



SP Series
3-Bed / 6-Row
Folding Potato Planter

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EU & UKCA Declaration of Conformity

According to the Machinery Directive 2006 / 42 / EC
& The Supply of Machinery (Safety) Regulations 2008

Manufacturer: Standen Engineering Limited
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Cambridgeshire
CB7 4BP England

We declare that the product, described below, meets the requirements of the above mentioned directive and has been assessed against and complies with the essential safety requirements application as specified in the Standards listed here.

Model	SP Series Potato Planter
Serial No.	BB.....

British Standards used in the implementation of this certificate

BS EN ISO 12100-1
BS EN ISO 12100-2
BS EN ISO 13857

Place of Issue: Standen Engineering Limited, Station Road, Ely,
Cambridgeshire, UK



M R Gammon - Technical Manager
For Standen Engineering Limited

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

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Introduction to the Handbook

This handbook provides the information for the operation, adjustment and maintenance of your **SP Series 3-Bed / 6-Row Folding Potato Planter**. 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.

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 rear section of this handbook contains lists 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.

Safety

Standen SP Series Potato Planters have 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 list of precautions should therefore be brought to the attention of all persons operating and working on the machine. The list is not exhaustive. All machinery is potentially dangerous and great care must be exercised by the operators at all times. Standen Engineering Limited will not accept liability for damage or injury caused by their products except when such liability is specifically imposed by English statute.



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

The tractor must be of a suitable size to lift the implement safely. This may entail the fitting of front weights to counterbalance the machine.

Always check that the machine has been correctly mounted to the tractor before setting off on operations and the stabilizers are correctly set.

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

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

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

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

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

The working area should be kept clear and free of obstructions at all times. Be alert for hidden obstructions. Should the machine hit an obstruction, stop and check for damage before proceeding.

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

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. Never work on or pass under the machine when it is raised on the tractor hydraulic linkage.



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

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 stand on the planter whilst the machine is operating.

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. Never operate the machine in a state of disrepair.

When in transport, the dual wheels must be fitted to the centre wheels to ensure stability.

When in transport keep the hopper empty. Always fill the hopper in the field. Transporting with a full hopper will cause strain on the planter and will pack the potatoes in the hopper causing 'bridging' when planting commences.

When in transport the hopper, mould boards and cage wheels must be fully raised. When locking the mould boards into the transport position, never walk under the raised board, always approach from the side.

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.

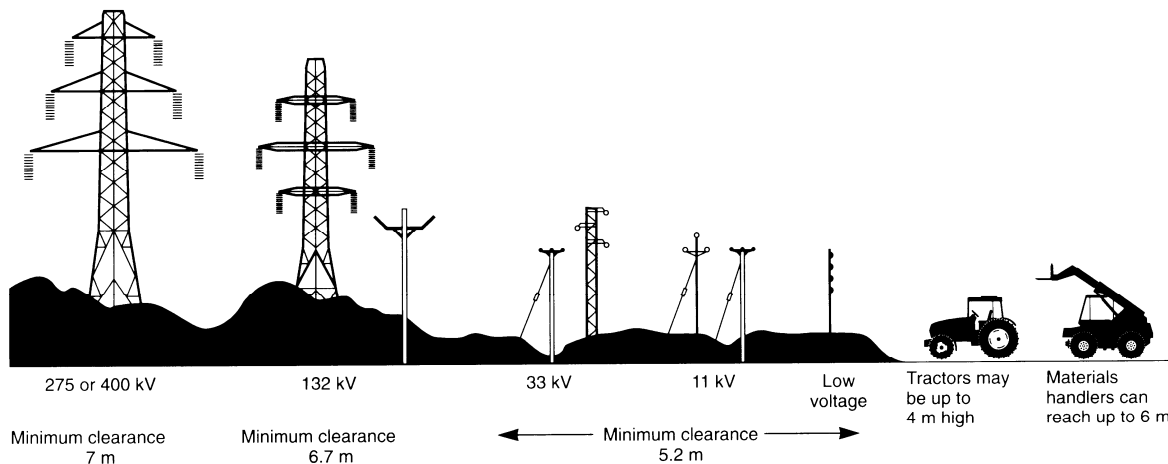
Care must be taken when carrying out any work on the hydraulic system. Even when stopped and disconnected from the tractor, residual pressure will exist within the hydraulic system. Therefore, before commencing any work on the hydraulics ensure that the system is free of residual pressure. Regularly check hydraulic hoses for chafing or damage and replace as necessary.

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

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.

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Overview

The SP Series 3-Bed / 6-Row Folding Potato Planter is designed to plant potatoes with extreme gentleness and accuracy. Seed spacing, planting depth and soil covering are all controlled for optimum results. Gentle seed handling is ensured by a controlled seed flow to the cups. Each moving floor belt is only activated when the seed is required.

Tractor Suitability

The tractor must be of a suitable size to lift the implement safely. This may entail the fitting of front weights to counterbalance the machine.



When fitting to the tractor ensure the planter is standing on firm level ground. The operator should have read and understood the tractor operators manual prior to attaching the machine and putting into work.

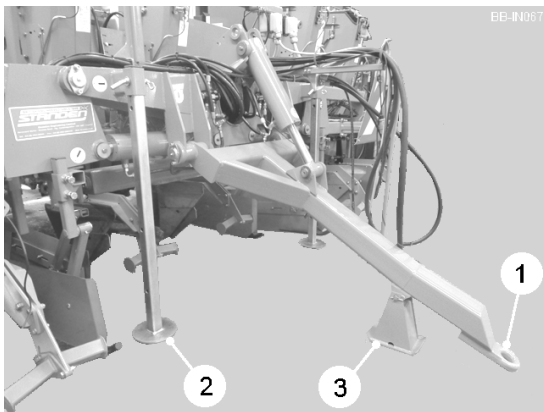


Fig 1

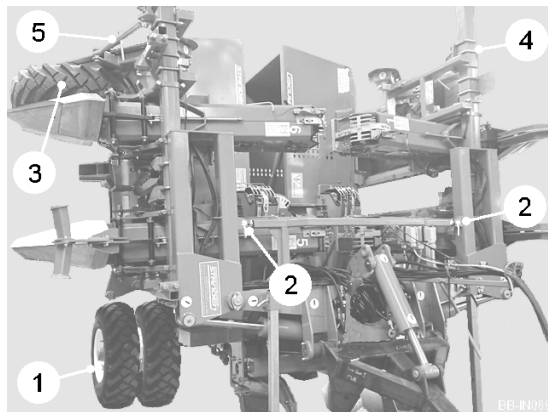


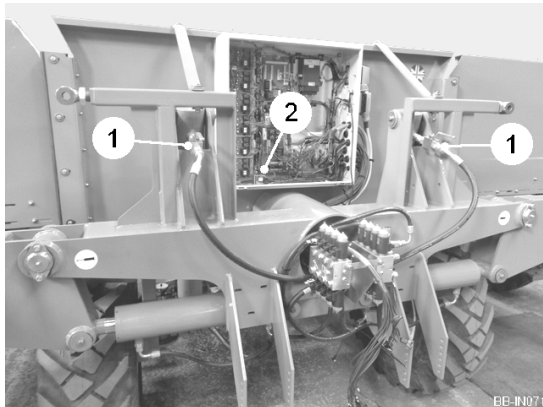
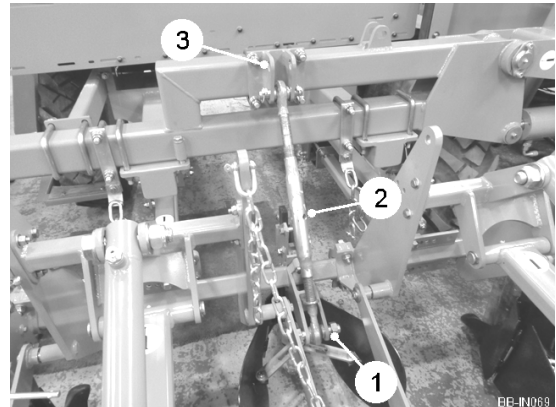
Fig 2

Attaching the Planter to the Tractor

1. Reverse the tractor up to the planter and engage the drawbar eye (item 1, fig 1) on the tractor pick-up hitch.
2. Raise the planter on the pick-up hitch.
3. Raise the parking stands (item 2, fig 1) and remove the stand (item 3, fig 1).
4. Connect the hydraulic pressure hose (marked red) to the tractor constant supply port. Connect the return hose (marked blue) to the tractor return port.
5. Mount the control boxes securely inside the tractor cab in a position where they are comfortable to operate when seated.
6. Connect the cables between the planter and control boxes ensuring they are safely and securely routed in the tractor cab. The control boxes require a 12v D.C. supply. Connect the power leads to the tractor electrical plug (if fitted) or directly to the tractor battery, blue lead to negative (-) terminal and brown lead to positive (+) terminal.

Preparing the Planter for Work

1. Remove the dual wheels (item 1, fig 2) from the centre wheels (see dual wheels instructions).
2. Open the rear ram shut-off valves x2 (item 1, fig 3) and lower the machine.
3. Remove the side wing locking pins x4 (item 2, fig 2) front and rear.
4. Lower the side wings until the outer wheels (item 3, fig 2) are just off the ground. Ensure the outer moulding boards / ridgers do not touch the ground first.
5. With the outer wheel on the ground, the arms (item 4, fig 2) should be parallel to the ground. Use the adjuster links (item 5, fig 2) to achieve this. The arms should never be allowed to go past the parallel position.
6. Remove the tool bar transport pins (item 1, fig 4). Swing the links (item 2, fig 4) up into the work position. Refit the pin into the top hole (item 3, fig 4) to secure it during work. Disconnect the cage wheel transport links (item 3, fig 11a).

**Fig 3****Fig 4****Preparing the Planter for Transport**

1. Empty the hopper.
2. Lower the rear of the planter.
3. With the outer mouldboards / ridgers on the ground, refit the tool bar links (item 2, fig 4). Adjust the centre link to raise the centre mouldboard / ridgers off the ground. Refit the cage wheel transport links (item 3, fig 11a).
4. Using the adjuster link (item 5, fig 2), lift the outer wheels off the ground. This ensures the overall width of the planter does not exceed 3.5 m when folded.

5. Raise the side wings. When fully raised, refit the front and rear locking pins (item 2, fig 2).
6. Refit the dual wheels (item 1, fig 2) to the centre wheels (see dual wheels instructions).
7. Raise the rear of the planter enough to ensure the centre mouldboard / ridgers are clear of the ground during transport.
8. Close the ram shut-off valves x2 (item 1, fig 3).



When in transport, the dual wheels must be fitted to the centre wheels to ensure stability. Always keep the planter as low and narrow as possible. Be aware of the height and width of the machine.



Always turn the control box OFF before transporting the machine on the road.



Fig 5

Control Box Functions

POWER ON/OFF:	Power ON when LED is illuminated.
PLANTING MODULES RUN :	Starts / stops all selected drives simultaneously. ON when LED is illuminated.
AGITATORS ON / OFF :	Starts / stops cup belt agitators. ON when LED is illuminated.
BUZZER ON / OFF :	Buzzer sounds when no potatoes are detected in one of the rows possibly indicating a blockage.
BUZZER TIMER :	Time delay for seed monitors.
PLANTING MODULES 1,2,3,4,5,6 ON / OFF / PRIME :	Individual planting module ON / OFF control. Module ON when LED is illuminated. Select PRIME to fill the cup belts prior to planting or to empty the hopper.
AGITATORS 1,2,3,4,5,6 :	Agitator speed control.
ROW WIPERS 1,2,3,4,5,6 :	Lowers row wiper to remove the unwanted ridge.
AXLE RIGHT / LEFT :	Steers centre wheels in the direction indicated.
AXLE CENTRE :	Centres the wheels after turning.
FRONT RAISE / LOWER :	Raises / lowers the openers in and out of work
REAR RAISE / LOWER :	Raises / lowers the mouldboards / ridgers in and out of work.
SIDE WINGS LH RAISE / LOWER :	Raises / lowers the LH outer modules.
SIDE WINGS RH RAISE / LOWER :	Raises / lowers the RH outer modules.
SIDE FLOAT :	Allows outer modules to rise and fall during work . Float function active when LED is illuminated.
TOUCH-SCREEN :	Selects the seed spacing and displays the number of sets per hectare / acre (see TOUCH-SCREEN OPERATION).

Planting

Careful planting is one of the pre-requisites for a good crop of high quality potatoes. The potatoes should be planted in straight ridges without gaps and at a correct and even depth. This is achieved when, at the beginning of planting, the functions of the planter and the different adjustments are carefully studied. The seed potatoes used can vary a great deal (i.e. different varieties, shape, size, number of sprouts, skin quality etc.) and the planter must be adjusted accordingly.

Prior to planting, fill up the cup belts by setting the switches marked 'PLANTING MODULES 1,2,3,4,5,6 to PRIME. Once full, reset to ON. This way the machine commences to plant immediately on starting.

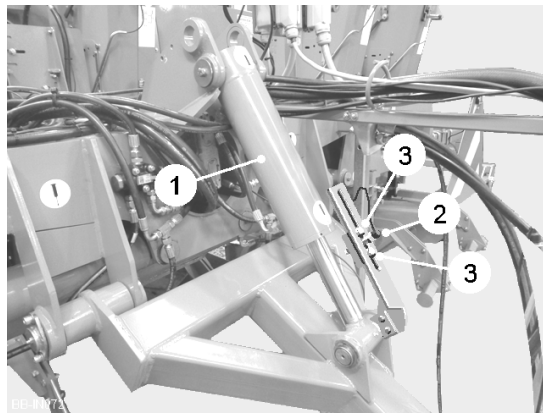


Fig 6

Planting Depth

Planting depth is set by the ram (item 1, fig 6). The ram is used to set the machine into work and to lift the machine out of work at the end of the rows. The ram is operated by the switch marked ' FRONT RAISE / LOWER'. Planting depth is controlled by the sensor (item 2, fig 6). When lowering the openers into work, the sensor stops the depth ram at the preset depth. To increase the depth, loosen the two screws (item 3, fig 6) and move the sensor block further down the slot and resecure. Conversely, moving the block further up the slot will decrease the planting depth.



Always lift the openers and mould boards out of work before reversing or turning the planter on the headland.

Floating Openers

The bottom spring (item 1, fig 7) allows the opener (item 2, fig 7) to ride over obstructions reducing damage to the planter. The top spacer (item 3, fig 7) carries the weight of the opener and prevent it from 'nose diving' in soft soil. The bottom spring should be set to allow the ground pressure during work to lift the opener into the working position. To adjust, reposition the locknuts (item 4, fig 7). On machines fitted with opener depth wheels, the bottom springs should be released to allow the depth wheel to float freely and the top springs should be set to allow 25mm (1") of free downward movement during work.

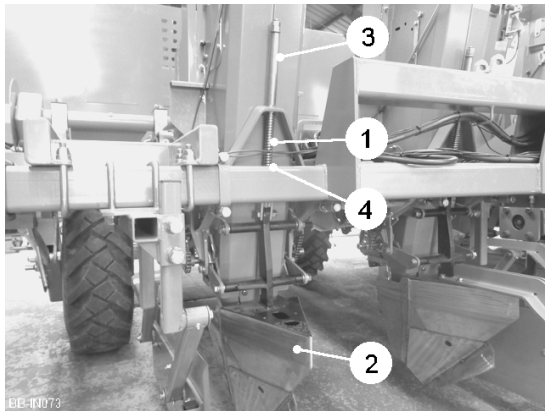


Fig 7

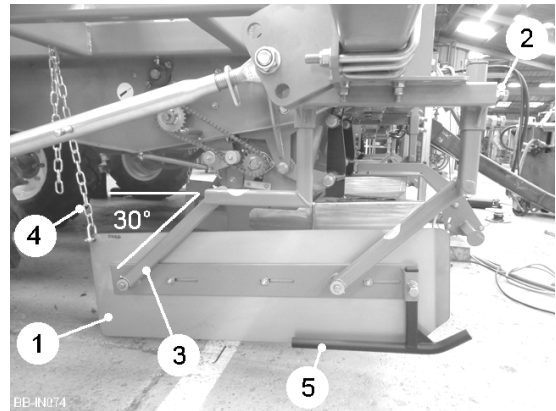


Fig 8

Soil Retention Panels

The soil retention panels (item 1, fig 8) prevent soil from flowing into the wheelings from the openers.

Vertical adjustment is provided to allow the panels to be raised / lowered to match wheel height. To adjust the height loosen the front and rear leg retaining screws (item 2, fig 8) and raise / lower the legs to the required position. Ensure the panel runs parallel with the ground. The angle at which the pivot arms (item 3, fig 8) operate should be approximately 30° from horizontal allowing the panels to ride the contours of the ground. The depth chains (item 4, fig 8) should be adjusted to allow the panels to float when in work but prevent them from dropping too low when the planter is lifted out of work. The skids (item 5, figure 7) are fitted to assist the soil retention panels in riding over the ground. The skid should be set slightly below the bottom edge of the panel.

Parallel Linkage Tool Bars

The ridgers / mould boards are mounted at the rear of the planter via parallel linkage arms (item 2, fig 9). During work these arms should be approximately 10° from horizontal. This can be achieved by repositioning the bolts (item 1, fig 10) into a different set of holes. The height and downward pressure exerted by the ridgers / mould board is controlled by the reaction arm (item 2, fig 10) and upper and lower stops. The lower stop (item 3, fig 10) controls the height, whilst simultaneously reduces the pressure. The upper stop (item 4, fig 10) induces a downward pressure by loading the rubber torsion springs (item 5, fig 10) within the lower arm pivots. Both stops are adjusted by loosening their retaining bolt and sliding the stop around the slot to the required position. If no pressure is required, the stops can be adjusted to allow the reaction (item 2, fig 10) to move freely.

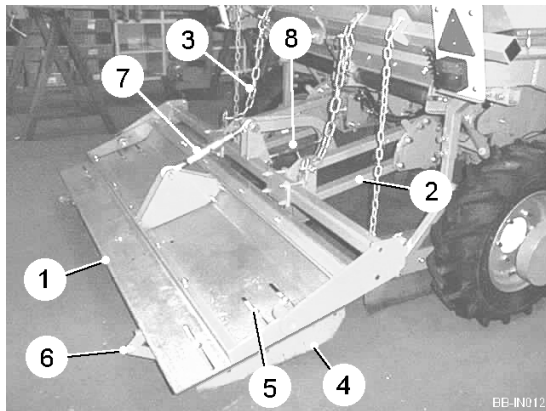


Fig 9

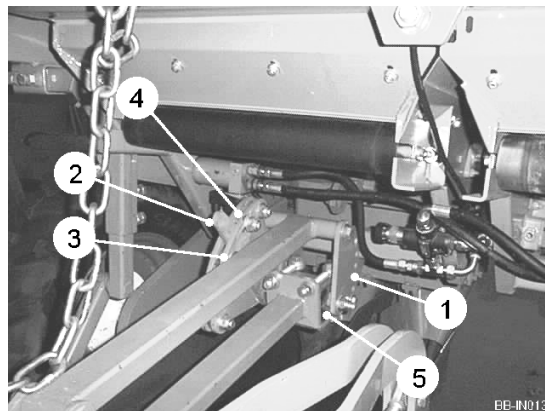


Fig 10

Adjustable Mould Boards (optional)

The position of the wings (item 4, fig 9) is important to ensure a nicely formed bed. The outer wings are adjustable for both position and angle. The position of the wing determines the width of the finished bed. To adjust, loosen the mounting bolts (item 5, fig 9) and slide the outer wing assembly to the required position. The angle at which the wings operate will determine the shape of the bed. To adjust, loosen the retaining bolt (item 6, fig 9) and rotate the wings to the required position. The top link (item 7, fig 9) sets the mould board angle. Initially the angle should be set at approximately 5° from horizontal. Increasing the angle will allow more soil under the board.

The depth at which the centre plough operates is set using the top link (item 8, fig 9). The deeper the plough is set, the more soil it will push sideways. Care should be taken however as going too deep may move the seed in the bed.

Ridger Bodies (optional)

The ridger bodies (item 1, fig 11) create the sides of the bed. The position of the ridger bodies can be adjusted by loosening the retaining bolts (item 2, fig 11) and sliding the ridger units along the tool bar.

The height of the ridger bodies can be adjusted by loosening the retaining bolts (item 3, fig 11) and then raising or lowering each unit. The angle at which the ridger bodies operate can be altered in the same way. To adjust, loosen one bolt and then tighten the other. Which bolt to tighten and which to loosen depends on the required direction of tilt. The wings (item 4, fig 11) can be adjusted by loosening the securing bolt (item 5, fig 11) and pulling them apart or pushing them together. In addition, the wings on some ridgers can be raised or lowered by loosening the bolt (item 6, figure 11). The lower the wing is positioned, the less soil will be lifted. Each ridger body is protected by a shear bolt (item 7, fig 11). If the ridger hits an obstruction the bolt will break and allow the ridger body to swing backwards so avoiding any serious damage to the machine.



If a shear bolt breaks, stop, lift the machine out of work and check for damage. Reset the ridger and replace the shear bolt. The shear bolts should be kept tight at all times.

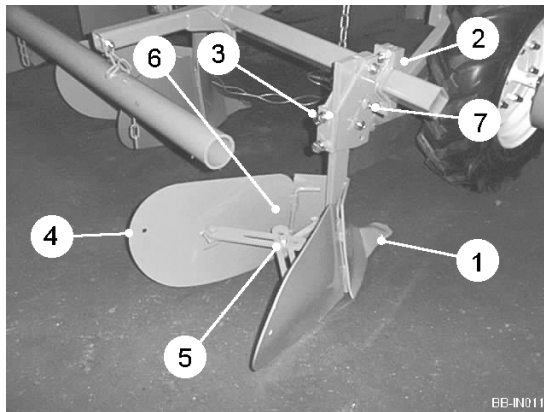


Fig 11

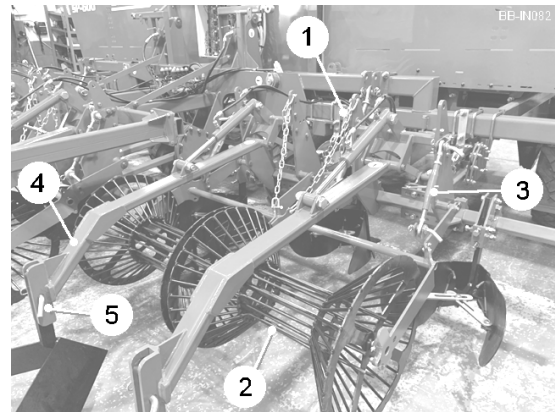


Fig 11a

Cage Wheels (optional)

In work, the chains (item 1, fig. 11a) support the cage wheels (item 2, fig. 11a) when lifting the machine at the end of the rows.



Always disconnect the transport links (item 3, fig. 11a) to allow the cage wheels to rise and fall freely in work. Refit the links when transporting the machine on the road.

Row Wipers (optional)

The working height of the row wipers (item 4, fig. 11a) is set by repositioning the locking pins (item 5, fig. 11a).

Feed of Potatoes to Cups

When planting, check that the flow of potatoes from the hopper to the feeding cups is satisfactory and that no 'bridging' occurs. The size of gap between the hopper and the feed belts (item 1, fig 12) can be altered by adjusting the regulator plates (item 2, fig 12).

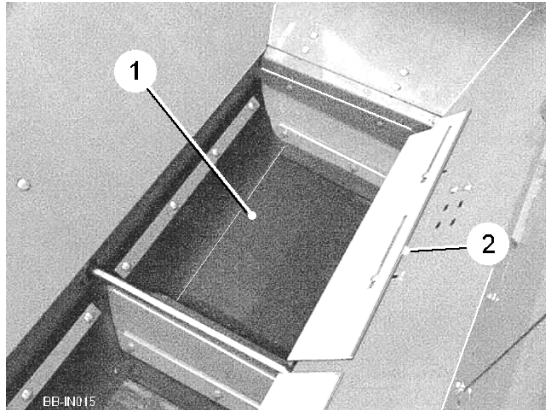


Fig 12

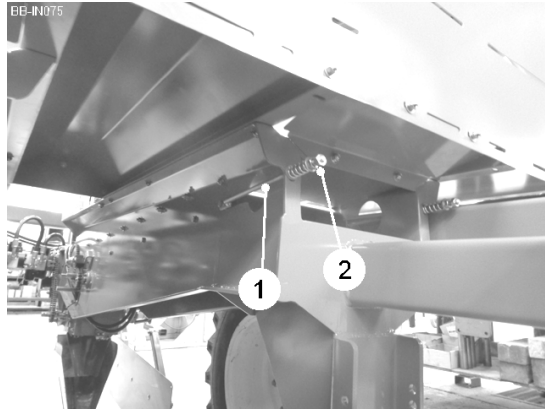


Fig 13

Feed Belts

The feed belts (item 1, fig 12) convey the seed potatoes from the hopper to the feeding pockets. Each feed belt is driven by a hydraulic motor. To create a positive drive, spring loaded tensioners (item 1, fig 13) maintain constant tension on the belt. To alter the tension turn the adjuster nuts (item 2, fig 13). Ensure both sides are adjusted evenly.



Do not overtighten the feed belts otherwise premature wear of the bearings and belts may occur.

The feed belt motors are actuated by the sensors (item 1, fig 14) situated between the belts and the feeding pockets. When the quantity of potatoes in one of the feeding pockets is so small that the distance between the sensor and the potatoes is more than 8cm (or the feeding pocket is empty), the sensor gives the relay an impulse. This impulse closes the circuit causing the relevant motor to engage and drive the feed belt to transport the potatoes to the feeding pocket. When the quantity of potatoes in the feeding pocket increases such that the distance between the potatoes and the sensor is approximately 8cm, the sensor gives the relay a new impulse which then causes the motor to disengage and so stop the drive to the feed belt. The feed belt will remain at standstill until the quantity of potatoes in the feeding pocket is small enough that the process is repeated. This way the potato layer in the feeding pocket is always kept thin and the feeding cups do not damage the potatoes.

Depending on the size of potatoes being planted, it may be necessary to alter the height of the sensor (item 1, fig 14) in relation to the feeding pocket. The sensor should be positioned higher for larger potatoes and lower for smaller potatoes. To adjust the height of the sensor, loosen the set screw (item 2, fig 14) and slide the support arm (item 3, fig 14) to the required position and re-tighten. Minor adjustments to the sensing distance can be made by turning the screw located on the side of the sensor. The sensing distance is increased by turning the screw clockwise and decreased by turning it anti-clockwise.

The speed of the feed belts can be adjusted by turning the dial (item 2, fig 3) within the junction box.

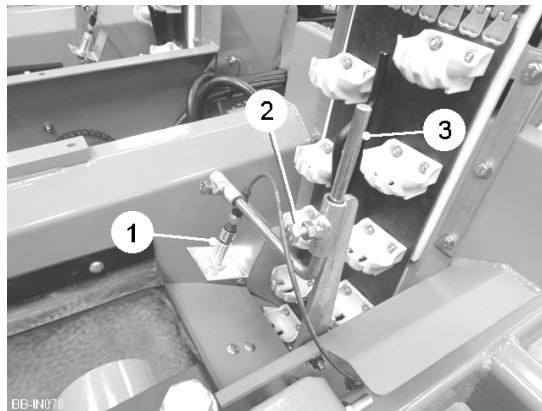


Fig 14

Cup Belts

The cup belts pick up the seed from the feeding pocket and transfer them to the ground. Rapid locking brackets (item 1, fig 15) fitted to each of the tunnels keep the cup belts tensioned and also allow maintenance of the cup belts. To slacken the cup belts, push the handles fully down until hanging loose. Each belt is tensioned by two spring adjusters (item 2, fig 15) which when tensioned correctly avoid slipping of the belt around the top and bottom rollers. Always adjust both sides evenly.



Ensure the cup belts are not over-tightened otherwise premature failure of the bearings and belts may occur. After adjustment ensure the belts are running in the centre of the rollers so as to avoid damage to the edge of the belts.

Insert Cups (optional)

The shape of the feeding cups is designed to pick up the irregular long shaped seed in a large grade. For a seed grade with a wide range of sizes and long seed, every alternate cup should be fitted with a medium insert. For a narrow range seed grade with more irregular shapes a full set of medium inserts should be fitted. For a small size seed grade, small inserts should be fitted. To attach the inserts, simply press them into the hole in the centre of the feeding cups.

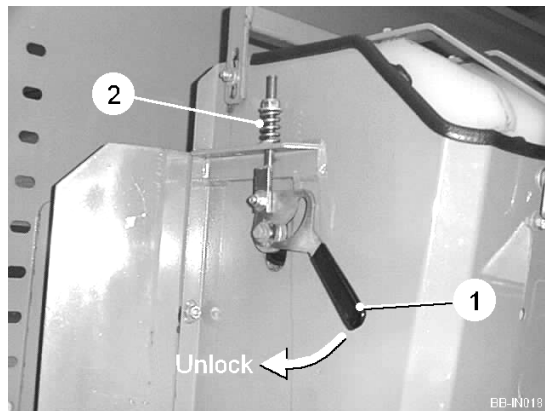


Fig 15

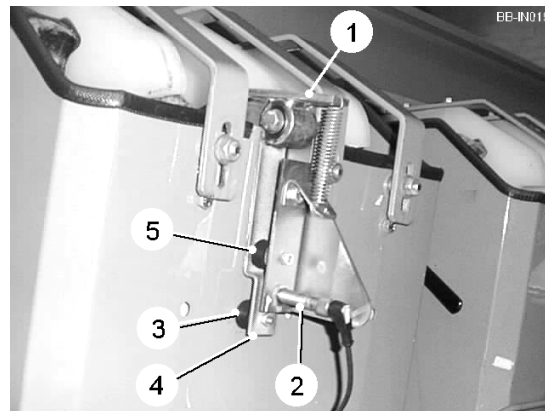


Fig 16

Seed Monitors (optional)

The seed monitors fitted to the top of each tunnel are designed to detect the potatoes as they pass over the top of the cup belts prior to planting. If during work one of the six indicators along the top of the home screen remains on for longer than a predetermined period, a buzzer will sound indicating that there are no potatoes in the feeding cups in that row possibly suggesting a blockage. The time delay can be increased / decreased by turning the dial marked 'TIMER'. The buzzer can also be turned ON / OFF on the control box.

The seed monitors should be adjusted so that the potatoes in the RH cups of each cup belt consistently trip the pivot plates (item 1, fig 16) thus activating the proximity sensors (item 2, fig 16). Initially the bottom stop (item 3, fig 16) should be adjusted so that a gap of approximately 3mm exists between the pivot plate (item 1, fig 16) and the inner face of the tunnel. Loosen the proximity sensor retaining nuts and slowly move the sensor closer to the sensor plate (item 4, fig 16) until it activates. When activated a red light appears on the sensor body. Screw the sensor out until the sensor deactivates and continue for another half turn then retighten the retaining nuts. This setting should leave a gap of approximately 1-2mm between the proximity sensor and the sensor plate. Finally, adjust the top stop (item 5, fig 16) to prevent the sensor plate coming into contact with the proximity sensor. If everything is adjusted correctly the proximity sensor will be activated and deactivated with only a slight deflection of the seed pivot plate (item 1, fig 16).

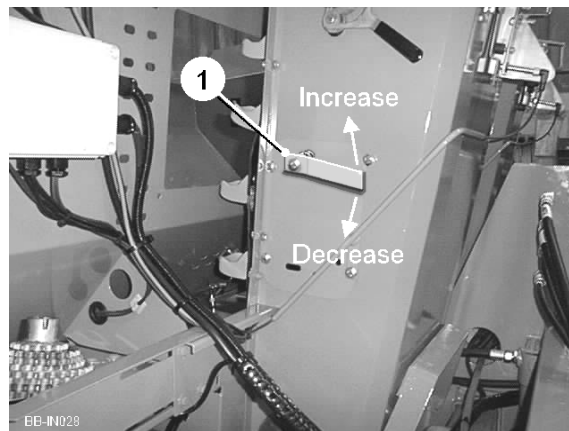


Fig 17

Cup Belt Agitators

The cup belt agitators control the number of potatoes in a cup. The planter can be fitted with either manually or electrically adjusted agitators. When planting seed of good quality and size it is possible to drive faster without compromising planting accuracy. The agitation in this case can be kept to a minimum. If the seed is uneven the influence of the agitator can be increased by driving faster. In this case there will be more movement of the cups and the excess potatoes will drop off. When using potatoes which tend to fall out of the cups i.e. oversized or oblong etc. the speed should be slow and agitation set to minimum otherwise gaps may occur.

On machines fitted with electrical agitators, agitation of each cup belt is increased / decreased from the dials on the control box marked 'AGITATORS 1,2,3,4,5,6'. On machines fitted with manually adjusted agitators, the handles (item 1, fig 17) fitted to the side of each tunnel are used. Raising the handle will increase agitation while lowering it will decrease agitation.

Hydraulic Space Selector

Seed space setting is electronically selected on the control box touch-screen (see TOUCH-SCREEN OPERATION). The hydraulic circuit requires a supply from the tractor of a minimum 13.5 litres/minute (3 gal).

The circuit consists of 3 (on 3-bed) or 6 (on 6-row) hydraulic motors. A monitor is fitted to the output shaft of each motor which provides speed information to the control box. Another monitor is fitted to one of the centre land wheels to provide forward speed information.



To ensure accurate results, regular maintenance of the tractor hydraulic oil filters (as recommended by the tractor manufacturer) is essential. Contaminated oil will result in excessive wear.

Hydraulic Space Selector in Operation

At the end of each row :

1. Disengage the planter drives using the switch 'PLANTER MODULES RUN'.
2. Lift the front of the planter using the switch 'FRONT RAISE' until the openers and soil retention panels are clear of the bed.
3. Draw forward to cover the remaining uncovered sets in the row, then raise the mould boards / ridgers using the switch 'REAR RAISE'.
4. Make the headland turn.
5. On recommencing planting, lower the openers and mould boards and engage the planter drives using the switch 'PLANTER MODULES RUN'.

Lubrication

Regular lubrication is an integral part of looking after your machine. The schedule of maintenance outlined below is a guide to when certain actions should be carried out. If your machine requires a more frequent lubrication schedule because of your workload, then it is advisable to reduce the time intervals.

Shafts, bearings and pivot points fitted with grease nipples should be greased with good quality medium grease. Do not allow these points to run dry, as this will accelerate wear

When greasing bearings some are sealed and pre-lubricated. You should take care not to over grease this type as the seals may be damaged. If the seals become damaged it may be possible for dirt to enter the bearing causing accelerated wear.

Use only the BP lubricants recommended by Standen or an exact equivalent recommended by your lubricant supplier.

Medium grease = BP Energrease L S E P 2

Mechanical Drives Maintenance

All chain drives have adjusters that are visible when the appropriate guard is removed. Adjust the chains tight enough to give positive drive without undue stretching. Where plastic chain tension or guide blocks are fitted, these will show fairly rapid wear initially, but will settle down when the chain rollers rather than the side plates come into contact with the plastic. A suitable chain lubricant or a smear of grease should be regularly applied to the chains to prevent wear.

Electrical System Maintenance

The components within the electrical system are designed to be maintenance free. If it becomes necessary to carry out any repair, only a competent engineer capable of this type of work should carry out the repair. Periodically ensure that all multi pin plugs are correctly fitted into their sockets and are not becoming loose.

Proximity Sensor Adjustment

The hydraulic space selector proximity sensors are activated by the teeth of the monitor wheels passing in front of them. When activated a red light appears on the sensor body. Should the sensor not activate, the gap between the sensor and the monitor wheel may need adjustment. A retaining nut holds the proximity sensor in position. The distance between the sensor and the monitor wheel can be adjusted by loosening the retaining nut and then moving the sensor closer or further from the monitor wheel. This setting should be approximately 1mm to 1.5mm. Do not overtighten. The proximity sensor must be centrally mounted over the monitor wheel.

Hydraulic System Maintenance

The components within the hydraulic circuit are designed, on the whole, to be maintenance free. If it becomes necessary to carry out any repair, the work should be carried out by a competent engineer capable of this type of work.



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.

Cleanliness is of paramount importance. Before dismantling any part of the hydraulic system, ensure the surrounding area is clean. If necessary, wash the area to be worked on. Dirt must be prevented from entering the system so any orifices must be blanked off with a suitable plug. Do not use cloth as the lint can contaminate.

As the tractor supplies the oil for the planter hydraulics, ensure that the tractor hydraulics are serviced in accordance with the manufacturer's recommendations. To extend the life of the hydraulic components it is important to monitor the condition of the hydraulic oil.

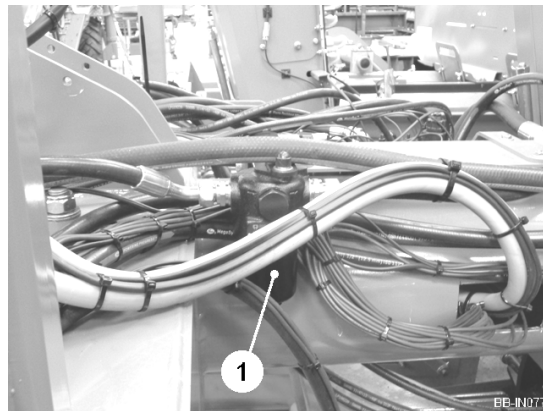


Fig 18

The pressure filter (item 1, fig 18) should be replaced after the first 50 hours running time and then every 500 hours or annually thereafter.

To replace the filter element:

1. Switch off the tractor, apply the handbrake and remove the ignition key.
2. Operate the spool valve feeding the planter to release any residual pressure and then disconnect the feed hose from the tractor.
3. Unscrew the bottom casing using the spanner spigot.
4. Remove the filter element and rinse out the casing. Check the seal and renew if necessary.
5. Fit the new element and refit the casing ensuring that it is tight.
6. Run the system and check for leaks.

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. 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 wheel nuts for tightness.
4. Check all hydraulic cylinders, valves and pipe work for signs of leaks or damage, repair or replace as necessary.
5. Carry out lubrication

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 for undue wear and replace as necessary.
3. Check all bearings for lubrication, grease as necessary.
4. Check openers, soil retention panels, ridgers / moulding boards etc. for excessive wear, replace if necessary.

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 feed belts and cup belts for any damage or wear and repair or replace as necessary.
3. Check metalwork for any damage or wear and repair or replace as necessary.
4. Inspect wheel bearings and check for excessive wear, replace as necessary. Re-pack with fresh grease on re-assembly.
5. Replace the pressure filter element. Use only genuine Standen replacement parts. **THESE ARE NOT WASHABLE ELEMENTS.**

Out of Season Storage

The machine can frequently operate in soils which contain chemical fertilisers etc. When the working season is completed wash 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. Any parts of hydraulic cylinders rods that are 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 control consoles are 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.

Dimensions

Length	5.5 m (without cage wheels & row wipers)
Width (in work)	7.0 m
Width (in transport)	3.85 m
Height (in work)	2.4 m
Height (in transport max.)	4.3 m

Weight

6-row (empty)	5240 kg
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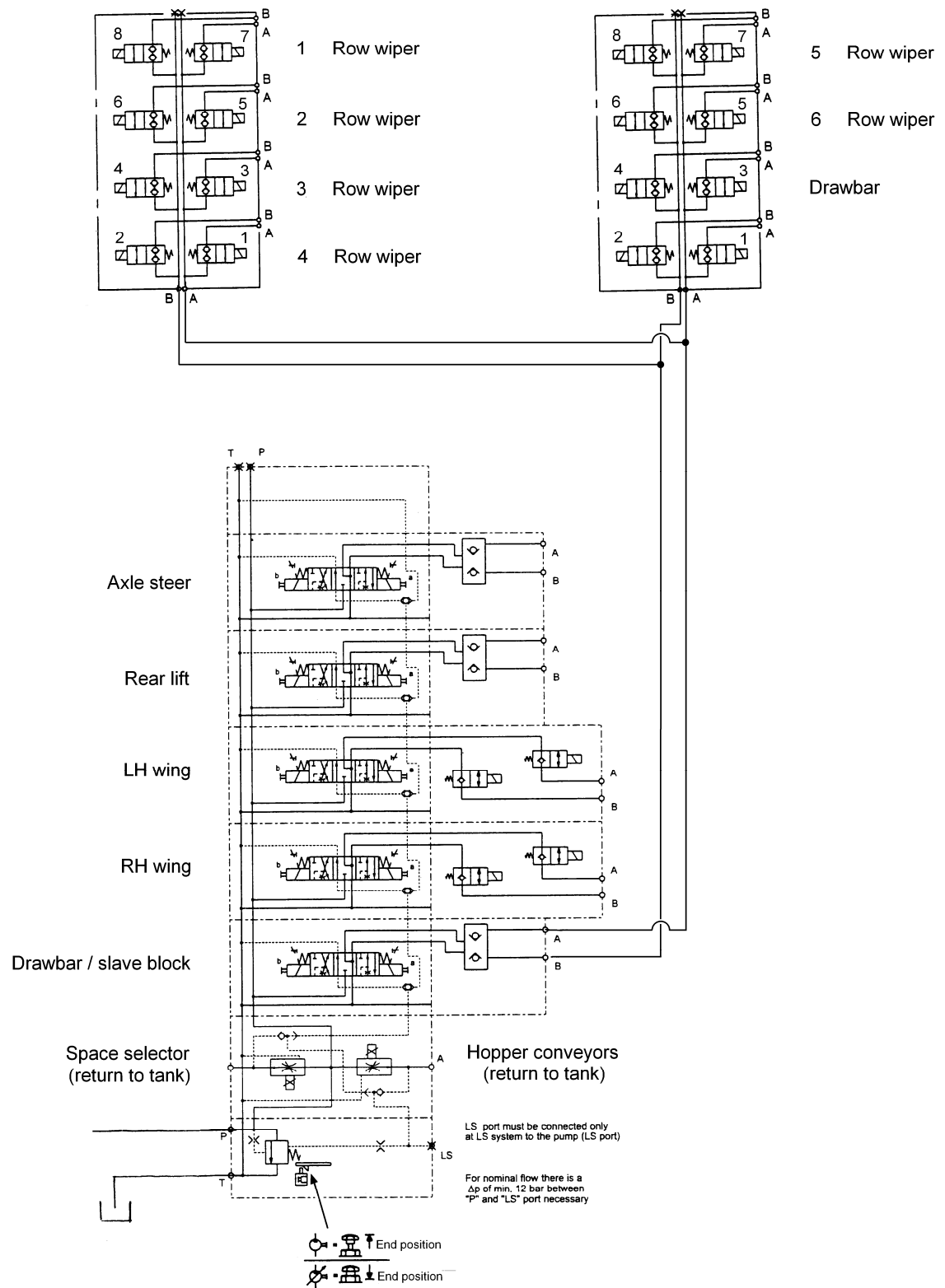
Technical Data

Hopper capacity	3000 kg
Tractor power requirement	118 kW (160 bhp) minimum
Minimum oil flow requirement	13.5 ltr/min (3 gal)
Tyre size (standard)	12.5x18 12 ply
Tyre pressure	3.5 Bar (50 psi)
Wheel nut torque	360 Nm
Speed in transport (max.)	20 kph (12 mph)

Nut / Bolt Torque

Description	Torque	Description	Torque
M6 nyloc zinc nut	14 nm	M6 bolt/steel nut	10 nm
M8 nyloc zinc nut	31 nm	M8 bolt/steel nut	26 nm
M10 nyloc zinc nut	60 nm	M10 bolt/steel nut	52 nm
M12 nyloc zinc nut	118 nm	M12 bolt/steel nut	95 nm
M16 nyloc zinc nut	282 nm	M16 bolt/steel nut	230 nm
M20 nyloc zinc nut	515 nm	M20 bolt/steel nut	440 nm
M24 nyloc zinc nut	936 nm	M24 bolt/steel nut	766 nm

Hydraulic Valve Bank and Slave Valves



StocksAG

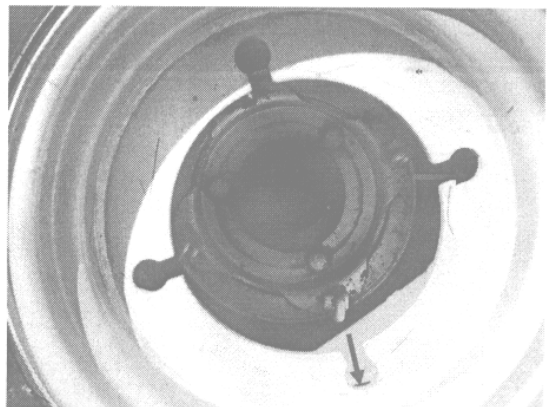
FITTING STOCKS KEYHOLE FLANGE BOLT ON DUAL WHEELS rev 1/16



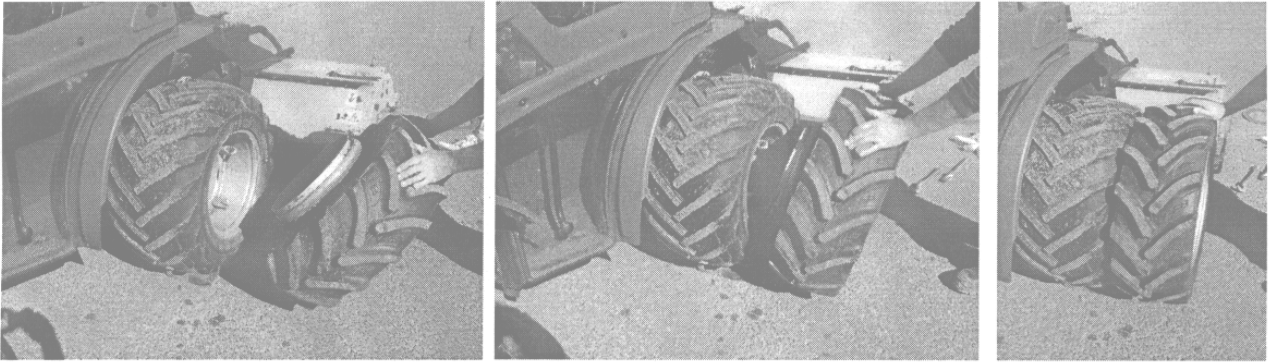
Drive the vehicle onto a thin piece of wood to raise the wheel off the ground slightly – this will aid fitting the dual wheel.



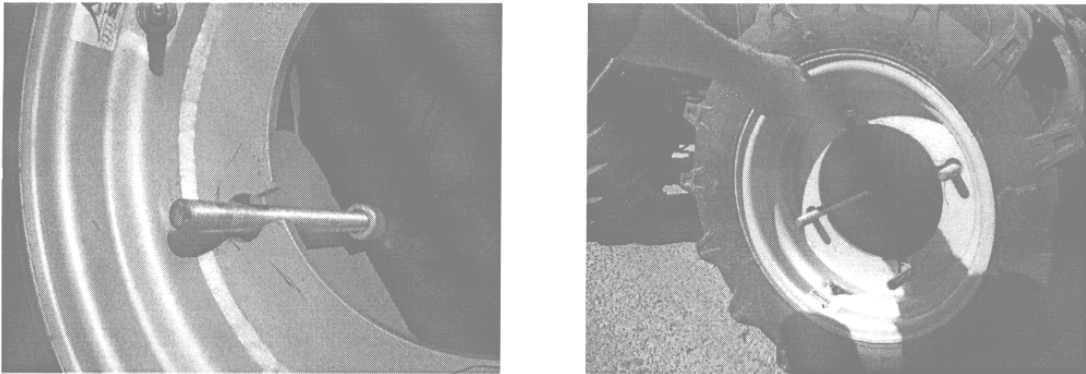
Position the dual wheel alongside the tractor wheel, and ensure the keyhole shaped cutouts in the flange will align with the eye nuts fitted to the vehicle wheel, positioned to accept the threaded hooks.



Fit the dual wheel into position – locating the spacer band into the tapered bead section of the tractor wheel.

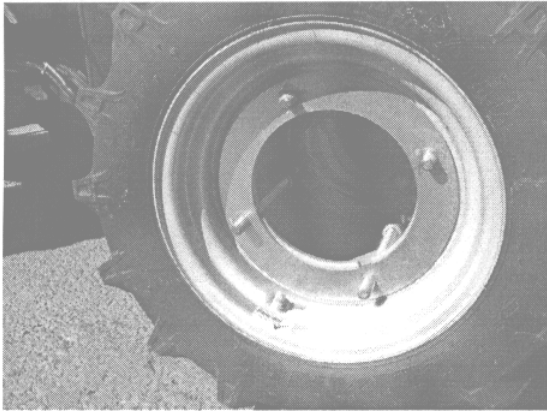


Working through the open centre bore – fit the hooks to the eyenuts and place the threaded rod into the keyhole cutouts in the flange.



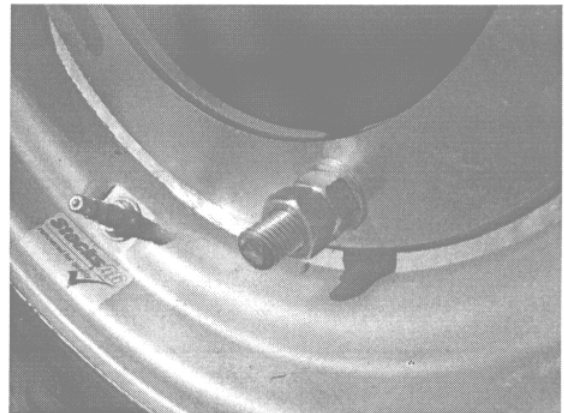
Fit the locking ring over the protruding threaded rod.





Fit the washers and nuts to each threaded rod, and tighten working in sequence and in opposite pairs until the dual is pulled fully home into the tractor wheel.

Fit the locknuts and tighten.



After 30 minutes work – check the nuts are tight. Check daily.

Touch-Screen Space Selector



Fig 1A

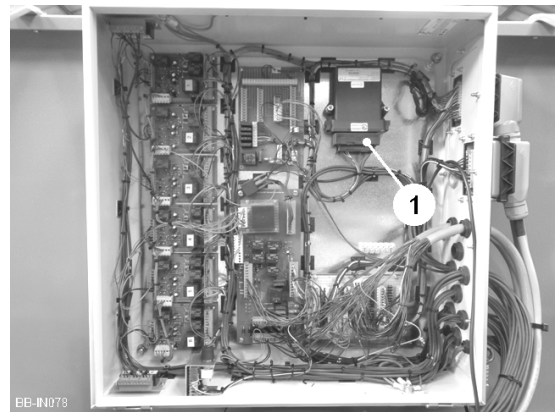


Fig 2A



Always turn the control system OFF before transporting the planter on the road.



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








WELDING WARNING:

Before carrying out any welding on the planter, always disconnect the plugs (item 1, fig 2A). Failure to observe the above precaution may result in severe damage to the planter control system.

Setting Up The Control System

Turn the control system ON. When fully powered up, the 'home' screen will display (see fig 3A).


To ensure the calculations for seed spacing and seed coverage are correct, the following information must be set.

1. Press the icon  once.
2. **Imperial or Metric Units**
Select either Imperial or Metric (see fig 5A).
3. **Number Of Active Rows**
Using the yellow arrows, scroll until the 'active rows' screen is displayed (see fig 8A). Turn rows ON / OFF using the + and – icons.
4. Press the icon  for 3 seconds.
5. **Wheel Circumference**
The 'wheel circumference' screen is displayed (see fig 12A). This setting is factory set. If the wheels are changed this figure will need to be reset. With the planter wheels on the ground, mark the sidewall of the tyre at the bottom and continue the mark onto the ground. Drive forward for one revolution of the wheel and mark the ground again. Measure the distance between the two marks. Record circumference using the + and – icons.
6. **Wheel Setting**
Using the yellow arrows, scroll until the 'wheelings' screen is displayed (see fig 13A). Record the wheel setting using the + and – icons. Alternatively, press the digits to display a keypad.
7. **Row Configuration**
Using the yellow arrows, scroll until the 'row configuration' screen is displayed (see fig 16A). Using the + and – icons, select the number of openers fitted to your planter.
8. **Seed Spacing** .
Press the icon . The 'seed spacing' screen will display (see fig 4A). Select the desired seed spacing using the + and – icons. The number of sets per hectare / acre updates automatically. Alternatively, press the digits to display a keypad.
9. Press  to return to the 'home' screen.


Calibrating The Control System

To ensure the seed is planted at the correct spacing the control system will need to be calibrated. The system should always be re-calibrated when changing seed size.


To calibrate the system:


1. Press the icon . The 'constant' screen is displayed (see fig 17A).
2. Using the + and – icons set the constant to 4.0.
3. Set the planter into work and measure the distance between 11 seeds.
4. Divide the distance by 10 and compare the result with the desired seed spacing.
5. If the spacing is too small decrease the 'constant'. If the spacing is too large increase the 'constant'. Always adjust in small steps e.g. 0.1.
6. Repeat the procedure until the correct seed spacing is achieved.

Screen Brightness

Press the icon  once. Using the yellow arrows, scroll until the 'screen brightness' screen is displayed (see fig 11A). Increase / decrease the brightness using the + and – icons. Alternatively, press the digits to display a keypad.

Statistics

Press the icon . The statistics screen will display (see fig 18A). The screen displays information on the output of the planter during its lifetime, season and day. Season and day figures can be reset to zero if required.

Press the icon  once and, using the yellow arrows, scroll until the 'reset season / reset day' screen is displayed (see fig 6A). Press to reset.



Home Screen

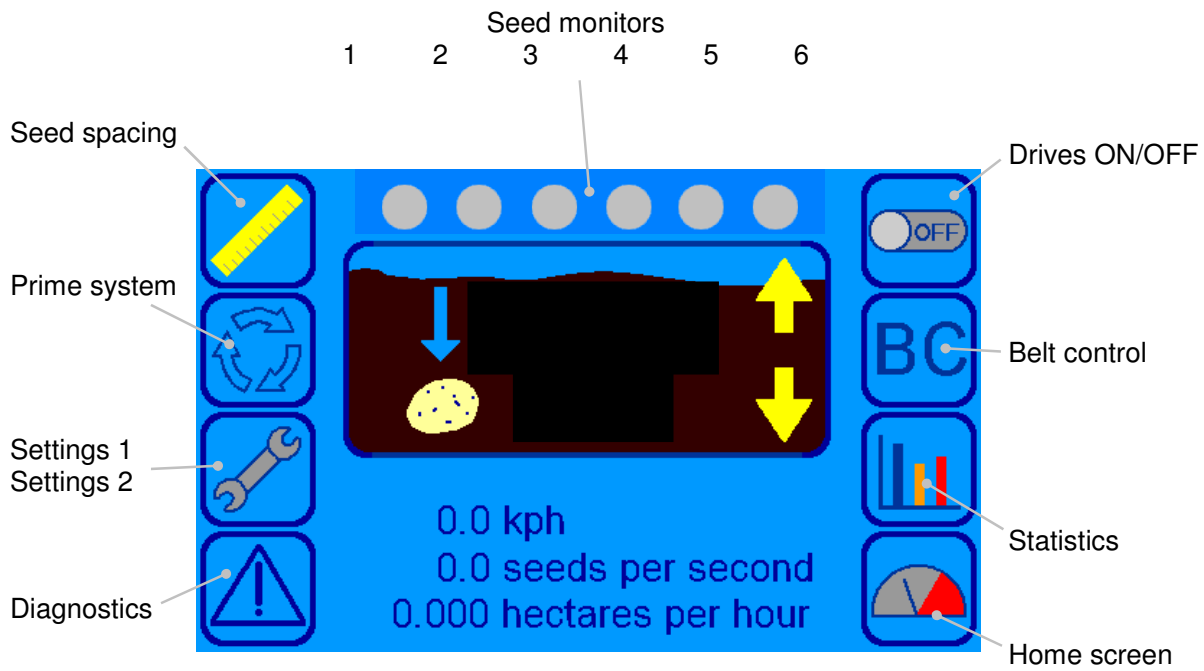


Fig 3A



Seed Spacing Screen

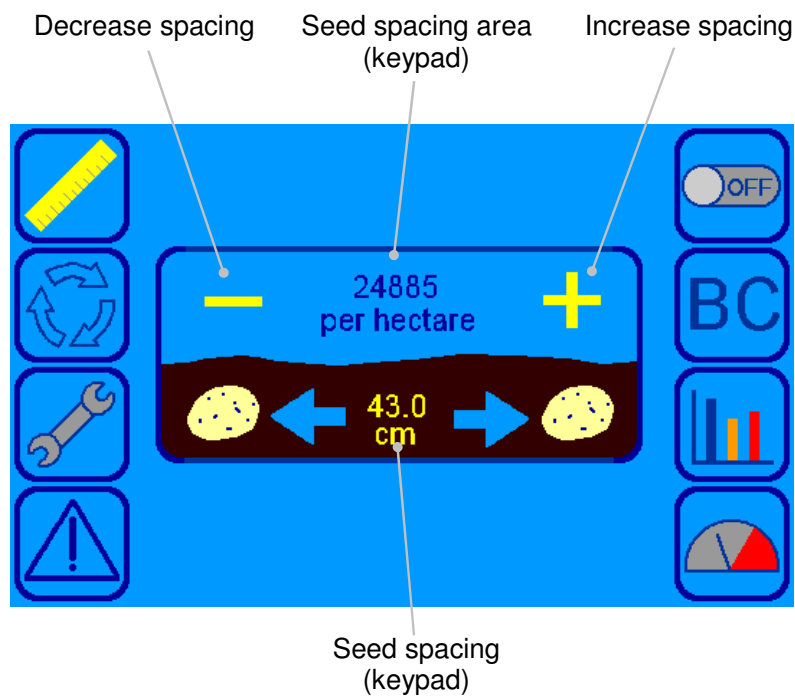
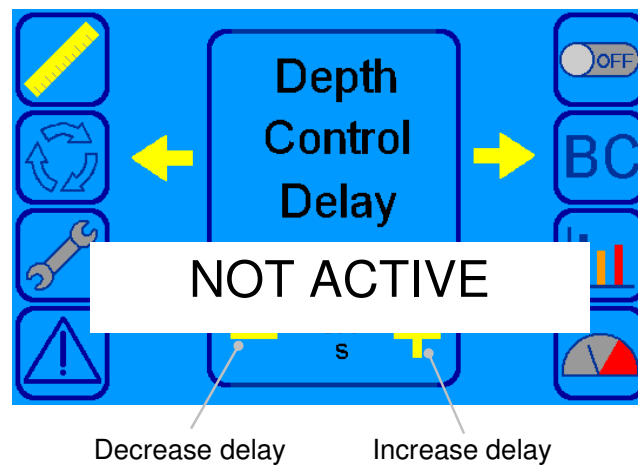
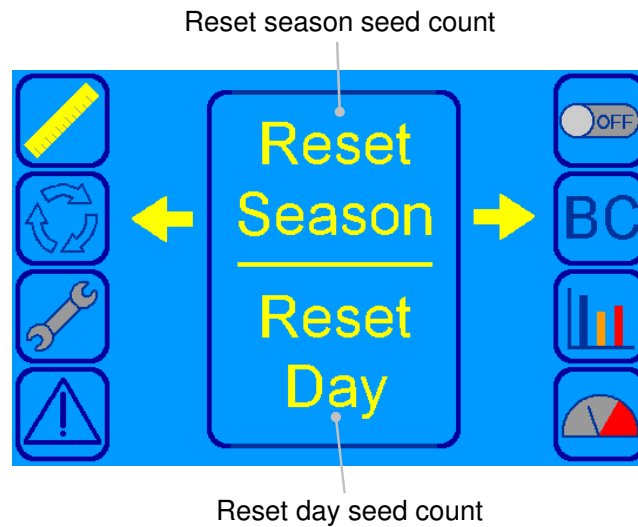
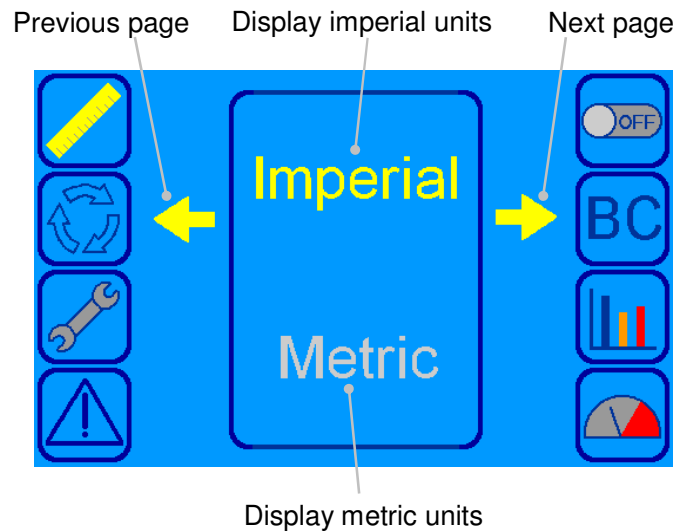
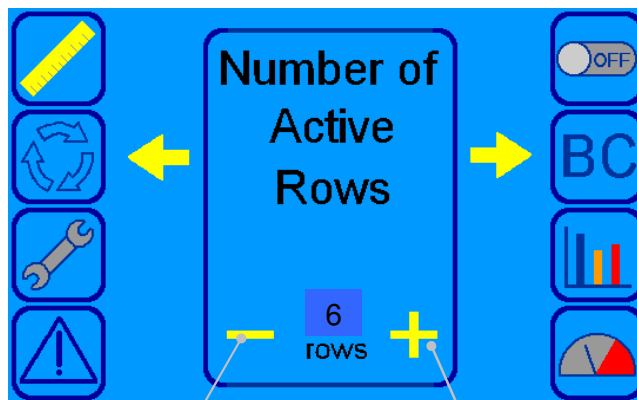


Fig 4A



Settings 1 (press once)





Decrease rows

Increase rows

Fig 8A

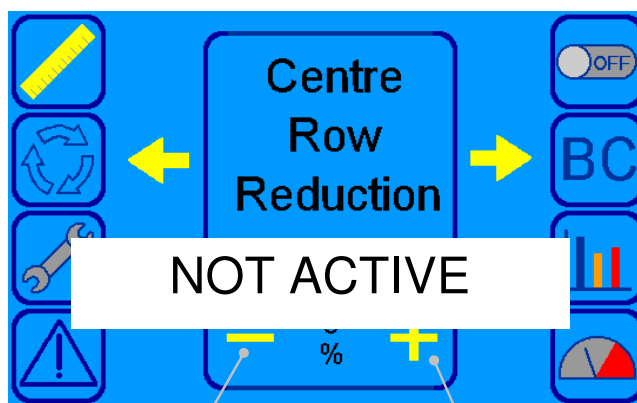
Decrease
percentageIncrease
percentage

Fig 9A

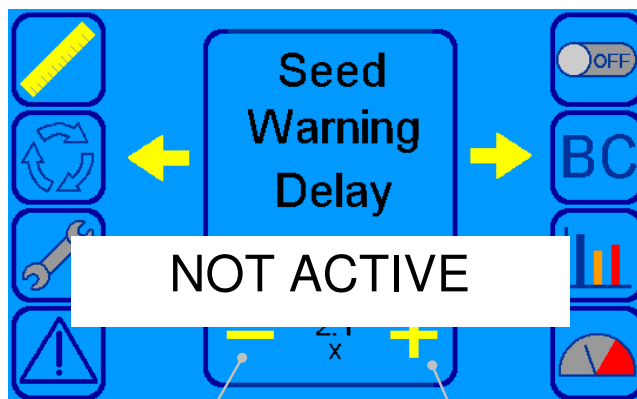
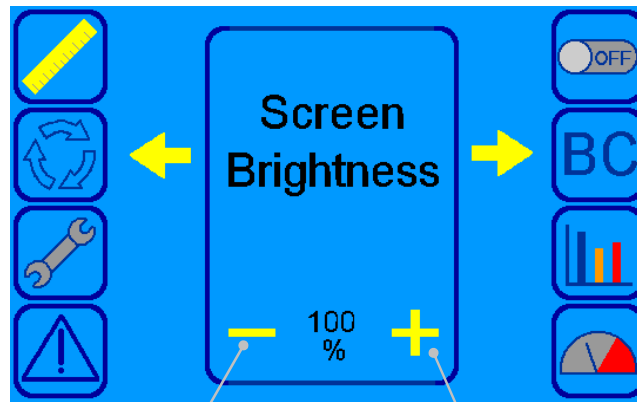
Seed monitor
decrease delaySeed monitor
increase delay

Fig 10A



Decrease
brightness

Increase
brightness

Fig 11A

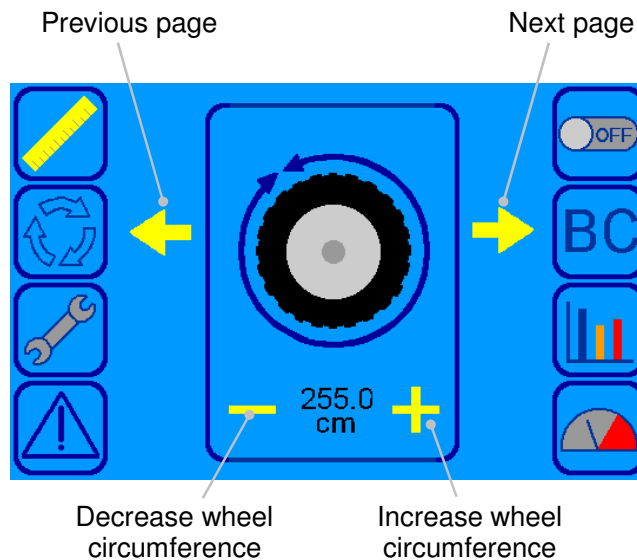
**Settings 2** (press for 3 seconds)

Fig 12A

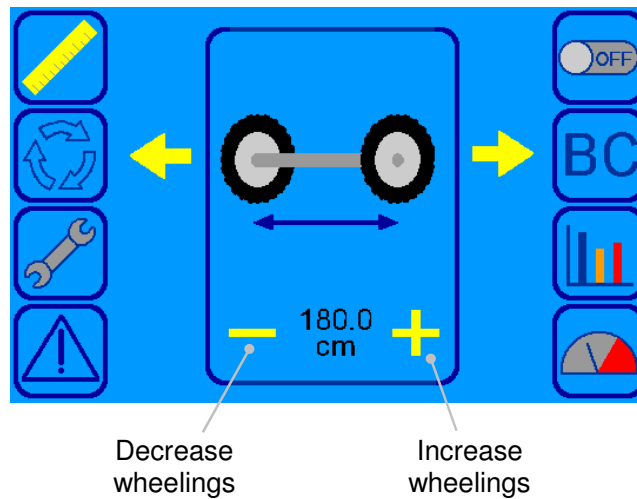


Fig 13A

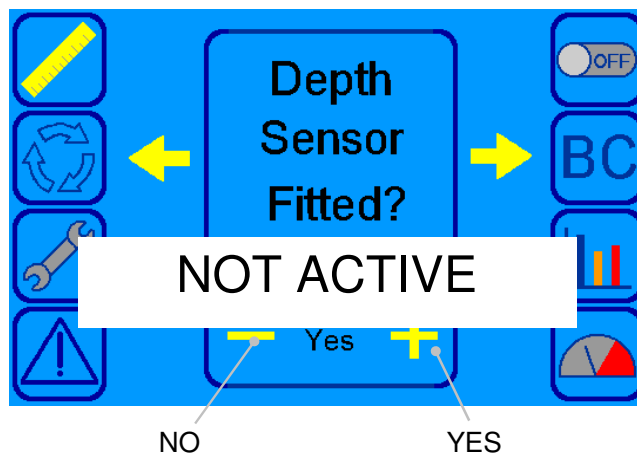
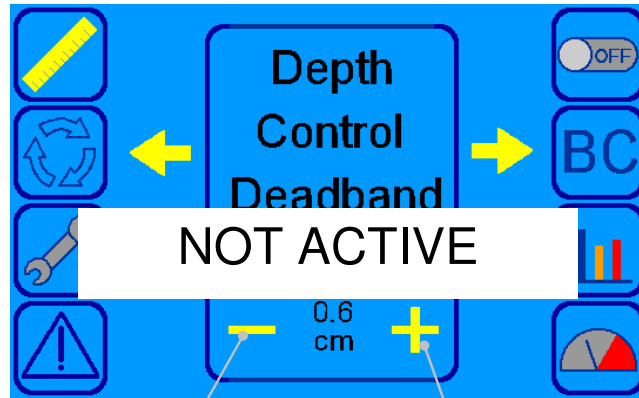


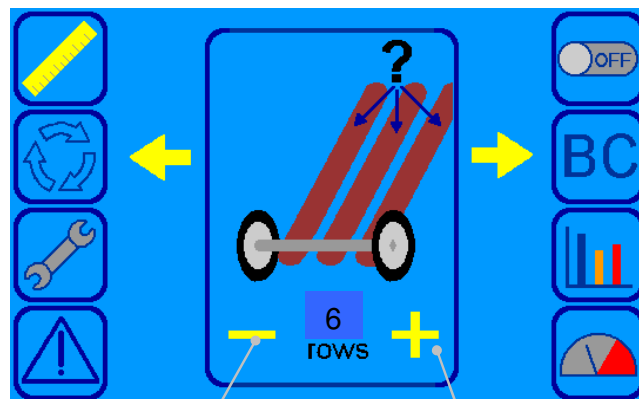
Fig 14A



Decrease
dead-band

Increase
dead-band

Fig 15A



Decrease row
configuration

Increase row
configuration

Fig 16A



Belt Control

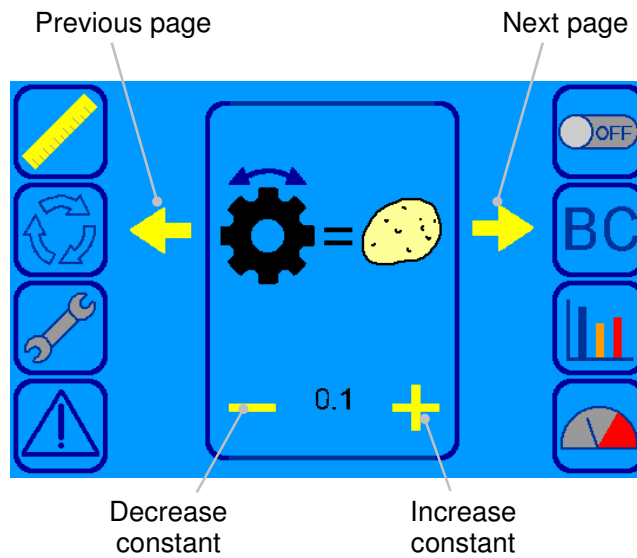


Fig 17A



Statistics Screen

	Lifetime	Season	Day
Seeds	312421	7	7
acres	0.0	0.0	0.0
miles	44.6	44.6	0.0
mins	1950	51	9
Seeds Total		4	

Fig 18A