SPREADMASTER®

TORNADO 1300 G-IV

OPERATING INSTRUCTIONS & SPARE PARTS MANUAL

Read carefully before operating machine

DO NOT USE TRACTOR PTO BRAKE

Aug 2021

Introduction

The Spreadmaster twin distribution disk fertiliser spreader, model TORNADO 1300 Generation IV, 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 galvanised frame 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 & Distributed by

Agriquip
AGRICULTURAL IMPLEMENT WHOLESALERS

P.O. Box 578, 30 Hurlstone Drive, New Plymouth, New Zealand
Phone: +64 6 759 8402 | Email: parts@agriquip.co.nz | Web: www.agriquip.co.nz

TABLE OF CONTENTS

1 – MAIN COMPONENTS

The Tornado 1300 Generation-IV is made up of some basic components, as shown in Fig. 01:

A- Reservoir
B- Chassis
C- Gearboxes
D- Distribution Vanes
E- Vanes
F- Agitators
G- Proportional System
H- Drive Shaft
I- Protection Screen
J- Protector Funnel
K- Decals

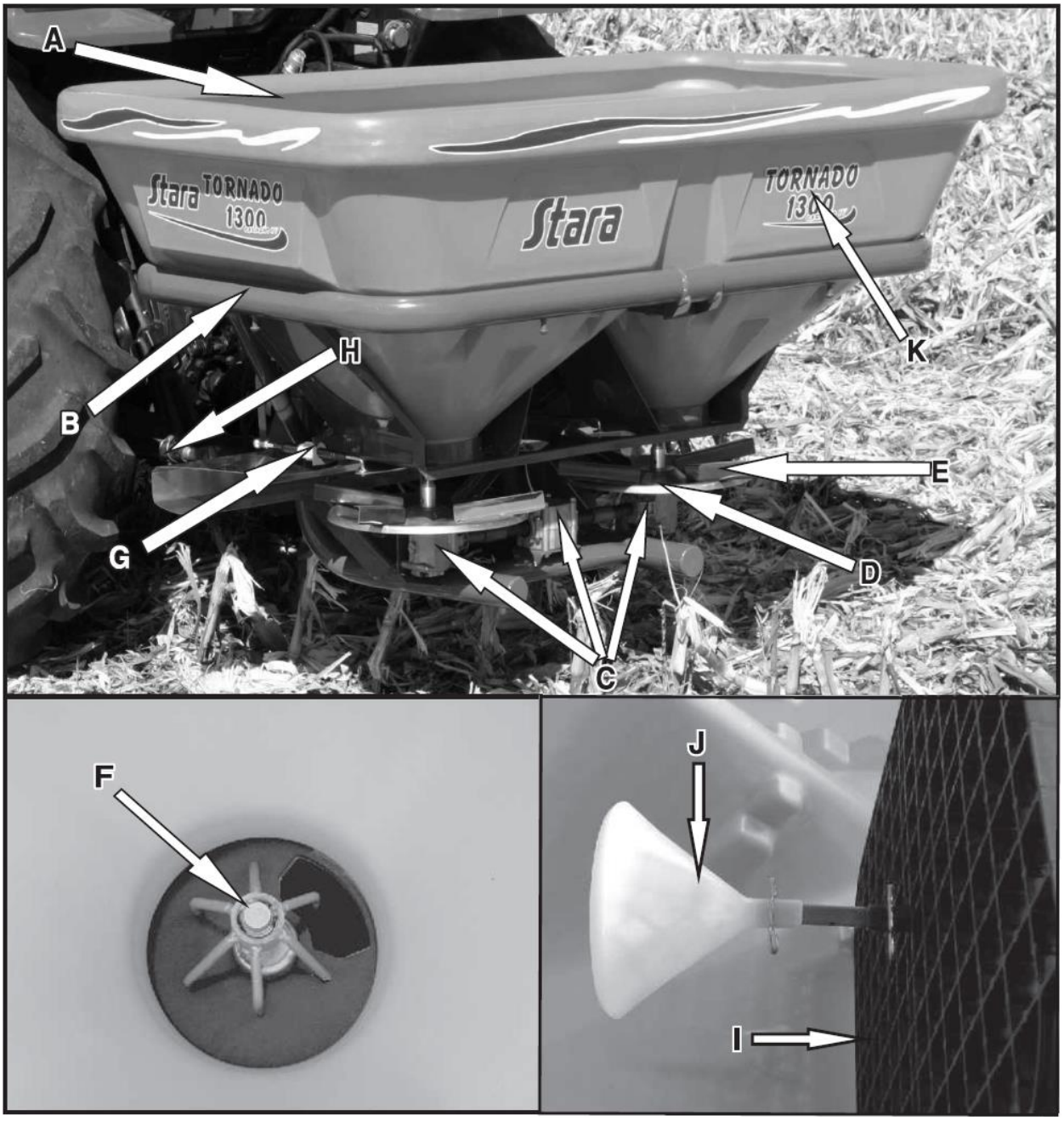


Fig. 01

2 - ID PLATE

The ID plate (Fig. 02) shows the model no. of the machine, weight, serial no., and also the date manufactured. This information is fundamental in the traceability of the machine during its life cycle. The ID plate is placed on the chassis of the implement.

Fig. 02

3 - TECHNICAL SPECIFICATIONS

Volumetric Capacity	1300 L
Weight Capacity	1340kg
Empty Weight	260kg
Height	1.2m
Width	2.3m
Length	1.3m
Mounting Type	3 Point Linkage/Cat. II
PTO RPM	540 RPM
Spreading Widths	See Distribution Tables
Tractor Recommendation	With Hyd. Lift Cylinder, Rated for 2.5 tons

4 – FEATURES AND FUNCTIONS

Chassis: Tubular construction, hot dip galvanised finish

Hopper Base: Stainless Steel (Fig. 03).

Hopper/Reservoir: One piece 6mm thick rotary moulded polyethylene, easily removable for cleaning (Fig. 04) Inside the hopper you will find a protective screen which has a protection funnel, which is adjustable over the agitator (Fig. 05). These components reduce the loading on the agitator and prevents undesirable flows and foreign objects obstructing the exit flow.

Transmission: The transmission consists of a central gearbox which connects to each of the two side gearboxes by a splined or keyed coupling locked into position by a locking pin.
Each gearbox has its own independent oil-bath lubrication. (Fig. 06)

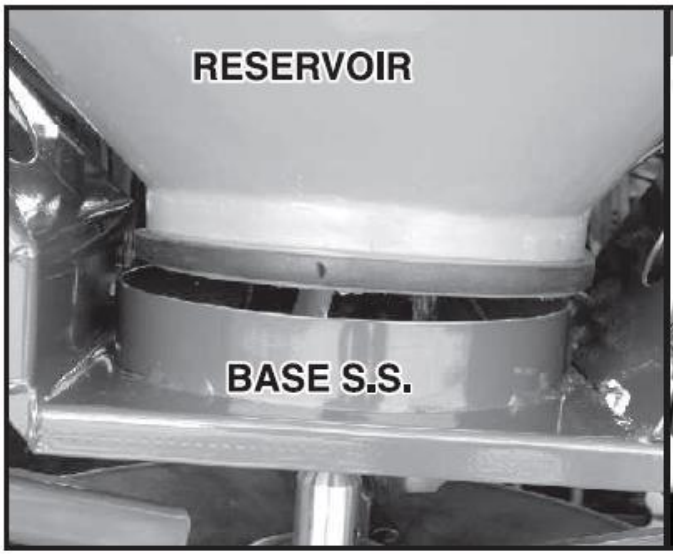


Fig. 03

Fig. 04

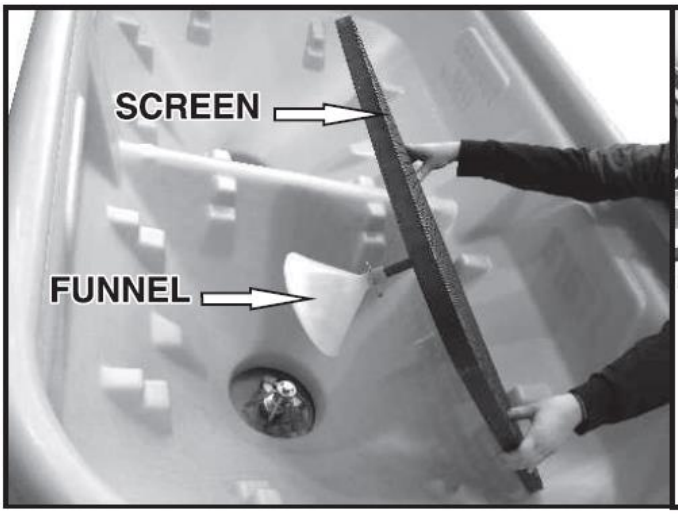


Fig. 05

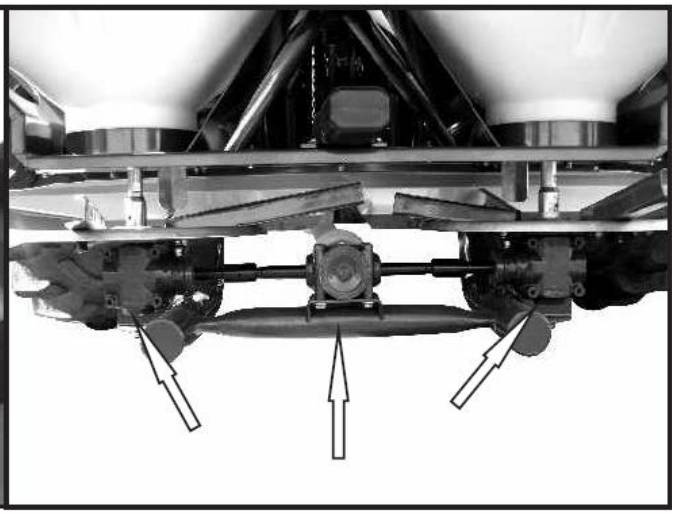


Fig. 06

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. 09).

Position "A": When using products of higher densities and/or where application rate per hectare is not too high (Fig. 07). E.g. Urea, potassium Chloride, NPK fertilizer.

Position "B": Used on products with lower densities and/or where the application rate per hectare is very high (Fig. 08). E.g.: Chicken coop beds, Limestone.

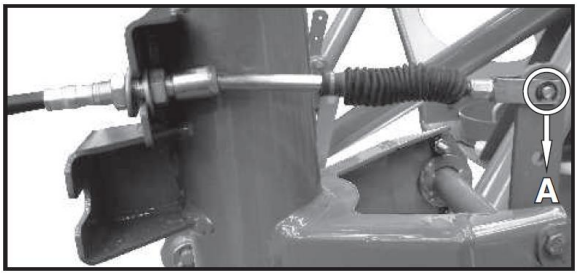


Fig. 07

Whenever possible, use the cable placement in the "A" position, thus making the slide-gate easier to operate.
The proportional opening adjustment can be made using the plastic adjusting nut (Fig. 09), which allows for a finer rate adjustment.

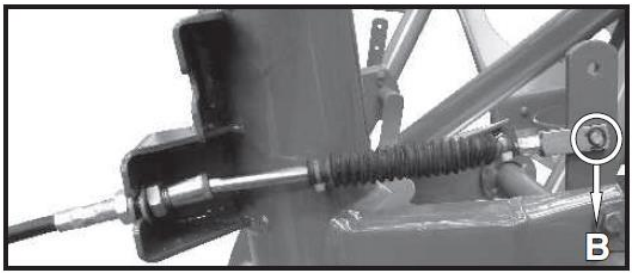


Fig. 08

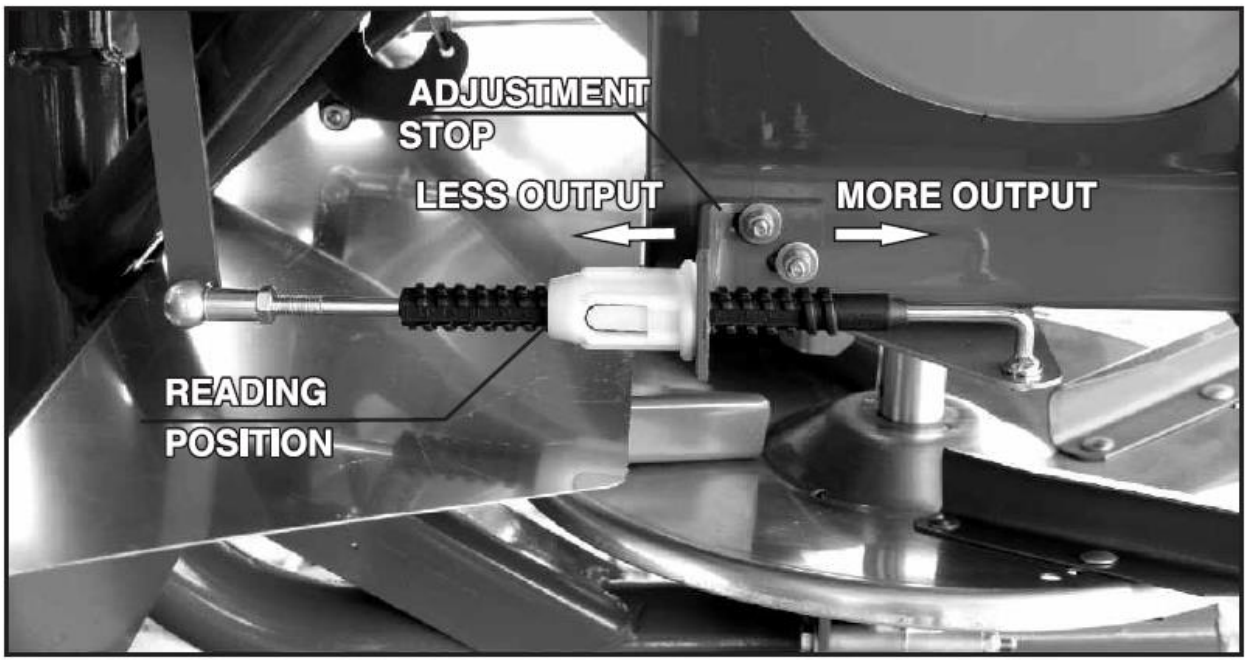
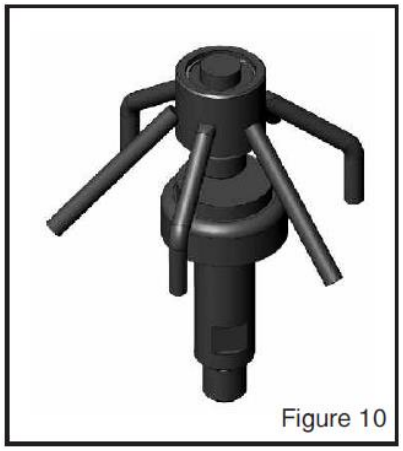


Fig. 09

Note! The sliding output gates overlap forming a variable diamond shape where the product can be deposited in one single spot, even if the amounts are small, guaranteeing excellent distribution performance with any dosage.

Agitators: The agitators work to maintain a continuous and uniform product flow on the discs. The agitators are a type of eccentric oscillator, which besides maintaining a uniform flow rate, does not damage the seeds, nor the fertiliser particles (Fig. 10).

Note: The Tornado 1300 agitators are sealed so they do <u>not</u> need periodic lubrication.



TECHNICAL SPECIFICATIONS

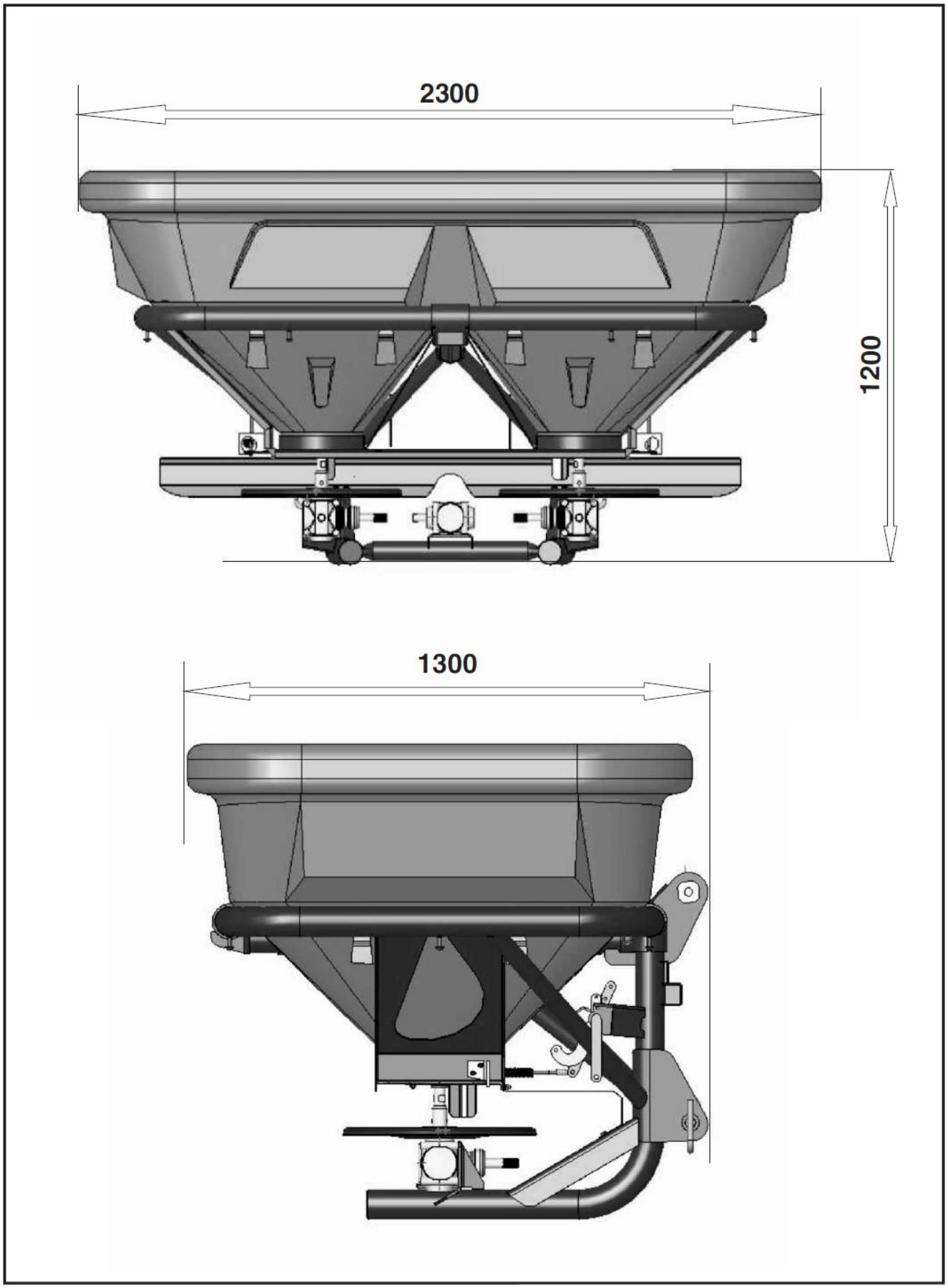


Fig. 11

5 – SAFETY PRECAUTIONS

The Tornado 1300 spreader is a relatively simple implement and does not pose any 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-point linkage;
b) Ensure the drive shaft is of the correct length (for adjustment see section 8.6.2);
c) Only attach the drive shaft to the PTO when the tractor is 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 remove 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 the tractor in motion;
i) Do not cut power to the spreader when the flow shutters are 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 whilst spreading;
l) Keep foreign items away that may accidentally fall into the product that is to be spread;
m) Ensure the tractor engine is off when lubricating, cleaning or maintaining;
n) Ensure the tractor has sufficient lifting capacity and weight to ensure that the tractor/spreader remains stable;
o) When towing trailers for transporting items behind the spreader use tandem axle trailers to prevent excess weight on the back of the implement;
p) Never go beneath the spreader when only supported by the tractor hydraulics. Support the spreader with appropriate stands if it has to be raised to perform the required maintenance.

6 - MAINTENANCE

The Tornado 1300 spreader are manufactured with corrosion resistant components, especially in the areas which come in 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.

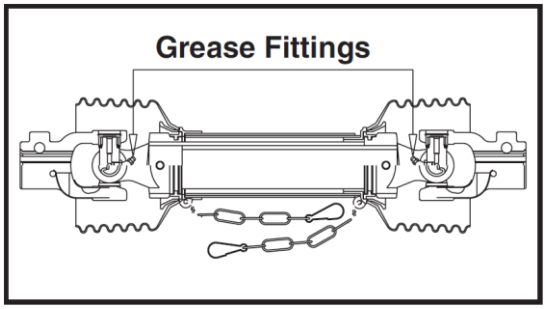


Fig. 12

6.1 – LUBRICATION AND DAILY INSPECTIONS

- Daily grease the drive shaft universal joints (Fig. 12) and check the level of the oil in the gearboxes.
- Observe the general operation of the implement and if you notice anything strange, find the problem and fix it before operating the spreader.

Recommended Greases	
Shell	Alvania EP2 or Retinax LX
Caltex	Multipurpose MP2
Castrol	Spheerol EPL 2

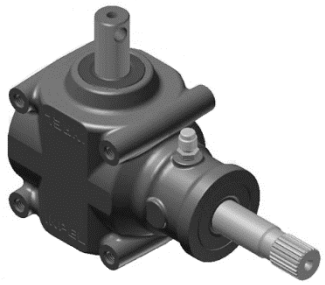
6.2 – GEARBOX MAINTENANCE

The first oil change should be done after the first 50 hours of operation, thereafter change the oil every 500 hours.

NOTE: Oil quantities will vary depending on the gearbox brand used on your Tornado 1300. 3 different brands of gearboxes have been used on the Tornado 1300, and the oil quantity in each will vary, as shown in the chart to the right:

Model	Quantity
INPEL	0.24L
BPN	0.5L
COMER	No oil change needed.

Below are the 3 different brands of gearboxes used:



IMPEL

COMER

BPN

How to check the oil levels.

With the implement levelled, remove the oil plug on each gear case (Fig. 13). If the oil doesn't reach the hole then the oil level is low and will have to be topped up until it reaches the edge of the hole. Use only oil of the same make and grade.

IMPORTANT! Do not mix oils of different brands.

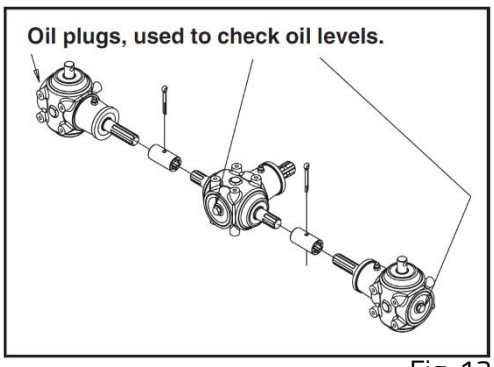


Fig. 13

How to change the oil.

(This is best done after the implement has been operating so that the oil is still warm and flows easier, also any debris in 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 bylaws). Put the recommended quantity of new oil (See table at top of page) in each of the gearboxes and insert and tighten the drain plugs. Refit the gearboxes to the spreader.

Note: The gearboxes are filled with AGIP-BLASIA 150 oil at the factory.

Recommended Oils

Specification	Manufacturer				
DIN 51517	CASTROL	AGIP	SHELL	CALTEX	MOBIL
Viscosity ISO VG 150 mm/s^2 @ 40°C	ILO SP150	BLASIA 150	OMALA 150	MEROPA 150	MOBILGEAR 629

6.3 – AGITATOR MAINTENANCE

The agitators have sealed bearings which self-lubricate. 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 bearings, circlips and seals for damage, replacing if necessary.

Before reassembling the agitator, clean and wash the parts with gasoline or mineral oil, then dry and reassemble again, greasing where indicated (Fig. 14).

Optional Fixed Agitator: Specific for hay-like seeds of low density which has the tendency to form a build-up or bunch-up. E.g. Rye Grass/Holly

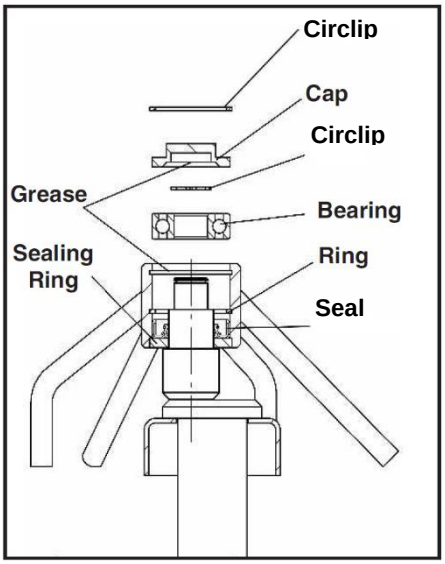


Fig. 14

6.4 - MAINTAINING AND STORING THE SPREADER

In the designing of the Tornado 1300 Gen. IV spreader, great care was taken in selecting highly corrosion resistant materials, especially in areas that come in direct contact with fertilisers. However, to keep the spreader in optimum working condition and to guarantee a long useful life, observe the following:

- Make sure the hopper is completely empty and thoroughly wash and dry the spreader as soon as possible after use.
- Wash down metallic parts with oil to reduce the risk of oxidation and seal components during down-time.
- Store the spreader dry and covered area.

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

6.5 – ASSEMBLY AND REMOVAL OF DISTRIBUTION DISCS AND AGITATORS

In order to disassemble the discs, it is necessary to remove the agitators from shaft "A" (Fig. 15). To do so, secure disc "B" and loosen shaft "A" using an open-ended spanner (24mm). Note that the axle "A" to the left, has a left-handed thread and the on the right side has a right-handed thread. To assist in identifying these parts, note that these are marked "D" for left and "E" for right.

Reassemble by reversing the disassembly procedure. Apply grease to the threads on the agitators before reassembling.

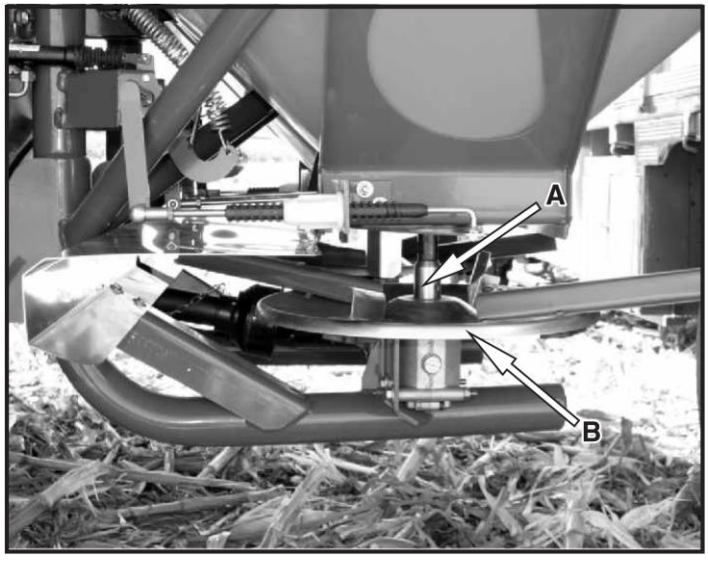


Fig. 15

7 –FIELD ASSEMBLY

To reduce the spreaders shipping volume, the reservoir and the drive shaft can be removed from the chassis and shipped separately.
To reassemble to reservoir, place it on the chassis and install the reservoir sealing ring onto its rim shoulder and mount onto the chassis' base.
In sequence, install the eye-bolts in such a way that the reservoir will remain firmly secured to the chassis (Fig. 16).

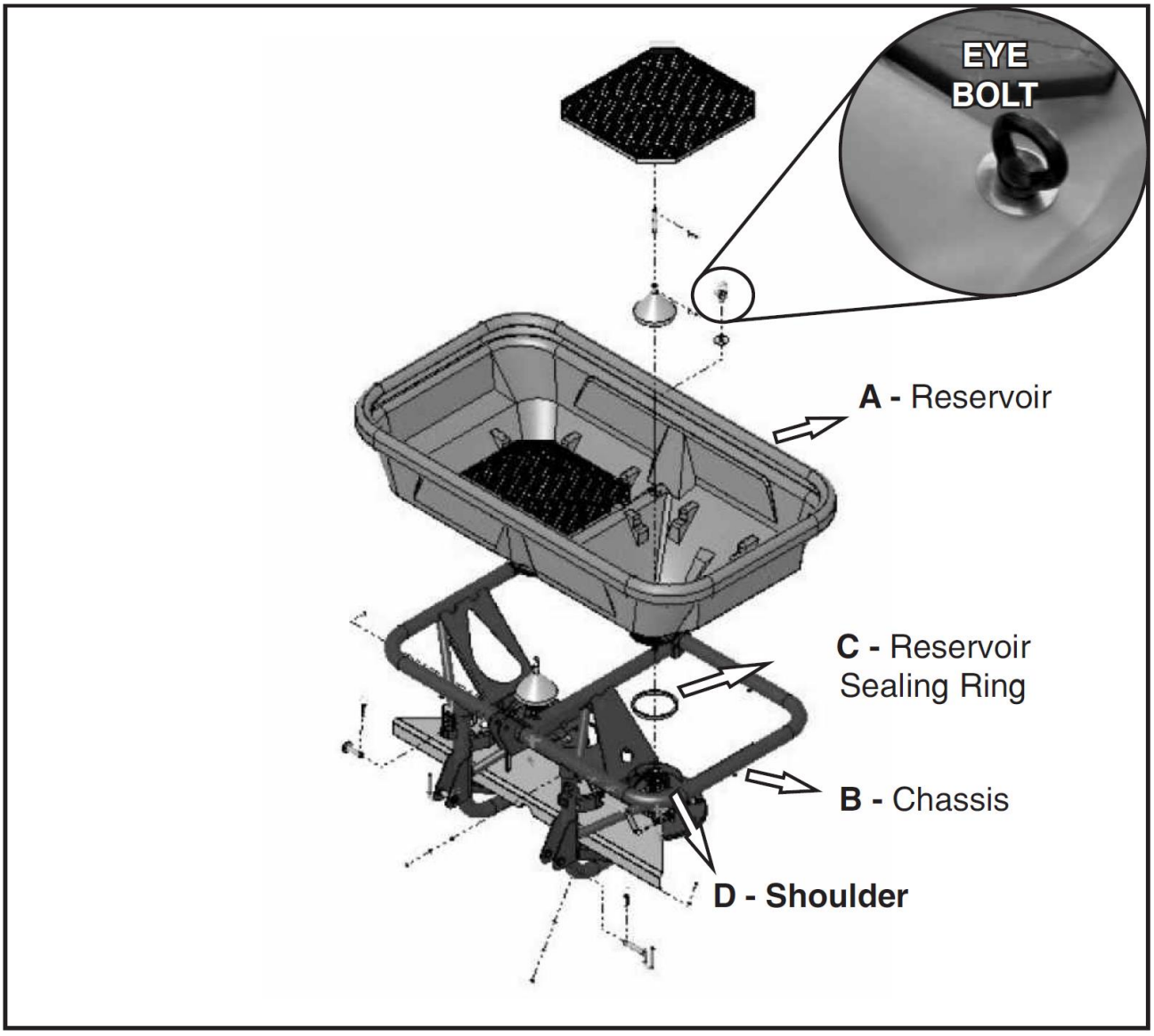


Fig. 16

Install the drive shaft onto the gearbox shaft. Before completing the assembly, adjust the drive shaft length according to the instructions on pages 14 and 15 of this manual.

8 – MOUNTING THE SPREADER AND ADJUSTMENTS

8.1 – Pre-operation Inspection

ATTENTION! Before operating the spreader follow these steps:

- Check that the reservoir is clean and clear of all foreign objects and remove if necessary.
- Remove plugs (A) from the gearboxes and replace them with breathers (Fig. 17).
- Check the oil level in the gearboxes. To do so, place the implement on a level surface and remove the oil plugs (B) to inspect. The gearboxes must be filled with oil to the level of the plugs (B).

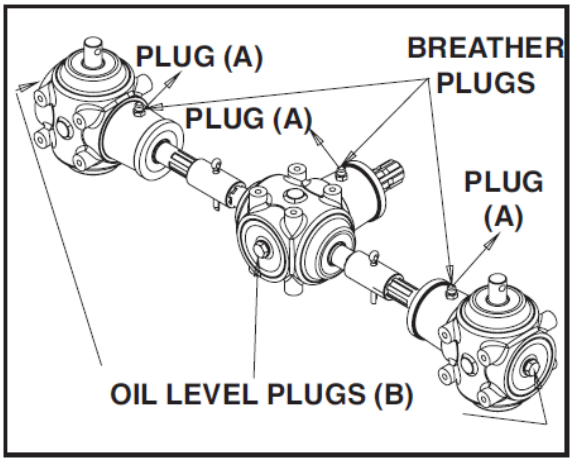


Fig. 17

The Tornado 1300 can be mounted to tractors which have a three point lifting hydraulic system that is capable of lifting loads of at least 2500kg. Weights may have to be mounted to the front of the tractor for added stability. To add counter weights to the tractor refer to the tractors instruction manual.

8.2 – 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. 18

8.3 - Adjustment of the Tractor Lower 3-Point Linkage Arms

The lower side arms should be adjusted using the side stabilisers, leaving a small gap of 5cm to keep the arms from contacting the tractors tyres (Fig. 19).

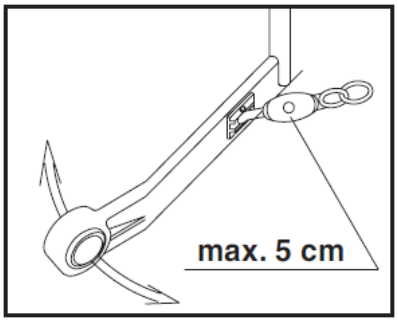


Fig. 19

8.4 - Hooking up the Tornado 1300 to the Tractor

The Tornado 1300 spreader is mounted on the tractor on the hydraulic three point linkage system, connecting the lower links first and lastly the third linkage point (Fig. 20).

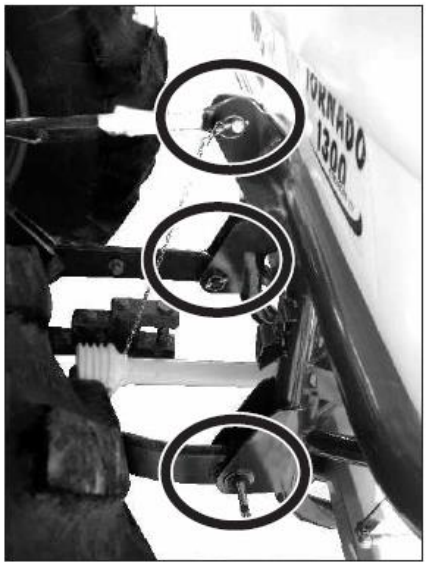


Fig. 20

8.5 – Height Adjustment and Horizontal Levelling

The correct working height of the Tornado 1300 is 80cm measuring from the distribution discs to the ground when on flat ground. Once the correct height is established, adjust the top link until the spreader is level with ground, which can be check by looking at the spreader from both the side and the rear, then check again that the distance from the discs to the ground is correct (Fig. 21).

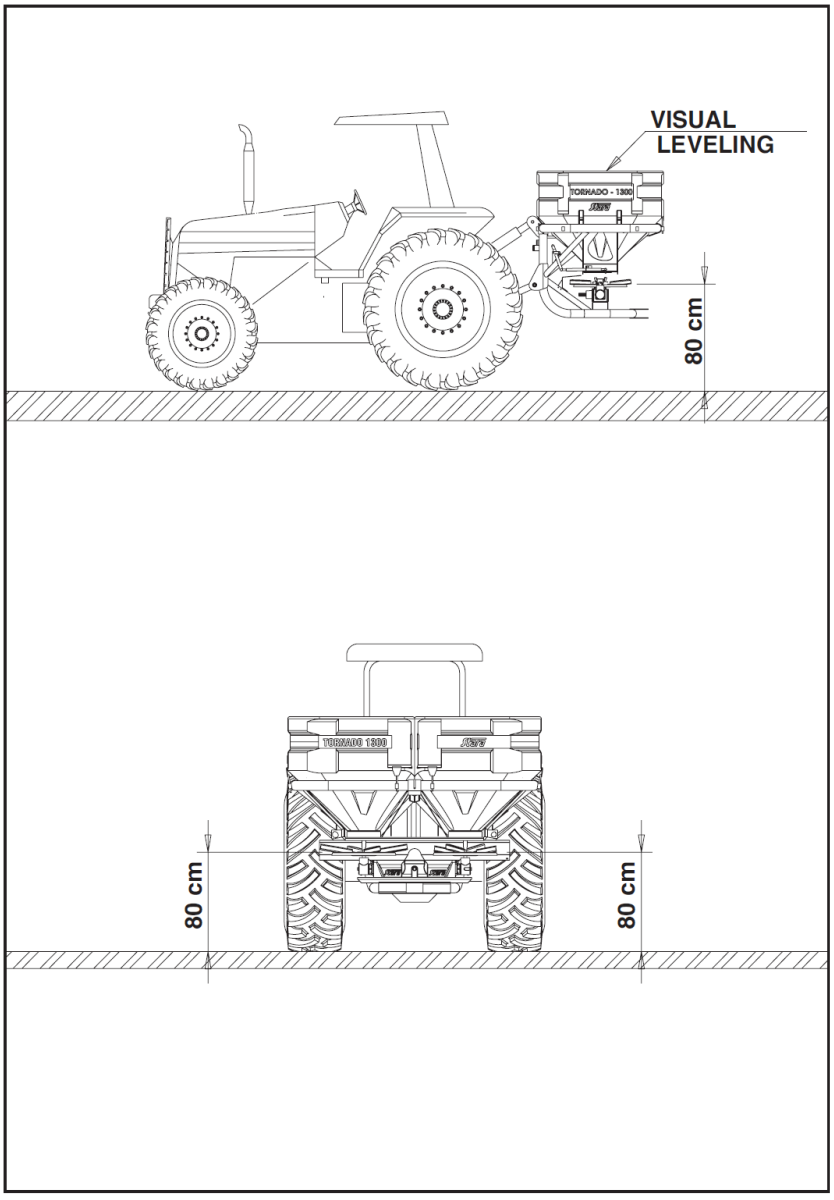


Fig. 21

8.6 – Drive Shaft

8.6.1 – Connecting

Before connecting the drive shaft, clean and grease the tractor PTO shaft spline, to make connection easier, and depress the quick connect pin and slide the drive shaft onto the tractor PTO output shaft (Fig. 22).

8.6.2 – Length Adjustment

Because of the many 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 so, raise the spreader until the spreaders PTO input shaft is the same height as the tractors PTO output shaft.

Place one half of the drive shaft against the shaft on the spreader and the other half on the PTO on the tractor (Fig. 23). The two tubes (male and female) must have a minimum end-clearance of 2.5cm (Fig. 24).

If the drive shaft is too long reduce the length of both tubes by the same amount (Fig. 26). Remove any debris and burrs and apply grease to the outside of the inner tube.

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.

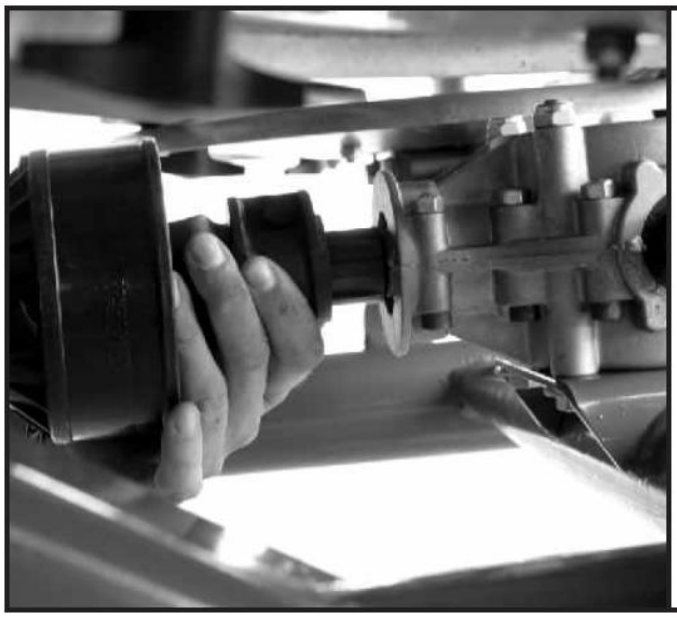


Fig. 22

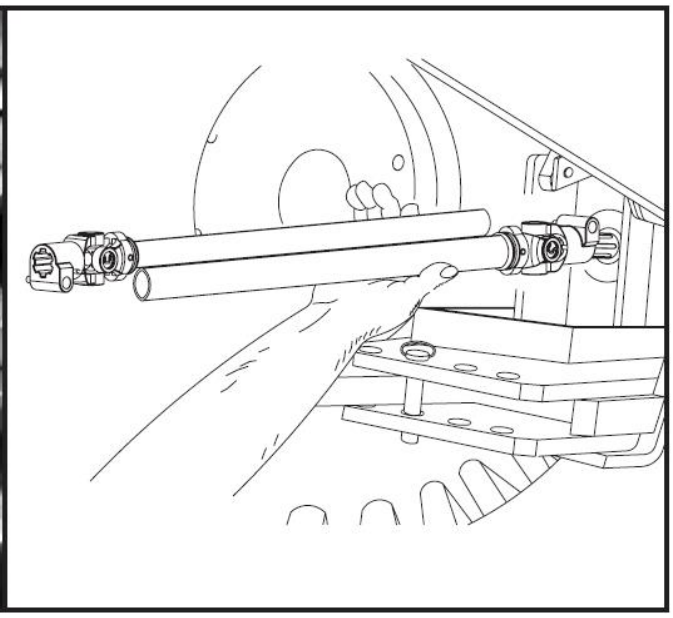


Fig. 23

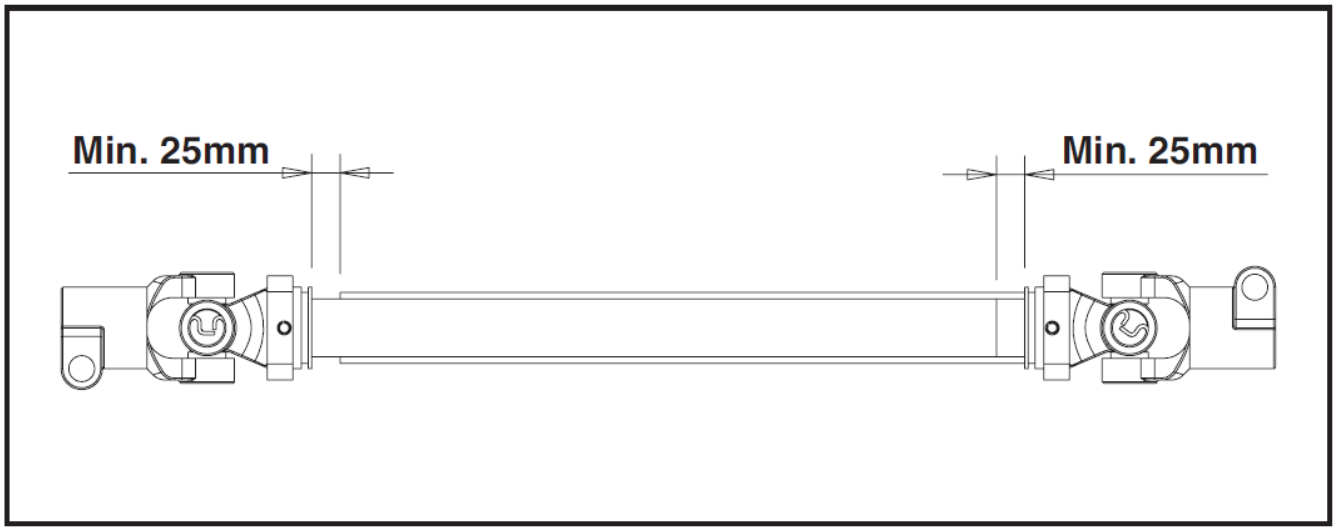


Fig. 24

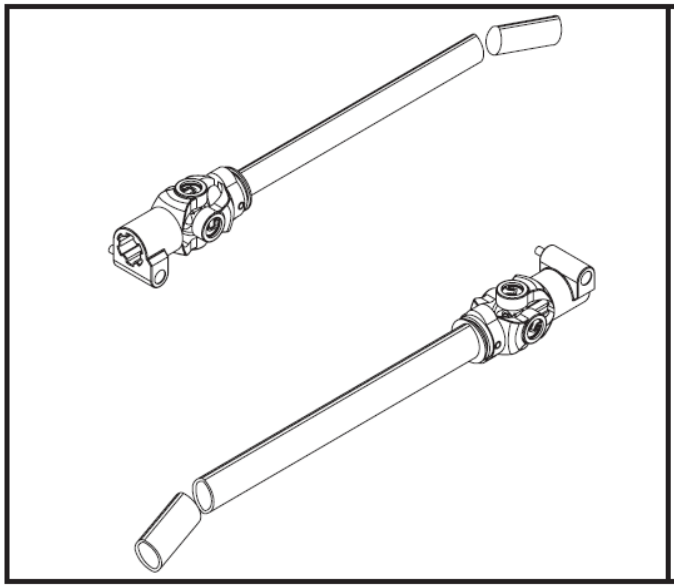


Fig. 25

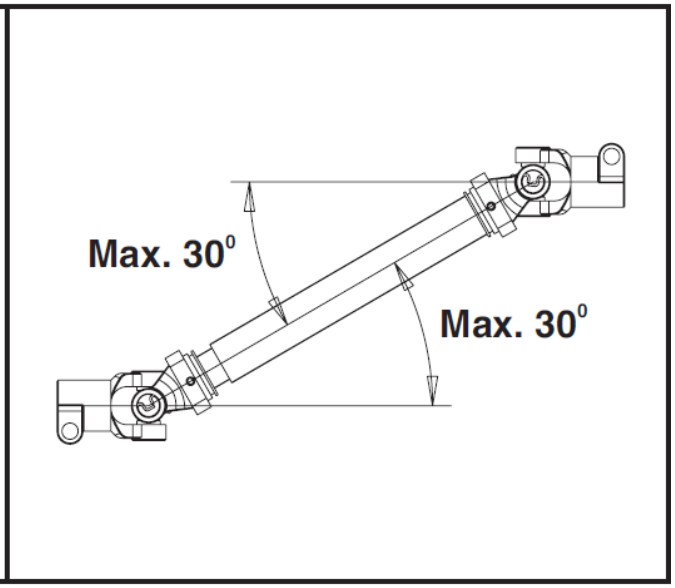


Fig. 26

Caution! The angle of the drive shaft must never exceed 30° when operating (Fig. 26).

9 – ADJUSTMENTS

9.1 – Tractor Speed

The tractor working 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 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 tractors owner's manual, or decal, to determine the speed, gear, engine and PTO rpm's, consult the tractors owner's manual or read the decals on the tractor relating to this.

DO NOT USE TRACTOR PTO BRAKE

DOING SO WILL CAUSE SERIOUS SPREADER DRIVE LINE DAMAGE FAILURE.

9.2 – PTO Speed

So that the product is applied correctly, it is necessary that the rpm's of the PTO is kept at a constant 540 rpm during the spreading operation. 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. 27).

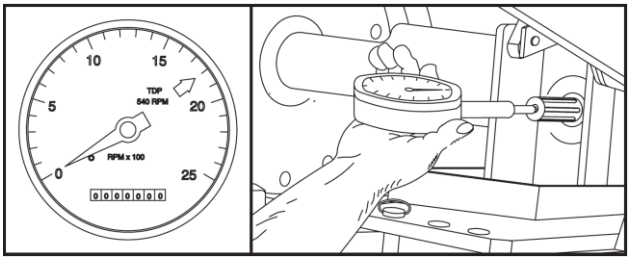


Fig. 27

9.3 – Setting the Vanes

The Tornado 1300 has two distribution discs with vanes, 365mm, 250mm, 235mm, and 205mm that can be combined in pairs on each distribution disc. Each vane has four positions it can be set on the disc which allows the path of the product to be advanced or delayed in exiting the discs. 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 11.

Figure 28 below shows the direction of rotation of the distribution discs and the options for setting the vanes. Note the assembly order, the short and long vanes must be mounted alternatively on the disc and also in relation to the other disc.

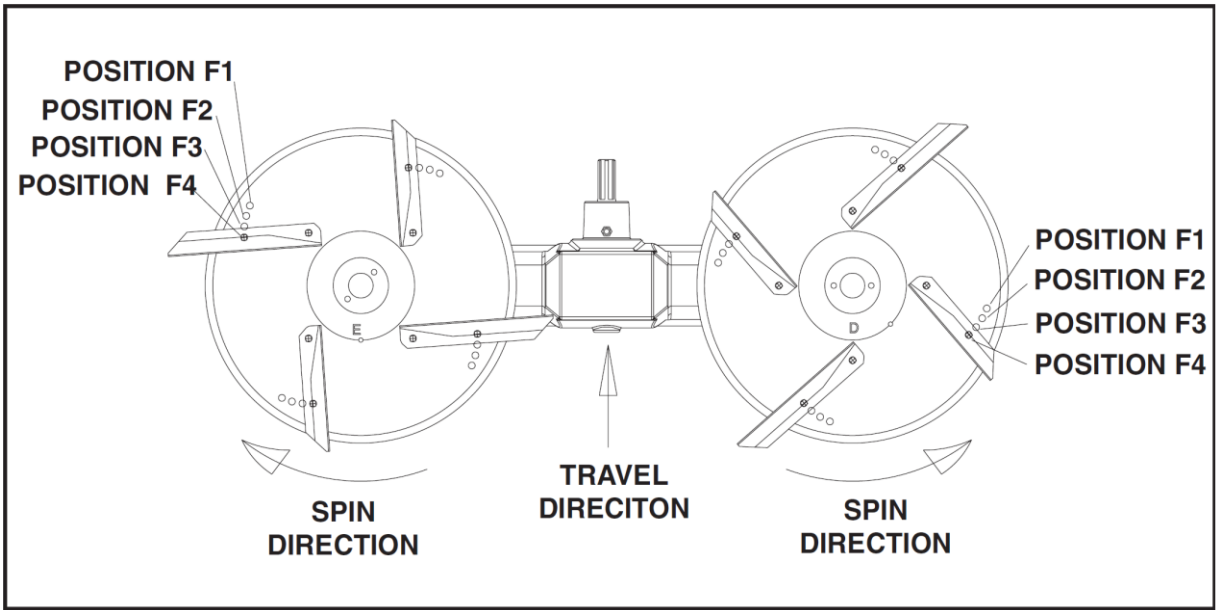


Fig. 28

9.4 – Defining Working Width

When spreading fertiliser and seeds there is always a lower concentration of product at the extremities of the working parameters (Fig. 29). To achieve uniform coverage you have to overlap successive passes 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. 29).

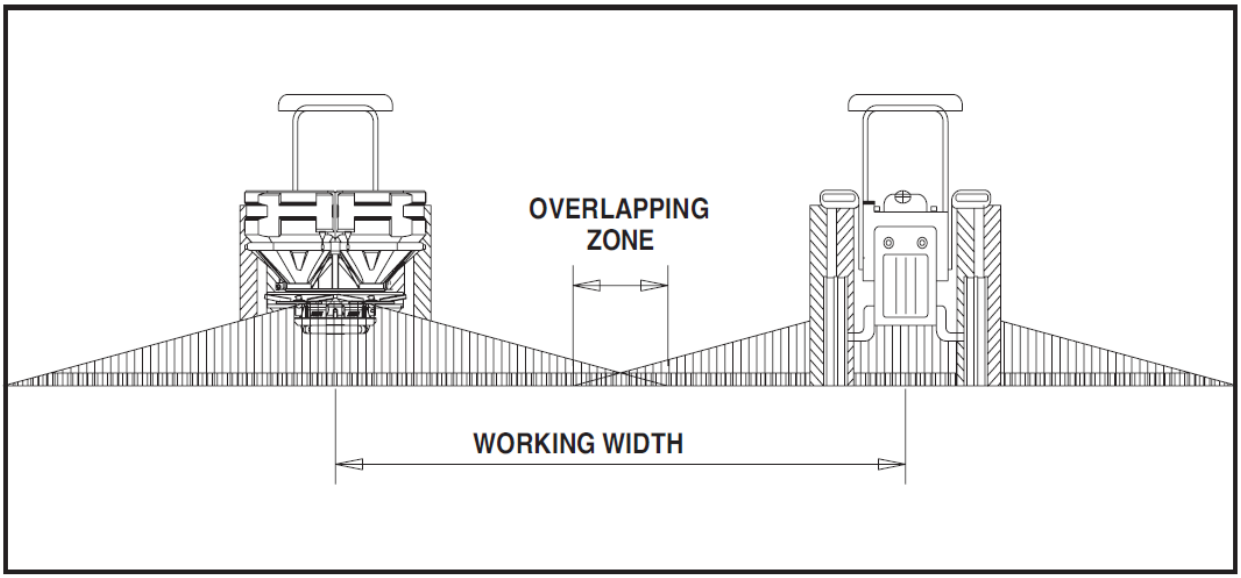


Fig. 29

9.5 – Marking Successive Passes

The spreading width of the Tornado 1300 spreader normally exceeds 12 metres making it difficult to see where the last pass was made. To overcome this, either use natural landmarks or insert pegs to achieve uniform coverage (Fig. 30).

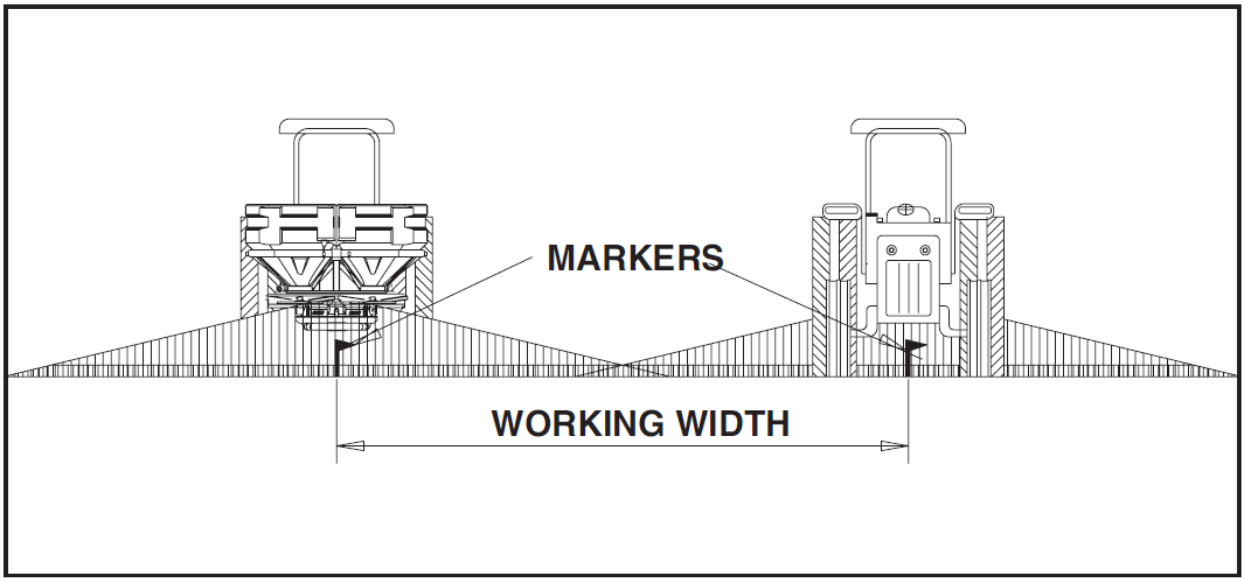


Fig. 30

9.6 – 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 spreader controls have independent drive so that only one side is spreading product (Fig. 31).

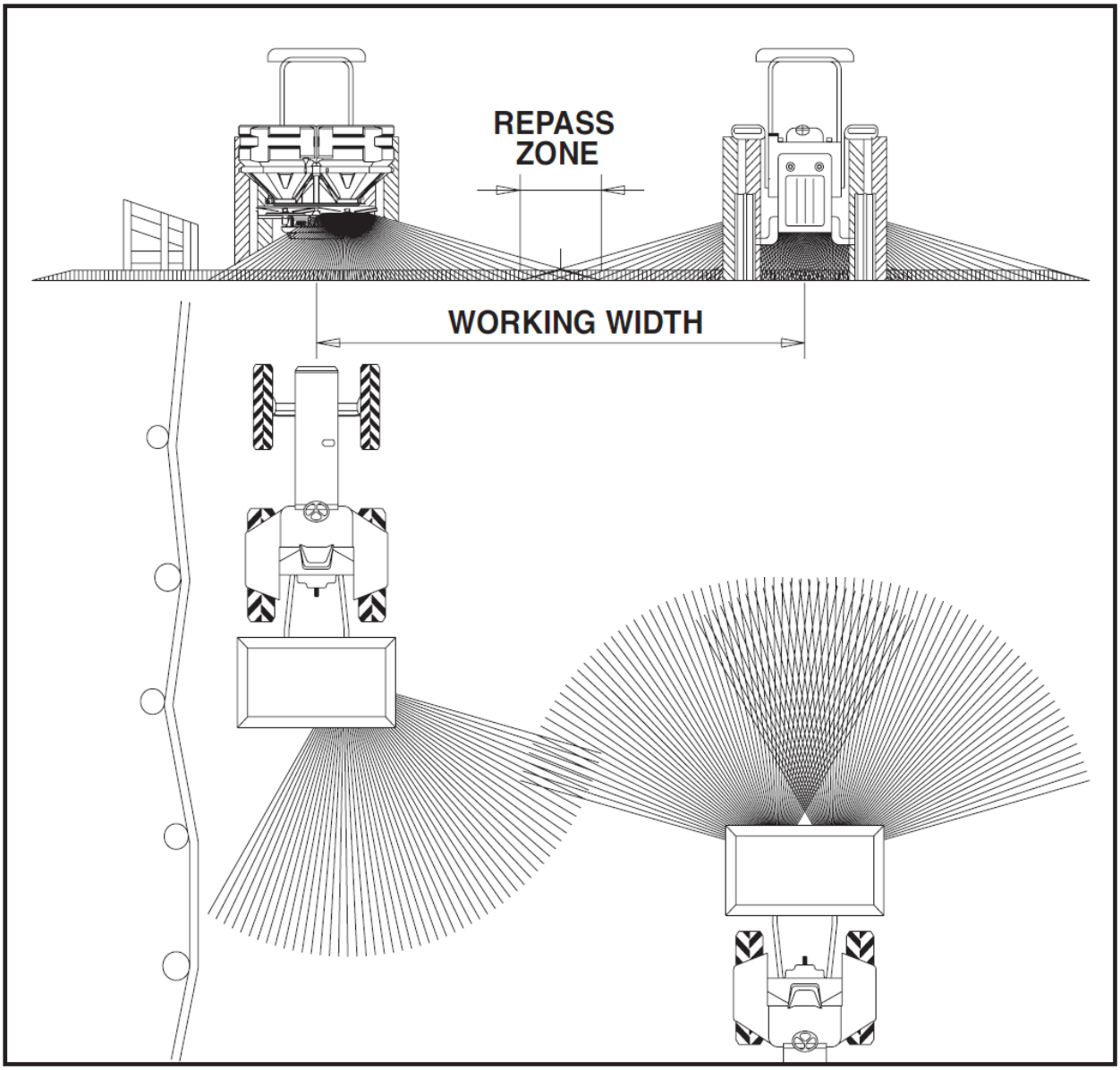


Fig. 31

9.7 – Procedure & Calculations for setting Machine Output (Recommended)

To assist you with the settings for the Tornado 1300 spreader, this manual includes tables for the more commonly found 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 (Refer to Section 6.5 of this manual);
b) Remove the distribution discs;
c) Refit the agitators without the discs (Fig. 32);
d) Half fill the spreader with the product to be spread;
e) Level the machine following the instructions in Section 8.5;
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 09 in Section 4. Take note of the

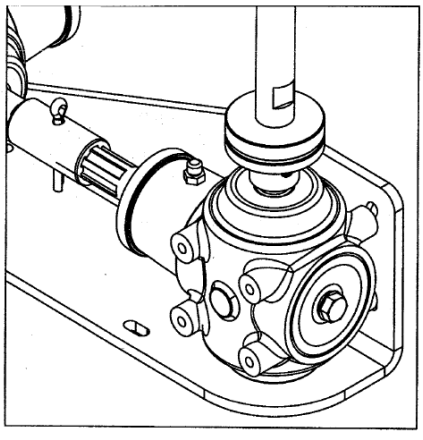


Fig. 32

outflow given in the table, which is the total amount of product which must come out of the two exits in the hopper in one minute of operation;

g) Place suitable containers under each hopper and start the spreader, with the PTO rotating at 540rpm;
h) Open the shutters using the control levers for exactly one minute;
i) Weigh the product that has come out of each of the hopper exits individually. The weight should match with that given in the table. If it differs, make the necessary adjustments and repeat the operation;
j) If there is a difference in the amount of product that came out of each side of the hopper, adjust the adjustor as shown in Figure 09 in Section 4.

9.8 – Procedure & Calculations for Setting Machine Output (Field Trial)

To assist you with the settings for the Tornado 1300 spreader, this manual includes tables for the more commonly found 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 hopper: 100kg
Q= Amount of urea to be applied = 225kg/ha
Consulting Application Table 11.1, we have:
I= Effective Working Width = 22m
Scale Opening: No° = 5.5
Spreading Speed = 12km/h
Position of the Vanes: Vane 250 – F2 and the 205 Vane – F3.

With this information we calculate the area to be covered in order to consume the 100kg of urea placed in the hopper.

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

d= 202 metres

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

10 – TROUBLESHOOTING

Problem	Possible Causes	Solutions
Restricted outflow of product, or flow is inconsistent.	Scale opening is not adjusted correctly.	Adjust opening as per Section 9.7 & 9.8
	Foreign objects in hopper obstructing flow.	Remove objects.
	Product build-up at the exits due to excessive humidity.	Dry the product or suspend the work until product has dried.
		Adjust the height of the Protective Funnel to increase the flow of the product.
	Lumps in 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 8.5.
	Incorrect PTO speed.	Adjust PTO to 540rpm.
	The vanes are not set correctly for the product.	Check the Distribution Tables and adjust setting as 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 – PRODUCT APPLICATION TABLES

11.1 – Urea (45-00-00) 750kg/m³ ø2mm

Scale opening	Rate kg/min	Tractor Speed km/h							work width (m)	Vane Positions (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				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				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					
5,5	99.0	550	471	412	367	330	300	275					
2,0	12.0	60	51	45	40	36	33	30	20				F2
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					
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	22		F2		F3
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					
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											

11.1 – Urea (45-00-00) 750kg/m³ ø2mm (continued)

Scale Opening	Rate Kg/min	Tractor Speeds km/h							Work Width (m)	Vane Positions(mm)			
		6	7	8	9	10	11	12		365	250	235	205
2	12	50	43	38	33	30	27	25	24	F4		F3	
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		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					
3	33.5	120	103	90	80	72	65	60	28	F3		F3	
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		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					

11.2 – Potassium Chloride (00-00-60) 1120kg/m³

Scale Opening	Rate kg/min	Tractor Speeds km/h							Work Width (m)	Vane Positions (mm)	
		6	7	8	9	10	11	12		250	205
2,0	10.0	56	48	42	37	33	30	28	18		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		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	
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			

11.3 – Super Phosphate (0-42-0) 1000kg/m³

Scale Opening	Rate kg/min	Tractor Speeds km/h							Work width	Vane Positions (mm)			
		6	7	8	9	10	11	12	(m)	365	250	235	205
2,0	10.5	35	30	26	23	21	19	17,5	30		F2		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		F3	
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		F3	
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		F2		F4	
8	220	611	524	458	407	367	333	306					
8,5	250	694	595	521	463	417	379	347					

Average lateral overlapping 7m

11.4 – Ammonium Sulphate (21-00-00 + 5) 1005kg/m³

Scale Opening	Rate kg/min	Tractor Speeds km/h							Work width	Vane Positions (mm)	
		6	7	8	9	10	11	12	(m)	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			

Average lateral overlapping 6m

11.5 – Ammonium Nitrate Granules (32-0-2) 960kg/m³

Scale Opening	Rates kg/min	Tractor Speeds km/h							Job Wd	Vane Positions(mm)			
		6	7	8	9	10	11	12	(m)	365	250	235	205
1,5	6.5	27	23	20	18	16	15	13,5	24		F2		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		F3	
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		
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		F2	F4		
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					

Average lateral overlapping 5m

11.6 – NPK Supreme (10-18-24) 1040kg/m³

Scale Opening	Rate kg/min	Tractor Speeds km/h							Work width (m)	Vane Positions	
		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			

Average lateral overlapping 5m

11.7 – NPK Mixture (08-18-28) 1010kg/m³

Scale Opening	Rate kg/min	Tractor Speeds (km/h)							Work width (m)	Vane Positions(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			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		F4	
3	37	132	113	99	88	79	72	66					
3,5	47	168	144	126	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		F1			F4
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			F4
4,5	82	273	234	205	182	164	149	137					
5	97	323	277	243	216	194	176	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					

Average lateral overlapping 5m

11.8 – Phosmag (5-6-7)

Scale Opening	Rate Kg/min	Tractor Speeds km/h							Work width (m)	Vane Positions (mm)			
		6	7	8	9	10	11	12		365	250	235	205
2	16	114	98	86	76	69	62	57	14			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					

11.9 - Dry Rice 610kg/m³

Scale Opening	Rate kg/min	Tractor Speeds km/h							Work width (m)	Vane positions (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		

Average lateral overlapping 5m

11.10 – Rice/Pre-Germinated IRGA-410 600kg/m³-dry

Scale Opening	Rate kg/min	Tractor Speed Km/h							Work width (m)	Vane positions (mm)	
		6	7	8	9	10	11	12		250	205
6,5	12.0	66	57	50	44	40	36	33	18	F2	F3
7,0	18.0	100	86	75	66	60	54	50			
7,5	25.5	142	121	106	94	85	77	71			
8,0	33.0	183	157	137	122	110	100	92			
8,5	39.0	216	185	162	144	130	118	108			
9,0	46.0	255	219	191	170	153	139	128			
9,5	50.0	278	238	208	185	167	151	139			
10,0	54.5	303	259	227	202	181	165	151			

NOTE: Place the seed protective cap on the #2 hole (highest hole).

11.11 – Black Oats 555kg/m³

Scale Opening	Rate kg/min	Tractor Speed Km/h							Work width (m)	Vane positions(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		F4
4,5	22.3	115	98	86	77	69	63	58	20		
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 overlapping 6m

11.12 – Barley 695kg/m³

Scale Opening	Rate kg/min	Tractor Speed km/hr							Work width (m)	Vane positions (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		

11.13 – Millet 810kg/m³

Scale Opening	Rate kg/min	Tractor Speeds (km/h)							Work width (m)	Vane positions (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	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
1,50	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		

11.14 – Wheat 810kg/m³

Scale Opening	Rate kg/min	Tractor Speeds (km/h)							Work width (m)	Vane Positions (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	87	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		

11.15 – Rye Grass 400kg/m³

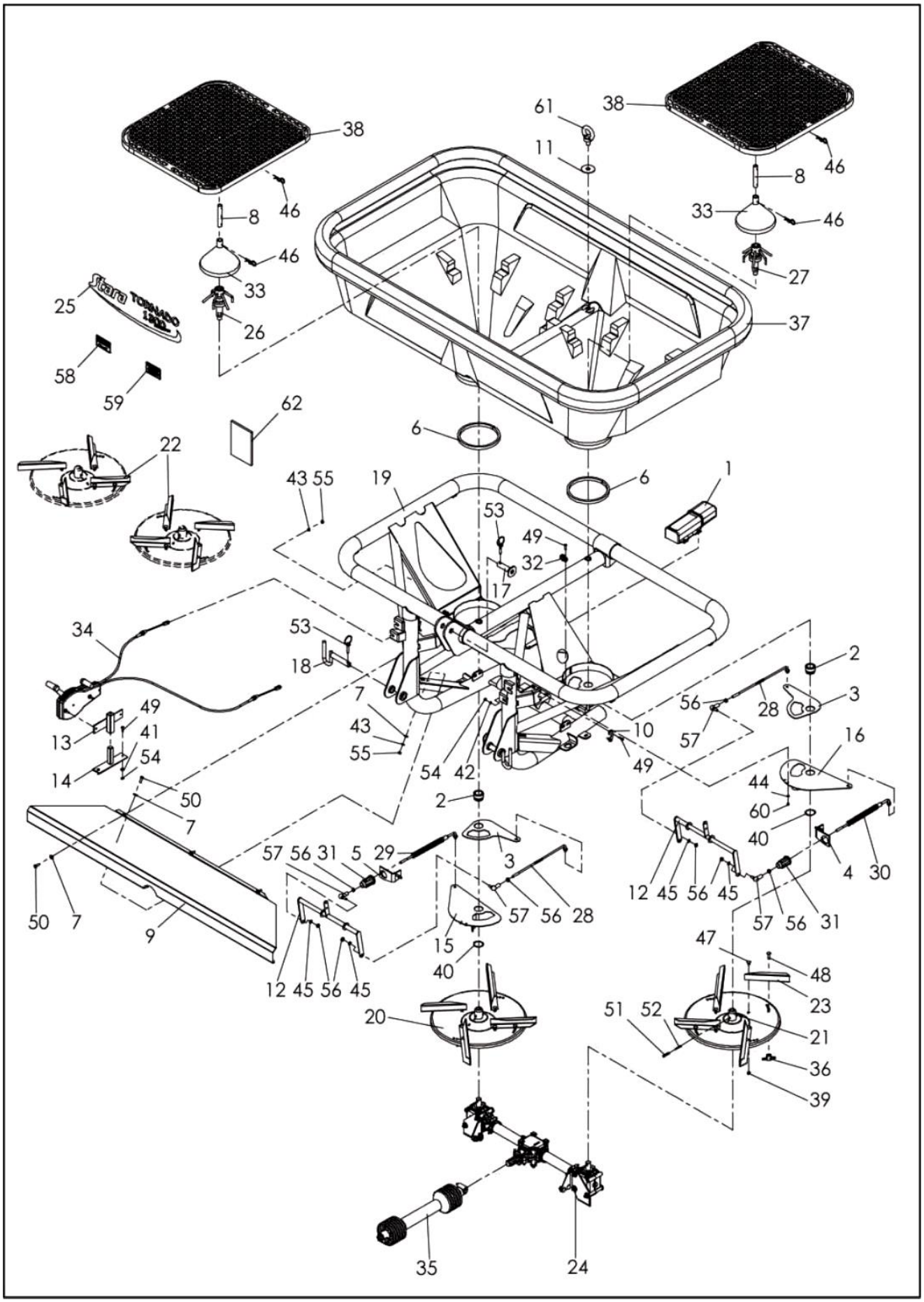
Scale Opening	Rate kg/min	Tractor Speeds (km/h)							Work width (m)	Vane positions (mm)	
		6	7	8	9	10	11	12		250	205
1,5	2,00	25	21,4	18,75	16,7	15	13,6	12,5	8	F1	F2
1,75	3,63	45,4	38,9	34	30,2	27,2	24,75	22,7			
2,00	5,16	64,5	55,3	48,3	43	38,7	35,18	32,25			

This seed requires the use of the fixed agitator.

TORNADO 1300 G-IV

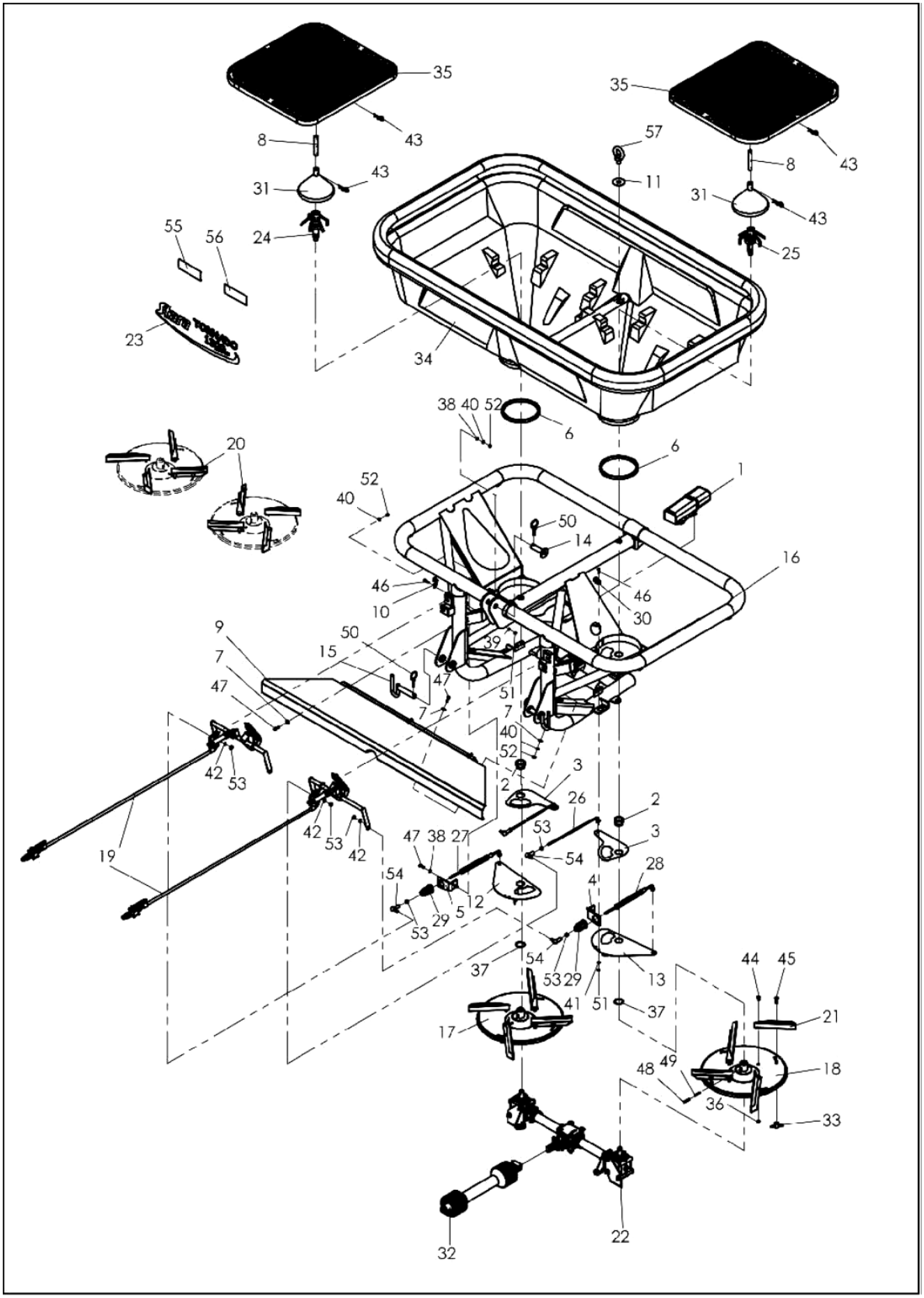
12 - SPARE PARTS SECTION

12.1 - Tornado 1300/Main Assy/Cable Controls **4810-3052**



12.1 - Tornado 1300/Main Assy/Cable Controls 4810-3052

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1072-3096	Manual Holder	1
2	4810-1114	Central Bushing	2
3	4810-1152	Regulator – Flow Control Cover	2
4	4810-1161	Regulator Stop Bracket - Left	1
5	4810-1162	Regulator Stop Bracket - Right	1
6	4810-1180	Seal Ring	2
7	4810-1202	Flat Washer M8 (8.5x22x2)	19
8	4810-1233	Tube - Funnel Support	2
9	4810-1234	Guard	1
10	4810-1259	Restrictor	4
11	4810-1262	Washer 21x70x3	2
12	4810-2003	Control Lever	2
13	4810-2007	Control Case Support Bracket	1
14	4810-2008	Attachment Base	1
15	4810-2011	Regulator – Right	1
16	4810-2012	Regulator - Left	1
17	4810-2013	Pin – 25.4 x 80 C/CAB	1
18	4810-2026	Pin – Lower Link	2
19	4810-2036	Chassis Tornado 1300 G-IV	1
20	4810-2038	Disc - Left	1
21	4810-2039	Disc – Right	1
22	4810-3045	Vane Kit – (Short)	1
23	4810-3046	Vane Kit – (Long)	1
24	4810-3050	Gearbox Module	1
25	4810-3055	Decal – Tornado 1300 G IV	1
26	4810-3057	Agitator Assembly – Left (See page 10 for breakdown)	1
27	4810-3058	Agitator Assembly - Right (See page 10 for breakdown)	1
28	4810-4101	Rod	2
29	4810-4102	Left Agitator Adjusting Rod	1
30	4810-4103	Right Agitator Adjusting Rod	1
31	4810-4104	Regulator	2
32	4810-4105	Support	2
33	4810-4108	Funnel	2
34	4810-4114	Cable Control Assembly	1
35	4810-4115	PTO Shaft Assembly – CW1001/20P S1000W	1
36	4810-4151	Wingnut	8
37	4810-4153	Hopper Tornado 1300 G IV	1
38	4810-4163	Plastic Protector Screen	2
39	7110-4143	Self-Locking Nut S/S M8	8
40	9100-0212	Circlip 45mm Ext.	2
41	9100-0468	Flat Washer M6 S/S	2
42	9100-0496	Spring Washer ¼” S/S	8
43	9100-0501	Spring Washer M8 S/S	11
44	9100-0546	Spring Washer M6 S/S	4
45	9100-0551	Spring Washer M10 S/S	4
46	9100-0665	R-Clip 3.8 x 28.5	4
47	9100-1159	Bolt M8x16 S/S	8
48	9100-1161	Bolt M8x35 S/S	8
49	9100-1411	Bolt M6x25 S/S	14
50	9100-1441	Bolt M8x25 S/S	11
51	9100-2503	Roll Pin 10x40	2
52	9100-2504	Roll Pin 6x40	2
53	9100-2590	Linch Pin 7/16” x 2”	3
54	9100-2801	Nut M6 S/S	10
55	9100-2891	Nut M8 S/S	11
56	9100-2904	Nut M10 S/S	8
57	9100-3411	Rod End M10x1.5	4
58	9100-3580	Decal – PTO Shaft Adjustment	1
59	9100-3587	Decal - Attention	1
60	9100-3752	Nut M6 S/S	4
61	9100-3854	Eye Bolts	2
62	MANU-4810-GIV	Manual Tornado 1300 Generation IV	1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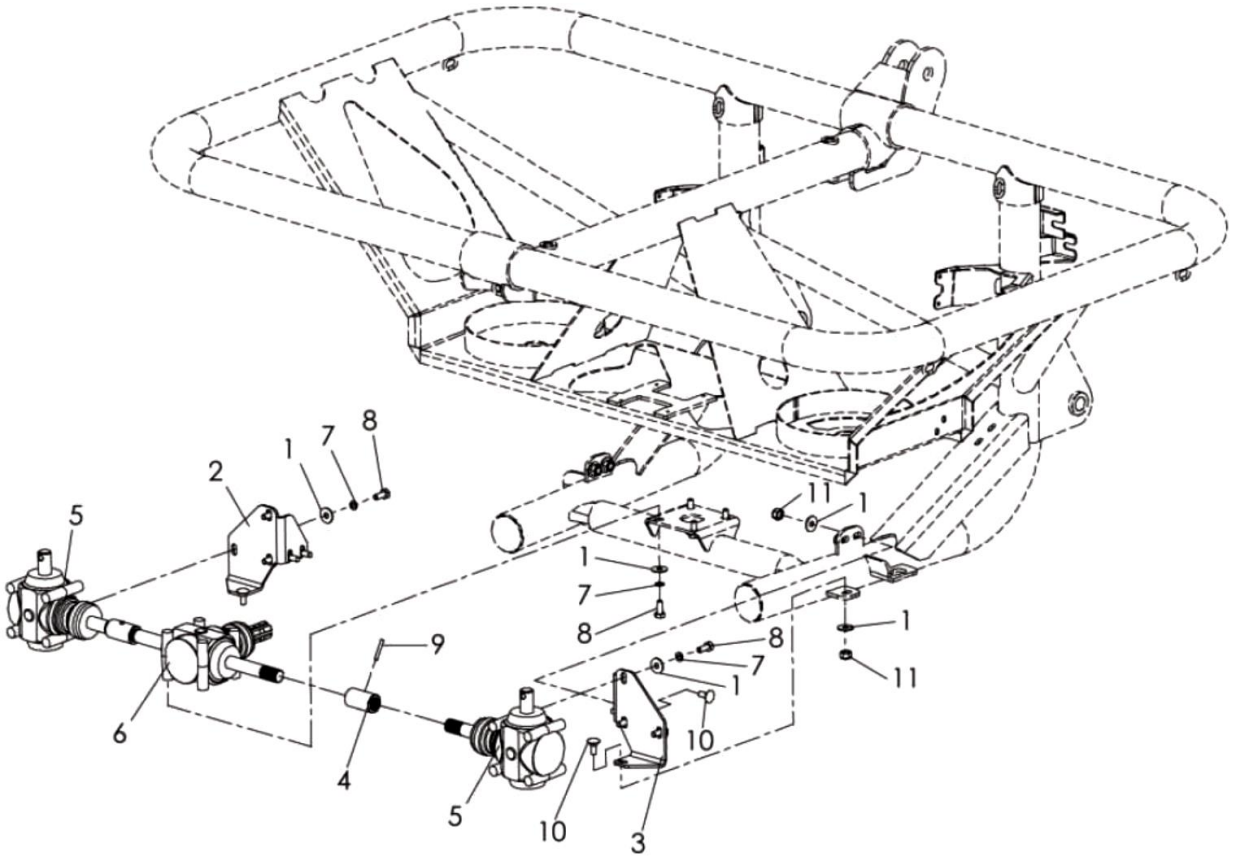
12.2 – Tornado 1300/Main Assy/Hydraulic Controls 4810-3053

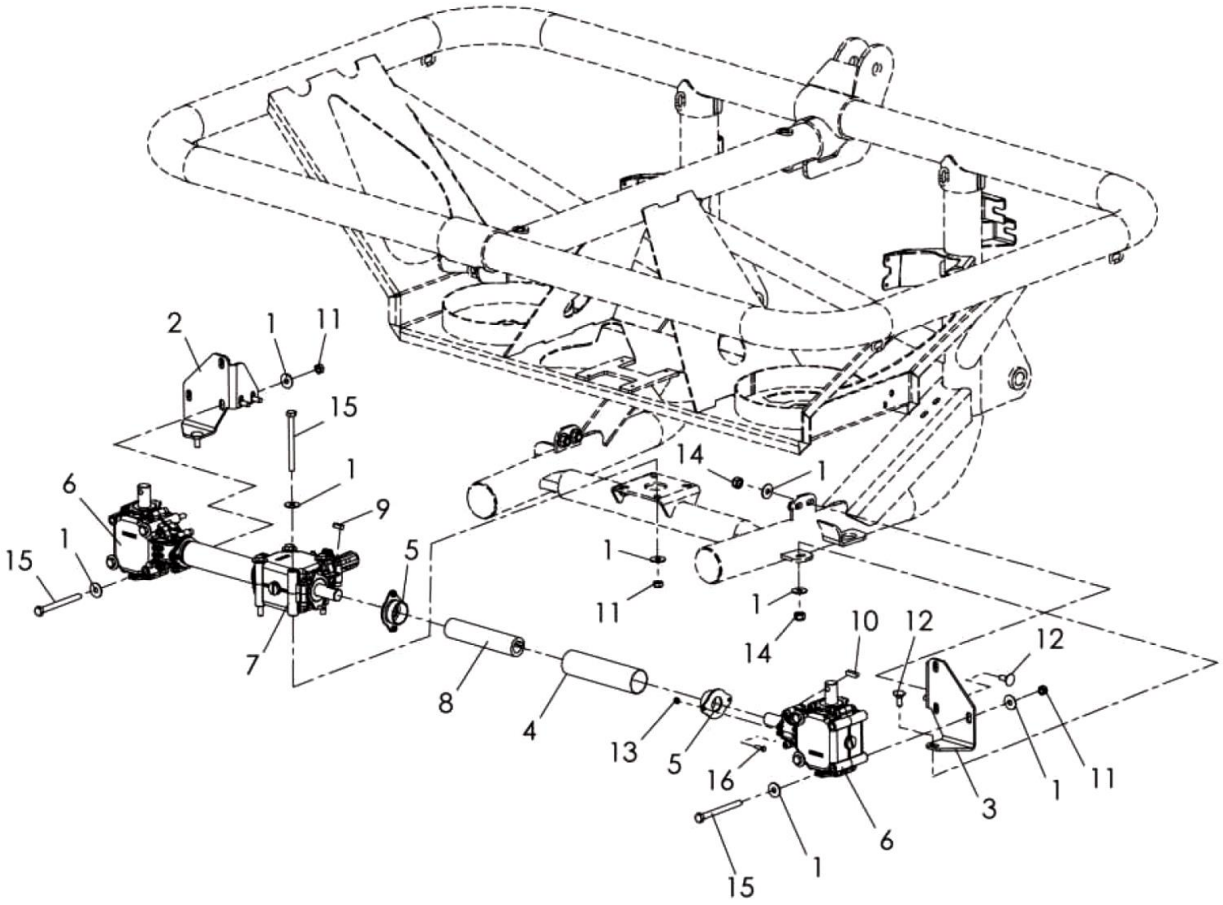
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1072-3096	Manual Holder	1
2	4810-1114	Central Bushing	2
3	4810-1152	Regulator – Flow Control Cover	2
4	4810-1161	Regulator Stop Bracket - Left	1
5	4810-1162	Regulator Stop Bracket - Right	1
6	4810-1180	Seal Ring	2
7	4810-1202	Flat Washer M8 (8.5x22x2)	11
8	4810-1233	Tube - Funnel Support	2
9	4810-1234	Guard	1
10	4810-1259	Restrictor	4
11	4810-1262	Washer 21x70x3	2
12	4810-2011	Regulator – Right	1
13	4810-2012	Regulator - Left	1
14	4810-2013	Pin – 25.4 x 80 C/CAB	1
15	4810-2026	Pin – Lower Link	2
16	4810-2036	Chassis Tornado 1300 G-IV	1
17	4810-2038	Disc - Left	1
18	4810-2039	Disc – Right	1
19	4810-3017	Hydraulic Control Assembly (See page 11 for breakdown)	1
20	4810-3045	Vane Kit – (Short)	1
21	4810-3046	Vane Kit – (Long)	1
22	4810-3050	Gearbox Module	1
23	4810-3055	Decal – Tornado 1300 G IV	1
24	4810-3057	Agitator Assembly – Left (See page 10 for breakdown)	1
25	4810-3058	Agitator Assembly - Right (See page 10 for breakdown)	1
26	4810-4101	Rod	2
27	4810-4102	Left Agitator Adjusting Rod	1
28	4810-4103	Right Agitator Adjusting Rod	1
29	4810-4104	Regulator	2
30	4810-4105	Support	2
31	4810-4108	Funnel	2
32	4810-4115	PTO Shaft Assembly – CW1001/20P S1000W	1
33	4810-4151	Wingnut	8
34	4810-4153	Hopper Tornado 1300 G IV	1
35	4810-4163	Plastic Protector Screen	2
36	7110-4143	Self-Locking Nut S/S M8	8
37	9100-0212	Circlip 45mm Ext.	2
38	9100-0436	Flat Washer 8x16x1.6 S/S	8
39	9100-0496	Spring Washer ¼” S/S	8
40	9100-0501	Spring Washer M8 S/S	11
41	9100-0546	Spring Washer M6 S/S	4
42	9100-0551	Spring Washer M10 S/S	4
43	9100-0665	R-Clip 3.8 x 28.5	4
44	9100-1159	Bolt M8x16 S/S	8
45	9100-1161	Bolt M8x35 S/S	8
46	9100-1411	Bolt M6x25 S/S	12
47	9100-1441	Bolt M8x25 S/S	11
48	9100-2503	Roll Pin 10x40	2
49	9100-2504	Roll Pin 6x40	2
50	9100-2590	Linch Pin 7/16” x 2”	3
51	9100-2801	Nut M6 S/S	12
52	9100-2891	Nut M8 S/S	11
53	9100-2904	Nut M10 S/S	8
54	9100-3411	Rod End M10x1.5	4
55	9100-3580	Decal PTO Shaft Adjustment	1
56	9100-3587	Decal – Attention	1
57	9100-3854	Eye Bolt	2

12.3 – Gearbox Frame Assembly, Tornado 1300 – Inpel/BPN 4810-3050



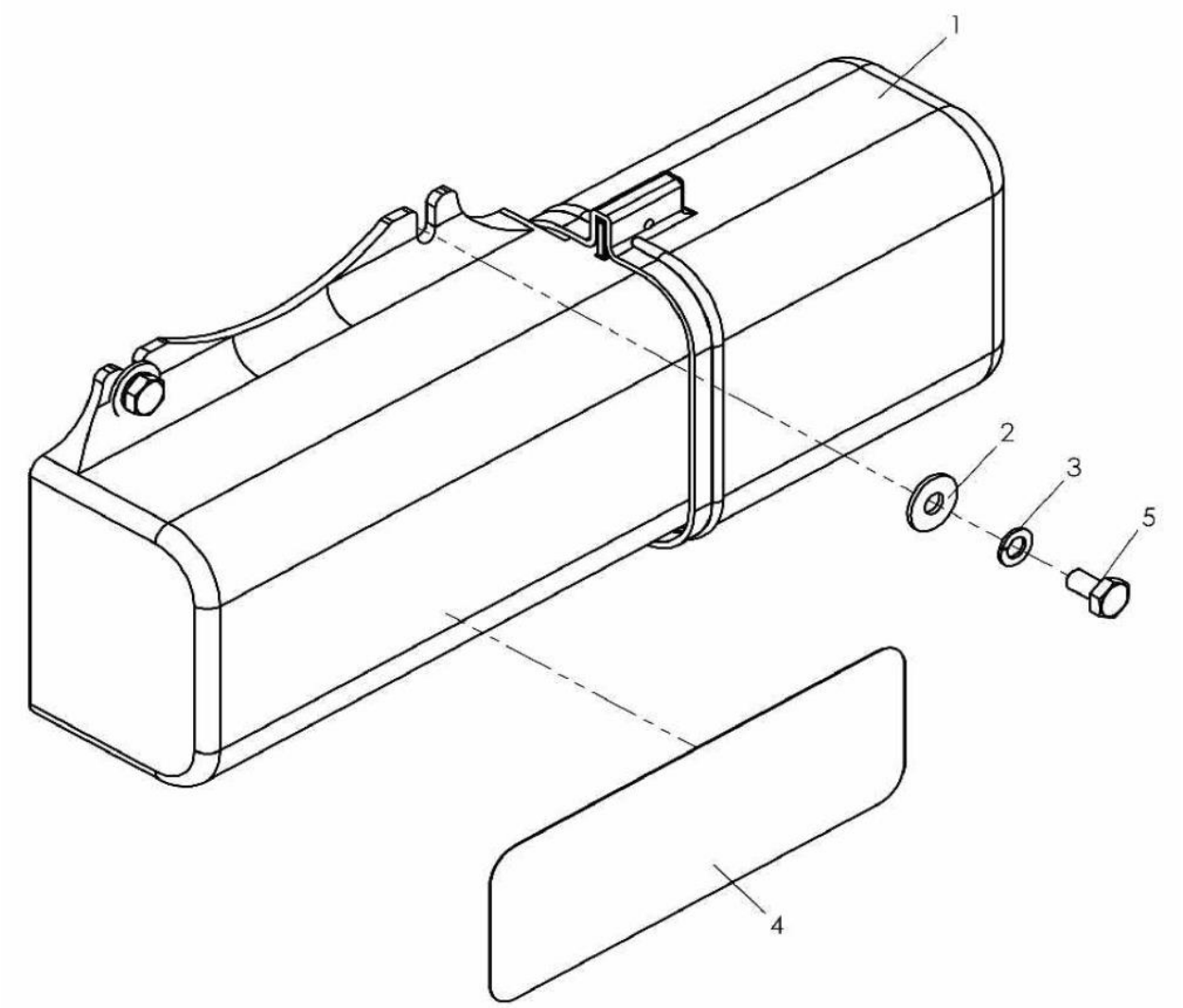
ITEM NO.	PART NO.	DESCRIPTION	INPEL	BPN
1	4810-1201	Flat Washer M10 (10.5x30x2) S/S	16	16
2	4810-1275	Gearbox Mounting Bracket - Right	1	1
3	4810-1278	Gearbox Support Bracket - Left	1	1
4	4810-4162	Coupling Bush (Inpel)	2	-
4	4810-4169	Coupling Bush (BPN)	-	2
5	4810-4167	Gearbox – Side (BPN)	-	2
5	4810-4170	Gearbox – Side (Inpel) CT7001-ZH	2	-
6	4810-4168	Gearbox – Centre (BPN)	-	1
6	4810-4171	Gearbox – Centre (Inpel)	1	-
7	9100-0551	Spring Washer M10 S/S	10	10
8	9100-2324	Bolt M10x25 S/S	10	10
9	9100-2504	Roll Pin 6x40	2	2
10	9100-3750	Cup Head SQ Bolt M10x25 S/S	6	6
11	9100-3781	Nyloc Nut M12 S/S	7	7

12.4 – Gearbox Frame Assembly, Tornado 1300 - Comer 4810-3050



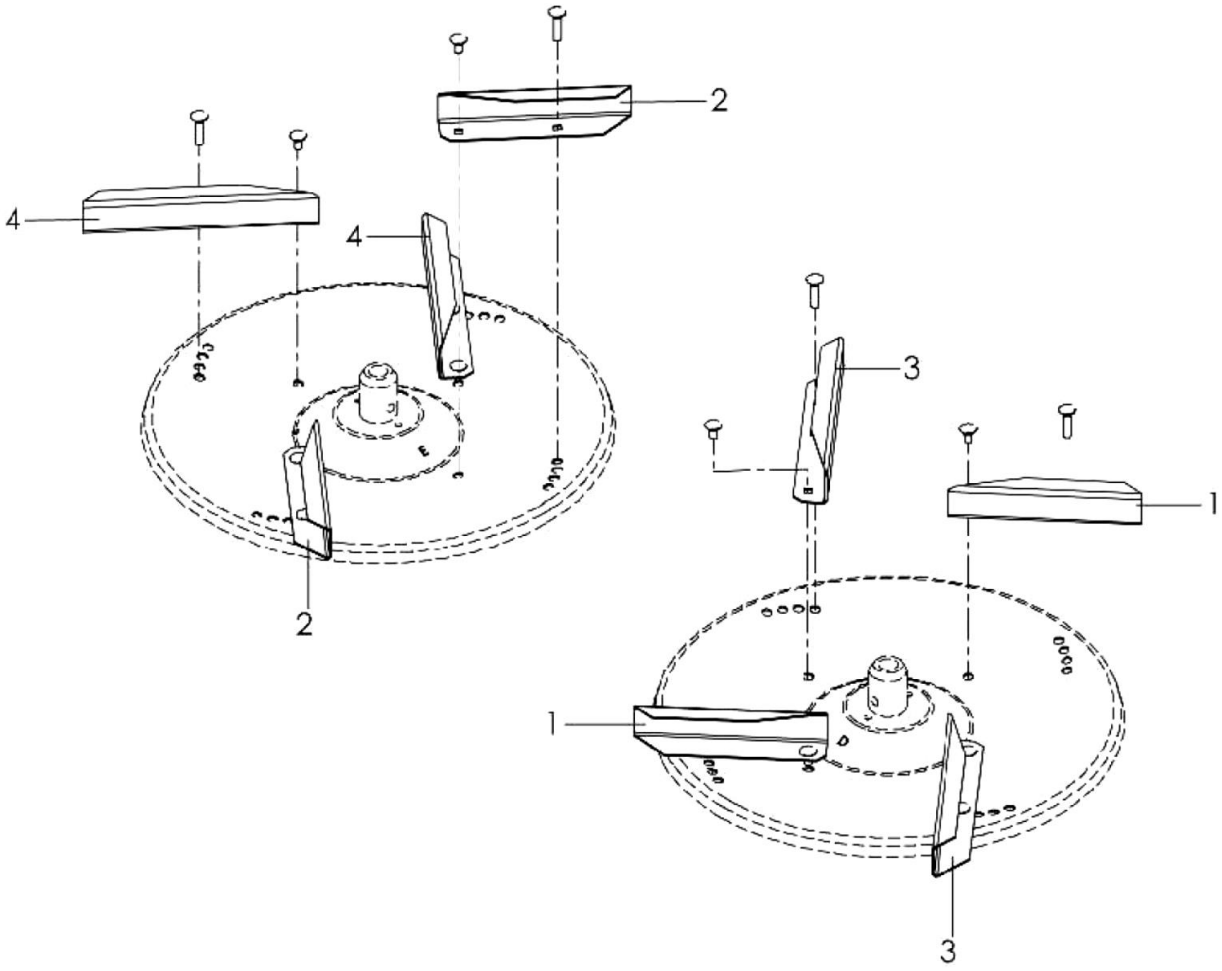
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	4810-1201	Flat Washer M10 (10.5x30x2) S/S	26
2	4810-1275	Gearbox Mounting Bracket - Right	1
3	4810-1278	Gearbox Support Bracket - Left	1
4	4810-1286	Tube PVC 50x188mm	2
5	4810-2046	Tube Mounting Bracket	4
6	4810-4164	Gearbox – Side (Comer)	2
7	4810-4165	Gearbox – Centre (Comer)	1
8	4810-4166	Coupling Bush	2
9	7210-4125	Key 8x7x25	2
10	9100-0625	Key 8x7x30	2
11	9100-2906	Nyloc Nut M10 S/S	10
12	9100-3750	Cup Head SQ Bolt M10x25 S/S	6
13	9100-3752	Nyloc Nut M6 S/S	8
14	9100-3781	Nyloc Nut M12 S/S	7
15	9100-3979	Bolt M10x125mm S/S	10
16	9100-6140	Bolt M6x20 S/S	8

12.5 – Manual Holder Assembly 1072-3096



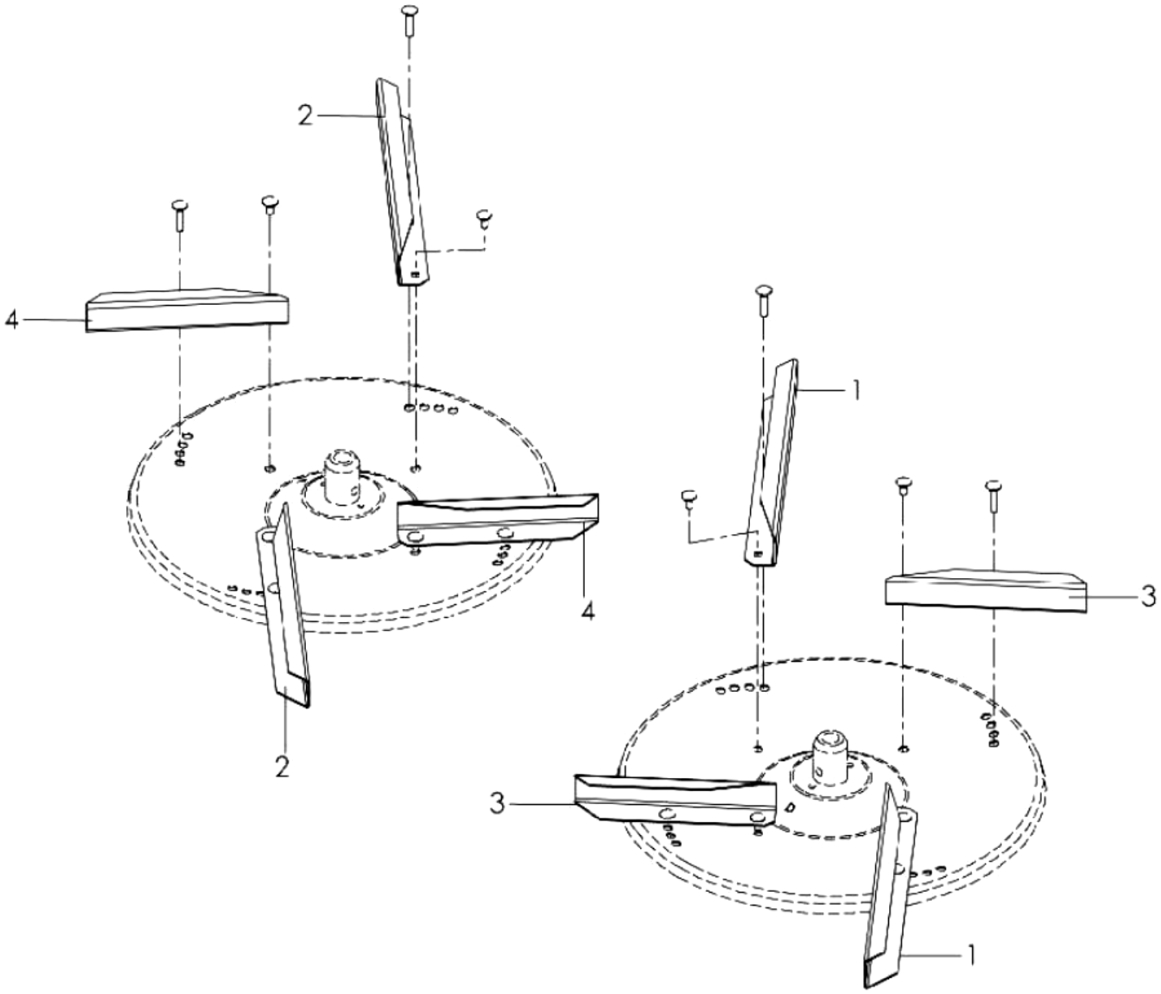
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	6117-4193	Manual Holder	1
2	9100-0468	Flat Washer M6	4
3	9100-0546	Spring Washer M6	4
4	9100-4614	Decal – Manuals	1
5	9100-6138	Bolt M6x12 S/S	4

12.6 – Vane Kit, 20-24, Short 4810-3045



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-1264	Vane – Right H. 205mm	2
2	4810-1265	Vane – Left H. 205mm	2
3	4810-1266	Vane – Right H. 250mm	2
4	4810-1267	Vane – Left H. 250mm	2

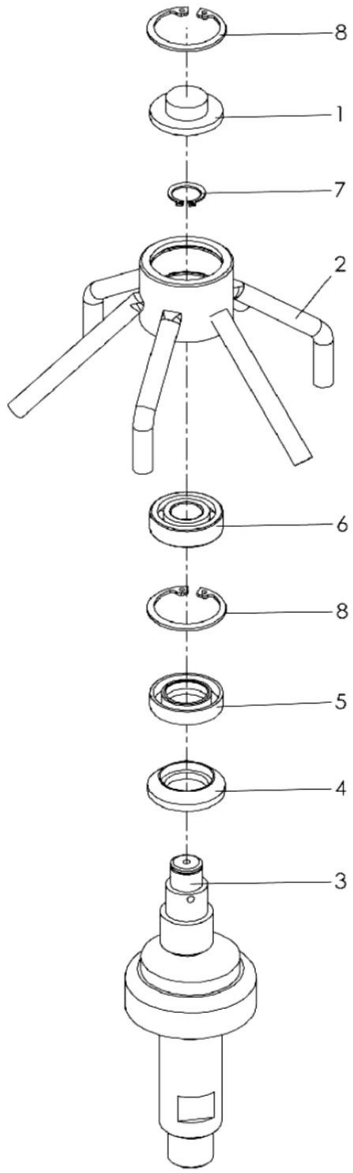
12.7 – Vane Kit, 30-36, Long 4810-3046



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-1268	Vane – Right H. 365mm	2
2	4810-1269	Vane – Left H. 365mm	2
3	4810-1270	Vane – Right H. 235mm	2
4	4810-1271	Vane – Left H. 235mm	2

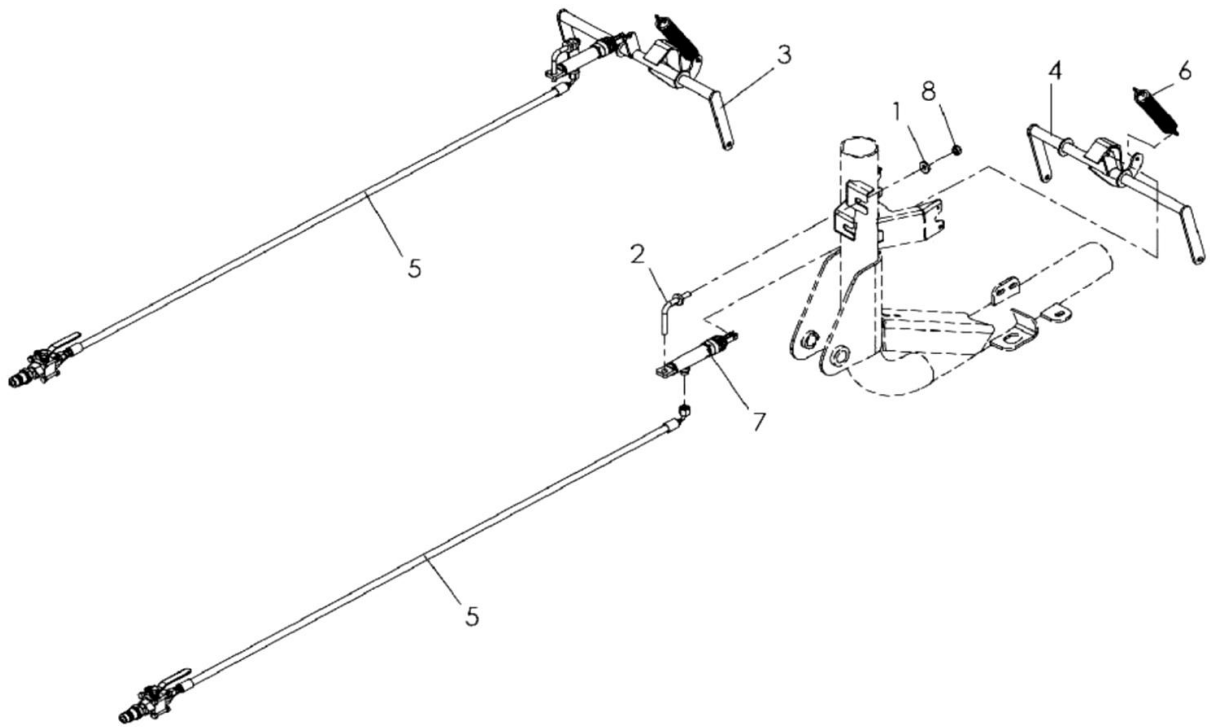
12.8 – Agitator Assembly, Left 4810-3057

Agitator Assembly, Right 4810-3058



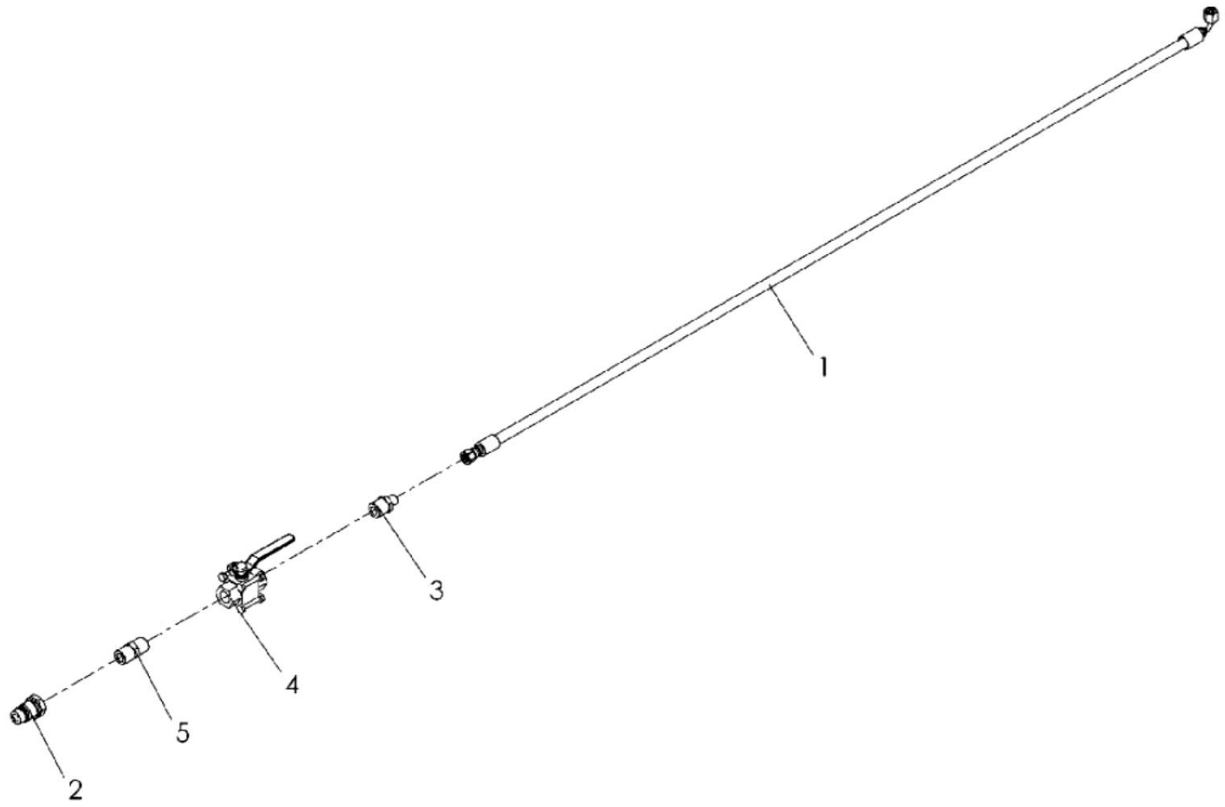
ITEM NO.	PART NO.	DESCRIPTION	4810-3057	4810-3058
1	4810-1108	Cover	1	1
2	4810-2002	Agitator Tip	1	1
3	4810-2044	Agitator Shaft – Left H.	1	-
3	4810-2045	Agitator Shaft – Right H.	-	1
4	4810-4107	Seal Ring	1	1
5	9100-3161	Seal 20x35x8	1	1
6	9100-3282	Ball Bearing 6202-2RS	1	1
7	9100-3576	Circlip	1	1
8	9100-3577	Circlip	2	2

12.9 – Hydraulic Control Assembly 4810-3017



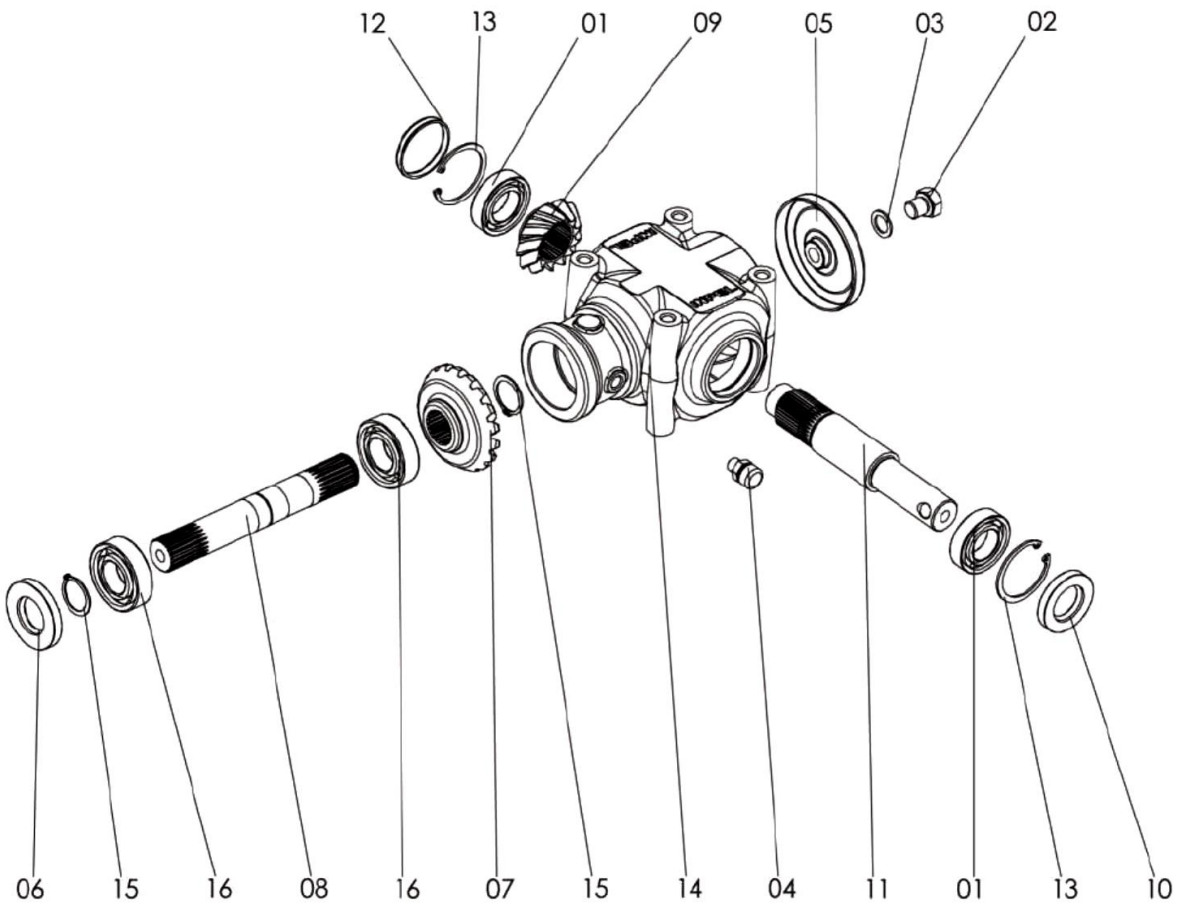
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-1200	Washer	2
2	4810-2018	Latch	2
3	4810-2028	Control Lever – Right H.	1
4	4810-2029	Control Lever – Left H.	1
5	4810-3009	Hose Assy (See page 12 for breakdown)	2
6	4810-4119	Spring	2
7	4810-4901	Hydraulic Cylinder	2
8	9100-2906	Nyloc Nut M10 S/S	2

12.10 – Hose Assy 4810-3009



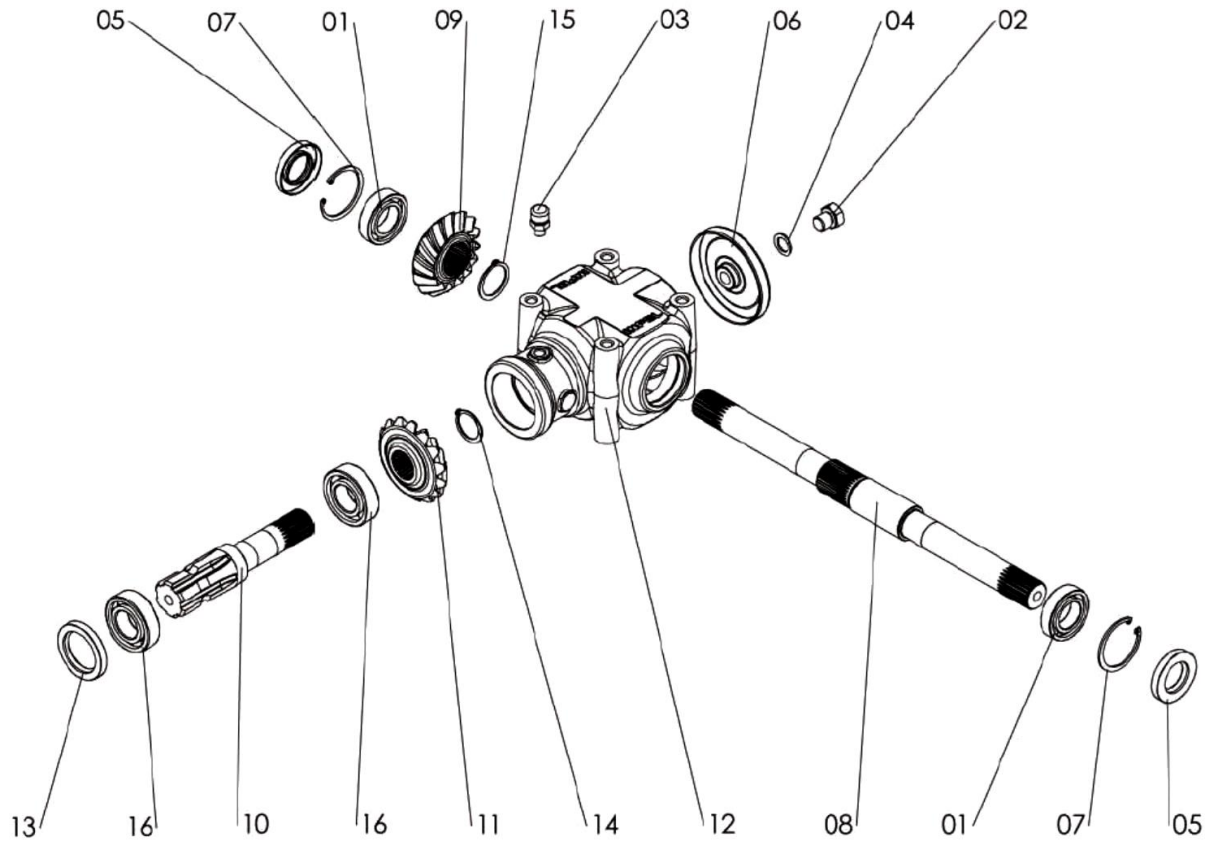
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-3016	Hose	1
2	9100-0790	Quick Connection	1
3	9100-1045	Adapter	1
4	9100-4901	Valve	1
5	9100-3609	Adapter	1

12.11 – Gearbox Assy – Side, INPEL CT7001-ZH 4810-4160



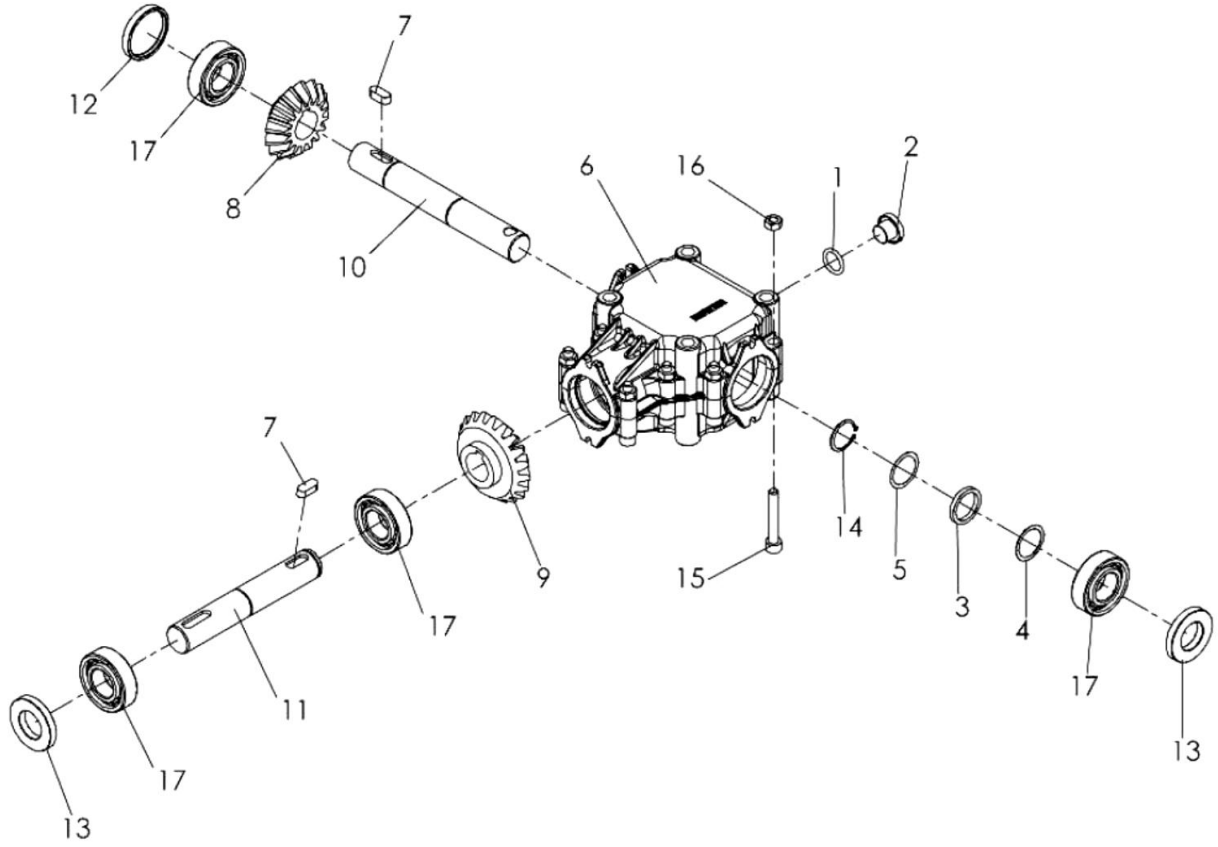
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4210-4165	Ball Bearing 6005-2RS	2
2	4810-4111-TM	Drain Plug	1
3	4810-4111-JT1	Dowty Washer	1
4	4810-4112-RP	Breather	1
5	4810-4160-T1	Cover	1
6	4810-4160-RT1	Seal 25x52x7	1
7	4810-4160-EN1	Gear	1
8	4810-4160-E1	Shaft	1
9	4810-4160-EN2	Gear	1
10	4810-4160-RT2	Seal 25x47x7	1
11	4810-4160-E2	Shaft	1
12	4810-4160-T2	Cap	1
13	4810-4160-AE	Circlip	2
14	4810-4160-CA	Gearbox Casing	1
15	9100-0199	Circlip	2
16	9100-3289	Ball Bearing 6205	2

12.12 – Gearbox Assy – Centre, INPEL CT7201-ZH 4810-4161



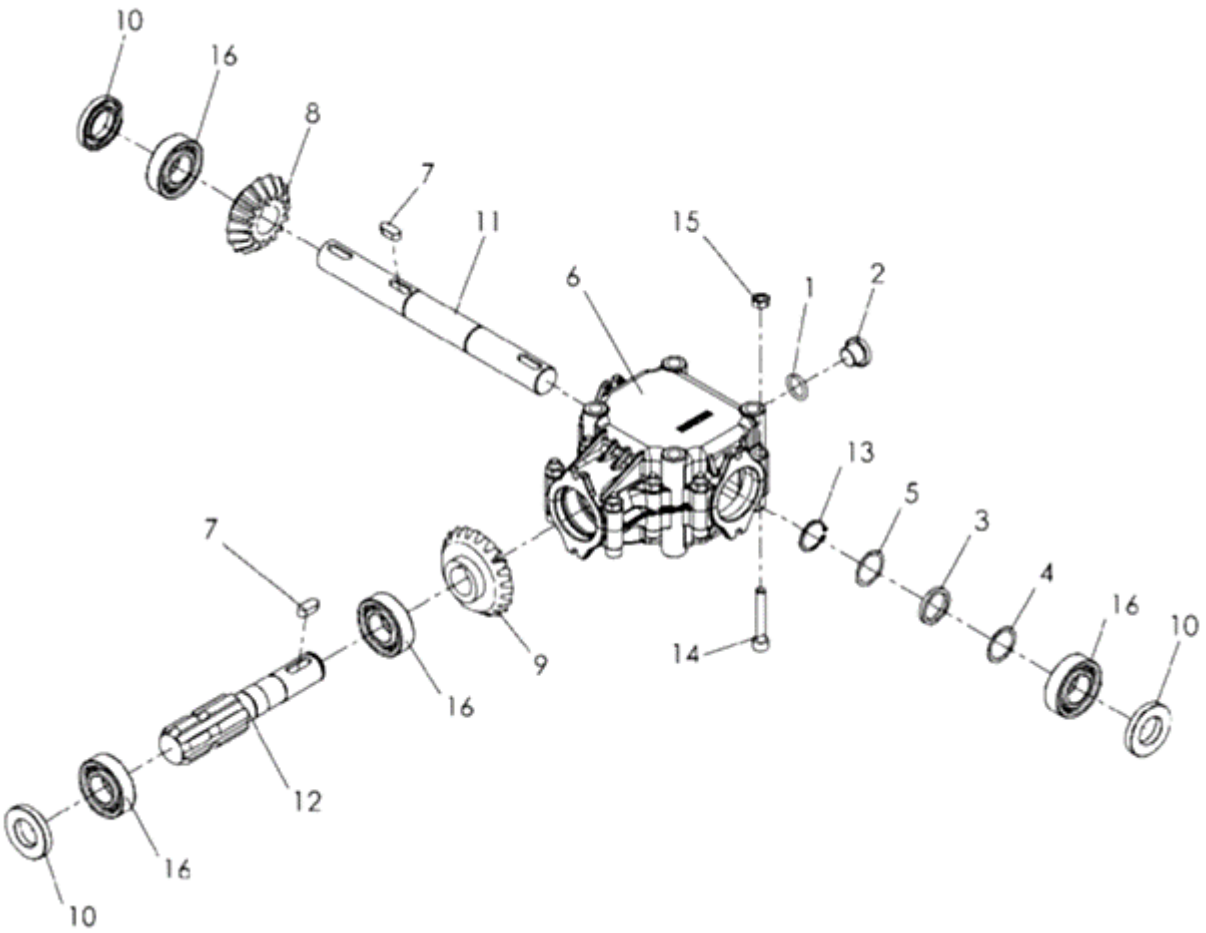
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4210-4165	Ball Bearing 6005	2
2	4810-4111-TM	Drain Plug	1
3	4810-4112-RP	Breather	1
4	4810-4111-JT1	Drain Plug Washer	1
5	4810-4160-RT2	Seal 25x52x7	2
6	4810-4160-T1	Cover	1
7	4810-4160-AE	Circlip	2
8	4810-4161-E1	Shaft	1
9	4810-4161-EN1	Gear	1
10	4810-4161-EN2	Shaft	1
11	4810-4161-EN3	Gear	1
12	4810-4160-CA	Gearbox Casing	1
13	4810-4161-RT	Seal 35x52x7	2
14	9100-0199	Circlip	1
15	9100-3646	Circlip	1
16	9100-3289	Ball Bearing 6205	2

12.13 – Gearbox Assy – Side, Comer 4810-4164



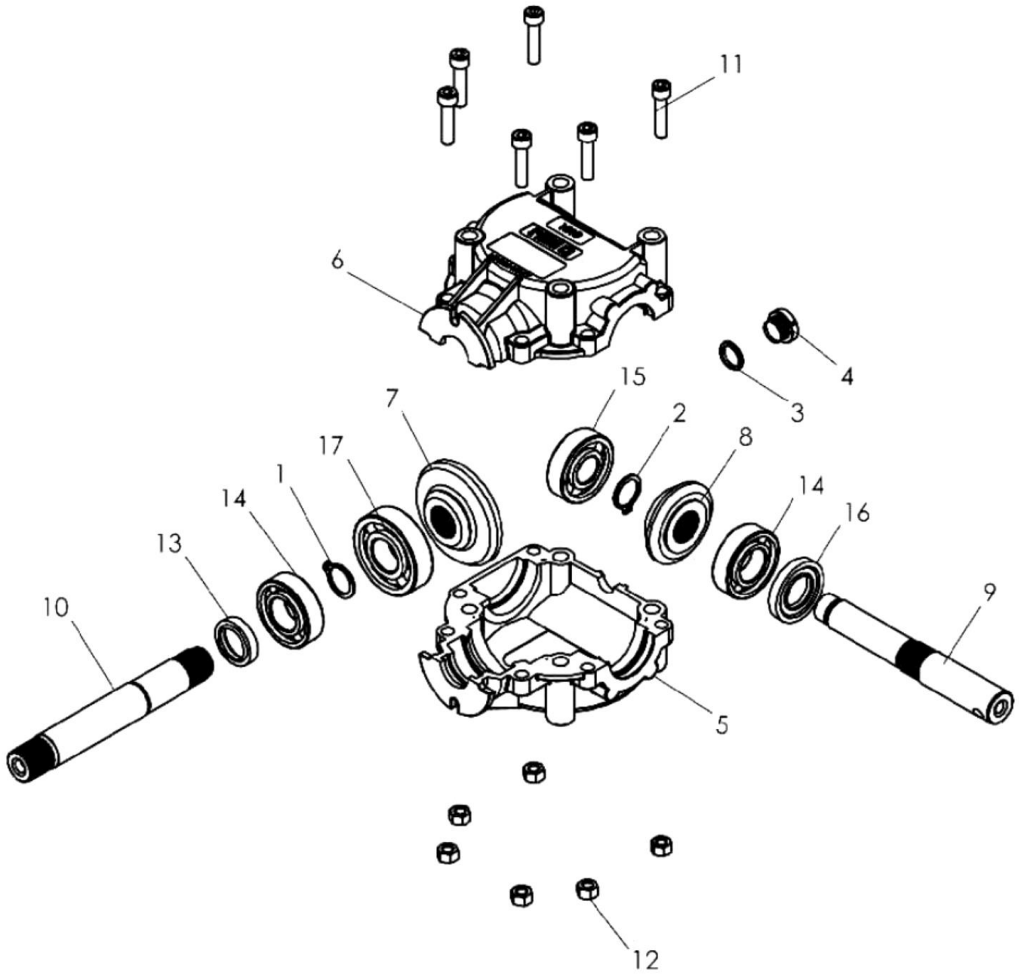
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-4164-CAV	Dowty Washer	1
2	4810-4164-CB	Drain Plug 3/8”	1
3	4810-4164CC1	Shim 4mm	1
4	4810-4164-CC2	Shim 0.5mm	1
5	4810-4164-CC3	Shim 0.2mm	1
6	4810-4164-CCA	Gearbox Casing	2
7	4810-4164-CCH	Key 8x7x20	2
8	4810-4164-CE1	Gear Z16 M4	1
9	4810-4164-CE2	Gear Z20 M4	1
10	4810-4164-CEI	Shaft – Output	1
11	4810-4164-CEX	Shaft – Input	1
12	4810-4164-CR1	Cap	1
13	4810-4164-CR2	Seal 25x47x7	2
14	9100-0199	Circlip	1
15	9100-1114	Capscrew M8x50 ZP	8
16	9100-2899	Nut M8	8
17	9100-3289	Ball Bearing 6205	4

12.14 – Gearbox Assy – Centre, Comer 4810-4165



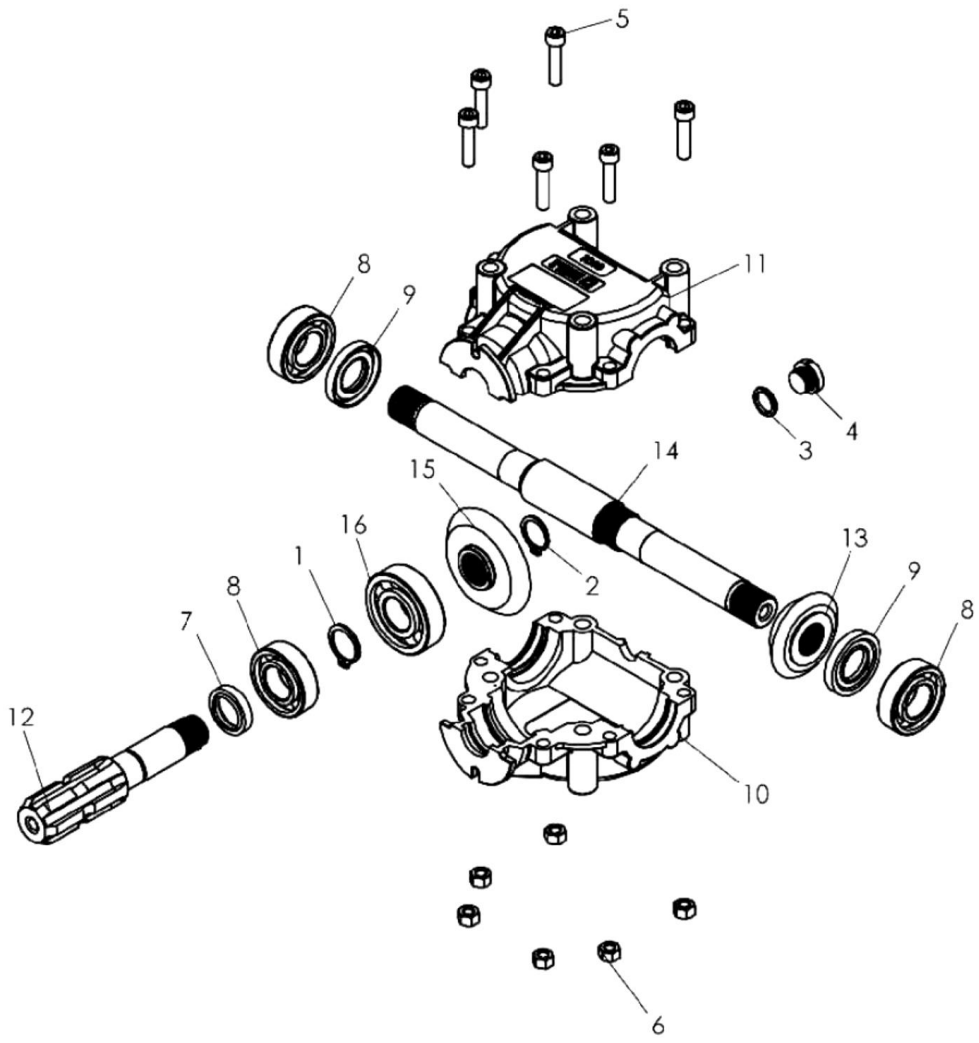
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-4164-CAV	Dowty Seal	1
2	4810-4164-CB	Drain Plug 3/8”	1
3	4810-4164-CC1	Shim 4mm	1
4	4810-4164-CC2	Shim 0.5mm	1
5	4810-4164-CC3	Shim 0.2mm	1
6	4810-4164-CCA	Gearbox Casing	2
7	4810-4164-CCH	Key 8x7x20	2
8	4810-4164-CE1	Gear	1
9	4810-4164-CE2	Gear	1
10	4810-4164-CR2	Seal 25x47x7	3
11	4810-4165-CEI	Shaft 25mm	1
12	4810-4165-CEX	Shaft – Input 6 Spine	1
13	9100-0199	Circlip	1
14	9100-1114	Capscrew M8x50 ZP	8
15	9100-2899	Nut M8	8
16	9100-3289	Ball Bearing 6205	4

12.15 – Gearbox Assy – Side, BPN-1020 4810-4167



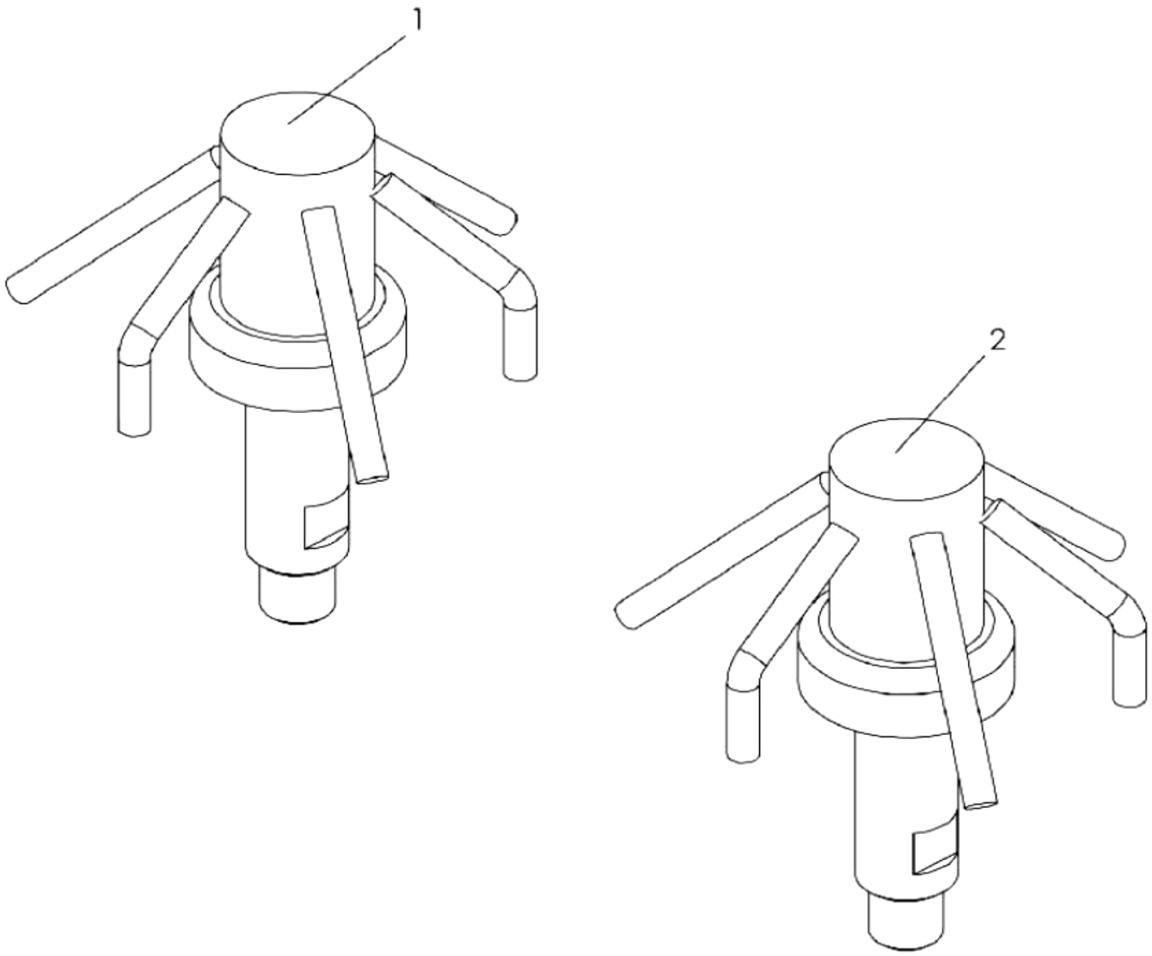
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-4167-BA	Circlip Ext 25x2.0mm	2
2	4810-4167-BAE	Circlip Ext 22x2.0mm	1
3	4810-4167-BAN	Dowty Seal 16x21.5x2.5mm	1
4	4810-4167-BB	Drain Plug 3/8”	1
5	4810-4167-BC	Gearbox Casing ½	1
6	4810-4167-BC1	Gearbox Casing ½	1
7	4810-4167-BE2	Gear	1
8	4810-4167-BE3	Gear	1
9	4810-4167-BES	Shaft	1
10	4810-4167-BEX	Shaft	1
11	4810-4167-BPA	Capscrew – M8x35	6
12	4810-4167-BPO	Nut M8	6
13	4810-4167-BR	Seal 25x35x7	1
14	4810-4167-BR1	Ball Bearing 6205	2
15	4810-4167-BR3	Ball Bearing 6304	1
16	4810-4167-BRE	Seal 25x47x7	1
17	9100-3324	Ball Bearing 6305	1

12.16 – Gearbox Assy – Centre, BPN-1020 4810-4168



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-4167-BA	Circlip Ext 25x2.0mm	1
2	4810-4167-BAE	Circlip Ext 22x2.0mm	1
3	4810-4167-BAN	Dowty Seal 16x21.5x2.5mm	1
4	4810-4167-BB	Drain Plug 3/8”	1
5	4810-4167-BPA	Capscrew M8x35	6
6	4810-4167-BPO	Hex Nut M8	6
7	4810-4167-BR	Seal 25x35x7	1
8	4810-4167-BR1	Bearing 6205	3
9	4810-4167-BRE	Seal 25x47x7	2
10	4810-4168-BC2	Gearbox Casing ½	1
11	4810-4168-BC3	Gearbox Casing ½	1
12	4810-4168-BE	Shaft - Input 6 Spline	1
13	4810-4168-BE1	Gear	1
14	4810-4168-BEI	Shaft	1
15	4810-4168-BEN	Gear	1
16	9100-3324	Ball Bearing 6305	1

12.17 – Fixed Agitator Assy (Optional) 4810-3010



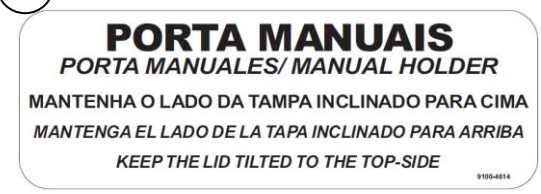
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	4810-2042	Agitator – Fixed Left H.	1
2	4810-2043	Agitator – Fixed Right H.	1

12.18 – Decals, Tornado 1300 G-IV	4810-3055

1

2

3



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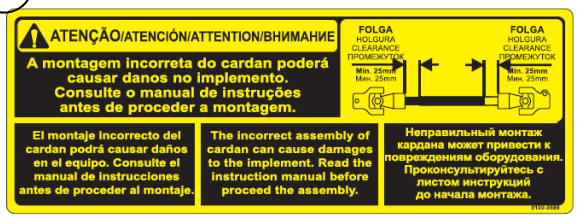

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ITEM NO.	PART NO.	DESCRIPTION	QTY
2	9100-3981	Decal, TORNADO 1300 G-IV 350x160	2
3	9100-3982	Decal, TORNADO 1300 G-IV 550x190	2
4	9100-4614	Decal, Manual Holder	1
5	9100-3580	Decal, Drive Shaft Adjustment	1
6	9100-3587	Decal, Attention! PTO	1

DO NOT USE TRACTOR PTO BRAKE

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AgriQuip Limited, 30 Hurlstone Drive, New Plymouth, New Zealand. 4312
Phone: +64 6 759 8402, Email: parts@agriquip.co.nz, Web: www.agriquip.co.nz