



Heavy-duty tillers - ROTAS

FPM 612 836 - 1,4m

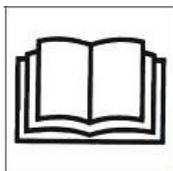
FPM 612 837 - 1,6m

FPM 612 838 - 1,8m

FPM 612 839 - 2,1m

FPM 612 840 - 2,6m

INSTRUCTIONS MANUAL AND LIST OF SPARE PARTS



PLEASE, READ CAREFULLY BEFORE USE

1. INTRODUCTION

1.1 General information about the product

Rotary tillers “ROTAS” fall into the category of heavy-duty rotary tillers and are designed for primary and secondary tillage in all types of agricultural production. Due to the four-stage reduction gear and their robust and massive structure, this type of tillers can be used even under the most difficult operating conditions and on all types of soil.

 **REMARK:** The terms tiller, soil chipper, product or machine in this Manual refer to heavy-duty rotary tillers ROTAS.

The main parts and assemblies of heavy-duty tiller ROTAS:

I. - Body of the tiller

- 1 - Supporting frame - assembly
- 2 - Pyramid – assembly
- 3 - Rear cover
- 4 - Right side plate
- 5 - Left side plate
- 6 - Right side slider
- 7 - Left side slider
- 13 - Left and right guards

II. - Transmission

- 9 - Reduction gear - assembly
- 10 - Shaft – assembly
- 11 - Lateral transmission

III. - Operating bodies - rotor with blades

- 12 - Rotor - assembly with horizontal axis of rotation

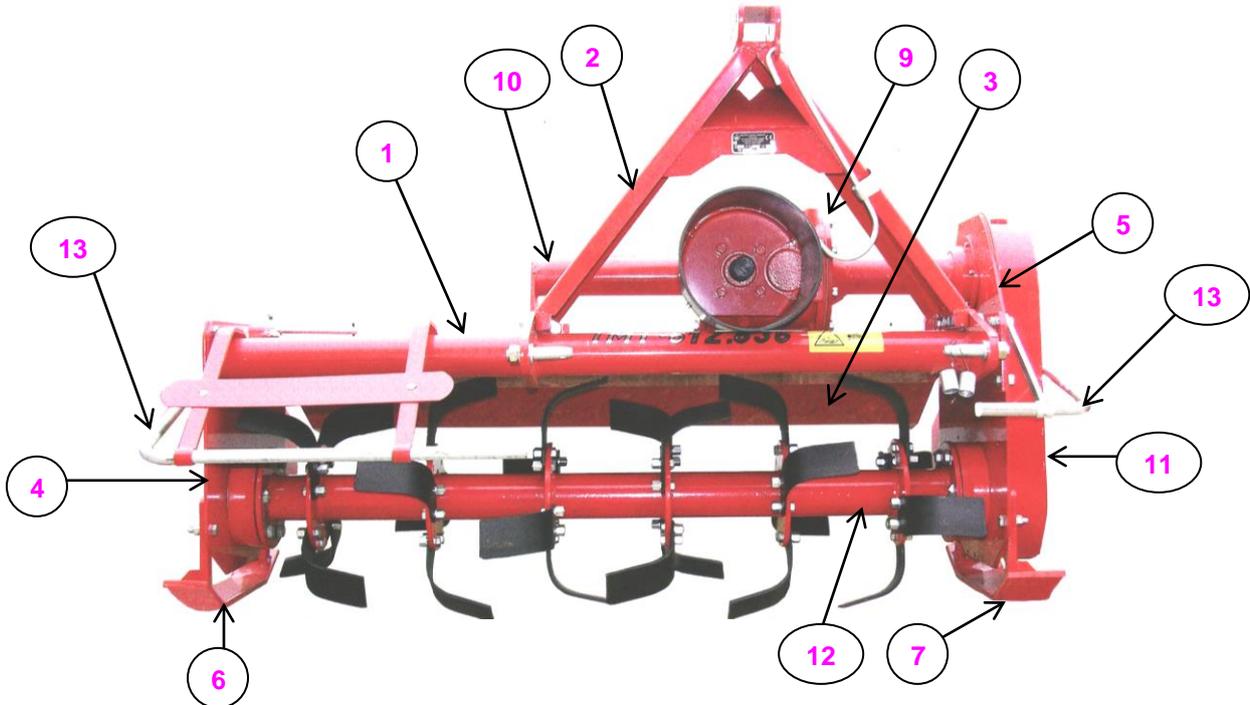


Figure 1. Heavy-duty tiller ROTAS

1.2 Technical characteristics

Type	FPM 612.836	FPM 612.837	FPM 612.838	FPM 612.839	FPM 612.840
Working width (m)	1,4	1,6	1,8	2,1	2,6
Total width (m)	1,7	1,9	2,1	2,4	2,9
Tractor minimum power output-kw(Hp)	30(40)	33(45)	37(50)	44(60)	55(75)
Linkage	3-point				
Tractor category	I, II			II	
Tractor output shaft RPM (o/min)	540				
Rotor RPM (o/min)	I-198 / II-224 / III-279 / IV-316				
Adjustment of number of rotor rotations	4-stage reduction gear				
Rotor diameter (mm)	88,9 (thick-walled tube 6,3mm)				88,9 (thick-walled tube 8 mm)
Blade rotor diameter (mm)	460				
Lateral transmission	gears				
Number of blades per flange / total - (standard)	4 / 24	4 / 28	4 / 32	4 / 40	4 / 48
Number of blades per flange / total - (option)	6 / 36	6 / 42	6 / 48	6 / 60	6 / 72
Maximum working depth (cm)	20				
Depth adjustment	Side sliders				
Working width related to the tractor axis (cm)	L 46,5 / D 93,5	L 65 / D 95	L 85 / D 95	L 108 / D 102	L 114 / D 146
Weight (kg)	315	345	375	405	455

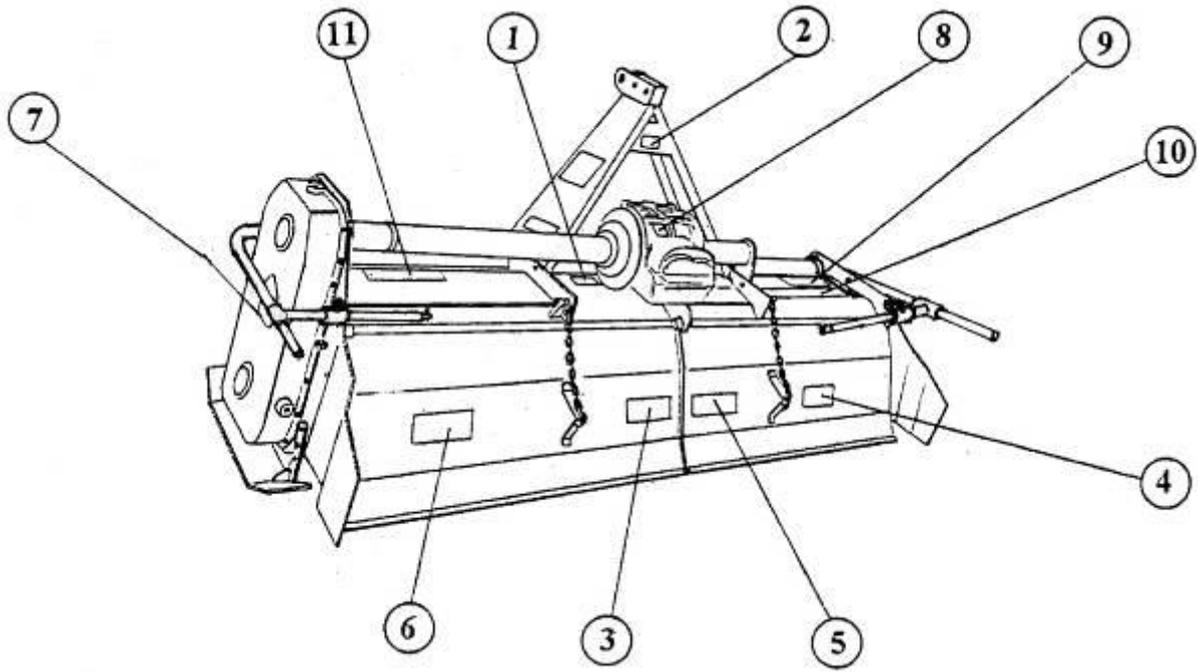
1.3 Identification plate

1.4 Limited warranty

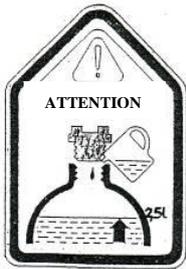
2. Safety warnings

2.1 The meaning of warning symbols

2.3 Warning labels

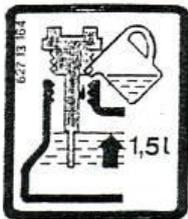


7



Regularly check the oil level in the lateral transmission.

8



Regularly check the oil level in the reduction gear.

3. Installation

4. CONNECTING TO THE TRACTOR

4.1 PTO shaft

5. USE OF HEAVY-DUTY TILLER “ROTAS”

5.1 Before the first use

Before the first use of the machine be sure to make the following checks:

No.	Description	OK (✓)
1	Completeness of the product	
2	Tightness of the screws of lateral transmission	
3	Tightness of the screws on blades and ends of rotor	
4	Tightness of all other screws	
5	Position of the cutting blades	
6	Oil level in lateral transmission	
7	Oil level in reduction gear	
8	Lubrication of all grease nipples	



REMARK: When operating with the tiller, it is mandatory to use stabilizing levers (Figure 2) or stabilizing chains (Figure 3).

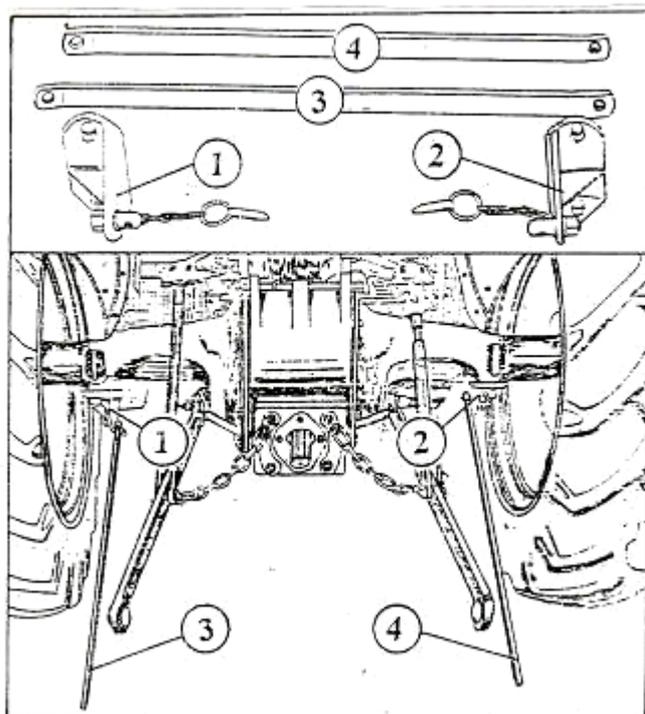


Figure 2 – Installation of stabilizing levers

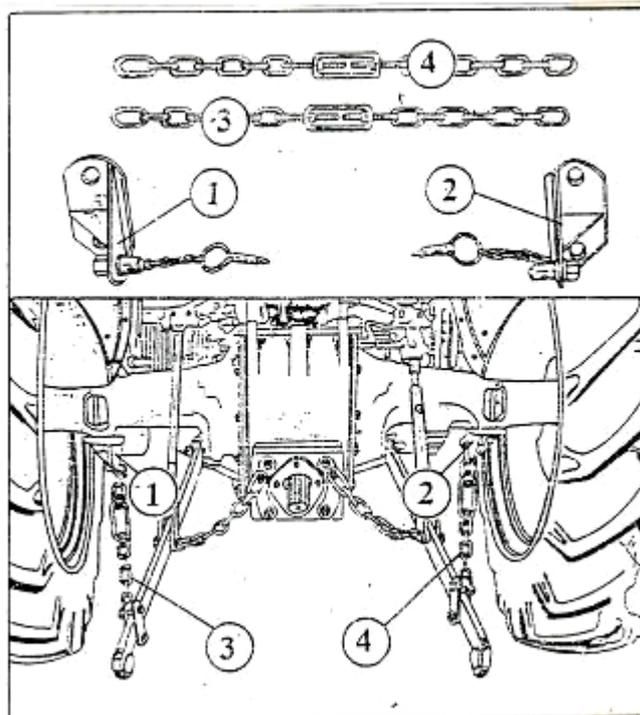


Figure 3 – Installation of stabilizing chains

5.2 Working with the tiller

5.2.1 WORKING DEPTH ADJUSTMENT

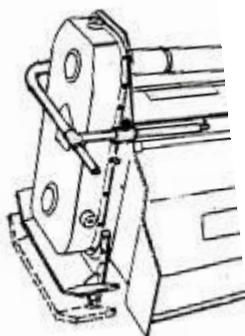


Figure 14. Adjustment with the left slider

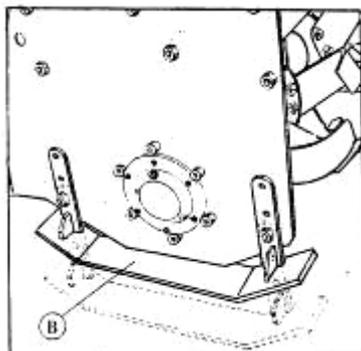


Figure 15. Adjustment with the right slider

Side sliders are used for working depth adjustment (see Figures 14 and 15). Unscrew the regulation screw (Fig. 14 and 15, Pos. 1), lift or lower the sliders (A) and (B) to the desired height, and then again screw/tighten the regulation screw.

 **REMARK:** When adjusting the height it is very important to adjust both left and right slider at the same height.

If you want to achieve a maximum working depth of 20cm with your tiller, you have to till the same area twice. First, use the tool at 12.5 cm depth; the maximum depth can be achieved at the repeated operation.

5.2.3 SETTING ROTOR ROTATION SPEED

Heavy-duty tillers “ROTAS” are equipped with 4-stage reduction gear with two pairs of replaceable gears and lateral 1-stage gear. Setting of the desired rotor rotation speed is performed by the appropriate positioning of the gears as shown in Table 1.

(Gear)		520-540 min ⁻¹ 
I	 17/19	180 - 200
II	 19/24	200 - 230
III	 19/17	230 - 280
IV	 24/19	280 - 320

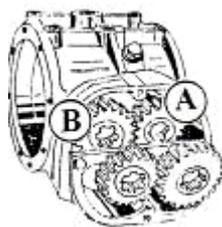


Table 1. Rotor RPM depending on the position of gears

Depending on the type and condition of soil which is being tilled, by changing the rotor RPM you obtain a different degree and quality of the tilled soil at the same speed of the tiller as shown in Figure 27

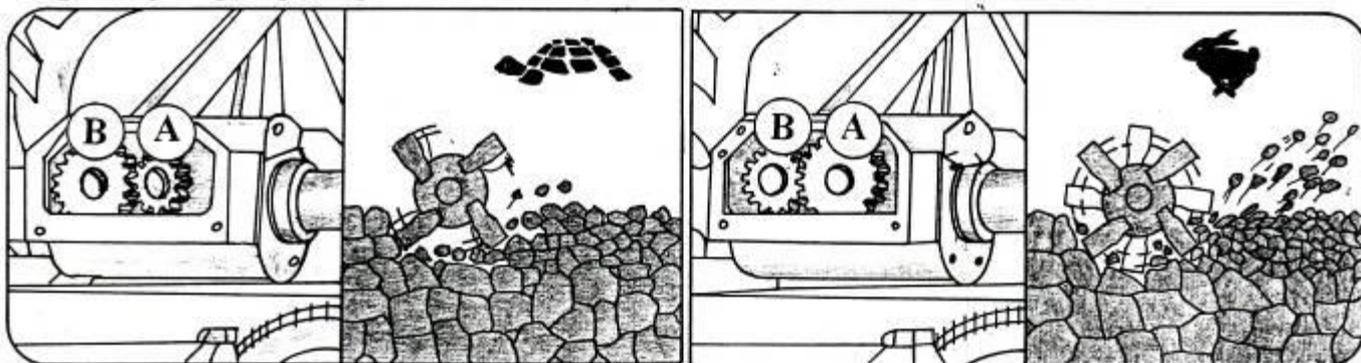


Figure 27. Change of rotor RPM

6. MAINTENANCE

6.1.1 BLADES AND ROTOR

It is possible to install several types of rotors with different types of blades on heavy-duty tillers "ROTAS". In the standard option, the tillers are equipped with rotors with blades S-01, and all available types of blades are shown in Figure 8.

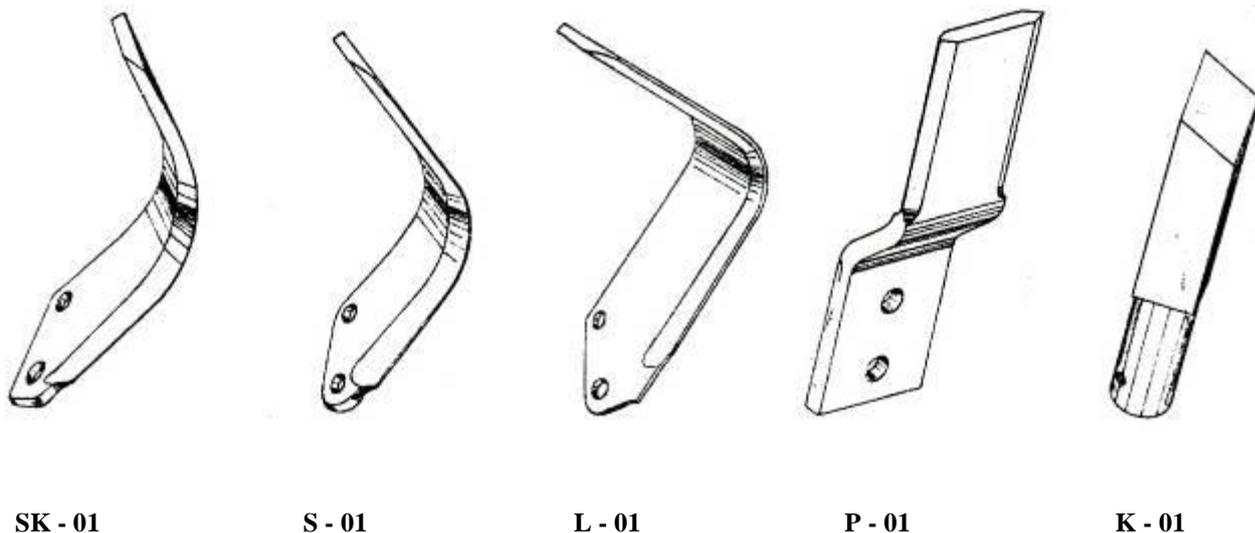


Figure 8. Types of blades

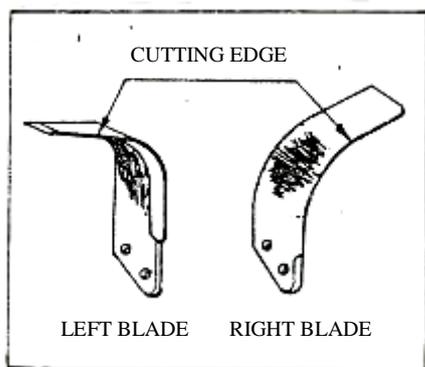


Figure 8. Left and right blade

The blades must be properly installed and in a satisfactory condition, otherwise there is a rapid wear and tear and poor quality of the machine operation. The blades which are increasingly damaged during operation should be immediately replaced.

The blades can be sharpened until the hardened blade lasts, but one must take care to keep the defined angle of the cutting edge.

Movable tillers are delivered with the blades properly mounted on the rotor. When replacing the worn-out blades do the following:

1. Determine which blades are left and which are right ones (see Figure 8);
2. Tighten them with screws to their bearings, so that the left "leader" blade on each section is fixed to the bearing so that the opening $\varnothing 5$ is in the center of the blade. Each section bears 2 left and 2 right blades or 3 left and 3 right blades (Figures 9 and 10, Position of blades on rotor bearings).

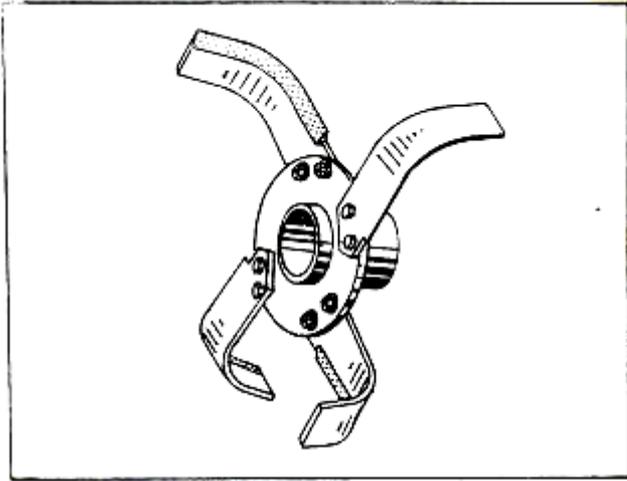


Figure 9. Position of blades 2L + 2R

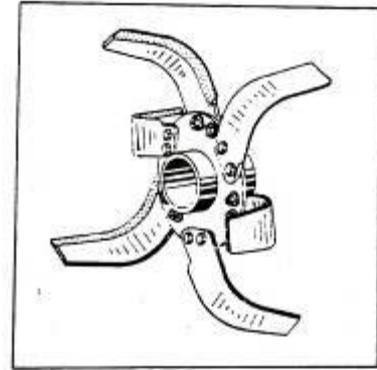


Figure 10. Position of blades 3L + 3R



REMARK: USE ONLY ORIGINAL AND RECOMMENDED PARTS OF FPM AGROMEHANIKA

When the blades are properly fixed to their bearings then all left blades are moved forward for a certain distance. In this way, the blades are placed in a helical position, as can be seen in Figure 12, which provides the least resistance at work and evenness of processing both per width and depth.

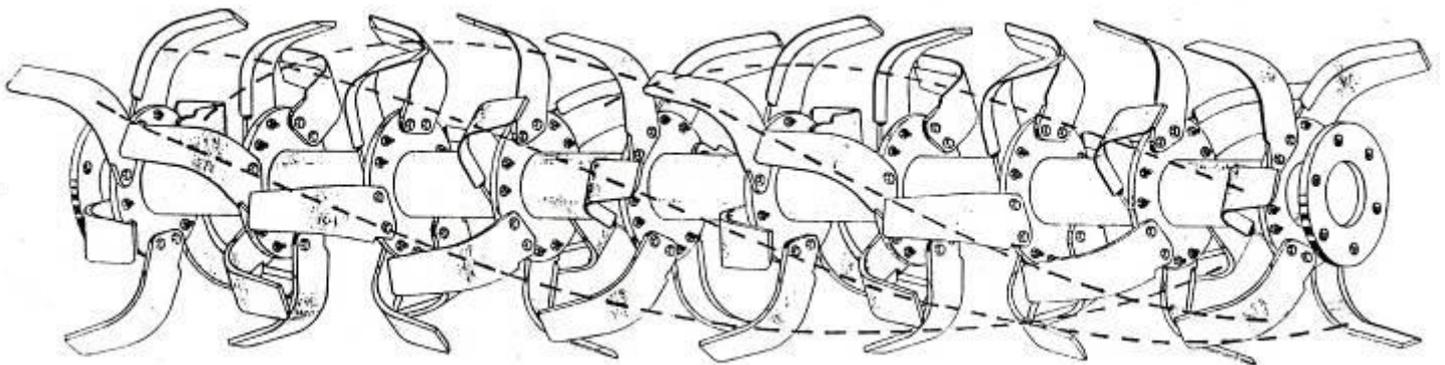


Figure 12. Blades placed in a helical position



CAUTION! When installing the blades, the screw heads should adhere to the knives and the spring washers should be placed beneath the nuts on the opposite side of the blade bearings as shown in Figure 13.

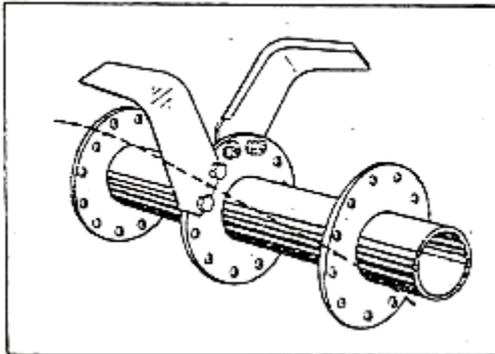


Figure 13. Screw heads

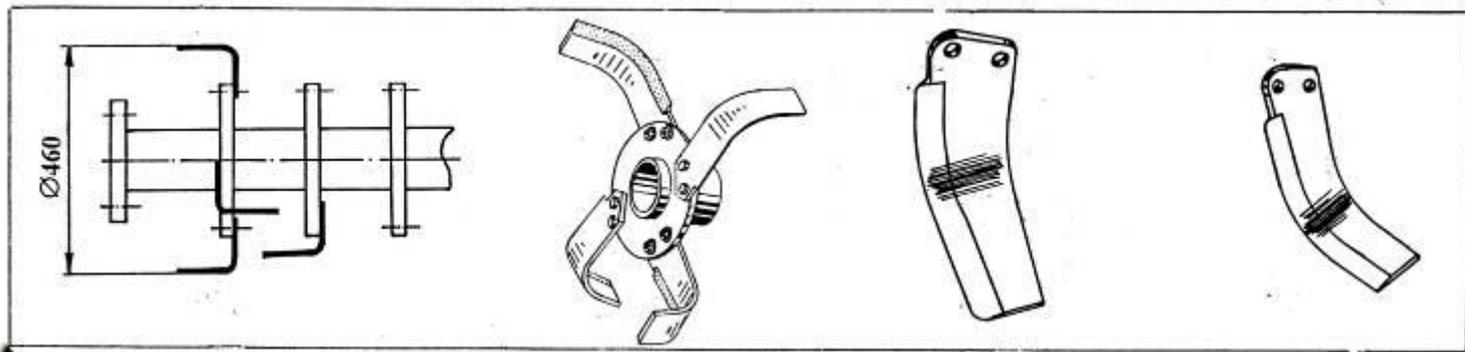


Figure 14. POSITION OF BLADES 2L + 2R

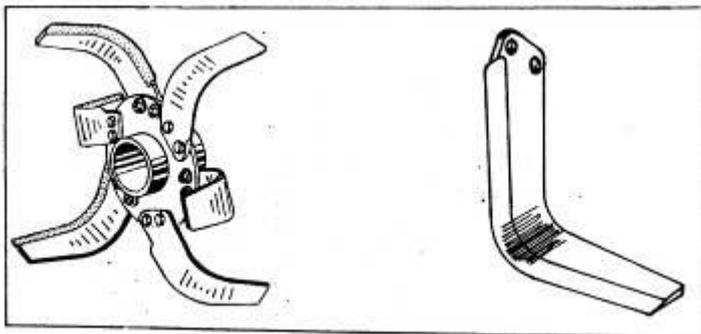


Figure 15. POSITION OF BLADES 3L + 3R

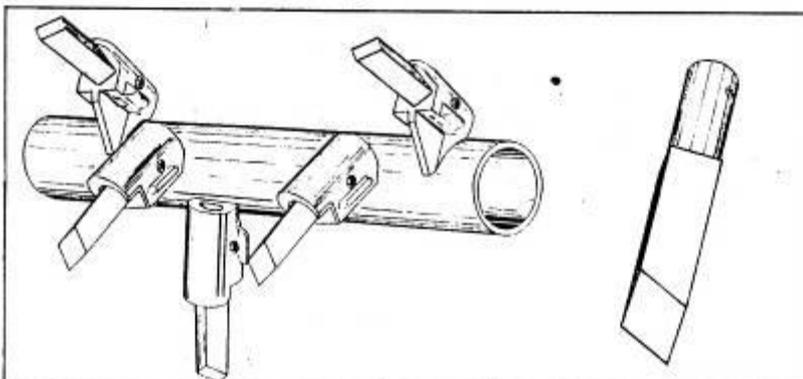
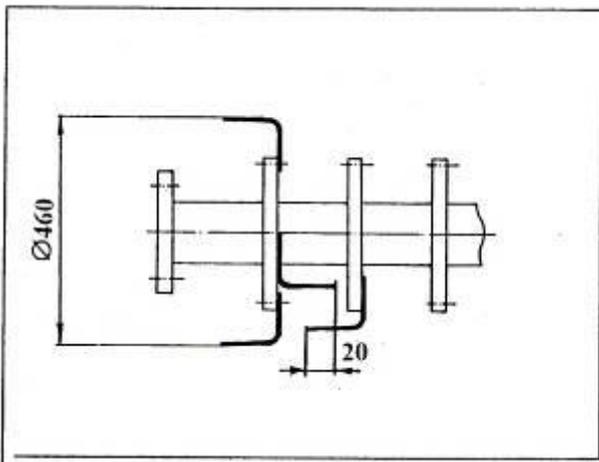


Figure 16. Position of PINS K-01 ON THE ROTOR RK-01

POSITION OF BLADES TYPE S-01 ON THE ROTOR RS-01



	FPM 612 836	FPM 612 837	FPM 612 838
WORKING WIDTH	1,4 m	1,6 m	1,8 m
IDENTIF. NUMBER	612 01 518	612 01 574	612 01 555
NUMBER OF BLADES 3L + 3R	18 + 18	21 + 21	24 + 24
NUMBER OF BLADES 2L + 2R	12 + 12	14 + 14	16 + 16

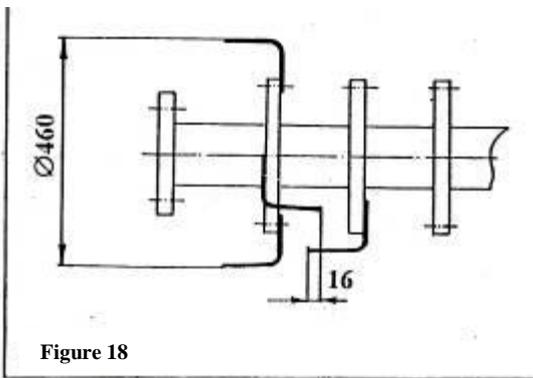


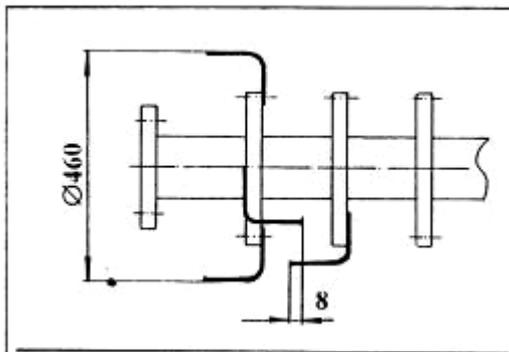
Figure 18

**CUTTING TOOL
BLADE TYPE S-01**



	FPM 612 839	FPM 612 840
WORKING WIDTH	2,1 m	2,6 m
IDENTIF. NUMBER	612 01 103	612 01 107
NUMBER OF BLADES 3L + 3R	30 + 30	36 + 36
NUMBER OF BLADES 2L + 2R	20 + 20	24 + 24

POSITION OF BLADES TYPE L-01 ON THE ROTOR RL-01



**CUTTING TOOL
BLADE TYPE L-01**



	FPM 612 837	FPM 612 838
WORKING WIDTH	1,6 m	1,8 m
IDENTIF. NUMBER	612 01 534	612 01 580
NUMBER OF BLADES 3L + 3R	21 + 21	24 + 24

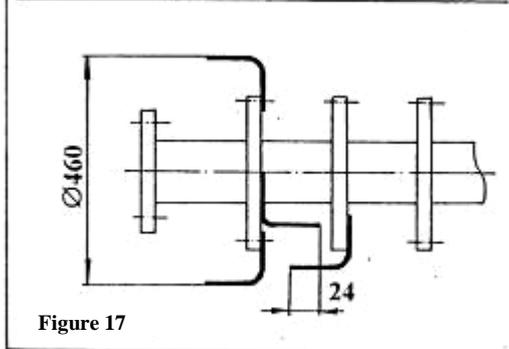
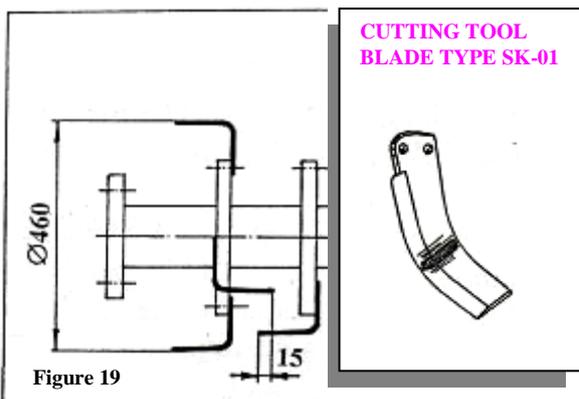


Figure 17

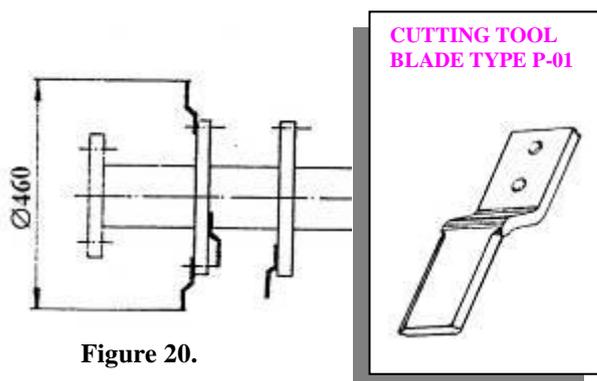
	FPM 612 838	FPM 612 839	FPM 612 840
WORKING WIDTH	1,4 m	2,1 m	2,6 m
IDENTIF. NUMBER	612 01 578	612 01 014	612 04 105
NUMBER OF BLADES 3L + 3R	18 + 18	27 + 27	23 + 23

POSITION OF BLADES TYPE SK-01 ON THE ROTOR RSK-01



	FPM 612 836	FPM 612 837	FPM 612 838	FPM 612 839	FPM 612 840
WORKING WIDTH	1,4 m	1,6 m	1,8 m	2,1 m	2,6 m
IDENTIF. NUMBER	612 01 528	612 01 525	612 01 584	612 01 706	612 04 103
NUMBER OF BLADES 2L – 2R	14 + 14	18 + 18	20 + 20	24 + 24	30 + 30

POSITION OF BLADES TYPE P-01 ON THE ROTOR RP-01



	FPM 612 836	FPM 612 837	FPM 612 838	FPM 612 839	FPM 612 840
WORKING WIDTH	1,4 m	1,6 m	1,8 m	2,1 m	2,6 m
IDENTIF. NUMBER	/	/	612 04 111	612 04 113	612 04 115
NUMBER OF BLADES 2L + 2R	/	/	32 + 32	36 + 36	44 + 44

6.2 LUBRICATION

6.2.1 REDUCTION GEAR

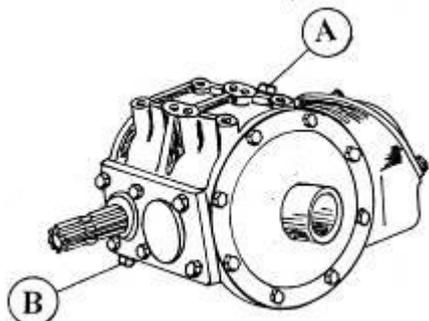


Figure 22. Reduction gear housing

A – oil inlet opening
(oil dipstick)

B – oil outlet opening

Plug A (Figure 13, Pos. A) is used for controlling and refilling of oil in the reduction gear housing.

It is best to perform the discharge of oil immediately after finishing work with the tool since the oil is still warm then, and the residue in it is still not bottom-leveled – do it by unscrewing the oil drain plug B (Figure 22, Pos. B).

When you place the plug B back to its position, you need to pour 2.5 liter of oil through the opening A.

FOR OIL CHANGE, USE

NAME OF MANUFACTURER	OIL CODE
FABRIKA MAZIVA KRUŠEVAC	FAMHIPO 90 EP
RAFINERIJA BEOGRAD	HIPOL B
SHELL	E.P.80
AGIP ROTRA	MP SAE 85W/140

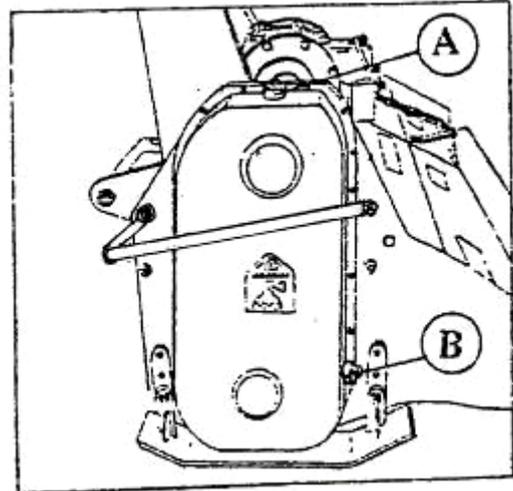
or oils of other manufacturers that are in compliance with the specification

- MIL - L 21 05 B
- API - Service GL 5
- JUS B. H3: 303 MP – 5

6.2.2 LATERAL TRANSMISSION

After every 500 hours of operation remove the cover from the transmission housing and clean it thoroughly. First of all, unscrew all the screws that secure the housing cover, which also allows the oil to flow from the housing, since there is no any special oil drain hole. Remove the housing cover carefully, taking care not to damage the seal. Then, thoroughly rinse the housing with petroleum, as well as the gears. When this is finished, re-secure the cover making sure that no dust and dirt gets into the housing. To put the seal easier when securing the cover, coat it with the technical grease. Then, pour the oil through the opening for filling the oil (see Figure 12, opening A) so that the oil level reaches the oil controller (see Figure 12, opening B).

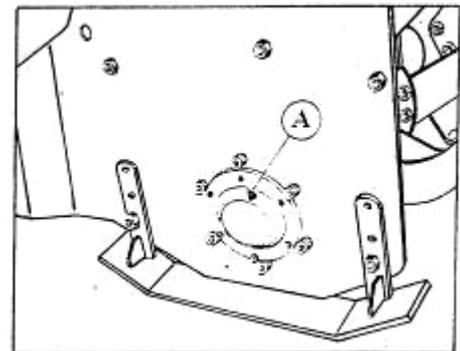
Figure 12. Transmission housing
A - Opening for oil-fill
B - Oil level controller



6.2.3 Lubrication of ROTOR AXIS

Rotor axis is lubricated through grease nipple (marked with A on figure 19.). Prior to lubrication, clean thoroughly the grease nipple with a cloth to remove all dirt.

Figure 19. Lubrication of rotor axis



6.2.4 Lubrication of grease nipple and sliding areas

6.2.5 Lubrication of PTO shaft

6.3 Schedule of regular service and maintenance

7. PARKING AND STORAGE

7.1 Parking

7.2 STORAGE

If you do not use the tiller for a longer period of time, we recommend that you do the following:

8. USEFUL TIPS

9. LIST OF SPARE PARTS

1. Group: Supporting frame - working width 1,4m and 1,6m
2. Group: Pyramid
3. Group: Reductor
4. Group: Lateral transmission
5. Group: Rotor with blades
6. Group: Lateral side - rotor axis
7. Group: Rear cover
8. Group: Shaft - assembly

Options for....



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DECLARATION OF CONFORMITY 2006/42/EC

We,

FPM Agromehanika DOO,
Djordja Simeonovica 25, 19370, Boljevac, Serbia

hereby declare, as manufacturers within our responsibility that the product

Type: Rotary tiller (ROTAS)

Model: FPM 612 836 – working width 1,4 m
FPM 612 837 – working width 1,6 m
FPM 612 838 – working width 1,8 m
FPM 612 839 – working width 2,1 m
FPM 612 840 – working width 2,6 m

is in compliance with the requirements defined by **European Directive 2006/42/EC (for the machines)**.

The product complies with the following standards:

- SRPS EN ISO 12100:2014
- SRPS EN ISO 13857:2010
- SRPS EN ISO 4254-1:2013
- SRPS EN ISO 4254-5:2011
- EN 1553:2000
- SRPS ISO 11684:1999
- SRPS EN ISO 11201:2014

In Boljevac,
26.12.2014.

Authorized person

Branislav Rajic, BA in Mechanical Engineering
Director