T2

Two Row Potato Harvester

Standen Engineering Limited.
Hereward Works,
Station Road, Ely,
Cambridgeshire.
CB7 4BP
England.

Tel: +44 (0)1353 661111 www.standen.co.uk Fax: +44 (0)1353 662370

IMPORTANT

This operator's 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.

CONTENTS

1.1 INTRODUCTION

Introduction to the Handbook

This handbook provides the information for the operation, adjustment and maintenance of your Standen T2. 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 driver's 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.

WELDING WARNING:
Before carrying out any welding on the harvester <u>always</u> disconnect the KS1 & KS2 plugs from the bottom of the harvester control module and completely disconnect the harvester from the tractor. Failure to observe the above precautions may cause severe damage to the harvester and tractor electrical systems.

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.

THE OMEGA SEPARATION UNITS COMPRISED IN THIS HARVESTER ARE ONLY APPROVED FOR USE WITH EBONITE AND STEEL ROLLERS. RUBBER ROLLERS MUST NOT BE FITTED INTO THESE MACHINES IN THE PLACE OF THE EBONITE OR STEEL ROLLERS.

Section 3 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.

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

1.3 SAFETY PRECAUTIONS

Safety

The Standen T2 has been designed to comply with current Safety Regulations. However, as with all machinery there will be inherent dangers whilst operating and carrying out maintenance on the machine. The following safety precautions should therefore be brought to the attention of all persons operating and working on the machine. The list is not exhaustive. All machinery is potentially dangerous and the operators must exercise great care 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.

Machine Noise Level

Average continuous noise level at the operator's ear with machine harvesting crop is 80.75dB (maximum peak level 85.6dB). It should be noted that this level could vary dependant upon tractor/machine combinations.

Operation

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

Never allow children or animals in the vicinity where machines are working and never allow anyone to ride on the machine.

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.

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

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

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

Never set machinery in motion before ensuring that everyone in the vicinity is aware of your intentions.

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

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

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

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

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 machine is in the 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

Always switch off the electrical control system before transporting the harvester on the road.

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 operator's 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

HSE
Health & Safety Executive

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.

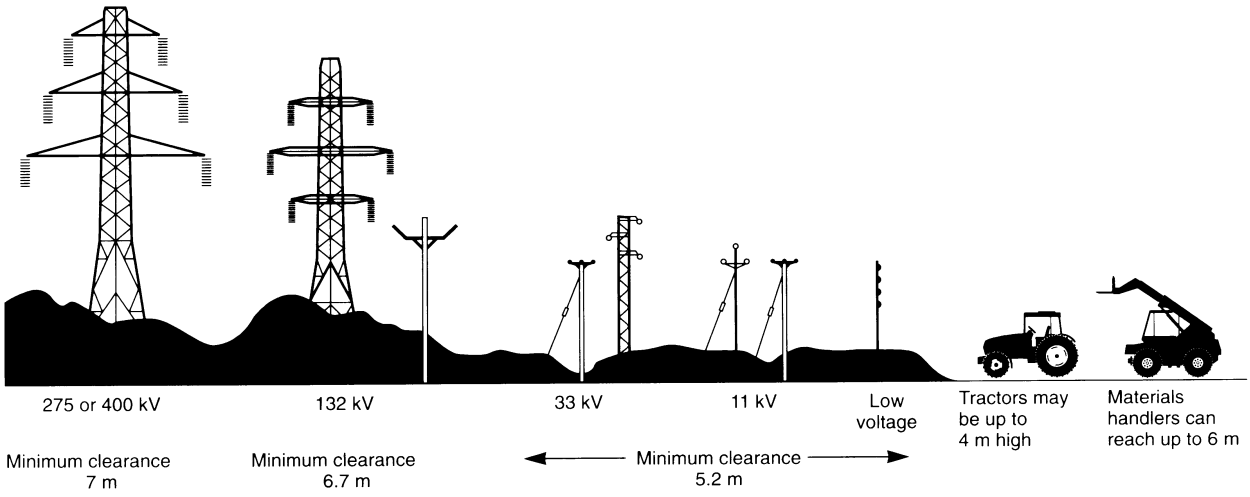
Printed and published by HSE 3/97 AIS13 C50

HSE information sheet

HSE
Health & Safety Executive

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).

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.

HSE home page on the World Wide Web: http://www.open.gov.uk/hse/hsehome.htm

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

Printed and published by HSE 6/97 AIS 8 (rev) C60

T2

The Standen T2 is a 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 built with a digging width of 1630mm, and direct loads the crop with no manning on the machine. Optionally, a manned picking table can be fitted.

Before starting work, check that the machine is in a safe working condition. Check components that 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 T2 is four-wheel drive with 134 KW (180 bhp) for the basic unmanned machine and 150 KW (200 bhp) when used with a front mounted topper. 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 50 litres/minute with a low back pressure/free return to the tractor. A load sensed oil supply above this figure this is recommended. Also required is a 12volt D.C. negative earth power supply rated at 50 amps to feed the electrical control system. A control box, and touch screen are 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 touch screen gives control of all adjustable functions, and diagnostic functions.

The T2 is designed to be towed from the pick-up hitch hook of the tractor and imposes a transferred load of 1.8 tonnes to the tractor with basic unmanned model.

Should the T2 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 to be lifted. 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 operator's manual prior to attaching the machine and putting it to work.

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 (item 1, figure 1) should be adjusted accordingly to compensate. To adjust the eye position, remove the bolts (item 2, figure 1) and move the eye to the required position. Refit the eye using a minimum of 2 bolts. The eye can be turned over to achieve a second range of adjustments. The stand (item 3, fig 1) is provided so that the machine is held at a suitable height for safe coupling to the tractor. When the machine has been securely attached to the tractor, the stand can be folded back into the working position by removing the pin (item 4, figure 1), rotating the stand and then re-securing with the pin.

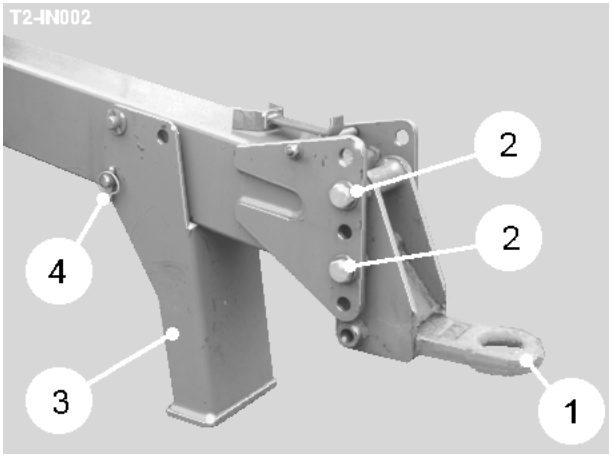


Fig 1

Switch off the tractor engine before making any other connections. The hydraulic and electrical connections can then be made. Connect the hydraulic return hose marked 'RETURN' to the tractor manufacturers recommended low back-pressure return coupling. Connect the pressure hose marked 'FLOW' to the tractor outlet recommended for constant supply. If in doubt, refer to the tractor handbook. Connect the load sense hose to the tractor L/S outlet. Mount the in-cab control boxes securely inside the tractor in a position where they are comfortable to operate when seated. Connect the control box power supply cable directly to the tractor battery. The black lead to negative (-) and the red leads to positive (+). Mount the tractor harness plug on the rear of the cab in an accessible position. Connect the control box, and touch screen cables. Connect the harvester control harness plug to the socket on the tractor harness, ensuring that the harness is safely routed. Connect the power lead. Connect the lighting plug to the tractor lighting socket.

PTO Shaft

It is essential that the PTO shaft be 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 standard specification machine is geared to operate at 1000 rpm PTO speed.

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.

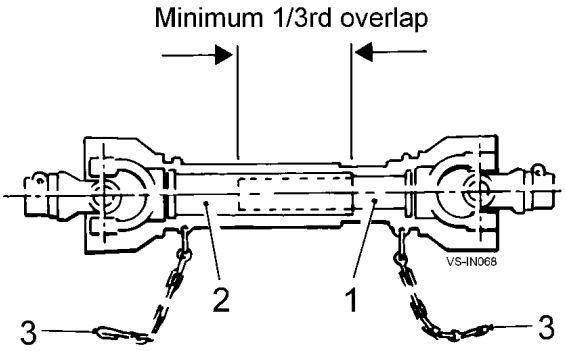


Fig 2

1. Separate the male shaft (item 1, fig 2) and female shaft (item 2, fig 2) 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.

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.

7. Finally, attach the safety chains (item 3, fig 2) to secure anchoring points on the tractor and machine ensuring that the chains will not over-tighten when the machine is turning.

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

Drawbar

The steerable drawbar is operated by the switch 'Drawbar right/left' on the touch screen, or by the left-hand joystick on the slave box. The drawbar is used in conjunction with the axle steering to ensure the machine operates parallel to the rows.

Only operate the drawbar when the digger assembly is raised or when the machine is moving otherwise components may be damaged.

Digger Assembly

The digger assembly, which includes the depth wheels, disc coulters, shares and digger web is retained in the raised position by transport chains. Before attempting to operate the digger assembly the transport chains (item 1, fig 3) will need to be unhooked from the chassis.

The digger assembly is controlled electronically from the in-cab control box. The 'Digger Share' rocker switch manually raises and automatically lowers the digger web. When set to the digger is in the automatic / lower position, and will continue to lower until the depth wheels or shares rest on the ridge. Returning the switch to the neutral position will hold the digger at its present setting. In operation the digging depth is set using the 'Auto Depth' control. The set depth is displayed on the service terminal screen allowing the operator to adjust the working depth through the field.

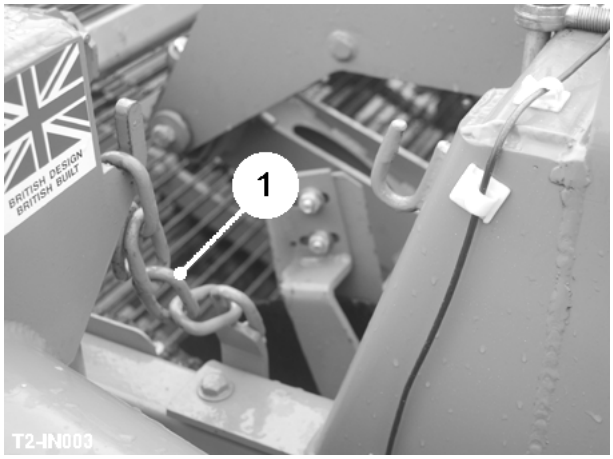


Fig 3

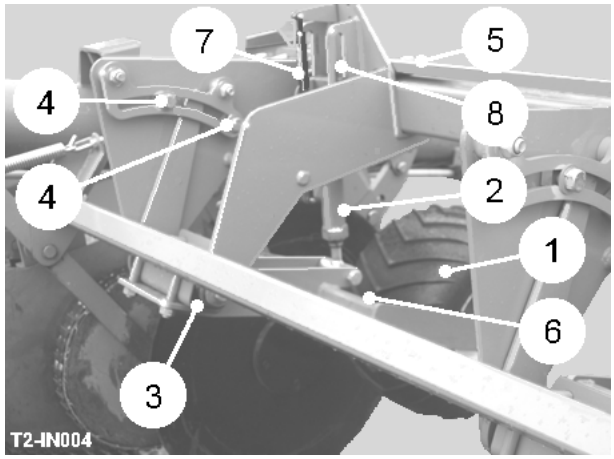


Fig 4

Depth Wheels

The depth wheels (item 1, fig 4) running on each ridge control the share depth. Their setting is very important to the effective operation of the harvester. The turnbuckle (item 2, fig 4) sets the working depth of the wheels. 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 wheels are mounted on rubber torsion springs (item 3, fig 4) which allow the weight to be carried off the wheels 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 pressure setting needs to be made when the machine is in work so that the relative working position of the depth wheel to the ridge is correct. By positioning the clamp stops (item 4, fig 4) in the pressure-setting quadrant, weight can be removed from the depth wheel, or extra pressure can be added to the wheel.

NOTE: Care should be taken to ensure that the depth wheels are not locked solid. Free float must be available when the digger is raised and lowered.

Row width settings are adjusted by loosening the clamp bolts (item 5, fig 4), and sliding the wheel assembly until positioned centrally over the ridge. Repeat for the other wheel ensuring they are set symmetrically about the centre line of the machine. The depth wheels are each fitted with a scraper (item 6, fig 4). The scrapers should be set as close to the wheels as possible without fouling them.

Diablo Rollers (optional)

Diablo rollers can be fitted in place of the depth wheels. Rubber torsion springs allow the weight to be carried off the roller 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. 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.

The button  starts/stops the diablo roller drive and speed can be varied by adjusting the flow setting on the service terminal. 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.

Automatic Depth Control

Pressing the button  turns on the automatic depth control. Selecting  will manually raise the digger. The depth wheels control the depth setting of each digger ram independently. The time delay for each side of the digger can be set by adjusting the left and right delay parameters via the service terminal. Maximum and minimum dead-band limits can also be set. When the auto-depth control is active, a numerical figure representing the set depth is displayed. In work, the digging depth can be varied using the auto-depth parameter on the service terminal.

A depth sensor (item 7, fig 4) is fitted to each depth wheel unit. The depth control unit allows each wheel 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 sensor detects the position of the top of the depth turnbuckle. The initial depth setting should be made with the machine on a firm level surface. Place a 10” (250mm) spacer block under each depth wheel and lower the digger until the shares touch the ground. In this position, adjust the turnbuckles so that the top pin is central in the slot (item 8, fig 4). By default, the depth on the screen should be set to 250mm. The depth adjustment can be varied approximately +/-75mm by the operator from the tractor cab.

Disc Coulters

On row work, the harvester is fitted with four disc coulters (item 1, fig 5). On full width bed work, the harvester is fitted with two disc coulters. The discs 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 and feeding it over the shares onto the digger web.

To set the disc coulter row width/cutting width, release the clamp bolts (item 2, fig 5) and slide the disc assembly along the bridge beam to the required position. When correctly set the discs should be approximately 20mm clear of the edge of the share blades. To set the disc coulter depth, turn the adjusting handle (item 3, fig 5), which also increases the spring load on the disc. The disc coulters are each fitted with two scrapers (item 4 & 5, fig 5). These should be set as close to the disc as possible without fouling it.

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

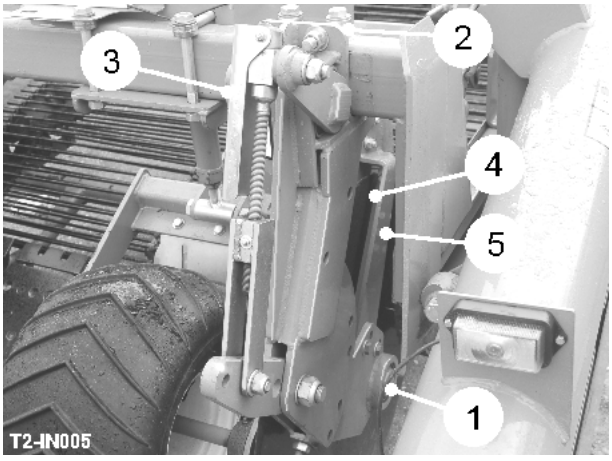


Fig 5

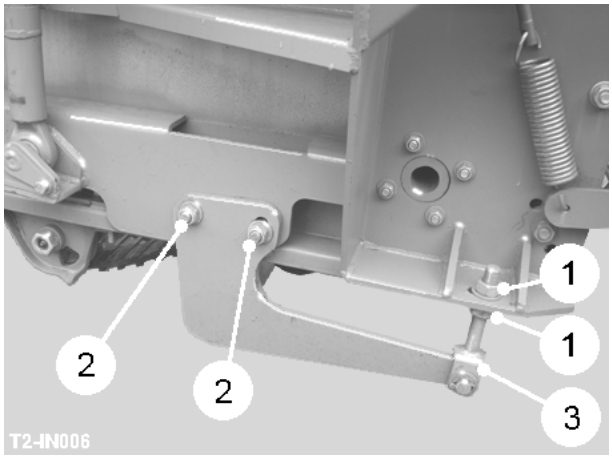


Fig 6

Shares

To adjust the angle of the shares loosen the locknuts (item 1, fig 6) on both sides of the machine, slacken mounting bolts (item 2, fig 6) and re-position adjuster (item 3, fig 6). Ensure both sides are adjusted evenly by measuring from the tip of the outer shares up to the disc support bridge above. The points of the share should be kept as high as practicable whilst still maintaining adequate digging depth. Lowering the points will assist penetration but may increase risk of crop damage. If the soil has been adequately cultivated this should not be necessary. If the pitch is too steep (points lowered) it can greatly increase the loading or 'bulldozing' effect on the share frame, especially when in hard or tough conditions. Regularly check for soil build-up on the share frame (especially in wet conditions) as a pad of soil at this point will create a considerable braking effect on the digger web. Ensure that the share frame is not in contact with the web bars at this point.

Haulm Intake Rollers

Haulm intake rollers (item 1, fig 7) 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. Depending on the width of the digger web and the row width configuration to be lifted, the haulm roller build will vary. The rollers are spring loaded onto the digger web bars. The outer roller assemblies are fitted with tension springs (item 2, fig 7), and are tensioned by the adjusters (item 3, fig 7). The centre rollers (if fitted) are mounted on a spring-loaded arm and are tensioned similarly with a coil spring and threaded adjuster. Alternatively, rubber deflectors may be fitted between the centre disc units.

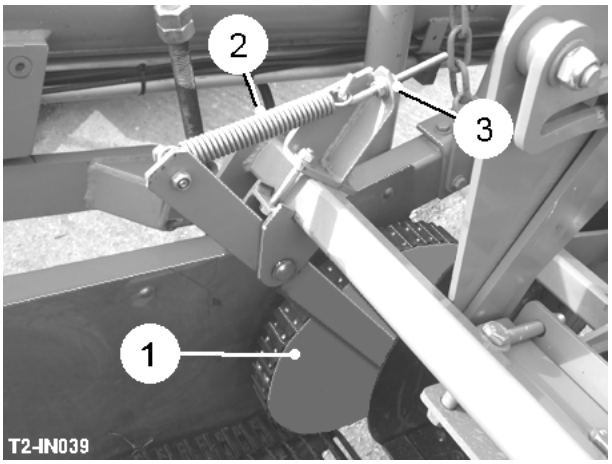


Fig 7

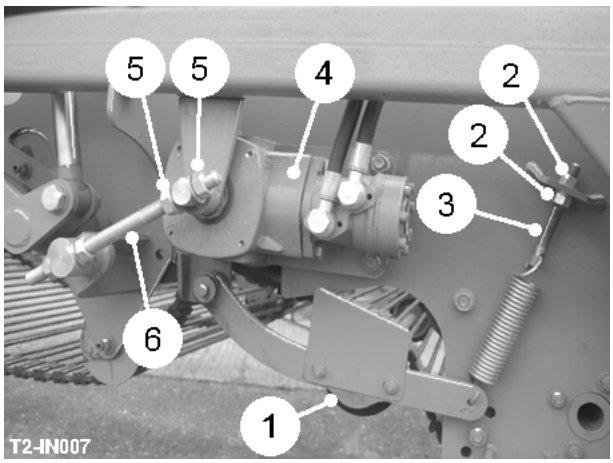


Fig 8

Digger Web

The standard specification machine is fitted with a 1630mm wide, 36mm pitch digger web. A 1500 mm digger web is available as an option. Also, should an alternative pitch web be required to suit particular crop and soil conditions, this will be a special requirement and will need to be discussed with Standen Engineering Limited. The spring-loaded tension rollers (item 1, fig 8) maintain the drive on the return side of the web. To tension the web, loosen the locknuts (item 2, fig 8) and reposition the spring adjuster (item 3, fig 8). Ensure both sides are adjusted equally.

The digger web is driven by the motor gearbox unit (Item 4, fig 8). The button starts/stops the digger web and the speed is set on the service terminal.

VariSep

The drop height from the digger web to the sieving web can be adjusted using the 'Web Split' button on the slave box. The gap between the two webs can be manually set according to the crop size, and the separation required. The gap is adjusted by releasing the locknuts (item 5, fig 8)) and moving the adjuster (item 6, fig 8) until the required gap is obtained. Ensure both sides are adjusted evenly.

Digger Suspension

If required, the digger assembly can be suspended on the rubber torsion blocks (item 1, fig 9). This is normally set to act when the digger is operating in conditions where the soil pan is close to the digging depth and the maximum depth needs to be limited.

The suspension is set with the digger at maximum depth. Release the lock nuts (item 2, fig 9), and wind them down to the top of the trunnion (item 3, fig 9). Continue to wind down the nuts equally on both sides, one full turn at a time, until the required 'carry off' is reached with maximum digging depth still retained. Finally, retighten the lock nuts.

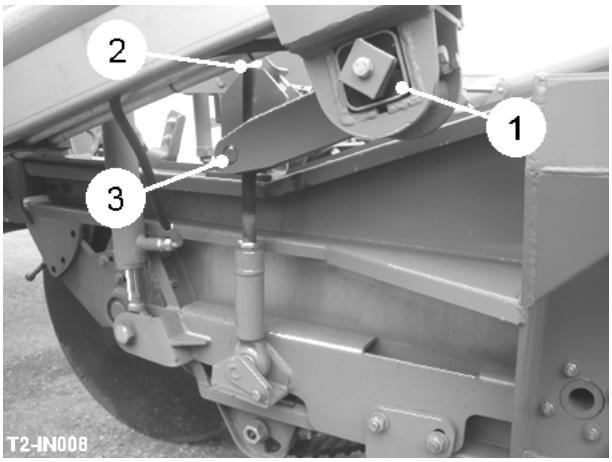


Fig 9

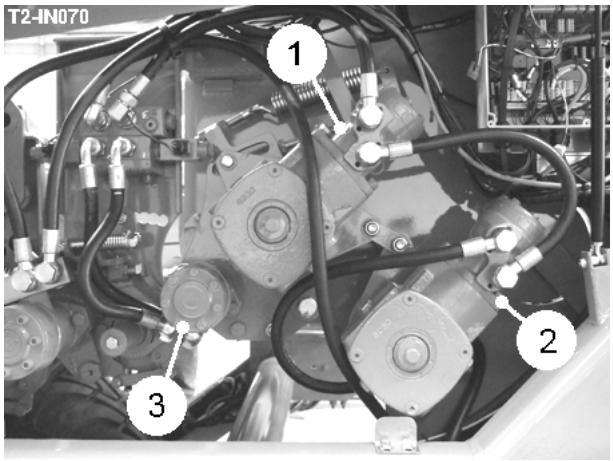


Fig 10

Sieving Web

The 1630mm wide sieving web is available in 28mm, 32mm, 36mm, 40mm, 45mm and 50mm pitches to suit the crop and soil conditions being harvested. The sieving web drive uses the 'Standen Wrap Drive' configuration fitted with a reverse running assister drive on the return side. This gives a virtually slip-free drive under most conditions and eliminates web drive sprockets allowing for easy web pitch changes. The web is driven by two shaft mounted motor gearboxes. The hydraulic motor (item 1, fig 10) drives the main drive shaft. The motor (item 2, fig 10) drives the assister drive shaft.

Changing webs is a simple operation of removing the web 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.

Sieving web drive is controlled electronically from the service terminal. The  button starts/stops the sieving web and the pre-set speed is adjustable via the service terminal.

Rotary Agitators

Three rotary agitators shafts are fitted inside the sieving web. These are designed to separate the soil from the crop as it is elevated up the web. Drive for each agitator shaft is by a directly coupled hydraulic motor fitted with a bypass valve.

The button  starts/stops all the agitator shafts. Frequency of agitation can be varied by adjusting the set speed on the service terminal. Individual shafts can also be selected to freewheel. 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 the entire soil cushion has been removed before reaching the haulm roller.

Sweeping Clod Fingers (optional)

The sweeping clod fingers 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 rotary agitators.

The button starts/stops the clod fingers and speed can be varied by adjusting the preset speed on the service terminal.

To set the height of the fingers (item 1, fig 11) above the web, remove the clamp bolts (item 2, fig 11) and rotate the mounting bar (item 3, fig 11) 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.

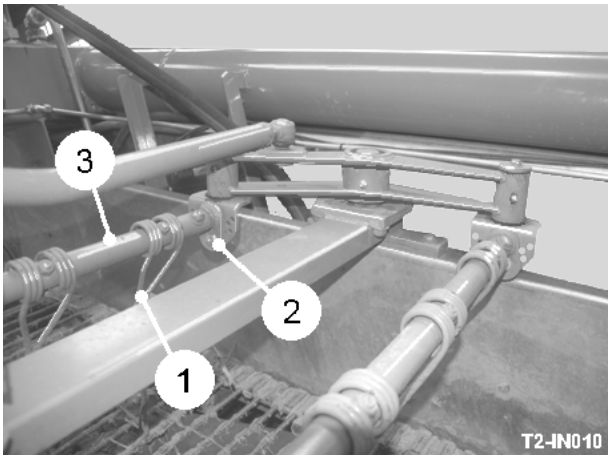


Fig 11

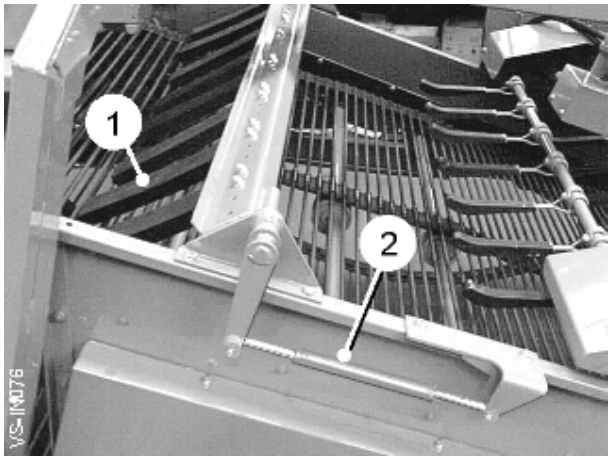


Fig 12

Clod Breaking Fingers (optional)

The clod breaking fingers consist of one or two rows of trailing rubber blocks (item 1, fig 12). 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, fig 12). Care should be taken not to set the fingers to operate too rigidly onto the web or bruising and skin scuffing may occur.

Haulm Roller

The haulm roller (item 1, fig 13) s designed to pinch the haulm and trash and drop it onto the ground under the machine. The haulm roller is driven by the hydraulic motor (item 3, fig 10). Roller speed is controlled from the service terminal screen. For some types of crop such as onions etc. it is advantageous to reverse the direction of rotation of the haulm roller. To reverse the haulm roller, simply press the button on the service terminal.

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.

Due to the danger of flying objects, eye protection must be worn when visually monitoring haulm roller performance.

To increase/decrease the gap between the haulm roller and digger web, release the locknut (item 2, fig 13) and turn the setscrew (item 3, fig 13). The gap must be set equally on both sides. **Do not close the 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 4, fig 13). Adjust both sides evenly and check the setting by measuring the length of exposed thread on the spring tensioners.

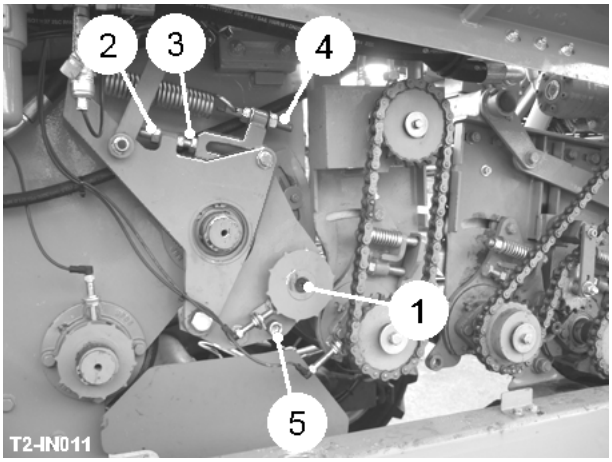


Fig 13

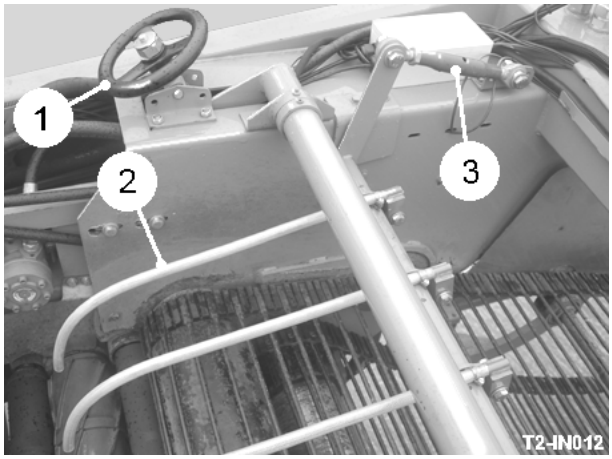


Fig 14

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 adjusted by turning the hand wheel (item 1, fig 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 1st separator unit. Adjusting the haulm roller until the maximum amount of haulm is removed with the minimum amount of potatoes being pulled through or nipped 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 T2.

The haulm roller is fitted with a scraper (item 5, fig 13). Set the scraper as close to the roller as possible without actually fouling it.

Haulm Fingers

The function of the haulm fingers (item 2, fig 14) 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 adjusting the turnbuckle (item 3, fig 14) the fingers can be raised or lowered. A plastic sleeve is fitted to each finger. The sleeves prevent bruising of the potatoes and should be replaced when they wear through or are lost.

Omega Separator Units

The Omega feed unit is positioned immediately behind the haulm roller. The unit consists of one row of polyurethane scrolls (item 1, fig 15) and one Ø85mm rubber clod roller (item 2, fig 15). The 1st unit is run with the clod roller rotating with the crop flow to move the crop away from the haulm roller. Speed of the unit can be adjusted from the service terminal screen.

To set the height of the clod roller (item 2, fig 15) relative to the scroll shaft, loosen the clamp bolts (item 3, fig 15) and rotate the clod roller mounting plate in the slot as required. Ensure both sides are adjusted evenly. The drive chain tension is set by releasing the motor mounting bolts and adjusting the jacking screw (item 4, fig 15).

Separation on all the Omega units operates fundamentally in the same way. The height of the polyurethane scrolls can be specified as 10mm (standard) or 6mm for less aggressive action.

The clod rollers can be ebonite, mild steel, or stainless steel. Stainless steel is the least aggressive due to the smooth, shiny surface, while ebonite will give more aggressive, general-purpose results. Also, fitting a smaller diameter clod roller allows larger more aggressive gaps to be set through the separator.

By raising the height of the clod roller relative to the scroll, a larger ripple is introduced into the crop flow creating more separation by allowing the crop to ride over the soil and top. To work in conjunction with this, the relative speed and rotation direction of the clod rollers can be set. When running the clod roller in reverse to the crop flow, the higher the speed, the more aggressive the separation will be. Reducing the speed lessens the pinching effect of the clod rollers. Running the clod roller with the crop flow at a slow speed will give some separation, while increasing the speed will transfer all the crop and soil.

The clod rollers will normally be adjusted to run approximately 1 to 2 mm away from the tip of the scrolls for effective haulm removal. The clod roller gap is set by adjusting the stop bolts (item 5, fig 15) against the spring tension on the clod roller mounting plates. Spring tension is adjusted on the spring tie bolts (item 6, fig 15).

Each clod roller is fitted with a scraper (item 7, fig 15) which needs to be closely adjusted to remove loose soil from the rollers.

NOTE: All adjustments must be made evenly on both sides of the units.

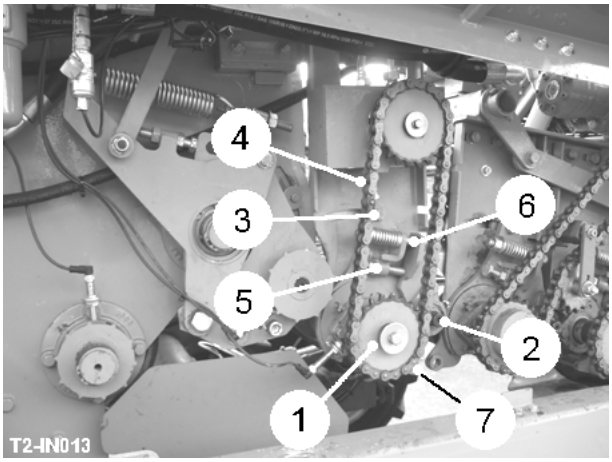


Fig 15

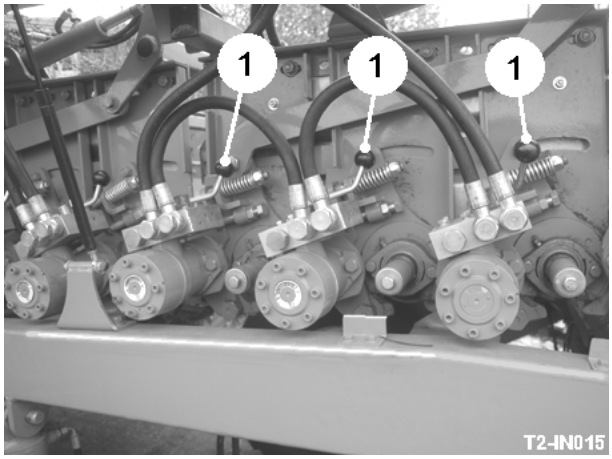


Fig 16

The 1st and 2nd Omega separators are both 3 roller units. To encourage a steady feed over the separators, they are individually mounted allowing them to be hydraulically angled between 0° and 8°. The scroll speed of each unit can be set on the service terminal screen. The speed of each set of clod rollers is set on the service terminal. In addition, each clod roller motor is fitted with a manual reversing valve (item 1, fig 16) allowing the operator to fine tune the separation.

Drive chain tension can be set by releasing the bolt (item 1, fig 17), rotating the tensioner mounting (item 2, fig 17).

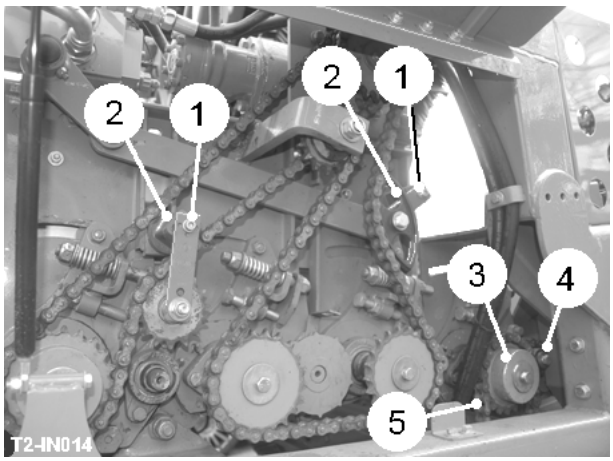


Fig 17

The 1st Omega separator angle and clod roller heights are adjusted by the second functions on the left-hand joystick. The 2nd Omega separator angle and clod roller heights are adjusted by the second functions on the right-hand joystick. Pressing and holding the front button on the joystick while operating the joystick north/south axis, raises and lowers the clod rollers. The east/west axis operates the angle.

The Omega transfer unit feeds the crop onto the spreader webs or transfer web (depending on machine specification). The unit consists of one row of polyurethane scrolls (item 3, fig 17) and one steel clod roller (item 4, fig 17). The speed of the unit is set from the service terminal. The clod roller height should be set to give the best feed onto the following web. The drive chain (item 5, fig 17) is adjusted by releasing the motor mounting bolts and rotating the motor in the mounting slot.

Make all adjustments evenly. Uneven adjustment may cause shafts to run out of line and eventually cause premature failure of the shafts and drives.

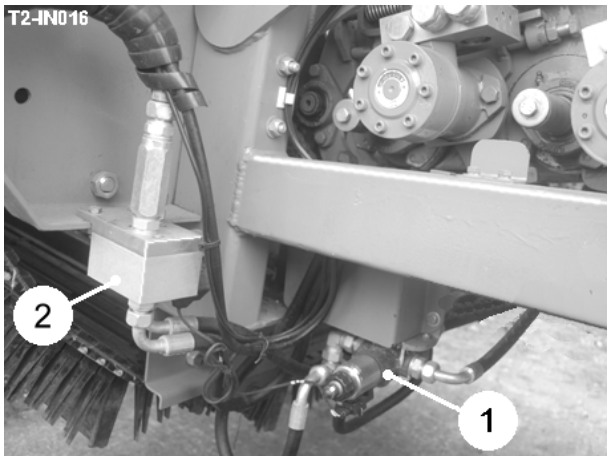


Fig 18

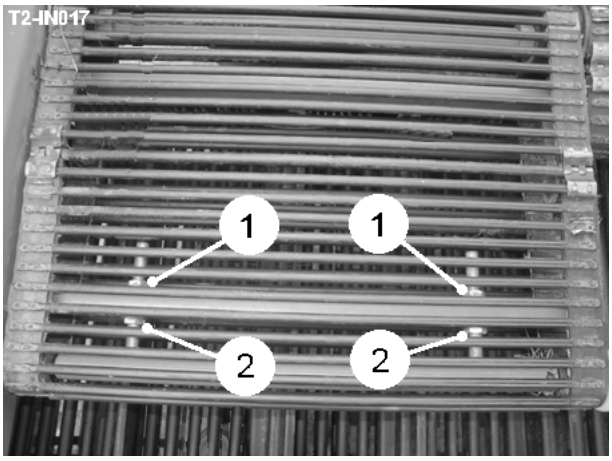


Fig 19

THE OMEGA SEPARATION UNITS COMPRISED IN THIS HARVESTER ARE ONLY APPROVED FOR USE WITH EBONITE AND STEEL ROLLERS. RUBBER ROLLERS MUST NOT BE FITTED INTO THESE MACHINES IN THE PLACE OF THE EBONITE OR STEEL ROLLERS.

Spreader Unit

The spreader unit webs are designed to distribute the crop evenly over the full width of the discharge elevator.

For the spreader to run, the auxiliary valve bank discharge section must first be turned on using the button on the service terminal screen. The button will then start/stop the spreader independently of the elevator web. The speed of the spreader web is controlled by the flow divider (item 1, fig 18) from the service terminal.

The spreader webs are tensioned using the locknuts (item 1 & 2, fig 19). Ensure both sides of the web are adjusted evenly.

Discharge Elevator

The 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 of the centre and top sections is controlled by the slave box right-hand joystick. Fold in and fold out of the centre section is primarily used to set the working height and reach. Raise and lower of the top section 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 pressing the button on the service terminal.

NOTE: 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 from the service terminal.

The service terminal button starts/stops all the elements of the rear section of the harvester. With the service terminal button on, the joystick button starts/stops only the elevator web by operating the bypass valve (item 2, fig 18).

On machines fitted with a picking table, the button starts/ stops the manned elements of the machine.

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.

Rear Axle

The rear axle is fitted with steerable wheels and is linked to the chassis by a pivot and a hydraulic levelling ram (item 1**,** fig 20). The RH wheel is moved from the transport position to the work position by the tracking ram (item 2, fig 20) within the axle beam.

The 'Machine Level' button on the slave box and service terminal screen, operates the levelling ram. 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 on the service terminal.

The left-hand joystick steers the rear of the machine and the button operates the self-centring circuit to automatically set the wheels to the straight-ahead position.

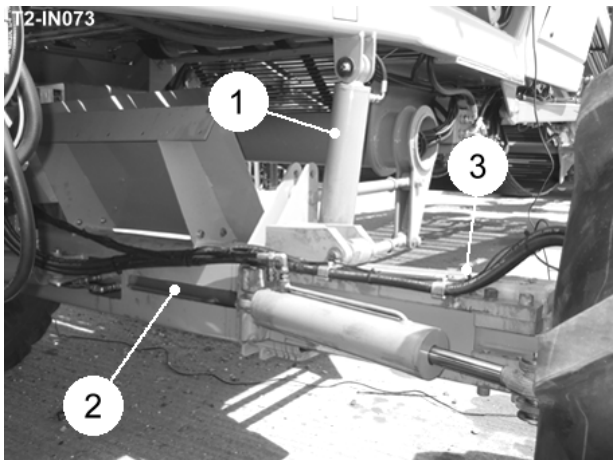


Fig 20

Rear Axle Tracking Procedure

To avoid damage to the machine, always ensure the discharge elevator is fully folded in and the machine is moving forwards so as to reduce stress on the axle and chassis.

The RH wheel should be tracked fully in for transport and fully out during work to give optimum balance and reduce wheel loading during operation. Tracking of RH wheel is done using the service terminal buttons. With the machine on firm level ground, slowly move the machine forward to assist the axle to slide and to relieve ground resistance on the tyre.

To prevent corrosion and to reduce friction, the RH axle beam (item 3, fig 20) should be regularly lubricated using wax oil.

Consult Standen Engineering Ltd. for information on different row widths and wheel equipment.

Powered Axle

The powered axle provides additional traction during work. The powered axle transfers power from the tractor PTO to hydraulically drive the harvester wheels up to a maximum speed of 5.5 kmh (3.5 mph). This is achieved by means of a load sensing, pressure compensated, variable displacement pump (item 1, fig 26), which provides the hydraulic oil flow to drive the wheel motors (item 1, fig 21).

Ensure the wheel motor casings are filled hydraulic oil before starting (see heading 'Bleeding/Filling Wheel Motors'). Failure to do so may cause premature failure of the wheel motors.

Each wheel motor is fitted with a grease collar. The collar must be purged with grease to prevent ingress of dirt and dust (see heading 'Purging the Grease Collar').

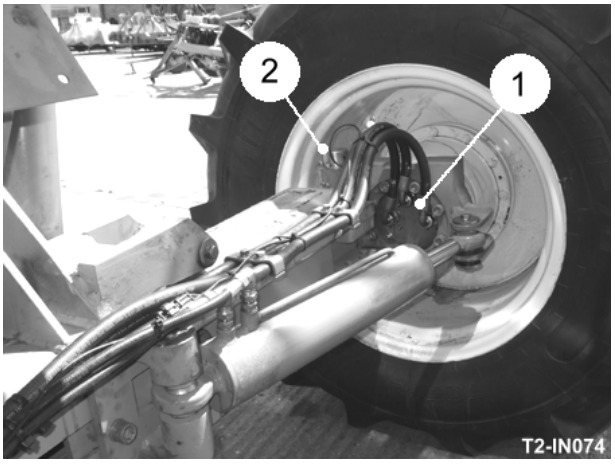


Fig 21

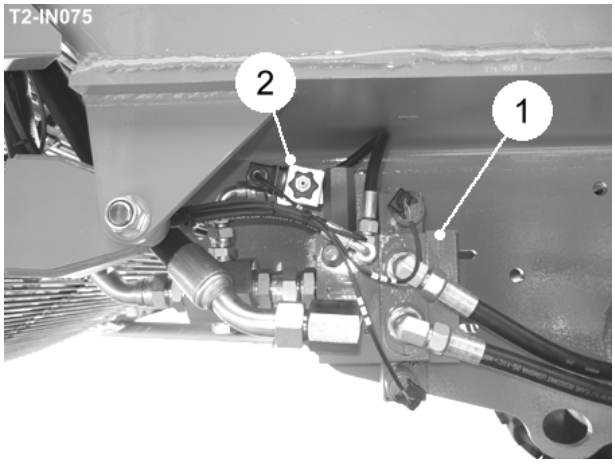


Fig 22

The axle drive can be set to forward, neutral or reverse from the yellow rocker switch on the slave box or from the service terminal. When forward or reverse is selected, the directional control valve (item 1, fig 22) 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, fig 22) from the service terminal. This valve allows a low operating pressure to be set which is adjustable to give the required drive assistance for normal harvesting. Forward speed can be matched to the tractor by using the speed adjust on the service terminal. When the high pressure button is pressed, the system operating pressure is increased to the setting of the main compensator within the pump.

Bleeding / Filling Wheel Motors

Place the wheel motor (item 1, fig 23) in a position in which the filler plug (item 2, fig 23) is at the top. Remove the plug and pour in hydraulic oil until all trapped air has been eliminated. Refit the plug and repeat for the second motor. Run the motors unloaded. Finally, operate the motors under load and check for leaks and extraneous noise.

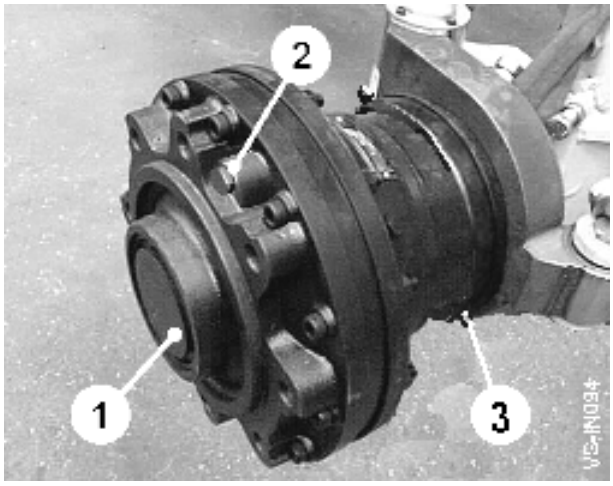


Fig 23

Purging the Wheel Motor Grease Collar

The grease collar must not be pressurised when purging as this can cause internal seal damage.

To purge dirt from the grease collar remove one of the grease nipples (item 3, fig 23) completely and pump grease into the other nipple until clean grease comes out of the open hole. Finally, refit the nipple to close the system.

Hydraulic Systems

Two completely separate hydraulic systems consisting of five different circuits are fitted to the harvester. The hydraulic rams, discharge elevator and spreader unit are powered from the tractor external supply. The webs and the other hydraulically driven elements on the machine are supplied from four PTO driven pumps and the onboard oil supply. The pumps are fed through the two suction filters submerged in the front beam and fed to the valves through pressure filters.

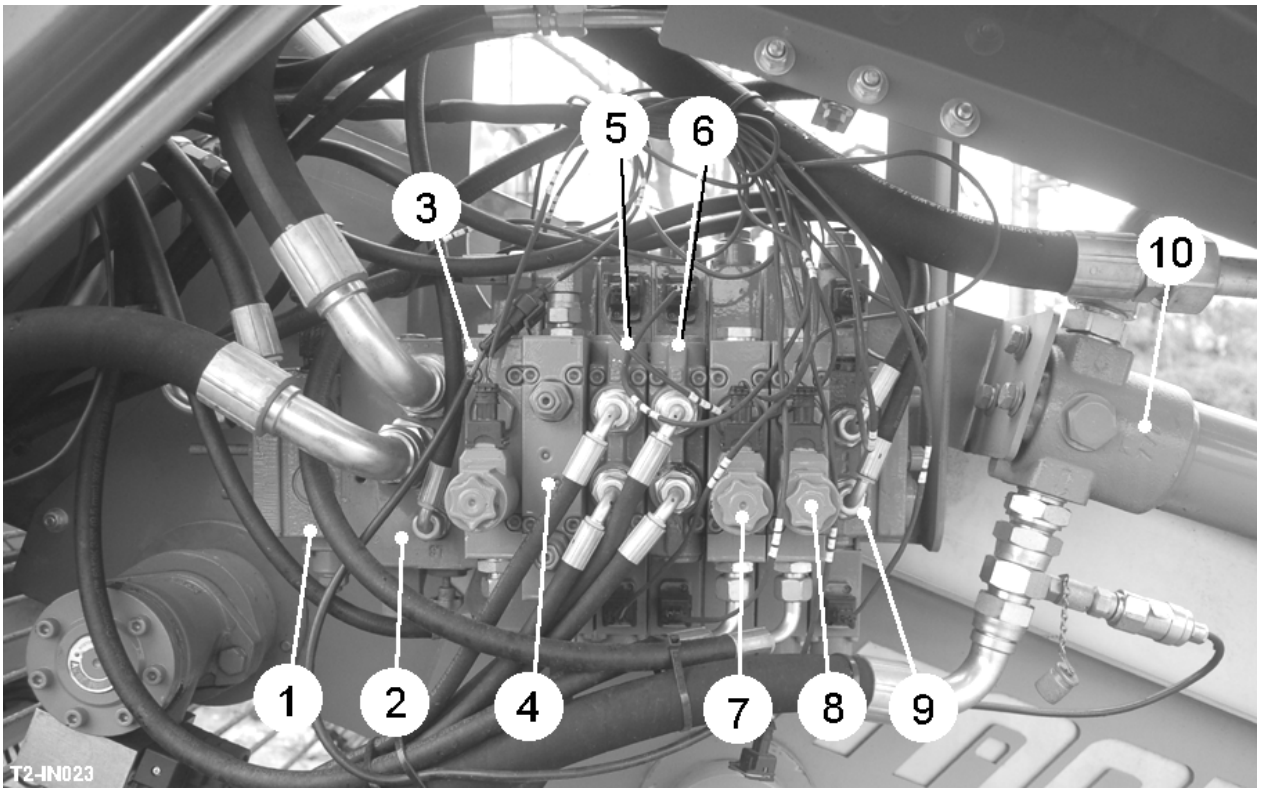


Fig 24

Item 1 = Elevator/spreader
Item 2 = Valve inlet section
Item 3 = Elevator swanneck
Item 4 = Elevator fold
Item 5 = LH steer
Item 6 = RH steer
Item 7 = LH digger lift
Item 8 = RH digger lift
Item 9 = Master section

Circuit 1 – Auxiliary Hydraulics

The hydraulic ram services and discharge elevator/spreader drives are supplied with hydraulic oil from the tractor. A minimum supply of 50 litres/minute is fed through the pressure filter (item 10, fig 24) into the inlet section of the auxiliary valve bank (see fig 24). The system will accept up to 80 litres/minute maximum. The flow rate of all the valves are proportionally controlled from the electrical system and are adjustable via the service terminal. Additional ram services are powered by the master valve section via slave valves. The slave valve (see fig 25) operates the drawbar, web split, machine level and wheel tracking rams. The slave valve (see fig 26) operates the 1st and 2nd Omega separator angles and clod roller heights. The elevator valve section at the rear of the auxiliary valve bank powers the discharge web and spreader motors. The elevator valve has priority over the ram service valves. The flow rate for the spreader is adjustable independently up to the flow set for the elevator. 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 auxiliary circuit, the system relies totally on the tractor relief valve.

The auxiliary valve bank is capable of operation with open centre, closed centre, or load sensed tractor systems. When sweeping clod fingers are fitted, an additional valve section is added to the end of the valve block after the elevator/spreader section.

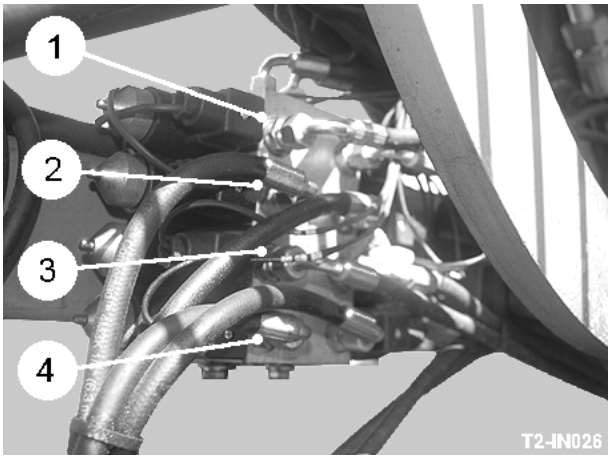


Fig 25

Item 1 = Drawbar steer
Item 2 = Web split
Item 3 = Machine level
Item 4 = Wheel tracking

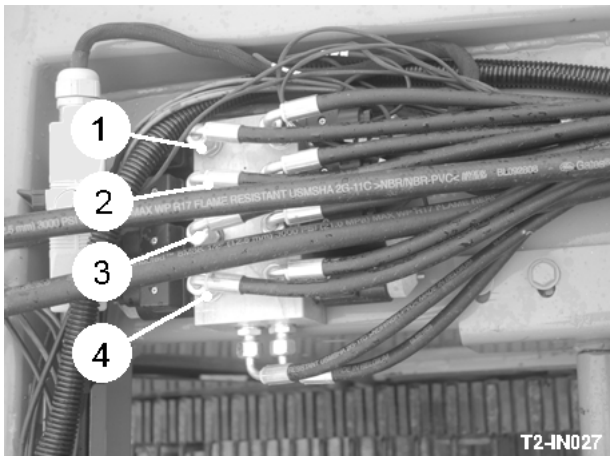


Fig 26

Item 1 = 2nd Omega angle
Item 2 = 2nd Omega clod roller
Item 3 = 1st Omega angle
Item 4 = 1st Omega clod roller

Circuit 2

The pump (item 1, fig 27) supplies the powered axle. From the pump the feed is into the valve (item 1, fig 28). The axle drive is switched for forward and reverse from the slave box or the service terminal. The + button overrides the external pressure control valve (item 2, fig 28) and brings the maximum system pressure to the pump maximum.

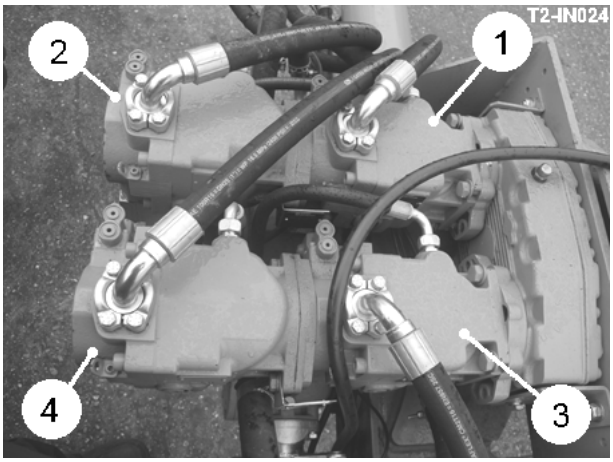


Fig 27

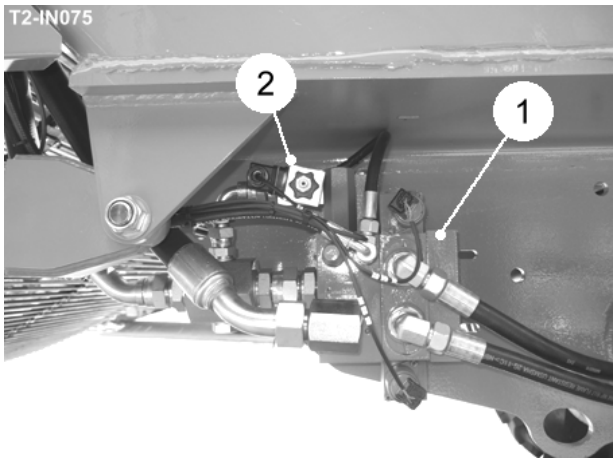
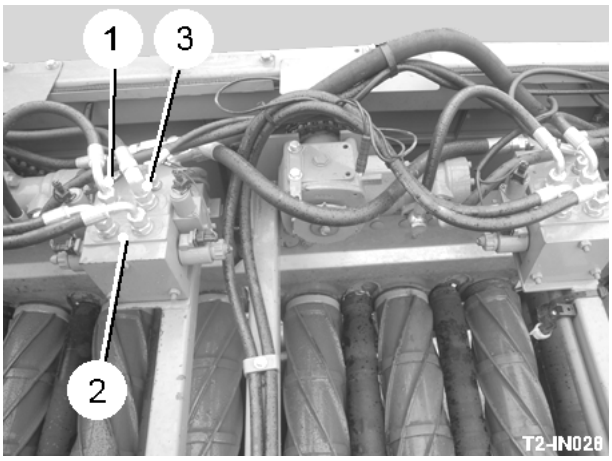


Fig 28

Circuit 3

The pump (item 2, fig 27) powers the 2nd Omega separator Unit. From the pump the feed is into the valve (see fig 29). On/off control and scroll speed is proportionally controlled from the service terminal. The clod rollers are in a series circuit fed from a double-acting valve allowing the clod roller set to be reversed. This also enables the operator to reverse the rollers to eject a blockage. A manual reversing valve is fitted to each clod roller motor allowing individual rotations to be set. The remaining valve section feeds the Omega transfer unit. A pressure transducer mounted next to the circuit filter monitors the working pressure within the circuit.

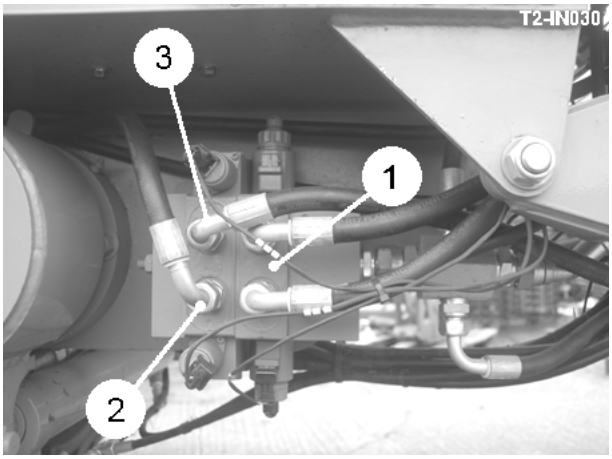


Item 1 = Omega transfer unit
Item 2 = 2nd Omega clod rollers
Item 3 = 2nd Omega scrolls

Fig 29

Circuit 4

The pump (item 3, fig 27) powers the digger web, sieving web and rotary agitators. From the pump the feed is into the valve (see fig 30). On/off and speed control is from the service terminal. The digger web speed should be adjusted to give a consistent crop take-away from the shares, and the sieving web speed should be adjusted to give a consistent crop take-away from the digger web. The agitators should be used to the minimum to separate the loose soil from the crop.



Item 1 = Digger web
Item 2 = Sieving web
Item 3 = Rotary agitators

Fig 30

Circuit 5

The pump (item 4, fig 27) powers the 1st Omega separator unit. From the pump the feed is into the valve (see fig 31). On/off control and scroll speed is proportionally controlled from the service terminal. The clod rollers are in a series circuit fed from a double-acting valve allowing the clod roller set to be reversed. This also enables the operator to reverse the rollers to eject a blockage. A manual reversing valve is fitted to each clod roller motor allowing individual rotations to be set.

The remaining valve section feeds the Omega feed unit. A pressure transducer mounted next to the circuit filter monitors the working pressure within the circuit.

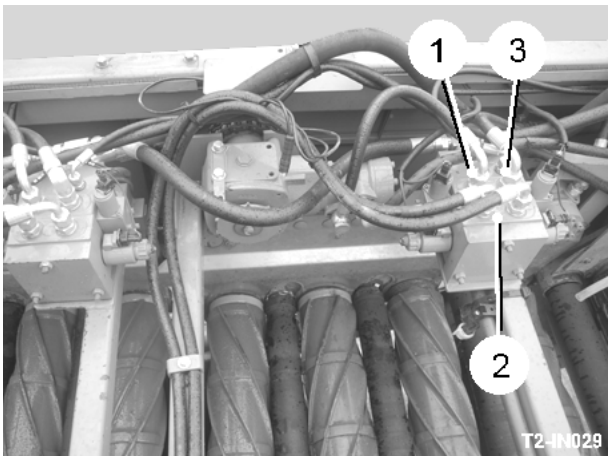


Fig 31

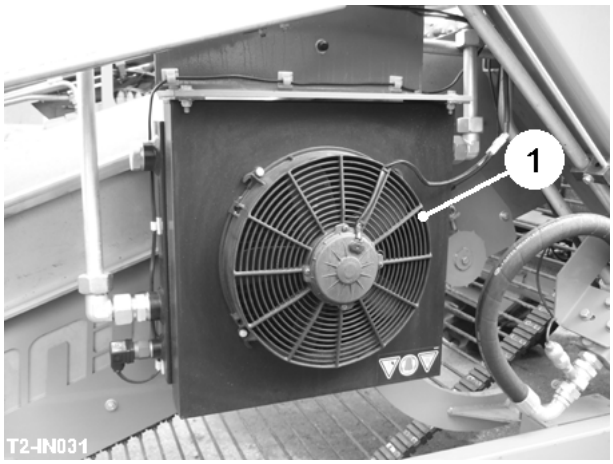


Fig 32

Item 1 = Omega feed unit
Item 2 = 1st Omega clod rollers
Item 3 = 1st Omega scrolls

Some of the return oil from circuits 4 and 5 returns to tank through the oil cooler (item 1, fig 32). The electric powered fan is thermostatically switched to operate when the oil reaches 60°C.

Electrical Control System

WARNING: Always switch off the electrical control system before transporting the harvester on the road.

Control of all the operating functions of the T2 are through the Can-bus control system. The in-cab controls are covered by the touch-screen service terminal (Item 1, fig 33) and the slave box (Item 2, fig 33). The slave box covers all the basic switched functions used in normal operation and these are also repeated on the service terminal. The primary function of the touch screen service terminal is to allow easy access to all the variable functions such as speeds etc., and to allow all the operating functions to be monitored on the screen. Setting and monitoring can be carried out by following the instructions in the 'Control System' section, or as shown on the display screen. On manned machines, an additional control box (item 1, fig 34) is fitted above the picking table which allows the pickers to adjust the picking web speed and axle level etc.

NOTE: If the tractor engine is stopped and restarted the control system should be turned off and on again to protect the program from showing errors.

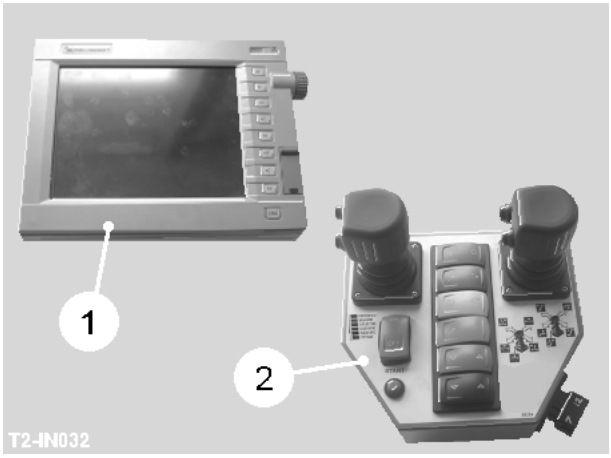


Fig 33

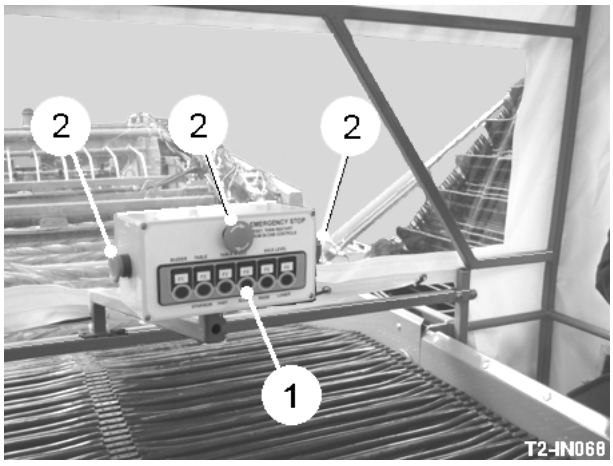


Fig 34

Do not store the control consoles outside and always disconnect them from the tractor supply when not in use, so avoiding the possibility of draining the battery. Ensure that plug pins are clean and undamaged before connection and they are securely locked together before the power is switched on.

Emergency Stop Buttons

When activated, the manual emergency stop buttons (item 2, fig 34) shut down all hydraulic drives and electrical controls by turning off the machine control module and displaying the 'Press Start' screen on the service terminal. The service terminal remains live but will not operate any function.

NOTE: 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 'Start' button on the slave box will latch on to the machine control module.

Starting Off Your Harvester

Before commencing work whether starting off a new machine or starting work in a new field, it is advisable to carry out the following checks.

Ensure the harvester is level when hitched to the tractor.

Ensure the hydraulic and electrical connections from the tractor are correctly made and are secure.

Ensure the tractor and harvester wheel settings match the rows to be harvested.

Ensure the shares are set to the correct row widths and are set centrally to the rows.

Release the digger transport chains from their transport position.

Set the shares so that they are evenly spaced and the tip plates are in line with the top of the digger web.

Ensure the depth rollers are mounted centrally over the rows.

Set the disc coulters to the correct width to suit the ridges being lifted, typically 20mm from the outer edge of the share blade.

Ensure the disc coulters are sharp, especially in soft ground or trash.

Ensure the ant-roll flaps/haulm intake rollers are set to the correct width.

Check that the web pitch is suitable for the size of crop to be lifted.

Damage Prevention

A machine that is incorrectly adjusted or operated can cause a significant amount of damage to the crop. The type of damage found in the sample will usually give an indication as to how the damage was caused and where it is occurring. Examine samples at various points. Start in the row in front of the machine and follow the path of the crop through to the trailer. Somewhere between the last undamaged sample and the first signs of damage will be the area causing the problem. The shape and nature of the damage will give clues as to the cause.

When satisfied that the tractor and harvester are set up correctly then commence work. Work the machine for approximately 30 metres and stop. Do not run the machine out, leave the crop and soil on all of the sections of the machine. By a series of visual checks you can assess how the harvester settings are performing, and carry out the following checks.

Damage can take various forms. The following comments will help find and cure some of the more common problems. Remember, the harvester is not always the culprit.

The speed and efficiency of mechanical harvesting can be greatly improved by good planting techniques and adequate cultivation methods. Visually check behind the harvester. If cut or sliced potatoes are evident, the digging depth or disc settings may be incorrect. Potatoes with an uneven cut are normally caused by the shares while a clean straight cut can be caused by the discs.

Check for correct depth of lifting by digging into the lifted rows. Potatoes in the ground indicate depth too shallow. If depth is too deep, then excessive soil will be lifted making the separating areas of the harvester work harder. Avoid lifting the unworked soil below the ridge. A small amount of extra depth will equate to many tonnes of extra soil being lifted.

If undamaged potatoes lie on the surface behind the machine, check their position. If they are to the side of the lifted rows, they may have spilled out of the front of the digger web. Check disc position and anti-roll flaps or haulm intake rollers if fitted. If potatoes lie on top of the lifted rows, check webs are correct pitch for crop being lifted and gap between star shafts is not too large.

If damaged potatoes lie on top of the lifted rows, these may be being lost through the separating areas of the machine. Check the following.

Crushed potatoes may be caused by the haulm roller or separator unit clod roller setting. Nipped potatoes may be caused by the cleaner unit roller size, speed, or angle.

Looking on top of the soil under the harvester may give an indication as to where these damaged potatoes are being produced.

Inspect the crop on the digger web. If cut potatoes are evident, check digging depth and disc settings. If clods or stones are present at the sides of the web, then the discs an shares may be set too wide and are picking up material from the wheelings. Excessive soil on the digger web indicates depth too deep.

Check these points with the appropriate section of this handbook. When making adjustments do so one at a time and try harvesting to see the result. More than one adjustment at a time may cause confusion.

In dry conditions:
Keep adequate soil around the crop to prevent risk of damage. Keep soil in the machine as long as possible to cushion the crop. A combination of digging depth and forward speed will help to achieve this. Keep agitation and crop movement down to a minimum. Set depth wheels to exert lightest amount of downward pressure so as not to disturb the ridge or bruise the crop. Use a water misting kit to minimise nipping.

In wet conditions:
Set digger web slightly faster than ground speed.

In clod conditions:
Open gap between star shafts in Star units. Fit smaller cleaner unit rollers.

In stony conditions:
In stony ground a stone can become wedged between the share blades preventing penetration. Make sure discs are kept sharp so that they cut the haulm and prevent wrapping and blockages around the roller mountings.

Damage prevention:
Do not hold the crop on the roller cleaner unit longer than necessary. Run the discharge elevator at a suitable speed to take the crop away smoothly without overloading the web flights or throwing the crop into the trailer.

Getting The Best Results During Harvesting

Tractor/Harvester
Ensure tractor wheel widths are at the correct settings for your row widths and system and that the tyre widths are no too wide as to crush the side of the ridges. Ensure tractor drawbar pin is not too long or the harvester drawbar set too low that it can drag and bunch up haulm which in turn will go into the harvester in large bunches and damage crop at the haulm extraction point. Ensure correct tractor forward speed to match the conditions and harvester capabilities. While standing on level ground and with the harvester connected to the tractor, ensure the drawbar eye is adjusted so that the elevator is parallel to the ground. This will ensure that the machine is at the correct angle for haulm rollers and separators to work at maximum efficiency.

Shares
Ensure the shares are set at the correct width settings for your row widths and system. Make sure the outside corners are cut off the outside share blades, this will help to stop the haulm that the discs have pressed into the ground wrapping around the front corners of the blades. Make sure chamfer on front edge of blades is not too acute as to cause a restriction or bulldozing effect. Ensure the shares are clean and shiny before commencing work. This will reduce drag and help flow into the machine. In wet, heavy conditions, make sure the share area is kept clean. A build up of soil under the flaps may cause them to stand up, causing flow and damage problems to the crop. Also, keep the share frame area clean as this will prolong the life of the web, reduce drive roller wear, and reduce the load on the drive system. If using a centre share blade, ensure the blade is parallel with the other blades. This will maintain an even depth across the bed. Ensure the correct depth settings when moving to different fields and/or varieties. Use the correct share frame and blade configuration for your conditions. As soon as the harvester has finished work, apply a film of grease over the bright working surfaces. This will reduce corrosion and assist flow when the machine starts work next season.

Disc Coulters
Ensure the disc are set to the correct depth. Too much depth will cause soil to slab and encourage the soil to stick to the discs preventing them from turning. Make sure the discs are kept sharp to cut the haulm and that the disc does not have to be set deeper to compensate for not cutting the haulm. In wet conditions set a wider gap between the discs and the share blades (25mm). If crop is rolling back down the web and hitting the discs causing damage, reduce the web speed slightly so there is more soil to carry the crop away. Make sure the discs are being scraped clean. This will help flow into the machine.

Anti-roll Flaps/Haulm Intake Rollers
Ensure the anti-roll flaps fill the gap between the discs and do not stop them from turning. If you experience problems with haulm rapping around the front roller mountings, the haulm intake rollers (if fitted) are adjustable forwards and sideways to position them for optimum performance. If this problem is allowed to continue, it may cause haulm to build up and possibly affect the next row by dragging the crop out or lift the digging depth out, causing damage to the crop. Ensure the rollers are turning at all times. The rollers constantly feed the haulm into the machine and reduce damage at the haulm extraction points. Downward pressure of the rollers is a balance between too little so that he rollers stop turning, and too much so that the rollers are unable to lift when required to.

Depth Wheels
Ensure the depth wheels are set to the correct width settings for your particular system. Double check as sometimes with ridging up during the growing season the ridge positions can vary. Do not apply too much pressure on the depth wheels. As a result of too much pressure, clods could be produced and soil made to stick to the crop. If happens, more agitation will be necessary meaning the possibility of more crop damage. Enough pressure to keep the wheels turning is sufficient in most conditions.

Machine Level
It is important to maintain the level attitude of the machine so that an even spread of material across the width of he machine is maintained to allow the separator and haulm extraction areas to work to their maximum capacity.

Digger Web
The digger web speed in conjunction with ground speed is essential for the harvester to work efficiently. Incorrect web speed can result in crop damage and poor harvester performance. If web speed is too fast this will result in roll back and poor take off after the share. Either decrease web speed or increase forward speed. If the web speed is too slow this will result in the machine being overloaded which will cause poor performance of the separating areas, putting undue stress on the mechanical components, reducing the life of the machine, and putting excessive amounts of soil and haulm into the discharge elevator. Either increase web speed or decrease forward speed. There must be enough web speed for the crop to be carried over the haulm roller and not into it.

Web split
The variable step between the digger web and sieving web is used to break up the ridge and to start to separate the crop from the soil. In the fully raised position the crop will pass across with minimum disturbance, while fully dropped the ridge will be broken up allowing the soil to drop through the web.

Sieving web
Separation on the sieving web is mainly controlled by changing the pitch of the web.
The speed of the web relative to the digger web will give more or less spread to the crop on the web, and determine the amount of soil carried over onto the separators.

Sweeping Clod Fingers (optional)
The first row of the sweeping clod fingers should be set higher than the second row. The motion of the fingers should gradually disturb the ridge. If fingers are set too low then a restriction, and damage will occur causing loss of output. The speed of the fingers is adjustable from the service terminal. Ensure enough speed to result in an even spread of material across the width of the machine allowing the separator and haulm extraction areas of the machine to work to their maximum capacity.

Clod Breaking Fingers (optional)
The clod breaking fingers are adjustable for angle. This gives a restriction to the crop and soil to flow through. Ensure the blocks are not over adjusted such that crop is damaged by rubbing on the web bars, or that the flow of material is restricted too much causing haulm and debris to bunch up which can cause problems at the haulm extraction points. It is important that an even spread of material across the width of the machine is maintained to allow the separator and haulm extraction areas to work to their maximum capacity.

Agitators
Over use of the agitators is one of the main causes of damage and will result in roll back and bounce of the crop causing bruising etc. Always use the minimum amount of agitation. When starting to harvest it is best to begin with minimal agitation. Add more agitation as conditions dictate

Haulm Roller
The gap between the haulm roller and the web must be set to a minimum. The best way to achieve this is to turn the web until the web joiner is next to the haulm roller, and then adjust the gap so that the web joiner is only just missing the haulm roller. To reduce the risk of damage to the crop it is best to let the crop land on the stars past the haulm extraction point and let the haulm be guided back into the pinch point of the haulm roller by the haulm guide fingers.

Haulm Guide Fingers
Position the haulm guide fingers out of the way for minimum damage. Only apply tension to the fingers in very wet conditions or when trying to get maximum output from the machine. Ensure enough web speed for the crop to clear the haulm roller. Check condition of rubber finger covers daily before harvesting.

Omega Separator Units
Separation on all Omega units operates fundamentally in the same way. The height of the polyurethane scroll can be specified as 10mm (standard), or 6mm for less aggressive action. The clod rollers can be ebonite, plain steel, or stainless steel. Stainless steel is the least aggressive due to the smooth, shiny surface, while ebonite will give more aggressive, general-purpose results. Also, fitting a smaller diameter clod roller allows larger more aggressive gaps to be set through the separator. By raising the height of the clod roller relative to the scroll, a larger ripple is introduced into the crop flow creating more separation by allowing the crop to ride over the soil and top. To work in conjunction with this, the relative speed and rotation direction of the clod rollers can be set. When running the clod roller in reverse to the crop flow, the higher the speed, the more aggressive the separation will be. Reducing the speed lessens the pinching effect of the clod rollers. Running the clod roller with the crop flow at a slow speed will give some separation, while increasing the speed will transfer all the crop and soil.

The clod rollers will normally be adjusted to run approximately 1 to 2 mm away from the tip of the scrolls for effective haulm removal.

Star Separator Units
Insufficient starflow speed will cause a nipping effect on the crop. Excessive speed will propel soil/crop over the separating area. Ensure the correct shape of clod roller is being used for your requirements, either round, hexagonal or square. The shape of the clod roller affects the level of extraction. The round roller is the least aggressive, while the square roller is the most aggressive. Ensure the gap between the clod roller and the star shaft is not too big so that it takes haulm out as well as stone and clod, as this may cause a restriction and stop the flow. If there is any restriction whatsoever caused by the clod roller it must be adjusted accordingly or reversed. Forward speed of the harvester is essential to maximise the efficiency of the separator. Always apply a film of grease to the clod rollers after work to keep them bright, this will assist flow when the machine starts work again. Failing to do so makes the clod roller very greedy until the rust has worn off.

Galaxy Separator
On the Galaxy separator module, ensure the correct shape of clod roller is fitted for your requirements, either round, hexagonal or square. The shape of the clod roller affects the level of extraction. The round roller is the least aggressive, while the square roller is the most aggressive. Excessive speed of the Galaxy unit causes propulsion of the crop/soil/stone over the separator. Insufficient speed will cause a nipping effect on the crop. If brushes are fitted over the Galaxy unit, only use them in very bad conditions. Always apply a film of grease to the clod rollers after work to keep them bright, this will assist flow when the machine starts work again. Failing to do so makes the clod roller very greedy until the rust has worn off.

Roller Cleaner Unit
The speed of the cleaner unit rollers is essential. Running the rollers too slow will cause nipping. Speed must be enough to keep the crop virtually clear of the rollers for minimum damage. The angle is also very important. The amount of angle will directly relate to the amount of time the crop spends on the rollers. If the angle is sloping downwards, then the crop travels across quickly. Angle is adjusted from the control box. If brushes are fitted over the cleaner unit, only use them in very bad conditions. Different roller diameters are available to suit varying conditions. Changing roller diameter effects the gap through which waste material is extracted. A small gap being ideal for dry light conditions and a large gap for heavier conditions.

Spreader Unit
Do not use excessive speed on the spreader unit as this will propel the crop into the rear elevator panel. Conversely, insufficient speed will cause a restriction in the flow.

Discharge Elevator
Correct discharge elevator speed is essential. The objective is to have the speed as slow as possible, filling every compartment with crop. As far as crop damage is concerned, the more crop in each compartment the better. It should also be fast enough not to cause the crop to spill out over the top of the web flights and roll back causing a restriction at the bottom of the elevator. Too much crop at this position can cause nipping as the web goes around the corner.

Maintenance of the 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 (see heading 'Residual Hydraulic Pressure Dump Procedure').

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 system.

The hydraulic oil should be carefully monitored. The cold oil level should be kept to the lower mark on the dipstick (item 1, fig 35) with the dipstick screwed fully in. On earlier machines the level should be kept between the sight glasses (item 2, fig 35). Maintain the level by topping up or refilling with Esso Nuto 46 Hydraulic Oil. The reservoir holds approximately 410 litres. Should a high water content becomes apparent or a cloudiness in the oil, the hydraulic oil should be changed.

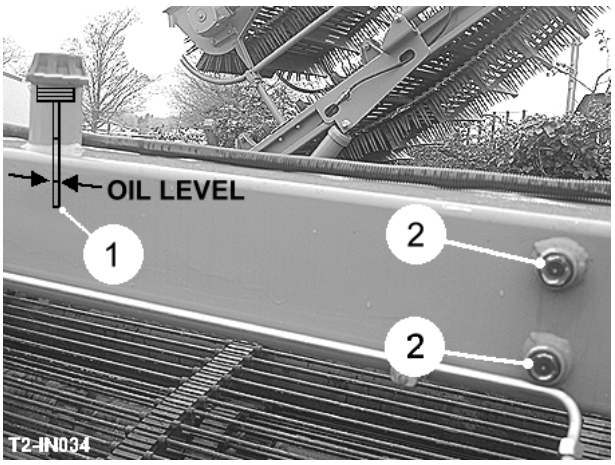


Fig 35

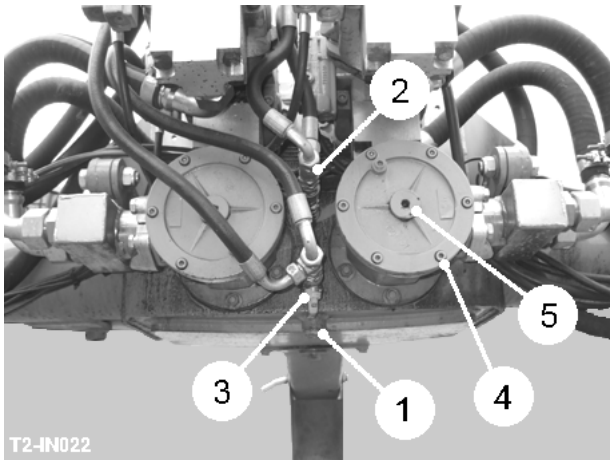


Fig 36

The oil reservoir magnetic plug (item 1, fig 36), located underneath the centre of the front beam, 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.

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

The shut-off valves (item 2 & 3, fig 36) connected to the pump case drain lines allow maintenance to be carried out without draining the oil tank.

The two suction filter elements should be replaced after the first 50 hours running time and then every 500 hours or annually thereafter. The suction filter elements are serviced as follows:

1. Wind the suction filter screw (item 4, fig 36) fully out anti-clockwise to close the cut-off valve within the filter housing.
2. Release the six screws (item 5, fig 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 screw (item 4, fig 36) fully in clockwise to open the cut-off valve.
6. Run the system and check for leaks.

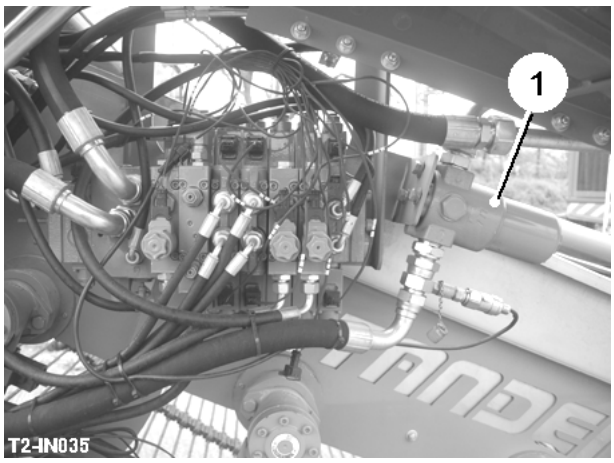


Fig 37

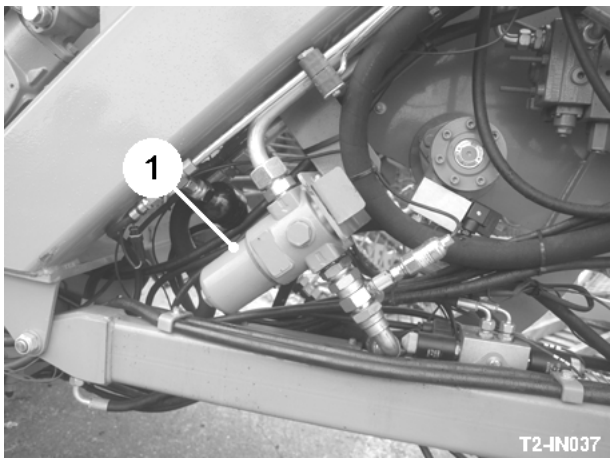


Fig 38

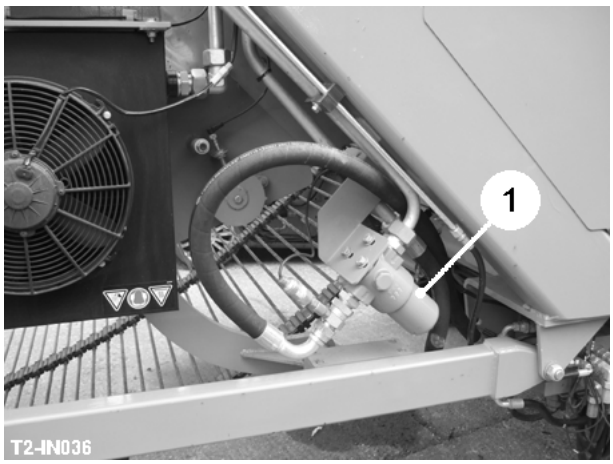


Fig 39

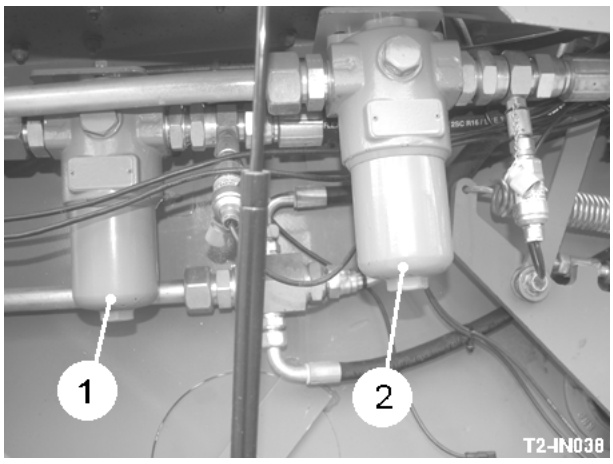


Fig 40

The pressure filter elements (item 1, fig 37, 38, & 39) and (item 1 & 2, fig 40) should be replaced after the first 50 hours running time and then every 500 hours or annually thereafter.

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, fig 37), 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.

Residual Hydraulic Pressure Dump Procedure

The following procedure outlines the method of relieving the residual pressure within the hydraulic system. It is essential that this procedure is carried out before any maintenance or repairs are attempted on the hydraulic system.

1. Set the discharge elevator into the fully folded position.

2. Place chocks to the front and rear of both wheels to prevent the machine from moving.

3. Lower the digger assembly to the ground.

4. Lower the harvester onto the drawbar stand and disconnect it from the tractor leaving the hydraulic and electrical connections in place.

5. Operate the machine level ram to set the machine to its lowest position.

6. Switch off the tractor engine.

7. Operate all switches on the driver's control box, in turn, to remove any remaining pressure within the hydraulic system.

8. Disconnect the hydraulic and electrical connections from the tractor.

Rear Axle Self-centring

The rotary sensors Item 2, fig 21) mounted on top of each axle king pin, feed a position signal into the system which 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. The steering display and centring is controlled by the rotary sensor. The wheel centre position is then registered and set on the Can-bus display screen with centre and dead-band parameters.

Cleaner Unit Oil Seal Replacement

The cleaner unit roller shafts (item 1, fig 41) are each fitted with an oil seal (item 2, fig 41) 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, fig 41) 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, fig 41) until the seal protrudes approximately 1-2mm beyond the ring face (see fig 41). Slide the compression ring complete with seal over the roller shaft (item 1, fig 41) and locate the seal into the aperture.

5. Locate the slide hammer (item 4, fig 41) 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.

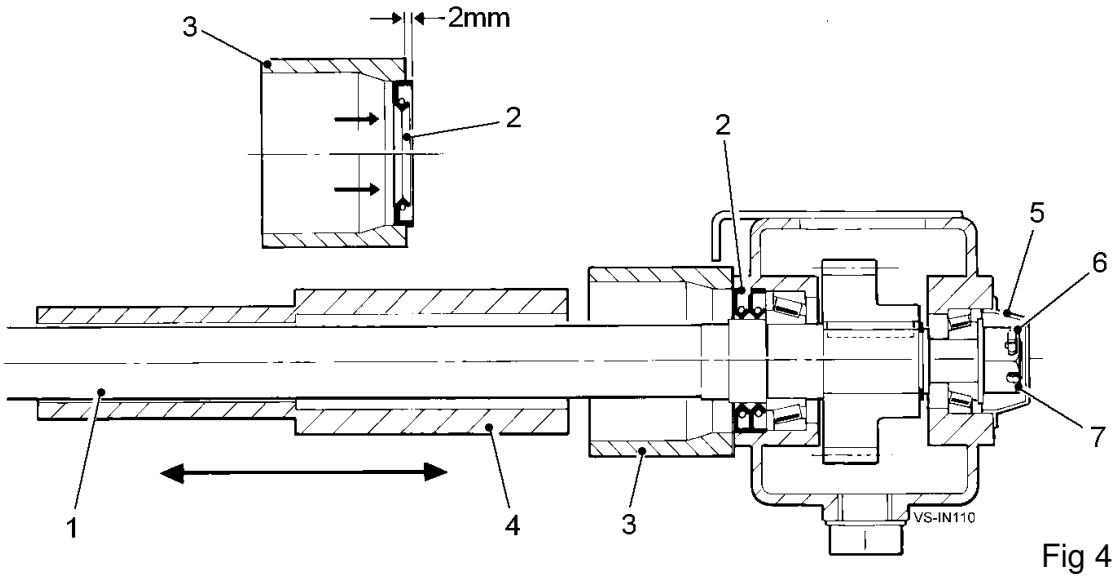


Fig 41

Tightening the Cleaner Bearings

If excessive play can be felt at the end of a roller shaft (10-15mm), 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, fig 41).

2. Remove the split pin (item 6, fig 41) from the castellated nut (item 7, fig 41) and tighten the nut to a torque of 22 lb/ft.

3. Check the roller shaft (item 1, fig 41) again for free play.

4. Refit the split pin (item 6, fig 41) 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.

Split Web Drive Sprockets

Split web drive sprockets (item 1, fig 42) on some 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. Keep the split halves of the sprockets in the correct pairs to prevent mis-match when fitting.

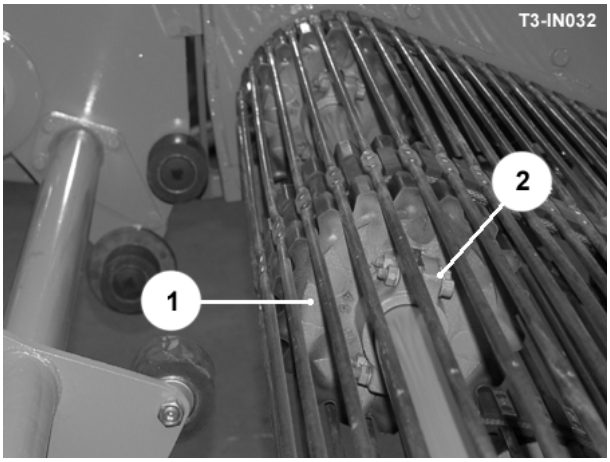


Fig 42

Maintenance of the Mechanical Drives

Drive chains must be maintained at the correct tension. Maintaining correct tension, alignment and lubrication will ensure the efficient running of the harvester and prolong the life of the drive components. Adjust the chains to give positive drive without undue stretching. Where plastic chain tension or guides are fitted, these will show fairly rapid wear initially but will settle down when the chain rollers rather than the chain side plates come into contact with the plastic.

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 the Electrical System

Trouble shooting of the control system must be carried out by a competent engineer familiar with electrical servicing. Items such as the Can-bus modules, display unit, and the control circuit boards may be damaged if incorrectly connected.

Before carrying out any welding on the harvester <u>always</u> disconnect the KS1 & KS2 plugs from the bottom of the harvester control module and completely disconnect the harvester from the tractor. Failure to observe the above precautions may cause severe damage to the harvester and tractor electrical systems.

New Machines

It is important during the first few weeks with a new machine to keep a regular check for any bolts, screws, connections etc. which may work loose during this initial working period.

Machine Lubrication

Regular lubrication will ensure that the Standen T2 provides a long and efficient service life. Depending on soil and weather conditions, the service schedule can vary. It is recommended that the harvester be 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. Optional automatic greasing kits can be fitted to the machine and are recommended for machines covering large acreages to reduce maintenance time.

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.

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.

Gearbox oil levels 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 and exposed threads etc. to ensure they remain free of corrosion. Regularly apply wax oil to the RH axle beam to reduce friction.

Daily Maintenance

During the working season the following daily maintenance should be carried out. Check all covers and guards are in position, free from damage, and all retaining latches and hinges are in place and operative. Repair or replace any found to be defective before operating the machine.

Carry out the following checklist:

1. Check tension of all drive chains, adjust if necessary and lubricate with clean oil.

2. Check tyre pressures and adjust if necessary.

3. Check for any damaged or broken rollers, web bars or stars etc. Repair or replace as necessary.

4. Check wheel nuts for tightness.

5. Check all scraper clearances and adjust as necessary. Scrapers should be adjusted as close as possible without actually touching.

6. Check all hydraulic cylinders, valves and pipe work for signs of leaks or damage, repair or replace as necessary.

7. Carry out lubrication

8. Grease axle king pins

Weekly Maintenance

During the working season the following weekly maintenance should be carried out.

1. Carry out all the procedures listed in daily maintenance.

2. Check all shafts, bearings and rollers for undue wear, and replace as necessary.

3. Check all bearings for lubrication, grease as necessary.

4. Check discs and shares blades for excessive wear, replace if necessary.

5. Check hydraulic and gearbox oil levels.

Annual Maintenance

Prior to the start of the working season the following maintenance should be carried out.

1. Carry out all the procedures listed in daily and weekly maintenance.

2. Check all webs for damage or wear and repair or replace as necessary.

3. Check stars and replace any worn parts.

4. Check metalwork (e.g. side plates) for any damage or wear and repair or replace as necessary.

5. Replace the pressure and suction filter elements Use only genuine Standen replacement parts.

Out of Season Storage

The machine can frequently operate in soils which contain residual chemical fertilisers etc. When the working season is completed wash and clean the machine thoroughly prior to carrying out the following checks and operations.

1. Apply oil, grease or an anti rust agent on any exposed bright metal surfaces which have been polished by the soil flow.

2. Clean all drive chains and lubricate with oil.

3. After carrying out the hydraulic residual pressure dump procedure, any parts of hydraulic cylinders rods that are still exposed should be greased or oiled to prevent corrosion.

4. Ensure that the tyres are inflated to the correct pressure.

5. Ensure that the hydraulic hose quick release couplings and the electrical connectors on the machine are kept clean and dry.

6. Check the whole machine carefully and note any repairs that may need to be carried out. It is always better to carry out any repairs well before the commencement of the following season.

7. Carry out all the lubrication checks outlined in routine maintenance.

8. Ensure the driver's control box is kept in a safe, dry place and available for use at the commencement of work or for any maintenance to be carried out.

9. Ensure that this handbook is kept in a safe place and available for use at the commencement of work or for any maintenance to be carried out.

1.45 SPECIFICATIONS

Dimensions

	Basic Machine	Inline Machine
Length:	10.75 m	12.65 m
Width (in transport):	3.00 m	3.35 m
Height (in transport):	3.85 m	3.85 m

Weights

Gross weight	7500 kg	8900 kg
Weight on drawbar	1800 kg	1440 kg
Weight on LH wheel	4800 kg (max)	4800 kg (max)
Weight on RH wheel	2900 kg (max)	2900 kg (max)

Technical Data

Minimum tractor power requirement:	134 KW (180 bhp)
P.T.O. input speed:	1000 rpm
Minimum tractor hydraulic flow rate:	50 litres/minute
Harvester oil reservoir capacity:	410 litres (92 gallons)
Electrical requirements:	12V DC negative earth
Maximum brake torque:	6860 Nm
Maximum road speed:	32 kmh (20 mph)

Tyre size:	560/45 R22.5	560/60 R22.5	420/70 R24
Tyre pressure:	@ 3 bar (45 psi)	@ 3 bar (45 psi)	@ 2.4 bar (35 psi)

Nut and Bolt Tightening Torques

Powered axle wheel nuts	580 Nm (427 lb/ft)
Cleaner unit roller shaft bolts	30 Nm (22 lb/ft)
M6 nyloc zinc plated nut	14 Nm (10 lb/ft)
M8 nyloc zinc plated nut	31 Nm (23 lb/ft)
M10 nyloc zinc plated nut	60 Nm (44 lb/ft)
M12 nyloc zinc plated nut	118 Nm (87 lb/ft)
M16 nyloc zinc plated nut	282 Nm (208 lb/ft)
M20 nyloc zinc plated nut	515 Nm (380 lb/ft)
M24 nyloc zinc plated nut	936 Nm (690 lb/ft)
M6 bolt/steel nut	9 Nm (7 lb/ft)
M8 bolt/steel nut	26 Nm (19 lb/ft)
M10 bolt/steel nut	52 Nm (38 lb/ft)
M12 bolt/steel nut	95 Nm (70 lb/ft)
M16 bolt/steel nut	230 Nm (170 lb/ft)
M20 bolt/steel nut	440 Nm (325 lb/ft)
M24 bolt/steel nut	766 Nm (565 lb/ft)

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

Roller Table Separator

The roller table has 10 pairs of contra-rotating rollers. Two hydraulic motors running in parallel drive the unit and are able to automatically reverse to clear blockages. Table angle, roller speed and reverse pressure settings are adjustable from the in-cab consoles.

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.

Table Angle

The steeper the angle of the unit, the quicker the crop flows over it and the less time it has to be cleaned.

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 Sizes

Various sizes of plain rubber rollers are available. 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.

Roller Scrapers

Scrapers mounted below each plain roller prevent excessive build up of soil and trash damaging or stalling the cleaner unit. To adjust the scrapers, slacken the mounting bolts and slide the scraper blade up until it is 2-3mm clear of the roller.

Changing Rollers

To remove a roller:

1. Raise the roller table.

2. Remove the rear pivot link bolts (item 1, fig 43) on both sides of the machine.

3. Raise the roller table to its maximum height.

4. On machines fitted with a picking off belt, loosen the side panels (item 2, fig 43) to allow removal of the outer rollers.

5. Remove the retaining bolt and washer located at the discharge end of the roller (item 3, fig 43).

6. 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.

To replace a roller:

1. Apply grease to the roller shaft.

2. Slide the roller onto the shaft ensuring the drive flats in the roller are aligned with the drive flats on the shaft.

3. Refit the roller retaining bolt and washer.

4. Retighten the picking off belt side panels (if fitted).

5. Lower the roller table and refit the pivot link bolts (item 1, fig 43).

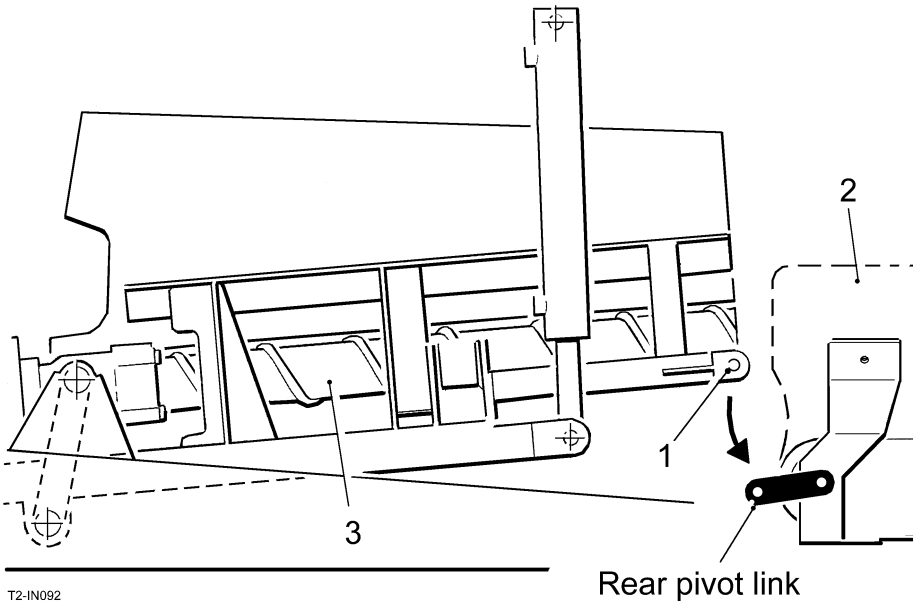
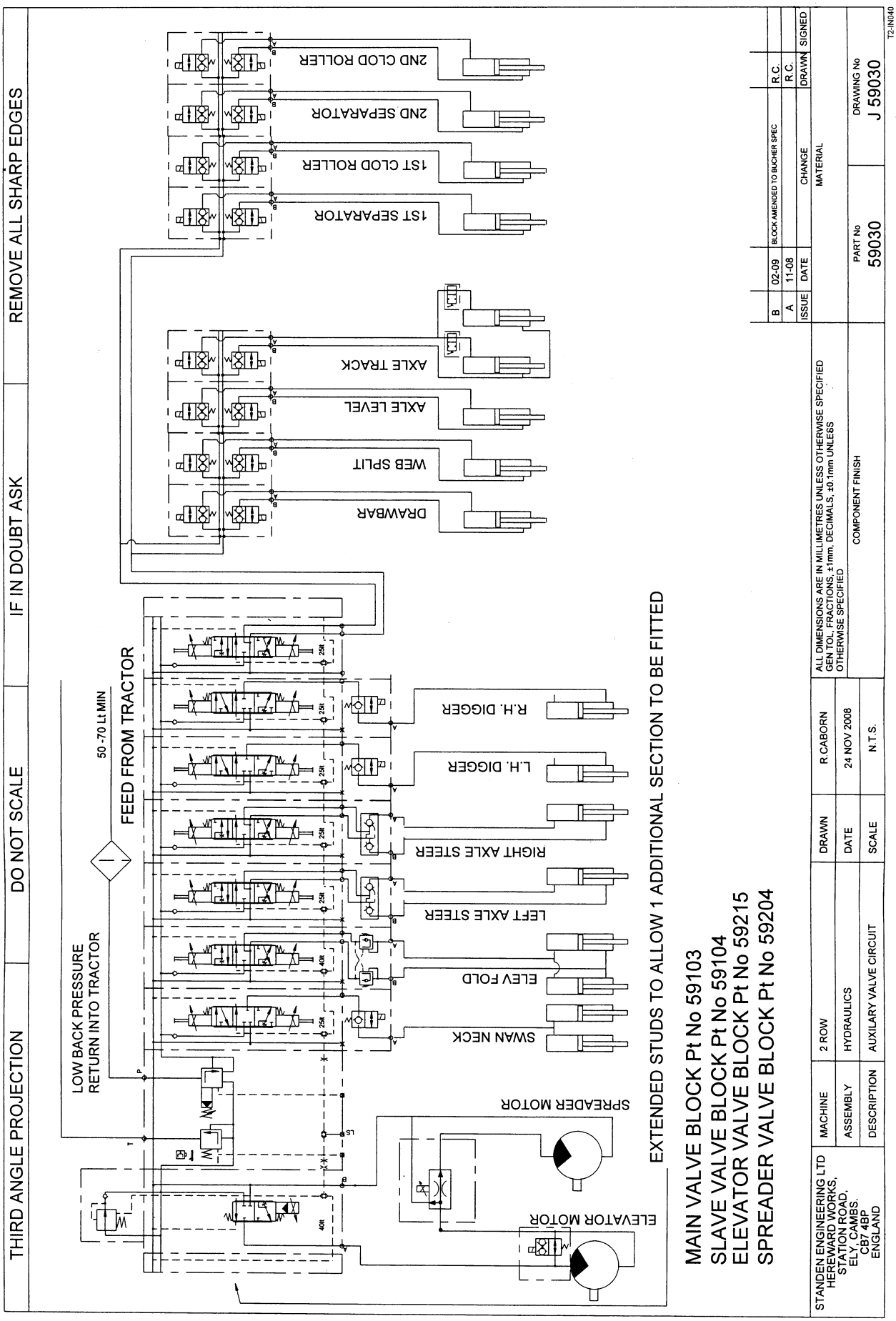


Fig 43

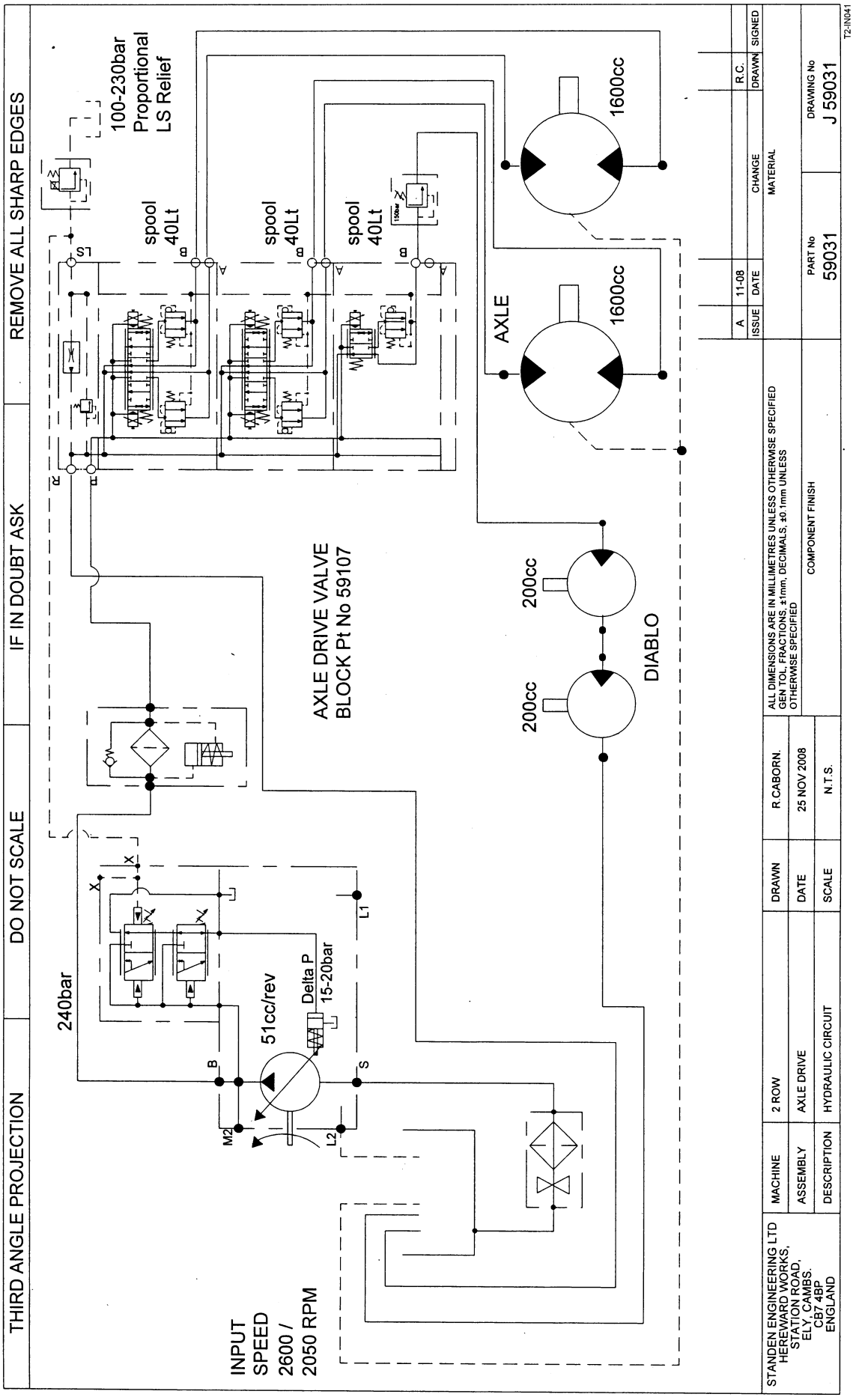
CONTENTS

DIAGRAMS

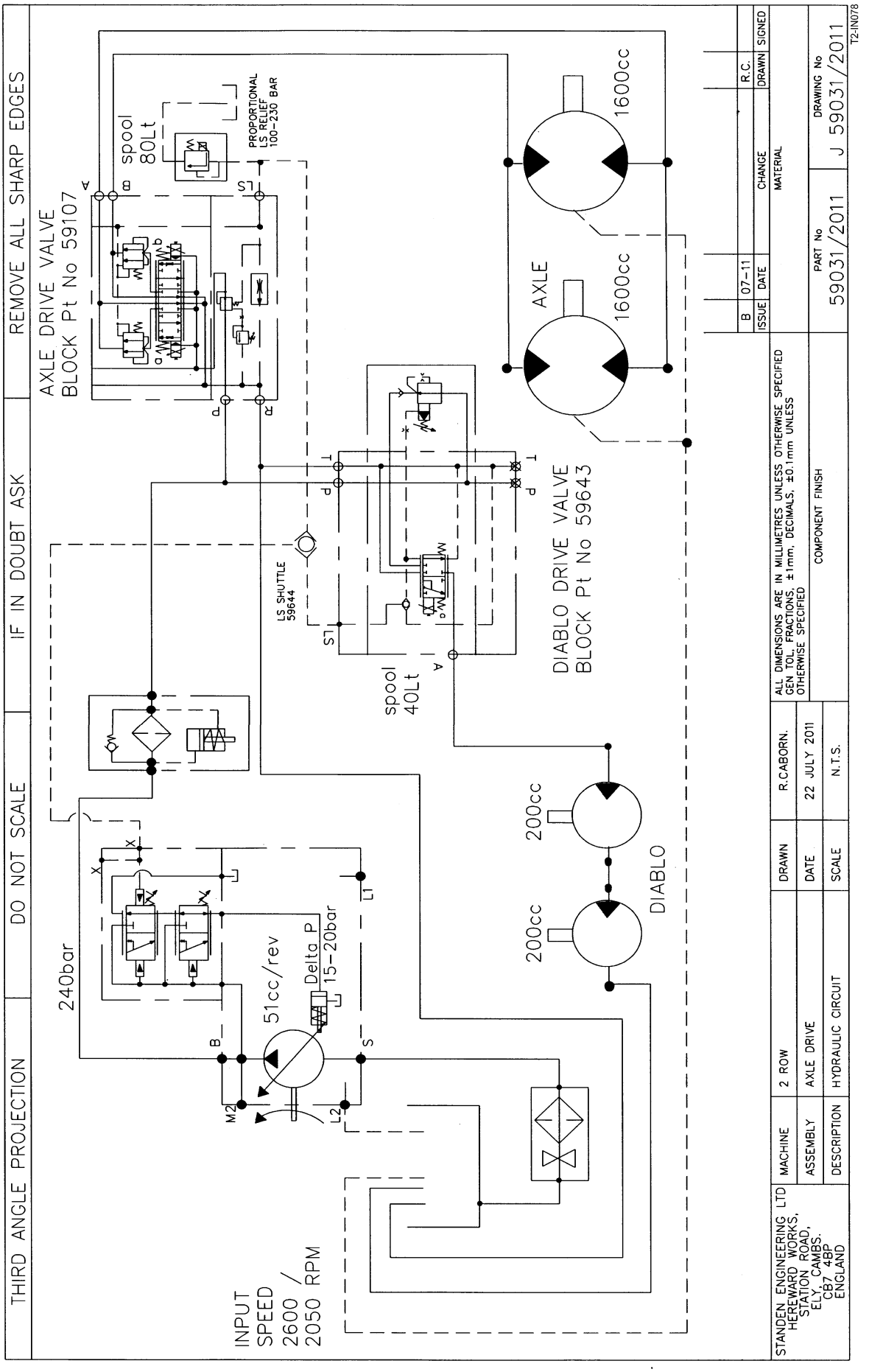
Auxiliary Hydraulics



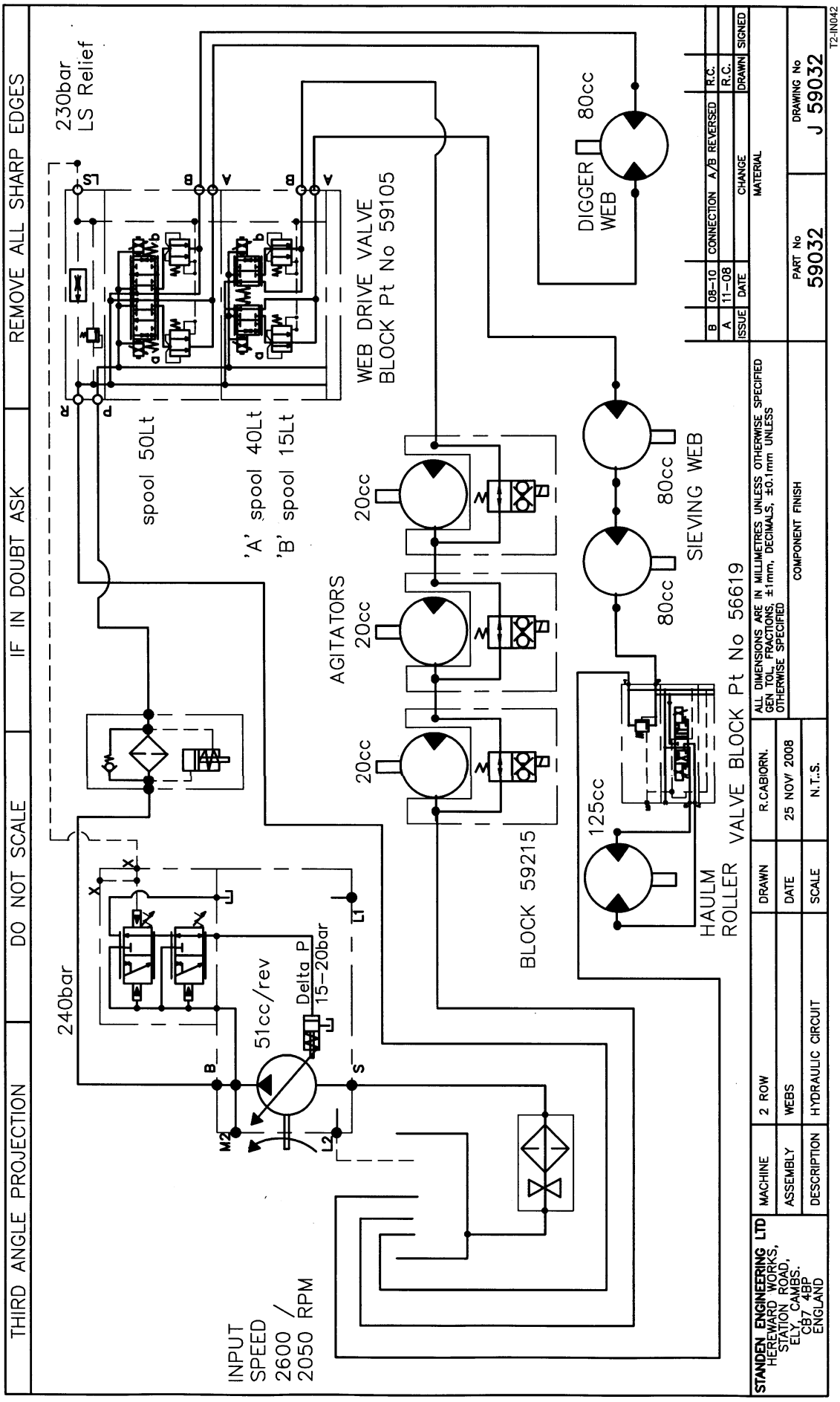
Powered Axle Hydraulics (prior to 2011)



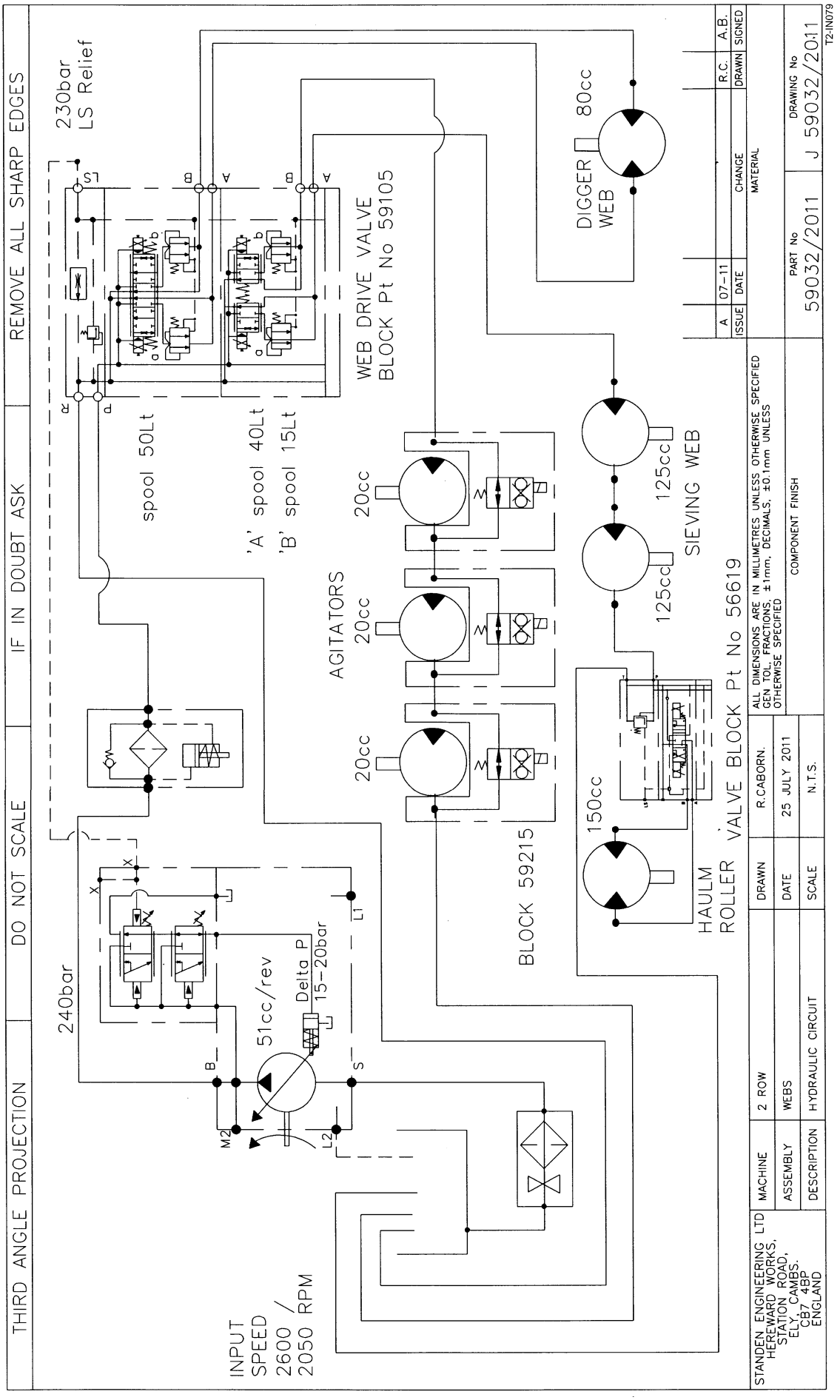
Powered Axle Hydraulics (from 2011)



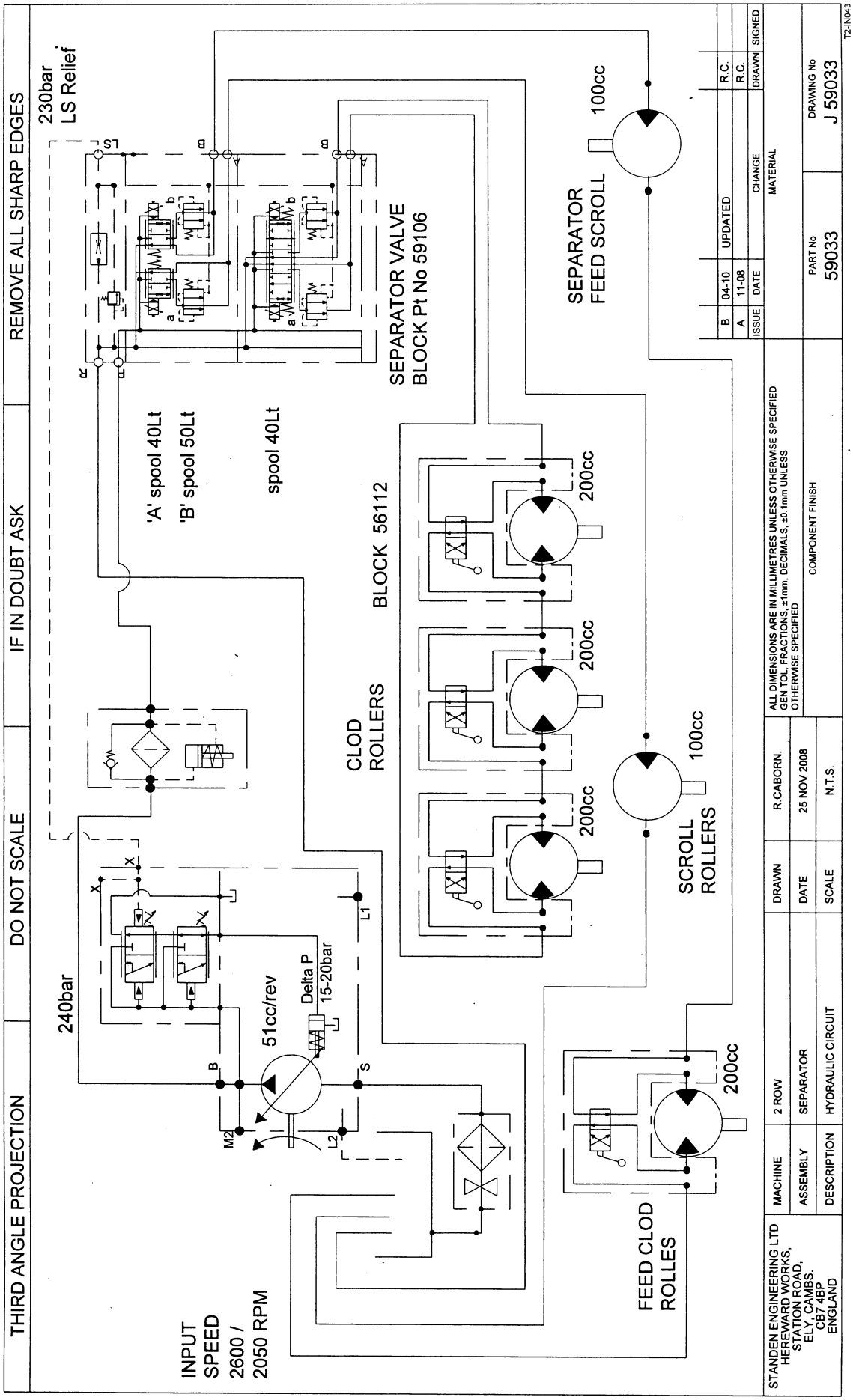
Digger Web, Sieving Web & Rotary Agitator Hydraulics (prior to 2011)



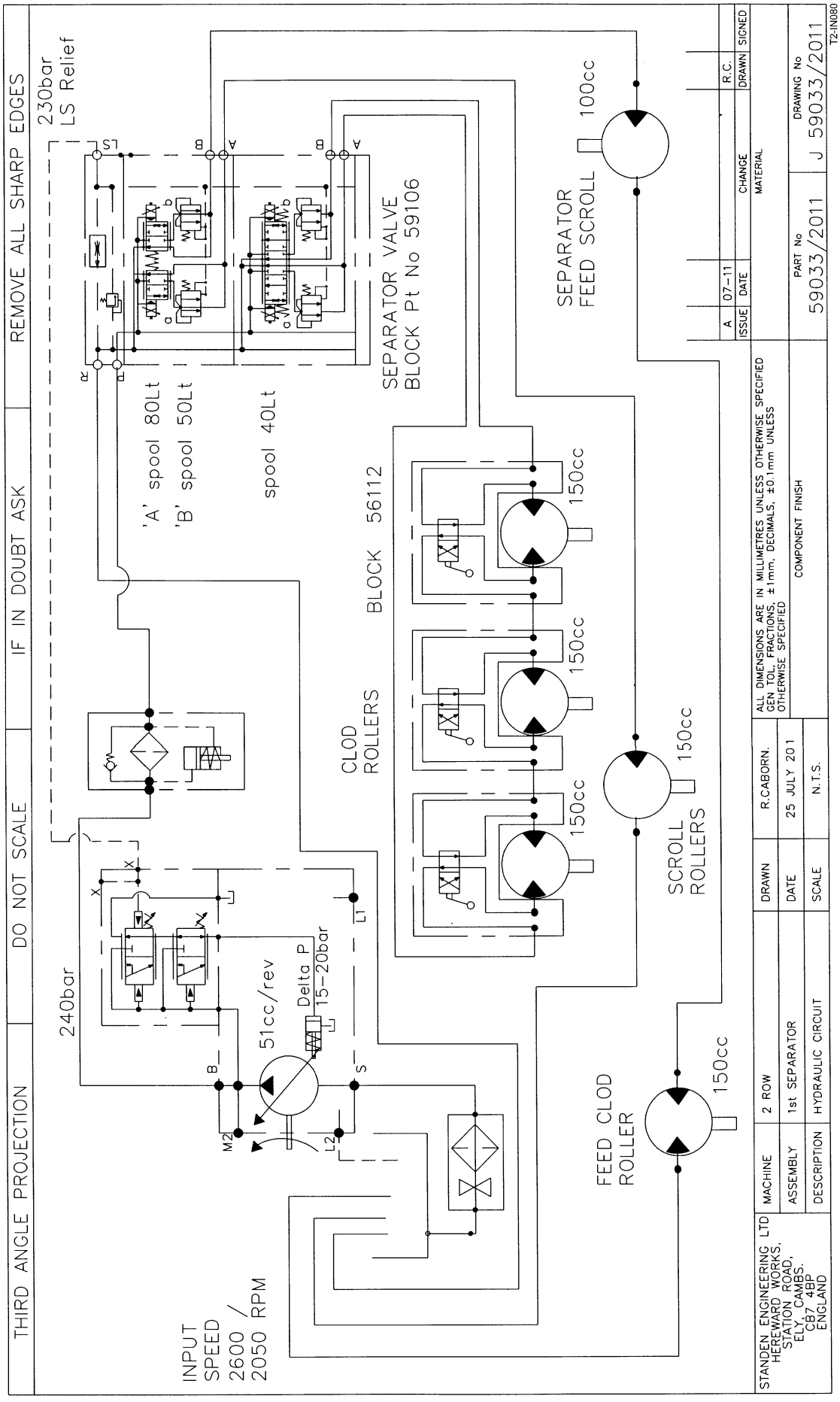
Digger Web, Sieving Web & Rotary Agitator Hydraulics (from 2011)



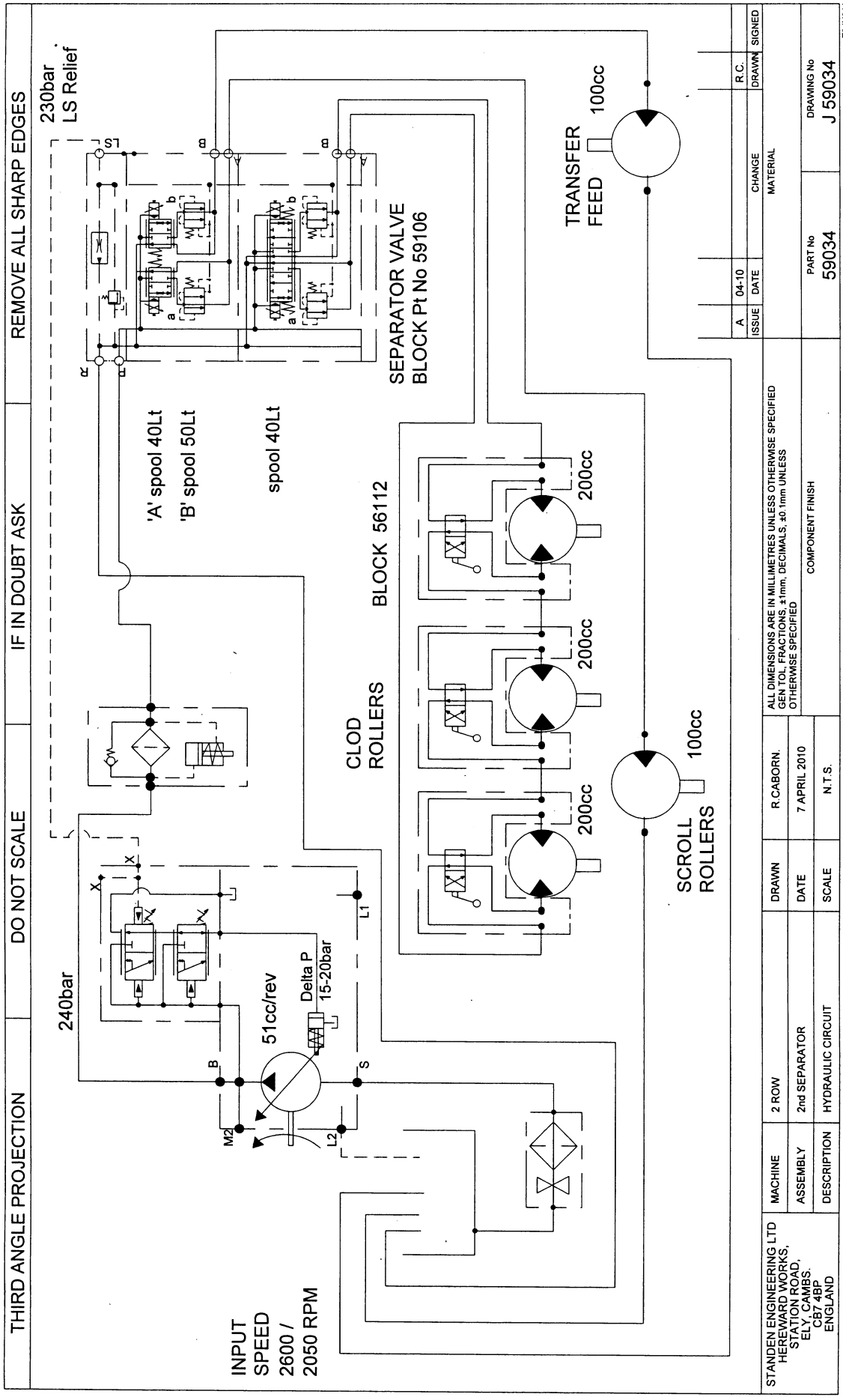
1st Omega Separator & Omega Feed Unit Hydraulics (prior to 2011)



1st Omega Separator & Omega Feed Unit Hydraulics (from 2011)



2nd Omega Separator & Omega Transfer Unit Hydraulics (prior to 2011)



2nd Omega Separator & Omega Transfer Unit Hydraulics (from 2011)