



***SR 200***  
**2 Row**  
**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**  
**Station Road, ELY**  
**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.

<b>Model</b>	SR Series Potato Planter
<b>Serial No.</b>	SR.....

## 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 **Standen SR 200 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**

The Standen SR 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 when in the raised position.*

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

*Never 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 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.*

*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.*

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

*Always ensure road lights are clean and in good working order.*

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

*Regularly check hydraulic hoses for chafing or damage and replace as necessary.*

*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.*

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

### Overview

The Standen SR200 is a tractor-mounted, 2-row cup planter designed to plant seed potatoes with extreme gentleness and accuracy in either standard planting or bed work. A touch-screen operates the hydraulic space selector to give high levels of control over seed spacing. A manual space selector option is also available. The rear moulding board and pressure sensing system is designed to form perfect rows at fast forward speeds.

### Tractor Suitability

The SR 200 planter is suitable for tractors of 74.6 Kw (100 hp) minimum.



*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 in the raised position.*

### Attaching the Planter to the Tractor

The planter is designed to be mounted onto the tractor 3-point linkage.



*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.*

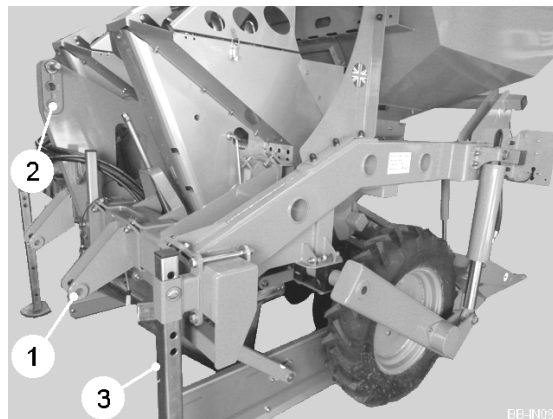


Fig. 1

Reverse the tractor up to the planter and engage the tractor lower link arms onto the planter lower hitch pins (item 1, fig. 1). The tractor arms and stabilisers must be set to ensure the planter runs central to the tractor. Fit the top link (item 2, fig. 1) and adjust to level the planter.

Once mounted to the tractor, the hydraulic and electrical control services can be connected. The hydraulic pressure hose (marked red), should be connected to the tractor constant supply port. The return hose (marked blue) should be connected to the tractor return port. The load sense hose should be connected to the tractor L/S outlet. The control box should be mounted securely inside the tractor cab in a position where it is comfortable to operate when seated. Connect the cable between the planter and control box ensuring it is safely and securely routed in the tractor cab. The box requires a 12v D.C. supply.

Connect the power lead directly to the tractor battery, blue lead to negative (-) terminal and brown lead to positive (+) terminal. Finally, connect the planter road lights plug to the tractor 7-pin socket.




*The parking stands (item 3, fig. 1) must be raised before commencing work. When disconnecting the planter from the tractor always ensure the stands are lowered to support the machine.*

## 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.

Seed potatoes can vary a great deal (i.e. different varieties, shape, size, number of sprouts, skin quality etc.). The cup chain scoops will therefore need to be fitted with the correct insert cups to suit the size of seed being planted.

To ensure the machine commences to plant immediately on starting, always prime the cups before planting. On machines with automatic space selector, press the button  until every cup is filled.

On machines with manual space selector, lift the planter on the tractor 3-point linkage and turn the RH land wheel until every cup is filled.

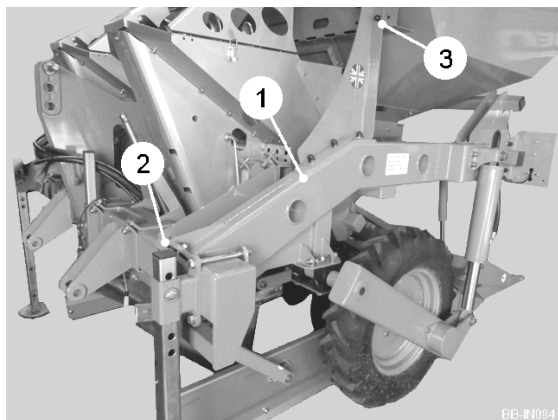


Fig. 2

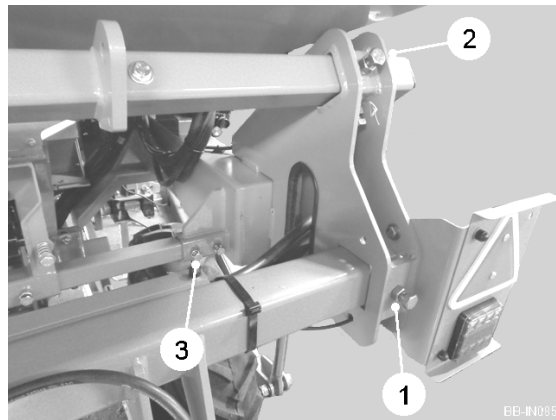


Fig. 3

## Land Wheels

The land wheels must be set to straddle the rows. The LH and RH side frames units (item 1, fig. 2) are adjustable to allow the wheels to be set between 1.52m (60") and 1.83m (72").

To adjust the land wheels:

1. Loosen the side frame clamp bolts x4 (item 2, fig. 2) and the hopper front mounting bolts x2 (item 3, fig. 2).
2. Loosen the rear cross beam setscrews x2 (item 1, fig. 3), the hopper support beam setscrews x2 (item 2, fig. 3) and the feed belt support beam setscrews x2 (item 3, fig. 3).
3. Slide the side frame unit (item 1, fig. 2) along the front beam to the required setting ensuring it is adjusted equally about the centre-line of the machine.
4. Finally, retighten all bolts and setscrews. Repeat for the opposite frame.

## Feed Belts

The feed belts (item 1, fig. 4) convey the seed potatoes from the hopper to the feed pockets. The belts run intermittently to keep the feed pockets supplied with the correct amount of seed potatoes. Each belt is actuated by a sensor (item 1, fig. 6) mounted inside the feed pocket. When the quantity of potatoes in the pocket gets to a minimum (or the pocket is empty), the sensor gives an impulse causing the relevant motor to engage and drive the feed belt to transport the potatoes to the feed pocket. When the quantity of potatoes in the feed pocket gets to a maximum, the sensor gives the relay a new impulse which then causes the belt to stop. The feed belt will remain at standstill until the quantity of potatoes in the feed pocket is small enough that the process is repeated. This way the potato layer in the feed pocket is always kept thin and the cups do not damage the potatoes.



*The quantity of seed potatoes in the feed pocket should never be higher than the inspection holes (see fig. 5).*

To create a positive drive, spring-loaded tensioners (item 2, fig. 4) maintain constant tension on the belt. To alter the tension, turn the tensioner screws (item 3, fig. 4). Ensure both sides are adjusted evenly.



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

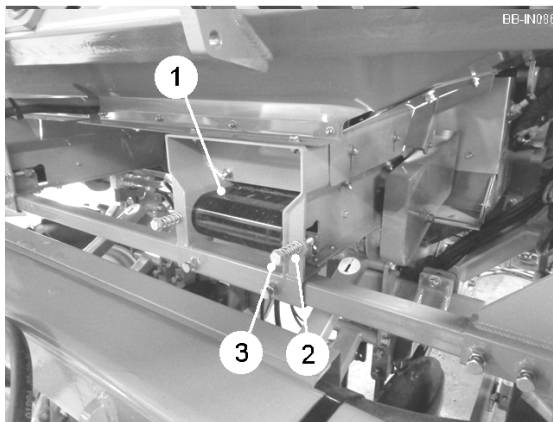


Fig. 4

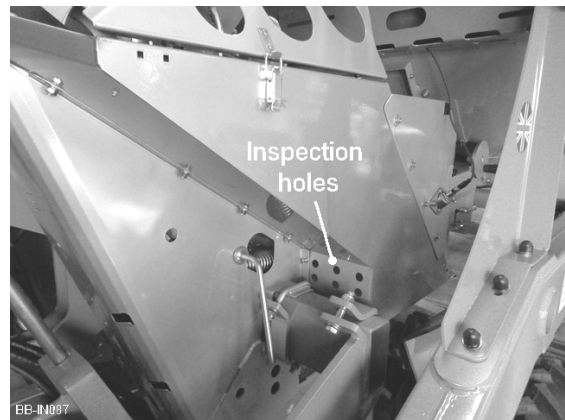


Fig. 5

### Regulator Plates

When planting, check the flow of potatoes from the hopper to the cups is satisfactory and that no 'bridging' occurs. The hopper openings can be altered by adjusting the regulator plates (item 2, fig. 6). The regulator plates should be set lower for small potatoes and higher for large potatoes. To adjust the regulator plates, loosen the locking knob (item 1, fig. 7) and turn the hexagon bar (item 2, fig. 7).

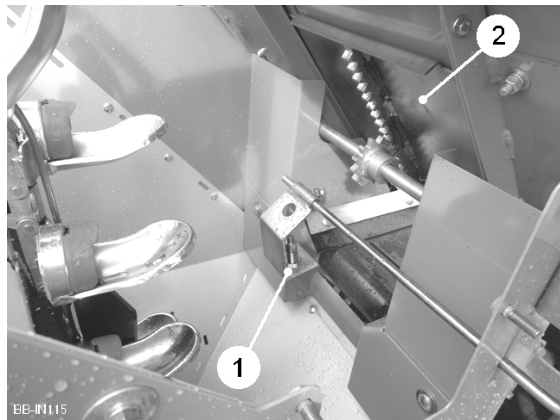


Fig. 6

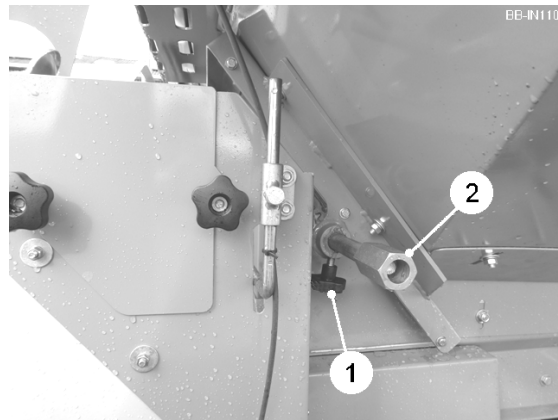


Fig. 7

### Cup Chain

The cup chain (item 1, fig. 8) transfers the seed from the feed pocket to the ground. The agitator roller (item 2, fig. 8) vibrates the cups preventing 'doubles'. The excess potatoes fall back into the feed pocket. The amount of agitation is increased / decreased by setting the handle (item 3, fig. 8).



*Never adjust the agitator handle (item 3, fig. 8) with the cup chain running.*

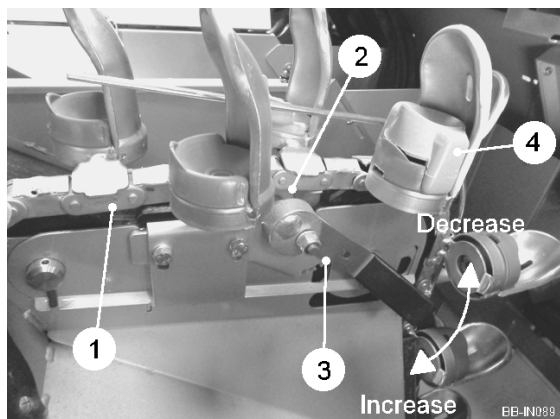


Fig. 8

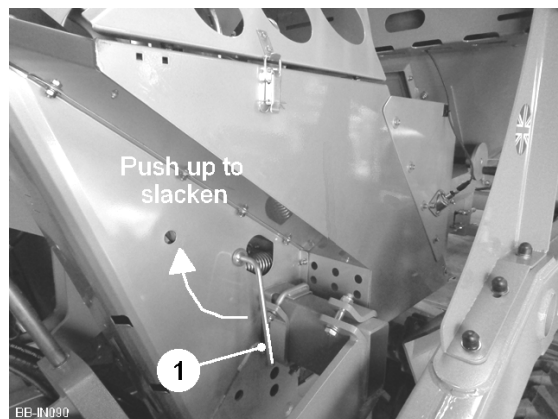


Fig. 9



The spring tensioner handle (item 1, fig. 9) keeps the cup chain tensioned during work and also allows the chain to be slackened to manually rotate the chain when changing the cup inserts. To slacken the cup chain, grip the handle tightly and push the handle upwards.



*Take great care when using the tensioner handles (item 1, fig. 9) as the over-centre action of the handles can cause injury.*

### **Insert Cups**

Depending on the size of the seed being planted, the scoops should be fitted with the correct insert cups. Three cup sizes are available.

Seed up to 35mm - blue insert cup.

Seed 35mm to 55mm - red insert cup (standard).

Seed over 55mm - grey insert cup.

To remove an insert cup, using a suitable diameter punch, push the centre plug out through the bottom of the cup to release it. The new insert cup can then be fixed in position by refitting the plug (chamfer downwards) into the centre of the new cup from above. The blue insert cups (item 4, fig. 8) are designed to fit inside the red cups as shown. When inserting the blue cups, the centre plugs will need to be removed first.

### Openers

The bottom springs (item 1, fig. 10) allow the openers (item 2, fig. 10) to ride over obstructions reducing damage to the planter. The top springs/spacers (item 3, fig. 10) carry the weight of the openers and prevent them from 'nose diving' in soft soil. The bottom springs 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. 10).

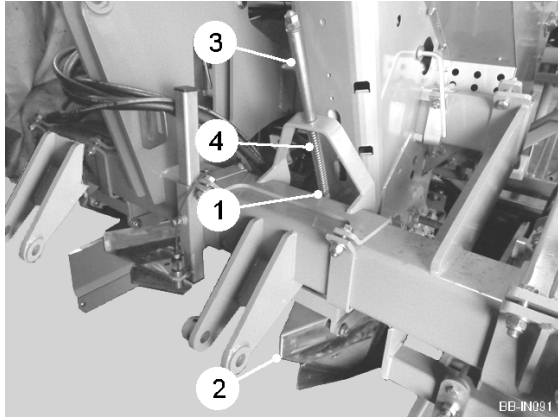


Fig. 10

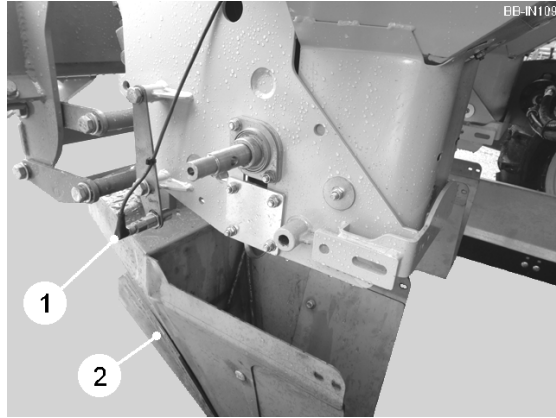


Fig. 11

### Seed Monitors

The sensor (item 1, fig. 11) detects the seed potatoes as they fall from the cups into the opener (item 2, fig. 11). In normal conditions, the seed monitors will flash on the Home Screen indicating potatoes passing the sensors. If there is a blockage the seed monitor for that row will remain illuminated and a buzzer will sound. If the buzzer sounds too frequently without a blockage occurring, the delay can be adjusted or the buzzer switched off from the touch-screen terminal.

**Soil Retention Panels**

The soil retention panels (item 1, fig. 12) 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 screws (item 2, fig. 12) and raise / lower the leg (item 3, fig. 12) to the required position. The front of the panels should be set slightly wider than the rear, causing the soil to converge as it approaches the moulding board.

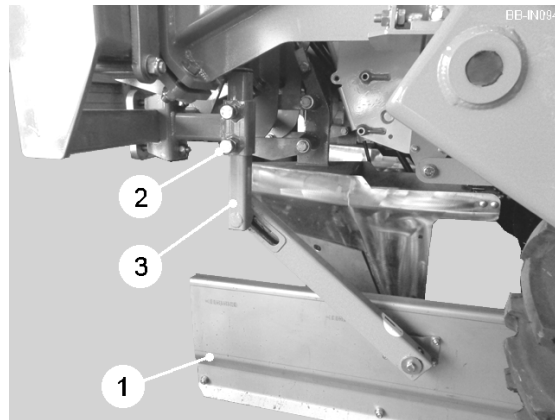


Fig. 12

### Adjustable Moulding Board (Hood)

The adjustable moulding board (item 1, fig. 13) is mounted to the rear of the planter via the parallel linkage arms (item 2, fig. 13). The pressure exerted by the board is controlled from the touch-screen terminal. In manual mode, the board will rest on the bed under its own weight (float) and the ram(s) (item 3, fig. 13) will open and close freely as the moulding board rises and falls. In automatic mode, additional hydraulic pressure is added to the moulding board by the accumulator (item 1, fig. 14) and pressure transducer circuit (item 2, fig. 14). For hydraulic pressure adjustment see 'Moulding Board Pressure' in the TOUCH-SCREEN OPERATION section of this handbook.

The position of the wings (item 5, fig. 13) 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 6, fig. 13) 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 7, fig. 13) and rotate the wings to the required position. The top links (item 8, fig. 13) set the moulding board angle. Initially, the angle should be set at approximately 5° from horizontal. Increasing the angle will allow more soil under the board.

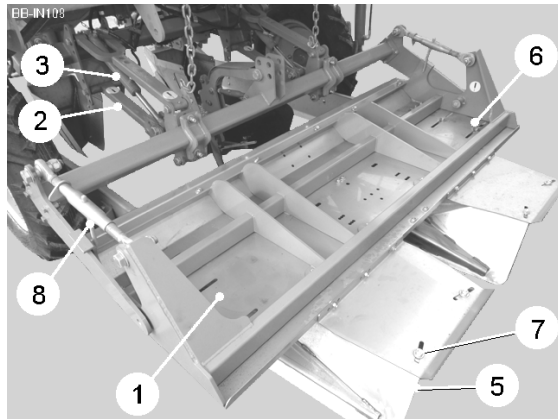


Fig. 13

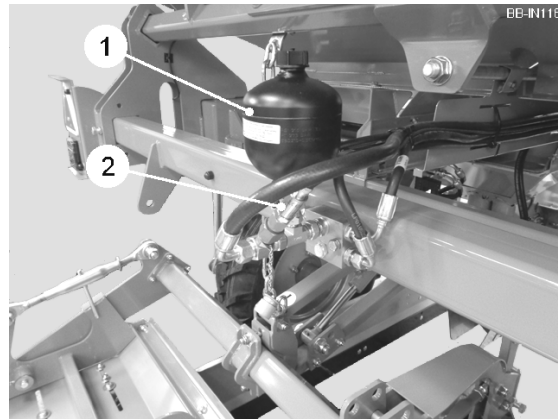


Fig. 14

The depth at which the centre plough (item 1, fig. 15) operates is set using the top link (item 2, fig. 15). 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.

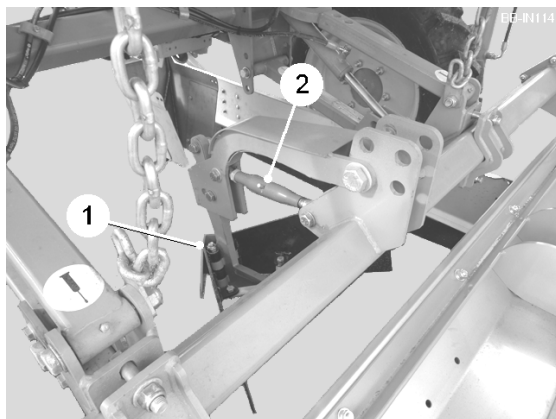


Fig. 15



Fig. 16

## Setting the Opener Planting Depth

The openers (item 2, fig. 10) are adjustable for depth by raising or lowering the land wheels relative to the planter body. On machines with manual depth control, the planting depth is adjusted by a turnbuckle. Ensure both sides are adjusted equally.

On machines with hydraulic depth control, the planting depth is adjusted by the depth rams (item 1, fig. 16) from the touch-screen terminal. The pointer (item 1, fig. 17) gives a visual indication of the action of the hydraulic depth control.

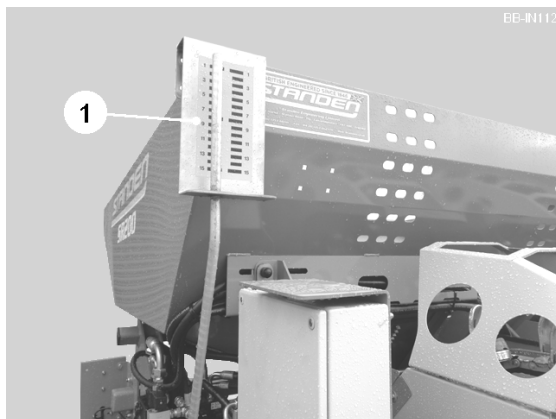


Fig. 17

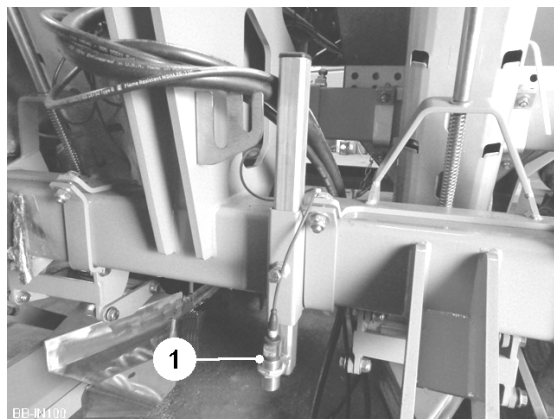


Fig. 18

## Automatic Depth Control (optional)

The depth sensor (item 1, fig. 18) ensures that the desired planting depth is maintained irrespective of the contours of the bed.

For the depth sensor to operate the 'depth sensor fitted' screen should be set to YES. See 'settings 2' in the TOUCH-SCREEN OPERATION section of this handbook.

To set up the planting depth:

1. Position the planter over the bed.
2. Ensure the home screen 'AUTO DEPTH' is OFF.
3. Use the UP / DOWN arrows to manually set the openers (item 2, fig. 10) at the required planting depth.
4. Using - + buttons, set the display to 15.0 cm. This is the middle (zero) point, allowing the depth to be increased by 10 cm or decreased by 10 cm.
5. Loosen the sensor leg, and raise / lower the sensor to 40 cm above the bed (the sensor is preset at the factory to operate at 40 cm).
6. Switch the 'AUTO DEPTH' to ON.
7. Drive forward and check the planting depth.
8. If necessary, alter the planting depth using the - + buttons to make the openers plant shallower (-) or deeper (+).

Example 1:

Changing the display from 15.0 cm to 10.0 cm alters the sensing distance by 5 cm, causing the openers dig shallower by 5 cm.

Example 2:

Changing the display from 15.0 cm to 20.0 cm alters the sensing distance by 5 cm, causing the openers dig deeper by 5 cm.

Depth control dead-band creates a neutral zone either side of the sensing distance which allows the bed to change height without triggering the hydraulic depth rams. This is normally set to 1.5 cm. To alter the dead-band, see 'settings 2' in the TOUCH-SCREEN OPERATION section of this handbook.

Depth control delay provides a time delay between activation of the sensor and actuation of the hydraulic rams. Normally a 3 second delay smoothes out any surface irregularities, allowing the planter to gradually change height according to changes in bed height. To alter the depth control delay, see 'settings 1' in the TOUCH-SCREEN OPERATION section of this handbook.

### **Setting the Seed Spacing (machines with hydraulic space selector)**

To set the seed spacing see 'Setting Up The Control System' in the TOUCH-SCREEN OPERATION section of this handbook.

### **Setting the Seed Spacing (machines with manual space selector)**

The seed spacing is adjusted by changing the ratio of the drive transmission taken from the RH land wheel.

Open the RH land wheel drive guard. Choose the required seed spacing from the sprocket table and select the sprockets indicated. **Note: The values indicated are a guide only. Soil type and inflation of tyres may affect the results.**

To change the seed spacing:

Remove the drive chain (item 1, fig. 18a) by rotating the tensioner (item 2, fig. 18a) to increase slack. If this is difficult, release the tension by loosening the spring anchor (item 3, fig. 18a). Remove the sprocket retaining bolts (item 4, fig. 18a) and slide the sprockets from their shafts. Fit the selected sprockets ensuring they locate on the driving pins (item 1, fig. 18b). When fitting the 18 tooth sprocket, the sprocket boss (item 2, fig. 18b) is not required. When refitting the sprocket boss, or fitting the 18 tooth sprocket, ensure the drive shaft pin (item 3, fig. 18b) engages in the boss. Replace the sprocket retaining bolts (item 4, fig. 18a). Re-fit the drive chain (item 1, fig. 18a) and adjust the tension by repositioning the spring anchor (item 3, fig. 18a).

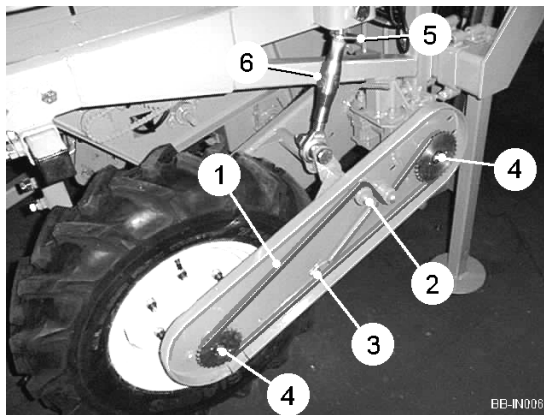


Fig. 18a

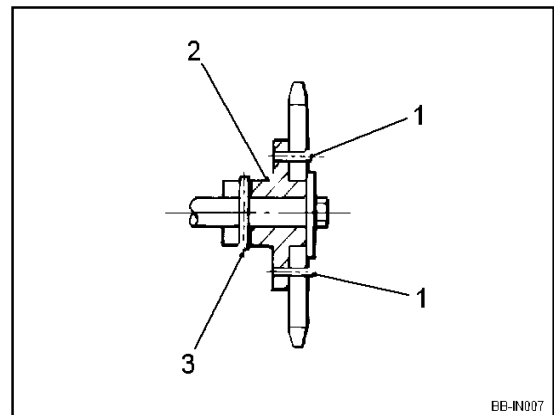


Fig. 18b

## Hillside Axle Kit (optional)

A steerable LH wheel can be fitted to assist in controlling the planter on hillsides etc. The kit consists of a steerable wheel actuated by a hydraulic ram (item 1, fig. 19). The ram is connected to the double acting spool valve on the tractor. A wheel position indicator (item 1, fig. 20) is fitted to assist the operator.

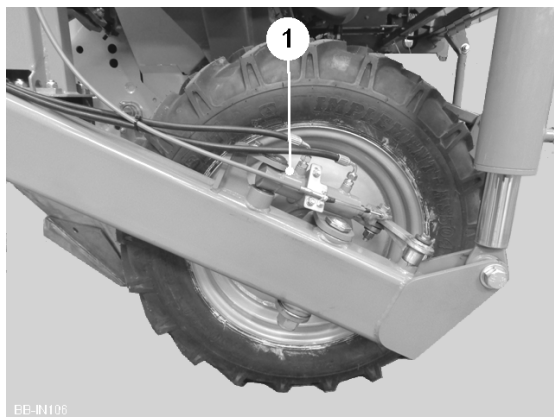


Fig. 19

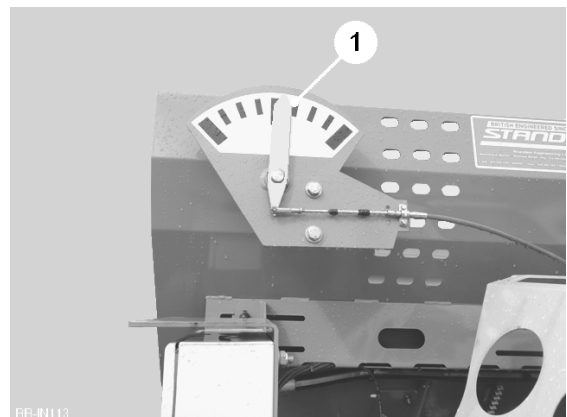


Fig. 20

### 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

Each feed belt drive chain Item 1, fig. 21) is fitted with a plastic tensioner (item 2, fig. 21). This will show rapid wear initially, but will settle down when the chain rollers rather than the side plates come into contact with the plastic.

The automatic space selector drive chain (item 1, fig. 22) is tensioned by loosening the hydraulic motor mounting bolts (x2) and then adjusting the motor adjuster screw (item 2, fig. 22) behind the plate to rotate the motor in the bottom slot. Finally, retighten the bolts.

A suitable chain lubricant should be regularly applied to the drive chains to prevent wear.

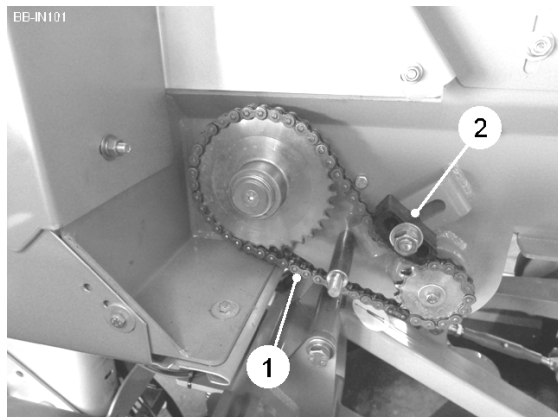


Fig. 21

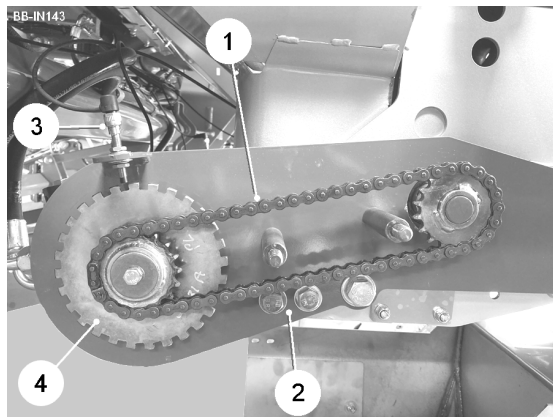


Fig. 22



### **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.

The hydraulic space selector proximity sensors (item 3, fig. 22), one behind the motor guard (shown) and one behind the RH wheel leg guard, are activated by the teeth of the monitor wheels (item 4, fig. 22) 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, power wash the area to be worked on. Dirt must be prevented from entering the system, so any orifices left open, such as pipe ends or ports of motors must be blanked off with a suitable plug. Do not use cloth or rag, as the lint from these can contaminate.

As the tractor supplies the oil for the machine's hydraulics, ensure that the tractor hydraulic system is serviced in accordance with the manufacturer's recommendations to prevent any contamination of the machine's system. To extend the life of the hydraulic components it is important to monitor the condition of the hydraulic oil. Always maintain adequate oil level in the tractor's reservoir.

The pressure filter (item 1, fig. 23) should be replaced after the first 50 hours running time and then every 500 hours or annually thereafter.

To replace the filter element:

1. Lower the planter to the ground. Switch off the tractor engine, 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.

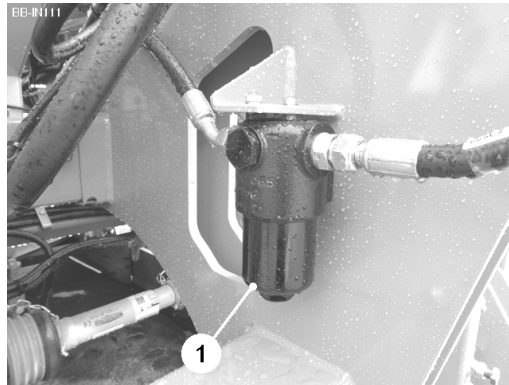


Fig. 23

### Balancing the Depth Control Rams

The two depth rams are linked together by a balancing hose (item 1, fig. 24). The hose diverts oil from the bottom of the large LH ram to the top of the small RH ram and vice versa. In this way, the rams reach open and closed centres at the same time irrespective of the load distribution within the hopper. The circuit between the two rams must contain the correct volume of oil for the rams to operate evenly. The balancing circuit is preset at the factory but after a period of service it may need to be reset due to leakage or replacement of rams and hoses.

To reset the balancing circuit, the following procedure should be followed.



*Remember, hydraulic oil under pressure is dangerous. Take particular care when carrying out maintenance on the hydraulic system.*

1. Raise the planter on the tractor 3-point linkage.
2. Connect a hydraulic hose (item 2, fig. 24) from the tractor spool valve to the balancing circuit 1/8" BSP filler port (item 3, fig. 24).
3. Loosen the pressure hose connections (item 4 & 5, fig. 24) enough to allow oil to escape.
4. Gently operate the tractor spool valve until the RH ram is fully extended and the LH ram is fully retracted, then disconnect the hose from the bleed port and tractor spool.
5. Loosen the filler port (item 3, fig. 24) enough to allow oil to escape and, using the tractor 3-point linkage, gently lower the planter onto its wheels. The excess oil within the balancing circuit will escape through the loosened port.
6. Continue lowering the planter until both rams are fully closed, then retighten the filler port (item 3, fig. 24) to seal the circuit. The balancing circuit now contains the correct volume of oil.
7. Finally, retighten the pressure hose connections (item 4 & 5, fig. 24) and operate the depth control valve five or six times to remove air from the hydraulic system.

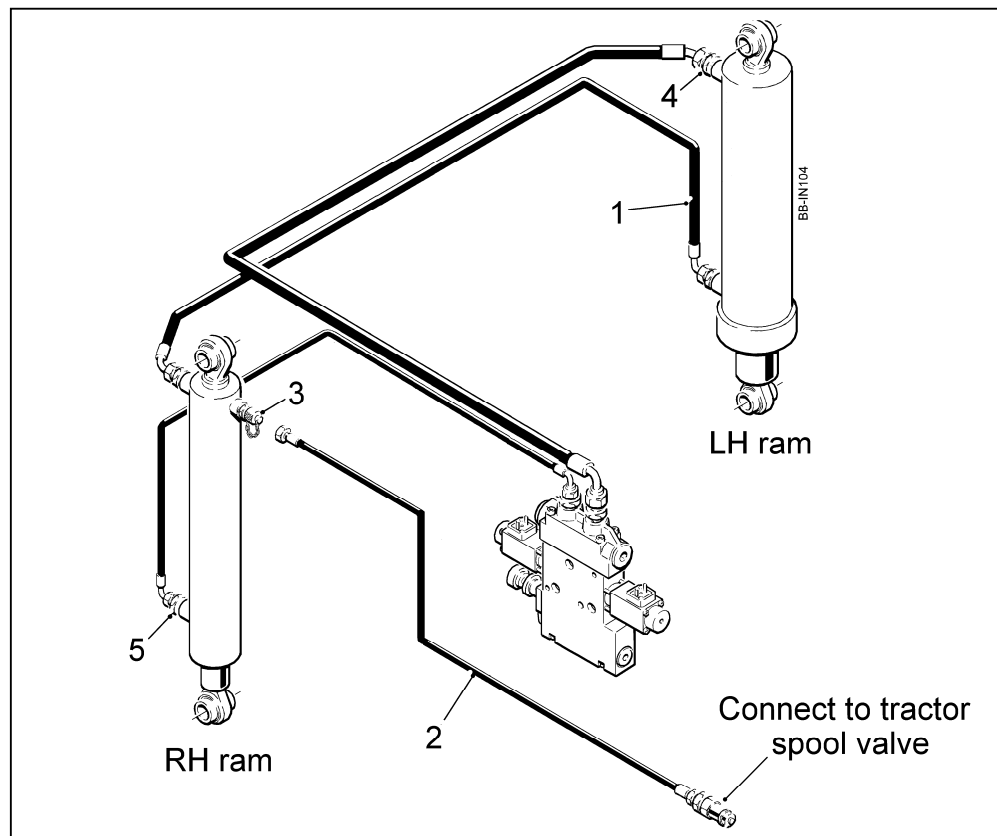


Fig. 24

**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, 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 chains 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 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 control boxes are kept in a safe, dry place and available for use at the commencement of work or for any maintenance to be carried out.
6. 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 (with moulding board)	3.25 m
Width	2.56 m
Height	2.40 m

**Weight**

(with moulding board)	1970 kg (empty)
-----------------------	-----------------

**Technical Data**

Row widths	0.76m to 0.91m (30" to 36")
Seed spacing	**** to ****
Hopper capacity	1500 kg
Tractor Attachment	Lower link CAT 2. Top link CAT 2/3
Tractor power requirement	74.6 Kw (100 bhp) minimum
Oil requirement	60 ltr/min max. (L/S or open centre)
Tyre size (standard)	7.5 x 20 (standard)
Tyre pressure	2.4 Bar (35 psi) maximum

**Nut/bolt torque**

Description	Torque	Description	Torque
M6 nyloc zinc nut	10 lb/ft	M6 bolt/steel nut	7 lb/ft
M8 nyloc zinc nut	23 lb/ft	M8 bolt/steel nut	19 lb/ft
M10 nyloc zinc nut	44 lb/ft	M10 bolt/steel nut	38 lb/ft
M12 nyloc zinc nut	87 lb/ft	M12 bolt/steel nut	70 lb/ft
M16 nyloc zinc nut	208 lb/ft	M16 bolt/steel nut	170 lb/ft
M20 nyloc zinc nut	380 lb/ft	M20 bolt/steel nut	325 lb/ft
M24 nyloc zinc nut	690 lb/ft	M24 bolt/steel nut	565 lb/ft

## Seed Population per Acre

Seed Spacing	2 Row Planter Wheelings (Bed Width)				
	152cm (60")	163cm (64")	173cm (68")	183cm (72")	203cm (80")
13cm (5")	40,840	38,300	36,040	34,040	30,620
14cm (5.5")	37,920	35,560	33,460	31,600	28,440
15cm (6")	35,400	33,200	31,240	29,500	26,540
16cm (6.5")	33,180	31,120	29,280	27,660	24,880
18cm (7")	29,500	27,660	26,020	24,580	22,120
19cm (7.5")	27,940	26,200	24,660	23,280	20,940
20cm (8")	26,540	24,900	23,420	22,120	19,900
22cm (8.5")	24,120	22,620	21,300	20,100	18,600
24cm (9.25")	22,120	20,740	19,520	18,440	16,580
26cm (10")	20,420	19,140	18,020	17,020	15,300
28cm (11")	18,960	17,780	16,720	15,800	14,220
31cm (12")	17,120	16,060	15,100	14,260	12,840
33cm (13")	16,080	15,080	14,200	13,400	12,060
35cm (14")	15,160	14,220	13,380	12,640	11,360
38cm (15")	13,960	13,100	12,320	11,640	10,460
40cm (16")	13,260	12,440	11,700	11,060	9,940
42cm (16.5")	12,640	11,840	11,140	10,520	9,480
44cm (17")	12,060	11,300	10,640	10,040	9,040
46cm (18")	11,540	10,820	10,180	9,620	8,640
51cm (20")	10,410	9,760	9,180	8,680	7,790
53cm (21")	10,020	9,390	8,840	8,350	7,500
56cm (22")	9,480	8,890	8,360	7,900	7,100
59cm (23")	9,000	8,440	7,940	7,500	6,740
61cm (24")	8,700	8,160	7,680	7,250	6,520
65cm (25.5")	8,170	7,660	7,200	6,810	6,110
	or 2 rows at 76cm (30")	or 2 rows at 81cm (32")	or 2 rows at 86cm (34")	or 2 rows at 91cm (36")	or 2 rows at 102cm (40")

BB-IN002



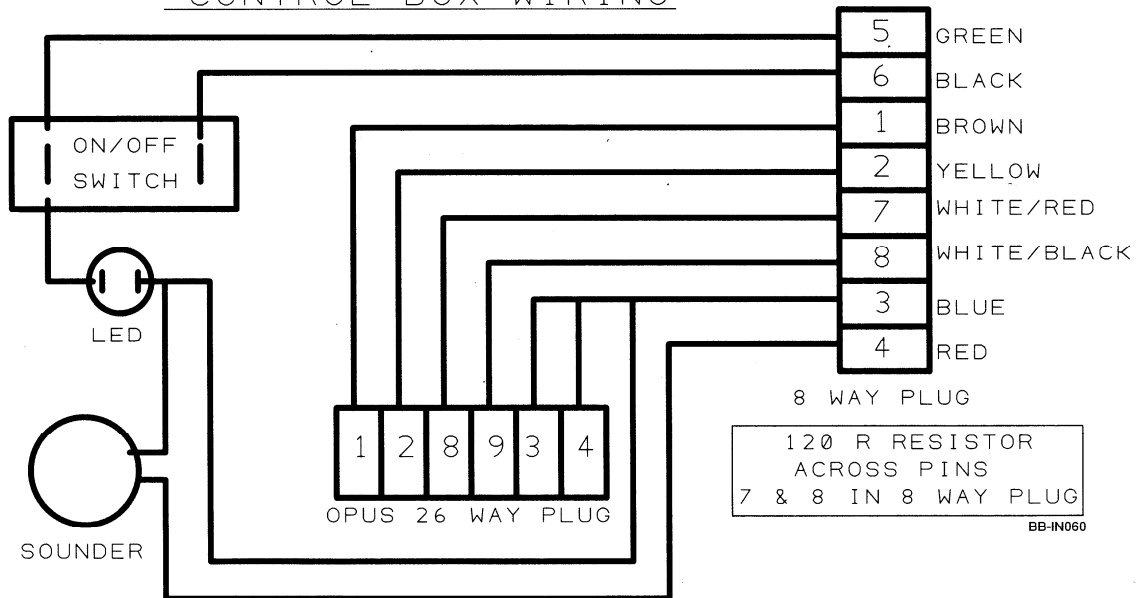
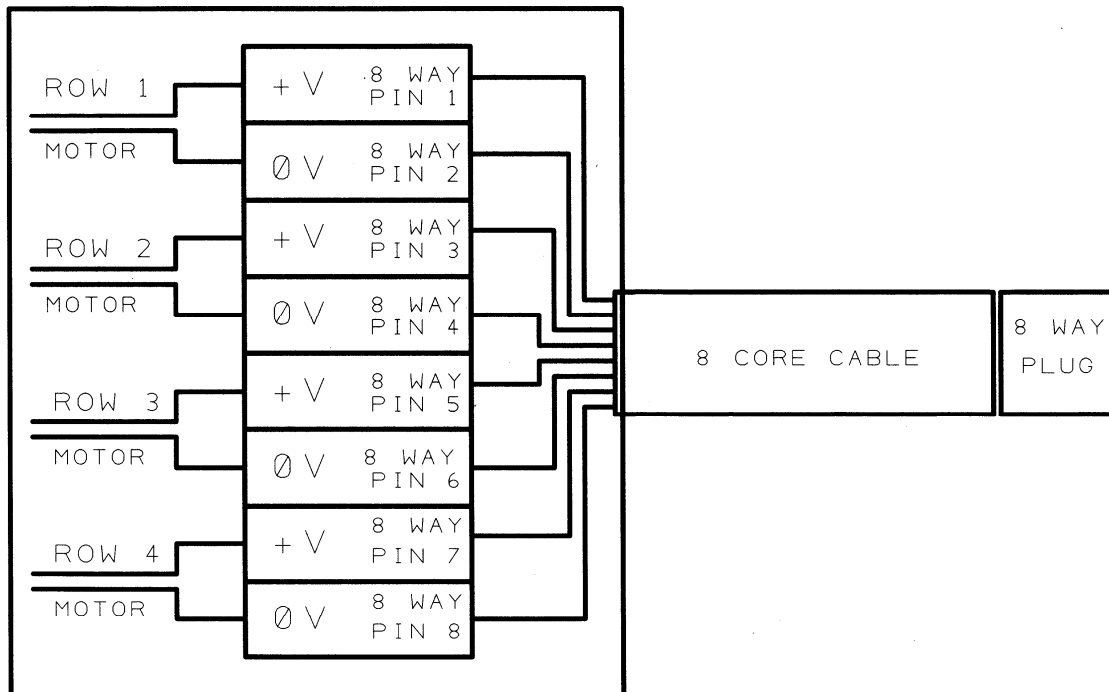


## 8-Way Plug Control Box &amp; Distribution Box

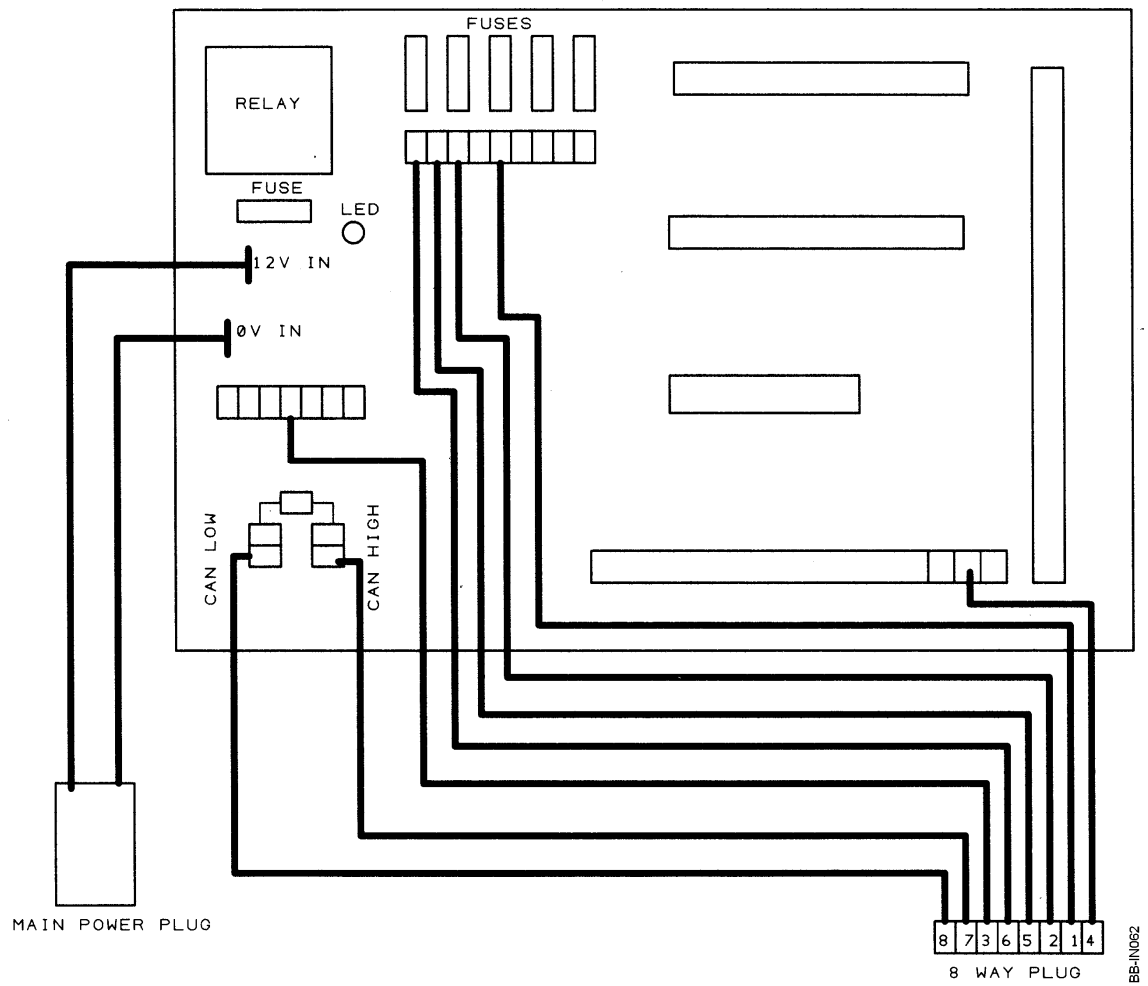
PIN	WIRE COLOUR	FUNCTION	
1	BROWN	12 VOLTS	OPUS PIN 1
2	YELLOW	IGNITION	OPUS PIN 2
3	BLUE	0 VOLTS	OPUS PIN 3-4
4	RED	SOUNDER	
5	GREEN	RETURN FROM SWITCH	
6	BLACK	12V TO SWITCH	
7	WHITE & RED	CAN HIGH	OPUS PIN 8
8	WHITE & BLACK	CAN LOW	OPUS PIN 9
		LINK 7-8 IN C/BOX WITH 120R	
		RESISTOR IN PLUG	
		CUT CABLES @	
	DISTRIBUTION BOX	600MM FROM PLUG REAR	
		HEAT SHRINK 200MM FROM PLUG	
	CONTROL BOX	300MM FROM PLUG REAR	
		solder join to wire from pin 3	
		2 x blue for opus	
		1 x blue to led	
		1 x blue to sounder	

BB-INC59

D HILLS DECEMBER 2018

CONTROL BOX WIRINGJUNCTION BOX

8WAY PLUG WIRING TO BOARD IN DISTRIBUTION BOX



**IN & OUTS ESX-10XP**

**SENSOR INPUTS FROM PLANTER**

**HOPPER BELT SENSORS**

1	2	3	4
BROWN	WHITE	BLACK	BROWN
0V	1	2	3
0V	0V	0V	0V
0V	0V	0V	0V

**SEED MONITOR SENSORS**

1	2	3	4
BROWN	WHITE	BLACK	BROWN
0V	1	2	3
0V	0V	0V	0V
0V	0V	0V	0V

**SPACE SELECTOR SENSORS**

1	2	3	4
BROWN	WHITE	BLACK	BROWN
0V	1	2	3
0V	0V	0V	0V
0V	0V	0V	0V

**DEPTH CONTROL SENSORS**

1	2	3	4
BROWN	WHITE	BLACK	BROWN
0V	1	2	3
0V	0V	0V	0V
0V	0V	0V	0V

**ESX-10XP PIN 1**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	

**ESX-10XP PIN 15**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	

**ESX-10XP PIN 17**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	

**ESX-10XP PIN 18**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	

**ESX-10XP PIN 20**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	

**ESX-10XP PIN 22**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
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## Touch-Screen Control System

The SR SERIES console consists of the touch-screen (item 1, fig 1A), the control system ON/OFF switch (item 2, fig 1A), an optional tunnel shaker switch (item 3, fig 1A), the drives ON/OFF button (item 4, fig. 1A), and the buzzer ON/OFF switch (item 5, fig. 1A).

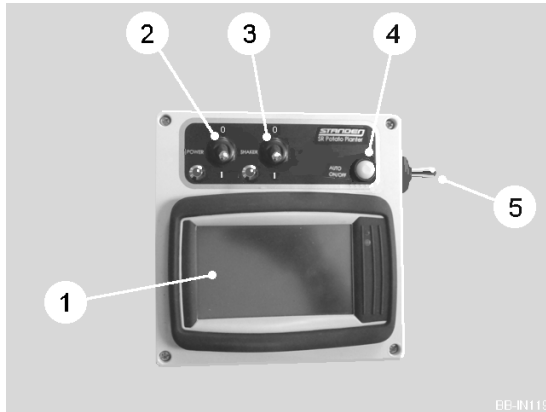


Fig 1A

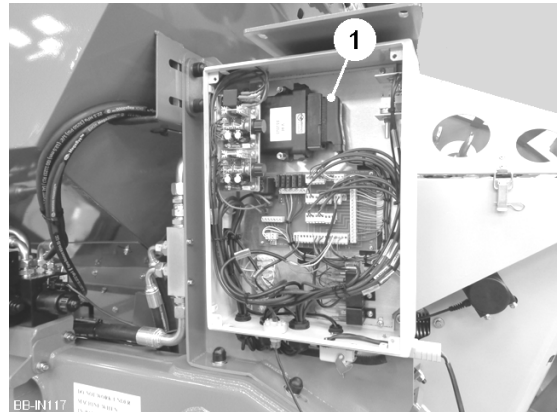


Fig 2A



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



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








### **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 using the switch (item 2, fig 1A). 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. If only 1 row is selected, the RH row will be active. On a 3-row planter, selecting 2 rows will turn the centre row OFF.
4. **Centre Row Reduction (3-row only)**  
Using the yellow arrows, scroll until the 'centre row reduction' screen is displayed (see fig 9A). Using the + and – icons select the percentage reduction. Alternatively, press the digits to display a keypad.
5. Press the icon  for 3 seconds.
6. **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.
7. **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.
8. **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.
9. **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.
10. 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.


**Manual Hydraulic Depth Control (optional)**

On the 'home' screen (see fig 3A) press the UP and DOWN arrows to hydraulically change the seed planting depth. To plant shallower press the UP arrow. To plant deeper press the DOWN arrow.


**Automatic Hydraulic Depth Control (optional)**

Automatic depth control ensures the preset planting depth is maintained irrespective of the contours of the bed. The control system will need to be told that a depth sensor is fitted.




Press the icon  for 3 seconds. Using the yellow arrows, scroll until the 'depth sensor fitted' screen is displayed (see fig 14A). Record YES or NO using the + and – icons.



Press  to return to the 'home' screen (see fig 3A). Using the + and – icons set the desired depth. Alternatively, press the digits to display a keypad and enter the depth. Press 'DONE' to confirm input. Press the 'auto-depth ON / OFF' icon to activate the system. The automatic depth control can be overridden momentarily by pressing the UP and DOWN arrows.


The depth control can be adjusted to set the amount of time (delay) before the depth rams actuate. This helps to smooth out surface irregularities enabling the planter to gradually change depth according to changes in bed height.



To adjust the delay, press the icon  once and, using the yellow arrows, scroll until the 'depth control delay' screen is displayed (see fig 7A). Initially set the delay to 2.0 seconds.

A dead-band zone should be set to allow some movement up and down before activating the depth rams.




To adjust the dead-band, press the icon  for 3 seconds. Using the yellow arrows, scroll until the 'depth control dead-band' screen is displayed (see fig 15A). Using the + and – icons, initially set the dead-band to 1.5cm.

**Seed Warning Delay**


In normal conditions, the seed monitors on the touch-screen will flash indicating potatoes passing the sensors. If there is a blockage the seed monitor for that row will remain illuminated and a buzzer will sound. If the buzzer sounds too frequently without a blockage occurring the delay can be adjusted as follows.



Press the icon  once. Using the yellow arrows, scroll until the 'seed warning delay' screen is displayed (see fig 10A). Increase / decrease the delay using the + and – icons. If required, the buzzer can be switched OFF using the switch (item 4, fig 1A).




## 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.

## Moulding Board Pressure



Press the icon . The moulding board pressure screen will display (see fig 19A).

In manual mode (OFF position), the moulding board will rest on the bed under its own weight (float) and the parallel linkage rams will open and close freely as the mouldboard rises and falls.


In automatic mode (ON position), additional hydraulic pressure is added to the mouldboard by the accumulator and pressure transducer controlled circuit. The operator is able to adjust the target pressure, pressure variance and time delay necessary to ensure a consistent bed is formed. When the actual pressure rises/falls (as the mouldboard rises/falls), the pressure transducer signal causes the hydraulic valve to add or release pressure within the circuit to regain the target pressure. The pressure variance ( $\pm$  % of target pressure) and the time delay (ms) should be set to prevent the circuit from constantly actuating to slight changes in moulding board pressure and height. Initially, set the variance to 10% and the time delay to 500 ms.

## Converting from 3-Rows to 2-Rows

The 3-row planter can be converted to 2-row by deactivating the centre row.

1. Remove the centre opener and the opener leg.
2. Fit the centre row cover plates as shown in the parts book.
3. Fit the correct combination of moulding board / ridgers.



4. Press the icon  once. Using the yellow arrows, scroll until the 'active rows' screen is displayed (see fig 8A). Set to 2-rows.



## Home Screen

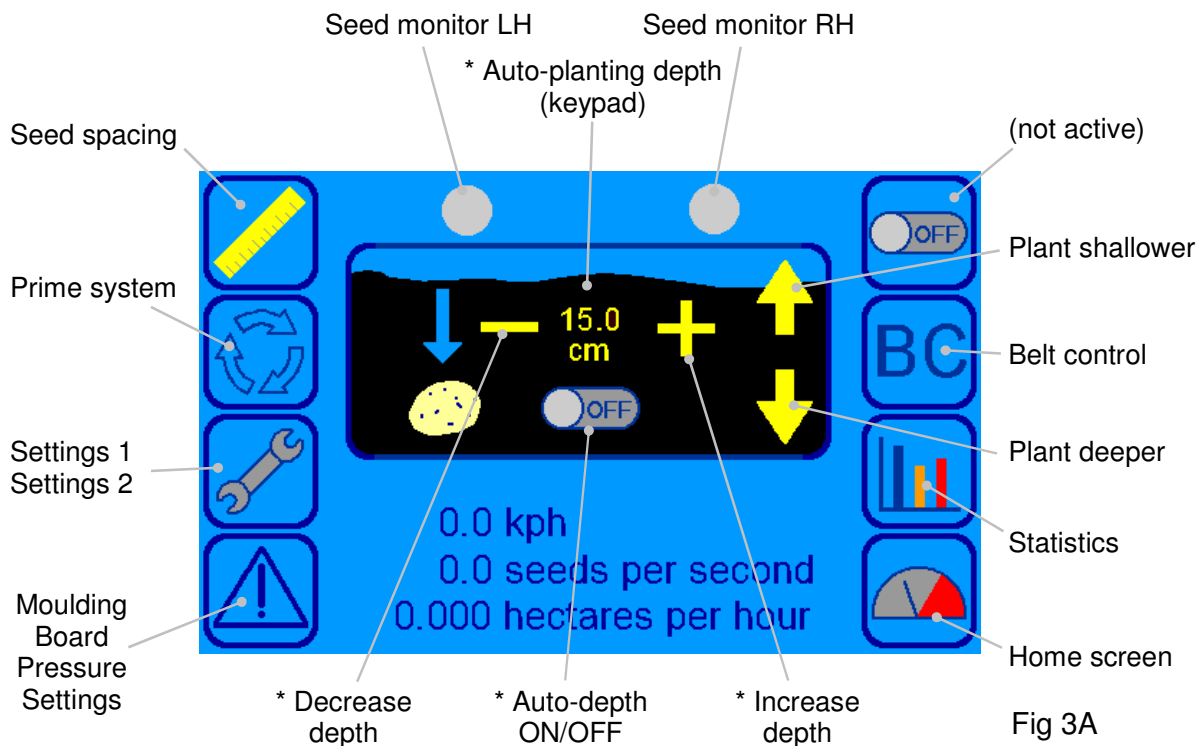


Fig 3A

Note: Icons marked \* displayed only when 'depth sensor fitted' screen is active.



## Seed Spacing Screen

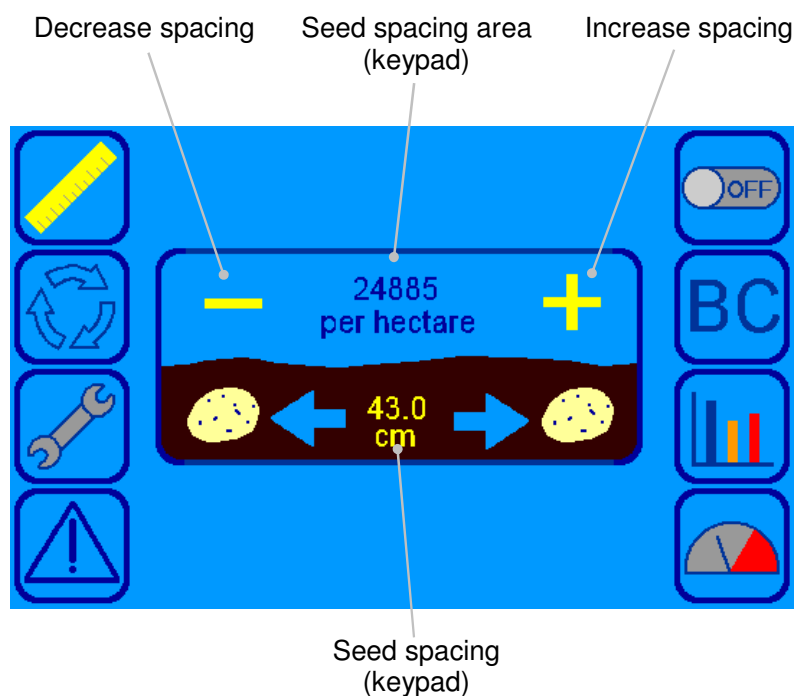
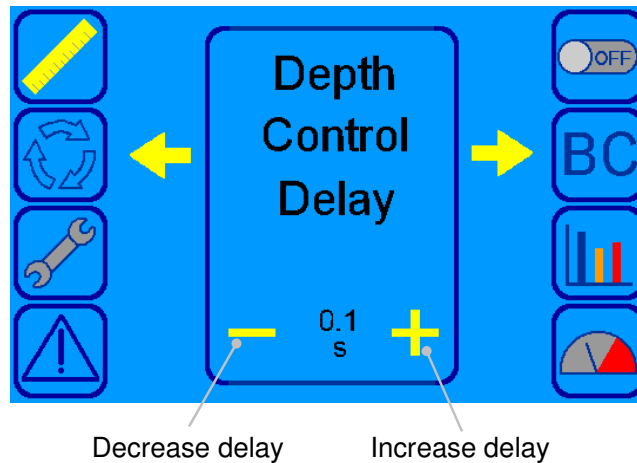
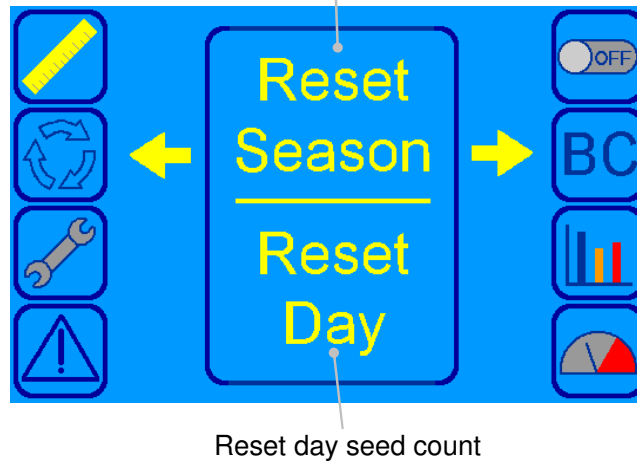
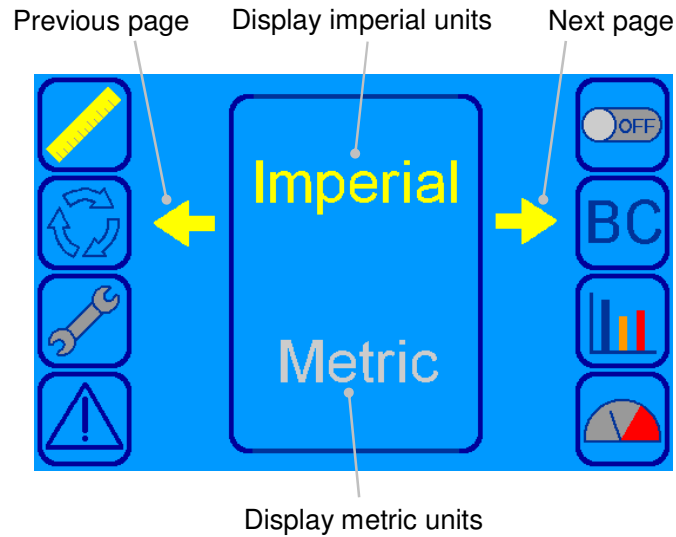
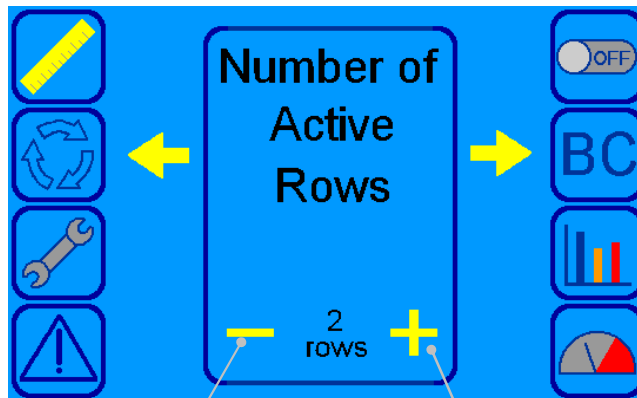


Fig 4A



## Settings 1 (press once)





Decrease rows

Increase rows

Fig 8A

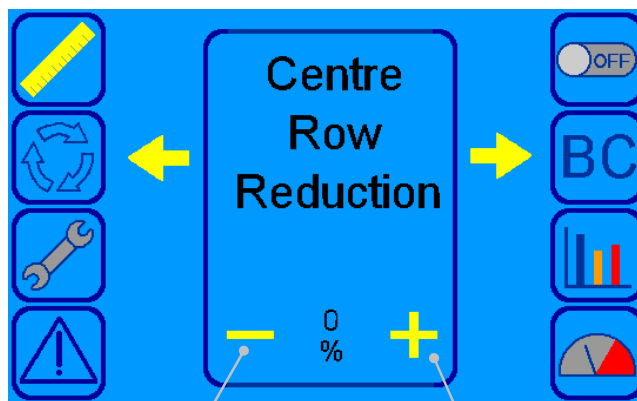
Decrease  
percentageIncrease  
percentage

Fig 9A

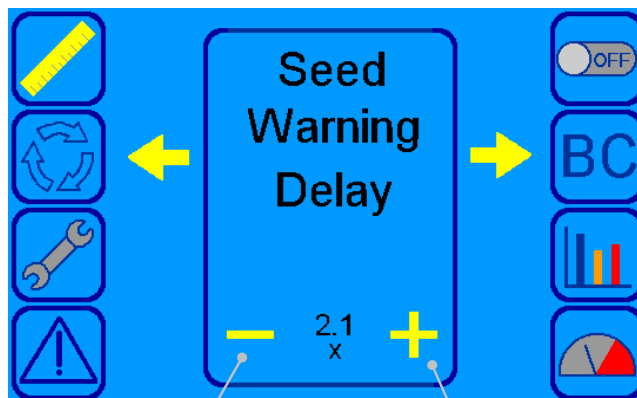
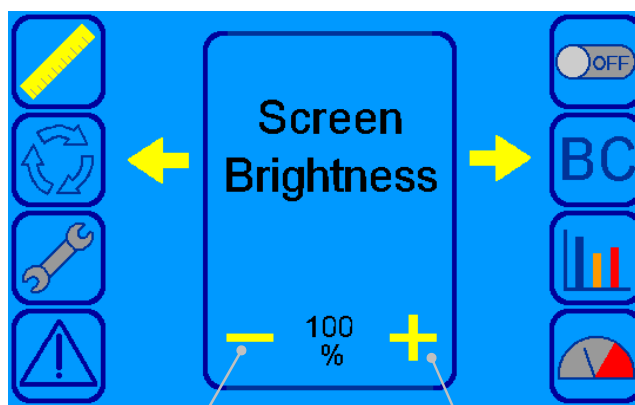
Seed monitor  
decrease delaySeed monitor  
increase delay

Fig 10A



Decrease  
brightness

Increase  
brightness

Fig 11A

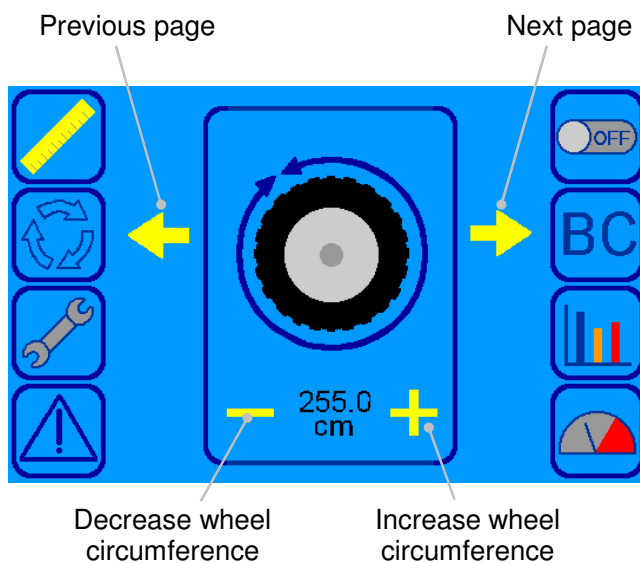
**Settings 2** (press for 3 seconds)

Fig 12A

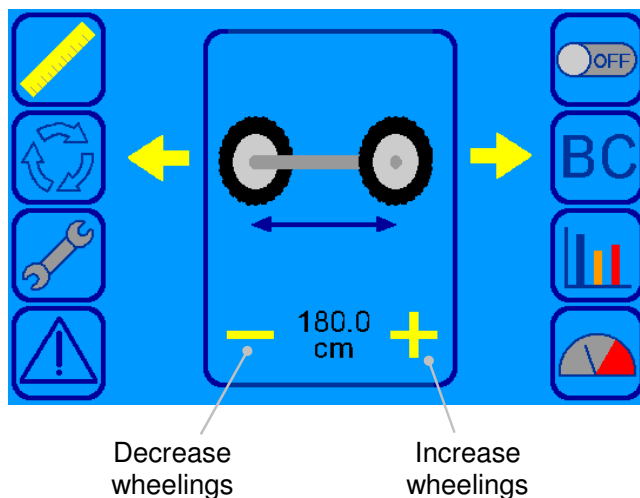


Fig 13A

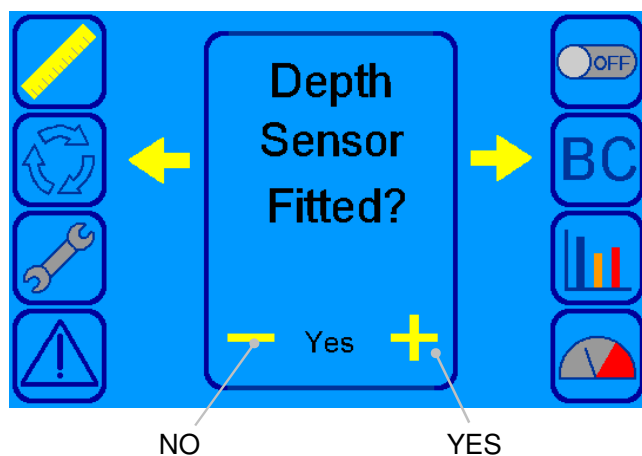


Fig 14A

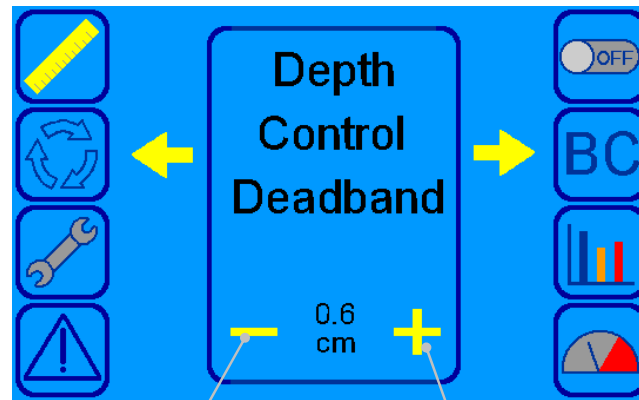


Fig 15A

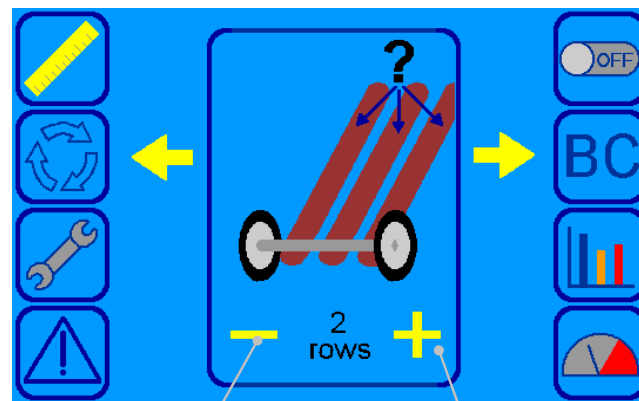


Fig 16A

Decrease row configuration

Increase row configuration



## Belt Control

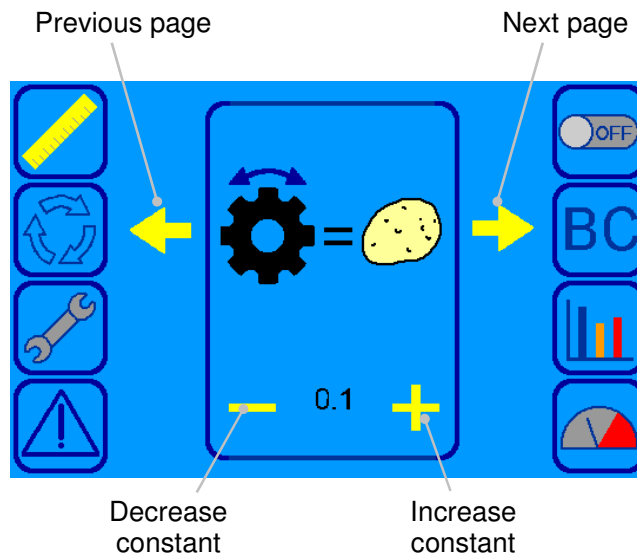


Fig 17A



## 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





## Moulding Board Pressure

Pressure transducer  
signal  
(red = no signal)

OFF = Manual (floating, no hydraulic pressure)  
ON = Automatic (pressure settings active)

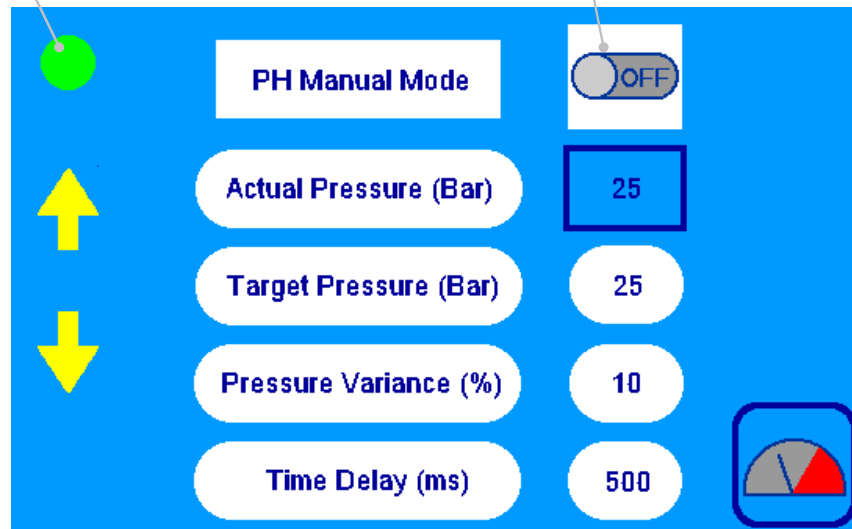


Fig 19A