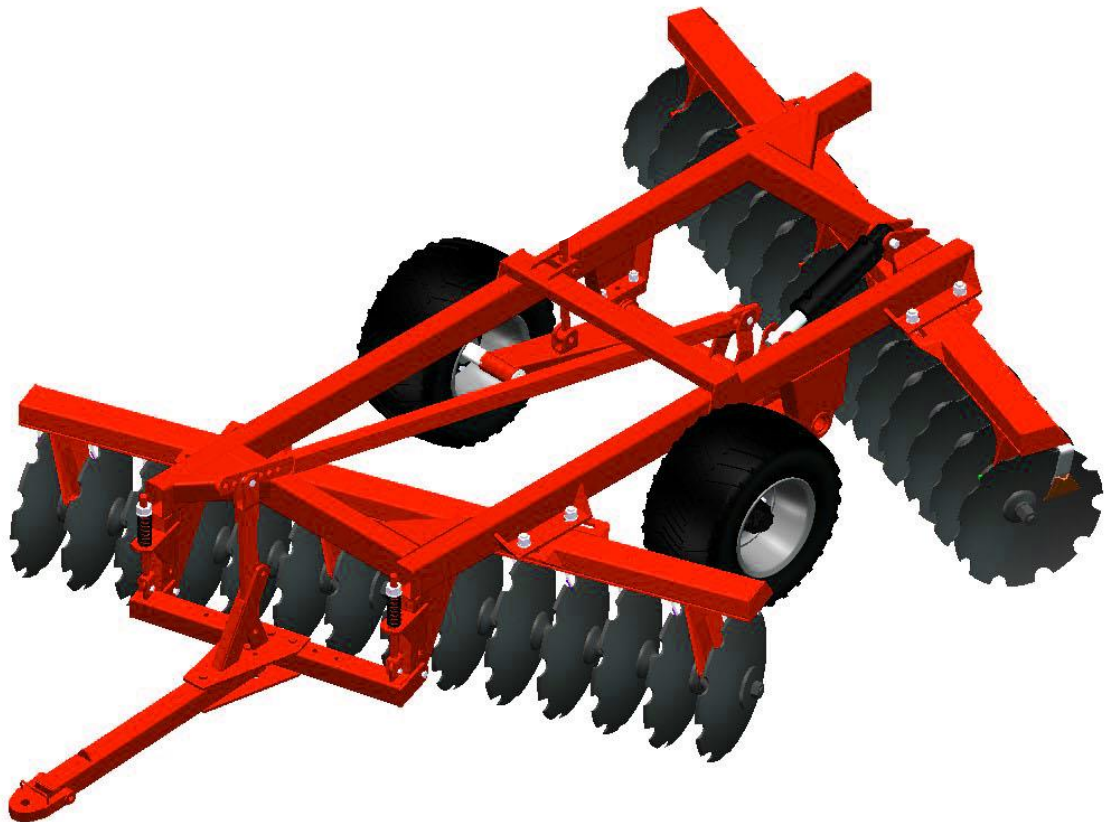


Serafin
ECO SERIES

20 – 32 Plate Offset Disc

Operation Manual



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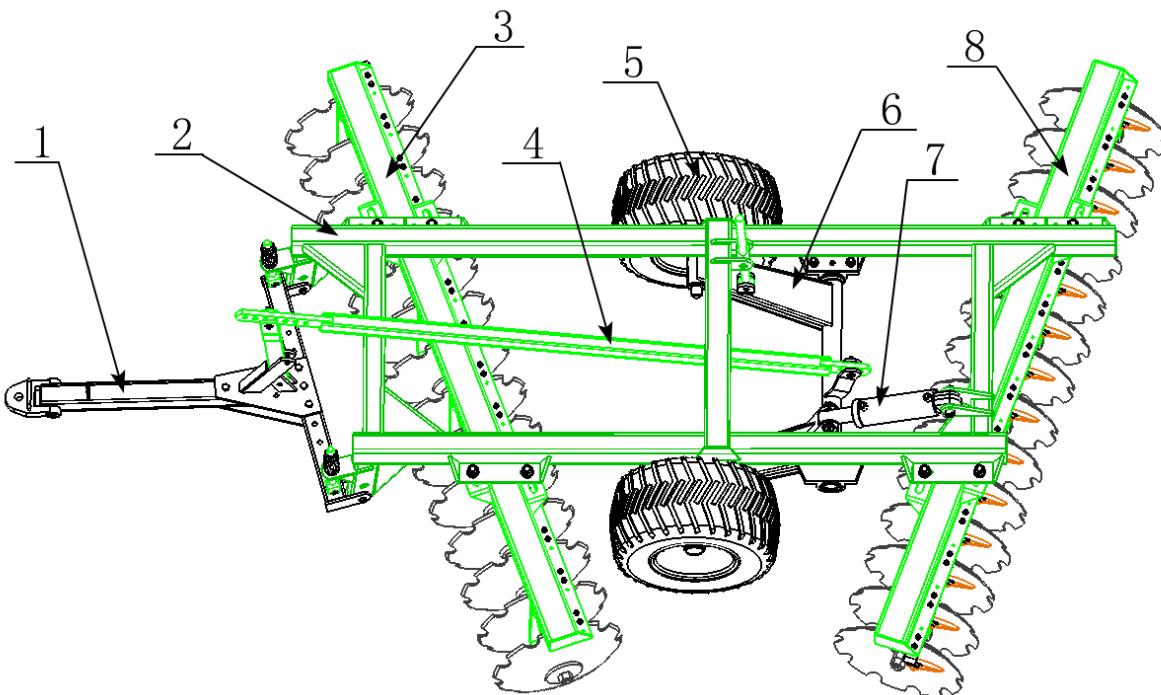
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1. SPECIFICATIONS AND MAIN TECHNICAL PARAMETERS

Model	Working width (m)	Wording depth (mm)	Dia. of disc (mm)	No. of disc (pc)	Weight (kg)	Matched power (kw)
24	2.8	150-200	560	24	2200	85-95
28	3.2	150-200	560	28	2360	100-110
32	3.5	150-200	560	32	2950	120-130

2. STRUCTURE AND FUNCTIONS OF ALL PARTS



1. Adjustable hitch assembly 2. Main frame 3. Front discs row
 4. Leveling bar assembly 5. Wheel frame assembly 6. Wheel linkage assembly
 7. Hydraulic lift cylinder 8. Back discs row

3. USE AND ADJUSTMENT

Hitch-connection

The front end of the hitch assembly of the harrow is connected with the drawbar of the tractor by the drawbar pin. During connection, the tractor is reversed slowly, pay attention to safety.

The main lift ram hydraulic hose is connected to the hydraulic output connector of the tractor by the quick connector.

Ensure that the transport pin is removed prior to operation (see diagram on page 6)

Precautions

Before operation, check all fastenings are secured and the rotating parts turns easily.

The hydraulic handle of the tractor is manipulated to lift and lower the harrow several times, check if the lifting mechanism is normal and is no oil leaking from fittings.

The nuts on the square shaft of the harrow must be checked to make sure it remains tight after 2 hours of operation and then each morning afterwards to prevent the gangs from becoming loose.

Do not reverse or suddenly turn the harrow during operation, if it is necessary for the harrow to be reversed or suddenly turned, ensure to lift it first completely.

Do not maintain, repair or adjust the harrow during operation and do not allow any person to ride on the harrow.

Ensure you remove the transport pin at the rear of the hitch assembly to allow the leveling bar assembly to articulate. Failure to do so can result in damage to pin, hitch assembly and/or leveling bar assembly.

Adjustment of transport position

During long-distance transport of the harrow, adjust the spring leveling mechanism so that the front and rear harrow bodies are basically in horizontal state or with the tail slightly higher to ensure smooth transport and good through put capacity.



IMPORTANT

The disc scraper (1) must be mounted maintaining a 10mm space from the disc. (Figure 10).

31 - Most tractors have now height adjustment on the tractor hitch that makes levelling of the connection easier.



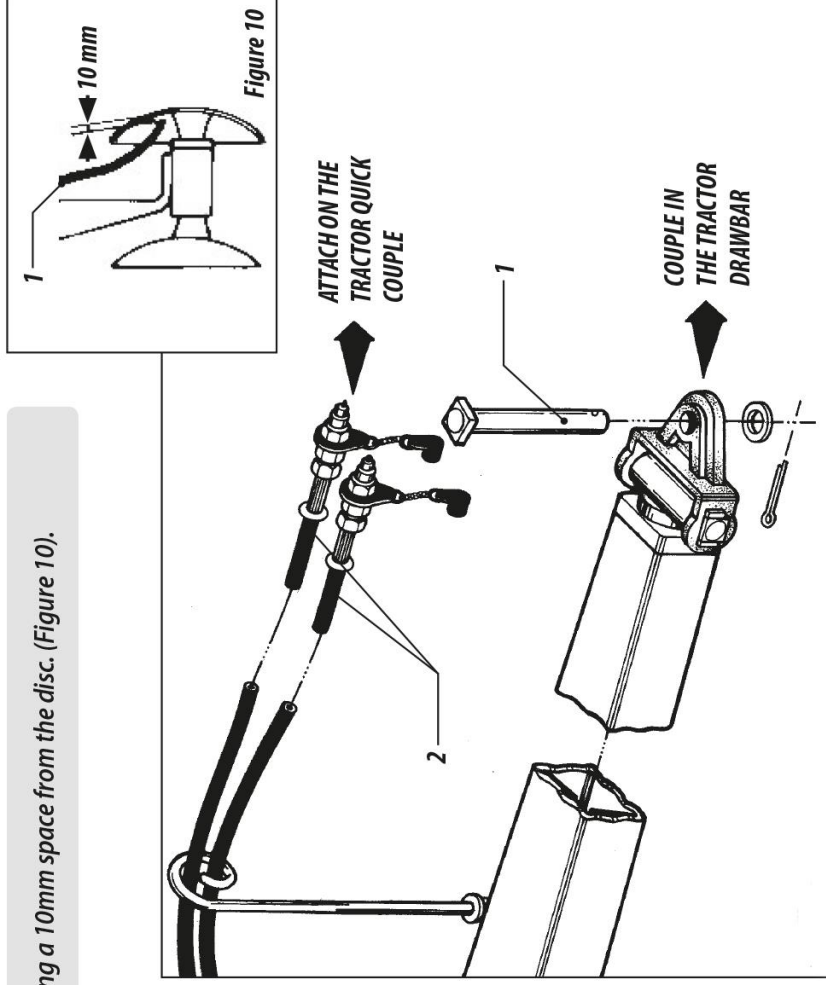
DO NOT TRANSPORT PEOPLE ON THIS DRAWBAR AT ANY CIRCUMSTANCE!

07. HITCHING TO THE TRACTOR

- 01 - Before doing so, verify if the tractor is ready for the operation and that the front and wheel, weights are in place, according to the manufacturer's specifications.
- 02 - Line the tractor up in front the equipment and adjust the tool bar of the tractor and of the equipment so both come in a straight line (level) for optimum performance.

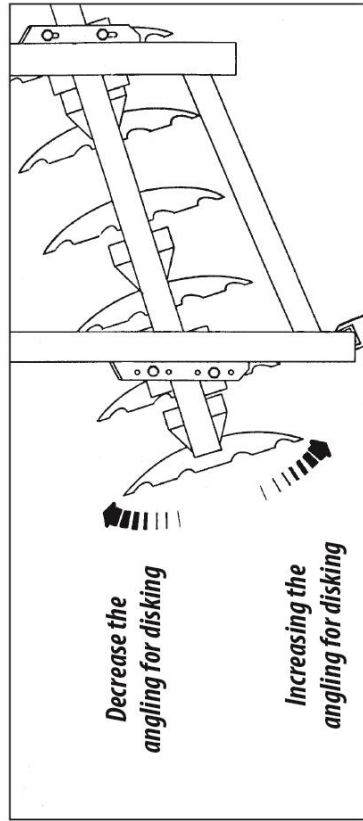


To connect the hydraulic hoses to the tractor, which is the next step, stop the tractor engine and take all the pressure off by using the tractor commands. Beware for accidents with surrounding people.



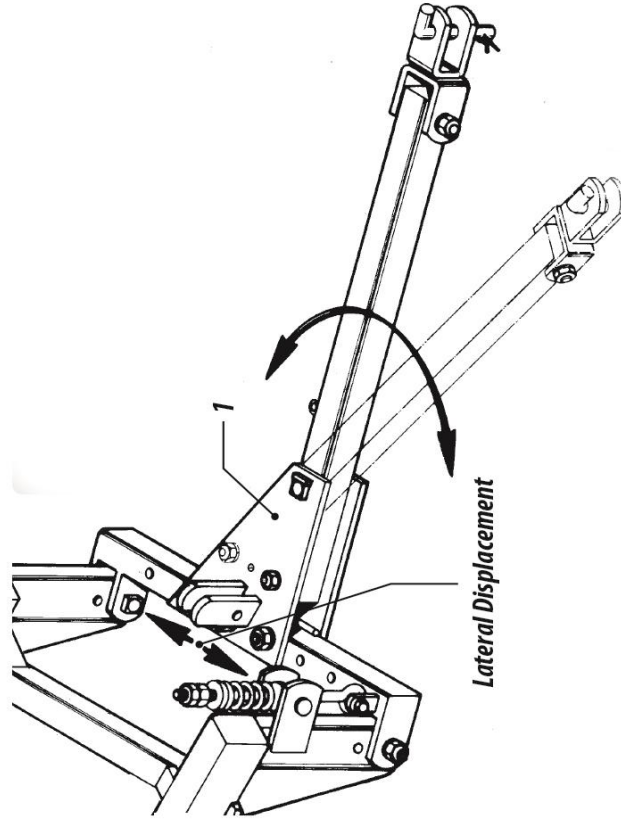
DISK HARROW GANGS ADJUSTMENTS

- 01 - The following adjustments can be made for a better disk blade penetration. In certain soil conditions, less penetration on gangs may occur, to avoid it adjust the angle of the disc.
- Nor hard ground conditions, or when more penetration is desired increase the angling of the discs as illustrated on the figure 14.
 - For normal ground conditions decrease the angling for disking.
- 02 - To increase or decrease the angle of the disc remove the bolts from the frame and adjust to the desired position.
- 03 - The ground wheel helps on the depth control.



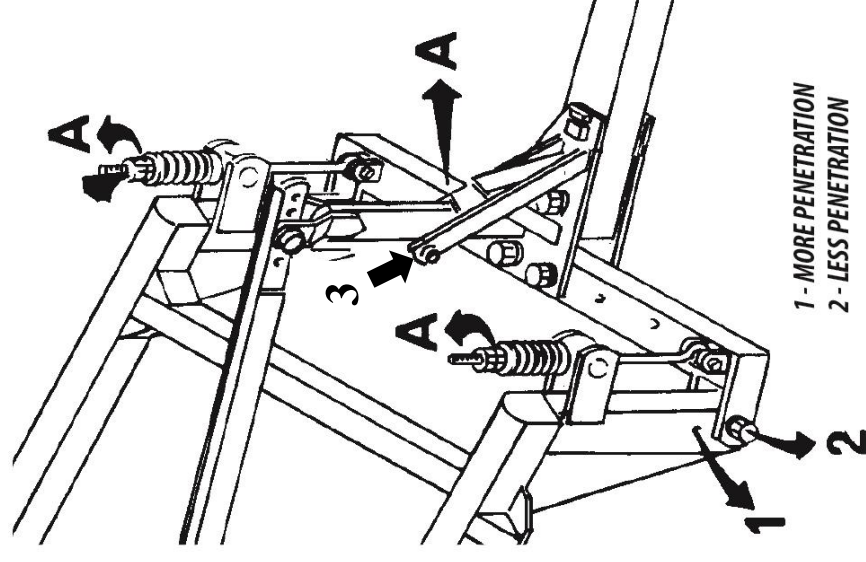
DISPLACEMENT ADJUSTMENT

- 01 - This lateral displacement is used to center the harrow behind the tractor, normally when working in unlevelled areas.
- 02 - The hitch beam also has a regulation system to change the discs penetration.



HITCH TRANSVERSAL BAR ADJUSTMENT

- 01 - The transversal bar has two fixation points on the main frame, (1) and (2). It is important that the hitch beam, that connects implement and tractor, is level when in the operational position so the harrow "floats" evenly over the field.
- 02 - If the transversal bar, is attached to the bottom hole (2) while the hitch beam is sloping up to match the tractor hitch, when pulling, the harrow will be "lifted out" of, the ground in front, reducing penetration while the pressure transferred to the rear gang will increase penetration.
- 03 - The opposite will happen when the hitch beam is pulled downwards.
- 04 - These combinations can be used as needed.
- 05 - When working, the nut (A) must maintain a minimum distance of 20 mm from the spring bushing.
- 06 - Also maintain a minimum distance of 20 mm between the stabilizer bar and the hitch beam support (A).
- 07 - The pin (3) is used to elevate the hitch beam when coupling to the tractor.
- 08 - Using the hydraulic system, suspending the harrows wheel, will make the hitch beam also suspend.
- 09 - When the implement is connected to the tractor and you are ready for operation. Take pin (3) out to allow the harrow to flex behind the tractor.



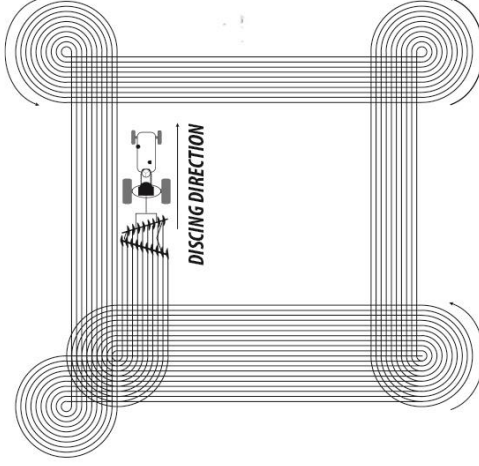
OPERATIONS

01 - Before the beginning of the season use clean off any dirt or grease that may have accumulated on moving parts. This will prevent abrasive action that could cause excessive wear, thoroughly inspect the disk for loose parts and adjust as necessary.

HOW TO START THE DISC

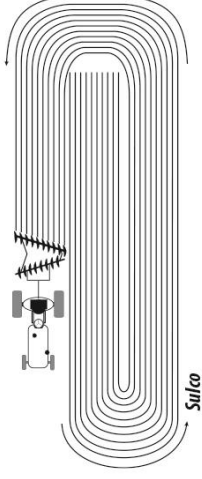
- 02 - Before starting the disc be sure that the harrow is following the contour plowing in order to it stay in left side of the tractor.
- 03 - Do not turn to the right side, as illustrated on drawing 16, the discing area must be in the left side of the tractor.
- 04 - The next drawing show some operations.

DISC FROM OUTSIDE TO INSIDE



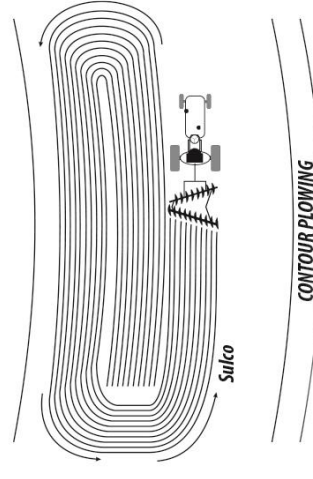
DISC FROM INSIDE TO OUTSIDE

05 - In this direction obtain more accurate discing, when you are working on the edge you should start a new block.



WORKING IN TERRAIN WITH CONTOUR PLOWING

06 - In terrain with contour plowing you should start two blocks each time, be sure that the contour is located on the left side of tractor. When you arrive on half the block you should start a new block to save fuel.



LUBRICATION

- 01 - The correct lubrication is very important for providing a high durability and good working of the rotating parts of the engine which will result in years of trouble-free from the disc Harrow.
- 02 - Before running the engine, lubricate all-grease nipples in accordance with the schedule on the next pages. Use good quality lubrication recommended by the manufacturers.

LUBRICATION OF GREASE BEARING

- 03 - Clean all grease nipple and when it is replace damaged.
- 04 - The amount of grease for each bearing is 200 grams from when bearing is empty.
- 05 - The grease bearing must lubricated every 100 -150 | hours in accordance with the table below. Two full shots of grease is sufficient for ongoing maintenance.

LUBRICATION OF OIL BATH BEARING

- 06 - When you start to use the harrow check the oil level and the rings from the bearing daily.
- 07 - After several weeks inspect the oil level every 120 working hours.
- 08 - Replace the oil every 1200 working hours. Use oil SAE 90.

TABLE OF EQUIVALENT AND GREASES

Manufacturer	Grease Type
Petrobrás	Lubrax GMA 2
Atlantic	Litholine MP 2
Ipiranga	Super Grasa Ipiranga Ipiranga Super Grasa 2 Ipiflex 2
Castrol	LM 2
Mobil	Mobilgrease MP 77
Texaco	Marfak 2 Agrotex 2
Shell	Retinax A Alvania EP 2
Esso	Multipurpose grease H
Bardahl	Maxlub APG 2 EP



If there were other manufacturers or and other. Equivalent trends that are not listed in this. Table, consult the manufacturer's technical manual.

4. MAINTENANCE AND CARE

Check if all fastenings of the harrow are secured before and after operation and if all rotating parts turn easily.

Keep the surface of parts in the hydraulic system clean.

The oil cup of wheel carrier shaft seat should be filled with grease once a week.

See previous section for information on the lubrication guide for the bearings.

5. TROUBLESHOOTING

Q. The harrow section is blocked due to too loose soil texture and too much depth in the soil.

A. Due to too loose soil texture, the harrow section cannot usually work under large angle, or else, it has too much depth in the soil because of large declination, even the whole harrow section gets in the soil and blocked, at this time, the tractor shall be stopped and the harrow is lifted by the hydraulic mechanism to remove the piled-up earth, then, the harrow section declination is decreased for operation.

Q. The harrow section is blocked due to too much soil moisture and too much clay on the harrow.

A. Due to too much soil moisture, too much clay is on the harrow so that the harrow is blocked because of unnoticeable function of scraper. Therefore, the tractor is stopped and the harrow is lifted to remove the clay and piled-up earth. The gap between the scraper plate and the concave face of the harrow is decreased and the harrow is not used for operation until the scraper plate does not usually contact with the harrow, if there is the clay and blockage, the harrow shall not be used for operation.

Q. The bearing does not rotate flexibly and the operation is abnormal.

A. The reasons that the bearing may not rotate flexibly are as follows:

(1) The bearing support plate is installed in incorrect position (2) The bearing support plate is deformed (3) The nut of square shaft is loosened (4) The square shaft is deformed. Under the above four conditions, the bearing is usually under the axial pressure and easy to damaged, so the tractor shall be stopped at once to repair the bearing.

When the bearing support plate is installed in incorrect position, the clamp nut of the cross beam of the harrow section can be loosened to adjust the installation position of the bearing support plate by the long hole of the bearing support plate. When the bearing support plate is deformed, it can be installed again after shaping and repairing and the square shaft is straightened and the nuts are tightened to remove the axial pressure of the bearing.

6. PRECAUTIONS

1. The operator must be familiar with the structure, performance and the methods of operation and adjustment of the harrow.
2. The harrow must be checked before operation to prevent the fastenings are loosened or the rotating parts do not rotate or work.
3. When the tractor and harrow are operated, it is not allowed maintaining, repairing, adjusting the harrow, also being close to the harrow, even riding on the harrow.
4. When the harrow is operated, the hydraulic distributor handle of the tractor must be placed in the floating position and the harrow must be lifted during turning or reversing at the turn land.
5. Do not turn the harrow with discs in the ground to the right.
6. Do not turn the harrow sharply to the left with the discs in the ground (slight, slow turn is ok)

7. PARTS BREAKDOWN

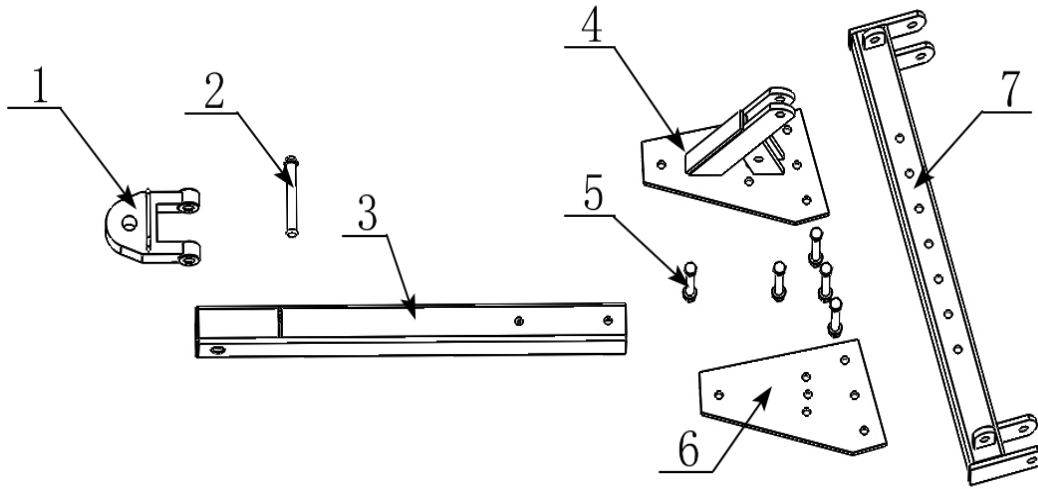


Figure 8

1. Tow hitch 2. Hitch pin 3. Draw bar 4. Draw bar support 5. Bolt M
6. Draw bar support 7. Draw bar attachment beam

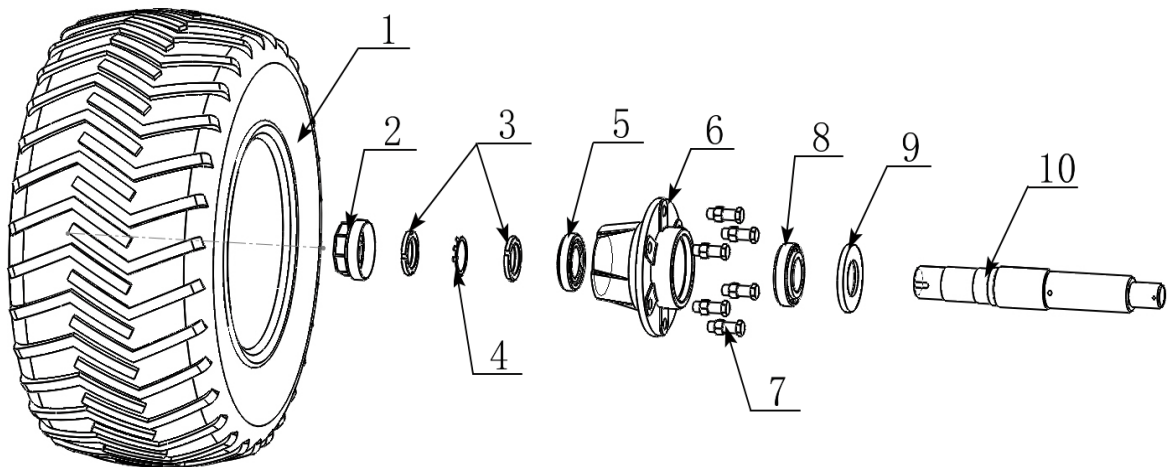


Figure 9

1. Tyre – 11.5/80-15.3 2. Anti-dust cap 3. Castellated lock nut 4. Internal Circlip
5. Bearing 33212 6. Wheel hub 7. Wheel stud M20x65 8. Bearing 32211
9. Seal 120 x 65 x 12 10. Wheel shaft

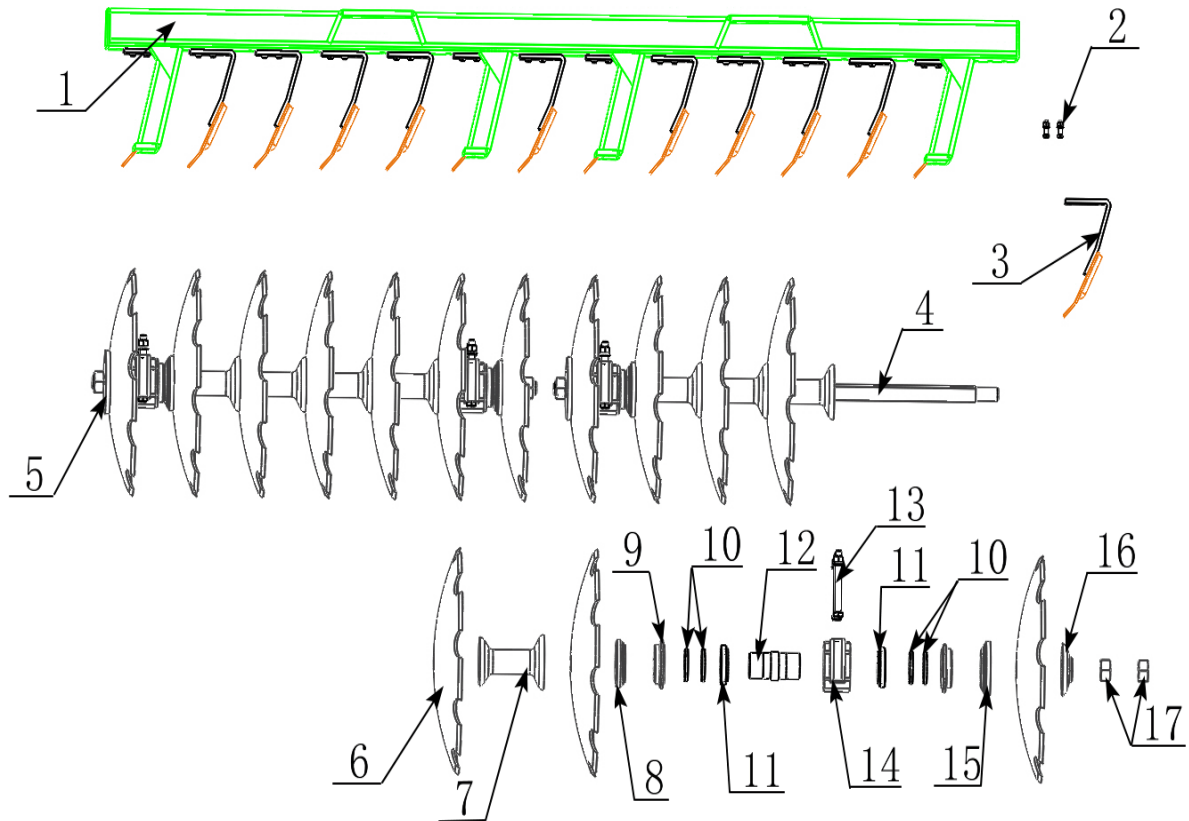


Figure 10

1. Disc hanger 2. Bolt M12 x 40 3. Scraper front/rear 4. 1 ½ square shaft
 5. End plate concave 6. Disc scallop 26" x 6mm 7. Spool 225mm 8. End plate convex – BRG HSG
 9. Seal casing 10. Seal 75 x 95 x 10 11. Bearing 32015
 12. Internal bearing shaft 13. Bolt M20 x 200 14. Bearing housing 15. End plate concave – BSG HSG
 16. End plate convex 17. 1 ½ gang nuts

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