

Z275 HAYBOB USER MANUAL & SPARE PARTS LIST



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1. INTRODUCTION

The service manual let you use the rake-tedder in a best way. Compliance with all the warnings and instructions of this manual guarantees the safety of the user and the maximal working capacity of the machine. To use the machine for many years we recommend only the original spare parts produced in "MESKO-ROL" Sp. z o.o.

2. APPROPRIATE USE OF THE MACHINE

The carousel rake is assigned only for agricultural works – raking the hay and low-stem green forage. Using this machine for other purpose will be understood as an inappropriate.

The rake should be used and repaired only by a person who is acquainted with its characteristics and rules of behaving due to safety principles.

Changes made by an unauthorized person can relieve the producer from the responsibility for possible harms and damages.

3. SAFETY OF USE

The rake-tedder is produced according to the demands of safety standards. Compliance with all the warnings and instructions guarantees the safety of use.



GENERAL WARNING. While working with the rake-tedder comply with warnings and safety principles marked with this sign.



CAREFULLY read the service manual before you start work with the machine.

CAREFULLY READ THE SERVICE
MANUAL BEFORE YOU START WORK
WITH THE MACHINE.

LABEL TR 61/A



STOP the tractor's engine and take the ignition key off before any service or repair.



DO NOT TOUCH moving parts of the machine until they are absolutely still.



STAYING and carrying out a technical surveys or repairs in the reach of lifted rake-tedder is forbidden.



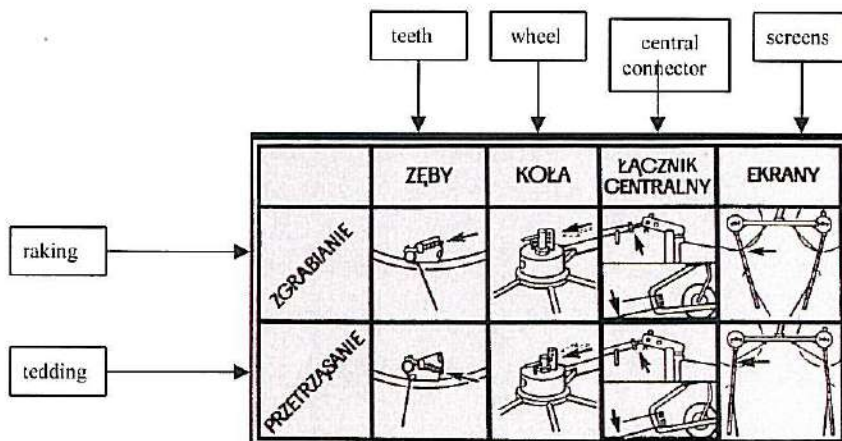
MIND that there is no people or animals near working unit – in a distance of 50 m.

MIND THAT THERE IS NO PEOPLE
OR ANIMALS NEAR WORKING UNIT
– IN A DISTANCE OF 50 M

LABEL TRA 1



DO NOT STAY within the bend of the unit while tractor's engine working.



LABEL TR 21/A – setting elements of the rake-tedder

Especially important information and warning are shown on labels placed on the machine according the Fig. 1.

Keep the label clear and readable while using the rake.

If the label is damaged or illegible replace it with a new one.

You can purchase new labels at producer or dealer. While ordering, please advise catalogue number of the label (given at Fig.1.)

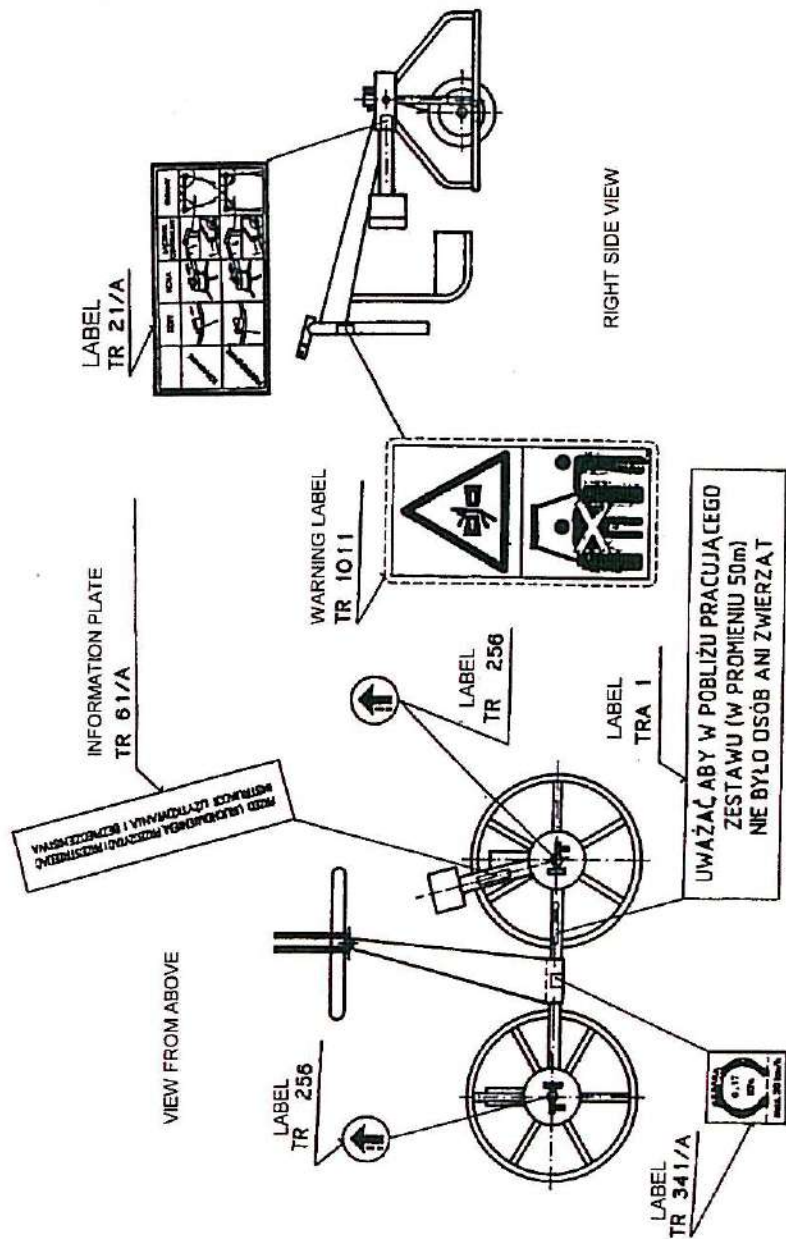


Fig. 1.
Placing the information and warning labels on the rake-tedder.

4. GENERAL CHARAKTERISTICS.

4.1. OVERALL INFORMATION.

The rake-tedder Z-275 is produced under the licence of the Dutch company "GREENLAND GELDROF". Many years' experience of this company guarantees safe and failure-free use of the machine and low working costs.

The rake-tedder is assigned for tedding and raking the hay and low-stem green forage on even and sloped up to 12 degrees fields and meadows.

It can cooperate with an over 15 kW tractors.

In case of problems with the machine contact with a dealer or producer.

Teeth PZ 106, PZ 107, PZ 110 PZ 111 are not under warranty.

4.2. TECHNICAL DATA.

- Working width	3000 mm
- Transporting width	2950 mm
- without protective bows	2800 mm
- Height	1250 mm
- Weight	300 kg
- Number of rotors	2 pcs
- Number of raking teeth	20 pcs
- Tyres	15 x 6.00 (4PR)
- Tyre pressure	0,17 MPa
- PTO shaft revolutions	350-540 rpm
- Working speed	up to 12 km/h
- Transporting speed	up to 20 km/h
- Capacity	up to 3,6 ha/h



CAUTION !

For driving the rake-tedder use only the PTO shaft C-40970 with shear bolt clutch Lmin – 1010 mm, Lmax – 1780 mm.

4.3. CONSTRUCTION AND FUNCTIONING.

The rake-tedder Z-275 consists of the following main assemblies:

1. three-point frame
2. intermediate frame
3. main frame
4. left rotor
5. right rotor
6. left screen

- 7. right screen
- 8. divider
- 9. left bow
- 10. right bow

The three-point frame 1 is attached for mounting the rake-tedder on a tractor. The three-point frame 1 is connected to the intermediate frame with a joint that enables user to drive the machine easy and form the raked banks in bows while turning. Such forming of the bows is useful while collecting them with self-collecting machines.

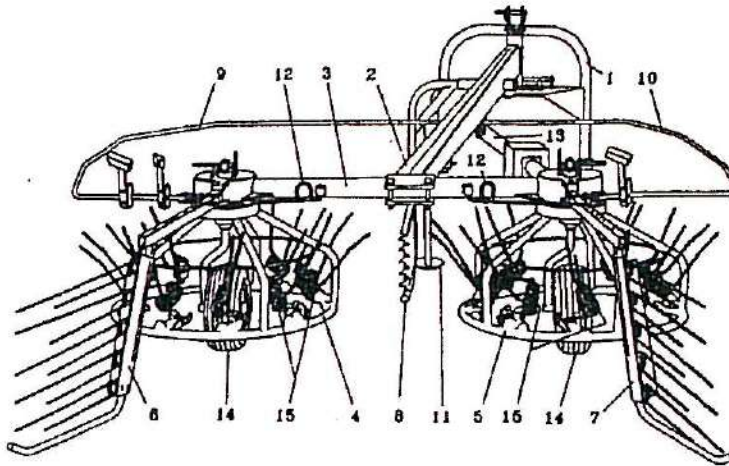


Fig. 2. Rake-tedder Z-275

- 1 – three-point frame, 2 – intermediate frame, 3 – main frame, 4 – left rotor,
- 5 – right rotor, 6 – left screen, 7 – right screen, 8 – divider, 9 – left bow,
- 10 – right bow, 11 – support, 12 – stop, 13 – PTO shaft, 14 – driving wheel,
- 15 – raking teeth.

While transporting the joint is blocked with a locking pawl 17 (Fig. 5.). Movable bottom catches 16 (Fig.3.) and driving wheels 14 enable rotors 4 and 5 with teeth 15 to adapt to the surface of the ground crosswise to the direction of driving.

Power is transmitted from tractor to rotors 4 and 5 through the PTO shaft 13 and intersecting axis gears placed in the main frame 3.

Raking teeth 15 can be reset for tedding or raking.

The teeth are put down to working position with the centrifugal force when the revolutions of tractor's power input shaft are between 35- and 540 rpm.

Divider 8 prevents throwing the crop from one rotor to the other.

Screens 6 and 7, blocked with the stops 12 reduce the scattering of teded or raked crop to demanded width.

For safety of the user and strangers the rake-tedder is equipped with the protective bows 9 and 10.

5. PREPARATION FOR WORK.

5.1. LINKING RAKE-TEDDER AND TRACTOR INTO A WORKING UNIT

- Fit the spacing of the bottom catches 16 of the three-point frame 1 to the three-point suspension system of the tractor (Fig. 3.)
- Level the bottom pull rods of the tractor's three-point suspension system so that the three-point frame 1 is not swinging. It prevents the PTO shaft 13 from touching the three-point frame 1.
- Use front or back holes of the three-point frame 1 to fasten the central connector of tractor's three-point suspension system according to its length (Fig. 7.)
- Connect the three-point frame 1 to the three-point suspension system of the tractor according to the tractor's service manual.

5.2. FASTENING THE PTO SHAFT.



CAUTION !

- The user is obliged to use casings of the shafts in rake-tedder and tractor.
- The ending with shear bolt clutch fastens to the power input shaft of the rake-tedder.
- Casings of the PTO shaft secure against turning according to the shaft's service manual.

5.3. TRANSPORT OF RAKE-TEDDER SUSPENDED ON TRACTOR

Setting the rake-tedder for transport:

- Fold the screens 6 and 7 to the inside and block them with the stop 12 (Fig. 4.)
- Lift the rake-tedder, relieve the support 11 (Fig. 5.), lift it and block in the high position.
- Lower the rake-tedder, move the tractor slightly to the right and block the joint between the three-point frame 1 and intermediate frame 2 with the locking pawl 17 (Fig. 5.)
- You can set the locking pawl 17 with the string 21, while sitting on the tractor.
- Lift the rake-tedder to the transport position.

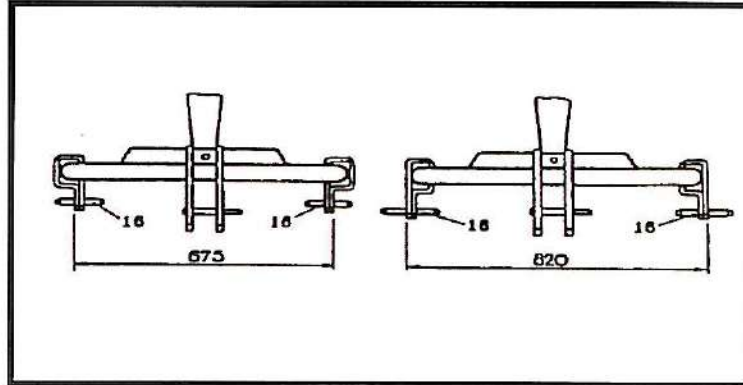


Fig. 3. Spacing of pins of bottom catches of three-point frame.

16 – bottom catches

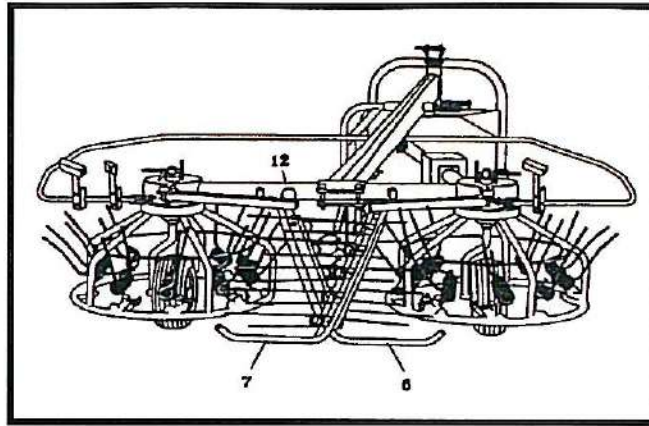


Fig. 4. rake-tedder with screens blocked for transport.
6 – left screen, 7 – right screen, 12 – stop

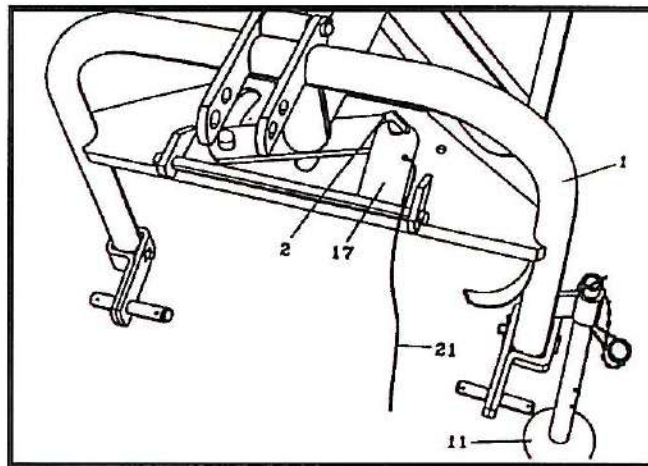


Fig. 5. Blocked joint between the three-point frame and intermediate frame.
1 – three-point frame, 2 – intermediate frame, 11 – support, 17 – locking pawl,
21 – string

5.4. SETTING THE RAKE-TEDDER FOR WORK

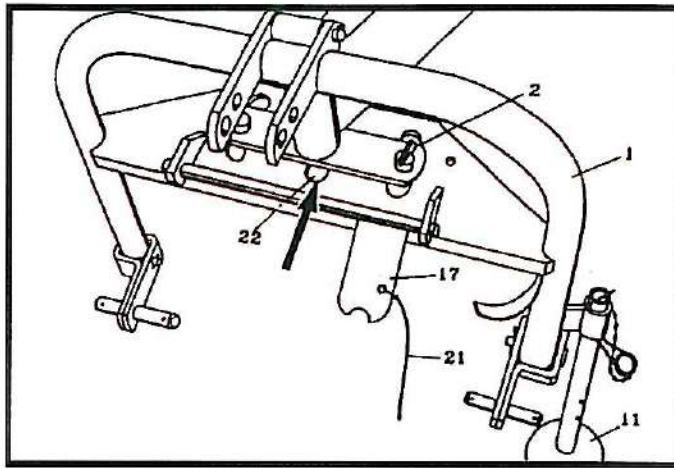


Fig. 6. Relieved joint between the three-point frame and intermediate frame.
 1 – three-point frame, 2 – intermediate frame, 11 – support, 17 – locking pawl,
 21 – string, 22 – central hole

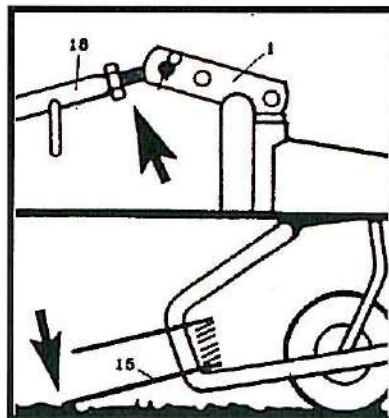


Fig. 7. Setting the raking teeth
 1 – three-point frame, 15 – teeth, 18 – central connector of the tractor's
 three-point suspension system

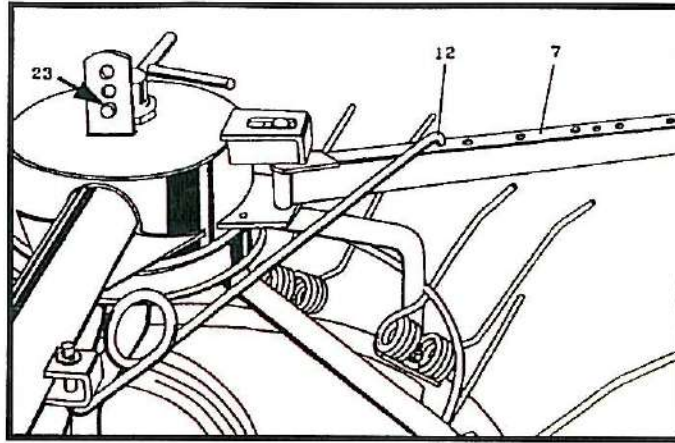


Fig. 8. Setting the height of rotors in the bottom holes.

7 - screen, 12 - stop, 23 - lock

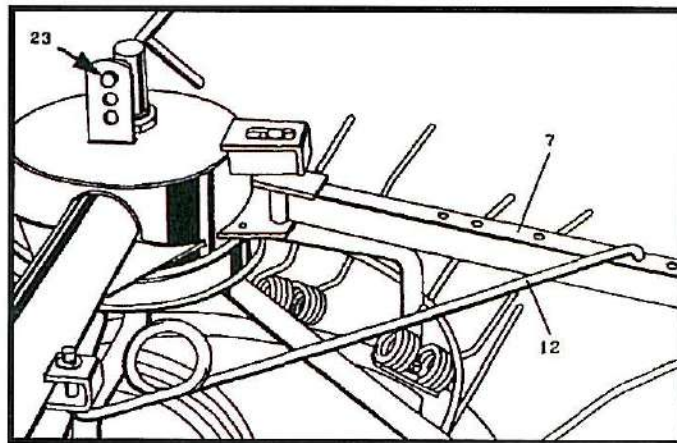


Fig. 9. Setting the height of rotors in the top holes.

7 - screen, 12 - stop, 23 - lock

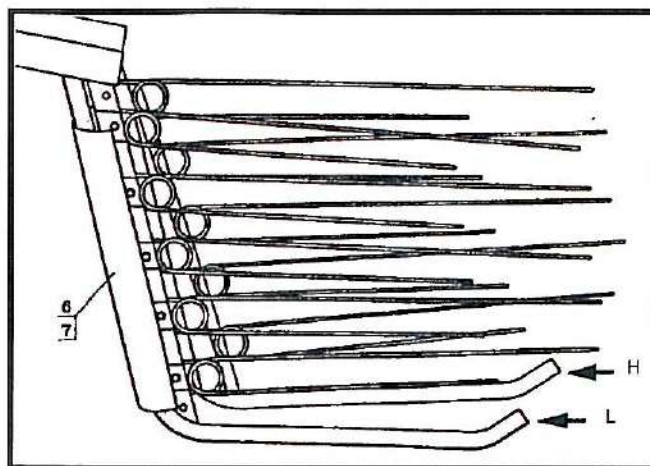


Fig. 10. Setting the screens at vertical plane.

6 – left screen, 7 – right screen
H – higher position, L – lower position

- Lower the rake-tedder, move the tractor slightly to the right and relieve the joint between the three-point frame 1 and intermediate frame 2 (Fig. 6.)



CAUTION !

- Endings of the bottom arms of double raking teeth 15 (Fig. 7.) should touch the stubble during rotation. If they do not touch the stubble or plunge into the ground, adjust the slope of rotors.
- Plunging the teeth into the ground causes:
 - excessive bending aside and breaking the teeth
 - devastating the ground and root system
 - contaminating the crop.
- Adjust slop of the rotors by changing the height of the rotors due to driving wheels cantilever (Fig. 8. and 9.) and the length of central connector 18 (Fig. 7)

- Set the slope of the screens 6 and 7 at vertical plane in higher position H (Fig. 10. and 11.) or in lower position L (Fig. 10. and 12.)
For changing the position, take the screen off the socket (Fig. 13.) and turn the brick 24 through 180 degrees and put it back into the socket.
It is recommended to set the higher position H (Fig. 11.) when the screens in working position have a little vertical clearance.

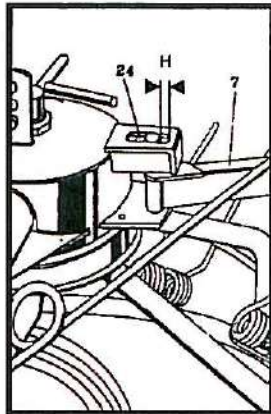


Fig. 11. Screens set in higher position H.

7 – right screen, 24 – brick, H – higher position

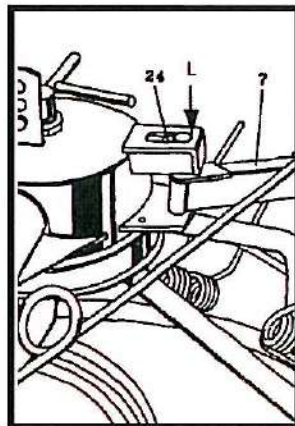


Fig. 12. Screens set in lower position L.

7 – right screen, 24 – brick, L – lower position

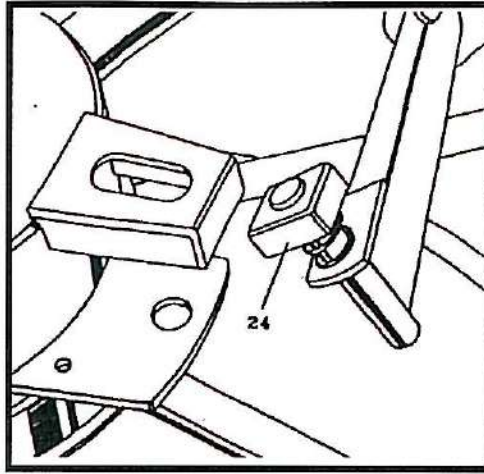


Fig. 13. Central position of the brick while putting the screens into and taking them off the socket.

24 – brick

6. WORKING



CAUTION!

- Starting and test of functioning of the rake-tedder cannot be held indoors.
- Maintain the rake-tedder after you stop the tractor's engine, stop the PTO shaft and lower the machine on the ground.
- Before leaving the tractor always stop the engine and lower the machine on the ground.
- Start the rake-tedder only in working position.
- Do not lift the rake-tedder while working and rotating rotors.
- If the front axle of tractor is too lightened, always use front weights.
- While disconnecting the rake-tedder from the tractor, always set the machine on a support.
- Do not let the children operate the machine.

OPERATIONAL RECOMMENDATIONS

- While working, the lever of the hydraulic system should be set so that the jack's arms move easily up and down and let the rotors with teeth adapt to the ground.
- Set the PTO shaft to 350 – 540 rpm.
Lower revolutions number is recommended for tedding and raking of fragile and dry crop on light ground with a weak root system.
Working on lower revolutions is advantageous for the tractor and the rake-tedder, for low fuel expenditure, for avoiding loss and contaminating the crop.
Higher revolutions number is recommended for tedding big and wet crop on tough ground with strong root system.
- Do not turn right suddenly because of the bigger axle of the work of PTO shaft.

6.1. TEDDING

- Set all teeth in tedding position T (Fig. 14.)
- Set the height of rotors with the locks 23 (Fig.8.) put in low holes. When the crop is short and heavy, use higher holes.
- Set the wanted width of tedding with the screens 6 and 7 and stops 12 (Fig. 15.)
- Move the tractor slightly forward until exposing the central hole 22 in the three-point frame 1 (arrow at Fig. 8.). In that position rotors are most tilted to the ground. Now set the full revolutions power (350 – 540 rpm). Endings of teeth should touch the ground (Fig. 7.). If teeth do not touch the ground or plunge into the ground, change the length of the central connector.

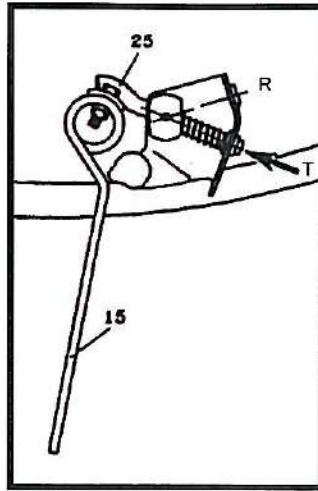


Fig. 14. Setting the teeth for tedding.

15 – raking tooth, 25 – tooth holder, T – tedding position

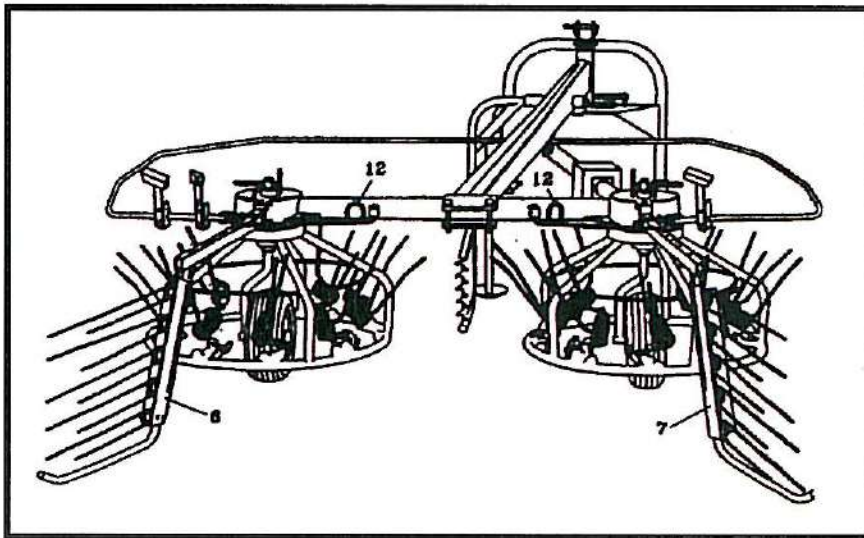


Fig. 15. Setting the screens for tedding.

6 – left screen, 7 – right screen, 12 – stop

6.2. RAKING

- Set all teeth in raking position R (Fig. 16.)
- Set the height of rotors with locks 23 (Fig. 9.) put in top holes. When the stubble is long, use the low holes for clean raking.
- Set wanted width of raking with screens 6 and 7 and stops 12 (Fig. 17.)
- Move the tractor slightly forward until exposing the central hole 22 in the three-point frame 1 (arrow at Fig. 8.). In that position rotors are most tilted to the ground. Now set the full revolutions power (350 – 540 rpm). Endings of teeth should touch the ground (Fig. 7.). If teeth do not touch the ground or plunge into the ground, change the length of the central connector.

Always make sure that the distance between screens is big enough, especially when the crop is big, to avoid forming misshapen banks.

Setting screens as shown at Fig. 18., lets put banks in close pairs. Close banks can be put together during the next drive. In that way you get one bank from the width of 6 m.

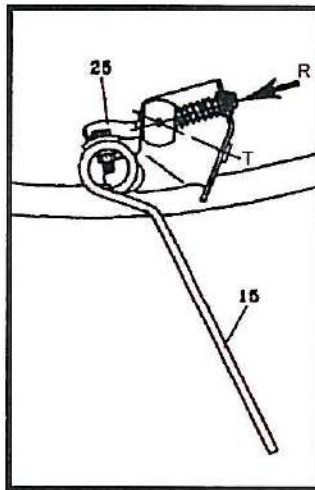


Fig. Setting the teeth for raking.

15 – raking tooth, 25 – tooth holder, R – raking position.

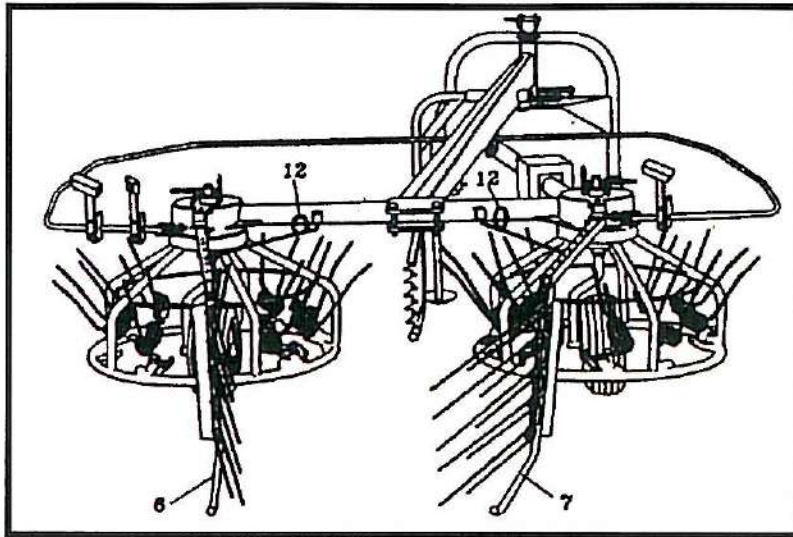


Fig. 17. Setting the screens for raking.
6 – left screen, 7 – right screen, 12 – stop

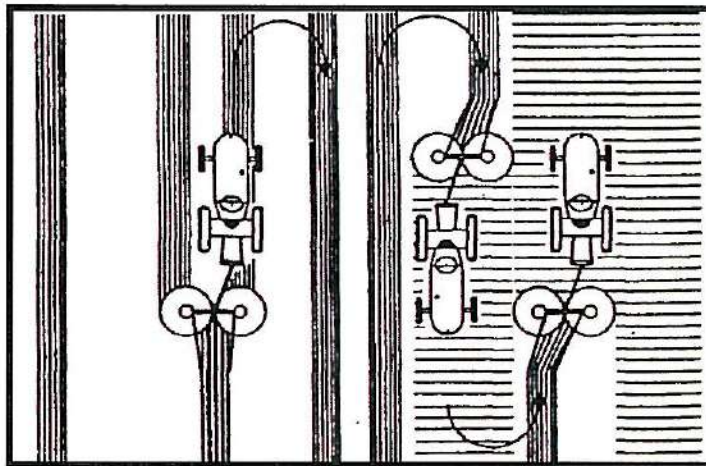


Fig. 18. Recommended method of raking.

7. TECHNICAL MAINTENANCE



CAUTIONS ! IMPORTANT ! REMEMBER !

- Regularly check condition of bolt connections, particularly fastening of:
 - intermediate frame 2 to main frame 3
 - rotor 6 and 7
 - raking teeth 15 (Fig. 14. and 16.) to tooth holders
 - Pay special attention while fastening loosen or changed teeth 15. The central inflexion of the tooth should rest on the bolt 26 (Fig. 19.), because that is the condition of proper working and resistance to breaks.
 - The rake-tedder is equipped with four kinds of teeth that are fastened to:
 - left rotor 6 marked with blue labels:
 - PZ 107 – left narrow tooth (b) marked with blue labels – 5 pcs
 - PZ 110 – left wide tooth (b) marked with blue labels – 5 pcs
 - right rotor 7 marked with yellow labels:
 - PZ 106 – right narrow tooth (y) marked with yellow labels – 5 pcs
 - PZ 111 – right wide tooth (y) marked with yellow labels – 5 pcs
- Wide and narrow teeth fasten alternately as shown at Fig. 7., 14., 16. and 21. (for the left rotor).

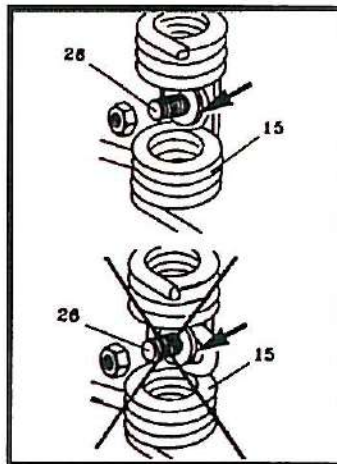


Fig. 19. Correct settling of the raking teeth.

15 – tooth, 26 – bolt.

7.1. ROUTINE TECHNICAL MAINTENANCE

- Regularly check :
 - pressure in tyres
 - way of settling the locks 23 (Fig. 8. and 9.)
- Every time after finished work clean the machine of plant remains and dirt, repair any defects and replace used parts with the new ones if necessary.
- If the rake does not working properly or if there are any serious damages, contact the dealer or the service facility.
- If there is a need of replacing any used parts to the new ones, use only the original ones, offered by a producer. Only these parts can guarantee demanded quality of the repaired machine.
- Before you disassemble any elements that affect the stability of the rake-tedder, make sure the machine is secured against moving and dropping of different parts with an extra support.

7.2. LUBRICATING

- During a working season lubricate the rake-tedder every day. Put the grease into the points shown with arrows at Fig. 20.
- While lubricating turn rotors to guarantee uniform distribution of grease on the tooth wheel rims.
- Put 2 cm³ of grease into each lubricating point.
- Use Liten EPG-00 or other grease for gears.
- Lubricate PTO shaft according to it's service manual.

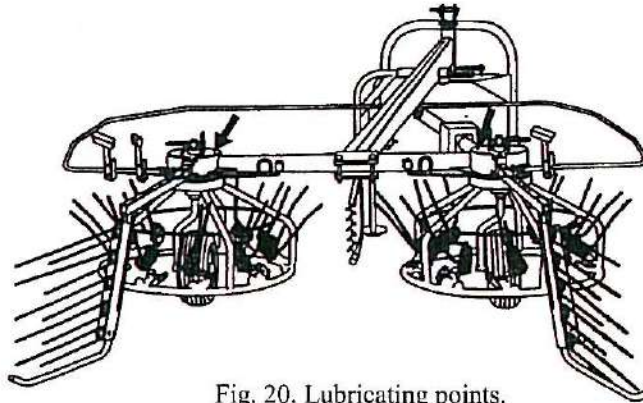


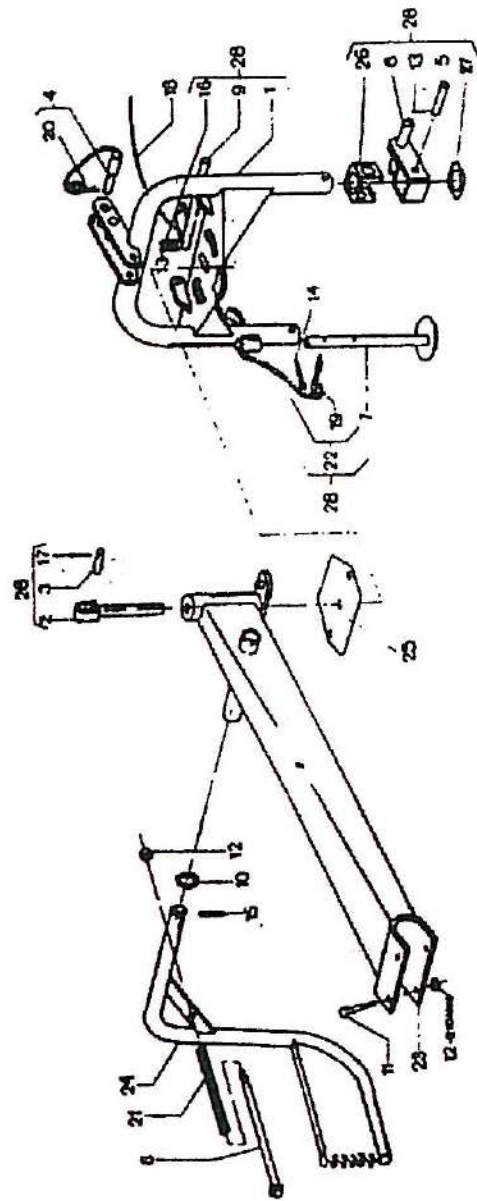
Fig. 20. Lubricating points.

7.3. SERVICING AND STORAGE

- When the season is over, clean the rake-tedder and carry out a technical survey. If any defects are found, remove them. If paint has come off in some places, they should be cleaned of rust and repainted.
- Cover unpainted parts with a thin layer of grease, e.g. STP or vaseline.
- Pay special attention to raking teeth. If any rust appears on them, it can seriously decrease their strength.
- Store the rake-tedder indoors to protect it from moisture and precipitation.
- If the rake-tedder is not placed on props for a long-term stop, you have to shift it once a month to change the adjoining point of the tyres to the ground.

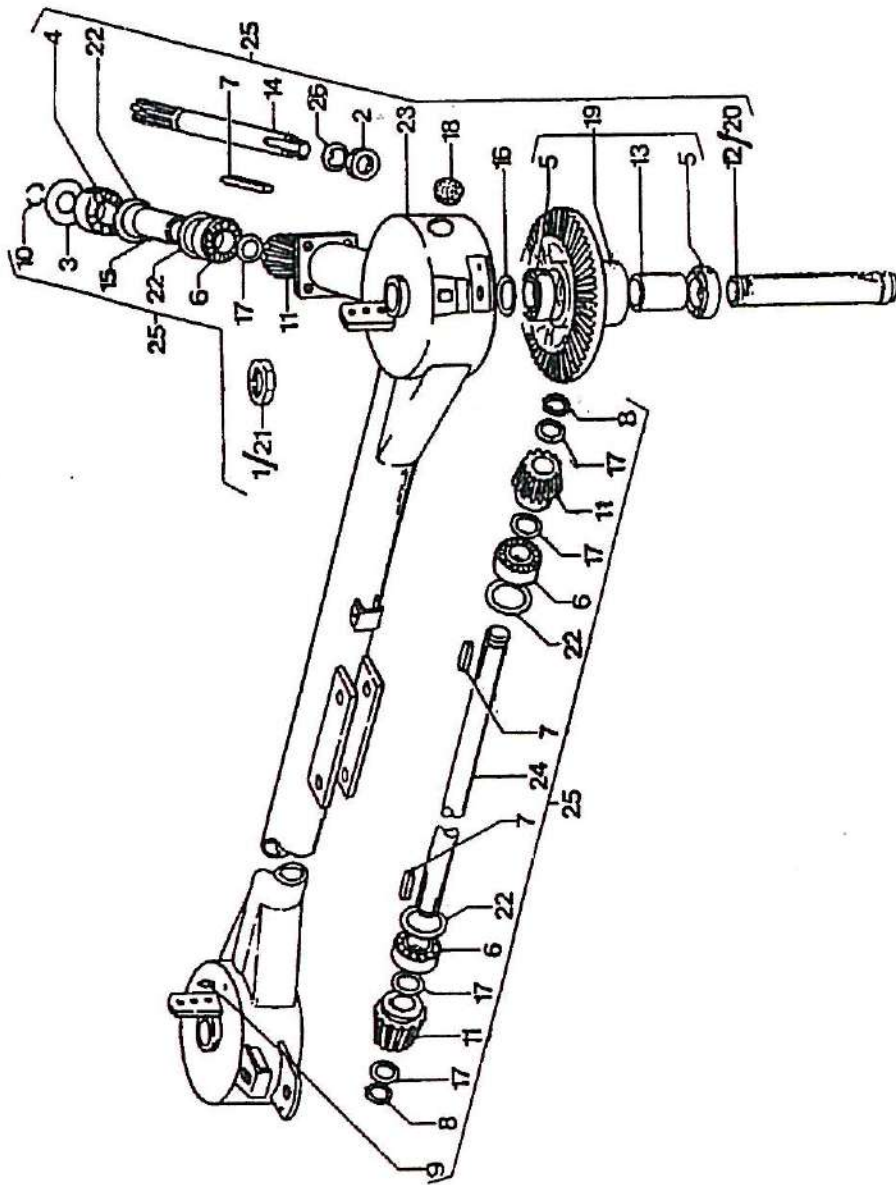
8. PARTS LIST

When ordering please advise **the name and the number** of the part.



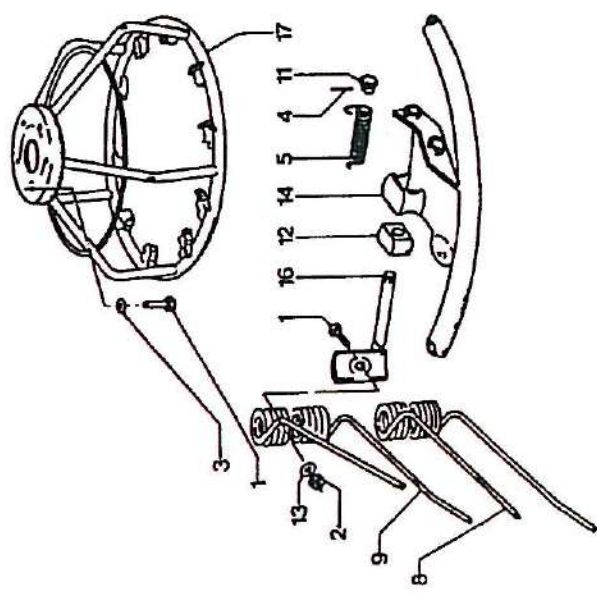
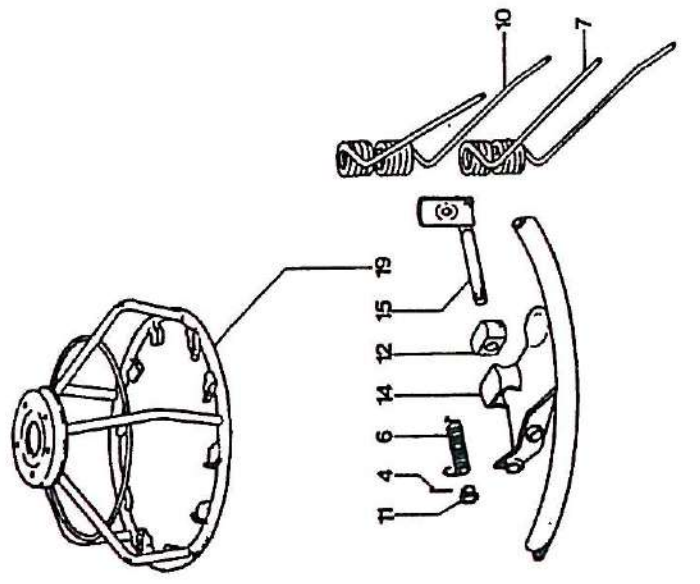
Three-point frame with intermediate frame.

Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	GV 037	Welded three-point frame	1
2	GZ 0281V	Complete pin	1
3	GZ 283V	Pin	1
4	HK 0028V	Complete mandrel	1
5	HS 182V	Pin	2
6	HS 0188/A	Complete bottom catch	2
7	HS 0200	Support	1
8	HS 0210V	Complete mandrel	1
9	HS 0218	Locking pawl	1
10	MT 84V	Ring 3x43,5x60	1
11	ND 1037V	Bolt M16x120-8.8-B-Fe/Zn8cC	2
12	ND 2090V	Nut P M16-8-A-Fe/Zn8cC	3
13	ND 4020V	Cotter pin S-Zn 5x36	3
14	ND 4022V	Cotter pin S-Zn 8x63	1
15	ND 4040V	Spring pin 8x60	1
16	ND 4044V	Spring pin 6x60	1
17	ND 4055V	Cotter pin S-Zn 6,3x36	2
18	ND 9347	String	1
19	PZ 199V	Plug	1
20	PZ 25V	Plug	1
21	PZ 281V	Spring	1
22	PZ 00199V	Complete plug	1
23	TH 0179/A	Welded intermediate frame	1
24	TH 0181	Divider	1
25	TH 262	Flat casing	1
26	TH 263	Casing	2
27	TH 264	Casing	2
28	TH 00205/A	Complete three-point frame	1



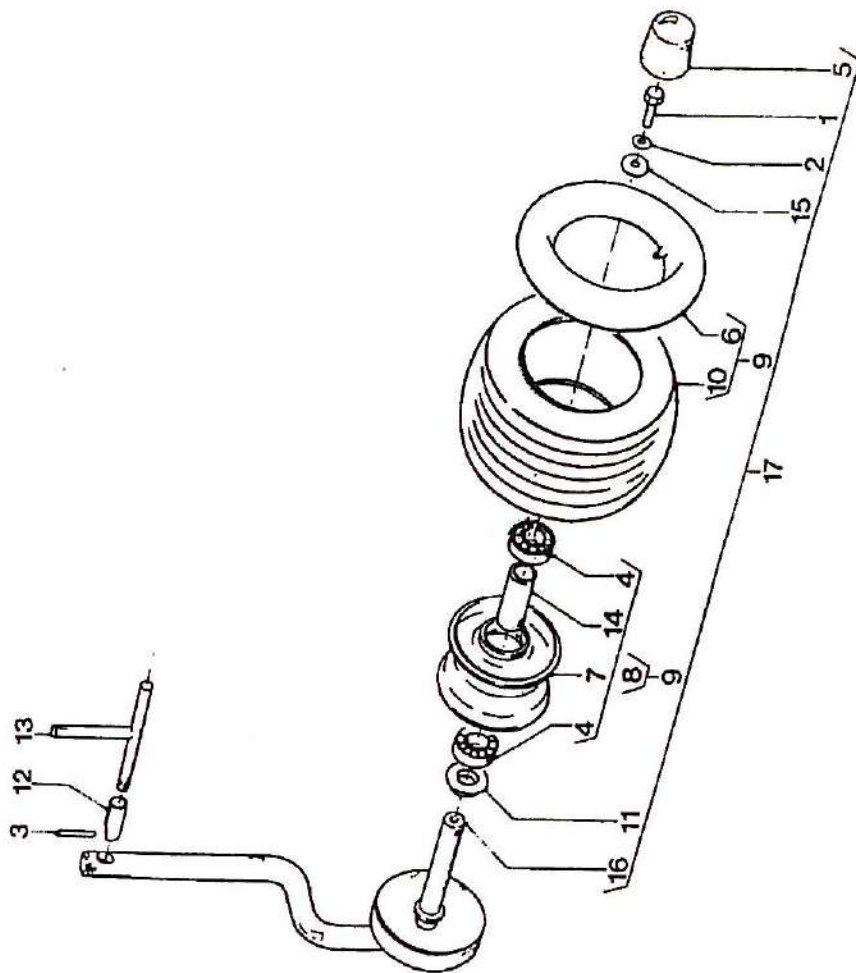
Main frame with gears.

Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	GT 37V	Nut	1
2	MT 174V	Nut M30x1,5H=12	1
3	MT 365V	Cover	1
4	ND 5027	Ball bearing 6207-2RS	1
5	ND 5036	Bearing 6210-2Z-C3	4
6	ND 5048	Bearing 6207-2Z	3
7	ND 7003	Parallel key A 8x7x50	3
8	ND 8008V	Spring mounting ring Z 35x1,5	2
9	ND 9004V	Grease nipple M6	2
10	PZ 72V	Spring ring	1
11	TH 2	Gear wheel	3
12	TH 041	Complete right rotor axle	1
13	TH 65	Distance sleeve	2
14	TH 67	Main shaft	1
15	TH 68	Distance sleeve	1
16	TH 0078	Set of distance washers	--
17	TH 0079	Set of distance washers	--
18	THA 2	Plug	2
19	TH 00137	Complete plate wheel	2
20	TH 0140	Complete left rotor axle	1
21	TH 141V	Left nut	1
22	TH 00145	Set of distance washers	--
23	THA 0173	Main frame	1
24	TH 190	Shaft	1
25	TH 00190	Complete main frame	1
26	VS 81	Washer	1



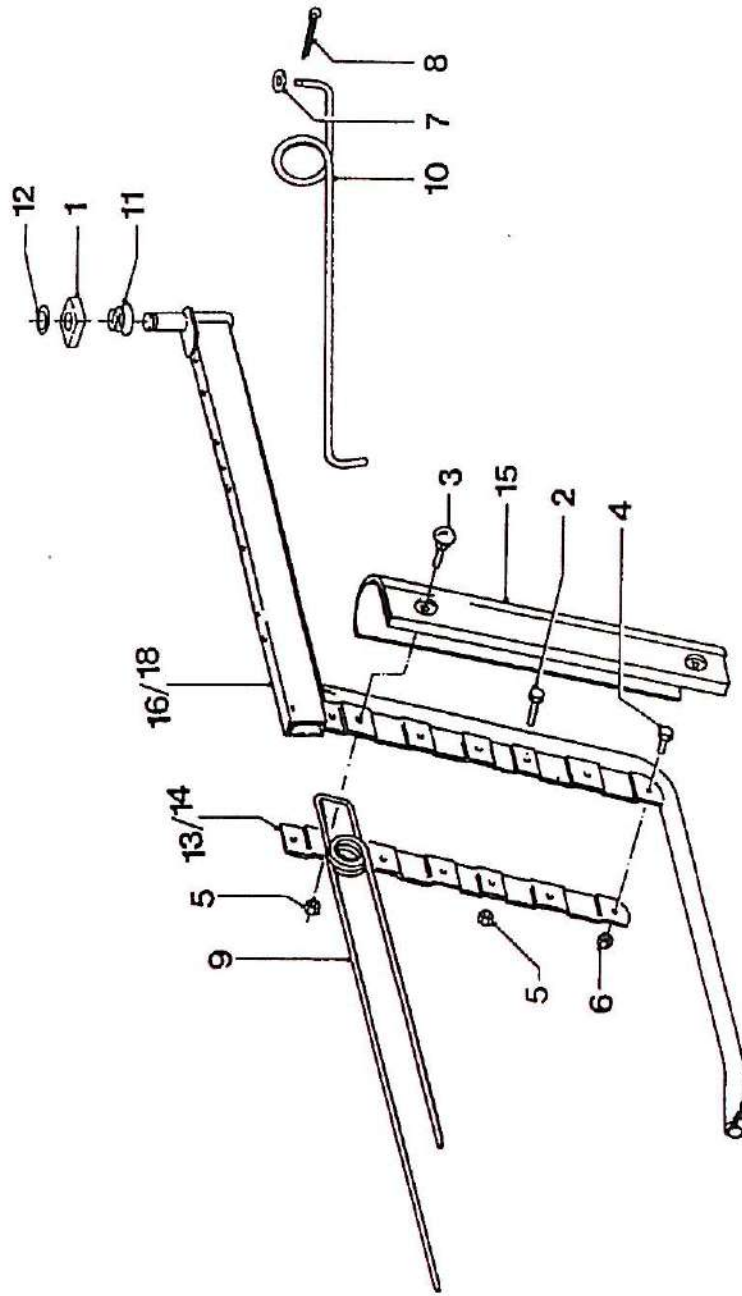
Rotors

Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	ND 1075V	Bolt M12x40-8.8-B-Fe/Zn8cC	30
2	ND 2085V	Nut P M12-8-A-Fe/Zn8cC	20
3	ND 3105V	Washer 12-Fe/Zn9cC	10
4	ND 4027V	Spring pin 6x40	20
5	PZ 99	Left spring	10
6	PZ 100	Right spring	10
7	PZ 106	Right narrow tooth (yellow)	5+1
8	PZ 107	Left narrow tooth (blue)	5+1
9	PZ 110	Left wide tooth (blue)	5+1
10	PZ 111	Right wide tooth (yellow)	5+1
11	TH 42	Ring	20
12	TH 93	Bearing	20
13	TH 100V	Washer	20
14	TH 107	Mounting	20
15	TH 0108V	Right tooth holder	10
16	TH 0109V	Left tooth holder	10
17	TH 0203	Left rotor	1
18	TH 00203	Complete left rotor (blue)	1
19	TH 0204	Right rotor	1
20	TH 00204	Complete right rotor (yellow)	1



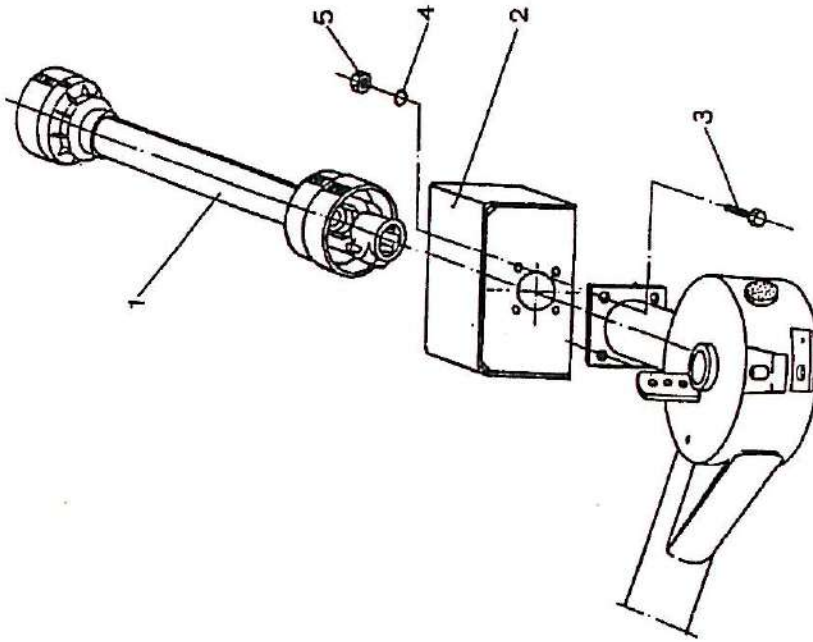
Driving wheels

Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	ND 1072V	Bolt M12x25-8.8-B-Fe/Zn8cC	2
2	ND 3105V	Washer 12-Fe/Zn9cC	2
3	ND 4035V	Spring pin 5x20	2
4	ND 5003	Ball bearing 6205-2RS	4
5	THA 10	Cap	2
6	ND 9779	Inner tube 15x6.00	2
7	THA 07	Wheel band 4.50Ax6	2
8	THA 007	Complete wheel band 4.50Ax6	2
9	THA 008	Complete wheel 15x6.00-6 4PR	2
10	ND 9842	Tyre 15x6.00-6 4PR v6	2
11	TH 9	Packing ring	2
12	TH 33V	Spring sleeve	2
13	TH 062V	Lock	2
14	TH 66	Distance sleeve	2
15	TH 100V	Washer 5x12,5x30	2
16	TH 0188	Wheel cantilever	2
17	TH 00188/A	Complete driving wheel	2



Screens

Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	JH 66	Brick	2
2	ND 1007V	Bolt M10x20-8.8-B-Fe/Zn8cC	6
3	ND 1055V	Bolt P M10x20-8.8-Fe/Zn8cC	4
4	ND 1063V	Bolt M8x16-8.8-B-Fe/Zn8cC	4
5	ND 2084V	Nut P M10-8-A-Fe/Zn8cC	10
6	ND 2091V	Nut P M8-8-A-Fe/Zn8cC	4
7	ND 3009V	Washer K13-Fe/Zn9cC	2
8	ND 4025V	Cotter pin S-Zn 4x25	2
9	PZ 114	Screen tooth	10
10	PZ 115	Stop	2
11	PZ 300V	Spring	2
12	PZ 301V	Spring ring	2
13	TH 115	Left cover strap	1
14	TH 116	Right cover strap	1
15	TH 125	Casing	2
16	TH 0208	Right screen arm	1
17	TH 00208	Right screen	1
18	TH 0209	Left screen arm	1
19	TH 00209	Left screen	1



Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	4R-302-7-BA-K401	PTO shaft C40970	1
2	THA 061	Power input shaft casing	1
3	ND 1063V	Bolt M8x16-8.8-B-Fe/Zn8cC	4
4	NP 0290V	Washer 8,4Fe/Zn9cC	4
5	ND 2091V	Nut P M8-8-A-Fe/Zn8cC	4

Ord. №	Plant part number	Name of part or assembly	№ of pcs
1	THA 0194	Left bow	1
2	THA 0195	Right bow	1
3	THA 01010	Left cantilever	1
4	THA 01011	Right cantilever	1
5	THA 1012	Triangle cantilever	1
6	NP 0318	Holder	1
7	NP 0317V	Bolt Z M8x25-8.8-Fe/Zn8cC	2
8	NP 0345	Spring washer Z8,2Fe/Zn9cC	2
9	NP 0290V	Washer 8,4-Fe/Zn9cC	2
10	ND 2004V	Nut M8-8-B-Fe/Zn8cC	2
11	NP. 0280V	Bolt M10x25-8.8-B-Fe/zn8cC	6
12	ND 2084V	Nut P M10-8-A-Fe/Zn8cC	8
13	ND 1099V	Bolt M10x40-8.8-B-Fe/Zn8cC	2
14	NP. 0238V	Bolt M12x40-8.8-B-Fe/zn8cC	3
15	ND 2085V	Nut P M12-8-A-Fe/Zn8cC	4
16	NP. 0237V	Bolt M12x25-8.8-B-Fe/Zn8cC	1
17	THA 01012	Complete triangle cantilever	1

9. REMEDIAL MAINTENANCE CARD

Name and type of product: CAROUSEL RAKE-TEDDER Z-275

Factory number

Filling date	Date of performance	Scope of repair	Seal, signature