

# Standen



**✓ision**  
Two Row Potato Harvester

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# **IMPORTANT**

- This operators handbook should be regarded as part of the machine. Suppliers of both new and second-hand machines are advised to retain documentary evidence that this handbook was supplied along with the machine.
- On installation of the machine (i.e. starting off in the field), the New Machine Installation Record Card should be completed by the dealer/distributor and be countersigned by the customer. The document is proof that the correct procedures have been followed.
- The New Machine Installation Record Card should be returned to Standen Engineering Limited within 7 days of installation. Failure to do so may invalidate the machine warranty.

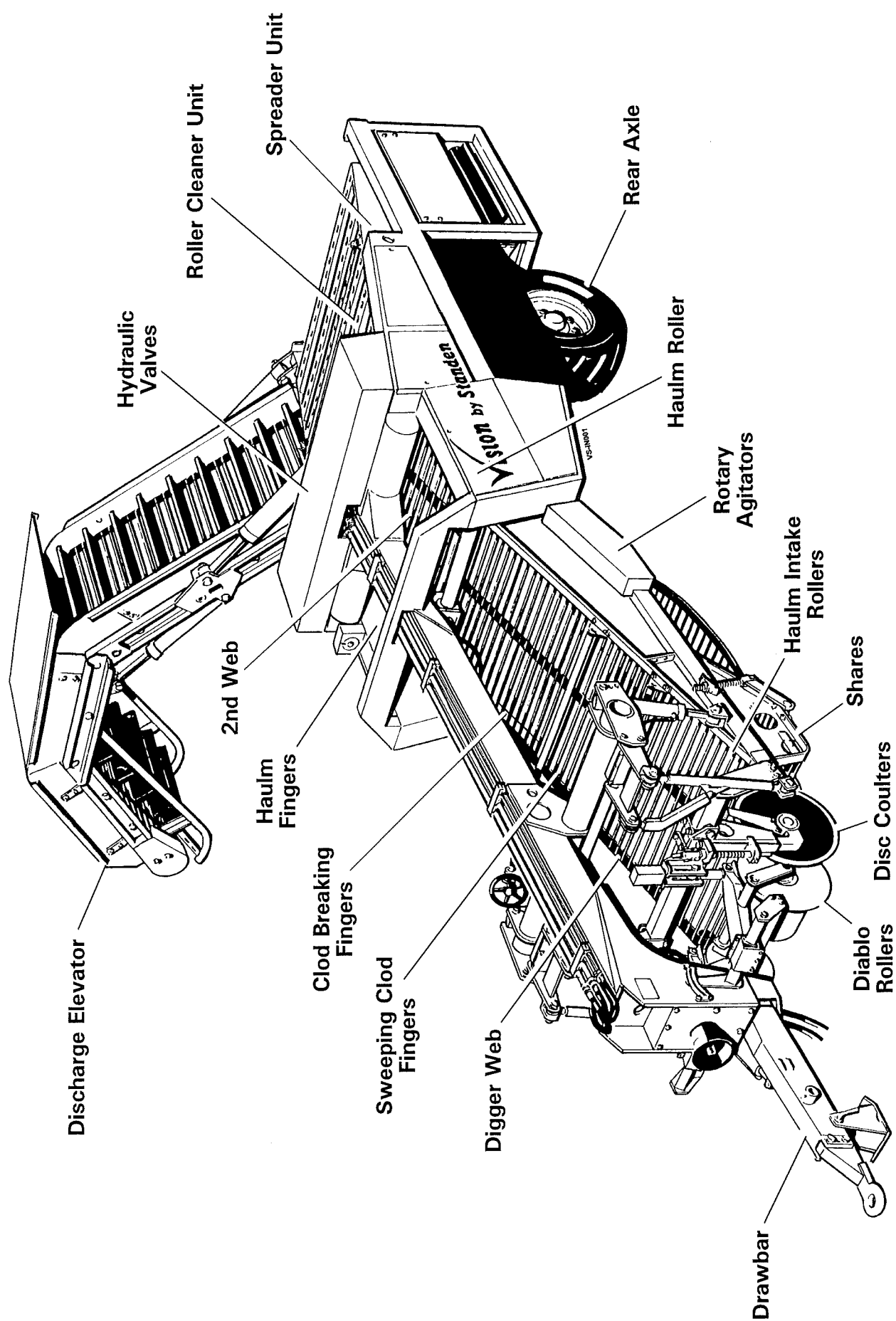
On delivery, check that the machine is as ordered and has not been damaged in transit. Please report any shortfall to your Standen dealer.

The contents of this handbook, although correct at the time of publication, may be subject to alteration by the manufacturers without prior notice.

Standen Engineering Limited operate a policy of continual product development. Therefore, some illustrations and/or text within this publication may differ from your machine.

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# CONTENTS





## INTRODUCTION

Introduction to the Handbook	1.1
Warranty	1.1
Replacement Parts	1.2

## SAFETY PRECAUTIONS

Safety	1.3
Operation	1.3
Transport	1.4
Maintenance	1.4
Safe use of potato harvesters	1.5
Working safely near overhead power lines	1.7

## INSTALLATION

Vision by Standen	1.9
Tractor Suitability	1.9
Tractor Wheel Setting	1.9
Attaching the Harvester	1.10
PTO Shaft	1.11

## OPERATION

Digger Assembly	1.12
Automatic Depth Control	1.12
Shares	1.13
Diablo Rollers	1.14
Hydraulically powered Diablos	1.14
Disc Coulters	1.15
Hydraulically Powered Discs	1.15
Setting the Digger Suspension	1.16
Digger Web	1.16
Mechanical Digger Web Drive	1.17
Hydraulic Digger Web Drive	1.17
Haulm Intake Rollers	1.18
Sweeping Clod Fingers	1.19
Rotary Agitators	1.20
Clod Breaking Fingers	1.20
Haulm Roller	1.21
Haulm Fingers	1.22
2nd Web Star Separator	1.22
2nd Web	1.23
Roller Cleaner Unit	1.24
Cleaner Unit Reverse Pressure	1.26
Spreader Unit	1.26
Discharge Elevator	1.27
Windrow Attachment	1.27

Picking Table	1.28
Rear Axle	1.28
Rear Axle Wheel Setting	1.29
Powered Axle	1.30
Mechanical Drives	1.32
Hydraulic Systems	1.33
Electrical Control System	1.35
Emergency Stop Button	1.35

## OPERATION IN THE FIELD

Checks Before Starting a New Machine, Changing Tractor, or when Changing Field or Crop	1.36
Setting the Machine into Work	1.36
General Operating Hints	1.37

## MAINTENANCE

Maintenance of Hydraulic Systems	1.38
Maintenance of Mechanical Drives	1.40
Maintenance of Electrical System	1.40
Speed Control Card Setting Procedure	1.41
Setting the Rear Axle Self-centring Mechanism	1.41
Setting the Automatic Depth Control	1.43
Cleaner Unit Oil Seal Replacement	1.45
Tightening the Cleaner Bearings	1.45
Split Web Drive Sprockets	1.46
Lubrication	1.47
Service Schedule	1.49

## SPECIFICATIONS

Nut/Bolt Tightening Torque	1.50
Dimensions	1.50
Technical Data	1.50

## Introduction to the Handbook

This handbook provides the information for the operation, adjustment and maintenance of your Standen Vision. To enable you to achieve the best results from the machine, the manufacturer recommends that you read the handbook thoroughly prior to using the machine for the first time.

Record below the details of your machine.

*Dealers name.....*

*Address.....*

*.....*

*Telephone number.....*

*Machine serial number.....*

*Date purchased.....*

*Date started work.....*



*This symbol indicates important safety messages within this handbook. When you see this symbol, be alert to the possibility of injury to yourself or others and/or damage to the machine and carefully read the message that follows.*

Throughout this handbook the terms 'front', 'rear', 'left hand' (LH) and 'right hand' (RH) are derived from the tractor drivers position facing forward in the normal direction of travel.

Adjustments to the machine may have to be made singly or in combination according soil conditions. Always allow the machine to settle to a new setting before making further adjustments.

Recommended lubrication and maintenance instructions are included in this handbook and if followed will help to keep the machine in a safe working condition.

## Warranty

Should the machine suffer any faults or defects within the warranty period, please contact your dealer. The warranty shall be effective only if the dealer is informed of any such defect as soon as practicable upon discovery.

**Replacement Parts**

Recommended replacement parts are designed for your machine and have the full backing of the warranty. Only when recommended parts are used can responsibility be considered under the terms of the warranty.

Section 2 of this handbook contains a list of spare parts available through your Standen Agents. Each illustration shows a complete unit or assembly in exploded form. Standen's policy of continual product development means that components or even complete assemblies are redesigned from time to time. Where possible the modifications are shown in the remarks column.

The first printing of each page in the spare parts section is identified as issue 1 at the foot of the page. When a complete unit or assembly has been redesigned the appropriate pages are revised and printed as issue 2. The revised pages are filed behind the existing issue so that a complete modification history is gradually built up. When using an illustration and parts list it is essential that both are of the same issue.

**Note:** Always quote the full serial number of your machine when ordering spare parts.

**SAFETY**

The Standen Vision has been designed to comply with current Safety Regulations, however, as with all farm machinery there will be inherent dangers whilst operating and carrying out maintenance on the machine. The following list of precautions should therefore be brought to the attention of all persons operating and working on the machine. The list is not exhaustive. All farm machinery is potentially dangerous and great care must be exercised by the operators 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.

**OPERATION**

*The machine must never be operated by untrained personnel or children.*



*Never attempt to fit drive chains or drive belts to the machine while the drive sprockets or pulleys are in motion.*



*Never set machinery in motion without giving prior notice to the pickers. Ensure that everyone in the vicinity is aware of your intentions.*



*Normal safe working procedures should be adopted at all times. Reduce speed when transporting the machine on sloping ground.*



*Never allow children in the vicinity where machines are working.*



*Do not work on ground where there is a possibility of overturning or across steep slopes.*



*Never wear loose clothing and always tie back long hair whilst working on the picking area of the machine.*



*The working area should be kept clear and free of obstructions at all times.*



*Before carrying out any work on the machine, lower the machine to the ground, switch off the tractor engine, apply the handbrake, remove the ignition key and disconnect the PTO shaft.*



*Be alert for hidden obstructions. Should the machine hit an obstruction, stop and check for damage before proceeding.*



*Never operate the machine with the discharge elevator in the folded transport position.*



*Wear substantial or proper safety footwear. Avoid loose clothing near moving parts. Wear gloves when handling the implement or parts with sharp edges.*



*The operator must not leave the tractor seat until the machine has been lowered to the ground, the tractor engine switched off, the handbrake applied and the ignition key removed.*



*Never reverse or turn unless the digger assembly is in the fully raised position.*



*All guards, covers, warning transfers and safety devices must be correctly fitted and operable at all times.*



*Inspect the machine on a regular basis and replace damaged or worn parts as necessary.*



*Inspect the machine for damage after use. Rectify as required.*



*Never operate the machine in a state of disrepair.*

## TRANSPORT



*When in transport, the digger assembly must be locked in the raised position .*



*When in transport, the discharge elevator must be in the folded transport position.*



*Only transport the machine at a speed suitable to the prevailing conditions. Be aware of the weight and overall length of the machine at all times.*

## MAINTENANCE



*When left free standing i.e. not attached to the tractor, the machine must be on level ground.*



*When working under the machine or if the machine is to be left to stand for any length of time, the digger assembly should be locked in the raised position.*



*Before working on the machine, all free moving parts should be locked to prevent them moving.*



*Inspect the hydraulic hoses and fittings for cuts and abrasions. Replace immediately.*



*The hydraulic system may be under pressure with the machine at rest. Ensure all residual pressure is released before disconnecting any pipework.*



*Regularly lubricate the machine as per the operators handbook and check the tightness of all nuts and bolts.*



*Always use mechanical or additional help when lifting heavy parts.*

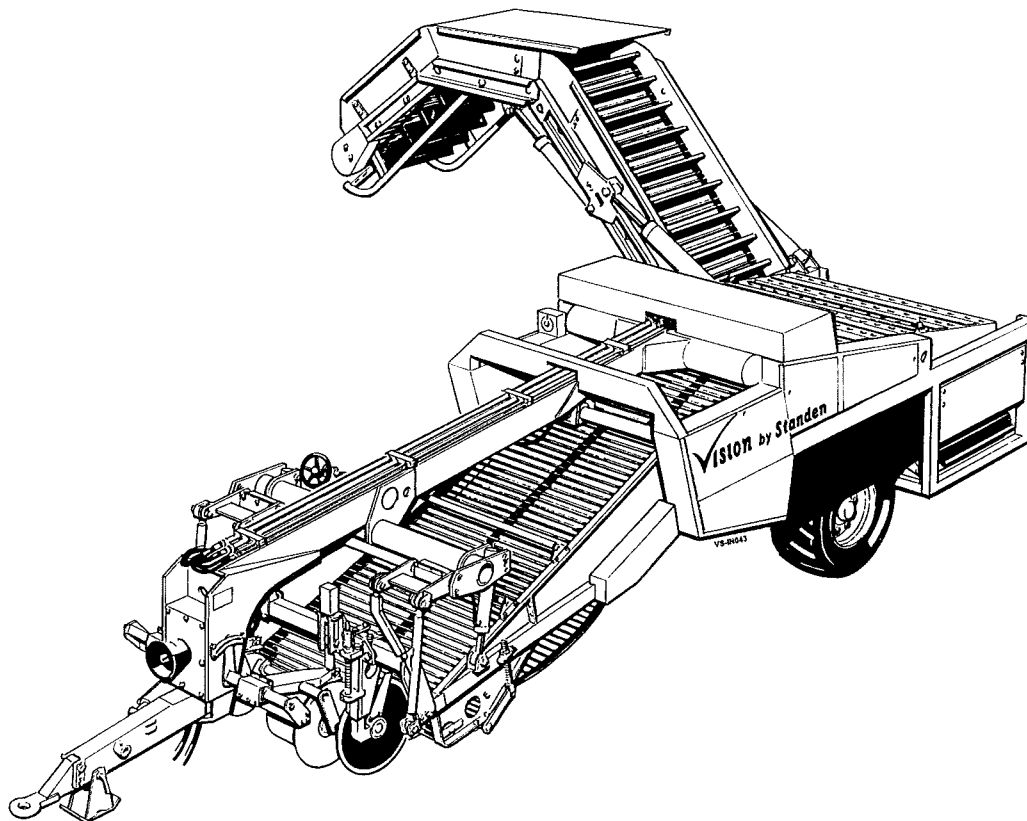


***Safety is the responsibility of the persons working with this machine. Think "safety" at all times. Read and remember the contents of this handbook.***

*HSE information sheet*

# Safe use of potato harvesters

Agriculture Sheet No 13



## Introduction

This information sheet outlines the key dangers common to most potato harvesters. It also lists essential Do's and Don'ts for the safe operation of these machines.

A study of accidents investigated by HSE showed that 11 people were killed and 121 seriously injured when working with potato harvesters between 1988 and 1996.

Five people died and seven were seriously injured when they were run over by potato harvesters.

Ninety-seven people injured arms or legs when caught in haulm or cleaning rollers. These accidents often caused amputations.

All users of potato harvesters need to identify the hazards caused by their harvesters and make sure all those working with these machines know and follow safe working practices to prevent accidents and serious injuries.

## Key dangers

Injuries are caused by:

- getting caught in haulm and cleaning rollers;
- harvesters and tractors running over people;
- falling from access ladders and platforms;
- getting caught in conveyors or elevator chains;
- getting caught by the drive mechanisms;
- getting wrapped around the power take-off (PTO) shaft;
- failing to switch off **all** power sources;
- handling bags of potatoes;
- poor working positions causing back strains etc.

## Do's and Don'ts

### Do:

- make sure everyone working on the harvester has understood the safety instructions in the handbook;
- provide the operator with clear instructions on the safe way to clean the harvester of haulm, stones, potatoes etc;
- agree a system for communicating between the platform and the tractor driver, eg sound the horn before starting the engine, reversing or engaging drives;
- check that **all** haulm, clod and cleaning rollers are properly guarded. Fit additional guards if anyone can reach the rollers with arms or legs from any position. Manufacturers can help with guard kits;
- fit an alarm or stopping device on the platform;
- make sure you and any of your employees, relief drivers and contractors are properly trained in the safe use of the potato harvester and have read this sheet;
- remember that putting the PTO out of gear will not cut the power to some hydraulically driven components;
- take particular care when reversing; make sure you can see what is behind or seek assistance if the view is obscured;
- stop the tractor engine and pocket the ignition key before you carry out any work on the potato harvester;
- make sure all guards are in position and correctly fitted before starting work;
- **stop the engine before anyone clears a blockage;**
- **stop the tractor before anyone gets on or off the harvester.**

### Don't:

- reach into the potato harvester unless all drives are stopped;
- climb over harvesters;
- jump on or off the harvester when it is moving;

- leave the driving position of a moving or running tractor;
- work under box handling attachments without using the supports provided;
- carry out maintenance with the tractor engine running;
- park or carry out maintenance when under or near overhead power lines;
- run the harvester with the guards raised or removed;
- allow children on or near the harvester.

## General guidance

Take care when working in difficult conditions or those with weed or haulm problems - don't overload the machine. Remember that avoiding blockages is easier than clearing them. Use drive reversing mechanisms when fitted and encourage the use of conveyor controls to optimise picking conditions.

Make use of relevant training courses such as those run by ATB Landbase, manufacturers and dealers. They will help to ensure the safe and efficient use of your potato harvester.

## Further information

HSE priced and free publications are available by mail order from:

HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS  
Tel: 01787 881165 Fax: 01787 313995.

HSE priced publications are also available from good booksellers.

For other enquiries ring HSE's InfoLine Tel: 0541 545500 or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ.

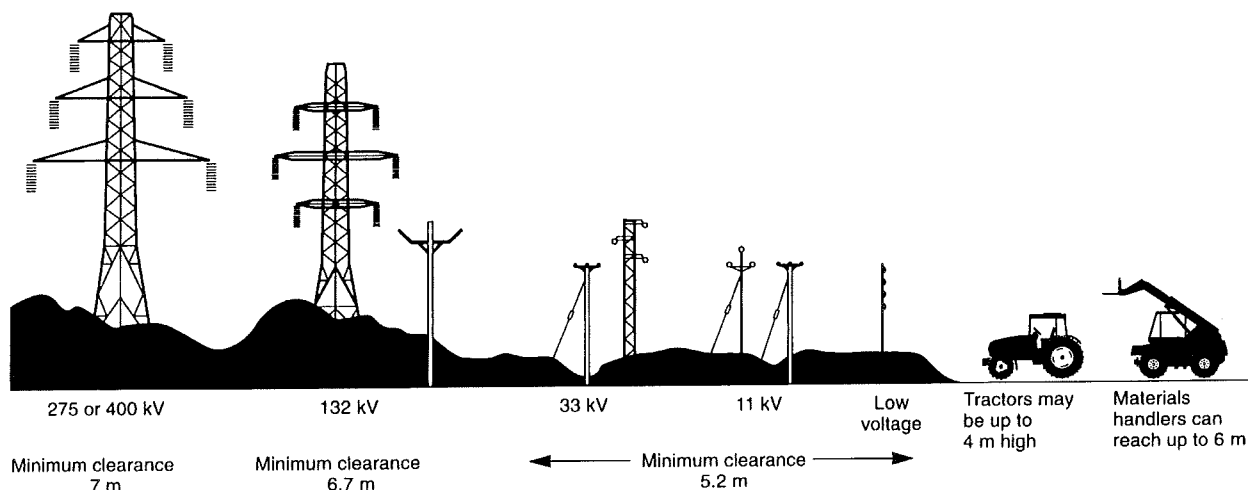
This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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*HSE information sheet*

# Working safely near overhead power lines

Agriculture Information Sheet No 8 (rev)

**Be aware of line heights****Introduction**

About five people are killed every year in accidents involving overhead power lines during agricultural work. Machinery (eg combines, tipping trailers and loaders); equipment (eg irrigation pipes and ladders); and activities (eg stacking) are often involved. Contact with the lines does not need to be made. Electricity can flash over when machinery or equipment gets close to overhead lines.

Most incidents involve high-voltage lines supported on wooden poles, but the dangers of other power lines cannot be ignored.

This information sheet outlines the steps you can take to reduce the risks when working near overhead power lines. Remember the Electricity at Work Regulations 1989 apply to work activities carried out near power lines.

**Planning precautions**

**Consult your local electricity company.** They will provide free information and advice about precautions and safe working procedures which can be followed near power lines.

**Find out** the maximum height and maximum vertical reach of your machines and those used by contractors.

**Find out** the routes of **all** overhead lines on your land or near your boundaries. Mark them on the farm map. The electricity company will give you this information.

**Make sure** you have information about all the lines on your land - if not, contact the owners of those lines.

The farm map can be used as a reference when planning cropping or other work, instructing machine operators and contractors, or buying new equipment.

In cases where there is a significant risk area, it is sensible to discuss the following measures with the electricity company:

- **access:** creating alternative access points and routes - this is often the cheapest option;
- **divert lines:** benefits can arise from burying lines or changing routes - an option particularly suited to farmyards;
- **barriers and goal posts:** by erecting goal posts and barriers, machines which have to pass beneath lines can be limited to a safe height - an option especially suited to gateways and tracks.

**Working safely**

Key elements of safe systems of work are:

**Training**

Everybody who works near overhead power lines with a machine or equipment needs to know what the dangers of overhead lines are and the precautions to follow.



**Visitors**

Contractors are at risk when they work on farms where overhead lines are present. Make sure they know where the lines are and tell them the precautions they need to take. Routes can be marked with safety signs to warn all visitors of the dangers.

**Use of machinery**

Accidents can be avoided if the following operations are **not** carried out within a horizontal distance of at least 9 m from power lines on wooden poles or at least 15 m of lines on metal towers:

- stacking bales or potato boxes;
- folding sprayer booms;
- tipping trailers or lorries;
- operating materials handlers;
- working on top of combines or other high machinery.

**Risks can be reduced by:**

- using sprayers with horizontally folding booms;
- taking care not to damage poles and stays;
- making sure machinery can operate safely near any overhead lines;
- fitting shorter radio aerials to high machines so they cannot cause danger;
- carrying irrigation pipes horizontally using two people and not storing pipes near power lines.

**EMERGENCY ACTION IN THE EVENT OF AN ACCIDENT**

- **Never touch an overhead line - even if it has been brought down by machinery, or has fallen. Never assume lines are dead.**
- **When a machine is in contact with an overhead line, electrocution is possible if anyone touches both the machine and the ground.**
- **If you need to get out to summon help or because of fire, jump out without touching any wires or the machine. Keep away.**
- **Get the electricity company to disconnect the supply. Even if the line appears dead, do not touch it - automatic switching may reconnect the power.**

**Further advice**

For further advice and information contact your local electricity supply company. You can also get advice from the Farm Energy Centre, National Agricultural Centre, Stoneleigh Park, Warwickshire CV8 2LS (Tel: 01203 696512). To obtain the latest edition of their handbook *Safe use of electricity in farming and horticulture* (FEC 2100: 3rd edition 1992), send them a cheque for £2.50 made payable to Farm Energy Centre.

**Further reading**

*Avoidance of danger from overhead electrical lines* GS 6 (rev) HSE Books 1991 ISBN 0 11 885668 5

Farm Electric *The safe use of irrigators and slurry guns near overhead electric power lines* Electricity Association Technology Ltd. Available free from the Farm Energy Centre, National Agricultural Centre, Stoneleigh Park, Warwickshire CV8 2LS

*Memorandum of guidance on the Electricity at Work Regulations 1989* HSE Books 1989 ISBN 0 11 883963 2

*Management of health and safety at work. Management of Health and Safety at Work Regulations 1992. Approved Code of Practice* HSE Books 1992 ISBN 0 7176 0412 8

An HSE video called *Shock horror* is available for purchase or hire from CFL Vision, PO Box 35, Wetherby LS23 7EX (Tel: 01937 541010).

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<http://www.open.gov.uk/hse/hsehome.htm>

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## Vision by Standen

Vision by Standen is a two row tractor drawn potato harvester designed to harvest two rows of potatoes, clean, elevate and load them into a trailer running alongside. The basic machine is manufactured in two digging widths, 1700mm and 1500mm and direct loads the crop with no manning on the machine. Optionally, a manned sorting table allowing up to four pickers can be fitted to the rear of the machine.



*Before starting work, check that the machine is in a safe working condition. Check components which could work loose during operation such as wheel nuts, chains, sprockets and share arms etc. These checks are especially important during the first week of work.*



*Pay attention to the maintenance and lubrication instructions within this handbook and pay particular attention to the safety precautions, they are written as a guide to protect you and others.*

## Tractor Suitability

The recommended tractor for the Vision is four wheel drive with 102hp for the basic unmanned machine and 120hp for the manned machine. These powers may need to be varied to achieve optimum output under different crop conditions, and depending on the specification of the harvester.

The harvester requires a constant hydraulic oil supply from the tractor of a minimum 50litres/minute with a low back pressure/free return to the tractor. Also required is a 12volt d.c. negative earth

power supply rated at 30amp to feed the electrical control box which is mounted inside the tractor cab. The control box allows the hydraulically and electrically powered functions on the harvester to be operated from the drivers seat while the machine is working.

The Vision is designed to be towed from the pick-up hitch hook of the tractor and imposes a transferred load of 1.4 tonnes to the tractor with the basic unmanned model and approximately 1.1 tonnes with the manned model.

Should the Vision be towed from the tractor clevis hitch then the optional ring hitch spacer must be used to eliminate chop on the clevis pin.

## Tractor Wheel Setting

Both the front and rear wheels of the tractor must be set to straddle the bed. This will ensure the wheels run in the centre-line of the wheelings. The instructions for adjusting the tractor wheels are given in the tractor manufacturer's handbook.



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

## Attaching the Harvester



*The operator should have read and understood the tractor operators manual prior to attaching the machine and putting it into work.*

With the harvester standing on firm, level ground, reverse the tractor up to the harvester aligning the drawbar and pick-up hitch. Measure the height of the tractor hitch hook from the ground and set the harvester drawbar eye to one of the positions shown (see figure 1). Raise the harvester on the pick-up hitch. The harvester chassis should be nominally level. If the chassis is in a nose up attitude or extremely nose down, the drawbar eye should be adjusted accordingly to compensate.

Switch off the tractor engine before making any other connections. The hydraulic and electrical connections can then be made as detailed below.

1. Connect the hydraulic return hose marked blue (item 1, figure 2) to the tractor manufacturer's recommended low back pressure return coupling.
2. Connect the pressure hose marked red (item 2, figure 2) to the tractor outlet recommended for constant supply. If in doubt, refer to the tractor handbook. If the flow is adjustable, it should be set to supply a minimum 50 litres/minute. The harvester hydraulics will accept up to 80 litres/minute maximum.
3. Mount the in-cab control box securely inside the tractor in a position where it is comfortable to operate when seated.
4. Connect the harvester control harness plug to the socket on the control box harness ensuring that the harness is safely routed into the cab. Connect the lighting plug to the tractor lighting socket.

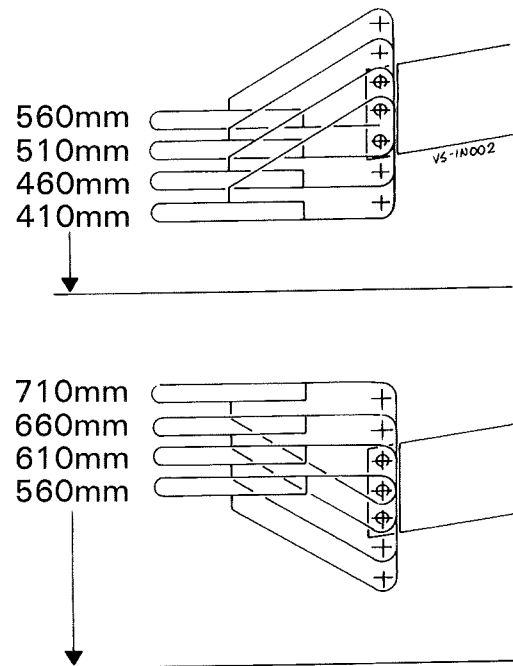


Figure 1

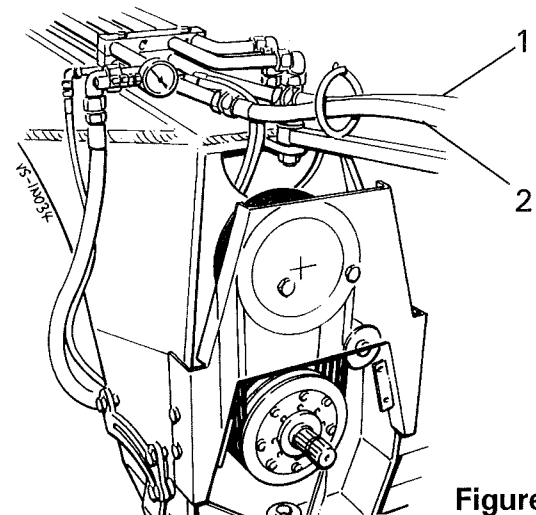


Figure 2

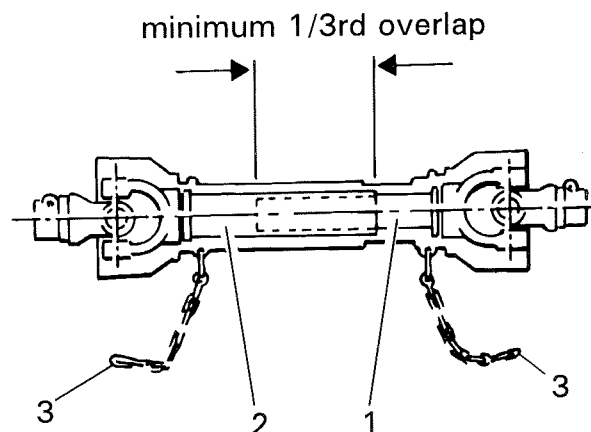
5. Connect the control box power supply cable to the tractors highest rated electrical plug if fitted, the blue lead to negative (-) and the brown lead to positive (+). If the tractor does not have a suitable power socket, then either ask your dealer to fit one, or connect the supply lead directly to the tractor battery.

### PTO Shaft



*It is essential that the PTO shaft is matched to the tractor to give the correct drive line and to ensure that it is safe in work. An incorrectly fitted or badly guarded PTO shaft can be lethal. Do not take chances.*

The PTO shaft supplied with the machine may require cutting to the correct length to suit individual tractors but should be kept as long as possible in all cases.



**Figure 3**

1. Separate the male shaft (*item 1, figure 3*) and female shaft (*item 2, figure 3*) and fit them to the tractor and harvester respectively.
2. Support the shafts alongside each other and mark the maximum possible length.
3. Cut the surplus length equally from both male and female drive tubes and guards.
7. Finally, attach the safety chains (*item 3, figure 3*) to secure anchoring points on the tractor and machine ensuring that the chains will not overtighten when the machine is turning.

Refer to the manufacturers instructions, these are fitted to all PTO shafts when the machine is delivered.



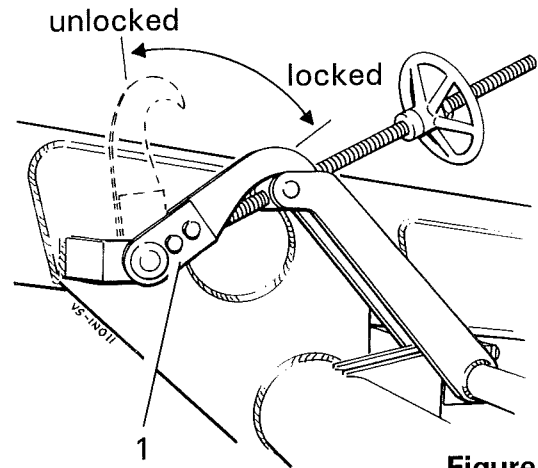
*Ensure a minimum of 1/3rd overlap and check that there is no possibility of the shafts butting up when the tractor linkage is raised.*

4. Once the correct length of shaft has been obtained, remove all rough edges and swarf.
5. Grease the shafts to ensure they telescope correctly and then fit the shaft in place
6. Check the PTO shaft does not foul any part of the machine or tractor and inspect the guards to make sure they are fitted correctly and are not damaged.

## Digger Assembly


The digger assembly, which includes the diablo rollers, disc coulters, shares and digger web, is retained in the raised position by the transport lock (*item 1, figure 4*). Before attempting to operate the digger assembly, the transport lock will need to be released.

The digger assembly is controlled electronically from the in-cab control box. The 'Digger Share' switch manually raises and lowers the digger web. With the switch set to lower ▼ the digger is in the float position and will continue to drop until the diablo rollers or shares rest on the ridge. Returning the switch to the neutral position will hold the digger at its present setting.



**Figure 4**

## Automatic Depth Control

Pressing the button  brings the automatic depth control into circuit. The 'Digger Share' switch operates the system. Selecting raise ▲, will manually raise the digger, while selecting lower ▼ turns on the automatic depth and the diablo rollers control the depth setting of each digger ram independently.

The 'Auto Depth' indicator lights 'L' (left) and 'R' (right) show when the depth control sensors are operating. Time delay for each side of the digger can be set by adjusting the 'Response' timer control knobs on the panel. A depth control unit is fitted to each diablo roller. The depth control unit allows each roller to sense the

height of the ridge it is running on and in doing so, maintains the constant depth of the share below the top of the ridge. The sensor unit fits directly on top of the diablo roller reaction bracket and senses the position of the depth adjusting turnbuckle. The electrical leads plug into the socket on the harvester loom junction on the front right hand side of the chassis.

The proximity switches inside the depth control box are preset and will not normally need to be adjusted in service. For the proximity switch adjustment procedure, see the maintenance section of this handbook.

## Shares

The shares are of a quick-attach design which do not require the share bar to be removed to detach the arms, this allows for easy alteration from row to full width digging and simple adjustment of each individual arm. Row widths from 76cm (30") to 102cm (40") can be catered for.



*When working under the machine or if the machine is to be left to stand for any length of time, the digger assembly must be locked in the raised position.*



*Before carrying out any work on the machine, lower the machine to the ground, switch off the tractor engine, apply the handbrake, remove the ignition key and disconnect the PTO shaft.*

To adjust the shares for width:

Loosen the clamp plate locknuts (*item 1, figure 5*) and slide the share to the required position. The shares should be set symmetrically about the centre-line of the machine.

To adjust the angle of the shares:

Release the locknuts (*item 2, figure 5*) on both sides of the machine. The top nut turned down will pitch the nose of the shares down. The bottom nut turned up will pitch the nose of the shares up.

Check that the shares are adjusted evenly on both sides. Measure from the tip of the outside shares to the disc support bridge, not the length of the adjuster thread.



*Do not pitch up the shares such that the web is running on the share arms.*

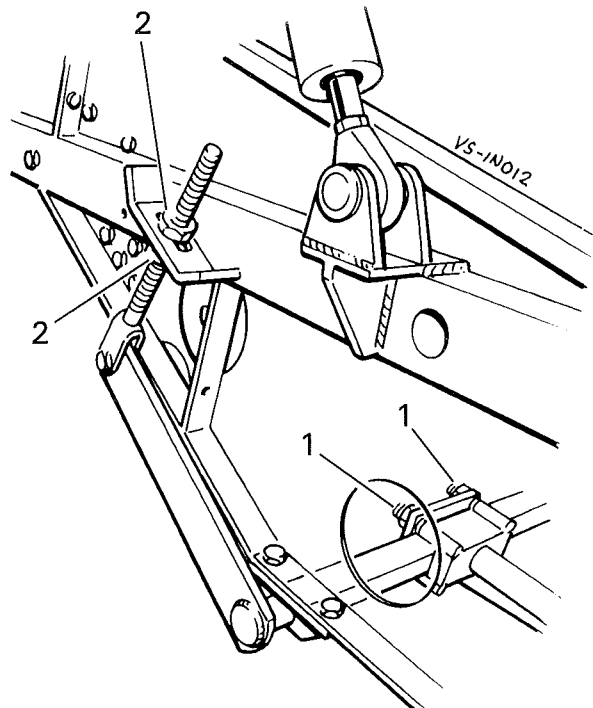


Figure 5

## Diablo Rollers

The diablo rollers control the depth of digging. Their setting is very important to the effective operation of the harvester.

To set the row width of the diablo rollers:

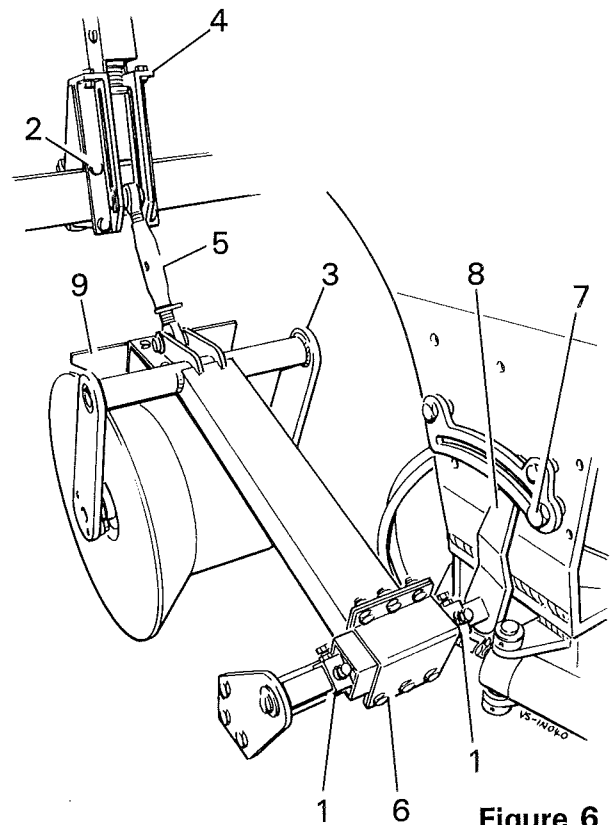
1. Release the clamp collars (*item 1, figure 6*) and reaction bracket bolts (*item 2, figure 6*).
2. Slide the roller frame (*item 3, figure 6*) and reaction bracket (*item 4, figure 6*) to the required setting and retighten.
3. Repeat for the other diablo roller ensuring they are set symmetrically about the centre-line of the machine.

The turnbuckle (*item 5, figure 6*) sets the working depth of the diablo rollers. Lengthening the turnbuckle will cause the shares to run shallower beneath the top of the ridge and shortening will allow the share to run deeper.

The diablo rollers are mounted on rubber torsion springs (*item 6, figure 6*) which allow the weight to be carried off the rollers to reduce compaction of the ridge, or for additional pressure to be put on the ridge to consolidate it in light conditions when the flow over the shares is poor. The diablo roller pressure setting needs to be made when the machine is in work so that the relative working position of the diablo roller to the ridge is correct. By positioning the stop (*item 7, figure 6*) behind the arm (*item 8, figure 6*) in the pressure setting quadrant, weight is removed from the diablo roller. Positioning the stop in front of the arm puts extra pressure on the roller.

**Note:** Care should be taken to ensure that the diablo roller is not locked solid. Free float must be available when the digger is raised and lowered.

The diablo rollers are each fitted with a scraper (*item 9, figure 6*). The scrapers




**Figure 6**

should be set as close to the rollers as possible without fouling them.

## Hydraulically Powered Diablos

Optional hydraulically powered diablo rollers are available for use in soil conditions where poor ridge flow over the shares onto the digger web is regularly experienced.

Hydraulic power is taken from the load sensed pump (*item 2, figure 30*) and controlled from the in-cab control box. The button  starts/stops the diablo roller drive and speed can be varied by turning the control knob clockwise to increase or anticlockwise to decrease speed. Setting the speed of the diablo rollers to run slightly faster than ground speed will induce a positive flow of the ridge onto the shares. Care must be taken not to run the diablo rollers excessively fast as this can cause scuffing to potatoes that are near the top of the ridge.

### Disc Coulters

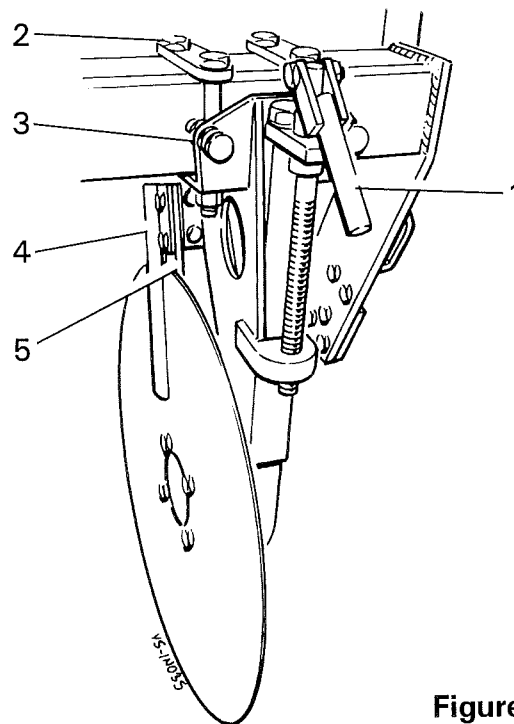
For two row work the harvester is fitted with four 64cm diameter disc coulters, and for full width bed work, with two. The disc coulters run on either side of the ridge, cutting and parting the haulm and trash in front of the shares whilst at the same time containing the ridge under the diablo roller and feeding it over the shares onto the digger web. The disc coulters are adjustable for depth of work and for different row widths.

To set the disc coulters depth, turn the adjusting handle (*item 1, figure 7*) until the required depth is reached.

To set the disc coulters row width/cutting width:

1. Release the clamp bolts (*item 2, figure 7*) and locking bolts (*item 3, figure 7*), and slide the disc assembly along the bridge beam to the required position.
2. Retighten the clamp bolts (*item 2, figure 7*) and then retighten the locking bolts (*item 3, figure 7*).
3. Repeat for the other discs ensuring they are set symmetrically about the centre-line of the machine.

The disc coulters are each fitted with two scrapers (*item 4&5, figure 7*), these should be set as close to the disc as possible without fouling it.



**Figure 7**

### Hydraulically Powered Discs

For very light soil conditions hydraulically powered disc coulters are available to help keep the discs turning. Hydraulic power is derived from the same source as for powered diablo. Total combinations of hydraulic options need to be discussed with Standen Engineering Ltd.

Spring loading is also part of the powered disc specification, and can be supplied as a separate option.



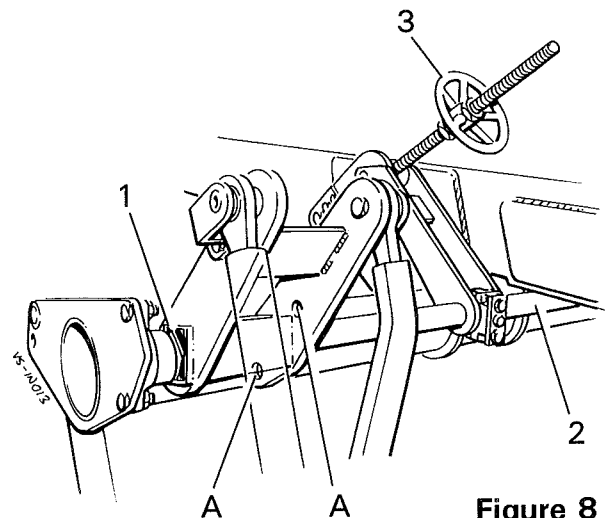
## Setting the Digger Suspension

The rubber torsion spring suspension on the digger assembly is designed to reduce pressure on the ridges and allow accurate, sensitive depth control from the diablo rollers.

The torsion springs (*item 1, figure 8*) are mounted on the cross shaft (*item 2, figure 8*) which is linked to each side of the digger assembly. The holes (*item A, figure 8*) are provided to lock the springs out of work if required.

The setting of the digger suspension can only be effectively carried out when the machine is in work.

To set the required amount of spring suspension the hand wheel (*item 3, figure 8*) should be screwed down until, when the harvester is travelling forward, the diablo rollers lift easily each side of the digger thus maintaining the share depth. Too much spring assistance will cause the digger to ride out of work, while too little will compact the ridge and in turn may lead to crop damage. The optimum setting for the suspension will vary for different soil and crop conditions, therefore the operator will need to monitor the setting especially when changing from one field to another.



**Figure 8**

## Digger Web

The digger web will be either 1700mm or 1500mm wide depending on the build specification of the machine. Web pitches of 28mm, 32mm, 36mm, 40mm, 45mm and 50mm are available for both widths and need to be selected to suit the crop and soil conditions being harvested at the time.

Changing webs is a simple operation of removing the joining rod, connecting the alternative web to the end of the existing web, then slowly winding it on as the other is wound off and then joining the

replacement web together on the machine.

The digger web drive uses the Standen 'Supadrive' web configuration fitted with a reverse running assister drive on the return side. This gives a virtually slip-free drive under most conditions and reduces the load on the web drive sprockets.

## Mechanical Digger Web Drive

Mechanical digger web drive is taken from the tractor PTO via four SPB section 'V'belts (item 1, figure 9). From the top pulley, a drive shaft and Hardy Spicer coupling transmit the power to a gearbox mounted under the central chassis beam. From the gearbox cross shaft, the drive is by chain to the assister drive shaft and then by gear train to the main web shaft, this ensures that the web drive stays exactly in phase eliminating any hunting in the web.

The digger web drive chain (item 1, figure 10) is fitted with an adjustable tension roller (item 2, figure 10) which should be checked regularly and adjusted as required.



*Overload protection for the digger web is provided by the 'V'belts (item 1, figure 9). Do not overtighten the belts. The belts should be tensioned to drive normally without slipping, but not so great that the belts cannot slip when the drive is obstructed.*

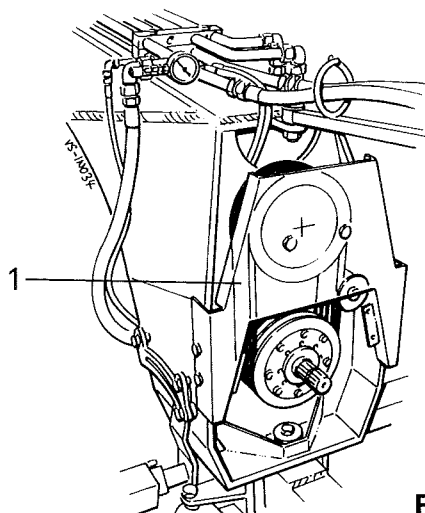


Figure 9

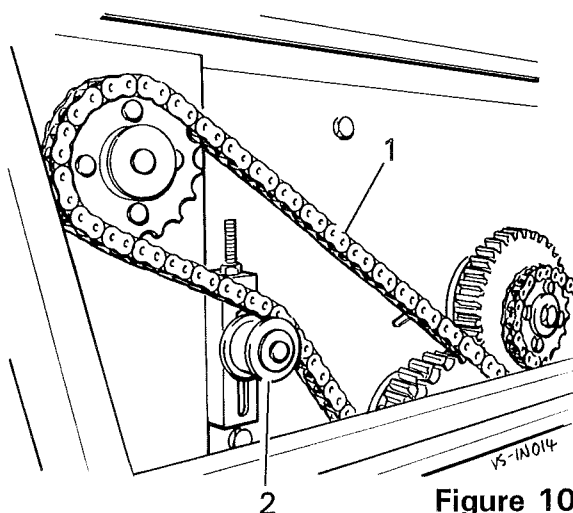



Figure 10

## Hydraulic Digger Web Drive

Hydraulic digger web drive is taken from an additional load sensing hydraulic pump. The pump supplies oil through the control valve to the motor mounted under the central chassis beam. From the motor cross shaft, the drive is by chain to the assister drive shaft and then by gear train to the main web shaft, this ensures that the web drive stays exactly in phase eliminating any hunting in the web.

The digger web is controlled electronically from the in-cab control box. The button  starts/stops the digger web and speed can be varied by turning the speed control knob clockwise to increase or anticlockwise to decrease speed.

## Haulm Intake Rollers

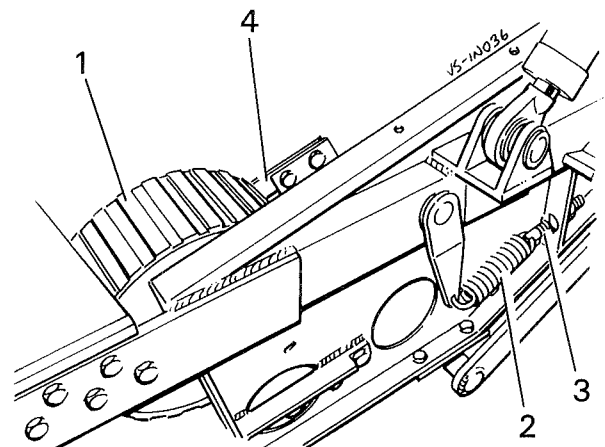
The haulm intake rollers are fitted for two reasons. The primary reason is to draw in loose haulm and trash from the sides of the ridges and feed it onto the digger web, thus preventing it from building up on the leading edges of the web sides or between the centre disc coulters. The second function is to prevent potatoes from rolling out of the front of the digger web between the discs coulters and the web sides.

The haulm intake rollers (*item 1, figure 11*) are spring loaded onto the digger web bars. The outer rollers are fitted with tension springs (*item 2, figure 11*) which are mounted to the web sides by the threaded adjusters (*item 3, figure 11*) which allow the required amount of tension to be applied.

The centre rollers (if fitted) are mounted on a spring loaded arm and are tensioned with a coil spring and threaded adjuster.

The scrapers (*item 4, figure 11*) fitted to each roller should be set as near to the roller as possible without fouling it.


Depending on the width of the digger web and the row width configuration to be lifted, the haulm roller build will vary.



**Figure 11**

## Sweeping Clod Fingers

The sweeping clod fingers (if fitted) have three functions, firstly to spread the ridge to the full width of the digger web and so maximise the area used for soil separation, secondly to break up the ridge when the soil is solid and start to separate the potatoes from the soil, and thirdly to rub the soil through the web before reaching the agitators.

Hydraulic drive for the sweeping clod fingers is controlled from the in-cab control box. The button  starts/stops the clod fingers and speed can be varied by turning the control knob clockwise to increase or anticlockwise to decrease speed.

To set the height of the fingers (*item 1, figure 12*) above the web, loosen the clamp bolts (*item 2, figure 12*) and rotate the mounting tube (*item 3, figure 12*) until the fingers are at the required height.

It is not always necessary to set both rows of clod fingers completely down, it is often better to have the second row lower than the first.

In heavy green top or rubbish, the clod fingers may cause material to ball up and overload the haulm roller. If this occurs, the fingers should be lifted out of work.

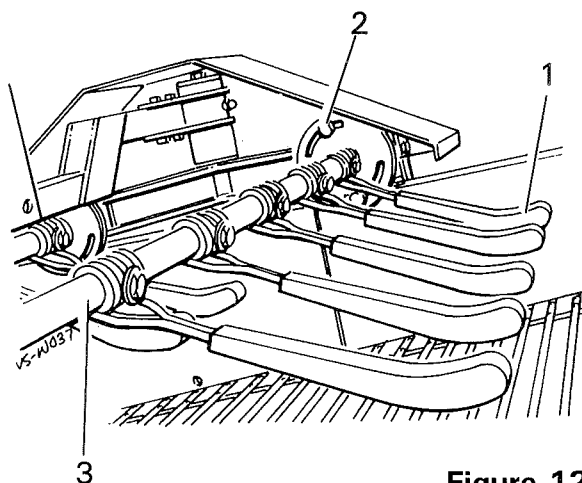



Figure 12

## Rotary Agitators

The rotary agitators are designed to separate the soil from the crop as it is elevated up the digger web. Hydraulic drive for the agitators is controlled from the in-cab control box. The  button starts/stops the agitators and frequency of agitation can be varied by turning the control knob clockwise to increase or anticlockwise to decrease the agitator speed. The faster the speed the more separation takes place, but also more bruising damage may occur.

The amount of agitation necessary will depend on the crop and soil conditions encountered. On light soils care should be taken not to remove too much soil too early as this can lead to crop damage if all of the soil cushion has been removed before reaching the haulm roller.

When additional agitation is required, an optional third shaft can be fitted.

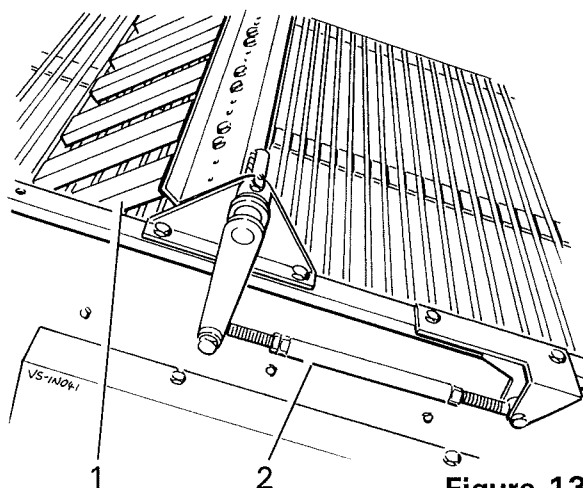
## Clod Breaking Fingers

The clod breaking fingers (if fitted) consist of one or two rows of trailing rubber blocks (*item 1, figure 13*). These operate by rolling the clods and potatoes which, in some soil conditions, has the effect of splitting the clods and allowing the smaller pieces to fall through the web.

To vary their effectiveness the clod fingers can be raised above or lowered down onto the web by adjusting the turnbuckle (*item 2, figure 13*). Care should be taken not to set the fingers to operate too rigidly onto the web or bruising and skin scuffing may occur.



*Do not attempt to adjust the clod breakers while the machine is running. Always stop the tractor and turn off the engine first.*



**Figure 13**

## Haulm Roller



*Do not attempt to adjust, unblock or open any of the access guards to the haulm roller while the machine is running and never attempt to reach into the haulm roller from below. Always stop the tractor and turn off the engine first.*

The haulm roller is designed to pinch the haulm and trash and drop it back onto the ground under the machine. Adjustments for the haulm roller are as follows:

To increase/decrease the gap between the haulm roller and digger web, release the locknut (*item 1, figure 14*) and turn the setscrew (*item 2, figure 14*). Care must be taken to set the gap equally on both sides.

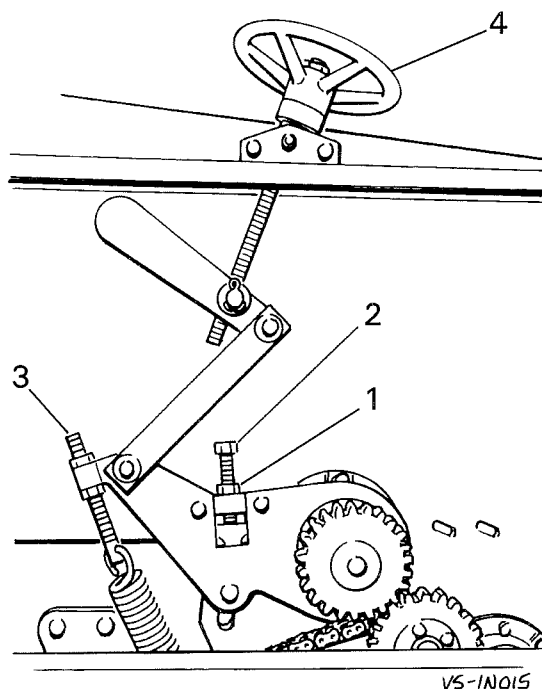


*Do not attempt to close the haulm roller gap too much or the web joiner may foul the haulm roller causing damage to both.*

To increase/decrease the haulm roller spring tension, adjust the setting of the spring tensioner (*item 3, figure 14*). Adjust both sides evenly and check the setting by measuring the length of exposed thread on the spring tensioners.

Rotating the position of the haulm roller relative to the digger web alters the amount of material the roller removes. The roller position can be altered by turning the hand wheel (*item 4, figure 14*).

The higher the roller is positioned relative to the web, the more material will be removed. Lowering the roller relative to the web will allow the flow of material to pass over the top of the roller onto the 2nd web. Adjusting the haulm roller until the maximum amount of haulm is removed with the minimum amount of potatoes being pulled through or nipped



**Figure 14**

requires careful setting. This setting will need to be altered for different crop conditions, but the initial setting should start with the roller well down and then gradually raising it up. For effective harvesting this is one of the most critical adjustments, hence the simplicity with which it can be varied on the Vision.

The haulm roller is fitted with a scraper. Set the scraper as close to the roller as possible without fouling it.

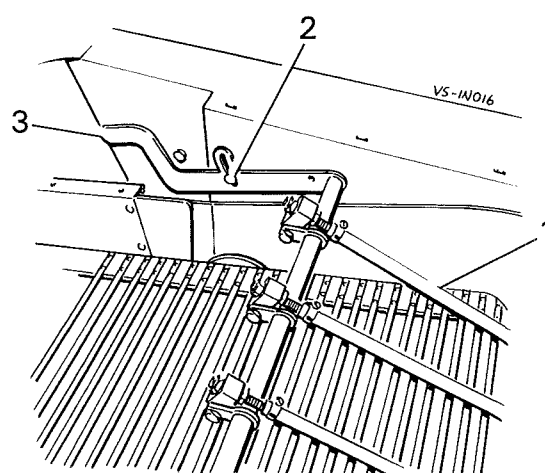
## Haulm Fingers

The function of the haulm fingers (*item 1, figure 15*) is to catch the haulm and direct it down into the haulm roller.

Moving the haulm fingers away from the web will allow a clearer flow for the crop. In green top or heavy trash it may be necessary to rotate some of the fingers out of the crop flow to prevent overloading of the haulm roller and excessive damage to the crop.

By releasing the clamp bolt (*item 2, figure 15*) and raising/lowering the handle (*item 3, figure 15*), all of the fingers can be moved as a set.

A plastic sleeve is fitted to each finger and fastened with a hose clamp. The sleeves are fitted to prevent bruising of the potatoes and should be replaced when they wear through or are lost.



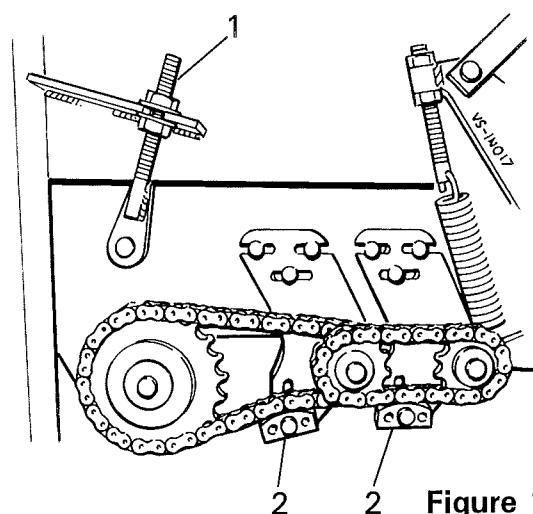
**Figure 15**

## 2nd Web Star Separator

The 2nd web star separator is positioned between the haulm roller and 2nd web. The unit consists of two rows of twelve fingered rubber stars which are designed to give a degree of soil and clod separation depending on the crop and soil conditions.

The relative height of the stars behind the haulm roller can be set by the adjusters (*item 1, figure 16*) on either side of the chassis. Ensure the unit is level by checking the height of the top of the stars below the top of the chassis web sides.

Chain drive to the star separator is from the right hand end of the 2nd web drive shaft. Chain tensioners (*item 2, figure 16*) are fitted to maintain the correct drive tension, and prevent jerking in the star drive.



**Figure 16**

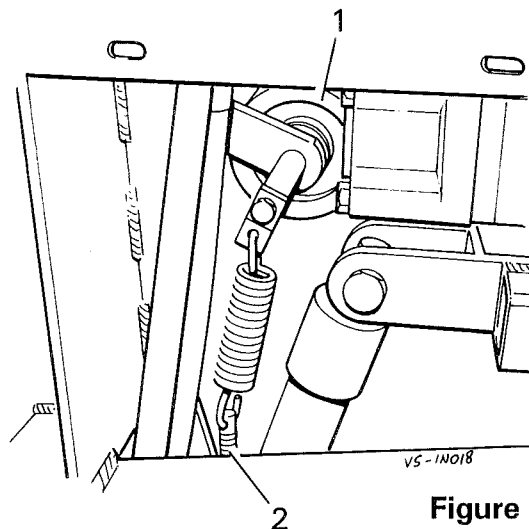
## 2nd Web

The 35mm pitch 2nd web is 1720mm wide regardless of the digger web width. Rubber covers are fitted to the web bars to minimise crop damage and drop-away links release any material trapped inside the web.

The 2nd web is sprocket driven on the web belting and the drive shaft is mounted on the return side of the web to allow only a small drop onto the cleaner unit. To accommodate the variation in web length that occurs when raising and lowering the cleaner unit, the web is fitted with a pair of spring loaded tension rollers (*item 1, figure 17*). The pressure exerted by the tension rollers should be set with the cleaner in its mid-angle position using the adjusters (*item 2, figure 17*).



*Make all adjustments evenly. Uneven adjustment may cause the web to run to one side and eventually cause premature failure of the web or slip clutch.*

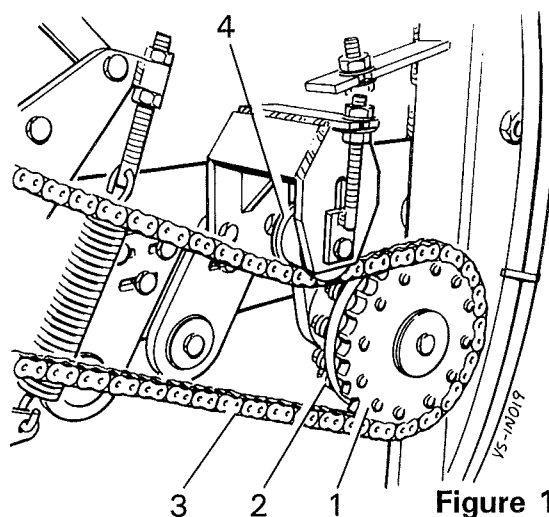


**Figure 17**

The 2nd web is chain driven via the spring loaded slip clutch (*item 1, figure 18*) which is fitted to protect the web should any major blockage occur. The amount of torque required to start the clutch slipping can be varied by turning the spring bolts (*item 2, figure 18*). The clutch should be set to just drive without slipping under normal conditions. Ensure all twelve bolts are adjusted equally. When the star separator is not fitted it may be necessary to remove three or even six spring bolts to allow the clutch to slip at a lower torque.



*Care should be taken when adjusting the slip clutch spring bolts (item 2, figure 18), as overtightening of the bolts will render the clutch ineffective.*







**Figure 18**

The 2nd web drive chain (*item 3, figure 18*) is fitted with a tension roller (*item 4, figure 18*) which should be checked regularly and adjusted as required.



## Roller Cleaner Unit

The harvester is fitted with a 20 roller cleaner unit. Two hydraulic motors running in parallel drive the cleaner unit rollers and are able to automatically reverse to clear blockages.

Control for the roller cleaner unit is supplied electronically from the in-cab control box. Controls consist of; 'Cleaner Table' angle increase , decrease , start/stop , manual 'Reverse' , and speed control. The 'Reverse' button starts the roller reverse sequence allowing stones and trash seen by the operator to be ejected before a blockage occurs.




*All guards must be in place when the cleaner unit is in operation. Never attempt to clear any blockage from above or below the rollers unless the machine has been stopped and the tractor engine has been switched off. Always isolate the emergency stop button before working on the cleaner unit to prevent accidental restarting.*



*Regular checks should be made to ensure that any damaged seals or bearings that have worked loose are rectified before any damage occurs. Worn or damaged seals will show up due to oil leakage at the back of the gear case. Bearing wear will be seen as excessive play (1-1.5cm) at the end of the roller shafts. For seal/bearing adjustment procedures, see the maintenance section of this handbook.*

## Cleaner Unit Angle

The steeper the angle of the cleaner unit, the quicker the crop flows over it and the less time it has to be cleaned. The angle is variable through 11°. An optional auto angle unit can be fitted to maintain a preset angle on the cleaner when working on undulating ground. The auto angle unit is activated by pressing the button .

## Roller Speed

By increasing the roller speed, the crop is accelerated across the table by the scrolled rollers while the heavier soil and stones settle and are pulled through. Slowing the rollers down holds the crop on the table longer allowing more cleaning to take place. It will be necessary to determine the optimum speed and angle of the table to suit the crop being harvested. Variations in crop and soil conditions will change the effectiveness of the table.

## Roller Size

Two sizes of plain rubber roller are available, Ø82.5mm and Ø74.5mm, these are normally used in conjunction with Ø82mm or Ø75mm inner diameter spiral scrolled rollers. The large diameter plain rollers in conjunction with small diameter spiral rollers will normally be used where tuber size is small and in dry soil conditions. The small diameter plain rollers in conjunction with large diameter spiral rollers are generally used on main crop and where soil conditions are wetter and heavier. However, there is a cross over in the use of the alternative rollers. By varying the angle of the table and the roller speed, the operator will often find an acceptable sample can be achieved without changing rollers. Intermediate gaps can be obtained by selecting alternative combinations of rollers. The same sizes of roller are also available in polyurethane covering, which has been found to be more tolerant of sharp stones.

Plain and scrolled steel rollers are also available primarily for use on crops such as carrots, bulbs, onions and parsnips, but can also be successfully used on some varieties of potato.

### Changing the Cleaner Rollers

The rollers are retained on the cleaner unit shafts by a single bolt and washer (*item 1, figure 19*). To remove a roller, remove the bolt and slide the roller off the shaft. The rollers are a close fit on the spigot at the gearbox end and may need to be prised off or bumped free. When replacing a roller, it is advisable to smear grease on the spigot. Take care to align the driving flats as the shaft slides home and do not force them if they are not in line.

### Roller Scrapers

Scrapers are fitted to prevent excessive build up of soil and trash damaging or stalling the cleaner unit. To adjust the scrapers, slacken the mounting bolts (*item 1, figure 20*) and slide the scraper blade (*item 2, figure 20*) up until it is 2-3mm clear of the roller. Retighten the mounting bolts and check that the rollers do not foul on the scraper blades when running.

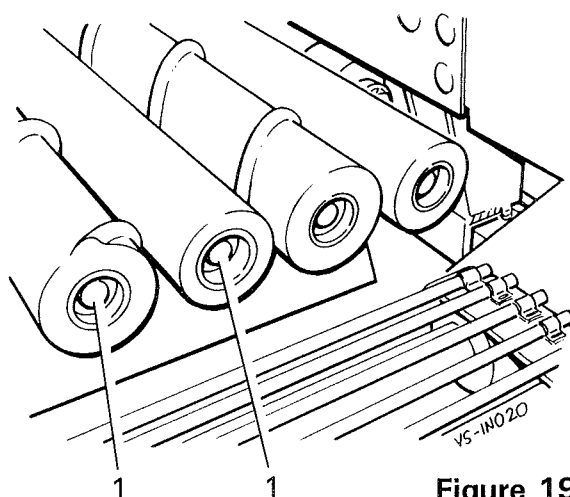


Figure 19

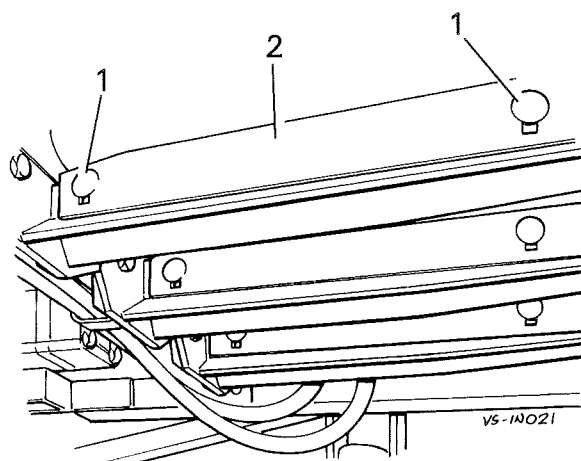


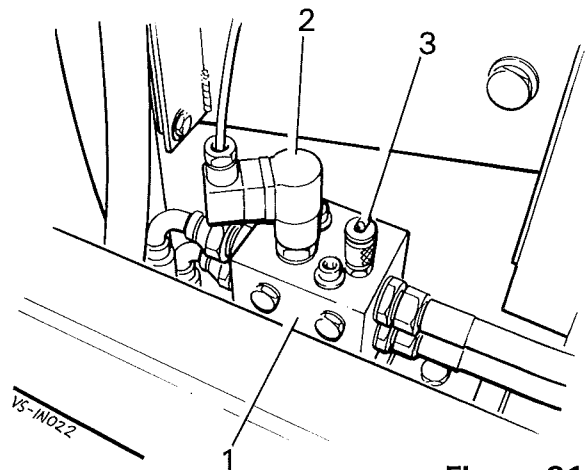
Figure 20

## Cleaner Unit Reverse Pressure

During varying harvesting conditions it may be found necessary to change the pressure at which the cleaner reverses. The automatic reverse control is operated by an adjustable pressure switch and an electronic timer relay. The pressure switch is mounted on the cleaner unit left hand motor manifold (*item 1, figure 21*).

To adjust the pressure switch:

1. Lift the cover cap (*item 2, figure 21*) to expose the adjuster screw that changes the switch setting.
2. Connect a pressure gauge to the forward gauge port (*item 3, figure 21*) and a throttle valve between the male/female coupling (*item 4, figure 32*) of the return hose (on some machines a throttle valve is already fitted behind the LH centre guard door). Connect a self-powered test light or multimeter across the pressure switch terminals leaving the harness plug disconnected.
3. Run the cleaner unit at approximately half speed and throttle the flow from the cleaner motors slowly until the pressure switch makes. Note the pressure gauge reading, this is the reverse pressure.
4. Adjust the the screw on the switch until the required pressure is reached.




**Figure 21**


## Spreader Unit



In a direct loading machine, as the crop passes off the cleaner unit onto the elevator web it first passes over the spreader unit. The spreader is designed to distribute the crop evenly over the full width of the elevator. Depending on the length of the cleaner rollers, this will be either a two or three step unit. The two step unit consists of two webs of different lengths and is used when short


(975mm) cleaner rollers are fitted. The three step unit consists of two 500mm wide webs of different lengths and a rubbered roller and is used when long (1125mm) cleaner rollers are fitted.

The button marked 'Table'  will start/stop the spreader independently of the elevator web.

## Discharge Elevator

The hydraulically driven discharge elevator is designed to fold within the width of the machine for transport and open out for work when loading potatoes into a trailer running alongside. Folding and unfolding is controlled by the control box joystick. Fold in ◀ and fold out ▶, operates the bottom section which is primarily used to set the working height and reach. Raise ▲ and lower ▼, operates the top section which adjusts the discharge height of the crop into the trailer and allows for even loading. The optional auto height sensor (if fitted) is activated by the button . The auto height sensor is turned off automatically if any of the elevator fold functions are operated.

The speed of the discharge web is controlled electronically by the speed control knob. The button 'Spreader'  starts/stops all the elements of the rear section of the harvester. With the 'Spreader' button on, the button 'Elevator'  starts/stops the elevator web only.

On machines fitted with a picking table, the button 'Table'  starts/stops the manned elements of the machine. On an unmanned machine the button starts/stops the spreader unit.

Because the tractor oil supply is used to power the discharge elevator, the maximum speed of the web will depend on the hydraulic flow from the tractor and may be subject to slight fluctuation when ram services are operated. If ram services are taken to relief (dead headed) the elevator will stop while the tractor relief valve is blowing.

To ensure the web panels (*item 1, figure 22*) do not foul the elevator web, they are mounted on slotted brackets (*item 2, figure 22*) which allow them to be positioned vertically and horizontally relative to the web. Care should be taken

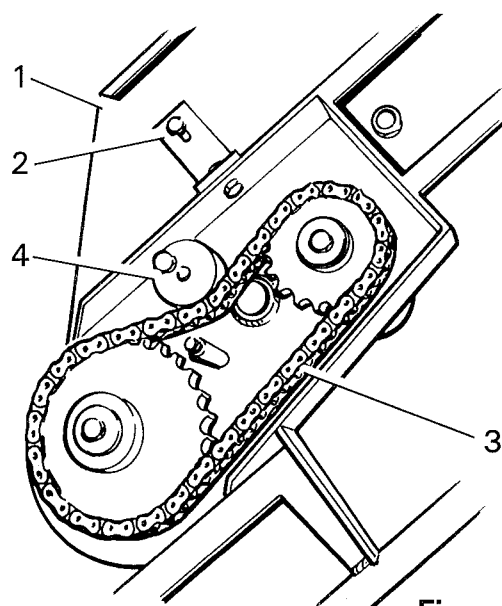



Figure 22

when adjusting the panels to ensure they do not rub on the web bars, as this will cause rapid wear and damage to both the web and panels.

The discharge elevator drive chain (*item 3, figure 22*) is tensioned by rotating the tensioner block (*item 4, figure 22*).


## Windrow Attachment

An optional windrow attachment can be fitted to the harvester which allows the crop to be discharged between the two unlifted rows on the left hand side of the machine. An adjustable rubber chute is hooked onto the left hand end of the elevator web. This is easily removed to reduce transport width.

The button 'Windrow'  reverses the elevator drive to discharge the crop on the left hand side of the machine.

## Picking Table

The optional low level picking table allows up to four pickers to work in comfort, two on either side of the picking belt. The picking off-surface is a wide rubber belt, with a simple divider in the middle. Reject material is placed within the divider and carried to the rear of the harvester.

The control box button 'Table'  starts/stops the manned elements of the machine. The speed of the picking belt can be varied to suit crop conditions by adjusting the flow control knob mounted at the rear of the RH platform.





*Care must be taken at all times when working on moving machinery. Never wear loose clothing and always tie back long hair. People working on the harvester must be made aware of the tractor drivers intentions.*





*The emergency stop buttons positioned above the picking belt, when activated, shut down all hydraulic drives and electrical controls.*


The picking table feed web can be moved rearwards hydraulically. This allows easy changing of cleaner unit rollers or, with the addition of the spreader unit, a bypassing of the picking table altogether.




The control box buttons 'Option' raise  and lower  operate the feed web hydraulic rams. Ensure the front canopy is released from the top of the feed web before raising. On machines with additional options such as onion gate or sweeping clod fingers etc., the ram circuit is shared and the feed ram circuit will need to be selected by operating the manual diverter valve mounted behind the RH centre guard door.

## Rear Axle

The rear axle is fitted with steerable wheels and is linked to the chassis by a pivot and hydraulic ram which allows the harvester to be levelled relative to the ground.

Control of the steering and levelling is from the in-cab control box. The buttons 'Axle Level' raise  and  lower operate the levelling ram between the chassis and axle.

Optional automatic levelling can be fitted to maintain side to side 'horizon' level when operating on undulating ground. The automatic levelling is activated by the button 'Axle Level' .

The buttons 'Axle Steer' right  and left  steer the rear of the machine in the indicated direction. The auto centre button  when pressed and held operates the self-centring circuit to automatically set the wheels to the straight ahead position.

Two different sized wheels are fitted to the harvester. The fixed LH wheel is tracked to match a position suitable for all row widths and is an 18x19.5 Trac Grip tyre.

The adjustable RH wheel is a larger 16.9x24 Trac Grip tyre and, with its greater rolling radius, gives better performance on soft soil. The wheel can be adjusted for 32"-36" row widths. By reversing the wheel pan the range can be extended to 40" work.

To operate the harvester on 28" and 30" rows the harvester needs to be fitted with an optional narrow axle and usually with a 13.6x28 RH wheel.

## Rear Axle Wheel Setting

The RH wheel setting procedure is as follows:



*Before attempting to adjust the wheels, ensure the machine is on firm, level ground. Position the jack under the axle beam inboard of the clamp. Make sure the jack is stable when lifting the machine and before removing a wheel, place additional support under the chassis in case the jack should fail or become dislodged.*

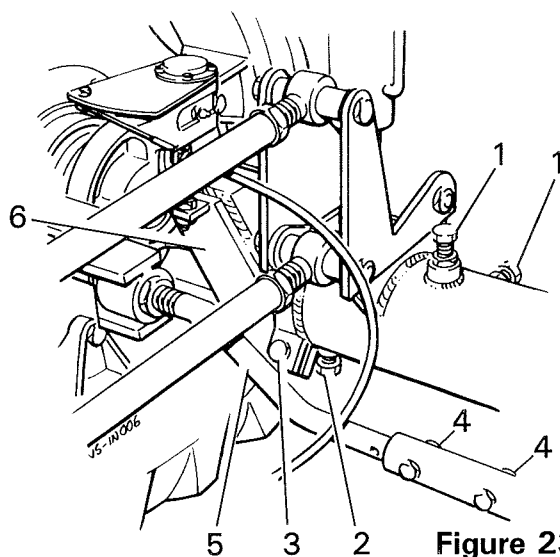
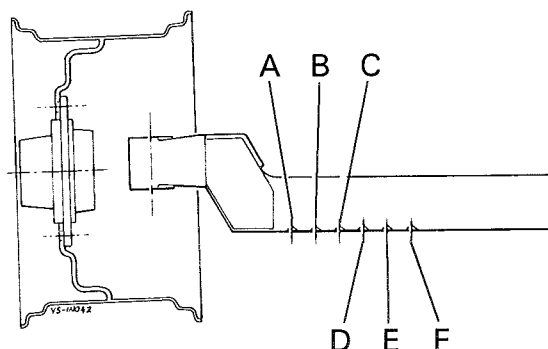


Figure 23

1. Switch off the tractor engine, apply the hand brake and jack up the machine.
2. Slacken the two clamp bolts (*item 1, figure 23*), the locking bolt (*item 2, figure 23*) and release the clamp (*item 3, figure 23*).
3. Remove the drag link bolts (*item 4, figure 23*).
4. To set the track, pivot the wheel by hand to lengthen or shorten the drag link (*item 5, figure 23*) and replace the drag link bolts loosely.
5. Slide the axle beam (*item 6, figure 23*) out to the required position by pulling on the wheel opposite the drag link.
6. Relocate the locking bolt (*item 2, figure 23*) into the appropriate dimple (*A, B, C, D, E or F, figure 24*) under the axle beam and retighten all bolts.
7. Check the tracking is correct and the wheels are parallel.



Row Width	RH Axle Position
76cm (30")	A
79cm (31")	B
81cm (32")	C
84cm (33")	D
86cm (34")	E
89cm (35")	F

Figure 24

## Powered Axle

The optional hydraulic powered axle is designed to provide additional traction during work. The powered axle is capable of transferring up to 45hp from the tractor PTO to hydraulically drive the harvester wheels giving a maximum speed of 5.5kmh (3.5mph). This is achieved by means of the load sensing, pressure compensated, variable displacement pump (item 1, figure 25) which provides the hydraulic oil flow to drive the wheel motors (item 1, figure 27).

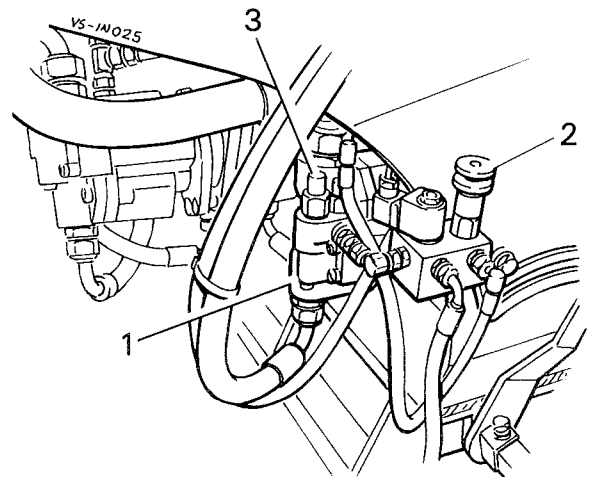


*Ensure the wheel motor casings are filled with hydraulic oil before starting. Failure to do so may cause premature failure of the motors.*

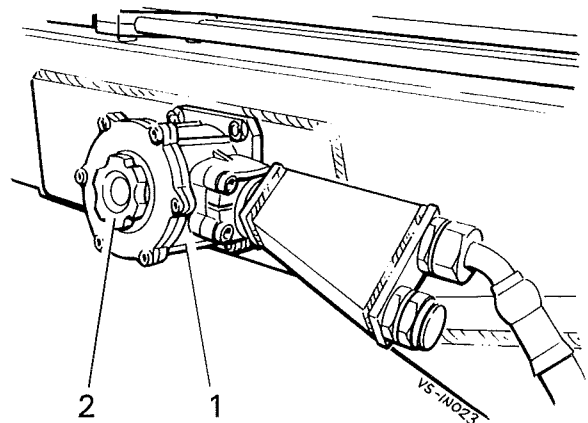
The wheels can be set to forward ◀, neutral or reverse ▶ by operating the 3-way 'Axle Drive' switch on the control box. When forward or reverse is selected, the directional control valve on the axle beam demands oil flow from the pump to provide the necessary flow required to match the harvester wheel speed to the tractor speed. When the flow matches, the pressure compensator within the pump maintains a constant pressure in the hydraulic system which is set on the external pressure control valve (item 2, figure 25). The pressure is adjustable to give the required drive assistance for normal harvesting. When the high pressure button ⊕ is pressed, the system operating pressure is increased to the setting of the main compensator within pump. Hydraulic oil for the system is supplied from the integral chassis tank. Oil feed to the pump is through the suction filter (item 1, figure 26).



*Always ensure the suction filter knob (item 2, figure 26) is wound fully in clockwise before operating the harvester.*



**Figure 25**



**Figure 26**

The pump (*item 1, figure 25*) is mounted to a double outlet splitter gearbox which mounts in place of the single gearbox used on the basic build machine. Maximum pump output at 540rpm PTO speed is 85-90 litres/minute with the axle in drive. This can be checked by fitting a flow meter between the pump outlet and the pressure hose and then running the powered axle with both wheels clear of the ground.

The system pressure is controlled by the pump relief valve (*item 3, figure 25*) which is preset at 200 bar. It may be necessary to adjust the system pressure if the harvester is trying to push the tractor. One turn anti-clockwise will reduce the relief valve pressure setting by approximately 25 bar. The pressure can be monitored on the pressure gauge (fitted to the main pressure pipe) while allowing the harvester to push against a braked tractor.



*The pressure relief valve setting should never exceed 200 bar.*

### Bleeding/Filling Wheel Motors

Place the motor in a position in which one of the bleed screws (*item 2, figure 27*) is topmost. Remove the bleed screw and pour in hydraulic oil until all trapped air has been eliminated. Refit the bleed screw and repeat for the second motor. Run the motors unloaded. Finally, operate the motors under load and check for leaks and extraneous noise.

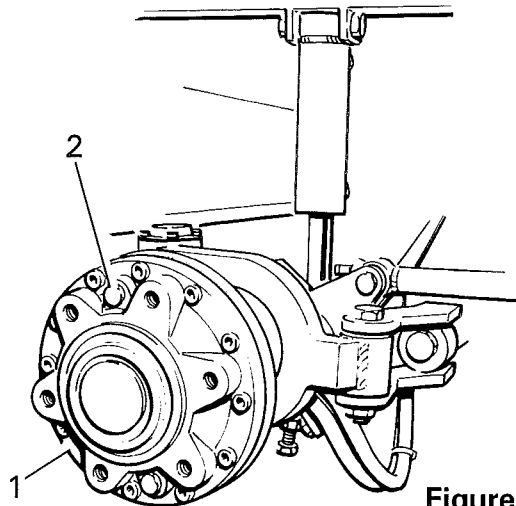


Figure 27



## Mechanical Drives

All power requirements for the harvester are taken hydraulically or mechanically from the tractor power take-off shaft. The PTO drive shaft is coupled to the harvester front gearbox. The four 'V'belts (*item 1, figure 28*) transmit the power up to the central drive shaft. The drive shaft is connected to the input of the centrally mounted main gearbox. From the gearbox, chain drives power the digger web and 2nd web. These are detailed in the relevant sections within this handbook.

The main drive can be fitted with an optional electro-magnetic clutch. The clutch replaces the upper 'V'belt pulley (*item 2, figure 28*) allowing the mechanical web drives to be isolated if required. The electromagnetic clutch is actuated by a button on the in-cab control box.

To adjust the V'belt tension, loosen the clamp bolt (*item 3, figure 28*) and push the tension roller (*item 4, figure 28*) against the belts using hand pressure only and retighten.

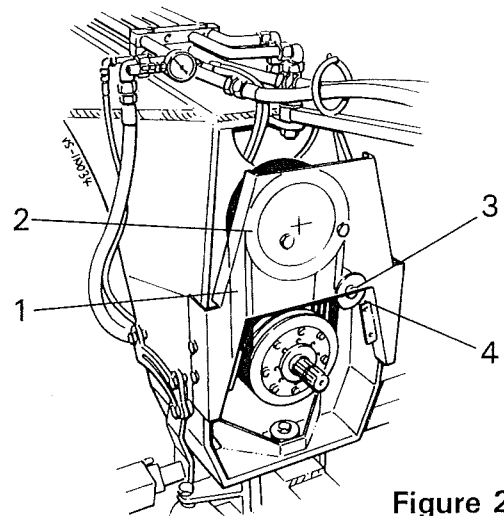


Figure 28



*Do not overtighten the 'V'belts. Besides providing a drive the 'V'belts act as a slip clutch. The belt tension should be sufficient to drive normally without slipping, but not so great that the belts cannot slip when the drive is obstructed.*



*All revolving drives; chains, pulleys, shafts etc. are potentially dangerous. Never attempt to make any repairs or adjustments while the machine is running. Always switch off the tractor engine, apply the hand brake, remove the ignition key and disconnect the PTO shaft.*

## Hydraulic Systems

Two separate hydraulic systems are fitted to the harvester and have no interaction apart from the electrical control system.

### Circuit 1. Auxiliary Hydraulics

The hydraulic ram services and discharge elevator drives are supplied with hydraulic oil from the tractor. A minimum supply of 50 litres/minute is fed through the pressure filter (*item 1, figure 33*) into the flow divider section of the auxiliary valve bank (*item 1, figure 29*). The system will accept up to 80 litres/minute maximum. The link valve (*item 2, figure 29*) allows both digger ram circuits to be operated simultaneously using the 'Digger Share' switch on the control box. The proportional valve (*item 3, figure 29*) which controls the discharge web and spreader motors has priority over the ram service valves. The flow rate through each ram service valve is controlled by the spool size and the individual flow settings. The return oil flow from the valves and motors recombines and is returned to the tractor, ideally through a low back pressure or free-flow return coupling. No separate relief valve is fitted to the circuit, the system relies totally on the tractor relief valve.

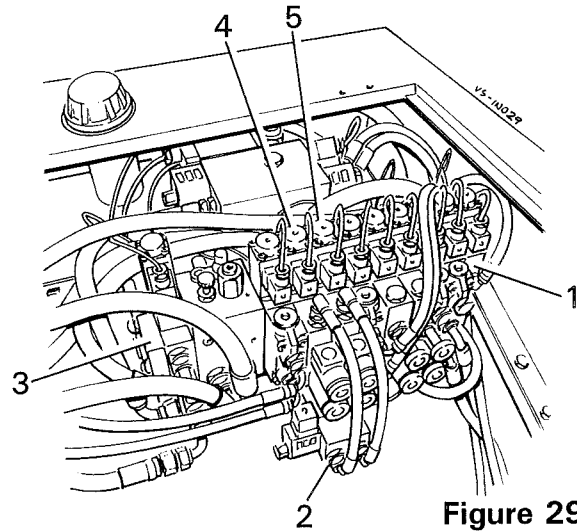


Figure 29

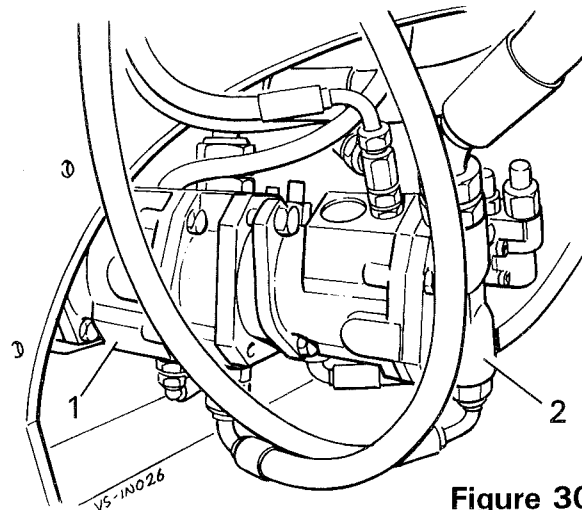


Figure 30

### Circuit 2. PTO Powered Hydraulics

#### Cleaner Unit Hydraulics

The hydraulic supply for the cleaner unit system is taken from the pump (*item 1, figure 30*). The oil reservoir is integral within the centre chassis beam and has a capacity of 400 litres. The feed into the pump is through the suction filter (*item 1, figure 31*) submerged in the side of the centre beam.



*When the machine is in use, the suction filter knob (item 2, figure 31) must be wound fully in clockwise at all times.*

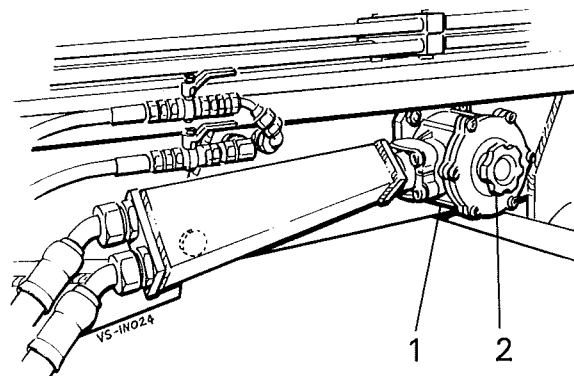


Figure 31

The oil flow from the pump (85-90 litres/minute at 540 PTO r.p.m.) passes through the pressure filter (*item 2, figure 33*) into the cleaner unit proportional load sensing control valve (*item 1, figure 32*). Also incorporated within the valve is the pressure relief valve (*item 2, figure 32*) which is preset at 200 bar.



*The pressure relief valve (item 2, figure 32) 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.*

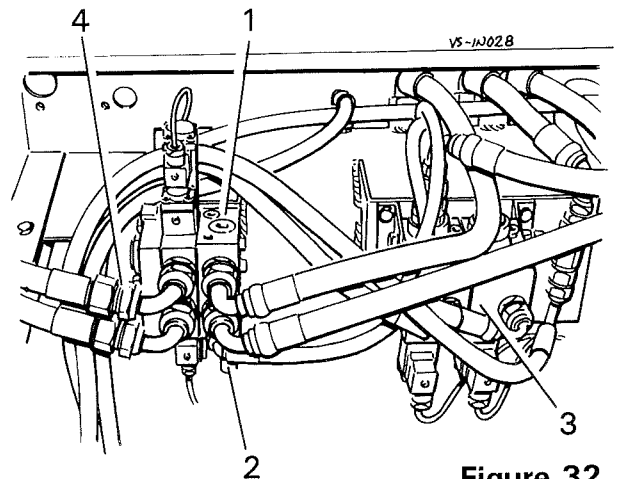
From the proportional valve, the flow is taken to the left hand cleaner unit motor manifold block (*item 1, figure 21*) and then tee'd in parallel to the right hand motor.

## Secondary Hydraulics

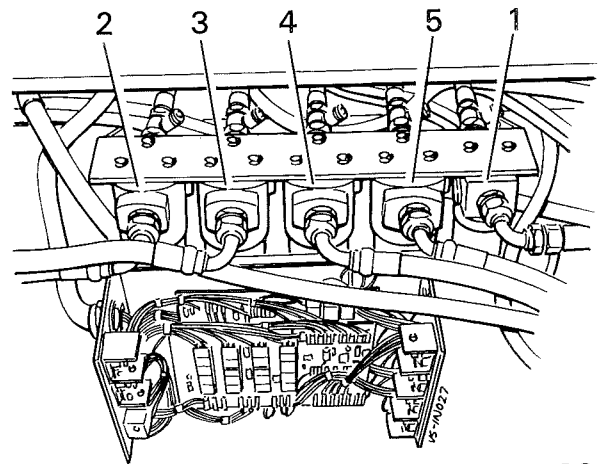
The hydraulic pump (*item 2, figure 30*) supplies oil for the rotary agitators, sweeping clod fingers, and one other option when fitted. The oil supply is taken from the suction filter (*item 1, figure 31*), and fed through the pressure filter (*item 3, figure 33*) to the secondary proportional load sensing valve bank (*item 3, figure 32*). The LH valve section, fitted with a 25litre spool, controls the rotary agitators. The second valve section controls the sweeping clod fingers. On, off and speed control are provided from the control box. A third proportional valve section can be fitted to provide for an additional option such as powered diablo rollers etc.

## Optional Hydraulic Systems

Depending upon the options built into the Vision, one or two additional load sensed pumps can be mounted on the PTO driven gearbox. The pumps supply oil for the powered axle and/or the hydraulically driven digger web. Additional filters will



**Figure 32**



**Figure 33**

also be fitted consisting of the hydraulic digger web pressure filter (*item 4, figure 33*) and/or the powered axle pressure filter (*item 5, figure 33*).

### Electrical Control System

Control for the major functions of the Standen Vision are provided electronically by the switches mounted on the in-cab control box.

Fuses rated at 30amps are fitted in the control box. These ratings should not be exceeded as irreparable damage may be caused to the electrical system.

Ensure that all plug and socket connections are clean and coupling pins undamaged before connection, and that they are securely locked together before the power is switched on.



*Do not leave or store the control box outside in the open and always disconnect the control box from the tractor electrical supply when not in use, so avoiding the possibility of draining the battery.*

### Emergency Stop Button

The emergency stop button fitted at the rear of the harvester, when activated, shuts down all hydraulic drives and electrical controls.



*The emergency stop button does not isolate any mechanically driven components.*

The electrical control system will only function as a completely connected circuit. The emergency stop button completes the looped circuit and this circuit must be unbroken before the control box can be turned on or reset. If the emergency stop button is tripped, the button must be reset before the in-cab control box will latch on.

**Checks Before Starting a New Machine,  
Changing Tractor, or when Changing Field or Crop**

1. Ensure the harvester is level when hitched to the tractor.
2. Ensure the hydraulic and electrical connections from the tractor are correctly made and are secure.
3. Ensure the tractor and harvester wheel settings match the rows to be harvested.
4. Ensure the shares are set to the correct row widths and are set centrally to the rows.
5. Set the shares so that they are evenly spaced and the tip plates are in line with the top of the digger web.
6. Ensure the diablo rollers are mounted centrally over the rows.
7. Set the disc coulters to the correct width to suit the ridges being lifted, typically 2.5cm (1") from the outer edge of the share blade.
8. Ensure the disc coulters are set parallel to each another.
9. Ensure the disc coulters are sharp, especially in soft ground or trash.
10. Ensure the haulm intake rollers are set to the correct width.
11. Check that the web pitch is suitable for the size of crop to be lifted.

**Setting the Machine into Work**

1. Set the machine into work, harvest about twice the length of the machine and then stop.
2. Dig into the lifted rows behind the machine to check the depth of work.

Cut potatoes in the ground may indicate that the machine is digging too shallow. Potatoes with an uneven cut are usually caused by the shares. Adjust the diablo depth turnbuckle. Clean cut potatoes at the side of the lifted rows may mean that the disc coulters are set too close to the sides of the share. Set the discs slightly wider.

Check that the disc coulters are set to the correct depth, normally just above the bottom of the shares.

Uncut potatoes on the surface at the side of the machine may have rolled around the front of the discs, or off the front of the digger web. Set the discs and haulm intake rollers to contain the crop.

Excessive depth of digging will lift too much soil onto the harvester and cause separation problems (1/2" depth equates to 30 tons per acre). Set the diablo rollers to carry the shares just under the potatoes. Avoid digging into the unworked soil beneath the ridge.

Turn down the digger suspension hand wheel until it is hard against the trunnion on the torsion bar.

3. Check the potatoes on the digger web.

Cut potatoes will indicate either too shallow digging or badly set discs. Excessive soil may indicate too deep digging. Reset accordingly.

Stones and clod at the side of the web may indicate that the discs and shares are set too wide causing material to be lifted out of the wheelings.

4. Look for undamaged potatoes laid randomly on the surface of the soil.

The size of these potatoes should be checked against the web pitches fitted to the machine and may indicate that narrower pitch webs or web rod cover kits should be fitted.

Check other elements of the machine that may have forced potatoes through the webs. If set too close to the digger web, the sweeping clod fingers and rubber clod fingers may force potatoes through the web.

5. Look for crushed potatoes on the surface.

Especially if mixed with haulm and trash, crushed potatoes usually indicate that the haulm roller setting needs to be adjusted. The haulm roller may be set too high, the roller spring tension too weak, or the haulm fingers set too close to the roller, all of these points will cause potatoes to be pulled through the haulm roller. Check all of these settings and adjust until the correct setting is found.

In some crop conditions it may help to vary the speed of the 2nd web in order to pull the potatoes away from the back of the haulm roller. Alternative drive sprockets are available which can be fitted to the gear on the LH end of the digger web shaft.

6. Check for nipped potatoes under the roller cleaner unit.

Changing the setting of the roller cleaner unit will normally eliminate the problem of potatoes being pulled through the rollers. The angle, speed and roller size can all be varied.

### General Operating Hints

1. In dry or light soil conditions, it is beneficial to carry soil through to the roller cleaner unit.
2. Keep web agitation and crop movement to a minimum to obtain a clean sample.
3. Set the diablo roller and digger web suspension to exert the lightest pressure possible on the ridge while still maintaining crop flow, this will minimise bruising in the ridge.
4. Do not hold the crop on the cleaner unit longer than is necessary as this can encourage crop damage.
5. Run the discharge elevator at a speed which takes the crop away smoothly without waterfaling or throwing.
6. Operate the harvester smoothly and make adjustments logically, one at a time, until the optimum sample is achieved.

## Maintenance of Hydraulic Systems

The components utilised in the design of the hydraulic systems have been chosen for their maintenance free characteristics. Should it be necessary to remove any of the hydraulic components, cleanliness is of the utmost importance. Before breaking any connection in the system, ensure the surrounding area is clean. Pressure wash the machine if possible. Prevent contamination entering the system by plugging any open pipe work and ports with plastic plugs or clean paper wipes. Do not use cloth or rags. Preventing contamination entering the system will prolong the life of the various hydraulic components and will help prevent component failure.

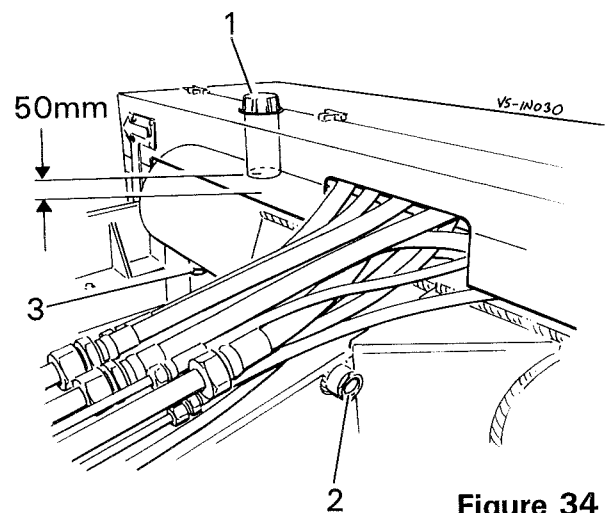


*Hydraulic oil under pressure is dangerous. Ensure that any residual pressure is released safely before working on the system. Do not release ram hoses without first supporting the part of the machine the ram controls.*



*Remember that the tractor hydraulic oil supply serves the machine. Ensure the tractor hydraulic system is serviced in accordance with the manufacturers recommendations to prevent cross contamination of the harvester auxiliary system.*

To extend the life of the hydraulic system, the hydraulic oil should be carefully monitored. The hot oil level should be kept at approximately 50mm below the bottom of the chassis mounted filler neck (item 1, figure 34), and covering the sight glass (item 2, figure 34). Maintain the filler level by topping up or refilling with Esso Nuto 46 Hydraulic Oil. The reservoir holds approximately 400 litres (80 gallons).



**Figure 34**

If a high water content becomes apparent or a cloudiness in the oil, the hydraulic oil should be changed.

The oil reservoir magnetic plug (item 1, figure 36) should be removed and cleaned annually. This plug is also used to drain the reservoir, so if the oil is not being changed a temporary 3/4" BSP plug should be used to seal the tank and minimise oil loss. An additional drain plug (item 3, figure 34) is used to drain the remaining oil left in the top section of the tank.



*Regularly check all hoses for chafing or accidental damage and replace immediately.*

The pressure filter elements (*item 1, 2, 3, 4 & 5, figure 35*) should be replaced after the first 50 hours running time and then every 500 hours or annually thereafter. Subsequently the filter elements should be replaced if the indicators show that the elements are becoming blocked.

To replace a pressure filter element:

1. Switch off the tractor engine and apply the hand brake.
2. In the case of the auxiliary circuit pressure filter (*item 1, figure 35*), operate the spool valve feeding the harvester to release any residual pressure and then disconnect the feed hose from the tractor.
3. Unscrew the bottom casing of the filter housing.
4. Remove the filter element and rinse out the casing.
5. Fit the new element and refit the casing ensuring that it is tight.
6. Run the system and check for leaks.

The suction filter elements (*item 2, figure 36*) should be replaced after the first 50 hours running time and then every 500 hours or annually thereafter. Subsequently the filter elements should be cleaned or replaced if the indicator shows that the element is becoming blocked.

The suction filter elements are serviced as follows:

1. Wind the suction filter knob (*item 3, figure 36*) fully out anti-clockwise to close the cut off valve within the filter housing.
2. Release the screws (*item 4, figure 36*) holding the filter lid. A small amount of oil will be lost from the filter body.
3. Remove the top of the filter and withdraw the element.
4. Clean or replace the element and reassemble.
5. Wind the suction filter knob (*item 3, figure 36*) fully in clockwise to open the cut off valve.
6. Run the system and check for leaks.

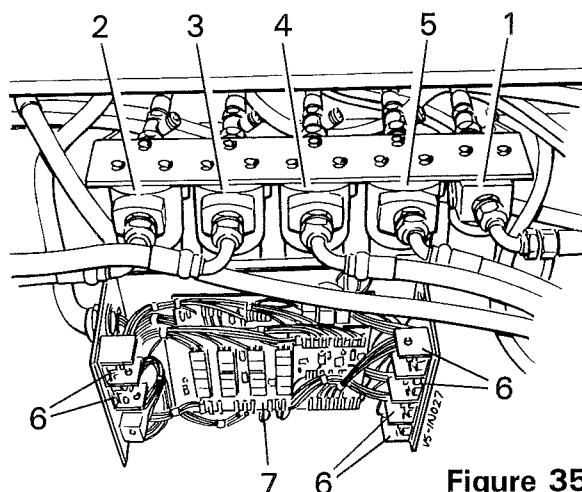


Figure 35

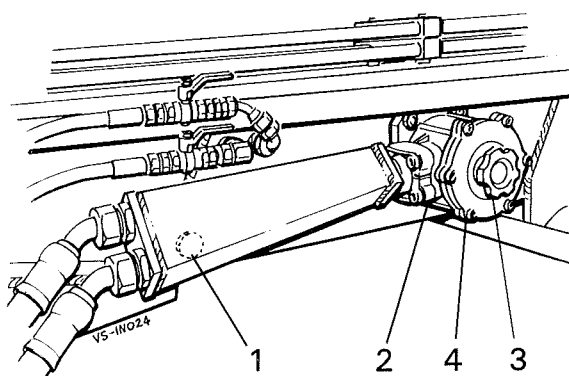


Figure 36



**Maintenance of Mechanical Drives**

Drive chains and belts must be maintained at the correct tension. The various adjustments are detailed within this handbook. Maintaining correct tension, alignment and lubrication will ensure the efficient running of the harvester and prolong the life of the drive components.

The input drive shaft from the tractor PTO should be checked for damage regularly and the inner and outer tubes checked to ensure a free sliding movement. Binding between the input drive shaft components will cause severe end loading on the gearbox input shaft leading to premature failure of the gearbox.

**Maintenance of Electrical System**

Trouble shooting of the control system must be carried out by a competent engineer familiar with electrical servicing. Items such as the proportional valve control cards, and the control circuit boards may be damaged if incorrectly connected.

The basic test to confirm an electrical fault if a service does not operate, is to try to operate the service using the manual override pins fitted to the hydraulic valve block. If the service operates manually, then checks should be made to see if power is reaching the relevant solenoid on the valve. Tell tale lights are incorporated in the distribution boards (*item 7, figure 35*) in the rear distribution box. If the service does not operate manually, then it is possible the fault lies within the hydraulic system.

## Speed Control Card Setting Procedure

The minimum and maximum speed of the discharge elevator, cleaner unit, digger web, agitators, sweeping clod fingers, and manned picking table are factory set on the control cards (*item 6, figure 35*) inside the rear distribution box. Should it be necessary to reset the control cards, the following procedure must be followed.

### 1. To set the minimum speed.

With the motor running and the relevant speed control knob turned just on, adjust the screw marked 'P2' on the relevant control card (*example see figure 37*) to decrease the speed until the required minimum speed is obtained.

### 2. To set the maximum speed.

With the motor running and the relevant speed control knob turned to maximum, adjust the screw marked 'P3' on the relevant control card (*example see figure 37*) until the required maximum speed is obtained.

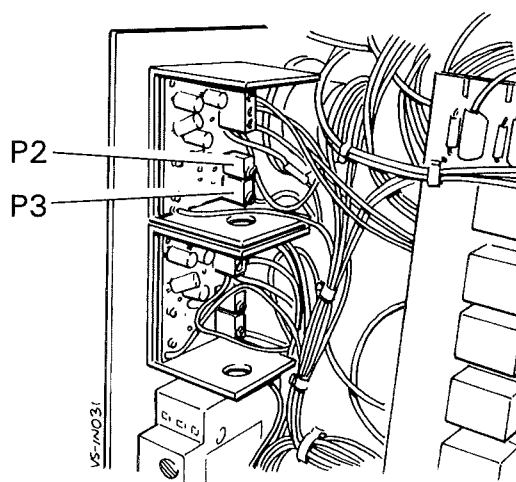


Figure 37

## Setting the Rear Axle Self-centring Mechanism


The rear axle self-centring mechanism is combined with the wheel position indicator (*see figure 39*) and is used to bring the harvester wheels back to the straight ahead position after manoeuvring. The centre position is factory-set but may need to be adjusted after a period of service. Should the cable (*item 1, figure 38*) be in need of adjustment, the wheels will tend to centre to a RH bias. To correct the centre position, the cable can be reset by means of the cable adjuster on the axle king pin mounting. Release the bolts holding the cable anchor plate (*item 2, figure 38*) to the top of the king pin, and rotate the plate until the wheels return to the straight ahead position when operated.

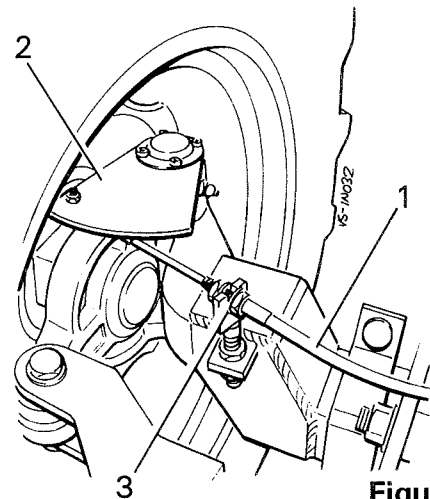
Retighten the bolts fully when the correct position is reached.

The setting of the proximity switches (*item 1, figure 39*) in the position indicator will only need adjustment if the unit has been dismantled for any reason and should be carried out by a competent service engineer.

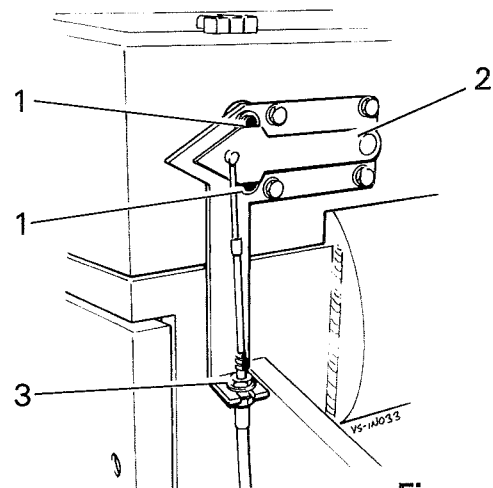
The setting sequence for the indicator unit is as follows and must be followed through in order:

1. Manually set the wheels in the straight ahead position checking that the RH wheel is parallel to the side of the chassis at the front and back of the tyre.

2. Release the cable anchor plate (*item 2, figure 38*). Set the indicator (*item 2, figure 39*) in the horizontal position as indicated by the background pointer.
3. Check all the cable fixings for tightness, adjust as required.
4. Set the cable adjusters to the midway position by turning the locknuts (*item 3, figure 38 & 39*).
5. Lock the cable anchor plate (*item 2, figure 38*) to the king pin.
6. With an assistant holding down the 'Auto Centre' button , both light bands on the proximity switches (*item 1, figure 39*) should be off.
7. Check the centre position of the wheels returning from both LH and RH lock and fine tune this position by adjusting the relevant proximity switch. The upper edge of the indicator (*item 2, figure 39*) will be seen to cover the top proximity switch on LH lock and the lower edge will cover the bottom proximity switch on RH lock. The point at which the light band goes off is the point where the ram stops moving.
8. Fine tune the cut off position of the switches to ensure that the wheels centre from both directions.
9. If a proximity switch does not illuminate, it may need to be moved closer to the indicator (*item 2, figure 39*) by adjusting the switch body locknuts. Ensure that the proximity switch does not touch the indicator when everything is tight. A clearance of approximately 1mm should be set between the indicator and the face of the proximity switch.



**Figure 38**



**Figure 39**

**Note:** At no time should both proximity switches (*item 1, figure 39*) light up together. A neutral band must always be present where both switches are off.


## Setting the Automatic Depth Control

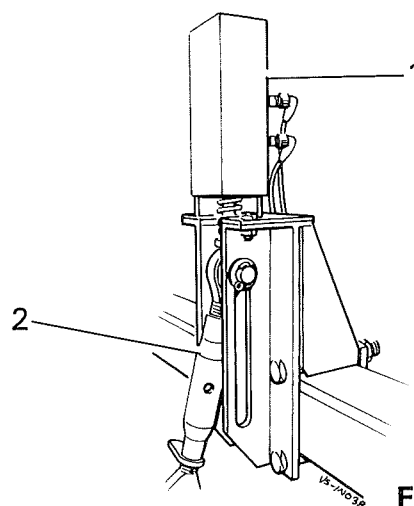
The depth control unit (*item 1, figure 40*) allows each diablo roller to sense the height of the ridge it is running on and in doing so, maintains the constant depth of the share below the top of the ridge. The depth control unit senses the position of the depth adjusting turnbuckle (*item 2, figure 40*). The proximity switches (*item 1, figure 41*) are factory-set but may need to be adjusted after a period of service.

The setting sequence for the depth control unit is as follows and must be followed through in order:

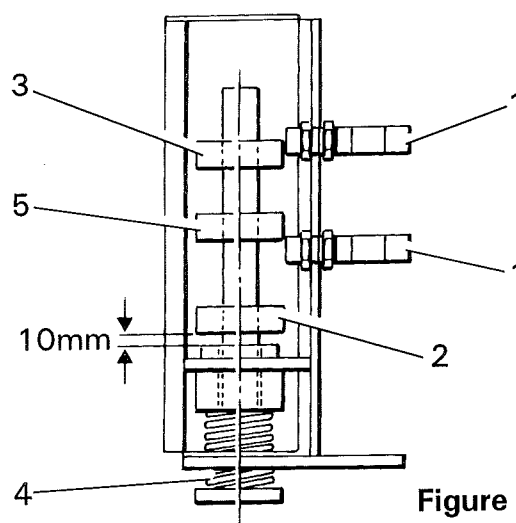
1. Remove the guard by slackening the two bolts and then slide the guard forward.
2. With the turnbuckle (*item 2, figure 40*) at the top of the slot in the reaction bracket, the spring stop (*item 2, figure 41*) can be set. Release the grubscrews and move the spring stop disc until a gap of 10mm is obtained between the stop and the bush housing (*see figure 41*). Retighten the grubscrews.
3. With the turnbuckle still at the top of the slot, the top stop (*item 3, figure 41*) can be set.

### **DO NOT START THE TRACTOR.**

Press the automatic depth button  and set the 'Digger Share' switch to lower ▼, this puts power into the depth control circuit. Release the grubscrews on the top stop disc (*item 3, figure 41*) and move the disc until the light band on the top proximity switch turns on. Retighten the grubscrews. If needed, the proximity switch can be moved closer to the edge of the disc by releasing the proximity switch locknuts and setting the switch to a distance of approximately 1mm.

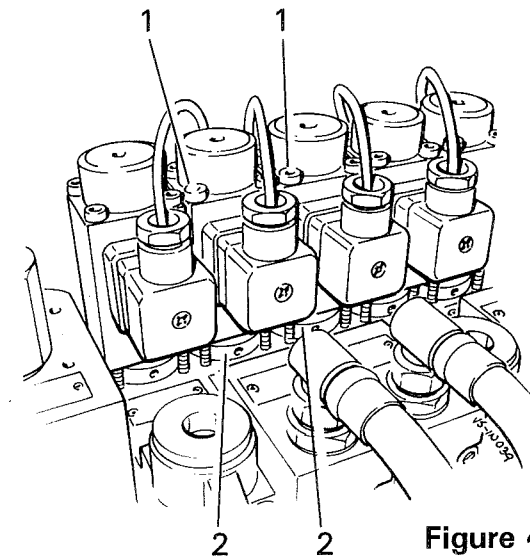


**Figure 40**



**Figure 41**

4. Lower the turnbuckle from the top of the slot until the spring (*item 4, figure 41*) holds the spring stop (*item 2, figure 41*) onto the bush housing.
5. The bottom stop disc (*item 5, figure 41*) is then adjusted until the bottom edge of the disc turns on the light band on the bottom proximity switch. Refit the guard.
6. Finally, set the raise timers to give the required delay. The 'Auto Depth' left hand (L) and right hand (R) 'Response' timers are fitted in the control box along with sensor repeater lights. Initially, the 'Response' timers should be set to give approximately a 5 second delay. During work, the timers can be adjusted so that the digger does not lift out of work when sensing sudden variations, but only rises to give a constant depth.
7. Speed of lift can be adjusted on the digger valve sections (*item 4&5, figure 29*) of the auxiliary valve bank. Slightly loosen the the screws (*item 1, figure 42*) holding the coil on the valve block and rotate the rings (*item 2, figure 42*) clockwise to increase or anticlockwise to decrease flow. Finally, retighten the screws.



**Figure 42**

### Cleaner Unit Oil Seal Replacement

The cleaner unit roller shafts (*item 1, figure 43*) are each fitted with an oil seal (*item 2, figure 43*) which is press-fitted into the gearbox casing. The seals prevent loss of oil from the gearbox and also prevent the ingress of dirt. If leakage is apparent, the seals can be replaced in situ by using the guide sleeve and slide hammer service kit.

1. Remove the roller and clean the loose soil and any other material from around the gearbox face.
2. Prise out the worn seal (*item 2, figure 43*) taking care not to damage the seal aperture in the gearbox. Clean the seal aperture and the surrounding face of the gearbox.
3. Grease the inner and outer faces of the new seal and grease the inside of the seal aperture.
4. Push the new seal into the compression ring (*item 3, figure 43*) until the seal protrudes approximately 1-2mm beyond the ring face (*see figure 43*). Slide the compression ring complete with seal over the roller shaft (*item 1, figure 43*) and locate the seal into the aperture.

5. Locate the slide hammer (*item 4, figure 43*) over the roller shaft and, holding the compression ring and seal firmly against the gearbox face, bump the seal into the gearbox. If required, a second seal can be fitted behind the first to give additional backup.

### Tightening the Cleaner Bearings

If excessive play can be felt at the end of a roller shaft (1-1.5cm), the roller should be removed to ensure that it is not a loose fitting roller that can be felt and then, if necessary, the bearings adjusted as follows.

1. Clean the loose soil from around the gearbox face and prise out the end cap (*item 5, figure 43*).
2. Remove the split pin (*item 6, figure 43*) from the castellated nut (*item 7, figure 43*) and tighten the nut to a torque of 22 lb/ft.
3. Check the roller shaft (*item 1, figure 43*) again for free play.
4. Refit the split pin (*item 6, figure 43*) in the next clear hole, tightening the nut a maximum of one flat if needed.
5. Smear the end cap mating face with an oil resistant silicon sealer and tap the cap back into place.

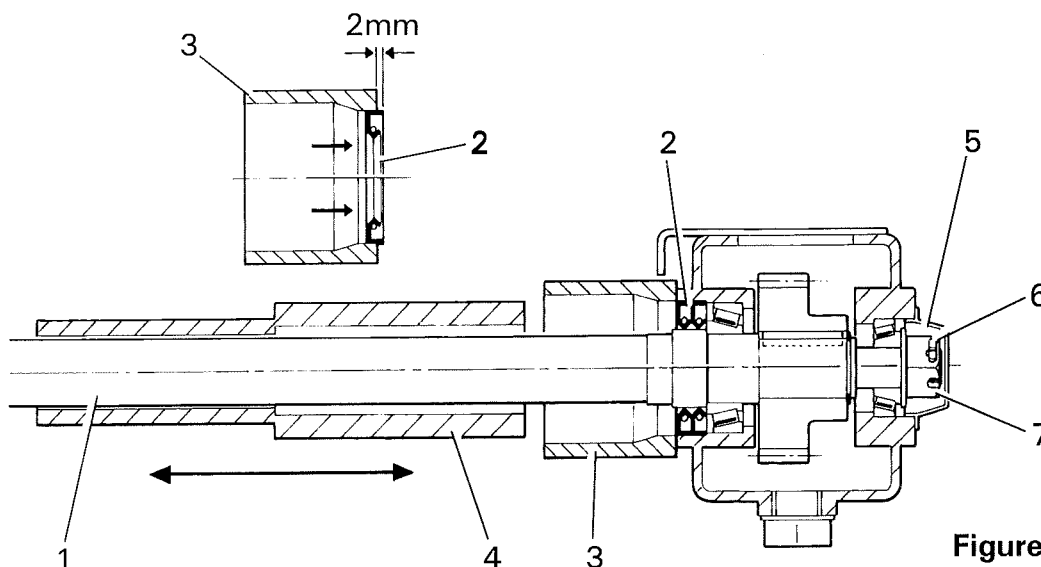


Figure 43

## Split Web Drive Sprockets

Split web drive sprockets are fitted as standard on all of the web drive shafts. The sprockets allow for worn sprockets to be replaced or alternative pitch sprockets to be fitted without dismantling the drive shafts.

Most drive sprockets will have been split on initial installation, but if not, they should be split with a hammer and sharp chisel. Before splitting a sprocket on or off the machine, remove the fixing bolts (*item 1, figure 44*). Keep the split halves of the sprockets in the correct pairs to prevent mis-match when fitting.

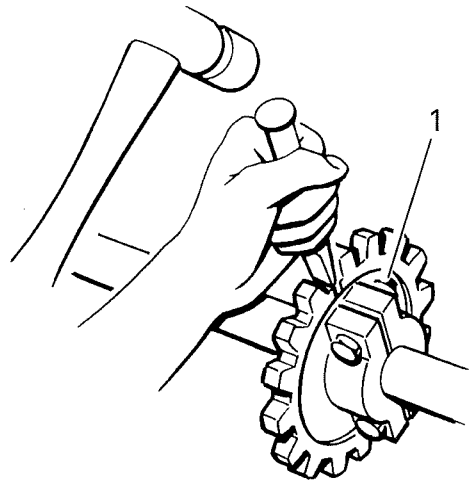


Figure 44

## Lubrication

Regular lubrication will ensure that the Standen Vision provides a long and efficient service life. Depending on soil and weather conditions, the service schedule can vary. It is recommended that the harvester is given a thorough inspection at least weekly during the working season and at this time the machine should be greased and the gearbox oil levels checked.

Shafts and bearings fitted with grease nipples should be lubricated using a good quality general purpose grease. Bearings must not be allowed to run dry. When greasing it is better to give a little frequently than a lot a long intervals. The grease nipple locations are shown on the lubrication chart (*see figure 45*).

With reference to the lubrication chart, some of the bearings are sealed and pre-lubricated. Care should be taken not to flood these bearings with grease or the seals may burst allowing 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 strokes of the grease gun every twenty acres of work is necessary.

Non-sealed bearings should be greased at least once a day or every ten acres.

When checking the chain and gear drives, proprietary chain lubricant or a smear of grease should be applied to prolong their life.

The gearboxes should be checked occasionally and topped up with EP90 gear oil.

The cleaner unit gearbox should be checked regularly and topped up with BP Energrease F-GL.

Universal couplings (such as the PTO shaft) should be dismantled periodically and their shafts smeared with grease.

Apply grease to all pivot points, slideways and exposed threads etc. to ensure they operate easily and remain free of corrosion.

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



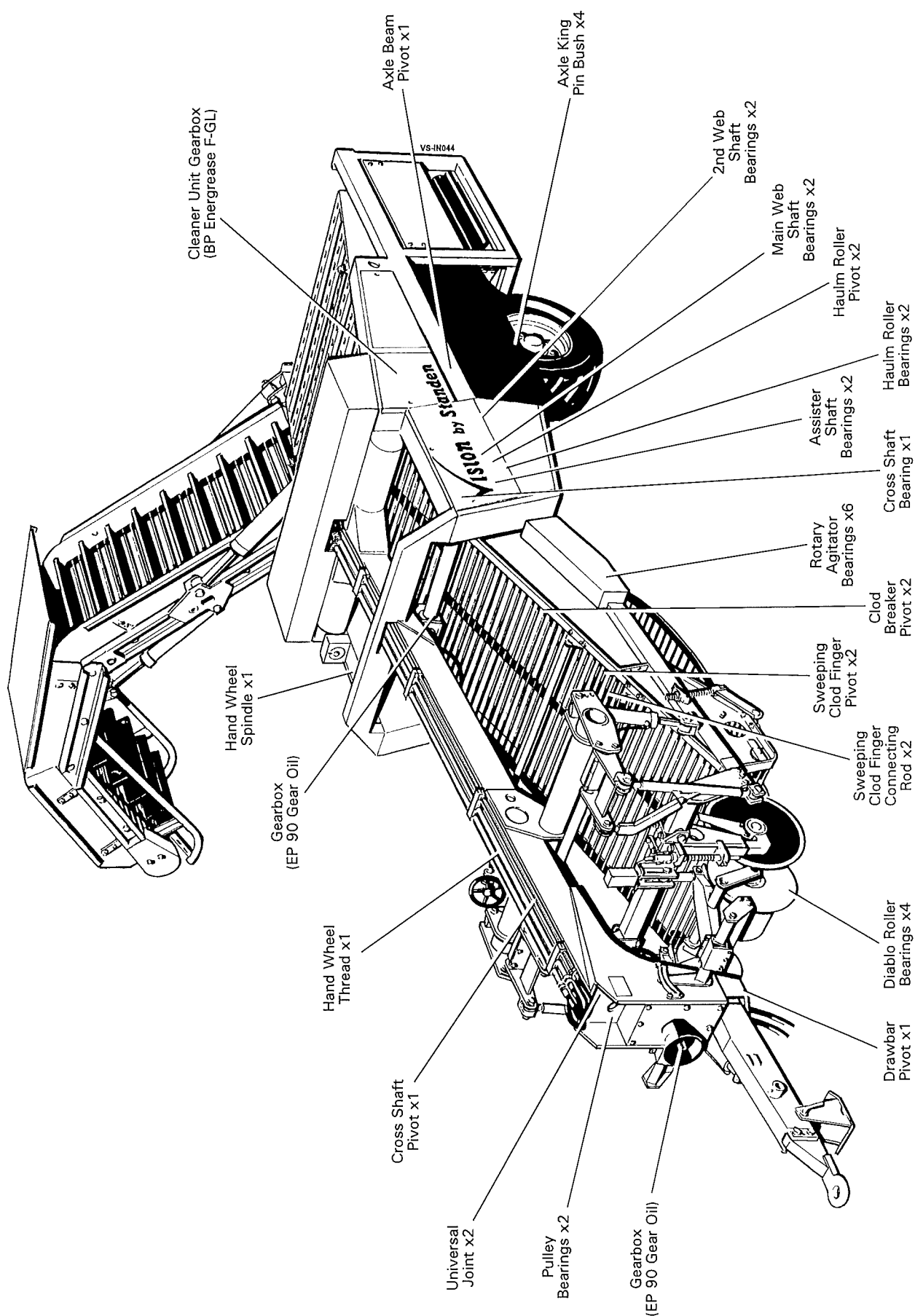


Figure 45

**Service Schedule****On delivery and after the first 2 hours**

Nuts, bolts and keyways	Check tightness
Machine	Lubricate

**Every day (or every 10 acres)**

Hydraulic oil	Check level
Nuts, bolts and keyways	Check tightness
Non-sealed bearings	Lubricate
Hydraulic hoses and fittings	Check condition
Machine components	Check condition

**Every two days (or every 20 acres)**

Sealed bearings	lubricate
Chain drives	Check tension and lubricate

**After the first 50 hours**

Pressure filters	Replace filter elements
Suction filters	Clean or replace filter elements
Gearboxes	Change oil

**Every 500 hours (or annually)**

Pressure and suction filters	Replace filter elements
Hydraulic oil	Change
Magnetic drain plug	Clean

**End of the season**

Machine	Clean down thoroughly
Machine components	Check condition
Machine	Lubricate
Bright surfaces	Treat with rust preventative
Paintwork	Touch up
Slip clutches	Slacken off
Machine	Store in a dry place
Control box	Remove and store in a dry place

# SPECIFICATIONS

1.50

## Nut/Bolt Tightening Torque

<i>Description</i>	<i>Torque</i>		<i>Description</i>	<i>Torque</i>
Standard axle wheel nuts	325 lb/ft		M20 nyloc zinc plated nut	380 lb/ft
Powered axle wheel nuts	398 lb/ft		M24 nyloc zinc plated nut	690 lb/ft
Cleaner roller shaft nuts	22 lb/ft		M6 bolt/steel nut	7 lb/ft
			M8 bolt/steel nut	19 lb/ft
M6 nyloc zinc plated nut	10 lb/ft		M10 bolt/steel nut	38 lb/ft
M8 nyloc zinc plated nut	23 lb/ft		M12 bolt/steel nut	70 lb/ft
M10 nyloc zinc plated nut	44 lb/ft		M16 bolt/steel nut	170 lb/ft
M12 nyloc zinc plated nut	87 lb/ft		M20 bolt/steel nut	325 lb/ft
M16 nyloc zinc plated nut	208 lb/ft		M24 bolt/steel nut	565 lb/ft

<b>Dimensions</b>	<b>Unmanned</b>	<b>Manned</b>
Length	9.35m	10.60m
Width (in transport)	2.90m	2.90m
Height (in transport)	3.20m	3.20m

## Technical Data

Weight	6.7 tonnes	7.3 tonnes
Tractor hp requirement	100hp min.	120hp min.
Tractor hydraulic flow rate	50 litres/minute min.	50 litres/minute min.
Oil reservoir capacity (Esso Nuto 46 Hydraulic Oil)	400 litres	400 litres
Tyre pressure	(16.9x24) 36psi (18x19.5) 65psi	(16.9x24) 36psi (18x19.5) 65psi

Standen Engineering's policy of continual product development means that specifications may be altered without prior notice. All dimensions are approximate.



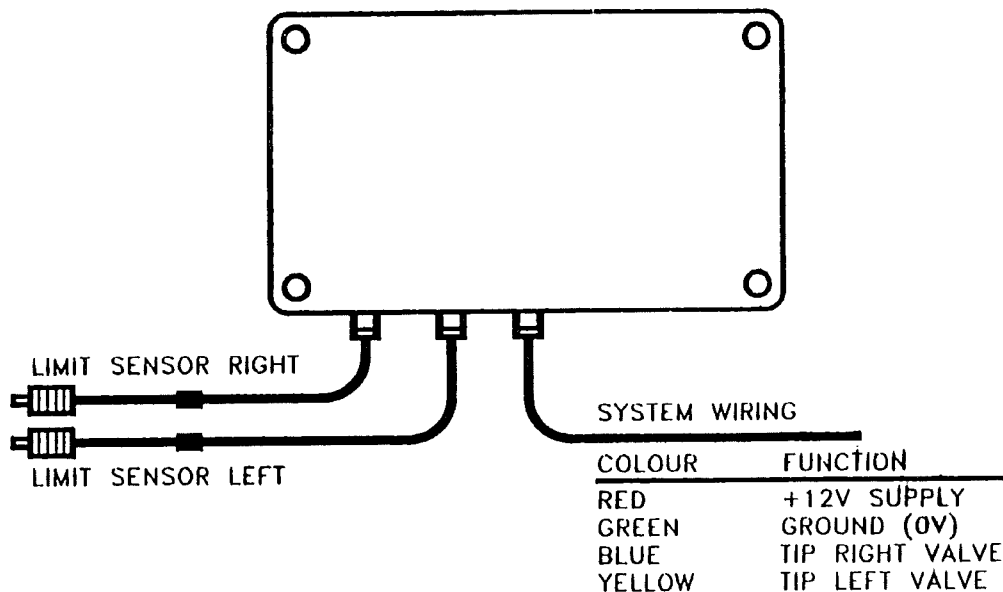
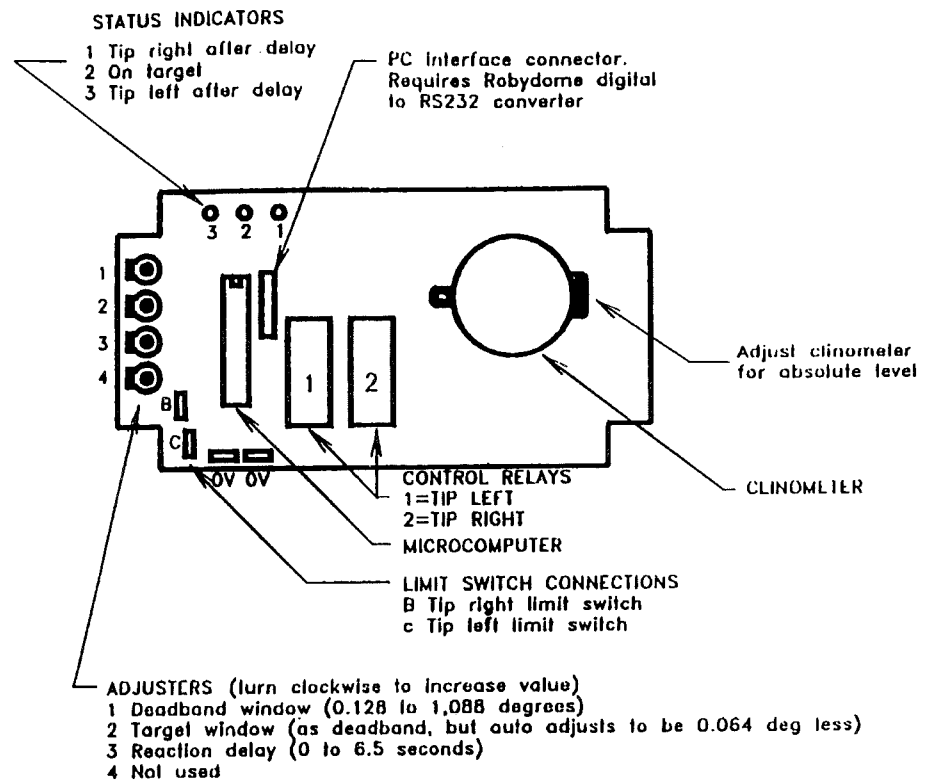
## **DIAGRAMS**

Axle Level Controller	2.1
Cleaner Angle Indicator Mounting Position	2.2
Control Box Facia	2.3
Wiring Allocations	2.4
Wiring Loom Schematic	2.5
Valve Positions/Connections	2.6
Circuit Board No2	2.7
Circuit Board No3	2.8
Tractor Powered Hydraulics Block Diagram	2.9
Tractor Powered Hydraulics Circuit Diagram	2.10
Harvester Hydraulics Block Diagram	2.11
Cleaner Hydraulic Circuit	2.12
Secondary Hydraulics Circuit	2.13
Powered Axle Hydraulic Circuit	2.14
Hydraulic Digger Web Circuit	2.15
Hydraulic Flow/Speed Table	2.16



## Axle Level Controller

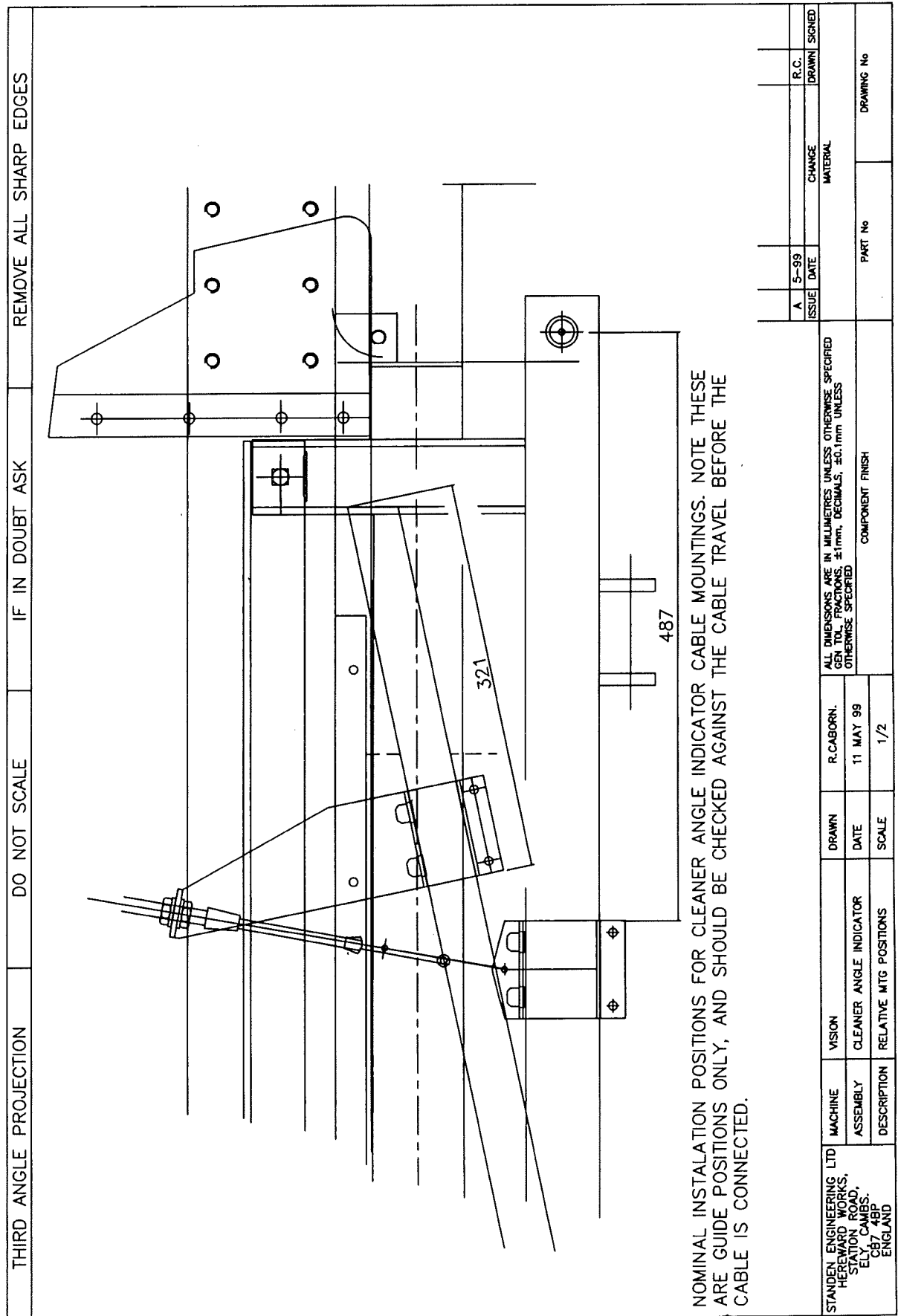
### VIEW OF INTERNAL PCB ASSY FOR LEVEL SENSOR 5201183







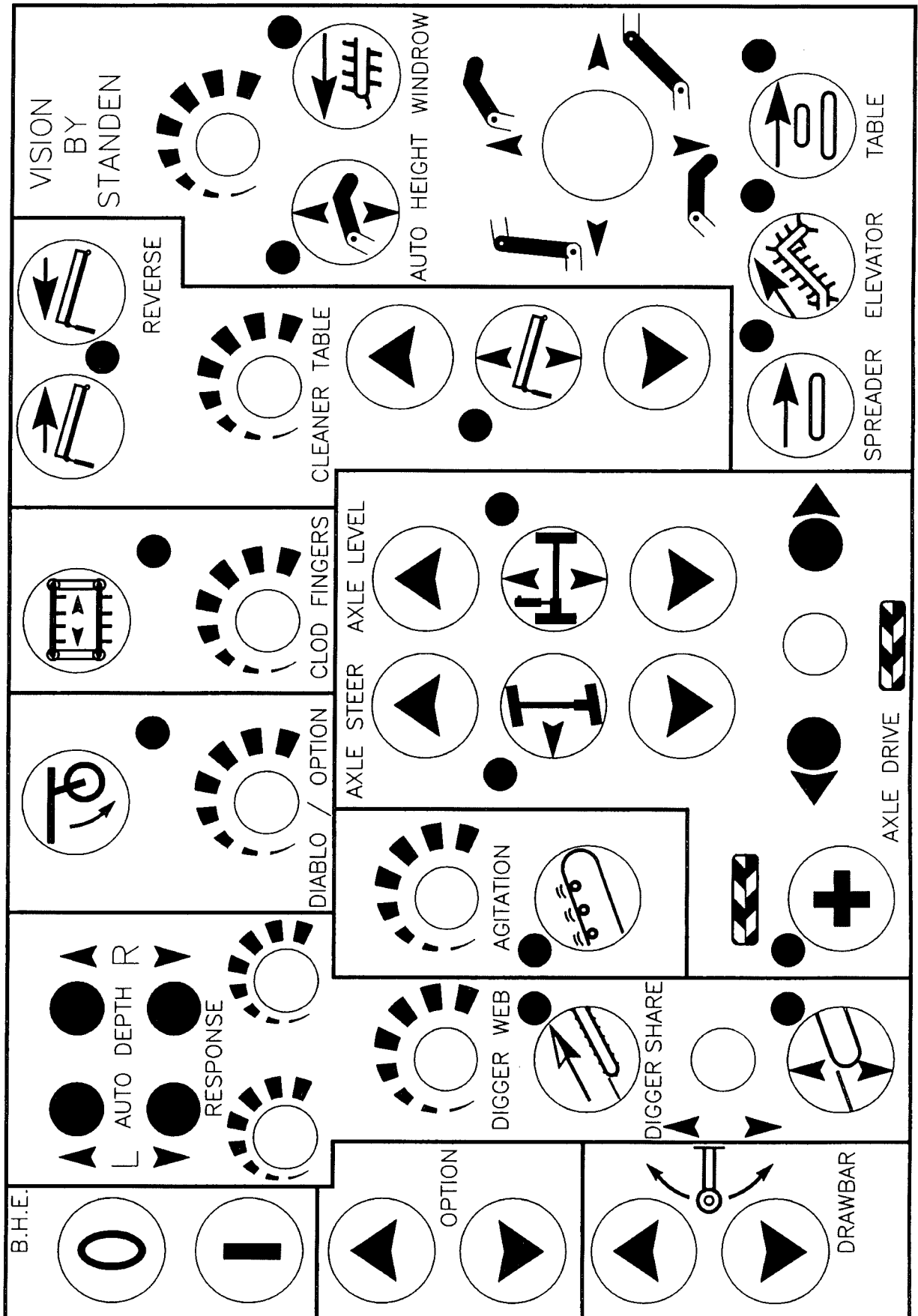
## Cleaner Angle Indicator Mounting Position



VS-IN060



## Control Box Facia



VS-IN045



## Wiring Allocations

CABLE NUMBER	FUNCTION	MAIN LOOM COLOURS	PLUG PIN NUMBERS	FUNCTION	CONNECTION LOOMS COLOURS	AUTO OPTION CONNECTIONS
			FRONT----SIDE			
1	DRAWBAR LEFT	BLACK / RED	1	DRAWBAR LEFT	BLACK / RED	
2	DRAWBAR RIGHT	BLACK / BLUE	2	DRAWBAR RIGHT	BLACK / BLUE	
3				LEFT DIGGER MANUAL RAISE	BLUE / RED	
4		BLUE / YELLOW		LEFT DIGGER LOWER	BLUE / YELLOW	
5		BLUE / RED		LEFT DIGGER AUTO RAISE	BLACK	
6				DIGGER LINK VALVE	BROWN	
7	RIGHT DIGGER MANUAL RAISE	RED / GREEN	7	RIGHT DIGGER MANUAL RAISE	RED / GREEN	
8	RIGHT DIGGER LOWER	RED / WHITE	8	RIGHT DIGGER LOWER	RED / WHITE	
9		BLUE / GREEN		RIGHT DIGGER AUTO RAISE	RED	DEPTH CONTROL
10	AUTO DEPTH SENSOR POWER	RED / BLACK	10-----PIN 5	SENSOR BROWN POWER, BLUE EARTH		PIN 5 - EARTH PIN 10
11	LEFT SENSOR RAISE/INDICATOR	BLUE / RED	11-----PIN 2	SENSOR BLACK SIGNAL		PIN 2
12	LEFT SENSOR LOWER/INDICATOR	BLUE / YELLOW	12-----PIN 1	SENSOR BLACK SIGNAL		PIN 1
13	RIGHT SENSOR RAISE/INDICATOR	BLUE / GREEN	13-----PIN 3	SENSOR BLACK SIGNAL		PIN 3
14	RIGHT SENSOR LOWER/INDICATOR	BLUE / WHITE	14-----PIN 4	SENSOR BLACK SIGNAL		PIN 4
15	DIGGER WEB POT	BLUE / BROWN	15	DIGGER WEB COIL	BLUE / BROWN	
16	DIGGER WEB ON	GREEN / BLUE	16	DIGGER WEB COIL	BLUE / BROWN	
17	LATCHED POWER FEED	RED	POWER PIN 3			
18	SPARE	BLACK	POWER PIN 4			
19	ROTARY AGITATOR ON	GREEN / BROWN	19	ROTARY AGITATOR COIL	GREEN / BROWN	
20	ROTARY AGITATOR ADJUST	GREEN / RED	20	ROTARY AGITATOR COIL	GREEN / BROWN	
21	DIABLO ON	GREEN / PURPLE	21	DIABLO COIL	GREEN / PURPLE	
22	DIABLO ADJUST	GREEN / WHITE	22	DIABLO COIL	GREEN / PURPLE	
23	SWEEPING CLOD FINGERS ON	GREEN / YELLOW	23	SWEEPING CLOD FINGERS COIL	GREEN / YELLOW	
24	SWEEPING CLOD FINGERS ADJUST	GREEN / BLACK	24	SWEEPING CLOD FINGERS COIL	GREEN / YELLOW	
25	AXLE STEER LEFT	PINK	25	AXLE STEER LEFT	PINK	
26	AXLE STEER RIGHT	ORANGE	26	AXLE STEER RIGHT	ORANGE	
27	AXLE AUTO CENTRE	SLATE	27	SENSOR BROWN POWER, BLUE EARTH		27 + 69 EARTH
28				LEFT AXLE SENSOR BLACK	S.E.L. REF 32037/2	
29				RIGHT AXLE SENSOR BLACK	S.E.L. REF 32037/2	
30	AXLE LEVEL RAISE	YELLOW / BROWN	30	AXLE LEVEL RAISE	YELLOW / BROWN	
31	AXLE LEVEL LOWER	YELLOW / BLUE	31	AXLE LEVEL LOWER	YELLOW / BLUE	
32	AXLE LEVEL AUTO POWER	YELLOW / RED	32			32 + 69 EARTH
33	AXLE DRIVE FORWARD	YELLOW / GREEN	33	AXLE DRIVE FORWARD	YELLOW / GREEN	
34	AXLE DRIVE REVERSE	YELLOW / BLACK	34	AXLE DRIVE REVERSE	YELLOW / BLACK	
35	AXLE DRIVE HIGH POWER	YELLOW / WHITE	35-----PIN 6			PIN 6
36	CLEANER RAISE	PURPLE / BLUE	36	CLEANER RAISE	PURPLE / BLUE	
37				CLEANER AUTO RAISE	PURPLE / WHITE	
38	CLEANER LOWER	PURPLE / GREEN	38	CLEANER LOWER	PURPLE / GREEN	
39	CLEANER AUTO LEVEL POWER	PURPLE / WHITE	39			39 + 69 EARTH
40	CLEANER TABLE ADJUST	PURPLE / YELLOW	40	CLEANER FORWARD COIL	PURPLE / BLACK	
41	CLEANER FORWARD	PURPLE / BLACK	41	CLEANER FORWARD COIL	PURPLE / BLACK	
42	CLEANER REVERSE	WHITE / BROWN	42	CLEANER REVERSE COIL	WHITE / BROWN	
43				CLEANER REVERSE LOOP	PURPLE / YELLOW	SWITCH TERMINAL 1
44				CLEANER REVERSE LOOP	PURPLE / YELLOW	SWITCH TERMINAL 3
45	OPTION RAISE	WHITE / PURPLE	45	OPTION RAISE	WHITE / PURPLE	
46	OPTION LOWER	WHITE / GREEN	46	OPTION LOWER	WHITE / GREEN	
47	ELEVATOR SWAN NECK RAISE	BROWN / BLUE	47	ELEVATOR SWAN NECK RAISE	BROWN / BLUE	SENSOR RED
48				ELEVATOR SWAN NECK AUTO RAISE	BROWN / BLACK	
49	ELEVATOR SWAN NECK LOWER	RED / BLUE	49	ELEVATOR SWAN NECK LOWER	RED / BLUE	SENSOR BLACK
50	ELEVATOR AUTO HEIGHT POWER	BROWN / RED	50	SENSOR BROWN POWER, BLUE EARTH		50 + 69 EARTH
51	ELEVATOR FOLD IN	BROWN / GREEN	51	ELEVATOR FOLD IN	BROWN / GREEN	
52	ELEVATOR FOLD OUT	BROWN / WHITE	52	ELEVATOR FOLD OUT	BROWN / WHITE	
53	SPREADER ON	BROWN / YELLOW	53	SPREADER /ELEVATOR COIL	BROWN / YELLOW	
54	SPREADER /ELEVATOR ADJUST	BROWN / BLACK	54	SPREADER /ELEVATOR COIL	BROWN / YELLOW	
55	ELEVATOR STOP COIL	LI GREEN / BROWN	55	ELEVATOR STOP COIL	LI GREEN / BROWN	
56	TABLE STOP COIL	LI GREEN / YELLOW	56	TABLE STOP COIL	LI GREEN / YELLOW	
57	ELEVATOR WNDROW	LI GREEN	57	ELEVATOR WNDROW	LI GREEN	
58	EMERGENCY STOP LOOP	LI GREEN / BLACK	58	EMERGENCY STOP LOOP	LI GREEN / BLACK	
59	EMERGENCY STOP LOOP	LI GREEN / BLACK	59	EMERGENCY STOP LOOP	LI GREEN / BLACK	
60	REAR LIGHTS	YELLOW	60	REAR LIGHTS	YELLOW	7(N) PIN 1
61	REAR LIGHTS	BLUE	61	REAR LIGHTS	BLUE	7(N) PIN 2
62	REAR LIGHTS	WHITE	62	REAR LIGHTS	WHITE	7(N) PIN 3
63	REAR LIGHTS	GREEN	63	REAR LIGHTS	GREEN	7(N) PIN 4
64	REAR LIGHTS	BROWN	64	REAR LIGHTS	BROWN	7(N) PIN 5
65	REAR LIGHTS	RED	65	REAR LIGHTS	RED	7(N) PIN 6
66	REAR LIGHTS	BLACK	66	REAR LIGHTS	BLACK	7(N) PIN 7
67	CAMERA POWER OUTLET	BROWN				
68	MAIN POWER IN	BROWN	POWER PIN 1			
69	EARTH	WHITE	PWR PIN 2--10	EARTH	WHITE	
70	DIGGER POT ADJUST	WHITE / YELLOW	69			
71	DIGGER POT ADJUST	WHITE / YELLOW	70			
72	DIGGER POT ADJUST	BLACK / WHITE	71			
73	DIGGER POT ADJUST	BLACK / WHITE	72			
74		BLUE / WHITE				ISSUE 30 APRIL 1999
FIT PLUG INSERTS ON CHASSIS WITH NUMBER 1 PIN OF BOTH SHELLS TOP RIGHT, POWER SHELL IN UPPER POSITION						
FIRST COLOUR IS THE MAIN COLOUR, SECOND COLOUR IS THE STRIPE						

VS-IN046



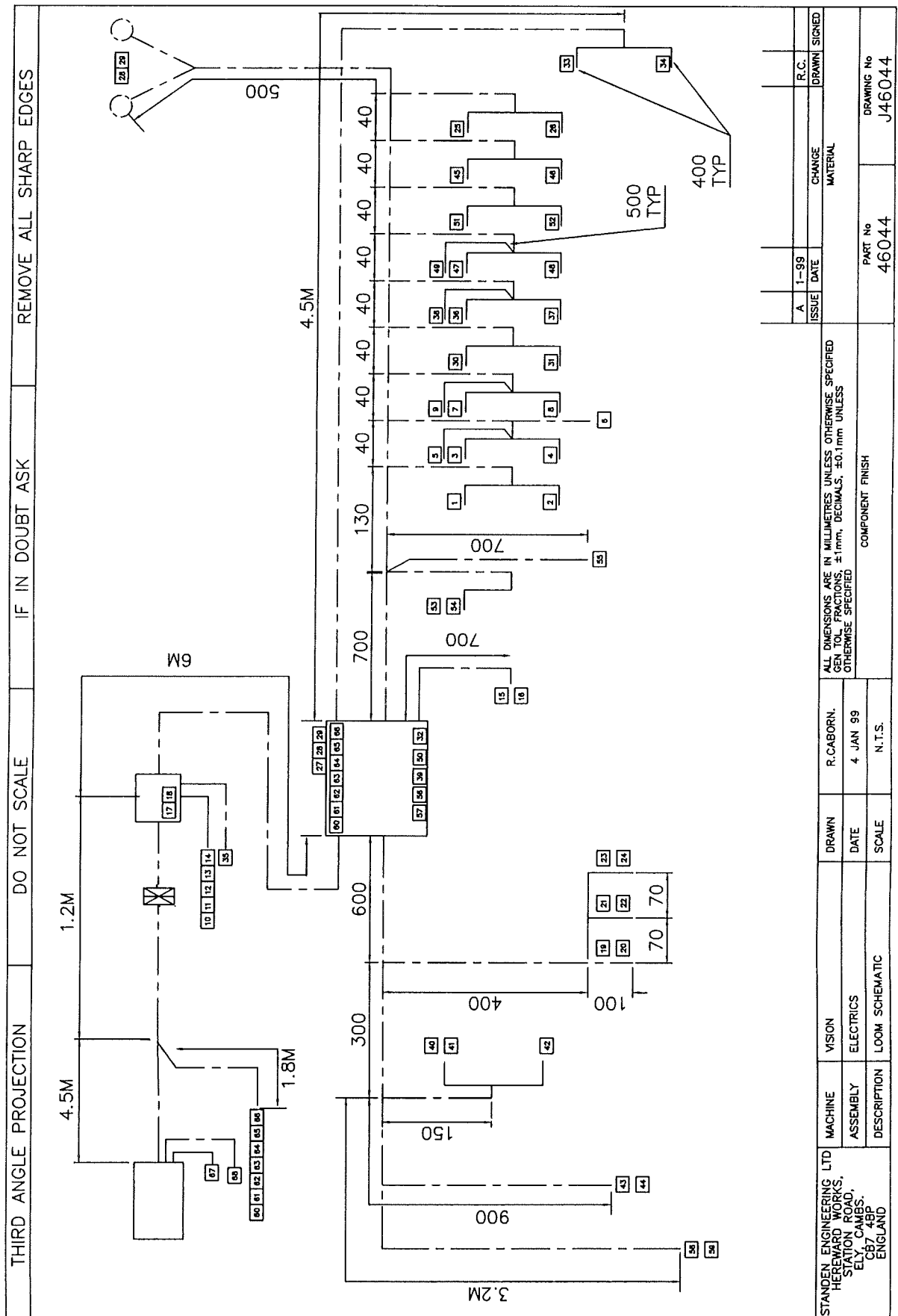
## Wiring Allocations

VS-IN062



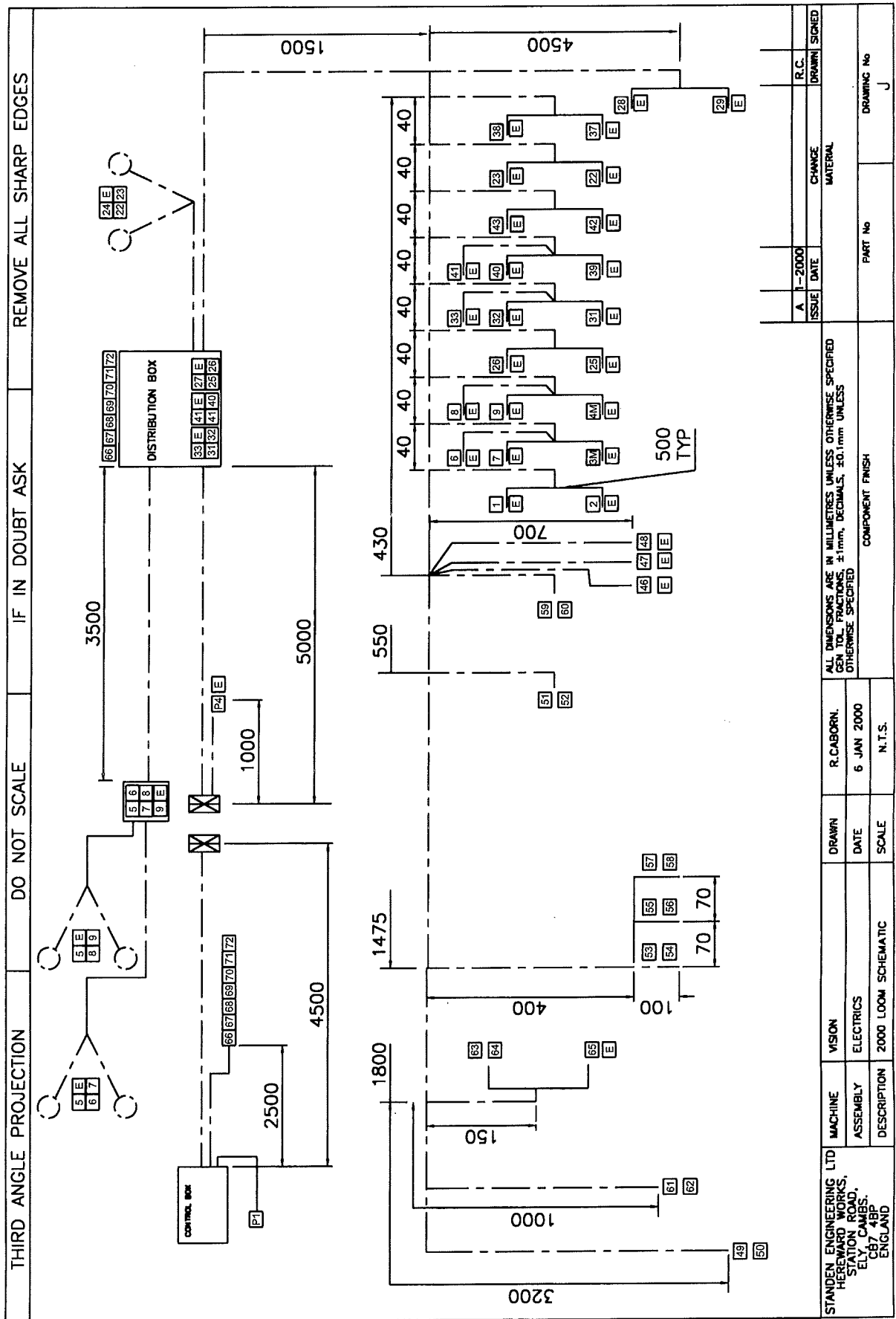


## Wiring Loom Schematic



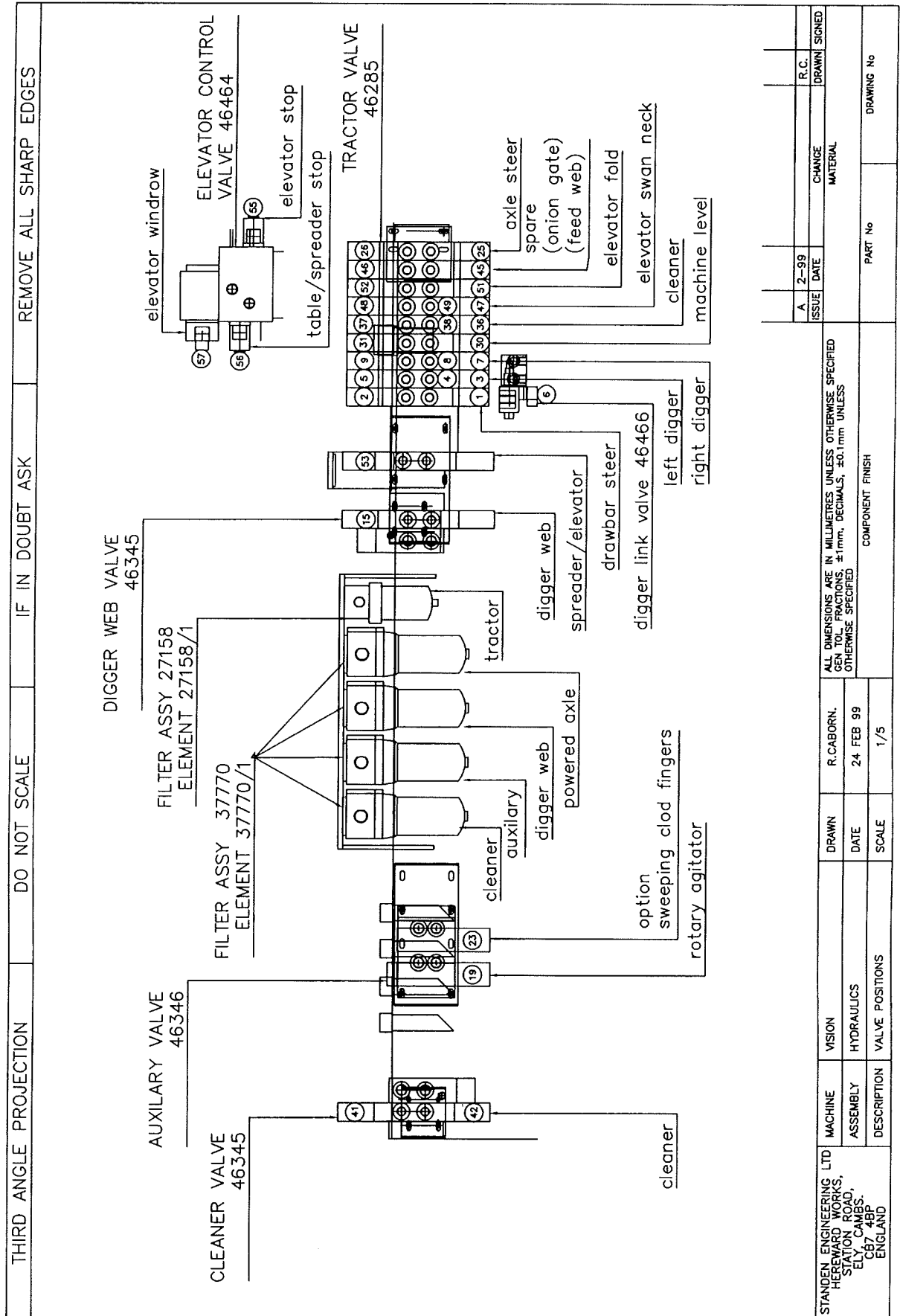


## Wiring Loom Schematic





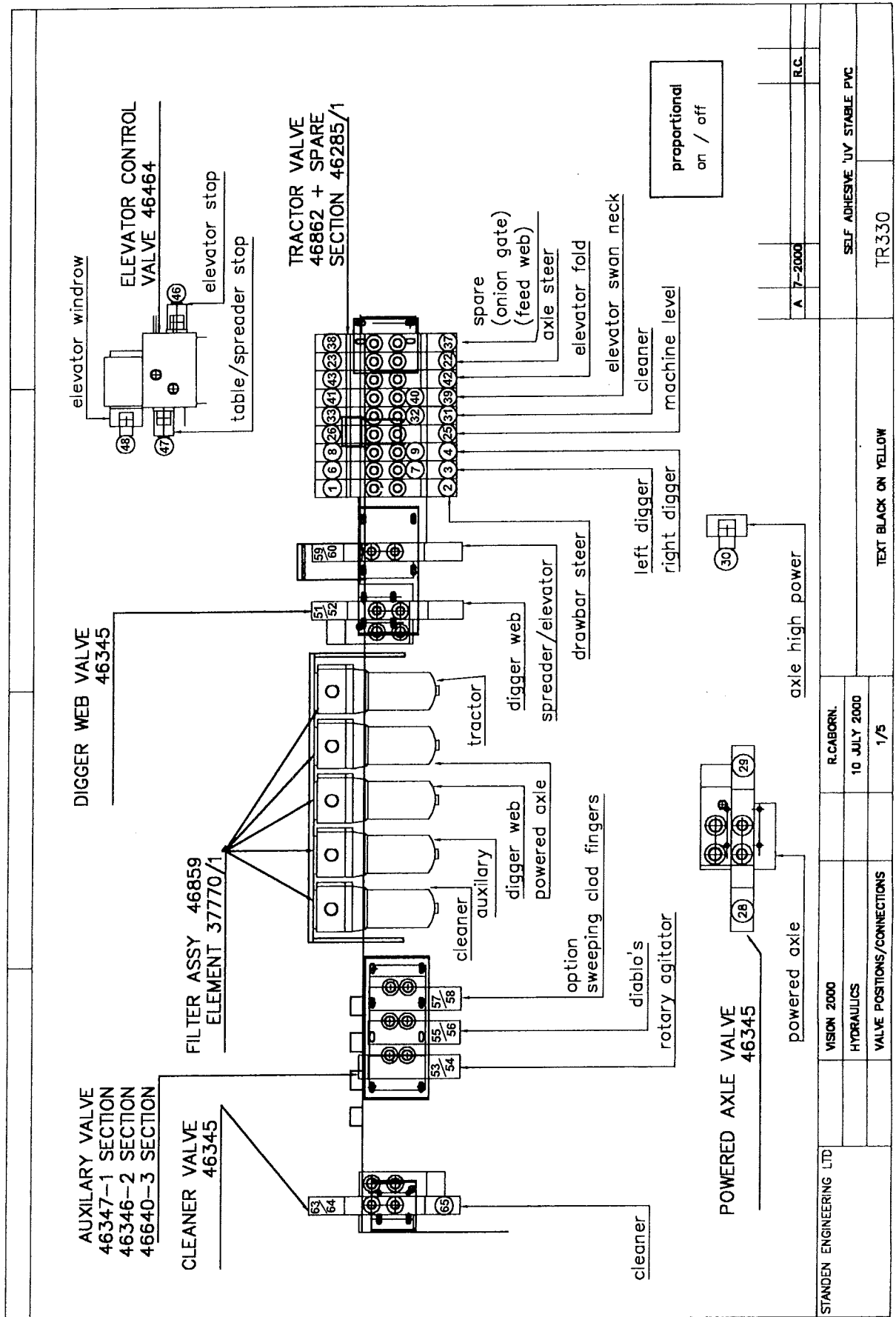
## Valve Positions/Connections





Machines from Serial No VIS 032

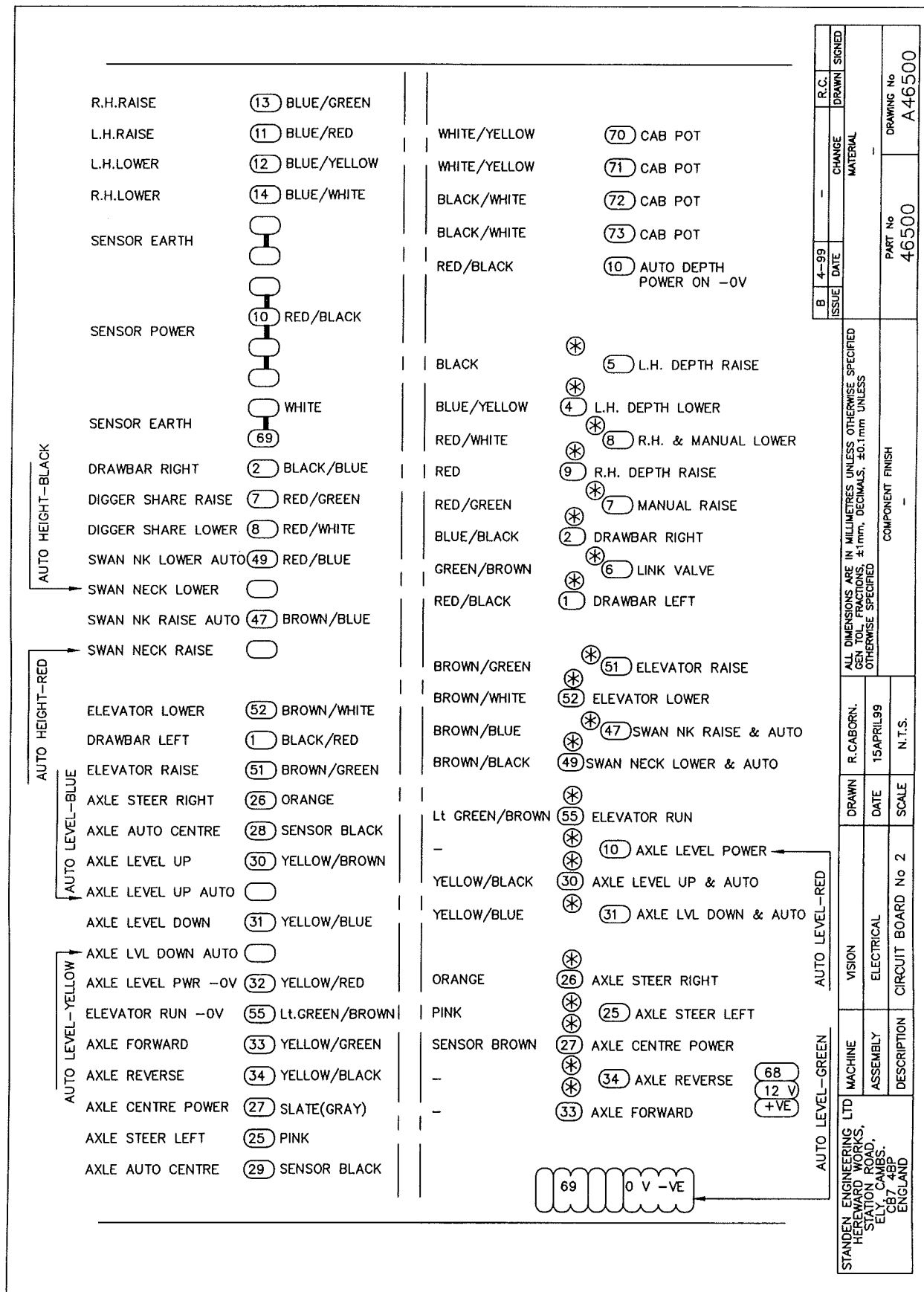
## Valve Positions/Connections







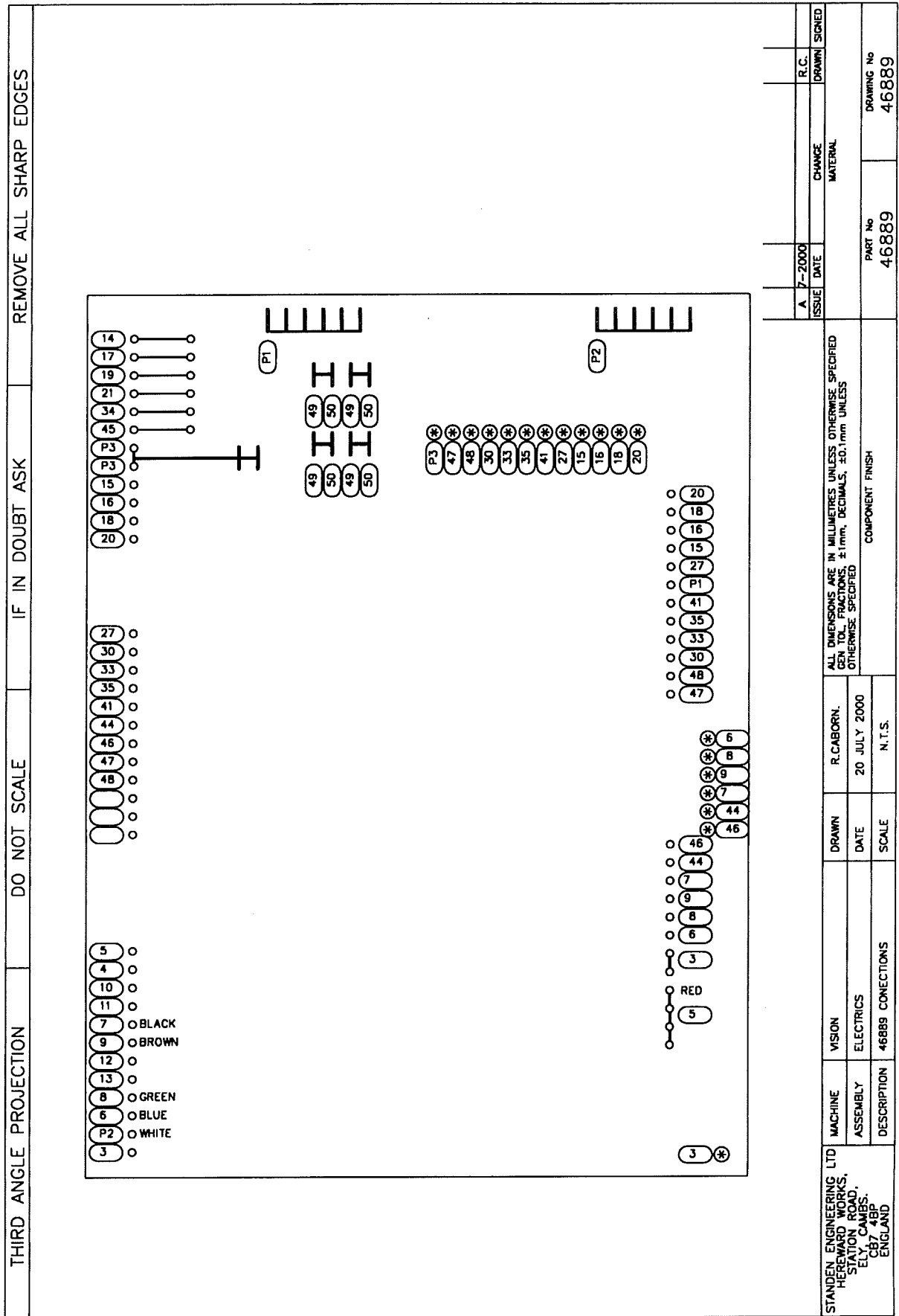
## Circuit Board No2





Machines from Serial No VIS 032

## Circuit Board No2





WATER SPRAY/DIABLO (22) GREEN/WHITE  
 DIGGER WEB (15) BLUE/BROWN  
 AGITATOR (20) GREEN/RED  
 CLOD FINGERS/OPTION (24) GREEN/BLACK  
 CLEANER (40) PURPLE/YELLOW  
 ELEVATOR (54) BROWN/BLACK  
 VALVE ( ) ( ) (X)  
 VALVE ( ) ( ) (X)  
 VALVE ( ) (18) (X)  
 VALVE ( ) ( ) (X)  
 VALVE ( ) ( ) (X)  
 CARD POWER LINK ( ) (17) (X) RED  
 CLOD FINGER PWR -OV (23) GREEN/YELLOW  
 AGITATOR POWER -OV (19) GREEN/BROWN  
 DIGGER WEB PWR -OV (16) GREEN/BLUE  
 DIABLO POWER -OV (21) GREEN/PURPLE  
 WINDROW POWER -OV (57) Lt GREEN  
 ( )  
 AUTO LEVEL PWR -OV (39) PURPLE/WHITE

AUTO LEVEL-BLUE  
 AUTO ELEV PWR -OV (50) BROWN/RED  
 CLEANER POWER -OV (41) PURPLE/BLACK  
 CLEANER REVERSE ON (42) WHITE/BROWN  
 CLEANER MAN UP (36) PURPLE/BLUE  
 CLEANER AUTO UP ( ) ( )  
 CLEANER MAN DOWN (38) PURPLE/GREEN  
 CLEANER AUTO DOWN ( ) ( )  
 SPARE ( ) ( )  
 OPTION RAISE (45) WHITE/PURPLE  
 SPARE -OV ( ) ( )  
 PICKING TABLE -OV (57) GREEN/YELLOW  
 SPREADER ON -OV (53) BROWN/YELLOW  
 AXLE HIGH POWER -OV (35) YELLOW/WHITE  
 SPARE ( ) ( )  
 SPARE ( ) ( )  
 OPTION LOWER (46) WHITE/GREEN

RED TO CONTROL POTS  
 (59) (58)  
 (59) (58)  
 ( ) ( )  
 Lt GREEN/BLACK  
 'E' STOP LINKS

(22) WATER SPRAY/DIABLO  
 (15) DIGGER WEB  
 (20) AGITATOR  
 (24) CLOD FINGERS/OPTION  
 (40) CLEANER  
 (54) ELEVATOR

0 V -VE  
 0 V -VE  
 0 V -VE  
 0 V -VE  
 0 V -VE  
 0 V -VE  
 0 V -VE

RED  
 RED  
 RED  
 RED  
 RED  
 RED  
 -  
 -  
 Lt GREEN  
 Lt GREEN/YELLOW  
 -  
 WHITE/PURPLE  
 PURPLE/GREEN  
 PURPLE/BLUE  
 WHITE GREEN  
 YELLOW/WHITE  
 RED

SWITCHED FEED TO CONTROL CARDS  
 ( ) DIABLO  
 (X) ( ) DIGGER WEB  
 ( ) AGITATION  
 (X) ( ) CLOD FINGERS/OPTION  
 ( ) CLEANER TABLE ON  
 (X) ( ) CLEANER REVERSE POWER  
 (X) ( ) ELEVATOR AUTO POWER  
 (X) ( ) CLEANER AUTO POWER  
 (57) WINDROW  
 (56) PICKING TABLE  
 (X) ( ) SPARE  
 (45) OPTION RAISE  
 (38) CLEANER DOWN  
 (36) CLEANER UP  
 (X) (46) OPTION LOWER  
 ( ) SPARE  
 (X) (35) AXLE HIGH POWER (68) (12 V) (+VE)  
 ( ) SPREADER

AUTO HEIGHT-BROWN  
 AUTO LEVEL-RED  
 AUTO LEVEL-BLUE  
 AUTO LEVEL-GREEN

69 0 V -VE

STANDEN ENGINEERING LTD  
 HEREFORD WORKS,  
 STATION ROAD,  
 ELY CAMBS,  
 CB7 4BP  
 ENGLAND

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED  
 GEN TOL FRACTIONS: ±1mm, DECIMALS, ±0.1mm UNLESS  
 OTHERWISE SPECIFIED

COMPONENT FINISH  
 -

R.C. DRAWN  
 CHANGE  
 MATERIAL  
 DATE  
 4-99  
 ISSUE  
 B

PART No  
 46525  
 DRAWING No  
 A46525

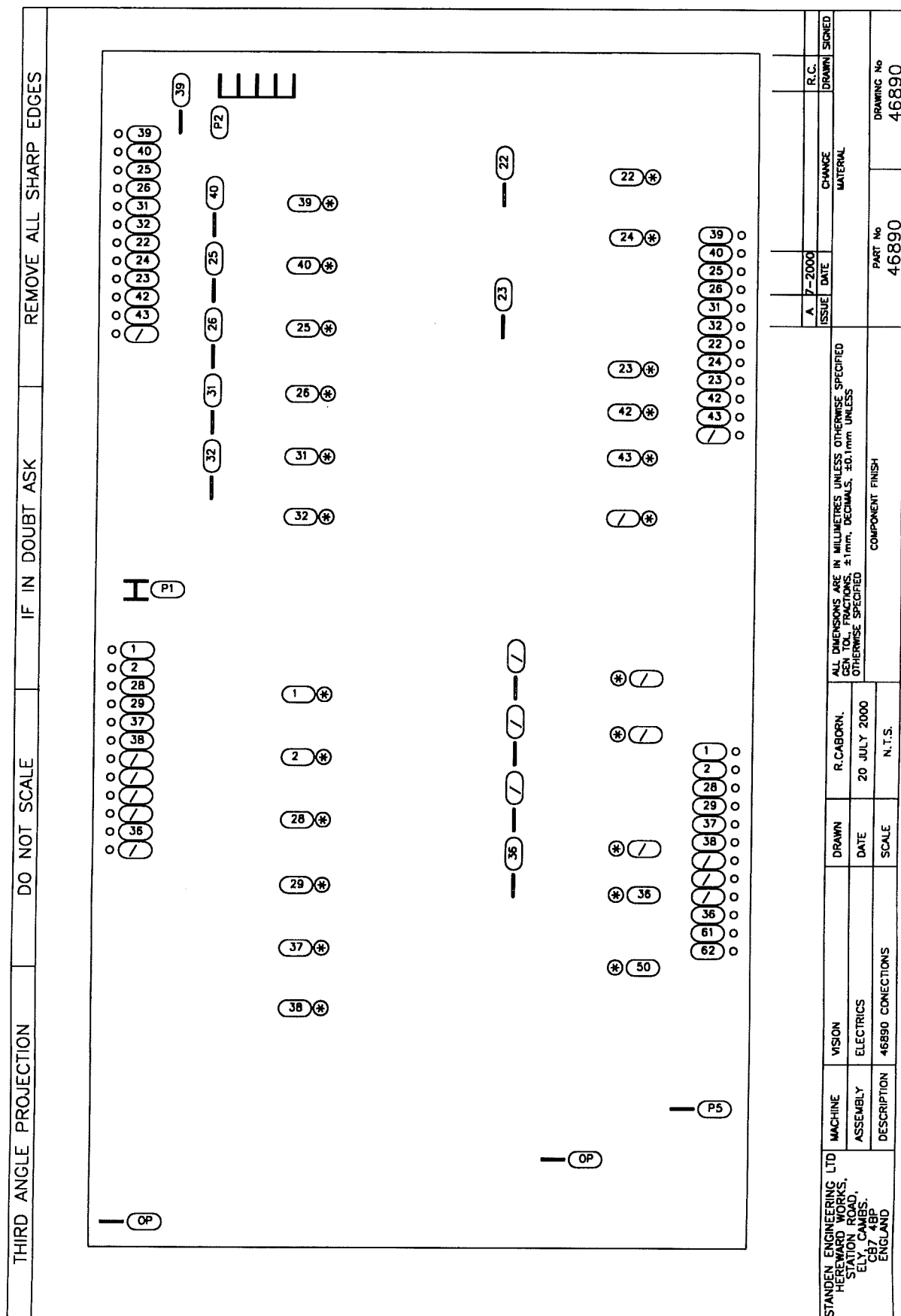
VISION  
 ELECTRICAL  
 CIRCUIT BOARD No 3  
 SCALE  
 15 APRIL 99  
 N.T.S.

DESCRIPTION  
 MACHINE ASSEMBLY



## 2.8

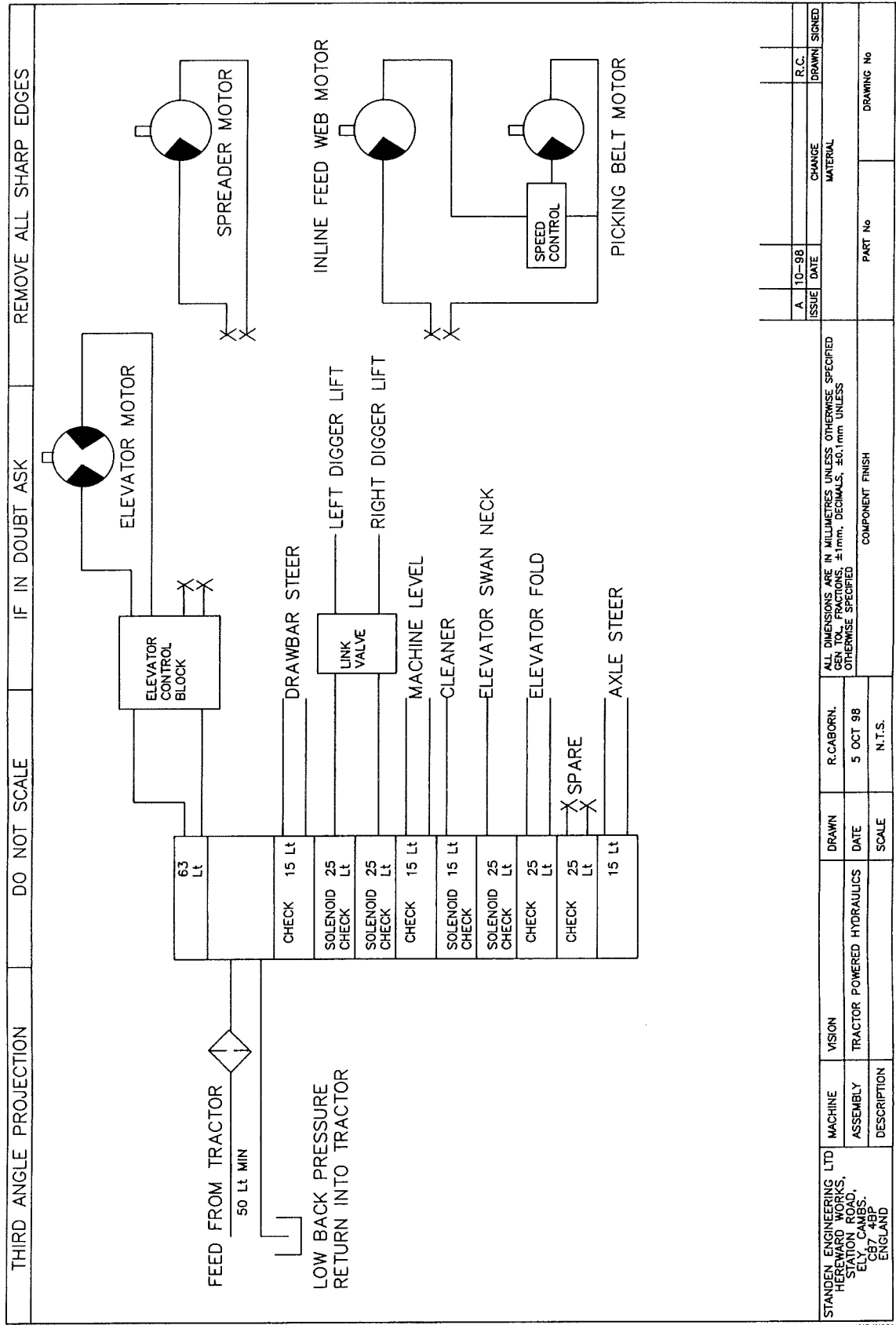
## Circuit Board No3





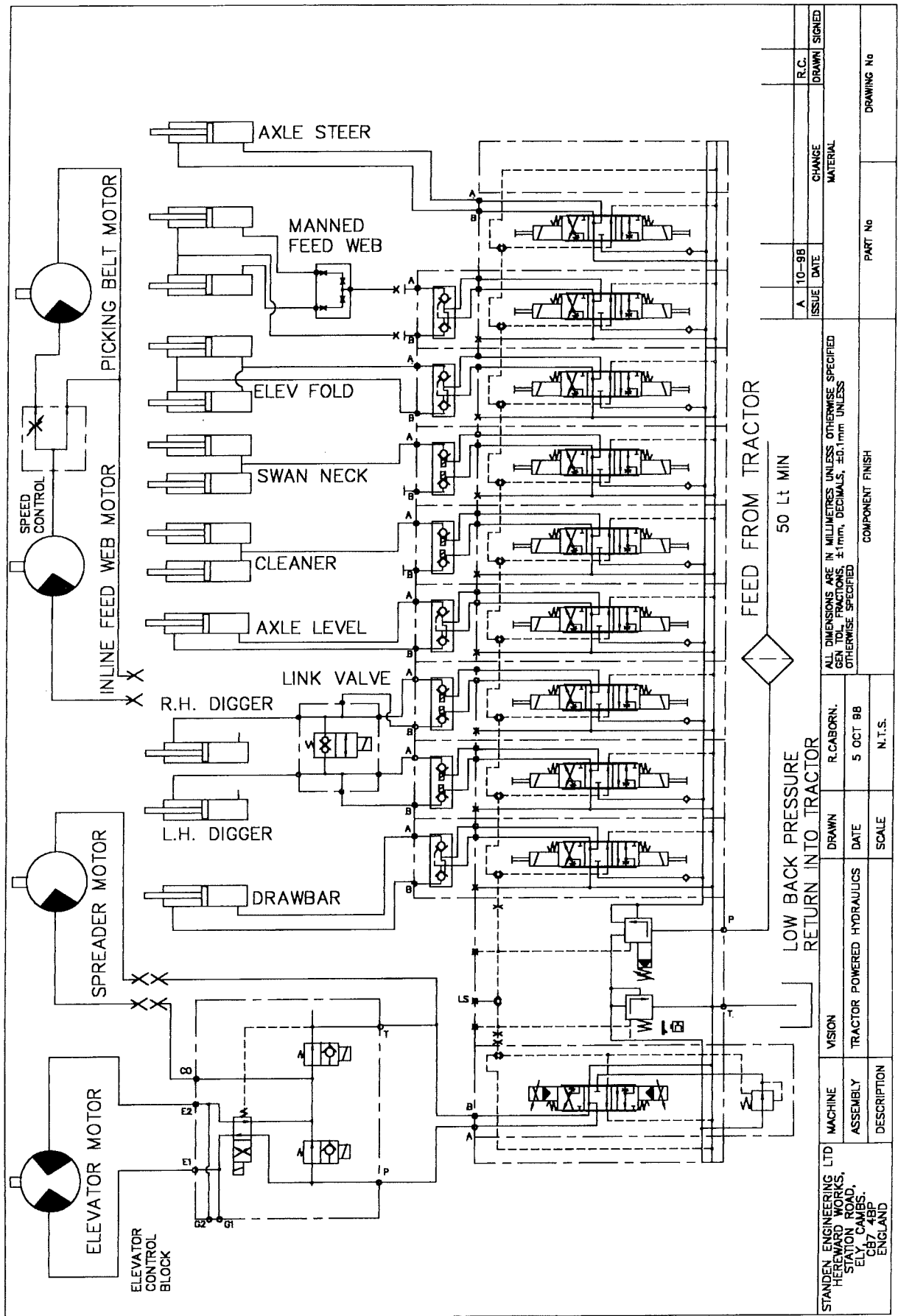


## Tractor Powered Hydraulics Block Diagram





## Tractor Powered Hydraulics Circuit Diagram

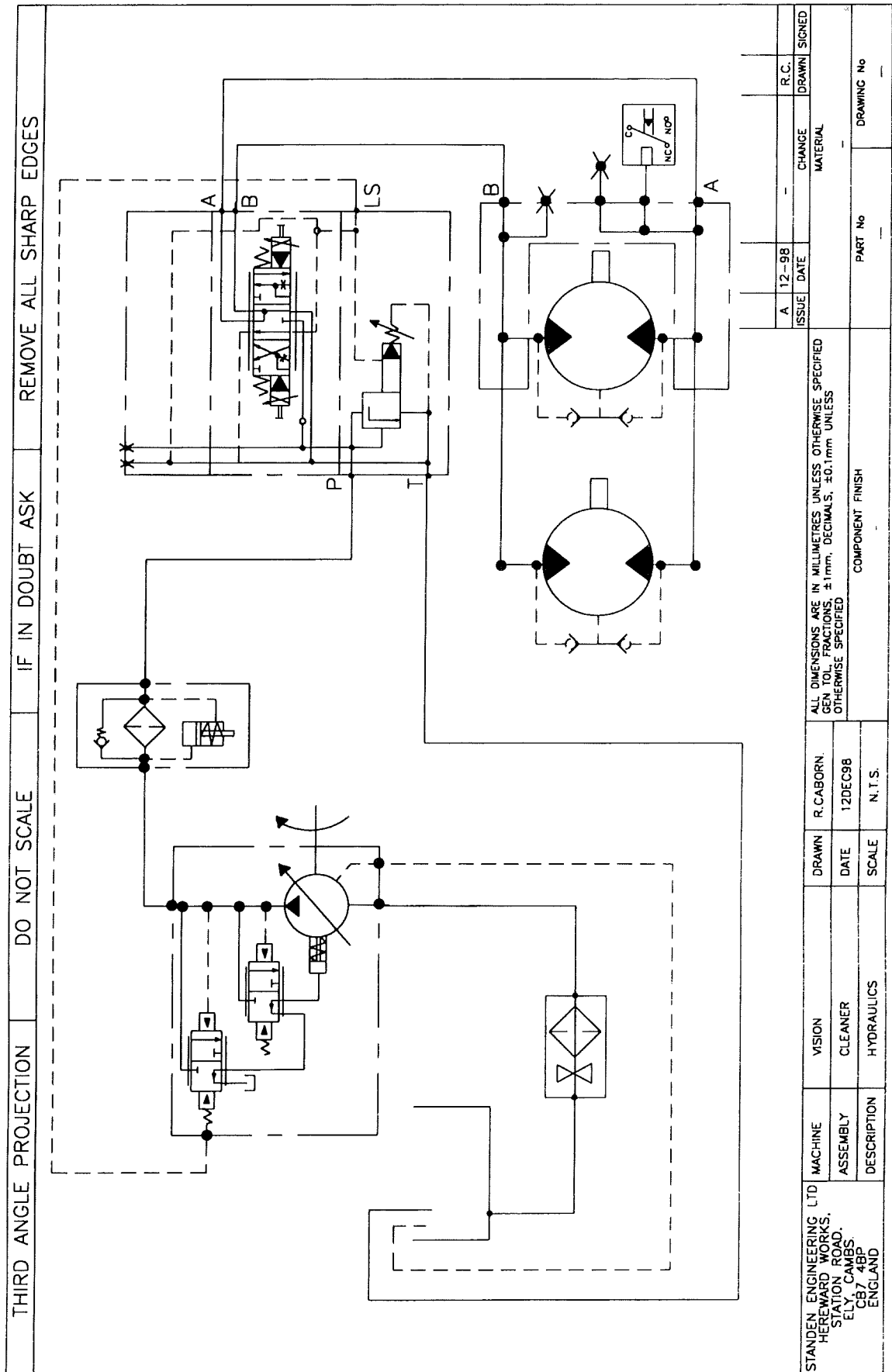




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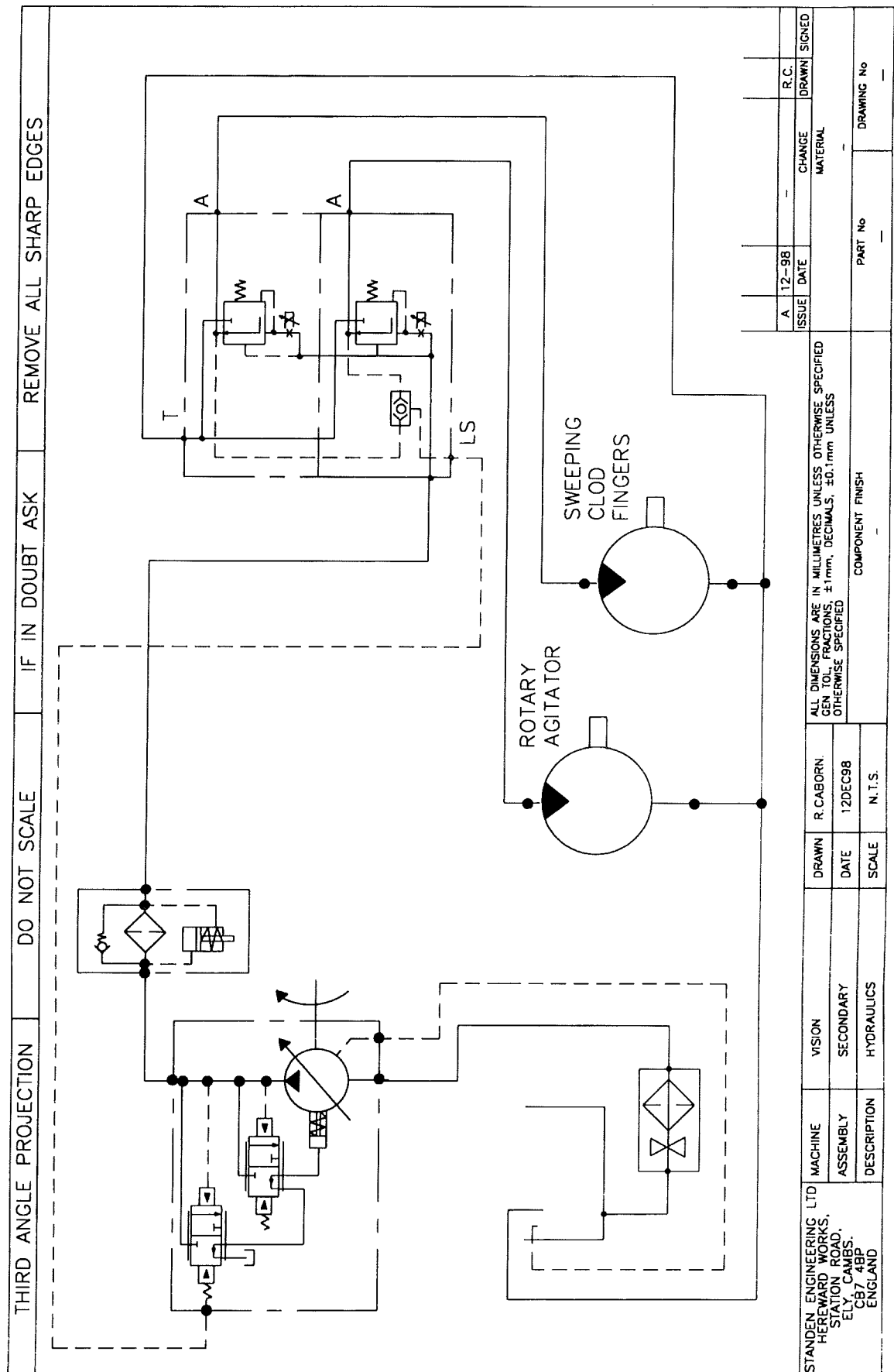
## Cleaner Hydraulic Circuit





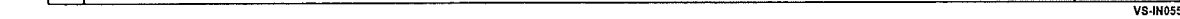


## Secondary Hydraulics Circuit



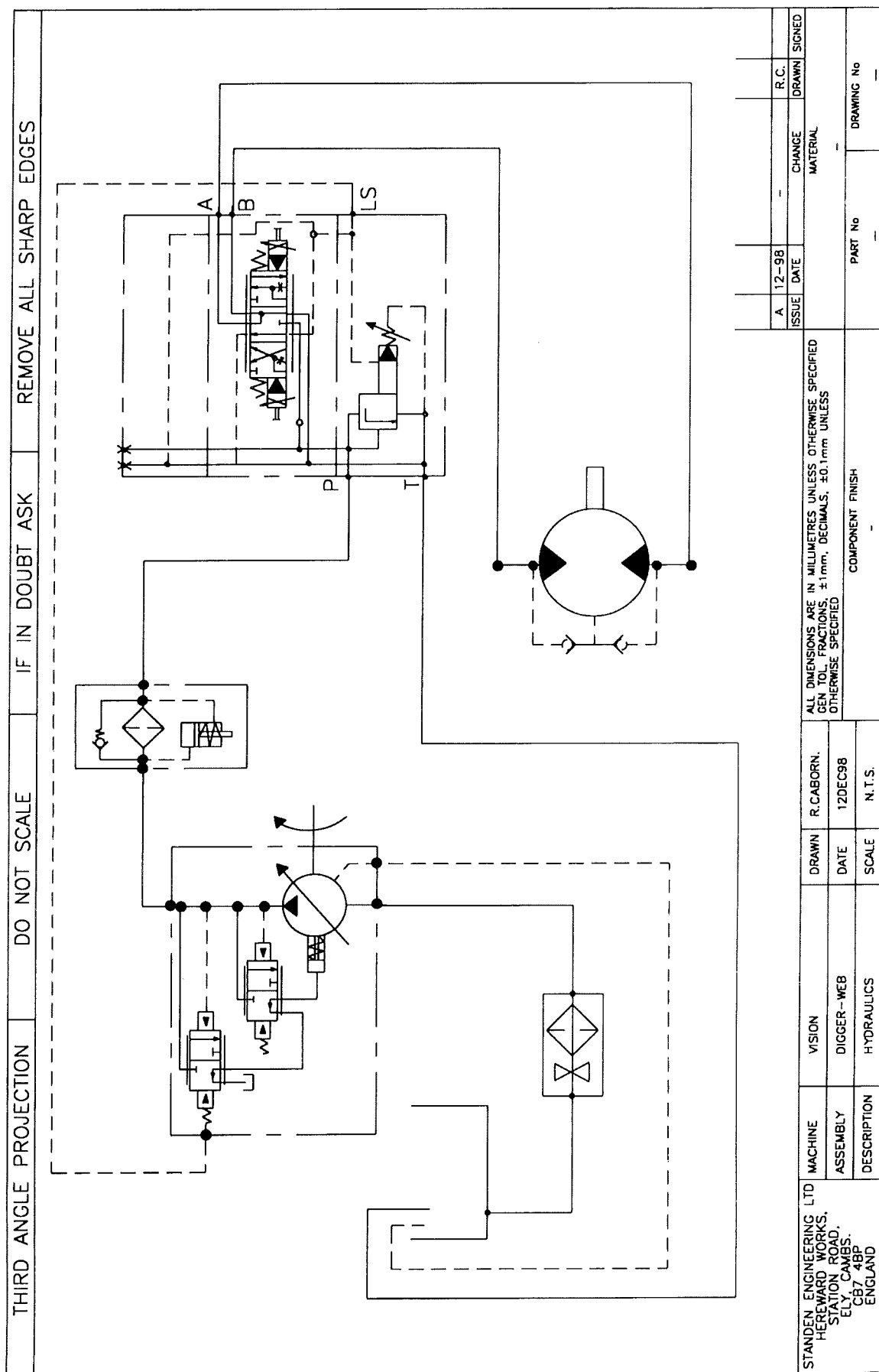


## Powered Axle Hydraulic Circuit





## Hydraulic Digger Web Circuit





## Hydraulic Flow/Speed Table

CIRCUIT	VISION HYDRAULIC CIRCUITS FLOW / SPEED RELATIONSHIP.						
	STANDBY PRESSURE BEFORE FILTER	MIN SPEED	MIN FLOW	LT RUN PRESSURE BEFORE FILTER	MAX SPEED	MAX FLOW	LT RUN PRESSURE BEFORE FILTER
CLEANER	22 BAR	0 RPM	0 LT/MIN	22 BAR	490 RPM	85 LT/MIN	105 BAR
ROTARY AGITATOR	14.5 BAR	0 RPM	0 LT/MIN	14.5 BAR	CLEANER SHAFT 995 RPM	25 LT/MIN	85 BAR
ONION PADDLE	14.5 BAR	0 RPM	0 LT/MIN	14.5 BAR	AGITATOR SHAFT 320 RPM	25 LT/MIN	85 BAR
SWEEPING CLOD FINGERS		0 RPM	0 LT/MIN	14.5 BAR	PADDLE SHAFT		
POWERED DISCS						41 LT/MIN	
POWERED DIABLOS						41 LT/MIN	
STAR SEPARATOR							
DISCHARGE ELEVATOR / SPREADER		10 RPM	2 LT/MIN		180 RPM MOTOR SHAFT	36 LT/MIN	
DIGGER WEB	22 BAR	0 RPM	0 LT/MIN	22 BAR	200 RPM MOTOR SHAFT	85 LT/MIN	
SPROCKETS 19-34					111 RPM		
SPROCKETS 21-34					123 RPM		
SPROCKETS 23-34					135 RPM		
POWERED AXLE	22 BAR				WEB SHAFT	85 LT/MIN	
07-Apr-99							

VS-IN057

