GASON®

AGRICULTURE

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2399

1200, 1700 & 1800 SERIES AIR SEEDER OPERATOR'S MANUAL

Fitted with Series 1 Meterbox

Covering the 1220/30/40, 1730/50 & 1830/50 Models

GPN 207838 ***REVISION A*** ***10/09***

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INTRODUCTION

A.F. Gason Pty Ltd is an Australian owned family business operating from within rural Victoria. The Gason company has been servicing the needs of rural Australians for more than 60 years. We operate through a local dealer support network that spans the country. A.F. Gason's would like to thank you for purchasing your Australian made Air Seeder, and trust that you will have many years of trouble free service.

The Air Seeder's have been designed to be functional, practical and reliable. They incorporate the latest technology in air seeder design but retain their basic functionality to ensure ease of maintenance.

The Gason range of Air Seeders can perform a variety of seeding operations and are available in either a front tow (FT), rear tow (RT) or implement mounted (IM) models. There are a number of bin capacities available with either 2 or 3 bin configurations. A large range of sowing outlet configurations are available, making the Air Seeder adaptable to a variety of implements to perform different tillage practices.

The Gason Series 1 metering system is a positive and accurate method of placing seed and fertilizer into the air stream. The system is capable of sowing conventionally, often referred to as single shooting (seed and fertilizer together), deep banding (separating the seed and fertilizer) or triple shooting (handling 3 separate products through to the implement). The system can also sow summer and winter crops with minimal adjustment.

This manual endeavors to provide the owner with a complete understanding of the Air Seeder's operation and the processes required to obtain the highest level of performance possible. It is suggested that the owner/operator read this manual and any other literature that has been supplied with your machine to ensure a safe and trouble free operation.

References to the left and right hand sides of the Air Seeder are from the rear of the machine looking forward.

Fig. 1 1850RT Series Air Seeder (optional rear hitch fitted).

Fig. 2 1230 IM3 Series Air Seeder Mounted on CT2 Implement

Fig. 3 1750RT Series with Optional Auger and Pasture Planter

Introduction

The Air Seeder uses the flow of air to convey seed and fertilizer to each tine. This type of material transfer is known as pneumatic conveyance (refer Fig. G1).

The material being sown must be metered accurately into the air stream to deliver a constant application rate.

How the Air Seeder Operates

Seed and fertilizer are transferred from pressurized bins to multiple conveying tubes via separate meterboxes. A meterwheel arrangement inside the meterbox is rotated by either a ground wheel (ground drive seeder) or hydraulic motor (VRT equipped Seeder).

As the ground wheel rotates, so too does the metering system. The metering system can be disengaged or engaged at the tractor cab.

A blower is located upstream of the meterbox on the Air Seeder. It is used to produce the airflow required to convey the material.

The seed and fertilizer is conveyed towards the implement. It is then evenly divided into smaller amounts as it passes through the primary splitters.

The material then travels along the secondary hoses to the secondary manifold heads. It is distributed to the tertiary hoses and transferred to the sowing boots mounted on the tines.

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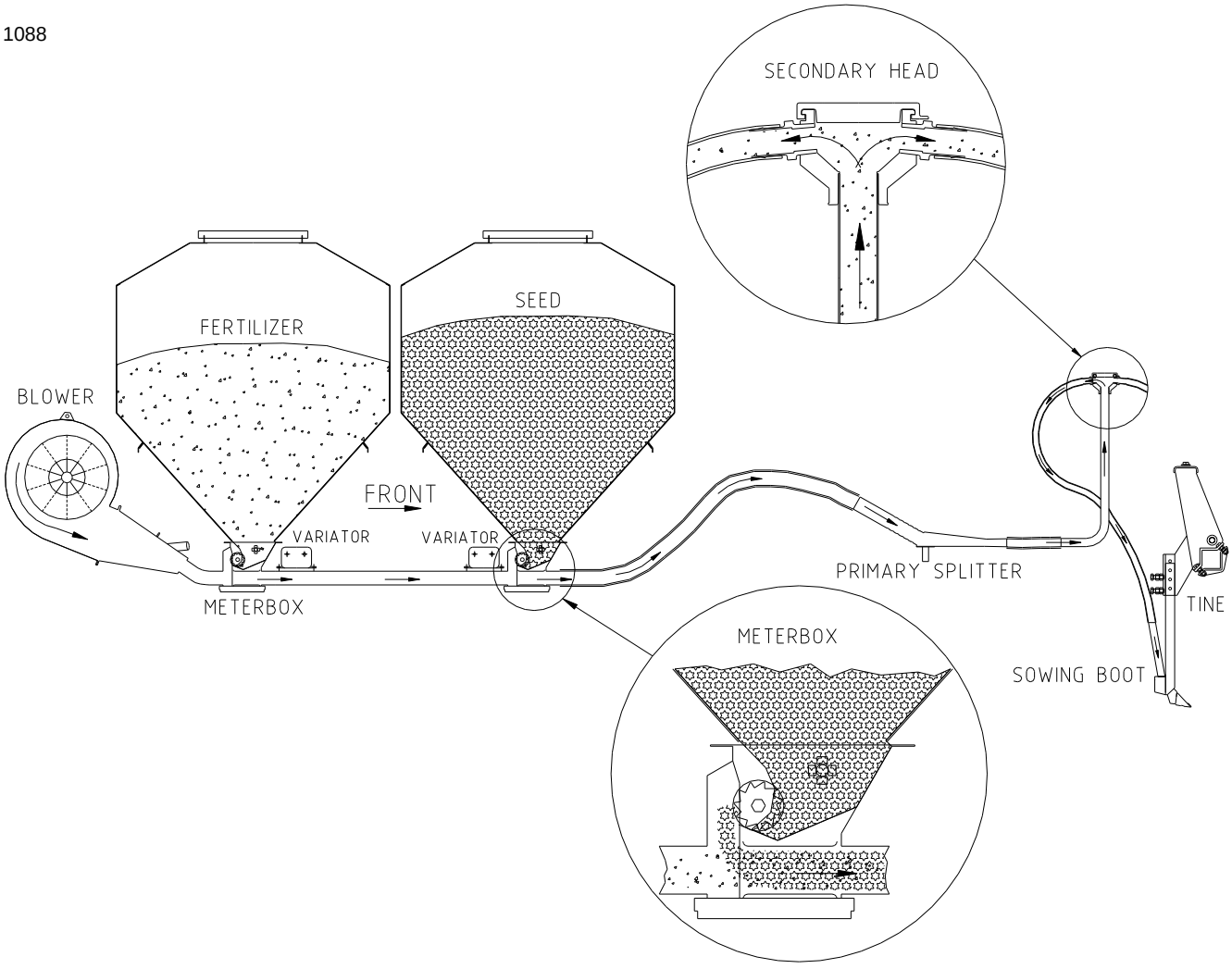


Fig. G1 Two bin model shown.

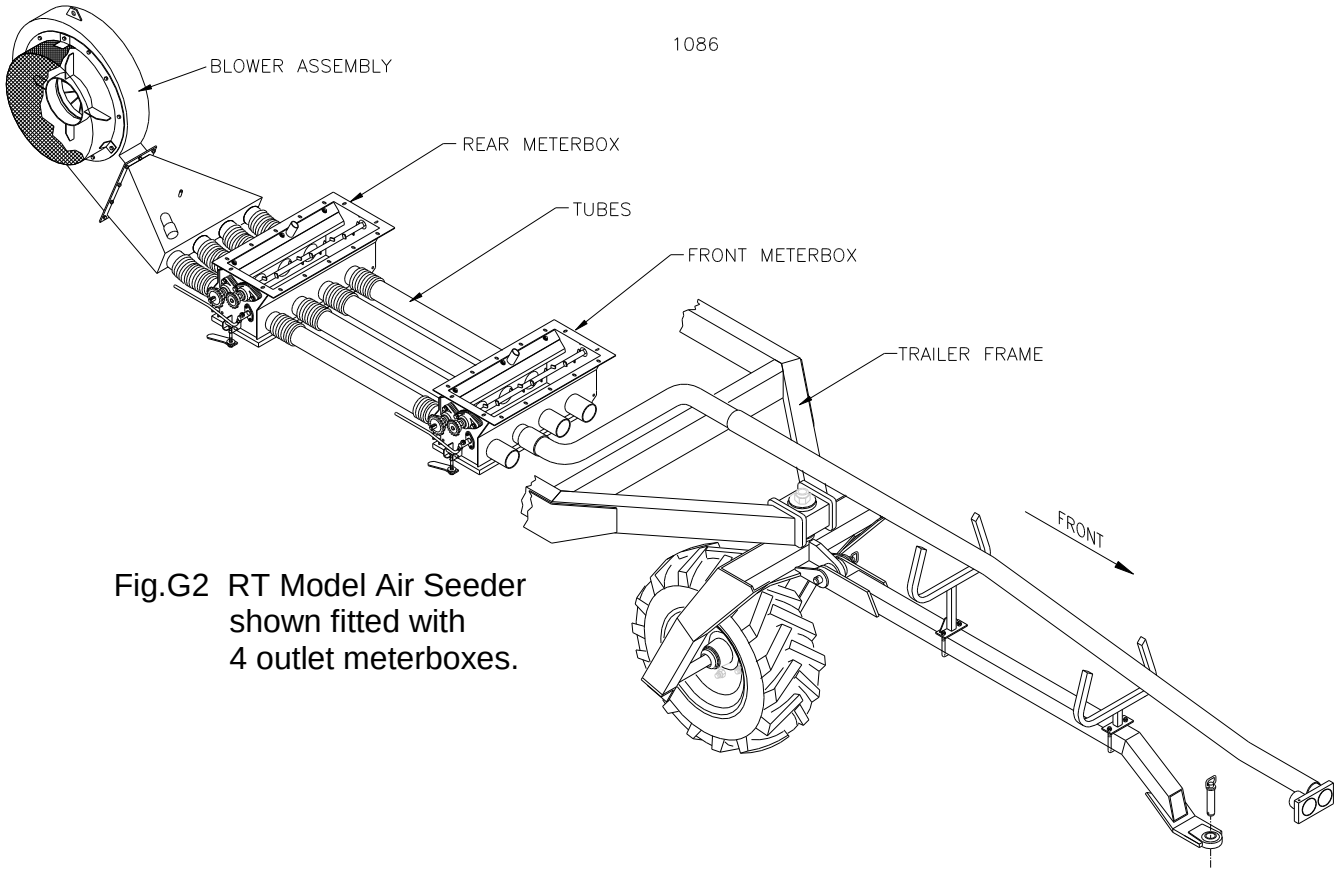


Fig.G2 RT Model Air Seeder shown fitted with 4 outlet meterboxes.

Air Seeder Construction

RT model air seeders trail behind the implement while the FT models are towed in front of the implement. The IM models are mounted onto the drawbar of the implement and require special bracketry to support the frame of the seeder. The basic operation of all of the designs is the same other than the location of the seeder.

The RT models are supplied with all components to attach to the rear of the implement. Some modifications may be required when fitting to non-Gason implements but in most cases fitment is a straight forward operation. The rear tow models are also available with a rear hitch system that attaches to the rear of the seeder, which will allow a set of harrows or light prickle chain to be towed.

The 1850FT model is fitted with a roller style rear hitch with which to pull the implement. This hitch, when left unpinned, dramatically reduces the load on the seeder during turning which will help extend the life of the machine. The trailer has also been designed to withstand the high loads exerted on the frame while pulling the implement.

The IM model is supplied with a wheel speed target that is mounted onto a wheel of the implement. A standard kit is supplied with the seeder. In all cases, the seeders have been designed to allow quick and easy detachment from the implement and tractor.

The 1200, 1700 and 1830/50 models are fitted with a sturdy walkway and handrail to the left-hand side of the machine. A folding ladder gives access to the walkway and a separate platform mounted on top of the bins allows access to the bin lids.

The bins have been made from 2.0 to 2.5mm thick mild steel with folded corners, which are fully welded, on both internal and external joints.

The bins for all trailed models have been produced in two halves and are painted using a high bake enamel to reduce corrosion both inside and out before joining. The bin halves are then joined using structural quality rivets and sealed with high-grade sealant. The sealant can be replaced at any time, if required, without splitting the bins.

The support frame and trailers are built from 350/450-grade rectangular hollow section with either side plates or truss system for stiffening. It has been designed and tested to reduce the possibility of rearing if unevenly loaded.

The metering system incorporates nylon and stainless steel componentry in areas affected by fertilizer induced corrosion.

The output of the ground driven metering system is controlled by a stepless variable speed gearbox, which can easily be adjusted. Each meter system has its own separate adjustment. VRT equipped seeders use individual hydraulic motors to control metering rates.

The blower's hydraulic system uses quality components and will require minimal maintenance. The system has been designed to operate in a harsh environment. It is fitted with a check valve to prevent damage if incorrectly connected.

The blower is mounted on the trailer frame and houses a high capacity impeller. It has been specifically designed to operate in the rough conditions that occur during normal operation. The impeller is directly mounted to the motor, which means that there are no external bearings or an external coupling.

Calibrating the ground driven metering system has been simplified by providing a chart with instructions to the side of the bin. There is no need to calculate figures if calibrating within average application rates.

A collection tray and an accurate scale set is included with the Air Seeder.

For further information on individual aspects of the seeder refer to the appropriate section in this manual.

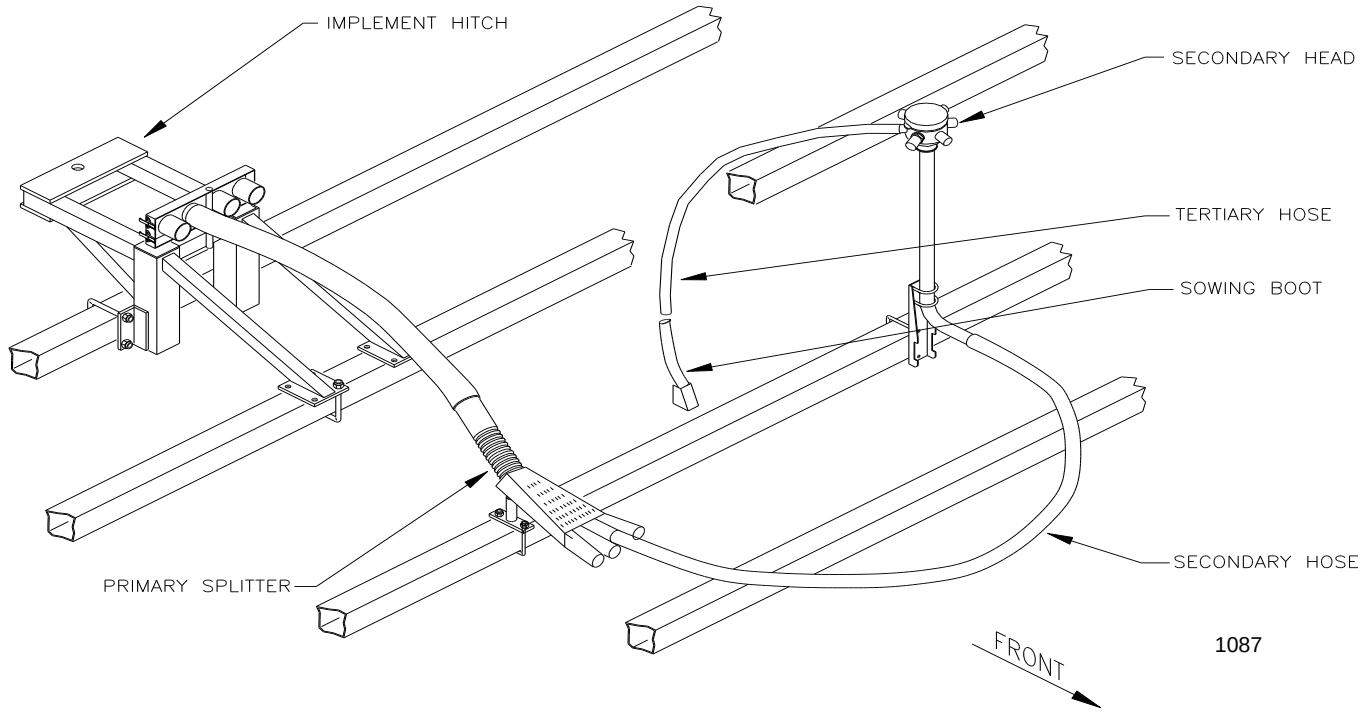


Fig. G3 Distribution System.

The Air Seeder has been designed with safety in mind. However, the equipment is only as safe as the person operating it.

Do not operate the Air Seeder until you have read and understood this manual. If you feel you need help or advice on the operation of the Seeder, contact your local authorized Gason Dealer.

To ensure trouble free and safe operation of your seeder, it is important to carry out a daily safety check to reduce the possibility of a costly breakdown.

Items to Check Daily During Operation

1. Check all wheel nuts are tight during the first couple of days of seeding or after transportation. Refer Bolt Spec. table for recommended assembly torque.
2. Check all tyre pressures and tyre conditions in general. **NOTE:** a badly worn rear drive tyre will affect the metering accuracy.
3. Ensure the safety guard on the blower unit is fitted.
4. Check all hydraulic breakaway connections are locked into position.
5. Check all hydraulic hoses and fittings for leaks.
6. Check all chains and sprockets for wear or movement on the shaft.
7. Check metershafts turn freely before operating each day or after transporting when loaded (refer page 58).
8. Check draw bar pins for wear.
9. Ensure bin lids are closed and that there are no air leaks when blower is operating.
10. Check distribution hoses for damage or kinks, especially after operating the wing fold system on the implement.

General Safety Conditions

DO NOT ride on the machine when operating.

DO NOT touch or attempt to adjust any moving parts.

DO NOT adjust hydraulic fittings while under pressure.

DO NOT remove any safety guards while the seeder is operating.

DO carry out the daily safety checks and operate the seeder in a **safety conscious** manner.

Hydraulics

Before working on the hydraulic system always check that the blower **is not** operating, and that there is no pressure in the hydraulic system.

Never attempt to disconnect a breakaway coupling if the blower is operating. Turn the **tractor off** if working on the metering system of a **VRT** equipped seeder.

Leaving the Air Seeder Unattended

Always close the bin lids and ensure that no material is left in the bins after seeding.

Chock the Air Seeder wheels to prevent it from rolling.

When Working on the Air Seeder

Place suitable stands under the trailer if removing a wheel or carrying out major work.

Never enter the bin compartment unless another person is present. Always take proper safeguards if entering a bin or working on components that have been exposed to treated seed.

Wear ear protection if working near the blower while operating.

Transporting

Never transport the seeder with the clutch switch engaged.

Avoid transporting the seeder long distances when loaded. Do not exceed 15km/h when towing the seeder when loaded. Maximum speed for towing an empty seeder is 40km/h.

For further information and helpful tips on transporting refer to the Transporting section of this manual.

Fig. G4 1220 IM3 with the CT implement with optional Pasture Planter

Dimensions	***1220 IM2***	***1230 IM2***	***1230 IM3***	***1240 IM3***
Overall width	1350	1350	1350	1350mm
Overall height*	1520	1820	1820	1820mm
Top of bin height	1625	1925	1925	1925mm
Overall length	2860	2860	3920	3920mm

* Overall height not including height of pull. This may vary between 600mm & 1200mm depending mounting implement.

Weights	***1220 IM2***	***1230 IM2***	***1230 IM3***	***1240 IM3***
Unloaded	750	780	940	955kg
Loaded	2950	3980	4240	4755kg

(material in both bins at 1000kg/1000 litres)

Bin Capacity – 2 Bin

By volume:		***1220 IM2***	***1230 IM2***
Front bin	50%	1100	1600Lt
Rear bin	50%	1100	1600Lt
Total capacity		2200	3200Lt

By weight:

Front bin (wheat)	935	1360kg
Rear bin (super)	1276	1856kg
Total weight	2211	3216kg

(wheat = 850kg/1000 litres)

(super = 1160kg/1000 litres)

Bin Capacity – 3 Bin (Equal Bin)

By volume:		***1230 IM3***
Front bin	33.3%	1100Lt
Middle bin	33.3%	1100Lt
Rear bin	33.3%	1100Lt
Total capacity		3300Lt

Bin Capacity – 3 Bin (Larger Front Bin)

By volume:		***1240 IM4***
Front bin	42%	1600 Lt
Middle bin	28.9%	1100 Lt
Rear bin	28.9%	1100 Lt
Total capacity		3800 Lt

Refer to page 9 for Hydraulic and Drive System Specifications.

Dimensions	***1730RT***	***1750RT***
Overall width	2435	2540mm
Overall height*	2775	2840mm
Top of bin height	2150	2550mm
Overall length^	8050	8050mm
Seeder length	6630	6630mm
Rear wheel centres	2000	2010mm
Step height	630	660mm
Ground Clearance	420	460mm

*Worklight stand folded down. ^Includes hitch but no options.

Weights*	***1730RT***	***1750RT***
Unloaded	1760	1850kg
Loaded	5160	6950kg

(material in both bins at 1000kg/1000 litres)
*Weights are for 2 bin models only and excludes Auger and options.

Bin Capacity – 2 Bin

By volume:		***1730RT***	***1750RT***
Front bin	50%	1700	2550Lt
Rear bin	50%	1700	2550Lt
Total capacity		3400	5100Lt

By weight:

Front bin (wheat)	1445	2167kg
Rear bin (super)	1972	2958kg
Total weight	3417	5125kg

(wheat = 850kg/1000 litres)
(super = 1160kg/1000 litres)

Bin Capacity – 3 Bin (Equal Front/Middle Bin)

By volume:		***1730RT***	***1750RT***
Front bin	26.7%	-	1415Lt
Middle bin	25.3%	-	1345Lt
Rear bin	48%	-	2550Lt
Total capacity		-	5310Lt

Bin Capacity – 3 Bin (Larger Front Bin)

By volume:		***1730RT***	***1750RT***
Front bin	29.1%	-	1545Lt
Middle bin	22.9%	-	1215Lt
Rear bin	48%	-	2550Lt
Total capacity		-	5310Lt

Wheels

Size:	***1730RT***	***1750RT***
Rear tyres	14.9-26	18.4-26

Type:

Rear tyres	R1 Gripster

Tyre	**Recommended Pressure**	
	KPa	psi
14.9-26 (8pr) Gripster	180	26
18.4-26 (10pr) Gripster	170	25

Hydraulics

Fan Motor type.....fixed displacement
.....axial-piston
Connections.....pressure inlet/main return outlet/case drain outlet

Hydraulic capacity...44.3 l/min. @ 4500rpm
(Ground Drive) (4 outlet meterbox)
.....or 54 l/min. @ 4500rpm
(6 outlet meterbox)

Hydraulic capacity…65 l/min. @ 4500rpm
(VRT Hydraulic) (4 outlet meterbox)
or……75 l/min. @ 4500 rpm
(6 outlet meterbox)

Fan Speed control ..pressure compensated flow control valve
Filter capacity.....100 l/m @ 10 microns absolute med. viscosity
Maximum case drain pressure.....5 Bar (72.5 psi)
Maximum motor pressure.....350 Bar (5075 psi)
Maximum return line oil temp .....90° C max.
Hydraulic fluid .....Mobil fluid 424 or equivalent High quality High VI multigrade transmission and hydrostatic tractor oil.

Drive System - (Ground Drive)

Clutch ..... electro-magnetic
Chain ..... ½ ASA 40
Sprockets..... Nylon/steel
Bearing lubrication ..... Mobil HP grease (general purpose)

Variator – (Ground Drive)

Type ..... Stepless variable speed
Oil ..... Mobil Delvac 1240 D or SAE 40 motor oil
Oil capacity ..... 1.27 litres
(level with centre of top shaft)

Dimensions	***1830RT***	***1850RT***	***1850FT***
Overall width	2435	2540	2980mm
Overall width CT model	2760	2760	
Overall height*	2775	2840	2840mm
Top of bin height	2150	2550	2550mm
Overall length^	8025	8025	5790mm
Seeder length	4970	4970	5790mm
Rear wheel centres	2000	2010	2500mm
Front wheel centres (CTC)	2000	2000	-
Step height	630	660	660mm
Ground Clearance	420	460	420mm

*Worklight stand folded down. ^Includes hitch but no options.

Weights*	***1830RT***	***1850RT***	***1850FT***
Unloaded	1760	1850	1950kg
Loaded	5160	6950	7050kg

(material in both bins at 1000kg/1000 litres)

*Weights are for 2 bin models only and excludes Auger and options.

Bin Capacity – 2 Bin

By volume:		***1830RT***	***1850RT***	***1850FT***
Front bin	50%	1700	2550	2550Lt
Rear bin	50%	1700	2550	2550Lt
Total capacity		3400	5100	5100Lt

By weight:

Front bin (wheat)	1445	2167	2167kg
Rear bin (super)	1972	2958	2958kg
Total weight	3417	5125	5125kg

(wheat = 850kg/1000 litres)

(super = 1160kg/1000 litres)

Bin Capacity – 3 Bin (Equal Front/Middle Bin)

By volume:		***1830RT***	***1850RT***	***1850FT***
Front bin	26.7%	-	1415	1450Lt
Middle bin	25.3%	-	1345	1345Lt
Rear bin	48%	-	2550	2550Lt
Total capacity		-	5310	5310Lt

Bin Capacity – 3 Bin (Larger Front Bin)

By volume:		***1830RT***	***1850RT***	***1850FT***
Front bin	29.1%	-	1545	1545Lt
Middle bin	22.9%	-	1215	1215Lt
Rear bin	48%	-	2550	2550Lt
Total capacity		-	5310	5310Lt

Wheels

Size:	***1830RT***	***1850RT***	***1850FT***
Front tyre (single)	11.5/80-15.3	340/80 R18	- - -
Front tyre (CTC)	11.5/80-15.3	11.5/80-15.3	- - -
Rear tyres	14.9-26	18.4-26	18.4-26

Type:

Front tyres	Pattern MPT/Radial
Rear tyres	R1 Gripster

Tyre	**Recommended Pressure**	
	KPa	psi
11.5/80-15.3 (10pr) single	225	33
11.5/80-15.3 (10pr) dual & CT	170	25
12.5-18 (12pr) single	225	33
340/80 R18 single	225	33
14.9-26 (8pr) Gripster	180	26
18.4-26 (10pr) Gripster	170	25

Refer to page 9 for Hydraulic, Variator and Drive System Specifications.

Fig. S1 1750RT Series Air Seeder

Fig. S2 1850RT Series Air Seeder CT (control traffic) Option.

Useful Conversions – Formulae

LENGTH:	1 km	= 0.621371 mile	1 mile	= 1.609344 km
	1 m	= 3.280840 ft.	1 ft	= 0.304800 m
	1 mm	= 0.039390 inch	1 inch	= 25.400 mm
SPEED:	1km/h	= 0.625 mph		
AREA:	1 ha	= 10,000 m^2 = 2.471054 acres		
	1 acre	= 10 sq. chain = 4840 sq. yd. = 0.404685ha		
	1 km^2	= 0.386102 sq. mile	1 sq. mile	
VOLUME:	1 m^3	= 35.31476 cu. Ft.	1 cu. ft.	= 0.028317 m^3
	1 L	= 0.26418 US gal.	1 US gal.	
	1 UK gal = 1.201 US gal.			
	1 UK Bushel = 8.00 UK gal. = 1.2843 cu. Ft.			
	1 L	= 0.0274962 U Bushels	1 UK Bushel = 36.369 L	
	1 L	= 0.0283785 US Bushel	1 US Bushel = 35.2379 L	
TORQUE:	1 Nm	= 0.7375624 lbft.	1 lbft.	= 1.3558175 Nm
FORCE:	1 lbf	= 4.4482 N	1N	= 0.22481 lbf
PRESSURE:	1 psi	= 6.89476 kPa = 0.0689476 Bar		
	1 kPa	= 0.145038 psi = 0.01 Bar		
	1 Bar	= 14.5 psi		
MASS:	1 kg	= 2.204622 lb	1 lb	= 0.453592 kg
	1 kg	= 1000 grams		
POWER:	1 kW	= 1.341 hp	1 hp	= 745.7 W
DENSITY:	1 kg/m^3		1 lb/ft^3	= 16.0185 kg/m^3
APPLICATION RATE:	1 kg/ha	= 0.892 lb/acre	1 lb/acre	= 1.121 kg/ha

HYDRAULIC HORSE POWER:

$$1\ hp = \frac{\text{FLOW (US GPM)} \times \text{PRESSURE (psi)}}{1714}$$

MASS FLOW RATE:

$$kg/min = \frac{\text{Application Rate (kg/ha)} \times \text{Area Rate (ha/hour)}}{60}$$

$$lb/min = \frac{\text{Application Rate (lb/acre)} \times \text{Acre Rate (acre/hour)}}{60}$$

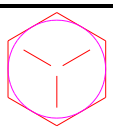
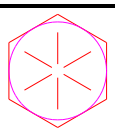
STANDARD BOLT HEAD MARKINGS AND TORQUE SPECIFICATIONS:

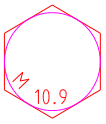
CAUTION: Loose bolts can cause elongation of holes and part failures resulting in dangerous operating conditions and equipment breakdown. Check all bolts and nuts periodically during equipment operation and keep them tightened to the specified torque. If hardware replacement becomes necessary, replace with equivalent metric grade number.

NOTE: The following torque figures are those recommended for zinc plated, lightly oiled bolts. Recommended assembly torques may be obtained by multiplying the torque figures in the table below by:

0.78 – for degreased zinc plated bolts
1.10 – for black oxide finished bolts
0.81 – for M20x2.5P Tine Toolbar Hardware

It is necessary that all bolts be tightened to the correct recommended assembly torque.

Size	Thread Pitch	Recommended Assembly Torque					
		lbf.ft	Nm	lbf.ft	Nm	lbf.ft	Nm
S.A.E Grade Number		**5**		**8**		**Wheel Stud**	
Head Markings (Manufacturers marks may vary)							
7/16	UNF	43	59	60	82	-	-
7/16	UNC	39	53	54	74	-	-
1/2	UNF	67	91	94	128	-	-
1/2	UNC	59	81	83	113	-	-
5/8	UNF	135	184	186	253	-	-
5/8	UNC	117	159	165	224	-	-
3/4	UNF	235	319	325	441	-	-
3/4	UNC	210	285	290	394	-	-
7/8	UNF	370	502	520	706	-	-
7/8	UNC	335	455	470	638	-	-
1	UNF	550	746	775	1052	-	-
1	UNC	505	685	710	963	-	-

Metric Grade Number		8.8		10.9		Wheel Stud	
Head Markings (Manufacturers marks may vary)							
M10	1.5	29	40	41	56	-	-
M12	1.75	51	70	73	100	-	-
M16	-	-	-	-	-	170	231
M16	2.0	126	171	180	245	-	-
M18	-	-	-	-	-	254	345
M20	-	-	-	-	-	376	510
M20	2.5	247	335	351	477	-	-
M22	-	-	-	-	-	475	645
M24	-	-	-	-	-	500	679
M24	3.0	425	577	608	825	-	-

When Ordering Parts:

The following information must be supplied to facilitate fast and accurate processing of a replacement parts order:-

- Gason part number and description (as given in this manual)
- Quantity
- Machine model and serial number
- Method of despatch.
- Your Dealers name and address

For your convenience record the following information below:

Name:_____

_____

Address: _____

_____

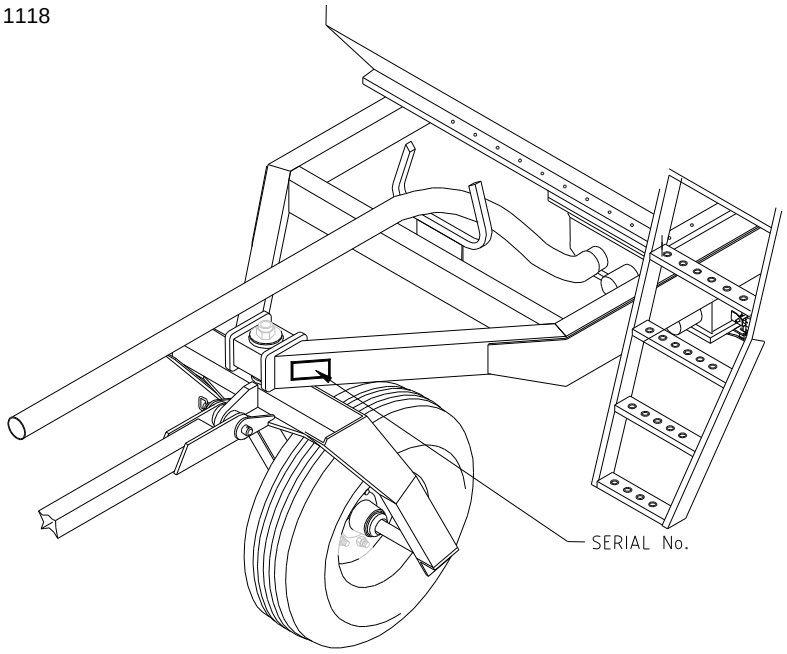
Telephone Number: _____

Machine Model No:_____

Date Machine Purchased: _____

Serial No.:_____

1118



Serial No. tag at left front of trailer frame

Subject to any applicable Federal, State or Territory laws or ordinances, which may apply from time to time, A. F. Gason Pty Ltd reserves the right to make changes in design and specifications without notice or obligation and to change or discontinue models at any time without incurring any liability to any Purchaser thereof.

Left and right hand: All references in this manual are determined by facing the direction of travel.

For warranty provisions please consult your Installation and Warranty Registration document.

SPARE PARTS RECORD

PART No.	***DESCRIPTION***	***QTY.***	***COST***	***DATE***

Introduction

The Air Seeder has been assembled as far as practicable at the factory to minimize the amount of work required in the field. The unit has been inspected and tested before it leaves the factory and requires only a few basic checks before it is commissioned.

Lifting the Air Seeder

All trailed Air Seeders are fitted with 2 lifting eyes located on the trailer frame between the bins. In most cases this will be close to the centre of gravity. An extra strap running to the front of the seeder may need to be used to keep the machine level.

The 1200 series frame mounted seeder has lifting points at the external corners of the bins. The machine should never be lifted from these points if the machine bins contain product.

Ensure you have safe lifting equipment with the correct capacity before attempting to hoist the machine.

When lifting the seeder it is preferable to use soft slings and shackles. If chains must be used ensure that the bins are protected against paint damage.

Seeder Weight Unloaded

1220 model	750kg approx.
1240 model	955kg approx.
1730 model	1600kg approx.
1750 model	1900kg approx.
1830 model	1700kg approx.
1850 model	2200kg approx.

Pull Assembly for 1730/1750 RT Model

Fit pull to front of seeder using pins and turnbuckle as supplied. Adjust height of pull to maintain level trailer frame during operation when hitched to implement..

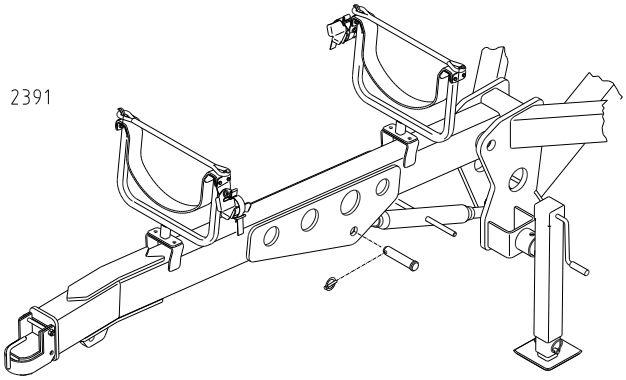


Fig. A1 1730/50 Seeder pull.

Draw Bar Assembly for 1830/1850 RT Single Castor Wheel Model

To fit the draw bar simply attach the bearing housings to the castor frame using the bolts supplied. The single castor frame retains the bearings on the inside face of the supports (refer Fig. A1).

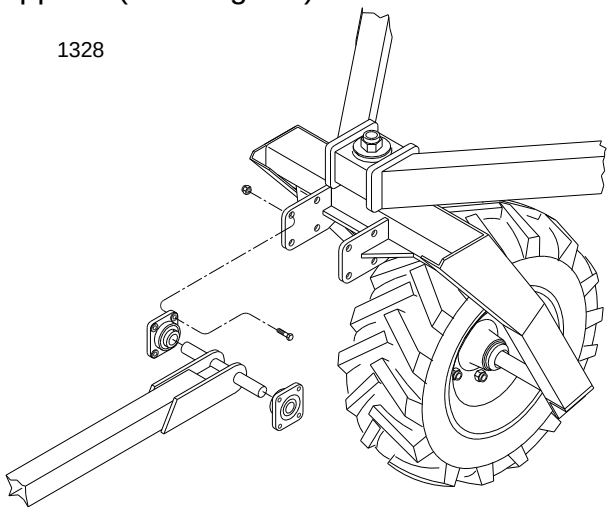


Fig. A2 Single Castor on 1830/1850 RT.

Fit the hose supports to the draw bar using hardware supplied (refer Fig. A3).

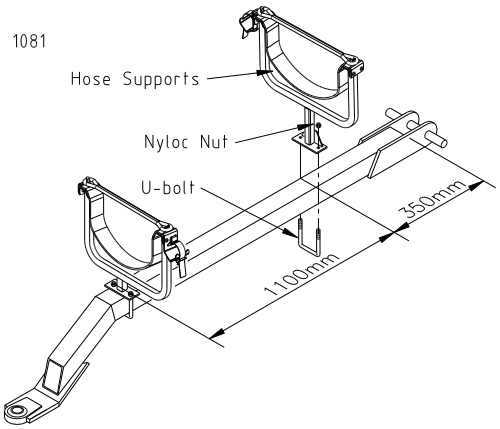


Fig. A3 Draw Bar Assembly to suit 1830/1850 RT.

Seeder to Implement Hitch for RT (Rear Tow) Seeders

The correct seeder to implement hitch must be mounted at the rear of the bar to enable the seeder to be connected. The hitch must be securely fastened to the implement using the hardware supplied.

Gason's have a variety of hitches to suit their standard range of implements but a hitch may require some modification if being fitted to a non Gason implement. Any field modification to a hitch must be performed by a competent engineer.

Seeder to Implement Hitch to Suit 1730/1750RT

In most cases the 1730/50RT implement hitch will attach to the last two rows of the toolbar on the implement. Ensure hitch is mounted central on the implement and that the hydraulic hoses have been secured to the frame.

Seeder to Implement Hitch to Suit 1830/1850RT (Single Castor)

The implement hitch for the 1830/50RT (single castor) seeder will attach to the last two rows of the toolbar on the implement. Ensure hitch is mounted central on the implement and that the hydraulic hoses have been secured to the frame.

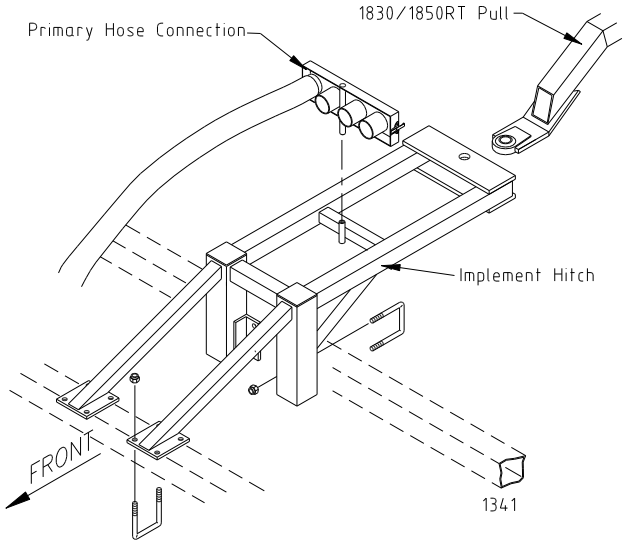


Fig. A5 Rear Implement Hitch to suit 1830/1850RT.

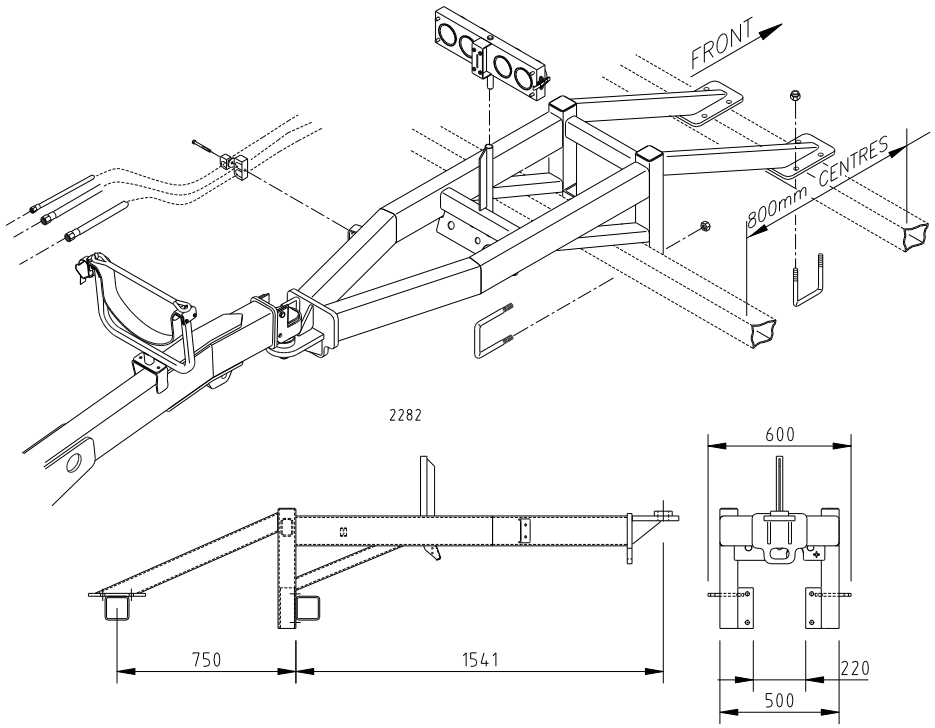


Fig. A4 Implement Hitch for a 1730/50RT seeder

Seeder to Implement Hitch to Suit 1830/1850RT –CTC (Control Traffic Castor)

The implement hitch on the CT model seeder must be mounted at the rear of the bar. The 2 extension beams that protrude rearward can be spaced to clear tines and other implement structure but should be symmetrical about the implement centre-line.

The cross beam can then be bolted to the extension beams. The 'A' frame pull is pinned in 2 places to the cross beam. The spring mechanism should be fitted to hold the 'A' frame pull off the ground to allow the implement to be manoeuvered without the seeder attached. (refer Fig. A6).

The extension beams may require some modification by a competent field engineer if being fitted to a non Gason implement. Special extension beams are available to suit the CT2 Gason implement. These beams mount onto the fore-aft implement supports near the wing fold area on the centre section of the bar.

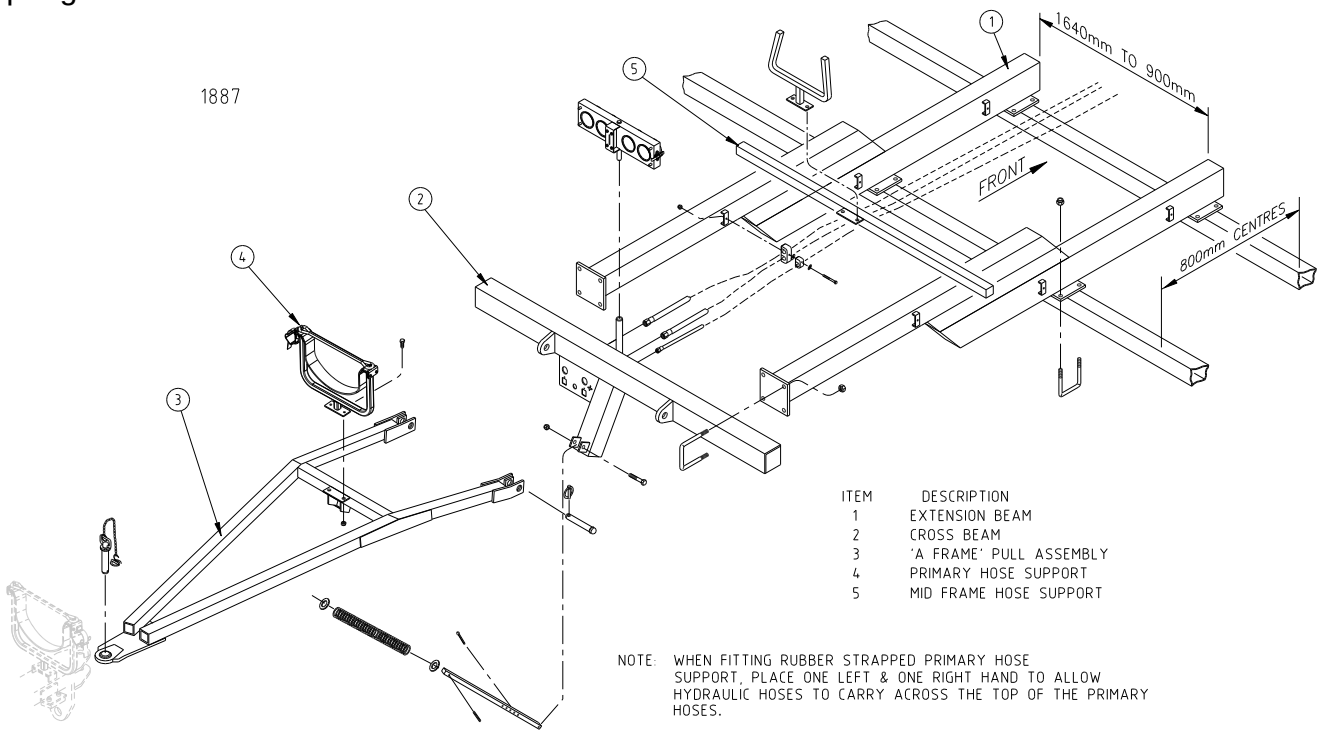


Fig.A6 1830/1850RT-CTC Implement Hitch.

Fig. A7 CTC A-frame supported by spring mechanism

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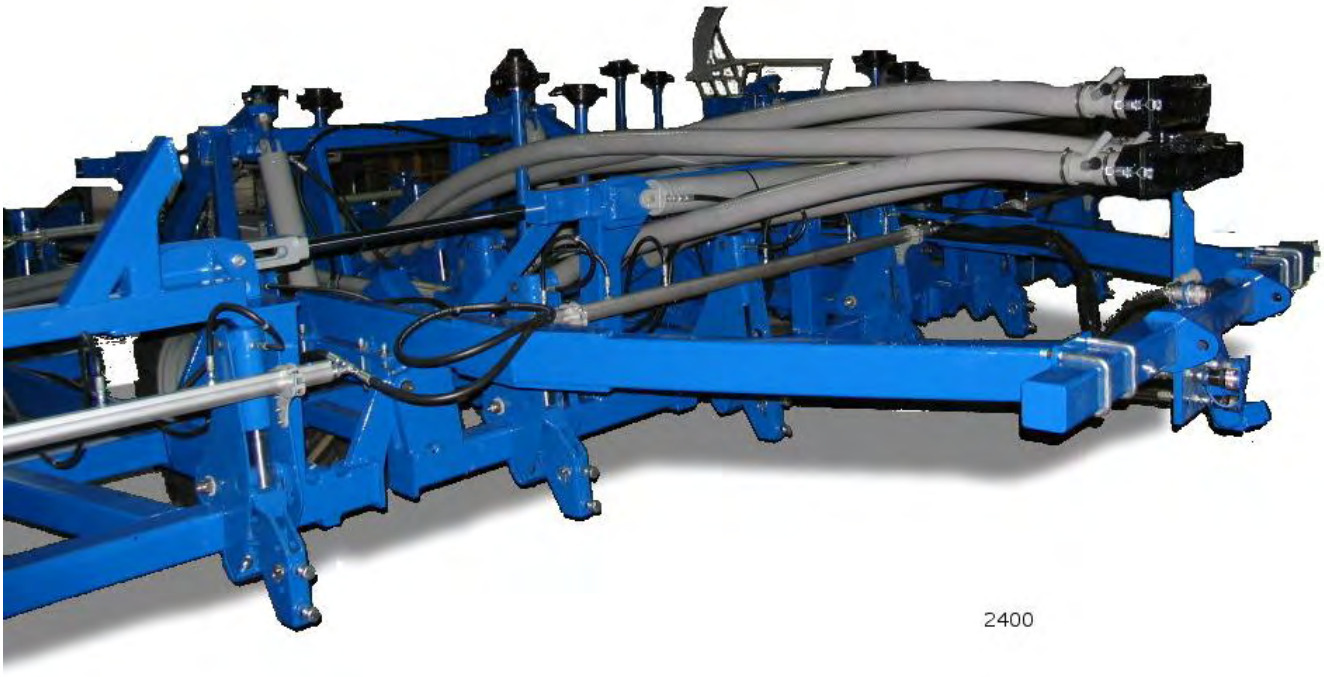

Fig. A8 CTC Extension beams mounted to a CT2 implement. Note the wide set on the extension beams.

Metering System

If you have informed the dealer of your planting needs at the time of purchase the seeder may already be ready for use. However, if changes need to be made refer to the 'Metering System' section for altering the meter system configuration.

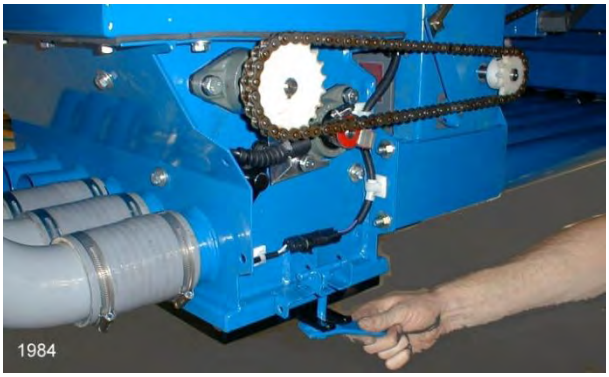

Fig A9 Meterbox Assembly.

Check all Wheel Nuts

Wheel nuts can work loose in transportation and should be checked before towing. Once the seeder is operating the wheel nuts should again be checked until they have bedded in. Refer to the Bolt Specifications page for the correct tension settings. Use a torque wrench with support bar when checking tension.

Monitor and Electrical System

The Air Seeder is supplied with a monitor and loom system that will need to be mounted in the tractor cab. Depending on the model and options ordered there should be a couple of monitors, a worklight switch bracket, a clutch switch box (ground drive models only) and other components as required.

Fig. A10 Ground drive Monitor Mounting.

The monitors require 12 volt DC power to operate and must be connected directly to the tractor's battery. Refer to the specific Farmscan Operators Manual as supplied with the monitor for instructions. Read the installation section thoroughly.

NOTE: Incorrect installation of the monitors can affect the operation and performance of the air seeder.

Care must be taken to ensure that the monitor and worklight looms are routed clear of sharp corners and areas that may damage the cable. Cable tie looms into position.

The worklight switch bracket should be fitted as per instructions supplied. The power to operate the lights should come directly from the battery.

NOTE: Please complete your 'Guarantee Registration form' that is supplied in the monitor kit, and mail as per instructions.

Hydraulic System

Before the seeder can be operated it will be necessary to fit the hydraulic hose kit to the implement on RT models, and to have the tractor fitted with the appropriate hoses to return the flow direct to the tank for all seeders. Refer to the 'Hydraulic System' section in this manual for further details.

Distribution System Introduction

The distribution system consists of primary, secondary and tertiary stages. Components for each stage must be fitted to the implement (refer Fig. A11).

The distribution system is supplied as a kit and is fitted once the implement has been fully assembled.

A distribution layout drawing is often supplied with a new kit to aid in the placement of components.

It must be remembered that this layout is a guide only and may vary slightly from the actual machine being set-up.

Fitting the Distribution Kit

Step 1. Locate all secondary head support stands, heads and primary splitters into position using the layout supplied with the kit as a guide.

Step 2. Slowly and carefully fold the wings on the implement observing that all secondary heads clear the frame work and each other. Remember to allow room for the tertiary hoses. Reposition if a clearance problem has occurred.

Step 3. Fit the tertiary hoses to check that the secondary head support towers are suitably located and that all sowing boots can be reached.

Step 4. Again slowly and carefully fold the wings on the implement observing that all tertiary hoses clear framework and each other. Reposition if a clearance problem has occurred.

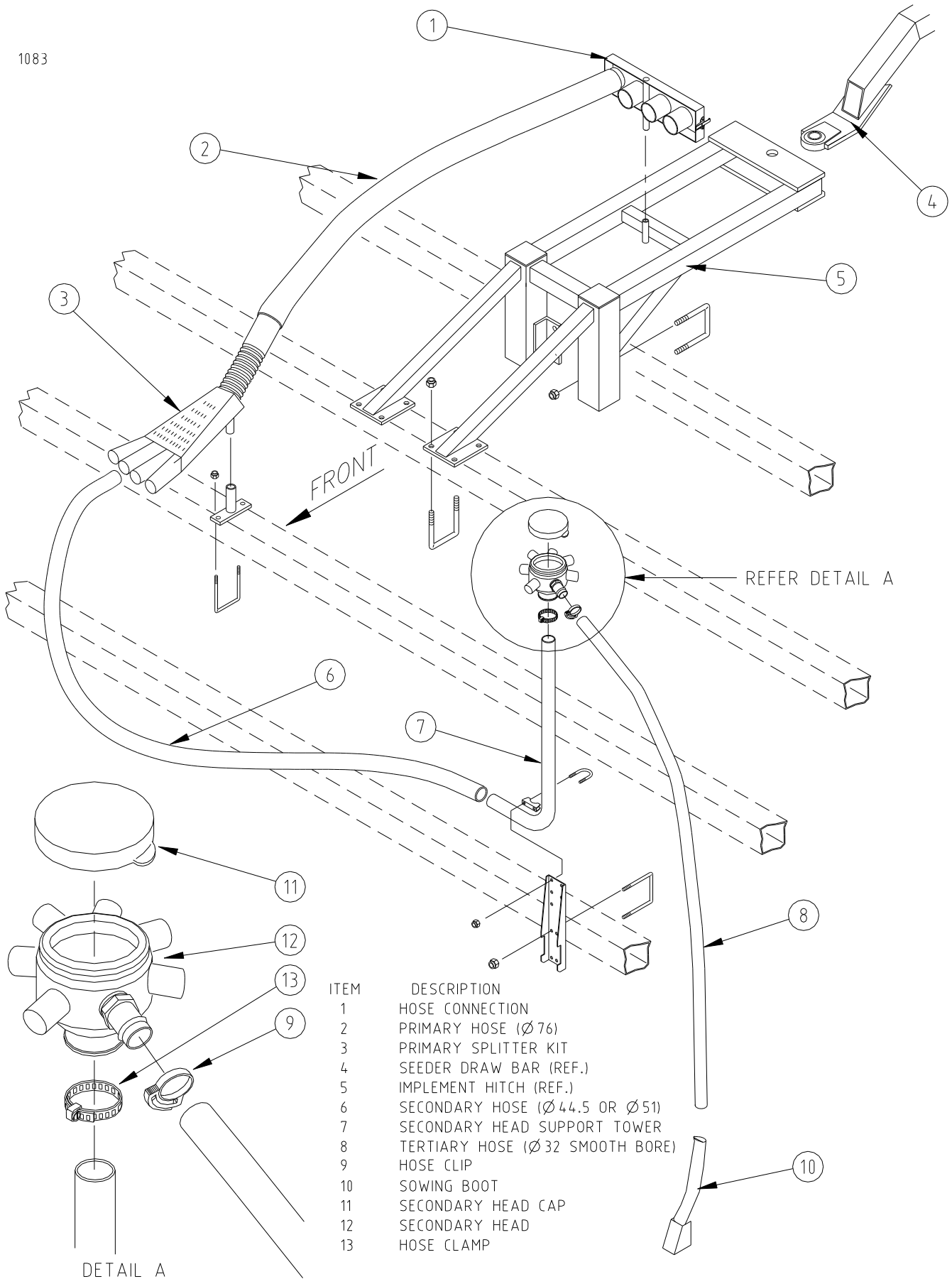

Fig. A11 Distribution Layout.

Step 5. Fit all primary and secondary hoses. Ensure that there are no sharp turns and that the hoses stay as level as possible.

A level and smooth fitting of hoses will help prevent blockages from occurring, and extend the life of the hose.

Use the large plastic ties to prevent hoses from sagging or wearing on moving parts.

IMPORTANT

Tertiary hoses when fitted to the secondary heads must fall at a minimum of 10 to 15° angle. The hose fall must be constant and increase as it approaches the sowing boot. Blockages will occur if the tertiary hoses rise or lay flat when leaving the secondary heads.

Fig.A12 Typical fall on tertiary hose.

When choosing a secondary head port to attach the tertiary hose, the installer should ensure that the hose can rotate if a tine jumps (refer Fig A13 & A14). If the hose movement is restricted the tertiary hose will kink.

Tertiary hoses that carry across a wing-fold zone must also be curved to allow for rotation.

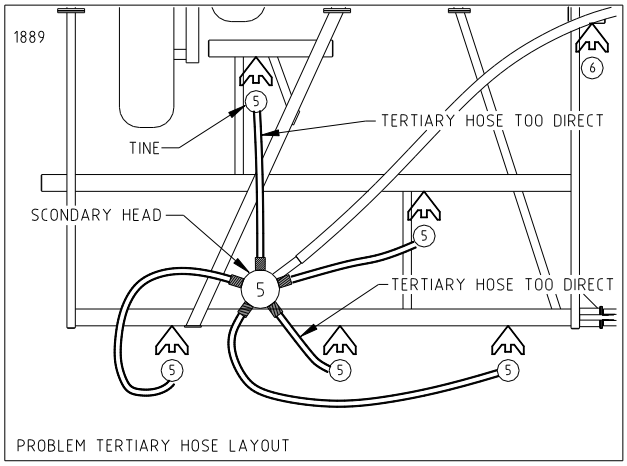

Fig. A13 Poor Tertiary hose routing.

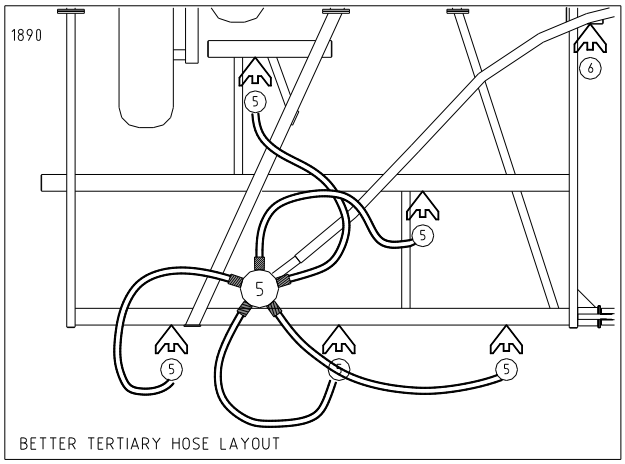

Fig.A14 Good Tertiary hose routing.

Head Blockage Junction Box

The standard Head Blockage sensor is supplied with a junction box to join the relevant wires. It is possible to mount the junction box onto the secondary head support bracket using cable ties (refer Fig.15).

Fig. A15 Junction Box.

Final Pre-Delivery Check List

After the Air Seeder has been assembled and the distribution system fitted to the implement a final check should be carried out before delivery.

Trailer General

1. All wheel nuts tight (refer page 13).
2. Front axle bolts tight (single castor only).
3. Check tyre pressures (refer pages 8-10)
4. Bins clean on inside, no loose items.
5. Implement hitch system is fitted correctly and all fasteners are tight.
6. Calibration tray fitted & scales tested.

Electrical System

1. Check cable routing is clear of corners and that there is enough slack for turning.
2. Check that the installation of the monitor in the tractor is as per the specific monitor's operator's manual.

Ground Drive Metering System

1. Check clutch operation.
2. Set the implement seeding width on the 2200 Surveillance monitor.
3. Check magnetic clutch bolt tight (40Nm).
4. Check correct metering system fitted.
5. All bearings greased (meterbox and drive system).

Ground Drive Metering System - Cont.

7. Meterbox hatches fitted.
8. Metering system turns freely.
9. Variator adjustment operates.
10. Calibration handle fitted.
11. Metershaft handle fitted.
12. Calibration sample box fitted.
13. All sprockets are aligned and tightened.

VRT Hydraulic Drive Metering System

1. Inspect large aluminium connectors at the breakaway points for damage.
2. Set the implement seeding width factor on the monitor.
3. Check correct metering system fitted.
4. All bearings greased (meterbox).
5. Meterbox hatches fitted.
6. Quick-change sprocket ratio handle fitted.
7. Quick-change sprocket ratio shaft screws are tight (use handle).
8. Calibration sample box fitted.
9. Prime metering system when the tractor is connected to the seeder to test electrical and hydraulic systems.

Distribution System

1. All retaining bolts are tight.
2. All hoses clear of moving parts.
3. Hoses do not sag or turn sharply.
4. Tertiary hoses have constant fall.
5. Hoses clear as wings fold.
6. All secondary head caps fitted.
7. All sowing boot fixings tight.

Fig. A16 1230IM (Implement Mounted) air seeder.

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Transporting the Air Seeder

Once the Air Seeder has been fully assembled it is possible to quickly disconnect it from the implement for transporting.

Before towing on the road you should consult with the appropriate state or local authority for any specific regulations and permits that may be required eg. dimension, weight, time of day and bridge restrictions, area category etc.

Avoid transporting the seeder long distances when loaded. Do not exceed 15km/h when transporting the seeder when loaded. Maximum speed for towing an empty seeder is 40km/h.

Always shift into low gear when travelling down steep slopes.

DO NOT TOW:

- With the clutch switch engaged.
- At speed over rough ground.
- With any person or persons riding on the machine.
- At night unless lights are fitted and a permit has been issued if required.
- In a dangerous manner that may threaten the safety of any person.

Tips to remember when towing the Air Seeder

1. If towing long distances disconnect the drive system by removing the chain that connects the rear wheel to the clutch shaft drive sprocket on Ground Drive Models (refer Fig. T1).

Fig.T1 Wheel Sprocket on a Ground Drive model.

2. Ensure all seeder primary hoses and hydraulic hoses have been secured to the draw bar.

3. Reduce the pressure in the front tyre, single castor model only, to reduce the bounce that may occur while transporting.

4. The tyre manufacturer recommends that you increase the rear tyre pressure to the maximum rating when towing on a hard surface for any extended length of time. This will prevent the Gripster lugs from distorting and rapid wear occurring.

5. Use a draw bar pin that is the correct size and that can be locked into position. Use safety chains if fitted.

6. After transporting for a few kilometres stop and check all wheel nuts. This should be repeated again if transporting an extended distance or if the wheels have just been fitted.

General Information

Before operating the Air Seeder for the first time, check that all components have been fitted and that the machine is ready for use (refer checklist, page 23).

Once the seeder has been connected to the rear or front of the implement it will be necessary to connect the hydraulic breakaway fittings to both the tractor and the implement.

Check that the hydraulic hoses that run along the seeder's draw bar have room to move when the seeder is turning. Use nylon ties if necessary to help retain the hoses.

Connect the primary hoses from the seeder to the rear or front of the implement (refer Fig. O1).

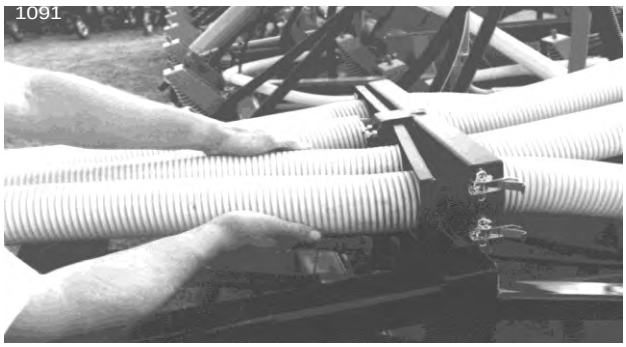


Fig. O1 Primary hoses coupling.

Connect the electrical plugs at both the tractor and implement to operate the monitors, worklights and clutch if fitted.

It will now be necessary to calibrate the metering system to obtain the desired application rate for the particular material being sown. Refer to either the Ground Drive or VRT Hydraulic Drive sections in this manual for the appropriate calibration information.

It will also be necessary to set an appropriate fan speed for your application rate. Refer to the Blower section.

You are now ready to begin your seeding operation.

Filling the Seeder's Bins

In most cases operators will tend to fill the front bin with seed and the rear bin with fertilizer. This can however, be reversed if it suits your loading facility.

Before filling, check that the trap doors on both metering systems have been locked into position, and that there are no modifications needed to the meterbox.

The grates that are fitted to the top of the bin should always be left in place when filling. This will help in preventing large clumps of material and foreign objects from entering the bin and possibly damaging or blocking the meter system.

Never place damp or dusty fertilser in the bin. Damage may occur to the metering system.

To Empty the Bin

Remove the bottom meterbox hatch. Place a suitable container or unloading auger underneath the bin and operate the meterbox trap door.

To ensure all of the bin's contents has been removed it is recommended that you rotate the metershaft one full revolution. This should clear the metering system of any product in that area.

Use a broom from the top of the bin if any material remains in the bin.

Seeding Operation

To start the seeding operation you need to firstly switch on the monitors that are fitted to the tractor.

Engage the hydraulic system to operate the blower from within the tractor.

While the blower is warming up ***check that the meter shafts turn freely.*** Refer to the "Metering System' for further details.

IMPORTANT

On cold wet mornings it is recommended that you run the blower at its operating speed for at least 10 to 15 minutes before seeding. This extended start-up time will help dry the distribution system if moisture is present.

It is suggested that the operator does not lower the points of the implement into the ground until the machine is moving. This will help in preventing the sowing boots becoming blocked in muddy conditions.

Engage the clutch on Ground Drive Models or take monitor off hold on VRT Seeders when you wish to apply material. To stop seeding, simply turn the clutch off or place monitor on hold on VRT Seeders. This will disengage the drive system.

Monitor Operation

The monitor system is different for the Ground Drive and VRT equipped seeders.

The operator should read the specific monitor manuals supplied for all technical information on installing and operating the many features of each unit.

Before the monitor can be used the appropriate sowing width needs to be loaded, and for VRT seeders, a calibration procedure performed.

To obtain basic information and the preset values used on your specific model supplied, refer to either the Ground Drive-Monitor Operation section (page 28) or the VRT Hydraulic Drive section (page 60).

1020 Air Seeder Monitor

The main function of this monitor is to show the operator that material is being conveyed through the system to the secondary head and warn against a blockage in that secondary distribution hose.

The monitor should be switched on before operating the seeder. The toggle switch on the front face of the monitor should remain on "RESET"

Fig. O2 Farmscan 1020 Monitor.

Head Blockage Kit

The Gason Air Seeder is supplied with one head blockage sensor (GPN 208651) and harness. This can be expanded to 21 sensors at a later stage if necessary.

To operate, adjust the sensitivity knob while conveying product so that the monitor's red light and audible warning stops. If the red light comes on, check for a blockage.

When finely adjusted the light will sometimes flicker when the tractor slows or turns. This is caused by either the material rate dropping off because the drive wheel on the seeder has slowed or fan speed has reduced because of other demands on hydraulic oil flow i.e. steering/implement lift.

The sensitivity of the monitor is such that the system will pick-up this small difference in the material rate or velocity.

Introduction (Ground Drive)

All Gason Ground Drive air seeders are equipped with the Farmscan 2200 Surveillance monitor.

Fig.G1 Ground Drive Seeder Monitors and worklight switch bracket.

The 2200 Surveillance monitor has been configured and loaded with the preset alarm values. The monitor will however require operator input for the calibration width of the cultivator being used.

Setting Implement Width

The calibration width is the actual sowing width in metres. To load this value simply:

- Press the ***'CAL'*** key to display ***'WIDTH'***.
- Press the up or down arrow keys to set the appropriate sowing width in metres.
- Once set press either the speed, area or function keys to close the calibration program.

Monitor Operation

The monitor is linked to an independent clutch switch that engages the metering system and places the monitor either on or off hold.

If the monitor is switched on but the clutch is off, the monitor will repeat the message ***'MONITOR ON HOLD'***. This is simply alerting the operator that the clutch is disengaged and that the trip meter has stopped measuring distance/area covered and that alarms are de-activated.

When the clutch switch is turned on the message ***'MONITOR OFF HOLD'*** will appear once to tell the operator that normal seeding operations have commenced. The monitor will now operate the trip meters as well as any alarms that have been set.

The ***Alarms*** have been given preset values as standard at the factory (refer page 29). All alarms can be reset at any time or removed altogether if desired. Refer to the monitor's handbook for a full explanation of the alarms and their control.

The ***speed, total area*** and ***trip area*** keys have multiple functions and are fully explained in the monitor's handbook.

The ***function*** key on your Gason Air Seeder has been specifically set-up to monitor 6 different areas of operation on the seeder.

1. FAN — Displays the speed of the blower impeller in rpm.
2. SHAFT 1 — Shows the speed of the first metershaft in rpm.
3. SHAFT 2 — Shows the speed of the second metershaft in rpm.
4. SHAFT 3 — Shows the speed of the third metershaft if fitted.
5. PRESSURE — Displays the air pressure in the plenum chamber in kPa.
6. BIN LEVEL — Displays the current bin status . Bin OK will show if product is above all sensors. Bin Low when below at least one sensor.

The different functions are operated by continually pressing the function key. This will allow the operator to go from fan speed to the shaft speeds etc and back again to the fan speed.

The **FAN** function will be required to set the appropriate blower speed. An alarm has been set to alert the operator if the fan is too fast. **DO NOT OPERATE THE FAN ABOVE 4500 RPM.** Check fan speed when seeding has commenced. Fan speeds will often be slightly higher when actually conveying material.

The ***Shaft 1***,***Shaft 2 and Shaft 3*** *(if fitted)* functions will show the speed of the metershaft that is actually metering the seed and fertilizer. Alarms have been preset to warn against slow or high shaft speeds. If after calibrating your seeder you forget to engage the front bin drive sprocket the alarm will sound and be displayed as ***'SHAFT 1 STOPPED'***. This alarm will repeat until the problem has been rectified.

The ***'PRESSURE'*** function will enable the operator to check the system's air pressure at any time. The pressure indicates the conveying performance of the blower. This may not be very useful when first using the air seeder but over time can help in checking your distribution system and even indicate if your have a blockage or major air leak.

Once familiar with the Air Seeder's operating pressure for a particular application rate, you may wish to set the low and high-pressure alarm to warn against a cap or hose coming loose or a blockage while conveying material.

Clutch Switch

A separate clutch switch is supplied that can be mounted independently from the monitors. It also requires its own power separate from the monitor. Do not use the lighter monitor power harness when connecting.

If for some reason the monitors have to be removed, it is still possible to run the clutch switch independently.

Fig. G2 Clutch Switch (single shown).

Preset Values

When you first switch the monitor on, check the setting. The monitor should display "Gason A/S GT 2/3". If the display is different it will be necessary to correct this. Refer to the section titled 'Calibration' default set-up in the Farmscan 2200 Surveillance monitor instructions manual.

Refer to the Farmscan operator's manual if more information is required.

If you need to recalibrate the monitor refer to the monitor's 'Operator's Manual' for details. The following Gason default values have been used to preset your monitor.

WIDTH 00.00m ‣ Operator to Set
WHEEL 0.675m

S1 LO ALM 5RPM
S1 HI ALM.....100RPM
S2 LO ALM 5RPM
S2 HI ALM.....100RPM
S3 LO ALM……..5RPM
S3HI ALM……100RPM
KPA LO 0.0KPA
KPA HI 0.0KPA
FAN SLOW 2500RPM
FAN FAST.....4550RPM
R/HOLD .....ACTIVE OFF

NOTE: 2 Bin Air Seeders do not require the 'S3' Shaft Alarms. It is suggested that the operator changes both the S3 Low and S3 high alarm value to zero to prevent activation.

Introduction

The calibration procedure involves the rotation of the metering system by hand to simulate the coverage of a certain area. A material sample needs to be collected and weighed to calculate the application rate. There are several ways to calibrate your seeder but only 3 methods will be discussed here. **Method B** is the **most common** and relates to taking a sample equal to 1/20th of a hectare.

When calibrating the machine it must be remembered that only one type of material should be measured at one time. This will require the operator disconnecting the front, middle or rear metering system.

For further information on calibrating a 3 bin machine refer to page 36.

The variator settings may show a slightly different value for the same material output and for this reason each variator should be set independently. For an approximate setting refer to the appropriate 'Variator Setting Guide' (page 38 to 51).

When calibrating ensure that there is enough material in the bins. In most cases 2 bags will be sufficient.

For very low or high rates it may be necessary to make minor adjustments to the metering system. Refer to the Meterbox Assembly section of this manual for further information.

It must be remembered that this style of seeder is dependent upon a correct wheel diameter for its operating accuracy. If this diameter is altered, (e.g. incorrect tyre fitted, wrong tyre pressure or extreme ground conditions), inaccurate metering may occur. Refer 'Method C' for checking the wheel circumference if extremely accurate metering is desired. All data in this section was compiled on medium black worked ground.

IMPORTANT

BEFORE CALIBRATION OR OPERATION, CHECK THAT THE METERING SHAFTS TURN FREELY.

Material in the bin will compact if transported after filling or left over night (especially fertilizers). For this reason, it is important that you check the metering system turns freely before calibrating and operation. Use the handle supplied and fit to the right-hand side of the metershaft (Fig. C1).

DAMAGE MAY OCCUR TO THE VARIATOR IF THE SYSTEM IS NOT CHECKED.

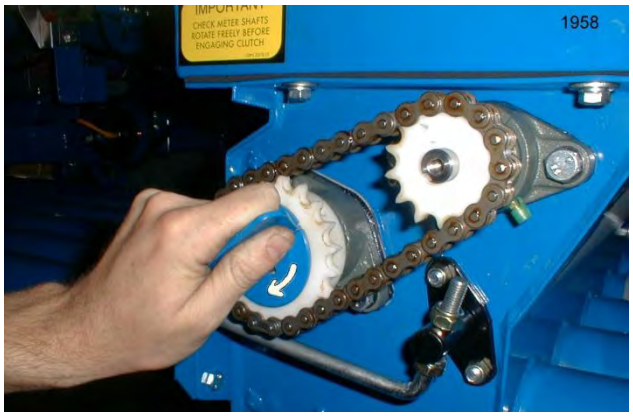


Fig. C1 Checking meter shaft turns freely.

During operation it is important to check that the product being metered is going out at the calibrated rate. Variations may occur if product is damp or material does not flow easily. Check rate is correct by monitoring bin levels while actually seeding.

Method A: For winter rates only.

This is a method that requires no calculations and is suitable for most mid range seeding applications.

By using the 'Calibration Chart' on the side of the seeder bin it is possible to set the metering systems application rate.

For rates less than 20kg/ha or higher than 140kg/ha refer to 'Methods B or C'.

Step 1. Remove the meterbox hatch from the bin being tested (Fig. C2).

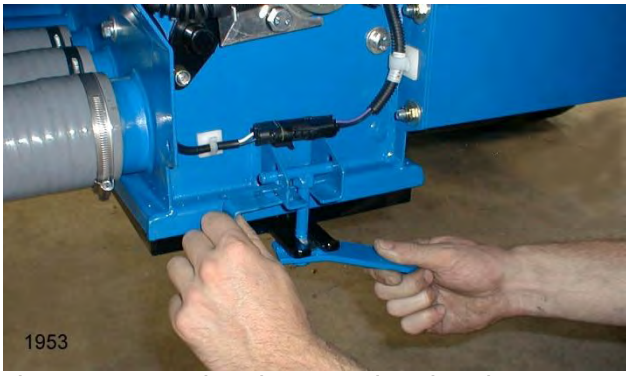


Fig. C2 Removing the meterbox hatch.

Step 2. Fit calibration collection box to rear of meterbox (Fig. C3). The collection box slides along the rear external shelf on the meterbox. The box will only fit one way.

Fig. C3 Fitting the calibration collection box.

Step 3. Disengage drive pin from bin not being calibrated (Fig. C4).

Fig. C4 Disengaging Sprocket.

Refer to page 36 when calibrating a 3 bin seeder or if an isolating clutch has been fitted to a meter shaft.

Step 4. Rotate calibration handle 10 or 20 turns anti-clockwise (follow arrow). For high rates, use 10 turns and for normal winter rates use 20 turns (Fig. C5).

Fig. C5 Calibration handle rotates anti-clockwise.

Step 5. Weigh sample taken on scales supplied. When using scales use the scale box as the container. Place box on top of scales before switching on. Check that the scales are set at zero before weighing sample (Fig.C6).

Fig. C6 Scales.

Step 6. Use calibration chart (on side of the seeder to confirm application. (Refer Fig. C7).

NOTE: It is the responsibility of the operator to check the accuracy of the scales on a regular basis. Refer to the general maintenance section for further information.

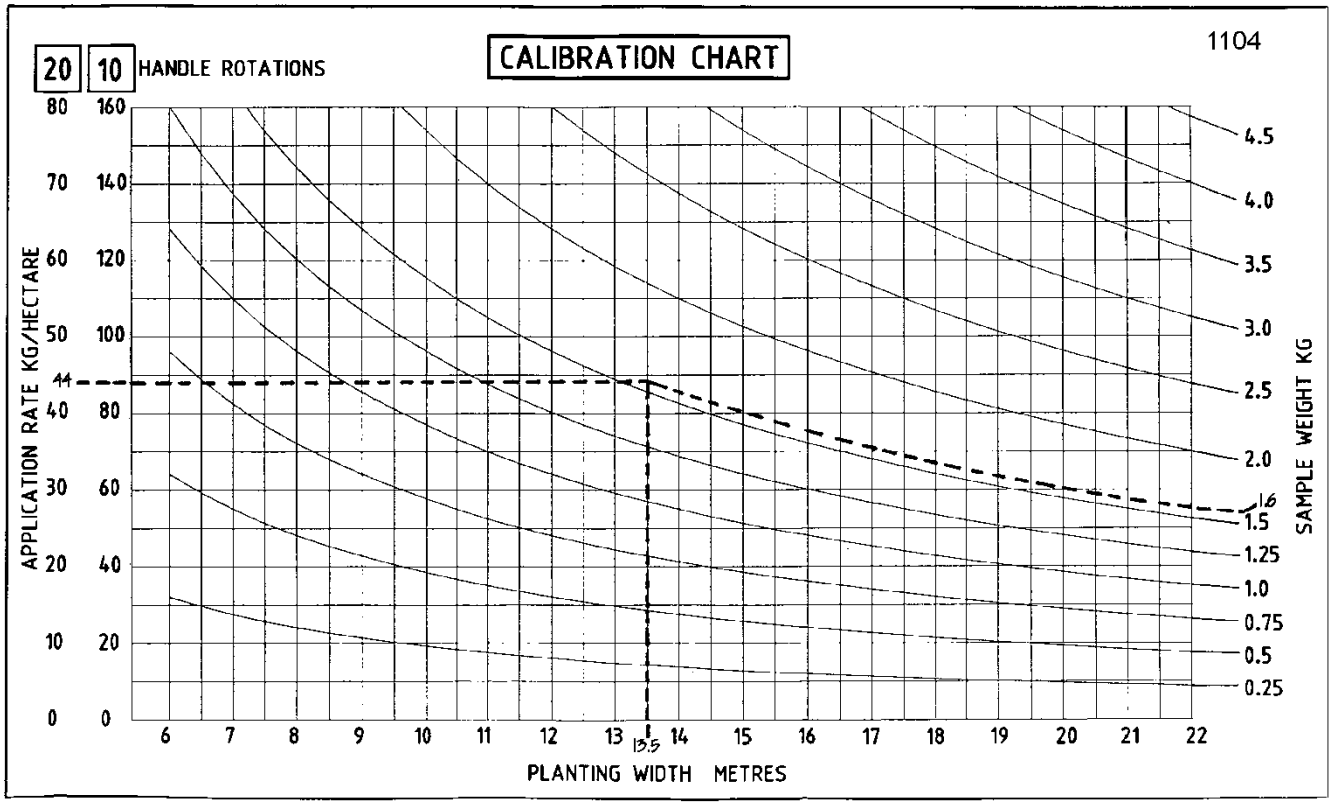


Fig. C7 Calibration Chart Decal.

An example is shown on the calibration chart (Fig. C7), for a planting width of 13.5 metres. In this example, an application rate of 44kg/ha is desired. By following the dotted line up and across we can find the intersection, then follow the curved line down to determine the appropriate sample weight required. In this case 1.6kg sample after 20 turns of the handle.

NOTE: Always use kilograms and hectares when using the chart. Refer 'Conversion Table' (page 54) to convert lb/acre to kg/ha.

Step 7. Adjust setting to obtain correct application rate and re-test. To adjust the setting simply unlock the handle, rotating the handle anti-clockwise, and either increase or decrease the setting.

NOTE: It is recommended that when adjusting the variator setting the operator goes past the desired setting (higher rate) a short distance and then rotates the handle back to the required setting. This method of adjustment will ensure that there is no slack in the cable.

After adjustment lock handle by rotating clockwise (Fig. C8).

Fig. C8 Variator Adjustment.

IMPORTANT When the calibration procedure is completed refit the meterbox hatch and engage the drive pins to allow the drive system to operate normally.

NOTE: Some fertilisers run freer than others and actual usage may vary from the first calibration sample taken. It is recommended that the operator checks the actual usage after the first bin load. It may be necessary to perform a second calibration test after some material has been metered.

Method B: Preferred method.

To be used when a more accurate application rate is desired or rates that are outside of the charts range of accuracy (less than 20kg/ha or higher than 140kg/ha).

Step 1. Prepare seeder to take sample from either the front, middle or rear bin (refer steps 1 to 3 in 'Method A').

Step 2. Refer to page 52 to determine the correct number of revolutions required to simulate 1/20th of a hectare for the appropriate seeding width in metres.

Step 3. Rotate the calibration handle the correct number of turns for the appropriate seeding width collecting all of the material in the sample box.

Step 4. Weigh the sample collected using the scales supplied and multiply that weight by 20. This figure will be the actual application rate in kg/ha.

Step 5. If the result is too low you will need to increase the setting on the variator. If too much material was collected the reverse applies. After making the adjustment you will need to retest the system following steps 4 and 5.

Example 1

An application rate of 60 kg/ha of wheat is desired on a planting width of 10.0 metres using a 4 outlet meterbox with 3 meterwheels fitted. From page 52 we can determine the required handle rotations (38.5 turns) and page 38 the approximate variator setting (3.5) for 3 meterwheels.

After setting the variator adjustment lever to 3.5 and rotating the calibration handle 38.5 turns we can weigh the collected seed. For this example we find we have a seed collection of:

Seed collected = 2.85 kg (2850 grams)

Therefore the actual sowing rate will be 2.85 kg x 20 = 57 kg/ha.

It will be necessary to increase the variator adjustment and retest the system to obtain the desired 60 kg/ha.

Example 2

An application rate of 120 kg/ha of urea is required on a planting width of 12 metres using 2 meterwheels in a 4 outlet meterbox. From page 52 we can determine the required handle rotations (32 turns) and page 42 the approximate variator setting (6) for 2 meterwheels using a high rate sprocket ratio (refer page 59).

Fertilizer collected = 5.5kg (5500 grams)
Actual sowing rate = 5.5kg x 20 = 110kg/ha

Therefore increase the variator setting slightly to obtain 120 kg/ha and retest.

To help in finding the new setting, use the following example.

$$\frac{\text{Desired rate x variator setting}}{\text{Actual collected rate}} = \text{new setting}$$

$$\frac{120\text{kg/ha} \times 6}{110\text{kg/ha}} = 6.55 \text{ variator setting}$$

Therefore increase the variator setting from 6 to 6.5 to obtain 120 kg/ha and retest.

Example 3

A 6 outlet meterbox is to be used to plant oats at 65kg/ha. The meterbox has all 6 meterwheels fitted. The implement has a 12.25 metre planting width which will require 31.4 calibration handle turns. (refer page 52).

To determine the appropriate setting for the adjustment assembly, refer to page 43. The approximate setting is 5.2. Also noted, on the top of page 43 is the need to remove the cover plate above the meterwheels. To do this, refer to page 103 in the meterbox section.

After the plate has been removed and some oats placed in the bin, the collection tray is fitted to the meterbox and calibration handle turned 31.4 turns.

Seed collected = 2.6kg/ha (2602 grams)
Actual sowing rate =2.6 x 20 = 52 kg/ha.

Therefore, increase setting to obtain the correct rate. Retest after adjustment.

Example 4

An application rate of 4.5 kg/ha of canola is desired on a planting width of 14.75 metres using a 4 outlet meter box with all meter wheels in place. From page 52 we can determine the required handle rotations (26 turns) and page 49 the approximate variator setting (1.0) for 4 primary hoses with meterwheel sleeves fitted (refer page 101).

Seed collected = 0.237 kg (237 grams)
Actual sowing rate
= .237 kg x 20 = 4.74 kg/ha

Therefore reduce the variator setting from 1.0 to 0.95 to obtain 4.5 kg/ha and retest.

NOTE: It is not recommended to run below 0.75 setting on the variator adjustment assembly. Use a 25mm reduction sleeve in conjunction with a 50mm reduction sleeve to reduce the metering capacity if required (refer page 101).

The monitor alarm may also need to be lowered when planting low rate crops. Refer to the Operating Section (page 29) for instructions on how to lower the preset alarm value.

Method C:

To be used for low rate seeding where a high degree of accuracy is required or when seeding in difficult conditions eg. very soft ground or with worn tyres.

Step 1. Check the wheel circumference to determine the appropriate calibration procedure. This will require the operator to check the distance travelled after a certain number of rear drive wheel rotations on the seeder. Once this is obtained we can multiply the figure by a known ratio to determine the exact number of calibration handle turns to do our standard $1/20^{th}$ of a hectare sample (Method B).

When doing the wheel test it is important that the bins are half full of product and that the tyre pressure is correct (refer page 8, 9 or 10). Testing should be carried out on the ground being sown.

When a seeder is hitched to the implement and in the paddock sitting on cultivated ground you should:

a. Mark the left-hand rear tyre (drive wheel) with chalk or paint on the sidewall at the base of the tyre (vertical line through wheel's centreline).

b. Place a marker on the ground next to the mark on the tyre.

c. Drive the seeder forward over the cultivated ground in a straight line so that the marked tyre rotates at least 5 times. You will need help to determine the number of rotations ie. One person drives the tractor the other being the observer. The marked tyre should be brought around so that the mark is at the base of the tyre as before.

d. Using a long tape, measure the distance travelled after the 5 rotations of the seeder wheel. Distance will be approximately 19 to 25 metres depending on the seeder model.

e. Divide this figure by the number of rotations (5) to determine the actual circumference of the wheel.

f. Use the wheel circumference along with the known sprocket ratio and sowing width to determine the appropriate number of calibration handle turns as shown below.

$$\frac{500 \times \text{sprocket ratio}}{\text{sowing width} \times \text{wheel circ.}} = \text{handle turns}$$

Sprocket ratio: *(drive wheel to calibration handle)*
1730 seeder = 3.198
1750 seeder = 3.457
1830 seeder = 3.198
1850 seeder = 3.457

Example 1

Determine the correct number of calibration handle turns to calibrate the seeder. After 5 rotations of the drive wheel in extremely soft conditions on an 1850 Series Seeder the measured distance travelled is 21.50 metres. Implement sowing width in this case is 13.75 metres. Therefore the wheel circumference is:

$$\frac{21.5 \text{ metres}}{5 \text{ rotations}} = 4.3 \text{ metres (wheel circ.)}$$

$$\frac{500 \times \text{sprocket ratio}}{\text{sowing width} \times \text{wheel circ.}} = \text{handle turns}$$

$$\frac{500 \times 3.457 \text{ ratio}}{13.75 \text{ mtrs} \times 4.3 \text{ mtrs}} = 29.2 \text{ turns}$$

EXAMPLE 2

Sowing width of 8 metres with an 1830 Air Seeder. After 7 turns of the rear wheel of the seeder, a distance of 27.048 metres was covered. Therefore the wheel circumference equals:

$$\frac{27.048}{7} = 3.864 \text{ metres}$$

The number of calibration handle turns to simulate 1/20th of a hectare equals:

$$\frac{500 \times 3.198 \text{ ratio}}{8 \text{ metres} \times 3.864 \text{ metres}} = 51.7 \text{ turns}$$

NOTE: After this figure has been calculated it is best to compare it with the figure shown in the manual on page 52. The variation should never be more than a couple of handle turns different (approximately 7%).

If a large variation occurs re-check your calculations. If you still find a large difference between your figure and the published figure please contact your authorised dealer for further information.

Once the correct number of handle turns has been determined it is simply a matter of using ‘Method B’ to calibrate your seeder.

Use your figure for the required number of handle turns instead of step 2 (the published figure).

NOTE: If you intend to use your own calibration handle rotation figure and it differs significantly from the published figure (by more than 5%), you should also review the wheel factor figure in the 2200 Surveillance Monitor.

Checking the Wheel Factor in the 2200 Surveillance Monitor

To determine the revised wheel factor value you will need to perform a calculation using your tested wheel circumference figure.

The current factory setting for the wheel factor in the 2200 monitor is 0.675m. This figure means that for every 675mm of forward motion of the seeder the wheel drive magnet, located on the top shaft between the bins, will rotate once past the sensor. Note: assumes **standard sprockets** are fitted (refer parts manual).

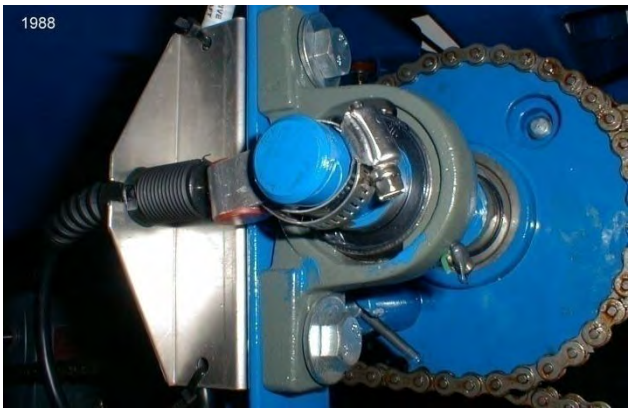


Fig. C9 Drive wheel magnet and sensor.

If the wheel circumference changes by more than a few percent you will probably see a difference between the ground speed displayed on the seeders monitor and the ground speed on the tractor. This variation will also alter the area sown.

To calculate the revised wheel factor you will need to perform the following calculation:

$$\frac{\text{tested wheel circumference}}{\text{drive wheel ratio}} = \text{New Wheel Factor}$$

Drive wheel ratio: 1730/1830 seeder = 6.150
1750/1850 seeder = 6.648
1880 seeder = 7.978
2120 seeder = 8.310

Example 1

Using example 1 on page 35 to determine the wheel circumference for a 1850 seeder half full of product the field figure was 4.3metres. Therefore the revised monitor wheel factor would be:

$$\frac{4.3}{6.648} = 0.647\text{m}$$

Based on this calculation you would replace the factory setting of 0.675 with you field determined figure. Refer to page 29 for information regarding changing the value.

NOTE: Normally, Method C need only be carried out once during the seeding operation. If seeding conditions change dramatically you may wish to check the wheel circumference again.

Calibrating 3 Bin Ground Drive Seeders

Most 3 bin ground drive air seeders are fitted with a second clutch that will allow one bin to be isolated while on the go. To calibrate, this bin will require power to the second clutch. This can be done at the tractor by turning on the clutch switch (master and second clutch). It will however be necessary to isolate the main drive clutch at the seeder to allow the calibration system to turn. The switch is located on the trailer frame near the master clutch.

The switch has two positions. Up to calibrate and Down to operate seeder. If you forget to place the switch in the down position after calibration, the monitor's alarm should activate when you start seeding.

Fig. C10 Master Clutch Isolation Switch on a 3 bin G/Drive seeder.

Introduction to Variator Setting Guide

The Variator Setting Guide should be used to approximate the variator setting when calibrating. Variations in product weight and metering performance will generally vary and for this reason it is necessary to always calibrate before seeding.

To use the 'Variator Setting Guide', turn to the page for the appropriate material being calibrated.

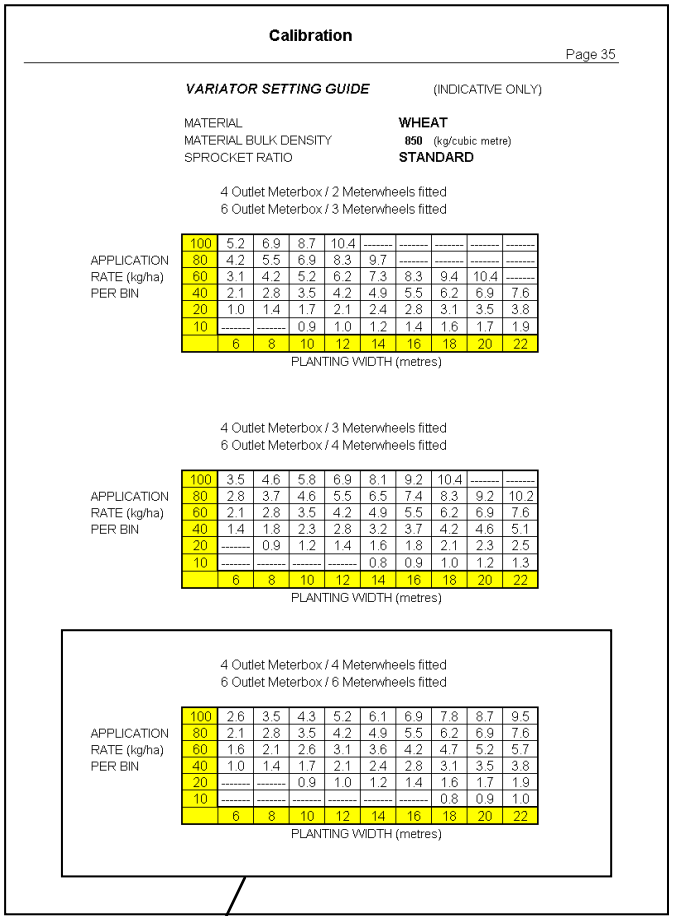
Special instructions relevant to the particular material will be listed at the top of each page. There are 3 charts on each page. Each chart represents the appropriate setting for the number of meterwheels fitted to either a 4 outlet or 6 outlet meterbox. You may need to check inside the appropriate meterbox if this is unknown.

Example

The approximate variator setting is required for metering wheat at 60kg/ha from a 12 metre width implement through a 4 outlet meterbox that has all four meterwheels fitted. By referring to page 38 we can see that there are no special changes required to the metering system. The bottom chart labeled '4 outlet meterbox / 4 meterwheels fitted' should be used.

By reading across and up the chart we can see that the recommended setting is 3.1.

This figure is a guide only and will need to be checked by the normal calibrating procedure.



Calibration

Page 35

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **WHEAT**
MATERIAL BULK DENSITY **850** (kg/cubic metre)
SPROCKET RATIO **STANDARD**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
100	5.2	6.9	8.7	10.4	-------	-------	-------	-------	-------
80	4.2	5.5	6.9	8.3	9.7	-------	-------	-------	-------
60	3.1	4.2	5.2	6.2	7.3	8.3	9.4	10.4	-------
40	2.1	2.8	3.5	4.2	4.9	5.5	6.2	6.9	7.6
20	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.5	3.8
10	-------	-------	0.9	1.0	1.2	1.4	1.6	1.7	1.9

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
100	3.5	4.6	5.8	6.9	8.1	9.2	10.4	-------	-------
80	2.8	3.7	4.6	5.5	6.5	7.4	8.3	9.2	10.2
60	2.1	2.8	3.5	4.2	4.9	5.5	6.2	6.9	7.6
40	1.4	1.8	2.3	2.8	3.2	3.7	4.2	4.6	5.1
20	-------	0.9	1.2	1.4	1.6	1.8	2.1	2.3	2.5
10	-------	-------	-------	-------	0.8	0.9	1.0	1.2	1.3

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
100	2.6	3.5	4.3	5.2	6.1	6.9	7.8	8.7	9.5
80	2.1	2.8	3.5	4.2	4.9	5.5	6.2	6.9	7.6
60	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7
40	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.5	3.8
20	-------	-------	0.9	1.0	1.2	1.4	1.6	1.7	1.9
10	-------	-------	-------	-------	-------	-------	0.8	0.9	1.0

PLANTING WIDTH (metres)

Fig. C11 Variator Setting Guide.

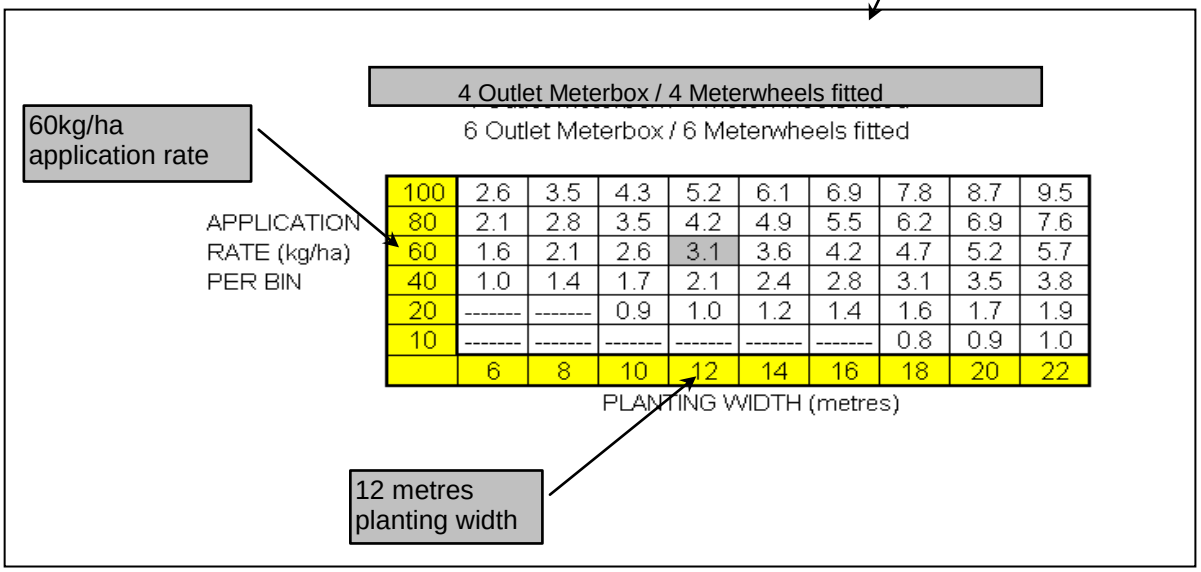


Fig. C12 Enlargement.

VARIATOR SETTING GUIDE

(INDICATIVE ONLY)

MATERIAL **WHEAT**

MATERIAL BULK DENSITY **850** (kg/cubic metre)

SPROCKET RATIO **STANDARD**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
100	5.2	6.9	8.7	-------	-------	-------	-------	-------	-------
80	4.2	5.5	6.9	8.3	9.7	-------	-------	-------	-------
60	3.1	4.2	5.2	6.2	7.3	8.3	9.4	-------	-------
40	2.1	2.8	3.5	4.2	4.9	5.5	6.2	6.9	7.6
20	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.5	3.8
10	-------	-------	0.9	1.0	1.2	1.4	1.6	1.7	1.9
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
100	3.5	4.6	5.8	6.9	8.1	9.2	-------	-------	-------
80	2.8	3.7	4.6	5.5	6.5	7.4	8.3	9.2	-------
60	2.1	2.8	3.5	4.2	4.9	5.5	6.2	6.9	7.6
40	1.4	1.8	2.3	2.8	3.2	3.7	4.2	4.6	5.1
20	-------	0.9	1.2	1.4	1.6	1.8	2.1	2.3	2.5
10	-------	-------	-------	-------	0.8	0.9	1.0	1.2	1.3
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
100	2.6	3.5	4.3	5.2	6.1	6.9	7.8	8.7	9.5
80	2.1	2.8	3.5	4.2	4.9	5.5	6.2	6.9	7.6
60	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7
40	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.5	3.8
20	-------	-------	0.9	1.0	1.2	1.4	1.6	1.7	1.9
10	-------	-------	-------	-------	-------	-------	0.8	0.9	1.0
	6	8	10	12	14	16	18	20	22

VARSETT1

PLANTING WIDTH (metres)

VARIATOR SETTING GUIDE

(INDICATIVE ONLY)

MATERIAL **SUPER PHOSPHATE**
MATERIAL BULK DENSITY **1160** (kg/cubic metre)
SPROCKET RATIO **STANDARD**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
160	6.1	8.1	-------	-------	-------	-------	-------	-------	-------
120	4.6	6.1	7.6	9.1	-------	-------	-------	-------	-------
100	3.8	5.1	6.3	7.6	8.9	-------	-------	-------	-------
80	3.0	4.1	5.1	6.1	7.1	8.1	9.1	-------	-------
60	2.3	3.0	3.8	4.6	5.3	6.1	6.9	7.6	8.4
40	1.5	2.0	2.5	3.0	3.6	4.1	4.6	5.1	5.6
20	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
160	4.1	5.4	6.8	8.1	9.5	-------	-------	-------	-------
120	3.0	4.1	5.1	6.1	7.1	8.1	9.1	-------	-------
100	2.5	3.4	4.2	5.1	5.9	6.8	7.6	8.5	9.3
80	2.0	2.7	3.4	4.1	4.7	5.4	6.1	6.8	7.4
60	1.5	2.0	2.5	3.0	3.6	4.1	4.6	5.1	5.6
40	1.0	1.4	1.7	2.0	2.4	2.7	3.0	3.4	3.7
20	-------	-------	0.8	1.0	1.2	1.4	1.5	1.7	1.9

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
160	3.0	4.1	5.1	6.1	7.1	8.1	9.1	-------	-------
120	2.3	3.0	3.8	4.6	5.3	6.1	6.9	7.6	8.4
100	1.9	2.5	3.2	3.8	4.4	5.1	5.7	6.3	7.0
80	1.5	2.0	2.5	3.0	3.6	4.1	4.6	5.1	5.6
60	1.1	1.5	1.9	2.3	2.7	3.0	3.4	3.8	4.2
40	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8
20	-------	-------	-------	0.8	0.9	1.0	1.1	1.3	1.4

PLANTING WIDTH (metres)

VARSETT2

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **SUPER PHOSPHATE**
MATERIAL BULK DENSITY **1160** (kg/cubic metre)
SPROCKET RATIO **HIGH RATE**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

160	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0	-------
120	2.0	2.7	3.4	4.1	4.7	5.4	6.1	6.8	7.4
100	1.7	2.3	2.8	3.4	4.0	4.5	5.1	5.6	6.2
80	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.5	5.0
60	1.0	1.4	1.7	2.0	2.4	2.7	3.0	3.4	3.7
40	-------	0.9	1.1	1.4	1.6	1.8	2.0	2.3	2.5
20	-------	-------	-------	-------	0.8	0.9	1.0	1.1	1.2
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

NOT RECOMMENDED

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

NOT RECOMMENDED

VARSETT3

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **UREA**
MATERIAL BULK DENSITY **780** (kg/cubic metre)
SPROCKET RATIO **STANDARD**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

160	9.1	-------	-------	-------	-------	-------	-------	-------	-------
120	6.8	9.1	-------	-------	-------	-------	-------	-------	-------
100	5.7	7.6	9.4	-------	-------	-------	-------	-------	-------
80	4.5	6.0	7.6	9.1	-------	-------	-------	-------	-------
60	3.4	4.5	5.7	6.8	7.9	9.1	-------	-------	-------
40	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.6	8.3
20	1.1	1.5	1.9	2.3	2.6	3.0	3.4	3.8	4.2
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

160	6.0	8.1	-------	-------	-------	-------	-------	-------	-------
120	4.5	6.0	7.6	9.1	-------	-------	-------	-------	-------
100	3.8	5.0	6.3	7.6	8.8	-------	-------	-------	-------
80	3.0	4.0	5.0	6.0	7.0	8.1	9.1	-------	-------
60	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.6	8.3
40	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
20	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

160	4.5	6.0	7.6	9.1	-------	-------	-------	-------	-------
120	3.4	4.5	5.7	6.8	7.9	9.1	-------	-------	-------
100	2.8	3.8	4.7	5.7	6.6	7.6	8.5	9.4	-------
80	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.6	8.3
60	1.7	2.3	2.8	3.4	4.0	4.5	5.1	5.7	6.2
40	1.1	1.5	1.9	2.3	2.6	3.0	3.4	3.8	4.2
20	-------	0.8	0.9	1.1	1.3	1.5	1.7	1.9	2.1
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

VARSETT4

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **UREA**

MATERIAL BULK DENSITY **780** (kg/cubic metre)

SPROCKET RATIO **HIGH RATE**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
160	4.0	5.4	6.7	8.1	9.4	-------	-------	-------	-------
120	3.0	4.0	5.0	6.0	7.0	8.1	9.1	-------	-------
100	2.5	3.4	4.2	5.0	5.9	6.7	7.6	8.4	9.2
80	2.0	2.7	3.4	4.0	4.7	5.4	6.0	6.7	7.4
60	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
40	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.4	3.7
20	-------	-------	0.8	1.0	1.2	1.3	1.5	1.7	1.8
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 meterwheels fitted

NOT RECOMMENDED

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

NOT RECOMMENDED

VARSETT11

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **OATS**

MATERIAL BULK DENSITY **540** (kg/cubic metre)

SPROCKET RATIO **STANDARD**

* ***REMOVE METERWHEEL COVER PLATE***

(Refer page 103 for full details)

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

120	9.8	-------	-------	-------	-------	-------	-------	-------	-------
100	8.2	-------	-------	-------	-------	-------	-------	-------	-------
80	6.5	8.7	-------	-------	-------	-------	-------	-------	-------
60	4.9	6.5	8.2	9.8	-------	-------	-------	-------	-------
40	3.3	4.4	5.5	6.5	7.6	8.7	9.8	-------	-------
20	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.5	6.0
10	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

120	6.5	8.7	-------	-------	-------	-------	-------	-------	-------
100	5.5	7.3	9.1	-------	-------	-------	-------	-------	-------
80	4.4	5.8	7.3	8.7	-------	-------	-------	-------	-------
60	3.3	4.4	5.5	6.5	7.6	8.7	9.8	-------	-------
40	2.2	2.9	3.6	4.4	5.1	5.8	6.5	7.3	8.0
20	1.1	1.5	1.8	2.2	2.5	2.9	3.3	3.6	4.0
10	-------	0.7	0.9	1.1	1.3	1.5	1.6	1.8	2.0
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN

120	4.9	6.5	8.2	9.8	-------	-------	-------	-------	-------
100	4.1	5.5	6.8	8.2	9.5	-------	-------	-------	-------
80	3.3	4.4	5.5	6.5	7.6	8.7	9.8	-------	-------
60	2.5	3.3	4.1	4.9	5.7	6.5	7.4	8.2	9.0
40	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.5	6.0
20	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0
10	-------	-------	-------	0.8	1.0	1.1	1.2	1.4	1.5
	6	8	10	12	14	16	18	20	22

VARSETT5

PLANTING WIDTH (metres)

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **BARLEY**
MATERIAL BULK DENSITY **750** (kg/cubic metre)
SPROCKET RATIO **STANDARD**

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
160	9.4	-------	-------	-------	-------	-------	-------	-------	-------
120	7.1	9.4	-------	-------	-------	-------	-------	-------	-------
100	5.9	7.9	9.8	-------	-------	-------	-------	-------	-------
80	4.7	6.3	7.9	9.4	-------	-------	-------	-------	-------
60	3.5	4.7	5.9	7.1	8.2	9.4	-------	-------	-------
40	2.4	3.1	3.9	4.7	5.5	6.3	7.1	7.9	8.6
20	1.2	1.6	2.0	2.4	2.7	3.1	3.5	3.9	4.3

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
160	6.3	8.4	-------	-------	-------	-------	-------	-------	-------
120	4.7	6.3	7.9	9.4	-------	-------	-------	-------	-------
100	3.9	5.2	6.5	7.9	9.2	-------	-------	-------	-------
80	3.1	4.2	5.2	6.3	7.3	8.4	9.4	-------	-------
60	2.4	3.1	3.9	4.7	5.5	6.3	7.1	7.9	8.6
40	1.6	2.1	2.6	3.1	3.7	4.2	4.7	5.2	5.8
20	0.8	1.0	1.3	1.6	1.8	2.1	2.4	2.6	2.9

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN	6	8	10	12	14	16	18	20	22
160	4.7	6.3	7.9	9.4	-------	-------	-------	-------	-------
120	3.5	4.7	5.9	7.1	8.2	9.4	-------	-------	-------
100	2.9	3.9	4.9	5.9	6.9	7.9	8.8	9.8	-------
80	2.4	3.1	3.9	4.7	5.5	6.3	7.1	7.9	8.6
60	1.8	2.4	2.9	3.5	4.1	4.7	5.3	5.9	6.5
40	1.2	1.6	2.0	2.4	2.7	3.1	3.5	3.9	4.3
20	-------	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2

PLANTING WIDTH (metres)

VARSETT6

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **PEAS**

MATERIAL BULK DENSITY **860** (kg/cubic metre)

SPROCKET RATIO **STANDARD**

MANIFOLD PLATE **LARGE SEEDS**

(4 outlet meterbox only refer page 102)

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	9.2	-------	-------	-------	-------	-------	-------	-------	-------
140	7.2	9.6	-------	-------	-------	-------	-------	-------	-------
120	6.2	8.2	-------	-------	-------	-------	-------	-------	-------
100	5.1	6.9	8.6	-------	-------	-------	-------	-------	-------
80	4.1	5.5	6.9	8.2	9.6	-------	-------	-------	-------
60	3.1	4.1	5.1	6.2	7.2	8.2	9.2	-------	-------
40	2.1	2.7	3.4	4.1	4.8	5.5	6.2	6.9	7.5
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	6.2	8.2	-------	-------	-------	-------	-------	-------	-------
140	4.8	6.4	8.0	9.6	-------	-------	-------	-------	-------
120	4.1	5.5	6.9	8.2	9.6	-------	-------	-------	-------
100	3.4	4.6	5.7	6.9	8.0	9.1	-------	-------	-------
80	2.7	3.7	4.6	5.5	6.4	7.3	8.2	9.1	-------
60	2.1	2.7	3.4	4.1	4.8	5.5	6.2	6.9	7.5
50	1.7	2.3	2.9	3.4	4.0	4.6	5.1	5.7	6.3
40	1.4	1.8	2.3	2.7	3.2	3.7	4.1	4.6	5.0
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	4.6	6.2	7.7	9.2	-------	-------	-------	-------	-------
140	3.6	4.8	6.0	7.2	8.4	9.6	-------	-------	-------
120	3.1	4.1	5.1	6.2	7.2	8.2	9.2	-------	-------
100	2.6	3.4	4.3	5.1	6.0	6.9	7.7	8.6	9.4
80	2.1	2.7	3.4	4.1	4.8	5.5	6.2	6.9	7.5
60	1.5	2.1	2.6	3.1	3.6	4.1	4.6	5.1	5.7
50	1.3	1.7	2.1	2.6	3.0	3.4	3.9	4.3	4.7
40	1.0	1.4	1.7	2.1	2.4	2.7	3.1	3.4	3.8
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

VARSETT8

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **PEAS**

MATERIAL BULK DENSITY **860** (kg/cubic metre)

SPROCKET RATIO **HIGH RATE**

MANIFOLD PLATE **LARGE SEEDS**

(4 outlet meterbox only refer page 102)

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	4.1	5.5	6.9	8.2	9.6	-------	-------	-------	-------
140	3.2	4.3	5.3	6.4	7.5	8.5	9.6	-------	-------
120	2.7	3.7	4.6	5.5	6.4	7.3	8.2	9.1	-------
100	2.3	3.0	3.8	4.6	5.3	6.1	6.9	7.6	8.4
80	1.8	2.4	3.0	3.7	4.3	4.9	5.5	6.1	6.7
60	1.4	1.8	2.3	2.7	3.2	3.7	4.1	4.6	5.0
40	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

NOT RECOMMENDED

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

NOT RECOMMENDED

VARSETT9

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **FABA BEANS**
MATERIAL BULK DENSITY **800** (kg/cubic metre)
SPROCKET RATIO **STANDARD**
MANIFOLD PLATE **LARGE SEEDS**

(4 outlet meterbox only refer page 102)

4 Outlet Meterbox / 2 Meterwheels fitted
6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	-------	-------	-------	-------	-------	-------	-------	-------	-------
140	9.0	-------	-------	-------	-------	-------	-------	-------	-------
120	7.7	-------	-------	-------	-------	-------	-------	-------	-------
100	6.4	8.5	-------	-------	-------	-------	-------	-------	-------
80	5.1	6.8	8.5	-------	-------	-------	-------	-------	-------
60	3.8	5.1	6.4	7.7	9.0	-------	-------	-------	-------
40	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	9.4
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted
6 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	7.7	-------	-------	-------	-------	-------	-------	-------	-------
140	6.0	8.0	-------	-------	-------	-------	-------	-------	-------
120	5.1	6.8	8.5	-------	-------	-------	-------	-------	-------
100	4.3	5.7	7.1	8.5	-------	-------	-------	-------	-------
80	3.4	4.6	5.7	6.8	8.0	9.1	-------	-------	-------
60	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	9.4
40	1.7	2.3	2.8	3.4	4.0	4.6	5.1	5.7	6.3
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted
6 Outlet Meterbox / 6 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	5.8	7.7	9.6	-------	-------	-------	-------	-------	-------
140	4.5	6.0	7.5	9.0	-------	-------	-------	-------	-------
120	3.8	5.1	6.4	7.7	9.0	-------	-------	-------	-------
100	3.2	4.3	5.3	6.4	7.5	8.5	9.6	-------	-------
80	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	9.4
60	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1
40	1.3	1.7	2.1	2.6	3.0	3.4	3.8	4.3	4.7
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

VARSETT14

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **FABA BEANS**

MATERIAL BULK DENSITY **800** (kg/cubic metre)

SPROCKET RATIO **HIGH RATE**

MANIFOLD PLATE **LARGE SEEDS**

(4 outlet meterbox only refer page 102)

4 Outlet Meterbox / 2 Meterwheels fitted

6 Outlet Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha) PER BIN									
180	5.1	6.8	8.5	-------	-------	-------	-------	-------	-------
140	4.0	5.3	6.6	8.0	9.3	-------	-------	-------	-------
120	3.4	4.6	5.7	6.8	8.0	9.1	-------	-------	-------
100	2.8	3.8	4.7	5.7	6.6	7.6	8.5	9.5	-------
80	2.3	3.0	3.8	4.6	5.3	6.1	6.8	7.6	8.4
60	1.7	2.3	2.8	3.4	4.0	4.6	5.1	5.7	6.3
40	1.1	1.5	1.9	2.3	2.7	3.0	3.4	3.8	4.2
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted

6 Outlet Meterbox / 4 Meterwheels fitted

NOT RECOMMENDED

4 Outlet Meterbox / 4 Meterwheels fitted

6 Outlet Meterbox / 6 Meterwheels fitted

NOT RECOMMENDED

VARSETT10

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **CANOLA**

MATERIAL BULK DENSITY **720** (kg/cubic metre)

SPROCKET RATIO **STANDARD**

METERWHEEL SLEEVE **SLEEVES FITTED**

(Refer to the meterbox section for further information)

4 Outlet Meterbox / 2 Meterwheels fitted (50mm sleeve)
6 Outlet Meterbox / 3 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN									
6.5	1.1	1.5	1.9	2.3	2.7	3.0	3.4	3.8	4.2
5.5	1.0	1.3	1.6	1.9	2.3	2.6	2.9	3.2	3.5
5	0.9	1.2	1.5	1.8	2.0	2.3	2.6	2.9	3.2
4.5	0.8	1.1	1.3	1.6	1.8	2.1	2.4	2.6	2.9
4	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.3	2.6
3.5	-------	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.3
3	-------	0.7	0.9	1.1	1.2	1.4	1.6	1.8	1.9
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted (50mm sleeve)
6 Outlet Meterbox / 4 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN									
6.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8
5.5	-------	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.4
5	-------	0.8	1.0	1.2	1.4	1.6	1.8	1.9	2.1
4.5	-------	0.7	0.9	1.1	1.2	1.4	1.6	1.8	1.9
4	-------	-------	0.8	0.9	1.1	1.2	1.4	1.6	1.7
3.5	-------	-------	-------	0.8	1.0	1.1	1.2	1.4	1.5
3	-------	-------	-------	0.7	0.8	0.9	1.1	1.2	1.3
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted (50mm sleeve)
6 Outlet Meterbox / 6 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN									
6.5	-------	0.8	0.9	1.1	1.3	1.5	1.7	1.9	2.1
5.5	-------	-------	0.8	1.0	1.1	1.3	1.4	1.6	1.8
5	-------	-------	0.7	0.9	1.0	1.2	1.3	1.5	1.6
4.5	-------	-------	-------	0.8	0.9	1.1	1.2	1.3	1.4
4	-------	-------	-------	0.7	0.8	0.9	1.1	1.2	1.3
3.5	-------	-------	-------	-------	0.7	0.8	0.9	1.0	1.1
3	-------	-------	-------	-------	-------	0.7	0.8	0.9	1.0
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

VARSETT7

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **SORGHUM**

MATERIAL BULK DENSITY **750** (kg/cubic metre)

SPROCKET RATIO **STANDARD**

METERWHEEL SLEEVE **SLEEVES FITTED**

(Refer to the meterbox section for further information)

4 Outlet Meterbox / 2 Meterwheels fitted (25+50mm sleeve)

6 Outlet Meterbox / 3 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN									
12	2.8	3.8	4.7	5.7	6.6	7.5	8.5	9.4	-------
8	1.9	2.5	3.1	3.8	4.4	5.0	5.7	6.3	6.9
7	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.5	6.0
6	1.4	1.9	2.4	2.8	3.3	3.8	4.2	4.7	5.2
5	1.2	1.6	2.0	2.4	2.7	3.1	3.5	3.9	4.3
4	0.9	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.5
3	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.4	2.6
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted (25+50mm sleeve)

6 Outlet Meterbox / 4 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN									
12	1.9	2.5	3.1	3.8	4.4	5.0	5.7	6.3	6.9
8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	4.2	4.6
7	1.1	1.5	1.8	2.2	2.6	2.9	3.3	3.7	4.0
6	0.9	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.5
5	0.8	1.0	1.3	1.6	1.8	2.1	2.4	2.6	2.9
4	-------	0.8	1.0	1.3	1.5	1.7	1.9	2.1	2.3
3	-------	-------	0.8	0.9	1.1	1.3	1.4	1.6	1.7
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted (25+50mm sleeve)

6 Outlet Meterbox / 6 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN									
12	1.4	1.9	2.4	2.8	3.3	3.8	4.2	4.7	5.2
8	0.9	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.5
7	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0
6	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.4	2.6
5	-------	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2
4	-------	-------	0.8	0.9	1.1	1.3	1.4	1.6	1.7
3	-------	-------	-------	0.7	0.8	0.9	1.1	1.2	1.3
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

VARSETT12

VARIATOR SETTING GUIDE (INDICATIVE ONLY)

MATERIAL **SUNFLOWER**

MATERIAL BULK DENSITY **460** (kg/cubic metre)

SPROCKET RATIO **STANDARD**

METERWHEEL SLEEVE **SLEEVES FITTED**

(Refer to the meterbox section for further information)

4 Outlet Meterbox / 2 Meterwheels fitted (25+50mm sleeve)

6 Outlet Meterbox / 3 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN

12	4.6	6.1	7.7	9.2	-------	-------	-------	-------	-------
10	3.8	5.1	6.4	7.7	9.0	-------	-------	-------	-------
8	3.1	4.1	5.1	6.1	7.2	8.2	9.2	-------	-------
6	2.3	3.1	3.8	4.6	5.4	6.1	6.9	7.7	8.5
5	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.0
4	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1	5.6
3	1.2	1.5	1.9	2.3	2.7	3.1	3.5	3.8	4.2
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 3 Meterwheels fitted (25+50mm sleeve)

6 Outlet Meterbox / 4 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN

12	3.1	4.1	5.1	6.1	7.2	8.2	9.2	-------	-------
10	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	9.4
8	2.0	2.7	3.4	4.1	4.8	5.5	6.1	6.8	7.5
7	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6
6	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1	5.6
5	1.3	1.7	2.1	2.6	3.0	3.4	3.8	4.3	4.7
4	1.0	1.4	1.7	2.0	2.4	2.7	3.1	3.4	3.8
3	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.6	2.8
	6	8	10	12	14	16	18	20	22

PLANTING WIDTH (metres)

4 Outlet Meterbox / 4 Meterwheels fitted (25+50mm sleeve)

6 Outlet Meterbox / 6 Meterwheels fitted (25mm sleeve)

APPLICATION RATE (kg/ha) PER BIN

12	2.3	3.1	3.8	4.6	5.4	6.1	6.9	7.7	8.5
10	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.0
8	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1	5.6
7	1.3	1.8	2.2	2.7	3.1	3.6	4.0	4.5	4.9
6	1.2	1.5	1.9	2.3	2.7	3.1	3.5	3.8	4.2
5	1.0	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.5
4	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.6	2.8
3	-------	0.8	1.0	1.2	1.3	1.5	1.7	1.9	2.1
	6	8	10	12	14	16	18	20	22

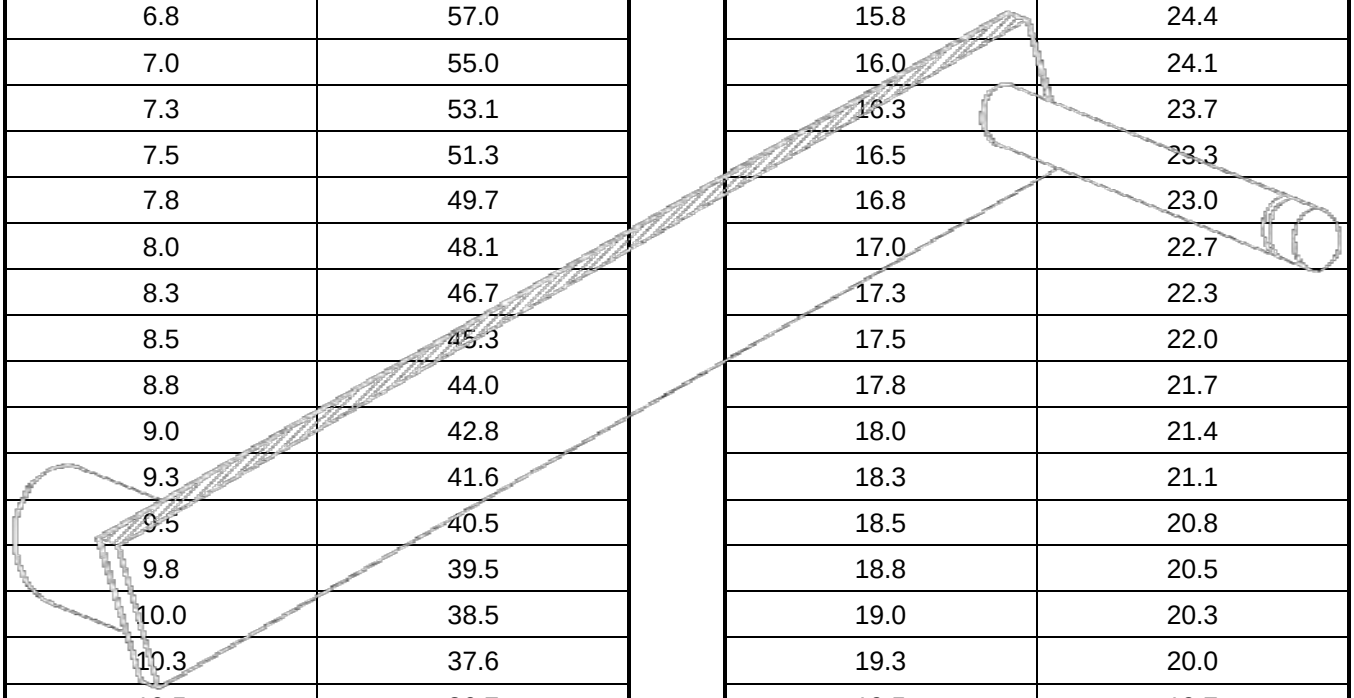
PLANTING WIDTH (metres)

VARSETT15

Calibration Handle Rotation Chart

PLANTING WIDTH (m)	***1/20th Hectare***
4.5	85.5
4.8	81.0
5.0	77.0
5.3	73.3
5.5	70.0
5.8	67.0
6.0	64.2
6.3	61.6
6.5	59.2
6.8	57.0
7.0	55.0
7.3	53.1
7.5	51.3
7.8	49.7
8.0	48.1
8.3	46.7
8.5	45.3
8.8	44.0
9.0	42.8
9.3	41.6
9.5	40.5
9.8	39.5
10.0	38.5
10.3	37.6
10.5	36.7
10.8	35.8
11.0	35.0
11.3	34.2
11.5	33.5
11.8	32.8
12.0	32.1
12.3	31.4
12.5	30.8
12.8	30.2
13.0	29.6
13.3	29.0

PLANTING WIDTH (m)	***1/20th Hectare***
13.5	28.5
13.8	28.0
14.0	27.5
14.3	27.0
14.5	26.5
14.8	26.1
15.0	25.7
15.3	25.2
15.5	24.8
15.8	24.4
16.0	24.1
16.3	23.7
16.5	23.3
16.8	23.0
17.0	22.7
17.3	22.3
17.5	22.0
17.8	21.7
18.0	21.4
18.3	21.1
18.5	20.8
18.8	20.5
19.0	20.3
19.3	20.0
19.5	19.7
19.8	19.5
20.0	19.3
20.3	19.0
20.5	18.8
20.8	18.6
21.0	18.3
21.3	18.1
21.5	17.9
21.8	17.7
22.0	17.5



AREA RATE (Hectares/Hour)

Width of Implement (Metres)

Ground Speed (Kilometres per Hour)	3	5	7	9	11	13	15	17	19	21	23	25
2	0.60	1.0	1.4	1.8	2.2	2.6	3.0	3.4	3.8	4.2	4.6	5.0
4	1.2	2.0	2.8	3.6	4.4	5.2	6.0	6.8	7.6	8.4	9.2	10
6	1.8	3.0	4.2	5.4	6.6	7.8	9.0	10	11	13	14	15
8	2.4	4.0	5.6	7.2	8.8	10	12	14	15	17	18	20
10	3.0	5.0	7.0	9.0	11	13	15	17	19	21	23	25
12	3.6	6.0	8.4	11	13	16	18	20	23	25	28	30
14	4.2	7.0	9.8	13	15	18	21	24	27	29	32	35
16	4.8	8.0	11	14	18	21	24	27	30	34	37	40

[Width (m) x Speed (Km/h)] x 0.1000

Metric to Imperial Conversion Scales

Speed	**Km/h**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**
	MPH	3.7	4.3	5	5.6	6.2	6.8	7.5	8.75

Width	**m**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
	ft	23	26	30	33	36	39	43	46	49	53	56	59

Conversion for Material Application Rates – lb / acre x 1.121 = kg / ha

lb / acre	*kg / ha*
1.0	1.1
1.5	1.7
2.0	2.2
2.5	2.8
3.0	3.4
3.5	3.9
4.0	4.5
4.5	5.0
5.0	5.6
5.5	6.2
6.0	6.7
6.5	7.3
7.0	7.8
7.5	8.4
8.0	9.0
8.5	9.5
9.0	10.1
9.5	10.6
10.0	11.2
12.0	13.5
14.0	15.7
16.0	17.9
18.0	20.2
20.0	22.4
22.0	24.7
24.0	26.9
26.0	29.1
28.0	31.4
30.0	33.6
32.0	35.9
34.0	38.1
36.0	40.4
38.0	42.6
40.0	44.8
42.0	47.1
44.0	49.3
46.0	51.6
48.0	53.8
50.0	56.1
52.0	58.3
54.0	60.5
56.0	62.8

lb / acre	*kg / ha*
58.0	65.0
60.0	67.3
62.0	69.5
64.0	71.7
66.0	74.0
68.0	76.2
70.0	78.5
72.0	80.7
74.0	73.0
76.0	85.2
78.0	87.4
80.0	89.7
82.0	91.9
84.0	94.2
86.0	96.4
88.0	98.6
90.0	100.9
95.0	106.5
100.0	112.1
105.0	117.7
110.0	123.3
115.0	128.9
120.0	134.5
125.0	140.1
130.0	145.7
135.0	151.3
140.0	156.9
145.0	162.5
150.0	168.2
155.0	173.8
160.0	179.4
170.0	190.6
180.0	201.8
190.0	213.0
200.0	224.2
225.0	252.2
250.0	280.3
275.0	308.3
300.0	336.3
325.0	364.3
350.0	392.4
400.0	448.4

PLANTING DETAIL REFERENCE CHART

DATE	*MATERIAL*	*BULK DENSITY*	*METERWHEELS SLEEVES / SPROCKET*	*VARIATOR SETTING*	*APPLICATION RATE*	*OTHER DETAILS*

DATE	MATERIAL	BULK DENSITY	METERWHEELS SLEEVES / SPROCKET	VARIATOR SETTING	APPLICATION RATE	OTHER DETAILS

Introduction

The metering system used on your Air Seeder has been designed to handle a large range of seeds and fertilizers at different rates.

Due to the large difference in material flow rates required on an air seeder i.e. 3 kg/ha of canola to 160 kg/ha plus of peas or fertilizer, certain adjustments may need to be made to the meterbox or drive system.

As a guide to when you may need to make changes to the standard system refer to the 'Variator Setting Guide' (pages 37 to 51) for the various materials being sown.

Variators

The metering system is driven through a variable speed gearbox. The variators are mounted next to the meterbox and are adjusted remotely via cables.

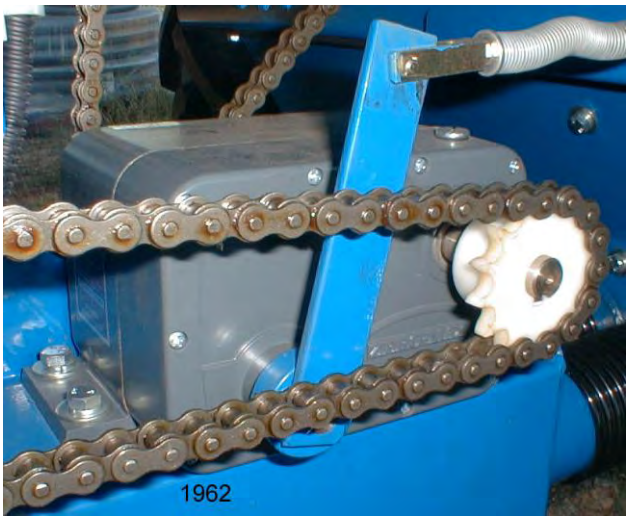


Fig. MD1 Variator Gearbox.

NOTE: It is recommended that when adjusting the variator setting the operator goes past the desired setting (higher rate) a short distance and then rotates the handle back to the required setting.

This method of adjustment will ensure that there is no slack in the cable.

Fig. MD2 Variator Adjustment (2 bin).

All of the main bins metering system can be set from the one station at different rates (fig. MD2).

Variator Maintenance

The variator is virtually maintenance free and will require only a brief inspection to check that the oil seals on both the input and output shafts are in good condition. Refer to the 'General Maintenance Section' for further details.

It is recommended that the oil in the variator be changed if there is any possibility that the fluid may have suffered contamination. Oil contamination will occur if any foreign matter or moisture finds its way into the sealed housing.

To change the variator oil you will need to remove the variator from the seeder and drain the oil at the filling cap. Fill with the correct oil (refer seeder specifications page 10) and refit the variator.

Oil should be level with the centre line of the top shaft after filling.

When re-fitting the adjustment arm to the variator ensure that the variator does not turn when set at zero. Lock both grub screws on the arm after setting.

Checking the Variator for Damage

It must be remembered that the variators, even though they are of robust construction, have a limited torque capacity. Care must be taken when operating the metering system to avoid overloading the metershaft.

DO NOT leave fertilizer in the bin for extended periods of time.

DO NOT use wet or damp fertilizer.

DO NOT use a 'High Rates' sprocket ratio if not recommended.

ALWAYS check that the metershaft turns freely by using the handle supplied (fig. MD3) before calibrating or engaging the clutch.

Fig. MD3 Checking Metershaft.

CHECK THAT THE METERING SHAFTS TURN FREELY.

This operation should become standard procedure after travelling any length of time which would allow the fertilizer to compact, or if material has been left in the bins overnight.

If you feel the variator is damaged in any way you should consult your local authorised service centre.

One method to check your variator is to place material in the bin and set the variable adjustment at the maximum setting (10). Fit the calibration collection box and turn the calibration handle to operate the variator.

The variator output shaft, when set at maximum, should rotate 1 turn for every 4 turns of the input shaft. You will need to mark the shaft or sprocket and have someone watch the input shaft side while the person turning the calibration handle watches the output side.

Drive System

The variators are driven by the ground wheel, through a series of sprockets, and an electro-magnetic clutch.

The clutch is operated from the cab of the tractor via the clutch switch. It can be engaged or disengaged at anytime when at seeding speeds or while stationary. **ALWAYS** check that the metershafts turn freely before engaging.

Two disengaging sprockets are fitted to the top shaft before the variators. These sprockets have a drive pin that can be operated to isolate a meterbox for calibration or seeding purposes.

The 3 bin model seeders often have a second clutch to isolate one of the bins that can be operated from the tractor cabin.

Checking the Drive System

To check the resistance of the drive system, fit the calibration handle and hang a spring scale from the handle. With the clutch disengaged and both metering systems operating, but both bins empty, rotate the handle pulling through some spring scales. Resistance should not be greater than 11kg at the handle.

Check bearings and all moving parts for damage if resistance is high.

Lubricate all bearings and chains.

Replace sprockets and chain if badly worn.

High Rate Sprocket Ratio

When wishing to meter high rates of seed or fertilizer it may be necessary to increase the speed range of the metershaft. This is done by altering the sprocket ratio from the standard rate to a ***'High Rates'*** sprocket ratio.

Generally this change in ratio would only occur when the machine is being used for deep banding and a reduced number of meterwheels are in place. The 'Variator Setting Guide' will alert the operator when this change may be necessary.

DO NOT use a 'High Rates' sprocket ratio if not recommended. Refer to 'Variator Setting Guide' (pages 37–51) for its appropriate use.

To Change Sprocket Ratio on a Ground Drive Seeder

1. Remove the chain on the right hand side of the meterbox that connects the agitator shaft and the meterwheel shaft.

2. Using an allen key loosen the grub screws that retain the nylon sprockets. Two screws per sprocket.

3. Remove both sprockets and swap their location. This will effectively more than double the speed of the metershaft i.e. the big sprocket now driving the little sprocket. (Fig. MD4).

4. Tighten the grub screws when the sprockets have been correctly located. Check that the metershaft handle still fits and that the 2 sprockets are in line.

5. Refit the chain and check that the system turns freely.

NOTE: Increasing the speed of the metershaft also increases the load on the variator. It is therefore not recommended to run the seeder's metering system in this ***'High Ratio'*** all the time. Variator damage may occur depending on the material's resistance.

Fig.MD4 High Rates Sprocket Ratio.

Reversing the sprockets will give you the standard sprocket ratio. **ALWAYS** run the system in this mode for normal seeding operations. (Refer Fig. MD5).

Fig.MD5 Standard Sprocket Ratio .

Introduction (VRT Hydraulic Drive)

The VRT Hydraulic Drive metering system fitted to the air seeder will allow the operator to control product application rates from the tractor cab.

The Gason VRT (variable rate technology) system uses hydraulic motors to rotate the seeder's metershafts. A special hydraulic manifold assembly controls oil flow from the tractor's hydraulic system to vary the different metershaft speeds. The Farmscan Canlink 3000 monitor and seeding pod is the control face of the Gason Hydraulic Drive system.

Fig.V1 The Canlink 3000 monitor .

This section will look at the specific information required to operate the monitor for the Gason VRT system.

It is recommended that the operator reads this section of the manual and views the 'VRT Training Video'. The laminated 'Quick Reference Guide' should be stored in the tractor cab and used to remind the operator how to calibrate the seeder when in the field.

Farmscan have also supplied an operator's manual with the Canlink system. This manual covers relevant information for the monitor system and its operation. It will not however give detailed information regarding the calibration and setup procedure for the various products to be sown using your Gason seeder.

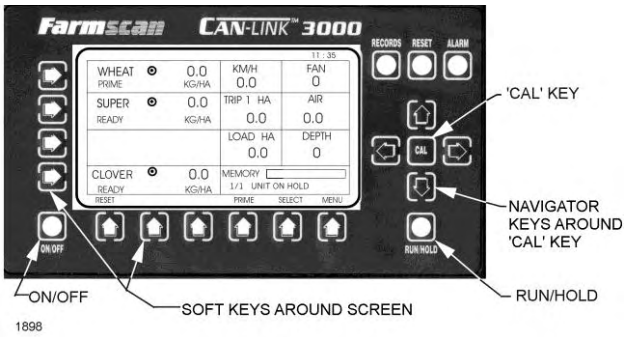


Fig.V2 Key names for the 3000 Canlink.

Monitor Installation (VRT)

Refer to the Farmscan operator's manual for specific information regarding the physical installation of the monitor to the tractor.

Setting Implement Width

The Air Seeder and monitor have been fully tested and the software setup at the factory to suit your specific model air seeder.

The only setting required by the dealer or operator before calibration and operation is the implement's seeding width. This information can be entered into the monitor by going to the menu screen. Push the 'CAL' key on the front face of the monitor.

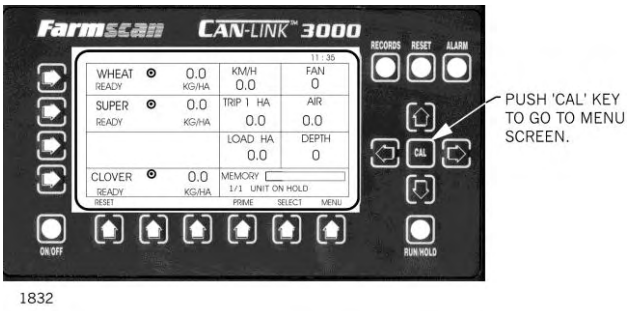


Fig.V3 Monitor Face.

Enter the 'MACHINE' screen by first highlighting the 'MACHINE' prompt, using the navigator keys to move the cursor, and then using the 'CAL' key to select.

Use the soft key to the left of the 'WIDTH FACTOR' to highlight the current factory setting of 10.00 metres. Use the navigator keys around the 'CAL' key to adjust the value. Once set, the operator can push the soft key under the 'EXIT' prompt to return to the main screen.

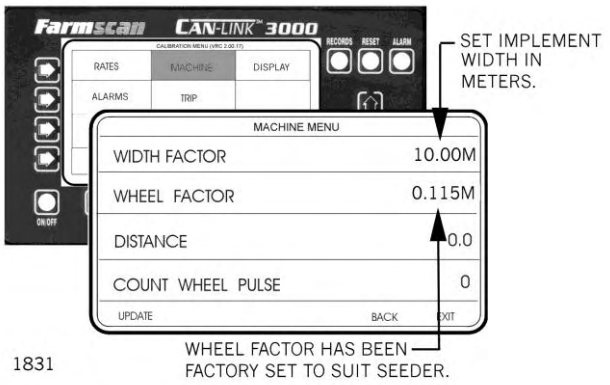


Fig.V4 'MACHINE MENU' screen displayed.

Monitor Operation (VRT)

The Canlink 3000 monitor, when calibrated, controls the application rate of the metering system.

The operator can either:

1. Set a specific application rate on the monitor's screen, and set incremental steps by which this preset rate can be altered while on the go.

2. Create a variable rate application map that has been generated from either a yield map or other field boundary map. A GPS antenna and cable are required. Refer to the Farmscan Operator's manual for more detailed information.

Before operating the seeder it will be necessary to calibrate the metering system. Refer to the Calibration (VRT) section of this manual (page 70) for more information.

Monitor Display Status
READY/OFF /NO CAL

After calibration, a '**READY**' prompt should be displayed on the main screen under each material to be sown.

'**NO CAL**' will be displayed if the bin has not been calibrated.

The status '**OFF**' will be displayed if that particular bin has been switched off.

To correct the 'NO CAL' display you will have to calibrate that particular product. To change the operating status from 'OFF' to 'READY' simply press and hold the soft key directly to the left of that particular bin display.

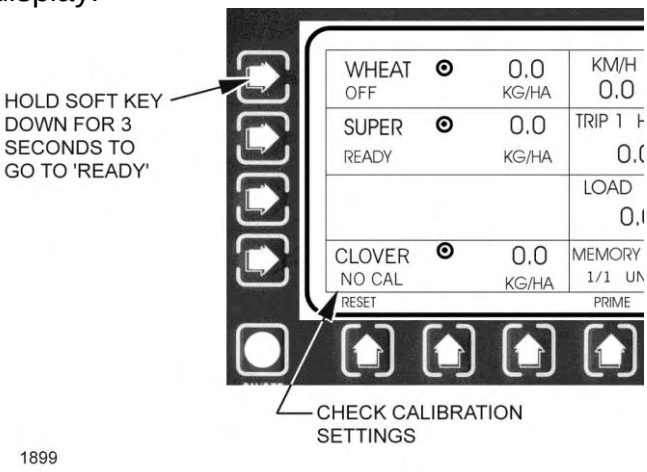


Fig.V5 Status displayed on the Main screen.

Displayed Application Rates

When stationary, the main screen will display 0.0 KG/HA application rate for all bins. This is to show the operator that the metering system is not operating. If you wish to check the actual set rate simply press the soft key to the left of the appropriate bin/product. The set rate will then be displayed for a few seconds before resuming the actual rate being metered.

Changing Displayed Rates

The Application rate can be altered while on the go by first highlighting the appropriate bin/product by pressing the soft key to the left, and then using either the up or down navigator keys around the 'CAL' key. To reset the target rate simply press the soft key under the 'RESET' prompt with the appropriate bin/product highlighted.

RUN/HOLD Function

When the monitor is switched on, the screen will display '**UNIT ON HOLD**'. This shows that the metering system is disengaged and will not operate even if it receives a ground speed feedback. The operator can change this status by simply pressing the 'RUN/HOLD' key.

Once 'OFF HOLD' the metering system will operate when it senses a ground speed, and if the fan speed is above the 'fan low alarm' point.

The trip functions will start recording the area and rates of application. All alarms will become active to monitor the seeder's operation.

To stop the metering system simply press the 'RUN/HOLD' key and the monitor will go back to its '**UNIT ON HOLD**' status.

PRIME Function

The '**PRIME**' function allows the operator to start the metering system while the seeder is stationary. This can be a useful tool if in the middle of a run or to ensure correct product flow.

It is possible to alter the prime functions run time by changing the preset value in the OPTIONS menu screen.

The prime function can be used similar to the 'RUN/HOLD' key. The operator can be stationary and on hold. By pressing the '**PRIME**' soft key and waiting 3 seconds to allow seed and fertiliser to reach the sowing boots before driving off, the operator can ensure complete ground coverage.

When the monitor registers a ground speed before the prime function stops the monitor will come 'OFF HOLD' automatically. To stop the metering system simply press the 'RUN/HOLD' function key.

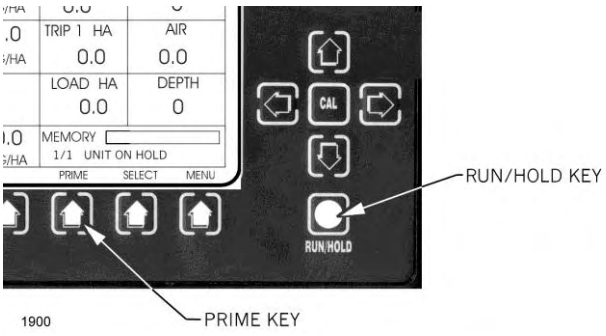


Fig.V6 Prime and Run/Hold key.

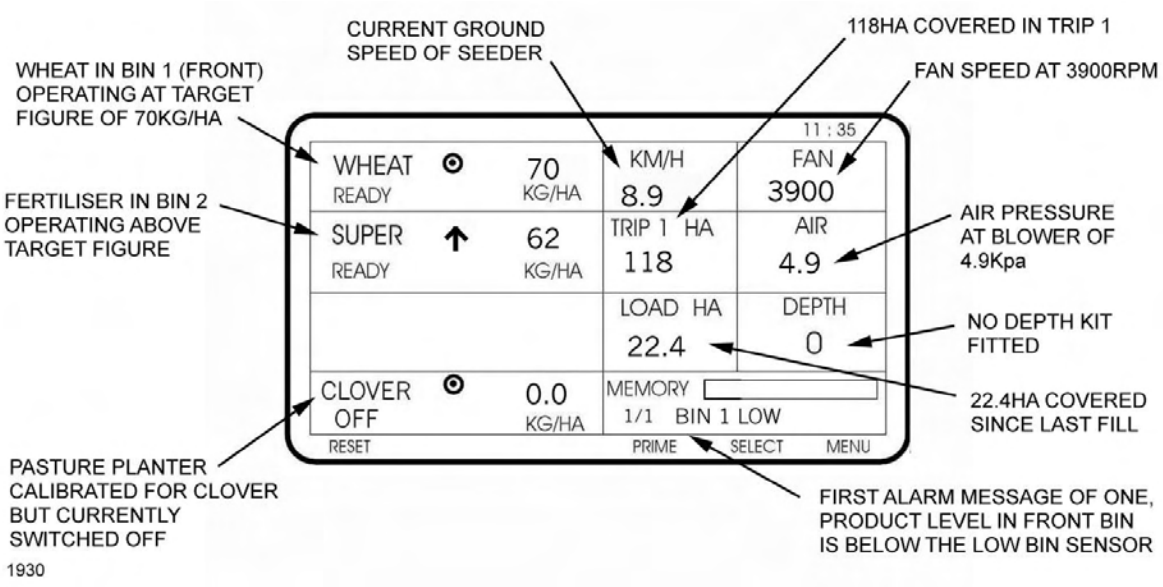


Fig.V7 Main screen showing a typical display while operating.

Message Display

If during the process of seeding a problem occurs with the seeder's operation an alarm will be displayed in the lower right hand corner of the screen.

For a full explanation of all possible alarms refer to the Message Display section in the Farmscan Operator's Manual. The most common alarms are listed in the following table.

UNIT ON HOLD	Monitor not in use.
FAN STOPPED	Fan stopped. Metering system will not run.
FAN SLOW	Fan below low alarm point. Metering system will not run.
FAN FAST	Fan above high alarm point. Fan speed must not exceed 4500rpm.
BIN 1 LOW	Bin level below sensor height on bin no.1. No alarm on bin 4
DRIVE 1-3 FAST	Variation of Sprocket Ratio. Check the preset value on the alarms ratio page.
DRIVE 1-3 SLOW	Variation of Sprocket Ratio. Check the preset value on the alarms ratio page.
BIN 1-4 RATE HI	Over target rate
BIN 1-4 RATE LO	Under target rate
NO COMMS	Pod not responding.

Table.V8 Common Alarms.

Refer to the VRT Trouble Shooting section in this manual for further explanation (p89).

SAFETY (VRT)

The VRT seeder uses hydraulic motors to turn the metering system. The hydraulic motors, which are mounted on the left hand side of each meterbox, takes hydraulic flow from the tractor to rotate.

The motors can be operated from the tractor or the seeder. Hydraulic flow is supplied to the metering system whenever the tractor's hydraulics have been engaged to run the fan or auger, if fitted.

It is important to disengage the tractor's hydraulic system and to **TURN THE TRACTOR OFF** before attempting to work on or around the metering system. The metering system could be activated if someone pushes the prime key or calibration function from the monitor.

The hydraulic motors can also be started from the seeder via the red/green calibration buttons on the left hand side of the seeder or the front face of the pod. Movement can also occur by rotating one or all of the large thumb knobs located on the front face of each bank of the manifold.

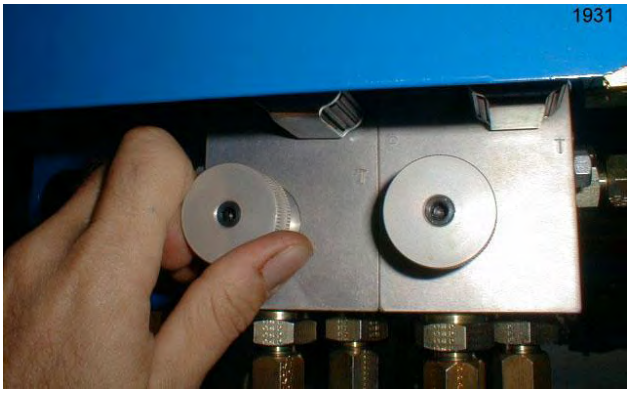


Fig.V9 Manual overide valve.

Protective hinged guards have been fitted to the side of each meterbox with warning decals. Ensure that the guards remain in place and that the decals are readable.

Fig.V10 Safety guard and decal.

Monitor Setup Procedure

The Setup Procedure refers to the specific values and settings required by the monitor and pod to operate your particular seeder. All new seeders coming from the Gason factory have already been setup and require only minimal input (refer to 'Setting Implement Width' on page 60).

It may be necessary to go through a setup procedure if the monitor or pod have been replaced, or if new software has been loaded to the Monitor or Monitor and Pod.

Refer to the Farmscan Operator's Manual for information about uploading programs to your pod and monitor. It is often possible to save your calibration settings (product information) onto the same data card or a spare card before uploading the new program. This will allow you to reload the previous default values and product details to retain existing information.

When you change software your existing product application records may be deleted. Later versions of monitor software will allow you to save this information for loading onto a home/office PC.

The following instructions therefore, refer to a monitor and pod system that have no stored values for your specific air seeder.

Setup Procedure

1. Go to the 'SETUP' screen via the 'MENU' screen by highlighting the appropriate prompt and pushing the 'CAL' key.

2. Enable bin 1 by pressing the soft key to the left of the screen for 3 seconds. Scroll through the various control systems by using the up and down navigator keys, selecting the 'HYD PROP/XPRO' option.

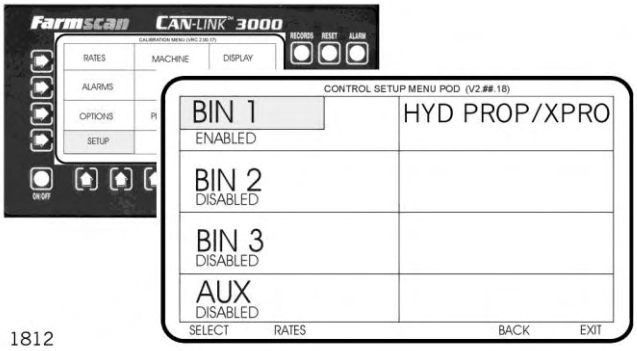


Fig.V11 Setup screen with bin 1 enabled.

3. Push the soft key under the 'SELECT' prompt on screen to go to the next stage of the set-up procedure.

4. Follow the instructions on this screen to obtain a feedback factor and 'MAX PPM' figure to ensure a connection has been made to the appropriate bin. This will involve pushing the soft key under the 'START' prompt on the screen, and then pushing the green calibration button on the left-hand side of the seeder. The tractor's hydraulic system will need to be engaged for this procedure. The particular bin's metering system will run for approximately 5 seconds at its maximum speed.

5. Push the soft-key under the 'END' prompt after the metering system has stopped. A factor will appear at the lower right-hand side of the screen. This factor should be either 3 or 4.

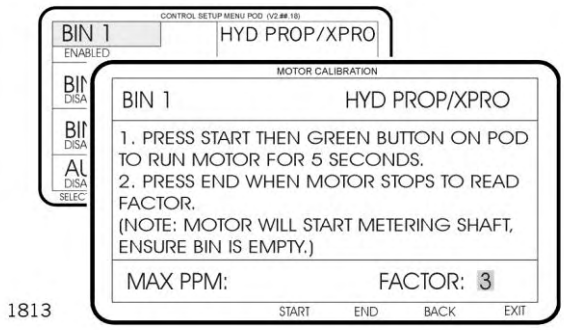


Fig. V12 Motor Calibration screen.

6. Return to the 'SETUP' screen by pushing the soft key under the 'BACK' prompt.

7. Repeat this process to enable all remaining bins. Set the pasture planter, if fitted, as the Auxiliary bin. The example shown below (Fig. V13) shows a typical 2 bin air seeder fitted with a pasture planter.

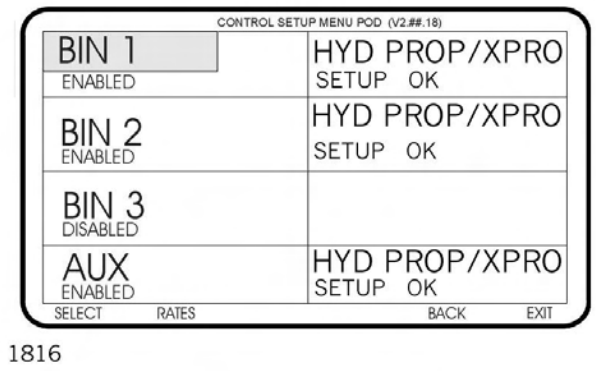


Fig. V13 Setup screen complete.

8. Next, set machine options from the 'OPTION' screen.

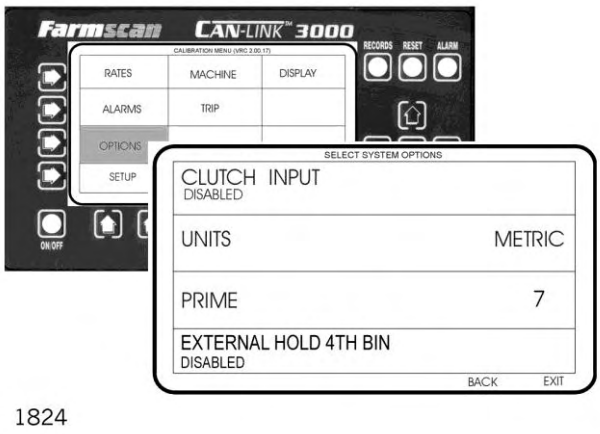


Fig. V14 Option screen.

9. Set the correct time and date on the 'CLOCK/GPS' screen. The GPS status should be disabled if this function is not going to be used. Push the soft key to the left of the GPS prompt. Continue pressing the soft key until the 'DISABLED' or 'ENABLED' zone is highlighted. Now use the navigator keys to change the status of the GPS system.

10. Set all seeder alarms from the 'ALARMS' screen. Refer ALARMS Settings section beginning this page.

11. Set the specific machine settings in the 'MACHINE' screen. Refer MACHINE Settings on page 66.

The monitor is now ready for operation. The next step is to calibrate the seeder with the product to be sown. Refer to the Calibration Procedure section starting on page 70.

Note: For further information on the monitor refer to the Farmscan Operator's manual, as supplied with the machine.

ALARM Settings

Alarm settings are normally factory set. These can be adjusted or disabled at anytime. Enter the 'ALARMS' screen from the 'MENU' screen. Factory settings for alarms are:

FAN	2000	4600
Enabled	*low alarm*	*high alarm*
AIR	0.0	20.0
Enabled	*low alarm*	*high alarm*
DEPTH (1)	0	
Disabled	*hold*	

(1) A Depth indicator can be fitted as an option on VRT equipped seeders. Disable if not in use.

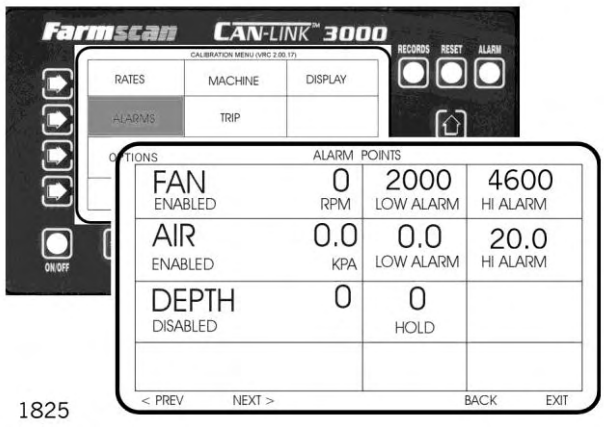


Fig. V15 The first Alarms screen of 3.

Press the soft key under 'NEXT' prompt to progress to the next alarm's screen.

DRIVE RATIO 105:1 for low ratio
ENABLED (2) *or*
24:1 for high ratio

(2) The Drive Ratio alarm monitors motor rotation to metershaft revolutions. Change setting when sprocket ratio is altered. No ratio check on DRIVE 4 (used for pasture planter). Leave DRIVE 4 disabled.

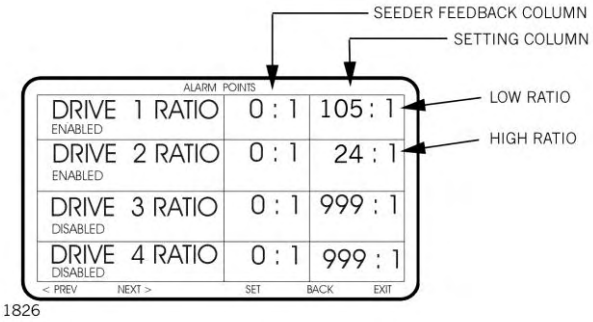


Fig. V16 Ratio setting alarm screen.

Again press the soft key under 'NEXT'.

BIN LEVEL
ENABLED (3)

(3) Bin level will, for example, display as 'BIN 1 LOW' on main screen if product falls below that particular bin's sensor. No bin sensor is fitted to pasture planter. The pasture planter is always shown as bin 4 or auxiliary.

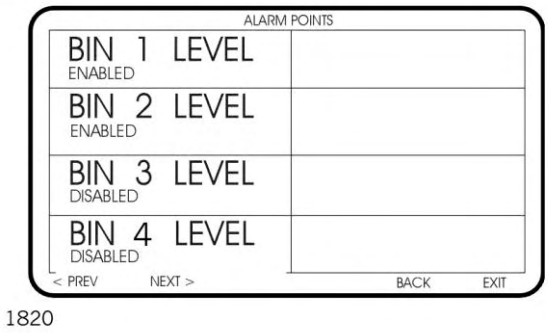


Fig. V17 Bin Level alarm screen.

Push 'NEXT' to start again at the first alarm's screen or 'EXIT' to go to the main operating screen.

MACHINE Settings: *WHEEL FACTOR*

The 'WHEEL FACTOR' has been preset at the factory to suit the particular seeder's drive wheel and target. The operator may wish to check this value when actually seeding if a difference between the tractor's ground speed and the seeder's displayed speed exists. Wheel factor can be affected by the tyres circumference. Variations in ground hardness, tyre pressure or product load in the bin may change the wheel's rolling circumference.

When checking the Wheel Factor ensure that the drive wheel, left rear wheel fitted with sensor and target, is inflated to the correct pressure and that the tyre is in good condition. The seeder's bins should be half full of product and the test performed on the actual ground to be sown. Refer to the Wheel Factor or Machine section of the Farmscan operator's manual for specific information.

To view the current wheel factor, enter the 'MACHINE' screen from the 'MENU' screen.

The factory settings for the 'WHEEL FACTOR' value for the different model air seeders are shown below.

WIDTH FACTOR *operator set in metres*
WHEEL FACTOR
Operator to check 1220/30/40 IM
0.105m 1730RT-1830RT
0.115m 1750RT-1850RT/FT
0.125m 1880RT/FT
0.129m 2120RT/FT

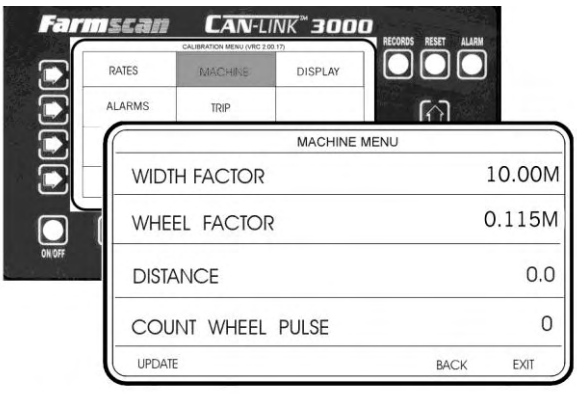


Fig. V18 Machine Menu screen.

Manual Override Introduction

The VRT Hydraulic Drive metering system on your Gason Air Seeder can be operated independently from the Farmscan monitor. This feature will be helpful if carrying out maintenance or in the event of a monitor or pod failure. The manual override system will allow the operator to continue seeding until the monitor system can be repaired or replaced.

The hydraulic manifold bank is a key component of the VRT seeder. It is located between the air seeder bins and can be accessed from the left-hand side of the machine. The manifold system is made up of a number of sections.

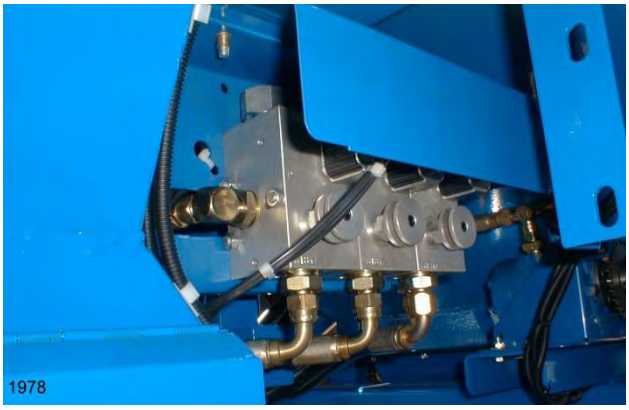


Fig. V19 VRT Manifold Assembly.

Each section controls one hydraulic motor used to run the metering system. The front manifold controls the flow of oil to the front bin (bin number one). The next manifold runs bin number two and so on. The last or most rearward manifold runs the pasture planter if fitted. The pasture planter bin is often referred to as the auxiliary bin.

Located on the lower portion of each of the manifolds is a large thumb knob. This thumb knob can be used to control the flow of hydraulic oil to each motor. Simply undo the rear locking knob and rotate the front thumb knob as you would a tap (anti-clockwise) to open the valve. You will need to have engaged the flow of oil from the tractor to the seeder.

Manual Override Calibration Procedure

Step 1. Place the product to be calibrated in the appropriate bin making any changes to the metering system beforehand.

Step 2. Refer to the manual override calibration chart (page 69) to determine the length of time in seconds you will need to run the metering system to collect a sample equivalent to 1/10th of a hectare. You need to determine an appropriate ground speed that can be constantly maintained during the seeding process.

Step 3. Remove the bottom meterbox hatch and place a large container or tarp on the ground to collect the sample material. If calibrating for a low application rate the standard calibration tray may be sufficient.

Fig. V20 Collection of sample.

Step 4. Disengage the fan by shutting off the flow control valve located next to the fan as per the normal calibration procedure.

Step 5. Open the specific manual flow control thumb knob on the manifold approximately 2 to 4 turns depending on the required application rate. Low rates require lesser oil to run the metering motors than high rates.

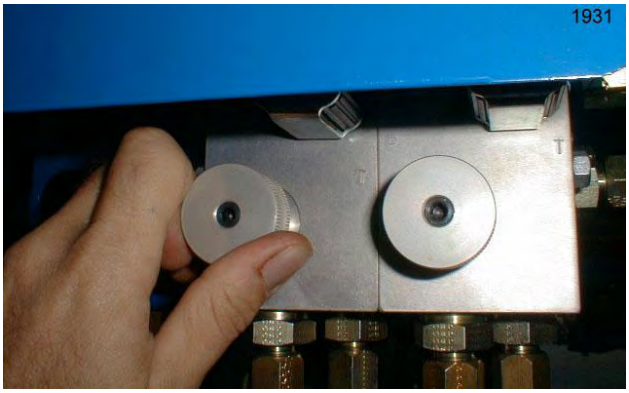


Fig. V21 Thumb knob on VRT manifold.

Step 6. Engage the hydraulics for the air seeder at the tractor. Run the hydraulics for the appropriate time to simulate the 1/10th of a hectare.

Example: If an implement had a 12.5metres sowing width and was driven at a constant 9km/h ground speed, the sample run time to calibrate the machine would be 32 seconds for a 1/10th of a hectare sample.

Step 7. Weigh the sample and multiply the sample weight by 10 to determine the actual application rate. Adjust the thumb knob appropriately to increase or decrease the next calibration sample to obtain the desired rate.

Example: After the 32 seconds the total sample weighs 8.25kg. Therefore :
8.25 x 10 =82.5kg/ha application rate.

Step 8. Repeat steps 6 and 7 until the correct rate has been obtained and checked. Lock the rear thumb knob in position before moving to the next bin.

Step 9. To calibrate the next bin it will be necessary to either remove the material from the first bin, let the material flow onto the ground or remove a chain to prevent the metering system from turning.

Step 10. Repeat the process as per the first bin until all products have been calibrated. Re-fit chains or refill bins to prepare for operation. Re-engage the fan's flow control valve.

The seeder should now be ready for operation. When you engage the hydraulics for the seeder at the tractor you will not only start the fan but rotate the metering system. It may be necessary to increase the fan speed slightly to ensure the distribution system is kept clear at all times.

Operational Limitations

The manual override system has limited accuracy. It requires the operator to maintain a constant ground speed. Variations in the hydraulic oil temperature from the tractor can create variations in metering speeds.

For example: as the tractor speeds up the effective application rate will be reduced. If the temperature of the oil varies from the calibration temperature the change in viscosity of the fluid can increase or decrease the motor's metering speed.

Therefore, it is important the operator checks the rate of application is within an acceptable range when using the Manual override procedure. Check the bin levels are lowering at the desired rate.

Note:
The manual override system is an emergency system only. It will allow the operator to complete a paddock or continue seeding when there is no other option. The first priority however, should be to determine the actual problem with the monitor or pod system. Refer to the trouble shooting section in this manual or in the Farmscan Operator's Manual. Contact your local dealer for more information.

Manual Override Calibration Chart for 1/10th of a Hectare

Sowing Width (m)	Constant Ground Speed (km/h)											
	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
6	92	86	80	75	71	67	63	60	57	55	52	50
6.25	89	82	77	72	68	64	61	58	55	52	50	48
6.5	85	79	74	69	65	62	58	55	53	50	48	46
7	79	73	69	64	61	57	54	51	49	47	45	43
7.5	74	69	64	60	56	53	51	48	46	44	42	40
8	69	64	60	56	53	50	47	45	43	41	39	38
8.5	65	61	56	53	50	47	45	42	40	39	37	35
9	62	57	53	50	47	44	42	40	38	36	35	33
9.5	58	54	51	47	45	42	40	38	36	34	33	32
10	55	51	48	45	42	40	38	36	34	33	31	30
10.5	53	49	46	43	40	38	36	34	33	31	30	29
11	50	47	44	41	39	36	34	33	31	30	28	27
11.5	48	45	42	39	37	35	33	31	30	28	27	26
12	46	43	40	38	35	33	32	30	29	27	26	25
12.5	44	41	38	36	34	**32**	30	29	27	26	25	24
13	43	40	37	35	33	31	29	28	26	25	24	23
13.5	41	38	36	33	31	30	28	27	25	24	23	22
14	40	37	34	32	30	29	27	26	24	23	22	21
14.5	38	35	33	31	29	28	26	25	24	23	22	21
15	37	34	32	30	28	27	25	24	23	22	21	20
15.5	36	33	31	29	27	26	24	23	22	21	20	19
16	35	32	30	28	26	25	24	23	21	20	20	19
16.5	34	31	29	27	26	24	23	22	21	20	19	18
17	33	30	28	26	25	24	22	21	20	19	18	18
17.5	32	29	27	26	24	23	22	21	20	19	18	17
18	31	29	27	25	24	22	21	20	19	18	17	17
18.5	30	28	26	24	23	22	20	19	19	18	17	16
19	29	27	25	24	22	21	20	19	18	17	16	16
19.5	28	26	25	23	22	21	19	18	18	17	16	15
20	28	26	24	23	21	20	19	18	17	16	16	15
21	26	24	23	21	20	19	18	17	16	16	15	14
22	25	23	22	20	19	18	17	16	16	15	14	14

Example:
An implement with a 12.5 metre sowing width driven at a constant 9km/h ground speed. The sample run time to calibrate the machine would be 32 seconds for a 1/10th of a hectare sample.

Introduction

The VRT seeder's calibration procedure involves a controlled rotation of the metering system to enable the collection of a sample of the product being sown.

The collected sample is then weighed and the value recorded in the 3000 Canlink monitor. Once this weight has been updated a pulse/kg figure will be displayed.

The **pulses/kg** figure, along with the implement's width and ground speed, forms the critical information the monitor and pod system uses to control the metering system to obtain the desired application rate.

A 'QUICK REFERENCE GUIDE' has been supplied with every VRT equipped seeder. The guide goes through a step by step procedure for calibrating your seeder.

The guide has been reproduced below with some further explanation where required. It is also suggested that the operator view the VRT Training Video. This will reinforce the operator's knowledge of the seeder and should be viewed at the beginning of each season.

Calibration Procedure

1. Change meterbox settings to suit product and application rate being sown. Some changes may need to be made to the meterbox before material is placed in the bin. Refer to the sprocket ratio selection guide (pages 74-84) for further information.

As a guide:

Low application rates (below 15 kg/ha)
-you may need to fit metershaft sleeves.
-use low ratio sprocket drive.

Medium to High application rates (above 15kg/ha)
-Select either low or high sprocket ratio.
Refer to the Sprocket Ratio Selection Guide for specific information.

2. Place at least 2 bags of the appropriate product in the bin being calibrated.

3. Disengage fan by shutting off the oil flow at the flow control valve located next to the fan. Rotate the handle anti-clockwise to turn off.

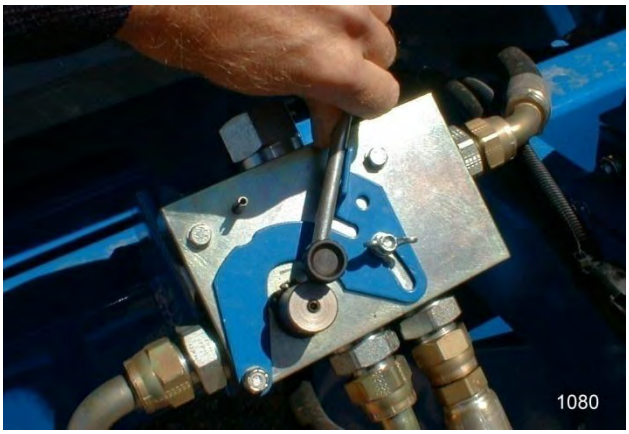


Fig.VC1 Fans Flow Control Valve (open).

4. Turn the monitor on inside the tractor.

5. At the monitor select a new trip (paddock) or reset a previously used trip. This is done from the 'RECORDS' screen. Press the soft key under the 'PREV' or 'NEXT' prompt to change trip, and then the 'SELECT' soft key to lock. To reset the current trip simply push the 'RESET' key twice to clear previous trip information.

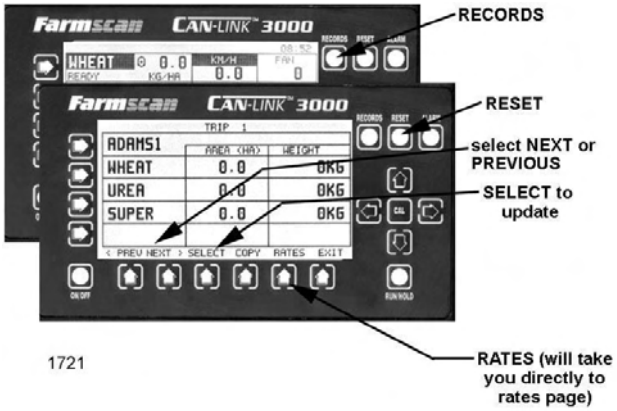


Fig.VC2 Records screen.

6. Go to the 'RATES' screen either directly from the 'RECORDS' screen or from the 'MENU' screen:-

a) Select the bin to calibrate (Bin number 1) by highlighting the appropriate zone and using the up or down navigator keys.

b) Select product for that bin (WHEAT). It is possible to edit or add new product names from the 'PRODUCT' screen

c) Input application rate (70 kg/ha).

d) Input increment steps (5 kg/ha).

e) Go to calibration page by pushing the soft key to the left of CALIB PROD prompt.

Fig. VC3 Rates Screen.

7. When in the calibration screen (refer Fig.VC4) you will need to set the following:-

a) 'CAL SPEED'. This is the speed at which the metershaft rotates during the calibration test (1-10). Refer Table VC6. The **default setting is 4**. The higher the setting the faster the speed.

b) 'TEST PULSES'. The number of pulses to run the test (generally 250 for cereals and fertiliser, 600 for Canola). The bigger the sample the better.

c) When complete push the soft key under the 'READY' prompt before leaving the cab. Test pulses will now be displayed as zero and will record feedback from the seeder.

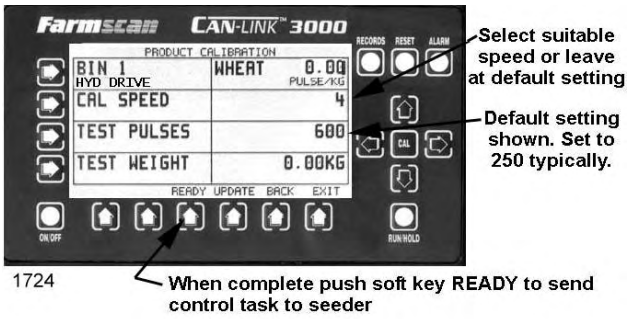


Fig.VC4 Product Calibration Screen.

8. To begin calibration procedure at the seeder:-

a) Engage tractor's hydraulic circuit to run the air seeder. The fan should not run because the flow control valve at the fan is turned off.

b) Remove the meterbox hatch on the bin being tested.

c) Fit the calibration sample tray to the bottom and rear of the meterbox.

d) Prime the system to ensure that the new product is fully surrounding the meterwheels. To do this, push the green button on the calibration control box on the seeder. Allow meterwheels to rotate a couple of revolutions. **PUSH THE RED BUTTON TO STOP**. This will stop the meter system and zero the 'TEST PULSES' count when the green button is next pushed.

Fig.VC5 Calibration control box.

e) Empty sample tray and refit for the full calibration run.

Calibration Speed Settings	(**Default setting 4**)	
Low application rates	2kg/ha – 20 kg/ha	2-3
Medium application rates	20kg/ha–120 kg/ha	**4**
High application rates	120kg - above	5-7

Table VC6

f) Push the green button to start calibration test.

g) Allow system to stop by itself. If the sample tray overflows or a larger sample is required, change the 'TEST PULSES' setting at monitor. It will be necessary to go back one screen and re-enter the Product Calibration screen before making changes to the 'TEST PULSES' value. Push 'READY' prompt again and re-run test at the seeder.

9. After a correct sample run, weigh the sample of product using the scales supplied with the seeder.

NOTE: It is the responsibility of the operator to check the accuracy of the scales on a regular basis. Refer to the general maintenance section for further information.

10. Record the sample weight and input this information into the monitor in kg in the 'TEST WEIGHT' area on the Product Calibration screen. Check that the 'TEST PULSES' value is as per your setting. A small increase in pulses is normal (eg. set at 250, will run and record 252) because the hydraulic motor will overrun slightly.

11. Update the pulses/kg by pushing the soft key under the 'UPDATE' prompt.

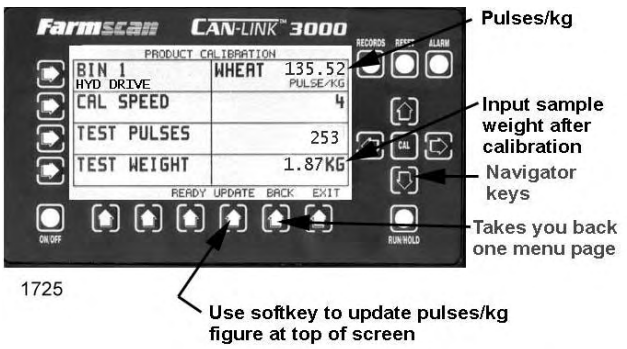


Fig.VC7 Sample weight and update.

12. Push soft key under 'BACK' prompt to go back one menu screen to the 'RATES' screen. Select the next bin to be calibrated by highlighting the BIN prompt at the top left hand side of the screen and using the up or down navigator keys to select the appropriate bin.

13. Repeat the product selection, rate setting and calibration procedure as listed in steps 6 to 12.

    If a product has been previously calibrated in the same bin but for a different trip, a pulses/kg figure will be displayed.

NOTE: It is recommended that the operator **re-calibrates** the bin with the current product and meterbox setup. This operation will ensure that any change in the product's bulk density, flow rate or meterbox setup will be confirmed.

On completion of the calibration process refit the meterbox hatches and calibration tray.

14. When all of the bins have been calibrated return to the main screen by pushing the soft key under the 'EXIT' prompt.

15. Ensure that all of the information displayed on the main page is correct. Bins should show the correct material and rates for 3 seconds and be in the 'READY' mode. Reset the trip and load areas on this screen by using the navigator keys and 'RESET' key if not already on zero.

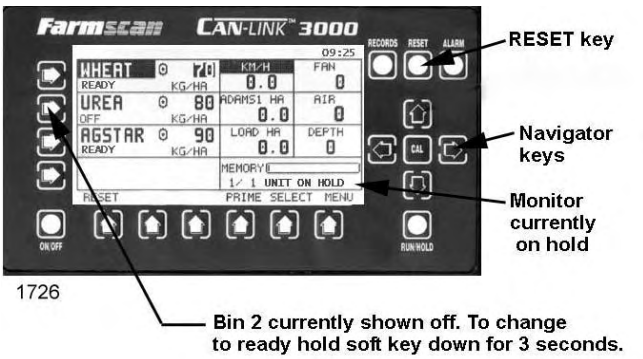


Fig.VC8 Main screen.

16. Re-engage the fan's flow control valve by turning the valve in a clockwise direction. You may wish to shut the flow of oil off at

the tractor before re-engaging the fan's flow control valve.

17. Start the fan by engaging the tractor's hydraulic system. Adjust the fan speed at the tractor if equipped with closed centre hydraulics or at the seeder's flow control valve if open centre hydraulics. For information on appropriate fan speeds refer to the Blower Operation section in this manual (page 108).

18. To begin seeding operation simply push the RUN/HOLD key. The monitor should come off hold and the appropriate rates of application should be displayed. Refer to the Monitor Operation (VRT) section, page 61, for more detail.

NOTE: After completing the calibration procedure it is recommended to record the various values on the record sheet provided (page 85-86) for future reference.

NOTE: Some fertilisers run freer than others and actual usage may vary from the first calibration sample taken. It is recommended that the operator checks the actual usage after the first bin load. It may be necessary to perform a second calibration test after some material has been metered.

Changing Drive Sprocket Ratio

The VRT hydraulic drive metering system is capable of metering products at very low rates (eg. 3kg/ha of canola) through to extremely high rates (200kg/ha and greater of fertiliser).

The hydraulic motors that rotate the metershafts have a limited speed range. To increase their range of operation a simple quick-change sprocket ratio system has been fitted to the right hand side of the VRT equipped meterbox.

To change the sprocket ratio simply undo the 2 x M8 screws, using the butterfly handle supplied, and remove the retaining collars. Now, simultaneously pull the 2 sprockets off the shafts leaving the chain attached.

Fig. VC9 Removing the retaining collars.

Reverse the placement of the sprockets to obtain the desired ratio (refer decal on underside of meterbox cover). You may need to rotate the metershaft slightly until the second sprocket lines up with the keyway on the agitator shaft. When both keyways line up you can then push the sprockets onto the shaft together. If you experience any problem with the alignment, remove the chain and place one sprocket on at a time.

Fig. VC10 Sprocket removal.

NOTE: It is important to disengage the tractor's hydraulic system and to **TURN THE TRACTOR OFF** before attempting to work on or around the metering system. The metering system could be activated if someone pushes the prime key or calibration function from the monitor.

Introduction to the Sprocket Selection Guide

The Sprocket Selection Guide is used to choose the correct sprocket ratio and meterbox settings required for metering various products at different rates. The chart takes into account the product's estimated bulk density, the implement's width and ground speed.

There are 3 charts on each page. Each chart displays the suggested sprocket ratio setting for the number of meterwheels fitted to either the 4 or 6 outlet meterbox.

Example:

The operator wishes to sow oats using a six outlet meterbox equipped air seeder. All six meterwheels are in place. The width of the implement is 12 metres and the anticipated ground speed is 10km/h. The application rate is 45kg/ha.

By referring to the appropriate guide you can determine the correct meterbox settings for particular products. For oats it suggests you remove the meterwheel cover plate. This is to ensure that the light and large seed can feed freely to the meterwheels and minimize the possibility of the product bridging.

By referring to the middle chart labelled '6 OUTLET METERBOX / 6 OUTLET METERWHEELS FITTED' the recommended ratio can be determined ie. follow the closest application row across and the appropriate implement width/ground speed column up. In this case it suggests LOW for 40kg/ha (refer Fig.VC12). Because we are wishing to plant at a slightly higher rate (45kg/ha) and the next cell shows the ratio selection as HIGH the operator should go to the high sprocket ratio.

SPROCKET RATIO SELECTION GUIDE (INDICITIVE ONLY)

MATERIAL **OATS**
MATERIAL BULK DENSITY **590** (kg /cubic meter)
METERBOX SETTINGS **REMOVE METERWHEEL COVER PLATE**
(Refer meterbox section for more information)

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	60	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

ENM207838.VRTSPOC04 oats reduced image

Fig.VC11 Sprocket Ratio Selection Guide.

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

Fig.VC12 Enlargement of middle chart for oats.

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **WHEAT**
MATERIAL BULK DENSITY **850** (kg /cubic metre)
METERBOX SETTINGS **STANDARD**

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	100	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	100	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	100	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **DAP/MAP**
MATERIAL BULK DENSITY **1000** (kg /cubic metre)
METERBOX SETTINGS **STANDARD**

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	100	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	100	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	120	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	100	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **UREA**
MATERIAL BULK DENSITY **780** (kg /cubic metre)
METERBOX SETTINGS **STANDARD**

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	120	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----	----	----	----
	100	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----
	60	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----
	100	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	100	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **OATS**
MATERIAL BULK DENSITY **590** (kg /cubic metre)
METERBOX SETTINGS **REMOVE METERWHEEL COVER PLATE**
(Refer meterbox section for more information)

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	60	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **BARLEY**
MATERIAL BULK DENSITY **740** (kg /cubic metre)
METERBOX SETTINGS **STANDARD**

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----
	60	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	80	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	20	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	10	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **PEAS**
MATERIAL BULK DENSITY **850** (kg /cubic metre)
METERBOX SETTINGS **LARGE SEEDS MANIFOLD PLATE**
(Required on 4 outlet meterbox's only. Refer meterbox section)

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	160	HIGH	HIGH	HIGH	HIGH	----	----	----	----	----	----	----	----
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	160	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	160	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	120	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **FABA BEANS**
MATERIAL BULK DENSITY **800** (kg /cubic metre)
METERBOX SETTINGS **LARGE SEEDS MANIFOLD PLATE**
(Required on 4 outlet meterbox's only. Refer meterbox section)

6 Outlet Meterbox / 4 Meterwheels fitted
4 Outlet Meterbox / 2 Meterwheels fitted
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	160	HIGH	HIGH	HIGH	HIGH	----	----	----	----	----	----	----	----
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	----	HIGH	----	----
	80	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted
4 Outlet Meterbox / 3 Meterwheels fitted
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	160	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	----	HIGH	----	----
	120	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted

APPLICATION RATE (kg/ha)													
	160	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	120	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	80	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	60	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
	40	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **CANOLA**
MATERIAL BULK DENSITY **710** (kg /cubic metre)
METERBOX SETTINGS **METERWHEEL SLEEVES FITTED**
(Refer to the meterbox section for further information)

6 Outlet Meterbox / 4 Meterwheels fitted (25mm sleeve)
4 Outlet Meterbox / 2 Meterwheels fitted (50mm sleeve)
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted (50mm sleeve)

APPLICATION RATE (kg/ha)													
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	5	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	2.5	----	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted (25mm sleeve)
4 Outlet Meterbox / 3 Meterwheels fitted (50mm sleeve)
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted (50mm sleeve)

APPLICATION RATE (kg/ha)													
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	5	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	----	----	----	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	2.5	----	----	----	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted (25 + 50mm sleeve)

APPLICATION RATE (kg/ha)													
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	5	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	2.5	----	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **SORGHUM**
MATERIAL BULK DENSITY **750** (kg /cubic metre)
METERBOX SETTINGS **METERWHEEL SLEEVES FITTED**
(Refer to the meterbox section for further information)

6 Outlet Meterbox / 4 Meterwheels fitted (25mm sleeve)
4 Outlet Meterbox / 2 Meterwheels fitted (50mm sleeve)
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted (50mm sleeve)

APPLICATION RATE (kg/ha)													
	12	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
	8	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted (25mm sleeve)
4 Outlet Meterbox / 3 Meterwheels fitted (50mm sleeve)
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted (50mm sleeve)

APPLICATION RATE (kg/ha)													
	12	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	8	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	----	----	----	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted (25 + 50mm sleeve)

APPLICATION RATE (kg/ha)													
	12	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
	8	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	----	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

SPROCKET RATIO SELECTION GUIDE (INDICATIVE ONLY)

MATERIAL **SUNFLOWER**
MATERIAL BULK DENSITY **460** (kg /cubic metre)
METERBOX SETTINGS **METERWHEEL SLEEVES FITTED**
(Refer to the meterbox section for further information)

6 Outlet Meterbox / 4 Meterwheels fitted (25mm sleeve)
4 Outlet Meterbox / 2 Meterwheels fitted (50mm sleeve)
4 Outlet Shut-off Meterbox / 3 Meterwheels fitted (50mm sleeve)

APPLICATION RATE (kg/ha)													
	12	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	8	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

6 Outlet Meterbox / 6 Meterwheels fitted (25mm sleeve)
4 Outlet Meterbox / 3 Meterwheels fitted (50mm sleeve)
4 Outlet Shut-off Meterbox / 4 Meterwheels fitted (50mm sleeve)

APPLICATION RATE (kg/ha)													
	12	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	8	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

4 Outlet Meterbox / 4 Meterwheels fitted (25 + 50mm sleeve)

APPLICATION RATE (kg/ha)													
	12	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
	8	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH
	6	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH
	4	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
	3	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
SPEED (km/h)		8	10	12	8	10	12	8	10	12	8	10	12
IMPLEMENT WIDTH (m)		6-10			10-14			14-18			18-22		

PLANTING DETAIL REFERENCE CHART FOR VRT METERING SYSTEM

DATE	*MATERIAL*	*BULK DENSITY (kg/litre)*	No. OF M/WHEELS	SPROCKET RATIO	SLEEVES FITTED	*APPLICATION RATE (kg/ha)*	*STEP SETTING (kg/ha)*	*CAL SPEED*	*TEST PULSES*	*SAMPLE* WEIGHT *(kg)*	*PULSE /KG*	*COMMENTS*
Example 12/5/02	MAP	0.975	6	H	NO	75	10	4	200	4.21	47.98	Tray over flowed at 250 pulses

PLANTING DETAIL REFERENCE CHART FOR VRT METERING SYSTEM

DATE	*MATERIAL*	*BULK DENSITY (kg/litre)*	No. OF M/WHEELS	SPROCKET RATIO	SLEEVES FITTED	*APPLICATION RATE* (kg/ha)	*STEP SETTING* (kg/ha)	*CAL SPEED*	*TEST PULSES*	*SAMPLE* WEIGHT *(kg)*	*PULSE /KG*	*COMMENTS*

Introduction

The VRT Hydraulic drive metering system utilizes robust and reliable hydraulic and electrical components that should offer excellent service. It is suggested however that regular maintenance checks are carried out on a yearly basis.

Yearly Checklist

At the beginning of each season, operators should carry out the following checks.

1. Hydraulic system:-

   - Replace the oil filter on the seeder and tractor at regular intervals. The seeder's filter should be replaced every 2 to 3 seasons depending on the usage.
   - Check for oil leaks at hose connections, valves and metering drive motors. Repair or replace any worn or leaking hoses or seals.

2. Electrical connectors and terminals:-

   - Check all breakaway electrical connectors for contamination, corrosion or damage. It is critical that the actual pins and receptacles have an excellent contact.

Fig.VM1 VRT breakaway connector.

   - Check the power take off terminal at the tractor's battery. Remove and clean if necessary.
   - Check that the electrical connector at the rear of the monitor is secure. Do not over tighten.
   - Inspect VRT loom routing on the tractor and implement. Replace broken cable ties. Add protection or move cable routing if necessary.

Proximity sensors:-

   - Check proximity sensors on the metering drive hydraulic motors for clearance and operation.
   - Check proximity sensor on the ground drive wheel (left hand rear wheel) that monitors ground speed for clearance and operation.

Proximity Sensor

The proximity sensors are used to record motor speed and ground speed. Their feedback is critical to the accurate operation of the VRT equipped air seeder.

***Wheel** Proximity Sensor*

To check that the Wheel sensor is operating correctly you will need to jack the left-hand rear wheel off the ground. With the monitor on, and seeder connected, spin the left-hand rear wheel. A small light at the cable end of the sensor should flash every time a target tooth goes past. Also check that the wheel bearings do not have excessive play. Adjust if necessary.

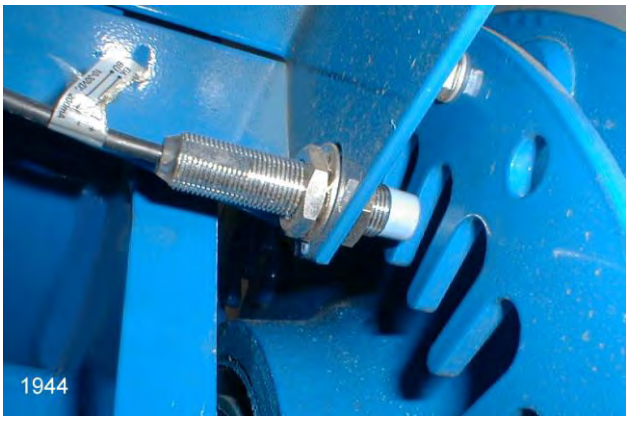


Fig.VM2 Wheel sensor and target.

If the light does not flash at every tooth you may need to reduce the sensor's clearance to the target, or check that the target runs true. Loosen the lock nuts on the sensor with a spanner and move it closer to the target checking that there is sufficient clearance to prevent damage from occurring. Do not over tighten the lock nuts after adjustment. Sensors are generally set with a 2 to 4mm clearance.

***Meter Drive** Proximity Sensor*

There are 2 ways to check the performance of the proximity sensors mounted next to the meter drive motors.

1. Check the drive ratio alarms screen on the monitor in the cab while seeding.
2. Manually operating each hydraulic motor to check that the light on the end of the sensor indicates consistently.

Monitor Checking Procedure

The operator can enter the Drive Ratio screen from the Alarms screen and compare the number of pulses of the proximity sensor to metershaft rotations.

There should be only 2 different values displayed on the monitor depending on the sprocket ratio being used. High ratio setup will return a 24:1 count, and low ratio setup should display 105:1 value.

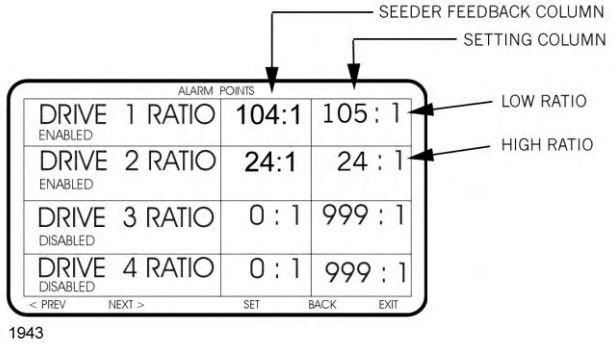


Fig. VM3 Drive ratio screen while seeding.

The centre column displays the actual feedback figure from the seeder. The right-hand column displays the alarm setting. During normal operation you would expect to see a slight variation between pulses when in the low sprocket ratio setting (eg.104:1 to 105:1).

If a large variation occurs an alarm will be activated while seeding to alert the operator of a problem. Stop the seeder and check the sensors manually.

Manual Checking and Adjustment

Engage the seeder's hydraulics at the tractor. Lift one of the left-hand meterbox hinged guards up to give access to the sensor. Open the appropriate manual override valve located on the seeder's manifold assembly, refer Manual Override section, to start the motor turning **slowly**.

Be careful not to place your hand or any loose clothing near the rotating sprockets.

A small light at the cable end of the sensor should flash every time a target tooth goes past.

If the sensor's light is not activated by every tooth, **STOP** the system and adjust sensor distance and alignment to target. Target to sensor gap should be approximately 1-3mm. Check light again at low speed.

NOTE: Do not attempt to adjust the position of the sensors while the meter system is running.

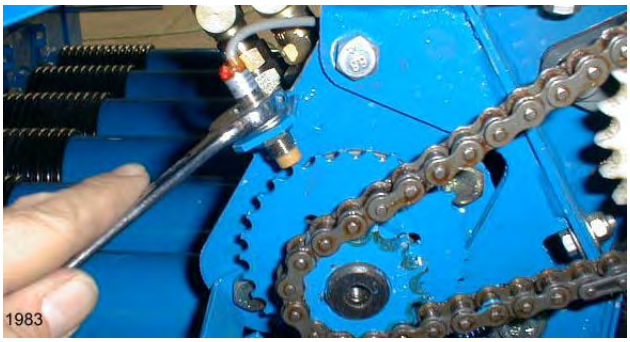


Fig. VM4 Adjusting the proximity sensor.

Problem	**Possible Solution**
1. Monitor will not turn on.	➢ Check connection at battery. ➢ Check cable connection is firm at back of monitor. ➢ Refer to the Monitor operator's manual.
2. Seeder's pod does not respond.	➢ If the alarm warning 'NO COMMS' is displayed on the monitor check the main breakaway electrical connectors. All pins must be free from dirt and corrosion. ➢ Check for wire loom damage near moving parts or pivoting areas. ➢ Check the voltage at the tractor's battery (12 volts minimum). ➢ Check separate power supply to pod. Use multimeter in bypass plug near pod (12 volts minimum). ➢ Remove remote calibration switch box from seeder loom & retry monitor. ➢ Remove the 2 large plugs from the base of the pod that go to the sensors and hyd. control valves & retry monitor. ➢ If there is power and still no response phone your service agent
3. Metering system will not run during the Calibration process.	➢ Check tractor's hydraulics are engaged. ➢ Try to calibrate another bin to check that the seeder's pod is responding. ➢ Check blade fuse in monitor's power loom near the battery terminal. ➢ Check Setup of seeder's configuration at the monitor. You will need to enter the 'SETUP' screen from the menu page. Refer to the VRT Monitor Setup Procedure section in this manual.
4. VRT hydraulic motor runs at irregular speed during the calibration procedure.	➢ Check that the hydraulic motor's proximity sensor is operating correctly. A small light at the cable end of the sensor should flash every time a target tooth goes past (refer to the VRT maintenance section of this manual).

5. *Calibration pulses/kg value is different to previous calibrations with similar product.*
   - Check bulk density of product is similar to the previous material.
   - Check material flows freely and is not wet or binding to bin or meterwheels.
   - Check sprocket ratio and meterbox setup is the same as previous samples.
   - Check that the proximity sensor is operating correctly.

6. *Monitor will not come off Hold.*
   - Fan has not been engaged or is running below the low fan alarm.

7. *Monitor comes off hold but metering system does not operate.*
   - Check monitor display for a ground speed feedback. If no speed is displayed check sensor operation and distance to target on the drive wheel.
   - Check the fuse attached to the main power loom at the battery. Replace with similar sized blade fuse (20amp).

8. *Reasons why a particular bin does not start.*
   - Bin is switched off.
   - Bin is not calibrated.
   - Some earlier model VRT seeders (pre 2001) are fitted with a blade fuse to protect each electric over hydraulic controller. Check and replace if necessary with similar sized blade fuse (3 amp). Fuses are located along loom on the left-hand side of the seeder, close to the hydraulic manifolds.
   - Refer to your service agent for further instructions.

9. *A particular bin will not stop or rotates slowly when the monitor is placed on hold.*
   - Check that the manual override valve is turned off. Refer to the manual override section for more information.
   - Remove all electrical power to the seeder's pod by disconnecting the main breakaway plugs (switch off monitor first). If the metering system stops the problem is electrical. If the Hydraulic motor continues to turn the problem is related to a hydraulic issue. At this stage it would be advisable to contact your local dealer for more information.

10. Unable to obtain a set application rate.

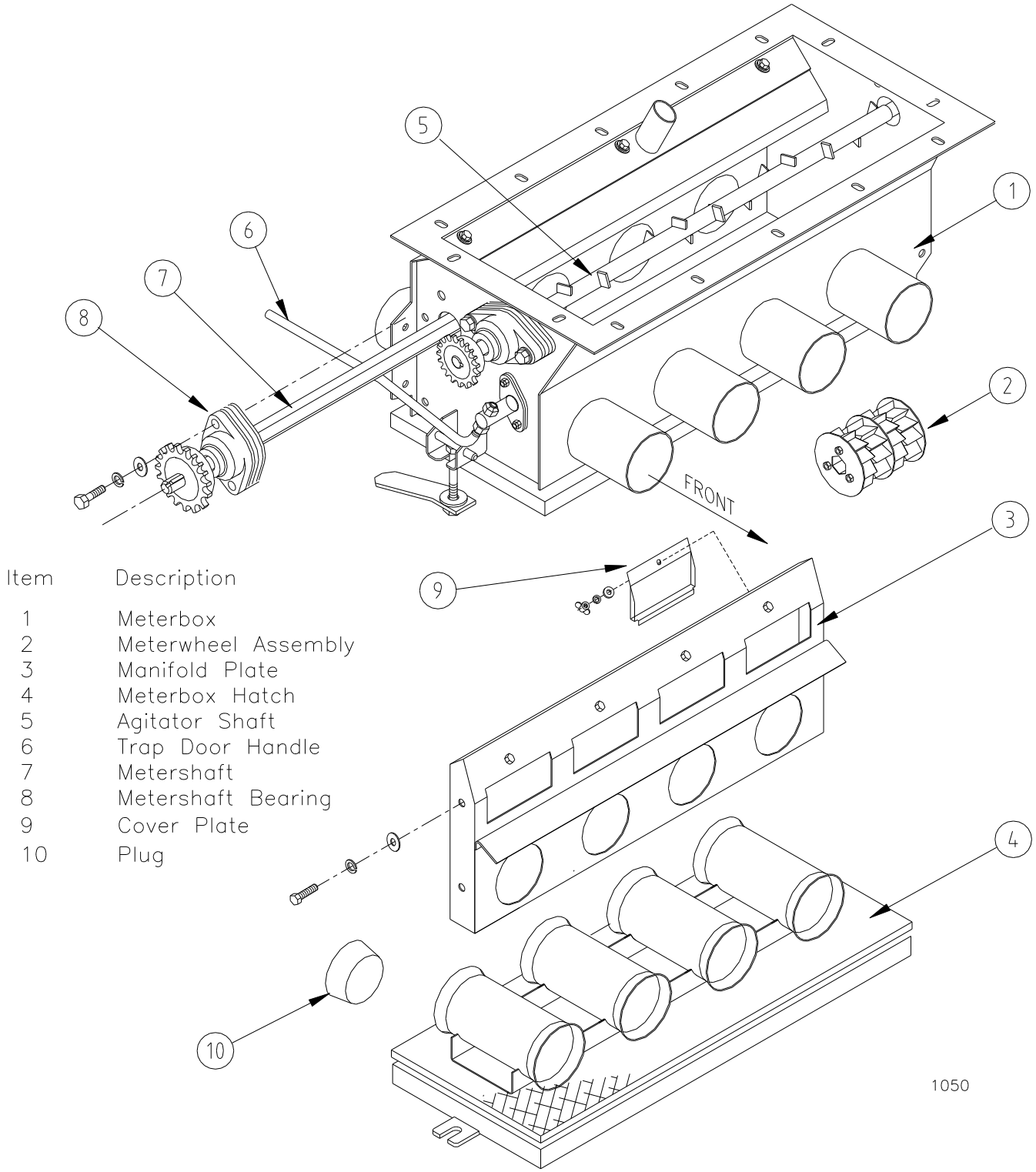
- Ground speed is too fast for a particular product.
- Sprocket ratio may need to be changed from low to high ratio. This is done from the right-hand side of the meterbox. **WARNING!** Switch tractor off before working on the seeder's metering system. Metershaft and motors could turn at anytime. Recalibrate metering system to suit new sprocket ratio.
- Meterwheel sleeves may still be in place, restricting maximum output.
- Check meterwheels are not clogged with material.
- Check calibration procedure. Compare pulses/kg figure with previously recorded samples.
- Check meterwheels are assembled and fitted to the metershaft assembly in the correct orientation & rotate in the correct direction.

11. Unstable Application Rates displayed on the screen while seeding.

- If all application rates are unstable, check ground speed on screen. If speed varies check proximity sensor operation and spacing on wheel target. Refer to the VRT Maintenance section on page 87. Also check that the target mounted wheel bearings are adjusted correctly to prevent excessive wheel play.
- If one bin has an unstable rate check that the sprocket ratio is set correctly for the product being sown. Metering system may not be able to obtain rate.

Check that the proximity sensor for that particular bin is operating correctly. You can do this from the tractor cab by going to the Drive Ratio screen within the Alarms screen. Refer to the VRT Maintenance section on page 88 for further explanation.

NOTE: If you experience a problem that is not solved by either the monitor's operating manual or the above trouble shooting section contact your local Gason Dealer for further instructions.



Item	Description
1	Meterbox
2	Meterwheel Assembly
3	Manifold Plate
4	Meterbox Hatch
5	Agitator Shaft
6	Trap Door Handle
7	Metershaft
8	Metershaft Bearing
9	Cover Plate
10	Plug

Fig. M1 4 Outlet Meterbox Assembly (standard).

4 Outlet Meterbox Series 1

The 4 outlet meterbox is designed for all standard seeding operations including deep banding and wide row cropping (summer cropping).

To obtain all the functions available, you may need to make the following changes during the seeding season.

Reducing the Outlets

When setting up the seeder system for either wide row cropping or deep banding (2 outlet system), standard seeding (3 outlet for narrow width or 4 outlet for normal implements) you will need to:-

- either fit or remove some of the meterwheel assemblies;
- blank off the unused ports in the manifold plate in the meterbox;
- and possibly block the air flow on the unused primary tubes.

DO NOT leave meterwheels in meterbox if not actually conveying material. Refer page 100 for information on removal procedure.

Any work to the meter system must be carried out with the bins empty to allow access to the metering components.

To remove the meterwheels refer to page 100 for detailed instructions.

To blank off unused manifold plate ports refer page 101.

For further information on blocking air flow refer fig.M4 on page 95 and page 102.

Low Rates (Meterwheel Sleeves)

To obtain extremely low rates of material flow (typical for canola and sorghum) it will be necessary to fit a meterwheel sleeve over the standard wheel assembly.

The sleeves need to be fitted before the seed is loaded into the bin. Fitting this sleeve will effectively reduce the seeder's output by half. Refer to page 101 for detailed instructions on fitting sleeve.

High Rates (Sprocket Ratio)

It may be necessary to alter the sprocket ratio on a particular meterbox to allow the various application rates to be sown. Refer to page 59 for information on ground driven seeders and page 73 for VRT equipped air seeders.

DO NOT use a 'High Rates' sprocket ratio on ground driven air seeders if it is not recommended in the 'Variator Setting guide' (refer pages 37–51).

Large Seeds Manifold Plate

When sowing large seeds such as peas and faba beans etc. it will be necessary to fit a ***'Large Seeds'*** manifold plate to the meterbox.

This special plate must be fitted to the bin that will contain the large seed before the seed is loaded.

The plate has been specifically designed to reduce the damage that often occurs when metering these large seeds. The plate has been painted blue for easy identification.

NOTE: The ***'Large Seeds'*** plate must not be used when conveying smaller seeds or fertilizer.

For fitting instructions refer to the section on 'Large Seeds Manifold Plate' on page 102.

Note: A special kit is also available for planting Broad Beans. Contact your Gason dealer for more information.

Deep Banding / Side Banding

The term deep banding and side banding refers to the placement of fertilizer and seed in two different locations, in the ground, in one pass while planting.

The Gason Air Seeder has the capability of performing this banding operation. It will however require the distribution system to have been specifically set up for this style of seeding. In effect, two separate distribution systems will need to be fitted to the implement.

Specifically designed sowing boots will also be required to keep the two materials separate for individual placement in the ground.

The air seeder will need either a special manifold plate, which directs product into a specific primary hose (refer Fig. M2), or by removing some of the meterwheel assemblies (refer Fig.M3).

This will, in effect, allow the seeder to be operated as two totally isolated conveyors of material. If possible, the Dealer should be aware of your intentions before the seeder is purchased to allow for the appropriate system layout.

Wide-row Cropping

Some operators may wish to plant their summer crop at double row spacings when compared with conventional cereal cropping. This style of planting effectively requires half of the seeder's distribution system being shut down.

Normally this would allow planting from the two rear rows of the implement. It may be necessary to move some tines on some implements to achieve the correct spacing.

To change the seeder over to this style of planting you will either need to block off 2 of the 4 primary outlets, removing the meterwheel assemblies, and blocking off the air supply to the unwanted hoses that lead to the implement's secondary system (refer Fig. M4), or fit special manifold plates to the meterboxes to divert material flow to the correct primary hoses (refer Fig. M2). Another method is to block some tertiary hoses off by using plugs inside of the secondary heads. Refer to the parts section for more details.

For further information on setting up your seeder for this style of planting consult your local Gason dealer.

Manifold Plates

By using specially modified manifold plates it is possible to speed up the change over operation for deep banding and wide row cropping (refer Fig. M2). These plates are available on request from your Gason Dealer. Other varieties exist which will allow the diversion of a percentage of material. Refer to your Dealer for more information.

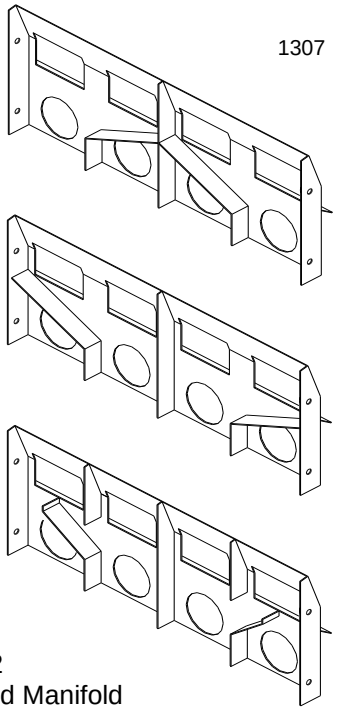


Fig. M2
Modified Manifold Plates.

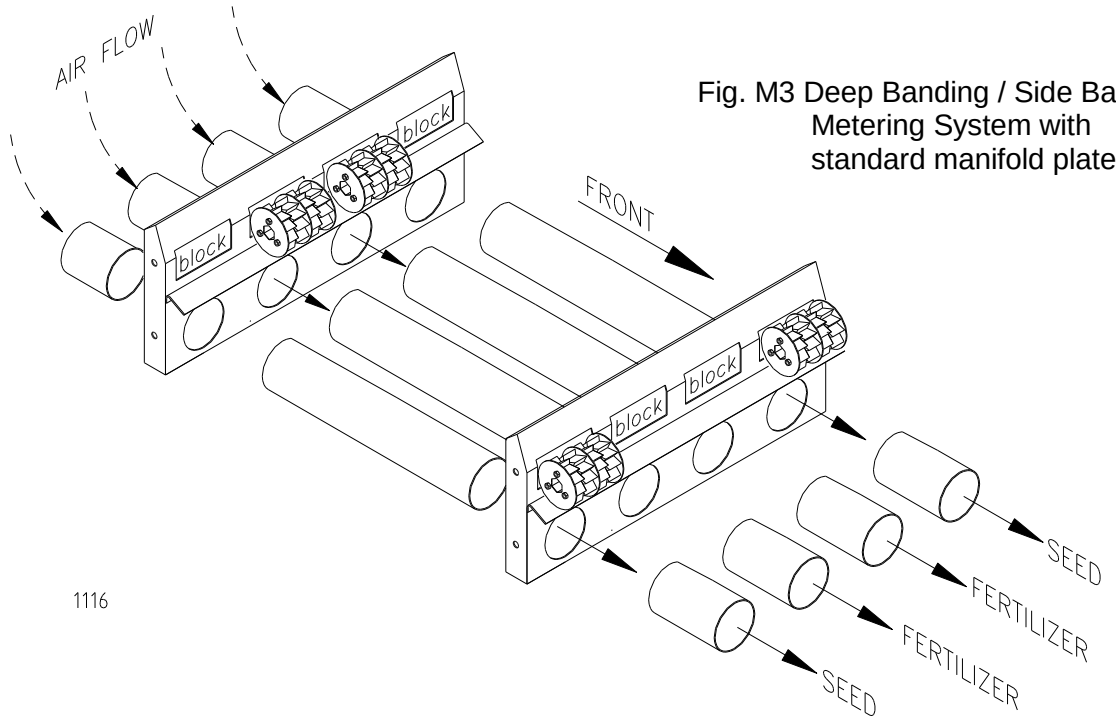


Fig. M3 Deep Banding / Side Banding Metering System with standard manifold plates.

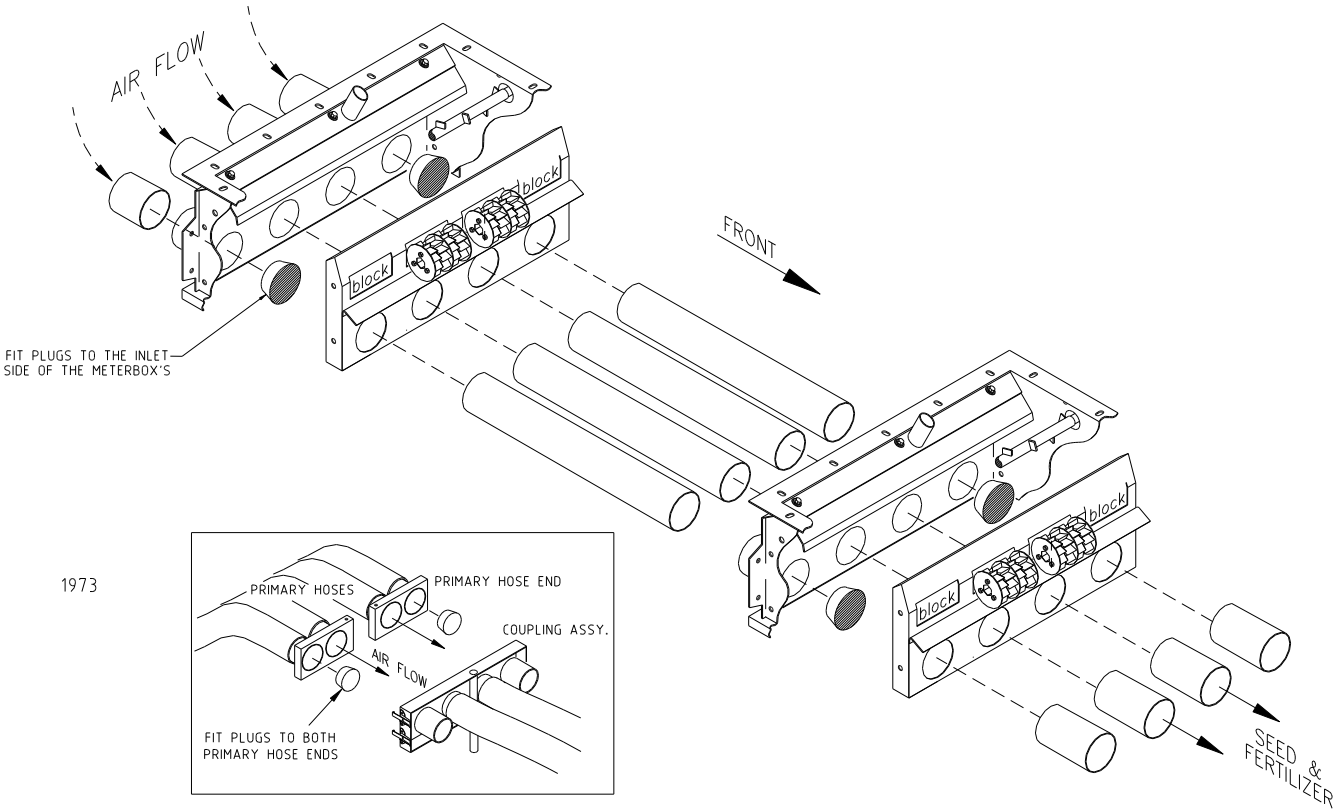
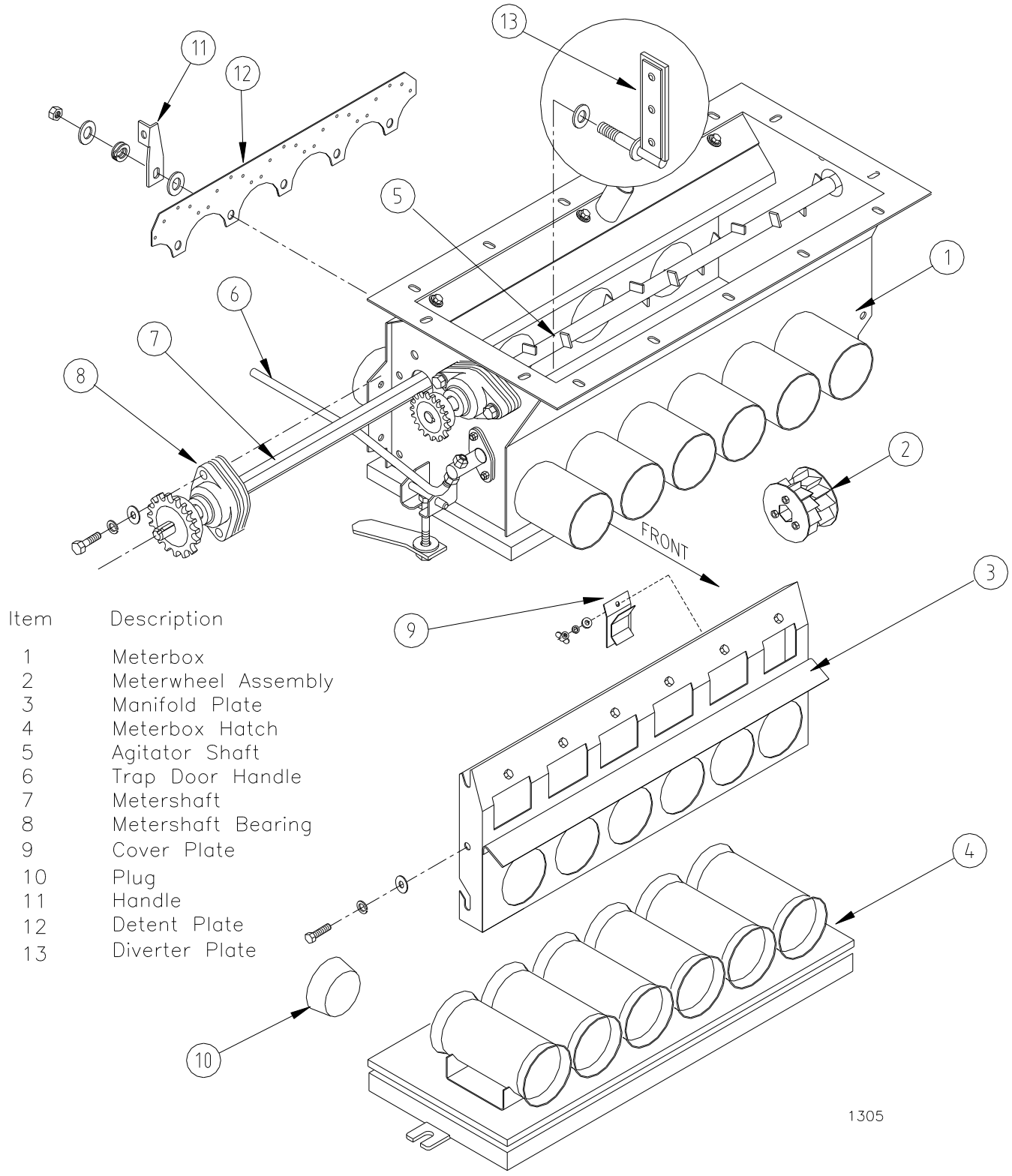


Fig. M4 Wide-row Cropping using standard manifold plates and showing plugs fitted.

METERBOX ASSEMBLY - 6 OUTLET Series 1



Item	Description
1	Meterbox
2	Meterwheel Assembly
3	Manifold Plate
4	Meterbox Hatch
5	Agitator Shaft
6	Trap Door Handle
7	Metershaft
8	Metershaft Bearing
9	Cover Plate
10	Plug
11	Handle
12	Detent Plate
13	Diverter Plate

Fig. M5 6 Outlet Meterbox Assembly.

6 Outlet Meterbox Series 1

The 6 outlet meterbox has been designed to enable triple shooting on the 3 bin model air seeders. This meterbox is also capable of performing standard seeding operations including deep banding and wide row cropping (summer cropping).

The 6 outlet meterbox has been fitted with adjustable plates to allow part or all material to be diverted from one meterwheel to an adjacent primary hose without having to alter the standard manifold plate. This has been made possible by the addition of 5 internal diverter plates that can be adjusted from the rear of each meterbox (refer fig. M6).

1306

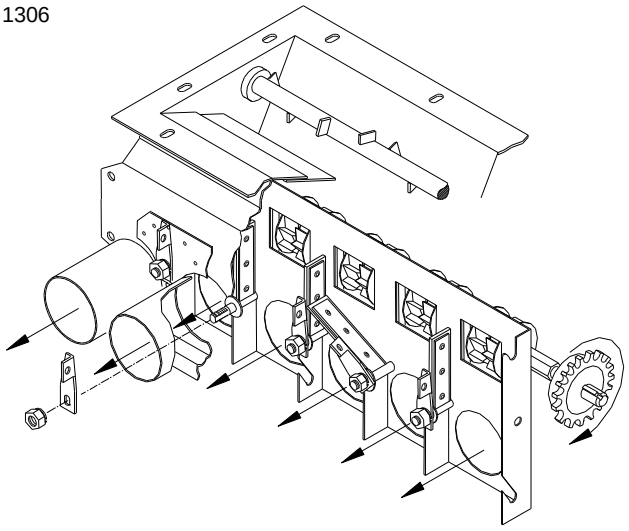


Fig. M6 Diverter Plates.

To obtain all the functions available, you may need to make the following changes during the seeding season.

Reducing the Outlets

When setting up the seeder system for either standard seeding, wide row cropping or deep banding, you may need to:-

- either fit or remove some of the meterwheel assemblies;
- blank off the unused ports in the manifold plate in the meterbox;
- and possibly block the air flow on the unused primary tubes.

DO NOT leave meter wheels in meterbox if not actually conveying material. Refer page 100 for information on removal procedure.

Any work to the meter system must be carried out with the bins empty to allow access to the metering components.

- To remove the meterwheels refer to page 100 for detailed instructions.
- To blank off unused manifold plate ports refer page 101.
- For further information on blocking air flow refer page 102.

Low Rates (Meterwheel Sleeve)

If extremely low rates of material flow are required (eg.canola and sorghum) it will be necessary to fit a meterwheel sleeve over the standard wheel assembly that would normally meter the seed.

This needs to be fitted before the seed is loaded into the hopper. Fitting this sleeve will effectively reduce the output by half. Refer to page 101 for detailed instructions on fitting sleeve.

High Rates (Sprocket Ratio)

It may be necessary to alter the sprocket ratio on a particular meterbox to allow the various application rates to be sown. Refer to page 59 for information on ground driven seeders and page 73 for VRT equipped air seeders.

DO NOT use a ‘High Rates’ sprocket ratio on ground driven air seeders if it is not recommended in the ‘Variator Setting guide’ (refer pages 37–51).

Large Seeds

The standard 6 outlet meterbox will meter most large seeds as standard.

Note: A special kit is available for planting Broad Beans. Contact your Gason dealer for more information.

Deep Banding

Changing from conventional planting to deep banding can be performed by simply moving the position of the diverter plates by using the handles on the rear of the meterbox. Where all product may have been conveyed down 3 of the 6 primary tubes for conventional planting, this is now altered by sending one product down the same 3 tubes and the second product down 3 different primary tubes.

The distribution system will need to have been set-up to run the dual hoses and heads required for deep banding. Refer to Fig. M8 for one possible configuration of the meterbox.

Triple Shooting

To run a triple shoot system it will be necessary to have a specific distribution set-up that will allow the placement of the three separate products all the way through to the implement. This can be performed by using deep banding sowing boots on the tines and fitting a urea spreader kit to the front of the implement.

The meterbox will also need some adjustment to separate materials from the 3 bins. By diverting the product from some meterwheels to specific primary conveying tubes we can ensure that the correct product is sent to the specific areas on the implement (refer Fig. M9). Refer to page 100 and 101 for details on removing meterwheels and fitting cover plates.

Partial Diversion

It is also possible to mix some product (fertilizer) with the seed or another fertilizer while metering. The diverter plates can be partially moved and held in position by using the detent on the plate under the diverter handle.

The detent plate has only one detent position for partial mixing. The standard plate will allow approximately 50% of the product from one meterwheel to be diverted to an adjacent primary tube. The operator should check the exact percentage of product diverted during the calibration process. The percentage can be affected by product type and application rate.

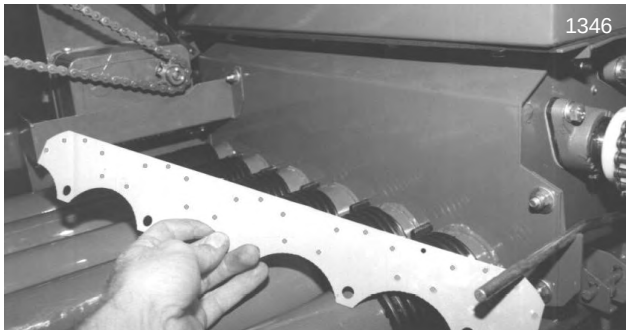


Fig. M7 Detent Plate.

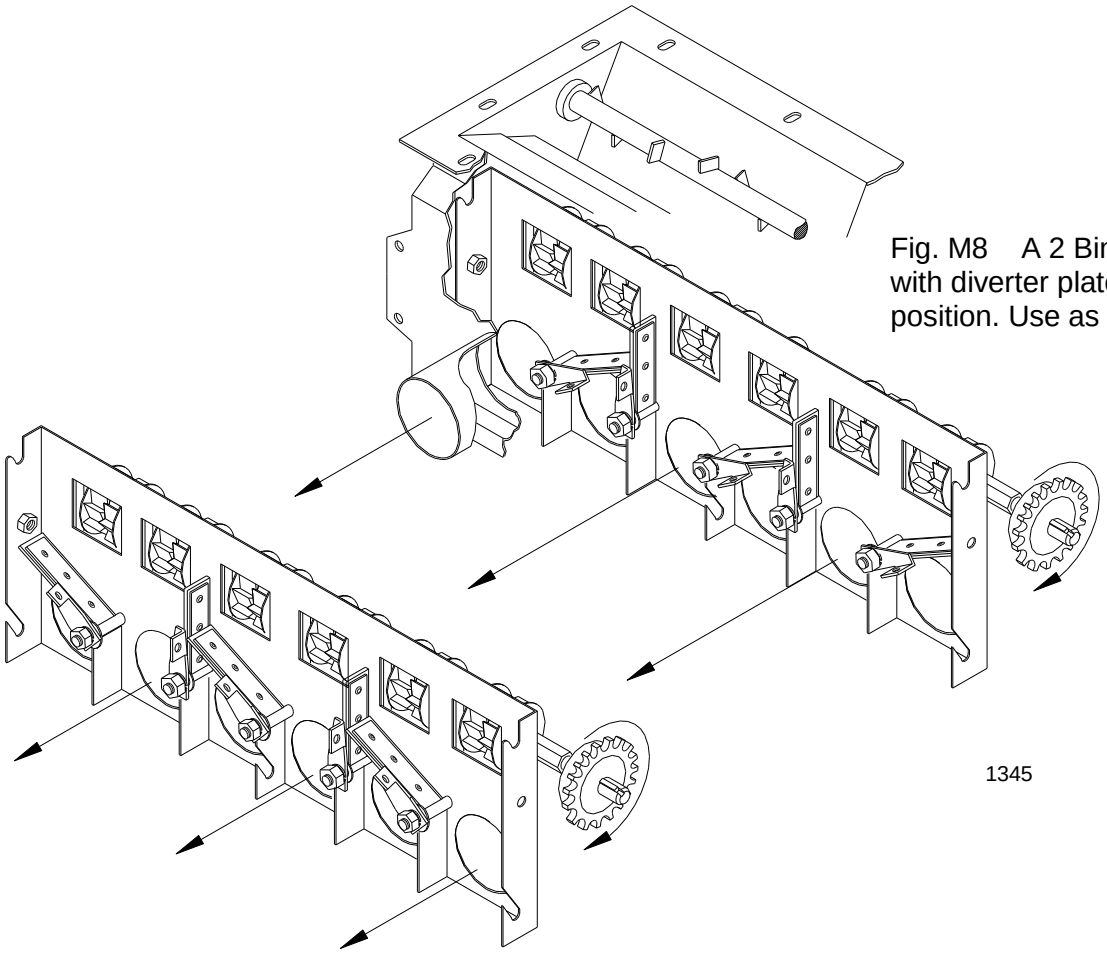
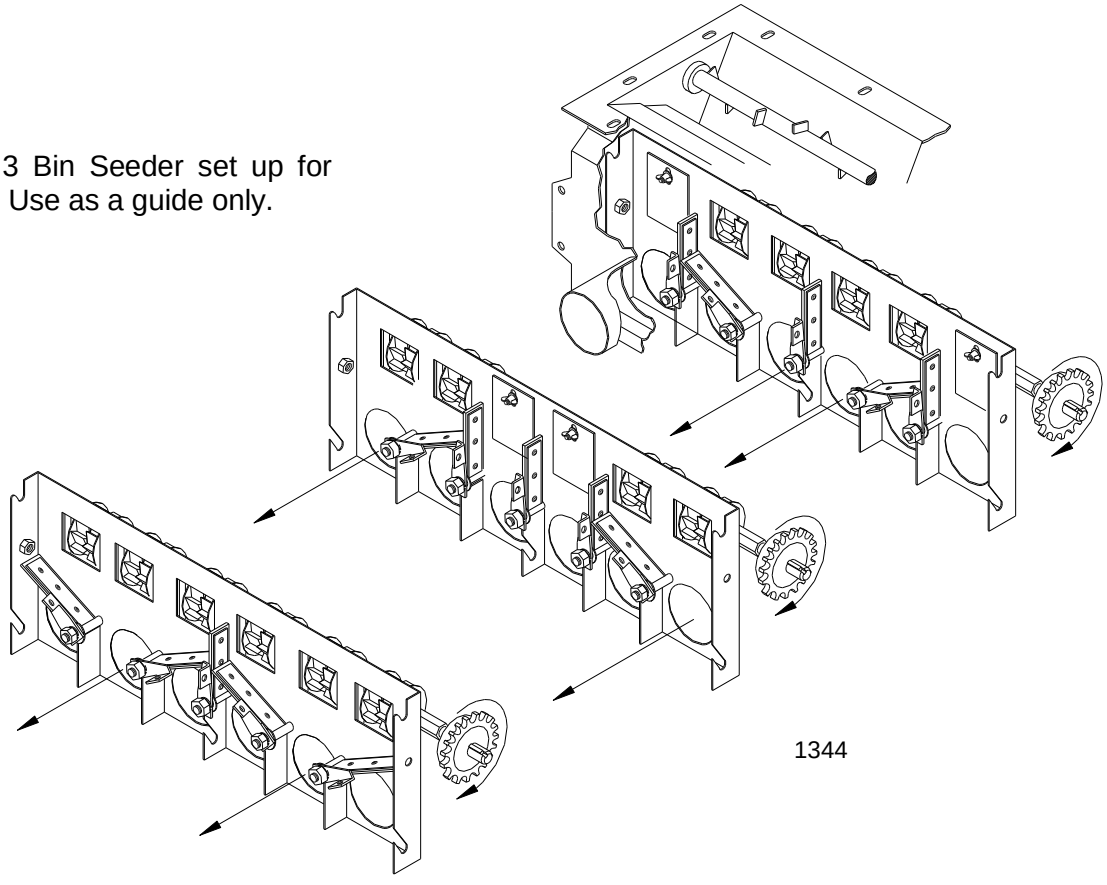


Fig. M8 A 2 Bin Model shown with diverter plates in deep banding position. Use as a guide only.

1345

Fig. M9 A 3 Bin Seeder set up for triple shooting. Use as a guide only.



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Removing Manifold Plate

1. Ensure that the bin is empty before attempting to remove the manifold plate.

2. Remove the meterbox hatch.

3. Open the trap door at the base of the bin operated from the right hand side of the machine.

4. Remove the bolts that retain the meterbox manifold plate in position.

5. Slide the manifold plate down through the base of the meterbox.

Assembly is a reversal of this procedure. Refer to the assembly drawings on page 92 and 96 to identify components.

Removing Meterwheels

1. Ensure that the bin is empty before attempting to remove the meterwheels.

2. Remove the manifold plate

3. Remove the metershaft sensor magnet and shaft bush from the left hand side of the meterbox (Fig. M10).

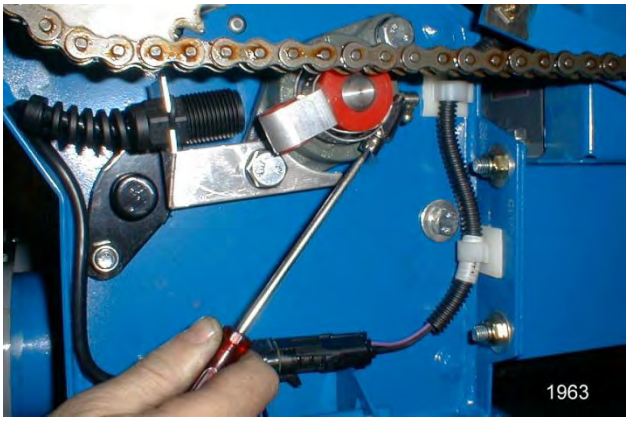


Fig. M10 Metershaft Sensor Magnet.

4. Loosen the 2 grub screws that retain the bearing on the metershaft on the left-hand side of the meterbox.

5. Remove the chain that joins the metershaft and the agitator shaft on the right hand side of the meterbox.

6. Remove the 2 bolts that retain the metershaft bearing on the right hand side of the machine (Fig. M11) and slide the metershaft partially out. The shaft may need to be tapped from the left-hand side of the box.

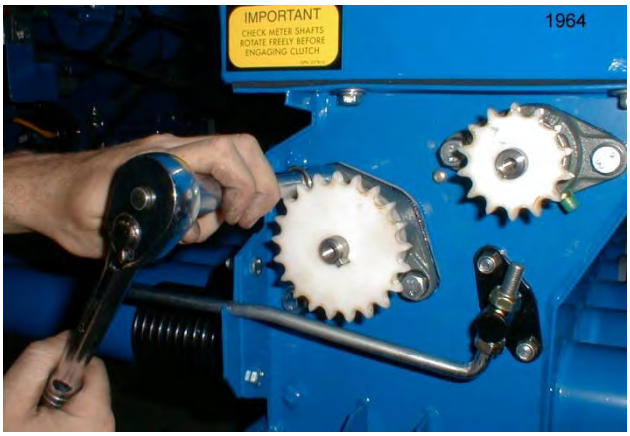


Fig. M11 Right hand side of meterbox.

7. Once the shaft has been moved, slide the meterwheel assemblies off the hexagonal shaft (refer Fig. M12).

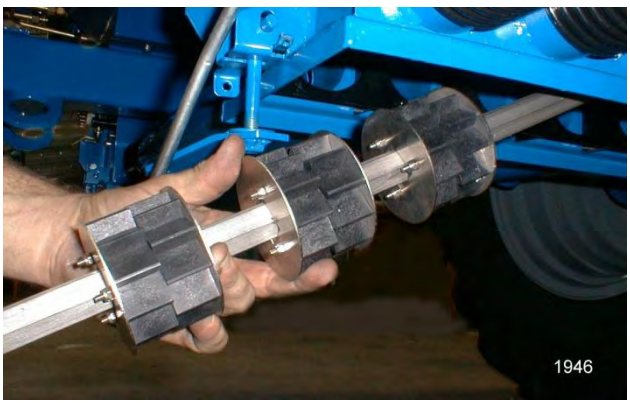
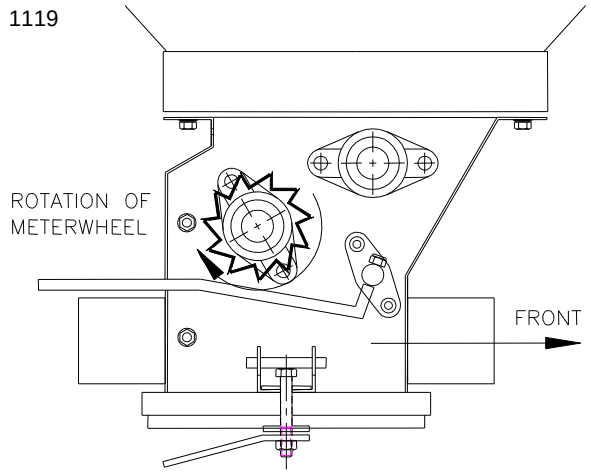


Fig. M12 6 Outlet Meterwheels shown.

Assembly is a reversal of this operation.

Refit the manifold plate checking that the meterwheels are correctly located in the ports and that the system turns freely.

IMPORTANT NOTE:
Meterwheel assemblies must be fitted to the shaft in the correct direction to allow the material to flow when the shaft is operating (refer Fig. M13).



VIEW FROM RIGHT HAND SIDE OF METERBOX

Fig. M13 Meterwheel Direction.

Blanking Manifold Plate (refer Fig. M14)

Note: Only to be fitted when meterwheels have been removed from the meterbox.

1. Ensure that the bin is empty before attempting to remove the manifold plate.
2. Remove the manifold plate
3. Fit the cover plate into the open port and fix into position using the wing nut and washers supplied.

Fig. M14 4 outlet manifold cover plate.

4. Check that the cover plate fits correctly and that there are no excessive gaps which may allow material to pass through.

Fitting the Low Rate Sleeve

1. Remove the manifold plate when the bin is empty.
2. With the meterwheels in place, slide one plastic sleeve over each meterwheel assembly so that its effective metering capacity is reduced (Fig. M15).

NOTE: Sleeves need only be fitted to the meterbox required to meter the low rates. Sleeve selection must maintain symmetrical material flow from the bin to the appropriate conveying tubes.

If after fitting the sleeve you still have difficulty in obtaining the low rates, it may be possible to fit a second sleeve or a wider sleeve to further reduce the application rates. There are 2 different width sleeves available (25 and 50 mm).

The 6 outlet meterbox will in most cases only require the narrow (25mm) sleeve to effectively reduce output by half. This is because the actual meterwheel width is half that of the 4 outlet meterbox.

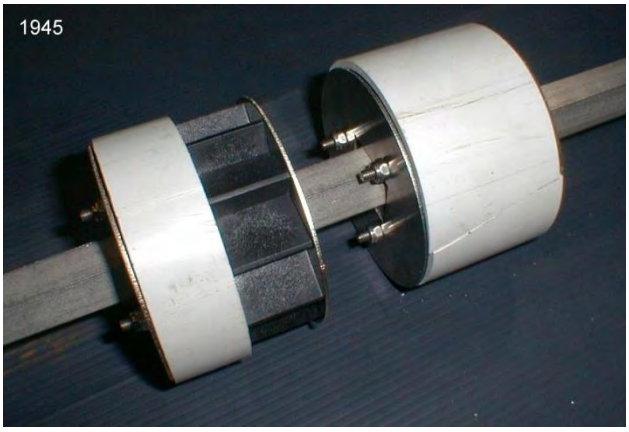


Fig.M15 25 & 50mm reducing sleeves on 6 outlet meterwheel assemblies.

3. Refit the manifold plate checking that the meterwheels are correctly located in the port and that the system turns freely.
4. When calibrating the seeder with the reducing sleeves in place, ensure that there are even piles of material in the calibration tray. This check will confirm that the sleeves have been located symmetrically.

Removal of the sleeves is a reversal of this procedure.

NOTE: Do not use reducing sleeves in a bin metering fertiliser. Damage may occur to the sleeves.

High and Low Rate Sprocket Ratio

The Ground and VRT Hydraulic Drive metering systems use a different method and reason for changing sprocket ratios. Refer to the relevant sections (page 59 or 73) in this manual for further information.

Fitting Large Seeds Manifold Plate

(4 Outlet Meterbox only)

1. Remove existing standard plate (refer page 100).
2. Fit the ***'Large Seeds Manifold Plate'*** (painted blue) to the meterbox and bolt into position using the same bolts as the standard plate.
3. After assembly, check that the trap door fits correctly. If a large gap exists you will need to modify the new manifold plate to allow the trap door to close correctly. Large gaps may allow seed to spill out.

NOTE: The ***'Large Seeds Manifold Plate'*** should only be used for large seeds. Refit the standard manifold plate (painted black) for all other seeds and fertilizers. A large seeds manifold plate is not required for the 6 outlet meterbox.

Blocking Air Flow

The meterboxes have been designed to run 4 or 6 primary hoses as standard. However, the meterbox is flexible enough to enable many variations in its metering configuration. In the case of the 4 outlet meterbox, it can be used as a 3 outlet machine to suit narrow planting widths, or as a 2 outlet system to perform wide-row planting (common for summer crops).

It may be necessary to fit plugs to the unused conveying tubes to ensure airflow has been controlled and restricted. Plugs are fitted from the inside of the meterbox. The plugs should be fitted to all meterboxes and the primary hose coupling assembly (refer figure M4 on page 95).

Airflow turbulence will occur inside the meterbox if a plug has been incorrectly located. This turbulence may create uneven or excessive material flow when sowing light seeds or product at extremely low application rates.

To fit the plugs, first remove the meterbox hatch. Firmly press the red plug, as supplied with the seeder, into the inlet tube towards the blower as shown in figure M16. The plug's placement must prevent air from travelling into the meterbox.

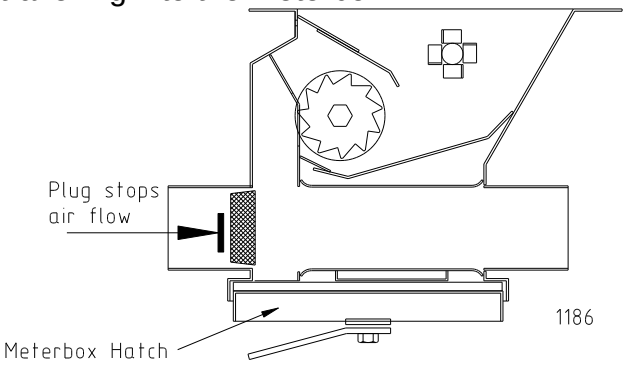


Fig. M16 Meterbox Cross Section on a Rear Tow Air Seeder. Reverse the plug location on Front Tow Seeders.

To remove the plug, simply use a screwdriver to prize the plug out.

When changing from the conventional 4 or 6 outlet system to a wide-row spacing layout, i.e. shutting half the system down, the operator will need to fit the plugs as well as make other changes to the metering system. Meterwheels may need to be removed or product diverted to place material down the correct sowing boots. Refer figure M4 on page 95 and figure M8 on page 99 for further details.

VRT Hyd. Motor Direction of Rotation

The VRT hydraulic motor must rotate in the correct direction to ensure reliable performance during operation.

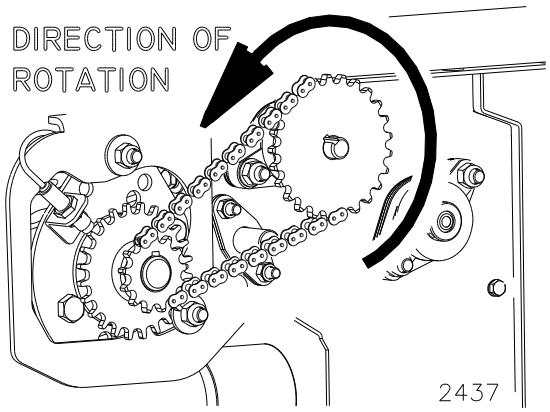


Fig. M17 VRT Hyd. Motor Rotation.

Metering Oats

It will be necessary to remove the cover plate that protects the meterwheels when metering oats. The cover plate is normally used to prevent material from directly sitting on top of the meterwheels and helps prevent the free flowing of product while the meterwheels are stationary. Removing the plate will help prevent the product from bridging.

We recommend that the oats are clipped and graded as a normal procedure before planting.

A trial run may be required to ensure that you do not have a problem during seeding. To check for bridging it will be necessary to place a known weight of product into the bin and to start the seeding operation.

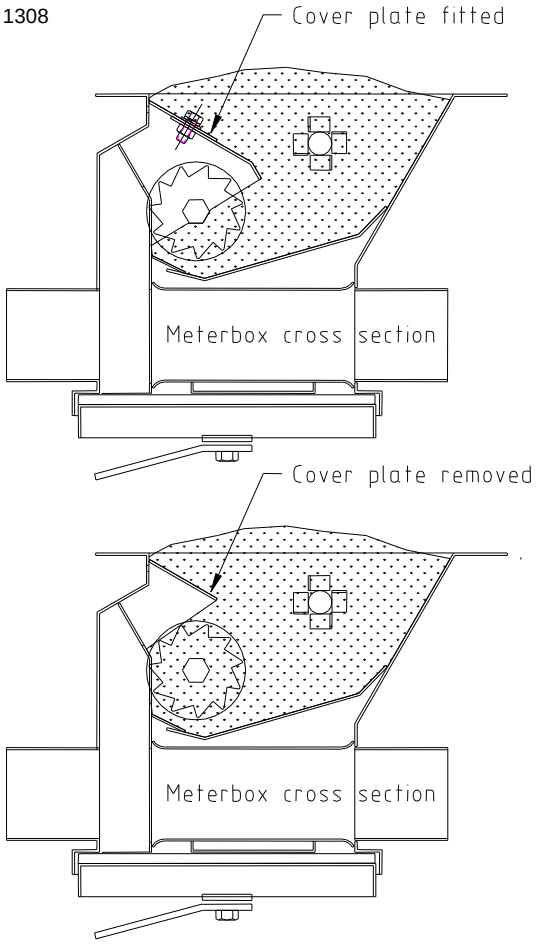


Fig. M18Removing the Metershaft Cover Plate.

After a known area has been seeded, eg. 10 hectares, stop and check that the bin has the correct reduced quantity left.

The plate **MUST BE REPLACED** after seeding the oats to prevent damage from occurring to the metering system.

To remove the meterwheel cover plate you will need to have the bin empty, meterbox hatch removed and the meterbox trap door open. From the inside of the bin remove the 3 x M8 Bolts that retain the plate. Slip the cover plate out through the bottom of the meterbox. Fitting the plate is a reversal of this procedure.

NOTE: For safety it is recommended that a second person be present before entering a bin. Always take proper precautions if entering a bin that has been exposed to treated seed.

Introduction

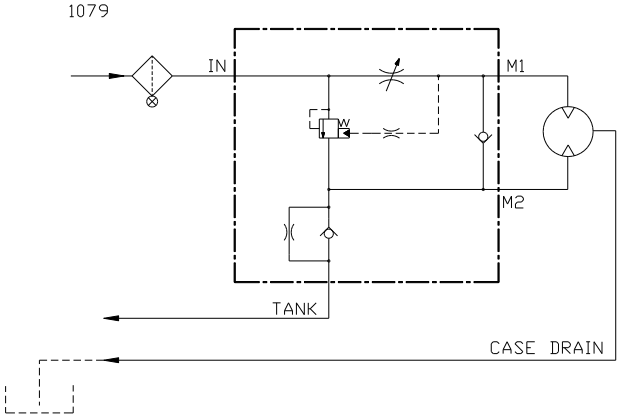
The hydraulic motor that drives the air seeder blower is a robust and highly efficient unit. It has been chosen because of its ability to operate at high speeds for extended periods.

The hydraulic circuit has also been designed to operate for extended periods with minimal maintenance. The only component that will require regular maintenance is the high capacity oil filter.

Refer to the hydraulic filter maintenance section for servicing information (page 106).

Flow Control Valve

A flow control valve is located near the fan. The valve can be used to adjust the fan's speed and will protect the motor against excess flow from the tractor. The valve will also protect the system from incorrect direction of flow in case the hoses are connected in reverse.



Tractor Requirements

A standard tractor's hydraulic system in good working order with a cooling system is all that will be required to run the Air Seeder. In most cases no modification will be necessary other than having 2 hoses fitted directly to the tractor's hydraulic reservoir for return flow.
The flow required to operate the air seeder will vary depending on the specific model and options.

Refer to table H1 & H2 to determine the flow requirement for the particular model air seeder. The tractor will need to obtain this flow at 160 bar (2350 psi) to achieve the indicated fan speed when conveying product.

	Ground Drive		VRT Hyd. Drive	
FAN RPM	4000	4500	4000	4500
L / MIN	39.3	44.3	60	65
GPM (US)	10.4	11.7	15.8	17.2

Table H1 4 Outlet Meterbox hyd. requirement.

	Ground Drive		VRT Hyd. Drive	
FAN RPM	4000	4500	4000	4500
L / MIN	48	54	68	75
GPM (US)	12.7	14.3	18	19.8

Table H2 6 Outlet Meterbox hyd. requirement.

Open Centre Tractor Hydraulics

It is preferable to have a slightly higher flow rate going to the seeder's system when the tractor is equipped with open centre hydraulics. This slight excess will help maintain constant fan speed and reduce the risk of material blockages in the distribution system.

Control the required fan speed at the seeder using the flow control valve (fig.H3).

Closed Centre Tractor Hydraulics

Some closed centre hydraulic systems that compensate pressure and flow will require a specific set-up procedure to control the fan speed and to eliminate possible fluctuations in fan speed.

It is necessary to control the fan speed from the tractor instead of the flow control valve on the seeder.

Use a set of remotes on the tractor that has some form of control device fitted as standard. Set the seeder flow control valve to its maximum position, against the stop, and lock into place.

With the system running it will now be possible to set the desired fan speed at the tractor.

You should consult with your local dealer for further details regarding your specific tractor's hydraulic needs.

NOTE: It is important that the operating temperature of the oil does not exceed 90°C. Damage may occur if operated above this temperature.

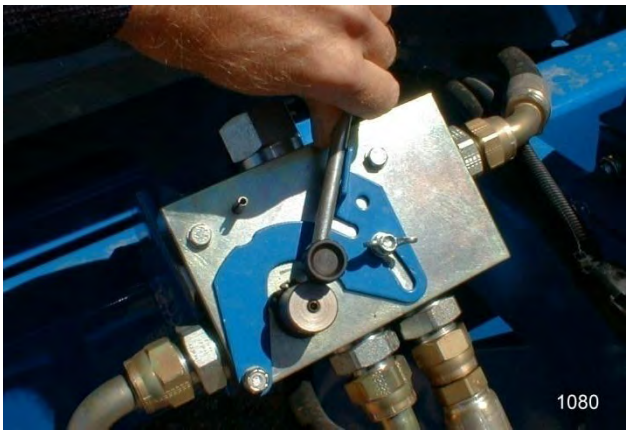


Fig. H3 Flow Control Valve.

Hydraulic Connections and Hose Kit

All quick release couplings required to connect the Air Seeder to the tractor have been supplied with your machine. Also included is a hydraulic hose kit, clamps and fixing hardware to fit your implement for all rear tow models.

Not included in the hydraulic kit however, are any hoses that may be required to run the return oil flow directly back to the tank on the tractor itself. Each tractor will require its own hoses and operators should contact their local authorized dealer for further instructions.

It is important that all return hoses fitted to the tractors hydraulic tank are placed below the reservoir oil level.

Case Drain

It is important to fit the case drain directly to the tank or through a dedicated case drain line that may already exist on the tractor. Case drain pressure **MUST NOT EXCEED** specifications (refer page 10). Seal damage will occur if case drain is restricted in any way.

DO NOT restrict the return flow by using small hydraulic fittings.

Connecting the Seeder Hydraulics to the Tractor

There are 3 hydraulic hoses that must be connected to the tractor to operate your Air Seeder (refer Fig. H4).

1. Return Hose (¾" SAE100R2) with a ¾" safety male (Tema) breakaway at the tractor. Connected direct to tank or through remotes, using the female TEMA fitting.

2. Case Drain Hose (3/8" SAE100R1) with a ½" safety male (Tema) breakaway at the tractor. Connected direct to tank.

3. Pressure Hose (3/4" SAE100R2) with a ½" standard male breakaway at the tractor. This hose is connected directly to the existing tractor's hydraulic circuit.

Fig. H4 Tractor Hydraulic Fittings.

Both return lines must be connected to the tractor using the safety (Tema) fittings supplied. This breakaway coupling has a locking ring that should be engaged when connected to prevent accidental disconnection. (Fig. H5).

NOTE: Severe damage can occur if a return line is accidentally disconnected while the hydraulic motor is operating.

Fig. H5 Locking Ring on pressure hose.

Fitting the Seeder Hoses over the Implement for RT Model Seeders

When fitting the implement's hydraulic hose kit some basic steps should be followed.

1. All hoses should be firmly fixed into position on the implement using the clamps supplied.

2. Keep hoses clear of any sharp edges or other obstructions that may cause wear on the outside of the hose.

3. Do not over bend or force hoses into position. Allow enough length for the hose to move if required.

For further details refer to the drawing supplied with the implement hydraulic kit. This drawing gives detailed information on the fitting of the specific hose kit to your implement.

Connecting the Seeder Hydraulics to the Implement on Rear Tow Seeders

When connecting the air seeder to the rear of the implement you will find that the pressure line on the seeder has a plastic sleeve fitted to the hose end, and has been supplied with its Tema fitting reversed. This will prevent the hoses from being connected incorrectly once the implement hose kit has been fitted.

Fig. H6 Implement Hitch with Tema couplings.

As per the tractor connection, the couplings have a locking ring that must be engaged when connected to prevent accidental disconnection (Fig. H5).

Disconnecting the Hydraulic Hoses

It is advisable to drain a small amount of oil from the hydraulic hoses when disconnecting the seeder from the tractor.

Fig. H7 Draining a small amount of oil.

Oil can be drained by pushing the tip on the male end of the Tema coupling against a clean hard surface.

This will allow a small amount of oil to run out (approximately 1/4 a cup) which will reduce any pressure that may build up in the hose during the non-operational period.

NOTE: The air seeder blower hydraulic motor shaft seal may be damaged if pressure builds up in the case drain hose. Drain a small amount of oil before storing seeder at end of season.

Hydraulic Filter Maintenance

The oil filter fitted to the air seeder is capable of filtering up to 100 l/min. (26.5 US gpm.) at high pressure (Fig. H8).

The filter has a built-in by-pass valve specifically designed to withstand surges that may occur during normal operation i.e. flow and pressure surges experienced during start-up procedure. This by-pass valve prevents dirt from being forced through a clogged element and potentially contaminating the circuit.

The disposable microglass element should be replaced every two to three years under normal operating conditions.

Fig. H8 Hydraulic Oil Filter.

If a badly clogged filter element is not replaced the by-pass valve could operate constantly. This would mean that all or part of the oil flow is no longer being filtered.

The filter manufacturer recommends changing the filter every 500 hours for normal operation. This should be used as a guide only. Always carry a spare filter on hand if extended operation is expected.

Replacing the Filter

1. To change the filter, simply unscrew the bowl using a container to collect the oil.

2. Remove the old filter element and discard in a responsible manner.

3. Clean the magnet, if fitted, on the filter body.

4. Fit the new filter element as per instructions marked on the filter body.

NOTE: Always use genuine parts when repairing and maintaining your equipment. Refer table H9 for filter part no.

Filter Type	***Date of Use***	**Element Part No.**
Parker 24P	Pre May '99	817042
Parker 18P	Post May '99	210423

Table H9

Introduction

The Air Seeder uses airflow to convey the material being sown, known as pneumatic conveyance. To produce enough airflow to convey the large amounts of seed and fertilizer, Gason's have developed a high performance blower of aluminium and steel construction.

Fig. B1 – Blower Assembly

The blower assembly is made up of a housing and impeller. The impeller operates at high speed being driven by a robust and efficient hydraulic motor. The impeller is directly mounted to the motor and is therefore free of any external bearings or coupling, making the system maintenance free.

It is important to remember that this is a rugged but high performance centrifugal fan operating at high speeds. Care must be taken when working on either the motor or blower assembly.

IMPORTANT: Never work on or near the blower intake without the protective intake cover fitted while the impeller is rotating. Serious injury may occur.

Performance

Three main factors determine the amount of material that must be conveyed pneumatically through the system:

- Planting width
- Ground speed
- Total application rate

Total Application Rate (Conventional Seeding)

Total application rate relates to the maximum amount of seed and fertilizer that you wish to convey through the system. If you are seeding using conventional practices the total application rate would be the fertilizer rate plus the seed rate (refer example 1).

Example 1

A cereal crop of wheat with an application rate 55 kg/ha along with fertilizer at a rate of 62 kg/ha would equal a total application rate of:

55 + 62 = 117 kg/ha

NOTE: To convert lb/acre to kg/hectare refer to page 54.

Application Rate (Deep Banding and Triple Shooting)

For working out the appropriate application rate for deep banding and triple shooting it is important to remember that the limiting factor for how much the system will convey is the heaviest application rate required using the least number of primary tubes. In most cases this will be the fertilizer that may be placed down 2 or 3 primary tubes.

Example 2

A deep banding system using a 4 outlet meterbox has been set up to plant 65kg/ha of barley down the 2 outside primary tubes and 95kg/ha of DAP fertilizer down the 2 middle primary tubes.

The most important figure to look at here is the heaviest amount of material being conveyed down the least number of primary tubes. In this case:

95kg/ha in 2 primary hoses.

Maximum allowable Application Rates

By referring to the charts on pages 112 to 115 we can determine the maximum amount of material that can be reliably conveyed.

Four charts have been produced to show the maximum rates of conveyance for 2, 3, 4 and 6 primary hose systems. It is possible to convey more material with 4 primary hoses than 2. This occurs because the 4 primary hose system simply has more available space in the hose to convey more material.

The charts also show that as the planting width is reduced the allowable application rate will increase. This is also true for the ground speed. As the speed reduces the allowable application rate will increase. Some examples follow.

Example 3

A conventional seeding system using a 4 outlet meterbox is required to plant 65kg/ha of wheat and 110kg/ha of fertilizer down all 4 primary tubes. The implement width is 14 metres and the proposed ground speed for seeding will be 11 km/h.

The total application rate in this case is:

65 + 110kg/ha = 175kg/ha

By going to the graph on page 114 headed ‘maximum application rate 4 primary hoses’ we can see that the maximum amount of material the system can handle at 11km/h and 14 metres width is approximately 280kg/ha. Therefore, there should be no problems in conveying the total application rate of 175kg/ha.

A moderate fan speed would appear to be all that was needed to suit the medium application rate of 175kg/ha. Choose a fan speed of 4100rpm (refer page 110).

Example 4

A deep banding system using a 4 outlet meterbox has been set up to plant 65kg/ha of barley down the 2 outside primary tubes and 95kg/ha of DAP fertilizer down the 2 middle primary tubes. The implement width is 12 metres and the proposed ground speed for seeding will be 10km/h.

In this case we use the fertilizer application rate to determine the conveyance capacity. By going to the graph on page 112 headed ‘maximum application rate 2 primary hoses’ we can see that the maximum amount of material the system can handle is 180kg/ha (worked example below the graph). Therefore, there should be no problems in conveying the 95kg/ha of fertilizer down the 2 middle tubes. Fan speed would again only require a middle range speed of 4100rpm.

Flow Control Valve

The Gason Air Seeder is fitted with a flow control valve located next to the blower unit. By altering the setting it is possible to change the speed of the blower (Fig. B2). After altering the setting lock the lever into position with the screw fitted to the handle.

For **Closed Centre Hydraulic Systems** refer to page 104.

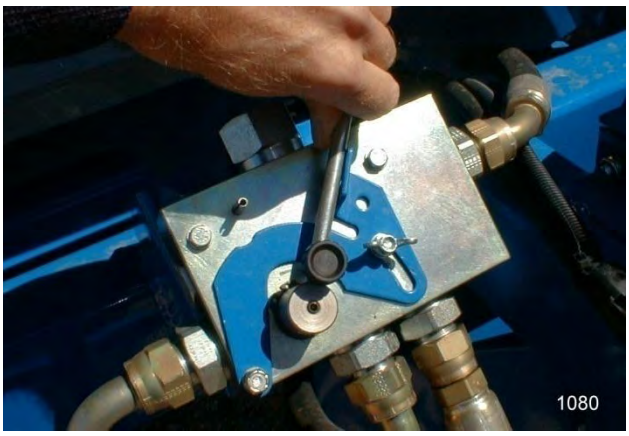


Fig. B2 Flow Control Valve.

The maximum allowable speed for the blower is 4500 rpm. A restrictor plate has been fitted to the flow control valve to help prevent over running the blower. The alarm on the monitor in the tractor has also been set to activate if the speed runs over the recommended maximum of 4500 rpm.

Constant over running of the blower will reduce the life of the hydraulic motor and possibly cause damage to the blower impeller.

Blower Speed

The speed setting for the blower will depend on the amount of material you wish to convey. Blower speed is not critical to the accuracy of the metering because of the inbuilt pressure equalisation system that exists on the Gason Air Seeder.

A more important factor when setting the blower speed is to supply enough air to reliably convey the product but not so much that you produce seed bounce or product damage at the sowing boot.

One method of checking fan speed is to remove one of the tertiary hoses from a sowing boot and hold it at chest height with the end of the hose pointing up. With the fan at operating speed have someone turn the calibration handle over to simulate ground speed, or activate the prime function if VRT equipped, to send product through the system. Material should exit the hose and be projected approximately 300 to 500mm vertically beyond the hose end.

NOTE: All reference to blower speed refers to operational speed while seeding. This speed may vary from the blower speed set when no material is being conveyed. It is important to remember when setting the blower speed to check the speed again when actually seeding. This can be done through the seeder's monitor in the cab of the tractor.

At low application rates the difference between a stationary fan speed setting and when actually seeding will vary little if at all. However on some tractors it may be impossible to obtain the high blower speeds (4500rpm) required, when the application rates are high, until the product is being conveyed.

To obtain maximum fan speed, simply set the flow control valve to maximum and begin seeding. Once material is being conveyed check fan speed on the monitor.

DO NOT EXCEED 4500 RPM BLOWER SPEED. EXCESSIVE BLOWER SPEED WILL REDUCE THE LIFE OF THE HYDRAULIC MOTOR AND IMPELLER.

If when seeding, you find that the blower is running too fast, stop the machine and reduce the setting on your flow control valve at the seeder (refer Fig. B2), or from the tractor, if equipped with closed centre hydraulics.

Determining the Appropriate Blower Speed

Blower speeds can be grouped into 4 different levels for material application.

A low total application rate will only require a relatively low blower speed. As the application rate increases so too will need for the blower speed to increase. Refer to Table B3 for recommended speeds.

Very low application rate	3000 rpm
Low application rate	3800 rpm
Medium application rate	4100 rpm
High application rate	4500 rpm

Table B3 Blower Speed

To determine the appropriate speed for the blower we must first determine the total material application rate to be conveyed.

Comparing this figure against the appropriate maximum application rate we can estimate the blower speed.

Example 5

A 3 primary hose system on a 12 metre wide planting width at 10 km/h will allow a maximum application rate of 270 kg/ha (refer page 113). If we compare this with our desired total application rate of 117 kg/ha in the earlier example (refer Example 1 on page 108), we can see that we are well short of the system's maximum capacity. This rate would only require a low fan speed of 3800 rpm.

Example 6

If however the same machine as in the previous example was used for planting peas at 140 kg/ha and fertiliser at 120 kg/ha the appropriate blower speed will be different. The new total application rate will be 140 + 120 = 260 kg/ha. This would be a high application rate when comparing it with the known maximum allowable of 270 kg/ha, and would require a high blower speed to convey the material i.e. 4500 rpm.

NOTE: While every effort has been made to determine accurate maximum conveyance levels, A. F. Gason Pty. Ltd. will not be held responsible for conveyance short falls in the system. This is because there are so many variables in determining the conveyance capacity of the system.

Damp or extremely dusty fertilser can cause blockages in the distribution system. Always ensure that the product is dry and palletised before operating the air seeder.

Fig. B4 Blower Assembly fitted to 1880FT Air Seeder.

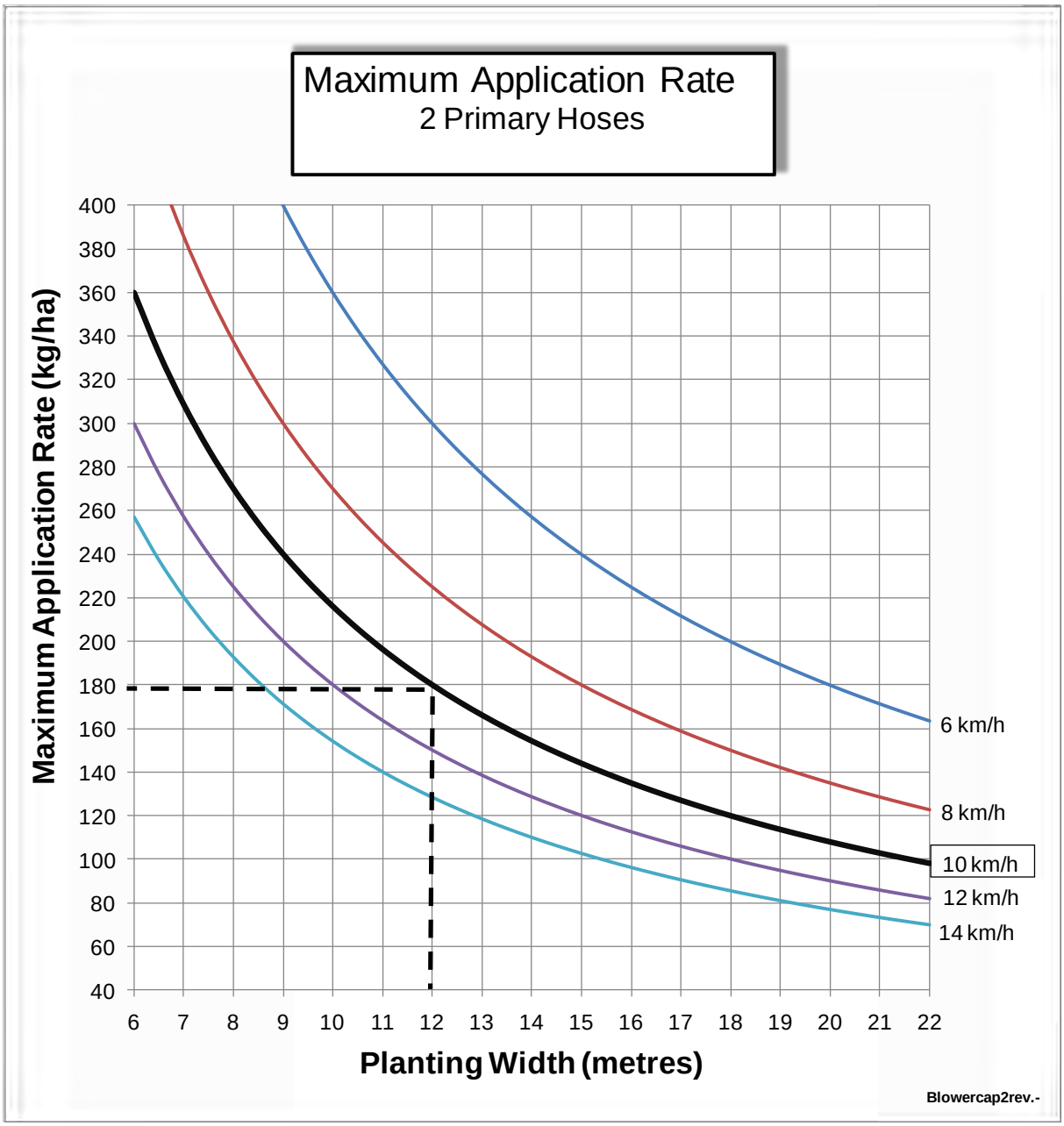


Table B5

Worked example:

Maximum sowing rate for a 2 outlet system on a 12 metre wide planting width at 10 km/h ground speed.

From graph maximum total application rate = 180 kg/h

NOTE: The above graph should be used as a guide only. Other factors will affect the conveying performance of the air seeder.

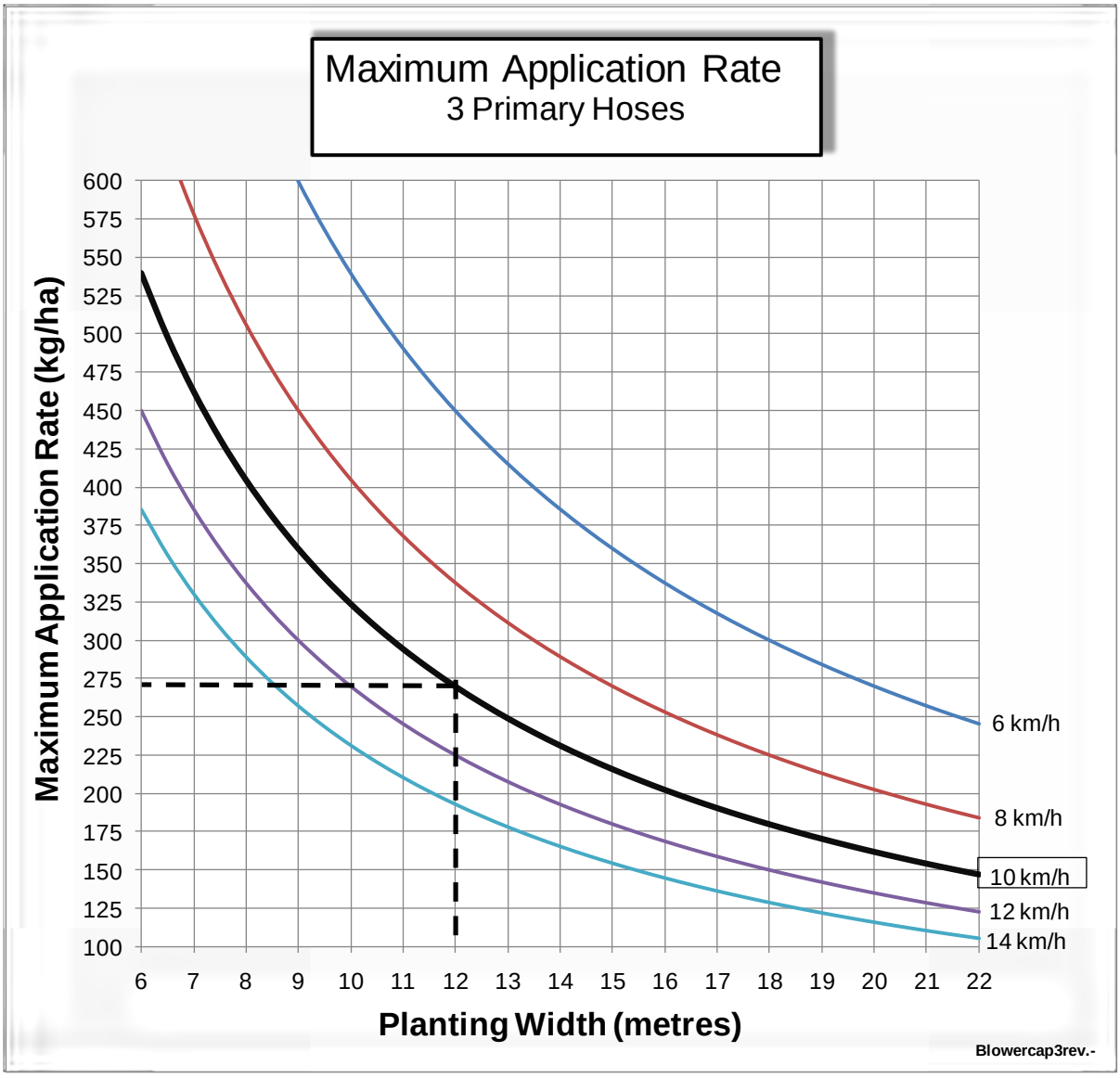


Table B6

Worked example:

Maximum sowing rate for a 3 outlet system on a 12 metre wide planting width at 10 km/h ground speed.

From graph maximum total application rate = 270 kg/ha

NOTE: The above graph should be used as a guide only. Other factors will affect the conveying performance of the air seeder.

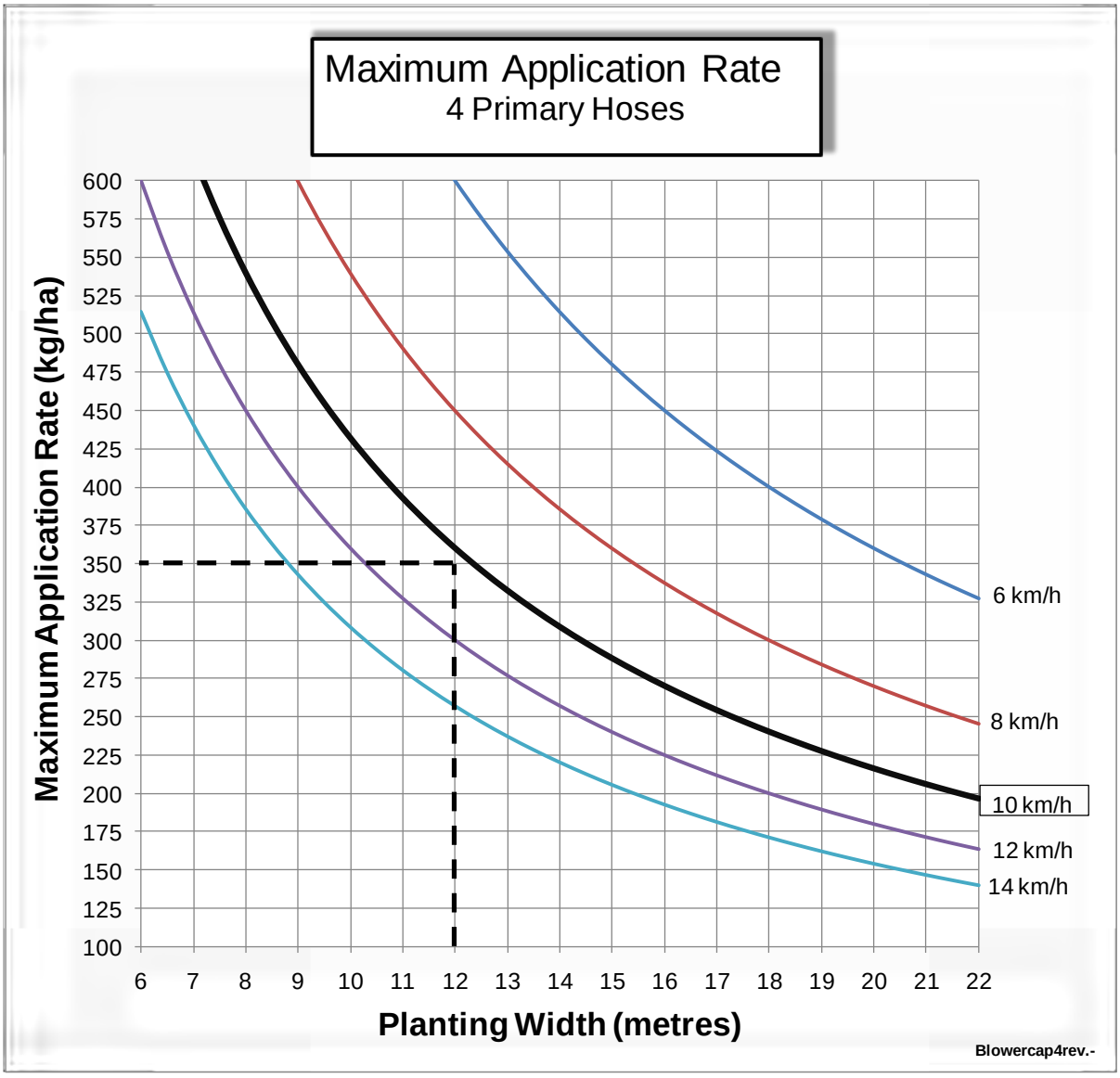


Table B7

Worked example:

Maximum sowing rate for a 4 outlet system on a 12 metre wide planting width at 10 km/h ground speed.

From graph maximum total application rate = 350 kg/ha

NOTE: The above graph should be used as a guide only. Other factors will affect the conveying performance of the air seeder.

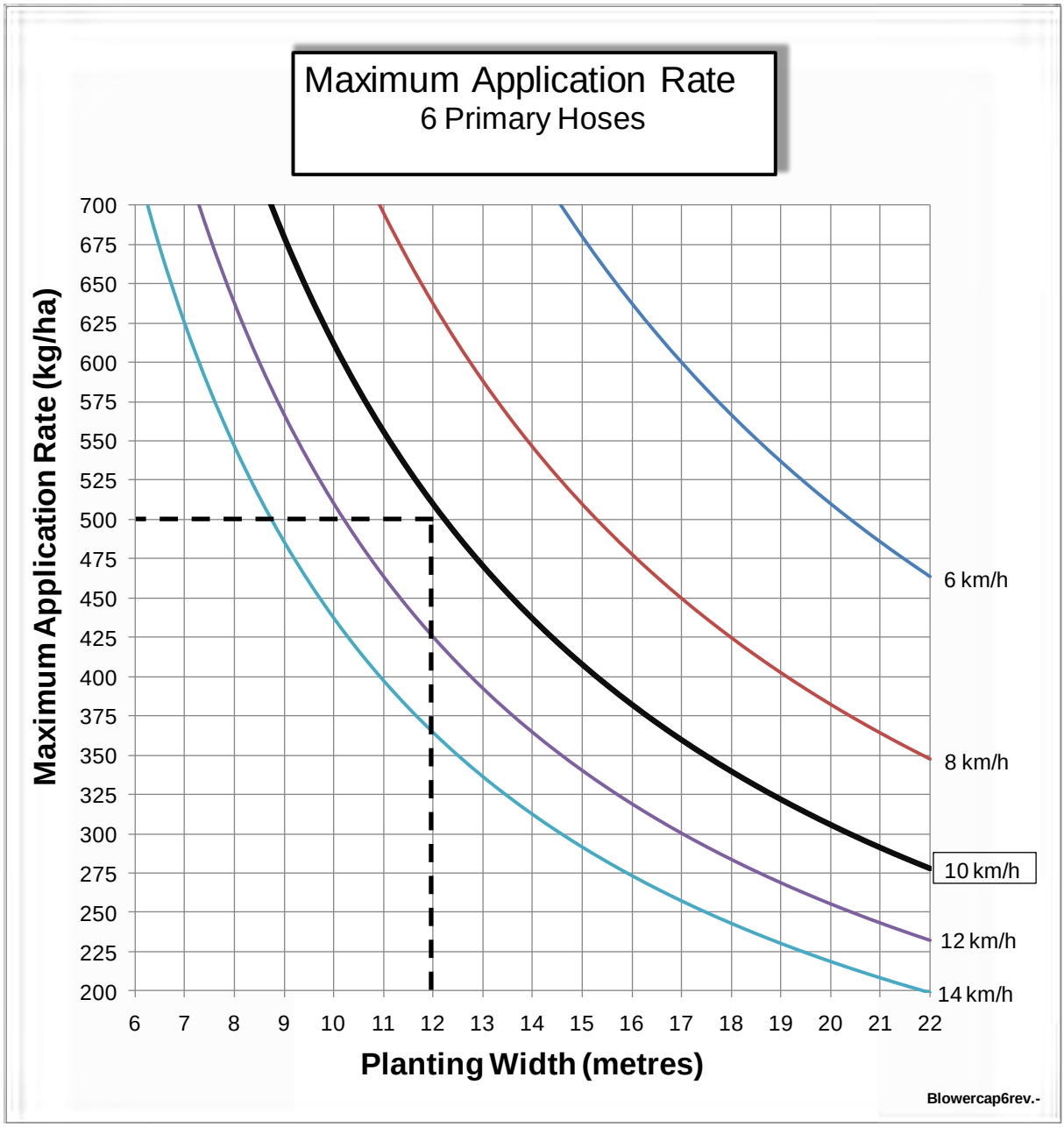


Table B8

Worked example:

Maximum sowing rate for a 6 outlet system on a 12 metre wide planting width at 10 km/h ground speed.

From graph maximum total application rate = 500 kg/ha

NOTE: The above graph should be used as a guide only. Other factors will affect the conveying performance of the air seeder.

Introduction

Regular maintenance will ensure trouble free operation for the life of the seeder. It is recommended that when replacing parts you use genuine components and fasteners of the same grade and quality as the ones used on the original machine.

DO NOT COMPROMISE SAFETY WITH FAULTY COMPONENTS.

Daily Checklist

1. Chain drives

   - Check chain tension (Fig. GM1).

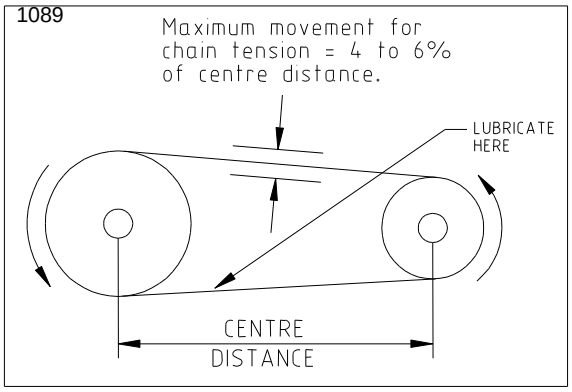


Fig. GM1 Chain Tension

   - Check for worn sprockets.
   - Check sprocket alignment.

2. Distribution hoses

   - Check for wear on external components.
   - Check hoses do not sag or bend sharply.
   - Check all hoses are fitted correctly.
   - Inspect secondary manifolds for product build-up.

3. Wheel nuts

   - Check tension of all wheel nuts when first working the air seeder after assembly or if a wheel has been fitted. This need only be done for the first couple of days of operating but then should be done on a weekly basis.

4. Hydraulic system

   - Check all breakaway fittings have their safety ring engaged (refer page 106).

Weekly Checklist

1. Drive system

   - Lubricate drive chains if necessary.
   - Grease all drive shaft bearings.
   - Check sprockets are tight.
   - Check clutch bolt is tight.

2. Meterbox bearings

   - Grease bearings (4 places per meterbox).

NOTE: It is recommended that the meterbox bearings are over-greased rather than under-greased. Excess grease from the bearings will help lubricate the mechanical seal that prevents product from reaching the bearing. If metering fine dusty material through the meterbox it is recommended to grease more frequently.

3. Distribution system

   - Check all hoses for internal wear. Rotate hoses if necessary.
   - Check gasket at primary hose connection mounted on the hitch assembly.
   - Check primary hoses for external wear on the drawbar and seeder trailer.

4. Hydraulic system

   - Inspect all hydraulic hoses for external wear.
   - Inspect all hydraulic fittings for possible leaks.

5. Variator

   - Check oil seals for leakage.

6. Auger (if fitted).

   - Check locking mechanism is correctly adjusted and that the auger barrel cannot move.

7. Wheel nuts

   - Check tension of all wheel nuts as per Bolt Specifications page.

Fig. GM2- 1850RT3 CT 2m Castor Option.

End of Season Checklist

1. General Checklist.

- Inspect tyres for wear or damage.
- Inspect all gaskets on hatches for wear and damage.
- Inspect bins and seals for damage (bins must be air tight).
- Replace oil filter if it has been used for more than two years.
- Release oil pressure in hydraulic hoses when disconnecting breakaway fittings.

The Gason Air Seeder should be prepared for storage at the end of planting season. Refer to the section on 'Storage and Cleaning' (page 126) for further details.

Pre-Season Checklist

1. Variators and Drive System

- Inspect both input and output shafts on variators for rust. Grease if necessary.
- Check variator oil seals for leaks.
- Replace oil in variator if contamination may have occurred due to condensation or faulty seals. (Refer page 57).
- Lubricate all chains.
- Check chains for tension and alignment.

2. General

- Check meterbox is free of fertilizer and seed.
- Check meterwheels are clean.
- Check metershafts turn freely.
- Grease all meterbox bearings.
- Check calibration system turns freely.
- Replace the hydraulic oil filter if necessary.
- Check meterbox hatch seals.
- Check clutch bolt is tight.
- Grease all drive shaft bearings.
- Check tyre pressures (refer seeder specification page).
- Check calibration scale accuracy (refer checking procedure below).
- Charge internal battery on scales.

Calibration Scale Accuracy Checking Procedure:

Note: It is the responsibility of the operator to check the accuracy of the scales on a regular basis.

The scales have been provided with a non-certified 2kg test weight that should be accurate enough for most seeding operations. Use the 2kg sample as a base weight and add extra weight to check the full range eg. Check 2 kg weight reads within 5 grams. Remove weight and add 2 kg of product. Now place the weight back on the scales to ensure the load indicated increases by 2kg plus or minus 5 grams. Continue process until the top limit of the scales is reached.

Fig. GM3- Scale Test Weight being used.

Problem	***Possible Solution***
Hydraulics	
1. Difficulty in obtaining fan speed.	➢ Check flow control valve is correctly adjusted and that the locking screw is tight. (Refer page 109). ➢ Check that the flow diverter valve is set correctly if a loading auger has been fitted. (Refer page 125). ➢ Check tractor hydraulics have been set correctly. (Refer page 104). ➢ Check tractor hydraulics for oil flow and pressure. This will require special equipment and you should consult your dealer or local hydraulics expert. **NOTE:** It may not be possible to obtain a high blower speed without material being conveyed (refer page 110 for explanation).
2. Fan Speed Fluctuating	➢ Refer to the Hydraulics Section (page 104 re close centre hydraulics).
3. Hydraulic system over heating	➢ Check fan speed is not above the recommended 4500 rpm max. ➢ Reduce oil flow from tractor to seeder as per model specifications. Refer page 104 for details on seeder requirements. ➢ Check that the flow diverter valve is set correctly if a loading auger has been fitted. (Refer page 125). ➢ Replace the oil filter if it has been used for more than two years. ➢ Check tractor hydraulic cooling system. **NOTE:** Do not exceed a return line oil temperature of 90°C from seeders hydraulic motor.

Problem	***Possible Solution***
4. Hydraulic system not operating	➢ Check that the correct hoses are attached at the tractor and implement and that the breakaways fitted are fully engaged. ➢ Check that the flow control valve on the seeder is not set at zero. ➢ Check that the flow diverter valve is set correctly if a loading auger has been fitted. (Refer page 125)
Metering System (Ground Drive)	*(Refer page 89 for VRT Metering system)*
1. Electric clutch not operating	➢ Check the power supply on the tractor. ➢ Check that the fuse inside the clutch switch box has not blown (pre 2001 models only). ➢ Check that the harness over the implement is attached and not damaged in some way. ➢ Check that the plug at the clutch, on the seeder, is connected. ➢ Check that the clutch bolt is tight. ➢ Remove clutch and clean dirt from the mating faces. ➢ Check that the sprocket drive system is operating correctly.
2. Clutch not disengaging	➢ Disassemble the clutch and clean unit. ➢ Check function of clutch switch.
3. Difficulty obtaining Low Rates	➢ Fit meterwheel sleeves (refer page 101). ➢ Check that the sprocket ratio is set as per standard ratio layout (refer page 59). ➢ Check main drive sprocket ratios have not been altered (refer Spare Parts Manual). ➢ Check your calibration procedure. ➢ It may be necessary in some circumstances to restrict the flow of air along the unused primary tubes at both the front and rear meterboxes. (Refer page 102, 'Blocking Air Flow'). ➢ Check that the variator is being adjusted correctly when operated through the cable. The variator should not turn when the adjustment is set at zero. Check grub screws that retain the arm onto the variator are tight.

Problem	*Possible Solution*
4. Difficulty obtaining High Rates	➢ Check the variator setting guide (pages 37 to 51) to obtain more information on what can be expected from the metering system. ➢ Check the meterwheels are not damaged in some way and have been fitted to the metershaft in the correct orientation. ➢ Check that the meter wheel sleeves have been removed (refer page 101). ➢ Check that the main drive sprocket ratios have not been altered (refer 'Parts Section'). ➢ Material bridging may be occurring if sowing difficult product. Refer to page 103 for oats. If product is fertilizer, check that it is not wet. ➢ Check that there is no blockage inside the bin at the meterbox. ➢ Check that the variator is being adjusted correctly when operated through the cable. The variator should not turn when adjustment is set at zero. Check grub screws that retain the arm onto the variator are tight. ➢ Check the variator for damage (refer page 58). ➢ Change the sprocket ratio over to the high ratio setting on the particular meterbox if required (refer page 59). Increase ratio only if recommended.
5. Seed Dribble occurring	➢ Block off unused primary tubes at the meterboxes. (Refer page 102, 'Blocking Air Flow' for further information). ➢ Check that the meterwheel cover plate is fitted. Refer page 103 in the metering oats section. ➢ Check for air leaks on the meterbox hatches and bin lids. ➢ Check for even airflow coming from the plenum chamber attached to the seeders blower. ➢ Check all primary hoses for a severe blockage that would cause an uneven pressure or airflow in the system.

Distribution System

1. Blockage occurring in hose system

- Check blower speed is set correctly (do not exceed 4500 rpm).
- Check that the sowing boots are clear of mud and flow is not restricted.
- Check that the material being sown is not wet or binding.
- If blockages are occurring after the machine has been sitting idle, check that water is not sitting in the base of the meterbox. Always warm the system up (run blower for 10 to 15 minutes) before conveying material.
- Hoses must not bend sharply or sag.
- Check the output of the metering system is as per your settings (recalibrate).
- Check blower capacity for maximum conveyance (refer to the appropriate chart on page 112 to 115).
- Inspect all other areas of the distribution system for air leaks.
- Check tractor ground speed has not increased to a point above the conveyance capacity of the system (refer pages 112 to 115).

2. Sowing boots blocking

- Conditions unsuitable for sowing.
- Do not lower points into ground until the implement is moving.

3. *Uneven distribution*

- Check the material is being metered evenly across the meterbox. Use the calibration collection tray and turn calibration handle.
- Check for a blockage in the distribution tubes and hoses.
- Check fan speed is not excessive.
- Ensure the primary splitters are sitting level on the implement.
- Ensure the secondary head support towers are vertical and not leaning to one side.
- Check the secondary heads for foreign matter i.e. straw.
- Check that the bin lids are locked and that meterbox hatches are not leaking.
- If sowing difficult product, check that material is not bridging across the bottom of the meterbox. If sowing oats, refer to page 103.

Rear Seeder Hitch for RT models

The rear seeder hitch kit has been designed to fit the rear of the trailer frame to give a strong attachment point for operators who wish to tow a light prickle chain or light set of harrows (not disc harrows).

The kit can be mounted in minutes and all hardware is supplied. The hitch point uses a 28.6mm (1-1/8") draw bar pin as standard. Refer to the parts manual for further details.

Pasture Planter

The Gason Pasture Planter has been designed to operate in conjunction with the range of Gason Air Seeders. The pasture planter is generally mounted directly to the Seeder's bin. It utilizes the Seeder's drive system to operate the metering assembly and the blower to convey the seed.

The Gason metering system is a positive and accurate method of placing small seeds into the air stream. The system is capable of sowing a wide variety of small seeds, with minimal adjustment.

Each model consists of a fully sealed bin, metering system driven by the standard Air Seeder drive system, hosing and tap to control air supply from blower and a platform with handrail.

The Gason Pasture Planter bin capacity:
380 litres / 10.5 bushels

Fig. OA1 Pasture Planter bin.

Loading and Unloading Auger

A loading and unloading auger can be fitted to most of the Air Seeder range. The auger operates from the same hydraulic system as the fan using a diverter value.

A 7" auger is used on the smaller seeders while an 8" auger is fitted to the larger range. For more information refer to the Auger Section in this manual (page 124).

Urea Spreading Kit

A urea spreader kit is available to operators wishing to triple shoot, or to maintain separate urea placement from their seed and starter fertilizer.

The kit bolts onto the front of the implement and distributes the urea through a standard secondary head arrangement to spreader plates. The spreader plates are supported in front of the implement on its own structure or can be mounted directly to the tool bar. Urea is spread evenly on the ground in front of the implement.

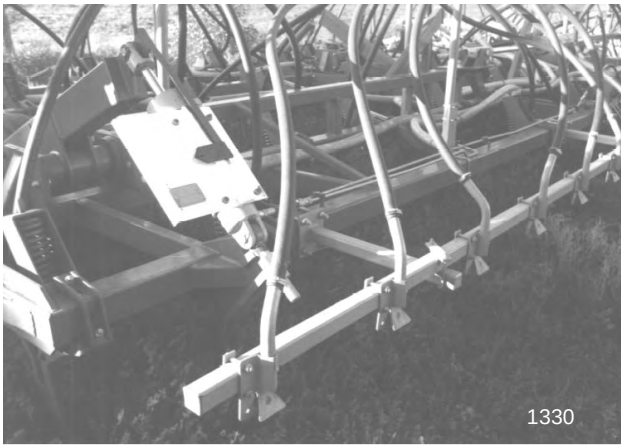


Fig. OA2 Urea spreader kit

Broad Beans Manifold Kit

A kit can be fitted to either the standard 4 outlet or 6 outlet meterbox air seeder that will allow it to meter Broad Beans. Contact your Gason dealer for further information.

Introduction

The auger (optional feature) can be used for loading and unloading the air seeder bins. The arm mechanism that supports the auger will allow the augers hopper to be positioned under the bins for unloading or beside the machine for filling.

Fig. AO1 2120RT with auger in filling position.

To operate the auger you will need to manoeuver the barrel away from the machine. Release the front auger barrel clamp on the side of the front bin (refer Fig. AO2).

Fig. AO2 Front auger barrel clamp.

Withdraw the pin that retains the primary arm to the trailer and pull the arm outwards a small distance to prevent the pin from re-engaging (refer Fig. AO3).

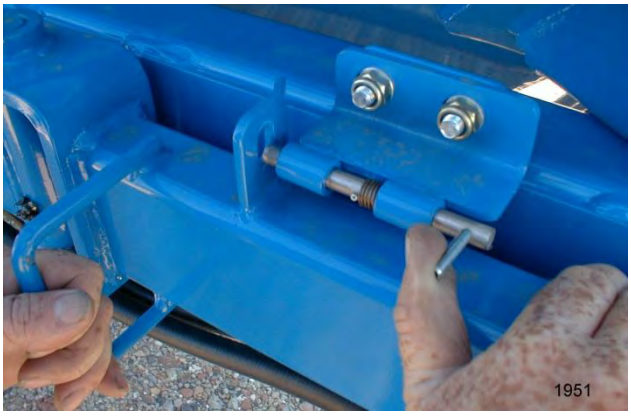


Fig. AO3 Pin retainer on auger arm.

Release the rear auger barrel clamp at the rear of the seeder to free the auger (refer Fig. AO4). Be careful that the auger does not tip forward if the barrel is out of balance. Move the auger away from the machine using the handle near the hopper to help in controlling its position. You may need to rotate the auger hopper if it has been tilted to its storage position.

Fig. AO4 Rear auger barrel clamp.

You are now free to manoeuvre the auger to either fill or empty the bins. If you wish to empty your bins it is advisable to remove the meterbox hatches before positioning the hopper underneath the meterbox.

Fig. AO5 Manoeuvring the auger.

Once the hopper is in position you can divert the oil flow away from the fan. Simply withdraw the plunger-style valve to transfer the flow. (Refer Fig. AO6).

Fig. AO6 Diverter Valve.

To operate the auger flight use the directional control valve (DCV) mounted on the auger barrel. (Refer Fig. AO7). This valve has three positions. Middle position is neutral. Pushing the handle up towards the top of the auger will run the unit forward and to reverse, simply operated handle in the opposite direction. A second handle is fitted to the top of the auger to give dual control.

Fig. AO7 Directional Control Valve.

Do not leave the auger running for extended periods unless actually conveying product. This will extend the life of the auger. Thoroughly clean the hopper and barrel after conveying the product to prevent contamination.

General Safety Conditions

Ensure that the auger does not move excessively in transport when locked into position. Adjust the front and rear locking mechanisms to tighten the barrel.

DO NOT place hands or feet near hopper guard while auger is operating. Severe injury may occur.

DO NOT operate auger without hopper guard or motor coupling guard in place.

DO NOT operate auger if hydraulic system is damaged in anyway. Inspect hoses for damage on a regular basis and at the beginning or end of each season.

DO carry out daily safety checks and operate the auger in a **SAFETY CONSCIOUS** manner.

Beware of overhead powerlines when operating the auger.

To maximize the life of the seeder it is suggested that basic cleaning and protection of some areas of the seeder is performed after each season.

1. Empty all bins of fertilizer and seed.

2. Release oil pressure in hydraulic hoses when disconnecting breakaway fittings (refer page 106).

3. Wash the inside of the bin and meterbox with warm soapy water to clean any fertilizer or toxic residue that may have been left. Flush with water and thoroughly dry before sealing the compartment area.

4. Wash the outside of the seeder to reduce the possibility of rust and to extend the life of the paint.

5. Grease and generally apply lubrication to all moving parts where practical. Lubricate chains with a suitable chain lubricant. Place grease or some form of rust inhibitor on the variator shafts.

6. Plug primary distribution hoses on seeder and fit cover plates supplied to implement to prevent infestation of pests.

7. Inflate tyres to maximum recommended pressure before storing. If practical use stands under seeder to take the load off the tyres.

8. If the seeder is to be stored outside, place covers over the tyres, hoses and blower intake to reduce the effects of weathering.

9. Loosen the meterbox hatch to allow the gasket to recover.

10. Chock the wheels to prevent seeder moving.

Preparing the Seeder for Operation

To prepare the seeder for operation after storage refer to the Maintenance Sections – ‘Pre-Season Checklist’ on page 118.