

Marshall Multispread

Service and Technical Support

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945TL 960TL 980T 910T 912T 914T

Operators Manual



Serial No:

Vee Belt Sizes	
Location	Belt Size
PTO Drive	
Spinner Drive	

Status	Released	Author	KR
Revision	1.1	Date	20/04/16
Doc No:	900-REF-OPM-001	App by	MKR

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 945TL, 960TL, 980T, 910T 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.

2. Caution - For Your Safety

READ BEFORE USING THE SPREADER

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

After 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. Safety stickers are located on your machine for further reference.

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

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

Do not ride on the 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.

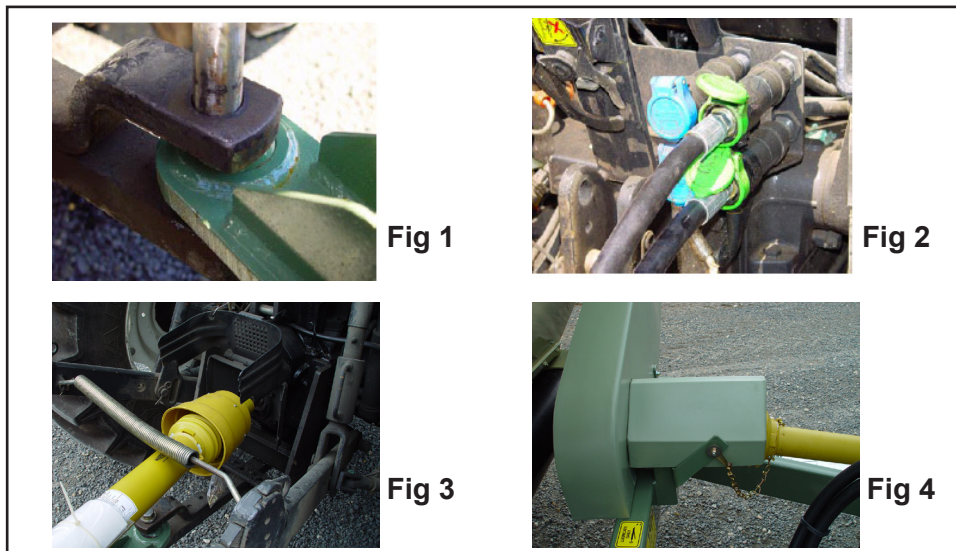
3. Operating Instructions

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 two sets of hydraulic hoses, one set activates the hydraulic cylinder used to engage the ground drive system. The second set provides hydraulic power to the spinner drive circuit. On machines with optional hydraulic feedbelt drive a third set of hoses is fitted. (See 3.3)

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.



3.2 PTO Drive Machines (Standard Equipment up to 2008 Manufacture)

Attach the PTO shaft to the tractor as shown in Fig 3 and 4. Ensure that the female spline on the PTO shaft is firmly fitted to the tractor PTO and the locking pin is engaged.

The PTO is fitted with a safety chain, ensure the chain is fastened to the poly guard retaining lugs as shown in the photo above.

Machines are supplied with 540 or 1000 RPM PTO drives or optional dual speed PTO. The table below details the correct gearing and RPM for each drive setup.

PTO Config.	Pulley - PTO	Pulley - Side Shaft	PTO Spline Size	Spinner RPM
540 RPM	12 x 2B	7 x 2B	6 spline	900 RPM
1000 RPM	7 x 2B	7 x 2B	20 or 21 spline	900 RPM
Dual - 540 RPM	12 x 1C	8 x 1C	6, 20 or 21 spline	900 RPM
Dual - 1000 RPM	10 x 1C	10 x 1C	6, 20 or 21 spline	900 RPM

Ensure correct PTO gearing and PTO RPM before starting work.

3.3 *Hydraulic Spinner Drive* (Standard Equipment from 2009 Manufacture)

IMPORTANT NOTE: Refer to your tractor operating manual or tractor dealer / service department for the recommended hydraulic connections to ensure continuous hydraulic flow rate of 45 to 72 L/min

Machines that are fitted with a hydraulic spinner drive require an oil flow from the tractor according to the chart below. Exceeding the recommended maximum spinner speed may cause oil seal failure and reduce the service life of the hydraulic motors.

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 the desired RPM see Fig 5 below. (To check the spinner RPM you will need a rev counter.)
3. When the spinners are running at the 900 RPM 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 Oil Flow Chart

Spinner Diameter	Oil Flow (L/min)	RPM
600mm	45	900
700mm	72	900

Spinner Oil Flow Chart

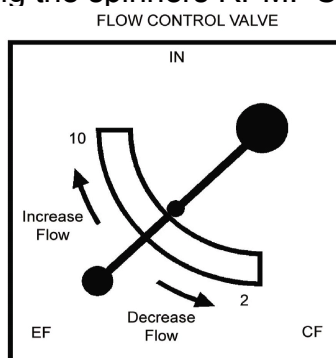


Fig 5

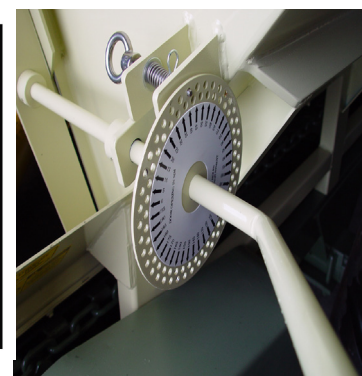


Fig 6

3.4 *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 6)

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.

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 PTO or Hydraulic control switches in the tractor.
4. Begin Work.

To finish work in the paddock :

1. Turn the spinners off using the PTO or 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 trailer tyre. When transporting the machine over long distances it is recommended that the wheel drive arm is fastened to the hopper with a suitable chain and 'D' shackle.

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. It is important that the top and bottom spinner bearings are greased once every four hours of operation.

4.2 **Drive Chains**

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

Location	Type	Qty
Wheel Drive	60-H Roller Chain - 3/4" pitch	5 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. The gearbox capacity is located at the rear of the machine. 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

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 CC180 Spinner Drive Belt - PTO Driven Spinners Only

CHECK FOR CORRECT V-BELT ALIGNMENT AND TENSION

The V-Belt should clear the left hand spinner pulley by approx 3 to 4mm (Fig 7) - adjust this by moving the side shaft pulley on the side shaft.

The tension pulley should just clear the V-Belt by about 2mm near the right hand spinner pulley (Fig 8) - adjust the angle at the tension pulley mount (Fig 9).

For the correct V-Belt tension see figure (10), once tension has been taken up there should be approximately 40mm from the top of the V-Belt to the top of the side shaft as shown. (Fig 10). To adjust tension loosen off the tension pulley shaft nut (Fig 6) then tension the adjuster (Fig 11).

Important Note: ENGAGING TRACTOR PTO DRIVE.

Before engaging the tractor PTO drive, the tractor engine should be idling at the lowest possible engine speed. Engage the PTO and then bring the tractor engine up to normal working RPM.

Important Note: 540/1000 RPM PTO GEARING

The correct spinner speed is between 700 and 900 RPM. If the PTO gearing is incorrect the spinners will over-rev and the spinner V-Belt may be dislodged from the rear pulleys. See Section 3.2 of this book for more information.

Fig 6 & 7

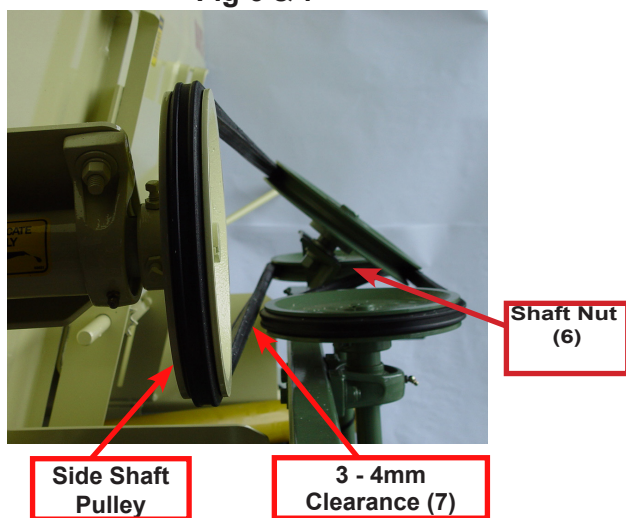


Fig 8 and 9

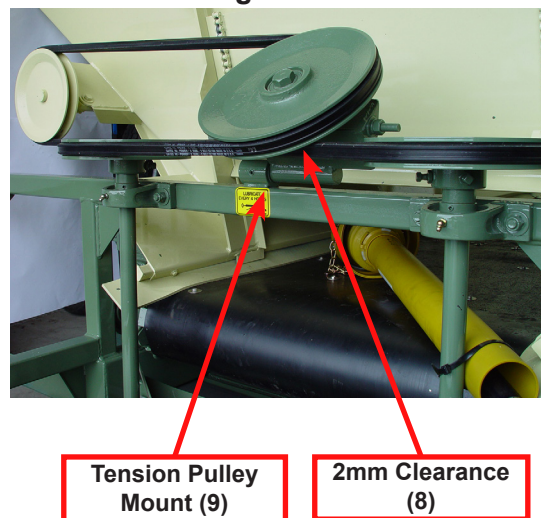


Fig 10

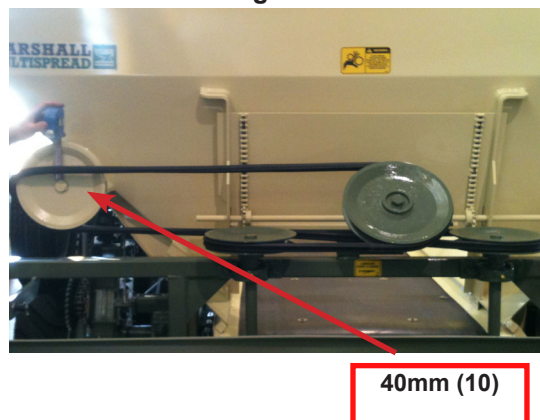


Fig 11



4.7 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 (13) 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 $\frac{1}{4}$ of a turn at a time. Too much tension on the belt will be detrimental to the belt tracking, see Fig 14.

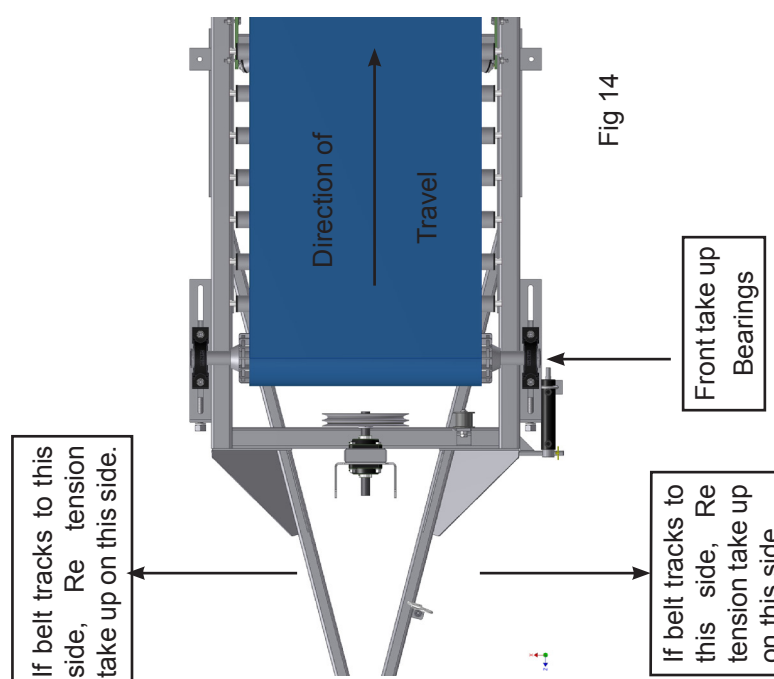


Fig 14

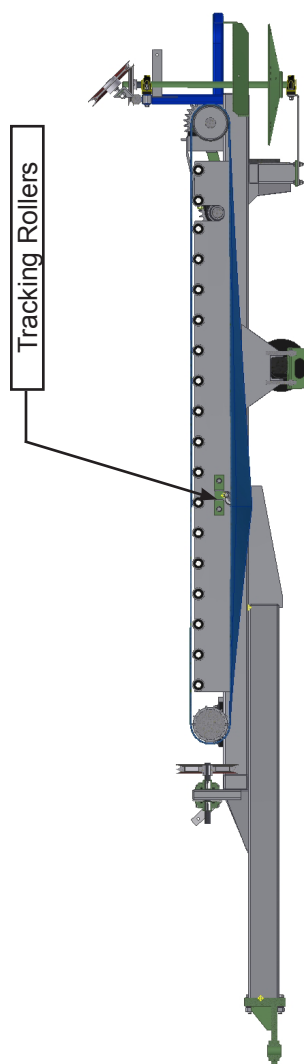


Fig 13

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.

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 15 and 16 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

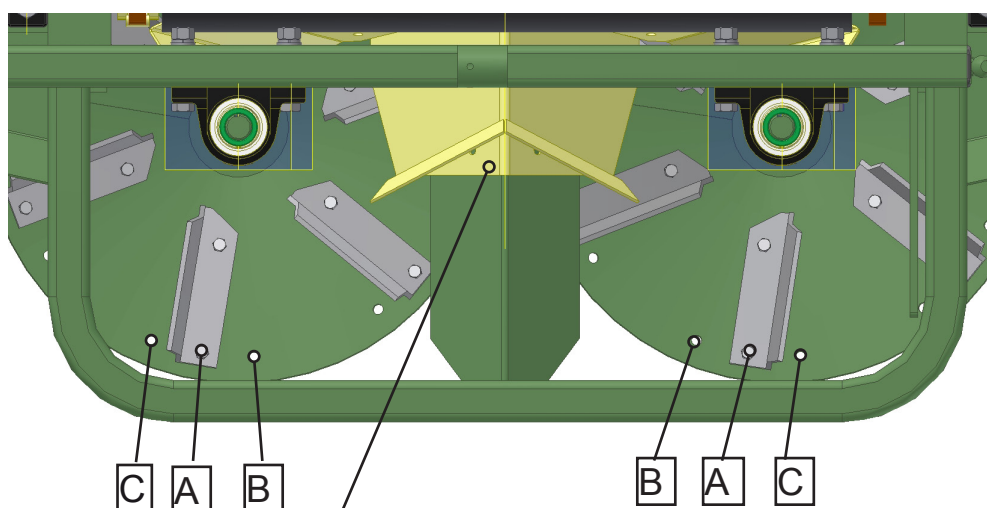


Fig 15

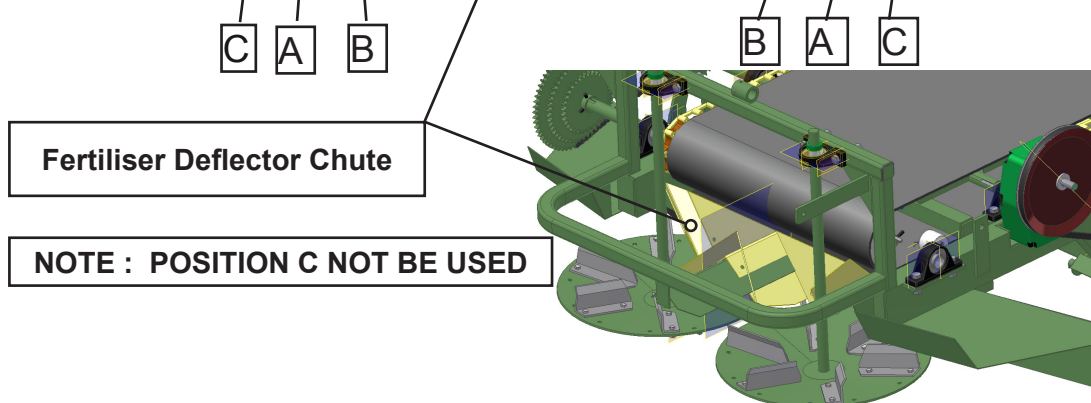


Fig 16

5.3 *Type B Vanes and Fertiliser Deflector*

900 Series Multispreads from 2006 production are fitted with three 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 12m.

The pitch or angle of each spinner vane can be altered to suit different fertiliser application rates. However a general setting to suit granulated fertilisers and non-granulated products is to have the three 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 17 below.

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

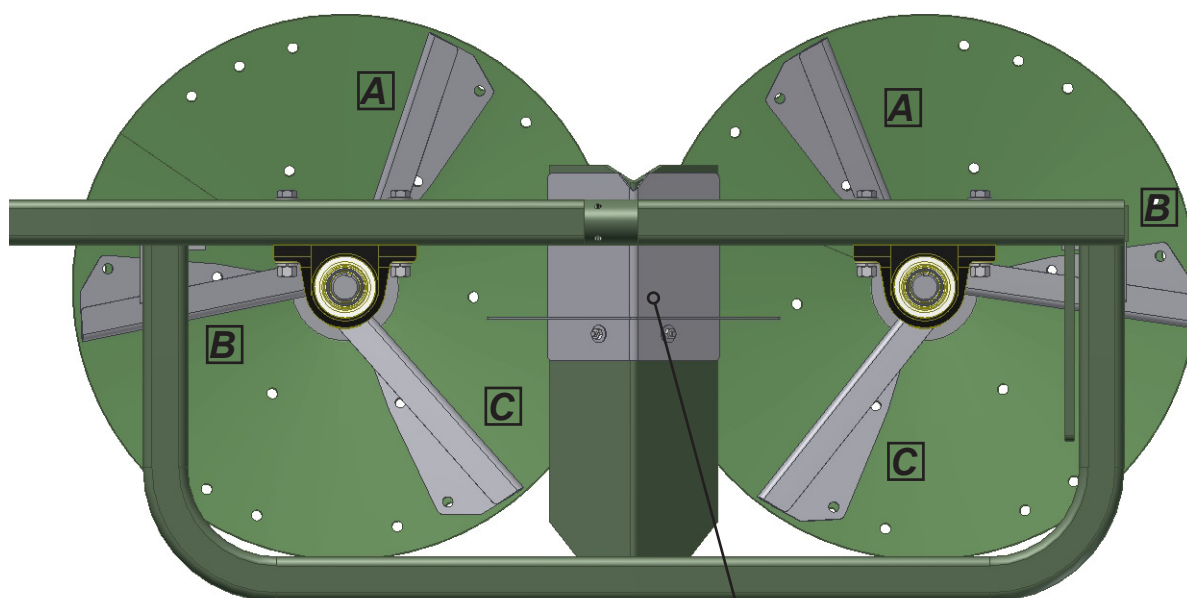


Fig 17

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

Fertiliser Deflector Chute

5.4 *Type C Vanes and Fertiliser Deflector*

900 Series Multispreads from 2009 production were fitted with two 700mm diameter spinners, with convex centre dish. Six spinner vanes, pressed in a “C” channel and manufactured from 5mm mild steel are fitted to each spinner. see Fig 18 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 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/m³) 22m to 28m

Compound Fertilizers (approx 950kg/m³) 24m to 28m

Superphosphate (approx 1150kg/m³) 26m to 32m

Dry Lime (approx 1000kg/m³) 10m to 12m

Non Granulated Products - Lime, Gypsum and Manures

To spread these non-granulated products that may be lumpy and damp and 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 12m

For further information on the fertiliser chute position see the drawing on the following page.

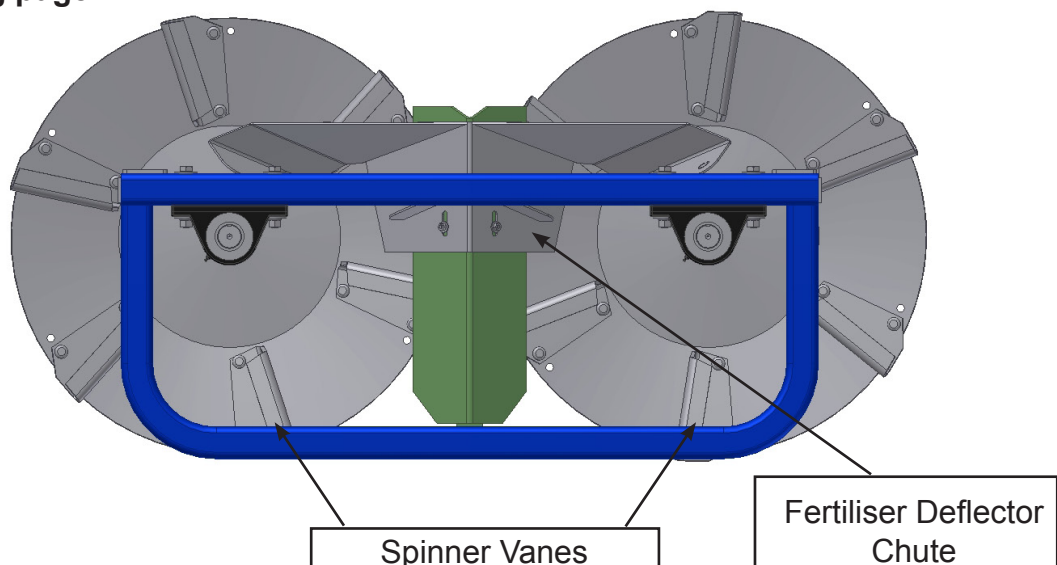
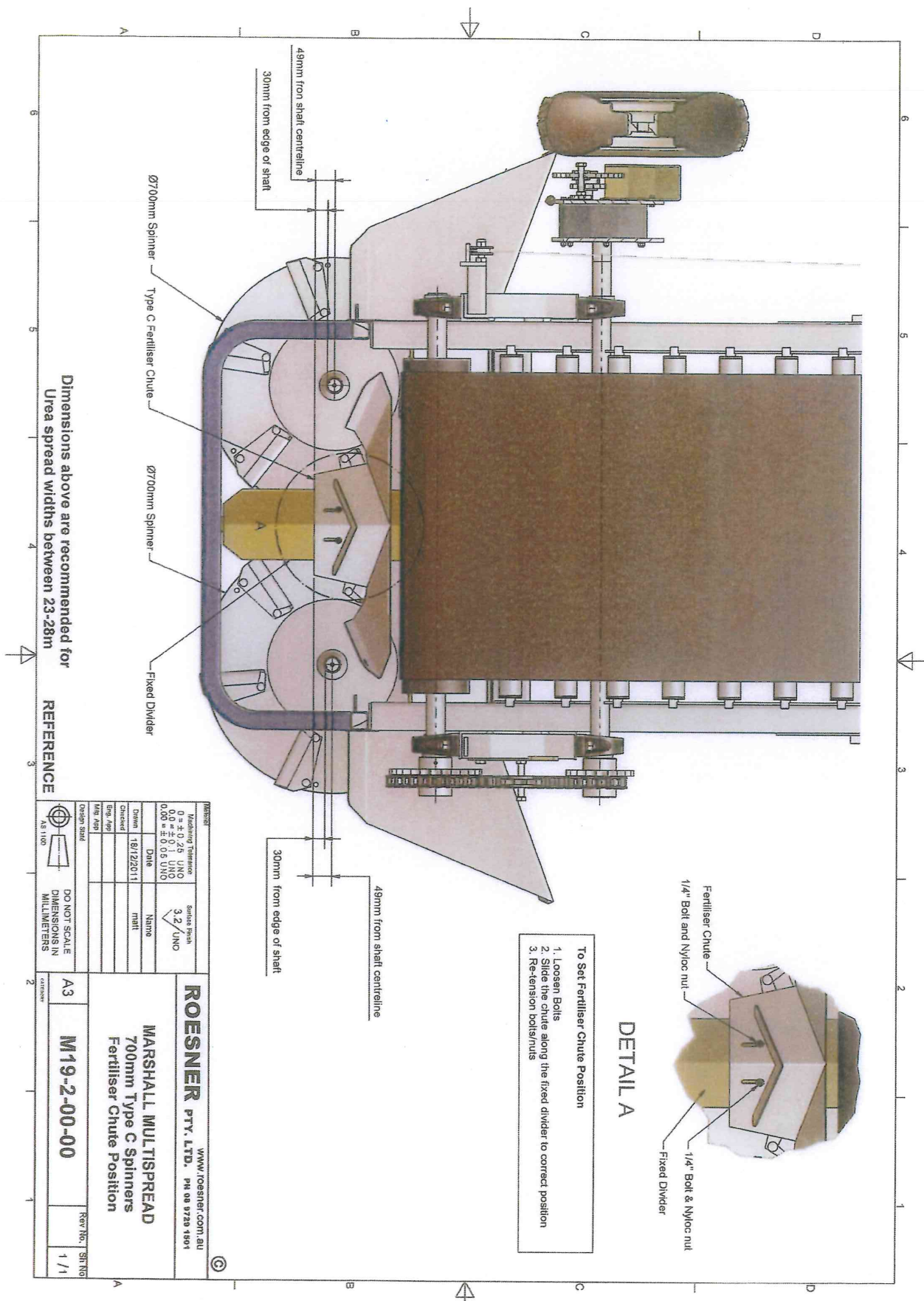


Fig 18

MARSHALL MULTISPREAD 945TL 960TL 980T 910T 912T 914T



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 alter the spreading width of different fertilisers.

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 to eliminate blockage of the chute and vanes.

In 2016 the Type D2 vane, spinner and chute upgrade was introduced. 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)

6. *Drive Sprocket Settings*

The machine is fitted with four sets of feedbelt drive sprockets, two on each side of the machine, see Fig 19 and 20 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 19

SIDE A - WHEEL DRIVE

Possible Combinations

14 tooth driving 30 tooth
(outside set)

30 tooth driving 14 tooth
(inside set)



Fig 20

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 !!

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 - 12m
2. Obtain the circumference of the wheel drive tyre.
Circumference = diameter x 3.141
example: jockey tyre diameter = 0.47m
Circumference = 0.47×3.141
= 1.476m
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
 0.0106×10000 to convert to kg/ha.
= 106 kg/ha.

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

8. Application Rate Charts

8.1 Type Of Material - Lime, Gypsum and Manure - 1000kg/m³

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	14
SIDE A 14 TOOTH DRIVING	65	415	311.25	249	207.5	178
30 TOOTH	130	830	622.5	498	415	356
SIDE B 15 TOOTH DRIVING	195	1245	933.75	747	622.5	534
30 TOOTH	260	1660	1245	996	830	711

SIDE A 14 TOOTH DRIVING	65	603	452.25	361.8	301.5	258
30 TOOTH	130	1206	904.5	723.6	603	517
SIDE B 20 TOOTH DRIVING	195	1809	1356.75	1085.4	904.5	775
28 TOOTH	260	2412	1809	1447.2	1206	1034

SIDE A 30 TOOTH DRIVING	65	1920	1440	1152	960	823
14 TOOTH	130	3840	2880	2304	1920	1646
SIDE B 15 TOOTH DRIVING	195	5760	4320	3456	2880	2469
30 TOOTH	260	7680	5760	4608	3840	3291

SIDE A 30 TOOTH DRIVING	65	2662	1996.5	1597.2	1331	1141
14 TOOTH	130	5324	3993	3194.4	2662	2282
SIDE B 20 TOOTH DRIVING	195	7986	5989.5	4791.6	3993	3423
28 TOOTH	260	10648	7986	6388.8	5324	4563

8. Application Rate Charts

8.2 Type Of Material - Granular Fertiliser - 1000kg/m³

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 (M)						
		24	26	28	30	32	34	36
	20	28	26	24	22	21	20	19
SIDE A	25	35	32	30	28	26	25	23
14 TOOTH	30	42	39	36	34	32	30	28
DRIVING	35	49	45	42	39	37	35	33
30 TOOTH	40	56	52	48	45	42	40	37
	45	63	58	54	50	47	44	42
	50	70	65	60	56	53	49	47
SIDE B	55	77	71	66	62	58	54	51
15 TOOTH	60	84	78	72	67	63	59	56
DRIVING	65	91	84	78	73	68	64	61
30 TOOTH	70	98	90	84	78	74	69	65
	75	105	97	90	84	79	74	70
SIDE A	20	35	32	30	28	26	25	23
14 TOOTH	25	44	40	38	35	33	31	29
DRIVING	30	53	48	45	42	39	37	35
30 TOOTH	35	61	57	53	49	46	43	41
	40	70	65	60	56	53	49	47
SIDE B	45	79	73	68	63	59	56	53
20 TOOTH	50	88	81	75	70	66	62	58
DRIVING	55	96	89	83	77	72	68	64
28 TOOTH	60	105	97	90	84	79	74	70
	65	114	105	98	91	85	80	76
	70	123	113	105	98	92	86	82
	75	131	121	113	105	98	93	88
SIDE A	20	117	108	100	94	88	83	78
30 TOOTH	25	146	135	125	117	110	103	98
DRIVING	30	176	162	150	140	132	124	117
14 TOOTH	35	205	189	176	164	154	145	137
	40	234	216	201	187	176	165	156
	45	263	243	226	211	197	186	176
SIDE B	50	293	270	251	234	219	206	195
15 TOOTH	55	322	297	276	257	241	227	215
DRIVING	60	351	324	301	281	263	248	234
30 TOOTH	65	380	351	326	304	285	268	254
	70	410	378	351	328	307	289	273
	75	439	405	376	351	329	310	293

8. Application Rate Charts

8.3 Type Of Material - Granular Superphosphate - 1150 kg/m³

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)	24	26	28	30	32	34	36
	20	32	30	27	26	24	23	21
SIDE A	25	40	37	34	32	30	28	27
14 TOOTH	30	48	44	41	38	36	34	32
DRIVING	35	56	52	48	45	42	40	37
30 TOOTH	40	64	59	55	51	48	45	43
	45	72	66	62	58	54	51	48
	50	80	74	69	64	60	56	53
SIDE B	55	88	81	75	70	66	62	59
15 TOOTH	60	96	89	82	77	72	68	64
DRIVING	65	104	96	89	83	78	73	69
30 TOOTH	70	112	103	96	90	84	79	75
	75	120	111	103	96	90	85	80
SIDE A	20	41	38	35	33	31	29	27
14 TOOTH	25	51	47	44	41	38	36	34
DRIVING	30	62	57	53	49	46	43	41
30 TOOTH	35	72	66	62	57	54	51	48
	40	82	76	70	66	62	58	55
SIDE B	45	92	85	79	74	69	65	62
20 TOOTH	50	103	95	88	82	77	72	68
DRIVING	55	113	104	97	90	85	80	75
28 TOOTH	60	123	114	105	98	92	87	82
	65	133	123	114	107	100	94	89
	70	144	132	123	115	108	101	96
	75	154	142	132	123	115	109	103
SIDE A	20	134	124	115	107	101	95	89
30 TOOTH	25	168	155	144	134	126	118	112
DRIVING	30	201	186	172	161	151	142	134
14 TOOTH	35	235	216	201	188	176	166	156
	40	268	247	230	214	201	189	179
	45	302	278	258	241	226	213	201
SIDE B	50	335	309	287	268	251	236	223
15 TOOTH	55	369	340	316	295	276	260	246
DRIVING	60	402	371	345	322	302	284	268
30 TOOTH	65	436	402	373	348	327	307	290
	70	469	433	402	375	352	331	313
	75	503	464	431	402	377	355	335

8. Application Rate Charts

8.4 Type Of Material - Granular Urea - 750 kg/m³

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)	24	26	28	30	32	34	36
	20	20	18	17	16	15	14	13
SIDE A	25	25	23	21	20	19	18	17
14 TOOTH	30	30	28	26	24	23	21	20
DRIVING	35	35	32	30	28	26	25	23
30 TOOTH	40	40	37	34	32	30	28	27
	45	45	42	39	36	34	32	30
	50	50	46	43	40	38	35	33
SIDE B	55	55	51	47	44	41	39	37
15 TOOTH	60	60	55	51	48	45	42	40
DRIVING	65	65	60	56	52	49	46	43
30 TOOTH	70	70	65	60	56	53	49	47
	75	75	69	64	60	56	53	50
SIDE A	20	29	27	25	23	22	20	19
14 TOOTH	25	36	33	31	29	27	26	24
DRIVING	30	44	40	37	35	33	31	29
30 TOOTH	35	51	47	44	41	38	36	34
	40	58	54	50	46	44	41	39
SIDE B	45	65	60	56	52	49	46	44
20 TOOTH	50	73	67	62	58	54	51	48
DRIVING	55	80	74	68	64	60	56	53
28 TOOTH	60	87	80	75	70	65	61	58
	65	94	87	81	75	71	67	63
	70	102	94	87	81	76	72	68
	75	109	100	93	87	82	77	73
SIDE A	20	95	88	81	76	71	67	63
30 TOOTH	25	119	110	102	95	89	84	79
DRIVING	30	143	132	122	114	107	101	95
14 TOOTH	35	166	153	143	133	125	117	111
	40	190	175	163	152	143	134	127
	45	214	197	183	171	160	151	143
SIDE B	50	238	219	204	190	178	168	158
15 TOOTH	55	261	241	224	209	196	184	174
DRIVING	60	285	263	244	228	214	201	190
30 TOOTH	65	309	285	265	247	232	218	206
	70	333	307	285	266	249	235	222
	75	356	329	305	285	267	251	238

MARSHALL MULTISPREAD 945TL 960TL 980T 910T 912T 914T

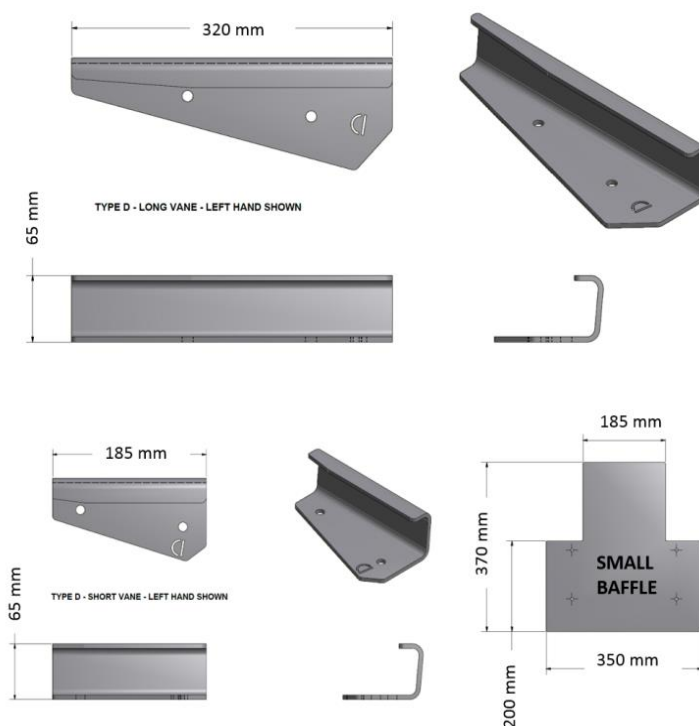
Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

Lime, Gypsum and Non-Granulated Fertilisers

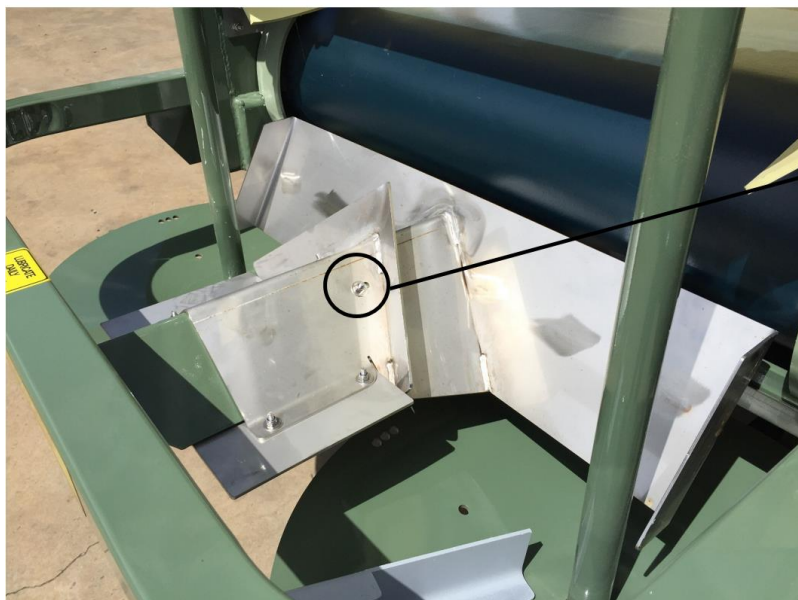


When spreading lime, gypsum, dolomite, manure, mulch and sulphate of ammonia, two Type D short and two Type D long vanes should be fitted to each spinner. The short chute baffle should also be fitted.

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



Lime, Gypsum and Non-Granulated Fertilisers – Chute Setup



Feedbelt



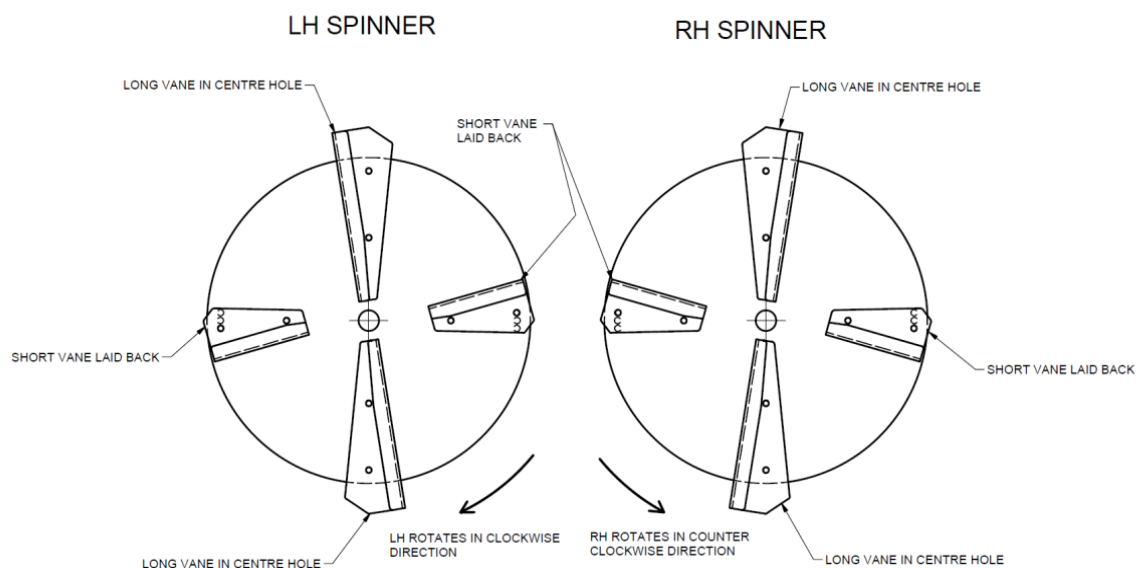
Bolt in rear hole
(toward back of
spreader)

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 – 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 LH Spinner



Short Vane on RH Spinner

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 may be 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 is drawn in behind the spreader by the air flow caused by the disc rotation. 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 may be compromised. Spreading into the wind will ensure an even distribution but the overall width may be 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 945TL 960TL 980T 910T 912T 914T

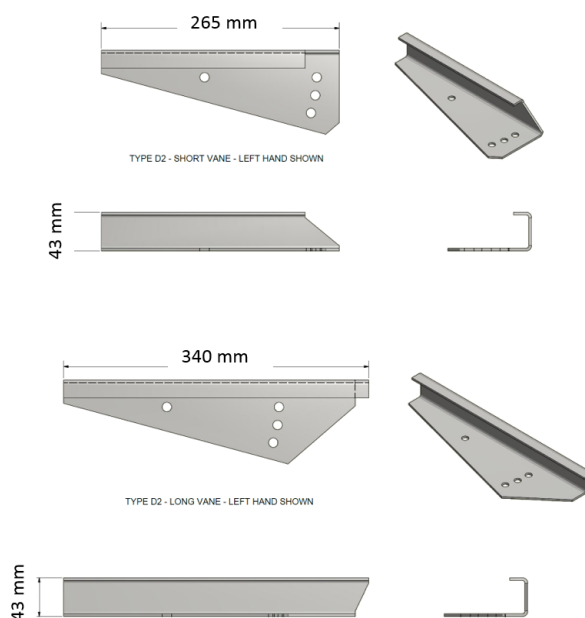
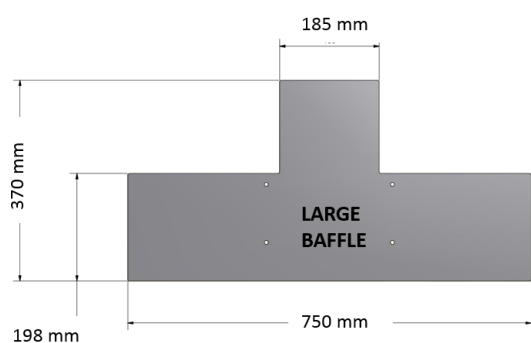
Marshall Multispread – Type D/D2 Spinner Vane Setup Supplement

Urea, Superphosphate and other Granular Fertilisers



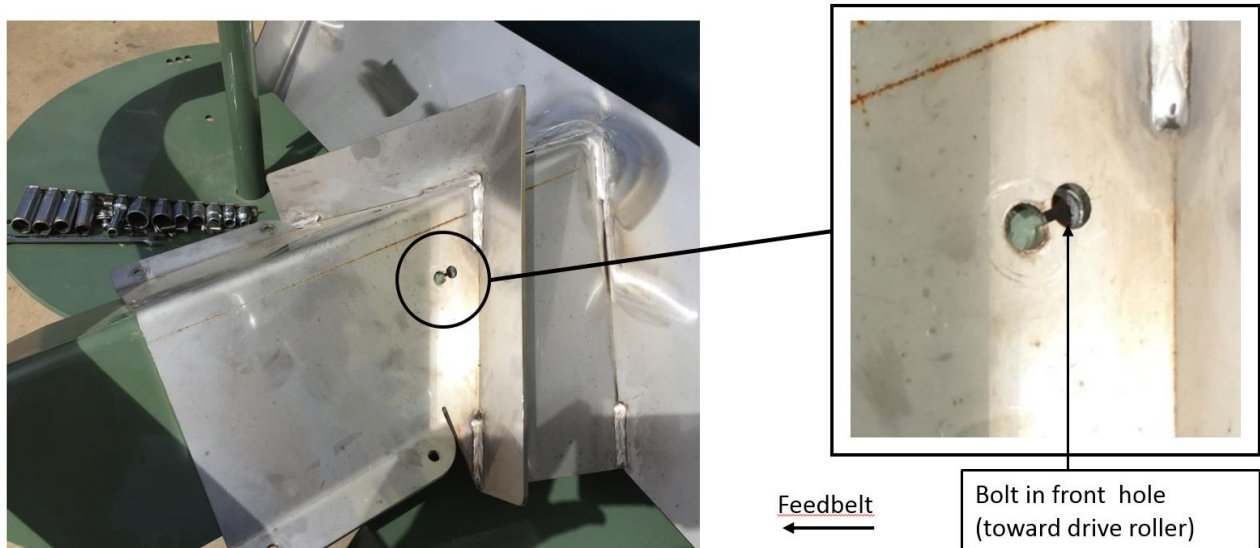
When spreading Urea, Superphosphate and other granulated fertilisers two Type D2 short and two Type D2 long vanes should be fitted to each spinner. The large chute baffle should also be fitted.

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 – Type D/D2 Spinner Vane Setup Supplement

Urea, Superphosphate and other Granular Fertilisers - Chute Setup

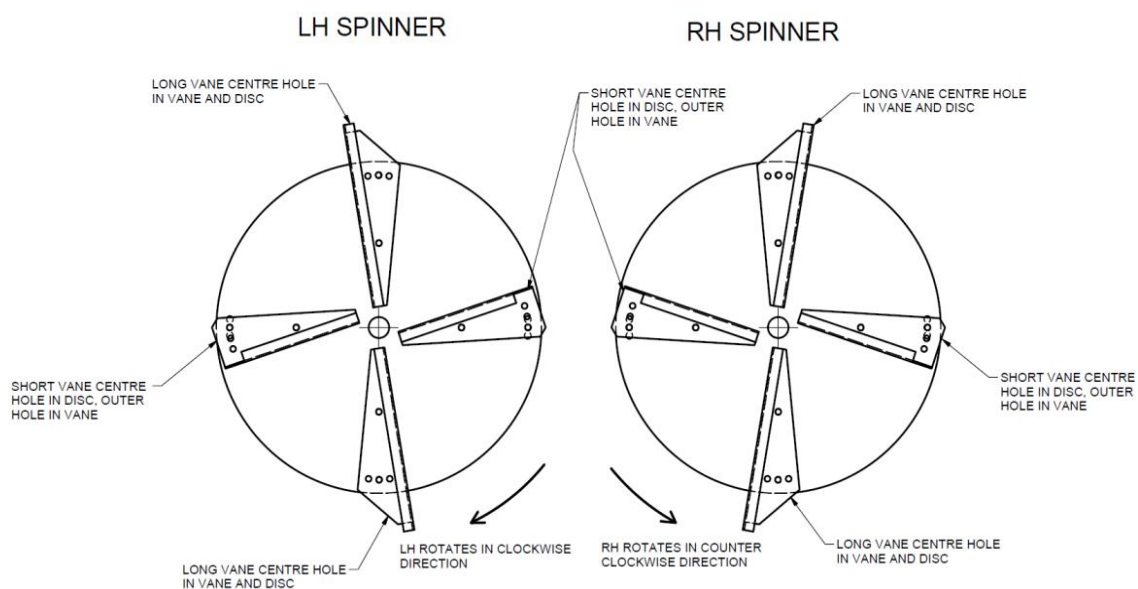


Fertiliser chute should be installed on fixed divider plate with the large baffle bolted on the underside of the fertiliser chute. (M6 x 25mm bolt/nyloc nut)

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 – 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

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 may be 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 compromises 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 may be compromised. Spreading into the wind will ensure an even distribution but the overall width may be 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

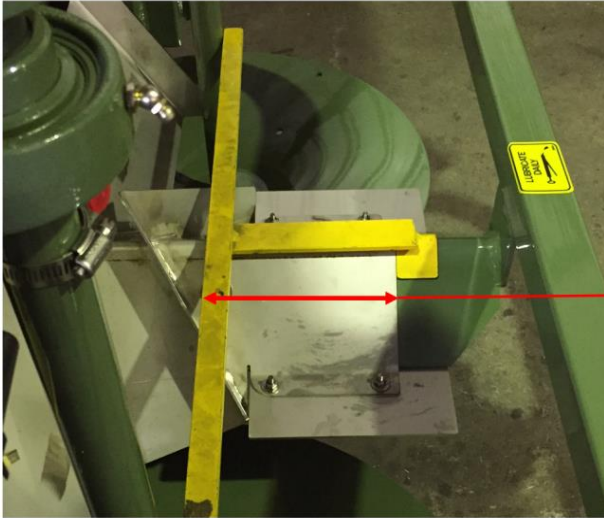
Worn spinner vanes and discs compromise the performance of the spreader. It is recommended that the vanes are kept clean and checked for wear on a regular basis. Vanes should be replaced if wear is visible.

5. Field Conditions

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

Marshall Multispread – 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

177mm : Urea and Granulated Fertilisers