

# *SPREADMASTER*



## **TORNADO G-III**

**OPERATING INSTRUCTIONS AND SPARE PARTS**  
**Read Carefully Before Operating Machine**

## Introduction

The Spreadmaster twin distribution disk fertiliser spreader, model TORNADO 1300 Generation III, imported into New Zealand by Agriquip, was developed to distribute granulated fertilisers and seeds uniformly and precisely.

In its development the manufacturers, the largest agricultural implement manufacturers in the Southern Hemisphere, sought to incorporate the following characteristics; load capacity compatible with medium-small tractors, high impact resistance, anticorrosive components, replaceable hopper, paints appropriate to the recommended use and outstanding spreading uniformity.

To achieve this these quality spreaders have polyethylene, nylon, stainless steel and rubber components and tubular profiles. These construction materials together with zinc phosphate primers and a baked-on polyester finish provides excellent impact characteristics and the superior corrosion resistance for contact with corrosive products such as fertilisers.

To preserve all these advantages, it is necessary that the spreader is used correctly and adequately maintained. It is important that you read this instruction manual carefully, maintain the equipment in good condition and only use it in accordance with this manual. If unsure of the suitability of an application refer to the dealer from whom you purchased the machine.

**Imported and Distributed by**



P.O. Box 578 30 Hurlstone Drive New Plymouth  
06-759 8402 NEW PLYMOUTH

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### 3. Components

- A – Hopper
- B – Chassis
- C – Box Transmission
- D – Distribution Disks
- E – Vanes
- F – Agitators
- G – Flow Control system
- H – Drive Shaft
- I – Protective Screen
- J – Protective Funnel



Fig 01

### 3. Identification

All Spreadmaster machines have an identification plate attached to the chassis stating the weight, model, date of manufacture and serial number. When ordering parts or requesting information from your dealer quote the model and serial number.

### 3. Features and Functions

Chassis: Tubular construction with red epoxy coating.

Hopper Base: Stainless steel (fig. 02).

Hopper: Rotary moulded in 6mm thick polyethylene, consists of 2 equal and replaceable parts (fig. 03). Inside the hopper is a protection screen that has an adjustable height protection funnel above the agitator (fig. 04).



Fig 02

These components reduce the loading on the agitator and prevent undesirable flows and foreign objects obstructing the exit flow.

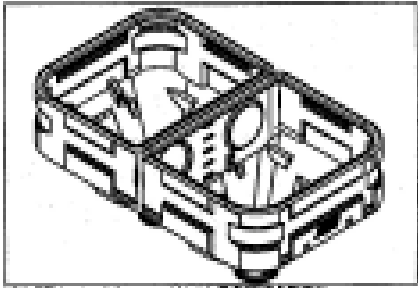


Fig 03

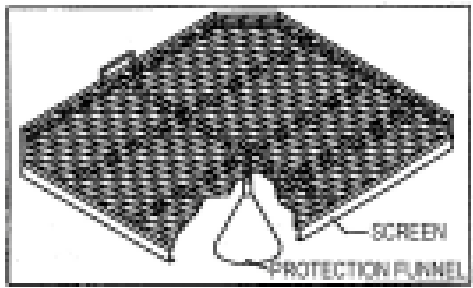


Fig 04

**Transmission:** The transmission consists of a central transmission box which connects to each of the two side gearboxes by a jointing sleeve locked in position by a locking pin.

By withdrawing the locking pin and sliding the jointing sleeve sideways any gearbox can be removed without having to remove the others. Each gearbox has its own independent oil-bath lubrication (fig. 05).

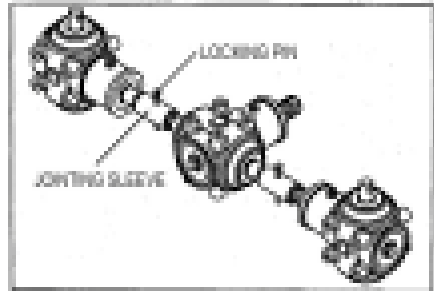


Fig 05

**Drive Control and Flow Regulation:** The drive to the system is engaged through double manual push/pull controllers while fine flow regulation is effected by opening spindles and nylon adjustors (fig. 06). This enables application from one side of the spreader if desired.

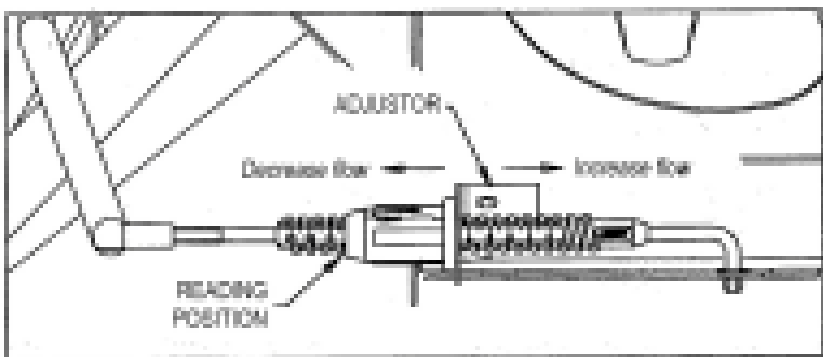


Fig 06

**Note:** The outputs are adjustable to allow the product to be deposited in controlled amounts at only one point, guaranteeing excellent distribution performance at any dosage rate.

Agitators: The eccentric rocking type agitators keep the flow of product continuous and uniform onto the distributor disks (fig. 07).

**Note**: The agitators of the TORNADO-1300 Generation III are sealed and thus do not require lubrication.

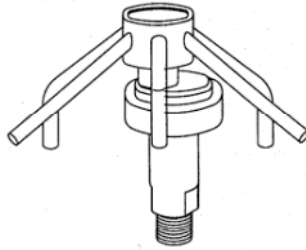


Fig 07

## .4. Technical Specifications

Volumetric capacity: .....	1300L
Load capacity: .....	1600kg
Weight: .....	300kg
Height: .....	1.38m
Width: .....	2m
Length: .....	1.2m
Linkage: .....	3-point Category II
PTO speed .....	540rpm
Spreading width .....	<i>see distribution tables</i>
Recommended tractor:.....	Hydraulic lift of 2.5t.

## 5. Safety Precautions

The TORNADO 1300 Generation III machines are simple implements and do not pose great risks to the operator, however it is important to observe some safety precautions, therefore observe the following measures:

- a) When connecting the implement be sure to place the retaining clips on the pins of the three-points linkage;
- b) Ensure the drive shaft is of the correct length (for adjustment see section 7.6.2);
- c) Only attach the drive shaft to the PTO when the tractor is turned off;
- d) Remain clear of the drive shaft when tractor is running;
- e) Never clear or disconnect the drive shaft when the engine is running;
- f) Never removes the drive shaft guards and ensure the retaining chain is adjusted so that it does not catch when the tractor is turning sharply;
- g) Keep people clear when operating the machinery;
- h) Check that the area around the tractor and spreader is clear of people, animals and obstacles before putting tractor in motion;
- i) Do not cut power to the spreader when the floodgate is open;

- j) Ensure the implement does not contact the PTO or that the drive shaft is at too acute an angle with the implement in the rest position;
- k) Keep people out of the spreading area when spreading;
- l) Keep foreign items away that may accidentally fall into the product to be distributed;
- m) Ensure the tractor engine is stopped when lubricating, cleaning or maintaining;
- n) Use only tractors with sufficient lifting capacity and size to ensure tractor/spreader remains stable;
- o) When towing trailers for transporting items behind the spreader use tandem axle trailers to prevent excess of weight on the back of the implement;
- p) Do not go beneath the spreader when only supported by the tractor hydraulics. Support the implement with appropriate stands if it has to be raised to perform the required maintenance.

## 6. Assembly of the Tornado 1300

To minimise the volume of the implement during shipping the hopper and the drive shaft are not attached to the chassis.

To assemble place the hoppers side by side on the chassis with the two internal faces (with circular print) mated together on the mounting collar, ensuring the rubber ring is in place. Mount the fasteners so that the hoppers are firmly locked into the chassis (fig. 08).

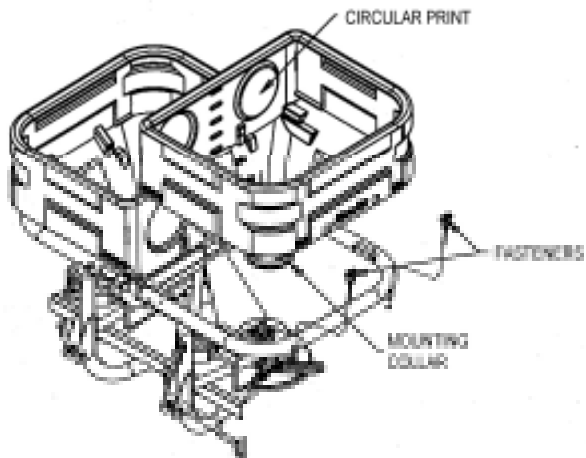


Fig 08



## 7. Connecting the Tornado 1300 to Tractor

The TORNADO 1300 Generation III fertiliser spreaders can be connected to tractors whose three-point hydraulic system is capable of lifting loads of at least 2500kg. Weights may have to be attached to the front of the tractor to give stability to the combination. To attach the weights follows the tractor manufacturer's instructions.

### 7.1. Preliminary Checks

**ATTENTION:** Before attaching the spreader perform the following checks:

- ★ Check that the reservoirs are clean. Removing any items from inside if necessary;
- ★ Check the oil levels in the gearboxes. To do this it ensure the spreader is level and remove the oil level plugs.

The gearboxes must be filled with oil to the level of the plugs or with at least 300ml oil.

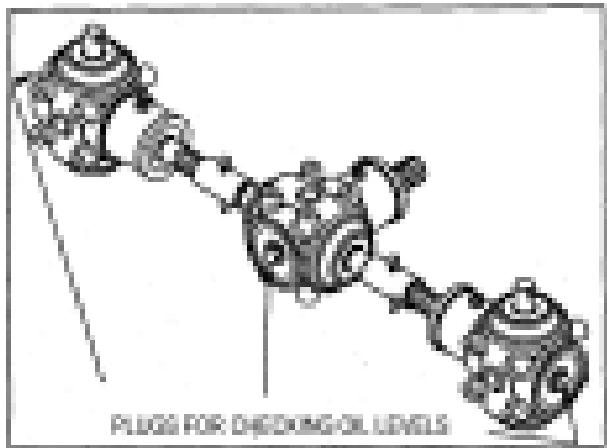


Fig 09

### 7.2. Removal of the Draw Bar

The draw bar on the tractor must be moved to one side to leave free space for the drive shaft (fig. 10).

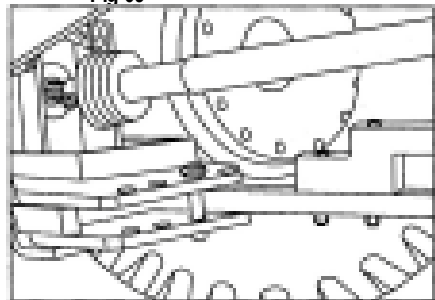


Fig 10

### 7.3. Lateral Adjustment of the Lower 3-point Linkage Arms

The lower arms of the three-point linkage system must be adjusted sideways by means of the lateral stabilisers, leaving a maximum 5cm gap to prevent the arms hitting against the tractor tyres (fig. 11).

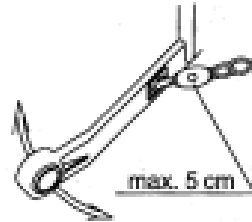


Fig 11

### 7.4. Connecting the TORNADO 1300 to the Tractor:

The TORNADO 1300 Generation III spreader is mounted on the tractor on the three points of the hydraulic system, connecting the lower links first and lastly the third linkage point (fig. 12).

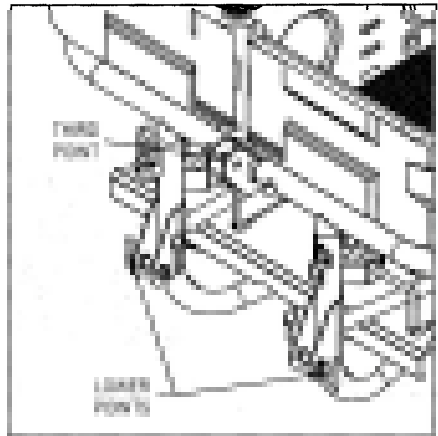


Fig 12

## 7.5. Height and Horizontal Levels

The TORNADO-1300 Generation III spreader must be mounted centred on the tractor. The distribution disks must be horizontal and 80cm above ground level when operating on flat ground. This can be checked by looking at the spreader from both the side and the rear (fig. 13 and 14).

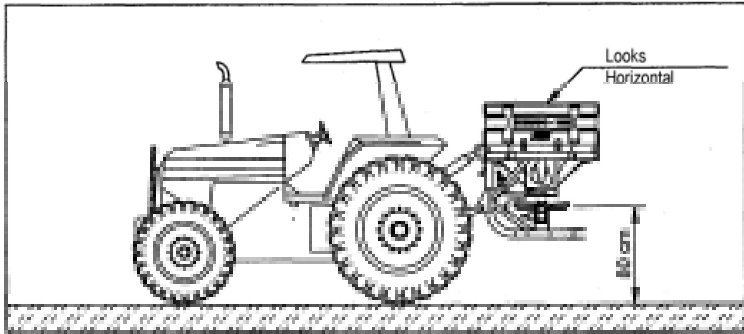


Fig 13

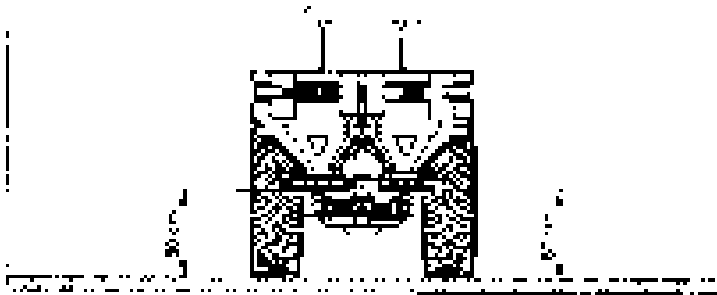


Fig 14

## 7.6. Drive Shaft

### 7.6.1. Connecting

Before connecting the drive shaft, clean and grease the PTO shaft splines to make connection easier and prevent wear.

### 7.6.2. Length Adjustment

Because of the different makes and models of tractors, it is necessary to adjust the length of the drive shaft when connecting to the tractor for the first time.

To do this raises the spreader until the drive shaft is the same height as the PTO shaft of the tractor (fig.15).

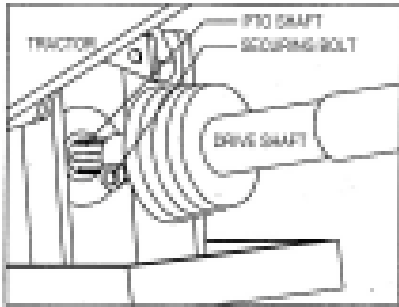


Fig 15

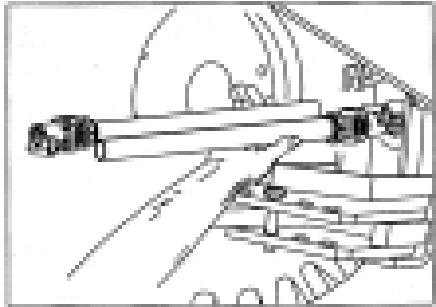


Fig 16

Place one half of the drive shaft against the shaft on the spreader and the other half on the PTO on the tractor (fig. 16). The two pipes (male and female) must have a minimum end-clearance of 2.5cm (fig.17).



Fig 17

If the drive shaft is too long reduce the length of both pipes by the same amount (fig.18). Remove any debris of burrs and apply grease the outside of the inner pipe.

**NOTE:** When the length of the drive shaft has been adjusted the plastic guard and its securing chain must also be shortened in the same ratio so that the guard does not turn with the drive shaft.

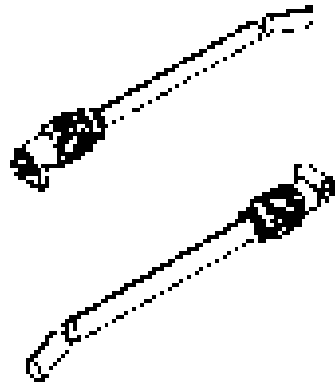


Fig 18

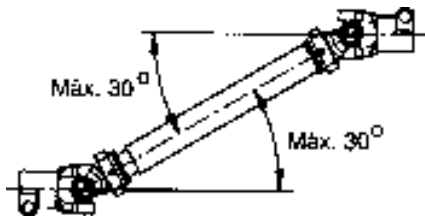


Fig 19

**CAUTION!** The angle of the drive shaft must never exceed 30° when operating (fig.19).

## 8. Settings

### 8.1. Tractor Speed

The tractor speed is influenced by the nature of the land. The more flat and even the land the faster the spreading operation can be performed.

The choice of the speed influences the speed of the PTO, therefore you must adjust the speed of the tractor and engine so that the PTO is kept at 540rpm.

Check the tractor owner's manual, or decal, to determine the relationship between, tractor and engine speed and PTO revolutions.

### 8.2. PTO Speed.

So that the product is applied correctly is necessary that the rotation of the PTO is kept constant at 540rpm during the work. The tractor normally makes use of governors to maintain the PTO revolutions. If in doubt consult the tractor manual, or check using a tachometer (fig. 20).

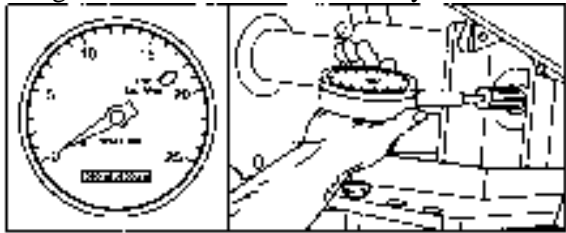


Fig 20

### 8.3. Setting the Vanes

The TORNADO 1300 Generation III spreader have two distribution disks with vanes, 365mm, 250mm, 235mm and 205mm that can be combined in pairs on each distribution disk. Each vane has four positions it can be assembled in the disk, which allows to vane to be advanced or delayed. This facility is necessary to correct variations in the distribution profile. The settings used for fertilisers and seeds are given in the Distribution Tables in section 9.

Figure 21 opposite shows the direction of rotation of the distribution disks and the options for assembling the vanes. Observe the assembly order. The short and long vanes must be mounted alternatively on the distribution disk and also in relation to the other distribution disk.

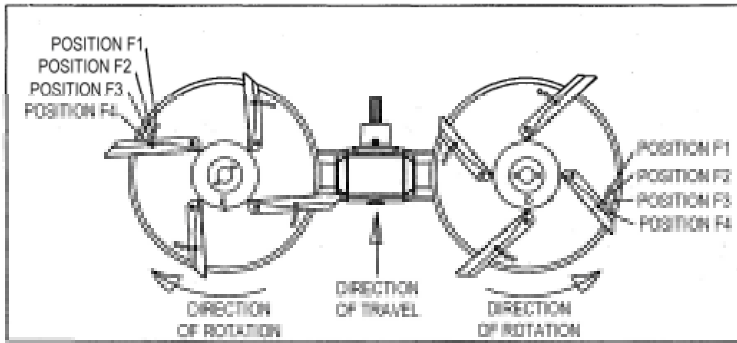


Fig 21

#### 8.4. Definition of Effective Working Width

When spreading fertiliser and seeds there is always a lower concentration of product at the extremities of the work band. So that the coverage is uniform you have to overlap successive passes by a sufficient amount so that the final concentration of product in this overlap zone is equal to the remainder of the work band, to compensate for the lower concentration of product on the edges of the spreading zone (fig. 22).

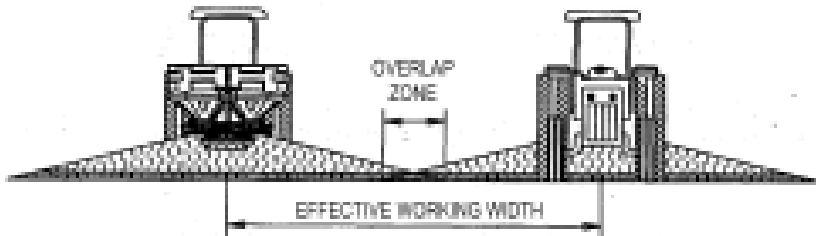


Fig 22

#### 8.5. Marking Successive Passes

The spreading width of the TORNADO 1300 Generation III spreaders normally exceeds the specified twelve metres making it difficult to see where the last pass was made. To overcome this either use natural landmarks or insert pegs to achieve a uniform coverage (fig 23).

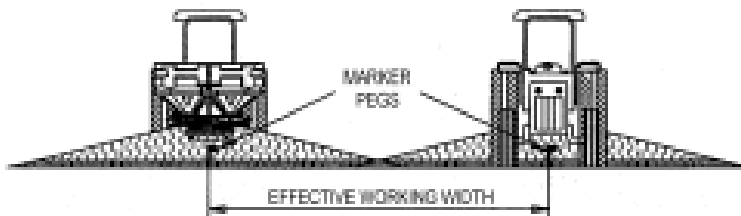


Fig 24

## 8.6. Finishing Off an Area

When finishing spreading an area the last pass normally means that the product has to be applied in a strip narrower than the effective working width. To make this easy the TORNADO 1300 Generation III spreaders controls have independent drive so that only one side is working spreading product (fig 24).

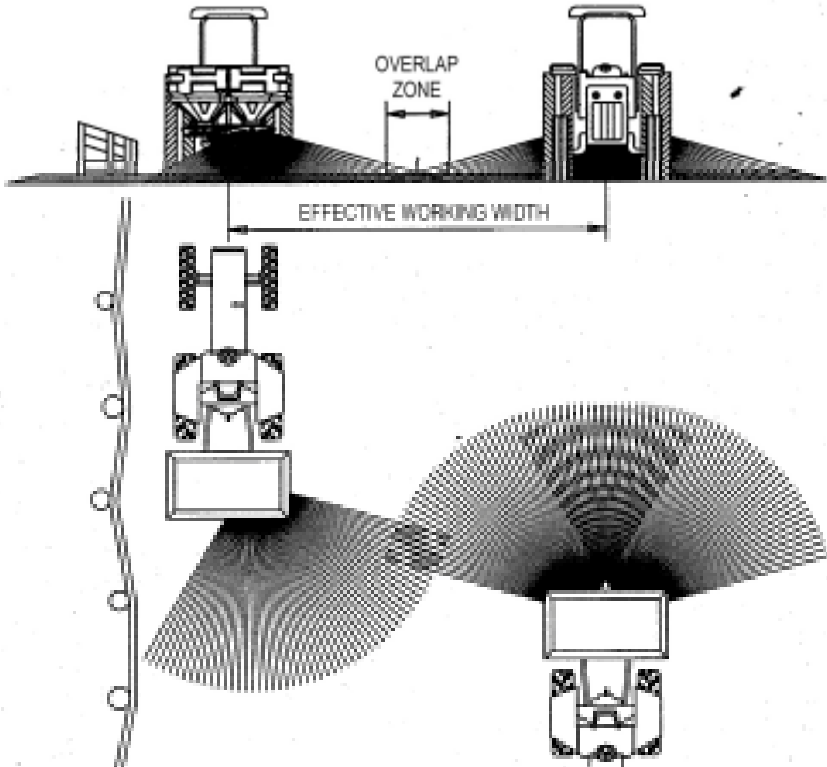


Fig 24

## 8.7. Procedure & Calculations for Setting Machine Output (Recommended)

To assist you with the settings for the TORNADO-1300 Generation III spreader, this manual includes tables for the more commonly encountered fertilisers and seeds. However, it may be necessary because the product differs in formulation, density and/or granule size from those given in the tables to make adjustments to the output of the spreader.

With the spreader connected to the tractor, perform the following steps:

- a) Remove the agitators as shown in Figure 29 of this manual, following the sequence given in Section 11.5;
- b) Remove the distribution disks;
- c) Refit the agitators without the distribution disks (Fig. 25);
- d) Half fill the spreader;
- e) Level the machine as shown in Figures 13 & 14 of this manual, following the instructions in Section 7.5;
- f) Find the opening setting in the Application Table for the product that will be used for the desired application rate, and make the adjustment shown in Figure 06 in Section 3. Take note of the outflow given in the table, which is the total amount of product which must come out of the two hoppers in one minutes operation;
- g) Place suitable containers under each hopper and start the spreader, with the PTO rotating at 540rpm;
- h) Open the floodgates using the control levers for exactly one minute;
- i) Weigh the product that has come out of each hopper individually. The weight should agree with that given in the table. If it differs, make the necessary adjustments and it repeat the operation;
- j) If there is a difference in the amount of product that came out of each hopper, adjust the adjustor as shown in Figure 6 in Section 3.

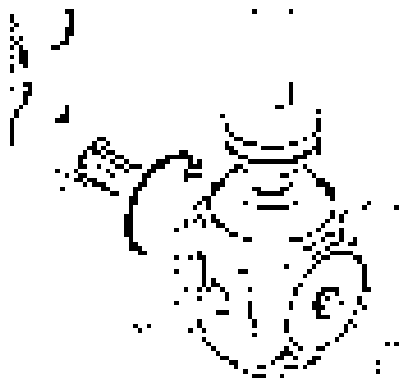


Fig 25



## 8.8. Procedure & Calculations for Setting Machine Output (Field Trial)

To assist you with the settings for the TORNADO-1300 Generation III spreader, this manual includes tables for the more commonly encountered fertilisers and seeds. However, it may be necessary because the product differs in formulation, density and/or granule size from those given in the tables to make adjustments to the output of the spreader.

To check the outflow use the following formula:

$$d = \frac{P \times 10,000}{Q \times I}$$

Where  
d = Distance travelled in metres  
P = Weight of product placed in hopper  
I = Effective working width  
Q = Application rate in kg/Ha

Example: We want to apply 225kg/ha of urea. PTO speed is 540rpm  
P = Amount of urea in the reservoirs: 100kg (50kg in each reservoir)  
Q = Amount of urea to be applied = 225kg/ha

Consulting Application Table 9.1, we have:

I = Effective Working Width = 22m

Scale Opening:  $n^\circ = 5.5$

Spreading Speed = 12km/h

Position of the vanes: vane 250 - F2 and the 205 vane - F3,

With these information we calculate the space to be covered to consume 100kg of urea placed in the reservoirs.

$$d = \frac{100 \times 10,000}{225 \times 22}$$

d = 202 metres

If before completing 202 metres the product was consumed, then we must proportionally close the scale opening and test again. If there was product left in the hoppers then we must proportionally open the scale opening and repeat the operation until obtaining the desired outflow.

## 9. Product Application Tables

### 9.1. Urea (45-00-00) 750kg/m<sup>3</sup> @ 2mm

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Position (mm)														
		6	7	8	9	10	11	12		365	250	235	205											
2.0	12.0	75	64	56	50	45	41	37.5	16	Remove Vane	Remove Vane	F4												
2.5	22.5	141	120	105	94	84	77	70																
3.0	33.5	209	179	157	140	126	114	105																
3.5	44.5	278	238	209	185	167	152	139																
4.0	59.5	372	319	279	248	223	203	186																
4.5	72.0	450	386	337	300	270	245	225																
2.0	12.0	67	57	50	44	40	36	33	18			Remove Vane		Remove Vane	F3									
2.5	22.5	125	107	94	83	75	68	63																
3.0	33.5	186	160	140	124	112	102	93																
3.5	44.5	247	212	185	165	148	135	124																
4.0	59.5	331	283	248	220	198	180	165																
4.5	72.0	400	343	300	267	240	218	200																
5.0	84.0	467	400	350	311	280	255	233	20						Remove Vane		Remove Vane	F2						
5.5	99.0	550	471	412	367	330	300	275																
2.0	12.0	60	51	45	40	36	33	30																
2.5	22.5	112	96	84	75	67	61	56																
3.0	33.5	167	144	126	112	100	91	84																
3.5	44.5	222	191	167	148	133	121	111																
4.0	59.5	298	255	223	198	179	162	149	22									Remove Vane		Remove Vane	F3			
4.5	72.0	360	309	270	240	216	196	180																
5.0	84.0	420	360	315	280	252	229	210																
2.0	12.0	55	47	41	36	33	30	27																
2.5	22.5	102	88	77	68	61	56	51																
3.0	33.5	152	131	114	102	91	83	76																
3.5	44.5	202	173	152	135	121	110	101	22		Remove Vane										Remove Vane		F3	
4.0	59.5	271	232	203	180	162	147	135																
4.5	72.0	327	280	245	218	196	179	164																
5.0	84.0	382	327	286	255	229	208	191																
5.5	99.0	450	386	337	300	270	245	225																
6.0	113.0	514	440	385	342	308	280	257																
		Kg/ha																						

**9.1. Urea (45-00-00) 750kg/m<sup>3</sup> @ 2mm (continued)**

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Position (mm)							
		6	7	8	9	10	11	12		365	250	235	205				
2	12	50	43	38	33	30	27	25	24	F4	Remove Vane	F3	Remove Vane				
2.5	22.5	94	80	70	63	56	51	47									
3	33.5	140	120	105	93	84	76	70									
3.5	44.5	185	159	139	124	111	101	93									
4	59.5	248	213	186	165	149	135	124									
4.5	72	300	275	225	200	180	164	150									
2	12	46	40	35	31	28	25	23	26	Remove Vane	F1	F3					
2.5	22.5	87	74	65	58	52	47	43									
3	33.5	129	110	97	86	77	70	64									
3.5	44.5	171	148	128	114	103	93	86									
4	59.5	229	196	172	153	137	125	114									
4.5	72	277	237	208	185	166	151	138									
5	84	323	277	242	215	194	176	161	28	F3	Remove Vane	F3					
3	33.5	120	103	90	80	72	65	60									
3.5	44.5	159	136	119	106	95	87	79									
4	59.5	213	182	159	142	128	116	106									
4.5	72	257	220	193	171	154	140	129									
5	84	300	257	225	200	180	164	150									
2	12	40	34	30	27	24	22	20	30	F2	Remove Vane	F3					
2.5	22.5	75	64	56	50	45	41	38									
3	33.5	112	96	84	74	67	61	56									
3.5	44.5	148	127	111	99	89	81	74									
4	59.5	198	170	149	132	119	108	99									
4.5	72	240	206	180	160	144	131	120									
5	84	280	240	210	187	168	153	140	5.5	99	330	283	248	220	198	180	165
5.5	99	330	283	248	220	198	180	165									
		Kg/ha															

Average Lateral Shift: 5m

## 9.2. Potassium Chloride (00-00-60) 1120kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)		
		6	7	8	9	10	11	12		250	205	
2.0	10.0	56	48	42	37	33	30	28	18	Remove Vane	F4	
2.5	21.0	117	100	88	78	70	64	58				
3.0	32.5	181	155	135	120	108	98	90				
3.5	46.0	256	219	192	170	153	138	128				
4.0	58.0	322	276	242	215	193	176	161				
4.5	72.0	400	343	300	267	240	218	200				
5.0	83.0	461	395	346	307	277	252	230				
5.5	102.0	567	486	425	378	340	309	283				
6.0	115.0	639	548	479	426	383	348	319				
6.5	128.0	711	609	533	474	427	388	356				
2.0	10.0	50	43	37	33	30	27	25	20		Remove Vane	F3
2.5	21.0	105	90	79	70	63	57	52				
3.0	32.5	163	139	122	108	98	89	81				
3.5	46.0	230	197	173	153	138	125	115				
4.0	58.0	290	249	217	193	174	158	145				
4.5	72.0	360	309	270	240	216	196	180				
5.0	83.0	415	356	311	277	249	226	208				
5.5	102.0	510	437	382	340	306	278	255				
6.0	115.0	575	493	431	383	345	314	287				
6.5	128.0	640	549	480	427	384	349	320				
3.0	32.5	148	127	111	98	89	81	74	22	F4		Remove Vane
3.5	46.0	209	179	157	139	125	114	105				
4.0	58.0	264	226	198	176	158	144	132				
4.5	72.0	327	280	245	218	196	178	164				
5.0	83.0	377	323	283	251	226	206	189				
5.5	102.0	464	397	348	309	278	253	232				
6.0	115.0	523	448	392	348	314	285	261				
6.5	128.0	582	499	436	389	349	317	291				
7.0	150.0	682	584	511	455	409	372	341				
2.0	10.0	42	36	31	28	25	23	21	24	F3		F4
2.5	21.0	87	75	66	58	52	48	44				
3.0	32.5	135	116	102	90	81	74	68				
3.5	46.0	192	164	144	128	115	105	96				
4.0	58.0	242	207	181	161	145	132	121				
4.5	72.0	300	257	225	200	180	164	150				
5.0	83.0	346	296	259	230	207	189	173				
5.5	102.0	425	364	319	283	255	232	212				
6.0	115.0	479	411	359	319	287	261	239				
6.5	128.0	533	457	400	355	320	291	267				
7.0	150.0	625	536	469	417	375	341	313				

### 9.3. Super Phosphate (0-42-0) 1000kgIm<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Position (mm)			
		6	7	8	9	10	11	12		365	250	235	205
2.0	10.5	35	30	26	23	21	19	17.5	30	Remove Vane	F2	Remove Vane	F3
2.5	18.0	60	51	45	40	36	33	30					
3.0	32.0	107	91	80	71	64	58	53					
3.5	41.0	137	117	102	91	82	75	68					
4.0	55.5	185	159	139	123	111	101	92					
4.5	64.0	213	183	160	142	128	116	107					
5.0	81.0	270	231	202	180	162	147	135					
5.5	97.0	323	277	242	215	194	176	162					
6.0	130.0	433	371	325	289	260	236	217					
6.5	150.0	500	429	375	333	300	273	250					
7.0	173.0	577	494	433	384	346	315	288					
7.5	196.0	653	560	490	435	392	356	327					
8.0	220.0	733	629	550	489	440	400	367					
8.5	250.0	833	714	625	555	500	455	416					
2	10.5	31	26	23	21	19	17	15	34	F2	Remove Vane	F3	Remove Vane
2.5	18	53	45	40	35	32	29	26					
3	32	94	81	71	63	56	51	47					
3.5	41	121	103	90	80	72	66	60					
4	55.5	163	140	122	109	98	89	82					
4.5	64	188	161	141	125	113	103	94					
5	81	238	204	179	159	143	130	120					
5.5	97	285	245	214	190	171	156	143					
4	55.5	154	132	116	103	93	84	77	36	F2	Remove Vane	F3	Remove Vane
4.5	64	178	152	133	119	107	97	89					
5	81	225	193	169	150	135	123	113					
5.5	97	270	231	202	180	162	147	135					
6	130	361	310	271	241	217	197	181		F1		F3	
6.5	150	417	357	313	278	250	227	208					
7	173	481	412	360	320	288	262	240					
7.5	196	544	467	408	363	327	297	272					
8	220	611	524	458	407	367	333	306	F2	F4			
8.5	250	694	595	521	463	417	379	347					
		Kg/ha											

Average Lateral Shift: 7m

#### 9.4. Ammonium Sulphate (21-00-00 + 5) 1005 kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12		250	205
1.5	7.0	29	25	22	19	17	16	15	24	F2	F3
2.0	12.0	50	43	37	33	30	27	25			
2.5	26.0	108	93	81	72	65	59	54			
3.0	39.0	162	139	122	108	97	89	81			
3.5	54.0	225	193	169	150	135	123	113			
4.0	66.0	275	236	206	183	165	150	138			
4.5	78.0	325	279	244	217	195	177	163			
5.0	94.0	392	336	294	261	235	214	196			
5.5	103.0	429	368	322	286	257	234	215			
6.0	128.0	533	457	400	356	320	291	267			
		Kg/ha									

Average Lateral Shift: 6m

### 9.5. Ammonium Nitrate Granules (32-00--2) 960 kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Position (mm)			
		6	7	8	9	10	11	12		365	250	235	205
1.5	6.5	27	23	20	18	16	15	13.5	24	Remove Vane	F2	Remove Vane	F3
2.0	14.5	60	52	45	40	36	33	30					
2.5	27.0	112	96	84	75	67	61	56					
3.0	39.5	165	141	123	110	99	90	82					
3.5	54.5	227	195	170	151	136	124	114					
4.0	73.0	304	261	228	203	183	166	152					
4.5	88.0	367	314	275	244	220	200	183					
5.0	102.0	425	364	319	283	255	232	212					
5.5	120.0	500	429	375	333	300	273	250					
6.0	138.0	575	493	431	383	345	313	287					
2	14.5	48	41	36	32	29	26	34	30	F2	Remove Vane	F3	Remove Vane
2.5	27	90	77	68	60	54	49	45					
3	39.5	132	113	99	88	79	72	66					
3.5	54.5	182	156	136	121	109	99	91					
4	73	243	209	183	162	146	133	122					
4.5	88	293	251	220	196	176	160	147					
5	102	340	291	255	227	204	185	170					
2	14.5	43	37	32	28	26	23	21	34	F2	F3	Remove Vane	
2.5	27	79	68	60	53	48	43	40					
3	39.5	116	100	87	77	70	63	58					
3.5	54.5	160	137	120	107	96	87	80					
4	73	215	184	161	143	129	117	107					
4.5	88	259	222	194	173	155	141	130					
5	102	300	257	225	200	180	164	150					
5.5	120	353	303	265	235	212	193	176					
6	138	406	348	304	271	244	221	203					
		Kg/ha											

Average Lateral Shift: 5m

## 9.6. NPK Supreme (10-18-24) 1040kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12		250	205
2.0	13.5	45	39	34	30	27	24.5	22.5	30	F2	F3
2.5	24.5	82	70	61	54	49	44.5	41			
3.0	37.5	125	107	94	83	75	68	62.5			
3.5	53.0	177	151	132	118	106	96	88			
4.0	68.0	227	194	170	151	136	124	113			
4.5	82.0	273	234	205	182	164	149	137			
5.0	94.0	313	269	235	209	188	171	157			
5.5	106.0	353	303	265	235	212	193	177			
6.0	123.0	410	351	307	273	246	224	205			
6.5	140.0	467	400	350	311	280	255	233			
7.0	156.0	520	446	390	347	312	284	260			
7.5	173.0	577	494	433	385	346	315	288			
8.0	190.0	633	543	475	422	380	346	317			
8.5	208.0	694	594	520	462	416	378	347			
		Kg/ha									

Average Lateral Shift: 5m



### 9.7. NPK Mixture (08-18-28) 1010 kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Position (mm)			
		6	7	8	9	10	11	12		365	250	235	205
2.0	12.0	50	43	37.5	33	30	27	25	24	F3	Remove Vane	F3	
2.5	24.5	102	88	77	68	61	56	51					
3.0	37.0	154	132	116	103	93	84	77					
3.5	47.0	196	168	147	131	118	107	98					
4.0	65.5	273	234	205	182	164	149	137					
4.5	82.0	342	293	256	228	205	186	171					
5.0	97.0	404	346	303	269	242	221	202					
5.5	112.0	467	400	350	311	280	255	233					
6.0	127.0	529	454	397	353	317	289	265					
6.5	144.0	600	514	450	400	360	327	300					
7.0	161.0	670	575	503	447	402	366	335					
7.5	178	742	636	556	494	445	405	371					
8.0	195	812	696	609	542	487	443	406					
8.5	213	887	761	666	592	532	484	444					
2.5	24.5	88	75	66	58	53	48	44	28	F1	Remove Vane	F4	
3	37	132	113	99	88	79	72	66					
3.5	47	168	144	125	112	101	92	84					
4	65.5	234	201	175	156	140	128	117					
4.5	82	293	251	220	195	176	160	146					
5	97	346	297	260	231	208	189	173					
5.5	112	400	343	300	267	240	218	200					
6	127	454	389	340	302	272	247	227					
6.5	144	514	441	386	343	309	281	257					
7	161	575	493	431	383	345	314	288					
4	65.5	218	187	164	146	131	119	109	30	F1	Remove Vane	F4	
4.5	82	273	234	205	182	164	149	137					
5	97	323	277	243	216	194	17	162					
5.5	112	373	320	280	249	224	204	187					
6	127	423	363	318	282	254	231	212					
6.5	144	480	411	360	320	288	262	240					
7	161	537	460	403	358	322	293	268					
7.5	178	593	509	445	396	356	324	297					
		Kq/ha											

Average Lateral Shift: 5m

### 9.8. Phosmag (5-6-7)

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Position (mm)				
		6	7	8	9	10	11	12		365	250	235	205	
2	16	114	98	86	76	69	62	57	14	Remove Vane	Remove Vane	F1	F4	
2.5	29	207	178	155	138	124	113	104						
3	46	329	281	246	219	197	179	164						
3.5	65	464	398	348	310	279	253	232						
4	82	586	502	439	390	351	319	293						
4.5	102.5	732	628	549	488	439	399	366						
5	130	929	796	696	619	557	506	464						
5.5	146	1043	894	782	695	626	569	521						
6	166.5	1189	1019	892	793	714	649	595						
		Kg/ha												

### 9.9. Dry Rice 610kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12		250	205
3.0	5.5	31	26	23	20	18	17	15	18	F2	F3
3.5	8.0	44	38	33	30.	27	24	22	18		
4.0	15.0	75	64	56	50	45	41	37.5	20		
4.5	21.0	105	90	79	70	63	57	53	20		
5.0	27.5	138	118	103	92	83	75	69	20		
5.5	34.0	170	146	128	113	102	93	85	20		
6.0	43.0	215	184	161	143	129	117	108	20		
6.5	51.0	255	219	191	170	153	139	128	20		

### 9.10. Black Oats 555kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12		250	205
2.5	1.80	10	8.6	7.5	6.7	6	5.5	5	18	F1	F3
3.0	4.0	22	19	16.5	15	13	12	11	18		
3.5	8.5	47	40.5	35.5	31.5	28	26	23.5	18		
4.0	14.5	80	69	60	54	48	44	40	18		
4.5	22.3	115	98	86°	77	69	63	58	20		F4
5.0	28.0	140	120	105	93	84	76	70	20		
5.5	34.5	172	148	129	115	103	94	86	20		
6.0	43.0	215	184	161	143	129	117	108	20		

Average Lateral Shift: 5m

### 9.11. Barley 695kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12		250	205
2.0	6.0	27	23	20	18	16	15	14	22	F2	F2
2.5	11.5	52	45	39	35	31	29	26	22		
3.0	22.0	100	86	75	67	60	55	50	22		
3.5	30.0	136	117	102	91	82	74	68	22		
4.0	39.0	163	139	122	108	97	88	81	24		
4.5	50.0	208	179	156	139	125	114	104	24		
5.0	60.0	250	214	187	167	150	136	125	24		

### 9.12. Millet 810kg/m

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)							Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12		250	205
0.5	0.6	3.8	3.2	2.8	2.5	2.3	2.0	1.9	16	F1	F2
0.75	1.8	11.3	9.5	8.5	7.5	6.8	6.0	5.5	16		
1.0	3.5	19	17	14.6	13	11.7	10.6	9.7	18		
1.25	5.0	28	24	21	18.5	17	15	14	18		F3
1.5	7.0	39	33	29	26	23	21	19.5	18		
1.75	11.0	55	47	41	37	33	30	27.5	20		
2.0	14.0	70	60	52.5	47	42	38	35	20		
2.25	20.0	100	86	75	67	60	55	50	20		

### 9.13. Wheat 810kg/m<sup>3</sup>

Scale Opening	Flow Rate (kg/min)	Tractor Speed (kph)								Eff. Work Width (m)	Vane Pos'n (mm)	
		6	7	8	9	10	11	12	250		205	
1.5	4.5	23	19	17	15	13	12	11	20	F2	F2	
2.0	9.0	45	39	34	30	27	25	23	20			
2.5	19.0	79	68	59	53	48	43	40	24			
3.0	26.0	108	93	81	72	65	59	54	24			
3.5	33.0	127	109	95	85	76	69	64	26			
4.0	45.0	173	148	130	115	104	94	84	26			
4.5	61.0	235	201	176	156	140	128	117	26			
5.0	77.0	296	254	222	197	178	162	148	26			
		Kg/ha										

Average Lateral Shift: 5m

## 10. Troubleshooting

Problem	Possible Causes	Solutions
Restricted outflow of product, or flow is not continuous	Scale opening is not adjusted correctly.	Adjust the opening as per section 8.7
	Foreign objects in hopper obstructing outflow.	Remove objects
	Product hanging up due to excess humidity.	Dry the product or suspend the work until product has dried.
		Adjust the height of the Protective Funnel to increase the flow of product.
	Lumps in the product.	Remove or break up the lumps.
		If possible increase the speed of the tractor and increase the outflow to facilitate the passage of small lumps.
	Agitator not operating correctly.	Repair and/or replace damaged components.
Distribution of product uneven.	Spreader not level.	Level spreader as per section 7.4
	Incorrect PTO speed	Adjust PTO to 540rpm.
	The vanes are not set correctly for the product	Check the Distribution Tables and adjust setting if necessary.
Excessive vibration or noise	Drive shaft universals worn.	Replace worn parts.
	Excessive play in the lower 3-point linkages.	Stabilise the lateral movement of the linkage
	Foreign objects in hopper.	Remove objects.
Excessive dusting or damage to seeds	Outflow too low	Choose a higher speed which allows the aperture to open further.
	Agitator not operating correctly.	Repair and/or replace damaged components.

**ATTENTION:** For your safety and the proper functioning of the Tornado 1300, ensure the bolts securing the hopper are tight and that the protective funnels are installed.

## 11. Maintenance

The TORNADO 1300 Generation III spreaders are manufactured with corrosion resistant components especially in those areas that come into direct contact with fertilisers, however to keep the spreader in optimum working condition and to guarantee a long useful life, lubricate when due, keep the machine clean and store out of the weather.

### 11.1. Daily Lubrication and Checks.

Daily grease the drive shaft universals (fig.26) and check the level of the oil in the gearboxes.

Observe the general functioning of the implement and if anything strange is noticed, locate the cause and correct it before using the spreader.

Check the tightness of all nuts, screws and other components.

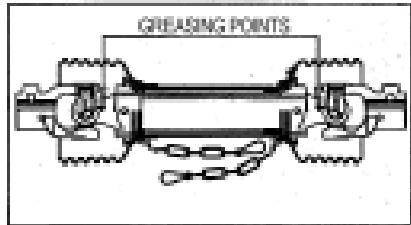


Fig 26

#### Recommended Greases

Shell	Alvania EP2 or Retinax
Caltex	Multipurpose MP2

### 11.2. Gearbox Maintenance

Change the oil in the gearboxes (capacity 300ml) after the first 50 hours of operation, thereafter change the oil every 1,000 hours.

To check the oil level: With the spreader stopped and level remove the oil level check plug (Fig. 27). If the oil does not reach the hole then the oil level is low and will have to be topped up. Use only oil of the same make and grade. Do not mix oils of different brands.

The spreaders are supplied filled with Agip Blasias 150.

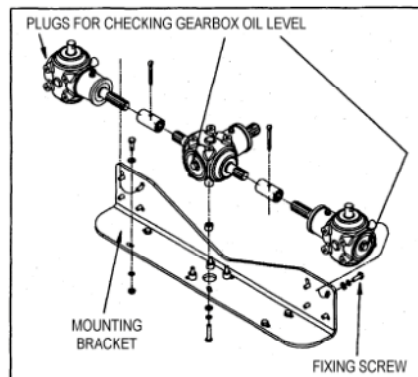


Fig 27

**To change the oil:** (This is best done after the implement has been operating so that the oil is warm and flows easier, also any debris within the oil has not got time to settle). Remove the gearboxes from the spreader. Remove the drain plugs and drain the old oil (dispose of the old oil in accordance with local by-laws). Put 300ml of the new oil in each of the gearboxes and insert and tighten the drain plugs. Refit the gearboxes to the spreader.

**Recommended Oils**

Castrol ILO SP150

Shell Omala 150

Mobil Gear Oil 629

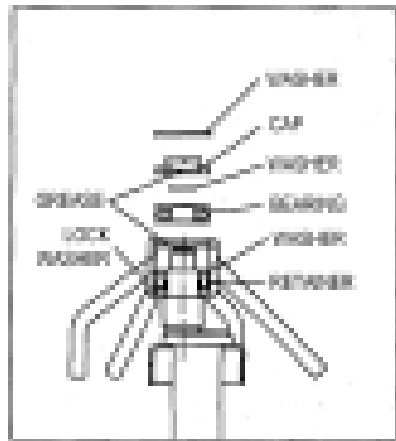
Agip Blasia 150

Caltex Meropa 150

### 11.3. Agitator Maintenance

The agitators have sealed bearings which do not need lubrication. However the units must be checked occasionally to ensure they are functioning correctly, that is slowly rotating during operation. If the agitators are not functioning properly, disassemble and check the retaining clips and seals for damage, replacing if necessary.

Before reassembling wash the parts with kerosene, dry and place grease where indicated (fig. 28).



**Fig 28**

### 11.4. Maintaining the Spreader

The TORNADO 1300 Generation III spreaders are manufactured with corrosion resistant components especially in those areas that come into direct contact with fertilisers, however to keep the spreader in optimum working condition and to guarantee a long useful life, observe the following:

- ★ Empty the hoppers and thoroughly wash and dry the spreader after use.
- ★ Touch up any damaged paint.
- ★ Spray all metallic components with oil to reduce corrosion and seizing.
- ★ Keep spreader in a sheltered and dry location.

**Note:** The condition of the spreader will quickly deteriorate if exposed for long periods to sun, rain and heat.

### **11.5. Assembly and Removal of Distribution Disks and Agitators:**

To disassemble the distributor disks it is necessary to remove the agitators from the axle (1)–(Fig. 29). To do this hold the disk (2) and release from the axle (1) using an 24mm open-ended spanner. Notice that the axle on the left side has a left-hand thread, while the one on the right has a right-hand thread. To facilitate identification the right-hand parts are marked with the letter “D” while those on the left are marked with an “E”.

To assemble proceed in reverse order, taking care to thoroughly clean the mounting surfaces of the disks. Grease the thread on the tip of the agitators before assembly.



**Fig 29**

## **12. Technical Assistance**

Refer to your dealer if you are having problems.

## **13. Parts Replacement**

When replacing parts only use original replacement parts supplied by your dealer to prevent compromising the functioning and long-life of the spreader. The use of non-original parts will invalidate the warranty.

## Parts Catalogue

### Chassis/Hoppers

Mod 30/36 Hyd 4810-3022





# Parts Catalogue

## Chassis/Hoppers

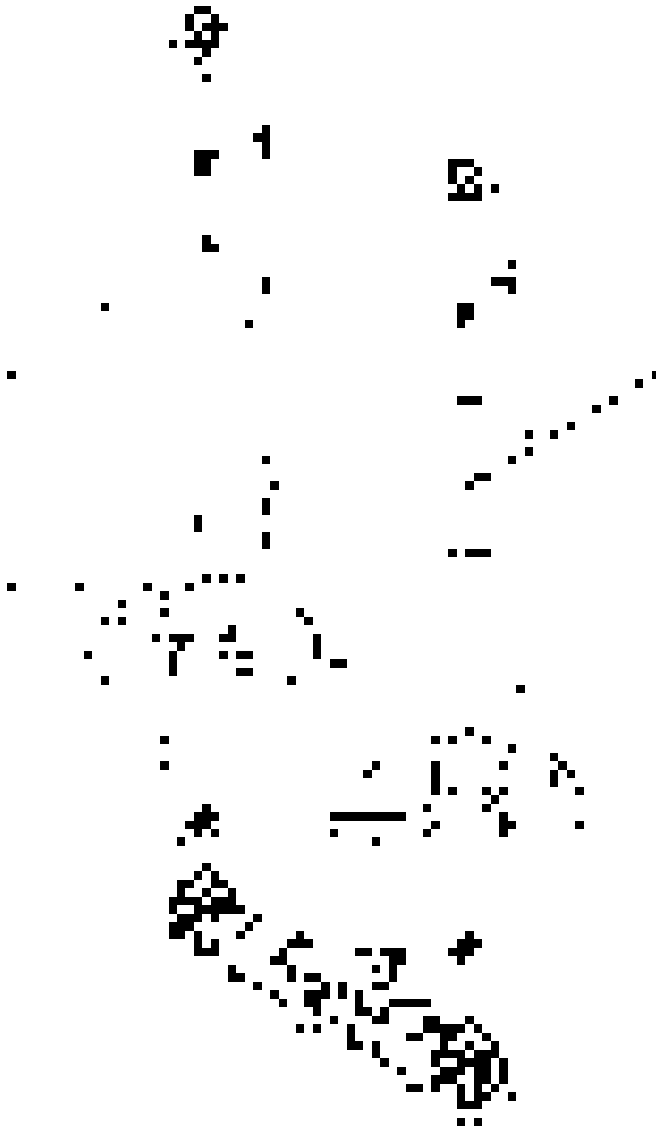
Mod 30/36 Hyd 4810-3022

Item	Part N°	Description	Qty
01	4810-1206	GUARD	01
02	4810-1173	SCREEN PIPE	02
03	4810-1180	HOPPER SEAL	02
04	4810-2025	CHASSIS	01
05	4810-2009	PROTECTIVE SCREEN	02
05	4810-2014	PROTECTIVE SCREEN FOR RICE (optional)	02
06	4810-2010	FIXING CLAMP	08
07	4810-2013	BOLT	01
08	4810-4108	FUNNEL	02
09	4810-4110	HOPPER	02
10	9100-0436	WASHER	04
11	9100-0501	SPRING WASHER	04
12	9100-0665	CLIP	04
13	9100-1441	PLUG	04
14	9100-2590	BOLT	03
15	9100-2811	NUT	04
16	9100-2906	NYLOC NUT	08
17	4810-2026	BOLT	02

## Parts Catalogue

## Distribution Disks & Regulators

Mod 30/36 Hyd 4810-3022



## Parts Catalogue

### Distribution Disks & Regulators

Mod 30/36 Hyd 4810-3022

Item	Part N°	Description	Qty
01	4810-1109	FLANGE	02
02	4810-1110	RIGHT CLAMP	01
03	4810-1111	LEFT CLAMP	01
04	48101114	CENTRAL BUSHING	02
05	4810-1115	RIGHT VANE 205mm (Accessory)	02
05	4810-1209	RIGHT VANE 235mm	02
06	4810-1116	LEFT VANE 205mm (Accessory)	02
06	4810-1210	LEFT VANE 235mm	02
07	4810-1117	RIGHT VANE 250mm (Accessory)	02
07	4810-1207	RIGHT VANE 365 mm	02
08	4810-1118	LEFT VANE 250mm (Accessory)	02
08	4810-1208	LEFT VANE 365mm	02
09	4810-1152	REGULATOR COVER LESSER OUTFLOW	02
10	4810-1155	LEFT DISTRIBUTION DISK	01
11	4810-1156	RIGHT DISTRIBUTION DISK	01
12	4810-2011	RIGHT REGULATOR	01
13	4810-2012	LEFT REGULATOR	01
14	4810-3005	RIGHT AGITATOR TIP	01
15	4810-3006	LEFT AGITATOR TIP	01
16	4810-4105	BRACKET	02
17	9100-0212	CIRCLIP	02
18	9100-0501	SPRING WASHER"	01
19	9100-1159	LOCATOR PIN	16
20	9100-2801	NUT S/STEEL	04
21	9100-2503	ELASTIC BOLT	02
22	9100-2504	ELASTIC BOLT	02
23	9100-2811	NUT	16
24	9100-1411	SCREW S/STEEL	04
25	9104-0546	SPRING WASHER	04

## Parts Catalogue – Decals

Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01	9100-0180	CHECK OIL LEVELS	01
02	9100-3711	TORNADO 1300 G. III	02
03	9100-3580	DRIVE SHAFT ADJUSTMENT	01
04	9100-3587	CAUTION – PTO	01
05	9100-3588	TRAILER WITH BRAKES PERMITTED	01

## Parts Catalogue – Gearboxes

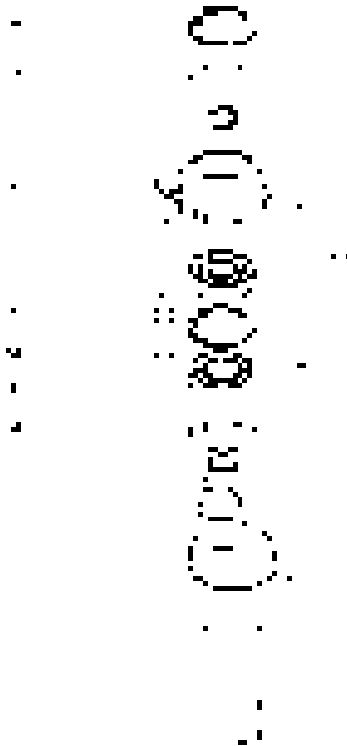
Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01	4810-1190	GEARBOX MOUNTING BRACKET	01
02	4810-1192	SPACER	04
03	4810-4123	SIDE GEARBOX CT8014-Z	02
04	4810-4124	CENTRAL GEARBOX CT8207-Z	01
05	4810-4125	JOINING SLEEVE	02
06	9100-0476	WASHER S/S	20
07	9100-0551	SPRING WASHER S/S	20
08	9100-0705	LOCKING PIN	02
09	9100-2329	SCREW S/S	12
10	9100-2446	SCREW S/S	04
11	9100-2904	NUT S/S	04
12	4810-4127	TRANSMISSION GUARD	01
	4810-3012	GEARBOX ASSEMBLY COMPLETE	

# Parts Catalogue – Agitator

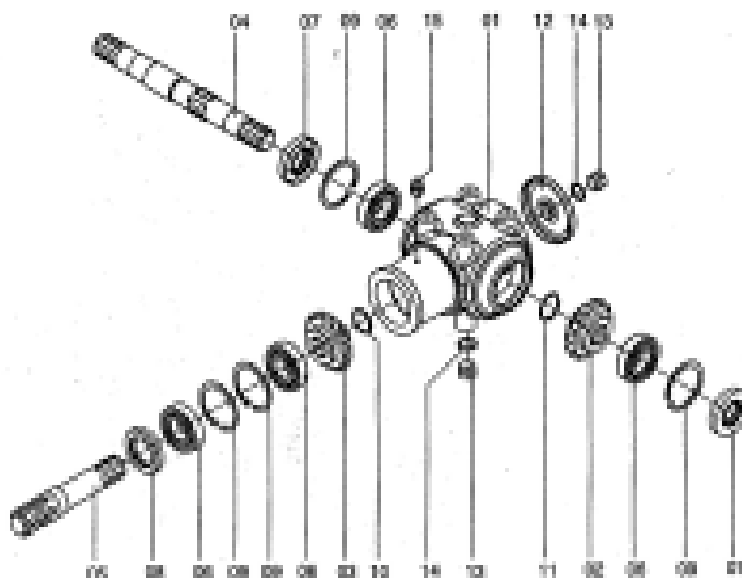
Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty	
			RH	LH
01	4810-1108	CAP	01	01
02	4810-2002	AGITATOR TIP	01	01
03	4810-2005	LEFT AGITATOR AXLE	01	-
03	4810-2006	RIGHT AGITATOR AXLE	-	01
04	4810-4107	WASHER	01	01
05	9100-3161	SEAL	01	01
06	9100-3282	BEARING	01	01
07	9100-3576	CIRCLIP	01	01
08	9100-3577	CIRCLIP	02	02
	4810-3005	RIGHT AGITATOR SET		
	4810-3006	LEFT AGITATOR SET		

## Parts Catalogue – Centre Gearbox

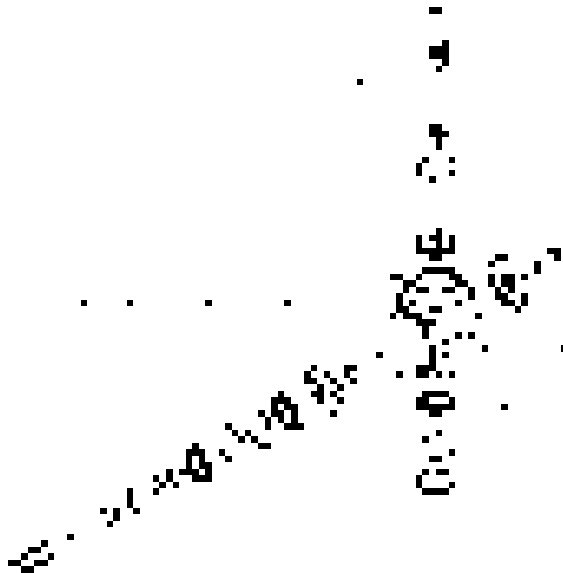
Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01	4810-4123-CA	CASE	01
02	4810-4124-EN1	CONICAL GEAR	01
03	4810-4124-EN2	CONICAL GEAR	01
04	4810-4124-E1	AXLE	01
05	4810-4124-E2	AXLE	01
06	9100-3290	BEARING	04
07	4810-4124-RT	SEAL	02
08	9100-3165	COFFER SEAL	01
09	9100-0205	CIRCLIP	04
10	9100-0199	CIRCLIP	01
11	9100-3647	CIRCLIP	01
12	4810-4123-T2	CAP	01
13	4810-4111-TM	OIL LEVEL CHECKING PLUG	02
14	4810-4111-JT1	DRAIN/FILLER PLUG	02
15	4810-4111-RP	BREATHER	01
	4810-4124	CENTRE GEARBOX COMPLETE CT8207-Z	

# Parts Catalogue – Lateral Gearbox

Mod 30/36 Hyd 4810-3022

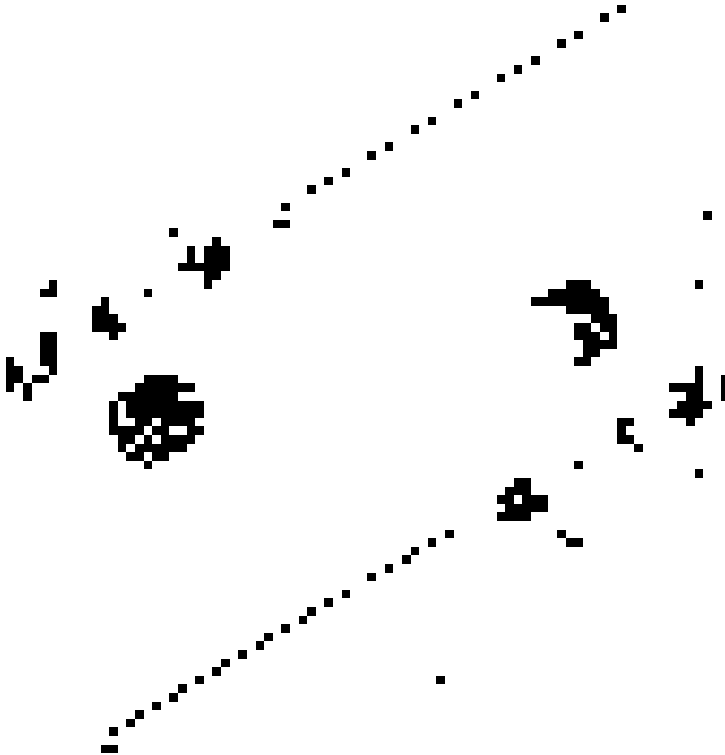


Item	Part N°	Description	Qty
01	4810-4123-CA	CASE	01
02	4810-4124-EN1	CONICAL GEAR	01
03	4810-4124-EN2	CONICAL GEAR	01
04	4810-4124-E1	AXLE	01
05	4810-4124-E2	AXLE	01
06	9100-3290	BEARING	03
07	9100-3324	BEARING	01
08	4810-4124-RT	SEAL	01
09	4810-4123-RT	SEAL	01
10	9100-0205	CIRCLIP	04
11	9100-3646	CIRCLIP	02
12	4810-4123-AE	WASHER	01
13	4810-4123-T1	CAP	01
14	4810-4123-T2	CAP	01
15	4810-4112-TA	OIL LEVEL CHECKING PLUG	01
16	4810-4111-JT1	DRAIN/FILLER PLUG	01
17	4810-4111-RP	BREATHER	01
	4810-4123	LATERAL GEARBOX COMPLETE CT8014-Z	



## Parts Catalogue – Drive Shaft

Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01		END	01
02		END	02
03		END	01
04		PIPE	01
05		BAR	01
06		CROSSPIECE	02
07		EXTERNAL PROTECTIVE BOOT	01
08		INTERNAL PROTECTIVE BOOT	01
09		GREASE NIPPLE 45°	02
10		ELASTIC BOLT	02
11		CIRCLIP	08
	4810-4115	DRIVE SHAFT COMPLETE	

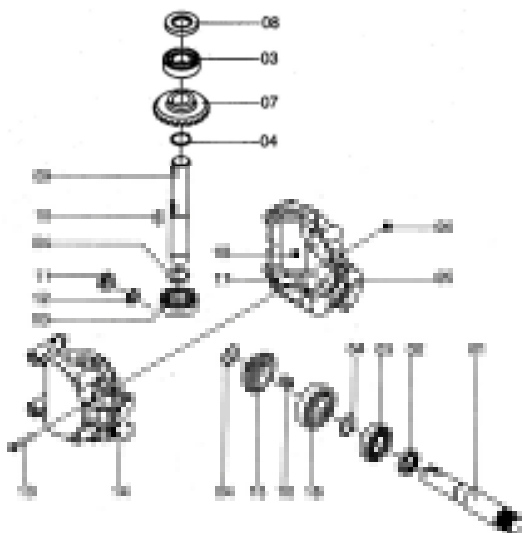
## Parts Catalogue – GEARBOXES BPN

Mod 30/36 Hyd 4810-3022



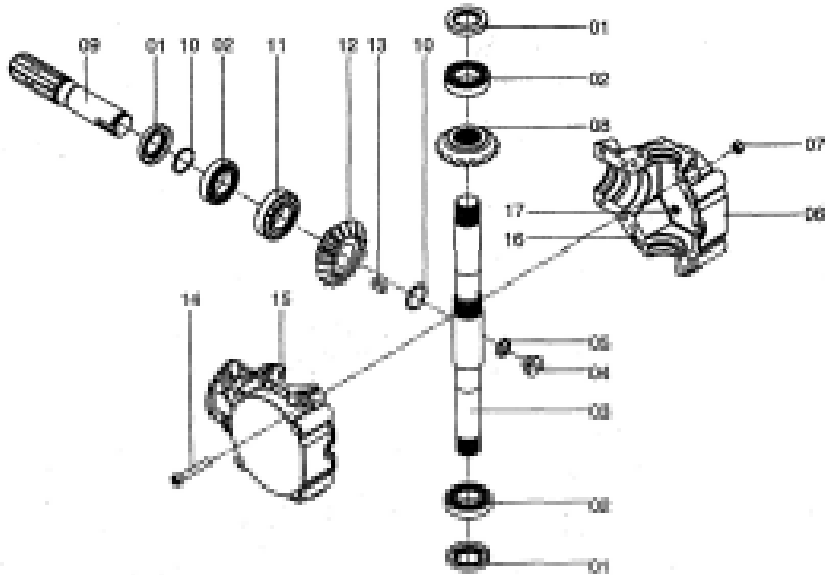
Item	Part N°	Description	Qty
01	4810-1190	GEARBOX MOUNTING BRACKET	01
02	9100-2346	SCREW S/S	08
03	4810-1192	SPACER	16
04	4810-4129	LATERAL GEARBOX	02
05	4810-4131	BUSHING	02
06	9100-2906	NYLOC NUT	16
07	4810-4130	CENTRE GEARBOX	01
08		LITHIUM BASE GREASE	
09	9100-2329	SCREW S/S	04
10	9100-0476	WASHER S/S	02
11	9100-2347	SCREW S/S	04
12	4810-4150	TRANSMISSION GUARD	01
	4810-3014	GEARBOX ASSEMBLY COMPLETE	

# Parts Catalogue – Lateral Gearbox BPN Mod 30/36 Hyd 4810-3022



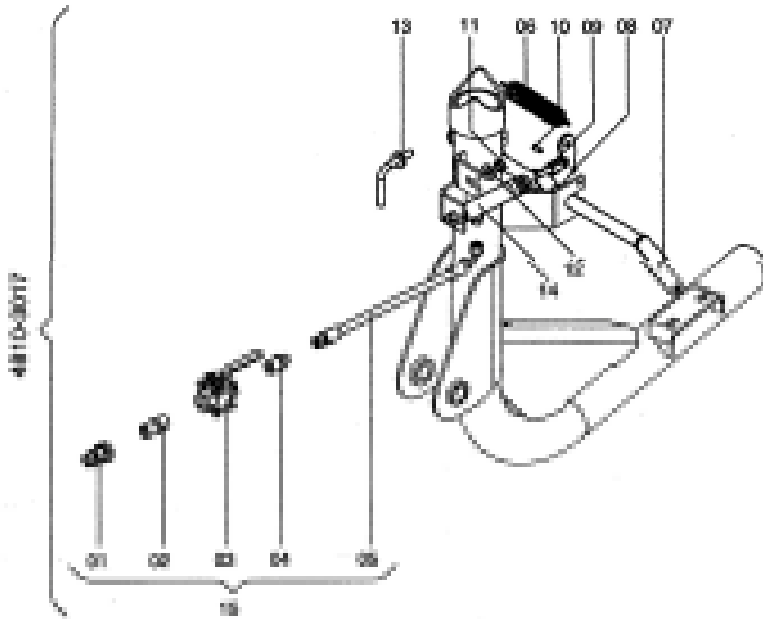
Item	Part N°	Description	Qty
01	4810-4132	SHAFT	01
02	9100-3159	SEAL	01
03	9100-3289	BEARING	03
04	9100-0238	CIRCLIP	04
05	4810-4133	HALF-CASE	01
06	9100-2846	NYLOC NUT	06
07	4810-4134	CONICAL GEAR 17-T	01
08	9100-3158	SEAL	01
09	4810-4135	SHAFT	01
10	4810-4136	KEY	02
11	4810-4137	CAP	01
12	4810-4138	RUBBER PLUG	02
13	9100-1120	ALLEN SCREW	06
14	4810-4139	HALF-CASE	01
15	4810-4140	CONICAL GEAR	01
16	9100-3324	BEARING	01
17		SILICON LOCTITE	
18		OIL – SAE 90 LP	0.4L
	4810-4129	LATERAL GEARBOX COMPLETE 1018 BPN	

## Parts Catalogue – Centre Gearbox BPN Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01	9100-3242	SEAL	03
02	9100-3283	BEARING	03
03	4810-4141	AXLE X-Y	01
04	4810-4137	CAP	01
05	4810-4138	RUBBER RING	01
06	4810-4142	HALF-CASE	01
07	9100-2846	NYLOC NUT	08
08	4810-4143	CONICAL GEAR 15T	01
09	4810-4144	AXLE	01
10	9100-3646	CIRCLIP	02
11	9100-3220	ROLLER BEARING	01
12	4810-4145	CONICAL GEAR 17T	01
13	9100-0623	KEY	02
14	9100-1114	ALLEN SCREW	08
15	4810-4146	HALF-CASE	01
16		SILICONE LOCTITE 20033	--
17		OIL SAE 90 EP.	0.6L
	4810-4130	CENTRE GEARBOX COMPLETE 1020 BPN	

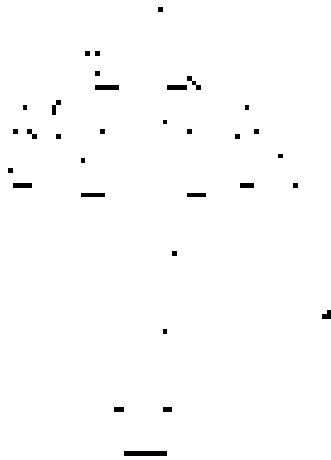
# Parts Catalogue – Hydraulic Controller      Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01	9100-0790	QUICK CONNECTION	02
02	9100-3609	ADAPTOR. M/M	02
03	9100-3061	BALL VALVE	02
04	9100-1045	NIPPLE (WINGED)	02
05	4810-3016	HOSE	02
06	4810-4119	SPRING	02
07	4810-2029	LEFT CONTROLLER LEVER	01
07	4810-2028	RIGHT CONTROLLER LEVER	--01
08	9100-0239	ELASTIC RING	02
09	4810-1198	YOKE	02
10	4810-1199	BOLT	02
11	9100-2906	NYLOC NUT	02
12	4810-1187	WASHER	02
13	4810-2018	RESTRICTOR	02
14	4810-4118	HYDRAULIC CYLINDER	02
15	4810-3009-CAT	HOSE	02
	4810-3017	HYDRAULIC CONTROLLER COMPLETE	

## Parts Catalogue – Fixed Agitator Tip (optional)

Mod 30/36 Hyd 4810-3022



Item	Part N°	Description	Qty
01	4810-2015	LEFT FIXED AGITATOR TIP	01
02	4810-2016	RIGHT FIXED AGITATOR TIP	01

## Notes

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