



METAL-FACH



STUBBLE CULTIVATOR UNIT
U786, U786/1, U786/2
INSTRUCTION MANUAL
TRANSLATION OF THE ORIGINAL POLISH MANUAL
REV. I
OCTOBER 2017



EC DECLARATION OF CONFORMITY

The undersigned:	Jacek Kucharewicz, Chairman of the Board	
declares hereby with full responsibility, that the complete machine:		
Stubble Cultivator Unit		
0.1.	Brand(s) (manufacturer's registered trademark):	Metal-Fach
0.2.	Type:	U786
	Variant:	U786/...
	Version:	N/A
0.2.1	Vehicle trading name(s) (if any):	N/A
0.3.	Type identification, if marked on the vehicle:	
0.3.1.	Manufacturer's plate (location and method of its attachment):	On the front part of the main frame, glued
0.3.2.	Chassis identification number (location):	
0.4.	Vehicle category ⁽³⁾ :	
0.5	Manufacturer's name and address:	Metal-Fach sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland
<p>complies with all the relevant regulations of Directive 2006/42/EC and Regulation of the Minister of Economy dated 21 October 2008 on principal requirements for machines (Journal of laws of 2008, No. 199, item 1228, as amended)</p> <p>The following harmonized standards were applied to assess the compliance: <u>PN-EN ISO 4254-1: 2016-02, PN-EN ISO 13857: 2010, PN-EN ISO 12100: 2012</u> and standards: PN-ISO 3600:1998, PN-ISO 11684:1998 and Regulation of the Minister of Infrastructure dated 31 December 2002 on technical conditions of vehicles and the range of their necessary equipment (Journal of Laws of 2003, No. 32, item 262, as amended).</p> <p>Safety testing report No.: LBC/80/16</p> <p>This declaration of conformity EC becomes null and void if the machine is changed or reconstructed with no consent of the manufacturer.</p>		

Sokółka
(Location)

26/05/2017
(Date)

Jacek Kucharewicz
(Signature)

Chairman of the Board
(Position)

Machine data

Machine kind:	Stubble cultivator unit
Type designation:	U786
Serial Number ⁽¹⁾ :	_____
Machine manufacturer:	METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Phone: (0-85) 711 98 40 Telefax: (0-85) 711 90 65
Seller:	_____
Address:	_____ _____
Phone/fax:	_____ _____
Delivery date:	_____
Owner or user:	Name: _____
	Address: _____ _____
	Phone/fax: _____

(1) The data is located on the machine rating plate located on the front part of the machine main frame

TABLE OF CONTENTS

INTRODUCTION.....	7
1. General description.....	9
1.1 Stubble cultivator unit identification	9
1.2 Unit intended use	10
1.3 Proper use	10
2. Safety of use.....	11
2.1 General safety principles.....	11
2.2 Technical service activities.....	12
2.3 Transport on public roads	12
2.4 Safety signs	14
3. Dismantling and Disposal	16
4. Lighting signalling system (for versions 3.5m and 3m).....	16
5. Unit design	17
5.1 U786 units technical specification	18
6. Delivery and loading on means of transport.....	19
7. Operation, use and maintenance	19
7.1 Unit preparation	19
7.2 Coupling the unit with the tractor.....	19
7.3 Unit adjustment.....	19
7.3.1 Working depth adjustment of the disc blades	19
7.3.2 Scraper working depth and angle adjustment	19
7.4 Unit operation	20
7.5 Lubrication and storage	21
7.6 Metrical bolt tightening torques	22
8. Residual Risk.....	24
8.1 Residual Risk.....	24
8.2 Residual risk assessment	24
9. Position of the machine centre of gravity	25
10. Stability of the tractor/stubble cultivator unit	25
11. Spare parts catalogue	27
11.1 How to use the spare parts catalogue.....	27
11.2 How to order spare parts	27
GUARANTEE TERMS AND SERVICES UNDER GUARANTEE	28
GUARANTEE CARD.....	30
GUARANTEE REPAIRS	31

CUSTOMER ORDER FORM FOR SPARE PARTS	32
NAME AND ABBREVIATION INDEXES.....	33
ALPHABETIC INDEX	34
NOTES.....	36

INTRODUCTION

This manual describes the operation of the U786, U786/1 and U786/1 Cultivators. If any extraordinary problems, which has not been discussed in the instruction manual attached, arise during the machine operation, please require supplementary information from the manufacturer or dealer. You receive the material obligations of the manufacturer in each Guarantee Certificate, which includes the complete regulations currently in force in the guarantee coverage.

METAL-FACH Sp. z o. o. reserves the right to make changes without prior notifications and without accepting any obligations.

The design of the unit ensures safe operation if they are used in accordance with the instruction manual. Please read therefore this manual before first start-up in order to be thoroughly familiar with the conditions of proper machine operations.

It is obligatory for each user to read and understand the content of this manual before using the machine.

This aims at getting familiar with the principles of correct operation of the unit and ensuring safety of use. It is a condition for proper exercising the warranty rights as well.

The instruction manual constitutes the basic equipment of the machine.

The substantial obligations of the manufacturer are presented in the guarantee card, which includes the complete and currently in force regulations on the guarantee coverage.

If the information included in the instruction manual prove to be incomprehensible, you should address the seller where the machine was purchased or the manufacturer directly for assistance.

The spare parts catalogue functions as a separate list and is attached in the form of a CD during the machine purchase and also is available at the Manufacturer's web site: www.metalfach.com.pl

Manufacturer address:

Metal-Fach sp. z o.o.
ul. Kresowa 62
16-100 Sokółka

Telephone:

Phone: (0-85) 711 98 40
Telefax: (0-85) 711 90 65

Symbols used in the instruction:



WARNING

Hazard warning symbol. It points to the occurrence of a serious hazard condition, which, if not avoided, may result in death or serious injury. The symbol warns against the most dangerous situations.



ATTENTION

The symbol pointing to especially important information and recommendations. Non-compliance with the described recommendations may result in serious damage of the machine due to its incorrect operation.



DANGER

The symbol indicating the possibility of occurrence of a hazard, which, if not avoided, may result in death or serious injury. This symbol informs about lower level of risk of injury than the symbol with the word "DANGER".



The symbol indicating useful information.

1. General description

1.1 Stubble cultivator unit identification

You will find the identification data of the unit on a plate located on the left-hand side wall of the frame, next to the bottom rods of the hitch system, which is illustrated in the drawing below.

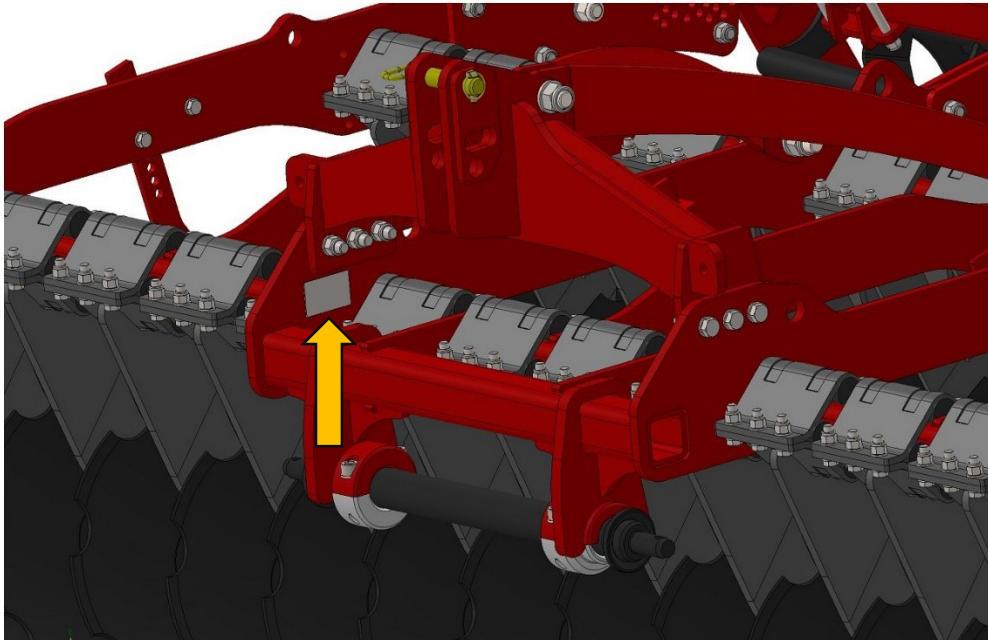


Figure 1. Location of the nameplate on the machine

METAL-FACH ®			
ul. Kresowa 62, 16-100 Sokółka, Poland			
tel.: +48 (85) 711 98 40-45, fax: +48 (85) 711 90 65			
4m stubble cultivator unit			
Symbol	<input type="text" value="U786"/>	Type	<input type="text" value="U786-00"/> CE
Year of manufacture.	<input type="text" value="20"/>	Weight*	<input type="text" value="3000"/> kg
Serial No.	<input type="text"/>	KJ	<input type="text"/>
<small>*Machine curb weight with a tubular shaft_m</small>			
www.metalfach.com.pl			

Figure 2. Rating plate.



Please write down the type and serial number of your unit. Submit this number each time you contact the dealer.

THIS USER MANUAL IS PART OF THE BASIC ACCESSORIES OF THE TOOL CARRIER

1.2 Unit intended use

The compact disc harrow is a versatile implement for cultivating the surface soil layer within the depth range of 5-15cm. Its intended use is both post-harvest tillage, as well as pre-sowing after-harvest soil cultivation and after no-tillage cultivation, when vegetation residue are not covered, but mixed with the upper (surface) soil layer (the so-called mulching). It can be used on all the soil types, including also stony conditions, thanks to the overload protection of the discs (independent disc suspension). The harrow ensures that the soil is loosened and mixed, and also loaded and compacted, when working with the roller. Because of high resistance to clogging, the harrow is excellent for cultivation of high stubble after harvesting cereals and corn, and for cultivation of aftercrops for green manure.

1.3 Proper use

The unit can be started, used and repaired only by persons who are familiar with the operation of the unit and a connectable tractor, as well as with the rules of procedure concerning safe operation of the unit.

The manufacturer shall not be liable for any unauthorised changes in the unit design.

During operation use only factory-made parts produced by METAL-FACH.



ATTENTION

ATTENTION!

The unit is intended solely for use in agriculture. Using it for purposes other than those specified in item 1.2 shall be construed as improper use. Any non-compliance with the unit operation, maintenance measures and perfect technical conditions recommended by the manufacturer shall also be interpreted as improper use.

The manufacturer shall not be liable for any damage arising from improper use of the unit.

2. Safety of use



Before you start operating and using the unit, read this instruction manual, learn the design of its assemblies, their functioning and adjustment ranges and methods, paying special attention to the notes regarding safety of operation.
It will be too late to do this during the operation.

2.1 General safety principles

The safety principles provided below refer to the unit. Notwithstanding, adhere to general safety and accident prevention rules, as well as the road traffic rules.

When operating the tillage unit (stubble cultivator unit + tractor), follow all precautions, particularly:

- before each time you start the operation, ensure that the unit and tractor condition guarantees traffic and operation safety;
- to retain the manoeuvrability, couple the unit with those tractors only which are fitted with a set of front axle weight ballast. The front axle load of the tractor with the suspended unit must be at least 20% of the tractor weight itself;
- follow the acceptable axle loads and transport dimensions;
- when connecting the unit with a tractor, lifting and lowering the unit on the tractor hydraulic lift, folding the the unit to the transport position and extending to the working position, and at headland, verify whether there are any bystanders, particularly children, in the vicinity;
- never stand between the tractor and the unit, when the tractor engine is working;
- noise – equivalent A-weighted emission sound pressure level (LpA) is not above 70 dB;
- when connecting lines to the hydraulic system of the tractor, ensure that the hydraulic system is not under pressure check the position of the control lever of the tractor hydraulic system;
- start the devices controlled by the hydraulic system only when there are no persons within the range of their operation;
- inspect the hydraulic lines and tubes periodically, and replace with new ones if required;
- hydraulic lines must be replaced every 6 years;
- the actions of lifting, lowering, folding and extending, and starting the unit must be executed slowly and without any sudden jerks;
- never reverse the tractor or turn at headland when the machine is lowered in the working position;
- turning at headland consider far-projecting components, do not apply independent brakes of the tractor;
- check tyre pressure of the tractor;
- standing on the unit or loading it with additional weights is forbidden during transport and operation,
- perform all repairs, lubrication or possible cleaning of the working components during operation only when you have switched off the engine and lowered the unit;

- detach the unit from the tractor after you have set it on level, compact surface, unfolded the hitch support and disabled the engine;
- store the unit in the extended position only, propped on all working units;
- during stoppages, store the unit at sites without the access of unauthorised persons or animals;
- Do not leave the vehicle with the machine on a hillside or other sloping surfaces, without securing the vehicle from rolling down; apply the parking brake in the machine and place chocks under the wheels;
- during the tractor and unit operation, there is a risk of lightning strike.

2.2 Technical service activities

Perform any technical service activities after you have lowered the unit to the ground. If the tractor is coupled with the machine, it must have the brakes enabled and the engine disabled.

To perform servicing, use only tools and instruments which are in good working condition and original materials and parts.

Use only common protections and cotter pins to secure pins which are components of the unit. Never use any substitute protections, such as bolts, rods, wires, which may become a cause of damage of the tractor or unit, resulting in hazardous situations during operation or transport.

2.3 Transport on public roads

Pursuant to the road traffic safety provisions (Regulation of the Minister of Infrastructure, Journal of Laws, item 2022 of 15 December 2016.



The unit composed of a farming tractor and a coupled farming machine must meet the same requirements as the tractor on its own.



WARNING

WARNING!

The unit (tractor + machine), being a vehicle part which extends beyond the rear outline of the tractor, impairing the view of the tractor rear lights, is a risk for other vehicles using the road.



ATTENTION

ATTENTION!

It is forbidden to drive the unit (tractor + machine) on public roads without suitable conspicuity markings.

When driving the tractor with unit on public roads, adhere to all provisions of the Road Code in force for this type of vehicles, particularly:

- Set the side sections of the unit in the transport position and secure them with pins against their extending during the passage (see Fig. 3);
- During the transport on public roads, the tillage and sowing units coupled to agricultural tractors require:
 - marking with white-and-red-striped warning marker plates,
 - being fitted with lighting,
 - marking a machine extending beyond the sides of the tractor (white front position lamps),
 - the same rear lamps as for the tractor (integrated lights and red reflective lights),
 - marking with a triangular plate indicating slowly moving vehicles,
- adhering to speed limits during transport, which are:
 - on smooth surface roads (asphalt), up to 20 km/h,
 - on farm or stone-paved roads, up to 6-10 km/h,
 - on potholed roads, up to 5 km/h.

You must adjust the speed to the quality of the road and conditions on the road. Exercise special care during driving past and overtaking and in curves.



ATTENTION

ATTENTION!

The transport width of the U457 unit is 4m (U786/1 is 3.5 m), which requires obtaining special licences and limiting conditions to drive it on public roads.

The accepted machine width to enter and use the public road is 3.0 m.

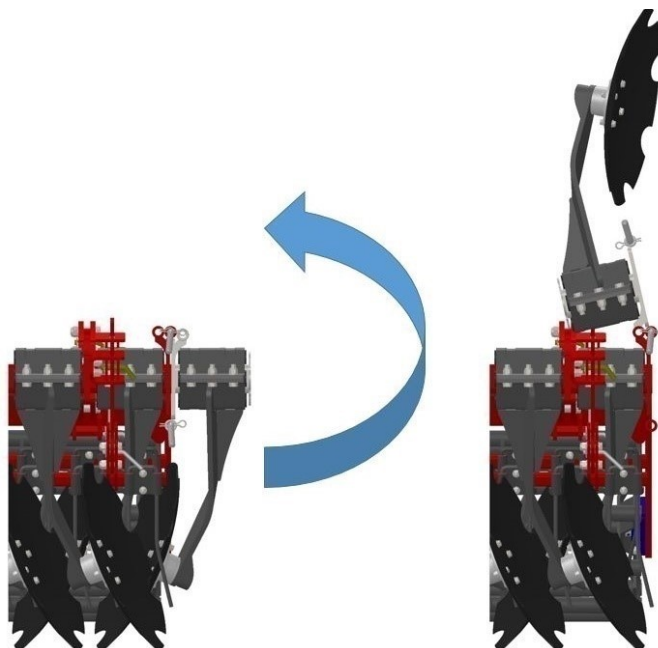


Figure 3. Working and transport positions (folded side sections)

2.4 Safety signs









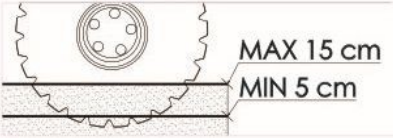
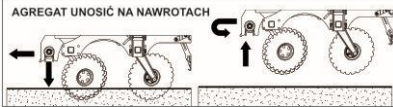
 ATTENTION	<p>ATTENTION!</p> <p>The user of the unit must maintain legibility of all warning inscriptions and signs attached on the machine or accessories over the whole period of operation.</p> <p>If they are damaged or destroyed, replace them with new ones.</p> <p>New safety signs can be purchased from the machine manufacturer.</p> <p>The assemblies replaced during the repair works must be marked with safety signs recommended by the manufacturer.</p>
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Tabela 1. Safety signs

No.	Safety symbol (mark)	Meaning of the symbol or content of the inscription	Position on the trailer
1	2	3	4
1	 1 pc. Dim. 100x50 Colour: yellow background, black signs	Read the instruction manual.	On the front left section of the frame.
2	 1 pc. Dim. 100x50 Colour: yellow background, black signs	Switch off the engine and remove the key before maintenance and repairs.	On the front left section of the frame.
3	 1 pc. Dim. 100x50 Colour: yellow background, black signs	Keep a safe distance from the machine. Danger of crushing by the machine.	On the front left section of the frame.
4	 4 pcs (4m), 6 pcs (3.5m), 5 pcs (3m), Dim. 100x50 Colour: yellow background, black signs	Do not reach into the crushing area if the elements can move.	On the side wall of the unit frame, in the area of adjustment of roller action depth (4m, 3.5m, 3m). On the side wall of the unit frame, in the area of side section folding, on right and left side (3.5m, 3m).

5	 <p>2 pcs Dim. 100x50 Colour: yellow background, black signs</p>	<p>Keep a safe distance from the machine. Danger of crushing toes or a foot. – Force applied from the top.</p>	<p>On the side wall of the unit frame, right and left side.</p>
6	 <p>4 pcs Dimensions: 50x50 Colour: white background, black signs</p>	<p>Pictogram marking the lifting points for loading the machine on transport means.</p>	<p>On both sides of the main frame, near the fixing of the 3-point upper tie-rod and at the sheets of roller fixing.</p>
7	 <p>4 pcs (4m) pcs 2 (3.5m, 3m) Dimensions: 35x25 Colour: white background, black signs</p>	<p>Point of lubrication.</p>	<p>On both sides of the roller frame - bearing lubrication.</p>
8	 <p>1 pc. Dimensions: 180x60 Colour: white background, black signs</p>	<p>Operating depth of the unit.</p>	<p>On the front left section of the frame.</p>
9	<p>SPRAWDZAJ DOKRĘCENIE PIAST TALERZY MOMENT 450 Nm</p> <p>2 pcs Dimensions: 300x50 Colour: yellow background, black signs</p>	<p>Verify the disc hubs are tightened with 450 Nm.</p>	<p>On the side wall of the unit frame, right and left side.</p>

10	 <p>1 pc. Dimensions: 260x70 Colour: white background, black signs</p>	Lift the unit at headland.	On the front left section of the frame.
11	<p>UWAGA !!! AGREGAT PRZEKRACZA DOPUSZCZALNĄ W RUCHU DROGOWYM SZEROKOŚĆ TRANSPORTOWĄ 3M ZABRANIA SIĘ PRZEJAZDU CIĄGNIKA SPRZĘGNIĘTEGO Z AGREGATEM PO DRÓGACH PUBLICZNYCH.</p> <p>1 pc. Dimensions: 260x70 Colour: yellow background, black signs</p>	<p>Note!!! The unit transport width for road traffic is in excess of the permitted width of 3m. It is forbidden to drive the tractor coupled with the unit on public roads.</p>	On the front left section of the frame (3.5 m, 4m).

3. Dismantling and Disposal

The stubble cultivator unit is composed of the materials which do not pose risks for the environment. After the period of use is terminated and further operation is not justified, the unit must be disassembled.

Due to a large number of parts during the disassembly, you must use lifting devices, like an overhead crane or fork lift.

Send the metal parts to a scrap metal yard, and dispose of the rubber parts or send them to sites which are licensed to store such waste. Gather all the used oil from the hydraulic system in the leak-tight containers and send them to petrol stations which collect it.

4. Lighting signalling system (for versions 3.5m* and 3m)

Prior to entrance on the public roads, you should fit the unit frame with a white-and-red-striped warning board, which is fitted with marker lamps, and install a board indicating slow-moving vehicles. Connect the supply cable with the tractor electrical system. The warning board with the conspicuity markings is an additional equipment of the unit and is delivered on request.

* Depending on the laws in force, driving the 3.5-wide machine in some countries is allowed.

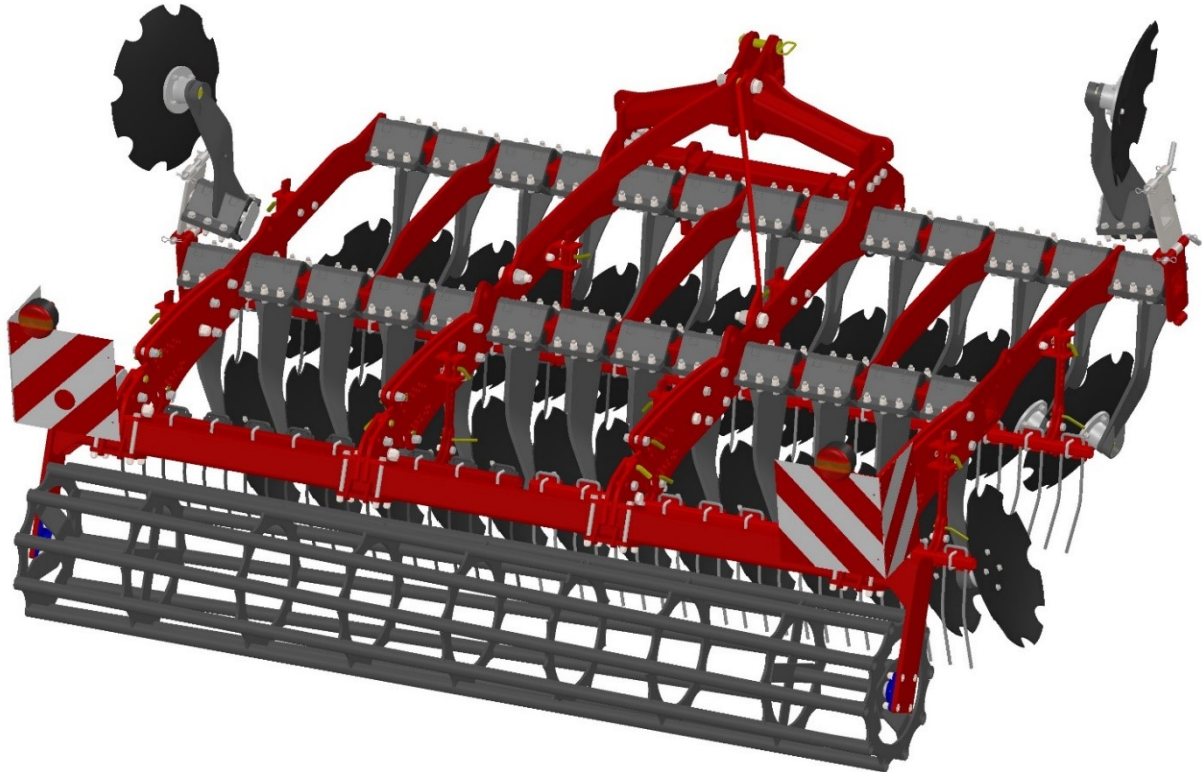


Figure 4. Fixing the lighting on the unit

5. Unit design

The 4-m stubble cultivator unit consists of the following assemblies and subassemblies:

- Main frame with a demountable three-point hitch system, to which two guy ropes are attached, and on the main frame, the disc blades are installed;
- Beams of bottom rods;
- Fixing of the roller with mechanical adjustment of operating depth; the rollers provide compaction of the opened soil to obtain optimised structure for sowing;
- Two beams with spring tines with a feature of working depth and inclination angle adjustments;
- In the 3.5m and 3m versions, two foldable supports of edge discs are installed on the main frame.

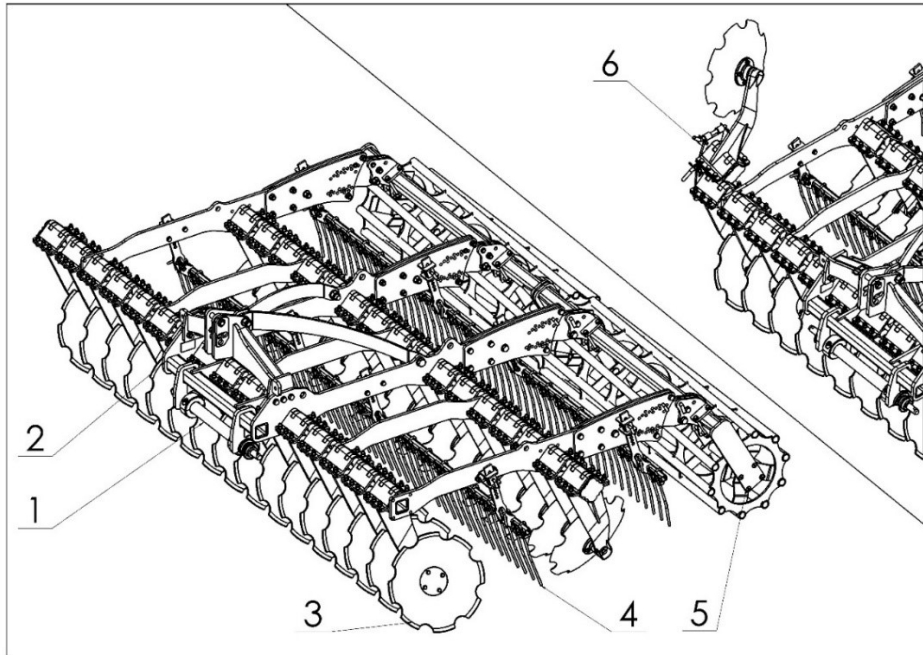


Figure 5. Cultivating and sowing unit: 1- beams of bottom rods, 2- unit frame, 3- disc blade, 4- scraper bar, 5- re-compaction roller, 6- foldable support of the edge disc (versions 3.5m and 3m)

5.1 U786 units technical specification

Tabela 2. Technical specification of the unit

No.	Parameters	UOM	Unit type		
			U786/2	U786/1	U786
1	Unit type	-	Suspended, fixed	Suspended, fixed	Suspended, fixed
2	Working width	m	3	3.5	4
3	Number of discs	pcs	24	28	32
4	Shaft type	-	- tubular (Ø600) - string (Ø600)	- tubular (Ø600) - string (Ø600)	- tubular (Ø600) - string (Ø600)
5	Disc diameter	mm	Ø620	Ø620	Ø620
6	No. of disc rows	pcs	2	2	2
7	Number of scrapers	pcs	34 (2 rows with 17 pcs per each)	42 (2 rows with 21 pcs per each)	46 (2 rows with 23 pcs per each)
8	Working depth range	cm	from 5 cm to 15 cm	from 5 cm to 15 cm	from 5 cm to 15 cm
9	Scale between discs	mm	250	250	250
10	Working speed	km/h	8-15	8-15	8-15
11	Effective capacity	ha/h	3.0-4.5	3.0-5.0	3.0-6.0
12	Power requirement	KM kW	100-160 74-118	120-200 90-150	160-240 118-177
13	Operation	persons	operator	operator	operator
14	Outer dimensions: W/H/L + working dimensions + transport dimensions	mm	3500/1450/2900 3000/2000/2900	4000/1450/2900 3500/2000/2900	4000/1450/2900 4000/1450/2900

No.	Parameters	UOM	Unit type		
			U786/2	U786/1	U786
15	Weight with a tubular shaft	kg	2100	2550	3000
16	Hitch diameter	[mm]	Ø36	Ø36	Ø36
17	Suspension category	-	III	III	III
18	Working depth adjustment	-	Mechanical	Mechanical	Mechanical
19	Clearance under frame	mm	790	790	790
20	Edge shields	-	Optional	Optional	Optional

6. Delivery and loading on means of transport

The unit is delivered for use in a partly disassembled condition. The extent of disassembly depends on the means of transport used. When loading and unloading, use parts of the frame marked on the machine with relevant pictogram as lifting points, see item 2.4.

7. Operation, use and maintenance

7.1 Unit preparation

Check the technical condition of the unit, and particularly its working components to prepare the machine for operation.

Additionally, perform the following:

- Check condition of the bolted joints,
- Check the unit for completeness,
- Turn the discs and rollers manually to check if the rotation is free and unhindered,
- Lubricate relevant components, as per instruction given in item 7.5.

7.2 Coupling the unit with the tractor

To ensure correct and safe coupling of the unit to the tractor, it should stand on solid and level surface.

When connecting the unit with the tractor, perform the following steps:

- Reverse the tractor to a distance which enables connecting the unit hitch with the tractor lower rods
- Connect the upper 3-point tie-rod to the unit and remove its play,
- Lift the unit and secure the lower rods of the tractor.

7.3 Unit adjustment

7.3.1 Working depth adjustment of the disc blades

The working depth of the disc blades can be adjusted with the three-point hitch system of the tractor and mechanical adjustment of the rollers.

The mechanical adjustment is made by adjusting the pin positions.

7.3.2 Scraper working depth and angle adjustment

Setting the working depth of the scrapers should be done by means of cotter pins fixed in proper holes of the plough frogs, secured with locking pins.

The angle however can be adjusted with lower pins of the scraper fixing.

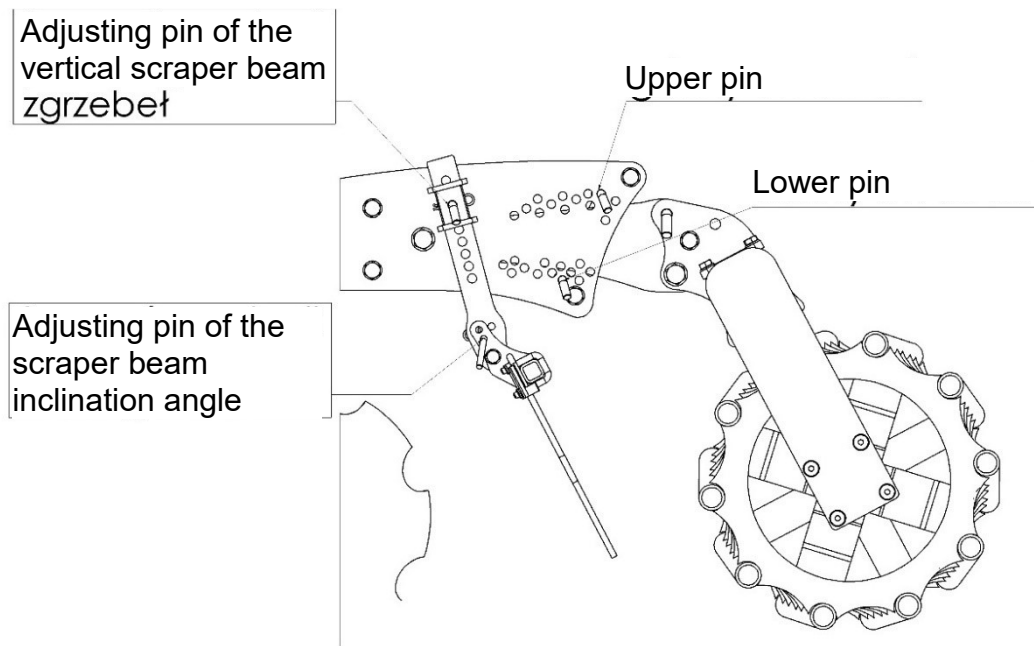


Figure 6. Unit work adjustment

The working depth of the disc blades can be adjusted with the three-point hitch system of the tractor and mechanical adjustment of the rollers. The roller adjustment should be performed with the use of cotter pins fixed in relevant holes of the roller fixing sheet, secured with locking pins (see Fig. 6).

To set the maximum working depth, insert the pin in the upper hole in the sheets of the roller fixing. To set a proper position of the lower pin, lift the roller and insert the pin in a proper hole. The adjustment can be made after stopping at the edge of the field next to elevated ground. Lower the unit roller on the elevated ground, which will make the roller rise and allow for the pin to be inserted in a relevant lower hole. Secure the pins with spring pins (the locking pins must be in the same holes on both sides of the unit). Make the adjustment after you have stopped the tractor engine and follow all the safety rules. Use special care when working with components which can crush feet or hands.

7.4 Unit operation

Before you start the operation of the unit:

- Check condition of the bolted joints – if any play is found, tighten bolts and nuts,
- Remove the warning marking,
- Unfold the unit to the working position (edge discs in versions 3 m, 3.5 m),
- Set the unit working depth,
- Lower the tractor lift and leave it in the floating position.

If during the operation the unit is clogged with excessive amount of vegetative residue, lift it for a moment on the tractor hydraulic lift and clean it.

The unit must be adjusted during first passage. The unit frame is correctly levelled when it is parallel to the field surface.



ATTENTION

ATTENTION!

1. Avoid sudden jerks during the unit operation.
2. Turn gently at headland and make sure you lift the unit to the transport position.
3. Do not reverse or u-turn with the unit at the working position, as it can lead to damage of the unit.



ATTENTION

ATTENTION!

After you have worked with the unit for first 40 hrs, check the disc hub tightening.



ATTENTION

ATTENTION!

If play is found, tighten the 3/4" UNF/16 bolt with a torque wrench according to the torque of 450Nm (wrench size 28) – Fig. 7. Verify the disc hub tightening before the spring and autumn seasons. Tighten the other bolts according to the table no. 3.

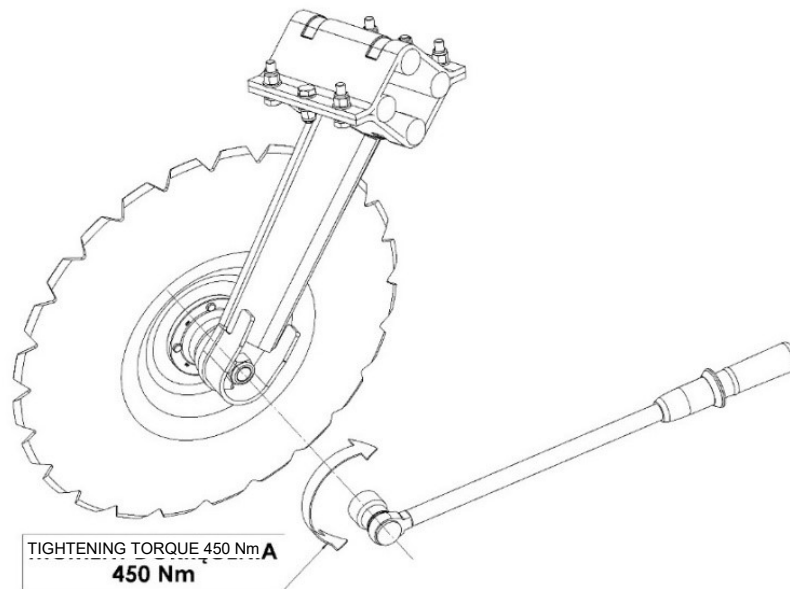


Figure 7. Tightening torque for the disc blade hub

7.5 Lubrication and storage

Durability and good working order of the unit depends primarily on systematic lubrication.

Use mineral greases for lubrication. Before applying the grease, clean the lubrication points. Carry out the lubrication as per Fig. 8.

Use ŁT-4S-3 grease once per season.

The disc blade hubs do not need lubrication.

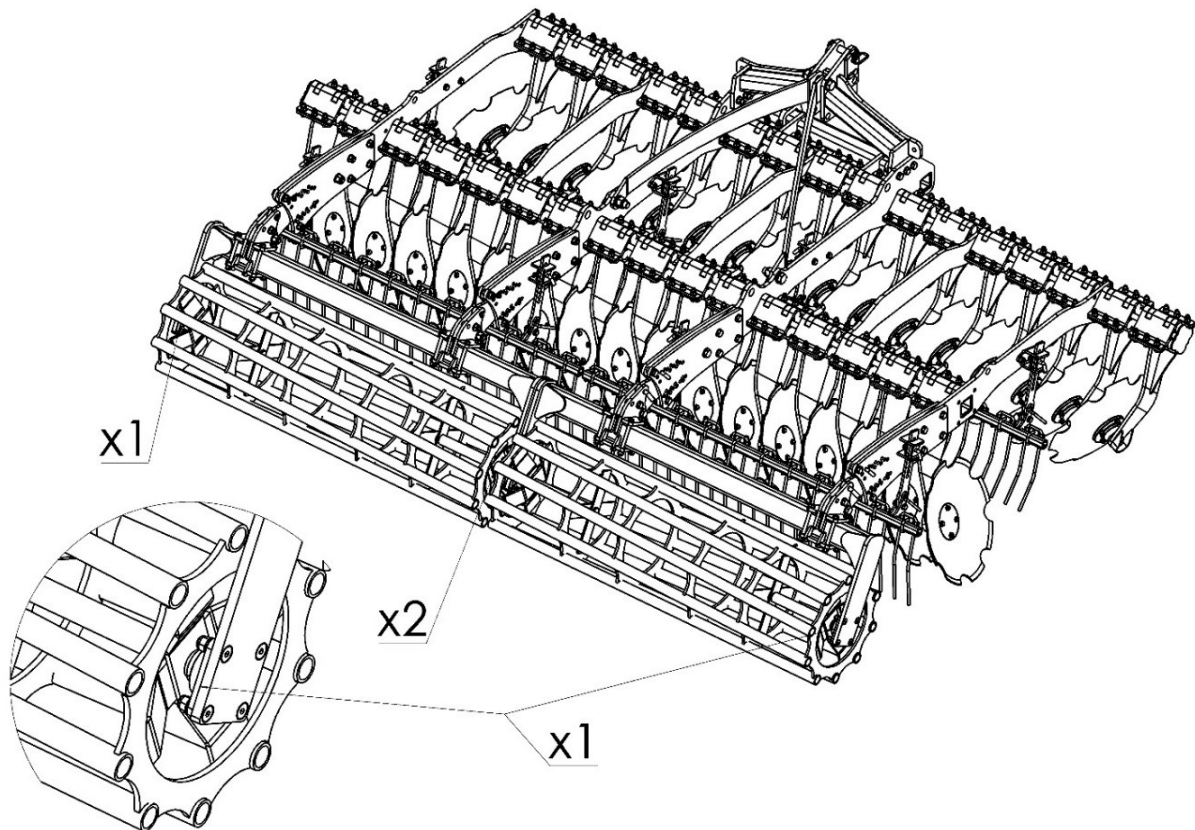


Figure 8. Roller bearing assembly – 4 lubrication points (version 4m), 2 lubrication points (versions 3.5m, 3m)

Before a long-term storage, clean the unit and remove faults found. Protect it from the adverse weather conditions. Store the unit in the extended setting on level compact ground.

7.6 Metrical bolt tightening torques

Optimised tightening torque values for bolts or screws and nuts [Nm].

Tabela 3. Metrical bolt tightening torques

Bolt tightening torques - metrical bolts in Nm							
Size Ø mm	Pitch mm	Bolt version - strength classes					Wheel nuts, wheel bolts
		4.8	5.8	8.8	10.9	12.9	
3	0.50	0.9	1.1	1.8	2.6	3.0	
4	0.70	1.6	2.0	3.1	4.5	5.3	
5	0.80	3.2	4.0	6.1	8.9	10.4	
6	1.00	5.5	6.8	10.4	15.3	17.9	
7	1.00	9.3	11.5	17.2	25	30	
8	1.25	13.6	16.8	25	37	44	
8	1.00	14.5	18	27	40	47	
10	1.50	26.6	33	50	73	86	45
10	1.25	28	35	53	78	91	
12	1.75	46	56	86	127	148	
12	1.50						80
12	1.25	50	62	95	139	163	
14	2.00	73	90	137	201	235	
14	1.50	79	96	150	220	257	140
16	2.00	113	141	214	314	369	
16	1.50	121	150	229	336	393	220
18	2.50	157	194	306	435	509	
18	1.50	178	220	345	491	575	300
20	2.50	222	275	432	615	719	
20	1.50	248	307	482	687	804	400
22	2.50	305	376	502	843	987	
22	2.00						450
22	1.50	337	416	654	932	1090	500
24	3.00	383	474	744	1080	1240	
24	2.00	420	519	814	1160	1360	
24	1.50						550
27	3.00	568	703	100	1570	1840	
27	2.00	615	760	1200	1700	1990	
30	3.50	772	995	1500	2130	2500	
30	2.00	850	1060	1670	2370	2380	

8. Residual Risk

8.1 Residual Risk

Most frequently, residual risk stems from improper procedures implemented by unit operators, their lack of care or knowledge. The greatest hazard occurs in the following cases:

- Operating the unit by underage persons or persons who do not know the instruction manual,
- Operation of the unit by persons under the influence of alcohol or other intoxicating substances,
- Using the unit for purposes other than this described in the instruction manual,
- Standing between the tractor and the unit while the tractor engine is running,
- Bystanders, children in particular, standing close to the running unit,
- Cleaning the unit during operation,
- Handling the moving components of the unit during operation,
- Checking the technical condition of the unit.

When specifying the residual risks, the unit is interpreted as a machine which was designed and made in accordance with the state of art in the year of its manufacture, and meeting basic H&S rules.

8.2 Residual risk assessment

The occurrence of residual risk may be reduced by meeting the recommendations presented below:

- Adhere to the safety rules described in the instruction manual,
- Read the operation manual carefully,
- Reaching into dangerous and prohibited places with your hands forbidden.
- Operating the unit in the presence of bystanders, children in particular, forbidden,
- The unit may be maintained and repaired by properly trained persons only,
- The unit may be operated only by persons who were trained and know the instruction manual,
- Protect the unit against the access by children,
- The unit may be operated by non-disabled persons who are not under the influence of stimulants.



ATTENTION

ATTENTION!

Failure to comply with the instructions and guidance provided herein may result in residual risks!

9. Position of the machine centre of gravity

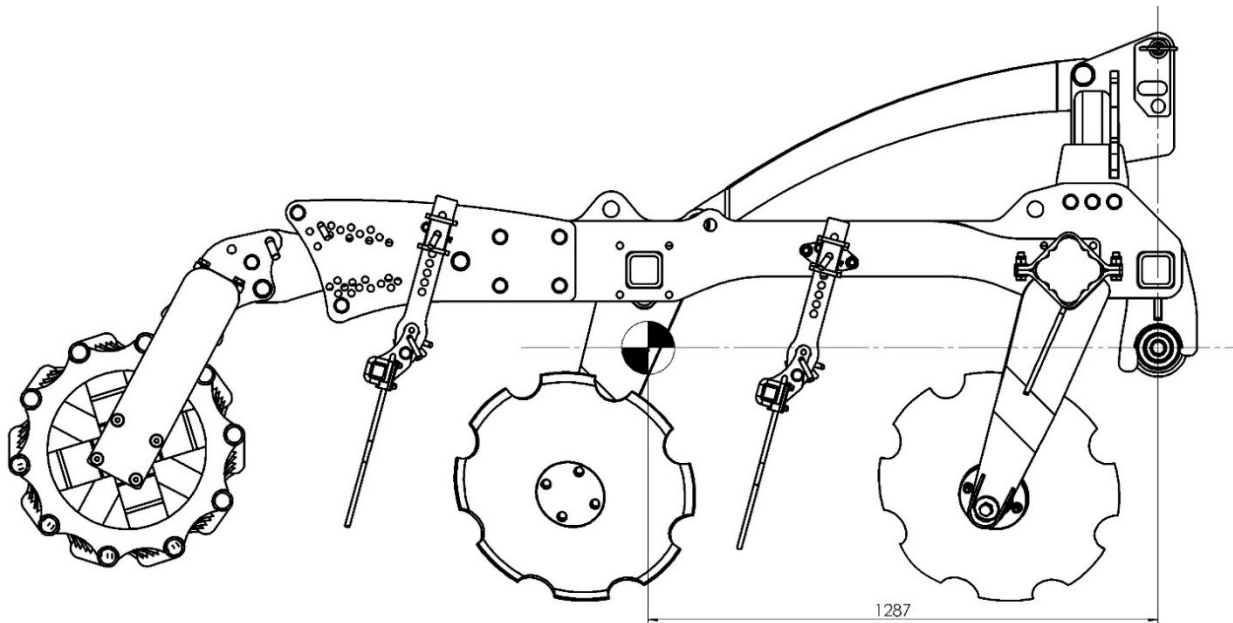


Figure 9. Position of the unit centre of gravity

10. Stability of the tractor/stubble cultivator unit

The traction vehicle should be loaded in the front with the relevant weight to ensure correct steering and braking actions. The front axle load of the tractor with the suspended unit must be at least 20% of the tractor weight itself (Fig. 10).

Remember that the road surface and the pulled machine affect the standard of ride. How you drive must be adjusted to terrain conditions and soil type.

Remember about the wide projection and buoyancy weight of the unit when driving in curves with hitched or semi-suspended machine.

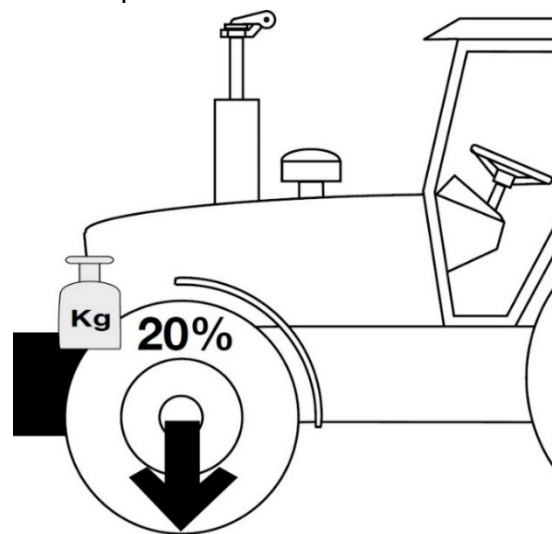


Figure 10. Minimum front axle load of the tractor

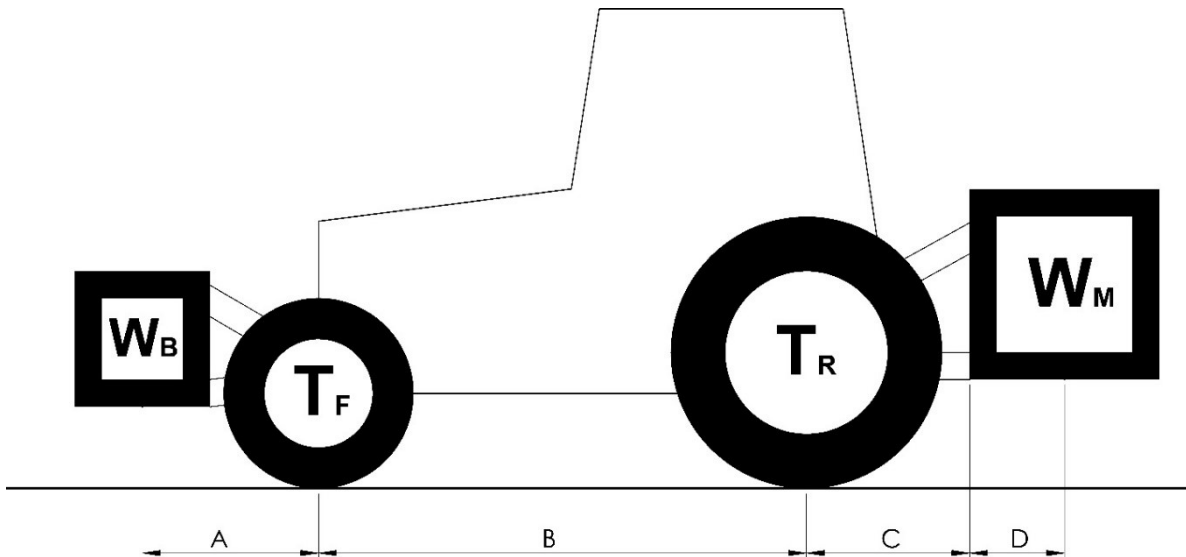


Figure 11. Determining the static stability

You need the following data for the calculation:

$$=*(+)-*+0,2**+$$

- A** [m] - distance from the centre of gravity of the front weight ballast/pulled machine on the front to the front axle centre;
- B** [m] - distance between the tractor wheels;
- C** [m] - distance between the centre of the rear axle and the centre of the lower tie-rod ball;
- D** [m] - distance between the middle of the lower tie-rod ball and the centre of gravity of the machine pulled on the back.
- T_c** [kg] - tractor curb weight;
- T_F** [kg] - empty tractor front axle load;
- T_R** [kg] - empty tractor rear axle load;
- W_M** [kg] - total weight of the machine pulled on the back;
- W_B** [kg] - total weight of the front ballast/machine pulled on the front.

11. Spare parts catalogue

11.1 How to use the spare parts catalogue

The Catalogue should be used as follows:

- a) Determine in which unit of the machine the part to be exchanged is located.
- b) Find respective drawing of the unit, and the corresponding number of the part to be found.
- c) With reference to this number, look in the description of the table for a relevant number in the drawing or order number and the number of pieces.

11.2 How to order spare parts

Order spare parts on the telephone or sending an e-mail including the following:

- a) The exact address of the customer,
- b) Name, code and serial number of the machine, manufacture year,
- c) Exact name of the part,
- d) No. of the drawing or standard in the spare parts catalogue,
- e) Number of pieces,
- f) Terms of payment.

The parts are delivered by courier company or the customer can collect them on its own from the manufacturer or from the local Metal-Fach distributor.

GUARANTEE TERMS AND SERVICES UNDER GUARANTEE

Detailed information on the guarantee terms for the agricultural equipment are stipulated in the Civil Code, Section III, Guarantees, Article 577-581. That information should be available in all the distribution centres of the agricultural equipment and in all repair garages of such equipment.

The services under the guarantee are to be executed by: (seller/dealer) - entered in the guarantee certificate during the sale.

Terms of guarantee:

1. Prior to the commencement of the operation, the user shall read this instruction manual carefully to avoid unnecessary defects, as failure to comply with the rules of proper operation leads to decreasing the fitness of the machine and loss of the guarantee entitlement.
2. The manufacturer hands over the machine designed and made according to the standards in force. The manufacturer guarantees that the supplied tool carrier is free from any manufacturing faults.
3. Metal-Fach Sp. z o.o. provides the machine with the guarantee period service during 24 months counted from the date of the first sale, at its use as intended, complying at the same time with the recommendations included in this instruction.
4. The prove of providing the guarantee by the manufacturer is the guarantee card correctly filled up by the dealer with the customer signature, confirming acceptance of the guarantee terms.
5. The guarantee shall include the defects of the machine caused by:
 - Defective assembly,
 - Incomplete delivery,
 - Faulty manufacturing of parts or assemblies,
 - Hidden defects of material,
 - Damage during transport (only manufacturer's transport).
6. The guarantee does not cover damages of the hydraulic system resulting from oil contamination.
7. The guarantee does not cover the parts subject to general wear, i.e. working components, cultivator points, springs, hydraulic hoses, Packer roller sweepers, bearings, fluids and lubrication agents, bulbs.
8. The guarantee does not cover mechanical damages and damages resulting from incorrect operation, incorrect maintenance and incorrect setting of the unit.
9. The guarantee does not cover damages resulting from incorrect storage of the machine.
10. Loss of the guarantee results from any unauthorised changes performed by the user.
11. The manufacturer is not liable for loss, damage or destruction of the product resulting from the causes other than the inherent faults of the supplied machine.
12. During the guarantee period the manufacturer shall perform all guarantee repairs of the faults caused by the manufacturing plant, except for the faults mentioned in points 6 to 10.
13. The guarantee repair shall be executed within 14 work days from the date of reporting/supplying the machine to the indicated service centres or on any other time agreed upon.
14. The guarantee shall be extended for the duration of the repair period.

15. The repairs under the guarantee shall be executed by the service centres for full charge.
16. The repairs performed by the service points in the guarantee period that are not covered by the guarantee shall be fully paid for. Prior to execution of such a repair the service point shall agree its performance with the user, proposing the scope of the repair, its planned costs and time of execution.
17. The decision on performing a machine repair for a charge during the guarantee period is taken by the customer.

GUARANTEE CARD

Metal-Fach sp. z o.o.
ul. Kresowa 62
16-100 Sokółka

.....
(name of the machine)

Guarantee services on behalf
of the manufacturer are rendered by _____

Filled up by the Seller

Manufacturing date _____

Serial number _____

Date of sale _____

Seller signature _____

Buyer's first and last name _____

Address _____

Buyer signature _____

GUARANTEE REPAIRS

No.	Date of breakdown removal	Description of performed actions and replaced parts	Guarantee period of the indicated part extended till	Seal and legible signature

CUSTOMER ORDER FORM FOR SPARE PARTS

1. Customer.....

[Full name, Tax Identification Number]

2. Address.....

(Postal code, place, street, no.)

3. Phone number.....

4. Ordered part specification:

No.	Machine/device name	Name of the parts	Order No.	Number of pcs.

.....
 (Place, date)

.....
 (legible signature of the customer)
 (Company stamp)

5. The order completed on:

.....
 (Legible signature of the Service centre employee)

- to be invoiced

- invoiced - No. of the Invoice.....

NAME AND ABBREVIATION INDEXES

OHS - occupational health and safety;

dB (A) - decibel A, sound pressure unit;

kg - kilogram, weight unit;

km/h - kilometre per hour, linear speed unit;

HP – horse power, power unit;

kN – kilonewton, power unit;

kW - kilowatt, power unit;

mm - millimetre, an auxiliary length unit equal to 0.001m;

Nm – newton metre, a unit of torque and moment of force;

Pictogram - an information plate;

Rating plate – a manufacturer's plate unambiguously identifying the machine;

UV – ultraviolet radiation, invisible electromagnetic, invisible electromagnetic radiation with negative effect on human health, the UV radiation has a negative effect on rubber parts;

V - Volt, voltage unit;

ALPHABETIC INDEX

A	
Assembly	16
C	
Centre of gravity	25
Coupling the unit with the tractor	19
D	
Disposal	16
F	
First starting up	21
G	
Guarantee	28, 29
Guarantee terms	28
Guarantee repairs	31
H	
Hitch, Three-point	9, 20
K	
Lighting signalling system	16, 17
Loading	19
Lubrication	22
Lubrication points	22
M	
Maintenance	19
Metrical bolt tightening torques	22
O	
Oil	16
P	
Pictograms	14-16
R	
Rating plate.	9
Risk	24
S	
Safety principles	11
Safety signs	14
Storage	22
T	
Technical service activities	12
Technical characteristics	18

Transport	12, 19
U	
Unit adjustment	41, 42
Unit design	17
Unit identification	9
Unit preparation	19



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The pictures do not necessarily show standard accessories.

Original spare parts are available from authorised dealers, located both in Poland and abroad, and also at the Metal-Fach retail outlet.

SERVICE

16-100 Sokółka, ul. Kresowa 62
Tel.: +48 85 711 07 80; Fax: +48 85 711 07 93
serwis@metalfach.com.pl

SALES

16-100 Sokółka, ul. Kresowa 62
Tel.: +48 85 711 07 88; Fax: +48 85 711 07 89
handel@metalfach.com.pl

SPARE PARTS WHOLESAL STORE

16-100 Sokółka, ul. Kresowa 62

Wholesale:

Tel.: +48 85 711 07 80; Fax: +48 85 711 07 93
serwis@metalfach.com.pl

Retail:

Tel.: +48 85 711 07 80; Fax: +48 85 711 07 93
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CURRENT INFORMATION ABOUT OUR PRODUCTS CAN BE FOUND AT WWW.METALFACH.COM.PL