

# ***Marshall Multispread***

## *Service and Technical Support*

Roesner Pty Ltd  
www.roesner.com.au

Freecall : 1800 651 288  
info@roesner.com.au

# 916T

## Operators Manual



Serial No:

Vee Belt Sizes

Location

PTO Drive

Spinner Drive

Belt Size

Status	Released	Author	KR
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# MARSHALL MULTISPREAD 916T

## ***DISCLAIMER***

### ***IMPORTANT, READ THIS BEFORE USING THE MARSHALL MULTISPREAD***

The Marshall Multispread is to be used in the Agricultural and Horticultural industries to apply granulated and non-granulated fertilisers. It is very important that you follow the Calibration procedures and Operating instructions before using the Marshall Multispread. Calibration and operation of the Marshall Multispread must be in accordance with these instructions. Use of the Marshall Multispread is subject to the following disclaimer;

1. So far as is legally permissible Roesner, or its distributors, shall not be liable, whatever the cause, for any increased costs, loss of profits, business, contracts, income, or anticipated savings or for any special, indirect or inconsequential damage.
2. The capabilities and functions of the Marshall Multispread are limited as set out in the specifications in this manual.
3. Without prejudice to the above it is hereby acknowledged that the Marshall Multispread is not designed nor intended to achieve application rates and spread widths outside the parameters published in this manual.

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## **1. Overview**

### ***This Manual***

This manual explains the everyday use of the machine to the operator, including Spinner Setup and Application Rate Charts.

### ***Application***

The Marshall Multispread 9160 Fertiliser Spreader will spread a wide range of granular and non-granular fertilisers, from lime, gypsum and manures through to granulated materials like superphosphate, urea and various seeds.

The machine is fitted with a Ground Driven Feed System. The feed of fertiliser from the hopper to the spinners, is driven by the small drive wheel which runs on the trailer tyre. This tyre also acts as the feed clutch and is activated by the hydraulic cylinder, which is controlled from the tractor cab.

For machines fitted with RDS electronic controllers, see the PS Apollo 8000 Calibration and Operation guides for system information.

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## **2. Caution - For Your Safety**

### **READ BEFORE USING THE SPREADER**

Turn off the tractor engine when making adjustments to the v-belts, drive sprockets and feed door or when carrying out normal maintenance.

When servicing the gearbox, final drive sprockets and drive belts ensure that the plastic guards are re-fitted to the spreader.

Do not stand or work near the spinners while they are rotating. Do not operate the spreader within 50m of stock, property or personnel. Failure to do so can result in damage and injury.

Disconnecting the machine from the tractor drawbar when the hopper is partially empty will cause the machine to overbalance and damage the spinners.

Please take notice of following information. Each of the stickers are located on your machine.

Forward speed is not to exceed 40km/h when machine unloaded and 25km/h when loaded with product. Excess speed will increase the chances of rollovers and also effect the accuracy of the spread pattern due to a slipstream effect.

It is not recommended to operate on inclines greater than 20 degrees, as the chances of rollover are greatly increased.

Do not ride on Spreader under any circumstances.

Stay well clear of the hydraulic hoses and pipes that run the spinner and feed belt systems.

The machine is fitted with safety stickers, do not remove under any circumstances.

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## 3. *Operating Instructions*

### 3.1 *Attaching To Tractor*

Attach the spreader to the tractor drawbar securely using a high tensile pin, see Fig 1. The pin slips between the spreader drawbar hole and the drawbar tongue of the tractor. Plug the hydraulic lines into the tractor hydraulic remotes, ensuring that the hydraulic lines cannot be damaged when the machine is turning, see Fig 2.

On standard machines there are three sets of hydraulic hoses that must be connected to the tractor. The table below details the oil flow for each circuit.

Ensure oil flow from tractor is minimised when activating the hydraulic cylinder. Excess oil flow and pressure will result in damage to the cylinder seals.

Circuit	Oil Flow (L/min)
Wheel Drive Cylinder	10
Spinner Drive *	45 - 60
Steering Lock out **	10
Feedbelt ***	40

\* See section 3.3 for further information.

\*\* A single hydraulic line is required to operate the steering lock out.

\*\*\* For machines with optional hydraulic feed belt drive, including VRT controllers.

### 3.2 *Application Rates*

Application Rates are altered by changing the speed of the feed belt and feed door opening. The feed belt speed is altered by using different drive sprocket combinations located on the wheel drive arm and final drive. (See Section 6 of this manual)

The feed door opening is adjusted by the feed door shaft located at the rear of the machine and is held in place by the feed door adjuster disc and spring loaded pin. (See Fig 3)

Refer to the charts in Section 8 of this manual for correct drive sprocket and feed door settings for different fertiliser types.

The outer holes on the disc equate to 5mm of feed door movement. The inner set of holes are used for fine adjustment in application rate and equate to 2.5mm of feed door movement.

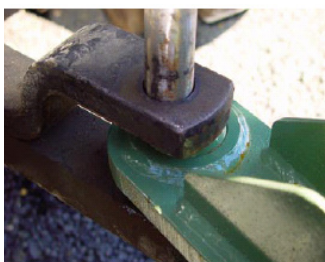


Fig 1

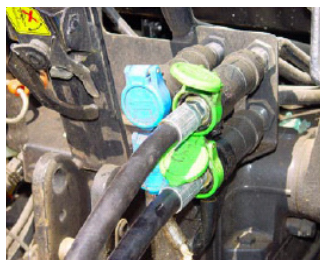


Fig 2



Fig 3

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## 3.3 Hydraulic Spinner Drive

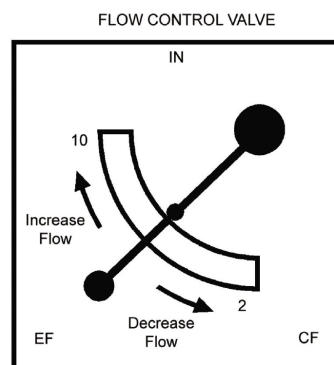
Machines that are fitted with a hydraulic spinner drive require an oil flow from the tractor according to the chart below.

To set the correct spinner speed follow this procedure:

1. Connect the two hoses to the tractor couplings - the pressure hose is the one marked **IN** on the spreader flow control valve.
2. Run the tractor until the oil has reached operating temperature and then increase the tractor engine to full throttle and adjust the spreader flow valve so that the spinners are running at 900RPM see Fig 4 below. (To check the spinner RPM you will need a rev counter.)
3. When the spinners are running at 900RPM with the tractor at full throttle, the tractor engine speed should be lowered to where the spinners drop below 700RPM. At this point make note of this lower tractor engine speed, as you can work from this engine speed up to full throttle without altering the spinners RPM. See fig 5 below.

Spinner Diameter	Oil Flow (L/min)
600mm	45
700mm	60

**Spinner Oil Flow Chart**



**Fig 4**



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## 3.4 *Steering Axle Operation*

The Marshall Multispread 9160 is equipped with a heavy duty tandem steering axle with suspension. The rear set of wheels passively steer the machine to prevent paddock and tyre damage on turning. The passive steering is locked out when the machine is reversed to prevent dangerous jack knife situations.

The rear set of tyres must be locked straight when the spreader is reversed. Hydraulic cylinders located on the rear axles lock the rear tyres in a straight position to allow safe reversing.(see position in fig 5 below). It is also recommended to have the rear wheels in position L when travelling over 25 km/h for extended periods.

**WHEN USING THE STEERING LOCK SYSTEM THE HYDRAULIC CYLINDERS MUST BE CONNECTED TO THE TRACTOR AT ALL TIMES. IF DISCONNECTED FROM THE TRACTOR IN POSITION F DAMAGE TO THE STEERING MECHANISM WILL RESULT.**

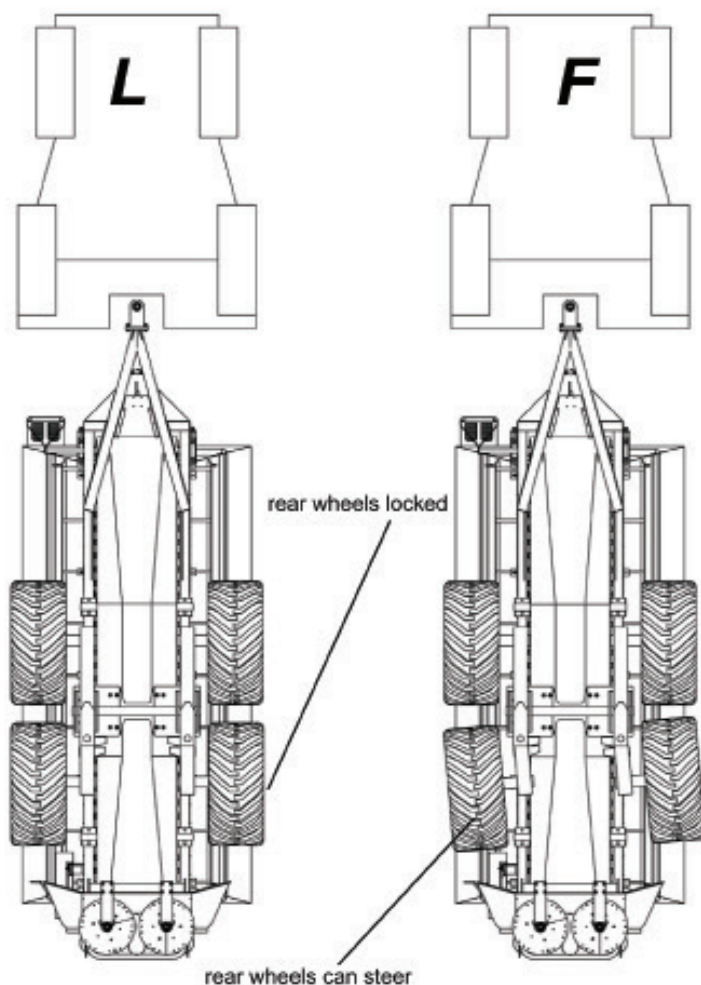


Fig 5

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## 3.4 *Steering Axle Operation*

To operate the steering lock out the hydraulic line must connected to the tractor remotes. Ensure that a maximum oil of 10 litres/min will be supplied to the steering lock out circuit. Excessive oil flow and pressure will damage the hydraulic cylinders.

Locking wheels Straight (Position L). see Fig 5

1. Drive the machine slowly forward in a straight line.
2. Activate the hydraulic circuit that the cylinders are connected to using the lever in the tractor cabin.
3. The wheels will pull into centre of the machine when the swing arm touches the stop plate the tractor relief valve will stop the oil flow locking the rear axles in position. (See Fig 6)

Steering Mode ( Position F) see Fig 5

1. Activate the hydraulic circuit that the cylinders are connected to using the lever in the tractor cabin. (you will need to move the lever in the opposite direction to the reversing procedure)
2. Pressure will be relieved from the hydraulic cylinders allowing the rear wheel to steer.

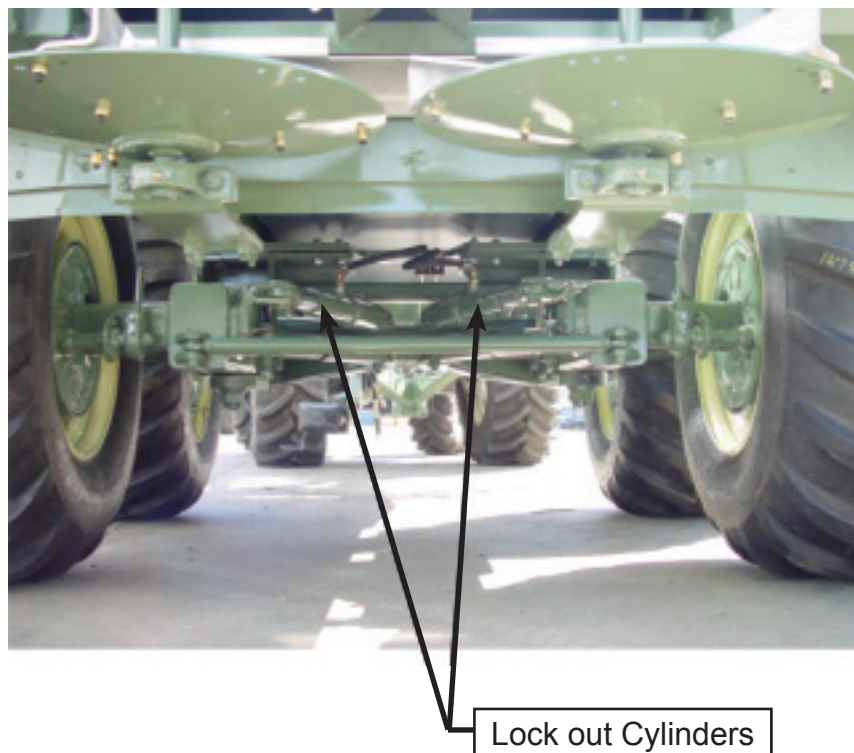


Fig 6

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## **3.5            *Width of Pass***

The Width of Pass is the distance between the centres of each run or pass in the paddock. Some initial testing is required to determine the correct width of pass for a particular material being spread. You should allow for wind conditions and fertiliser consistency.

There are three different spinner vane configurations fitted to Marshall Multispread 900 Series machines. The spinner vane design determines the width and accuracy of the machines spread pattern. Refer to Section 5 of this manual for details on the vane configuration.

It is strongly advised, for all granulated and non-granulated products, that a trial run or test is done to determine the best and most even spread width between passes, as wind conditions and product consistency may vary.

**!! CHECK SPINNER VANE CONFIGURATION BEFORE STARTING WORK !!**

## **3.6            *Starting and Stopping Work***

To start work in the paddock :

1. Ensure that the spreader is at least 50m from stock, personnel and property.
2. Engage the Wheel drive arm using the hydraulic cylinder. (NB : the wheel drive should not be engaged at speed greater than 5 km/h. Engaging at faster speeds will result in damage to the spreader feed mechanism.)
3. Turn on the Spinner Drive using the Hydraulic control switches in the tractor.
4. Begin Work.

To finish work in the paddock :

1. Turn the spinners off using the Hydraulic control switches in the tractor.
2. Slow down below 5km/h
3. Disengage the Wheel drive arm using the hydraulic cylinder.

(NB : In all circumstances when the spreader is not in work ensure that the wheel drive arm is lifted off the spreader tyre.)

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## 4. Maintenance

### 4.1 Bearings

The machine is fitted with sealed self aligning bearings, however due to the abrasive nature of fertilisers, grease must be applied regularly. There are a series of yellow stickers fixed to the machine that indicate the location of grease points and greasing intervals. The top and bottom spinner bearings must be greased once every four hours of operation.

### 4.2 Drive Chains

The Machine is fitted with roller chain drives on the wheel drive arm, counter drive and feedbelt final drive. The specifications of these chains are :

Location	Type	Qty
Wheel Drive	60-H Roller Chain - 3/4" pitch	5 ft
Counter Drive	80-H Roller Chain - 1" pitch	14 ft
Final Drive	80-H Roller Chain - 1" pitch	5 ft

### 4.3 Cleaning and Storage

After using the spreader all fertiliser should be removed from the hopper and spinner areas, then wash down the machine with a high pressure water hose.

**DO NOT USE OIL OR DIESEL NEAR THE PVC ENDLESS BELT.**

Always store the machine under cover and in a dry place. The PVC feed belt should not be exposed to prolonged periods on sunlight.

### 4.4 Gearbox Maintenance

The gearbox oil used on all 20:1 ratio gearboxes is : 85W140. Please check oil regularly, the chart below indicates filling capacity :

Please Note : All Gearboxes are labelled and have ID Plates.

Gearbox	Capacity	Output Shaft Size
Leroy Somer	1000 mL	28mm / 8mm Key
Fenner "D"	1500 mL	25mm / 8mm Key
Fenner "C"	1000 mL	22mm / 6mm Key
Rossi	1000 mL	24mm / 8mm Key

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## 4.5 *Recommended Tyre Pressures*

### CHECK TYRE PRESSURE REGULARLY

The table below details recommended spreader tyre pressures. Pressures can be adjusted to suit ground conditions, the values in the table below are a guide only.

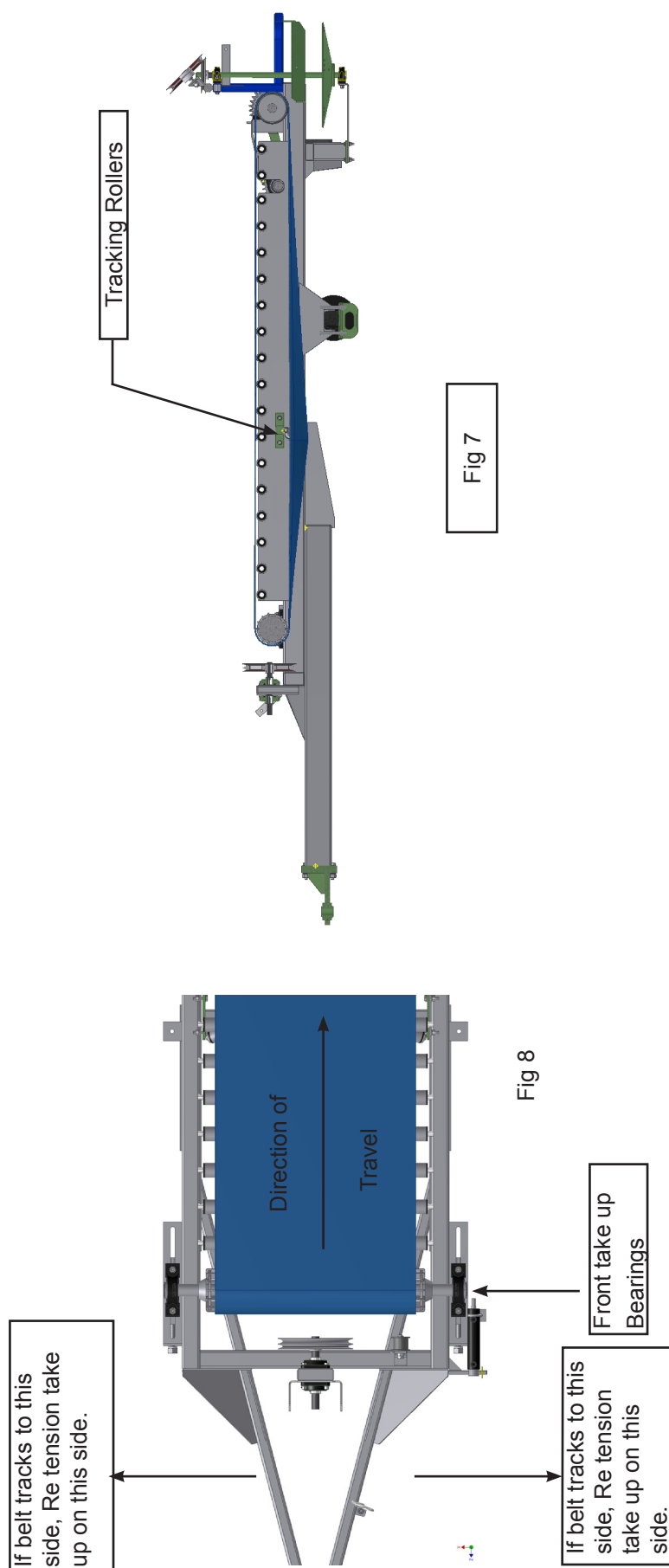
It is important that the ground drive wheel is inflated to the correct pressure as incorrect inflation can cause issues with the feed belt mechanism.

Tyre Size	Pressure (psi)	Pressure (bar)
Wheel Drive Tyres		
145x10 (800 Series)	22	1.5
185/70x13 (900 Series)	22	1.5
Spreader Tyres		
900x16	36	2.4
1100x16	36	2.4
400/60-15.5	22	1.5
14.9x24	26	1.8
16.9x28	28	1.9
18.4x28	32	2.2
23.1x26	32	2.2
500/60-22.5	22	1.5
550/60-22.5	23	1.6
600/55-26.5	25	1.7
600/60-30.5	26	1.7
650/65-30.5	24	1.6
750/60-30.5	22	1.5

## 4.6 Endless Belt System

The machine is fitted with a high quality PVC Endless Belt. This belt should be kept out of excess sunlight and away from oil and diesel. The tension of the belt is adjusted by the front take up bearings. The belt is pre-tensioned and the tracking set in the factory. The tracking rollers Fig (7) located on the underside of the chassis help the belt to track correctly. The belt may move slightly in the first few days of operation as the belt is worn in.

The correct belt tension is 3% of the overall belt length. It is important that the take up bearings are only adjusted 1/4 of a turn at a time. Excessive tension on the belt will be detrimental to belt tracking, see Fig 8.





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## 5. *Spinner Vane Setup*

### 5.1 *Multispread Spreading Performance*

There are many variables that affect the spreading performance of the Marshall Multispread. These variables include;

1. **Wind Speed and Direction.** Winds above 10 km/h influence the evenness of the spread pattern. In windy conditions it is recommended that the tractor/spreader is driven into the wind.
2. **Ground Speed.** In all cases ground speed should not exceed 25 km/h.
3. **Ground Contour.** The particles being spread up the slope will land at narrower widths and the width of pass should be reduced to compensate for this affect.
4. **In Crop Applications / Spreading in Stubble.** When spreading in standing crop or stubble the plants will dampen the flight and deflect the fertiliser to ground, narrowing the spread width.
5. **Component Wear.** Fertilisers can be abrasive which leads to component wear. It is recommended that the spinner discs and vanes are regularly checked for wear and replaced if necessary.
6. **Fertiliser Consistency.** Factors such as bulk density and particle size distribution influence the aerodynamic characteristics of the fertiliser particles. For example when spreading **Urea** it is recommended that the average particle size is greater than 3mm in diameter.

Before spreading it is recommended that a trial run is conducted on bare ground to visually inspect the evenness of the spread pattern.

For further information on spreader setup contact Roesner Pty Ltd support or your local Marshall Multispread dealer for more information.

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## 5.2 *Type A Vanes and Fertiliser Deflector*

Older model Multispread were fitted with 6 mild steel angle spinner vanes on each spinner disc. These vanes can be used to spread granulated fertilisers up to 24 metres and non-granulated products up to 10 metres.

The spinner vanes can be adjusted to spread light applications of granulated fertilisers and seeds as well as heavy rates of non granulated materials such as lime, gypsum and manures.

Each vane is attached to the spinner disc by two bolts - an inner and an outer. The outer bolt can be varied to alter the angle of the spinner vanes. see fig 9 and 10 below.

For non granulated materials the fertiliser deflector chute should be removed to prevent clogging around the spinners.

Material	Outer Bolt Position	Fertiliser Deflector Chute Fitted
Granulated Fertilisers, Grain and Seeds	A	YES
Light to Medium Applications of Non-Granulated Product - Lime/Gypsum/Manures	A	NO
Heavy Applications of Non-Granulated Product - Lime/Gypsum/Manures	B	NO

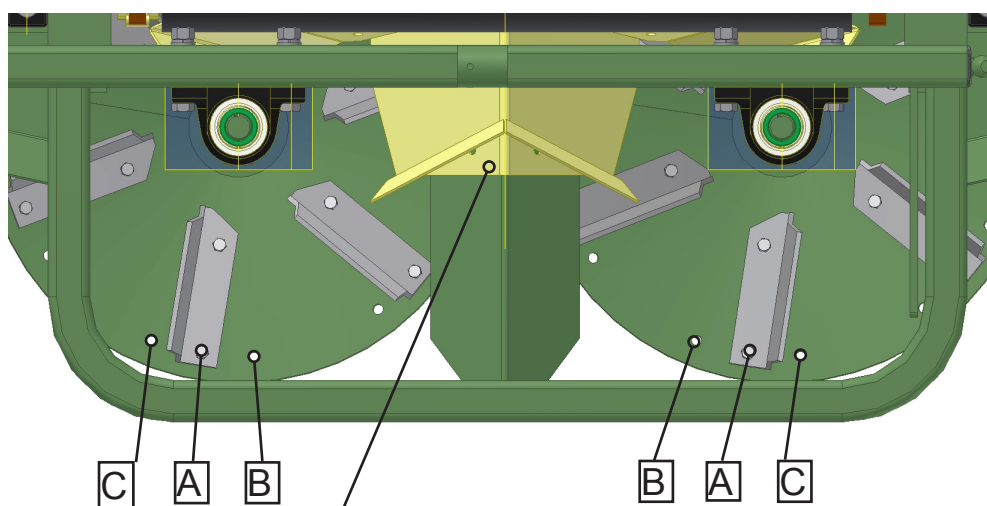


Fig 9

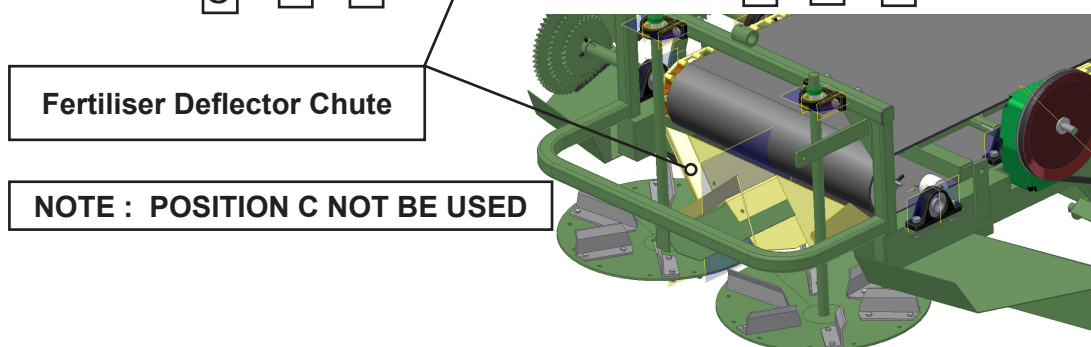


Fig 10



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## 5.3 *Type B Vanes and Fertiliser Deflector*

800 Series Multispreads from 2006 production are fitted with 3 spinner vanes, pressed in a “C” channel and manufactured from 5mm Mild Steel. A simplified fertiliser deflector is also fitted.

The pressed “C” channel vanes can be used to spread granulated fertiliser up to 28 metres and non-granulated products up to 14m.

The pitch or angle of each spinner vane can be altered to suit different types of fertiliser application rates. However a general setting to suit granulated fertilisers and non-granulated products is to have 3 vanes on each spinner on three different angles. This is done by setting each vane on different outer holes on the spinner disc - see Fig 11 below.

The Fertiliser Deflector should be fitted for both granulated and non-granulated products.

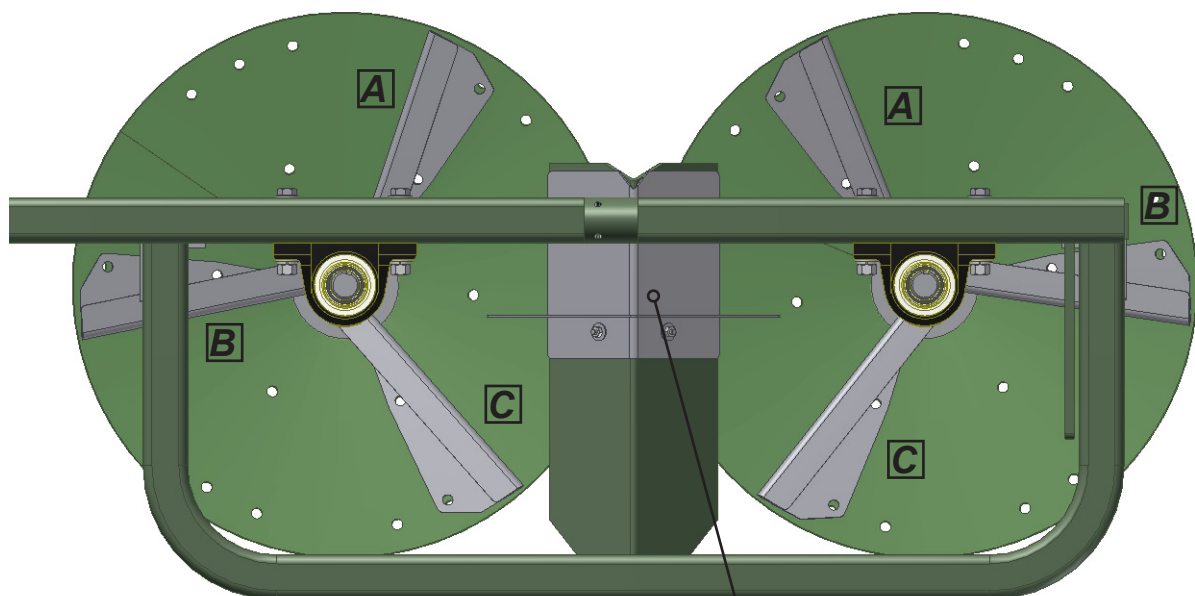


Fig 11

Vane Position	Outer Bolt Position
Position A	Centre Hole
Position B	Clockwise Hole
Position C	Counter Clockwise Hole

Fertiliser Deflector Chute

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## 5.4 *Type C Vanes and Fertiliser Deflector*

900 Series Multispreads from 2009 production were fitted with 3 700mm diameter spinners, with convex centre dish. 6 spinner vanes, pressed in a “C” channel and manufactured from 5mm mild steel are fitted to each spinner. see Fig 12 below.

### **All granulated Fertilizers, Seed and Dry Lime**

For the best spread widths and uniformity it is recommended that the Fertilizer Deflector Chute be fitted to the fixed divider above the spinners and each spinner vane be bolted to the disc in the middle outer hole.

### **Spinner Speed - 800 RPM**

#### **Spread widths between passes**

Seed - the spread width will depend on the size of seed.

Urea (approx 750kg/m<sup>3</sup>) 22m to 30m

Compound Fertilizers (approx 950kg/m<sup>3</sup>) 24m to 32m

Superphosphate (approx 1150kg/m<sup>3</sup>) 26m to 34m

Dry Lime (approx 1000kg/m<sup>3</sup>) 10m to 12m

### **Non Granulated Products - Lime, Gypsum and Manures**

Non-granulated products that may be lumpy and damp are generally applied at higher rates, it is recommended that the Fertilizer Deflector Chute is removed leaving only the fixed divider above the spinners. Each spinner vane is to be bolted to the disc in the middle outer hole.

### **Spinner Speed 700 to 800 RPM**

#### **Spread widths between passes**

Non-granulated products - 6m to 14m

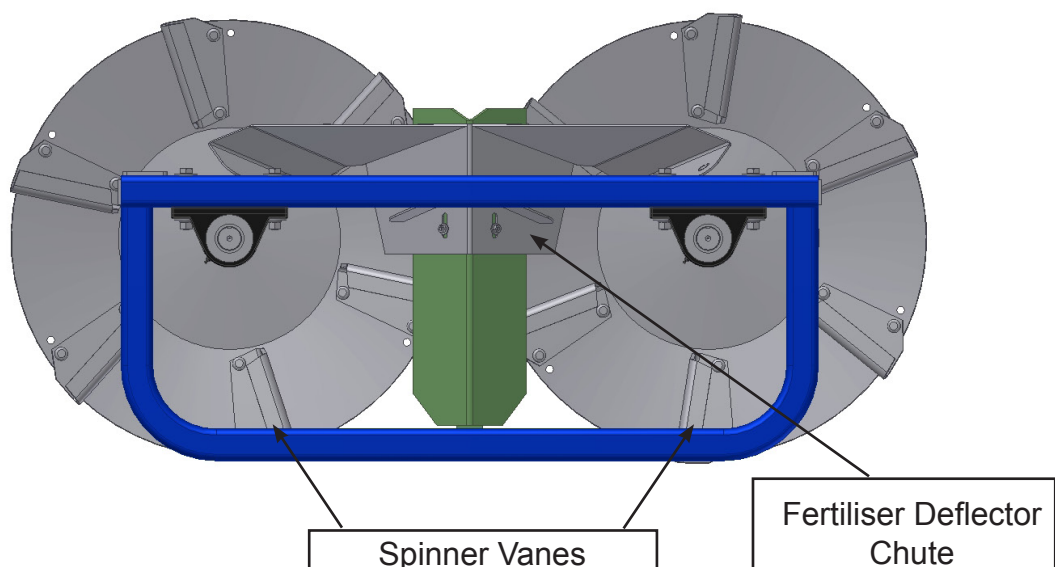
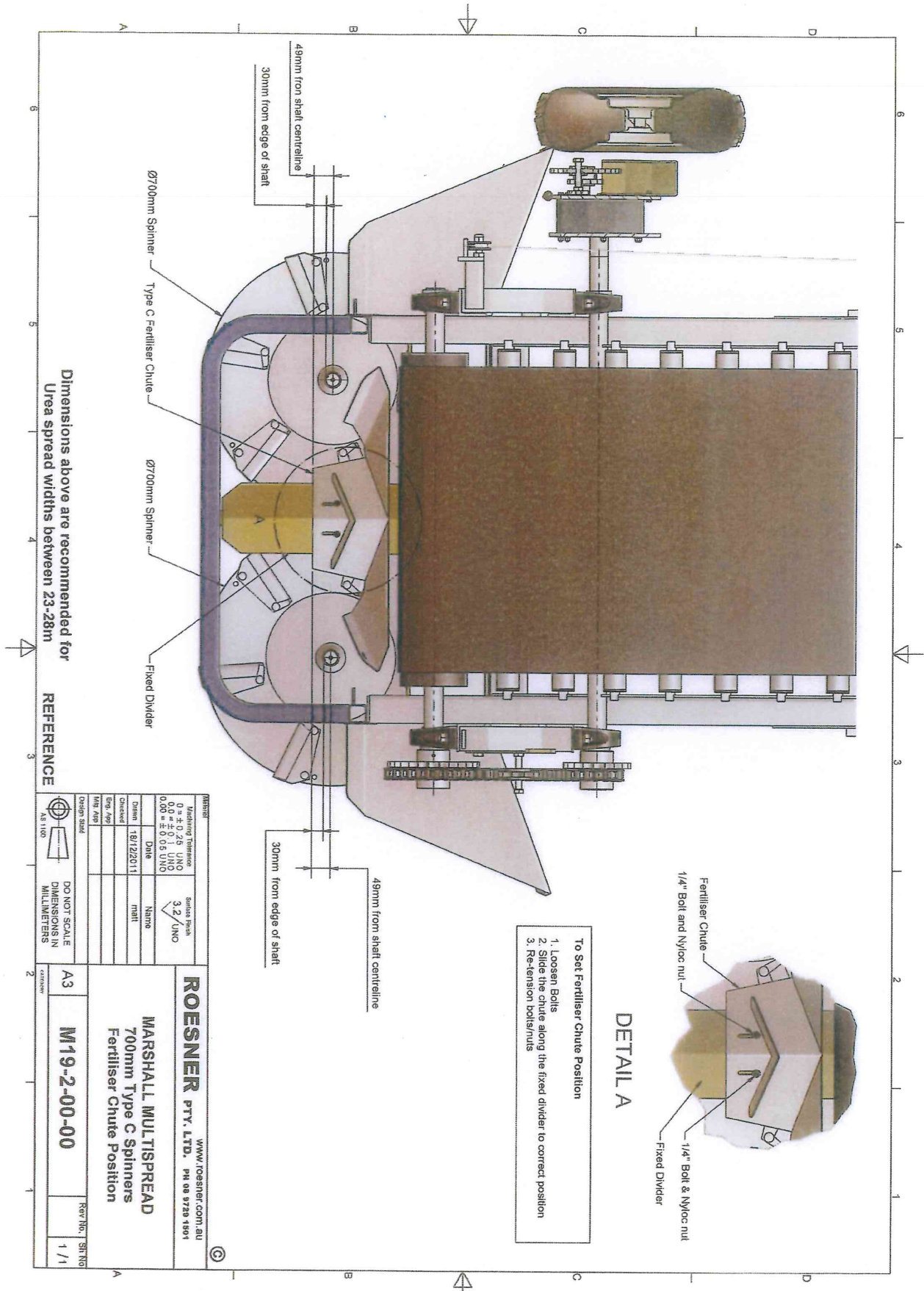


Fig 12

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## 5.5 *Type D/D2 Spinner, Vanes and Fertiliser Deflector*

Multispreads from 2012 production are fitted with two 600mm diameter spinners. There are two long vanes and two short vanes fitted to the spinner discs. The long vanes have an effective diameter of 700mm and are normally in the radial position on the disc. The short vanes have an effective diameter of 600mm, their angular position is adjusted to the spreading width of different materials.

A two part fertiliser chute consisting of a top deflector assembly and lower baffle plate is used to guide fertiliser and screened product onto the spinners.

For lumpy non granulated product the fertiliser chute may have to be removed.

In 2016 the Type D2 vane, spinner and chute upgrade was launched. The Type D2 configuration should be fitted when spreading Urea and other non-granulated fertilisers. For more information on the Type D/D2 vane configuration see Type D/D2 Spinner Supplement at the back of this manual.



Type D configuration (left), Type D2 configuration (right)



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## 6. *Drive Sprocket Settings*

The machine is fitted with four sets of feedbelt drive sprockets, two on each side of the machine, see Fig 13 and 14 below. These sprockets are used to alter the feedbelt gearing to suit the different rates and types of fertilisers.

A common drive chain runs between the sprocket sets. Release the spring loaded jockey to move the chain position.



Fig 13

### **SIDE A - WHEEL DRIVE**

Possible Combinations

14 tooth driving 30 tooth  
(outside set)

30 tooth driving 14 tooth  
(inside set)



Fig 14

### **SIDE B - FINAL DRIVE**

Possible Combinations

15 tooth driving 30 tooth  
(outside set)

20 tooth driving 28 tooth  
(inside set)

**!! REPLACE FINAL DRIVE GUARD AFTER ALTERING FINAL DRIVE RATIO !!**

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## 7. *Application Rate Calculations*

Application rates contained in this book are to be used as a guide only. The following can be used if you wish to check the application rate of the particular material that you are spreading.

1. Check the width of pass for the most even spread of material you will be using.  
Spreading Width Guide:  
Urea 16 - 28m  
Superphosphate 16 - 30m  
Lime and Gypsum 6 - 14m
2. Obtain the circumference of the wheel drive tyre.  
 $\text{Circumference} = \text{diameter} \times 3.141$   
example: jockey tyre diameter = 0.47m  
 $\text{Circumference} = 0.47 \times 3.141$   
 $= 1.476\text{m}$
3. Put a small quantity of the material to be spread in the hopper and ensure that the material is packed evenly around the feed door opening.
4. Rotate the wheel drive tyre until the material is falling evenly off the feedbelt.  
Note: The material must be falling evenly off the feedbelt to give an accurate reading.
5. Place a cardboard box or tarpaulin under the spinners to catch the material off the feedbelt.
6. Rotate the wheel drive wheel 10 times and then weigh the material caught off the feedbelt.
7. Multiply the distance travelled in the 10 turns of the wheel drive tyre by the width of pass.  
example:  $1.476 \times 10 = 14.76$  metres.  
Width of pass = 16m  
Then multiply  $16 \times 14.76 = 236.128\text{m}^2$
8. Divide the weight of the material collected by the square metres of spread over 10 turns of the wheel drive.  
example : 2.5kg of material divided by 236.128 = 0.0106  
 $0.0106 \times 10000$  to convert to kg/ha.  
 $= 106 \text{ kg/ha.}$

To vary spread rates make adjustments to the drive sprocket settings and the opening of the feed door.

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## 8. Application Rate Charts

### 8.1 Type Of Material - Lime, Gypsum and Manure - 1000kg/m<sup>3</sup>

Due to the variation of weight per cubic metre between the different types of materials the chart below is intended as a guide only.

1. Changing the drive sprocket settings.
2. Adjusting the feed door openings.
3. Varying the width of pass. (The closer the pass the heavier the applications.)

All values are measured in kg/ha. To convert to lb/acre deduct 10% from each value.

DRIVE SPROCKET SETTINGS	DOOR OPENING (mm)	WIDTH OF PASS			
		6	8	10	12
SIDE A 14 TOOTH DRIVING 30 TOOTH	50	310	232	186	155
	75	479	359	288	240
	100	639	480	384	320
	125	780	585	468	390
SIDE B 15 TOOTH DRIVING 30 TOOTH	150	975	731	585	487
	175	1138	853	683	569
	200	1300	975	780	650

SIDE A 14 TOOTH DRIVING 30 TOOTH	50	457	343	274	228
	75	696	522	418	348
	100	928	696	557	464
	125	1102	827	661	19
SIDE B 20 TOOTH DRIVING 28 TOOTH	150	1378	1033	827	689
	175	1608	1206	965	804
	200	1837	1378	1102	919

SIDE A 30 TOOTH DRIVING 14 TOOTH	50	1471	1103	882	735
	75	2215	1661	1329	1107
	100	2953	2215	1772	1477
	125	3532	2649	2119	1766
SIDE B 15 TOOTH DRIVING 30 TOOTH	150	4415	3311	2649	2207
	175	5151	3863	3091	2575
	200	5887	4415	3532	2943

SIDE A 30 TOOTH DRIVING 14 TOOTH	50	2034	1525	1220	1017
	75	3071	2303	1843	1536
	100	4095	3071	2457	2047
	125	5050	3787	3030	2525
SIDE B 20 TOOTH DRIVING 28 TOOTH	150	6312	4734	3757	3156
	175	7364	5523	4418	3682
	200	8416	6312	5050	4208

# MARSHALL MULTISPREAD 916T

## 8.2 Type Of Material - Granular Fertiliser - 1000kg/m<sup>3</sup>

Due to the variation of weight per cubic metre between the different types of materials the chart below is intended as a guide only.

1. Changing the drive sprocket settings.
2. Adjusting the feed door openings.
3. Varying the width of pass. (The closer the pass the heavier the applications.)

All values are measured in kg/ha. To convert to lb/acre deduct 10% from each value

DRIVE SPROCKET	DOOR OPENING	WIDTH OF PASS (M)						
SETTINGS	(mm)	18	20	22	24	26	28	30
SIDE A 14 TOOTH DRIVING 30 TOOTH	20	37	33	30	28	26	24	22
	25	46	41	38	35	32	30	28
	30	54	49	44	41	37	35	32
	35	63	57	52	47	44	41	38
	40	73	66	60	55	51	47	44
	45	82	74	67	62	57	53	49
SIDE B 15 TOOTH DRIVING 30 TOOTH	50	93	84	76	70	64	60	56
	55	102	92	83	77	71	66	61
	60	112	101	92	84	78	72	67
	65	122	110	100	92	84	78	73
	70	130	117	106	98	90	84	78
	75	139	125	114	104	96	89	83

SIDE A 14 TOOTH DRIVING 30 TOOTH	25	59	53	48	44	41	38	35
	30	73	66	60	55	51	47	44
	35	85	77	70	64	59	55	51
	40	100	90	82	75	69	64	60
	45	113	102	92	85	78	73	68
	50	127	114	104	95	88	82	76
SIDE B 20 TOOTH DRIVING 28 TOOTH	55	140	126	115	105	97	90	84
	60	155	140	127	116	107	100	93
	65	168	151	137	126	116	108	101
	70	180	162	147	135	125	116	108
	75	193	174	158	145	134	124	116

SIDE A 30 TOOTH DRIVING 14 TOOTH	25	194	175	159	146	134	125	116
	30	239	215	196	179	165	154	143
	35	279	251	228	209	193	179	167
	40	329	296	269	247	228	212	197
	45	370	333	303	278	256	238	222
	50	411	370	336	308	285	264	247
SIDE B 15 TOOTH DRIVING 30 TOOTH	55	453	408	371	340	314	291	272
	60	501	451	410	376	347	322	301
	65	543	489	444	407	376	349	326
	70	586	527	479	440	406	377	352
	75	628	565	514	471	435	404	377



# MARSHALL MULTISPREAD 916T

## 8.3 Type Of Material - Granular Superphosphate - 1150 kg/m<sup>3</sup>

Due to the variation of weight per cubic metre between the different types of materials the chart below is intended as a guide only.

1. Changing the drive sprocket settings.
2. Adjusting the feed door openings.
3. Varying the width of pass. (The closer the pass the heavier the applications.)

All values are measured in kg/ha. To convert to lb/acre deduct 10% from each value.

DRIVE SPROCKET	DOOR OPENING	WIDTH OF PASS							
SETTINGS	(mm)	20	22	24	26	28	30	32	34
SIDE A 14 TOOTH DRIVING 30 TOOTH	20	38	35	32	29	27	25	24	22
	25	47	43	39	36	34	31	29	28
	30	57	52	48	44	41	38	36	34
	35	66	60	55	51	47	44	41	39
	40	76	69	63	58	54	51	48	45
	45	85	77	71	65	61	57	53	50
	50	95	86	79	73	68	63	59	56
	55	105	95	88	81	75	70	66	62
	60	116	105	97	89	83	77	73	68
	65	126	115	105	97	90	84	79	74
SIDE B 15 TOOTH DRIVING 30 TOOTH	70	134	122	112	103	96	89	84	79
	75	144	131	120	111	103	96	90	85

SIDE A 14 TOOTH DRIVING 30 TOOTH	25	61	55	51	47	44	41	38	36
	30	75	68	63	58	54	50	47	44
	35	88	80	73	68	63	59	55	52
	40	104	95	87	80	74	69	65	61
	45	117	106	98	90	84	78	73	69
	50	133	121	111	102	95	89	83	78
SIDE B 20 TOOTH DRIVING 28 TOOTH	55	146	133	122	112	104	97	91	86
	60	161	146	134	124	115	107	101	95
	65	174	158	145	134	124	116	109	102
	70	187	170	156	144	134	125	117	110
	75	200	182	167	154	143	133	125	118

SIDE A 30 TOOTH DRIVING 14 TOOTH	25	201	183	168	155	144	134	126	118
	30	247	225	206	190	176	165	154	145
	35	289	263	241	222	206	193	181	170
	40	341	310	284	262	244	227	213	201
	45	384	349	320	295	274	256	240	226
	50	422	384	352	325	301	281	264	248
SIDE B 15 TOOTH DRIVING 30 TOOTH	55	469	426	391	361	335	313	293	276
	60	518	471	432	398	370	345	324	305
	65	561	510	468	432	401	374	351	330
	70	607	552	506	467	434	405	379	357
	75	650	591	542	500	464	433	406	382

# MARSHALL MULTISPREAD 916T

## 8.4 Type Of Material - Granular Urea - 750 kg/m<sup>3</sup>

Due to the variation of weight per cubic metre between the different types of materials the chart below is intended as a guide only.

1. Changing the drive sprocket settings.
2. Adjusting the feed door openings.
3. Varying the width of pass. (The closer the pass the heavier the applications.)

All values are measured in kg/ha. To convert to lb/acre deduct 10% from each value.

DRIVE SPROCKET	DOOR OPENING	WIDTH OF PASS (M)						
SETTINGS	(mm)	18	20	22	24	26	28	30
SIDE A 14 TOOTH DRIVING 30 TOOTH								
	20	27	24	22	20	19	17	16
	25	34	31	28	26	24	22	20
	30	41	37	34	31	28	26	25
	35	50	45	41	38	35	32	30
	40	60	54	49	45	42	39	36
	45	68	61	56	51	47	44	41
	50	75	68	61	56	52	48	45
	55	82	74	67	62	57	53	49
	60	92	83	75	69	64	59	55
SIDE B 15 TOOTH DRIVING 30 TOOTH	65	100	90	82	75	69	64	60
	70	109	98	89	82	75	70	65
	75	117	105	96	88	81	75	70

SIDE A 14 TOOTH DRIVING 30 TOOTH	20	39	35	32	29	26	24	22
	25	49	44	40	37	34	32	29
	30	61	55	50	46	42	39	37
	35	71	64	58	53	49	46	43
	40	87	78	71	65	60	56	52
	45	98	88	80	74	68	63	59
	50	106	95	87	80	73	68	64
	55	117	105	96	88	81	75	70
	60	131	118	107	98	91	84	79
	65	142	128	116	107	98	91	85
SIDE B 20 TOOTH DRIVING 28 TOOTH	70	154	139	126	116	107	99	92
	75	165	149	135	124	114	106	99

SIDE A 30 TOOTH DRIVING 14 TOOTH	20	128	115	105	95	87	79	73
	25	160	144	131	120	111	103	96
	30	205	185	168	154	142	132	123
	35	240	216	196	180	166	154	144
	40	276	248	226	207	191	177	166
	45	311	280	254	233	215	200	187
	50	345	311	282	259	239	222	207
	55	380	342	311	285	263	244	228
	60	423	381	346	317	293	272	254
	65	458	412	375	344	317	294	275
SIDE B 15 TOOTH DRIVING 30 TOOTH	70	490	441	401	368	339	315	294
	75	525	473	430	394	363	338	315

# MARSHALL MULTISPREAD 916T

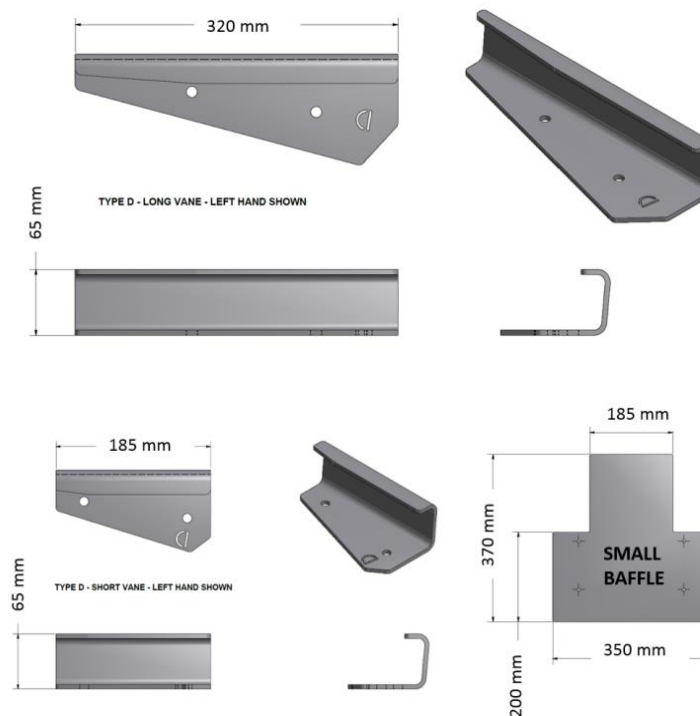
## Marshall Multisread – Type D/D2 Spinner Vane Setup Supplement

### Lime, Gypsum and Non-Granulated Fertilisers



When spreading lime, gypsum, dolomite, manure, mulch and sulphate of ammonia, two Type D short and two Type D long vanes should be fitted to each spinner. The short chute baffle should also be fitted.

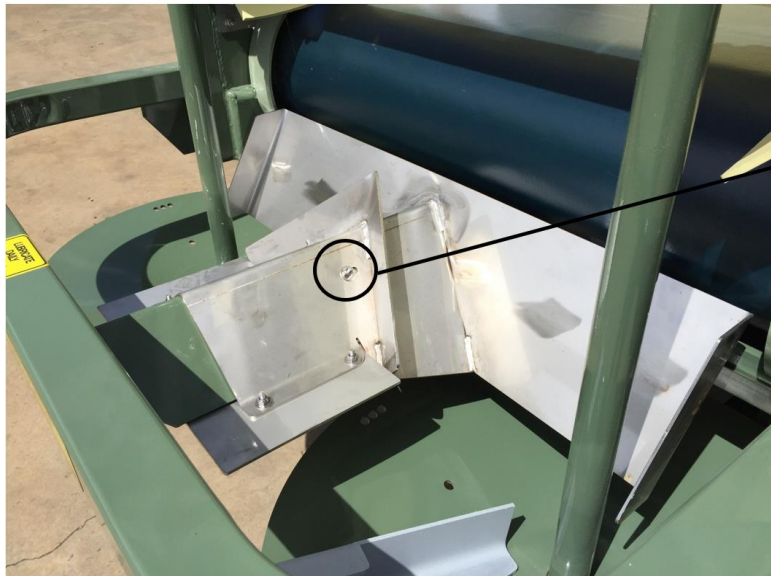
The Type D vanes are shown fitted to the spinner above. Overall dimensions of the Type D vanes and short baffle are shown below.



# MARSHALL MULTISPREAD 916T

## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Lime, Gypsum and Non-Granulated Fertilisers – Chute Setup



Feedbelt

→  
Bolt in rear hole  
(toward back of  
spreader)

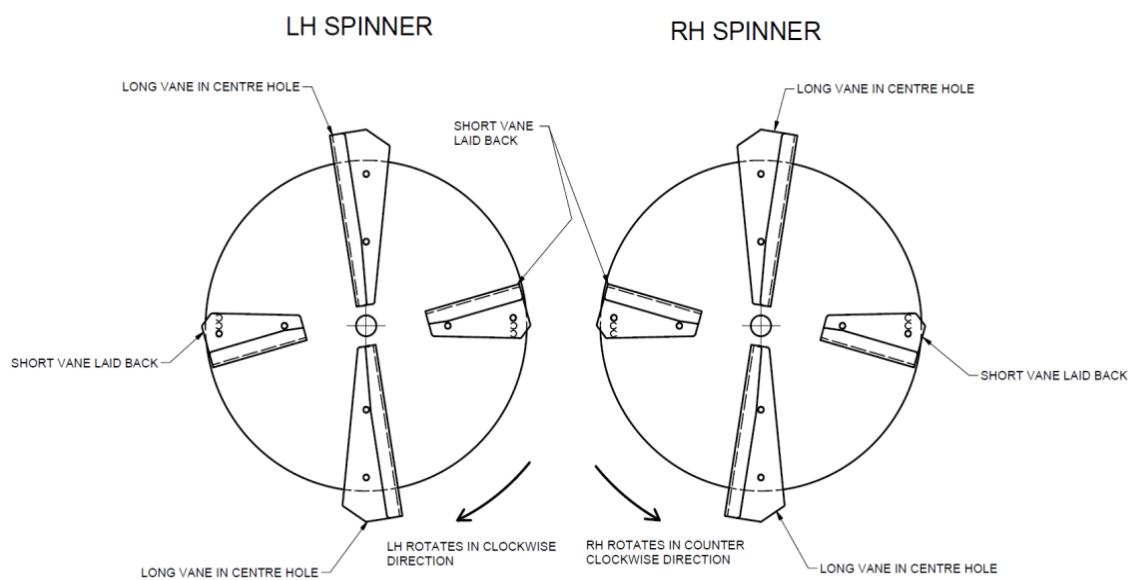
Fertiliser chute should be installed on fixed divider plate with the small baffle bolted on the underside of the fertiliser chute as shown. (M6 x 25mm bolt/nyloc nut)

The fertiliser chute should be set as close to the feedbelt as possible in the rear hole in the chute. Move the chute by undoing the central bolts and sliding the chute on the fixed divider.

# MARSHALL MULTISPREAD 916T

## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Lime, Gypsum and Non-Granulated Fertilisers – Vane Setup



Long Vane on LH Spinner



Long Vane on RH Spinner



Short Vane on RH Spinner

# MARSHALL MULTISPREAD 916T

## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Lime, Gypsum and Non-Granulated Fertilisers – Factors that affect Spread Pattern

It is important that the following variables are well understood prior to fertiliser application. Operational adjustments maybe required to maintain an even spread pattern to optimise fertiliser placement. Agronomic factors such as soil type, background soil nutrient levels and seasonal conditions should also be considered prior to spreading and setting application rates. Regular soil sampling is essential to understanding crop nutrient requirements. **Before starting work it is recommended that a short trial run over bare ground is undertaken to visually inspect the spread pattern. Width of pass should be adjusted in order to maintain an even spread pattern.**

#### 1. Spinner Speed

Nominal Spinner speed for spreading Lime, Gypsum, Manure and SOA is 900 RPM. For finer materials reducing the spinner speed to 700 RPM may improve the spread pattern as less material sucked in behind the spreader by the air flow caused by the rotation disc. When spreading, monitor the spinner speed using the tachometer provided with the spreader.

#### 2. Wind Speed and Direction

Fertiliser particles have relatively small diameters and masses, and as such their ballistic trajectories are influenced by wind speed and direction. Wind Conditions must be taken into account when choosing the width of pass in the paddock. It is recommended that spreading is carried out in still conditions with wind speeds no greater than 10 km/h. When spreading in a cross wind, the width of pass should be reduced to maintain a consistent overlap and ensure the accuracy of the spread distribution. Spreading with the wind may increase the spread width however the accuracy of the spread pattern maybe compromised. Spreading into the wind will ensure an even distribution but the overall width maybe reduced.

#### 3. Fertiliser Consistency

Fertiliser properties such as particle size distribution and bulk density will vary depending on where the product is sourced from and environmental factors such as humidity and moisture content. Finer particles have smaller masses and as such they don't spread as far as larger heavier particles. It is important to consider particle size and bulk density prior to selecting the spread width in the field.

#### 4. Component Wear

Worn spinner vanes and discs compromise the performance of the spreader. It is recommended that the vanes are kept clean and checked for wear on a regular basis. Vanes should be replaced if wear is visible.

#### 5. Field Conditions

Spreading in stubble and on slopes will reduce the effective spread width of the spreader.



# MARSHALL MULTISPREAD 916T

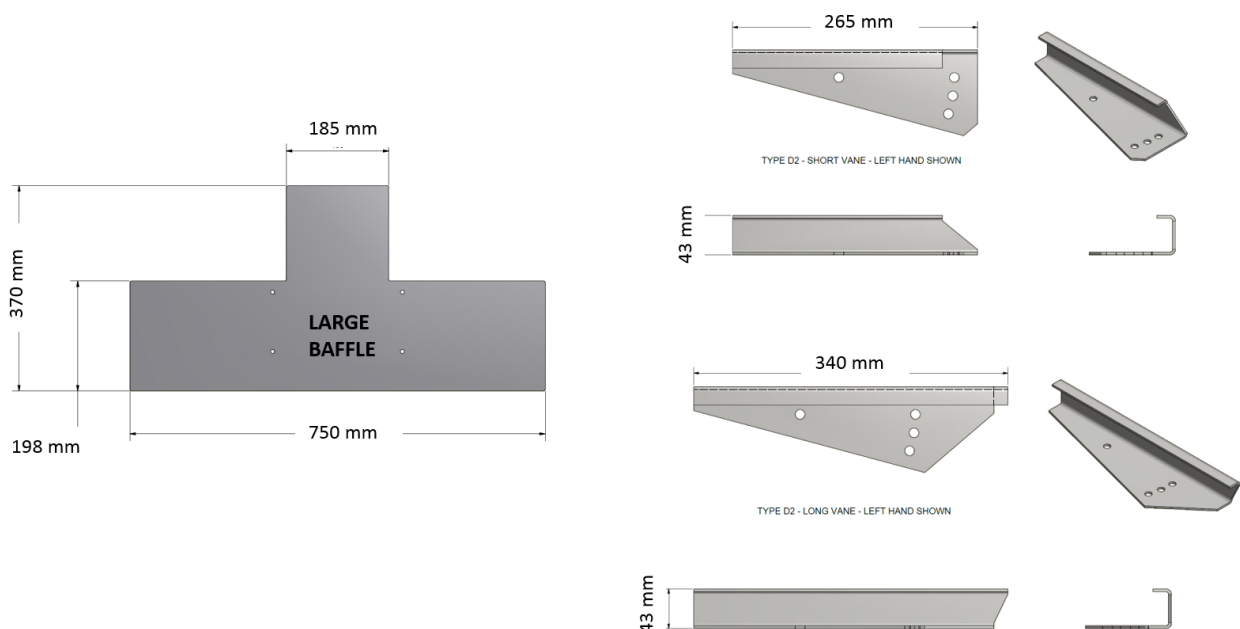
## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Urea, Superphosphate and other Granular Fertilisers



When spreading Urea, Superphosphate and other granulated fertilisers two Type D2 short and two Type D2 long vanes should be fitted to each spinner. The large chute baffle should also be fitted.

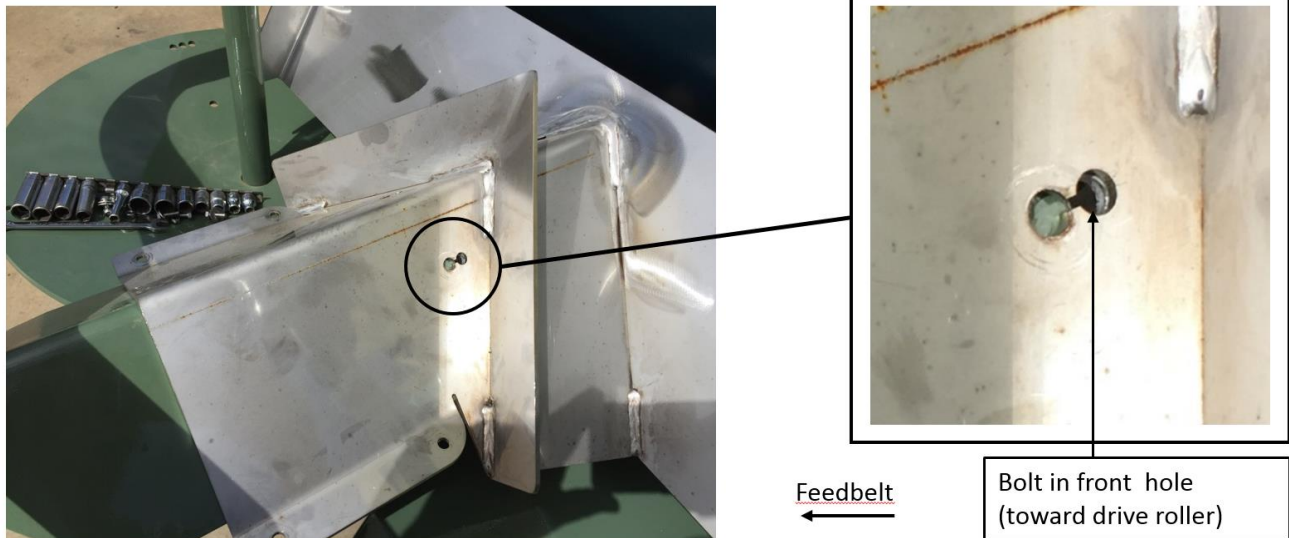
The Type D2 vanes are shown fitted to the spinner above. Overall dimensions of the Type D2 vanes and long baffle are shown below.



# MARSHALL MULTISPREAD 916T

## Marshall Multisread – Type D/D2 Spinner Vane Setup Supplement

### Urea, Superphosphate and other Granular Fertilisers - Chute Setup



Fertiliser chute should be installed on fixed divider plate with the large baffle bolted on the underside of the fertiliser chute. (M6 x 25mm bolt/nyloc nut)

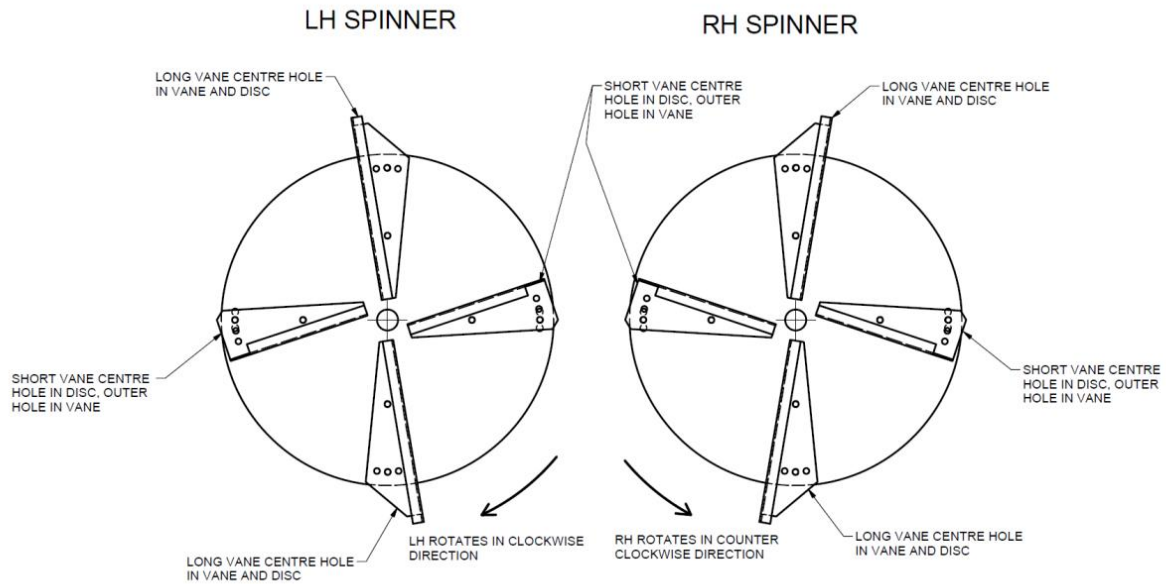
The fertiliser chute should be set away from feedbelt as possible in the front hole in the chute. Move the chute by undoing the central bolts and sliding the chute on the fixed divider.



# MARSHALL MULTISPREAD 916T

## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Urea, Superphosphate and other Granular Fertilisers - Vane Setup



Long Vane on LH Spinner



Long Vane on RH Spinner



Short Vane on LH Spinner



Short Vane on RH Spinner

# MARSHALL MULTISPREAD 916T

## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Urea, Superphosphate and other Granulated Fertilisers – Factors that affect Spread Pattern

It is important that the following variables are well understood prior to fertiliser application. Operational adjustments maybe required to maintain an even spread pattern to optimise fertiliser placement. Agronomic factors such as soil type, background soil nutrient levels and season conditions should also be considered prior to spreading and setting application rates. Regular soil sampling is essential to understanding crop nutrient requirements. **Before starting work it is recommended that a short trial run over bare ground is undertaken to visually inspect the spread pattern. Width of pass should be adjusted in order to maintain an even spread pattern.**

#### 1. Spinner Speed

Nominal Spinner speed for spreading all granulated fertilisers is 900 RPM. Variation in spinner speed compromised the width and accuracy of the spread pattern. When spreading, monitor the spinner speed using the tachometer provided with the spreader.

#### 2. Wind Speed and Direction

Fertiliser particles have relatively small diameters and masses, and as such their ballistic trajectories are influenced by wind speed and direction. Wind Conditions must be taken into account when choosing the width of pass in the paddock. It is recommended that spreading is carried out in still conditions with wind speeds no greater than 10 km/h. When spreading in a cross wind, the width of pass should be reduced to maintain a consistent overlap and ensure the accuracy of the spread distribution. Spreading with the wind may increase the spread width however the accuracy of the spread pattern maybe compromised. Spreading into the wind will ensure an even distribution but the overall width maybe reduced.

#### 3. Fertiliser Consistency

Fertiliser properties such as particle size distribution and bulk density will vary depending on where the product is sourced from and environmental factors such as humidity and moisture content. Finer particles have smaller masses and as such they don't spread as far as larger heavier particles. It is important to consider particle size and bulk density prior to selecting the spread width in the field.

#### 4. Component Wear

Worn spinner vanes and discs compromise the performance of the spreader. It is recommended that the vanes are kept clean and checked for wear on a regular basis. Vanes should be replaced if wear is visible.

#### 5. Field Conditions

Spreading in stubble and on slopes will reduce the effective spread width of the spreader.

# MARSHALL MULTISPREAD 916T

## Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

### Type D/D2 Chute Reference Dimensions



To check the chute position relative to the spinner shafts :

- Place straight edge between spinner shafts
- Measure from the inside edge of the straight edge to the end of the chute as shown

187mm : Lime, Gypsum and Non-Granulated Fertilisers  
197mm : Urea and Granulated Fertilisers