U740/1 CULTIVATOR

OPERATING MANUAL

EDITION I, JULY 2014 EN

METAL-FACH
16 - 100 SOKÓŁKA, ul. KRESOWA 62

CE **EC DECLARATION OF CONFORMITY** CE

FOR THE MACHINE

METAL-FACH COMPANY
ul. Kresowa 62
16-100 SOKÓŁKA
acting as the manufacturer

Machine:

DISC CULTIVATOR 3.0 m

type/model: U740/1-.....

serial number: .....

year of manufacture: .....

Function: soil cultivation before sowing and after stubble

We declare that the machine which this declaration concerns meets the following requirements:
- Directive 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL dated 17 May 2006 on machines and the Resolution of the Minister of Economy of 21 October 2008 concerning general requirements for machinery (Journal of Laws No. 199 item 1228);
The following harmonised standards were used for compliance evaluation:

PN-EN ISO 4254-1: 2013
PN-EN ISO 13857:2010
PN-EN ISO 12100:2012

- and the following standards: PN-ISO 3600:1998, PN-ISO 11684:1998; and the Declaration of the Ministry of Transportation, Construction and Marine Economy dated 06/06/2013 on the publication of the consolidated text of the Ordinance of the Ministry of Infrastructure on the technical requirements for vehicles and the scope of their necessary equipment (Journal of Laws of 22/08/2013, item 951), as amended;
Safety Test Report no.
Entity authorised to elaborate technical documentation: Metal-Fach Technical Department. This EC Declaration of Conformity becomes null and void if the machine is changed or modified in any manner without prior consent from the manufacturer.

Sokółka

President of Board,

Jacek Marek Kucharewicz

Symbols in the Operating Manual

Legend:

ATTENTION!

INFORMATION HIGHLIGHTED WITH THE WORD "ATTENTION!" DRAWS READER'S ATTENTION TO THE NECESSITY OF TAKING THE DESCRIBED ACTIONS IN AN ACCURATE MANNER IN ORDER TO AVOID PRODUCT DAMAGE, PROCESS DISRUPTION OR NEGATIVE ENVIRONMENTAL IMPACT IN THE PRODUCT VICINITY.

IMPORTANT!

THIS SYMBOL INDICATES ADDITIONAL INFORMATION WHICH ALLOWS TO OPTIMISE THE PRODUCT OPERATION.

CAUTION!

INFORMATION MARKED AS "WARNING" HIGHLIGHT THE VALIDITY OF SAFETY ISSUES IN CASE ANY RISK OF PERSONNEL'S INJURY IS PRESENT. THIS INFORMATION DRAW USERS' ATTENTION TO ACTIONS WHICH MUST BE TAKEN IN A CERTAIN MANNER TO AVOID SUCH RISKS.

Thank you for choosing our U740/1 disc cultivator, a machine designed for effective and reliable operation. The following manual will let you fully use the advantages of our cultivator and to optimise the soil cultivation process. The Manual contains a detailed table of contents followed by descriptions which will allow to easily identify the device and to make the best use of it.

The information regarding safety and comfort of operation, description of coupling with a tractor, operation, technical service activities and storage conditions are listed on the following pages of the manual.

A spare parts catalogue containing the list of the cultivator major components allowing for easy ordering is attached to the Manual in a digital form on a CD. A printed version of the catalogue can be purchased at authorised service outlets or directly from the manufacturer.

Both the Manual and the Spare Parts Catalogue contain basic information on the product. The elements fitted to the equipment may be slightly different from those presented in the manual.

The manufacturer reserves the right to introduce changes without notice.

IMPORTANT!

The latest Operating Manuals and Parts Catalogues are available on our website:
http://www.metalfach.com.pl/en/materialy-do-pobrania

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1. CULTIVATOR IDENTIFICATION, GENERAL SAFETY RULES

1.1. IDENTIFICATION OF THE U740/1 SEED DISC CULTIVATOR – 3.0 M

The cultivator is identified by its nameplate securely fastened to the main frame of the machine.

The information presented on the U740 cultivator nameplate is shown in the diagram below.

Fig. 1. Nameplate

CAUTION!	It is forbidden to drive the cultivator on public roads without its nameplate or with an illegible nameplate.
ATTENTION!	Should you have any doubts about the intended use of this machine, consult the manufacturer. The right selection of your work machine and the understanding of its use will improve your work safety.

THE MANUAL IS A PART OF THE CULTIVATOR ESSENTIAL EQUIPMENT.

KEEP THE OPERATING INSTRUCTIONS FOR FUTURE USE.

Fig. 2. Nameplate location on the machine

If the machine is sold to another user, it must be supplied with the operating manual. It is advised that the supplier has a confirmation stating that the manual was transferred together with the machine, signed by the buyer and filed.

Carefully read the Operating Manual.

IMPORTANT!	When purchasing the machine, check the serial number indicated in the manual and the warranty sheet against the serial number stamped on the nameplate.

1.2. INTENDED USE

The cultivator is a universal tool for the cultivation of the top layer of soil to the depth of 5 cm to 15 cm. It is designed for use after harvest and before sowing following ploughing or in soil cultivation without ploughing, when the vegetation remains are not covered but mixed with the top soil layer (i.e. mulched). It may be used on all types of soils including those with stones thanks to the use of elastic suspension of the harrow discs (overload protection). The harrow allows for opening and mixing of the soil and in connection with the packer also for packing and compressing of soil. Due to the resistance to clogging, the harrow is well suited for the cultivation of tall stubbles which remain after the harvest of crops and corn and for cultivation of aftercrop intended to be used as fertiliser.

1.3. MACHINE DESIGN

The disc seed cultivator consists of the following assemblies and subassemblies:

- main frame with a 3-point suspension system, to which two folding external disc supports are attached, and the harrow discs are attached to the frame;
- beams for lower hitches;
- packer brackets with hydraulic or mechanical adjustment of operating depth which allow for compacting of the opened soil to obtain the optimum soil structure for sowing;
- beams with spring-held teeth with operating depth and inclination angle adjustment;
- double acting hydraulic cylinders with cables (for the hydraulic operation adjustment variant);
- the hydropack.

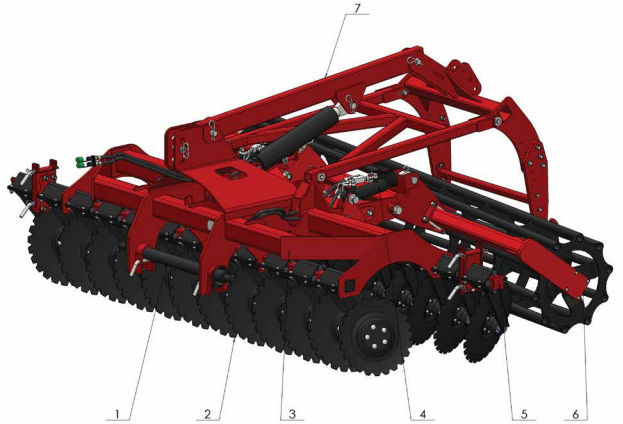

Fig. 3. KRUK cultivator design
1 – beam for lower hitches, 2 – machine frame, 3 – harrow discs, 4 – operating depth adjustment (hydraulic or mechanical), 5 – folding support for external plate, 6 – tubular shaft/Packer, 7 – hydropack

1.4. CULTIVATOR CHARACTERISTICS

Table 1. Cultivator characteristics

No.	Description	
I General data		
1.	Type	Cultivator
2.	Manufacturer	METAL-FACH COMPANY 16-100 Sokółka, ul. Kresowa 62
3.	Type /model	suspended/U740/1

5.	Nameplate location	main frame
6.	S/N stamping location	on the nameplate and underneath
7.	Service width [m]	3.0
8.	Number of discs [pcs]	24
9.	Packer type:	
	round, Ø 600	
	Packer, Ø 500	
10.	Main/outer disc diameter [mm]	510/460
11.	Depth adjustment range [cm]	5 - 15
12.	Disc pitch [mm]	250
13.	Power demand [kW/HP]	81-96/110-130
14.	Operators [no. of persons]	1 operating person
15.	Efficiency [ha/h]	3.0 - 5.0
16.	Overall dimensions	
	Transport position	
	width [mm]	2230
	height [mm]	2565
	length [mm]	3000
	service position	
	width [mm]	2600
	height [mm]	1370
	length [mm]	3508
17.	Weight with the Packer shaft	1620
18.	Hitch category	3
19.	Service speed [km/h]	8-13

1.5. CULTIVATOR DIMENSIONS

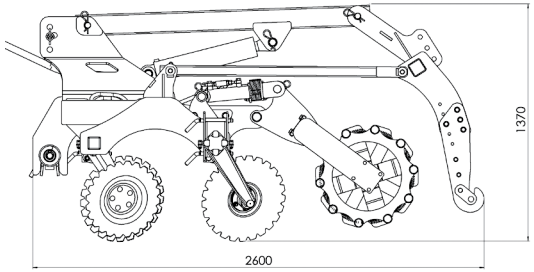

Fig. 4. Cultivator side view, operating position

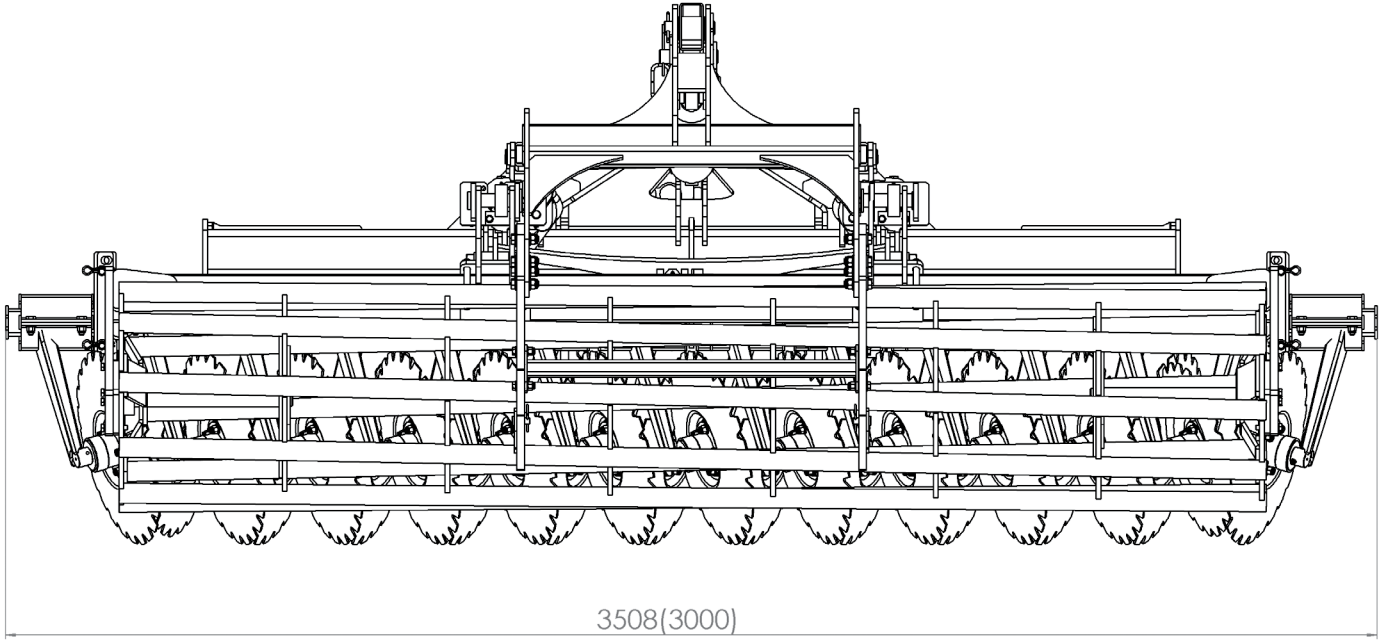

Fig. 5. Cultivator rear view

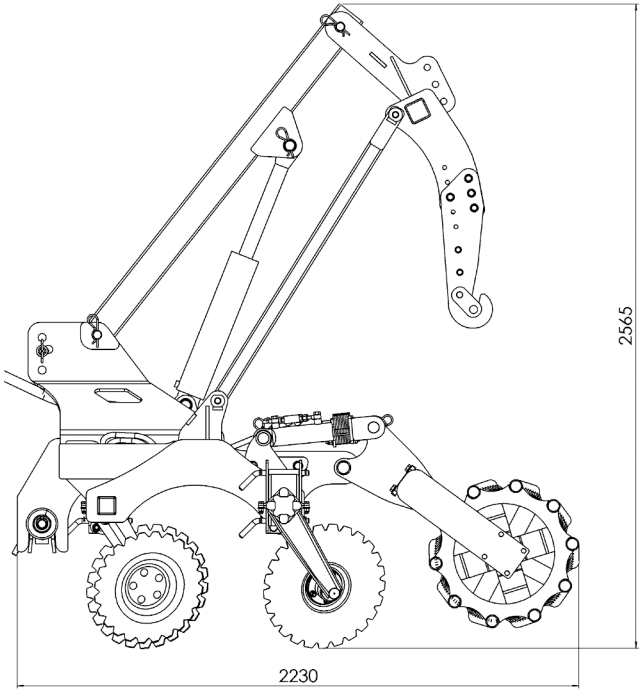

Fig. 6. Cultivator side view, operating position

1.6. WARNING SYMBOLS

Table 2. Warning symbols

No.	Safety symbol (marking)	Meaning of the symbol (marking) or text	Location on the machine
1.		Read the Operating Instructions.	On the left front frame section.
2.		Turn off the engine and remove the ignition key before servicing or repairs.	On the left front frame section.
3.		Keep a safe distance from the machine. Danger of being crushed by the machine.	On the left front frame section.
4.		Do not reach into the crushing area if the machine may move.	On the side wall of the machine frame in the side section folding areas on the left and right sides.
5.		Keep a safe distance from the machine. Danger of crushing of toes or feet. Force applied from above.	On the side wall of the machine frame in the side section folding areas on the left and right sides.
6.		Attachment points for loading on a means of transport.	On both sides of the main frame near the attachment point of the upper hitch of the 3-point hitch and near the carriage attachment plate.
7.		Lift the cultivator when turning around.	Cultivator main frame

8.		Cultivator service depth.	Cultivator main frame
9.		Lubrication point.	Actuator pivots, shaft bearing assemblies.
10.		Check the disc hub tightening.	On the cultivator frame side wall.

1.7. LOCATION OF SYMBOLS ON THE MACHINE

ATTENTION!

The cultivator user is required to keep the warning symbols and text on the trailer legible during its entire operating life. If damaged or destroyed, replace with new ones.

ATTENTION!

The symbols can be purchased directly from the manufacturer or the nearest Metal-Fach authorised representative.

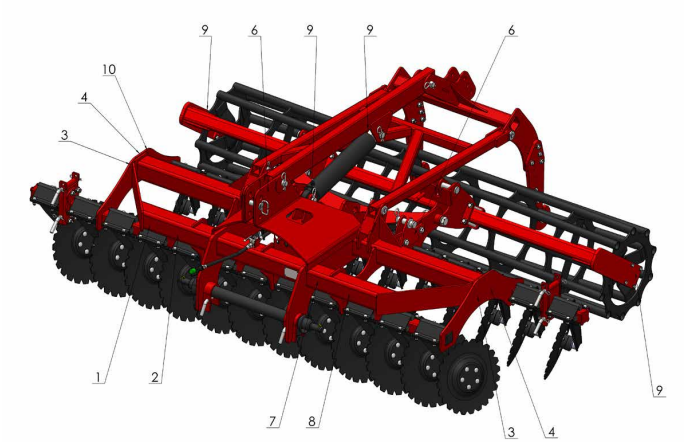

Fig. 7. Locations of signs on the cultivator

1.8. GENERAL SAFETY RULES

The safety regulations given below apply to the machine. Regardless of those regulations the user must also follow the general safety and accident prevention regulations and the traffic code.

The machine (cultivator + tractor) should be operated maintaining all rules of safe operation, in particular:

1. every time before start-up check the machine and the tractor - whether they are in condition which guarantees safety during movement and operation;

2. to maintain steerability the machine may only be coupled to a tractor with a full set of weights on the front axle. When the machine is coupled the load on the tractor's front axle must be at least 20% of the tractor's own weight;
3. the user must make sure to follow the maximum allowable axle loads and transport dimensions;
4. when coupling the machine to the tractor, raising and lowering the machine using the tractor's hydraulic system, unfolding the machine to its transport or working position and on headlands the operator must ensure that there are no bystanders near by, especially children;
5. when the engine is running no person is allowed between the tractor and the machine;
6. noise - the equivalent sound pressure emission corrected by A characteristics (LpA) does not exceed 70 dB;
7. when connecting the hydraulic lines to the tractor's hydraulic system the operator must make sure that the system is not under pressure; the operator must check the positions of the tractor hydraulic system control levers;
8. it is only allowed to operate the hydraulic elements when no person is nearby;
9. the hoses and pipes in the hydraulic lines must be checked on a regular basis and replaced with new ones it they are damaged;
10. all hydraulic lines must be replaced every 6 years;
11. raising, lowering, folding and unfolding and movements of the machine should be done slowly without jerking movements;
12. it is forbidden to reverse the tractor and make turns when the machine is lowered to its working position;
13. when making turns bear in mind that there are protruding elements in the machine, the use of tractor's independent brakes must be avoided;
14. check the tyre pressure on the tractor;
15. during transport no person should be allowed to stand on the machine nor any load may be placed on it;
16. any repairs, lubrication or cleaning of the working elements required during work may only be performed with the engine turned off and the machine lowered;
17. only uncouple the machine when its discs rest on stable firm ground and the engine is turned off;
18. the machine may only be stored in its unfolded position and resting on all service assemblies;
19. when not in use the machine should be stored in places where it cannot be accessed by unauthorised persons and animals;
20. during operation, use appropriate protective clothing and shoes with anti-slip soles;
21. follow the traffic code regulations and the manufacturer's recommendations when travelling on public roads;
22. before entering public roads, perform a visual inspection of the transported machine;
23. it is forbidden to operate the cultivator while under influence of alcohol;
24. it is forbidden to operate the cultivator while under influence of drugs or medicinal products with narcotic effects.

IMPORTANT!	REMEMBER - Before starting the maintenance or use of the machine the user should familiarise themselves with this operating manual and know the design of individual assemblies and their functions, scopes and means of adjustment paying particular attention to the information regarding safe operation. It is too late to learn that during work.

2. DRIVE OPERATION

2.1. COUPLING THE CULTIVATOR WITH THE DRIVE

Couple the cultivator with the agricultural tractors rated at a minimum of 110 HP and equipped with the three-point hitch system.

The cultivator is coupled with the tractor in the following way:

- Reverse the tractor to a distance which allows to couple the machine with the tractor's lower hitch.
- Couple the upper 3-point hitch link to the cultivator and remove any play; then level the cultivator.
- Connect the electric power supply and do a functional test (the lighting system is an optional accessory).
- Connect the hydraulic line and check for proper seal.
- Lift the cultivator and verify that the tractor front axle load is over 20% of the tractor weight. The tractor should remain fully steerable. See section 2.3.
- The machine should be adjusted during the first pass.

ATTENTION!	Be extremely careful when coupling the cultivator with the tractor. Do not stay between the cultivator and the tractor when coupling the machines together.

2.2. DECOUPLING THE CULTIVATOR FROM THE DRIVE

To decouple the cultivator from the tractor, it is required to perform the following actions:

- Make sure that there are no bystanders, especially children, in the coupling area.
- Place the cultivator for storage on a hard, flat and level ground.
- Disconnect the electric power supply (if applicable).
- Disconnect the hydraulic line.
- Disconnect the 3-point upper link and the tractor lower links.

2.3. STABILITY OF THE TRACTOR/CULTIVATOR ASSEMBLY

The tractor should have appropriate ballast at its front end to provide proper steering and braking performance. When the machine is coupled the load on the tractor's front axle must be at least 20% of the tractor's own weight (Fig. 8).

Remember that the road and the coupled machine influence the driving characteristics. Adapt the driving style to terrain conditions and the type of soil.

While negotiating corners with the coupled or suspended machine, it is important to mind the reach and weight of the machine.

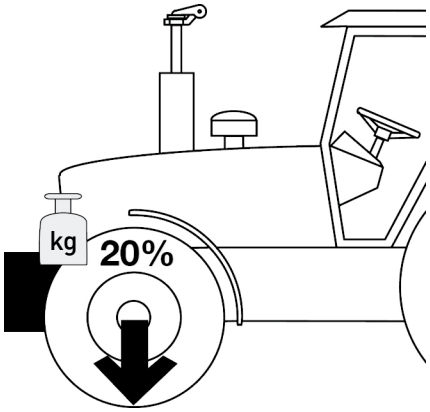

Fig. 8. Minimum front tractor axle load.

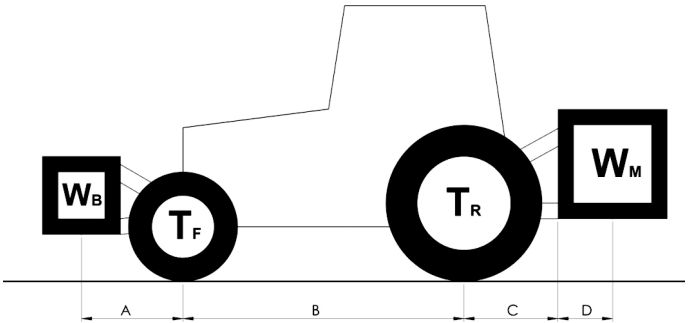

Fig. 9. Establishing the static stability.

The following data is required for the calculations:

$$W_B=(W_M*(C+D)-T_F*B+0.2*T_C*B)/(A+B)$$

A [m] – distance between the centre of gravity of the front ballast / front mounted equipment and the centre of the front axle;
B [m] – distance between the tractor wheels;
C [m] – distance between the centre of the rear axle and the lower link ball;
D [m] – distance between the lower link ball and the centre of gravity of the rear mounted machine;
Tc [kg] – tractor own weight;
Tf [kg] – front axle load of an unloaded tractor;
TR [kg] – rear axle load of an unloaded tractor;
WM [kg] – total weight of the machine installed in the rear;
WB [kg] – total weight of the front ballast/front mounted machine.

3. COMMISSIONING

ATTENTION!	Before commissioning the cultivator, read and understand this manual, and pay special attention to the sections concerning the safety of the operator and bystanders.

IMPORTANT!	If there are any doubts about safety, please contact your sales representative or the manufacturer.

4. ONGOING ADJUSTMENTS

The working depth of the harrow discs may be adjusted using the tractor's three point hitch or the mechanical or hydraulic shaft adjustment mechanism.

In case of the mechanical adjustment the depth is adjusted by changing the length of the turnbuckles.

In the case of hydraulic depth control, the adjustments are made using the hydraulic control levers inside the tractor's cabin by changing the number of pressure plates of the actuators placed on the piston rod.

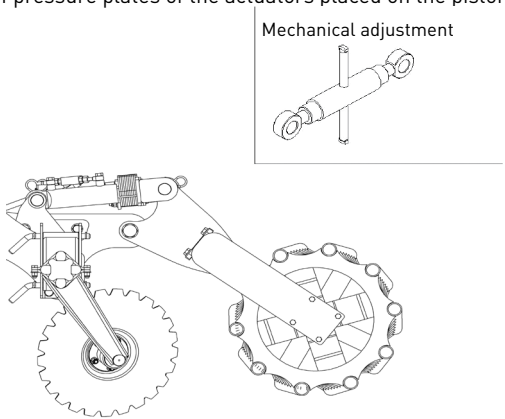

Fig. 10. Cultivator operation adjustment

ATTENTION!	Remember to always check the positioning of unused pressure plates of the actuator to avoid damaging the hydraulic adjustment system.

5. OPERATING THE CULTIVATOR

Before commencing fieldwork with the machine, do the following:

- check the condition of the bolted joints – if any play is found, retighten the bolts and nuts;
- check the folding and unfolding of the hydropack elements (if equipped);
- check the hydraulic lines; replace if necessary;
- remove the warning markings;
- set the machines working depth;
- lower the tractor lift to the set service depth.

If during operation the machine becomes clogged with vegetation remains it must be cleared by raising the machine for a moment using the tractor's hydraulic system.

The machine should be adjusted during the first pass.

If the machine is properly levelled, the frame is parallel to the field's surface.

ATTENTION!	• Avoid jerky movements while operating the cultivator. • Make turns gently, with the machine raised in the transport position. • Do not reverse or turn the tractor around with the machine in the working position as it may cause damage to the machine.

ATTENTION!	After initial 40 hours of cultivator operation, check the disc hub tightening. In case play is detected, tighten the M22 nut with a torque wrench (torque setting 300 Nm). Check the disc hub tightening before the spring and autumn season. Tighten other screw connections in line with Table 3.

Table 3. Optimum tightening torque values for bolts/screws and nuts

Thread dimensions [mm]		Bolt strength grade									
		3.6	4.6	4.8 - 5.6	5.8	6.6	6.8	6.9	8.8	10.9	12.9
diameter d	pitch P										
1	.25	.02	.025	.028	.03	.035	.04				
1.2	.25	.03	.041	.047	.05	.06	.07				
1.4	.3	.05	.06	.08	.09	.095	.1				
1.6	.35	.07	.09	.1	.13	1.4	1.7				
1.7	.35	.1	.11	.13	.14	.16	.19				
2	.4	.14	.19	.21	.24	.27	.31				
2.3	.4	.19	.26	.29	.32	.36	.44				
2.5	.45	.26	.35	.4	.44	.5	.6				
2.6	.45	.28	.37	.42	.48	.53	.63				
3	.5	.42	.56	.64	.73	.8	.97				
3.5	.6	.69	.93	1.1	1.2	1.32	1.6				
4	.7	1.05	1.4	1.6	1.8	2.0	2.4	2.7	3.2	4.51	5.2
5	.8	1.96	2.62	3.0	3.4	3.75	4.46	5.05	5.98	8.44	9.8
6	1	3.5	4.6	5.2	5.9	6.6	7.9	8.9	10.6	14.7	17.3
8	1.25	7.9	10.6	12.1	13.7	15.2	18.2	20.4	26.9	34.0	39.7
	1	7.0	9.3	10.6	12.0	13.2	15.9	18.0	21.3	29.9	35.0
10	1.5	15.2	20.2	23.2	26.1	29.0	34.8	39.2	46.3	65.2	76.0
	1	11.8	15.7	17.9	20.1	22.4	26.9	30.2	35.8	50.4	58.9
12	1.75	25.9	34.6	39.3	44.2	49.0	58.9	66.7	79.0	110.9	129.5
	1.25	21.4	28.5	32.4	36.3	40.7	48.6	55.0	65.1	91.2	107.0

Thread dimensions [mm]		Bolt strength grade									
		3.6	4.6	4.8 - 5.6	5.8	6.6	6.8	6.9	8.8	10.9	12.9
diameter d	pitch P										
14	2	40.7	54.0	61.8	69.7	77.5	92.2	14.5	123.6	173.7	203.0
	1.5	33.4	44.7	50.8	57.4	63.0	76.5	85.8	104.0	143.2	166.8
16	2	55.4	74.0	84.9	95.7	105.0	127.0	142.3	169.7	237.4	276.6
	1.5	45.6	61.0	69.9	78.5	87.3	104.5	117.7	139.3	196.2	228.1
18	2	84.7	112.9	130.5	145.2	161.4	193.8	217.8	258.0	363.0	421.8
	1.5	59.4	79.0	90.3	101.5	112.8	135.4	152.1	180.5	254.1	296.3
20	2.5	108.9	145.2	166.8	186.4	208.0	249.8	280.6	331.6	468.9	546.4
	1.5	75.3	100.1	114.3	128.5	143.2	171.7	192.8	228.6	321.8	374.7
22	2.5	136.4	181.5	208.0	233.5	259.0	307.0	350.2	415.0	583.6	681.8
	1.5	92.7	123.6	141.3	158.9	176.6	211.9	238.4	282.5	397.3	463.0
24	3	188.4	252.1	287.4	323.7	359.0	431.6	485.6	575.9	809.3	941.8
	2	140.3	188.4	215.8	241.3	268.8	321.8	363.0	429.7	603.3	706.3

5.1. PREPARING THE MACHINE FOR WORK AFTER STORAGE

Do the following to prepare the machine for work after a period of storage:

- check the condition of the bolted joints;
- check the condition of service/working units;
- check the condition of the hydraulic lines and actuators for any possible leaks (the machine's hydraulic system is filled HL46 hydraulic fluid);
- check whether the discs and shaft rotate freely by rotating them by hand;
- relubricate as instructed in Section 6.1.

5.2. OPERATION OF A CULTIVATOR WITH THE HYDROPACK COUPLED TO A SEEDER

The cultivator fitted with the hydropack can be coupled with a seeder by the three-point hitch. The hydropack position is shifted from transport to service by a hydraulic actuator. In order to set the proper seeder service position, adjust the TPH upper link. Adjust during the first pass.

Secure the hydropack in its transport position by turning the ball valve to its closed position.

Fig. 11. Securing the cultivator in the transport position

5.3. CULTIVATOR HYDRAULIC SYSTEM

- When the cultivator is running, its hydraulic system is under high pressure.
- Inspect all hydraulic lines each time before work and replace them every 6 years.
- Use only the oil grades recommended by the manufacturer. Do not mix oils of different grades!
- Verify that the tractor hydraulic system is depressurized before connecting with the machine hydraulic system. Keep the hydraulic quick-release couplings clean at all times.
- If the hydraulic system is damaged, hydraulic oil may leak out. Have the system repaired by qualified personnel.
- Return waste hydraulic oil to an authorised disposal point.
- The oil purity grade in the tractor hydraulic power system must meet the 20/18/15 requirement according to ISO 4406-1996.

ATTENTION!	If injured by high-pressure jets of hydraulic oil, immediately seek medical attention. If the hydraulic oil contaminates the eyes, flush the eyes with plenty of water and seek attention of an ophthalmologist. Wear adequate protective clothing at work.

5.4. FINISHING THE WORK WITH THE CULTIVATOR

Place the machine on a hard, flat, level ground. Disconnect the electrical power supply (if the optional lighting system is installed) and the hydraulic supply line. Disconnect the 3-point upper link and the tractor lower links. Before a long period of storage the cultivator should be cleaned and all malfunctions should be repaired; also verify the paint coat. If it is required to make some touch-ups, it is advised to use the paint repair kit supplied by the manufacturer. Protect the machine against weather conditions.

6. PERIODIC INSPECTION

While preparing the machine for work, it is required to check its technical condition, and first of all, the condition of the service assemblies.

In addition it is required to:

- check the condition of the bolted joints – if any play is found, retighten the bolts and nuts
- check whether the packer rotates freely by turning them by hand
- lubricate the elements of the machine in accordance with the guidelines specified in section 6.1.

ATTENTION!	Secure the raised cultivator parts with safety pins before servicing.

6.1. LUBRICATION AND STORAGE

The durability and efficiency of the machine depends to a large degree on systematic lubrication. Use mineral oils for lubricating the machine. Before adding grease clear the lubrication points. The lubrication should be performed according to fig. 11. Use the ŁT-4S-3 once per season.

The hubs of the harrow discs should be lubricated twice per year:
– before the spring season;
– before the autumn season.

IMPORTANT!	Always relubricate the service assemblies on the U740/1 cultivator before spring and autumn.

Store the cultivator extended on a hard, flat, and level surface.

When the working season is over, clean the cultivator and check the condition of the protective paint coating. If it is required to make some touch-ups, it is advised to use the paint repair kit supplied by the manufacturer.

Check the hydraulic system components; replace if damaged.

Check the condition and legibility of the nameplate. If the plate is damaged, notify the service station. Check the condition and legibility of the symbols. If they are damaged, replace them with new ones.

Plug the hydraulic line ends.

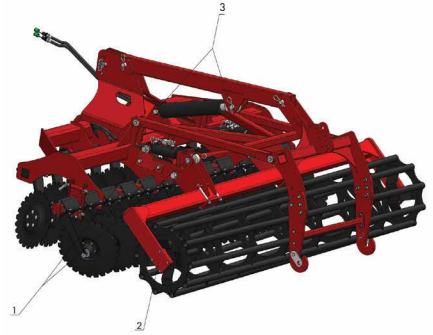

Fig. 11. Mower bar oil level check Lubrication points
1 – hydraulic cylinders / cylinder lug - 4 points (only in the variant with the hydraulic adjustment of working depth), 2 – shaft bearing set - 2 points, 3 – hydraulic cylinders/hydropack cylinder lug - 2 points

ATTENTION!	Store the cultivator in an atmosphere free of aggressive agents (e.g. ammonia, chemicals).

7. AUTHORISED SERVICE

7.1. WARRANTY SERVICE

The manufacturer issues a warranty on conditions described in the warranty card. During the period covered by the warranty, repairs shall be made at authorised service stations or at the manufacturer's service point.

7.2. ONGOING MAINTENANCE

After the warranty period, authorised service stations perform periodical inspections, adjustments and repairs.

7.3. ORDERING SPARE PARTS

Spare parts should be ordered from authorised resellers or directly from the manufacturer stating the full name of the user or company name and address. Send your order with the name, symbol, serial number and year of manufacture of the machine, catalogue name of the part, catalogue number of drawing or standard, and number of ordered items. Then arrange the terms of payment.

8. TRANSPORTING THE CULTIVATOR

8.1. LOAD TRANSPORT

The machine is supplied to the user partially disassembled. How much the machine is disassembled depends on the used mean of transport.

The components disassembled for delivery include:

- rear packer;
- seeder hydraulic lift.

Assembly procedure:

Seeder hydraulic lift:

- locate the hydropack bottom frame in its mounting locations on the cultivator frame, connect the assemblies with pins and secure the pins with cotter pins;
- locate the hydraulic cylinders, install the pins and secure them with cotter pins; next, install the threaded fasteners to mount the hydraulic lines to the cultivator frame;
- locate the hydropack upper beam and secure it with the pin and cotter;
- locate the seeder TPH in its mounting locations, install the pins and secure the pins with cotter pins.

Round packer:

- remove 8 packer bracket bolts;
- place the packer in the packer bracket support;
- install the packer bracket plate and secure with the removed bolts.

IMPORTANT!

The cultivator is suitable for road and rail transport using carriers with appropriate load bearing capacity.

ATTENTION!

While loading and unloading the machine, the parts of the frame indicated as lifting points with appropriate pictograms should be used for lifting the machine see section 1.6.

ATTENTION!	Due to the heavy weight of the individual parts, it is required to use lifting devices such as a gantry crane or a forklift during the dismantling process.

8.2. TRAVELLING ON PUBLIC ROADS

The cultivator can be driven on public roads as a machine installed on the tractor 3-point hitch (TPH).

According to the road travel safety rules (Ordinance of the Minister of Infrastructure of 21.12.2002 Journal of Laws no. 32 of 2002, item 262), a unit consisting of a tractor with a coupled farming machine must meet the same requirements as an individual tractor.

CAUTION!	The machine (part of the unit consisting of the tractor and machine) is a part protruding outside the outline of the vehicle and obstructing the tractor rear lights, and as such it poses a threat to other vehicles travelling on the road.

IMPORTANT!	It is forbidden to travel on the roads with the unit (tractor + machine) without appropriate marking.

When travelling on public roads with a unit consisting of the tractor and the machine, all rules of the Traffic Code specific to vehicles of this type apply, in particular:

- the cultivator hydropack must be folded to the transport position and secured with the pin against unfolding during transport
- during transport on the road, the cultivators coupled to a tractor require:
  - marking with warning plates with red and white stripes
  - lights
  - marking the elements protruding from the sides of the tractor (front marker lights – white)
  - repeated rear lights of the tractor (light clusters + reflective lights)
  - marking with a triangle plate indicating a slow moving vehicle
- do not exceed the maximum allowable transport speed, which is:
  - 20 km/h maximum on paved roads;
  - 6 to 10 km/h on dirt roads or cobblestone;
  - up to 5 km/h on uneven roads.

The speed must be adapted to road conditions and the condition of the road surface.

Special caution must be taken while passing or overtaking other vehicles and on corners. The maximum allowable width of the machine on public roads is 3.0 m.

Fig. 12. Transport position

Fig. 13. Service position

8.3. LIGHT SIGNALLING (OPTIONAL)

Before entering public roads a warning plate with red and white stripes, signal lights and a bracket for a plate indicating slow moving vehicles must be installed (the means for installation as specified in fig. 14). The power supply shall be connected with the tractor's electric system, and a triangle plate must be installed in the bracket. A warning plate with lights is a optional part of the machine and is supplied on request.

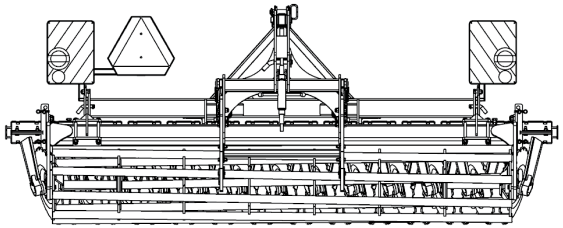

Fig. 14. Installation of the lighting system on the machine

9. CULTIVATOR STORAGE

Store the cultivator extended on a hard, flat, and level surface.

When the working season is over, clean the cultivator and check the condition of the protective paint coating. If it is required to make some touch-ups, it is advised to use the paint repair kit supplied by the manufacturer.

Check the hydraulic system components; replace if damaged.

Check the condition and legibility of the nameplate. If the plate is damaged, notify the service station.

Check the condition and legibility of the symbols. If they are damaged, replace them with new ones.

Plug the hydraulic line ends.

ATTENTION!	Store the cultivator in an atmosphere free of aggressive agents (e.g. ammonia, chemicals).

10. TROUBLESHOOTING

Table 4. Typical faults and methods of their rectification

No.	Problem	Cause	Rectification method
1.	The packer does not rotate or resists.	The packer is clogged with soil and plant remains.	Clean the pack...
		Damaged packer bearing assembly	Replace and relubricate the packer bearings.
2.	Hydropack is not lifted.	Incorrect connections of the hydraulic lines	Verify the connections of the hydraulic lines.
		Damaged hydraulic line	Replace with a new hydraulic line.
		Hydraulic system is obstructed.	Check for obstructions, remove if any and change the oil.
		No oil in the tractor system	Check the tractor oil level and refill if low.
3.	The harrow disc does not rotate or resists.	The harrow disc assembly is clogged with soil and plant remains.	Clean the spaces between the harrow discs.
		A harrow disc hub is damaged.	Replace the hub.
4.	A harrow disc is loose.	Incorrectly tightened hub.	Retighten the harrow disc to 300 Nm.

11. DISMANTLING, DISPOSAL AND ENVIRONMENTAL PROTECTION

The disc cultivator is made of materials which do not pose a threat to the environment. After its service life expires and further operation is no longer justified the machine must be dismantled.

Due to the heavy weight of the parts it is required to use lifting devices such as a gantry crane or a forklift during the dismantling process.

Segregate the dismantled components. Pass the dismantled components to relevant collection points. Waste oil from the hydraulic system should be collected in sealed containers and released to a point which collects such waste.

Dismantling procedure for the cultivator assemblies:

- drain waste hydraulic oil to a suitable catch pan and return the oil to an authorised disposal point;
- use adequate lifting equipment to dismantle the seeder lift and the rear round packer;
- lift the cultivator up, undo the disc brackets; segregate the rubber elements and release to an authorised disposal point;
- segregate the steel parts of the cultivator and release to an authorised scrap collection point.

ATTENTION!

During disassembly of the cultivator, use proper protective clothing and shoes.

ATTENTION!

Due to the heavy weight of the individual parts, it is required to use lifting devices such as a gantry crane or a forklift during the dismantling process. Follow the OHS regulations and wear protective clothing with safety gloves and safety shoes when dismantling the cultivator.

12. RESIDUAL RISKS

12.1. DESCRIPTION OF RESIDUAL RISKS

The residual risk stems mostly from improper behaviour of the operator caused by lack of knowledge or attention. The highest residual risk occurs in the following situations:

- the machine is operated by minors or persons who are unfamiliar with the operating instructions;
- the machine is operated by persons under the influence of alcohol or other intoxicants;
- using the cultivator for purposes other than its intended use defined in the operating instructions;
- a person is present between the tractor and the machine with the tractor's engine running;
- bystanders, especially children are present near the working machine;
- the machine is cleaned while working;
- manipulation of the moving elements while the machine is working;
- while checking the machine technical condition.

While presenting the residual risk the machine is treated as designed according to the state of knowledge in the year of its manufacture and maintaining the basic OHS rules.

12.2. EVALUATION OF THE RESIDUAL RISK

If the following guidelines are adhered to the occurrence of residual risk may be minimised:

- Always follow the safety regulations described in the operating instructions.
- Read and fully understand the operating manual.
- Keep your hands away from hazardous spaces.
- It is forbidden to operate the machine in the presence of bystanders and children in particular.
- Maintenance and repair of the machine may only be performed by trained personnel.
- The machine may only be operated by persons who have been trained in its operation and have familiarised themselves with the Operating Instructions.
- The machine is protected against access of children.
- The machine is operated by persons in good physical condition who are not under the influence of any intoxicants.

ATTENTION!

The residual risks are present when the aforementioned rules are not followed.

13. WARRANTY CONDITIONS

1. Before work, the user shall read and understand the Operating Manual in full to avoid failure by negligence. Failure to properly operate the machine will compromise the performance and void all warranty rights.
2. The manufacturer provides the cultivator which has been designed and built in compliance with the current standards. The manufacturer guarantees that the supplied cultivator is free of manufacturing defects.
3. Metal-Fach Sp. z o.o. provides warranty service for 12 months starting from the date of first sale, provided that the cultivator is used as intended and the Manual is strictly followed.
4. The warranty card properly filled in at the Dealership is the confirmation of the manufacturer's warranty; the acceptance of the warranty conditions must be confirmed by the customer's signature.
5. The warranty covers the defects caused by:
   - incorrect assembly;
   - incomplete delivery;
   - workmanship faults of parts or assemblies;
   - hidden faults of material;
   - damage in transport (if carried by the manufacturer).
6. The warranty does not cover any damage of the hydraulic system caused by contaminated hydraulic oil. The oil purity grade in the tractor hydraulic power system must meet the 20/18/15 requirement according to ISO 4406-1996.
7. The warranty does not cover wearing parts worn in normal operating conditions, i.e. harrow discs, hydraulic lines, packer rakes, bearings, fluids and lubricants, and light bulbs.
8. The warranty does not cover any mechanical damage or other damage resulting from improper use, improper maintenance or improper adjustment of the cultivator.
9. The warranty does not cover any damage resulting from improper storage of the cultivator.
10. Any unauthorised modifications of the design of the machine made by the user will result in automatic termination of the warranty.
11. The manufacturer shall not be held responsible for any loss, damage or destruction of the product resulting from causes other than defects of the supplied machine.
12. During the warranty period, the manufacturer will repair any defects which occurring as a result of the manufacturer's negligence, with the exception of defects listed in items from 6 to 10.
13. Warranty repairs shall be made within 14 working days of the notification/supply of the cultivator to the designated service station or at another time agreed upon.
14. The warranty is extended by the time required to complete the repair.
15. During the warranty period all repairs which are not covered by the warranty are performed by authorised service stations at full cost chargeable to the user.
16. During the warranty period all repairs which are not covered by the warranty are performed by authorised service stations at a full cost chargeable to the user. Before such repairs, the service station will inform the user of the suggested cost, time and scope of the repair.
17. The decision whether to commence a chargeable repair of the cultivator with the warranty valid at the time of repair is made by the customer.

ATTENTION!

Current information about the products is available at www.metalfach.com.pl

METAL-FACH

16-100 SOKÓŁKA, POLAND	UL. KRESOWA 62

WARRANTY CARD

DISC CULTIVATOR 3.0 m

U740/1

The warranty service is provided on behalf of the manufacturer by:

filled out by the seller

Date of manufacture	.....	Date of sale	.....
Stock Number	.....	Dealer's signature	.....
Customer's name and surname	.....		
Address	....		
	Customer's signature		

SALES METAL-FACH®

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

SERVICE METAL-FACH®

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

SPARE PARTS & SHOP METAL-FACH®

16-100 Sokółka, ul. Kresowa 62
phone: +48 85 711 07 81, fax: +48 85 711 07 93,
sklep.mf@metalfach.com.pl

METAL-FACH®

METAL-FACH Sp. z o.o. KRESOWA 62; 16-100 SOKÓŁKA