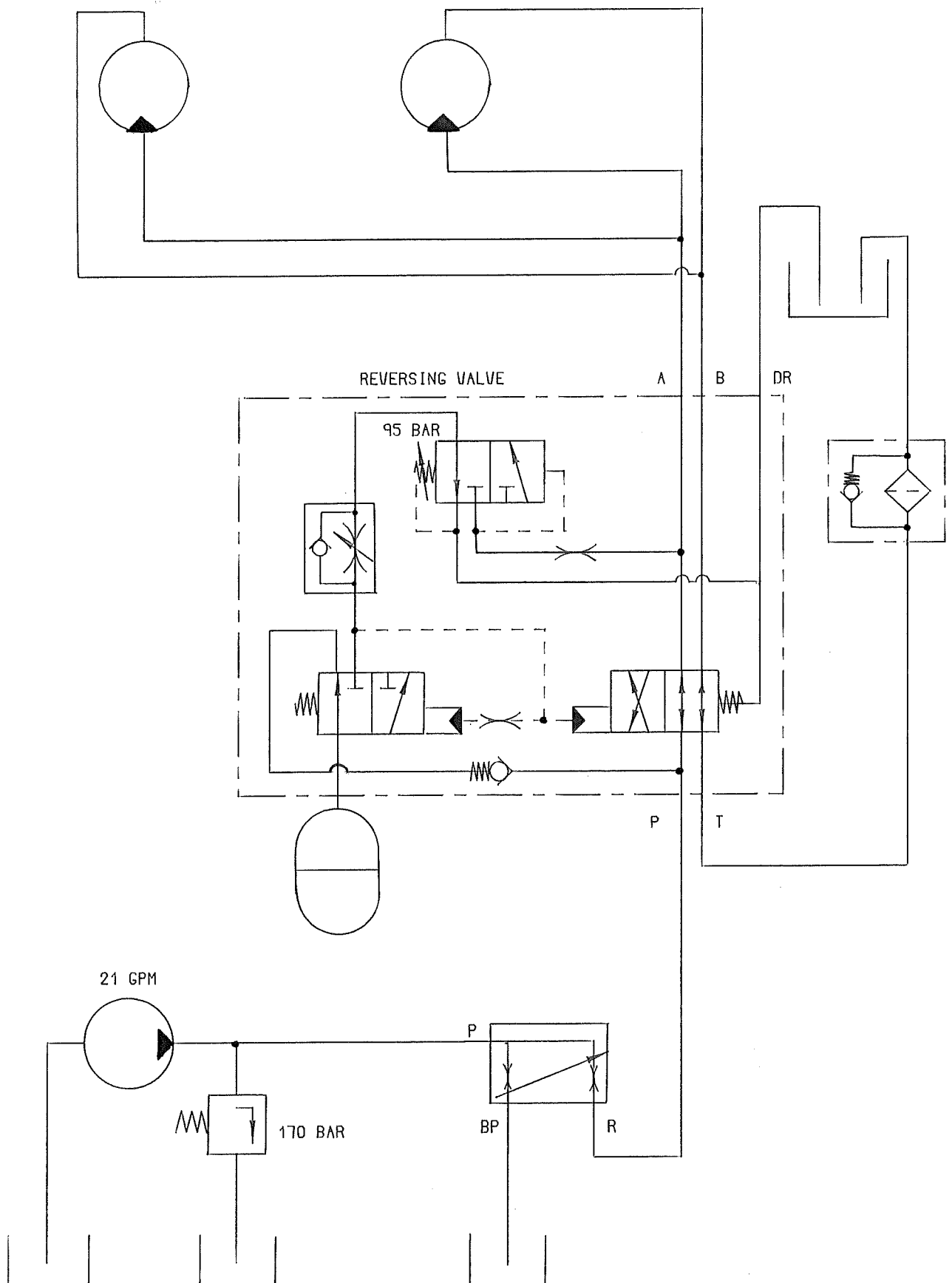


Fig 34

NUT/BOLT TIGHTENING TORQUE

DESCRIPTION	TORQUE	DESCRIPTION	TORQUE
WHEEL STUD	208 lb/ft	M6 (BOLT/STEEL NUT)	7 lb/ft
(CLEANER UNIT ROLLER SHAFT) CASTELLATED NUT	22 lb/ft	M8 (BOLT/STEEL NUT)	19 lb/ft
		M10 (BOLT/STEEL NUT)	38 lb/ft
M6 (NYLOC/ZINC PLATED NUT)	10 lb/ft	M12 (BOLT/STEEL NUT)	70 lb/ft
M8 (NYLOC/ZINC PLATED NUT)	23 lb/ft	M16 (BOLT/STEEL NUT)	170 lb/ft
M10 (NYLOC/ZINC PLATED NUT)	44 lb/ft	M20 (BOLT/STEEL NUT)	325 lb/ft
M12 (NYLOC/ZINC PLATED NUT)	87 lb/ft	M24 (BOLT/STEEL NUT)	565 lb/ft
M16 (NYLOC/ZINC PLATED NUT)	208 lb/ft		
M20 (NYLOC/ZINC PLATED NUT)	380 lb/ft		
M24 (NYLOC/ZINC PLATED NUT)	690 lb/ft		

CHECKS BEFORE STARTING A NEW MACHINE, STARTING IN A NEW FIELD OR VARIETY, OR STARTING WITH A NEW TRACTOR.

1. Ensure harvester is level when hitched to the tractor.
2. Ensure tractor and harvester wheel tracks match rows to be harvested.
3. Ensure return oil-flow from harvester into tractor is unrestricted. NB: On several makes of tractor this will require particular attention.
4. Set drawbar ram in middle of stroke.
5. Set shares with 1" gap between each share.
6. Check that the distance between the middle point of each set of shares matches width of rows.
7. Check that the middle point between the two sets of shares is in the middle of the web.
8. Set share arm so shares and tip plates are in line with top of web.
9. Set diablo roller adjusters in middle of threads.
10. Ensure centre of diablo is over centre of shares.
11. Ensure discs are sharp (in soft going).
12. Set discs 1" above shares and 1" to either side of shares (lower after correct digging depth obtained).
13. Ensure discs are parallel to one another.
14. Ensure haulm intake rollers clear discs, but with a gap no wider than $1\frac{1}{2}$ ".
15. Ensure outer haulm intake rollers are under tension.
16. Set spring tensioners on side of chassis, to show 3" of exposed adjuster thread.

SETTING INTO WORK

1. Set into work, travel a few yards, and stop. Repeat as necessary.
2. Dig into rows behind to check for depth of work.
 - Cut potatoes in the soil indicates digging too shallow. However, check the cut is caused by share (uneven cut, often curved) and not by a disc (a clean, flat cut). Only increase depth of digging if cut by share.
 - If digging too deep too much soil will be carried on webs ($\frac{1}{2}$ " = 30 tons of soil per acre) resulting in more wear and tear and harder job of separation. So set diggers to as shallow as possible.
 - Set bottom of discs to depth of shares.
 - Once depth is correct, tighten chassis tension springs to reduce weight of diablo on ridges.
3. Check potatoes on web for cuts
 - If clean slice visible, caused by discs:
Set appropriate disc wider, not forgetting to adjust tie-bar
(Beware widening too far and opening too wide a gap between share and disc).
 - If slice is curved probably caused by shares too shallow. Dig deeper.

4. Undamaged potatoes lying on ground

If potatoes are lying on ground, this can be caused by:

- Too large a pitch 1st web. Fit cover kit or change to smaller pitch web.
- Discs set too far from haulm intake rollers (or side of harvester on 36" rows). Adjust discs. (On middle pair of haulm intake rollers there are 3 widths of axle shaft. In extreme cases, you may need a different axle to the one fitted).
- Shares too far apart.
- Too much agitation.
- Rubber clod fingers set too hard against the web.
- Discharge elevator web sides need lowering.
- Haulm roller set too low or too high.

5. Crushed potatoes lying on ground

Crushed potatoes can indicate an incorrectly set haulm roller. Check the following:

- The haulm roller is set as close as possible to the web (check both ends) but is not actually touching it. Add or subtract spacers to adjust.
NB: (1) Fitting or removing web cover kits will necessitate adjusting haulm roller distance.
(2) Fitting half web cover kits causes pockets and should be avoided on small potato samples.

5. Crushed potatoes lying on ground continued

- Ensure haulm roller is under spring tension, to avoid bouncing. Tighten springs on adjusters.
- Set height of haulm rollers on adjusting handle to give best haulm removal without potato loss.
- Check scraper is set close to roller.
- Set guide fingers to just clear the web.
- Check no bent web rods on 1st web.

6. Crushed potatoes under Lockwood cleaner

If potatoes are passing through the rollers, take following action:

- Speed up rotation of rollers.
- In very dry conditions fit lead-in plate to front of rollers.
- In exceptionally dry conditions consider fitting roller moisturising kit.
- If small plain rollers fitted, change to large rollers.
- Increase angle of cleaner.
- Carry more loose soil onto cleaner.

GENERAL OPERATING HINTS

1. Carry soil to the top of the 1st web wherever possible.
2. Use as little web agitation as possible.
3. Use the levelling control to operate the harvester as level as possible.
4. Set discharge elevator speed as slow as possible (but not so slowly as to produce water-falling).
5. Set Lockwood cleaner angle as steep as possible.
Reduce angle for more cleaning.

TROUBLE SHOOTING

PROBLEM Bruised potatoes in trailer.

<u>Cause</u>	<u>Solution</u>
1. Potatoes already bruised in ground by previous field work, e.g., topping.	Change operating methods.
2. Chassis pressure springs too slack, causing excess diablo weight on ridge.	Increase spring pressure, but not so as to lift the shares above set depth.
3. Share angle too steep, or back of share too low, causing boiling in front of the 1st web.	Adjust as necessary.
4. Share arm bent, causing excess potato pressure against that share.	Replace share arm.
5. Bruising caused by web roll-back.	Carry more soil on the web, by travelling faster or slowing web, or reducing agitation. Consider fitting sweeping clod fingers to spread soil.
6. Rubber clod breaking fingers (if fitted) set too hard against the web.	Slacken pressure.
7. Haulm roller nipping potatoes.	Adjust roller as described earlier in this booklet.
8. Lockwood rollers causing bruising (unlikely except in very dry conditions).	Check settings, as described earlier.
9. Discharge into trailer too severe.	Slow down discharge elevator. Improve trailer loading technique.
10. Tractor or harvester wheels running against next unharvested row.	Adjust wheels, or fit narrow wheels.

PROBLEM

Malfunctioning Hydraulics

- | | |
|--|--|
| 1. Back pressure from tractors hydraulics interfering with oil flow. | Ask your dealer to fit necessary low pressure return flow kit. |
| 2. Filter needs changing. | Replace filter. |
| 3. Loose contacts in multi-pin connector. | Check all pins connecting with opposite sockets. |

PROBLEM

Poor soil flow onto 1st web

- | | |
|--|---|
| 1. Too much pressure on ridge from diablo. | Tighten chassis pressure springs. |
| 2. Diablo too far forward or too far back. | Adjust as necessary (one of 3 positions). |
| 3. Share angle too steep. | Adjust as necessary. |
| 4. Discs not turning. | Set discs deeper. Adjust tie-bar to give small degree of toe-in. Check scraper gaps. |
| 5. Share tip-plates stuck up. | Free off, ensure free to rise and fall. |
| 6. Haulm hanging up in front. | Sharpen discs. Check haulm intake roller spring pressure. Check rollers free to rotate. |

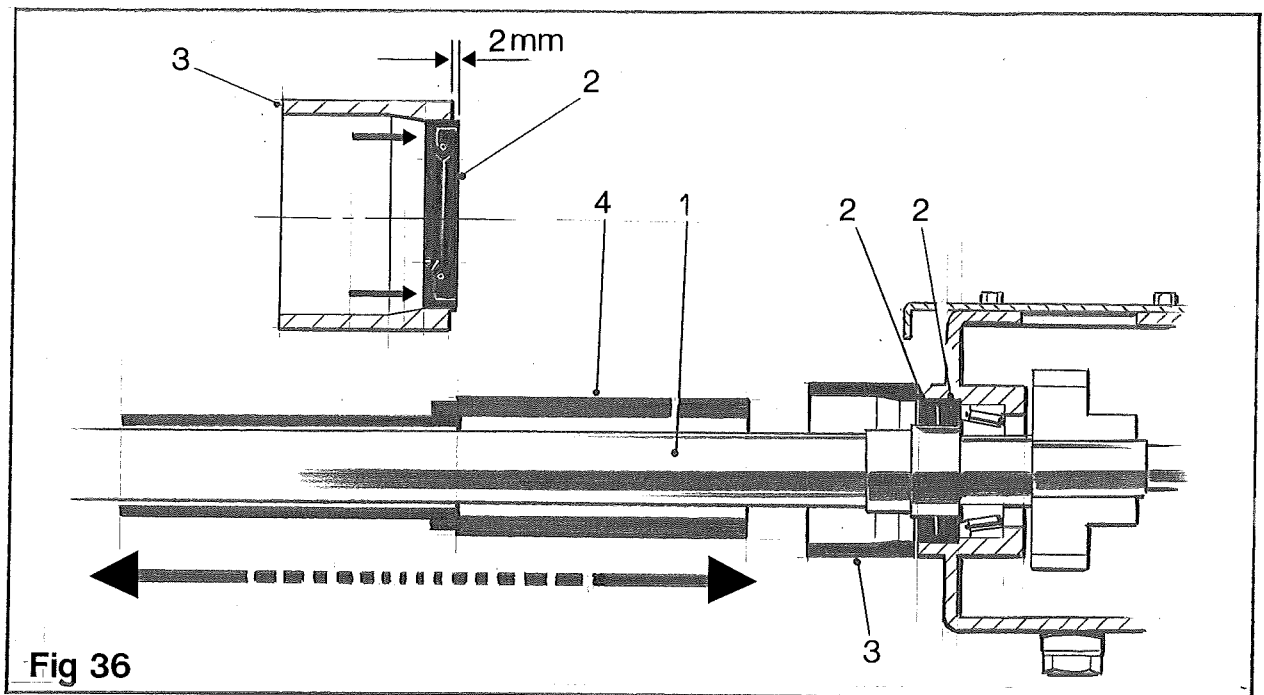
CLEANER UNIT OIL SEAL REPLACEMENT

The cleaner unit roller shafts (item 1, fig 36) are each fitted with two oil seals (item 2, fig 36) at the gearbox end (one behind the other). The seals prevent oil from escaping the gearbox housing and also prevent dirt from entering.

Depending on conditions, the oil seals (item 2, fig 36) may eventually become worn or damaged and begin to leak. At this point the oil seals will need to be replaced as follows:-

REMOVING THE WORN OIL SEALS

1. The rollers are retained on the steel roller shafts (item 1, fig 36) by a single bolt (item 1, fig 17) at the discharge end, and located on a spigot at the gearbox end. Remove the bolt and slide the roller off the discharge end of the shaft. The rollers are a close fit and may need to be prised off in some cases.
2. Prise out the damaged oil seals, 2 off, (item 2, fig 36) from the gear housing taking care not to scratch the seal apertures. Remove any dirt deposits.



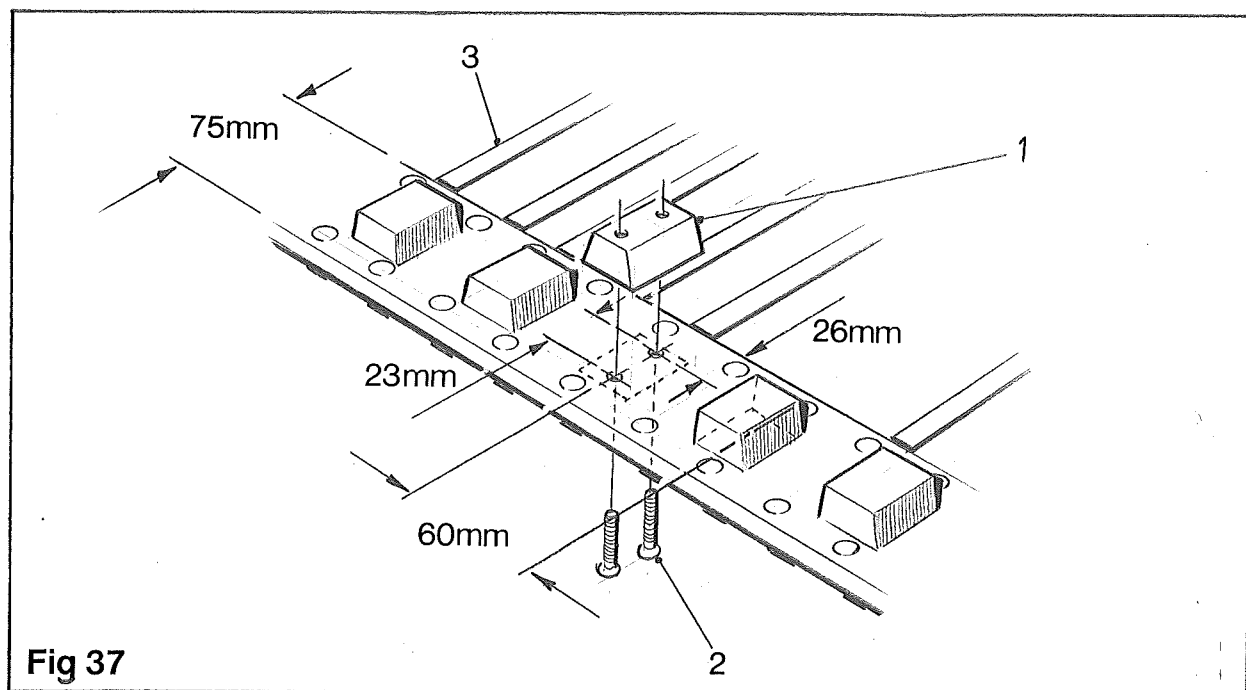
FITTING THE NEW OIL SEALS USING THE SEAL INSERTION KIT

1. Grease the inner and outer faces of the new seals to be fitted.
2. Push one of the seals into the compression ring (item 3, fig 36) so that the seal protrudes 1-2 mm beyond the ring face (see Fig. 36).
3. Locate the seal in the gear housing aperture and hold the ring firmly against the housing face.
4. Press the seal firmly home by sliding the hammer (item 4, fig 36) along the roller shaft (item 1, fig 36).
5. Repeat for the second seal.
6. Re-assemble roller onto roller shaft and tighten the bolt (item 1, fig 17).

REPLACEMENT WEB BELT DRIVING BLOCKS (SUPADRIVE WEBS ONLY)

In the event of a web belt drive block being damaged to the extent that a loss of web drive is experienced, the damaged blocks can be replaced with steel blocks (item 1, fig 37) as described in the fitting instructions below:-

1. Remove damaged block to leave surface of belt flat and free from loose rubber.
2. Drill or punch two holes 6 mm diameter in the belt to dimensions shown.
3. Screw block (item 1, fig 37) into place ensuring the counter sink on the screw (item 2, fig 37) is compressed as far as possible into the rubber belt top surface.
4. It is essential the pitch of 60 mm between block centres is maintained to ensure mating in the drive sprocket. If the position of a rod (item 3, fig 37) coincides with the required position of the holes for fixing the block, then the rod must be removed and re-riveted after fixing the block.



T E C H N I C A L D A T A

	<u>UNMANNED</u>	<u>MANNED</u>
LENGTH (IN WORK)	8.3 M	8.3 M
WIDTH (IN TRANSPORT)	3.1 M	3.4 M
HEIGHT (IN TRANSPORT)	3.1 M	3.8 M
ELEVATOR CLEARANCE (MAX)	3.0 M	3.8 M
WEIGHT (TONNES)	4.0 T	4.9 T
ROW WIDTHS HARVESTED	70-90 CM	70-90 CM
TRACTOR HP REQUIREMENT	75 HP, 4 WD	90 HP, 4 WD
HYDRAULIC FLOW RATE FROM TRACTOR ..	6 GALS/MIN	6 GALS/MIN
TYRES (MACHINES PRIOR TO SERIAL NO. WSU/M 118)	12.5 x 18	16 x 20
TYRES (MACHINES FROM SERIAL NO. WSU/M 118)	16.0/70-20 (12 PLY)	16.0/70-20 (12 PLY)
TYRE PRESSURES (MACHINES PRIOR TO SERIAL NO. WSU/M 118)	30 PSI	47 PSI (MAX) FIELD WORK 36 PSI (MAX) ROAD WORK
TYRE PRESSURES (MACHINES FROM SERIAL NO. WSU/M 118)	40 PSI	40 PSI

STANDENS POLICY OF CONTINUAL IMPROVEMENTS MEANS THAT SPECIFICATIONS
MAY BE ALTERED WITHOUT PRIOR NOTICE. DIMENSIONS ARE APPROXIMATE.

