



METAL-FACH



**MOUNTED DISC SEED DRILL CULTIVATOR
U740/25, U740/30, U740/35, U740/40, U740/50**

USER MANUAL

TRANSLATION OF THE ORIGINAL USER MANUAL

ISSUE 5

07/08/2023



EC DECLARATION OF CONFORMITY

The undersigned,	Jacek Kucharewicz, President of the Board,	
hereby declares, with full responsibility, that the complete machine:		
Mounted disc seed drill cultivator		
1.1.	Brand (trading name of the manufacturer):	Metal-Fach
1.2.	Type:	U740
1.2.1.	Variant:	
1.2.2.	Version:	
1.2.3.	Trade name(s) (if any):	U740/25/30/35/40/50
1.3.	Category, subcategory and vehicle speed indicator	
1.4.	Company name and manufacturer's address:	Metal-Fach Sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland
1.4.2.	Name and address of the manufacturer's authorised representative (if applicable)	
1.5.1.	Location of the manufacturer's rating plate	On the front part of the main frame of the machine
1.5.2.	Method used to fix the manufacturer's rating plate:	Bonded
1.6.1.	Location of the vehicle identification number on the chassis:	
2.	Machine identification number: (Location):	UAGR#.....
3.	Function:	Topsoil cultivation
<p>referred to in this declaration, meets the requirements of: Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery (Official Journal EU L157 of 09.06.2006, pp.24-86), the Regulation of the Minister of Economy of 21 October 2008 on basic requirements for machinery (Polish Journal of Laws 199, item 1228) and the Announcement of the Minister of Infrastructure and Construction of 27 October 2016 on the announcement of the consolidated text of the Regulation of the Minister of Infrastructure on the technical conditions of vehicles and the scope of their necessary equipment (Polish Journal of Laws 2016, item 2022)</p> <p>The following harmonised standards were applied in order to assess compliance. PN-EN ISO 4254-1:2016-02, PN-EN ISO 13857:2020-03 and standards and regulations: PN-EN ISO 12100:2012, ISO 3600:2015, PN-ISO 11684:1998</p> <p>Safety test report no. LBC/46/22</p> <p>The person responsible for making the technical documentation of the machine available is the Head of the Design and Technology Department, Metal-Fach sp. z o.o., ul. Kresowa 62, 16-100 Sokółka, Poland</p> <p>This EC Declaration of Conformity shall become null and void if the machine is modified or reconstructed without the manufacturer's consent.</p>		

Sokółka, Poland
(Place)

16 May 2023
(Date)

Jacek Kucharewicz
(Signature)

President of the Board
(position)

Machine data

Machine type:	Mounted disc seed drill cultivator
Type designation:	U740
Serial number ⁽¹⁾	_____
Machine manufacturer:	METAL-FACH Sp. z o.o. 16-100 Sokółka, Poland ul. Kresowa 62 Tel: (0-85) 711 98 40 Fax: (0-85) 711 90 65
Reseller:	_____
Address:	_____ _____
Tel/Fax:	_____ _____
Delivery date:	_____
Owner or user:	Surname: _____
	Address: _____ _____
	Tel/Fax: _____

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

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INTRODUCTION

The information included in the user manual is valid as of the date it was drawn up. The manufacturer reserves its right to make design changes to machines, and due to this, some values or illustrations might not correspond to the actual specifications of the machine supplied to the user. The manufacturer reserves its right to make design changes without amending these instructions. The user manual is part of the basic equipment of the machine. Before using the machine, the user is obliged to read the contents of this user manual and to comply with its recommendations. This will ensure the safe operation and reliable performance of the machine.

The machine has been designed in accordance with the standards and legal provisions contained in the Declaration of Conformity. This user manual defines the basic safety and operation principles regarding the agricultural trailer manufactured by Metal-Fach.

The significant obligations of the manufacturer are shown in the Warranty Card, which includes the complete regulations currently in force regarding guarantee services.

If you do not understand the information in the instruction manual, consult the original reseller of this machine or the manufacturer directly.

The spare parts catalogue functions as a separate list, and is attached in the form of a CD at the time of the machine's purchase, and it is also available on the manufacturer's website: www.metalfach.com.pl.

Pursuant to the Act of 4 February 1994 on Copyright and Related Rights (Polish Journal of Laws of 2017, item 880), this user manual is protected by copyright. It is prohibited to copy and distribute the contents and figures herein without the consent of the copyright owner.

Manufacturer address:

Metal-Fach Sp. z o.o.
ul. Kresowa 62
16-100 Sokółka, Poland

Contact:

Tel: (0-85) 711 98 40
Fax: (0-85) 711 90 65

The symbols used in these instructions:



Hazard warning symbol: indicates a severe hazard that, if not avoided, may result in death or serious injury. This symbol warns against the most dangerous situations.

DANGER



Symbol indicating especially important information and recommendations. Non-compliance can lead to serious damage to the machine, resulting from its incorrect operation.

CAUTION



This symbol indicates potential hazards that, if not avoided, can result in death or serious injury. This symbol indicates a lower level of risk of injury than the DANGER symbol.

WARNING



Symbol indicating useful information.

1. General description

1.1 Introduction

THIS USER MANUAL IS PART OF THE BASIC EQUIPMENT FOR THE "KRUK" MOUNTED DISC SEED DRILL CULTIVATOR

The machine can only be operated by persons who have read this user manual, are familiar with the design and operation of the unit, and also with the operation of the tractor it works with.

Read and follow all the information provided in this user manual in order to operate the machine in a safe manner. Abiding by the guidelines provided in the user manual ensures safe operation for the user, and also prolongs the machine's service.

1.2 Identification of the "KRUK" mounted disc seed drill cultivator

The instructions apply to cultivators with working widths of: 2.5 m; 3 m; 3.5 m; 4 m and 5 m. You will find the identification details 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.

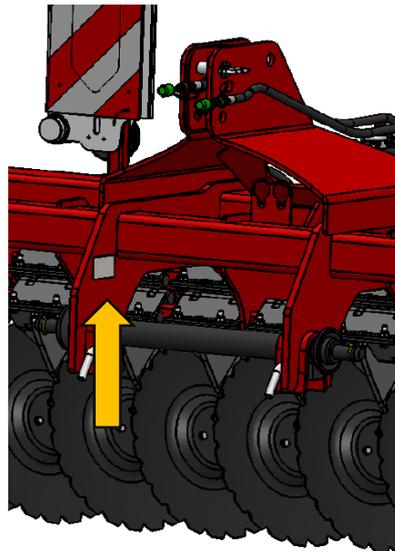


Figure 1. Location of the rating plate on the machine



Figure 2. Sample rating plate



Upon purchase, check the compliance of the serial number located on the machine's rating plate with the number provided in the Warranty Card.



It is often required to provide the cultivator's VIN to identify the machine in an unambiguous manner when ordering spare parts or if any other problems arise. Therefore, it is advisable that you write down the number provided below.

Unit serial number:

U	A	G	R	#						
---	---	---	---	---	--	--	--	--	--	--

THIS USER MANUAL CONSTITUTES A BASIC ELEMENT OF THE MACHINE.

1.3 Unit's intended use

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

1.4 Proper use

The unit can be started, used and repaired only by persons who are familiar with the operation of the unit and 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 cultivator's design.

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



CAUTION

CAUTION!

The unit is intended solely for use in agriculture. Using it for purposes other than those specified in item 1.3 shall be construed as improper use. Non-compliance with the manufacturer's recommended operating and maintenance conditions shall also be regarded as misuse.

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

1.4.1 Incorrect and prohibited uses

The following uses are incorrect and prohibited:

- aggregation of the machine with tractors which do not meet the requirements specified in the manual (characteristics shown in Table 2);
- checking the technical condition and cleaning the machine while the tractor engine is running;
- using faulty hydraulic hoses;
- operation of the machine while under the influence of alcohol or drugs;
- working with a defective machine;
- leaving the machine unsecured on slopes;
- working on sloping terrain;
- entering the area between the tractor and the machine with the engine running;
- any other use of the machine not in compliance with its intended purpose.



DANGER

DANGER!

Use of the machine other than for its intended purpose is prohibited. It may result in damage to the machine, loss of health or life of the machine's operator and/or of bystanders and loss of warranty.

2. Safety of use



Before you start operating and using the unit, read this user manual, learn the design of its assemblies, their functioning and adjustment ranges and methods, paying special attention to the notes regarding safety of operation.
Doing this at work will be too late!

2.1 General safety principles

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

When operating the tillage unit (mounted disc seed drill cultivator unit + tractor), follow all precautions, particularly:

- before starting the operation each time, ensure that the unit and tractor's condition guarantees traffic-related and operational safety;
- to retain manoeuvrability, couple the unit only with tractors that are fitted with a front axle weight ballast set. 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 unit into 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 running;
- noise – equivalent A-weighted emission sound pressure level (LpA) does not exceed 70 dB;
- when connecting lines to the hydraulic system of the tractor, ensure that the hydraulic system is not pressurised
- check the position of the control lever of the tractor hydraulic system;
- hydraulically controlled devices can only be operated when no-one is within their range;
- 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 make turns when the machine has been lowered to its working position;
- when turning, consider far-projecting components – do not apply the tractor's independent brakes;
- check the tractor's tyre pressure;
- 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 a 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 cultivator at sites inaccessible to unauthorised persons or animals;
- Do not leave the vehicle with the machine on hillsides or other sloping surfaces without securing the vehicle against rolling down. apply the parking brake to the machine and put chocks under the wheels;
- during tractor and unit operation, there is a risk of being struck by lightning.
- before reversing, bystanders must be warned by means of an audible signal or by the assisting person.

2.2 Technical maintenance

Perform any technical service activities after you have lowered the cultivator 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 tools and instruments that are in a good working condition, and only use original materials and parts.

Typical locks and cotter pins must be used to secure the pins that make up the unit. Never use any substitute protections, such as bolts, rods or wires, which may become a cause of damage to the tractor or unit, resulting in hazardous situations during operation or transport.

2.3 Transport on public roads

Pursuant to the provisions regarding road traffic safety (Regulation of the Minister of Infrastructure, Polish Journal of Laws, Item 2022, dated 27 October 2016.



A combination consisting of an agricultural tractor and an agricultural machine aggregated with it must meet the same requirements as the tractor itself.



WARNING

WARNING!

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



CAUTION

CAUTION!

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

When driving the tractor coupled with the cultivator on public roads, follow all the provisions of the Highway Code in force for this type of vehicle, particularly the following:

- Place the side sections of the unit in the transport position and secure them with pins against extending while driving (see Fig. 3);
- During transport on public roads, the mounted disc seed drill cultivators coupled to agricultural tractors require:
 - marking with white and red-striped warning marker plates,
 - installed lighting,
 - marking of the machinery 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 slow moving vehicles,
- the travelling speed during transport must be adjusted:
 - on smooth surface roads (asphalt), up to 40km/h (25 mph),
 - on farm or stone-paved roads, 6–10 km/h (4–6 mph),
 - on potholed roads, up to 5 km/h (3 mph).

You must also adjust the speed to the quality of the road and conditions on the road. The user must be particularly careful when passing and overtaking, as well as on turns.



CAUTION

CAUTION!

The transport width of the U740/35, U740/40 and U740/50 units exceeds the permissible transport width, making it impossible to drive on public roads without special permits and conditions.

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



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

2.3.1 Signal lights

Prior to entrance onto 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's electrical system. The warning board with the markings is additional unit equipment and is delivered on request.

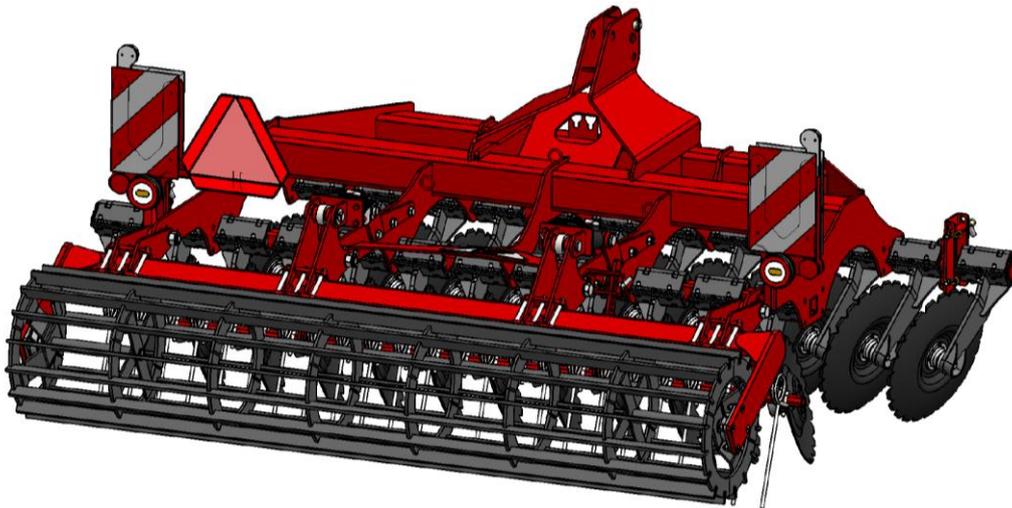


Figure 4. Fixing the lighting on the unit

2.4 Safety signs



CAUTION

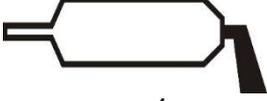
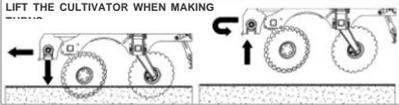
CAUTION!

The unit user must maintain legibility of all warning inscriptions and signs attached to the machine or accessories across the entire period of operation. If they are damaged or destroyed, replace them with new ones.

New safety signs can be purchased from the machine manufacturer. The assemblies replaced during repair works must be marked with the safety signs recommended by the manufacturer.

Tabel 1. Safety signs

No.	Safety symbol (sign)	Safety symbol (sign) meaning or notice text	Location on the machine
1	2	3	4
1	 <p>pcs.1 Size100x50 Colour: yellow background, black symbols</p>	Read the user manual.	On the front left section of the frame.
2	 <p>pcs.1 Size100x50 Colour: yellow background, black symbols</p>	Switch off the engine and remove the key before maintenance and repairs.	On the front left section of the frame.
3	 <p>pcs.1 Size100x50 Colour: yellow background, black symbols</p>	Keep a safe distance from the machine. Danger of crushing by the machine.	On the front left section of the frame.
4	 <p>pcs. 2 Size100x50 Colour: yellow background, black symbols</p>	Do not reach into the crushing area if the elements can move.	On the side wall of the unit frame, right and left side.
5	 <p>pcs.2 Size100x50 Colour: yellow background, black symbols</p>	Keep a safe distance from the machine. Danger of crushing toes or feet. – Force applied from the top.	On the side wall of the unit frame, right and left side.

6	 <p>pcs.4 Size: 50x50 Colour: white background, black symbols</p>	Pictogram marking the lifting points for loading the machine on the means of transport.	On both sides of the main frame, near the fixing of the upper 3-point connecting-rod and at the shaft's fixing plates.
7	 <p>pcs.4 Size: 35x25 Colour: white background, black symbols</p>	Lubrication point	On both sides of the shaft frame - (bearing lubrication) and at the hydraulic cylinders
8	 <p>MAX 15 cm MIN 5 cm</p> <p>pcs.1 Size: 180x60 Colour: white background, black symbols</p>	Operating depth of the unit.	On the front left section of the frame.
9	<p>CHECK THE TIGHTNESS OF THE DISC HUBS TORQUE: 300 Nm - SKF / 350 Nm - NKE</p> <p>pcs.2 Size: 300x50 Colour: yellow background, black symbols</p>	Check tightness of disc hubs 300Nm - SKF / 350Nm - NKE.	On the side wall of the unit frame, right and left side.
10	 <p>LIFT THE CULTIVATOR WHEN MAKING</p> <p>pcs.1 Size: 260x70 Colour: white background, black symbols</p>	Lift the cultivator, when making turns.	On the front left section of the frame.
11	<p>CAUTION!!!</p> <p>THE UNIT ROAD TRAFFIC TRANSPORT WIDTH IS IN EXCESS OF THE PERMITTED WIDTH OF 3 M. IT IS FORBIDDEN TO DRIVE THE TRACTOR COUPLED WITH THE UNIT ON PUBLIC ROADS.</p> <p>pcs.1 Size: 260x70 Colour: yellow background, black symbols</p>	<p>Note!!!</p> <p>The unit road traffic transport width is in excess of the permitted width of 3 m. 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, 4 m, 5 m).

3. Technical specifications of U740 units

Tabel 2. Unit technical specifications

No.	Parameters	UOM	Unit type					
			U740/25 mounted	U740/30 mounted	U740/35 mounted	U740/40 mounted	U740/50 mounted	
1	Unit type	-	U740/25 mounted	U740/30 mounted	U740/35 mounted	U740/40 mounted	U740/50 mounted	
2	Working width	m	2.5	3	3.5	4	5	
3	Number of discs	pcs.	20	24	28	32	40	
4	Roller type [kg]	Tubular roller	1	350	380	450	500	660 (2 pcs)
		U-box roller	1	-	460	600	-	-
		Double U-box roller	1	520	610	750	-	1040 (2 pcs)
		Packer roller	1	-	530	-	680	-
		DD-type heavy roller	1	540	600	-	-	1100 (2 pcs)
		String roller	1	-	430	540	-	-
		V-ring roller	1	340	400	-	-	680 (2 pcs)
		crushing and compacting roller		-	460	550	-	-
5	Disc diameter	mm	Ø560					
6	No. of disc rows	pcs.	2					
7	Number of scrapers	pcs.	20	24	28	34	44	
8	Working depth range	cm	from 5 cm to 15 cm					
9	Scale between discs	mm	250					
10	Working speed	km/h	9–15					
11	Effective capacity	ha/h	2.25–3.75	2.7–4.5	3.15–5.25	3.6–6	4.5–9	
12	Power requirement	HP kW	80–110 60–80	110–130 80–95	120–150 90–110	140–170 105–130	180–200 132–147	
13	Operation	-	Operator					
14	Outer dimensions: W/H/L + working dimensions + transport dimensions	mm	2980/1500/28 50 2500/1500/28 50	3530/1500/2850 3000/1500/2850	4020/1500/2850 3500/1500/2850	4600/1500/2850 4000/1500/2850	5500/1500/2850 5000/1500/2850	
15	Weight of unit without shaft	kg	1250	1420	1570	1780	2230	
16	Hitch diameter	mm	Ø36					
17	Hitch category	-	III					
18	Working depth adjustment	-	hydraulic					
19	Clearance under frame	mm	575					
20	Disc row spacing	cm	80					
21	Edge shields	-	Optional					

4. Unit design

The disc seed drill cultivator unit consists of the following assemblies and sub-assemblies:

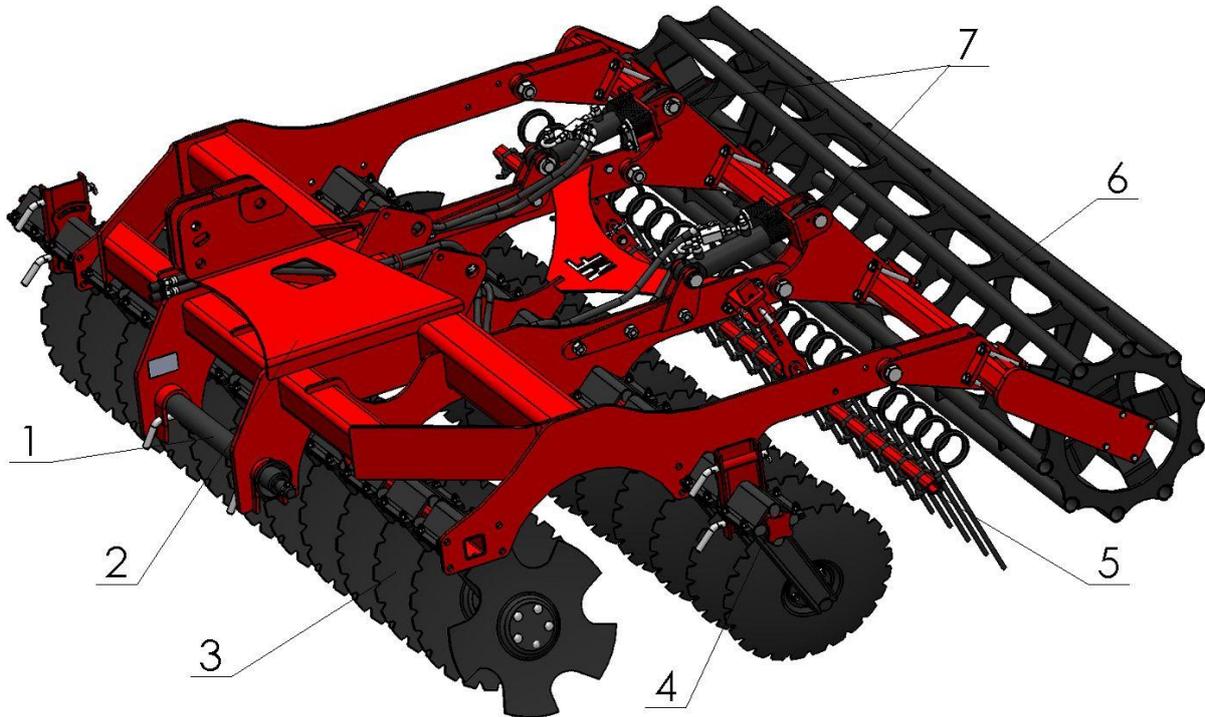


Figure 5. 1 – Lower link beam, 2 – Unit frame, 3 – Disc cutter, 4 – Outer disc support, 5 – Scraper beam, 6 – Shaft, 7 – Working depth adjustment.

4.1 Cultivator's hydraulic system.



CAUTION

CAUTION!

The cultivator's hydraulic system operates under high pressure. There is a risk of injuries from a high pressure oil stream or from burns caused by hot hydraulic oil. If injured due to high pressure or a hot oil burn, seek medical help immediately.



CAUTION

CAUTION!

Before performing any work on the hydraulic system, disconnect the hydraulic hoses and deactivate the tractor's engine. Carry out routine inspections of the hydraulic hoses and if any damage is found, replace them immediately with new ones that meet the technical requirements of the manufacturer.

4.1.1 Diagram and design of the hydraulic system

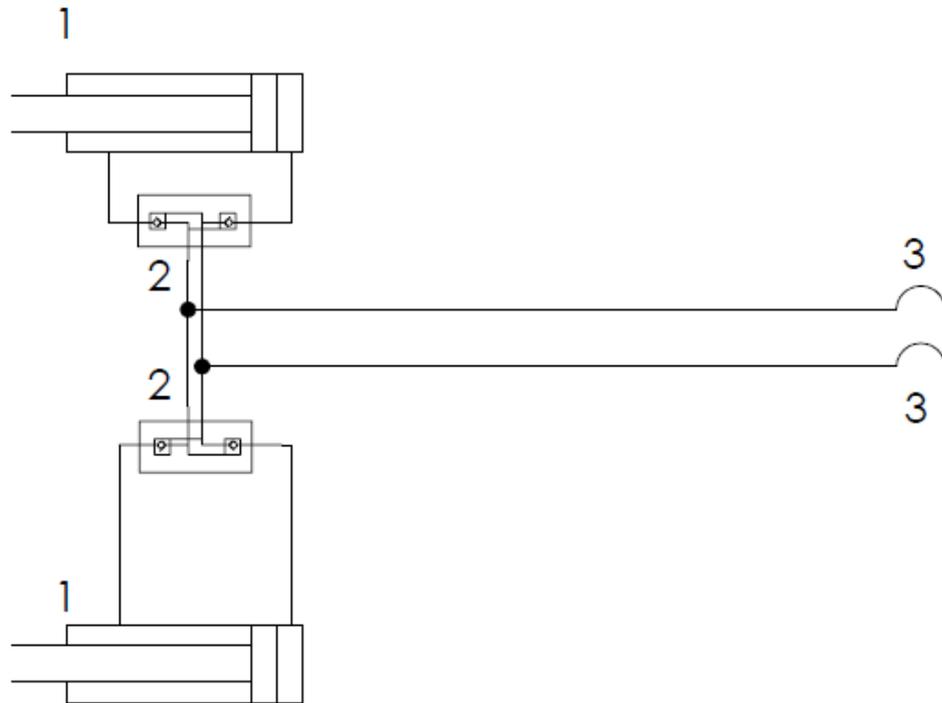


Figure 6. Hydraulic system diagram for U740/25, U740/30, U740/35, U740:
1 - Shaft actuator, 2 - Controlled twin check valve, 3 - Hydraulic coupling.

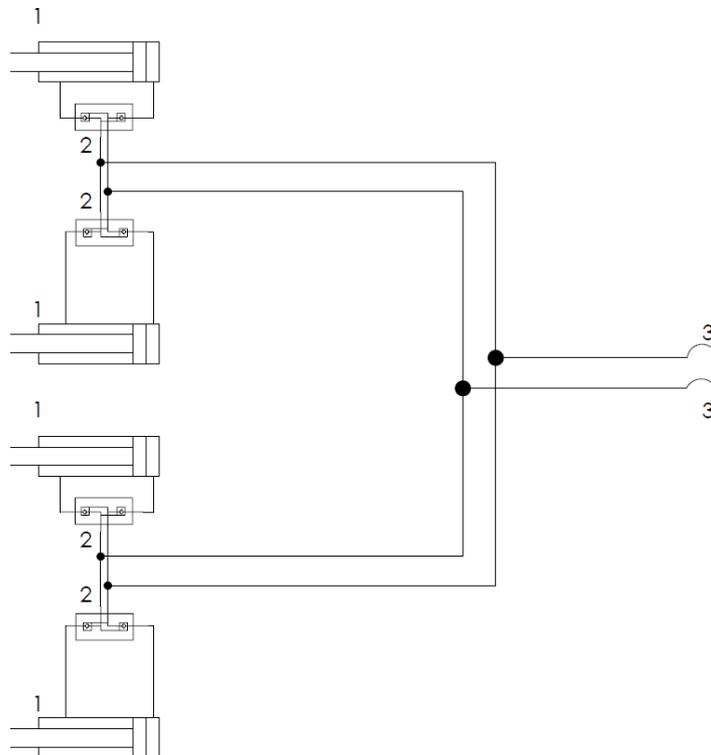


Figure 7. Hydraulic system diagram for U740/50:
1 - Shaft actuator, 2 - Controlled twin check valve, 3 - Hydraulic coupling.

4.1.2 Hydraulic system connection

- When connecting the hydraulic hoses, make sure you connect them to the tractor correctly.
- When connecting the hydraulic hoses, ensure that there is no pressure in the hydraulic system.
- Connect the hydraulic hoses in pairs to one control section; the pairs of hoses in one hydraulic section are marked with the same colour.

4.2 Electrical system

The cultivator comes equipped with a 12 V electric system. After connecting the power supply plug, make sure that all the lighting components operate correctly. The machine is fitted with an electrical pin socket compliant with the ISO 1724 standard.



CAUTION!
No fuse repair is allowed. A short circuit in the electrical system may result in fire.

CAUTION



WARNING!
Check the efficiency of the electrical system and lights before each time you drive the cultivator on public roads.

WARNING

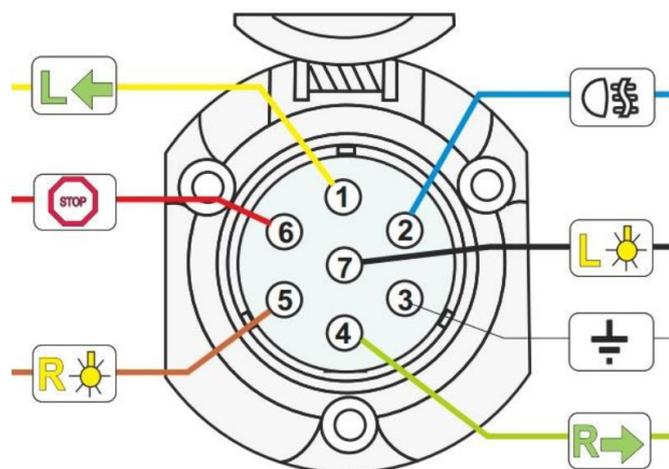


Figure 8. Diagram of the electrical plug connection

5. Operation, use and maintenance

5.1 Unit preparation

All activities must be done by a single operator who has read this user manual thoroughly, and the safety of operation section in particular.

Before starting work:

- Check the 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 instructions given in item 5.5.

5.2 Coupling the unit with the tractor

To ensure correct and safe coupling of the cultivator with the tractor, the latter must stand on solid and level ground.

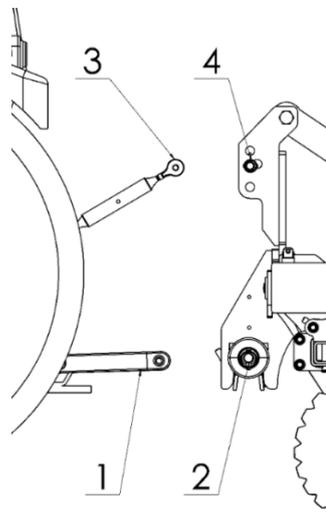


Figure 9. Connecting the unit to the tractor

When connecting the cultivator to the tractor, perform the following actions:

- reverse the tractor to a distance that enables connecting the cultivator's drawbar [2] to the lower connecting links of the tractor [1],
- use the pin [4] to connect the upper link [3] to one of the three holes in the machine,
- connect the hydraulic lines of the cultivator to the tractor's external hydraulic system,
- check the hydraulic system of the cultivator for leaks; also, the hydraulic lines cannot be kinked or damaged,
- connect the cultivator's lights and check them for proper operation.

5.3 Unit adjustment

5.3.1 Disc blade working depth adjustment

The working depth of the disc blades can be adjusted with the three-point hitch system of the tractor and hydraulic adjustment of the rollers [3A].

5.3.2 Scraper working depth and angle adjustment

Setting the working depth of the scrapers should be done by means of cotter pins [B] fixed in the proper holes of the plough frogs, secured with locking pins. The angle however can be adjusted with the lower pins [C] of the scraper fixing.

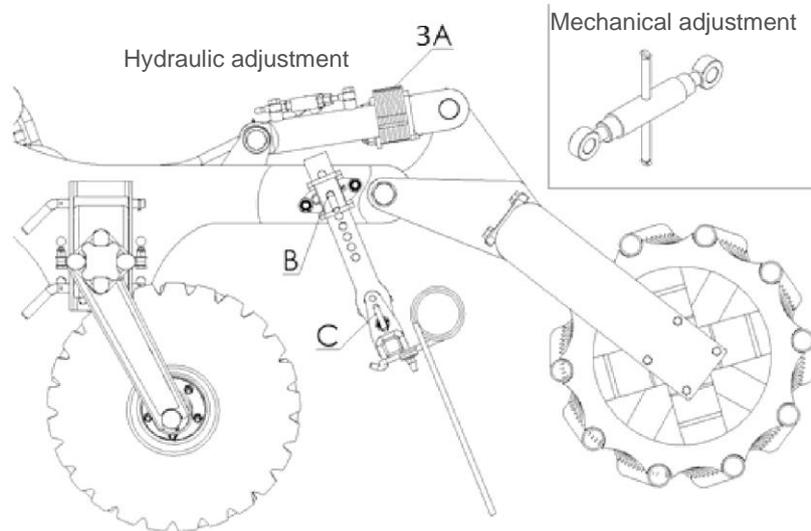


Figure 10. Unit work adjustment

5.4 Unit operation

Before you start operating the unit:

- Check the condition of the bolted joints – if any looseness is found, tighten bolts and nuts,
- Remove the warning marking,
- Unfold the unit to the working position,
- Set the unit working depth,
- Lower the tractor lift and leave it into the floating position.

If, during operation, the unit is clogged with an 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 cultivator's frame is correctly levelled when it is parallel to the surface of the field.



CAUTION

CAUTION!

1. Avoid sudden jerks during unit operation.
2. Turn gently at headland and make sure you lift the unit to the transport position.
3. Do not reverse or perform U-turns with the unit in the working position as this can lead to unit damage.



CAUTION

CAUTION!

After working the first 40 ha with the unit, check the tightening of the disc hubs [300 Nm-SKF, 350 Nm-NKE].

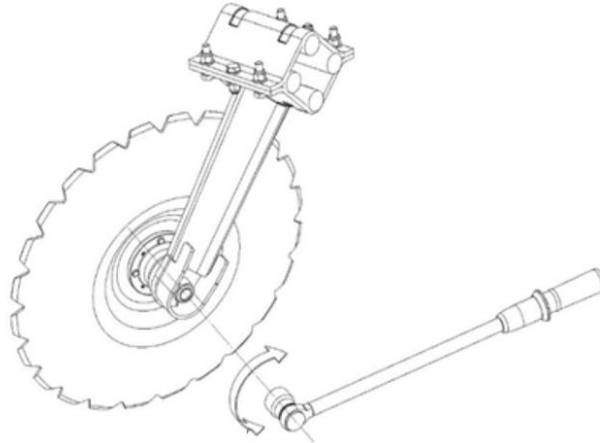


Figure 11. Tightening torque for the disc blade hub

5.5 Lubrication

The durability and good working order of the cultivator 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. 12.

Use ŁT-4S-3 grease once per season.

The disc blade hubs do not require lubrication.

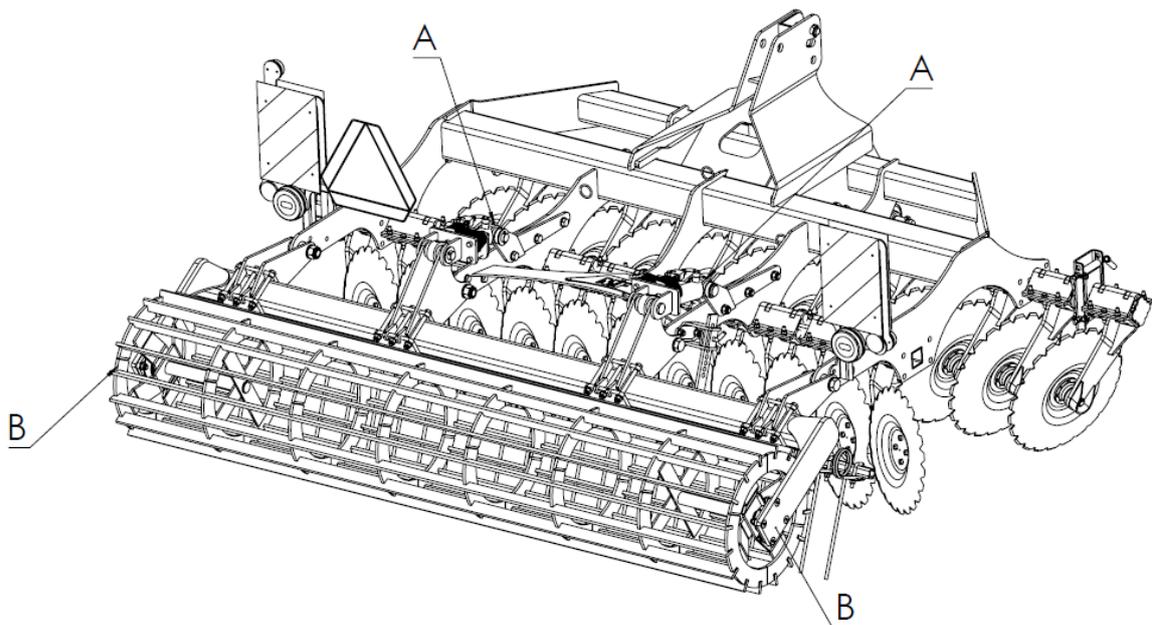


Figure 12. Lubrication of the unit: A - Shaft actuator, B - Shaft bearing assemblies.

5.6 Metric bolt tightening torques

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

Tabel 3. Metric bolt tightening torques

Bolt tightening torques – metric bolts in Nm							
Size, Ø mm	Pitch mm	Bolt version – strength class					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	

6. Transport and storage

6.1 Delivery and loading on various 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 the parts of the frame marked on the machine with the relevant pictogram as lifting points, see item 2.4.

6.2 Storage

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

7. Cleaning the unit



WARNING

WARNING!

Before cleaning the machine, ensure that the tractor engine is switched off (ignition key removed) and hydraulic lines have been disconnected.



WARNING

WARNING!

Use caution when cleaning, especially around the discs.

Prior to a longer stoppage, clean the unit of dust and remove harvest residue by means of compressed air. It is forbidden to direct the compressed air flow onto hydraulic components.

Before a prolonged stoppage, greasing all lubrication points is recommended (according to section 5.5).

8. Residual risk

8.1 Residual risk description

Residual risk is most often a result of incorrect behaviour of the cultivator operators, resulting from their carelessness or lack of knowledge. The greatest hazard occurs in the following cases:

- operation of the cultivator by underage persons or those who do not know the user manual,
- operation of the cultivator by persons under the influence of alcohol or other intoxicating substances,
- using the cultivator for purposes other than those described in the user manual,
- standing between the tractor and the cultivator while the tractor's engine is running,
- bystanders, in particular children, standing close to the running cultivator,
- cleaning the cultivator during operation,
- handling the moving components of the cultivator during operation,
- checking the technical condition of the cultivator.

When specifying the residual risks, the cultivator is seen as a machine, which was designed and manufactured, in accordance with the state of art in the year of its manufacture, and meeting the basic OHS rules.

8.2 Residual risk assessment

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

- adhering to the safety rules described in the user manual,
- reading the user manual carefully,
- not reaching into dangerous and prohibited areas with your hands,
- not operating the cultivator in the presence of bystanders, children in particular,
- having the cultivator maintained and repaired only by properly trained persons,
- having the cultivator operated only by persons who were trained and know the user manual,
- protecting the cultivator against access by children,
- having the cultivator operated by able-bodied persons, who are not under the influence of stimulants.



CAUTION

CAUTION!

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

9. Stability of the mounted cultivator-tractor combination

The front section of the towing vehicle should be loaded with the relevant weight, in order to ensure the 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. 13).

Remember that the road surface and the suspended machine affect the approach to driving. The approach to driving must be adjusted to the terrain conditions and type of soil.

When making a turn with a mounted machine, take into account the wide overhang and air buoyancy of the machine.

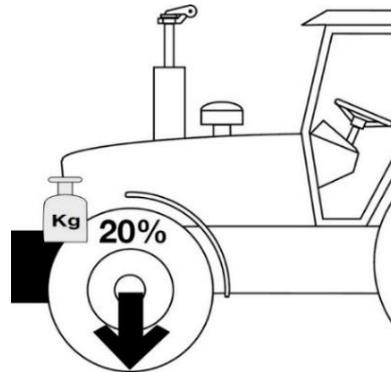


Figure 13. Minimum front axle load of the tractor

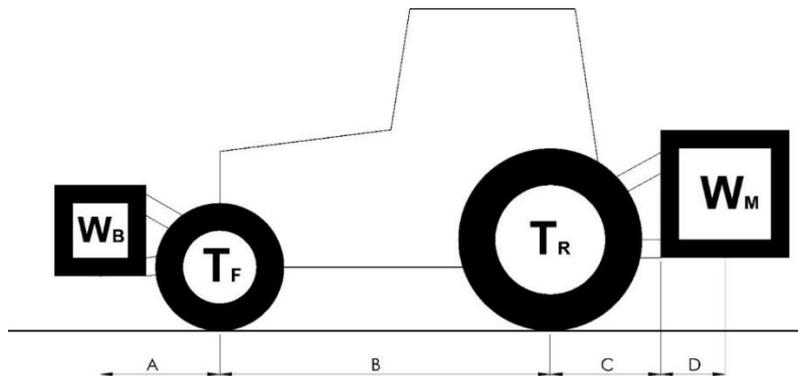


Figure 14. Determining the static stability

You need the following data for the calculation:

$$W_B = \frac{W_M * (C + D) - T_F * B + 0,2 * T_C * B}{A + B}$$

A [m] - the distance from the centre of gravity of the front ballast / machine mounted to the front and the centre of the front axle;

B [m] - the distance between the tractor's wheels;

C [m] - the distance between the centre of the rear axle and the centre of the lower link ball;

D [m] - distance between the middle of the lower tie rod ball and the centre of gravity of the machine placed 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] - the total weight of the machine mounted to the rear;

W_B [kg] - total weight of the front ballast/machine placed on the front.

9.1 Position of the machine's centre of gravity

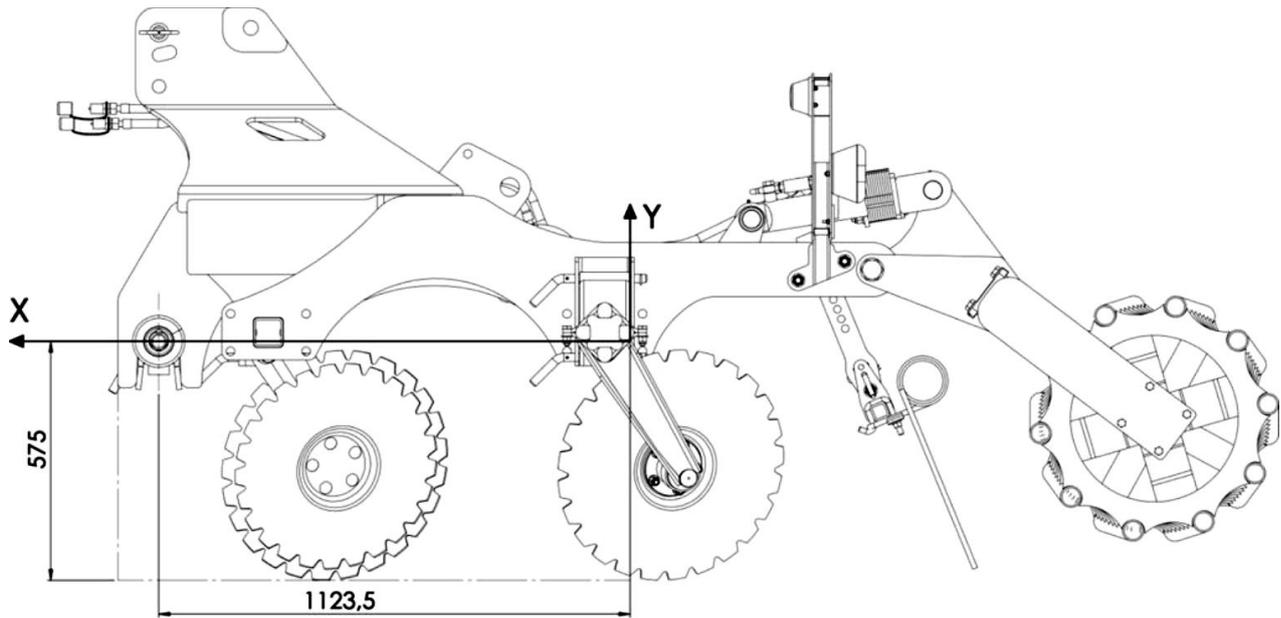


Figure 15. Position of the unit's centre of gravity – depending on the shaft used

10. Dismantling and disposal

The disc seed drill cultivator unit is composed of materials that do not pose risks for the environment. After its service life ends and further operation is not justified, the cultivator must be dismantled.

To dismantle the machine, use lifting equipment, for example an overhead crane or a fork lift, since the components involved are heavy.

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

11. Defects and troubleshooting

If faults or failures occur, they must be reported to Metal-Fach's service.

The most frequent faults and problems that may occur during machine operation are presented in the table below. After any repair work has been carried out, restart the machine and check that the proposed solution to the problem has corrected the fault. If the suggested solutions fail to bring the required result, contact the distributor or Metal-Fach's service centre.

Tabel 4. Possible faults

No.	Type of defect	Possible cause	Solution
1.	Clogging of the cultivator	Incorrectly adjusted cultivator.	Adjust the cultivator.
		The scraper beam is too low.	Lift the scraper beam and adjust the scraper's angle of inclination.
2.	The hydraulic system does not work.	No power supply to the hydraulic outputs.	Enable the hydraulic outputs from the tractor.
		Damaged hydraulic lines.	Change the hydraulic lines.
		Incorrectly adjusted brake and pressure relief valve.	Adjust the brake and pressure relief valve.
		Oil leak in cylinders (oil goes past the piston).	Replace the seals in the actuator.
3.	The electrical system does not work.	The 7-pin plug is dirty.	Clean the pins in the plug.
		Burnt out bulbs in the lamps.	Replace the bulbs.
		The wire harness is damaged.	Repair or replace the wire harness.
4.	The roller does not rotate or rotates with difficulty.	The roller is contaminated with soil and vegetative residue.	Clean the roller.
		Damaged roller bearing unit.	Change and lubricate the roller's bearings.
5.	The disc cutter does not rotate or rotates with difficulty.	The disc assembly is contaminated with soil and plant debris.	Clean the space between the disc cutters.
		The disc cutter's hub is damaged.	Replace the hub.
		The hub was tightened incorrectly.	Tighten the disc cutter's hub to 300 Nm.
6.	Loose disc cutter.	The hub was tightened incorrectly.	Tighten the disc cutter's hub to 300 Nm.
		Incorrectly tightened cutting disc.	Tighten the cutting disc.

12. Spare parts catalogue

12.1 How to use the spare parts catalogue

The catalogue should be used as follows:

- a) Determine where 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 table for the relevant number in the drawing or order number and the number of pieces.

12.2 How to order spare parts

Order spare parts over the telephone or send 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 a courier company or the customer can collect them on their own from the manufacturer or from the local Metal-Fach distributor.

INDEX OF NAMES AND ABBREVIATIONS

BHP – occupational health and safety (OHS);

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 – auxiliary unit of length equal to 0.001 m

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 radiation with a negative impact on human health; UV radiation has a negative effect on rubber parts;

V - Volt, voltage unit;

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The pictures do not necessarily show standard accessories.

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

METAL-FACH Sp. z o.o.

16-100 Sokółka, Poland, ul. Kresowa 62
Telephone: +48 85 711 98 40; Fax: +48 85 711 90 65
biuro@metalfach.com.pl

TECHNICAL SERVICE

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

SPARE PARTS WHOLESALE STORE

16-100 Sokółka, Poland, ul. Kresowa 62

Wholesale:
Telephone: +48 85 711 07 81; Fax: +48 85 711 07 93
hurtownia@metalfach.com.pl

Retail:
24/7 HOTLINE +48 533 111 477
Telephone: +48 85 711 07 90

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