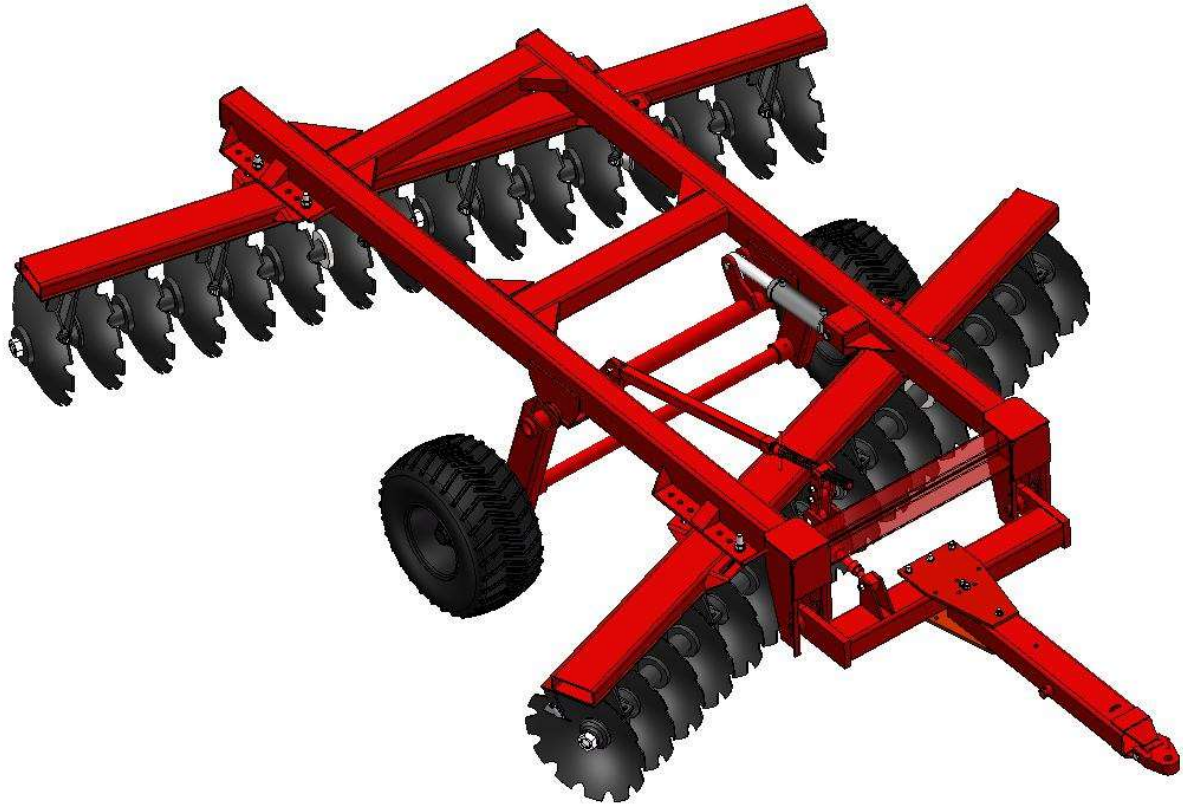


# *Serafin* **ECO GRANDE**

## 24, 28, 32 PLATES USER MANUAL



### **WARNING**

Before using the machine, you must carefully read the relevant regulations and requirements in the operation manual

In case of any violation of the operation regulations, the operator shall be responsible for all the consequences.

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## **Attention**

Before operating the machine, read the safety rules and operating instructions in the manual. The installation, commissioning and use personnel shall have relevant experience and be allowed to operate the machine by the authorized party. This manual should be kept as part of the machine and always with the machine. If you have any questions, please contact Serafin Machinery on (02) 6963 5588

To owners, users and operators:

Thank you for choosing and using our machine. This needs our joint efforts to achieve better. We believe that as the user and operator of the equipment, if you can comply with the following requirements, it will be very helpful for the safe use of the equipment:

1. Comply with user rules, workplace rules and government laws and regulations.
- 2 Read, understand and follow the instructions in the machine's accompanying manual and other manuals.
- 3 Carry out good safety work routine inspection according to the routine.
- 4 Only trained / certified operators or experienced and knowledgeable supervisors can operate the machine.

If there is ambiguous content in this manual or you think it should be added, please contact us.

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# Safety rules

In order to ensure the personal safety and equipment safety of operators and auxiliary personnel, please read the operation manual carefully and operate according to the specification.

If you do not follow the instructions and safety operation rules in this manual, or serious injury will occur, please operate carefully.

To avoid dangerous situations, know and understand the safety rules in advance before proceeding.

- 1、 Always perform a pre operation check.
- 2、 Always perform a pre use functional test.
- 3、 Check the workplace.
- 4、 Use the machine only according to its design intent.

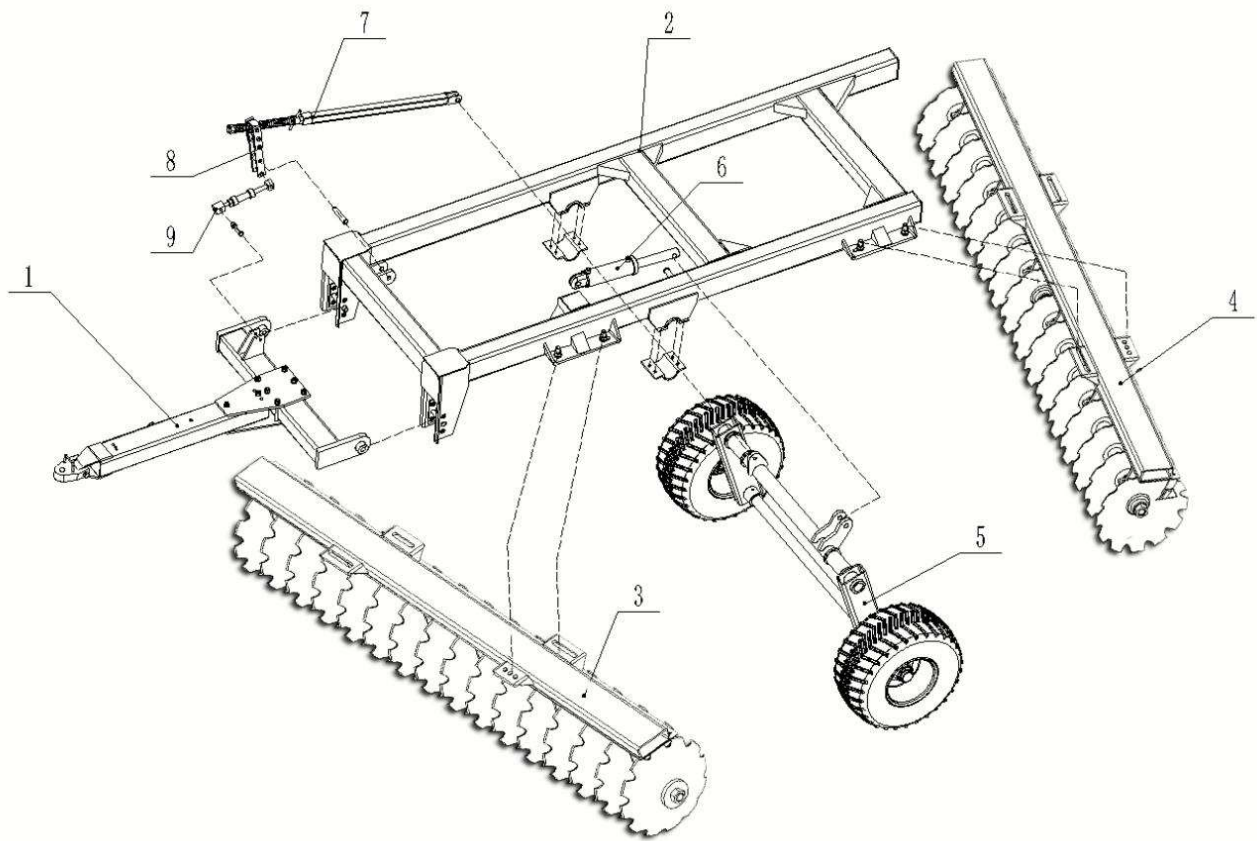
## Product introduction and components

### 1) 、 Brief introduction

1YT790 heavy duty disc harrow is applicable for hacking after the plough in heavy clay soil and stubble cleaning before the plough by “substitute harrow for plow” in moderate and light soil. Its features include high operating efficiency, reasonable power utilization, and strong capability of soil piercing and hacking, which ensures flat surface after harrowing, loose soil, stronger adaptability for clay, heavy soil, wild land and weedy land.

This harrow absorbs the advantages of similar advanced products at home and abroad and the whole machine uses the modular structure and takes integral square welded pipe rigid rake as main body, equipped with hydraulic lifting inflatable rubber transport wheels, spring leveling mechanism and sealed rolling bearings, including outer sphere and inner square hole, specially for of the disc harrow, and it has reasonable structure, which is firm, wearable, convenient for transport, small swing radius, easy for adjustment, convenient for maintenance, is currently advanced disc harrow product at home and abroad.

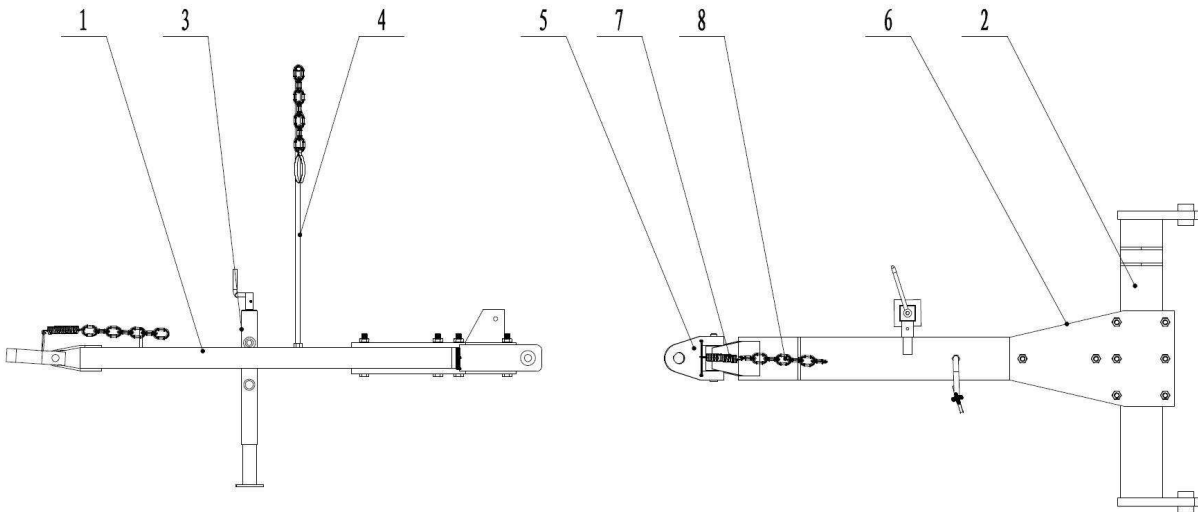
## 2) Main components



- 1、 Traction assembly    2、 frame    3、 Front discs row    4、 Back discs row  
5、 wheel frame assembly    6. oil cylinder    7、 Draw bar assembly    8、 leveling  
draw bar assembly    9、 Levelling spring pole

### 1、 Traction assembly

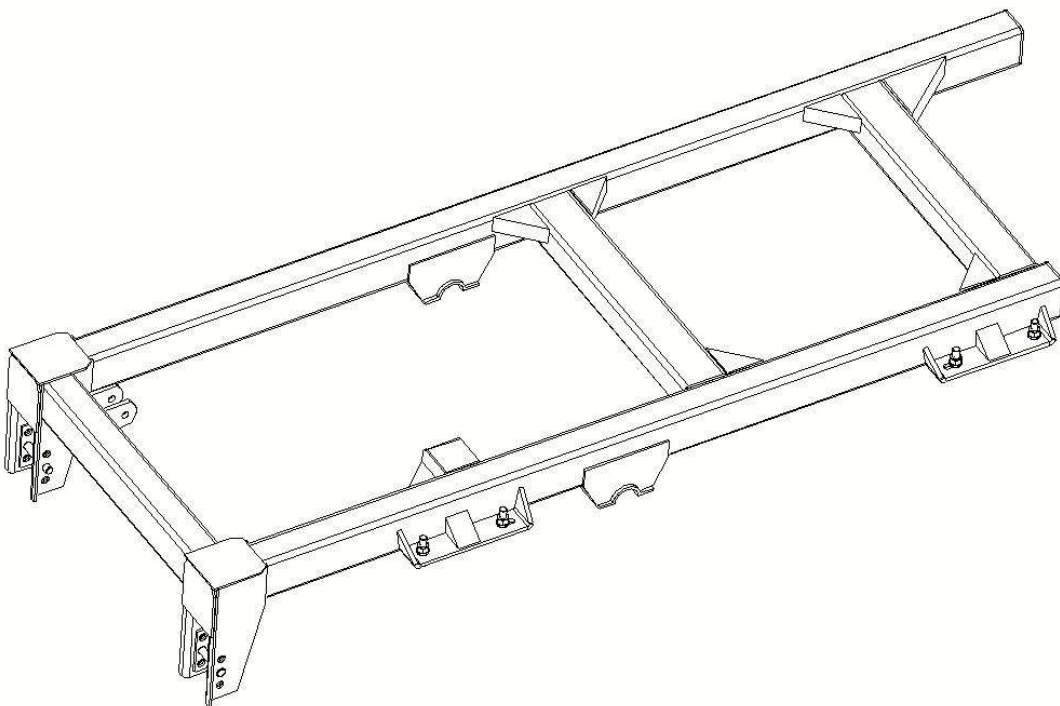
It is used to connect with the tractor, adjust the traction point and eliminate the partial traction.



1. traction stringer    2. Traction beam    3. brace    4. Large oil pipe support  
 5. Traction head    6. Traction splint    7. spring    8. chain

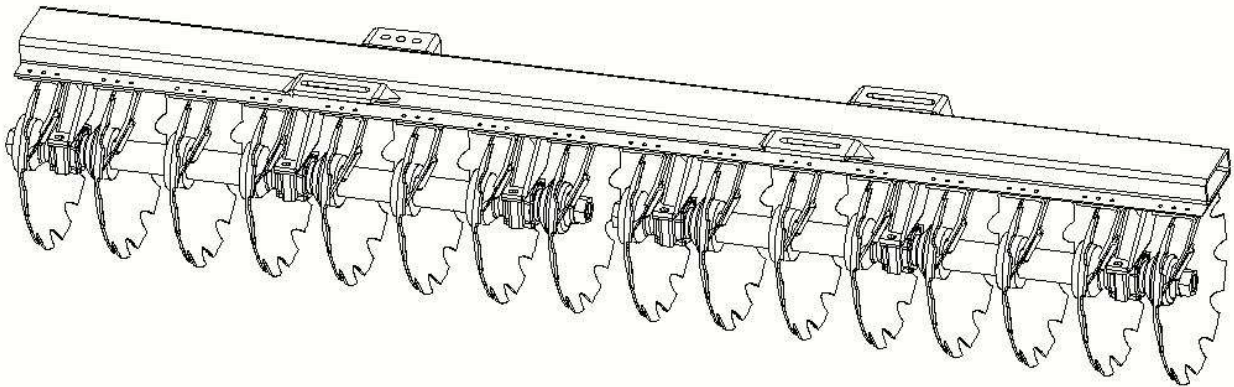
## 2、 Frame

Connect the traction parts, front and rear rows of harrow sections and the transport wheel assembly by the rake welding-on to form the whole harrow and ensure the front and rear harrow sections are in the same plane during operation of the harrow, the depth of front harrow is consistent with that of rear harrow and the surface is flat after harrow.。



### 3、 Front discs row:

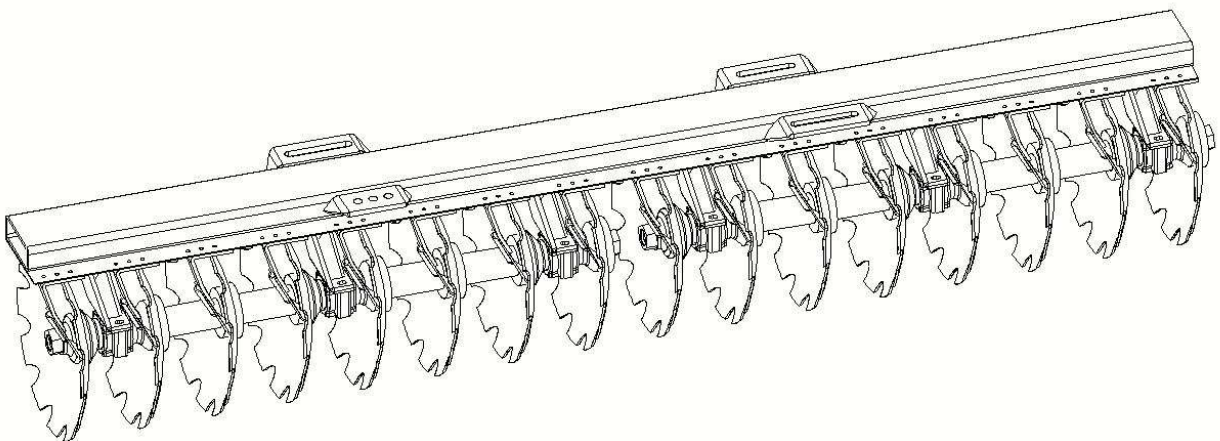
Main working portion of harrow is composed of front row of harrow section and rear row of harrow section and the front row of harrow section is used for hacking, loosening, finishing the task of harrow. The harrow is made of 65Mn steel plate, after heat treatment, firm, wearable and the bearing uses the taper roller bearing, with small resistance. The scraper is used to scrape the clay on the harrow to prevent from being blocked.。



### 4、 Back discs row

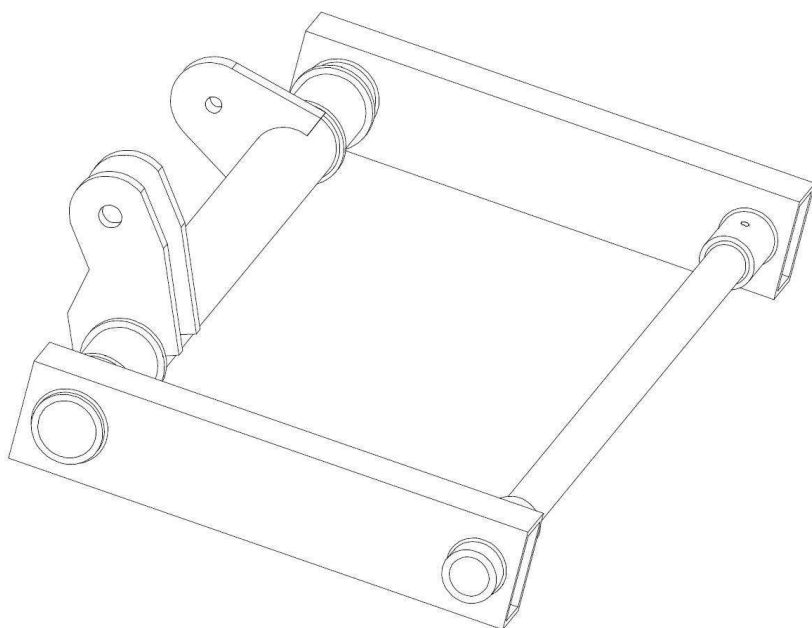
Function as front discs row

NOTE: Except for the scraper plate and axle box support, it is the same as the front row of harrow section.。



## 5、 wheel frame assembly

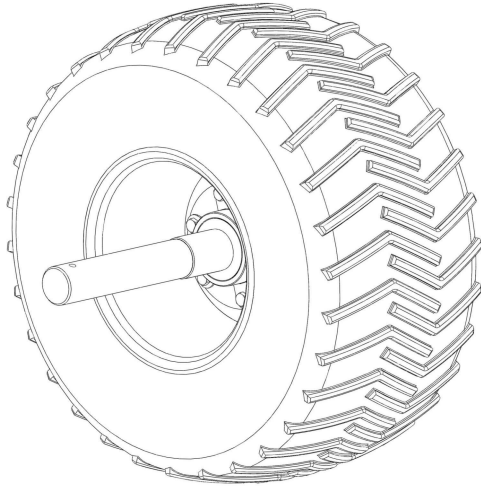
It is used to connect the rake, together with the transport rubber wheels, to achieve the transport effect.



## 6、 Transport rubber wheels assembly

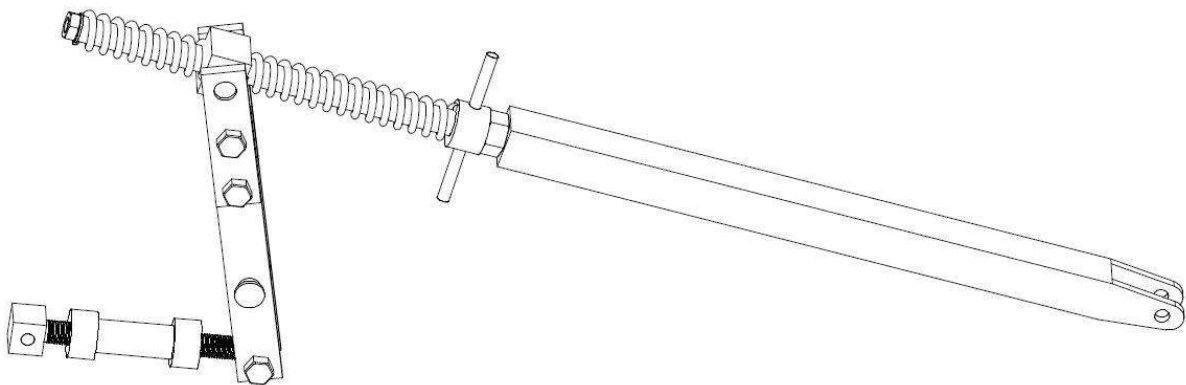
It is used mainly to transport the harrow and transfer the transport block, also to control the harrow depth to eliminate the blockage





## 7、 Leveling draw bar assembly

Used for adjust disc harrows levelling during working and transportation, The spring is used to cushion the vibration. Pay attention to the tension of the two springs when adjusting



# Specifications and main parameters

No	parameters	unit	Item
1	Name		Disc harrow
2	Linkage		traction
3	Model		1YT790
5	Tractor	HP	150-200
6	Transportation speed	Km/h	Max 10
7	Working speed	Km/h	4-5 (depends)
8	Working width	mm	2500/3000/3500
11	weight	kg	2600/2910/3100

## Use and adjustment

### 1.Hitch-connection

(1) The front end of the traction stringer of the harrow is connected with the traction point at the tail of the tractor by the late pin. During connection, the tractor is reversed slowly, pay attention to the safety.

(2) The front end of the oil pipe is connected to the hydraulic output connector of the tractor by the quick connector.

### 2.Precautions

(1) Before operation, it shall check if all fastenings are fastened and the rotating parts turn flexibly.

(2)The hydraulic handle of the tractor is manipulated to lift and lower the harrow several times and check if the lifting mechanism is normal and if there is oil leaking from all joints in the hydraulic oil way.

(3) The nuts on the square shaft of the harrow must be fastened again after a certain area of operation to prevent the harrow from being loosened, at the same time, check if other fastenings are loosened.

(4) Prohibit reversing or suddenly turning the harrow during operation, if the harrow is necessary to be reversed or suddenly turned, it shall be lifted firstly.

(5)Prohibit maintaining, repairing and adjusting the harrow during operation and person

riding on the harrow.

### 3. Adjustment of transport position

During long-distance transport of the harrow, it shall adjust the spring leveling mechanism (the adjusting method refers to the adjustment of spring leveling mechanism) so that the front and rear harrow bodies are basically in horizontal state or its tail is slightly higher to ensure smooth transport and good through put capacity.

### 4. Adjustment of job status

The harrow shall be adjusted as follows so that it is in normal job status during operation, That is to say, the harrow depth meets the requirements of operation; front and rear harrow bodies are in horizontal state or its head is slightly higher; the tractor drives straightly and the rake stringer is consistent with the direction that the tractor drives forward; no apparent partial traction for plant unit.

#### (1) Adjustment of harrow section declination

Lift the harrow and loosen the connecting bolt between the rake and the beam of the harrow section, push the beam of the harrow section to adjust the harrow section declination. After adjusting the declination properly, all connecting bolts must be tightened. Adjustment of the front and rear rows of the harrow section declination has mainly following functions:

① Change the harrow depth; when the harrow section declination is increased, the capability of soil piercing of the harrow is enhanced and the harrow depth is increased, generally, in order to ensure the front and rear rows of the harrow sections are under uniform stress, the rear row of the harrow section declination is one level more than the front row of the harrow section declination.

② Change the offset of harrow: when the harrow section declination is increased, the resistance center of harrow will shift right (see from the tail of plant unit, the same below), to match up the right shift of traction stringer, i.e. the harrow shifts left relative to the tractor and the offset is increased accordingly. In reverse, the offset is decreased.

In addition, the change in the harrow section declination has the influence on the partial traction of plant unit, after the declination is determined, the corresponding adjustment shall be carried out to eliminate or reduce the partial traction.

#### (2) Adjustment of height of traction beam

Pull out the connecting pin between the traction beam and the rake, i.e. change the height of traction beam according to the position of the corresponding hole, after the position is selected, the connecting pin and the lock pin shall be inserted. Adjusting the height of traction beam will have obvious influence on the harrow depth for front and rear rows of the harrow sections. When the position is moved upward, the harrow depth of front row of harrow section will be increased, in reverse, the harrow depth of rear row of harrow section will be increased.

#### (3) Adjustment of position of traction stringer

After removing the connecting bolts between the traction stringer and the traction beam, the transverse position and angle of the traction stringer will be changed according to the position of the corresponding hole; after the position and angle are selected, the connecting bolts shall be installed and fastened. Adjusting the position and angle of the traction stringer has mainly following functions:

① Remove or reduce the partial traction: when the partial traction occurs, the traction stringer shall shift right. The partial traction is more serious and the traction stringer shall shift right more till the partial traction is reduced obviously or eliminated.

② When the harrow depth of rear row of harrow section does not meet the requirement, the traction stringer will shift right appropriately to match up other adjustment so that the harrow depth is increased.

③ Change the offset: moving the position of the traction stringer, which is matched up by adjustment of the harrow section declination, can change the offset of the harrow relative to the tractor. The position is moved right more and the offset is larger. When the position is moved to the rightmost hole and the stringer angle is changed, the operation of large offset as special requirements can be achieved.

#### (4) Use of leveling mechanism assembly

◦ Adjusting the longitudinal horizontal position of the harrow body is one important part of job status adjustment of harrow, which can change the harrow depths of front and rear rows of harrow sections so as to obviously influence the longitudinal position and offset of harrow, therefore, it shall be adjusted carefully. During adjustment, as following figure shows, the upper screw nut and lower screw rod are adjusted jointly till the adjustment is satisfactory.

## Maintenance and care

### (一)、Maintenance

#### 1. Maintenance

(1) It shall check if all fastenings of the harrow are fastened before and after operation and if all rotating parts turn flexibly.

(2) It shall often keep the surface of parts in the hydraulic system clean.

(3) The oil cup of wheel carrier shaft seat is filled with the grease once every week.

#### 2. Care

(1) After one operation season, the whole harrow shall be disassembled and maintained once to clean the clay on the implement.

(2) Disassemble and clean the bearing, replace the lubricant in the bearing, clean up the outer sphere of the bearing and inside of the bearing block, during assembly, it shall be filled with the lubricant, after assembly, the seal ring is not allowed to rotate relative to the outer ring of the bearing.

(3) It shall lacquer in the place where the paint strips so as to avoid rust protection.

(4) After cleaning the harrow, the antirust or used oil shall be coated.

(5) The oil cylinder and oil pipe assembly shall be completely disassembled, cleaned and maintained and the wearing parts shall be replaced in time, and they are placed in clean, dry places in the room for safekeeping.

(6) The harrow shall be placed in the warehouse in fallow season to prevent from solarization and drench.

## 7. Troubleshooting

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

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.

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

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.

3. The accumulation is caused due to too much stubble and upturned soil in the ground  
When the accumulation is caused due to too much stubble and upturned soil in the ground, the tractor may not be stopped and the harrow is lifted to get over the accumulation for continuous operation.

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

The reasons that the bearing does 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 be 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.

## **8. 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.

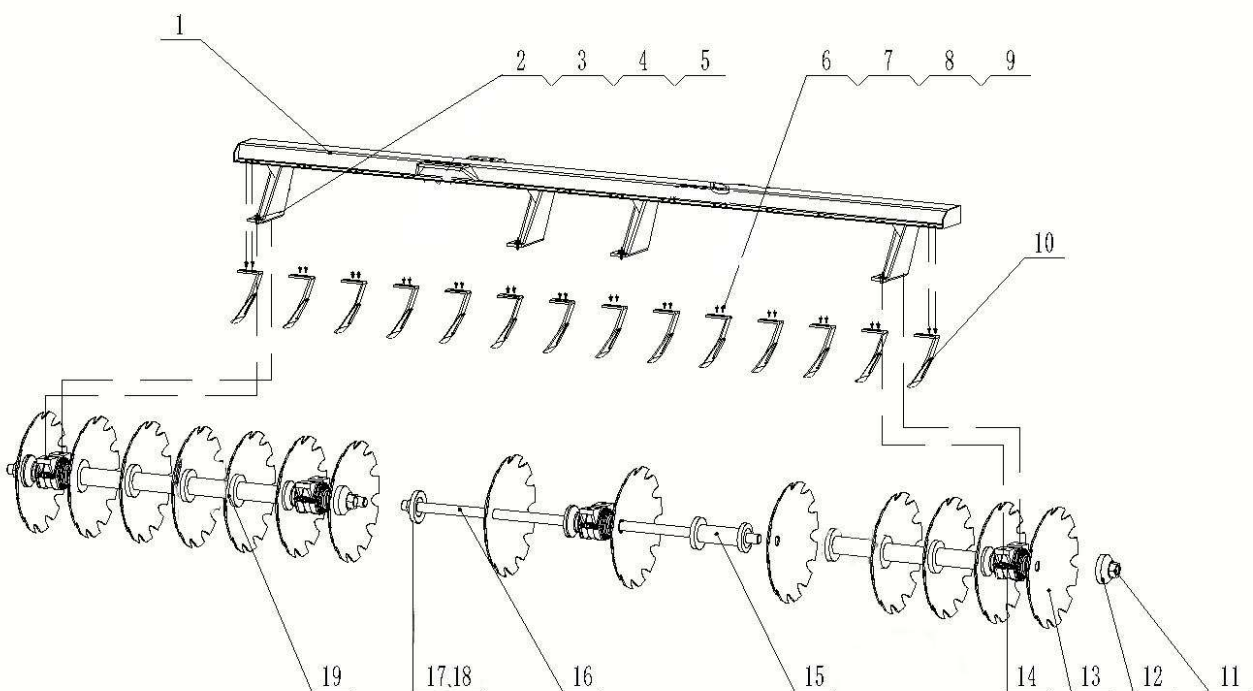
4. When the harrow is operated, the hydraulic distributor handle of the tractor must be placed in the floating position and the harrow must be lifted during turning or reversing at the turn land.

## INSTALLATION

In order to ensure convenient transport, the harrow is often divided into several packages for shipment and the quantities of parts and components are checked according to the packing list after receiving the packages or before installation, then, the dirt on the parts and components are cleaned up and the coatings on the parts friction surface shall be removed and filled with the lubricant according to the requirements of maintenance, before installation, the sequence and method of installation in the instruction shall be learned carefully and the flat ground is selected for installation.

The sequence of installation for the harrow is as follows:

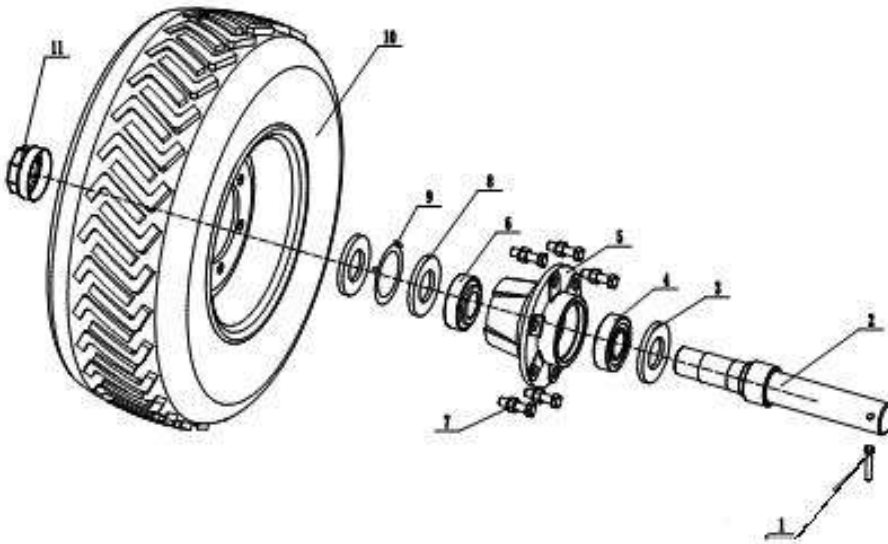
1、 Installation of front/back discs gang Install front discs gang,frame,scraper according to below Sketch Map,After assembly, the harrow discs can rotate flexibly, back discs gang installation same as front discs gang.



1、 frame    2-5、 M22\*80 screw    6-9、 M12\*40screw    10、 front scraper    11、 nut  
 12、 inner plate    13、 26”\*6h arrow disc    14、 270 bearing house    15、 spacer 16、 轴  
 shaft    17、 outer plate    18、 nut    19、 shaft

## 2、 Installation of transport wheel assembly:

Fit the assembled transport wheels with the transport wheel axle so that the transport wheels turn flexibly。



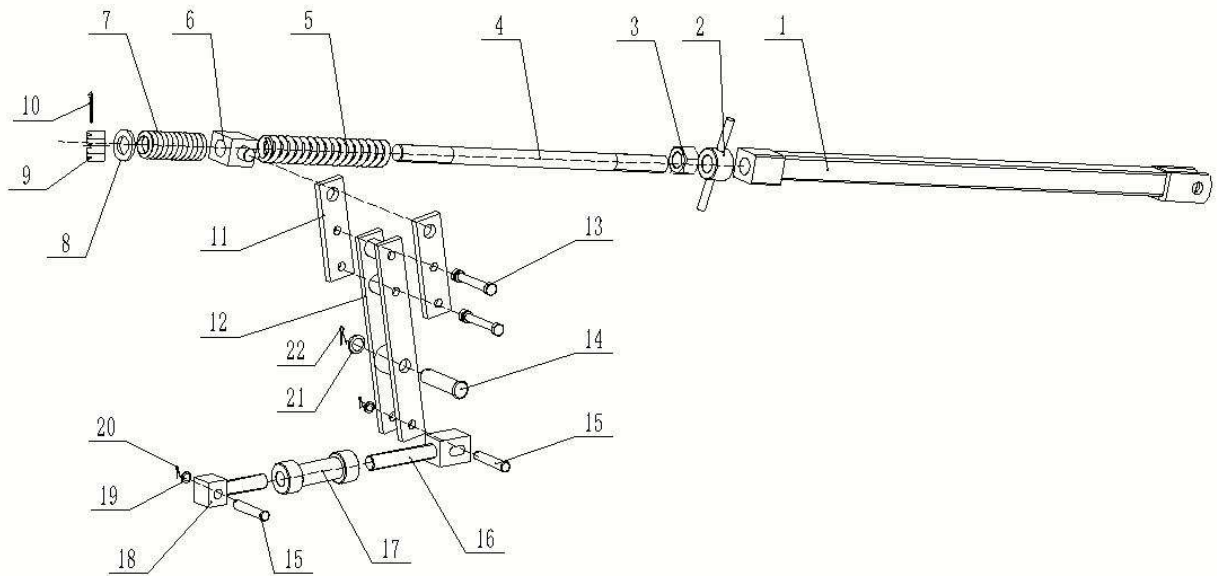
1.φ12\*95Cotter pin 2. wheel shaft 3. oil seal 4.33212 bearing 5. wheel hub

6.33211 bearing 7.M20x60 pin 8. nut 9.Stop washer 10.400 tyre 11. Dust cover

## 3、 Assembly and installation of leveling structure

Assemble the leveling rod, leveling guide frame assembly and leveling small screw rod according to the diagram below, and connect with the axle frame and rake frame with pin shaft. During the adjustment, the two springs must have a certain tension progress

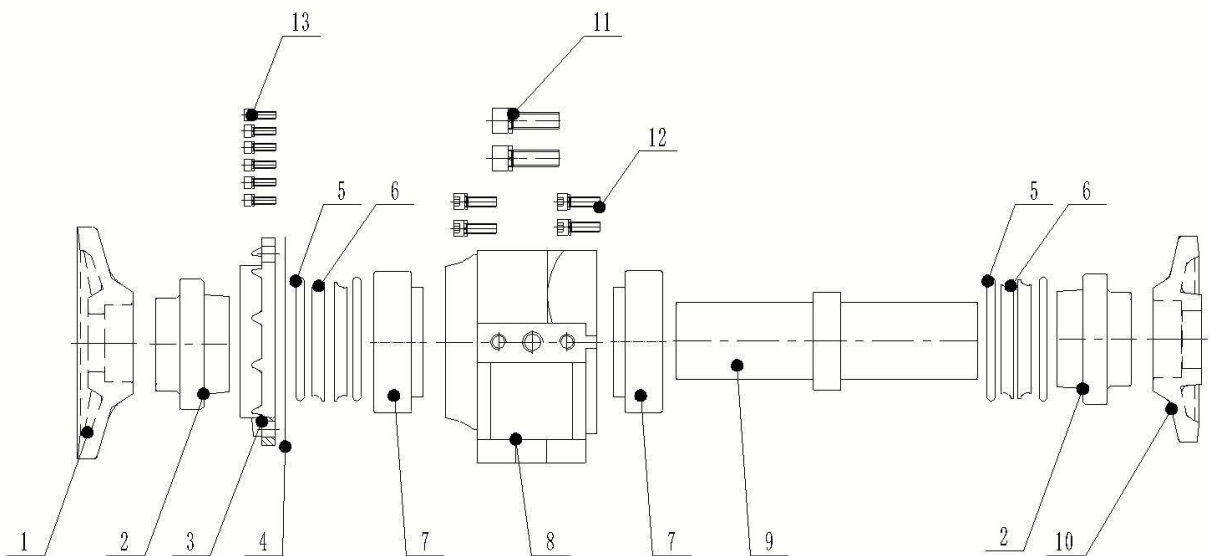




1. draw bar 2. nut 3.M36 nut 4. spring pole 5. spring-long 6. shaft  
 7.spring short 8. big end plate 9. Slotted nut 10. Cotter pin 11.Guide plate 12  
 guider 13.M16\*150 nut 14.φ30\*140 pin 15.φ20\*95 pin 16.Right-handed screw  
 17. Screw barrel 18. Left-handed screw  
 19. φ20 flat plate 20. Cotter pin 21.φ30flat plate 22.Cotter pin

#### 4、 Bearing house installation

The bearing box is oil bath axle box, which can reduce the resistance during the use, provide lubrication and take away the heat generated by friction, and extend the service life



1. bigger spacer    2. Axle sleeve    3. Axle cap    4. Paper pad    5. O shape  
 Seal ring    6. Seal sleeve    7. bearing 32212    8. Shaft seat    9. Axle tube  
 10. smaller spacer    11. M16\*20nut    12. M12\*20nut    13. M8\*25nut

Standard spare parts details						
Item	Name	Quantity			usage	NOTE
		32	28	24		
1	M20*240	8	8	8	Draw bar	
2	M30*80	8	8	8	Fixing of disc shaft	
3	M16*150	2	2	2	Draw bar guider	
4	M12*40	64	56	48	scraper	
5	M22*80	24	16	16	Bearing	Oil bath bearing
6	M20*60	12	12	12	tyre	
7	M16*60	8	8	8	Axle frame fixing	
8	φ35*200	1	1	1	Traction head pin	
9	φ35*180	2	2	2	Traction pin	
10	φ20*95	2	2	2	Small screw rod pin	
11	φ30*140	1	1	1	Guide frame fixing pin	
12	φ25*75	1	1	1	Rod rear pin	
13	φ35*140	1	1	1	Hydraulic cylinder pin (back)	
14	φ35*140	1	1	1	Hydraulic cylinder pin (front)	
15	M20 Nutt	2	2	2	Oil pipe support	
16	M36 Slotted nut	1	1	1	Leveling bar	Flat pad cotter pin
17	M36 nut	1	1	1	Leveling bar	
18	M22*1.5 nipple	2	2	2	Hydraulic cylinder	
19	M42 nut	8	8	8	Discs gang	