

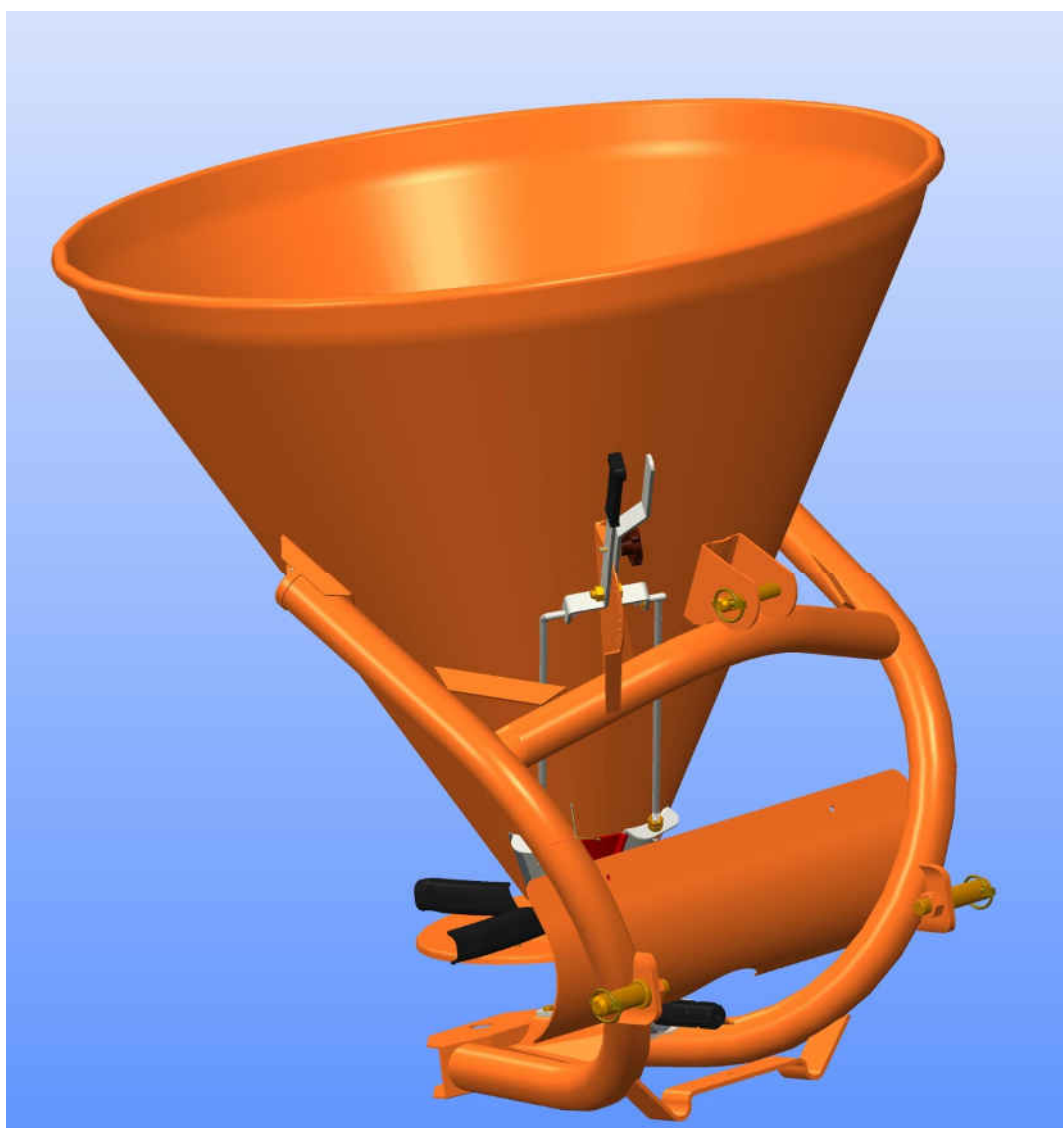
FERTILIZER BROADCASTER



OPERATOR'S MANUAL



FERTILIZER BROADCASTER



OM: 2011/Rev 01/2015

O P E R A T O R ' S M A N U A L



FERTILIZER BROADCASTER

MISSION:

Our mission is to manufacture & supply the most technologically advanced agricultural machinery & implements, worldwide, with acknowledged reliability, outstanding quality and with support by excellent services.

STRATEGY:

Our strategy is to provide best quality with customer delight on all parameters of agricultural machinery & implements, services and reach.

MANUFACTURER

Tirth Agro Technology Pvt. Ltd.

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To the Purchaser

This manual contains valuable information about your SHAKTIMAN FERTILIZER BROADCASTER. It has been carefully prepared to give you helpful suggestions for operating, adjusting, servicing repair parts.

Keep this manual in a convenient place for quick and easy reference. Study it carefully. You have purchased a dependable and sturdy implement, but only by proper care and operation can you expect to receive the service and long life designed and built into it.

RIGHT-HAND AND LEFT-HAND sides are determined by watching from the tractor side.

Sometime in the future your implement may need new parts to replace those that are worn or broken. If so, go to your dealer and provide him with the model and part number.

Customer information

Name _____

Purchased from _____

Purchased date _____

Model No. _____

Serial No. _____

CUSTOMER RESPONSIBILITY

It is the purchaser and/ or operator's responsibility to.....

- Read and understand the information contained in this manual.
- Operate, lubricate, assemble and maintain the equipment in accordance with all instructions and safety procedures in this manual.
- Inspect the equipment and replace or repair any parts that are damaged or worn out which under continued operation would cause damage, wear to other parts, or cause a safety hazard. The manufacturer declines all and every responsibility for damage to person or property or machine caused by negligence and failure to comply with these instructions.
- Return the equipment or parts to the authorized **SHAKTIMAN** dealer, from where it was purchased, for service or replacement of defective parts that are covered by warranty. (The Shaktiman factory may inspect equipment or parts before warranty claims are honored).

The manufacturer shall however remain at the customer's disposal for immediate and through assistance together with anything else that may be required in order to ensure the correct operation and maximum efficiency of the implement.

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02- INTRODUCTION

2.1 Introduction

The Shaktiman fertilizer spreader is designed exclusively for conventional agricultural applications and is suitable for spreading dry, granule, prilled and crystalline fertilizer & seed. The machine is attached with the tractor through 3-point hitch system and PTO rpm of 540. The machine consists of

- Frame
- One hopper designed to contain the product to be spread
- Distribution components, driving and adjustment components

The frame is the main parts of the machine which carries the other parts. Front side of the frame is equipped with a coupling structure with three coupling points to the tractor

The hopper in a metal sheet has a conical shape. The fertilizer contains in this hopper and there are two opening (1) at the bottom side of the hopper. The two opening is controlled through the lever which regulates the amount of fertilizer to be spread.

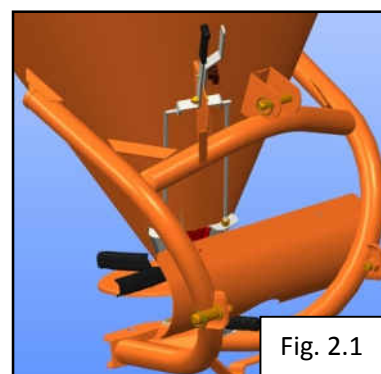


Fig. 2.1

The distribution unit is located just below the hopper. The unit consists of

- agitator to break the clod
- spreading disc & vanes
- Below the hopper there is the spreading disc.

The fertilizer falls due to gravity on this spreading disc unit through the two opening.

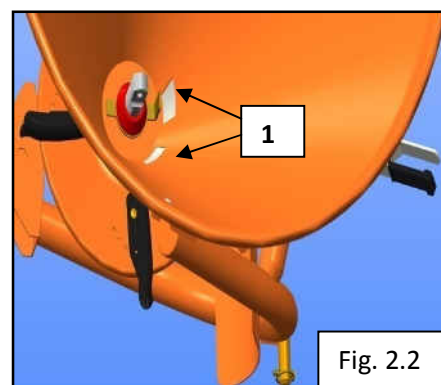


Fig. 2.2

The product is dispensed manually with a lever, by varying the size of two opening on the bottom of the hopper. The left and right lever helps in the spreading the fertilizer to the left, right and both side of the tractor.

The distributor spreader system consists of one horizontal disk which rotates about the vertical axis. The disk has 4 vanes positioned at 4 different location of the disk. The centrifugal force generated due to the rotation of the disk helps in the spreading the product in the field.

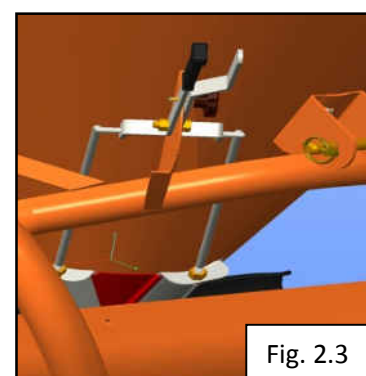
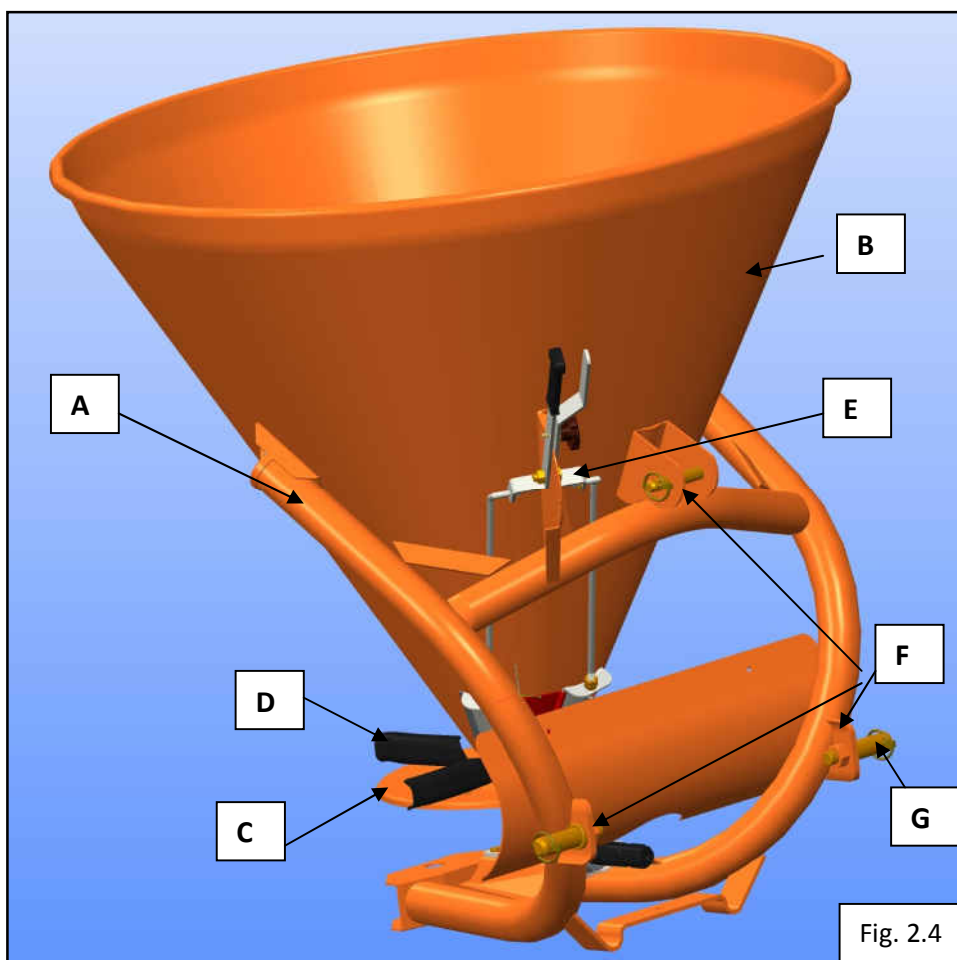


Fig. 2.3



2.2 Terminology



- A. FRAME B. HOPPER C. DISC
 D. VANE E. REGULATING LEVER F. 3- POINT HITCH G. HITCH PIN

2.3 Technical Specifications

	MODEL 500
HOPPER CAPACITY, Liters	345
WT. OF MACHINE, Kg	63
LOADING HEIGHT, m	1.13
SPREADING WIDTH, m	12-14
HOPPER WIDTH, m	1.11
POWER REQUIREMENT AT 540 RPM, hp/kw	8/6
CATAGORY OF TRACTOR	I

03-SAFETY

3.1 Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, Be alert to the potential for personal injury.

Follow recommended and safe operating practices.



3.2 Understand Signal

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on

CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



3.3 Follow Safety Instructions

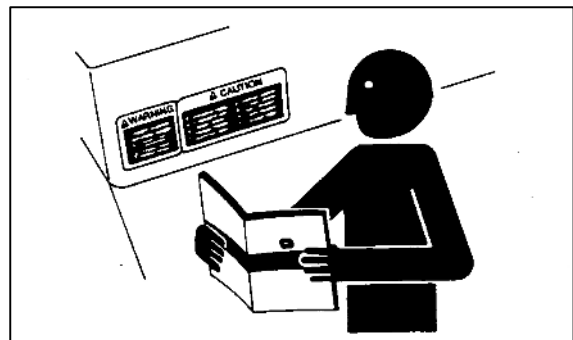
Carefully read all safety messages in this manual and safety signs on your machine. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your Shaktiman dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your Shaktiman dealer. The manufacturer declines all and every responsibility for failure to comply with the safety and accident preventing instructions mentioned in this manual book.



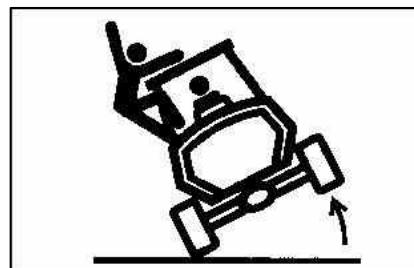
3.4 Operate Machine Safely

Thoroughly read all the instructions for safely operation of the Machine.

- Before starting the tractor and implement, always check all the safety devices are in perfect conditions.
- It is absolutely prohibited for persons without a driving license, inexpert persons or those in precarious health conditions to drive the tractor with implement mounted.
- The coupled implement may only be controlled through the propeller shaft complete with necessary safety devices for the overloads and with the guards having the appropriate chains. Keep away from the propeller shaft while it is turning.
- Always take care of the centrifugal force exercised by the furthered position of the centre of gravity, when turning corners with the implement mounted.
- Before engaging the PTO, check that RPM rate that is prescribed. Never exchange the 540 RPM rate for 1000 RPM rate.
- Before leaving the tractor, lower the implement coupled to the lift unit, stop the engine, engage the hand brake and remove ignition key from the control panel.
- It is absolutely prohibited to stand between the tractor and the implement where the engine is running and the propeller shaft is engaged without having first engaged the hand brake and placed a block or stone under the wheels to prevent them from moving.
- Always set the lift control lever to the locked position before coupling or releasing the implement from the three point coupling.
- The category of the implement coupling pins must correspond to that of lift coupling.
- Take care when working near the lift links. This is a very dangerous zone.
- It is absolutely prohibited to stand between the tractor and the implement when maneuvering the lift control from the outside.
- Fix the side lift links with the relative chains and idlers during the transport phase.
- Set the control lever of the hydraulic lift to the locked position during road transport with the implement raised.
- Only use the propeller shaft recommended by the manufacturer.
- Take great care of the propeller shaft guard, both in the transport and work positions.
- The propeller shaft must only be installed or dismantled whilst the engine is off.
- Take great care to ensure that the propeller shaft is correctly assembled and safe, and carefully check the PTO of the implement and the tractor.
- Before engaging the PTO, ensure that there is no person and animal in the field of action of the machine and that the selected running rate corresponds to the permissible value. Never exceed the recommended maximum rate.
- Never engage the PTO when the engine is off.
- Only clean and grease the propeller shaft when the PTO is disengage, the engine is off, the hand brake engaged and the ignition key removed.
- Refit the protective cap on the input shaft after having dismantled the propeller shaft.
- Never carry out maintenance or cleaning work unless the PTO has been disengaged, the engine switched off and the hand brake engaged and the tractor locked in position by a block or stone under the wheels.
- Always place adequate supports under the implement when servicing the machine
- Before working on vanes, disengage the PTO, switch off the tractor engine, engage the hand brake and check all the blades are completely at a standstill.
- Operate the implement carefully to avoid injury. If the implement must be raised for work on or near the implement make sure the service locks are installed or that the implement is safely supported.
- Be careful when operating the implement on slopes; the tractor can overturn if it hits a hole or ditch or if it encounters rough terrain.
- Only one person, the operator, should be in the tractor operator's station when the tractor and the implement are in use.

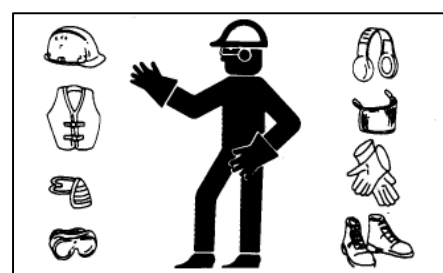
3.5 Keep Riders off Machine

- Only allow the operator on the machine. Keep riders off.
- Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine.
- Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.



3.6 Wear Protective Clothing

- Wear close fitting cloth and safety equipment appropriate to the job.
- Prolonged exposure to loud noise can cause impairment or loss of hearing.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.
- Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine.



3.7 Transport Safety

- Tractor brakes should be coupled.
- Engage a lower gear when going down steep hills or grades.
- Always operate at reasonable and safe speeds.
- Prevent collisions between other road users and slow-moving equipment operating on public roads.
- Frequently check for traffic from the rear, especially in turns, and use turn signal lights.
- Keep others away from the machine.
- It is absolutely prohibited to carry passenger and animal on the implement.
- For better stability and operator safety, make sure the tractor is correctly ballasted.
- If the tractor has a safety ROLL-GARD canopy, keep your seatbelt fastened during transport operations.

3.8 Comply with the Transport Speed Limit

The maximum permissible travel speed for this implement is 20 km/h (12 mph).

Some tractors can operate at speeds higher than the maximum speed limit for this implement. Do not exceed the implement's transport speed limit.

Exceeding the implement's maximum transport speed can result in:

- Loss of control of the tractor/implement combination
- Reduced stopping power or no ability to stop during braking
- Damage to the implement's structure or components

Be careful and slow down in adverse conditions, when turning and when operating on slopes.

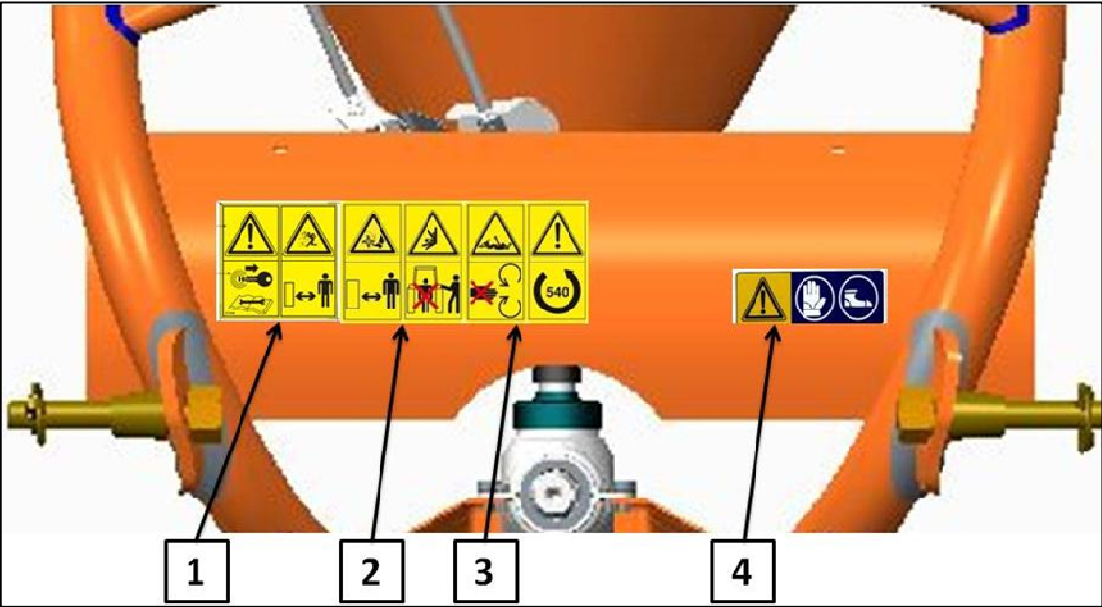
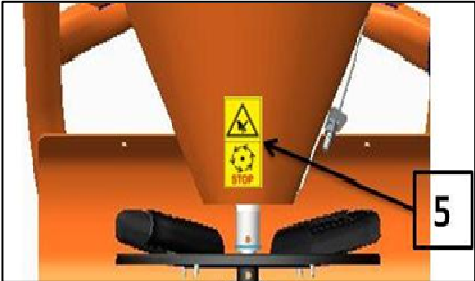
3.9 Service Machine Safely

- To help prevent personal injury caused by unexpected movement, be sure to service machine on level surface.
- If the implement must be in a raised position while working on or near it, be certain service locks are installed or machine is adequately supported.
- If implement is connected to tractor, engage parking brake and/or place transmission in "PARK", shut off engine and remove key.
- If the implement is detached from tractor, block wheels and use safety stands to prevent movement.
- Operations and adjustments to the implement must always be carried out when the engine is off and tractor braked.

3.10 Practice Safe Maintenance

- Understand service procedure before doing work. Keep area clean and dry.
- Never lubricate, service, or adjust implement while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power source. Lower implement to the ground. Stop the engine. Remove the key. Allow implement to cool.
- Securely support any implement elements that must be raised for service work.
- Keep all parts in good condition and properly installed.
- Fix damage immediately. Replace worn or broken parts.
- Remove any buildup of grease, oil, or debris.

04-SAFETY SIGNS

Sr. No.	Description
1	Attention Danger
2	Crushing hazards & Thrown or Flying objects hazards
3	Input Drivelines & PTO SPEED
4	SAFETY WEAR
5	WARNING - Hand Hazard


4.1 Safety Decals

The types of Safety Sign and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize with the various safety signs, the type of warning and the area or particular function related to that area that requires your safety awareness.

IMPORTANT: If Safety Signs have been damaged, removed, become illegible or parts replaced without signs, new safety signs must be applied.

New Safety signs are available from your authorized Shaktiman Dealer or factory.

Sr. No.	Decal No.	Description	Picture
1	D1077	<p>Attention Danger</p> <ul style="list-style-type: none"> • Before making any operation on the machine, stop the engine of the tractor or the self moving means, remove the key, put on the parking brake and read carefully the operator’s manual. • Attention danger possible throwing of material and/or objects, please do not come up the machine. • Keep a safety distance of 50 meters, at least, from the machine. 	
2	D1080	<p>Crushing hazards & Thrown or flying objects hazards</p> <ul style="list-style-type: none"> • Attention danger of crushing. • Do not stand between the machine and tractor when the tractor engine is running. 	
3	D1081	<p>Input Drivelines & PTO SPEED</p> <ul style="list-style-type: none"> • Attention checks the sense of rotation and the number of revolutions (540 rpm) of the tractor power placing the PTO shaft. • Attention danger of entangling and dragging. Do not put hands near the running gearbox. 	
4	D1068	<p>SAFETY WEAR</p> <ul style="list-style-type: none"> • Attentions use the individual protection devices, as required. 	

5	D1078	<p>WARNING - Hand Hazard</p> <ul style="list-style-type: none">• Wait until all machine components have completely stopped before touching them.	
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05-PREPARING THE TRACTOR

5.1 Use Your Tractor Operator's Manual

Note: Use the proper HP of tractor for the particular model of machine. See the section technical specification

- Always refer to YOUR tractor operator's manual for specific detailed information regarding operation of YOUR equipment.
- Following tractor related information uses tractors to illustrate preparation, attachment and operational procedures.
- Use your tractor OM for detailed information.

5.2 Front Counterweight

CAUTION: The front counterweight may not be able to maintain tractor stability if the tractor is driven at excessive speed on rough ground with the implement raised. Drive slowly and carefully in these conditions.

A minimum of 20 % of tractor and implement weight must be on the tractor front wheels. Install the appropriate amount of weight on the tractor front end. The weight may be attained with a front wheels weight, ballast in the tires or front tractor weight. For more detail see the tractor operator manual.

06-PREPARING THE IMPLEMENT

- Tighten all bolts and nuts. See the bolt torque tables in the maintenance section.
- Before starting the implement check that the machine is perfectly in order, that the lubricants are at the correct level and all parts subjected to wear and deterioration are fully efficient.

• 6.1 Upper Agitator Assembly :

IMPORTANT: Agitator should only be used with light fluffy material such as grass seeds, powdered fertilizer etc. Do not use with heavy dense materials such as fertilizer, salt and sand. Doing so can break the agitator.

- Check buffer wheel (2 in Fig. 6-1) to make sure it spins freely on the agitator. Slightly loosen nylock nut M12 (4 in Fig. 6-1) if buffer wheel does not spin freely.
- Attach upper agitator (1 in Fig 6-1) with entainer with M12 X 1.75 X 55 hex bolt (5 in Fig. 6-1). Secure with nylock nut M12 (4 in Fig. 6-1). Draw locknut up snug. Do not tighten.

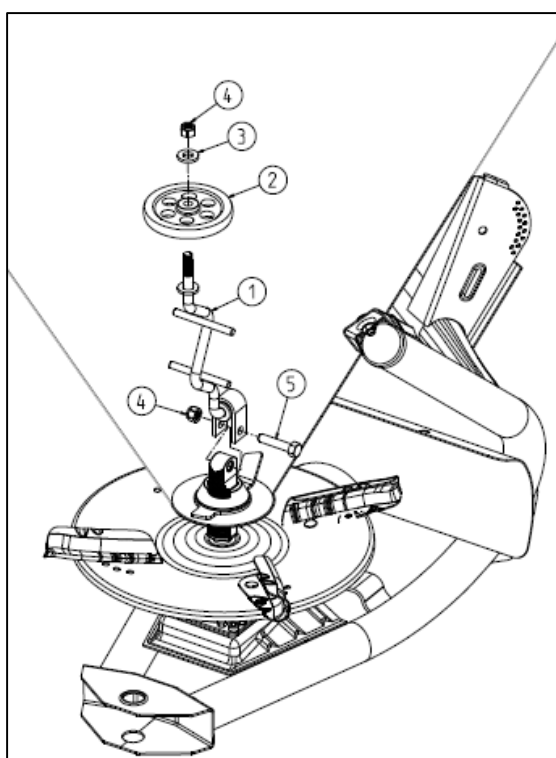


Fig. 6-1

07-ATTACHING AND DETACHING THE IMPLEMENT

7.1 Use Your Tractor Operator's Manual

- Always refer to YOUR tractor operator's manual for specific detailed information regarding operation of YOUR equipment.
- Following tractor related information uses tractors to illustrate preparation, attachment and operational procedures.
- Use your tractor OM for detailed information, as procedures will vary by equipment

7.2 Attaching implement to the Tractor

Implement can be attached to the suitable category tractor.
Follow below procedure for attaching the implement to the tractor



Warning: Trained person is required to attach and detach from the tractor. Else may cause major injury to operator and sevier damage to equipment and tractor.



Caution: Implement should always be park on level ground for attaching an detaching to tractor safely and easily.



Caution: Before attaching equipment to the tractor, check for any accessories fitted on tractor like drawbar, swinging drawbar, automatic hitch etc for any hindrance, restriction, proper functioning and free up and movement of equipment. If required remove accessories before attaching equipment.

When using tractors with multi-speed PTO, be certain that PTO is set for prescribed RPM.

1. Bring the tractor back and insert LH lower link (1) of the tractor to the corresponding hitch pin of the equipment and lock it with the help of latch pin (Fig. 1)
2. Similarly attach RH lower link (2) of the tractor to the corresponding hitch pin of the equipment. If required adjust height of lower link with the help of adjustable lift rod.
3. Attach top link (3) of tractor to top hitch point of the equipment. Adjust length of top link if required to reach and align to the required hole on the top hitch point.

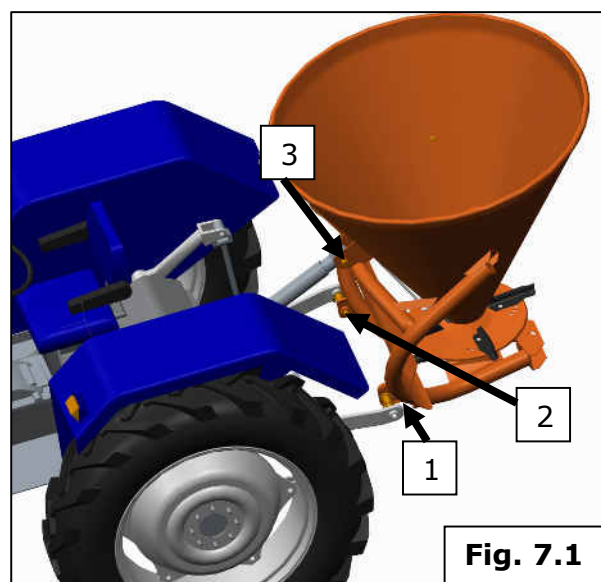


Fig. 7.1

7.3 Universal Propeller shaft Attachment



Warning: Length of propeller shaft is very important and requirement may vary from tractor to tractor. Please read section Universal propeller shaft length adjustment.

During propeller shaft installation, push the pushpin (1) then slide one end of propeller shaft over the tractor's splined PTO shaft and secure with locking device(push pin) 1 of drive shaft. Do the same process for the other end of the Propeller shaft.

Propeller shaft now be moved back and forth to ensure that it is secure on the PTO shaft of the tractor and implement gearbox.

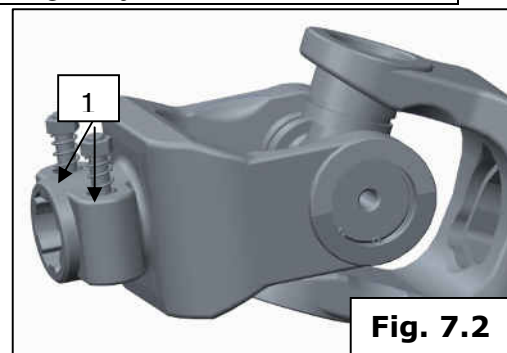


Fig. 7.2



Note: The till of the universal propeller shaft must not exceed 35°. (Fig. 5)

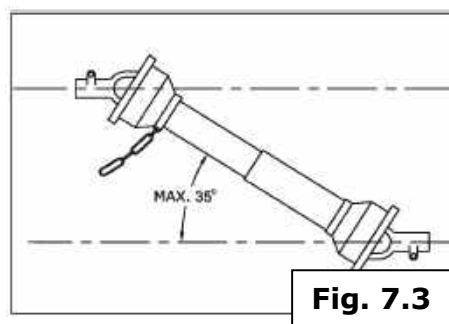


Fig. 7.3

7.4 Detaching Implement from the Tractor

- Detaching the equipment from tractor is reverse procedure of attaching the equipment.
- First lift down the equipment on the level ground and lower the stand and lock the stand so that equipment should not erect after detaching from tractor.
- Remove propeller shaft, followed by top link, then LH lower link and RH lower link of tractor.

7.5 Universal Propeller Shaft Length Adjustment

IMPORTANT:

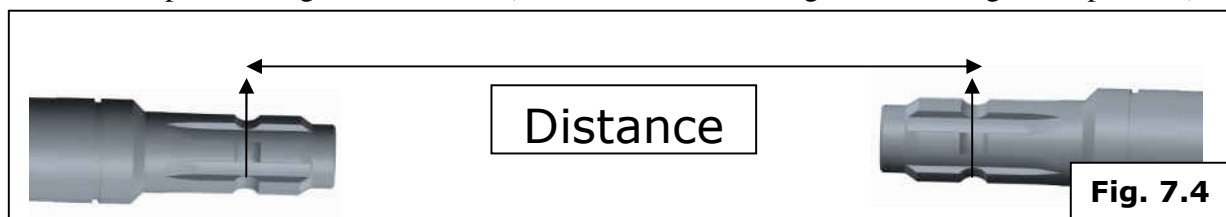
- The propeller shaft which will be used to operate the machine must definitely have protective covers.
- Propeller shaft without protective covers should never be used.
- The tractor may not be running during the mounting and dismounting of the shaft.
- No other persons should be around the propeller shaft during processes with the shaft.

Attention: The universal propeller shaft supplied, with the machine, is of standard length. Therefore it might be necessary to adapt the universal drive shaft.

Make sure the PTO shaft length is compatible with the different working positions of the implement. If the PTO shaft is too long it might bend and damage may occur to the tractor or implement.

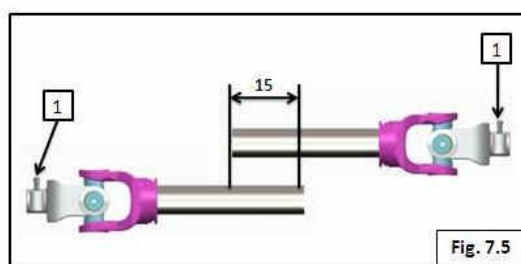
Place the tractor and the implement on a flat surface

Attach the 3 point linkage of the tractor (see the section attaching and detaching the implement)



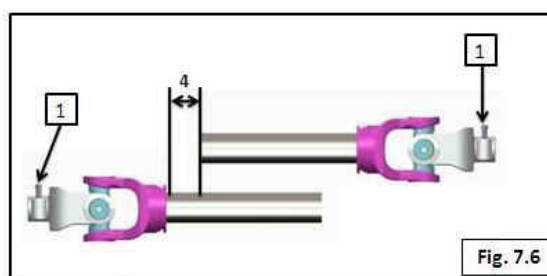
Find the length between the groove of PTO output on the tractor, and the PTO input on the implement when the implement and tractor is in horizontal position.

Raise the implement fully and measure from end-to-end between the two grooves. It is used to determine the shortest distance.



Lower the lift to about half and re-measure the distance, then drop the lift to the bottom and re-measure again.

Let the shortest distance be A and the longest distance be B. (Fig. 7.4)



Put the both halves of the propeller shaft on a flat surface parallel to each other (Fig. 7.6) in such a way that the distance between the two push pin (1) of the yoke should be equal to the shortest distance A.

Measure the minimum clearance, this distance should be minimum 4 cm (Fig. 7.6), if this distance is more than 4 cm then no need to cut the shaft. If the clearance is less than 4 cm then cut the pipe of propeller shaft along with cover both side such that the minimum clearance of 4 cm is maintained.

Again, put the both halves of the propeller shaft on a flat surface parallel to each other (Fig. 7.5) in such a way that the distance between the push pin (1) of the yoke should be equal to the maximum distance B. If the minimum overlap is 15 cm then no need to resize the propeller shaft and it is ready to be fit the tractor with the implement.



Danger: failure to make these adjustments will damage the unit and causes personal injury.



Note: Clean the filings from the metal and dress the edges of the cuts with a file when done.

08-TRANSPORTING

8.1 Transport Safely



CAUTION: When transporting on a public road or highway, use accessory lights and devices to provide adequate warning to operators of other vehicles.

Contact with electrical cables can cause severe injury or death. When transporting or operating the machine, make sure to avoid contact with electrical lines.

When transporting the implement, always travel at a speed that allows adequate control of steering and stopping.



CAUTION: When transporting the implement on a smooth surface road, do not operate the tractor at more than 20 km/h (12 mph). Reduce speed considerably when traveling over uneven ground. Make sure there is no one near the implement.

In the transport position, be sure to determine the amount of implement travel behind the tractor when turning corners. Be aware of width and height limits to avoid collisions with bridges and other vehicles.

Comply with the following recommendations:

- Use tractor with sufficient capacity to maintain control. Install adequate ballast on the tractor.
- Couple tractor brake pedals together.
- If the tractor has a safety ROLL-GARD canopy, keep your seatbelt fastened during transport operations.
- Engage a lower gear when going down steep hills or grades; never coast down hills.
- Always use the warning lights, day and night, when operating on public roads. Keep the reflectors clean and visible.
- Prevent collisions between other road users and slow-moving equipment operating on public roads.
- Frequently check for traffic from the rear, especially in turns, and use turn signal lights.
- Stopping distance increases with the speed and weight of mounted loads, and on slopes. Observe these recommended maximum travel speeds or the local speed limit that might be lower. Do not go faster than 20 km/h (12 mph).
- Ensure that the load does not exceed the recommended weight distribution. Add ballast while complying with tractor limits, lighten the load or use a heavier tractor.
- Be especially careful when transporting the machine in adverse conditions, when turning and when operating on slopes.

8.2 Transporting

IMPORTANT: Always disengage PTO before raising the implement to transport position.



CAUTION: When travelling on public roads whether at night or during the day, use accessory light and devices for adequate warning for operators of other vehicles.

- When raising the machine to the transport position, be sure that propeller shaft does not contact with tractor or machine.
- Adjust the tractor's three point hitch height so that the machine vanes are not lifted more than 32 inches off the ground.
- Be sure to tractor ground speed when turning and leave enough clearance so the implement does not contact obstacles such as building, trees and fences.
- Select a safe level ground speed when transporting from one area to another. When travelling on roadways, transport in such a way that faster moving vehicles may pass you safely.
- When travelling on rough or hilly terrain, shift tractor to lower speed.

09-OPERATING THE IMPLEMENT

9.1 Usage

The Shaktiman fertilizer spreader is designed exclusively for conventional agricultural applications and is suitable for spreading dry, granuled, prilled and crystalline fertilizer & seed.

The uses of implement for the purposes other than mentioned above are not recommended and failures under such conditions will not be covered under warranty even if the product is in warranty period.

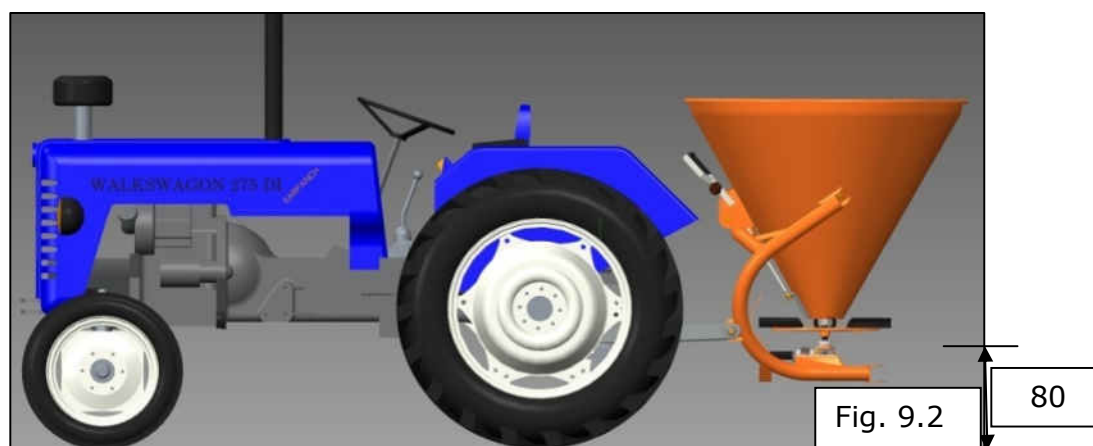
9.2 Field Operation

Before beginning to till the following operation should be performed:

- Check grease in the gearbox.
- Be sure all bolts and nuts are tight.
- Be certain all guards and shields are in place and secure.
- Apply grease to propeller shaft and all other grease points.
- Operate with prescribed RPM PTO tractor.

9.2.1 Working Height

The working height is measured from the spreader disc base above the ground or top of the crop. Generally this height is kept at 80 cm.



9.2.2 Field Distribution

After having hitched the machine to the tractor and having carried

out the necessary regulation, it is possible to begin to work

- Place the tractor at the beginning of the field (position 1). The distance from the border has to be half the working width ($D/2$) of the machine.
- Move along the field perimeter keeping the $D/2$ distance from the border as long as you arrive in the position 2. In this position you have to be at the D (working width of the machine) distance from the position 1.
- Go along till the position 3.
- Make a 90° turn, place the tractor in position 4 at the D distance from the position 3 and go along till the position 5.
- Repeat this procedure until you have spread the entire area of the field (positions 6 and 7).

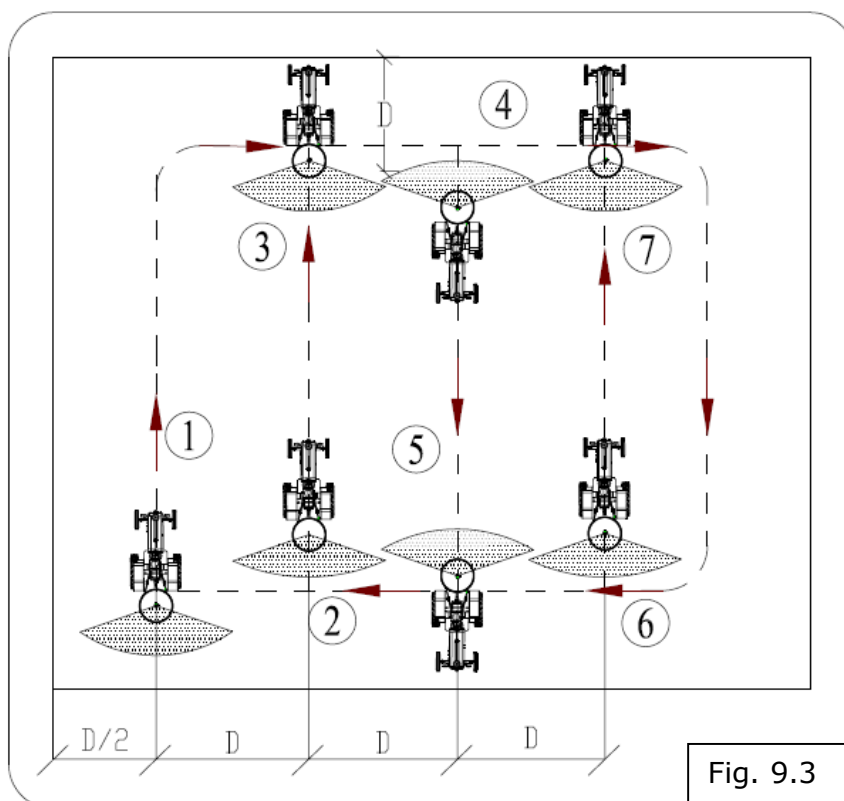


Fig. 9.3

9.2.3 Spreading Variables

The quantity of fertilizer spread depends on the tractor speed, the spreading area, fertilizer type and humidity, weather conditions and from the adjusting machine.

- Keep the tractor speed constant while working.
- Preserve the fertilizer in a way to keep its features from being altered.

9.3 Parking

The following steps should be done when preparing to store the implement or unhitch it from the tractor.

- Park the implement on level and fined ground.
- Shut off tractor engine and engage parking brake.
- Unhitch from tractor.
- Remove propeller shaft.

9.4 Starting Operation

- Attach the implement to the tractor as per the procedure given. See section “Attaching and Detaching Implement”.
- Make sure the propeller shaft is locked properly.
- Rest the implement on ground and engage tractor PTO.
- Do not engage PTO at full throttle.
- Adjust throttle to get 540/1000 PTO RPM.
- Do not engage PTO at full throttle.

10.0 ADJUSTMENTS

10.1 Loading the Hopper

Do not load the hopper over the edge to avoid the loss of fertilizer during the work and travel.

10.2 Spreader Disc Vane Adjustment

4 Blades are on the disc, adjustable in 4 different positions to allow an optimal distribution depending on the type of product and working conditions.

When all the vanes are put in hole 1 (Fig 10.1), the distribution of the product is increased toward left, compared to the way of the tractor moving. On the contrary, if the vanes are put in hole 4, the distribution will be bigger toward right.

Moving the vanes from position 1 to position 4, at the same speed, there will be an increase of the distributing width of fertilizer distribution.

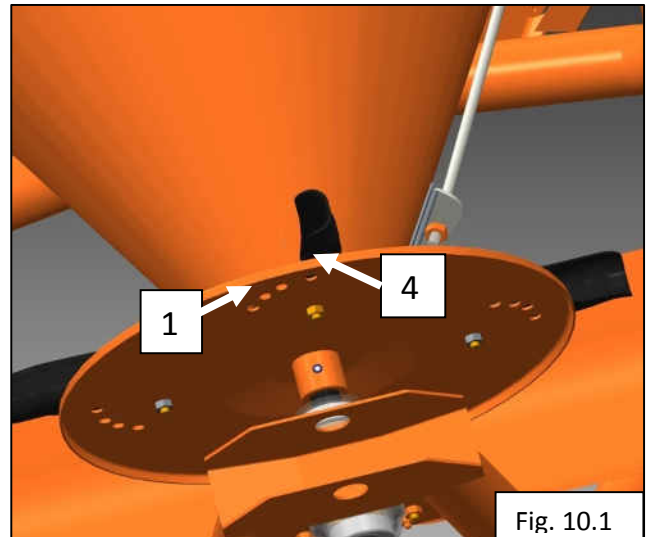


Fig. 10.1

10.3 Setting the Spread Rate

The fertilizer is guided through the two openings from the split hopper onto the spreading disc. This opening is adjusted with the lever A and B (Fig. 10.2)

Before any adjustment, check that by putting the lever in the fully closed position, the bottom opening of the hopper is fully closed by the shutter (C). If not then adjust the position of the shutter on the tie rod (D) through nut (E). (Fig. 10.2)

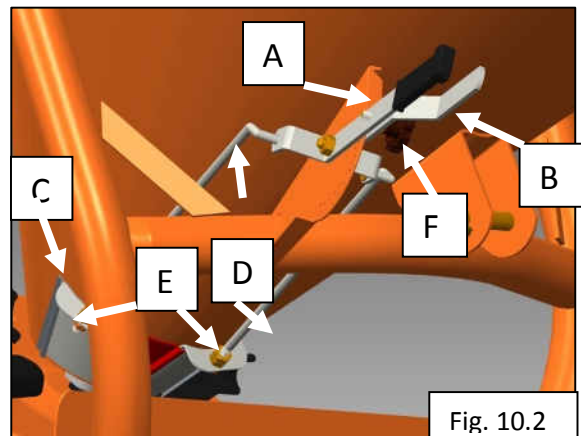


Fig. 10.2

See the rate chart (Fig. 10.6) for setting to the correct opening number, which is based on the tractor speed, fertilizer type and spread width.

Move the lever (A & B) along the graduated scale and lock it in the chosen position with the pin.

10.4 Adjusting Spreading Width

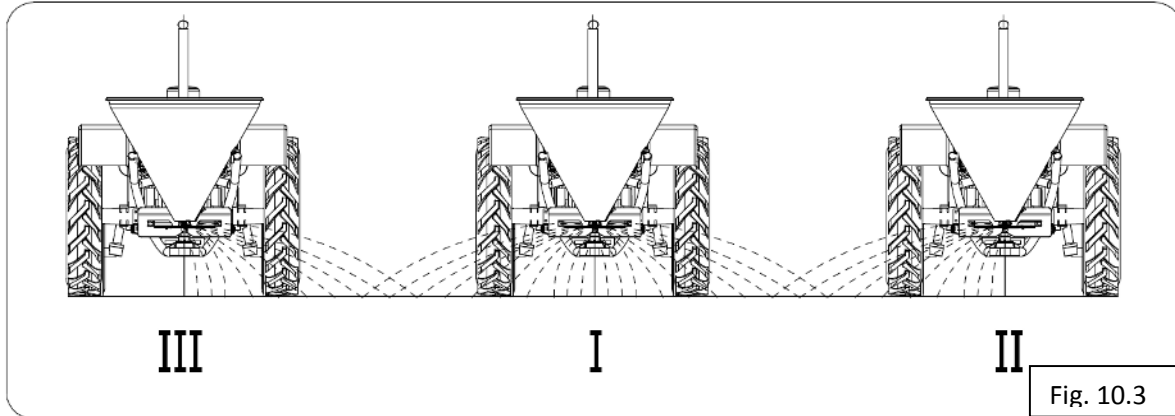


Fig. 10.3

To distribute the fertilizer on both sides (I in Fig. 10.3) A and B levers must be in the same position, connected through grip handle C (Fig. 10.2)

In order to carry out the spreading only through the left side (II in Fig. 10.3), it is necessary to disconnect the two levers (A & B) by removing the grip handle F (Fig.10.4) to set the lever A in the desired position as recommended by the spreading chart and bring the lever B towards the upper position in order to close the hopper opening at right side.

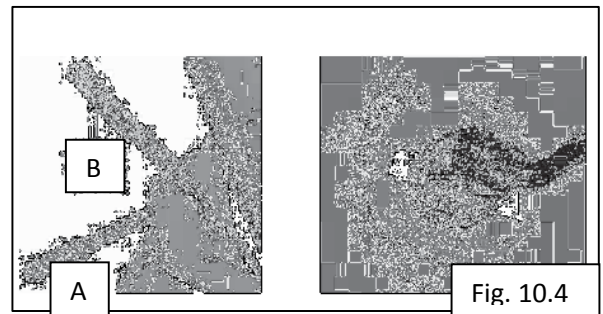


Fig. 10.4

In order to carry out the spreading through the right side only (III in Fig. 10.3) it is necessary to disconnect the two levers (A & B) by removing the grip handle F (Fig. 10.4), to set the lever B in the desired position as recommended by the spreading chart and bring the lever A towards the upper position in order to close the hopper opening at left side.

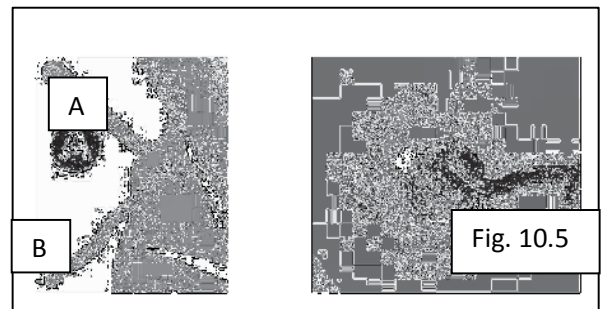
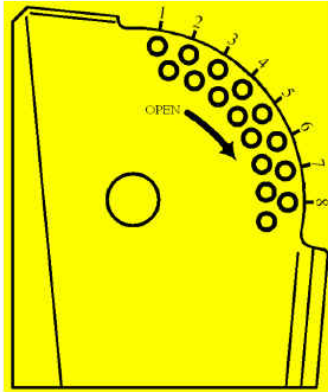


Fig. 10.5

10.5 Spreading Chart



SPREADING CHART

SPREADING CHART FOR FERTILIZER										
	TRACTOR SPEED (KM/H)	SPREAD WIDTH (METRES)	QUANTITY SPREAD IN KGS/HECTARE AT VARIOUS GATE SETTINGS							
			2	3	4	5	6	7	8	8.5
LARGE	5,0	18	148	275	451	712	1042	1137	1278	1400
GRANULAR	8,0		74	138	225	357	521	568	639	700
FERTILIZER	12,0		49	92	150	238	348	379	426	467
MEDIUM	5,0	16	-	348	502	795	1037	1149	1254	1325
GRANULAR	8,0		-	175	251	398	519	575	627	663
FERTILIZER	12,0		-	117	167	266	347	384	418	442
FINE	5,0	12	126	212	361	593	838	944	1080	1179
GRANULAR	8,0		63	107	186	297	419	472	541	590
FERTILIZER	12,0		41	71	124	199	279	314	360	394
CRYSTAL (AMMON. SULPHATE)	5,0	7	253	413	628	998	1386	1518	1707	1830
	8,0		127	206	314	499	693	759	853	915
	12,0		84	138	210	333	462	506	569	610
THOMAS MEAL	6,5	6	-	-	640	-	1422	-	1887	-
	13,0		-	-	320	-	711	-	944	-

(BASIC SLAG)

SPREADING CHART FOR SEED						
	TRACTOR SPEED (KM/H)	WORKING WIDTH (METRES)	QUANTITY SPREAD IN KG./HECTARE AT VARIOUS GATE SETTINGS			
			5	6	7	8
WHEAT	5	18	0	21	59	121
	8		0	13	35	73
	12		0	9	25	52
ALFALFA & CLOVER	5	11	19	73	153	290
	8		12	44	92	175
	12		9	32	66	125
FESCUE & RYEGRASS	5	7	0	0	38	72
	8		0	0	23	44
	12		0	0	16	31
RED CLOVER	5	11	20	75	150	289
	8		12	45	90	173
	12		9	32	64	124
KENTUCKY GRASS & BERMUNDA GRASS	5	4	14	59	140	297
	8		8	35	84	178
	12		6	25	60	127
SUDAN GRASS	5	18	0	22	59	122
	8		0	13	36	73
	12		0	9	25	52
BARLEY	5	17	0	11	36	84
	8		0	7	22	50
	12		0	5	16	36
RYE	5	14	0	11	36	84
	8		0	7	22	50
	12		0	5	16	36

Fig. 10.6

11- LUBRICATION AND MAINTENANCE

11.1 Safe Lubrication and Maintenance of the Machine



CAUTION: To avoid serious injuries or death from unexpected machine movement, locate the machine on a level surface before performing any maintenance work. Lower the machine to the ground or support the raised machine with adequate blocks before performing any maintenance work. If the machine is connected to the tractor, apply the park brake and/or place the transmission in PARK, shut off the engine and remove the key. If the machine is detached from the tractor, block the wheels and use shop stands to prevent rolling

11.2 Lubrication and Maintenance Procedures



CAUTION: Do not clean, lubricate or adjust the machine while it is moving.

IMPORTANT: The recommended maintenance intervals are based on normal operating conditions; in severe or unusual conditions it may be necessary to lubricate more frequently.

Clean the grease fittings before using a grease gun. Replace any missing or damaged grease fittings immediately. Proper lubrication of the Machine pointed out in this manual, using the grease and/or oil recommended will prolong the service life of your machine.

Failure to perform the above may result in failures as well as loss of time and money.

11.3 Lubrication & Maintenance in Implement

S.N	ACTIVITIES	EVERY 8 WORKING HOURS	EVERY 20 WORKING HOURS	EVERY 40 WORKING HOURS	EVERY 100 WORKING HOURS
1	Check & tight all bolts & nuts of vanes	✓			
2	Grease all crosses of drive shafts, shear bolt yoke & ensure the grease is coming out of all four cups.	✓			
3	Clean the both propeller & grease shaft. Grease both tubes & fit them by matching appropriate slot.	✓			
4	Grease the gearbox with Lithium base grease*		✓		
5	Change the grease of gear box and fill the gear box with Lithium base grease*				✓

* **Note: Do not overfill, Seal damage can occur.** There is no purge hole in gear box! Grease level can be checked by removing grease nipple. Grease should be up to the bottom of nipple hole when full.

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11.4 Propeller Shaft

Disconnect the drive shaft from the tractor and slide apart.

Clean and coat the inner tube of the drive shaft with a light film of grease on daily basis or every 8 hours of work and then reassemble.

Clean the greasing nipple (A) of the cross and shear bolt yoke from mud of other residuals before using them for inject lubricating grease. Lubricate with Lithium base grease as shown in the picture.

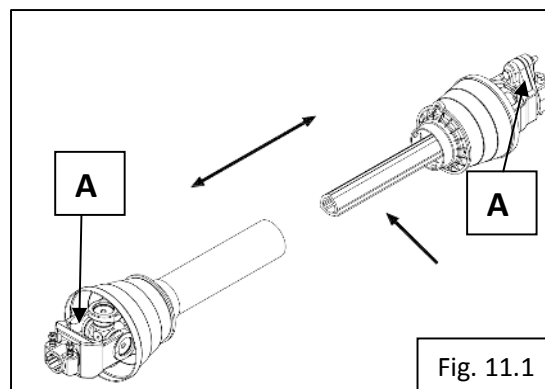


Fig. 11.1

11.5 Gear Box

Clean the greasing nipple (A) of the gearbox from mud of other residuals before using them for inject lubricating grease. Lubricate with Lithium base grease as shown in the picture.

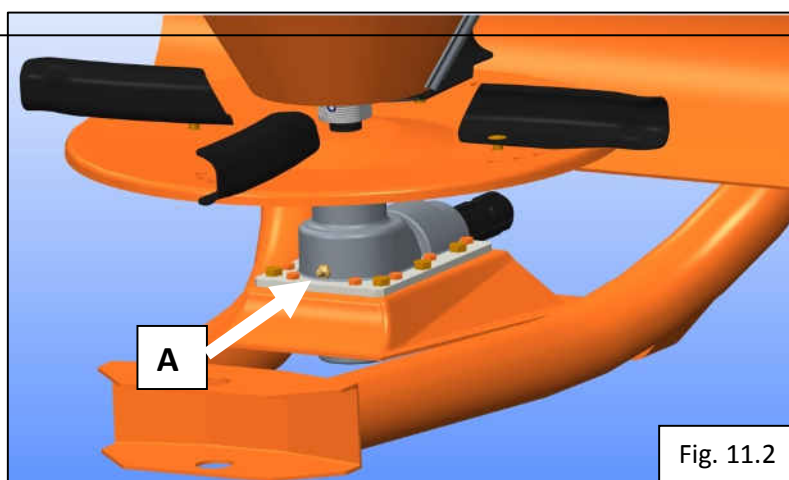


Fig. 11.2

11.6 Replacing the spreading vanes

The spreading vanes are made of especially wear resistant material. Nevertheless, we remind you that the spreading vanes are wear parts. Replace the spreading vanes as soon as holes from abrasion or damage are visible.



Note: It is essential to ensure that the spreading vanes are installed correctly. The open side of the U shape spreading vane must be facing the direction of rotation.

Follow the steps mentioned below:

- Unscrew the nut (A) and replace with new vane
- The fixing items (nuts and bolts) must be of same type of those prescribed by the manufacturer.
- Tighten the nut with a tool at proper torque.

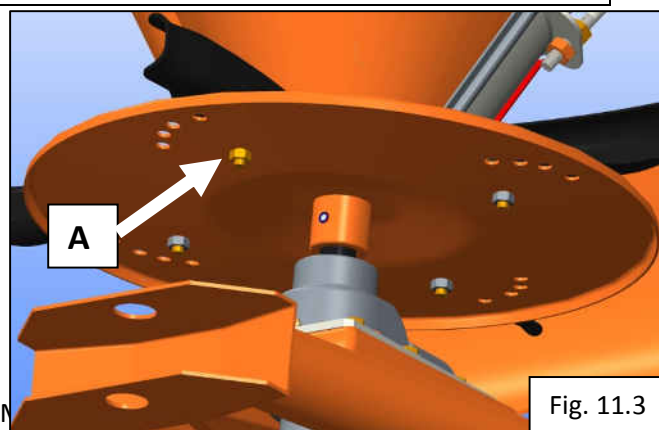


Fig. 11.3

11.7 STORAGE

General

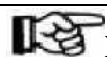
- Put the machine on the ground
- Take off PTO drive shaft and put it in rest position.
- Carefully check for any damaged or worm parts and replace these as necessary.
- Store it in a dry place.
- Carefully compliance with these instructions will be all the advantage of the user who will be sure to use perfect conditions when work begins again.

Off-Season Storage

- At the end of working season or when the machine will not be used for a long period, it is good practice to empty the hopper as fertilizers are generally corrosive,
- Clean off any dirt or grease that may have accumulated on any of the parts.
- Wash the implement, and then thoroughly dry it.
- Inspect the machine for loose, damaged or worn parts and adjust or replace if needed.
- Repaint parts where paint is removed or scratched to prevent rust.
- Cover the machine with a plastic sheet and store in a clean, dry place.

11.8 Metric Bolt and screw torque values:

Bolt or Screw size	class 4.8		class 8.8 or 9.8		class 10.9		class 12.9	
	Lubricated	Dry	Lubricated	Dry	Lubricated	Dry	Lubricated	Dry
	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm
M6	4.7	6	8.9	11.3	13	16.5	15.5	19.5
M8	11.5	14.5	22	27.5	32	40	37	47
M10	23	29	43	55	63	80	75	95
M12	40	50	75	95	110	140	130	165
M14	63	80	120	150	175	220	205	260
M16	100	125	190	240	275	350	320	400
M18	135	170	265	330	375	475	440	560
M20	190	245	375	475	530	675	625	790
M22	265	330	510	650	725	920	850	1080
M24	330	425	650	820	920	1150	1080	1350
M27	490	625	950	1200	1350	1700	1580	2000
M30	660	850	1290	1630	1850	2300	2140	2700
M33	900	1150	1750	2200	2500	3150	2900	3700
M36	1150	1450	2250	2850	3200	4050	3750	4750



Note: Torque values listed are for general use only, based on the strength of the bolt or screw.

Do not use these values if a different torque value or tightening procedure is given for a specific application.

12 - TROUBLE SHOOTING

PROBLEM	CAUSE	REMEADY
1. Fertilizer lateral distribution not uniform	1. Fertilizer deposit on the spreading discs and the spreading vanes. 2. Slider do not open all the way as it is loose	1. Clean the spreading discs and spreading vanes 2. Tighten the slider correctly.
2. Too much fertilizer in the tractor track	1. Prescribed spreading disc speed is not reached. 2. Spreading vanes and outlets are defective or worn	1. Increase tractor engine speed 2. Check the spreading vanes and outlets. Replaced defective or worn parts immediately.
3. Too much fertilizer in the overlap area	Prescribed spreading disc speed is exceeded	Reduce tractor engine speed.
4. Hopper tips do not empty uniformly.	1. Bridging of fertilizer	1. Eliminate cause of bridging
Spreading disc do not rotating	1. Shear bolt of drive shaft has failed	3. Replace the shear bolt.

13-WARRANTY

Tirth Agro Technology Pvt. Ltd. offer the following warranty to the purchaser of SHAKTIMAN FERTILIZER BROADCASTER mentioned herein above subject to the conditions set out herein after provided the SHAKTIMAN FERTILIZER BROADCASTER shall be in the possession of and used by such purchaser as from the date of delivery.

Tirth Agro Technology Pvt. Ltd. warrants its products for a period of six (6) months and will replaced at its factory and any part of parts there of that shall be returned, with transportation charges prepaid and which, when examined by us, shall disclose if to be defective, but this warranty shall not apply to implements or parts that have been subjected to negligence, of accident, or that have been altered or repaired or used with non-genuine parts.

CONDITIONS

- 1) The purchaser of SHAKTIMAN FERTILIZER BROADCASTER will strictly follow the instructions given in the instruction manual, provided by the company along with the SHAKTIMAN FERTILIZER BROADCASTER at the time of delivery. Changes if any, resulting in improper usage will not be covered by the warranty. This warranty will automatically terminate on the expiry of warranty period of six months even the SHAKTIMAN FERTILIZER BROADCASTER may not be in use for any time during the warranty period for any reason whatsoever including any technical reasons and time taken for such repairs / replacements of parts, and in transit, whether under this warranty or otherwise shall not be excluded from the warranty period.
- 2) While the company will make every effort to carry out repairs / replacements of parts under this warranty as soon as possible. It is expressly made clear that the company shall not be liable to do within any specific period of time.
In the event of repairs / replacement of any parts, this warranty will thereafter continue to remain in force only for the unexpired period of warranty.
- 3) It is entirely left to company discretion to affect repairs / replacements of parts at the site of delivery or at the service points of its branches of authorized representatives. The defective parts which has/have been agreed to be replaced, should be returned to the company without any further claim.
- 4) The warranty shall not cover any consequential or resulting liability, damage or loss arising directly or indirectly out of any defect in the SHAKTIMAN FERTILIZER BROADCASTER. This warranty shall be strictly limited to repairs and replacement of the defective parts specified in the warranty at our end, and does not cover any reimbursements of labour charges for any repairs so earned out at dealer/client end.

5) This warranty shall not be extended in any case forwards payments of any monetary consideration whatsoever of replacement or return of the SHAKTIMAN FERTILIZER BROADCASTER a whole. The purchaser of SHAKTIMAN FERTILIZER BROADCASTER wills itself fully responsible for model selection and series for purchasing machine.

6) This warranty does not cover excise duty, CST or state sales tax and octroi and other local taxes payable on any of the parts which the company may supply or repairs free of cost during the warranty period.

This warranty also does not cover the cost of packaging, to and fro freight and transportation charges etc., on the defective SHAKTIMAN FERTILIZER BROADCASTER or other parts of the SHAKTIMAN FERTILIZER BROADCASTER sent to the company or to the service station or its Branches or its Authorized Representative.

7) **THIS CONTRACT WILL BE INEFFECTIVE AND INOPERATIVE IF:**

a. The SHAKTIMAN FERTILIZER BROADCASTER has not been delivered, assembled, started and put into operation by the company or it's Authorized Representative.

b. The duly filled up warranty card is not in our possession within 15 days from the date of delivery.

c. The SHAKTIMAN FERTILIZER BROADCASTER or any parts thereof is subjected to neglect, fire, flood or other acts of God or if in the company's opinion any damage has caused to the SHAKTIMAN FERTILIZER BROADCASTER or transportation.

d. The original numbers are removed, obliterated or altered from the unit.

e. Any attempt is made to have the repairs executed by a person or persons, other than the company or its authorized representative.

f. Any defect is not informed immediately to the company or its authorized representative, any alteration in warranty card is made.

8) a. Any changes in the location of the SHAKTIMAN FERTILIZER BROADCASTER or in its ownership thereof during the warranty period must be intimated in writing to the company or its Authorized Representative ten days before the change. Failure to do so will absolve the company from the obligation under this warranty.

b. Further, in the case of shifting for the continuation of the warranty, the SHAKTIMAN FERTILIZER BROADCASTER has to be inspected by the company or its Authorized Representative before shifting from the original location and before using it at the new location. The inspection fee levied by the company's Authorized Representative as well as the cost of rectification of any

damage in transit, detected in the above inspection, and shall be borne by the Purchaser / Owner, If at the time of restarting, the SHAKTIMAN FERTILIZER BROADCASTER is found to be in working order by the company or its Authorized Representative, this warranty shall continue to be in force for the remaining period of the warranty.

Damage to the SHAKTIMAN FERTILIZER BROADCASTER or any part thereof caused, during shifting or transportation is not covered by this warranty.

- 9) The company's employees or its Authorized Representative have no authority to vary the terms of this warranty and the company is totally accountable and authorized in lieu of the warranty or the company's decision is final.
- 10) The agreement of the warranty is executed in Rajkot and claims if any, shall be made only before the courts having jurisdiction in Rajkot and no claim shall be made against the COMPANY outside Rajkot, notwithstanding that the SHAKTIMAN FERTILIZER BROADCASTER may have been sold or delivered or any stipulation or commitment in respect thereof may have been made elsewhere.
- 11) This warranty is given in lieu of all other guarantees and condition expressed or implied by law or by any person purporting to act on behalf of the COMPANY and excludes every condition, warranty or guarantee not herein expressly set out.

Note: The parts / materials that are not covered by the warranty are as follows:

1. Vanes
2. Universal Joint Cross
3. Paint
4. Bearing
5. Rubber Parts
6. Gaskets
7. Fasteners
8. Fabrication

WHEN THE WARRANTY BECOMES VOID

Besides the cases specified in the supply agreement, the warranty shall in any case become void:

- Should there have been a maneuvering error, use of an inadequate safety bolt on the cardan shaft torque limiter or when the cardan shaft clutch has been damaged through improper maintenance.
- When the implement has been used beyond the specified power limit as given in the technical data chart.
- When following repairs made by the customer without authorization from the manufacturer or owing to instillation of spurious spare parts, the machine is subjected to variations and the damage can be ascribed to these variations.
- Whenever the user or anyone else on his behalf applies equipment to the machine that has not been expressly approved by the manufacturer.
- When the user failed to comply with the instructions in this manual book.



Tirth Agro Technology Pvt. Ltd.

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