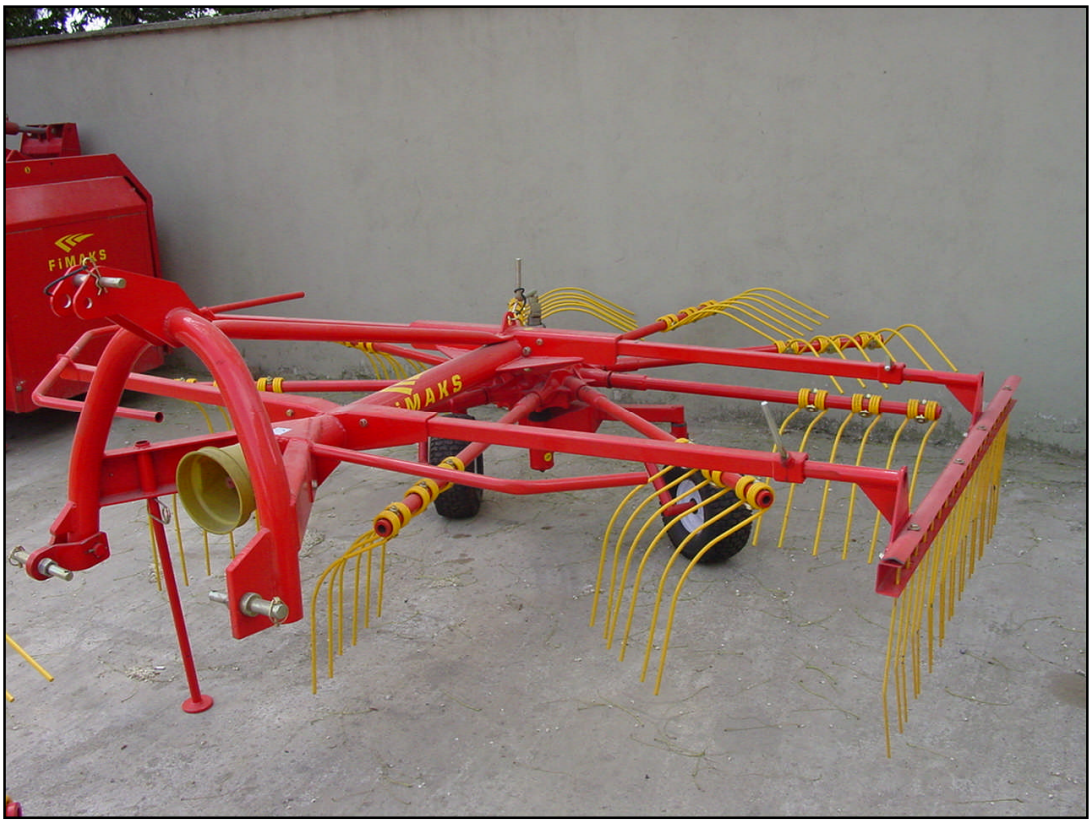
FiMAKS



FMR 330 – FMR 342
RAKE
USER'S MANUAL

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Dear Customer

You have just purchased Fimaks Rotary Rake and we congratulate you on your choice. This is a professional machine designed and manufactured with utmost care. Today, within your hands, you hold this machine's successful work force and long life term. You can use your machine for a long time with no problems provided that you read this manual carefully and follow the instructions of operation and maintenance.
This operation and maintenance manual consists of information to realize the below mentioned subjects:

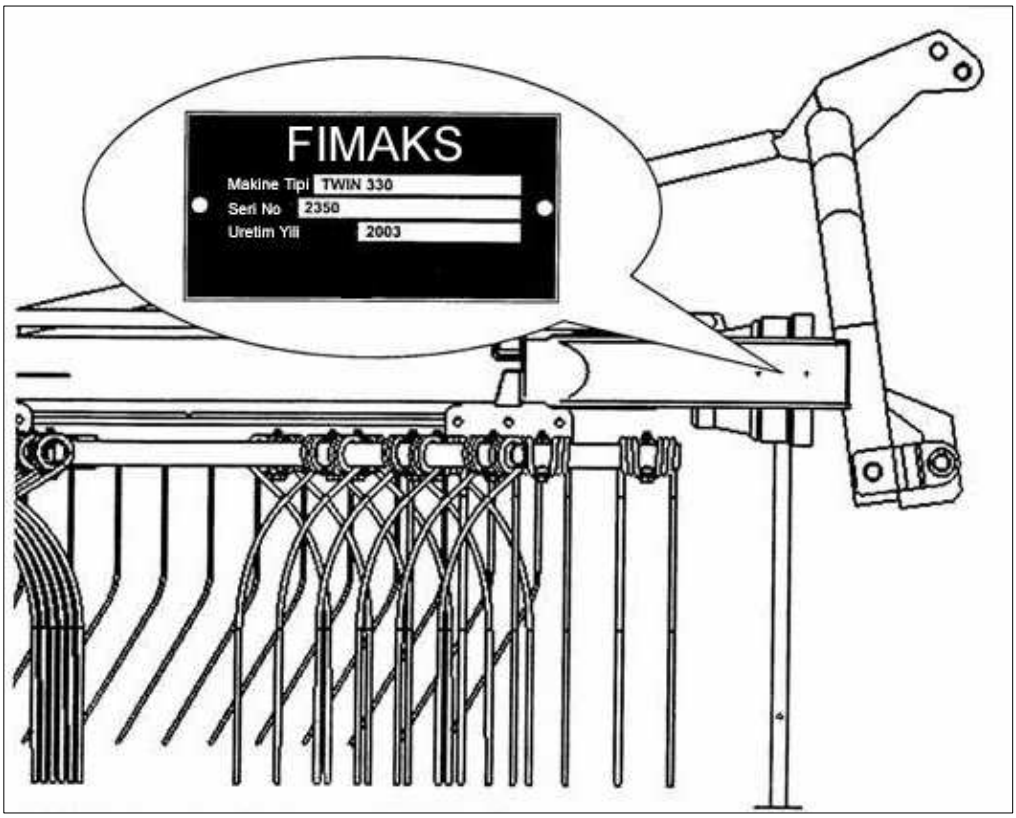
- To learn about your Rotary Rake better and to take advantage of all the advanced technological ease it has in the best working conditions.
- To obtain the best performance all the time by following the simple and this final operation and instructions manual.
- To take care of accidents with no harm and danger without losing time. The time you spend in reading this manual will be more than rewarded with the information and technical details you will obtain.

FİMAKS Service

- Service begins with the delivery of the product. Please count the number of boxes delivered to ensure that all the necessary accessories for the machine exist in the boxes.
- Your authorized dealer is the only privileged person you should be conferring with. He is specially trained so that you can use your machine in the most appropriate way. They will help you solve your problems by providing you expert support.
- Service also means to provide the spare parts you need in the shortest possible time. FİMAKS guarantees to deliver to its authorized dealers in the shortest time possible.
- The operation life term of this machine is 10 years under normal operating conditions.

MACHINE SERIAL NUMBER LABEL

This label provides the identification of the manufacturing date of the machine, model and serial number. The label is on the main part of the machine.



Let us see more closely which information is written on the serial number of your machine label below. Thanks to this plate, you hold all the necessary information in your hands that is likely to be needed by your authorized dealer or FİMAKS technician.

Type of Machine :

Serial Number :

Manufacturing Date :

GENERAL INFORMATION
SAFETY

Human safety is the most important issue to pay attention to and should be adhered to from the first design of the machine until it completes its life term.

Beginning of the Design

Safety precautions hold a very special place in all the phases of the machine beginning from the design stage and to the final stage of reaching the consumer. We have placed warning messages in this manual and on certain places on the machine to help you to be more informative on certain dangers.

On the Machine

Note:

If these warning labels stuck on the machine are worn out or in a condition that cannot be read clearly, please replace with new ones immediately. You can obtain the labels by placing an order to your authorized dealer.

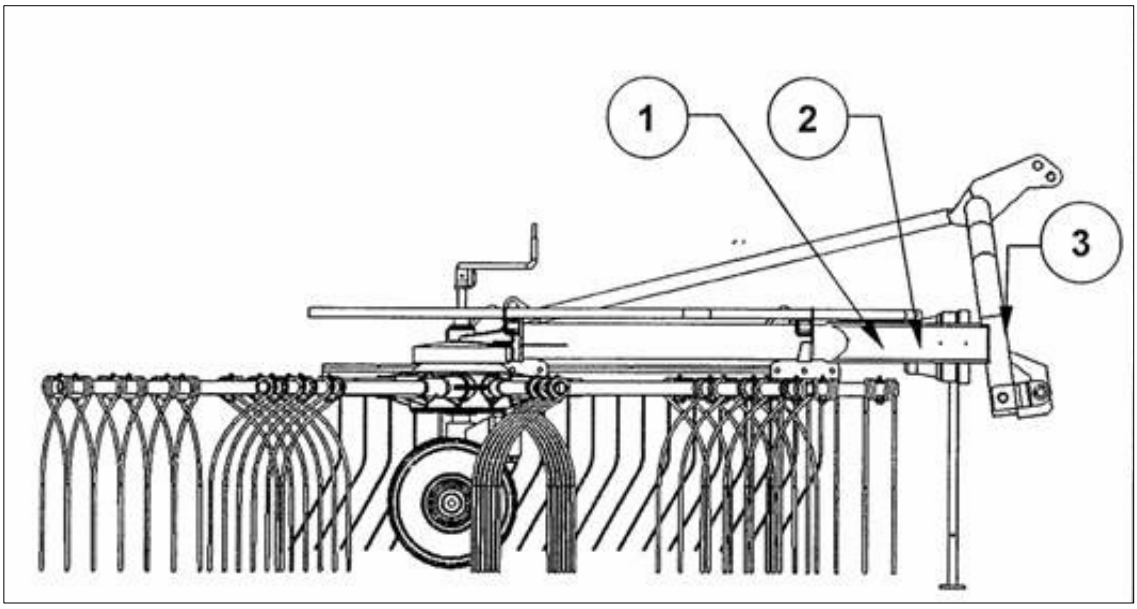
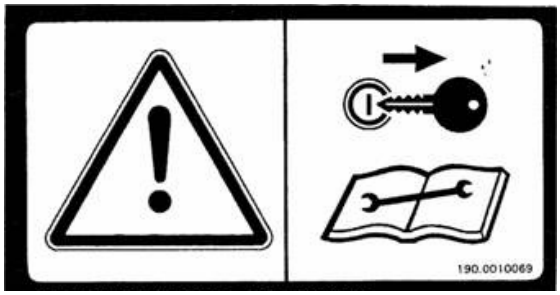


Figure 1 : Places where the safety labels are stuck

1

Please read the operation manual and follow the recommendations on "operating the machine for the first time."

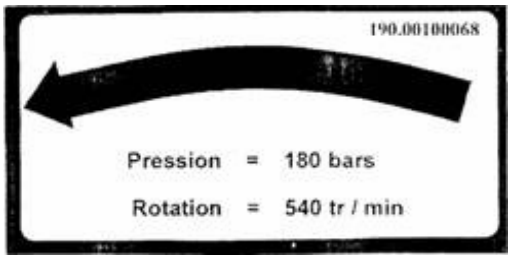


2

Do not stand between the machine and the tractor while in operating position

3

Cardan pivot rotation speed should be 540 rotations / minute



Warning Symbols within this manual:
Taking into account and displaying important recommendations both for people and material safety, warning symbols are listed as belows in the order of importance:

" **Danger** " symbol

Is used to show clearly that the danger can be deadly around the the machine or for people who operate it.

"**Careful**" Symbol

Is used to show clearly all the procedures that can endanger the people operating the machine or the dangers around the machine..

"**Important**" symbol

Is used for conditions where there is a risk of harm but the safety of the people is not involved.

" **Note** " symbol

Emphasizes a special point not causing any harm but if applied will have your machine work well. This symbol is also used to show fine procedures or to show easy assembly hints.

Starting the first operation

Please follow all the suggestions, warning symbols and instructions in this manual and on the machine, to lower the risk of accidents to a minimum as soon as your machine is delivered. .

It is important and necessary to read this manual carefully before starting to operate your machine.

Make sure that the tractor and the machine together comply with the instructions below every time it is operated and in preparing before operation.

- Precautions against accidents
- Operation Safety (Labour Law)
- Driving on the road (Traffic Law)

It is necessary to follow a few basic rules of warning for your and other people's protection and safety.

- Machine should be operated with an appropriate tractor and no other machine should be assembled. The connecting process of the machine to the tractor should be done according to the instructions in this manual.
- Do not get close to the machine with loose clothes that can be picked up by the moving arms and springs of the machine.
- The person to operate and repair the machine should be skilled and trained to the job and on the work to be done.
- Make sure you have sufficient visibility before starting to operate and starting the engine. Do not tolerate any objects around the work area (the risk of a foreign object suddenly moving into visibility)
- The rotating parts of the machine have been checked against hard conditions. However, they may not show resistance to very durable and strong matter (hard rock, metal stakes etc....) and to very high speed skips. Pay extra attention and be careful not crash the machine into these kinds of barriers.
- A machine adjusted for 540 rotation/minute power intake speed can not bu used at 1000 rotation/ minute under no circumstance.
- Check to see that the machine is tied and installed properly and the general condition of the tractor (brakes, steering wheel, the air pressure in the tires).
- Check the signal lights to see if they work before going into the road open to traffic. (Headlights, turning lights and turning siren lamps). Rotary Rake should not be used in the transportation of loads and people.
- Do not try to get on a moving tractor.
- Do not stand on the way of the machines' axis and within the area of its rotation limits.
- Pay extra attention and be extra careful in installing and uninstalling the machine into the tractor. Stop the motor while securing the axle or taking it off.

- Check to see that all protection, all protectors against skipping and security carters are in place and in good condition.
- Adapt your speed on the road according to the traffic conditions! Avoid changing directions rapidly on slopes, while climbing up and coming down.
- Have all the malfunctioning parts repaired before starting to operate.
- All maintenance and repair work should be done with the engine stopped, shaft not in operation and with the hand break pulled on.
- Check the machine overall , especially check regularly to see that all the bolts are secured.
- Do not start the engine before making sure that no tools or disassembled parts are left on the machine, after maintenance or repair work.
- A first aid kit should be kept within the tractor's cabin at all times. Other security equipment recommended by local law should also be complied with.
- No alterations should be done on the machine's manufactured structure without the written permission of the manufacturer.

DESCRIPTION

Rotary Rake, is manufactured to be operated and pulled by an agricultural tractor. The work it does consists of gathering the scattered straw back during shaping, in such a way as to collect them back (like a baling machine etc.) by a machine equipped with a collector.

All ways of using not in compliance with the description above is under the responsibility and at the risk of the operator.

The manufacturer does not accept responsibility on conditions below:

- Operating the machine not in compliance with the definition above.
- Making changes on the machine without written permission of the manufacturer.
- Failing to follow the instructions prepared for maintenance.
- Using imitated, not original spare parts or repairs being done by people who are not experts.

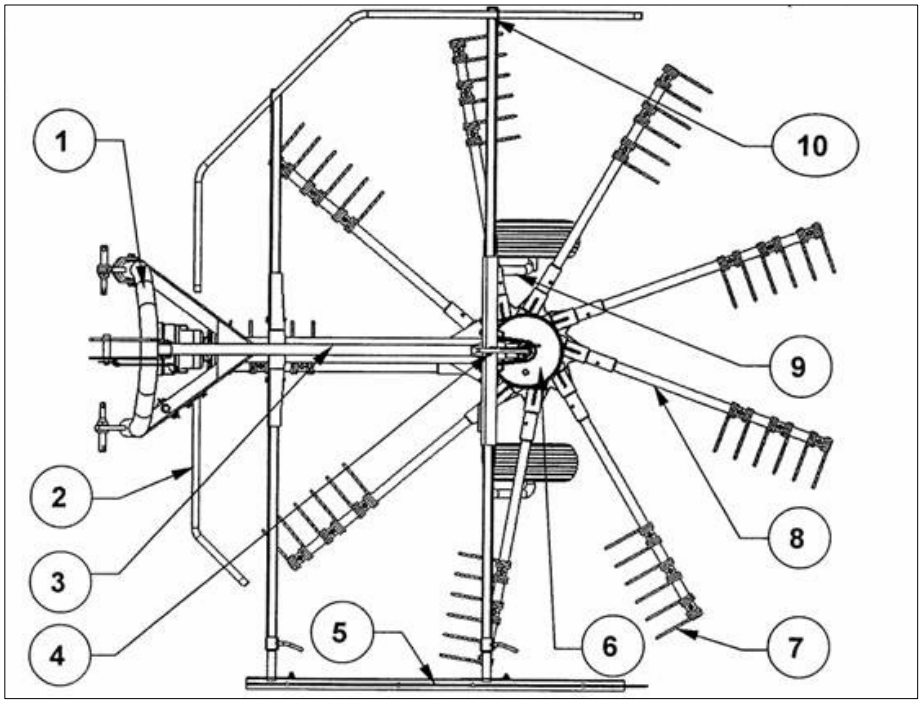
TECHNICAL SPECIFICATIONS

SPECIFICATIONS	FMR 330	FMR 342
Operation Width (cm)	310	320
Width in road position (cm)	250	250
Number of arms on each rotating knife	9	9
Number of springs on each arm	3	3
Tires	15/6.00X6	15/6.00X6
Necessary power intake (bg.) (Horse power)	25	25
Axis	2 wheels that can rotate on its axis	2 wheels that can rotate on its axis
Weight (kg)	300	330

Table 1 : Specifications according to model

Since FİMAKS is open to all technological advances, it reserves the right to change the specifications of ROTARY RAKE without the necessary corrections on the machine sold earlier and without prior notice.

NAMES OF THE MACHINE PARTS



Şekil 2: Rotary Rake FMR 330 - 342

In this paragraph, all the spare parts and the main elements consisting of the machine has been given in order. It is important to learn and remember these terms, since same terms are mentioned numerous times in every section of the manual.

1- Three Point Connection System
2- Left Protector
3- Support which the machine is built on.
4- Height Adjustment Lever
5- Tramboline
6- Gearbox
7- Spring
8- Arm
9- Wheel ax
10- Fixed Right Protector

DIMENSIONS

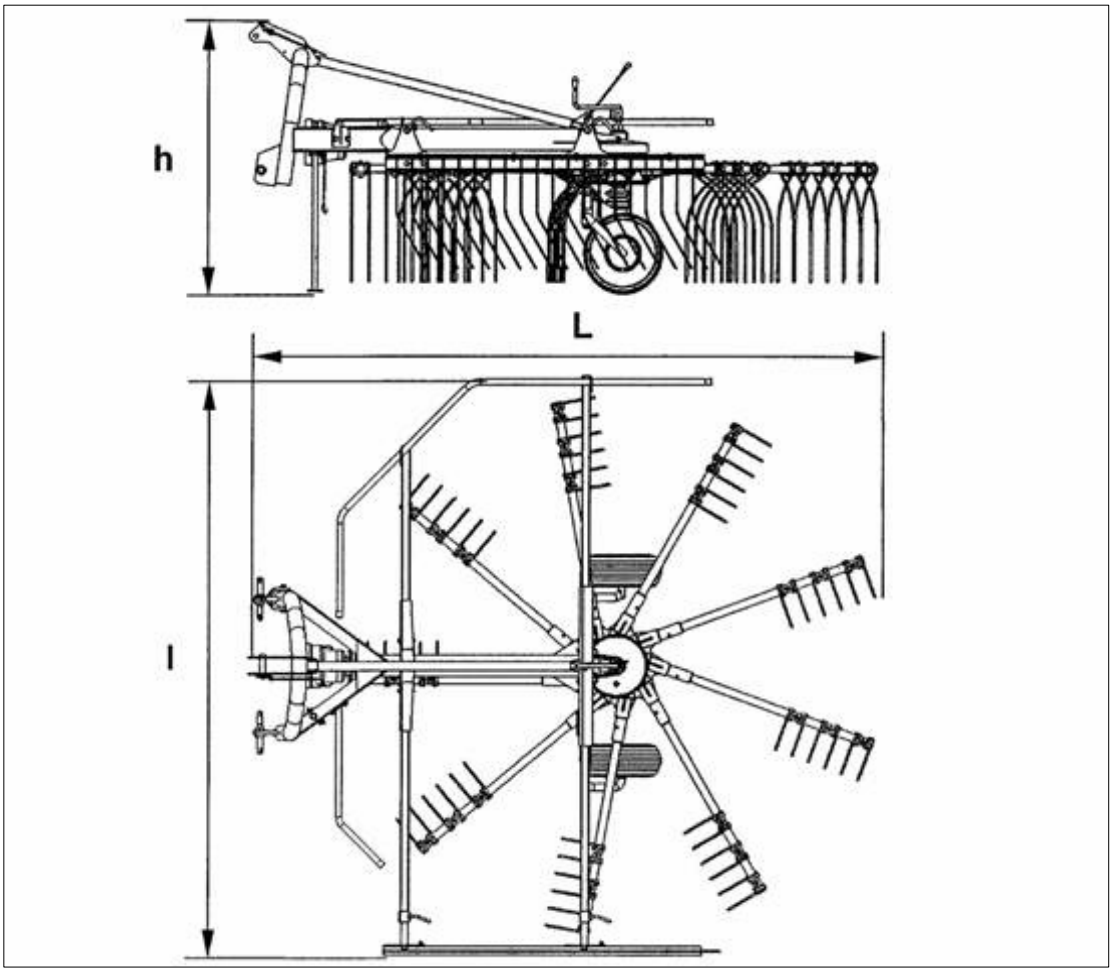


Figure 3: Dimensions of the machine

DIMENSIONS	FMR 330
I = Width (cm.)	270
L = Length (cm.)	300
h = Height (cm.)	125

Table 2 : Dimensions of the Reapers

Since FİMAKS is open to all technological advances, it reserves the right to change the specifications of ROTARY RAKE without necessary corrections on the machine sold earlier and without prior notice.

MOVING OF THE MACHINE

For the machine to be lifted and placed securely on the ground during moving, it is necessary to use levers officially authorized and with adequate lifting power. (machine's weight is shown on page 9.)

Attention:

Chains need to be in good condition and have adequate lifting capacity for the work to be done.

The point of chain fastening is located on the gearbox and three point lift system.

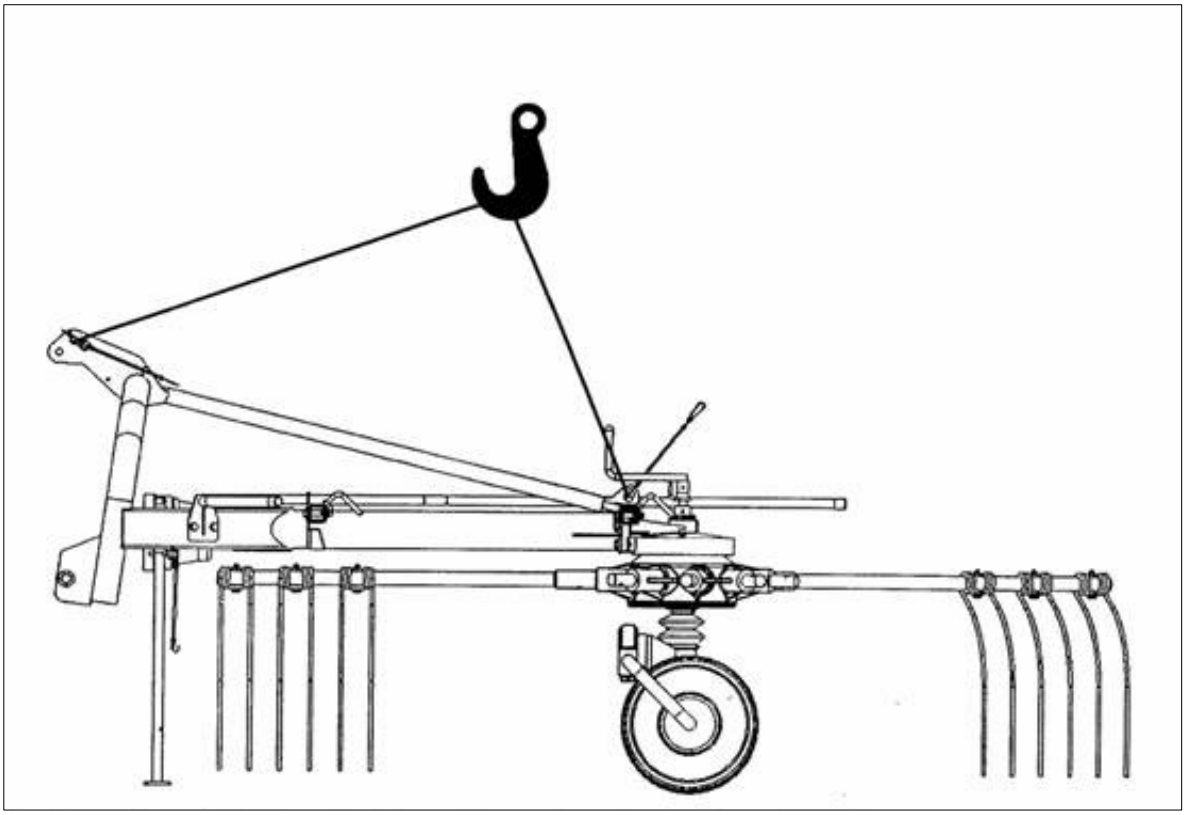


Figure 4 : Moving of the Machine

GUARANTEE

Terms of Guarantee

Official regulations are in "General Sales Conditions" section. Below mentioned points are a short summary of the liabilities of both parties.

- Guarantee will be effective after the sales of a brand new FİMAKS product.
- Guarantee will be effective on condition that the product is paid in full on the fixed due date put forward by the buyer.
- Guarantee period is extended as to cover one operation season, and is maximum "two" years starting with the preparation of the product for operation
- Guarantee is absolutely limited to changing of the original parts agreed to be defective ex factory. On this condition, the parts will be transferred to FİMAKS possession.

Limits of Guarantee

- Machine should have been operated in the operator's place of work or residence
- Machine should have been operated under normal work conditions.
- No changes should have been made on the machine.
- The care and maintenance of the machine should have been made by an expert.
- Using imitated, not original parts can make this guarantee void.

PREPARING A NEW MACHINE FOR THE OPERATION

It is of utmost importance to be extra careful in operating a new machine for the first time. Wrong assembly or wrong operation of the machine can result in very expensive repairs and harm to the machine not covered by the guarantee and these will not be provided by FİMAKS.

Under normal conditions, your machine is delivered fully assembled and ready for operation. If the machine is delivered unassembled and parts packed, please follow the assembly instructions mentioned below.

Contents of the Box:

- Main machine
- 9 arms with springs attached
- Protectors
- Supporting pipes for the protectors
- Plate and connections
- Axel
- Operation Manual

ASSEMBLY

Resistance value for each screw is etched on the heads of the screws. Please follow the tightening capacities shown in the table below.

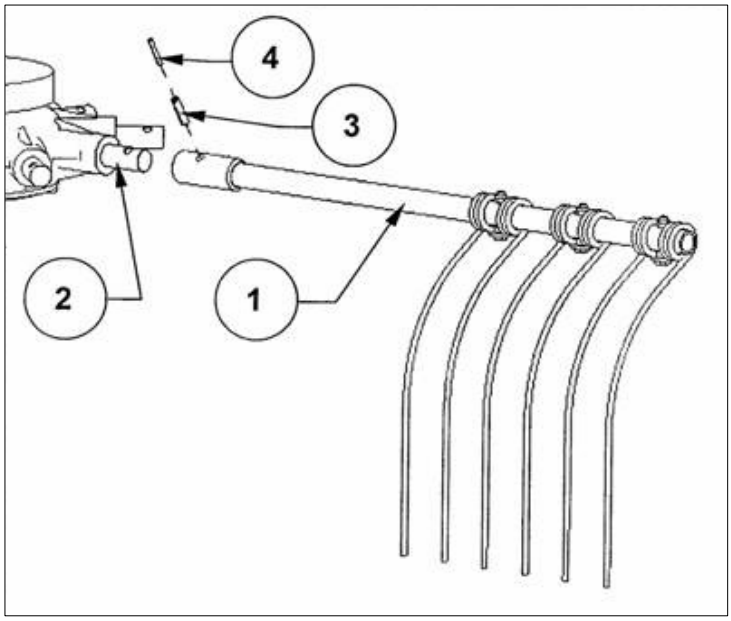
	Tightening Capacity in Nm				
Screw Ø	**5,6**	**6,9**	**8,8**	**10,9**	**12,9**
M5	2,8	5	6	8,5	10
M6	4,7	8,5	10	14	17
M8	12	21	25	35	41
M10	23	41	49	69	83
M12	40	72	86	120	145
M14	64	115	135	190	230
M16	100	180	210	295	355
M18	135	245	290	405	485
M20	190	345	410	580	690
M22	260	465	550	780	930
M24	330	600	710	1000	1200
M27	500	890	1050	1500	1800
M30	670	1200	1450	2000	2400

IMPORTANT:

Re-tighten all the sets of screws and nuts after two hours of operation for your own safety.

Assembly of the Spring Arms

- Lift the machine up after connecting it to the tractor.
- Fix the machine in the upper position before stopping the engine.
- Grease the inside cover of the spring arms.
- Place each spring arm (1) to gearbox outer axel (2) and fix by using 12X50 pin (3) and 7X50 pims (4).



Şekil 7 : Fixing spring arms

Assembly of the protecting pipes on FMR 330 – 342 :

- On immovable shaft (1) assemble two screws M12 bent and shaped like an elbow..
- Assemble the immovable shaft (1) to the left side of the machine chassis in the position as shown in the figure. Fix the shaft by using 2 pieces M12X70 screw (5), 4 pieces 12X27 flat washer (4) and 2 pieces M12 stopper bolts (6)
- Assemble the right side protector (2) and fix by using 2 pieces M12X70 screw (5), 4 pieces 12X27 flat rondela (4) and 2 pieces M12 stopper bolts (6)
- Assemble the left side protector (3) on the chasis and fix by using 2 pieces M12X30 screw (7), 2 pieces 12X27 flat rondela (4) and 2 pieces M12 stopper bolts (6).

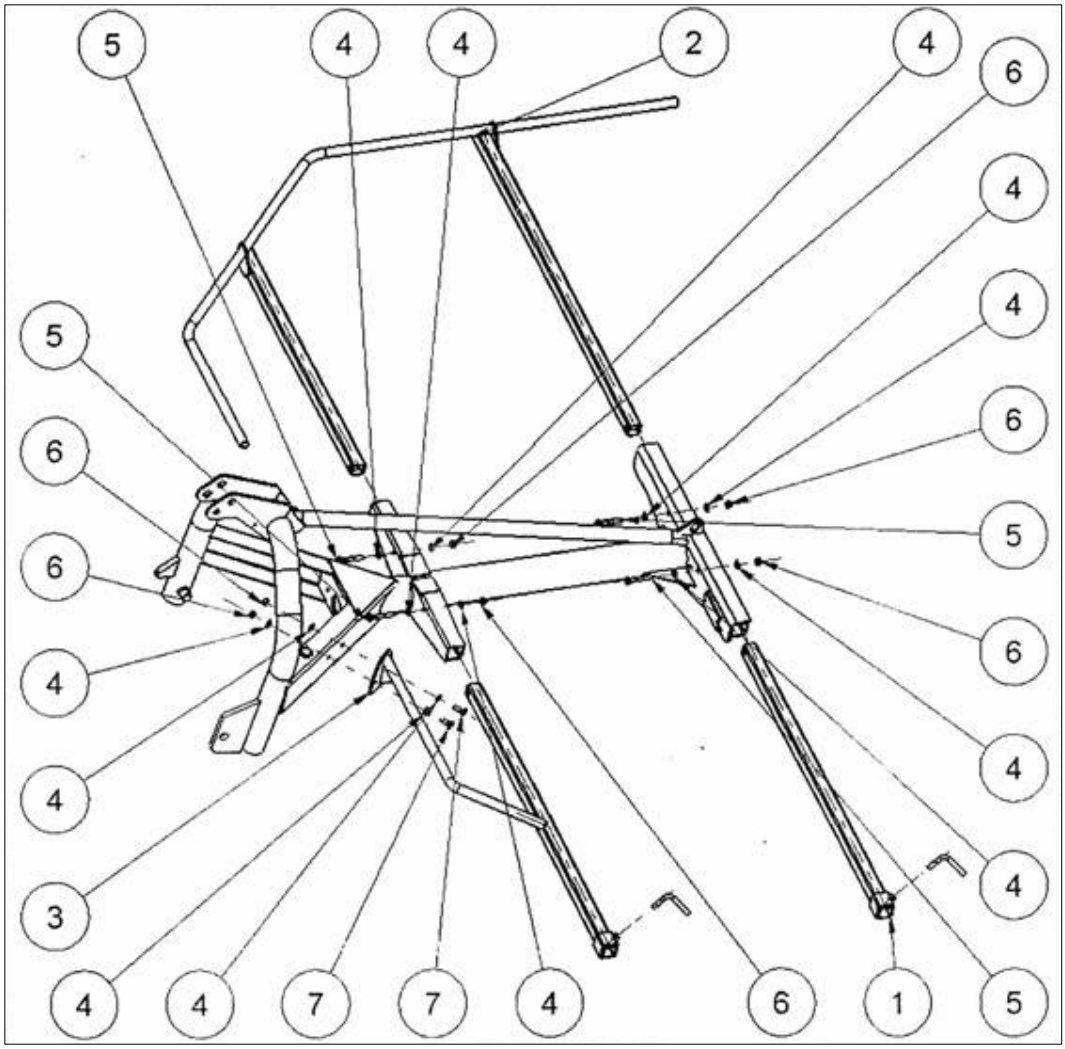


Figure 8 : Protecting elements on FMR 330 - 342

GETTING READY FOR OPERATION

PREPARING THE TRACTOR

Weight and Dimensions

Tractor should have proper power and dimensions to be able to carry the machine in all conditions. It should be equipped in compliance with local regulations.

Power Intake Rotation Speed

For all Rotary Rakes the rotation speed is 540 rpm.

Important

A machine manufactured for 540 rpm, if operated with 1000 rpm, a big risk of harm is involved.

CONNECTING THE MACHINE

Connecting the machine to the tractor

- Adjust the adjustment arms (1) so as to bring both arms to the same level.
- Tie them to the Lifting arms (2).
- Place the third connection point (3).
- Lift the machine up.
- Lift the front support up
- Tighten the fixers (4)

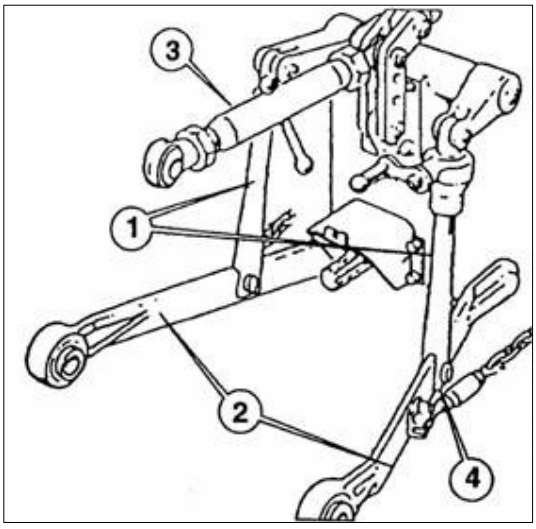


Figure 9 : Connection to the tractor

Important

Use good quality latches. Otherwise an accidental break in the connection can cause very important harm.

- Adjust the third point connection length so as the tips of the springs are parallel to the ground or slightly bent forward.
- Connect the shaft (detailed information on shaft connection and adjustment are in the next paragraph).

ADJUSTING THE SHAFT LENGTH

Preparing a New Shaft

- Adjust the lifting height so as the machine shaft out axis is on the tractor axis, then stop the tractor.
- Divide the shaft into two sections.
- Connect each section to the machine and tractor.
- Take a felt pen and bring together the two pipes together.
- Put a mark on each side 65 mm. away from the protecting sections as shown in Figure 10. This 65 mm. represents the distance needed for the transmission taken from the tractor's shaft axle.

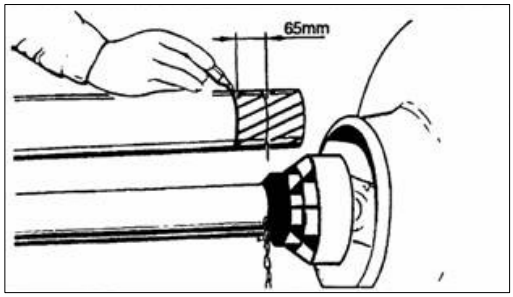


Figure 10 : measurement for cutting

Attention:

The re-covering of the metal tube should be minimum 300mm's.

- Only the plastic section should be cut.(Figure 11).

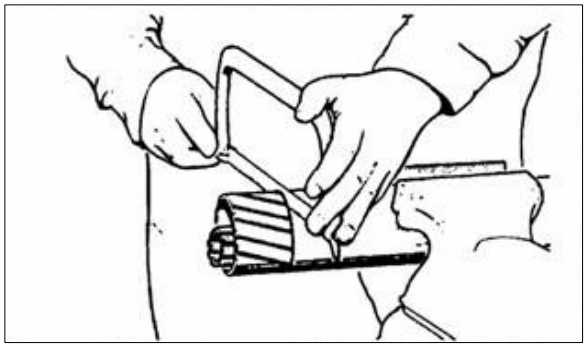


Figure 11: Cutting the plastic section

- By taking the plastic section as measurement point, a reminder on the metal tube,
- Cut the shaft pipe by using metal saw (Figure 12).

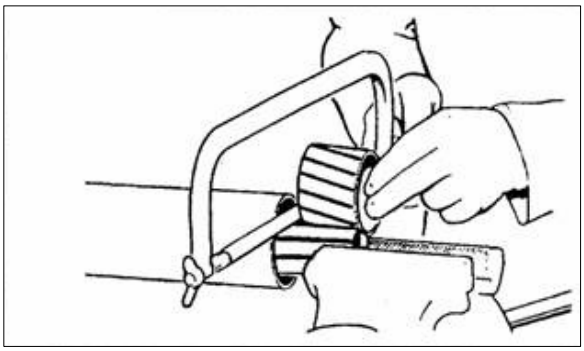


Figure 12: Cutting the shaft pipe

- File the inner side of the female pipe and outside the male pipe appropriately. (Figure 13), and then connect them. Both pipes should move into each other easily.

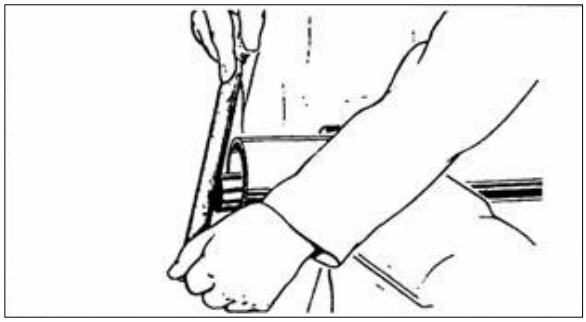


Figure 13 : Eliminating the rough edges of moulding.

- While pulling back, make sure that the male pipe does not hit the cross pieces on the female section of the shaft.
- Shaft, wheel breech pin stopper are assembled so as they are on the side of the machine.

Fimaks Rotary Rakes, should absolutely be operated with a power intake rotation speed of 540 rotations/minute.

TRANSPORTATION

Before starting on the road, bring the machine to the transporting position.

Re-folding For Transportation Position

- Fit the left protector on the spring arms to the maximum.
- Lift the machine up so as the wheels are off the ground.

Unfolding for Operating Position

- Leave the machine on the ground.
- Pull the left protector back so as to bring the rake carrying the tramboline to the main position.

CHECKING BEFORE OPERATING

- Check to see that the machine is installed properly and no part is damaged.
- Check to see that the shaft between the tractor and the machine is not too short so as not to come off.
- Machine should be operated with only 540 rotations/minute power intake.
- Grease all the connecting parts and joints (Consult the table in “MAINTENANCE" section).
- Check to see that the nuts, bolts and screws are tightened adequately in all the parts with screws after the first two hours of operation.
- Make sure that only the parts recommended by the manufacturer are installed on the machine.

OPERATION AND ADJUSTMENT

Bending of the Rake Spring

Bending of the rake spring is adjusted on the third connection point. Shortening the third connection point causes the rake spring to bend forward, on the other hand lengthening causes them to bend backward.

Height of the Rake Spring

The height of the rake spring is adjusted with the lever on the gearbox.
If the lever is turned (1) clockwise machine is brought down, if turned anticlockwise, the machine is lifted upwards. Tighten the nuts (2) again until the adjustment procedure is completed and block the lever with the help of the cord. (3).

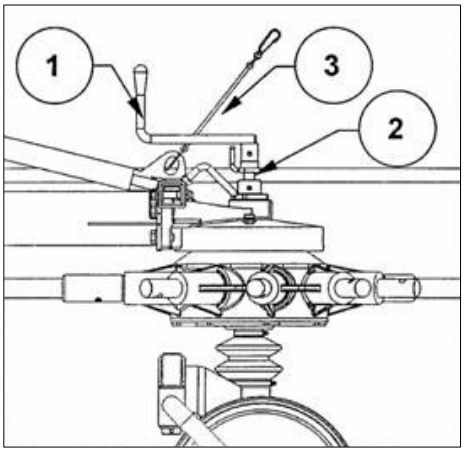


Figure 14: Height of the rake spring

ADJUSTMENT OF THE OPERATION POSITION

The most ideal operation position is achieved by interfering the height and bending.

Under normal conditions (with straw heavy or intermediate straw density), the height should be adjusted with the lever, so as the spring distance to the ground is 2-3 cm. The rake springs should be parallel to the ground or slightly bent.
If the amount of straw is not much, adjust the height so as the springs just touch the ground.

POWER INTAKE CYCLE AND OPERATION SPEED

Recommended power intake cycle is 540 rotations/minute..
Operation speed changes according to the amount of straw and humidity.
It is possible to operate with a fast speed as long as the ground is smooth and the straw is picked up properly and packed together, and therefore not leaving any straw on the ground.

POWER LIMITER

If the wheel power limiter continuously interferes while working on dense straw the speed of progress should be lowered. If the power limiter works more than 10 seconds while working on straw with normal density, the machine should immediately be stopped and problem should be solved.

WIDTH OF THE BAIL

The widths of the bail can be adjusted by changing the distance of the plate to the rake springs.

Loosen the screw (1), adjust for the distance wanted and tighten the screw.

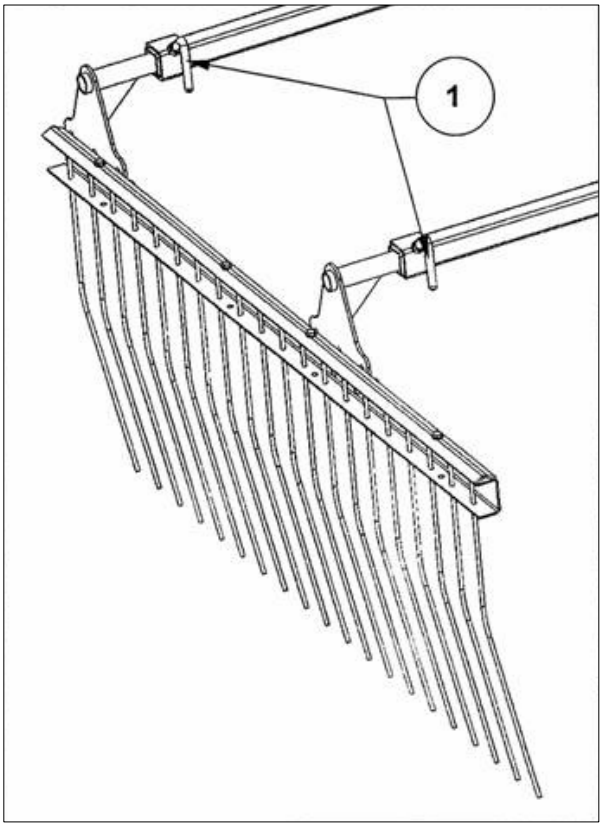


Figure 15 : Adjustment of the width of bails

SHAPES OF BAILS

The bailing machine can put together all the straw and grass scattered or piled previously in different shapes.

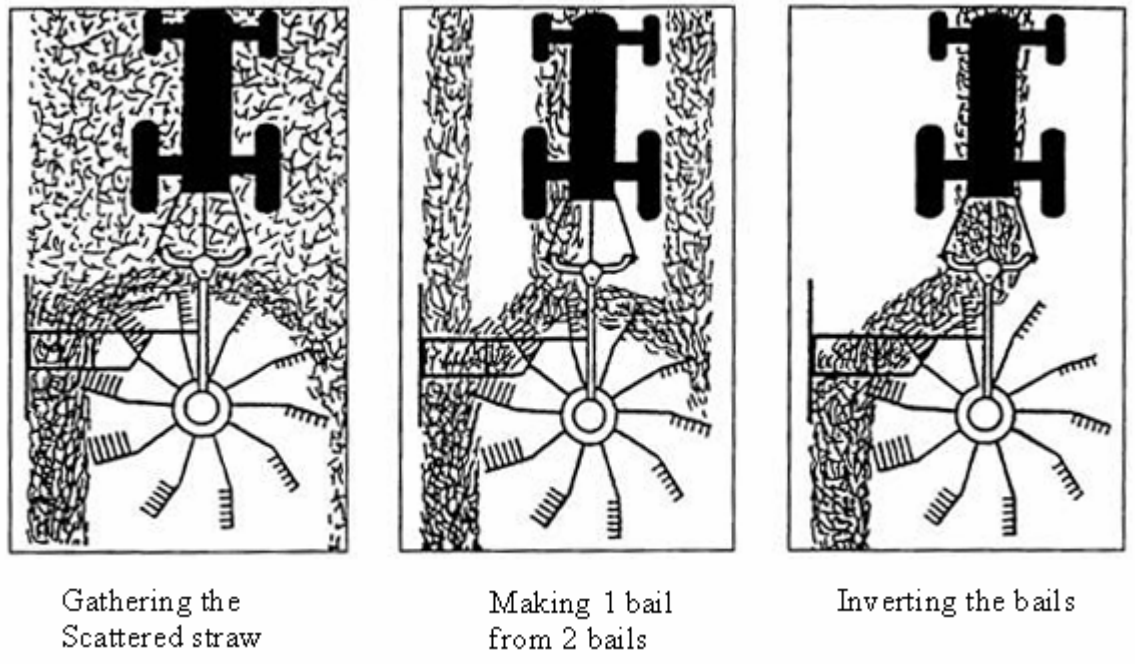


Figure 16: Bail Shapes

MAINTENANCE

Danger:

Whatever the reason for interfering is, the engine of the tractor should be stopped and ignition key should be taken off before oil change of the Rotary Rake or any repairs are done.

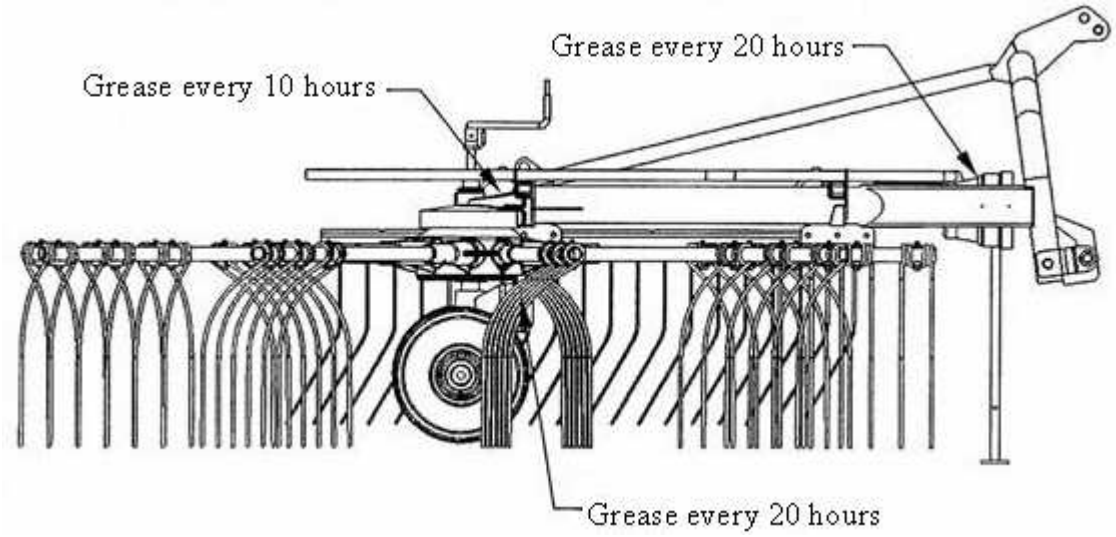


Figure 17 : Table for Greasing

GREASING

1- Shaft

Grease all the cross pieces after operating for 8 hours
After every 40 hours of operation, grease the bolts (çene sürgüleri) and daub the moving tubes on the groove with grease.

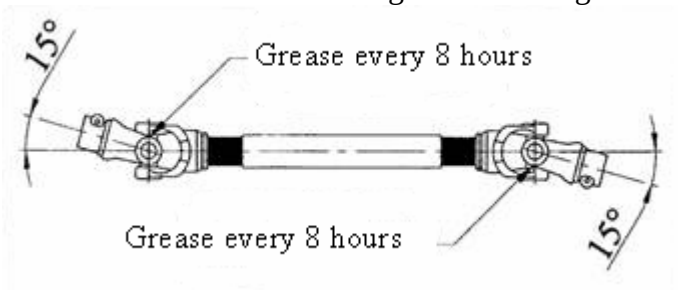


Figure 18 : Shaft

2- Gear box Axle bearing
Grease gearbox axle bearing after every 20 hours of operation

3- Gearbox entrance axle bearing
Grease gearbox entrance axle bearing after every 10 hours of operation

4- Socket for the height adjustment arm of rake springs
Grease the socket for the height adjustment arm of rake springs after every 20 hours of operation

LUBRICATION

There is oil in the gearbox where 9 pieces of arms are attached.
The quality of oil used is SAE 90 EP (maximum pressure).

- Amount of oil within the gearbox is 3,2 liters.
- Change the oil every 100 hectares or every year.

TIRES

The air in the tires should be maximum 2 bars.

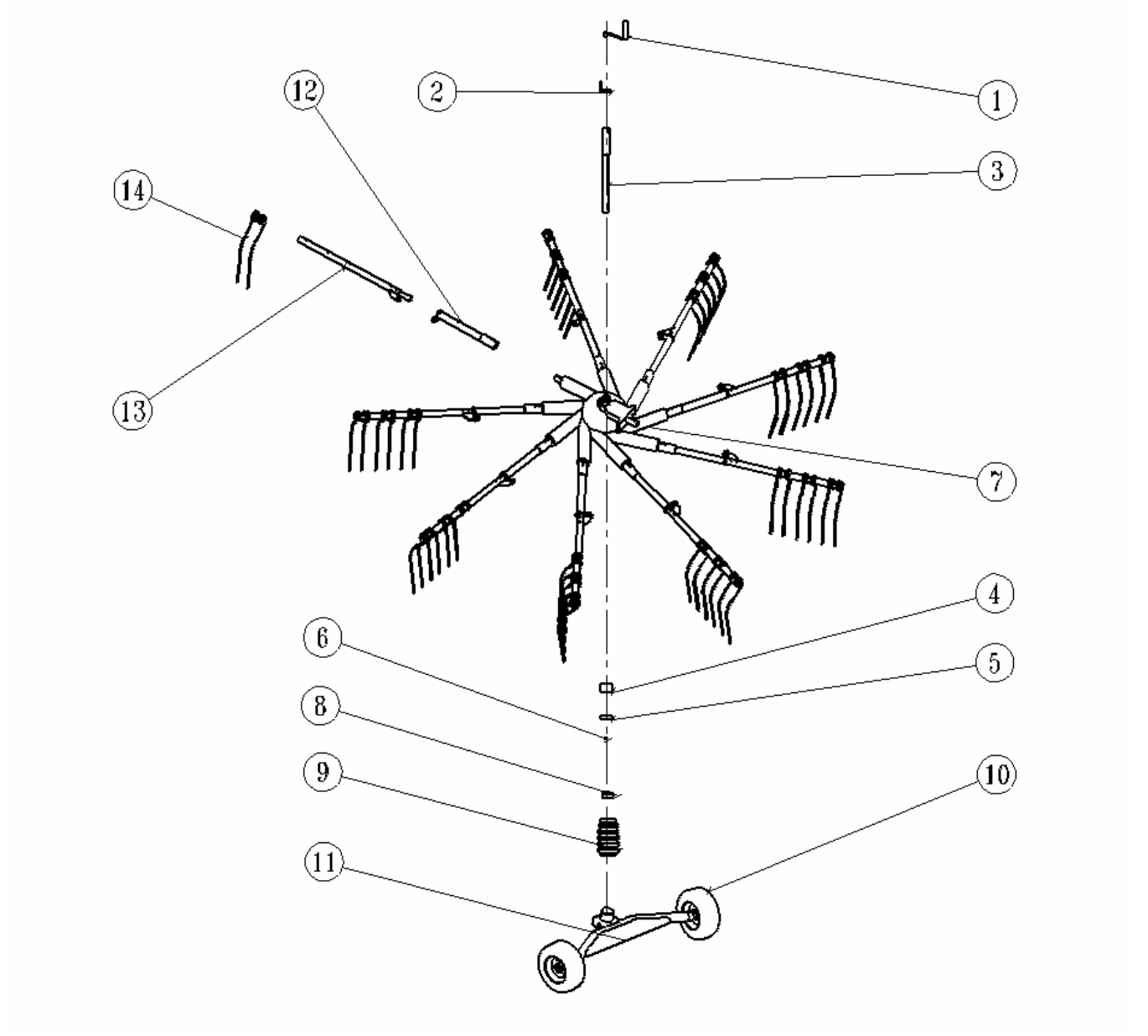
OTHER INTERVENTIONS

Repairs consisting of complicated procedures like repairs in the bearings with balls or on the boxes requiring the expertise and special tools and equipment owned only by your authorized dealer.

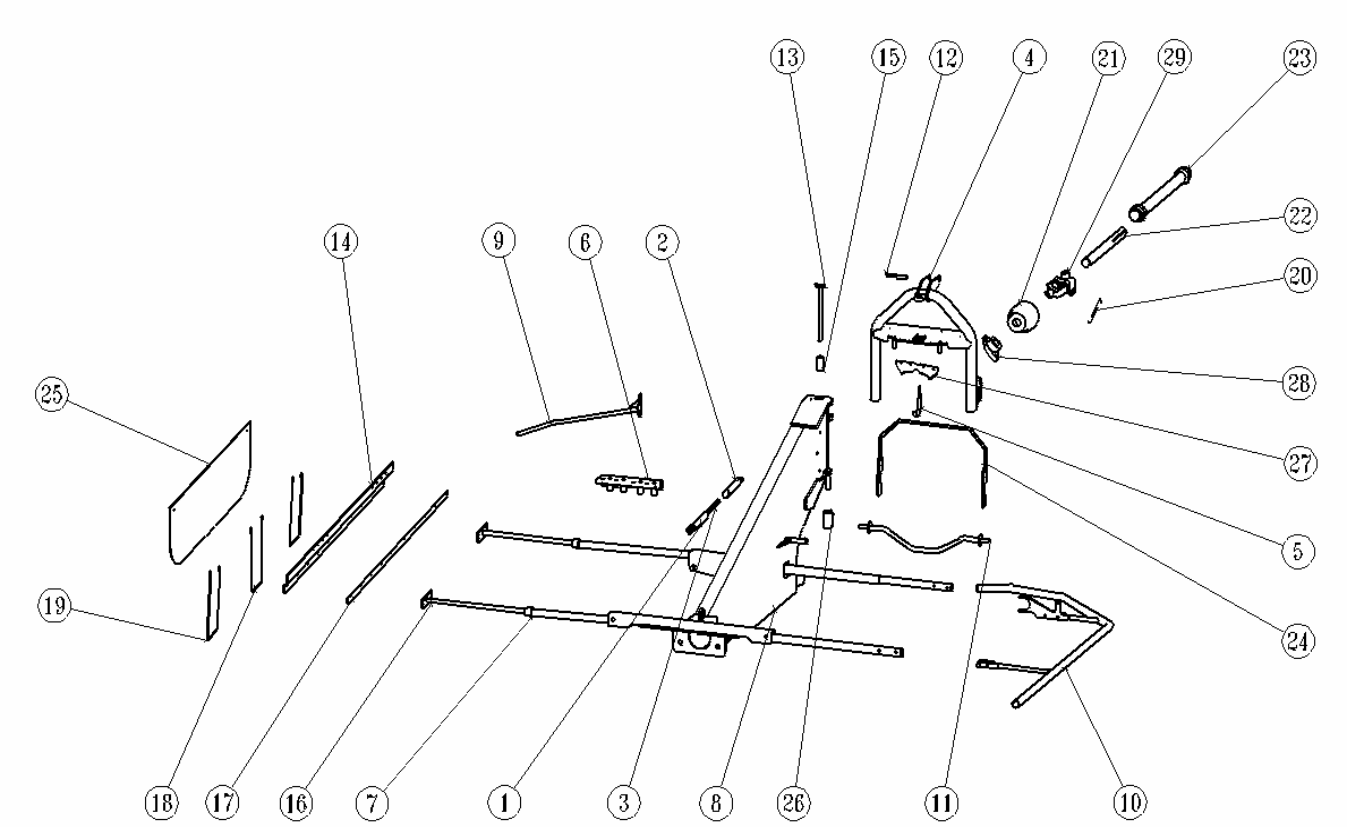
STORING END SEASON

The process for storing end season is done in transportation position and should be done on a strong and flat ground.
At the end of season, when you will not be using your machine for long period of time, you should follow the following procedures:

- First take the machine base off and fix it.
- Leave the machine on the ground.
- Separate the machine from the tractor.



No	Referans / Referance	Adet / Qty	TÜRKÇE	ENGLISH
			Parca Adı	Description
1	42.10.01.00.000	1	ÇEVİRME KOLU	Adjustment Lever
2	42.10.02.00.000	1	AYAR SOMUNU KOMPLE	Adjustment Nut
3	42.10.00.00.008	1	YÜKSEKLİK AYAR MİLİ	Adjustement Screw
4	42.10.00.00.009	1	MİL BURCU	Bush
5	100R.51104 BUTE	1	BUTE	Bute
6	42.10.00.00.010	1	BUTE BURCU	Bute bush
7	COMER K791-A	1	ŞANZIMAN KOMPLE	Gearbox
8	400HD.51-72	1	KÖRÜK KELEPÇESİ	Bellow clip
9	42.10.00.00.011	1	KÖRÜK	Bellow
10	100L.15*6.00-6L	2	TEKERLEK	Tyre
11	42.10.00.00.000	1	TEKERLEK ŞASESİ	Tyre Mounting
12	42.11.01.00.000	9	KOL BAGLANTI KOMPLE	Arm Connection rod
13	42.11.02.00.000	9	YAY KOLU KOMPLE	Arm
14	42.00.00.00.010	27	KOL YAYI	Spring



No	Referans / Referance	Adet / Qty	TÜRKÇE	ENGLISH
			Parca Adı	Description
1	42.01.01.00.000	2	AMORTİSÖR İÇ BORUSU	Shock absorber inner pipe
2	42.01.02.00.000	2	AMORTİSÖR DIŞ BORUSU	Shock absorber outer pipe
3	42.01.03.00.000	2	AMORTİSÖR YAYI	Shock absorber spring
4	42.02.00.00.000	1	ÇARDAK KOMPLE	3 Point Connection (complete)
5	42.03.00.00.000	1	ÇENGEL	Hook
6	42.06.00.00.000	1	KORUMA ELEMANLARI KOMPLE	Guard complete
7	42.07.02.00.000	2	PERDE BAGLANTI PROFİLİ KOMPLE	Trampoline connection profile
8	42.08.01.00.000	1	ŞASE KOMPLE	Chassis (complete)
9	42.09.00.00.000	1	SAG ÖN KORUMA BORUSU KOMPLE	Guard pipe
10	42.14.00.00.000	1	SAG MUHAFAZA GRUBU	Right guard (complete)
11	42.15.00.00.000	1	ÇEKİ MİLİ KOMPLE	Connection rod
12	42.00.00.00.005	1	ÖN KOL PİMİ	Upper pin
13	42.00.00.00.004	1	ORTA KOL PİMİ	Pin
14	42.12.00.00.000	1	PERDE BAGLANTI SACI	Trampoline connection sheet
15	42.16.00.00.002	1	ORTA KOL PİM BURCU	Bush for pin
16	42.13.00.00.001	2	YAN BAGLANTI BORUSU	Curtain connection pipe
17	42.00.00.00.001	1	PERDE BAGLANTI EK SACI	Trampoline connection additional sheet
18	42.00.00.00.002	1	ORTA BRANDA ORTA YAYI	Trampoline middle spring
19	42.00.00.00.003	2	BRANDA YAN YAYI	Trampoline side spring
20	42.00.00.00.007	1	ÇARDAK YAYI	3 point spring
21	100SF.SFT MHF	1	ŞAFT MUHAFAZA	Shaft cover
22	42.00.00.00.012	1	ŞAFT MİLİ	Shaft pipe
23	42.00.00.00.013	1	ŞAFT	Shaft
24	42.05.00.00.000	1	KİLİT SACI KOMPLE	Locking system complete
25	42.00.00.00.006	1	PERDE	Trampoline
26	42.00.00.00.015	1	DAYAMA BURCU	Bush
27	42.04.00.00.000	1	ÇARDAK PİM AYAR SACI	Three Point Adjustment Sheet
28	100R.UCFL207	1	UCFL 207 YATAK	UCFL207 Bearing
29	42.00.00.00.016	1	İSTAVROZ	Cross