

# Operator Manual

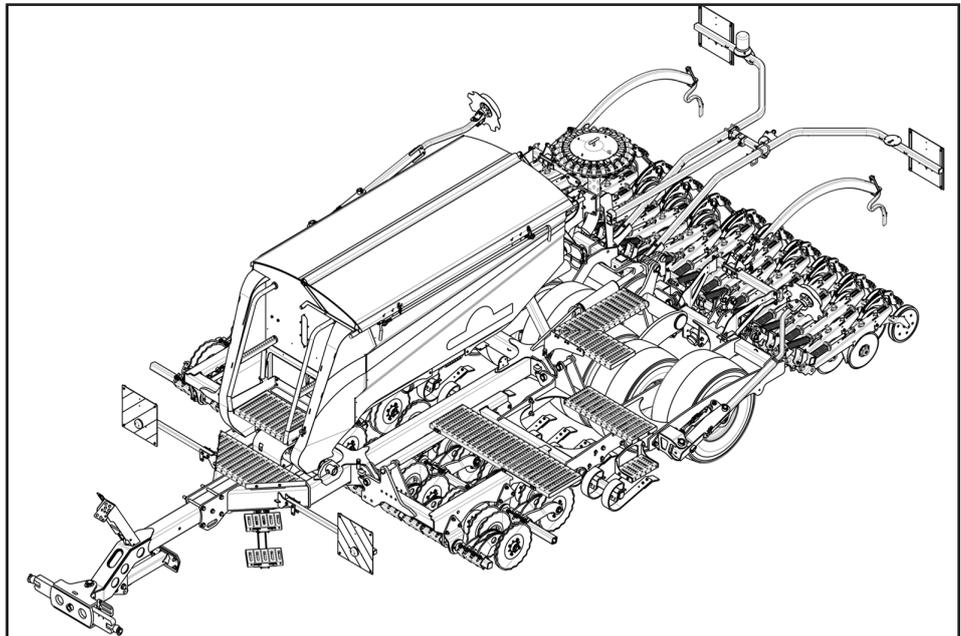
Centurion/Saxon  
3.0m, 4.0m & 6.0m Cultivation Drills

 **Great Plains**

Manufacturing, Inc.  
[www.greatplainsmfg.com](http://www.greatplainsmfg.com)



Read the operators manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!



*Illustrations may show optional equipment not supplied with standard unit.*

ORIGINAL INSTRUCTIONS

© Copyright 2017 Printed 2017-01-25

615-191M-ENG

Revision B

EN

- ENG** If you require a copy of this document in your native language please contact your dealer or Great Plains.
- CZE** Požadujete-li kopii tohoto dokumentu ve svém rodném jazyce, obraťte se prosím na svého prodejce nebo na společnost Great Plains.
- HUN** Ha szeretné ezt a leírást magyarul is megkapni, kérjük, értesítse a forgalmazóját vagy a Great Plains-t.
- FRA** Pour obtenir un exemplaire du présent document dans la langue de votre choix, veuillez contacter votre représentant ou Great Plains.
- LIT** Jei prireiktų šio dokumento kopijos Jūsų gimtąja kalba, kreipkitės į savo platintoją arba į „Great Plains“.
- BUL** Ако ви е необходимо копие на този документ на родния ви език, моля да се обърнете към вашия дилър или към Great Plains.
- RUM** Dacă aveți nevoie de o copie a acestui document în limba dumneavoastră natală vă rugăm să vă contactați dealerul sau Great Plains.
- RUS** Чтобы получить копию данного документа на вашем родном языке, обратитесь к своему дилеру или в компанию «Great Plains»
- GER** Wenn Sie ein Exemplar dieses Dokuments in Ihrer Muttersprache brauchen, dann wenden Sie sich bitte an Ihren Händler oder an die Great Plains.

**DECLARATION OF CONFORMITY**

Great Plains UK Ltd. hereby declare that the **Great Plains Centurion/Saxon**, as defined by the Serial Number attached to the Machine Chassis, conforms with the following Directives and Regulations, and has been certified accordingly.

**EC Machinery Directive 2006/42/EC.**

**The Supply of Machinery (Safety) Regulations 2008.**

The Provision and Use of Work Equipment Regulations 1998.  
Specifically related harmonised standards are:

**EN ISO 12100-1: 2003 (Safety of Machinery).**

**EN ISO 12100-2: 2003 (Safety of Machinery).**

**EN ISO 4254-1: 2009 (Agricultural machinery - Safety - General Requirements).**

THE MANUFACTURER:

Great Plains UK Ltd.  
Woodbridge Road  
SLEAFORD  
Lincolnshire  
NG34 7EW  
England

Telephone (+44) (0)1529 304654.

CERTIFIED ON BEHALF OF GREAT PLAINS UK LTD:



Alan Davies  
Head of UK Engineering



## WARRANTY TERMS AND CONDITIONS

In this warranty Great Plains UK Ltd., is referred to as “the Company”.

1. Subject to the provisions of this warranty the Company warrants each new machine sold by it to be sold free from any defect in material or workmanship for a period of 12 months from date of installation with the end-user.

Some specific items have additional warranty over and above the standard 12 months. Details of these can be obtained upon request directly from the distributor or Great Plains UK Ltd.

2. If the machine or part thereof supplied by the Company is not in accordance with the warranty given in clause 1 the Company will at its option:

- (a) make good the machine or part thereof at the Company's expense, or
- (b) make an allowance to the purchaser against the purchase price of the machine or part thereof, or
- (c) accept the return of the machine and at the buyers option either:
  - I) repay or allow the buyer the invoice price of the machine or part thereof, or
  - II) replace the machine or part thereof as is reasonably practical.

3. This warranty shall not oblige the Company to make any payment in respect of loss of profit or other consequential loss or contingent liability of the Purchaser alleged to arise from any defect in the machine or impose any liability on the Company other than that contained in clause 2.

4. Any claim under this warranty must be notified to the Company in writing specifying the matters complained of within 14 days from the date of repair.

5. Any claim under this warranty must be made by the original purchaser of the machine and is not assignable to any third party.

6. If the purchaser hires out the machine to any third party the warranty shall apply only to matters notified to the Company in writing within 90 days of the date of delivery and clause 1 shall be read as if the period of 90 days were substituted for the period of 12 months.

7. The warranty will cease to apply if:

- (a) any parts not made, supplied or approved in writing by the Company are fitted to the machine or
- (b) any repair is carried out to the machine other than by or with the express written approval of the Company or
- (c) any alterations not expressly authorized by the Company in writing are made to the machine or
- (d) the machine is damaged by accident or
- (e) the machine is abused or overloaded or used for a purpose or load beyond its design capabilities, or used in conjunction with a tractor whose power output capability exceeds the stated implement power requirement by more than 40%. For the purpose of these terms and conditions, “stated implement power requirement” refers to wheeled tractors unless specifically stated. These power requirements should be reduced by 20% when used in conjunction with tracked tractors.
- (f) the machine is operated as part of a ‘cultivation train’ where more than one implement is being towed, without the express written approval of Great Plains UK Ltd.
- (g) any maintenance is not carried out in accordance with the service schedules in the operator's manual.
- (h) the Installation and Warranty Registration Certificate is not received by Great Plains UK Ltd., Service Dept., Woodbridge Road, Sleaford, Lincolnshire, England, NG34 7EW, within 7 days of installing a new machine.

**Machine Identification**

Enter the relevant data in the following list upon acceptance of the machine:

Serial Number	
Type of Machine	
Machine Width	
Year of Construction	
Delivery Date	
First Operation	
Accessories	

**Dealer Address**

Name: \_\_\_\_\_

Street: \_\_\_\_\_

Place: \_\_\_\_\_

Tel.: \_\_\_\_\_

Dealer's Customer No.: \_\_\_\_\_

**Great Plains Address:**

Great Plains UK  
Woodbridge Road Ind. Est.  
Sleaford  
Lincolnshire  
NG34 7EW

Tel.: +44 (0) 1529 304654  
Fax: +44 (0) 1529 413468  
Email: gpuk@greatplainsmfg.com

Great Plains Customer No.: \_\_\_\_\_

**Contents**

Machine Identification.....5

**Introduction**

Foreword.....10  
 Use for the Intended Purpose .....10  
 Warranty Guidelines.....11

**1.0 Safety Data**

1.1 Safety Symbols on the machine.....12  
 1.2 Operational Safety.....14  
 1.3 No Liability for Consequential Damage.....14  
 1.4 Road Traffic Safety.....15  
 1.5 Accident Prevention.....15  
 1.5.1 Hitching-up the machine.....15  
 1.5.2 On the Hydraulic System.....15  
 1.5.3 Changing Equipment.....16  
 1.5.4 During Operation.....16  
 1.6 Servicing & Maintenance.....17  
 1.7 Operating Areas.....18  
 1.8 Authorised Operators.....18  
 1.9 Protective Equipment.....18  
 1.10 Radar Safety.....18  
 1.11 Chemical Safety.....19  
 1.12 Hopper Safety.....19  
 1.13 Tyre Safety.....20  
 1.14 Safety Lights and Devices.....20  
 1.15 Road Traffic Safety.....20  
 1.15.1 Transport Checklist.....20  
 1.16 Shutdown and Storage.....21  
 1.17 Practice Safe Maintenance.....21

**2.0 Transportation and Installation**

2.1 Delivery.....22  
 2.2 Transportation.....22  
 2.3 Installation.....22  
 2.4 Preparation and Setup.....23  
 2.4.1 Initial Setup.....23  
 2.4.2 Seasonal Setup.....23  
 2.4.3 Pre-Drilling Setup.....23  
 2.5 Hitching Tractor to Drill.....24  
 2.6 Hydraulic Hose Hookup.....25  
 2.7 Brake Hook-up.....25  
 2.7.1 Air Brake Hook-up.....26  
 2.7.2 Hydraulic Brake Hook-up.....26

2.7.3 Hydraulic Colour Coding.....	27
2.7.4 Electrical Hook-up.....	27
2.7.5 Beacon Operation.....	27
2.8 Heights and Levelling.....	28
2.9 Checking Drill Height.....	28
2.9.1 Boutmarker Setup.....	28
2.10 Unfolding and Folding.....	29
2.10.1 Unfolding.....	29
2.10.2 Folding.....	30
2.11 Lowering and Raising Drill.....	31
2.11.1 Lowering.....	31
2.11.2 Raising.....	32
2.12 Transporting the Drill.....	33
2.13 Parking the machine.....	34

### 3.0 Technical Data table

#### 4.0 Adjustment/Operation

4.1 Description.....	36
4.2 Operating Instructions.....	37
4.3 Pre-Start Checklist.....	37
4.4 Tongue.....	38
4.5 Track Eradictors.....	38
4.6 Cultivation Section.....	39
4.7 Boutmarkers.....	40
4.7.1 Marker Extension Adjustment.....	40
4.7.2 Boutmarker Disc Adjustment.....	41
4.8 Hopper.....	42
4.8.1 Loading Hopper.....	43
4.8.2 Hopper Cover Operation.....	43
4.9 Fan General Information.....	44
4.9.1 Fan Field Operation.....	44
4.9.2 Fan Speed.....	46
4.9.3 Adjusting Fan Speed.....	47
4.10 Tyre Packer.....	47
4.11 Seeding Elements.....	48
4.11.1 Opener Adjustments.....	48
4.11.2 Opener Spring Adjustment.....	49
4.11.3 Opener Disc Adjustments.....	49
4.11.4 Adjusting Disc Contact.....	50
4.11.5 Opener Disc Scraper Adjustments.....	50
4.11.6 Seed Firmer Adjustments.....	51
4.11.7 Keeton® Seed Firmer Adjustment.....	51
4.11.8 Opener Depth (Press Wheel Height).....	51

4.11.9 Row Unit Down Pressure.....	52
4.11.10 Double-Shoot Fertiliser.....	52
4.12 Following Harrow Adjustment.....	53
4.13 Pre-Emergence Markers.....	53
4.14 Work Instructions.....	53
4.14.1 Driving speed.....	53
4.14.2 Turning.....	53
4.14.3 Wing Pressure.....	53
4.14.4 Setting wing pressure:.....	54
4.15 Checks.....	54
4.16 Adjustment Overview .....	55
4.17 Control Panel.....	56
4.18 Control Panel Operation.....	57
4.18.1 Home Screen.....	57
4.18.2 Work Screen (1/2).....	58
4.18.3 Work Screen (2/2).....	59
4.18.4 Machine Tools Screen.....	60
4.18.5 Weigh System.....	60
4.18.6 Blockage Screens.....	61
4.18.7 Diagnostic Screens.....	61
4.18.8 Config. Screens.....	62
4.18.9 Totals Screens.....	63
4.18.10 Tramline Rhythm.....	64
4.18.11 Digi-Star Weigh System.....	64
4.19 Tramline Rhythms.....	65
4.19.1 3.0m Tramline Rhythms.....	65
4.19.2 4.0m Tramline Rhythms.....	68
4.19.3 6.0m Tramline Rhythms.....	70
4.20 Calibration.....	73
4.20.1 Compressing/Shims.....	74
4.20.2 Meter Disc Selection .....	74
4.21 Screen Map.....	78
4.22 Final Field Checklists.....	80

## 5.0 Servicing and Maintenance

5.1 Servicing.....	82
5.2 Cleaning.....	82
5.3 Preparation for Storage.....	82
5.4 Cultivation Elements.....	83
5.5 Operator Support.....	83
5.6 Maintenance Intervals.....	83
5.7 Maintenance and Lubrication.....	84
5.8 Handling of Lubricants.....	84

---

5.9 Lubricants.....	85
5.10 Maintenance Overview.....	86
5.11 Unloading Materials.....	89
5.11.1 Material Clean-Outs.....	90
5.11.2 Hopper Entry.....	90
5.12 Hydraulic Maintenance.....	91
5.13 Tyre Warranty Information.....	92
5.14 Torque Values Chart .....	92
5.15 Tyre Inflation Chart.....	92
5.16 Brakes & Wheel Hubs.....	93
5.17 End of Season Service/Storage .....	93
<b>6.0 Faults and Remedies</b>	
6.1 General Troubleshooting.....	94
6.2 Brake Troubleshooting .....	97
Index.....	100

# Introduction

## Foreword

Make sure you read and follow the Operating Instructions carefully before using the machine. By doing so, you will avoid accidents, reduce repair costs and downtime and increase the reliability and service life of your machine. Pay attention to the safety instructions!

Great Plains will not accept any responsibility for any damage or malfunctions resulting from failure to comply with the Operating Instructions.

These Operating Instructions will assist you in getting to know your machine and in using it correctly for its intended purposes. First, you are given general instructions in handling the machine. This is followed by sections on servicing, maintenance and the action to be taken should a malfunction occur.

These operating instructions are to be read and followed by all persons working on or with the machine, e.g:

- Operation (including preparation, remedying of faults in the operating sequence and servicing).
- Maintenance (maintenance and inspection)
- Transportation.

Together with the Operating Instructions, you will receive a Spare Parts List. Field service technicians will instruct you in the operation and servicing of your machine. Following this, the Machine Registration form is to be returned to your dealer. This confirms your formal acceptance of the machine. The warranty period begins on the date of delivery.

## Use for the Intended Purpose

The Centurion is built using the latest technology and in accordance with the relevant recognised safety regulations. However, risks of injury for the operator or third parties and impairment of the machine or other tangible assets can arise during use.

The machine is only to be operated when in a technically perfect condition and for the intended purpose, whilst taking into consideration safety and risks and following the Operating Instructions. In particular, faults that can impair safety are to be remedied immediately.

Original parts and accessories from Great Plains have been specially designed for this machine. Spare parts and accessories not supplied by us have not been tested or authorised. Installation or use of non-original Great Plains products may have a detrimental effect on specific design features of the machine. This may affect the safety of machine operators and the machine itself. Great Plains will accept no liability for damage resulting from the use of non-original parts or accessories.

This Great Plains machine is designed solely as a soil engaging implement. Use for any other purpose, e.g., as a means of transport, will be deemed to be improper use. Great Plains will accept no liability for damage resulting from improper use. The risk will be borne solely by the operator.

Use of the machine behind high power tractors (in excess of 40% above the maximum recommended) can lead to high loads and stresses. This can cause long term structural damage to the chassis and key components. Such overloading can compromise safety and is to be avoided.

We reserve the right to alter illustrations as well as technical data and weights contained in these Operating Instructions for the purpose of improving the machine.

## **Warranty Guidelines**

The period of liability for material defects (warranty) relating to our products is 12 months. In the case of written deviations from the statutory provisions, these agreements shall apply.

They shall become effective upon installation of the machine with the end customer. All wear parts are excluded from the warranty.

All warranty claims must be submitted to Great Plains via your dealer.

**1.0 Safety Data**

The following warnings and safety instructions apply to all sections of these Operating Instructions.

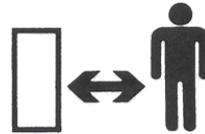


Parts may fly off during operation. Keep a safe distance away from the machine!

**1.1 Safety Symbols on the machine**



Read and observe the Operating Instructions before starting up the machine!



Keep clear of the working range of foldable machine components!



Watch out for escaping pressurised fluids! Follow the instructions in the Operating Instructions!



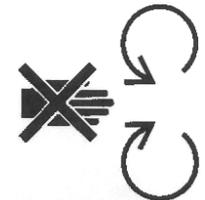
No passengers are allowed on the machine!



Never reach into areas where there is a danger of being crushed by moving parts!



Never reach into any revolving parts!

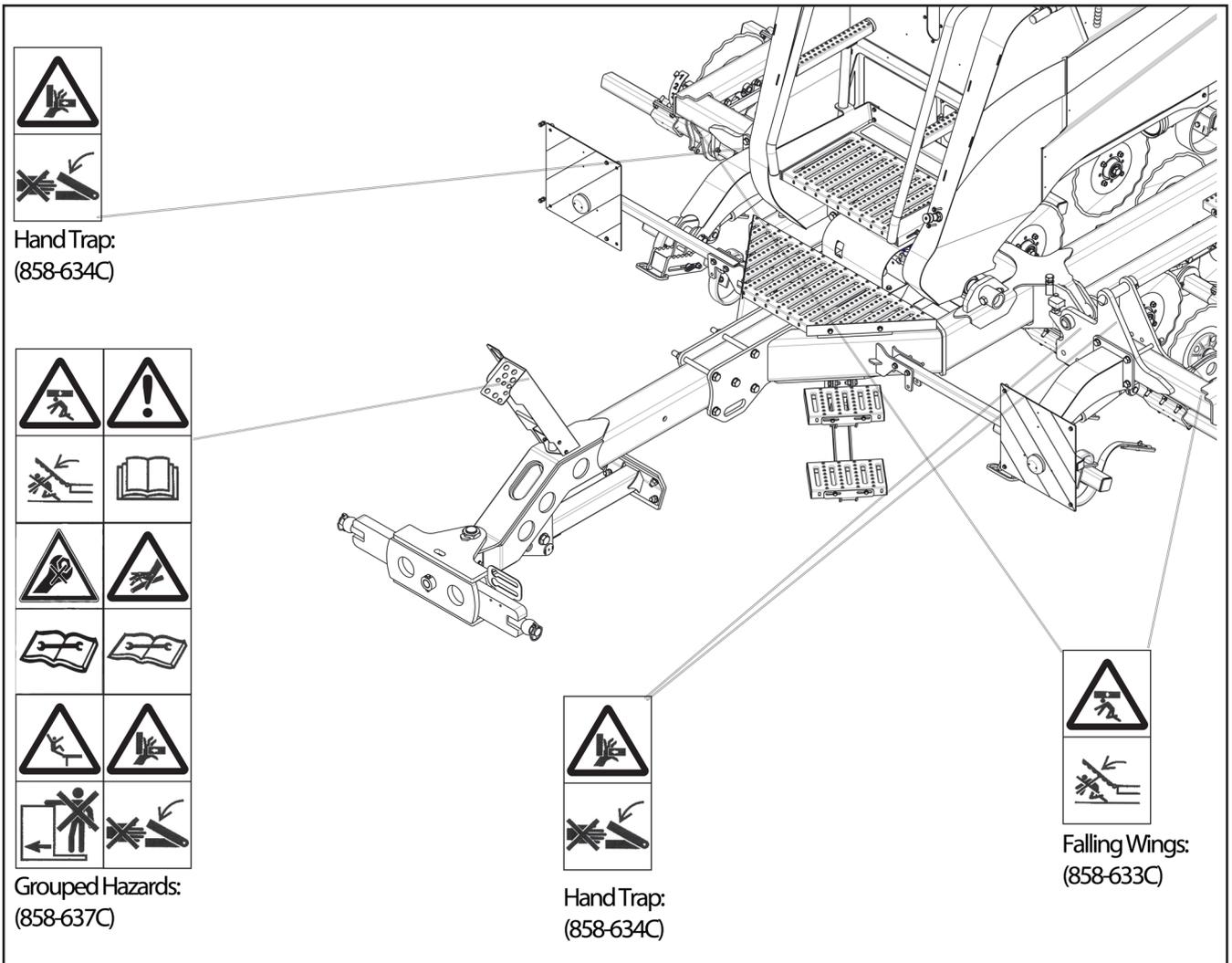




Refer to Operating Instructions before attempting maintenance.



The below image outlines where the safety decals appear on the machine and the part numbers to quote should replacements be required.



## Operating Instructions:

The Operating Instructions distinguish between three different types of warning and safety instructions. The following graphic symbols are used:



Important!



Risk of injury!



Risk of fatal and serious injuries!

It is important that all the safety instructions contained in these Operating Instructions and all the warning signs on the machine are read carefully.

Ensure that the warning signs are legible and replace any signs that are missing or damaged.

These instructions must be followed in order to prevent accidents. Inform other users of the warnings and safety instructions.

Do not carry out any operations which may affect safe use of the machine.

All references to left and right in this manual are made from the rear of the machine, facing the direction of travel (unless otherwise stated).

## 1.2 Operational Safety

The machine is to be put in operation only after instruction has been provided by an employee of the authorised dealer or an employee of Great Plains. The “Machine Registration” form is to be completed and returned to your dealer.

All protective and safety equipment, such as removable protective equipment, must be in place and functioning reliably before the machine is put in use.



**Check screws and bolts regularly for tightness and retighten if necessary.**



**In the event of malfunctions, stop and secure the machine immediately.**



**Ensure that any faults are remedied immediately.**

## 1.3 No Liability for Consequential Damage

The machine has been manufactured with great care. However, problems may still occur when it is used for the intended purpose. These may include:

- Worn wearing parts.
- Damage caused by external factors.
- Incorrect driving speeds.
- Incorrect setting of the unit (incorrect attachment, non-adherence to the Setting instructions).



**Therefore, it is crucial to always check your machine before and during operation for correct operation and adequate application accuracy.**

Compensation claims for damage which has not occurred to the machine is excluded. This includes any consequential damage resulting from incorrect operation.

### 1.4 Road Traffic Safety

When driving on public roads, tracks and areas, it is important to observe the relevant road traffic laws as well as the specific regulations relating to this machine.



**Pay attention to the permitted axle loads, tyre carrying capacity, and total weight in order to maintain adequate braking and steerability (these figures are shown on the serial plate).**



**Passengers on the machine are strictly forbidden!**



**Max. road transport speed 16mph (25km/h).**

### 1.5 Accident Prevention

In addition to the Operating Instructions, it is important to observe the accident prevention regulations specified by agricultural trade associations. It is the Operator's responsibility to ensure that all other persons are excluded from the danger zones surrounding or on the machine during its operation.

It is the Owner's responsibility to ensure:

- The Operator is trained and competent to use the machine & tractor,
- The tractor is suitable for the machine

- Adequate Risk and COSHH assessments have been undertaken regarding the machine's use. Specifically, these include issues concerning contact with the soil, dust, crop residues, chemicals, lubricants and other compounds during operation or maintenance, and the possibility of stones being ejected at high speed during work.



**Beware of trapping hazards when manipulating the parking stands or other moving parts. Ensure any heavy components are fully supported when removing pins/bolts.**

#### 1.5.1 Hitching-up the machine

There is a risk of injury when hitching/unhitching the machine. Observe the following:

- Secure the machine against rolling.
- Take special care when reversing the tractor!
- There is a risk of being crushed between the machine and the tractor!
- Park the machine on firm, level ground.

#### 1.5.2 On the Hydraulic System

Do not connect the hydraulic lines to the tractor until both hydraulic systems (machine and tractor) are depressurised.



Any hydraulic system containing an accumulator can remain under pressure permanently (even after following manual depressurisation procedures with a tractor/implement combination). It is therefore important to check all lines, pipes, and screw connections regularly for leaks and any recognisable external damage.



The hydraulic circuit contains specialised fittings which should not be tampered with under any circumstances. Do not attempt to modify hose routings or hose clamping arrangements, doing so may cause serious damage to the machine and/or injury.

Only use appropriate aids when checking for leaks. Repair any damage immediately. Spurting oil can cause injuries and fires!

In case of injury, contact a doctor immediately.

The socket and plugs for the hydraulic connections between the tractor and the machine should be colour-coded in order to avoid incorrect use.

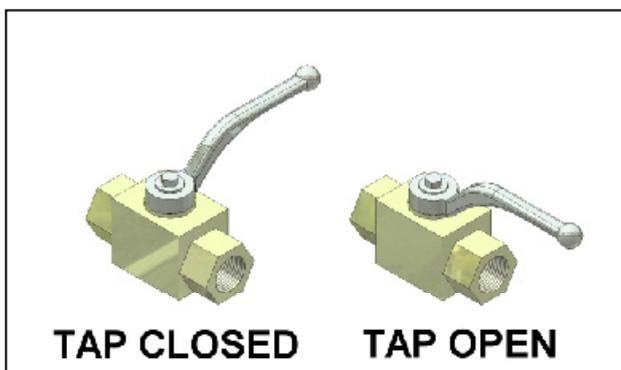


Figure. 1. Hydraulic Taps

### 1.5.3 Changing Equipment

- Secure the machine to prevent it from accidentally rolling away!
- Use suitable supports to secure any raised frame sections suspended above you!
- Caution! Risk of injury due to projecting parts!



Never climb on to rotating parts such as the roll unit. These parts may rotate causing you to slip and suffer serious injury!



Removing components during maintenance may affect the stability of the machine. Ensure it is fully supported in case of unexpected weight shifts.

### 1.5.4 During Operation

Ensure that the working range and the area around the machine are clear (children!) before operating the machine.

Always ensure adequate visibility!

Do not stand on the machine while it is in operation!

Operators must have a valid driving licence in order to drive on public roads. In the operating area, the operator is responsible for third parties.

The person in charge must:

- Provide the operator with a copy of the Operating Instructions, and ensure that the operator has read and understood the instructions.

- Make sure that the operator is aware of the specific regulations relating to the machine when driving on public roads.

## **1.6 Servicing & Maintenance**

Ensure that regular checks and inspections are always carried out within the periods required by law or specified in these Operating Instructions.

When carrying out service and maintenance work always:

- Switch off the tractor engine and remove the ignition key.
- Wait until all the machine parts have stopped moving.
- Depressurise the hydraulic system.

Many hydraulic circuits contain lock or overcentre valves which can retain pressure in the lines even after depressurising the tractor side of these circuits. If in doubt, consult trained personnel (such as your local Great Plains Dealer) to ensure such valves are depressurised to the correct procedure before removing or servicing any parts connected downstream of these valves.

Check all hydraulic lines for leaks, loose connections, chafe marks and damage. Remedy any deficiencies immediately! Pay particular attention to hose renewal intervals as outlined in the specific sections which follow. ALL hydraulic hoses have a safe maximum working life of 6 (SIX) years from date of installation, provided they remain in a safe condition. Hoses which exceed 6 years of age should be replaced, or inspected and certified by a suitably qualified person to have an extended life period which should be recorded.

Pay particular attention to those items which require specialist service tools or training to be carried out by qualified personnel. Do not attempt to service these items yourself! These include items retaining pressure (e.g. accumulator circuits), or force (e.g. spring tines), and DD Rolls of any type.

Prior to performing maintenance and servicing work, ensure that the machine is positioned on solid, level ground and is secured to prevent it rolling away. Do not use any parts to climb on to the machine unless they are specifically designed for this purpose.

Before cleaning the machine with water, steam jets (high-pressure cleaning apparatus) or other cleaning agents, cover all openings into which, for reasons of safety or operation, no water, steam or cleaning agents are to penetrate (bearings, for instance).

Lubricate all the lubricating points to force out any trapped water.

When carrying out servicing and maintenance work, retighten any loose screw connections.

When servicing the machine take precautions against soil, dust, seed coatings, oil or any other hazardous substances that you might encounter.

On a new machine tighten all nuts and bolts after 5 hours work and again after 15 hours. This also applies to parts that have been moved or replaced. After the initial 15 hours of work a once a week check should be sufficient depending on daily work rates.

## 1.7 Operating Areas

The operating areas include the drawbar, hydraulic connections and depth adjustment equipment as well as all operating points requiring maintenance.

All operating areas will be specified and described in detail in the following chapters on servicing and maintenance.

Observe all safety regulations included in the section dealing with Safety, and in the subsequent sections.

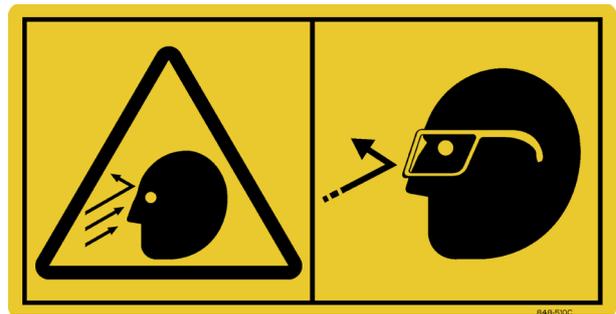
## 1.8 Authorised Operators

Only those persons who have been authorised and instructed by the operator may operate the machine. The operator must be at least 16 years of age.

## 1.9 Protective Equipment

For operation and maintenance:

- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.
- Wear protective clothing and equipment.
- Wear strong protective gloves (to provide protection against sharp-edged machine components).
- Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.
- Wear protective goggles to protect eyes from dirt, debris or flying objects.



- Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.
- Because operating equipment safely requires your full attention, avoid wearing entertainment headphones while operating machinery.

## 1.10 Radar Safety

The Radar is an intentional radiator of RF energy. Although its radiated energy level is far below the limits set by EN 61010-1:199A2:1995 Chapter 12.4, it is advisable not to look directly into the face of the unit.



The radar must radiate toward the ground and at least 20 cm (8 inches) away from a human during use to comply with the RF human exposure limits as called out in FCC 47 CFR Sec.2.1091. DO NOT RE-MOUNT OR USE THE RADAR IN A MANNER INCONSISTENT WITH ITS DEFINED USE.

1.11 Chemical Safety



Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.

Do not use liquid seed treatments with the Machine .

Read and follow chemical manufacturer’s instructions.

Wear protective clothing / gloves when handling chemicals.

1.12 Hopper Safety

A hopper that is full or merely appears full can be an entrapment hazard. You can sink entirely into the material, or into an oxygen-deficient void, and suffocate in a matter of seconds. Bridges and crusts are especially dangerous.

Do not enter a hopper for material loading, material unloading, hopper cleaning or meter maintenance.



Perform meter maintenance by removing meters from bottom of empty hopper.

Only use the steps / walkways on the machine for hopper filling, do not climb on any other parts of the machine.



### 1.13 Tyre Safety

Tyre changing can be dangerous and should be performed by trained personnel using correct tools and equipment.

When inflating tyres, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tyre assembly. Use a safety cage if available. When removing and installing wheels, use wheel-handling equipment adequate for the weight involved.

### 1.14 Safety Lights and Devices

Slow-moving tractors and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.

Use flashing warning lights and turn signals whenever driving on public roads. Use lights and devices provided with implement.

### 1.15 Road Traffic Safety

When driving on public roads, tracks and areas, it is important to observe the relevant local road traffic laws as well as the specific regulations relating to this machine.

Pay attention to the permitted axle loads, tyre carrying capacity, and total weight in order to maintain adequate braking and steerability.

Passengers on the machine are strictly forbidden!

Maximum transport speed for implement is 25kph or 16mph. Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions under Technical Data on page 35.

Do not fold or unfold the drill while the tractor is moving.

#### 1.15.1 Transport Checklist

- Plan the route. Keep clearances in mind.
- Ensure hydraulic, electrical and braking connections are secure.
- Close and secure hopper cover.
- Check that boutmarkers are stowed. If unfolded, fold and lock. See “Folding” on page 30.
- Always have lights (including the rear beacon) on for highway operation.
- Comply with all national, regional and local safety laws when travelling on public roads.
- Release all ‘parking’ brakes and travel with caution.

## 1.16 Shutdown and Storage

- Unfold and lower drill.
- Store drill in an area where children normally do not play.

## 1.17 Practice Safe Maintenance

- Understand procedures before commencing work. Use proper tools and equipment. Refer to this manual. For brake work, see specific information on page 93.
- Work in a clean, dry area.
- Unfold and lower the drill, put the tractor in park, turn off engine, and remove key before performing maintenance. If work must be performed with implement raised, raise machine fully and engage maintenance locks then lower machine onto locks. See 2.11.2 page 32. Lock in position with taps and support with axle stands as a safety precaution.
- Make sure all moving parts have stopped and all system pressure is relieved.



- Allow drill to cool completely.
- Disconnect battery ground cable (-) before servicing or adjusting electrical systems.
- Welding: Disconnect battery ground. Protect hydraulic lines. Avoid fumes from heated paint.
- Inspect all parts. Make sure parts are in good condition and installed properly.
- Remove buildup of grease, oil or debris.
- Remove all tools and unused parts from drill before operation.

## 2.0 Transportation and Installation

Transportation and initial installation of the machine are described in this chapter.

### 2.1 Delivery

The machine is normally delivered, fully assembled.

- The machine should be hitched to a tractor and driven off a low-loader.

### 2.2 Transportation

The Machine can be transported on public roads by hitching it up to a tractor or on a low-loader.

- It is important to observe the permitted dimensions and weights when transporting the machine.
- If the machine is transported on a trailer or a low-loader, it must be secured using straps or other devices.
- Before transporting the machine on public roads, it must be adjusted to its transportation position and the stipulations relating to road transportation fulfilled.



**The transportation width can vary according to the adjustment of working parts (eg. discs, roll, etc). It may be necessary to adjust these elements in order to achieve the minimum transport width.**



**Adjustments, including the attachment of transport devices, should be made at ground level; lowering the machine may be necessary to achieve this.**

- The maximum permissible speed is (16mph) 25 km/h.

### 2.3 Installation

When carrying out installation and maintenance work there is a higher risk of injury. It is important that you familiarise yourself with the machine and read the Operating Instructions beforehand.

Operator instruction and initial installation of the machine are carried out by our service technicians or authorised distributors.

The machine must not be used in any way beforehand! The machine can only be released for operation after instructions have been provided by our service technicians or authorised distributors.

- If any modules or parts have been removed for transportation, these shall be mounted by our service technicians/authorised dealers before the instruction takes place.
- Check all important screw connections
- Lubricate all nipples and joints
- Check all hydraulic connections and lines for damage

## 2.4 Preparation and Setup

This section helps you prepare your tractor and Machine for use, and covers seasonal tasks, and tasks when the tractor/ drill configuration changes. Before using the machine in the field, you must hitch the drill to a suitable tractor, inspect systems and level the drill. Before using the drill for the first time, and periodically thereafter, certain adjustments and calibrations are required.

### 2.4.1 Initial Setup

- Install the monitor console in the tractor cab.



**Mount the console so that it is easy to monitor during planting, but does not interfere with safe operation of the tractor in the field or on public roads.**

- Set boutmarker extension (page 40).

### 2.4.2 Seasonal Setup

On initial delivery, use with a new tractor, and seasonally, check and as necessary, complete these items before continuing to the routine setup items:

- Wing levelling and alignment.
- Speed sensor calibration.
- Half width calibration and function.
- Blow out entire air system to remove condensation. Check air flow at each row, for evidence of plugging.
- De-grease exposed cylinder rods if so protected at last storage.

### 2.4.3 Pre-Drilling Setup

Complete this checklist before routine setup:

- Read and understand “Safety Information” section starting on page 12.
- Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
- Check that all grease fittings are in place and lubricated. See “Maintenance and Lubrication” on page 84.
- Check that all safety decals and reflectors are correctly located and legible. Replace if damaged.
- Inflate tyres to pressure recommended and tighten wheel bolts as specified. See “Tyre Inflation Chart” on page 92.

## 2.5 Hitching Tractor to Drill



**You may be severely injured or killed by being crushed between the tractor and drill. Do not stand or place any part of your body inbetween drill and moving tractor. Stop tractor engine and set tractor parking brake before attaching cable and hoses.**

1. Back up the tractor to align tractor link arms and drill linkage.
2. Engage the link arms and the drill linkage, ensuring the balls are seated correctly.
3. Raise the link arms / linkage and move the parking stand into the work position.
4. Shut down tractor and remove key.
5. Connect hydraulic hoses (page 25).
6. Connect brake hoses (page 26).
7. Connect electrical cables (page 27).

## 2.6 Hydraulic Hose Hookup



Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, **NOT BODY PARTS**, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

Only trained personnel should work on system hydraulics!

Great Plains hydraulic hoses are colour coded to help you hook-up hoses to your tractor outlets. Hoses that go to the same remote valve have the same colour handles.

The fan pressure hose (black) must be connected to a circuit capable of continuous flow at high volume.

To distinguish hoses on the same hydraulic circuit, refer to the number of cable ties on each hose. Case Drain hose has 3x cable ties and the return "SUMP" hose has 2x cable ties.

Low Pressure (Case) Drain Connection: Attach case drain hose to low pressure drain connection in order to protect fan hydraulic motor seals.

Connect low pressure motor return hose, ("SUMP") to a high volume low pressure return port. The sump line is distinguished by a 3/4 in. BSP connector.

For the hydraulic fan, connect the hose with a retracted cylinder symbol to the pressure side of the motor.

The fan motor further requires hook-up of a (third) case drain line, which returns lubricating/cooling fluid.

## 2.7 Brake Hook-up

Two braking (trailer braking) systems are available for the Centurion/Saxon; a dual-line air system, and single-line hydraulic system. In both systems, the tractor's trailer brake remote port(s) operate a hydraulic slave cylinder on the drill. Tractor trailer braking systems are normally integrated with the tractor brakes, and operate the trailer brakes when tractor brakes are used during tractor movement. The trailer braking system may or may not be integrated with the tractor parking brake system. Trailer brakes typically are not automatically engaged when the tractor transmission is in Park, and may not be engaged by any tractor Emergency Brake.



**Make sure the operator understands when the drill brakes are engaged and when they are released.**

Also understand and comply with tractor operational restrictions when trailer brakes are used. For example, it is generally necessary to inter-tie split brakes, and avoid differential (steering braking) if trailer brakes are used.

### 2.7.1 Air Brake Hook-up

Please refer to the following procedure when coupling or decoupling any item of Great Plains machinery fitted with an AIR brake or AIR and HYDRAULIC brake system. Please note that this procedure does not apply to any machines fitted with a HYDRAULIC system ONLY.

#### When Coupling:

1. Reverse up to the machine and connect the machine to the tractor as instructed to on page 24.
2. With the machine connected couple the air lines. When coupling ensure the yellow line is attached first followed by the red line.
3. Your brake hoses are now attached and are ready for operation.
4. Following coupling, ensure machine handbrake is fully disengaged.

#### When De-coupling:

1. Bring the machine to the parking position as instructed to on page 34.
2. Prior to de-coupling ensure handbrake is fully engaged.
3. With the machine still connected to the tractor remove the red brake line followed by the yellow line.
4. Your brakes will now be ON and will hold, ensuring they have been adjusted and maintained correctly, the machine in position. (note: if the machine's tank is drained of air once all lines have been detached the brakes will come off (same situation as pushing the shunt valve).

5. Continue de-coupling the machine until it is fully disconnected.



**By following these instructions you will see that at NO point in the coupling or decoupling process has the red line been left in the tractor on its own. This is intentional and should be considered the 'rule' to coupling the hoses.**



**Do not use the Machine with a "single-line" air brake system. This drill is designed for transport speeds that require an air brake system to be "dual-line". A single line tractor system cannot charge the tank that powers the drill brakes.**

### 2.7.2 Hydraulic Brake Hook-up

This is a single hydraulic line, connected to the tractor "Brake" outlet. This has a female connector.



Figure 2. Brake Connection Hose

### 2.7.3 Hydraulic Colour Coding

The hydraulic Hoses are colour coded using cable ties to identify the different circuits. Hoses with 1 tie indicates the cylinder side of the circuit while hoses with 2 ties indicate the rod side.

CDA			
Tag	Marking	Function	Tractor SCV
1	Red	Raise	Double acting
2		Lower	
1	Yellow	Wing unfold	
2		Wing fold	
1	Black	Hydraulic fan	Single acting with priority
2		Tank return	High flow low pressure
3	Black	Case drain (600,400)	ZERO pressure return
1		Memory cylinder down	Double acting
2	Memory cylinder raise		
1	Orange	Levelling board lower	Double acting
2		Levelling board raise	

### 2.7.4 Electrical Hook-up

Make sure the tractor is shut down with accessory power off before making connections.

1. Mate lighting connector to tractor outlet.
2. Mate monitor connector to tractor harness.
3. Mate any optional or after-market electrical connectors.

Make connections prior to drill movement. Some drill hydraulic circuits are under monitor control.

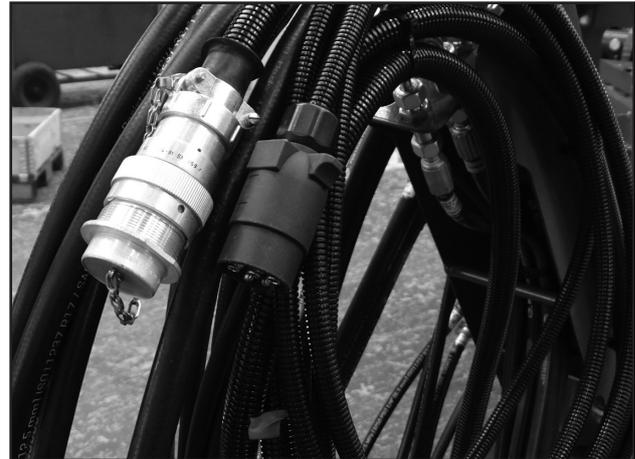


Figure 3. Electrical Connections

### 2.7.5 Beacon Operation

The flash strobe beacon should be on in all instances when the machine is being transported or used. It is part of the main light circuit and is on when the lights are on.

## 2.8 Heights and Levelling

All frame sections must be at the correct height and level to maintain even seeding depth. The hitch height sets the main frame level, and must be at a consistent height to both maintain level, and maintain radar speed calibration.

Periodic frame-levelling adjustments should not be necessary. If you are having problems with uneven depth, level drill if necessary.

To ensure consistent seeding depth the frame should be set level while planting. Failure to do so may result in implement not producing desired results.

## 2.9 Checking Drill Height

The implement frame should be level with the ground during seeding, this will allow the openers to operate at their most consistent drilling depth.

Your crop, soil conditions, disc wear and other factors may create a need to use a different toolbar height.

Cultivation disc and levelling board height is controlled hydraulically ahead of the tyre packer. On machines fitted with the weigh cell option, wing weight transfer is controlled automatically. The pressure can be monitored using the upper gauge at the front of the machine.

On Machines without the weigh cell option refer to section 4.14.4 page 54 for instructions on setting the wing pressure.

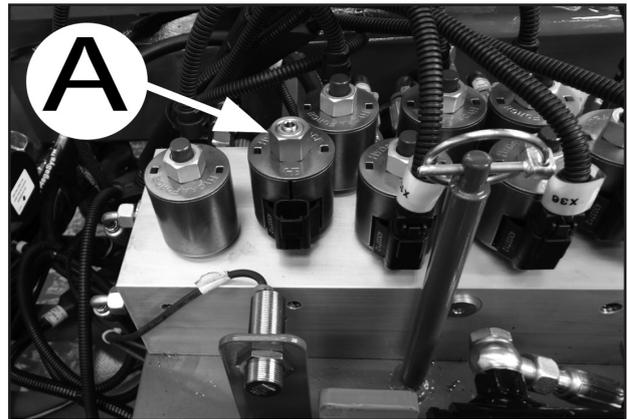


Figure 4. Wing pressure valve.

When checking toolbar height:

1. Move the drill to representative seeding soil conditions.
2. Set linkage height.
3. Lower and unfold the implement (page 29).
4. Pull forward 10 metres or so to put openers in the ground.
5. Check toolbar height across drill.

### 2.9.1 Boutmarker Setup

Prior to first use the marker extension should be set or reviewed. See “Boutmarker Adjustments” on page 40.

Prior to each seeding session, check and adjust “Boutmarker Disc Adjustment” on page 41.

## 2.10 Unfolding and Folding

Unfold and fold implement only if fold hydraulics are bled free of air and fully charged with hydraulic oil. Keep away and keep others away when unfolding or folding.

Keep clear of overhead power lines when unfolding, operating, folding or transporting the drill. Machine is not earthed. At higher voltages, electrocution can occur without direct contact. Any line voltage present on implement, cart or tractor can cause severe injury or death.

Keep people away from the drill and tractor during folding. Risks include pinching or crushing at pivot points and at multiple sites in pivoting assemblies.

Ensure that wing lock is engaged correctly. If a hydraulic failure occurs, or hydraulic levers are moved, unlocked wings could fall suddenly causing a major road accident, or crushing anything near the wings, resulting in death or serious injury, and property damage.

Do not use tyres as steps or platforms. All tyres can be in light ground contact, or free to spin, when implement is lowered. Fold only on hard level ground. If parked across a slope, wing lock bars could be difficult or impossible to engage or release.



**Working elements of the drill must be fully raised during the folding and un-folding.**

### 2.10.1 Unfolding

These steps presume a drill folded for transport, such as at initial delivery. Follow the detailed instructions below until this is a familiar operation.

1. Move the drill to level ground with adequate overhead and lateral clearances for the fold operation.
2. Ensure the machine is lifted on the transport axle and front hitch,
3. Ensure that the working elements are raised.
4. Disengage the wing lock.

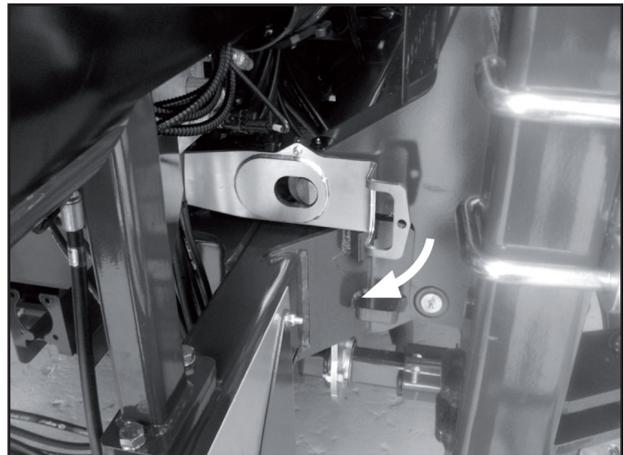


Figure 5. Wing Lock

4. Press the “Fold” key on the control panel to select the fold circuit. The tractor spools can then be used to fold/ unfold the wings. One wing may reach the ground before the other. It is not uncommon for the folding to be slightly non-symmetrical.

### 2.10.2 Folding

Fold the drill for moves between fields, transport over public roads, parking and storage.

Follow the detailed instructions below until this is a familiar operation.

1. Make sure boutmarkers are fully folded.
2. Move the drill to level ground with adequate overhead and lateral clearances for the fold operation.
3. Activate the lift circuit using the 'road transport button on' the lift circuit. Retract the lift cylinders to raise drill fully. Lock using taps. Ensure the front hitch is fully raised.
4. Activate the fold circuit on the control panel to retract the fold cylinders.

One wing may reach the stop before the other. A slight asymmetry is not uncommon in folding.

5. Ensure that the wing lock engages correctly.



**Working elements of the drill must be fully raised during folding and un-folding.**

## 2.11 Lowering and Raising Drill

This section refers to the lowering and raising of the entire drill using the lift axle cylinders.

Stay clear of wings and openers during lowering and raising. Wings are extremely heavy and are driven down with hydraulic pressure. Disc blades and opener discs are sharp. During lowering, openers will cut or crush anything beneath them, and can cause serious injury or death.

Park on level ground. Do not lower whilst any folding or unfolding operations are under way or partially complete. Openers can dig in or drag on ground and be damaged.

### 2.11.1 Lowering

Check that maintenance locks are installed on wheel lift cylinders and lifted and locked out of use.

The drill should be raised before folding and unfolding (ensure that the working elements are still raised).

Make sure all persons are clear of opener sections.

The drill is lowered by selecting the 'road transport' button on the control panel and operating the tractor spool.



**Do not stand in front of transport tyres when opening taps. Ensure lift mode is not activated when opening taps.**



**Do not stand on tyres. Wheels may turn suddenly and without warning if used as a step resulting in serious injury,**

### 2.11.2 Raising



The working elements should be raised for folding and un-folding. If lowered, the working elements on the inside of the wings drag or dig sideways during fold/unfold, and damage is likely.



Always fully raise the cultivation section/row unit for tight turns and reverse/backing operations. Backing with openers lowered may cause damage to openers. Tight turns with openers lowered may damage openers near the turn centre.

Verify that all persons are safely clear of implement sections.

After folding the machine, press the 'road transport' button on the control panel. This will activate the circuit allowing the machine to be raised / lowered on the transport wheels using the tractor spools. The cylinders can then be locked using the taps (see Figure 7). The cylinders should be retracted fully for road transport before locking with taps.



Figure 6. Lock in maintenance position



Figure 7. Lock in work/Disengaged position

The mechanical locks can be used to provide a locked transport/service height. As a safety precaution in case of a loss of hydraulic pressure.

The machine should be transported at full lift height. This provides adequate clearance under the machine.

### 2.12 Transporting the Drill



Tractor must weigh at least 67% of the drill as towed. Ensure that the towing vehicle is adequate for the task. Using an inadequate tow vehicle is extremely unsafe, and can result in loss of control, serious injury and death. See technical table on page 35. Do not tow if drill exceeds the load rating of the vehicle.



Check bridge loads and plan routes accordingly. A loaded drill can exceed the load ratings of bridges you must cross.



Maximum transport speed is 25 kph (16 mph) at all times, and lower with a lighter tractor. Excess speed can result in loss of control or inability to stop. Reduce speeds with materials loaded, or if road conditions are less than ideal.



Ensure the wing lock is engaged when the wings are folded.



Inflate tyres to factory specifications. Tighten wheel nuts to specifications. Underinflated tyres or loose nuts can cause loss of control. Overinflated tyres or over-tightened nuts can fail suddenly and cause loss of control. Loss of control can cause a major accident resulting in death, injury and equipment damage.



Check lights and reflectors regularly. Replace bulbs and faded/worn/missing decals as required. Use lights in transport. These features are critical to visibility, particularly with other drivers unfamiliar with farm equipment or not expecting to encounter a slow-moving vehicle. Front lights should be moved into the road transport position.



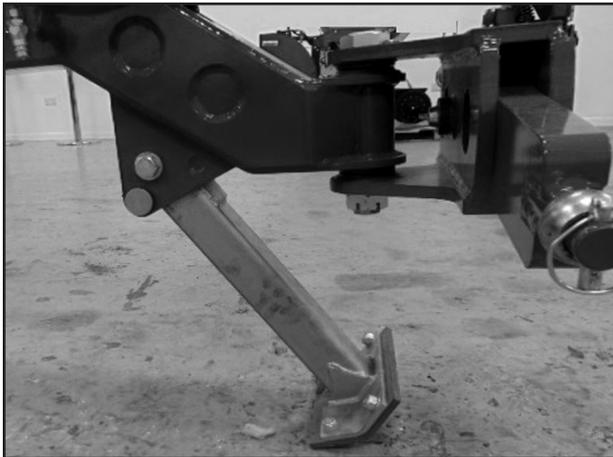
Figure 8. Front lights in road transportation position.

### 2.13 Parking the machine

In order to avoid damage as a result of moisture, the machine should be parked, if possible, indoors or under cover.

When manoeuvring the machine, pay attention to your surroundings. Ensure that nobody is in the manoeuvring area (watch for children!).

1. Park the machine on level and solid ground.
2. Lower the machine onto the parking stand /transport wheels ensuring that it is stable. Ensure pin is fitted correctly.
3. Uncouple the machine from the tractor link arms.
4. Switch off the tractor and remove key.
5. Uncouple the hydraulic hoses and electrical / brake connectors.



*Figure 9. Parking stand in 'park' position.*

**3.0 Technical Data table**

	<b>3,0m</b>	<b>4,0m</b>	<b>6,0m</b>
<b>Working Width</b>	3000mm	4000mm	6000mm
<b>Transport Width</b>	2980mm	2980mm	2980mm
<b>Transport Height</b>	2960mm	2960mm	3767mm
<b>Transport Length</b>	8800mm	8800mm	8800mm
<b>Weight</b>	5000kg	6600kg	9500kg
<b>Hopper Capacity</b>	3000 litres	3000/4000 litres	3000/4000 litres
<b>Tractor Power req.*</b>	110-260 HP	150-260 HP	225-400 HP

\* It is important to correctly match your implement to your tractor for optimum performance.

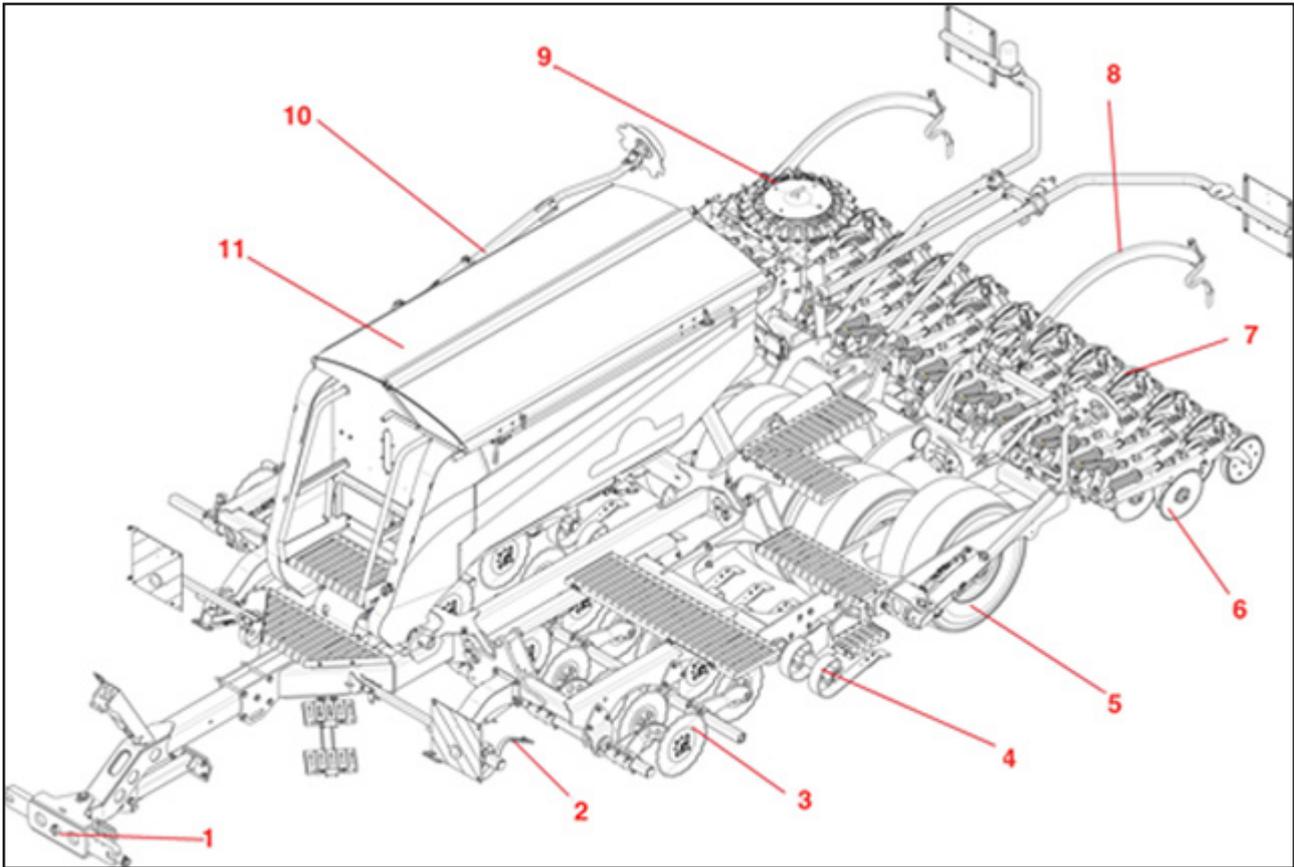
**4.0 Adjustment/Operation****4.1 Description**

Figure 10. Great Plains Centurion

1. Front Linkage
2. Track Eradicators
3. Cultivation Discs
4. Levelling Board
5. Tyre Packer
6. Disc Coulters
7. Following Harrow
8. Pre-Emergence Marker
9. Seed Towers
10. Boutmarker
11. Hopper

Designed to set new standards in productivity, efficiency and operating economy, the Centurion/Saxon incorporates a host of innovative features alongside proven technologies. The result is a disc-based cultivator drill, ideally suited to min-till and plough-based establishment systems, that delivers superb drilling accuracy, consistent seed placement and reliable depth control across a wide range of soil types and conditions. The Centurion is born out of the time proven Great Plains 'Science of Seeding' philosophy that provides uniform emergence and optimum yield.

## 4.2 Operating Instructions

This section covers general operating procedures. Experience, machine familiarity, and the following information will lead to efficient operation and good working habits. Always operate farm machinery with safety in mind.

To get full performance from your machine, you need an understanding of all component operations, and many provide adjustments for optimal field results.

Even if your seeding conditions rarely change, some of these items need periodic adjustment due to normal wear.

## 4.3 Pre-Start Checklist

Perform the following steps before transporting the Machine to the field.

Check all hydraulic lines and fittings before applying pressure.



**Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If an accident occurs, seek immediate medical assistance from a health care provider familiar with this type of injury.**

- Review “Safety Information” section starting on page 12.
- Lubricate as indicated at “Maintenance and Lubrication” on page 84.
- Check all tyres for proper inflation. See “Tyre Inflation Chart” on page 92.
- Check all bolts, pins, and fasteners. Torque as shown in “Torque Values Chart” on page 92.
- Check drill for worn or damaged parts. Repair or replace parts before going to the field.
- Check hydraulic hoses, fittings, and cylinders for leaks. Repair or replace before going to the field.

#### 4.4 Tongue

The Machine is fitted with a Category 3 or 4 cross-shaft linkage at the front of the machine.

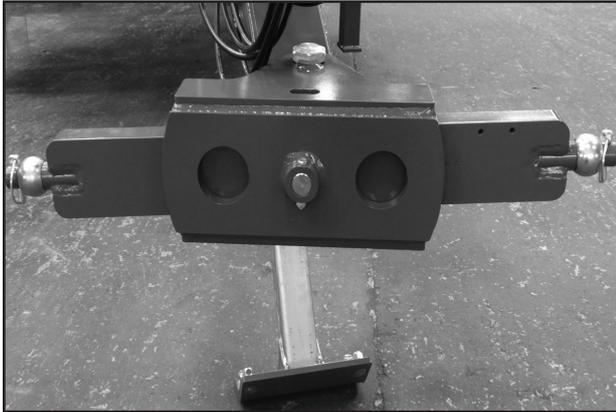


Figure 11. Drawbar w/cross-shaft linkage.

#### 4.5 Track Eradicators

The track eradicators are mounted on a hydraulically controlled beam allowing them to be moved to follow the tractor wheels. Each tine is sprung, allowing it to 'trip' over any stones or other obstructions in work to avoid damage.

The depth of the track eradicators can be adjusted by removing the pin and moving the notched profile up or down in the mounting bracket before refitting the pin.

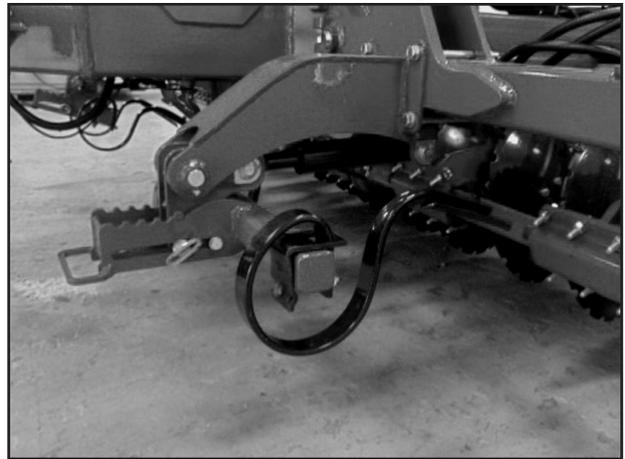


Figure 12. Track eradicators in raised position.



Figure 13. Track eradicators in work position.

### 4.6 Cultivation Section

The Machine features two rows of cultivation discs which chop and mix the crop residue. A disc spacing of 250mm ensures a fine tilth.

Soil deflectors are mounted at the end of the wings to hold soil within the machine width.

Independent 'on the-move' height adjustment of cultivating discs/levelling board is possible.

Cultivation section depth settings are controlled using memory cylinders. These hydraulic cylinders work by shortening the cylinder stroke to achieve the cultivation depth the user requires.

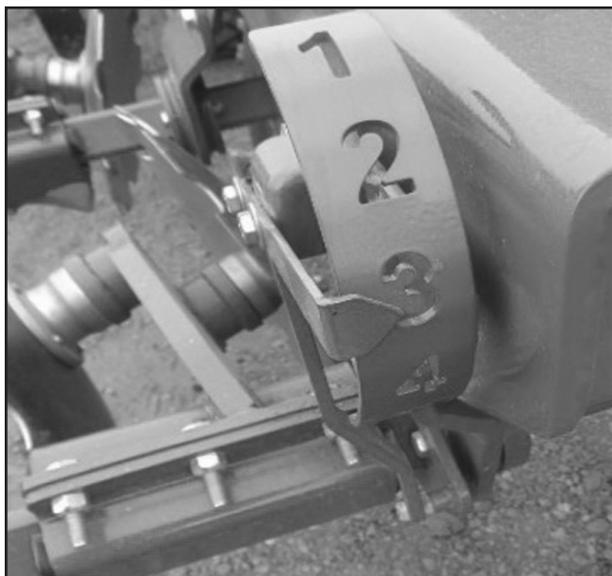


Figure 14. Levelling Boards

### Notched Cultivation Discs

These 460mm notched cultivation discs feature maintenance-free sealed hubs and rubber mounts to provide shock absorption.

### Turbo Coulters

The turbo design allows the blade flute to attack the residue vertically, providing improved cutting and penetration with decreased hairpinning. The Disc spacings are dependent on your specified row spacings of either 125mm or 167mm as they run in line with the opener.

## 4.7 Boutmarkers

At delivery, marker extension is typically set for shipment (arm fully retracted), and needs to be reset for field. Marker extension needs to be checked periodically thereafter, and needs to be checked and adjusted when:

- machine depth is changed,
- marker disc angle is changed, or;
- marker disc throw direction is changed.

Measure marker extension in representative field conditions, with openers in ground, after adjusting cultivation section height (page 39) and wing weight transfer (if applicable). If openers are not at planting depth when setting extension, the bout gap will be too large during planting.

Marker extension is measured on the ground, from the centre-line of the outside opener unit to the disc mark.

The marker extension is simply one half the span (distance between end openers) plus a bout gap of one opener space.

### 4.7.1 Marker Extension Adjustment

There are 2 designs of boutmarker, each have a different way of adjusting the length. Please ensure you check the style on your machine before performing any adjustments.

The following instructions refer to a design found on early 2015 4.0m models.

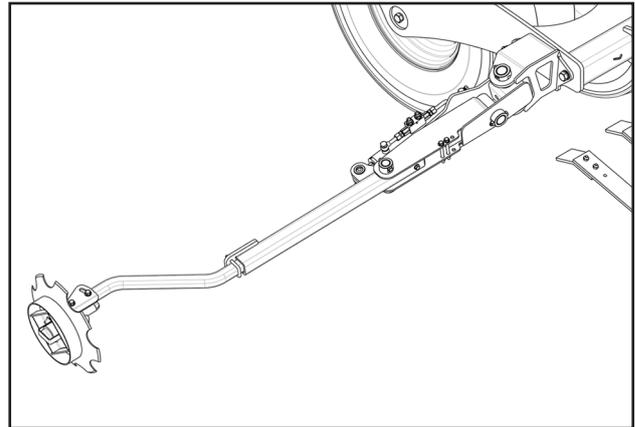


Figure 15. Boutmarker

To change marker extension, on a lowered drill:

1. Pull forward approximately 10m to leave a mark and a furrow.
2. Loosen the U bolt (A) securing the outer marker arm.
3. Slide the outer arm in or out until the disc is at the desired extension distance.
4. Re-secure the U bolt.
5. Fold the marker.
6. Boutmarker discs may be sharp. Use caution when making adjustments in this area.

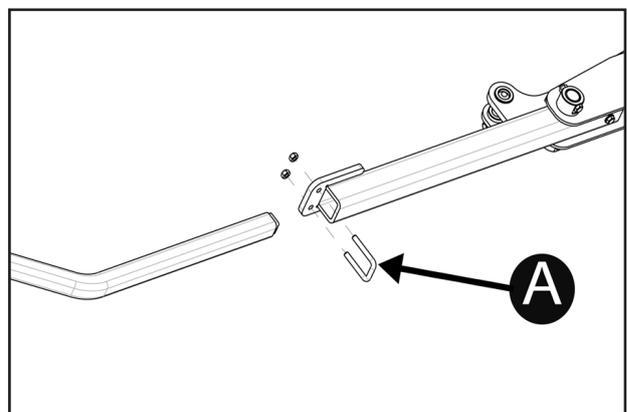


Figure 16. Boutmarker adjustment

### 4.7.2 Boutmarker Disc Adjustment

The following instructions refer to the boutmarker design on the majority of 3.0m, 4.0m and 6.0m machines.

Refer to Figure 17

1. To change angle of cut, and the width of the mark, loosen bolts holding the disc assembly.

For a wider mark, increase the angle of the marker with respect to the tube. For a narrower mark, reduce the angle.

Note: Do not set a marker angle wider than needed to make a useful mark. Excess angle increases wear on all marker components.

2. Tighten bolts.

Note: Direction of travel tends to drive the disc angle to Wide. If bolts are not tight enough, or loosen over time, disc slips into the Wide mark configuration.

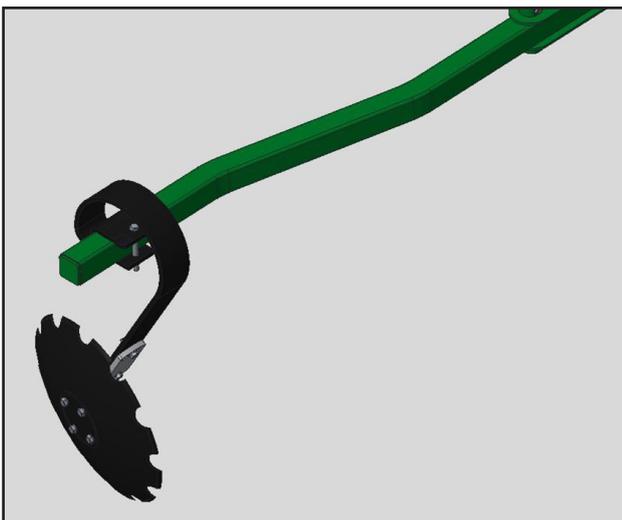


Figure 17. Boutmarker Disc

To change marker extension, on a lowered drill:

1. Pull forward approximately 10m to leave a mark and a furrow.
2. Loosen the vertical bolt.
3. Slide spring and clamp along arm until the disc is at the desired extension distance.
4. Re-secure the vertical bolt.
5. Fold the marker.
6. Boutmarker discs may be sharp. Use caution when making adjustments in this area.



**Sharp Overhead Object and Pinch/ Crush Hazards: Never allow anyone near the drill when folding or unfolding the markers. Markers may fall quickly and unexpectedly if the hydraulics fail. Anyone beneath may be injured if hit by an unfolding marker, or caught in a folding marker.**

### 4.8 Hopper

The hopper is available in 3000 Litre or 4000 Litre capacity. The hopper is fitted with a front window and 3 hopper level sensors are installed, with only two being active at any one time. This allows the top two to be manually plugged in/ unplugged according to the size of the seeds being drilled. The hopper features an opening of 2.7m long x 1 m wide - ideal for bucket loading. It also has a shut off flap for easy metering roller change.

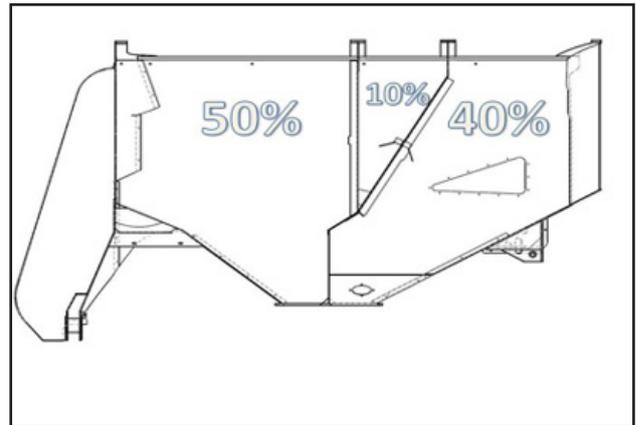


Figure 19. Hopper Distribution



Figure 18. Hopper

For the Grain and Fertiliser option the hopper can be divided 50/50 or 60/40. The divider in the middle of the hopper can be moved to provide the 60/40 split.

As standard when shipped the machines are configured with fertiliser at the front of the hopper and grain at the rear.

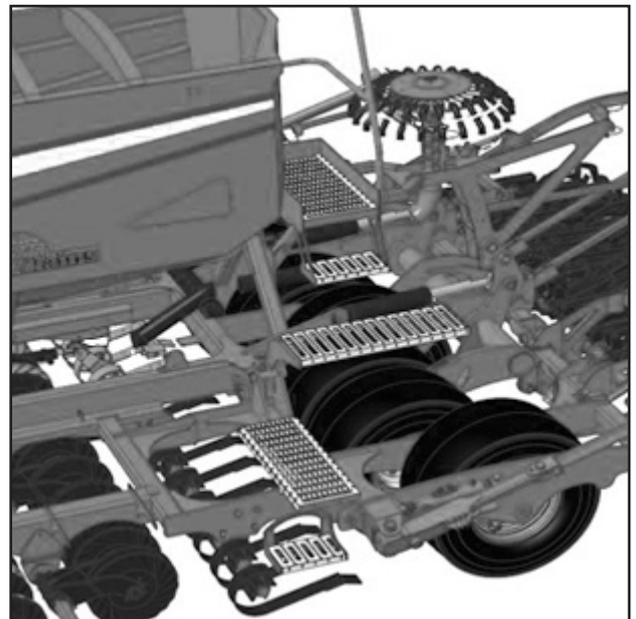


Figure 20. Rear Platform Access



If access is required to the rear of the hopper ensure the operator uses the rear platform provided.

4.8.1 Loading Hopper



**Entrapment and Rapid Suffocation Hazard:** Never enter a hopper for loading, unloading or routine maintenance. Keep cover closed during operations and keep cover locked during storage. Keep children away from drill.



A hopper that is full, or merely appears full, can be an entrapment hazard. You can sink entirely into the grain, or into an oxygen-deficient void, and suffocate in a matter of seconds. Grain bridges and crusts are especially dangerous.



When hazardous fumes or low oxygen levels are present, you can be quickly overcome even in an empty hopper with the cover open. There may be no odours to alert you to the hazard.



Turn off fan before opening hopper covers. Wear eye protection and dust mask or respirator. Even with the fan off, adding seed or fertilizer will create a dust cloud. Risks include exposure to hazardous chemicals, lung and eye irritation.

4.8.2 Hopper Cover Operation

Keep hopper cover closed. Open only for material loading, hopper clean-out and exceptional maintenance.

Wear gloves suitable for protection against recent fertilizers or seed treatments.

The hopper cover is opened and closed by lifting the arm over, through 180°.



Possible finger trap hazard.

## 4.9 Fan General Information

The hydraulic fan supplies the air stream that carries materials from the meters, through the primary hoses to the towers, then to the secondary hoses to the rows. The fan needs to be running in the correct direction, and within a narrow speed range, to reliably deliver material at your calibrated rates.

**Machine Damage Risk:** Always engage the fan with the tractor at a low engine speed. Engaging the fan when the tractor is at high speed may cause fan damage. Do not reverse hydraulic flow with the fan running.

1. Ensure fan speed does not fluctuate when in operation
2. Always check fan speed doesn't drop when operating additional hydraulic services
3. Fan hydraulics should always be the priority to ensure consistent speed.
4. Some tractors may require additional engine rpm to maintain flow.
5. Drops in fan speed can lead to blockages and inconsistent drilling.

### 4.9.1 Fan Field Operation

With the tractor engine at low rpm, slowly extend the lever for the Fan circuit. Bring the fan up to recommended speed (page 44). Let the fan warm up for 15 minutes before seeding.

Lower the openers before seeding is to begin. It takes a few seconds for seed to travel from the meters to the rows.

Leave the fan running during field turns. Meter drive is shut off when the openers are raised.

At the end of application, raise openers. Stop material flow before shutting off the fan.

Shut off the fan by carefully moving the Fan circuit lever to 'Float'. The fan does not stop instantly. A check valve in the fan circuit locally re-circulates oil until the blades coast to a stop.

### Fan Y-piece

When operating a Grain and Fertiliser drill (twin product) the fan speed must be set up to handle both products.

Often the 2 products can vary in size and weight along with differing application rates, this means that each product has an individual fan requirement.

It may therefore be necessary to restrict one side of the Y piece so small seed/low rates aren't blown out of the trench or excessive power is used by the fan unnecessarily.

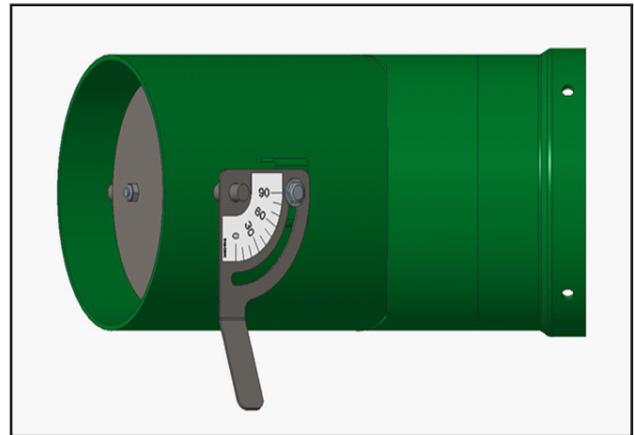


Figure 22. Butterfly Valve

**Note – 90° is maximum restriction (Handle denote angle of baffle)**

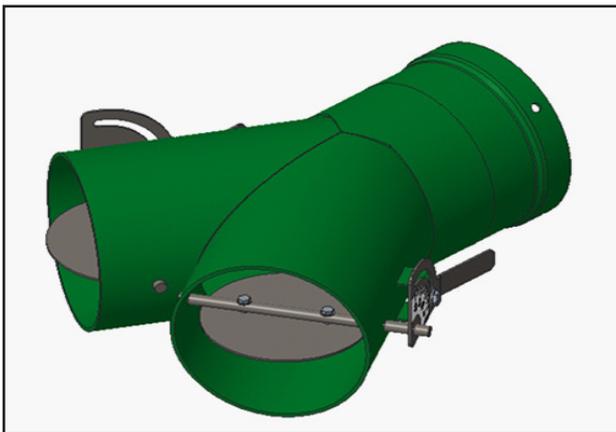


Figure 21. Air Splitter

### 4.9.2 Fan Speed

The specific fan rpm required varies considerably with drill configuration, material density, application rate, field speed and material properties. Develop and record settings that are suitable for your operations.

At ideal fan speed:

- flow is more than high enough to avoid blockages (from both meters on dual hopper drills).
- flow is even across all hoses from each meter.
- flow is low enough to minimize seed cracking and bounce.

Fan speed is monitored and reported by the seed monitor, but is manually controlled.

If the fan cannot reach 3000 rpm, one or more hoses may be mis-connected. Air moves toward the air box in either rotation direction, but reverse spinning airflow is too low to operate the system.

The air flow created from the fan transports the seed from the Venturi to the openers.

Key factors that influence the fan speed:

- Type of Seed
- Weight of Seed
- Working Width
- Sowing Speed

As a result field testing is required to establish the correct fan speed. Too strong an air flow may cause seeds to jump around and too weak an air flow may result in seed remaining in the tubes.



The below table only acts as a guide for the RPM, this must be checked using the field test results.

#### Grain Only- Seed Rate

Model Size	2 kg/ha	10 kg/ha	25 kg/ha	50 kg/ha	75 kg/ha	100 kg/ha	200 kg/ha	300 kg/ha	400 kg/ha
3.0m	1500 rpm	1500 rpm	1600 rpm	1700 rpm	1700 rpm	1800 rpm	2100 rpm	2400 rpm	2700 rpm
4.0m	1500 rpm	1500 rpm	1600 rpm	1700 rpm	1800 rpm	1900 rpm	2300 rpm	2700 rpm	3100 rpm
6.0m	1500 rpm	1600 rpm	1700 rpm	1800 rpm	2000 rpm	2100 rpm	2700 rpm	3300 rpm	3900 rpm

#### Grain & Fert - Combined Seed Rate

Model Size	2 kg/ha	10 kg/ha	25 kg/ha	50 kg/ha	75 kg/ha	100 kg/ha	200 kg/ha	300 kg/ha	400 kg/ha
3.0m	2000 rpm	2100 rpm	2200 rpm	2300 rpm	2500 rpm	2600 rpm	3200 rpm	4000 rpm	4000 rpm
4.0m	2000 rpm	2100 rpm	2200 rpm	2400 rpm	2600 rpm	2800 rpm	3600 rpm	4000 rpm	4000 rpm
6.0m	2000 rpm	2100 rpm	2300 rpm	2600 rpm	2900 rpm	3200 rpm	3850 rpm	3850 rpm	3850 rpm



Before seeding ensure the fan setting, seed transport and seed placement area are regularly checked at the coulters.

**4.9.3 Adjusting Fan Speed**

The fan speed should be adjusted according to your situation.

Start with flow on a low setting, 30-45 litres/ min (8-12 gpm) is average flow.

Run the fan for at least 15 minutes before seeding. Hydraulic fluid must be warm before fan and wing pressure systems operate properly.

Watch the seed monitor, and adjust fan speed by increasing or decreasing hydraulic flow from the tractor.

Fan RPM	Limits	
	Minimum	Maximum
Small Fan (No Case Drain)	1500 rpm	to 4000 rpm
Large Fan (Case Drain)	1500 rpm	to 4000 rpm

**4.10 Tyre Packer**

The large diameter full width central tyre packer works ahead of the drilling coulters to provide consistent seeding depth and consolidation.

Field mode ensures all tyres stay in contact with ground for headland turns. Transport mode increases ground clearance.

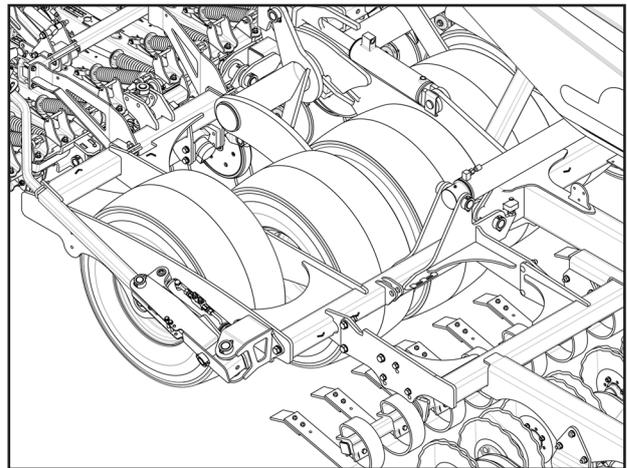


Figure 23. Tyre Packer

### 4.11 Seeding Elements

The machine has precise injection molded seed distribution heads with built-in tramline shut offs and optional seed flow sensors which accurately delivers seed to each opener.

Accurate seed placement is handled by heavy duty opener arms with 40-160kg adjustable down-pressure and easy depth adjustment. There is an option of 167mm or 125mm opener spacing.

The machines acclaimed drilling coulter features a pair of robust 4mm discs staggered front/back by 8mm so they open an effective seed slot. Discs are mounted on heavy-duty arms that can apply up to 160kgs down pressure which ensures penetration in the hardest conditions.

#### 4.11.1 Opener Adjustments

The Great Plains 00 Series opener can include the following capabilities (some optional):

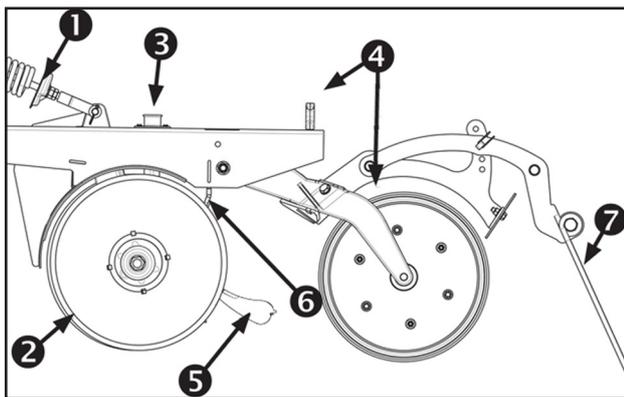


Figure 24. Opener

1. **Down Pressure Spring** - Each opener is mounted on the implement via arms which allow the opener to independently move up and down. The adjustable spring sets the force at which the opener rides up over obstructions. See “Opener Spring Adjustment” on page 49.

2. **Disc Blades** - Double disc blades open a furrow, creating the seed bed. Spacers adjust the blades for a clean furrow. See “Disc Blade Adjustments” on page 49.

3. **Seed delivery tube** - This tube delivers material from the hopper. No adjustments are necessary.

4. **Press wheels** - These close the seed trench. The press wheels also support the free end of the opener, and provide the primary control over seeding depth via the T-handle. See “Opener Depth (Press Wheel Height)” on page 51.

**Seed firmer** - (seed flap- not shown) A seed flap requires no adjustment, other than replacement when worn.

5. **Keeton® seed firmer** (shown) Improves seed-soil contact, and provides a stable arm for a low-rate liquid fertilizer delivery tube. See “Keeton® Seed Firmer Adjustment” on page 51.

6. **Inside Scraper** - Helps prevent clogging between disc blades. See “Opener Disc Scraper Adjustments” on page 50.

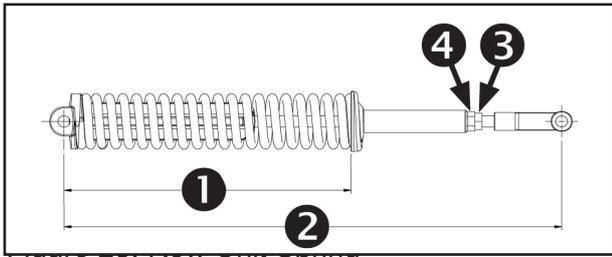
7. **Following Harrow** - Levels the ground after seeding.

### 4.11.2 Opener Spring Adjustment

Opener springs normally require no adjustment. The factory setting for the row unit springs is:

1. Spring length - 324 mm
2. Assembly length - 562 mm

In some unusual conditions, rows in tyre tracks may need to be set heavier. Make adjustments with the wings unfolded and the rows lifted off the ground, so that the springs are at full extension.



Loosen the locking nut (3). Rotate the adjuster nut (4). Shorten spring to increase down-force; lengthen spring to reduce down-force.

For each turn of the adjuster nut, the down force at the opener disc changes by approximately 1.7 kg/turn.

Re-tighten locking nut after setting force.

### 4.11.3 Opener Disc Adjustments

Opener disc angle and stagger is not adjustable, but disc-to-disc spacing is, and may need attention as discs experience normal wear. Spacers will need to be reset when blades are replaced.

The ideal spacing causes the blades to be in contact for about 25 mm. If you insert two pieces of paper between the blades, the gap between them should be 0 to 44 mm.

If the contact region is significantly larger or smaller (or there is no contact at all), it needs to be adjusted by moving one or more spacer washers. If the contact region varies with blade rotation, one or both blades is likely bent and in need of replacement.

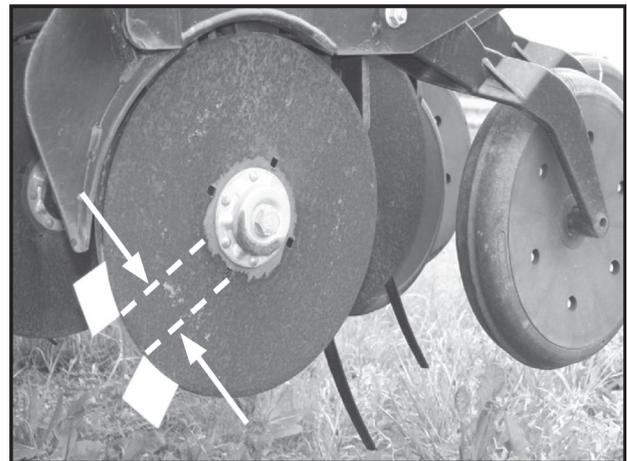


Figure 26. Checking Disc Contact

#### 4.11.4 Adjusting Disc Contact

Use caution when making adjustments in this area. Opener disc blades may be sharp.

Unfold implement. Configure implement for maintenance lift lock (page 32).

Remove the bolt retaining the opener disc on one side. Carefully remove the blade, noting how many spacers are outside the disc and how many are inside the disc. Do not lose the hub components and spacers. To reduce the spacing between the discs (the normal case), move one spacer washer from the inside to the outside.

When installing new blades, it is generally necessary to move outside spacers back inside after both discs are mounted.

Re-assemble and check disc contact.

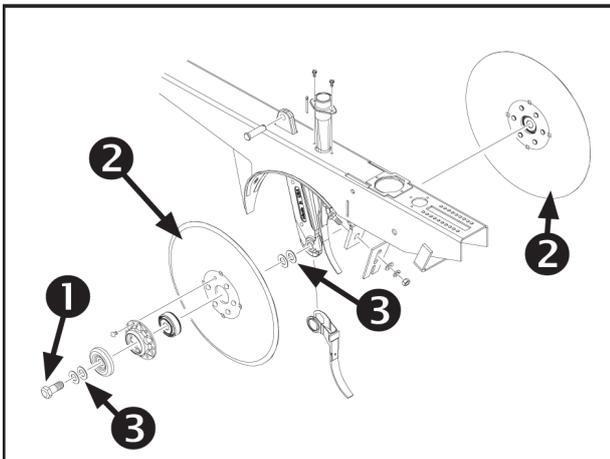


Figure 27. Adjusting Disc Spacers

#### 4.11.5 Opener Disc Scraper Adjustments

Slotted disc scrapers are standard. Spring loaded carbide disc scrapers are optional. To keep opener discs turning freely, dirt scrapers are mounted between discs to clean as discs rotate.

Use caution when making adjustments in this area. Row unit disc blades may be sharp.

As field conditions vary, scrapers may need to be adjusted. In damp conditions, lower scrapers. If openers are not turning freely, raise scrapers. To adjust, loosen bolt and move scraper as needed.

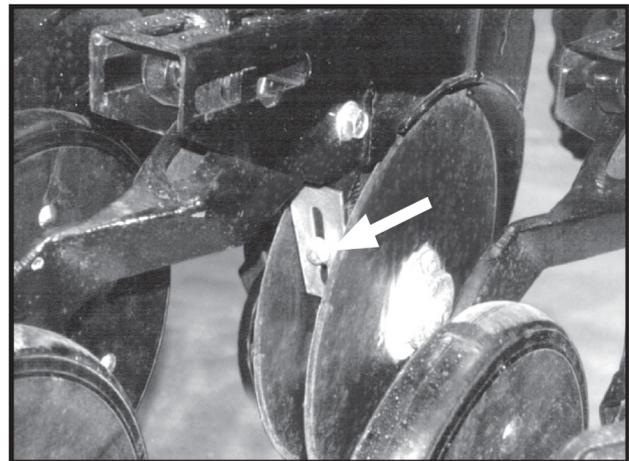


Figure 28. Scraper adjustment

### 4.11.6 Seed Firmer Adjustments

Openers include a seed flap, and accept one of two optional seed firmers.

The seed flap requires no adjustment, but may need to be replaced if worn, and may need to be shortened if an optional seed firmer is added after initial delivery.

Opener disc blades may be sharp. Use caution when making adjustments in this area. To adjust the Keeton® Seed Firmer, lower the drill until the discs of the row units are resting on the ground.

### 4.11.7 Keeton® Seed Firmer Adjustment

The optional Keeton® Seed Firmer is an engineered polymer shape that slides down the seed trench. It traps seeds as they exit the seed tube and firms them into the bottom of the “V”.

The firmer is provided with a preset tension which is recommended for using the first year. The tension screw (1) can be tightened in subsequent years according to your needs. Firmers should provide just enough tension to push seeds to the bottom of the trench.

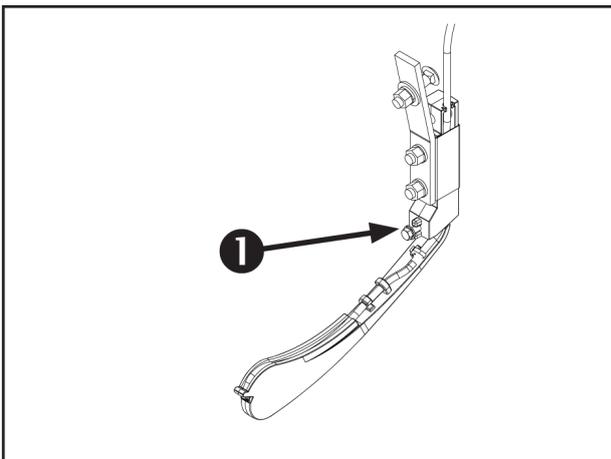


Figure 29. Keeton Seed Firmer

### 4.11.8 Opener Depth (Press Wheel Height)

Refer to Figure 30.

Set opener seeding depth by adjusting press-wheel height.

To adjust, first raise openers slightly, then lift and slide T handles on top of openers.

Adjust all press wheels to the same height. Each increment of the handle adjusts the seeding depth by approximately 6mm. The range is approximately 0-89 mm seeding depth.

For more shallow seeding, slide T handles forward toward implement. For deeper seeding, slide T handles backward away from implement.

 **Openers must be levelled using shims on the opener toolbar.**

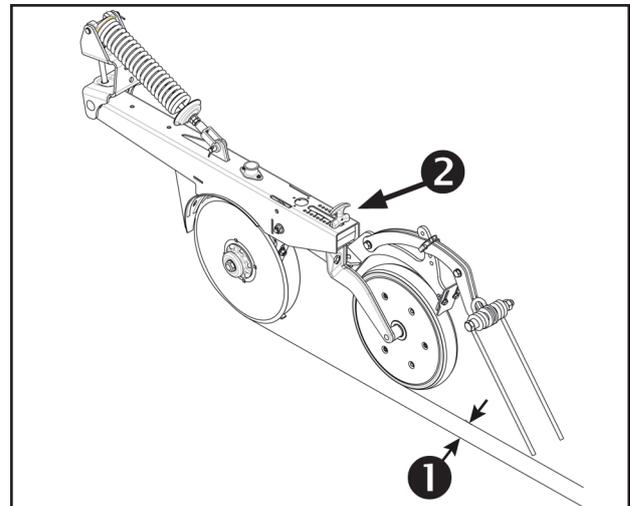


Figure 30. Adjusting Opener Depth

In front of the row unit toolbar is the depth link which is used to adjust opener depth with shims (Figure 31).

- Increasing Depth- Remove shims above the trunion (1) replace beneath the trunion (2)
- Decreasing Depth- Remove shims beneath the trunion (2) replace above the trunion (1).

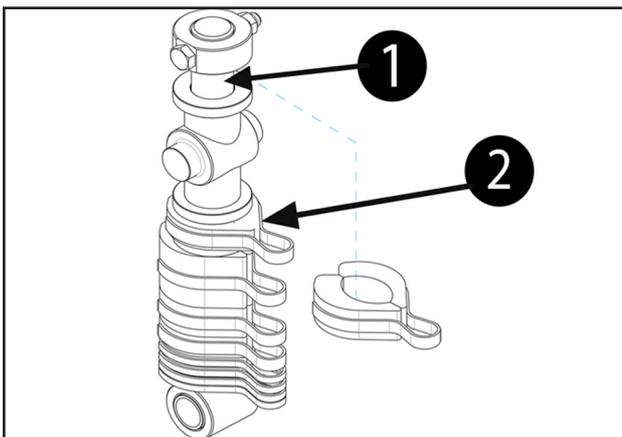


Figure 31. Depth Link Toolbar

#### 4.11.9 Opener Down Pressure

The down pressure of the openers is controlled using the handle on the down pressure valve at the front of the drill.

 Always run openers level in work.



Figure 32. Row Unit Pressure Adjustment

#### 4.11.10 Double-Shoot Fertiliser

On a double-shoot drill, deeper dry fertiliser placement may be achieved by rotating the fertiliser tube (1) to face forward.

This orientation is suggested only if the seed uniformer is a seed flap (2). If a Keeton® or Seed-Lok™ is present, fertiliser falls on the uniformer and may be scattered rather than placed deeper.

In this configuration it is suggested to turn the tube to the rear. The product is then placed in front of the press wheel.

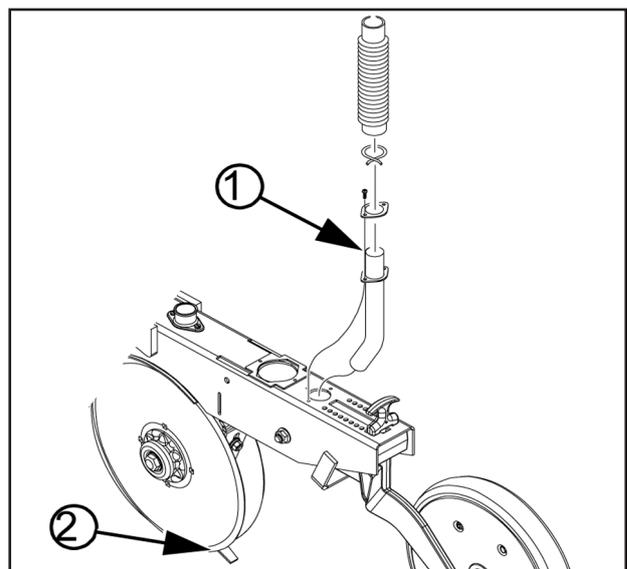


Figure 33. Double Shoot Fertiliser

## 4.12 Following Harrow Adjustment

The following harrow can be adjusted by removing the pin and repositioning as required.

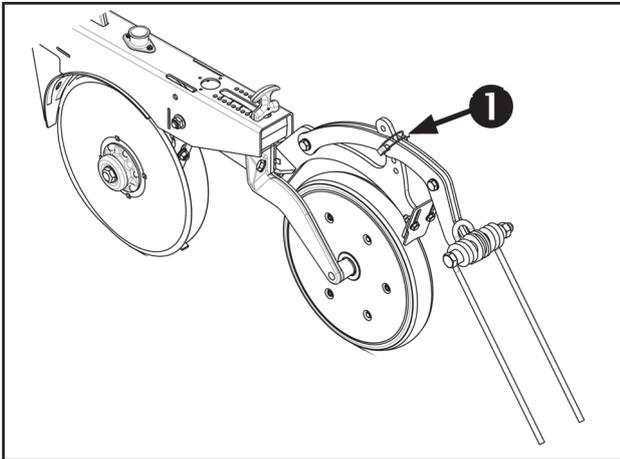


Figure 34. Following Harrow Adjustment.

## 4.13 Pre-Emergence Markers

The pre-emergence markers work after the seeding elements. They are able to be repositioned laterally on the beam in order to provide the best fit for tractor/sprayer wheelings.

The tine depth can be adjusted using pins at the top end of the marker arm.

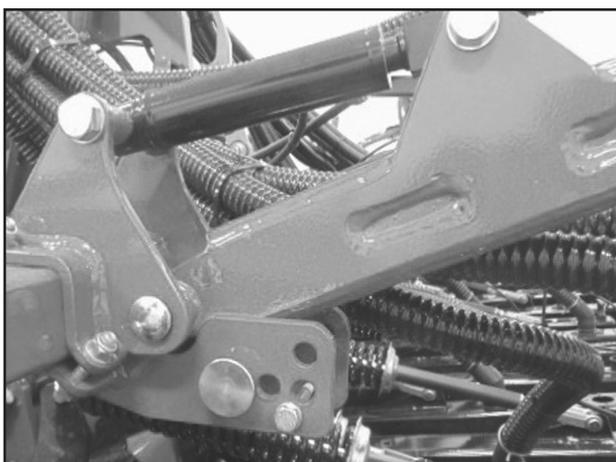


Figure 35. Pre-emergence Markers

## 4.14 Work Instructions

### 4.14.1 Driving speed

In work the machine can be driven at speeds of around 12 km/h. This depends on the field conditions (type of soil, surface trash, etc.).

Drive more slowly if the conditions are difficult or a firmer finish is required.

### 4.14.2 Turning

Before turning in work, at headlands for instance, all the ground engaging elements (cultivation section / row units) should be lifted out of work while driving, allowing the machine to turn on the packer wheels. These elements should only be lowered back into work once the turn has been completed. Depending which work mode is set on the control panel, the elements will either lift and lower in sequence or lift together and lower in sequence.

### 4.14.3 Wing Pressure

The CDA drill can be specified with an active wing pressure system which utilises load cells monitoring hopper weight to determine wing pressure. Machines without load cells will automatically default to 50% wing pressure setting unless manually set. Should any part of the automatic system fail the manual override can be used to continue seeding.

When operating the wing pressure system without weigh cells pressure will now be seen on the screen. To set the wing pressure simply adjust the PWM value with buttons 1&2 with the fan running until the drill physically sits level.

4.14.4 Setting wing pressure:

1. Turn on hydraulic fan
2. Go to drill diagnostic screen 3
3. Raise/lower pressure using icon 1&2
4. Press button 3 to store wing pressure setting

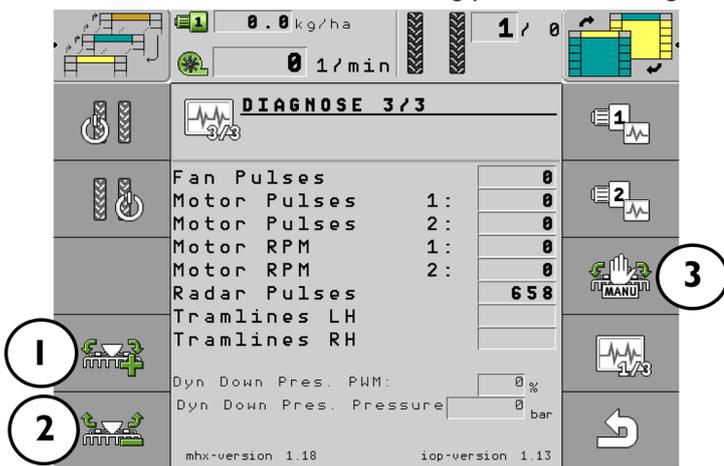


Figure 36. Diagnostic Screen 3

When the 'Manual wing pressure' is in operation the 'Manu' icon will appear in the 'Home' and 'Drill' screen.

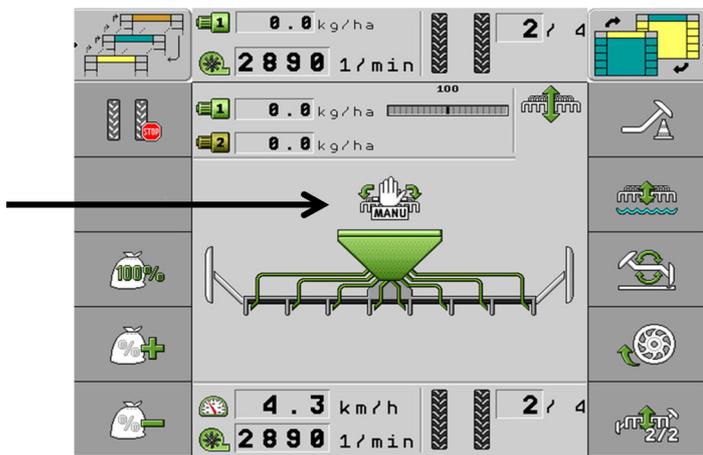


Figure 37. Drilling Screen

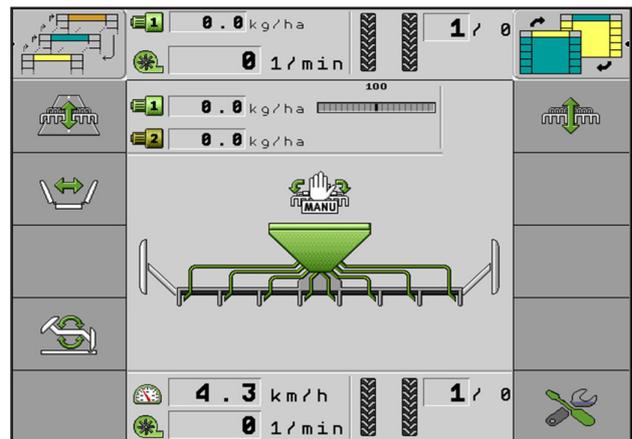


Figure 38. Home Screen

4.15 Checks

The working quality depends on the adjustments and checks made prior to and during work, as well as on regular servicing and maintenance of the machine.

Before beginning work it is therefore important to carry out any necessary servicing and to lubricate the machine as required.

Checks prior to, and during work:

- Is the machine correctly hitched up and the coupling device locked?
- Is the machine in a level operating position and the working depth set correctly?

Working Elements

- Are the discs and other cultivation tools in a serviceable condition?
- Are the scrapers still operable, so that the coulters do not jam?

**4.16 Adjustment Overview**

Adjustment	Page	The Adjustment Affects
Tractor Linkage Height	38	Correct draft load to tractor
Frame and Wing Alignment	-	Planting consistency
Height Switch Adjustment	-	Correct off/on state of meter drive
Air System		
Fan RPM	46	Consistent, gentle material delivery
Calibration	73	Correcting seed rate to your specific materials
Boutmarker Adjustments		
Marker Extension	40	Intended spacing of bouts
Marker Disc Angle and Direction	41	Visibility of mark
Wing Weight Transfer Adjustment	-	Ensuring that openers operate at desired depth
Row Unit Adjustments		
Opener Depth (Press Wheel Height)	51	Planting depth
Row Unit Down Pressure	52	Planting depth uniformity in tyre tracks
Opener Disc Adjustments	49	Seed depth, seed-to-soil contact
Inside Scrapers	48	Reliable disc operation
Seed Firmer Adjustments (Option)	48	Seed-soil contact
Press Wheel Adjustment	48	Effective soil coverage

**4.17 Control Panel**



Figure 39. Basic Control Panel



Figure 41. 1200 Muller touch screen



Figure 40. Comfort Control Panel



Figure 42. 800 Muller touch screen

1. Display
2. Power button
3. Escape Button
4. 'Task Manager' button. This enters the main panel menu allowing the user to switch between programs.
5. Keys to select and change numerical values and functions.
6. Knob to select and change numerical values (Comfort terminal)

The drill is controlled through the control panel using the ISO-Bus terminal in the tractor

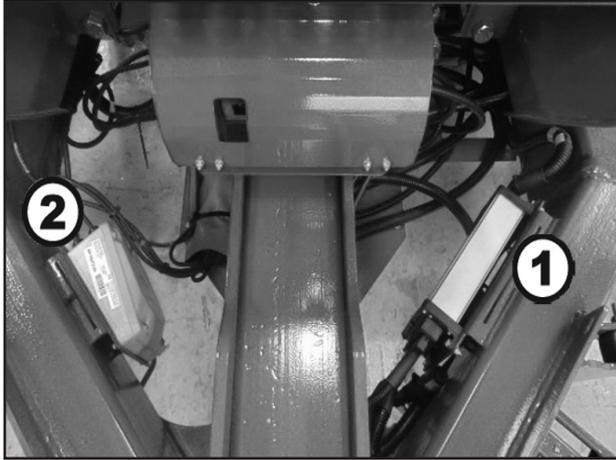


Figure 43. ECU & CPU



Figure 44. CPU

1. Müller ECU - This unit controls the primary functions of the drill.
2. Digi-Star CPU - controls information from the weigh cells (if fitted).
3. Dickey John CPU - controls the seedflow sensors (if fitted).

## 4.18 Control Panel Operation

### 4.18.1 Home Screen

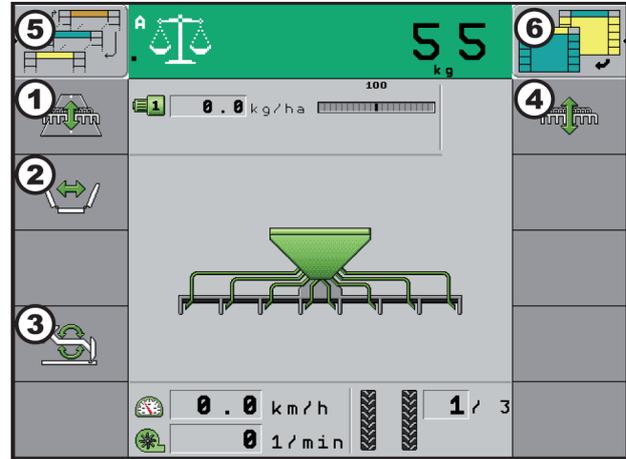


Figure 45. Home Screen

After switching on, the home page will appear as the initial page.

1. The button allows the machine to raise and lower for road transport.
2. Fold function key.
3. For operating markers only, as in when starting a field.
4. In 'full raise' mode the cultivation section and opens lower together but raise in sequence. The sequencing times can be set in the Config. screens.
5. This button cycles through the different headers that are available (the different applications in the 'task manager').
6. This button switches between the main screen and the header.

## 4.18.2 Work Screen (1/2)

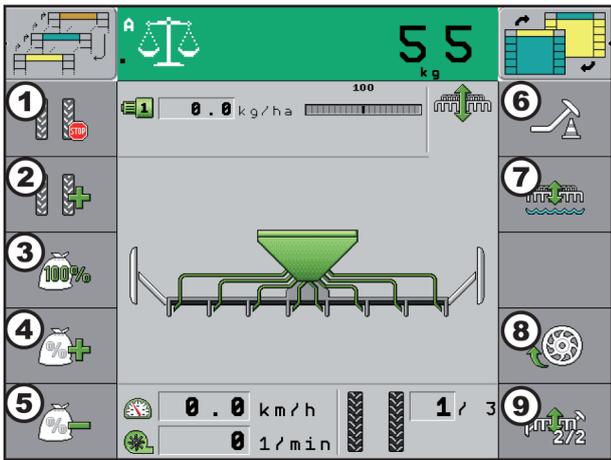


Figure 46. Work Screen 1

1. Stop - override button for tramline: This key prevents switching over of the tramline rhythm after lifting the machine. The stop sign is shown between the tracks to indicate this.

2. The tramline rhythm is offset by one track with every operation of the key. The track number is displayed beside the tracks.

3. Seed rate 100%: If the seed rate had been adjusted with the +% or -% keys, pressing this key will switch back to the default seed rate.

4. This button is used to increase the seed rate. The percentage increment can be changed in the machine data screen

5. This button is used to decrease the seed rate. The percentage increment can be changed in the machine data screen

6. This button activates the boutmarker circuit only, so that the main circuit will retract the boutmarkers in order to avoid obstacles but does not affect tramlines

7. “Wet hole” function: In certain situations, such as the machine sinking into wet patches in the field, this function can be used to raise the machine. The work signal is not interrupted and the tramline will not switch further. Normal drill function is resumed by pressing the button a second time or waiting for the user-defined time-out.

8. Pre-start button - this button runs the motor for a specified amount of time. If, during this time, the panel receives a speed signal from the radar the panel will take over.

9. This button allows the user to switch between screens. The second screen (2/2) defaults back to the first screen (1/2) after 12 seconds.

## 4.18.3 Work Screen (2/2)

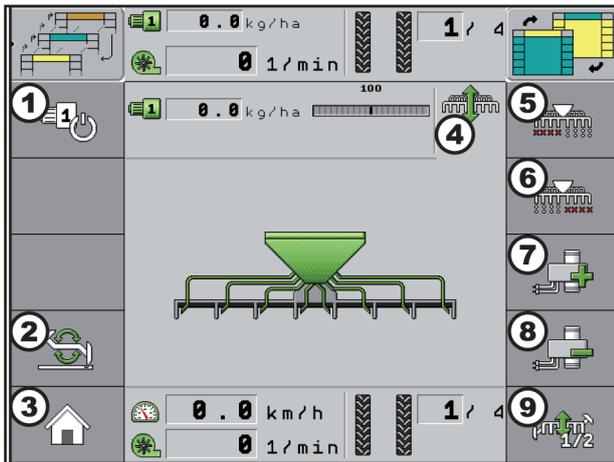


Figure 47. Work Screen 2

1. This button switches the metering function on and off. With the drill function switched off the display will show ALL METERING STOPPED at the top of the screen. If the drill function is switched on, the drill is lowered to work position and the computer receives a speed signal, the computer will start the control process.

2. Boutmarker mode: Pressing this button cycles through the boutmarker modes. These are (in order):

- Alternating markers, starting with right hand marker.
- Alternating markers, starting with left hand marker.
- Left hand marker only
- Right hand marker only
- Both markers working.
- No markers working.

3. This button switches the display to the home screen.

4. This symbol shows the current working mode.

5. Half width shut off - Left: Only the right hand outlets will continue seeding.

6. Half width shut off - Right: Only the left hand outlets will continue seeding.

7. This button increases the sensitivity of seedflow sensors.

8. This button decreases sensitivity of seedflow sensors.

9. This button allows the user to switch between screens. The second screen (2/2) defaults back to the first screen (1/2) after 12 seconds.

### 4.18.4 Machine Tools Screen

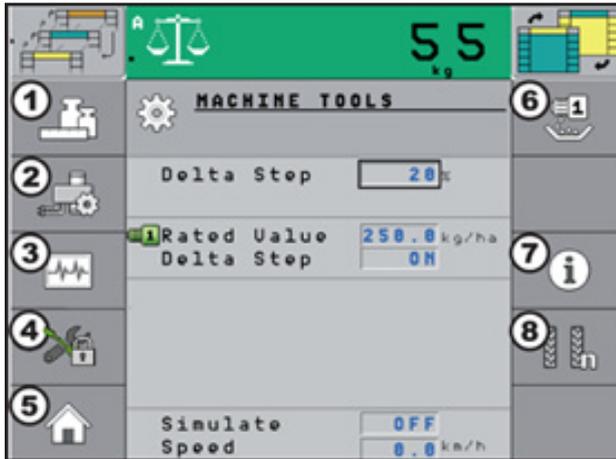


Figure 48. Machine Tools Screen

1. Weigh System - button enters the weigh system screen.
2. Blockage button - enters the 'blockage' screens.
3. Diagnostics - enters the diagnostics screens.
4. Configuration panel - To enter the configuration screens hold this button for 5 seconds.
5. Home button - Returns to the home screen.
6. Calibration - Enters calibration mode (see page 73).
7. Machine totals - Enters the Machine Totals screen.
8. Tramline setup - Enters the tramline setup screens.

### 4.18.5 Weigh System



Figure 49. Weigh System Screen 1

To enter the fill amount:

- Add the weight desired into the 'fill amount' box using the scroll wheel or input buttons.
- Press the 'start' button.
- Add material to the hopper until the target is reached - the screen will display 'HOPPER WEIGHT REACHED' and alarm will sound.
- Press ESC to clear.

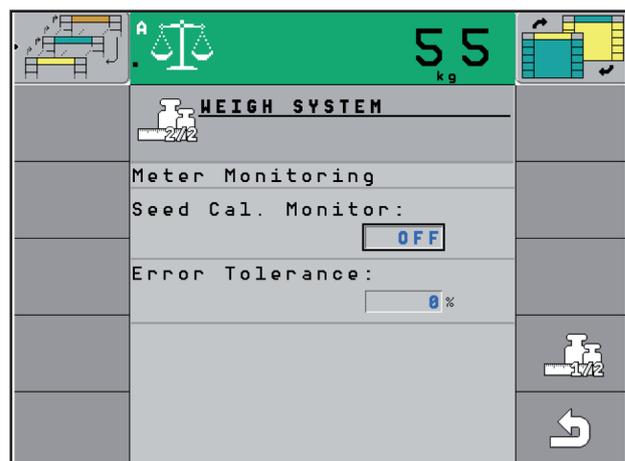


Figure 50. Weigh System Screen 2

Meter Monitoring causes an alarm to sound if the actual weight being seeded differs from the calibrated amount being seeded.

### 4.18.6 Blockage Screens

The Blockage screens are used to identify blockages within the system.

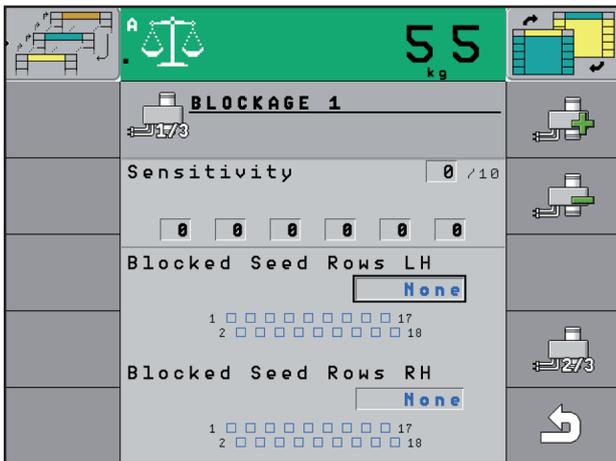


Figure 51. Blockage Screen 1

The sensitivity of the sensors is altered using a value between 1 and 10 (with 0 meaning the sensors are not active). The recommended way of setting the sensors is to increase the sensitivity until the alarm sounds and then reduce it by 1 or 2. The other information on the screen is used to determine where blockages have occurred.

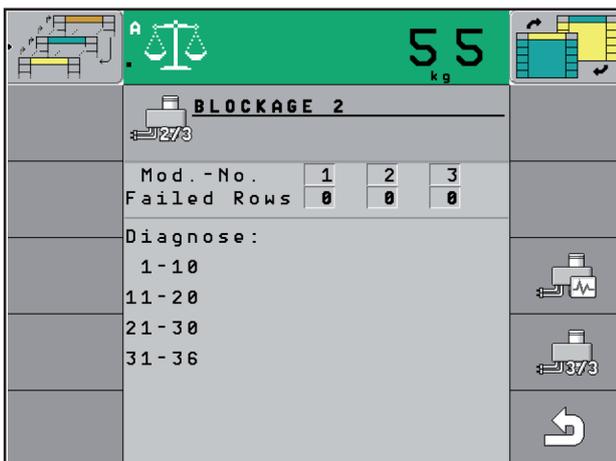


Figure 52. Blockage Screen 2

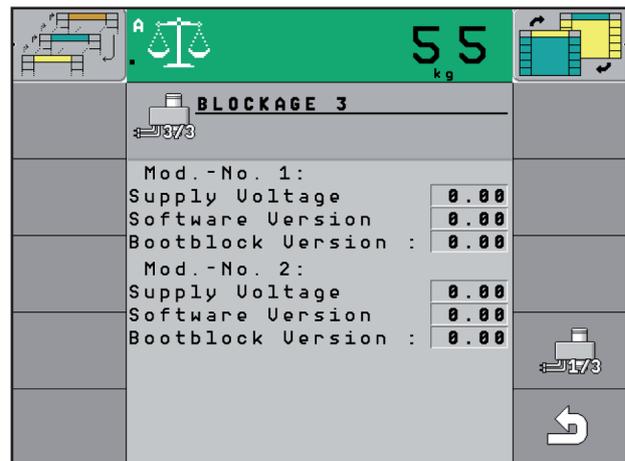


Figure 53. Blockage Screen 3

### 4.18.7 Diagnostic Screens

The Diagnostic screens are used to identify any problems within the system. The buttons along the sides are used to activate the various circuits / functions of the drill.

#### Screen 1

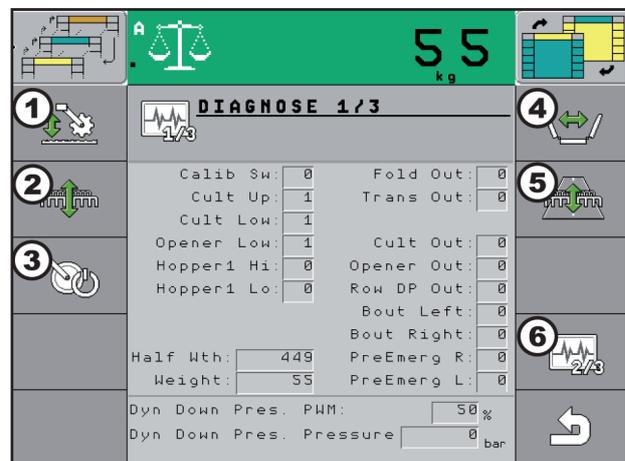


Figure 54. Diagnostics Screen 1

1. This activates the cultivation section allowing it to lift and lower.
2. This activates the row units allowing them to lift and lower.
3. Row unit down pressure.
4. This isolates the wing fold circuit.
5. This isolates the road transport circuit.
6. Switches to diagnostic page 2.

**Screen 2**

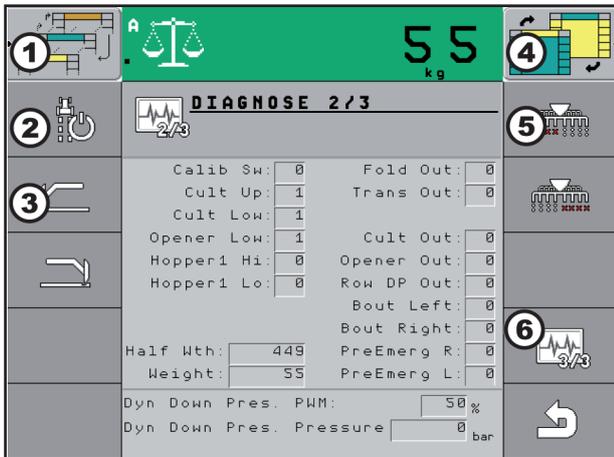


Figure 55. Diagnostics Screen 2

1. Activates the pre-emergence marker circuit.
2. Activates the left hand boutmarker.
3. Activates the right hand boutmarker.
4. Activates left hand half-width shut-off.
5. Activates right hand half-width shut-off.
6. Switches to diagnostic page 3.

**Screen 3**

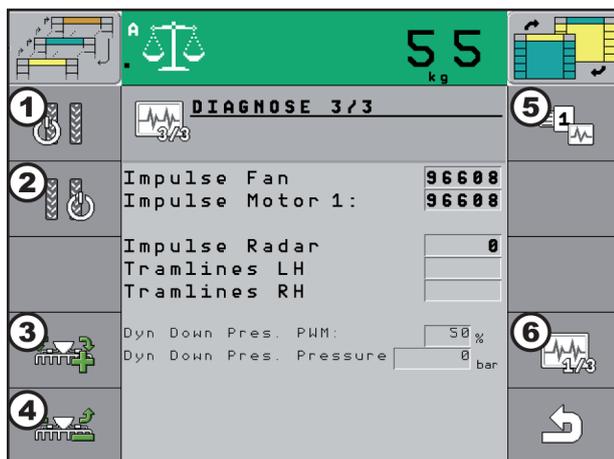


Figure 56. Diagnostics Screen 3

1. Activates left hand tramlining. Hold for 3 seconds to turn on and 3 seconds to turn off again.

2. Activates right hand tramlining. Hold for 3 seconds to turn on and 3 seconds to turn off again.
3. Increases down pressure.
4. Decreases down pressure.
5. Tests the meter motor.
6. Switches to diagnostic page 1.

**4.18.8 Config. Screens**

The Configuration screens are used to change the configuration of the machine such as the sequencing of the raising and lowering of the cultivation elements and fan speed.

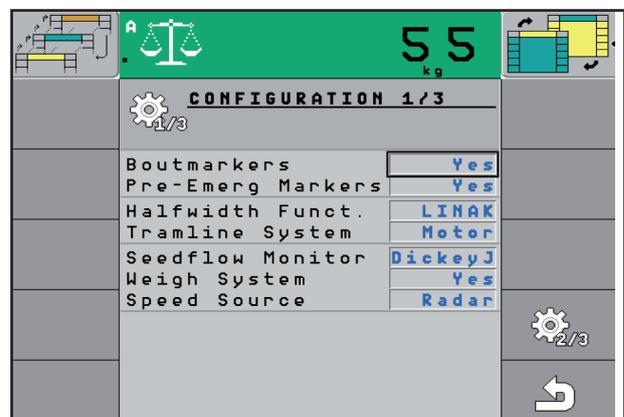


Figure 57. Config. Screen 1



Figure 58. Config. Screen 2

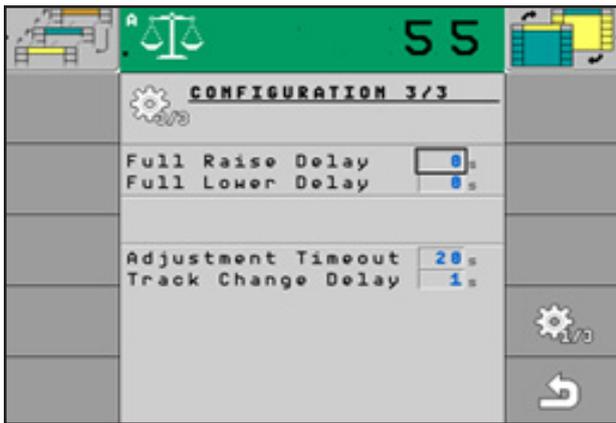


Figure 59. Config. Screen 3 (default settings shown)

Full Raise Delay- This determines how fast the openers lift after the cultivation section.

Base Setting - 2 Seconds

Full Lower Delay- This is used to adjust how long after lowering the drill the opener hydraulic float is engaged.

Base Setting- 4 Seconds

In the below screen shot you will see that you need to select the number of rows and towers please note some may be dual product.

Example- 6.0m Grain Only 125mm- Select 2x24 SS as the machine has 2 towers each with 24 rows.

4.0m Grain & Fertiliser machine 167mm- Select 2 x 24 S F as there are 2 towers each with 24 rows but one tower is for Grain and one for fertiliser.

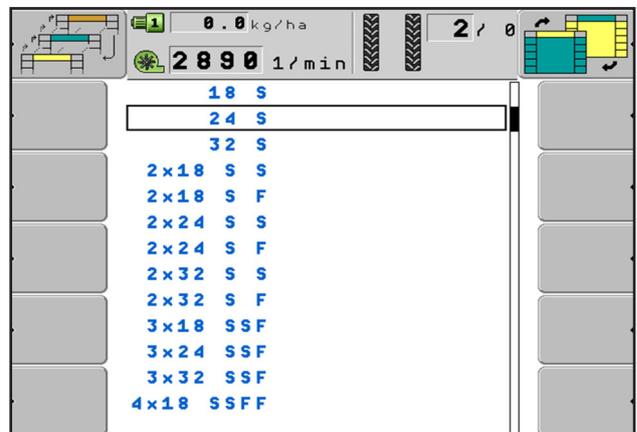


Figure 60. Tower Configurations

### 4.18.9 Totals Screens

The Totals screens are used to keep track of the drill's usage. The Results screen can be reset. The Lifetime Totals are not able to be reset.

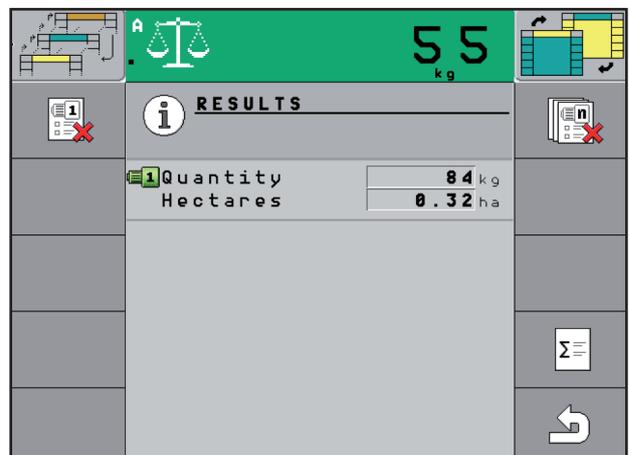


Figure 61. Totals Screen 1

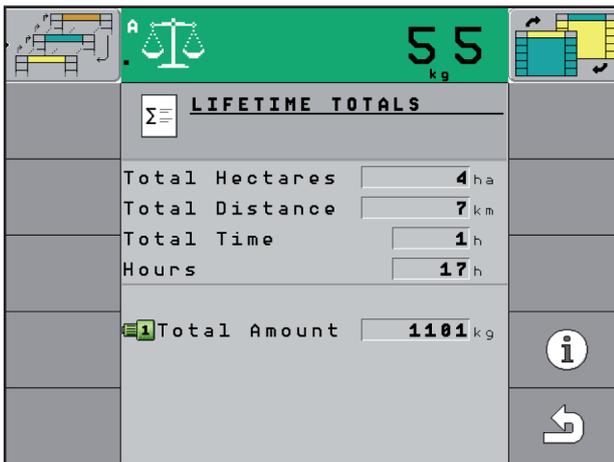


Figure 62. Totals Screen 2

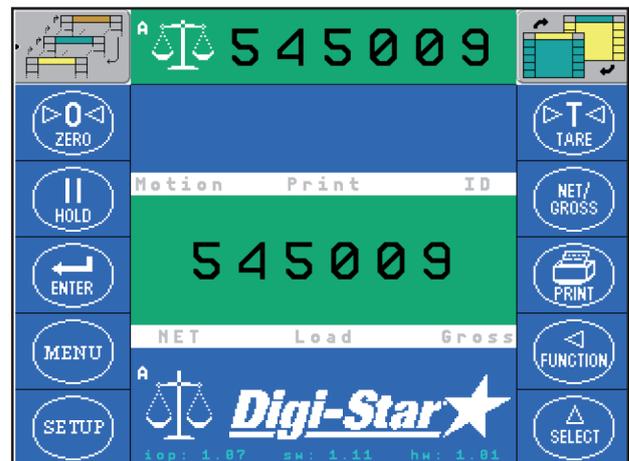


Figure 64. Digi-Star Weigh System Screen

### 4.18.10 Tramline Rhythm

The Rhythm screen is used to set the tramline rhythm for the drill. The top row of numbers contains preset tramline bouts. For custom bouts enter 999 under Ref. No. The diagrams on pages 65-72 show different tramline setups and values.

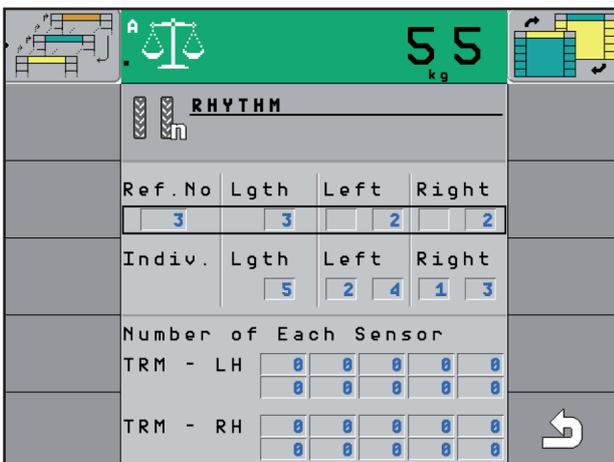


Figure 63. Tramline Rhythm Screen

### 4.18.11 Digi-Star Weigh System

The Digi-Star Weigh System is accessed through the 'Task Manager' screen. This software allows the user access to information from the weigh cells

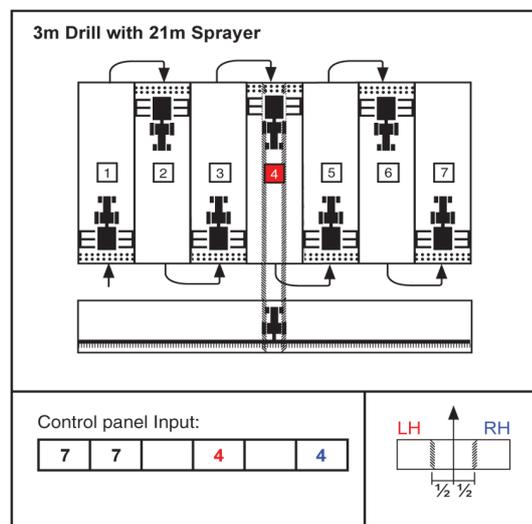
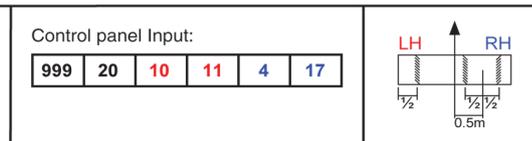
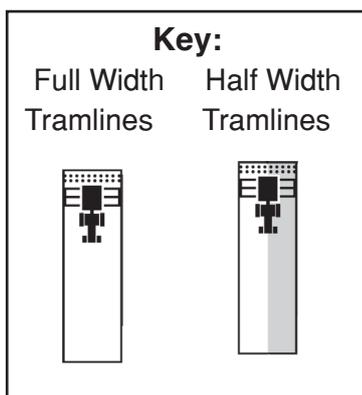
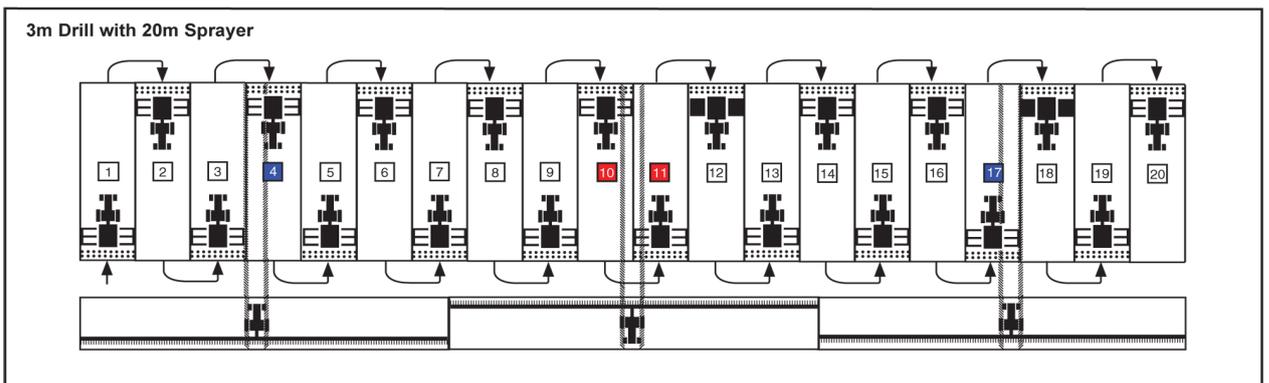
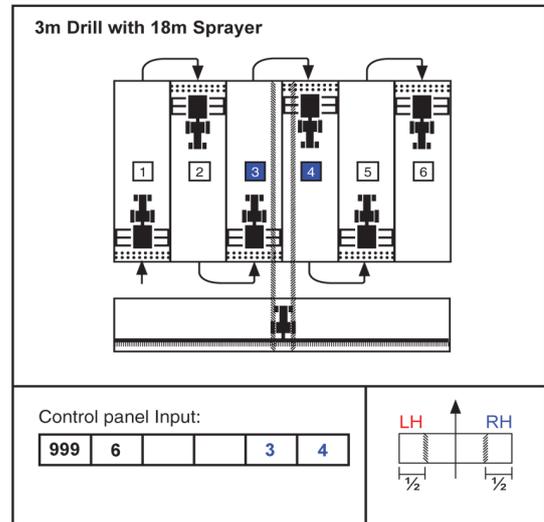
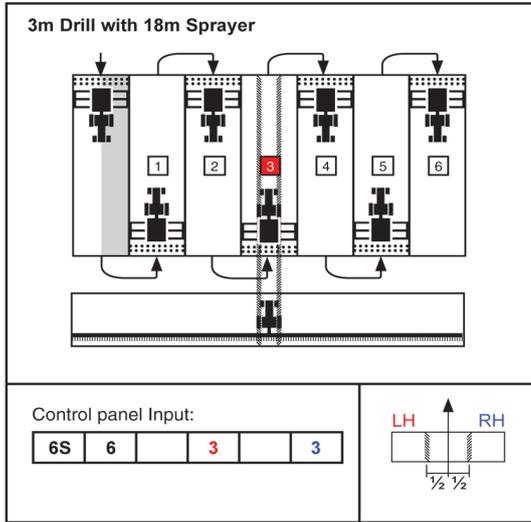
Under normal circumstances the Digi-Star Weigh System should not need changing. If it does need resetting for any reason the following procedure and values should be used.

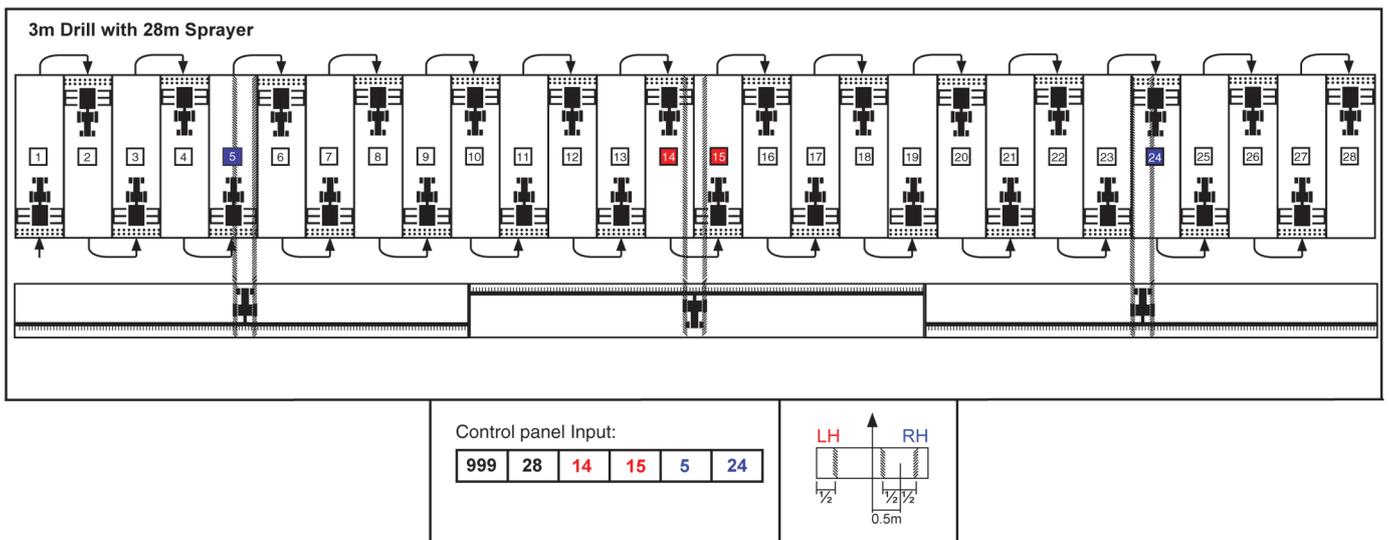
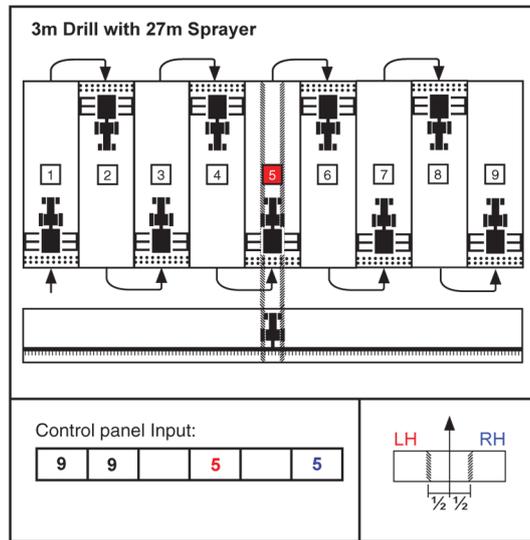
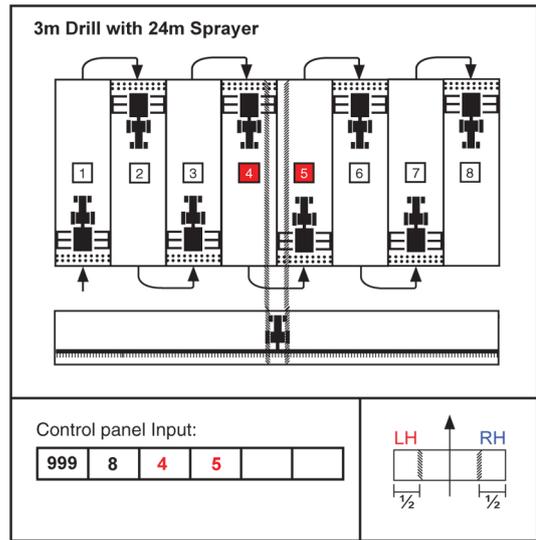
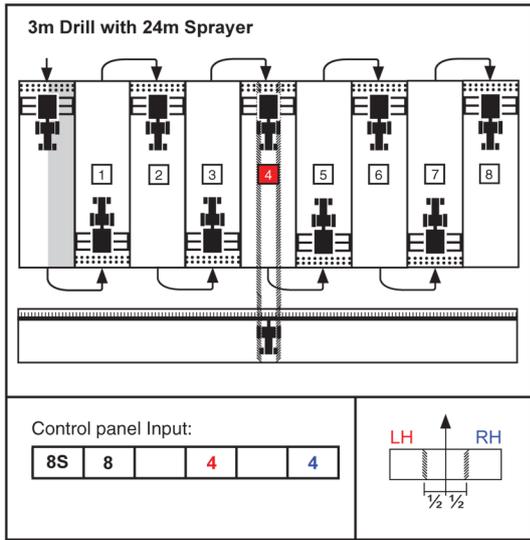
1. Repeatedly press (^SELECT) until SETUP is displayed.
2. Press (<FUNCTION)
3. The six-digit setup number is displayed. To change the number, press (^SELECT). To move to the left, press (<FUNCTION).
4. Press (ENTER) to store the Setup number.
5. Indicator now displays CAL. To change the number, press (^SELECT). To move to the left, press (<FUNCTION).
6. Press (ENTER) to exit.

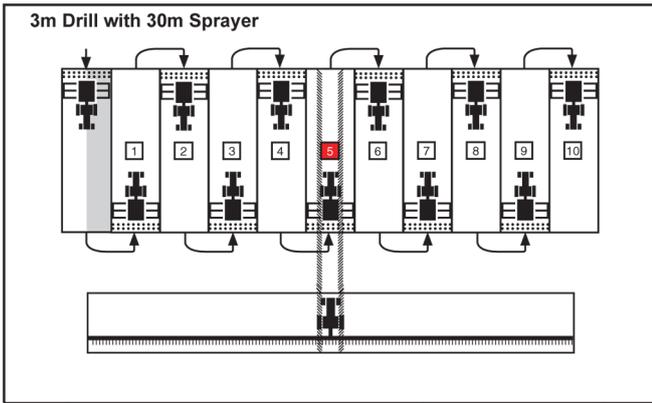
	Kg	lbs
Setup Nos.	545009	145020
Cal. Nos.	10866	24000

4.19 Tramline Rhythms

4.19.1 3.0m Tramline Rhythms

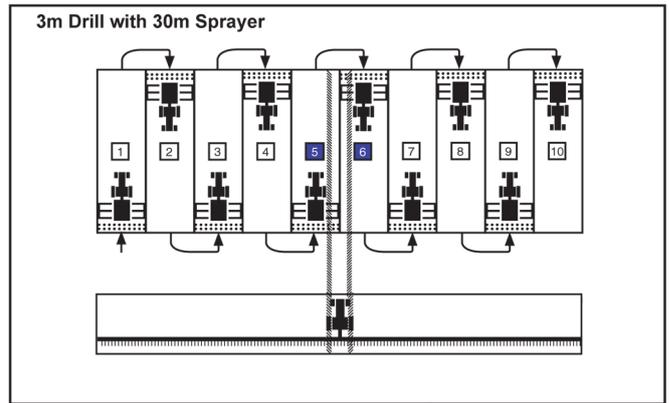






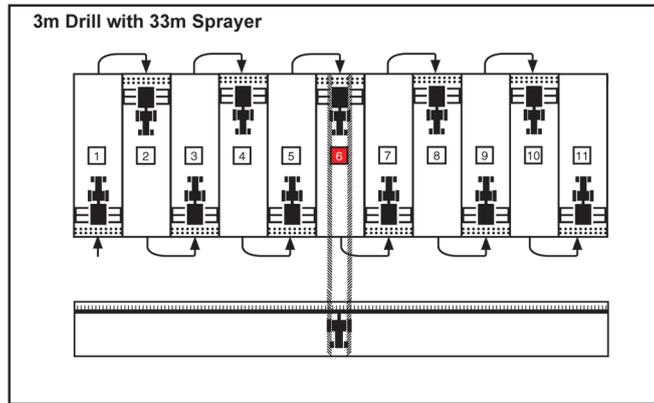
Control panel Input:

10S	10	5	5
-----	----	---	---



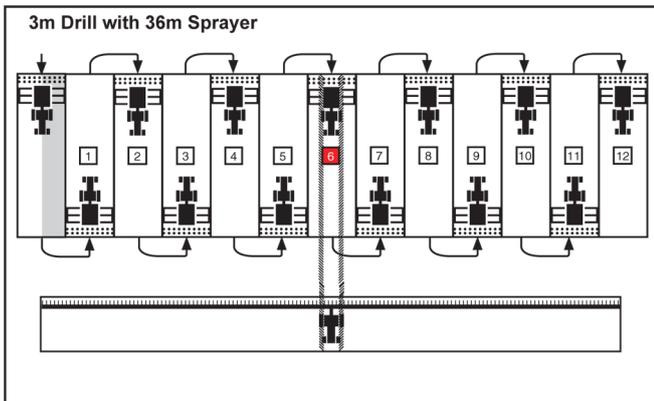
Control panel Input:

999	10	5	6
-----	----	---	---



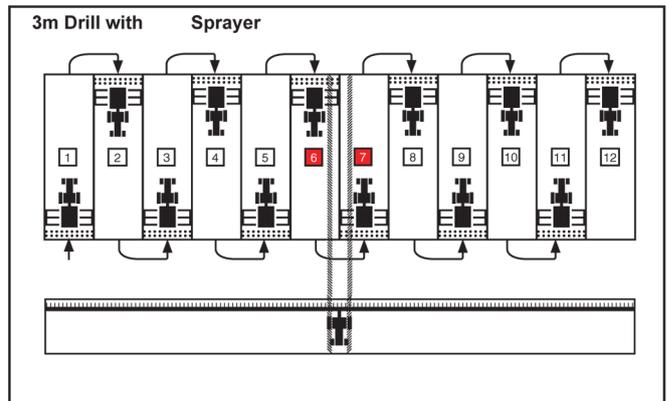
Control panel Input:

11	11	6	6
----	----	---	---



Control panel Input:

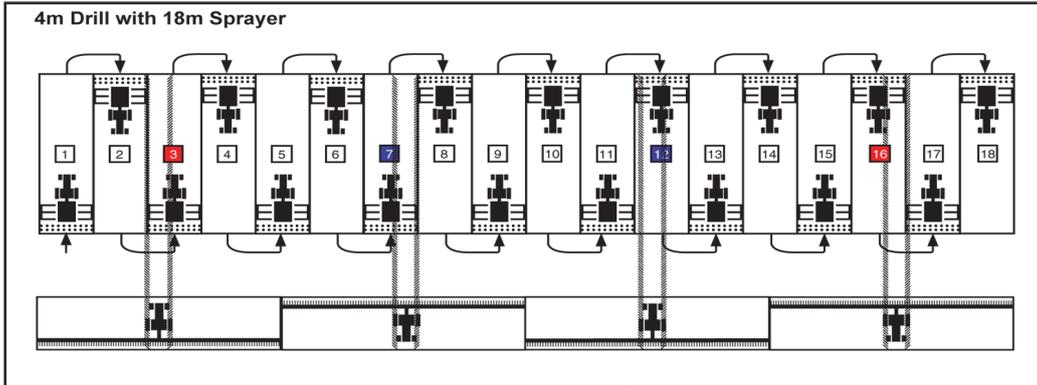
12S	12	6	6
-----	----	---	---



Control panel Input:

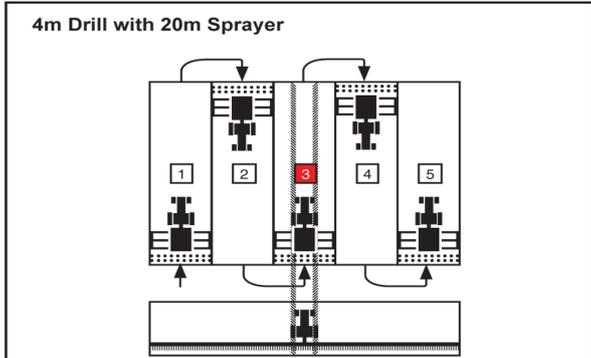
999	10	5	6
-----	----	---	---

**4.19.2 4.0m Tramline Rhythms**



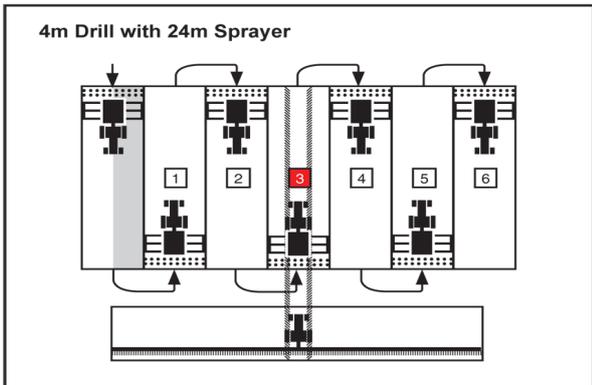
Control panel Input:

18	18	16	3	12	7
----	----	----	---	----	---



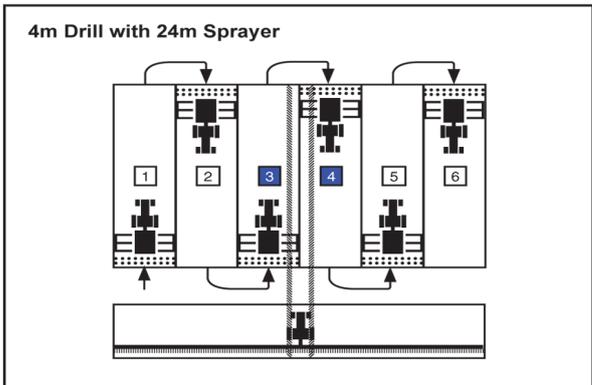
Control panel Input:

5	5		3		3
---	---	--	---	--	---



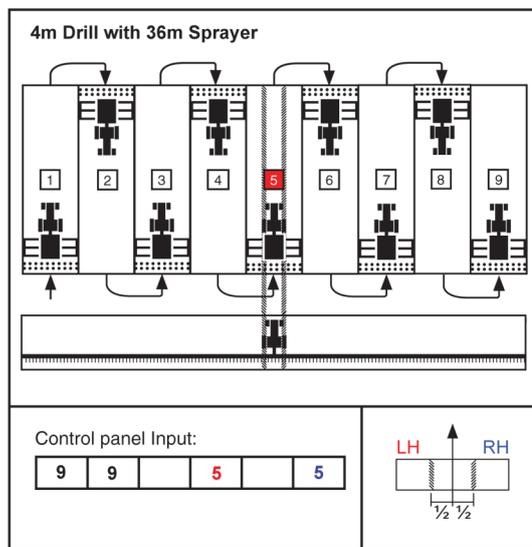
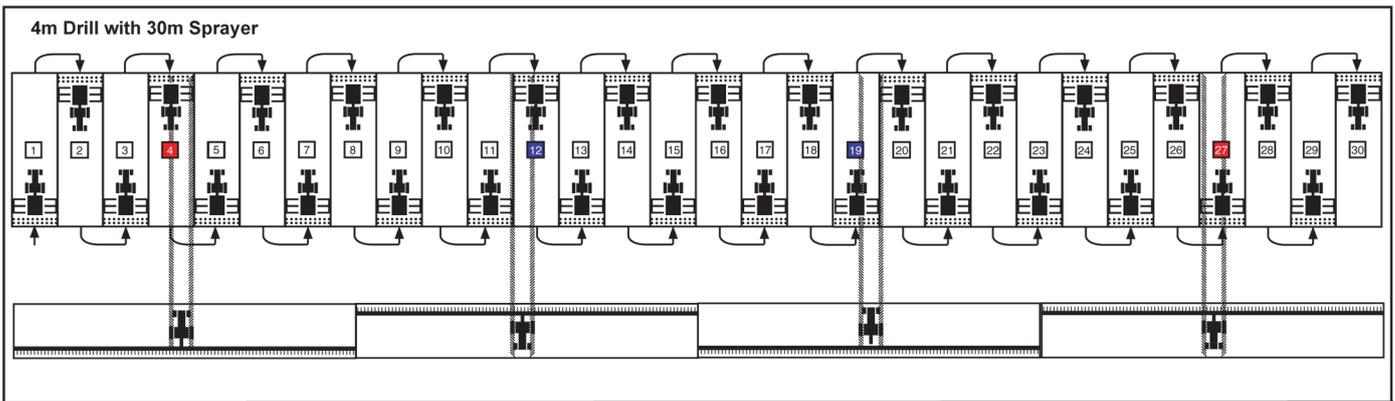
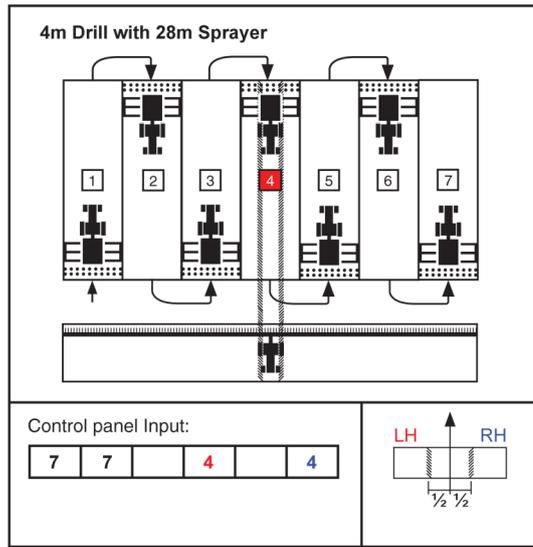
Control panel Input:

6S	6		3		3
----	---	--	---	--	---

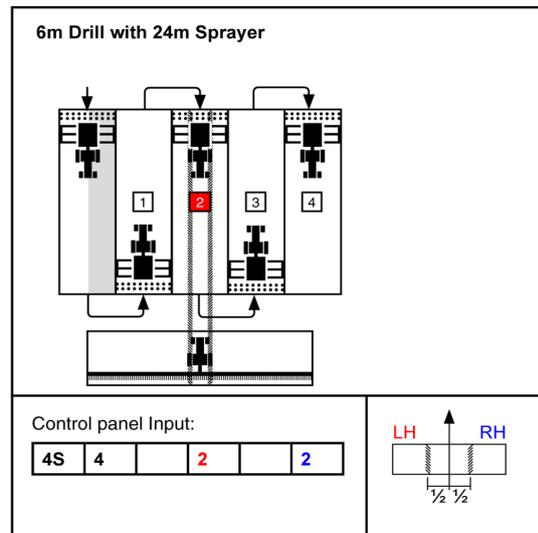
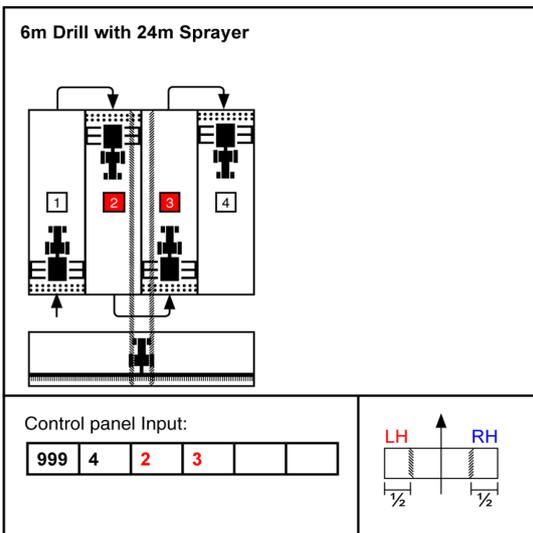
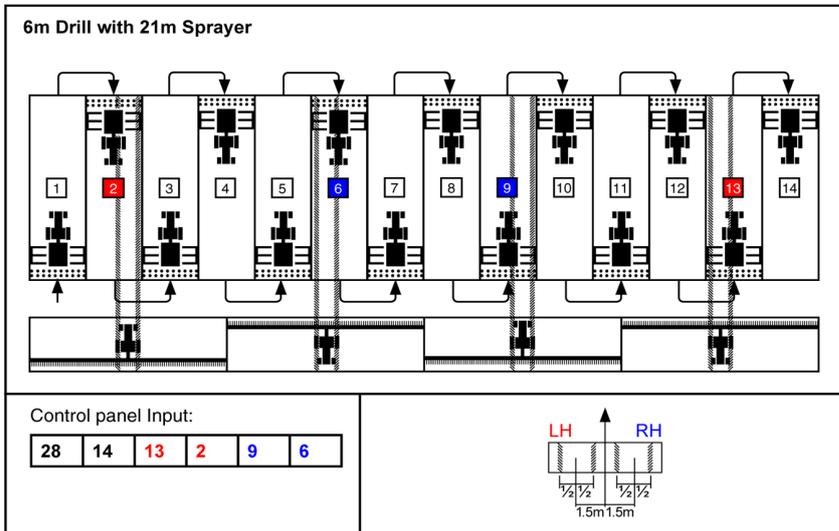
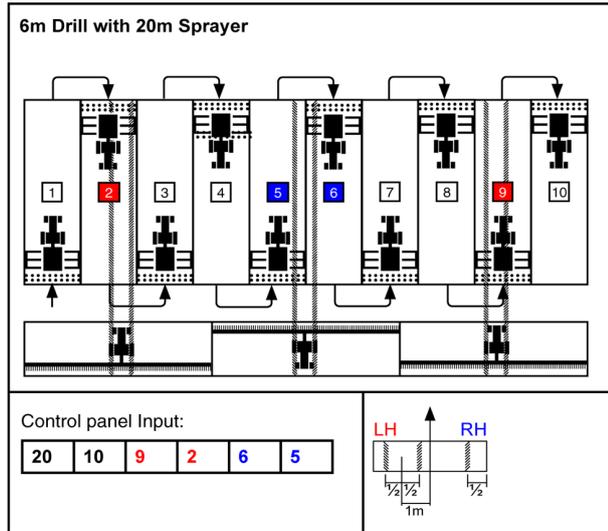
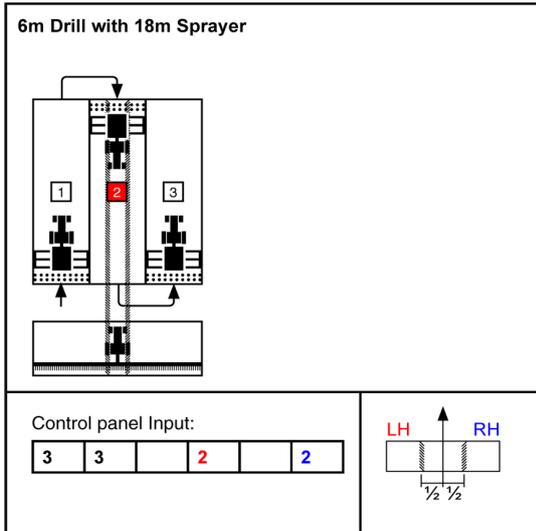


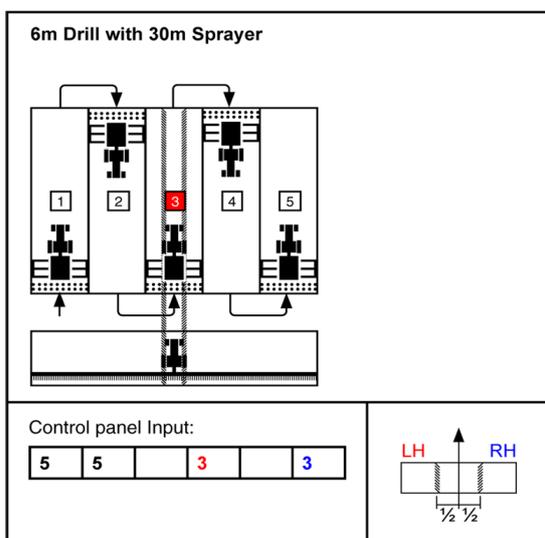
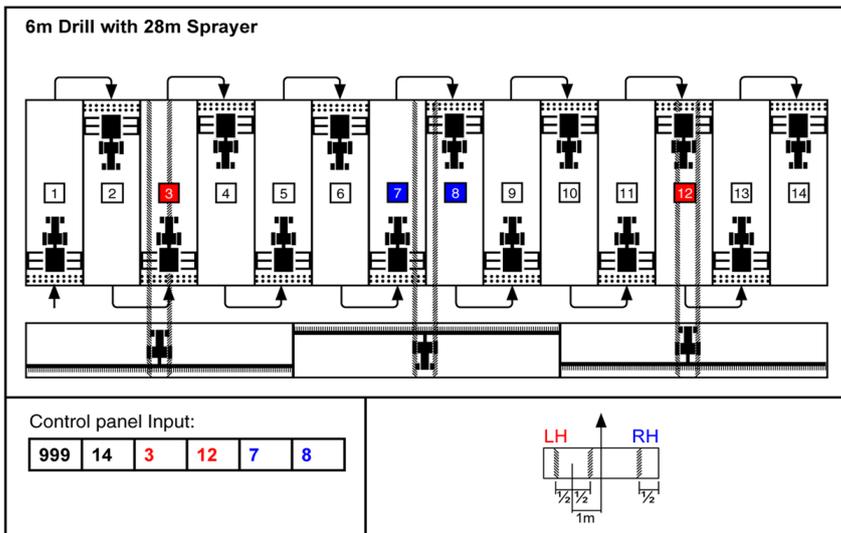
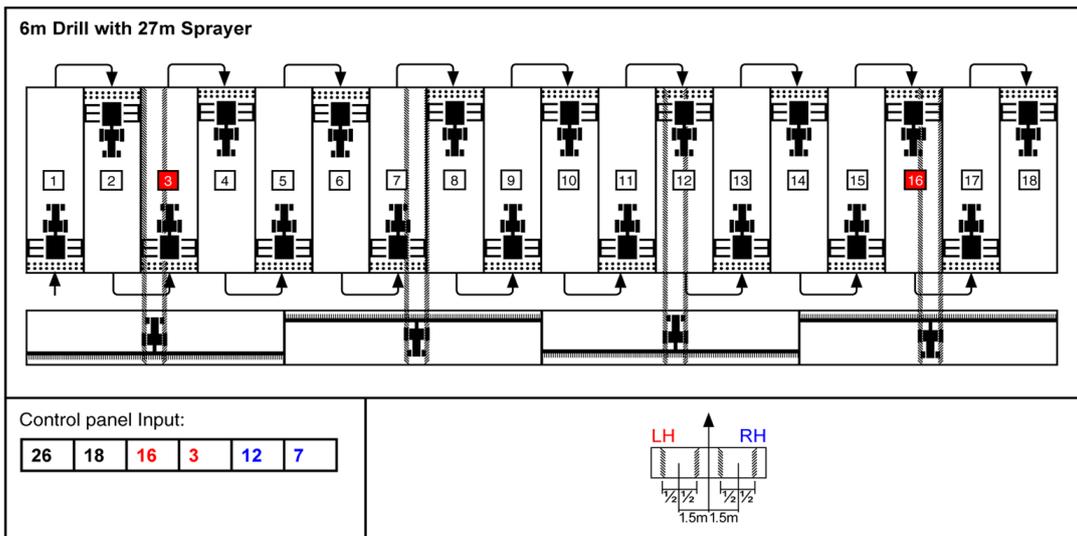
Control panel Input:

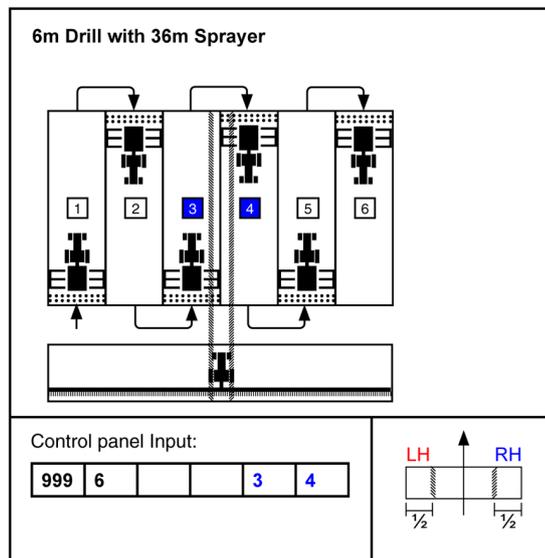
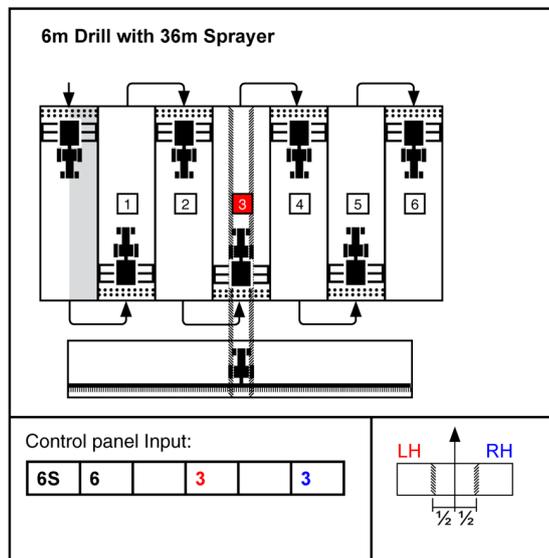
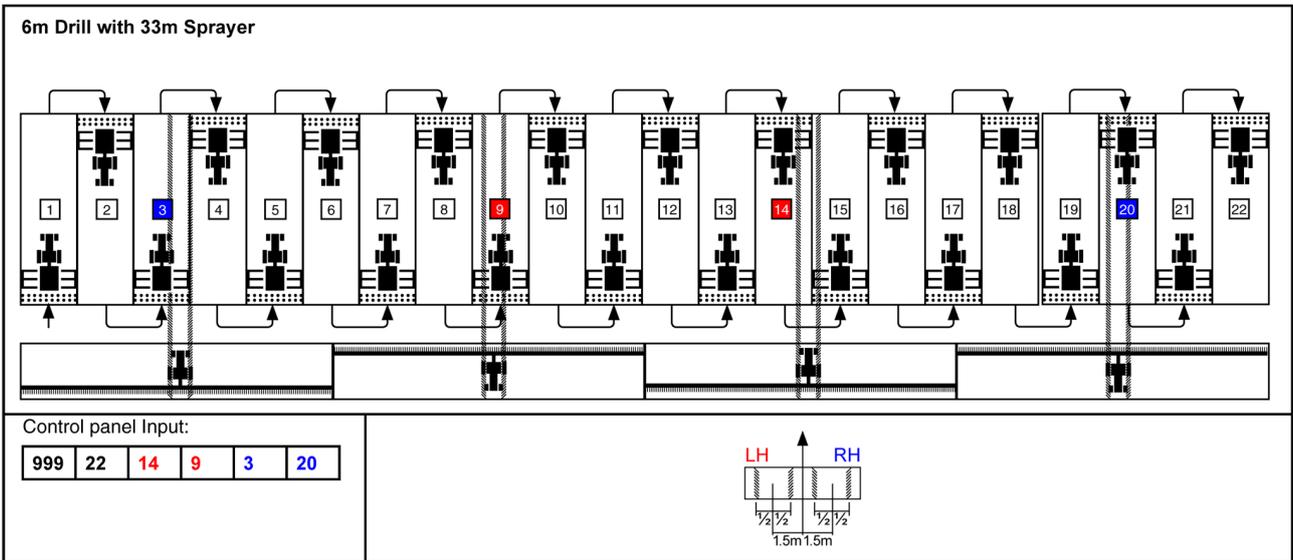
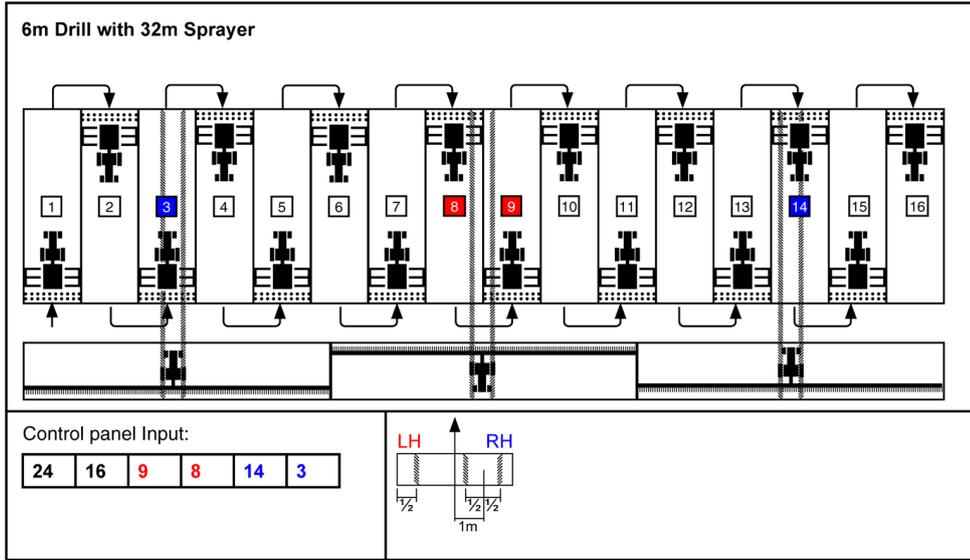
999	6			3	4
-----	---	--	--	---	---



**4.19.3 6.0m Tramline Rhythms**







**4.20 Calibration**

The Centurion/Saxon is a volumetric seed metering implement. For a given metering setup, rates vary for materials with different density and granularity. The tables provide a starting point, but calibration is essential for accurate application. The seed monitor reports and can optionally control seed rates. A red press-and-hold calibration switch is installed on the drill at the rear of the machine.



**Wear goggles and a dust mask when performing calibration procedures.**

1. Before starting calibration ensure that the correct metering discs are installed. (This must be done with slide gate in closed position).

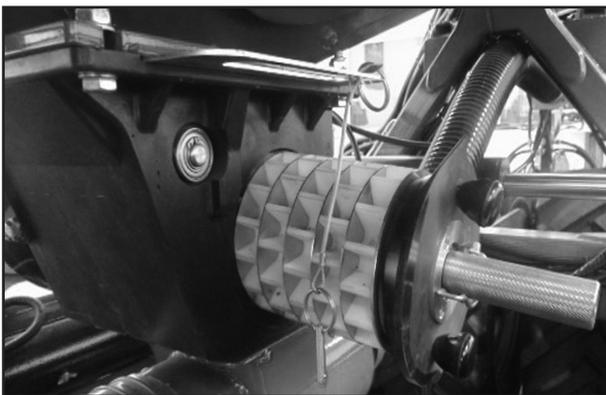


Figure 65. Metering Discs

2. Ensure slide gate is open and move the calibration diverter to divert seed to the hose running to the rear of the machine.

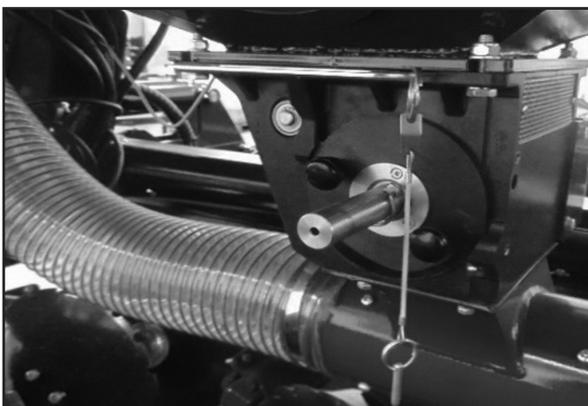


Figure 66. Meter door (shown in closed position)

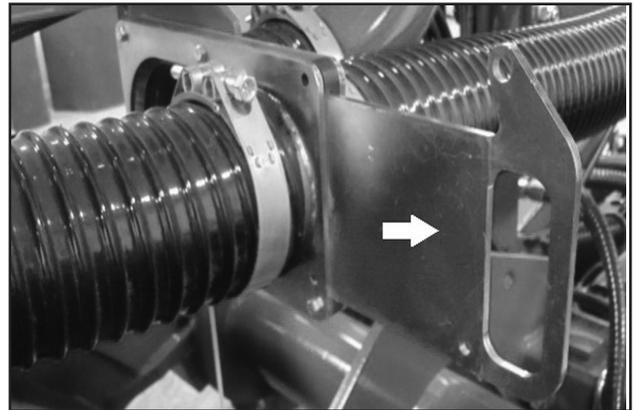


Figure 67. Calibration diverter

3. Use the Machine tools screen to to insert target rate.

Note- For dual venturi calibration, ensure that half width valve is all the way over to the right (figure 68). And following calibration returns to the centre for normal drilling (figure 69).

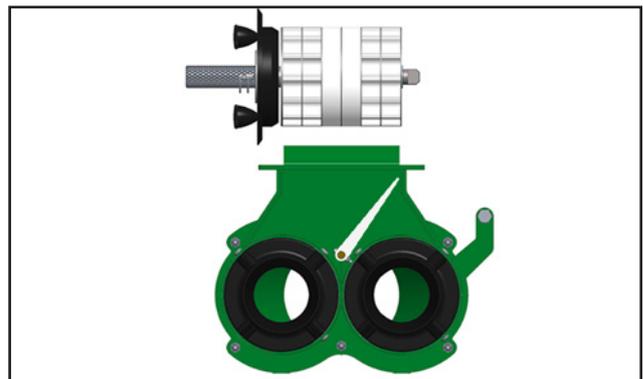


Figure 68. Half width valve to the right/ calibration

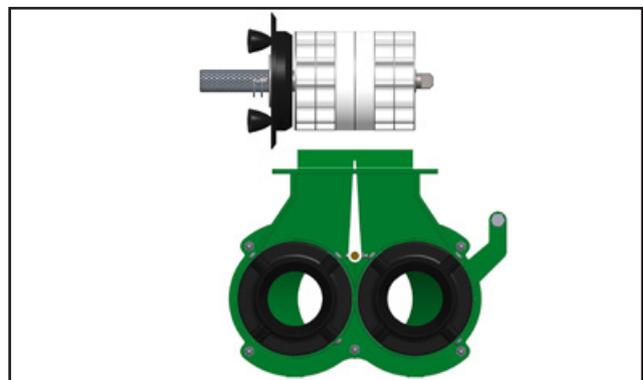


Figure 69. Half width valve to the centre/ Drill Mode

### 4.20.1 Compressing/Shims

When assembling the roller it is important to include all shims and end plates before compressing the roller assembly. When compressing tighten by hand before adjusting back to allow the lynch pin to secure the handle.

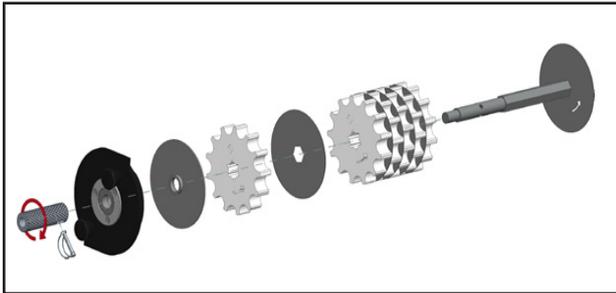


Figure 70. Cassette Layout

 **Important – 6.0m Drill must always have symmetrical rollers**

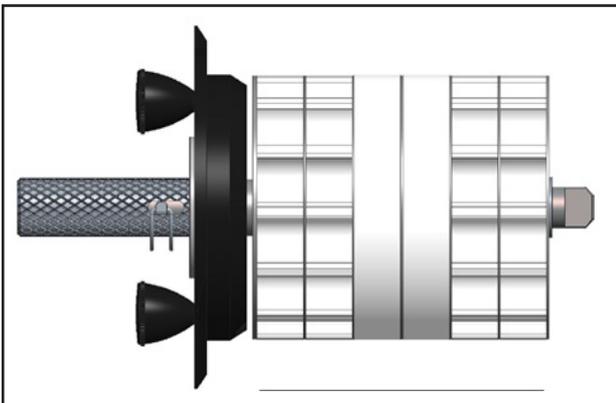


Figure 71. Metering Cassette

### 4.20.2 Meter Disc Selection

- 1 Disc per metre width of Seed Drill
- Always ensure largest seed (mixes) will fit into meter disc pocket
- Choose smallest pocket size for improved distribution
- Stagger seed discs on shaft for improved distribution
- Always observe direction arrows

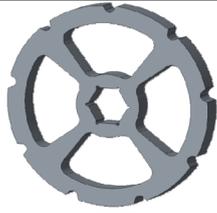
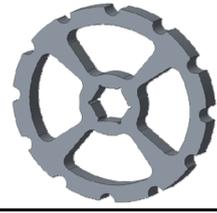
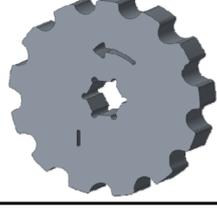
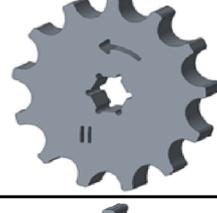
615-681D		Small Seed Only Low Rate: 2 - 5 kg/ha Eg - OSR, Mustard & Lucerne
615-680D		Small Seed Only High Rate: 5 - 30kg/ha Eg - OSR, Mustard & Lucerne
615-956D		Small Seed High rate - 30-100kg/ha
		Cereals / Cover Crop Mixes Low Rate 50-120kg/ha Eg - Hybrid Wheat/Barley, Sunflowers
615-957D		Cereals Standard Rate: 100-250kg/ha Eg - Wheat , Barley, Oats, Rye
615-955D		Cereals High Rate - 250-400kg/ha
		Large Seed Standard Rate: 100-300kg/ha Eg - Field Beans, Peas

Figure 72. Seed disc selection chart

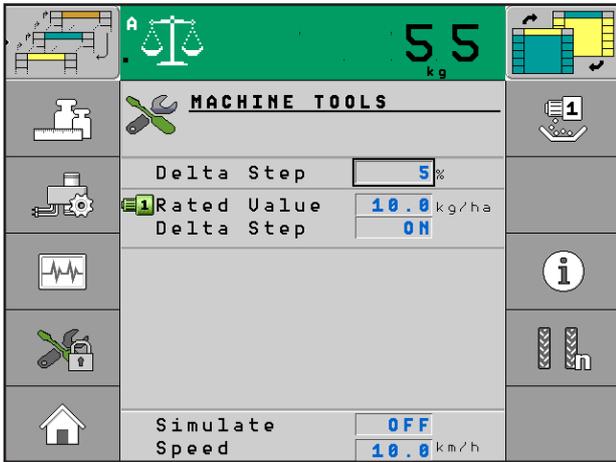


Figure 73. Calibration screen- Grain Only



Figure 75. Calibration Screen

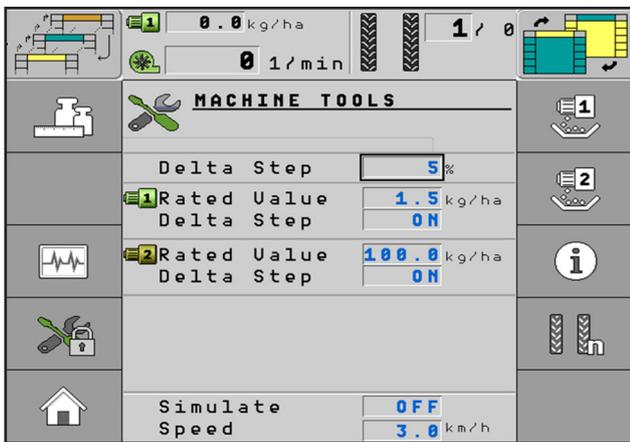


Figure 74. Calibration screen- Grain and Fert

5. Hang scales on hook at rear of machine. Place the bag on the scales and zero.

6. Attach the calibration bag to the hose at the rear of the machine (Figure 76).

4. If you require to prime the roller with seed select  on figure 75. calibration screen then select 'Start'.



Figure 76. Calibration bag attached.

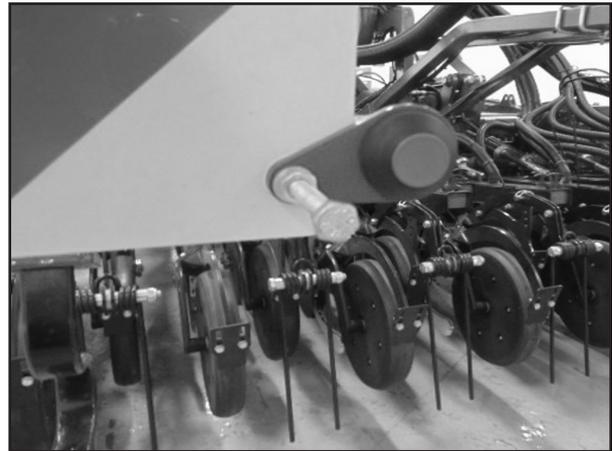


Figure 78. Rear Calibration Button

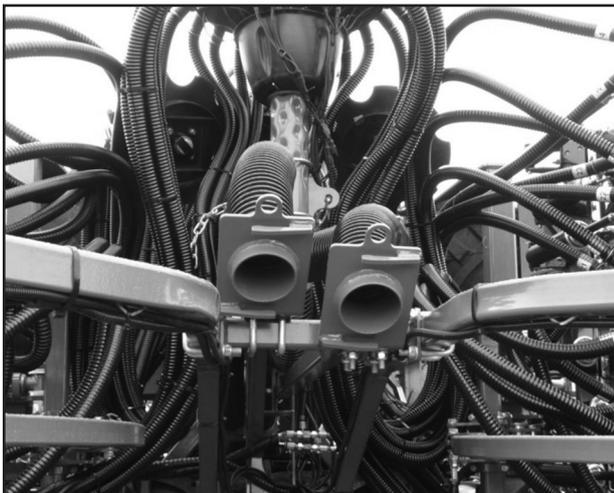


Figure 77 Calibration Outlet- Grain & Fertiliser

As per figure 77, fertiliser machines have a second callibration outlet but both use a single calibration button. However both products have to be calibrated individually.

7. Operate the calibration button - this will start the metering roller and fill the bag. Release the button when the bag is half full.

8. Weigh the seed bag.

9. Enter the weight into the control panel. After entering the weight the speed range will be displayed.

10. Close the calibration diverter.



Figure 79. Changing the weight

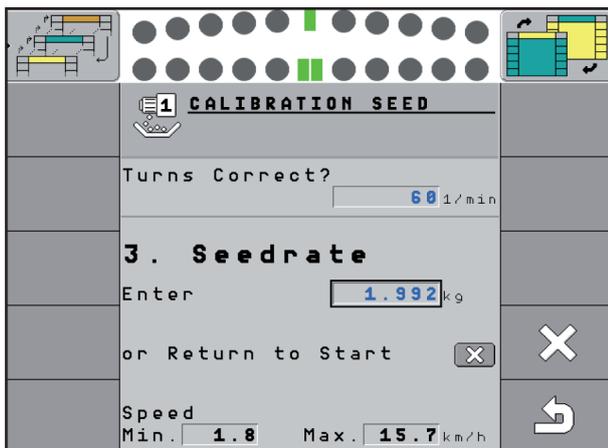
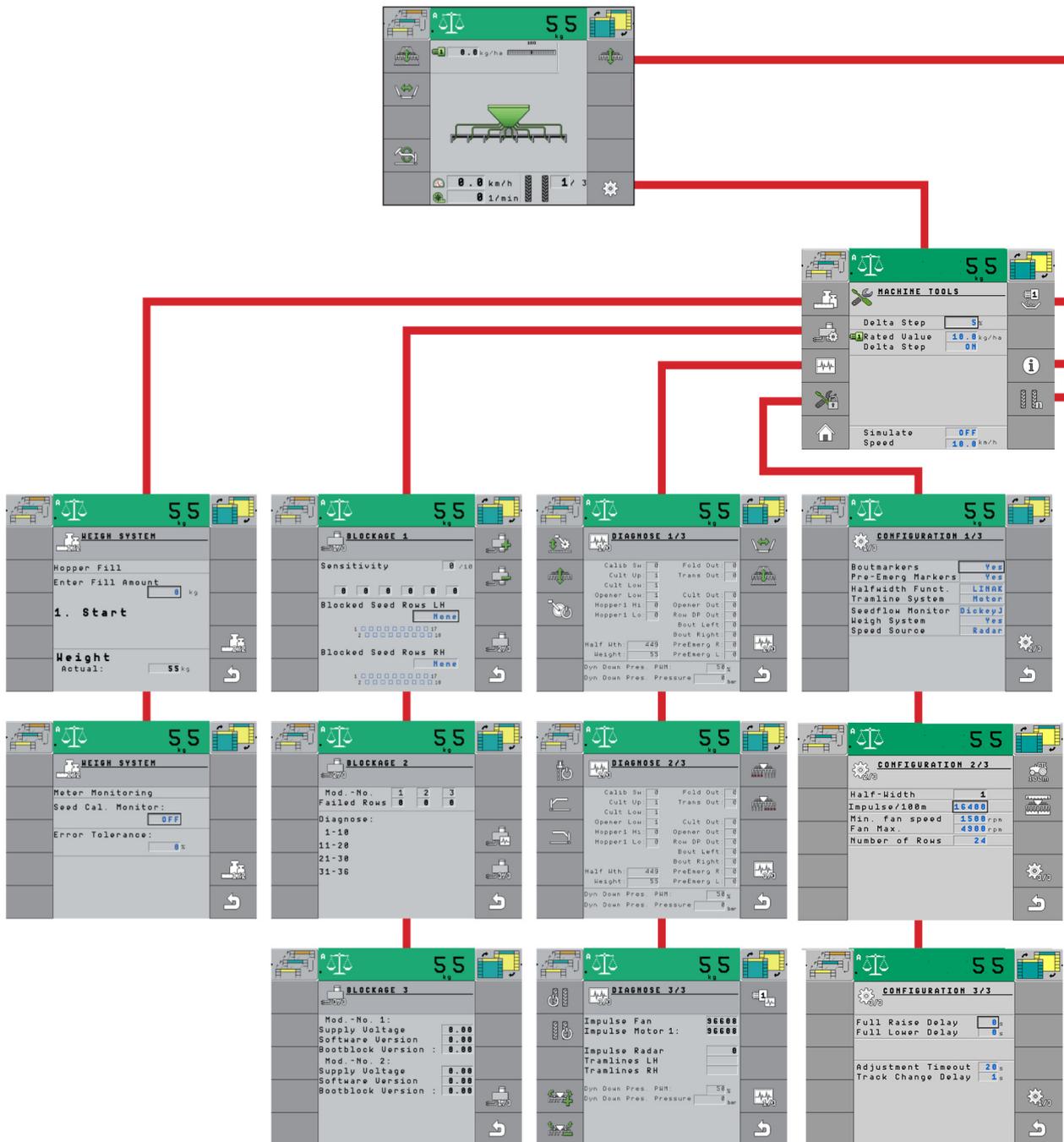


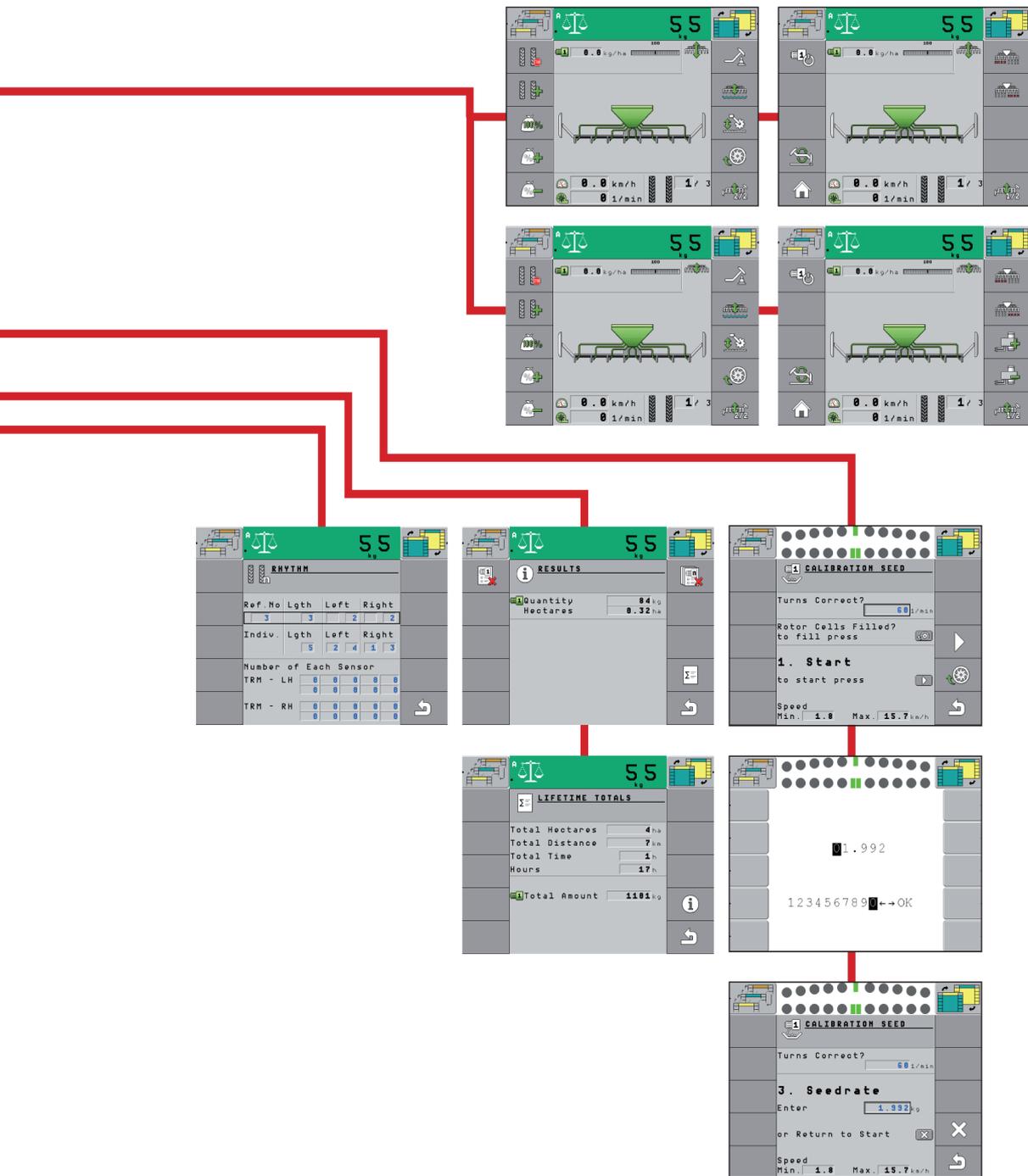
Figure 80. Calibration screen showing speed range



The displayed speed range should ordinarily be between 2km/h and 20km/h. A speed range that falls outside of your desired drill speed range may indicate that the roller needs changing or that the calibration procedure may need to be performed again.

4.21 Screen Map





## 4.22 Final Field Checklists

Use the following tables to develop a final checklist for your tractor/drill configuration. Additional or fewer steps may be necessary depending on tractor features, drill options and planting accessories.

Mechanical Checklist	Page
<input type="checkbox"/> Check all tyre pressures	92
<input type="checkbox"/> Tongue height	38
<input type="checkbox"/> Implement unfolded	29
<input type="checkbox"/> Boutmarker extension set	40
<input type="checkbox"/> Marker disc angle set	41

Electrical Checklist	Page
<input type="checkbox"/> Verify electrical hook-ups solid	27
<input type="checkbox"/> Ensure lights are on	20
<input type="checkbox"/> Check control panel and observe any diagnostic messages	61
<input type="checkbox"/> Configure monitor	62

Hopper and Air System Checklist	Page
<input type="checkbox"/> Hopper cover closed	42
<input type="checkbox"/> Materials loaded	-
<input type="checkbox"/> Hose routings - no sags, no pinches (check wing-folded & field positions)	-
<input type="checkbox"/> Hoses fully connected to meters, towers and openers	-

Cultivation Section Checklist	Page
<input type="checkbox"/> Disc blade wear / operation	39
<input type="checkbox"/> Levelling board wear / operation	39

Row Units Checklist	Page
<input type="checkbox"/> Preset depth handles alike.	51
<input type="checkbox"/> Preset down force springs alike, except in tracks.	52
<input type="checkbox"/> Check wheel scraper gaps (if installed)	50

Hydraulic System Checklist	Page
<input type="checkbox"/> Check tractor hydraulic reservoir full	-
<input type="checkbox"/> Inspect connections for leaks	-
<input type="checkbox"/> Perform a raise and lower operation	31
<input type="checkbox"/> Check fan operation	44

First Bout Operation Checklist	Page
<input type="checkbox"/> Drill unfolded and aligned for first bout, with opener discs about 3m (10ft) before field edge.	-
<input type="checkbox"/> Run fan for at least 15 minutes before planting.	44
<input type="checkbox"/> Unfold boutmarker on next-row side.	-
<input type="checkbox"/> Set fan hydraulic circuit to low flow, engage circuit. Gradually adjust fan hydraulic flow to obtain desired rpm.	44
<input type="checkbox"/> Check control panel for alerts.	62
<input type="checkbox"/> Pull forward, lower working elements and begin planting for a short distance.	-
<input type="checkbox"/> Stop. Assess:	
Cultivation section settings	39
planting depth	51
press wheel operation	51
<input type="checkbox"/> Make necessary adjustments	-

Sharp Field Turns Checklist	Page
<input type="checkbox"/> Fold boutmarker	59
<input type="checkbox"/> Raise working elements	53
<input type="checkbox"/> Make turn	53
<input type="checkbox"/> Unfold boutmarker on next-row side.	59
<input type="checkbox"/> Resume planting.	-

Suspending Planting Checklist	Page
<input type="checkbox"/> Stop tractor	-
<input type="checkbox"/> Fan hydraulic circuit to Float or Neutral	-
<input type="checkbox"/> Fold Boutmarker	59
<input type="checkbox"/> Raise cultivation section / row units	-

Ending Planting Checklist	Page
<input type="checkbox"/> Suspend operations as above, then:	-
<input type="checkbox"/> Lift working elements	-
<input type="checkbox"/> Select fold circuit.	30, 57
<input type="checkbox"/> Fold wings	30
<input type="checkbox"/> Wing lock engaged	30
<input type="checkbox"/> Lights / beacon ON for transport	27

## 5.0 Servicing and Maintenance



Follow the safety instructions for servicing and maintenance.

### 5.1 Servicing

Your machine has been designed and constructed for maximum performance, operational efficiency and operator friendliness under a wide variety of operating conditions.

Prior to delivery, your machine has been checked at the factory and by your authorised dealer to ensure that you receive a machine in optimum condition. Adjustments may be needed to suit your field conditions.



To ensure trouble-free operation, it is important that servicing and maintenance work is performed at the recommended intervals.

### 5.2 Cleaning

In order to ensure that the machine is always in operating condition and to achieve optimum performance, perform the cleaning and servicing work at regular intervals.

Avoid cleaning any bearings with a high pressure hose or a direct water jet. The housing, screwed connections and ball bearings are not watertight.

Do not apply wax to any steps or platforms. This may cause people to slip and fall causing injury.

### 5.3 Preparation for Storage

If you need to store the machine for a longer period, observe the following points:

- Park the machine undercover if possible
- Protect the discs against rust. If you need to spray the implements with oil, use light, biologically degradable oils, e.g. rape oil.



Cover any rubber sections before using oil sprays. These sections must not be oiled. Remove any traces of oil with a suitable cleaning agent.

### 5.4 Cultivation Elements



When performing maintenance work on cultivation elements (discs, levelling boards, eradicator tines) extreme care should be taken. Wear goggles and gloves at all times when maintaining ground engaging parts.



Do not attempt to assist fitting working elements with a steel headed hammer, this can lead to splintering of the metal due to its hardness, which can cause injury. If fitting requires assistance, a copper/hide or plastic mallet should be used.



Safely support the unfolded machine in raised position using maintenance locks and stands before attempting maintenance work on elements under the machine.

### 5.6 Maintenance Intervals

Apart from daily maintenance, the maintenance intervals are based on the number of operating hours and time data.

Keep a record of your operating hours to ensure that the specified maintenance intervals are adhered to as closely as possible.

Never use a machine that is due for maintenance. Ensure that all deficiencies found during regular checks are remedied immediately.



**Avoid sharp-edged and pointed parts (disc blades, etc.) when working on the machine.**



**Place the machine on suitable supports when working underneath! Do not work under a machine which is not supported!**

On a new machine tighten all nuts and bolts after 5 hours work and again after 15 hours. This also applies to parts that have been moved or replaced. After the initial 15 hours of work a once a week check should be sufficient depending on daily work rates.

### 5.5 Operator Support

If you have a problem, please contact your dealer. They will endeavour to solve any problems which may occur and provide you with support at all times.

In order to enable your dealer to deal with problems as quickly as possible, it helps if you can provide them with the following data. Always state the:

- Customer Number
- Name and Address
- Machine Model
- Serial Number of Machine
- Date of Purchase and Operating Hours
- Type of Problem

## 5.7 Maintenance and Lubrication

Proper servicing and maintenance is the key to long implement life. With careful and systematic inspection, you can avoid costly maintenance, downtime and repair.

Always turn off and remove the tractor key before making any adjustments or performing any maintenance.

You may be severely injured or killed by being crushed under a falling implement. Always use suitable supports when working near or under a raised implement.

Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Check all hydraulic lines and fittings before applying pressure. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If injured, seek immediate medical attention from a health care provider familiar with this type of injury.

Securely lock up drill before working on it. Lubricate areas listed under "Maintenance Overview" on page 86.

Check for air leaks at covers, doors, seals, caps and hose connections.

Inflate tyres as specified on "Tyre Inflation Chart" on page 92.

Replace any worn, damaged or illegible safety decals. Order new decals from your Great Plains dealer.

## 5.8 Handling of Lubricants

Please ensure that you read the following instructions as well as the relevant information. This also applies to any of your employees who handle lubricants.

### Hygiene

Lubricants do not present a health hazard provided they are used for their specified purpose.

In the case of prolonged skin contact, lubricants especially low-viscosity oils may remove the natural layer of fat contained in the skin, resulting in dryness and possible irritation.

It is important to take extreme care when handling waste oil as it may contain other irritants.

Vapours given off by cleaning agents and oils are also a potential health hazard. Therefore you should not carry any oily cloths around. Change soiled work clothing as soon as possible.

Always exercise extreme care and observe the recommended hygiene rules when handling mineral oil products. Details of these handling regulations can be found in information provided by the health authorities.

### Storage and Handling

- Always store lubricants where they cannot be accessed by children.
- Never store lubricants in open or unlabelled containers.

## Fresh Oil

• Apart from taking the usual care and observing hygiene rules, there is no need to take any special precautions when handling fresh oil.

## Waste Oil

• Waste oil can contain harmful contaminants which may cause skin cancer, allergies and other illnesses.

## Attention!

Oil is a toxic substance. Should you swallow any oil, do not try to vomit. Contact a doctor immediately.

Protect your hands with barrier cream or wear gloves to avoid contact with the skin. Wash off any traces of oil thoroughly with soap and hot water.

- Wash your skin thoroughly with soap and water.
- Use special cleaning agents to clean any dirt off your hands.
- Never wash oil residue from your skin with petrol, diesel fuel or paraffin.
- Avoid skin contact with any oily clothing.
- Do not keep any oily rags in your pockets.
- Wash soiled clothing before wearing it again.
- Ensure that any oily footwear is disposed of in the proper manner.

## Measures in case of injury through oil

### Eyes

Should any oil be splashed into your eyes, rinse with water for 15 minutes. If the eye is still irritated, contact a doctor immediately

## If Oil Is Swallowed

If oil is swallowed, it is important not to induce vomiting. Contact a doctor immediately.

## Skin irritation caused by oil

In case of prolonged skin contact, wash off the oil with soap and water.

## Oil Spills

Use either sand or a suitable granular absorbent to soak up any spilt oil. Dispose of the oil-contaminated absorbent in the proper manner.

## Oil Fires

Never use water to extinguish an oil fire. The oil will float on the water causing the fire to spread.

Burning oil-lubricant must be extinguished using a carbon dioxide powder or foam extinguisher. Always wear respiratory equipment when dealing with fires of this type.

## Waste Oil Disposal

Oil-contaminated waste and used oil must be disposed of in accordance with current legislation.

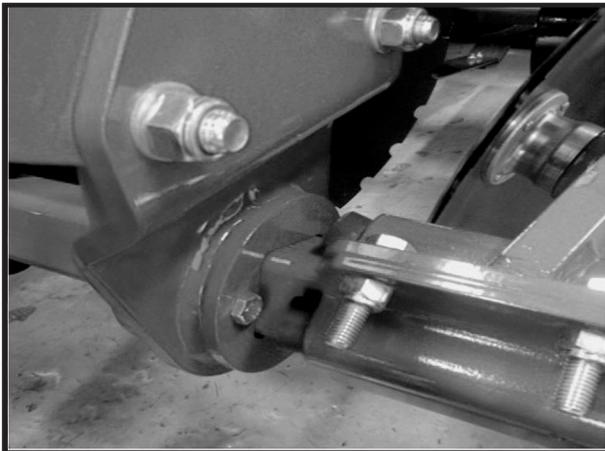
Waste oil must be collected and disposed of in accordance with local regulations. Never pour used oil into unsealed sewage systems or drains or onto the ground.

## 5.9 Lubricants

All lubricating points on the machine can be lubricated with multigrade lubricating grease as specified in DIN 51825 KP/2K - 40.

**5.10 Maintenance Overview**

 Multi-purpose spray lubricant	 Multi-purpose grease lubricant	 Multi-purpose oil lubricant	 Inspection	 Intervals (operating hours) at which service is required
---	--	---	--	--



 **10**

Check all disc and levelling board mounts, replace if necessary.



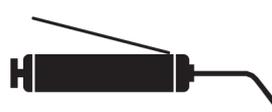
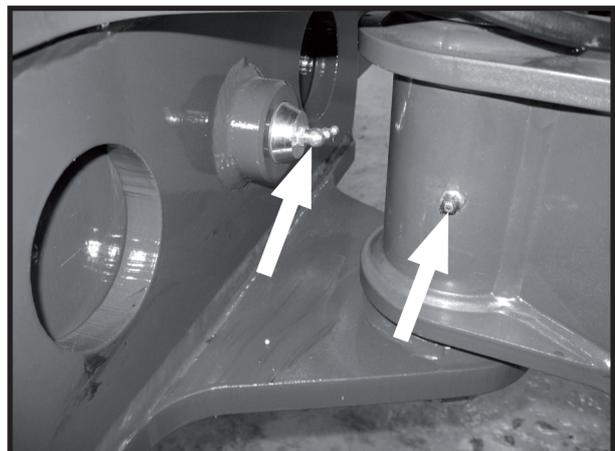
 **600**

Grease wheel hubs seasonally. Grease only until resistance is felt. Excess pressures or grease volume can damage seals.



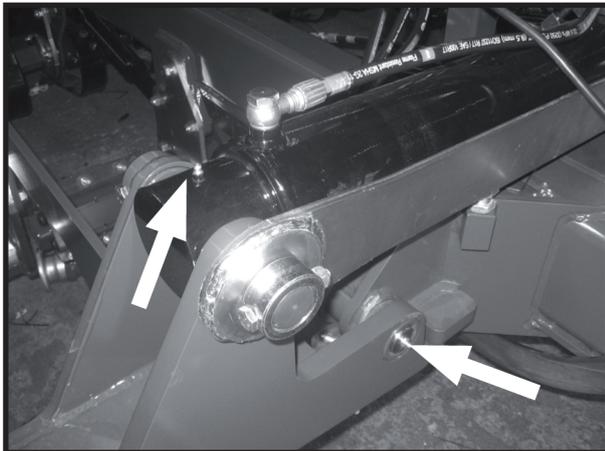
 **EACH USE**

Tyre pressures, wheel stud tightness and brake function should be checked before each use.



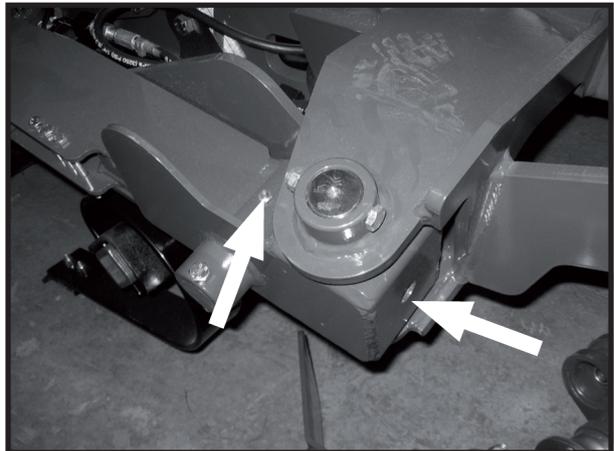
 **50**

Linkage cross shaft.



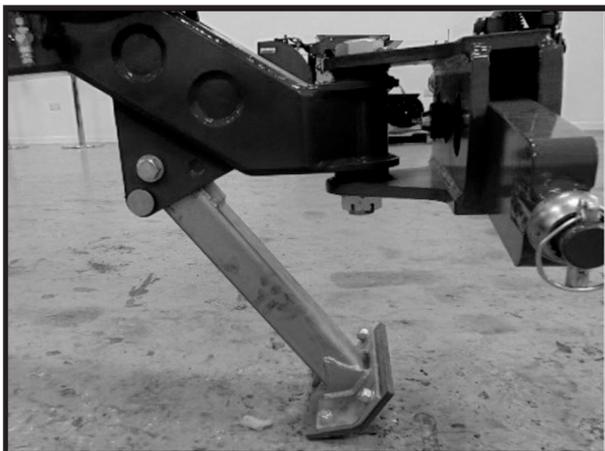
**50**

Wing pivots and both ends of fold cylinders.



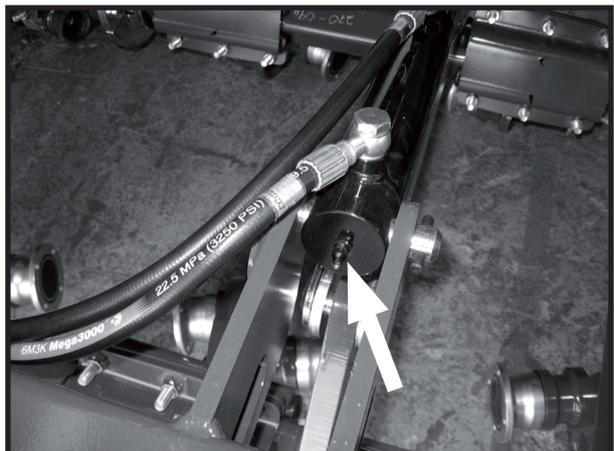
**50**

Boutmarker pivots and cylinders (both ends).



**EACH  
USE**

Parking stand should be inspected before each use.



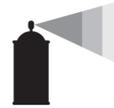
**50**

Cultivation disc depth / levelling board angling cylinders.



50

Row unit cylinders.



**AS  
NEEDED**

Hose mast pivot - spray as necessary.



50

Track eradicator cylinders (nipple located under beam)

### 5.11 Unloading Materials

Unloading materials has the same risks as loading material. Review the advice on page 42. Take the same materials safety precautions as for loading.

1. Position drill on a clear flat surface. Put the tractor in Park.
2. Place a suitable receptacle to catch seed under the rear hose.
3. Move the calibration diverter to redirect the flow of seed to the hose at the rear of the machine.

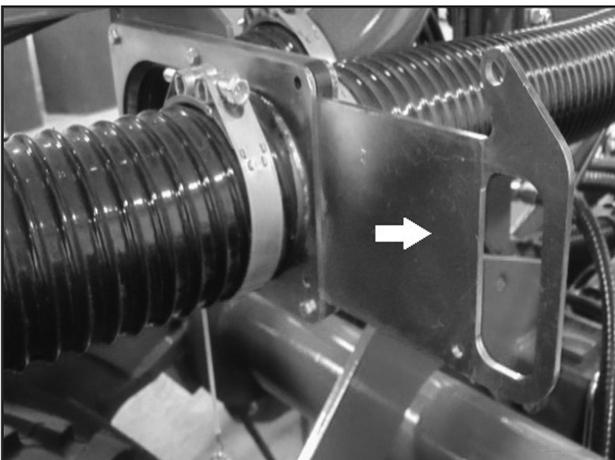


Figure 81. Calibration diverter

4. Open the meter door.
5. With the fan running navigate to the calibration screen and press the play button. Then hold the button on rear of the drill and this will empty the hopper through the hose at the rear of the machine.

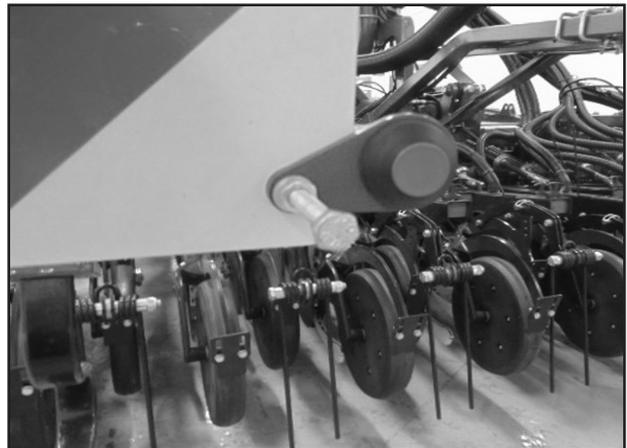


Figure 82. Calibration button

6. Shut down tractor.
7. Open meter box and remove roller. Clean out meter.
8. Wipe down doors and bottom of meter.
9. Replace roller, close meter box and meter door.

In instances where it is not possible to operate the air system to empty the hopper a chute is installed on the side of the hopper.

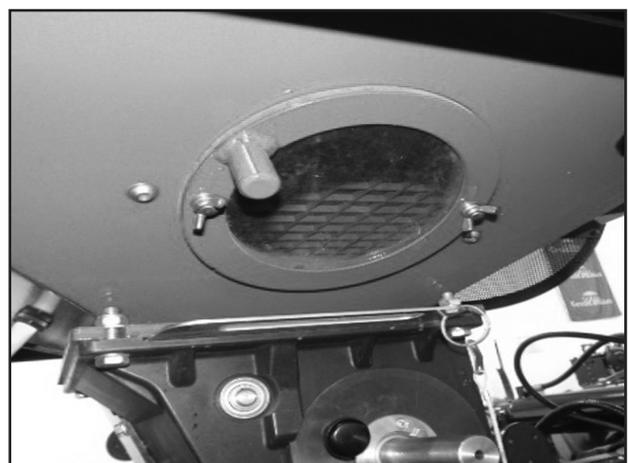


Figure 83. Hopper emptying unit.

### 5.11.1 Material Clean-Outs

For normal unloading of residual materials at completion of seeding, see “Unloading Materials” on page 89.

The present section covers completely cleaning out the hopper and air system, when residue needs to be minimized.

Perform normal material unloading, then fold and lock the drill in preparation for a move to a site suitable for wash-out. Reposition drill to a suitable site with air hose available.

Leave the tractor hitched and in Park with parking brake set.

After cleaning out the hopper, close all doors. Run air system for 10 minutes to blow moisture out of meters and lines.

Open the hopper meter door. Run air for 5 minutes. Close meter doors as for parking or storage. Move drill to parking or storage site.

Follow normal Parking or Storage instructions.

If, however, parking and storage recommendations have not been followed, or material is defective, it is possible to have hard-to-remove material present.

If the material fails to pass through the clean-out door, take the following steps to remove it. Do not consider entering the hopper until first completing these tasks.

1. Open the hopper cover.
2. Evaluate the problem, for example; If the problem is a single moveable large object, such as a dead animal, fishing out from above may be the solution.
3. For small amounts of residual materials, poking with a long pole / brush may suffice to push it through the clean-out.
4. If poking doesn't produce satisfactory results it may be necessary to use compressed air.

### 5.11.2 Hopper Entry

Normal use of the hopper and routine maintenance do not require entry.

Hopper entry may be necessary in some unusual circumstances. For instance, if the removal of an obstruction is too difficult to pull out with the meter box removed and not susceptible to fishing or pumping out from the open cover.

Should such a situation arise, observe the following precautions:

Review the Material Safety Data Sheets (MSDS) for any treatments and/or fertilizers used in the hopper since it was last thoroughly cleaned, and the most recent materials even if the hopper was subsequently cleaned. Retain the MSDS information for any medical treatment that might be required.

Designate or engage a team for hopper maintenance. Hopper entry is never a single-person activity. At least one attendant/observer is necessary. Give priority to individuals already trained in confined space operations. Designate a leader (who will not be the entrant) with authority to terminate the activity.

Ensure that the team is protected. Obtain the necessary safety equipment specified for confined space exposure to those materials, paying particular attention to safety harness/line, and respiratory support and protection. This may include contaminant detection equipment and positive ventilation to refresh air in the hopper.

At least one attendant must be equipped with communications capability, to summon outside aid in the event that the hopper worker is overcome. Equip the entrant with a safety harness and safety line. Review the hazards. Review the procedures. Understand the use of the protective equipment. Know the steps to take in emergencies. Practice them. Train the observer to summon aid, and not attempt hopper entry if the entrant is overcome.

Set brakes or block the drill wheels to prevent movement.

Disrupt any crusting or bridging that may be present. From outside the hopper, break up any hard surfacing on top of the material, or forming layers within the material. Such layers are extremely dangerous to stand on.

## 5.12 Hydraulic Maintenance

To function properly, the hydraulic systems must be free of contaminants, free of air and fully charged with oil.



**Do not loosen (“crack”) fittings with a circuit engaged. With a circuit in Neutral or Float, crack hydraulic lines carefully. There may still be pressure in lines even with the circuit in Float or Neutral. Wear gloves and eye protection. Crack fittings slowly. Supply fluid slowly. When circuit is energized, watch for fluid emergence at a safe distance.**



**Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical attention from a health care provider familiar with this type of injury.**

Check hydraulic fluid level in tractor reservoir and fill to proper level. Add fluid to system as needed

### 5.13 Tyre Warranty Information

All tyres are warranted by the original manufacturer of the tyre. Tyre warranty information is found online at the manufacturer's website listed below. For assistance or information, contact your nearest Authorised Farm Tyre Retailer.

Manufacturer	Website
BKT	www.bkt-tires.com

### 5.15 Tyre Inflation Chart

Tyre Size	Inflation
420 / 55 - 17	3.5 bar (50 psi)

### 5.14 Torque Values Chart

Bolt Size in-tpi <sup>a</sup>	Bolt Head Identification					
						
	N-m <sup>b</sup>	ft-lb <sup>d</sup>	N-m	ft-lb	N-m	ft-lb
1/4-20	7.4	5.6	11	8	16	12
1/4-28	8.5	6	13	10	18	14
5/16-18	15	11	24	17	33	25
5/16-24	17	13	26	19	37	27
3/8-16	27	20	42	31	59	44
3/8-24	31	22	47	35	67	49
7/16-14	43	32	67	49	95	70
7/16-20	49	36	75	55	105	78
1/2-13	66	49	105	76	145	105
1/2-20	75	55	115	85	165	120
9/16-12	95	70	150	110	210	155
9/16-18	105	79	165	120	235	170
5/8-11	130	97	205	150	285	210
5/8-18	150	110	230	170	325	240
3/4-10	235	170	360	265	510	375
3/4-16	260	190	405	295	570	420
7/8-9	225	165	585	430	820	605
7/8-14	250	185	640	475	905	670
1-8	340	250	875	645	1230	910
1-12	370	275	955	705	1350	995
1 1/8-7	480	355	1080	795	1750	1290
1 1/8-12	540	395	1210	890	1960	1440
1 1/4-7	680	500	1520	1120	2460	1820
1 1/4-12	750	555	1680	1240	2730	2010
1 3/8-6	890	655	1990	1470	3230	2380
1 3/8-12	1010	745	2270	1670	3680	2710
1 1/2-6	1180	870	2640	1950	4290	3160
1 1/2-12	1330	980	2970	2190	4820	3560

Bolt Size mm x pitch <sup>c</sup>	Bolt Head Identification					
						
	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

- a. in-tpi = nominal thread diameter in inches-threads per inch
- b. N·m = newton-meters
- c. mm x pitch = nominal thread diameter in mm x thread pitch
- d. ft-lb = foot pounds

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

25199

**5.16 Brakes & Wheel Hubs**

Check for hydraulic fluid and air leaks.



**Brake and hub maintenance and servicing should be carried out by an authorised Great Plains dealer.**

**5.17 End of Season Service/Storage**

The machine should be left parked in the unfolded position

Wheel bearings should be inspected and re-packed with grease if required

All greased pins/pivots should be lubricated.

Check for worn or damaged components and hardware, replace where required.

If fitted, check and where required adjust DD roller tension

Where hydraulic cylinder rods are exposed, re-coat chrome with oil/grease.

If the machine has been washed before storage it is good practice to function all hydraulic cylinders and services before storage.

Remove all fertiliser and seed from all metering units and hoppers.

Remove all metering cassette elements.

## 6.0 Faults and Remedies

### 6.1 General Troubleshooting

Fault	Possible Cause	Remedy
No material flow (all rows)	Empty hopper	Load material.
	Meter in use clogged	Clean-out meter.
	Fan speed too low	Increase fan speed to recommended range (page 46).
	Fan running backwards	Reverse fan circuit hoses at hitch.
No material flow (multiple rows)	Primary seed hose blocked	Check seed hoses for kinks, congealed materials at low spots, nests and pests.
	Tower inlet or turret blocked	Clear blockage.
No material flow (one or two rows)	Seed tube blocked at row	Inspect and clear seed tube.
	Tower port blocked for affected row	Open hopper lid and inspect.
	False alarm - seed tube sensor disconnected or failed	Run monitor self-test. Swap sensor with a working row to verify failure. Replace sensor. Adjust sensor sensitivity.
Material is flowing, but is not detected by seed monitor	This is normal during the first few meters/feet of planting, as it takes some time for material to reach rows.	Lower openers 3m/10ft before planting is to begin. Monitor does not check for blockage during first 5 seconds.
	Seed monitor disconnected.	Connect seed monitor.
Planting too little (some rows)	Partial blockage in meter chamber, seed hoses, towers, seed tubes	Treat as blockage. See "No material flow (multiple rows)" and "No material flow (one or two rows)".

## 6. Faults and Remedies

Fault	Possible Cause	Remedy
Planting too little (all rows)	Incorrect seed rate, meter flutes or rate range.	Check seed rate information beginning on page 73.
	Excessive field speed. Excessive field speed: Table rates were developed at 12 kph (7.5 mph)	Reduce field speed.
	Seed size and weight or fertilizer density and granularity vary from sowing tableseed rate chart.	Calibrate. Adjust rate to compensate.
	Seed or fertilizer density and granularity may vary from season to season, batch to batch and between different suppliers.	Re-calibrate if materials might have changed since last calibration.
	Low material level in hopper	Re-fill hopper..
	Fan speed too low	Increase fan speed.
	Fan won't run fast enough	Tractor must be able to supply 68 litres/min at 14 bar (18 gallons/minute at 200 psi).
	Fan won't run fast enough	Check that hydraulic fan check valve is not installed backward.
	Actual field size is different.	Verify field size.
	Excessive bout gaps.	Adjust boutmarker.
	Build-up of treatment or debris in seed meter.	Clean out seed meter.
	Plugged opener seed tube.	Lift drill, expose bottom of seed tube and clean out.
Planting too much (all rows)	Seed size and weight or fertilizer density and granularity vary from sowing tableseed rate chart.	Calibrate. Adjust rate to compensate.
	Seed or fertilizer density and granularity may vary from season to season, batch to batch and between different suppliers.	Re-calibrate if materials might have changed since last calibration.
	Actual field size is different.	Verify field size.
	Excessive bout overlap.	Adjust boutmarker.
Uneven seed depth	Excessive field speed.	Slow down. Check seed rate chart for correct maximum field speed.
	Implement not level	Level implement.
	Planting conditions too wet	Wait until drier weather.
	Wing tips drooping / plowing.	Lower centre section into work position.

## 6. Faults and Remedies

Fault	Possible Cause	Remedy
Uneven seed spacing	Excessive field speed.	Reduce field speed.
	Drill not level	Check level and weight transfer.
	Planting conditions too wet.	Wait until drier weather.
	Damaged or missing seed flaps.	Replace seed flaps.
	Partially plugged opener seed tube.	Expose bottom of seed tube and clean out.
Opener discs not turning freely	Opener plugged with dirt.	Clean opener.
	Planting conditions too wet.	Wait until drier weather.
	Failed disc bearings.	Replace disc bearings.
	Bent or twisted opener frame.	Replace opener frame.
	Partially plugged opener seed tube.	Lift up drill, expose bottom of seed tube and clean out.
Hectares or acres planted not correctly reported (Area tally is most accurate when seeding back and forth with boutmarkers with few headlands and curves).	Excessive overlap or gaps between bouts.	Avoid overlap or gaps. Adjust boutmarker.
	Soil conditions.	Loose soil and slippage will cause variations in acres registered.
	Actual field size different.	Verify field size.
Press wheels not compacting the soil as desired	Too wet or cloddy.	Wait until drier weather or rework ground.
	Inadequate or incorrect Weight Transfer adjustment.	Adjust weight transfer.
	Incorrect press wheel depth.	Reset press wheel depth, page 51.
Excessive seed cracking	Excessive field speed.	Reduce field speed.
	Unclean seed.	Use clean seed.
	Damaged, old or dry seed.	Use clean, new seed.
	Fan speed too high.	Use only enough speed for accurate delivery to all rows.
Press wheel or openers plugging	Planting conditions too wet.	Wait until drier weather.
	Backed up with drill in the ground.	Clean out and check for damage.
	Failed disc bearings.	Replace disc bearings.
	Disc blades worn.	Replace disc blades.
	Scraper worn or damaged.	Replace scraper.
Openers drill too deep (Bulldozing)	Disc Coulters set too deep	Raise opener frame.
	Incorrect press wheel adjustment.	Readjust press wheel, page 51.
	Too much down pressure.	Adjust row unit down pressure.

## 6. Faults and Remedies

Fault	Possible Cause	Remedy
Front of openers dropping too low in hard or minimum till conditions	Disc Coulters set too deep.	Raise opener frame.
Hydraulic boutmarker functioning improperly	Air or oil leaks in hose fittings or connections.	Check all hose fittings and connections for air or oil leaks.
	Low tractor hydraulic oil level.	Check tractor hydraulic oil level.
	Loose or missing bolts or fasteners.	Check all bolts and fasteners.
	Disc orientation not ideal for conditions.	Reverse boutmarker disc to pull or throw dirt.

### 6.2 Brake Troubleshooting



**Brake and hub maintenance and servicing should be carried out by an authorised Great Plains dealer..**

Fault	Possible Cause	Remedy
Smoke or odd burning odour from axle area	Overheated brakes, typically on long steep hills	Stop immediately. Wait for brakes to cool completely. Moderate downhill speed by using lower gear and frequent full stops. Check brake components for heat distortion.
	New brakes may exhibit slight smoking or odours until linings seat on drums.	Check brakes if problem persists, or braking action is insufficient.
Braking insufficient, one wheel	Tyre under-inflated.	Inflate all tyres to specification.
	Worn brake linings and/or drum	Service brakes.
	Worn or leaking brake cylinder	Rebuild or replace cylinder.
	Grease or oil on linings	Correct problem causing contamination. Service brakes.
	Brake adjuster not adjusting	Ice or dried mud can freeze mechanism. Check for damage seizing movement. Check for worn and inoperative pawl, or weak/damaged/missing pawl spring.

## 6. Faults and Remedies

Fault	Possible Cause	Remedy
Braking insufficient, all wheels	Air in drill brake lines	Check for loose fittings. Check for damaged fittings and lines. Check for damage or worn operating components. Correct source of leak. Recharge and bleed system.
	Air/Hydraulic system: damaged diaphragm in booster chamber	Replace booster.
	Air/Hydraulic system: leaks in air system	Repair leaks.
	Air/Hydraulic system: clogged filters	Clean filters.
	Air/Hydraulic system: valve open	Close dump valve.
Braking insufficient, all wheels (cont.)	Hydraulic/Hydraulic system: air in brake line from tractor	Bleed and recharge brake line.
	Brake linings and/or drums worn	Service brakes.
	Brake linings replaced with un-approved parts having inadequate friction rating	Replace shoes with approved parts.
	Pressure supplied by tractor insufficient	55 kPa (80 psi) minimum for air system.
No braking, one wheel	Bleed port open	Close port. Re-charge and bleed system.
	Brake lining worn or missing	Inspect and repair as needed.
	Brake cylinder frozen	Inspect and repair as needed.
	Brake parts broken or missing	Inspect and repair as needed.
No braking, all wheels	Loss of fluid in drill brake lines	Check for fluid loss at all fittings and bleed ports. Close/repair, recharge and bleed.
	Line(s) to tractor improperly connected	Check connections.
	Trailer brake system disabled or malfunctioning in tractor	Check function with another trailer.
	Tractor line pressure insufficient	Have dealer check pressure at port.
Drill pulling to one side	See "Dragging brake" below.	Check "wheel lockup" causes before flat spots develop on tyres.
Brakes always engaged, all wheels	Over-extended adjuster	Reset adjuster pawls and allow system to self-adjust.
	Air/Hydraulic system: Tractor air brake lines reversed, and Supply line is causing brakes to be always on	Reverse air line connections at hitch.
	Hydraulic/Hydraulic system: Drill brake line connected to incorrect always-on remote.	Connect drill brake line to correct remote.

## 6. Faults and Remedies

Fault	Possible Cause	Remedy
Brakes always engaged, all wheels	Pressure supplied by tractor brake line is always too high (hydraulic), or too low (air brake)	Maximum allowed hydraulic pressure is: 150 bar / 2175 psi. Minimum required air pressure is: 550 kPa / 80 psi
Dragging brake	Over-extended adjuster	Reset adjuster. Inspect to discover why it over-extended.
	Debris in brakes	Remove brake shoes. Clean and dry.
	Distorted brake parts scraping	Replace damaged parts.
	Weak return spring	Replace all springs.
	Piston seized in brake cylinder	Rebuild or replace cylinder.
Brakes grab, chatter or rattle	Weak return springs	Replace all springs.
	Drum worn, distorted or out of round	Re-surface drum if run-out is within specification, otherwise replace.
	Under-inflated or undersize tyre in pair	Replace tyre if inflation to specification does not solve unequal contact problem.
	Loose, worn, damaged or missing brake components in hub	Inspect brakes.
	Loose or worn wheel bearings	Replace bearings.
Flat spots on tyres	See ““Brakes always engaged, all wheels”	
Squealing from brakes	Worn brake linings	Check brakes. Replace worn linings.
	Distorted brake parts scraping	Check brakes. Replace damaged parts.

## Index

### A

authorised operators .....	18
axle stands .....	21

### B

basic control panel .....	56
beacon .....	27
blockage screens .....	57
boutmarkers .....	61
disc adjustment .....	41
marker extension adjustment .....	40
brakes .....	25
air brakes .....	26
brake troubleshooting .....	97
hydraulic brakes .....	26
brakes & wheel hubs .....	93
bridging .....	91

### C

calibration.....	73,89
calibration bag.....	76
calibration diverter .....	76
case drain connection .....	25
chemical safety .....	19
cleaning .....	82
colour coded hoses .....	27
comfort control panel .....	52
config. screens .....	62
contents .....	6
control panel .....	57
blockage screens .....	61
diagnostic screens .....	61
Digi-Star weigh system.....	64
home screen .....	57
machine tools screen .....	61
totals screens .....	63
tramline rhythm .....	64
weigh system .....	60
work screen .....	58
crusting .....	87
cultivation discs .....	39
cultivation elements .....	83

### D

declaration of conformity .....	3
delivery .....	22
diagnostic screens .....	61
Dickey John CPU.....	57
Digi-Star CPU .....	57
Digi-Star weigh system .....	64
direction of travel .....	14
disc contact .....	50
down pressure spring .....	48

### E

electrical hook-up .....	26
--------------------------	----

### F

fan .....	44
adjusting fan speed .....	46
fan operation .....	44
fan speed .....	46
faults and remedies .....	93
folding .....	30
following harrow .....	48

### G

grease .....	85
greasing .....	85

### H

half width shut off .....	59
home screen .....	57
hopper .....	42
cover operation .....	42
hopper entry .....	90
loading .....	43
hopper level sensors .....	43
hopper safety .....	19
hydraulic maintenance .....	91
hydraulic taps .....	16

### I

intended purpose .....	10
------------------------	----

### K

Keeton® seed firmer .....	48
---------------------------	----

**L**

left hand, defined .....	14
levelling board .....	39
liability .....	14
lights .....	20
lock channels .....	32
lowering .....	30
lubricants .....	84

**M**

machine identification .....	5
machine tools screen .....	56
maintenance and lubrication .....	84
maintenance intervals .....	86
manufacturer address .....	5
material clean-outs .....	90
maximum transport speed .....	33
muller cpu .....	56

**O**

opener depth .....	51
opener disc adjustments .....	49
opener disc scraper adjustments .....	50
operating areas .....	18
operator support .....	83
original parts and accessories .....	10

**P**

parking .....	34
parking stand .....	34
pre-emergence markers .....	53
press wheel height .....	51
press wheels .....	50
pre-start button .....	58
protective equipment .....	18

**R**

raising .....	32
right hand, defined .....	14
row unit down pressure .....	52
row units .....	48
row unit spring adjustment .....	49

**S**

safety information .....	12
chemical safety .....	19
hopper safety .....	19
lights and devices .....	20
radar safety .....	18
road traffic safety .....	20
tyre safety .....	20
scales .....	70
scraper .....	50
scraper adjustments .....	50
seed delivery tube .....	48
seed firmer .....	48
seed firmer adjustments .....	51
sensors, hopper level .....	42
servicing and maintenance .....	42
storage .....	20
sump line .....	24

**T**

t-handle .....	51
torque values chart .....	92
totals screens .....	63
tramline rhythm .....	64
tramline rhythm chart .....	65
transport .....	33
troubleshooting .....	94
turning .....	53
tyre inflation chart .....	92
tyre packer .....	47
tyre warranty information .....	92

**U**

unfolding .....	29
unloading materials .....	90

**V**

void .....	42
------------	----

**W**

warranty .....	4
weigh system .....	60
“wet hole” button .....	58
wing pivots .....	83
wing pressure .....	53
work screen .....	58

**This page has been left blank**

**This page has been left blank**



<b>Great Plains UK Ltd.</b>	<b>Tel:</b> +44(0)1529 304654
Woodbridge Road, Sleaford	<b>Fax:</b> +44(0)1529 413468
Lincolnshire, NG34 7EW	<b>E-Mail:</b> <a href="mailto:simba@greatplainsmfg.com">simba@greatplainsmfg.com</a>
United Kingdom	<b>Web:</b> <a href="http://www.greatplainsmfg.co.uk">www.greatplainsmfg.co.uk</a>