



UNIA

OPERATING AND MAINTENANCE MANUAL

REVERSIBLE PLOUGHS

IBIS XM IBIS VARIO



UNIA Sp. z o.o.

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Before starting machine read the operating manual and follow the safety instructions contained in it.

**VERSION
ENG 01/2018**

CE Declaration of Conformity

CE Declaration of Conformity

UNIA Sp. z o.o.

st. Szosa Torunska 32/38
86 – 300 Grudziadz, Poland

Herewith declare with full responsibility that our product:
reversible plough

IBIS XM / IBIS VARIO

type / model :

manufacturing year :

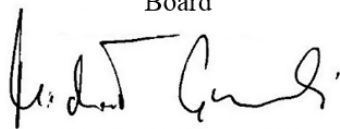
serial no. :

is in compliance with the Ordinance of the Minister of Economy of October 21, 2008 (Journal of Laws No. 199, item 1228) and the EU Directive 2006/42/EC of May 17, 2006 and the Ordinance of the Minister of Infrastructure of May 4, 2009 (Journal of Laws No. 75/2009, item 639) and the following standards:

PN-EN ISO 12100:2012	PN-EN-ISO 13857:2010
PN-ISO 3600:1998	PN-EN-ISO 4413:2011
PN-ISO 11684:1998	PN-EN 349+A1:2010
PN-EN ISO 11688-1:2010	PN-EN 14017+A2:2009
PN-EN ISO 4254-1:2016-02	PN-EN 13739-1:2012

This CE Declaration of Conformity is no longer valid if the machine has been modified or reconstructed without the manufacturer's consent.

Member of the Management
Board


Michał Guzowski

Member of the Management
Board


Michał Piotrowski

Grudziadz, 05.12.2017

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IBIS XL / IBIS XXL

MAINTENANCE AND OPERATING MANUAL

Machine identification data:

Type	<input type="text"/>
Production year	<input type="text"/>
Serial no.	<input type="text"/>



This maintenance and operating manual is an integral part of the machine. It is important that the manual is always in the possession of the machine user. Access to the manual should be provided to machine operators and cooperating persons while operation, regulation, repairs and renovations.



Before starting the machine please read the operating manual and follow the recommendations and instructions regarding safety and proper usage of the machine.

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PREFACE:

When buying the machine, check completeness of its accessories that include the following components:

- Operating Manual
- Spare Parts Catalogue
- Warranty Card

1. PRECAUTIONS

1.1. Before you Begin to Use Your Machine



Pay always special attention to the text and illustrations marked with this symbol!

These machines are intended for agricultural use only. Any use outside of this purpose shall be deemed as not intended use. Learn how to use your machine correctly and carefully! The machine may be dangerous when driven by not authorized individual or when operated carelessly.

1.2. Health and safety regulations

- Before each start, check whether the tractor and machine are safe for road traffic and during the transport.
- The tractor working with the plough must be equipped with the weights on the front axis! Balance of the tractor with the attached plough, its steerability and braking ability must always be kept.
- When connecting and disconnecting the machine to/from the tractor, its lifting and lowering on the hydraulic lift of the tractor, setting the machine in the transport and working positions and on the headlands, ensure that no bystanders and in particular children are present in the vicinity of the machine. Perform these operations slowly, without sudden jerks!
- Never stay between the tractor and cultivator when the tractor's engine is running!
- Never back or reverse the tractor when the machine is lowered to the working position!
- The machine may only be operated, maintained and repaired by the personnel who know its construction and are aware of the existing hazards!
- There are some places where crushing or cutting may occur on the parts actuated by the forces other than the human force (e.g. the hydraulic system). When connecting the hydraulic hoses to the hydraulic system of the tractor, always ensure that the hydraulics is depressurized! Check positions of the control levers of the tractor hydraulic system. Only actuate the hydraulically operated attachments when there is nobody present within their range of operation! Check the hydraulic hoses on regular basis and replace them with new items when damaged or worn!
- When driving on highways with the machine attached, lock the operating lever against its lowering!
- The attached warning and indicating signs contain information on safe work: they are intended for your safety!
- Before you start work, learn thoroughly operation of all devices and actuators and functions of the machine. It is too late for this after you start work!

- Avoid wearing any loose clothing, which could be caught by rotating components of the machine.
- Always keep the machine clean in order to avoid fire!
- Always check the surroundings before you start operation. Make sure that you have sufficient visibility!!
- Never back or reverse the tractor when the machine is lowered to the working position. When reversing, pay attention to the components that protrude far away and do not use the independent brakes of the tractor!
- Check air pressure in the wheels of the tractor and cultivator regularly.
- Never transport people on the machine and load it with any additional weights when operating the machine or transporting it!
- Check and attach the traffic equipment, such as lighting, warning devices and possible protective devices.
- Observe the admissible axial loads, total weights and transport dimensions.
- Check tightness of screws and nuts on regular basis and tighten them if required.
- Always use appropriate tools and wear safety gloves when changing tools.
- The spare parts must be conforming to the revisions specified by the manufacturer. This may only be provided by the genuine spare parts. Use typical protection devices and pins for securing all bolts of the unit (tractor + machine). Never use any temporary means of protection, such as screws, bars, wires etc., which can cause damage to the machine or tractor during transport and cause a safety hazard for other road users!
- Attach and disconnect the machine to/from the tractor after having parked the machine on a flat and hardened surface and with the tractor engine stopped. Store the machines unfolded.
- Store the machine in the locations inaccessible for unauthorized people or animals when not in use.
- Besides the above guidelines, follow the general safety rules.

1.3 Servicing

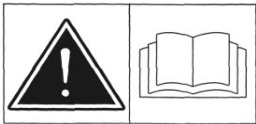
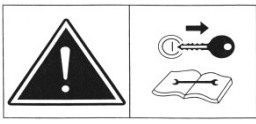
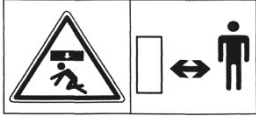





- Service the machine when it is lowered onto the ground. If the machine is coupled with the tractor, engine of the tractor must be off and brakes on!
- Use only tools in good technical condition and genuine materials and spare parts for servicing.
- Always protect the machine with appropriate supports when performing any maintenance or repair work on the machine lifted up.

1.4. Transport on highways

- Never exceed the speed limits allowed on highways and follow traffic regulations of the respective country.
- Pay special attention when passing and overtaking other vehicles and on curves (the machine is rigidly connected to the tractor).
- The machine, as the part of the vehicle that protrudes outside the rear side outline of the tractor covering the rear lamps of the tractor, poses a threat for other vehicles in the traffic.

- When transporting the machine on highways, always use warning lights, distinguishing plate and side reflectors.
- Allowable width of a machine that may run on highways is 3m! The machines with the transport width exceeding 3m require special traffic permit issued by respective traffic authority.

1.5. Safety Symbols

- A  Read through the Operating Manual thoroughly before operating the machine.
- B  Stop the tractor engine and take away the ignition key before any servicing and repair work.
- C  Keep safe distance off the machine.
- D  Never reach into the crushing area as long as the components can move.
- E  Do not stay within the machine tilting area.
- F  Points of attaching hooks of the lifting equipment.
- G  Stay away of the machine rotation and tilting area.
- H  Speed limit sign

UWAGA
PROSIMY O REGULARNE SMAROWANIE PUNKTÓW
SMARNYCH

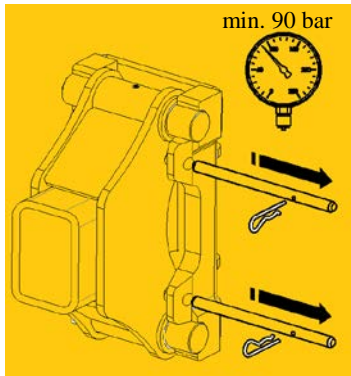
ATTENTION
PLEASE OIL REGULARLY LUBRICATION POINTS
UNDER THE OPERATING MANUAL

ACHTUNG
WIR BITTEN REGELMABIG DIE SCHMEIRSTELLEN
LAUT BETRIEBSANLEITUNG ZU SCHMIEREN

Lubricate the machine on regular basis

ACCORDING TO THE ROAD SAFETY REGULATIONS (REGULATION OF THE MINISTER OF
INFRASTRUCTURE OF 31/12/2002 - DZ. U. NO. 32 OF 2002, ITEM 262), DRIVE ON HIGHWAYS ONLY
AFTER HAVING OBTAINED AUTHORIZATION FROM THE COMPETENT HIGHWAYS
ADMINISTRATION BODY WHERE THE JOURNEY BEGINS.

For the machines that exceed the allowable transport width 3.0m



Hydraulic protection (if applicable)



Safety signs and inscriptions should be protected against damage, dirt and overpainting. Replace any damaged or illegible signs and inscriptions with new ones that are available from the manufacturer or vendor of the machines.

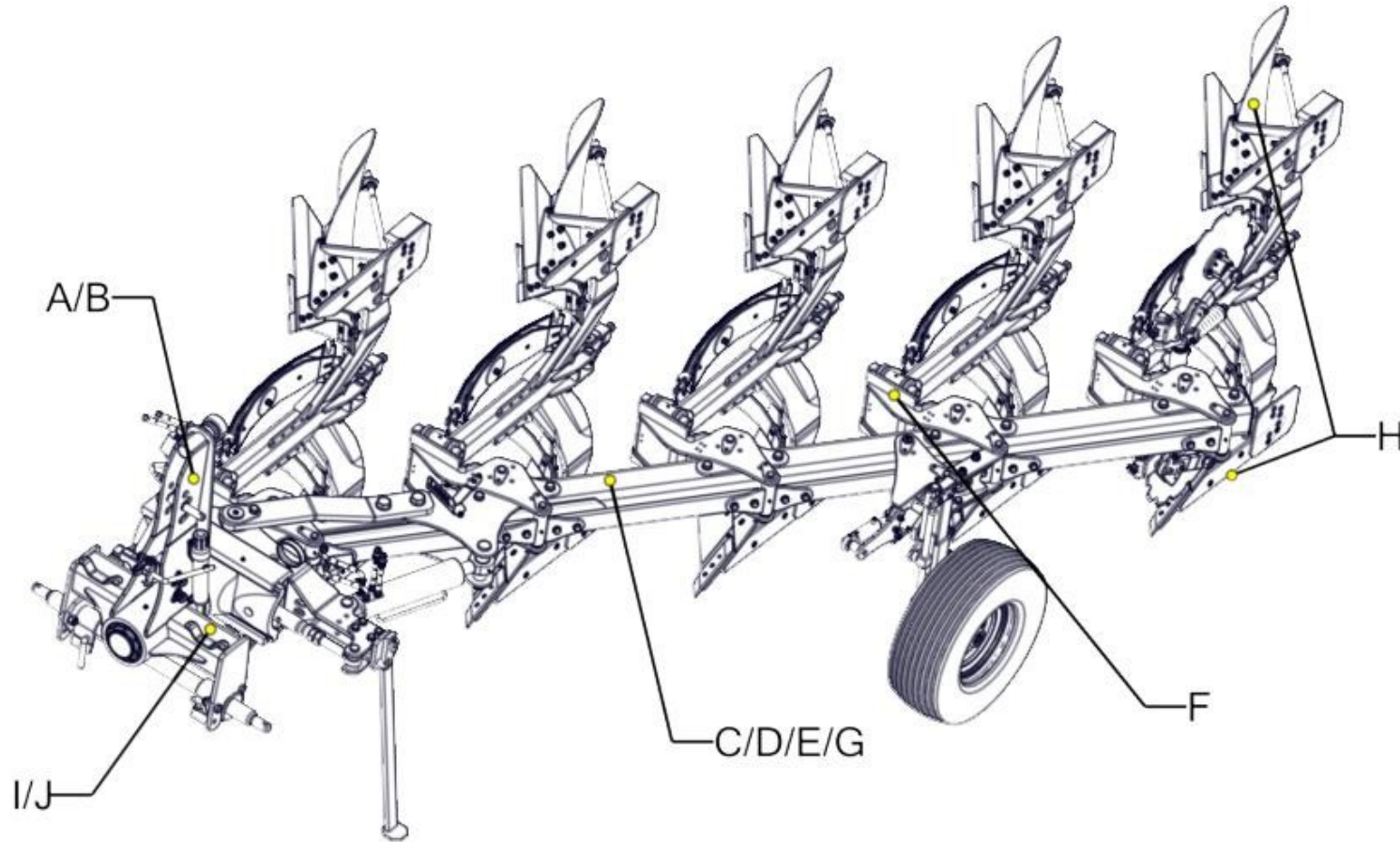
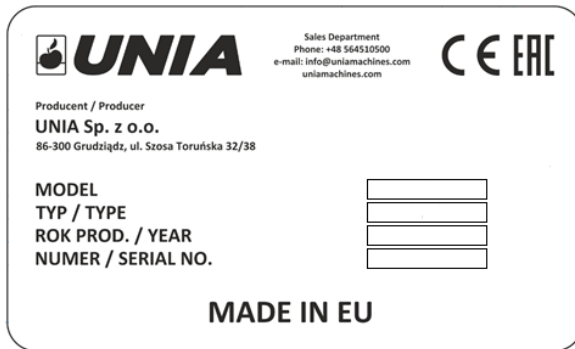


Fig 1: Location of the safety symbols

1.6. Nameplate

The unit data can be found on the nameplate



2. Identification of the Machine

IBIS / VARIO are delivered in the following versions

- **XM** - 120x120 beam, MX body

With spot adjustment of the ploughing width.

- **VARIO** - 120x120 beam (3-4 bodies) 140x140 beam (5 bodies), Long body

With variable adjustment of the ploughing width.

Protection options:

B – bolt protection

S – spring protection

H – hydraulic protection

IBIS XM ploughs are available in the following versions;

- **PREMIUM** (increased clearance under the beam)

VARIO can be supplied in the following version;

- **PLUS** (increased clearance under the beam and spacing of the plough bodies)

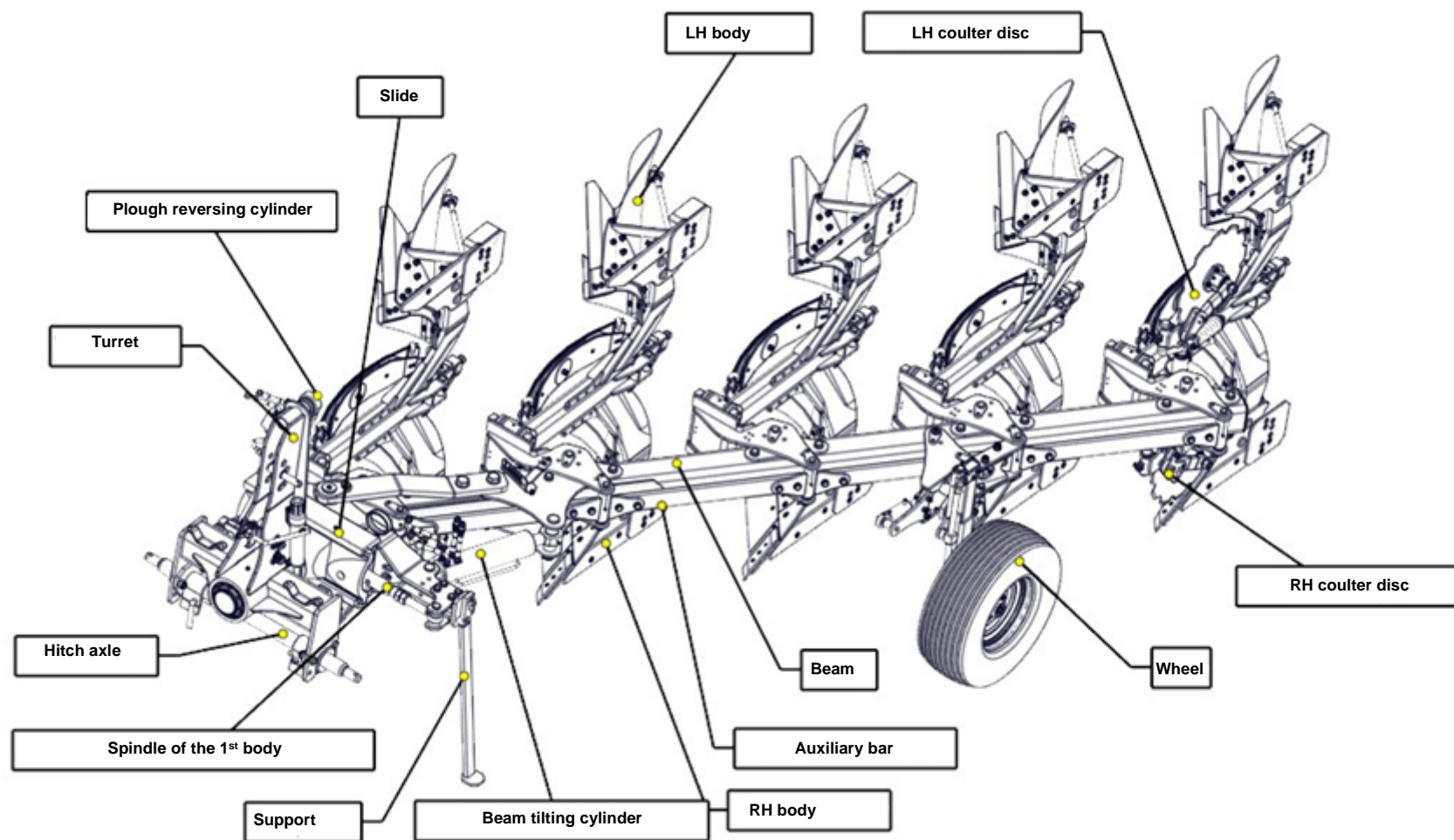


Fig.:2 Identification of the machine

2.1 IBIS specifications

Item	Parameter	U/m	Plough type											
			XM 4+ B	XM 4+1 B	XM 4+ H	XM 4+1 H	XM 4+ S	XM 4+1 S	XM 4+ B PREMIUM	XM 4+1 B PREMIUM	XM 4+ H PREMIUM	XM 4+1 H PREMIUM	XM 4+ S PREMIUM	XM 4+1 S PREMIUM
1	Quantity and type of plough bodies: RH & LH	pc.	MX 4/4	MX 5/5	MX 4/4	MX 5/5	MX 4/4	MX 5/5	MX 4/4	MX 5/5	MX 4/4	MX 5/5	MX 4/4	MX 5/5
2	Width of furrow-slice	m	0,35 0,40 0,45											
3	Nominal working width of the plough	m	1.40 1.60 1.80	1.75 2.00 2.25	1.40 1.60 1.80	1.75 2.00 2.25	1.40 1.60 1.80	1.75 2.00 2.25	1.40 1.60 1.80	1.75 2.00 2.25	1.40 1.60 1.80	1.75 2.00 2.25	1.40 1.60 1.80	1.75 2.00 2.25
4	Max working depth	m	0,28											
5	Clearance under the beam	m	0,75						0,8					
6	Spacing of the bodies	m	0,9											
7	Working speed	km/h	7 ÷ 12											
8	Effective capacity W1	ha/h	0.98÷2.16	1.22÷2.7	0.98÷2.16	1.22÷2.7	0.98÷2.16	1.22÷2.7	0.98÷2.16	1.22÷2.7	0.98÷2.16	1.22÷2.7	0.98÷2.16	1.22÷2.7
9	Power demand	HP	90÷110	100÷120	110÷130	130÷150	110÷130	130÷150	100÷120	120÷140	110÷130	130÷150	110÷130	130÷150
10	Weight /no accessories/ approx.	kg	1400	1600	1680	1960	1700	1970	1430	1630	1690	1990	1720	1990

Table:1 Specifications

Item	Parameter	U/m	Plough type								
			VARIO 3 B	VARIO 4 B	VARIO 5 B	VARIO 3 H	VARIO 4 H	VARIO 5 H	VARIO 3 S	VARIO 4 S	VARIO 5 S
1	Quantity and type of plough bodies: RH & LH	pc.	Long 3/3	Long 4/4	Long 5/5	Long 3/3	Long 4/4	Long 5/5	Long 3/3	Long 4/4	Long 5/5
2	Width of furrow-slice	m	0.35÷0.50								
3	Nominal working width of the plough	m	1.05÷1.50	1.40÷2.00	1.75÷2.50	1.05÷1.50	1.40÷2.00	1.75÷2.50	1.05÷1.50	1.40÷2.00	1.75÷2.50
4	Max working depth	m	0.28								
5	Clearance under the beam	m	0.75			0.8					
6	Spacing of the bodies	m	0.9								
7	Working speed	km/h	7 ÷ 12								
8	Effective capacity W1	ha/h	0.74÷1.80	0.82÷2.40	1.02÷3.0	0.74÷1.80	0.82÷2.40	1.02÷3.0	0.74÷1.80	0.82÷2.40	1.02÷3.0
9	Power demand	HP	90÷120	120÷150	140÷180	90÷120	130÷160	150÷200	100÷130	130÷160	150÷200
10	Weight /no accessories/ approx.	kg	1410	1660	1970	1590	1880	2250	1630	1930	2330

Table:2 Specifications #2

Item	Parameter	U/m	Plough type								
			VARIO 3 B PLUS	VARIO 4 B PLUS	VARIO 5 B PLUS	VARIO 3 H PLUS	VARIO 4 H PLUS	VARIO 5 H PLUS	VARIO 3 S PLUS	VARIO 4 S PLUS	VARIO 5 S PLUS
1	Quantity and type of plough bodies: RH & LH	pc.	Long 3/3	Long 4/4	Long 5/5	Long 3/3	Long 4/4	Long 5/5	Long 3/3	Long 4/4	Long 5/5
2	Width of furrow-slice	m	0.35÷0.50								
3	Nominal working width of the plough	m	1.05÷1.50	1.40÷2.00	1.75÷2.50	1.05÷1.50	1.40÷2.00	1.75÷2.50	1.05÷1.50	1.40÷2.00	1.75÷2.50
4	Max working depth	m	0.28								
5	Clearance under the beam	m	0.85			0.8					
6	Spacing of the bodies	m	1								
7	Working speed	km/h	7 ÷ 12								
8	Effective capacity W1	ha/h	0.74÷1.80	0.82÷2.40	1.02÷3.0	0.74÷1.80	0.82÷2.40	1.02÷3.0	0.74÷1.80	0.82÷2.40	1.02÷3.0
9	Power demand	HP	90÷120	130÷160	150÷200	90÷120	140÷170	150÷200	100÷130	140÷170	160÷210
10	Weight /no accessories/ approx.	kg	1520	1800	2180	1690	2000	2420	1730	1950	2500

Table:3 Specifications #3

3. Operating and Maintenance Manual

3.1. First Start

Before the first start of the machine:

- read the Operating Manual thoroughly
- check technical condition of the machine, and in particular, condition of its working parts, protecting mechanisms and the hydraulic system. When finding any damaged or worn parts, replace them with new ones
- check tightening of all screws, bolts and nuts. Tighten any loose nuts especially at the beginning of operation of the machine
- check fitting of the quick-connectors of the hydraulic hoses of the machine to the sockets on the tractor
- check, whether the disc coulters, rollers and spindles (turnbuckles) can rotate without any jams
- check the pressure in tyres acc. to the manufacturer's recommendations
- check, whether the components requiring lubrication are lubricated
- check, whether the machine attachment system fits the tractor attachment system

3.2. Preparation of the Unit (Tractor + Machine)

Pressure in the tractor wheels must be equal on the same axle in order to provide uniform working depth, and the tractor lower links (C) must be stiffened (lock the oblong holes) and at the same height above the ground level (A)

- set the lifting rods of the tractor links (W) so that you can pull down the lower links below the hitch axle in order to achieve the required working depth, while obtaining sufficient lifting height of the links for transport
- mount the front axle weights in order to keep balance of the tractor and the machine
- quick-connectors of the machine hydraulic hoses must fit the sockets on the tractor
- the hitch axle should be in the middle of the machine
- category of the lower articulated joint of the hitch axle must be the same on the tractor and the machine sides!

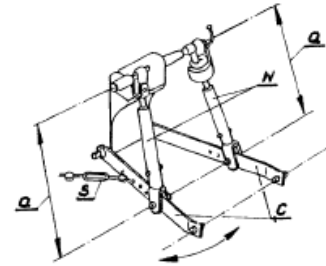


Fig.:3 Tractor lifting rod



Fig.:4 Front axle weight

3.3. Connection and Disconnection

3.3.1 Mounted Machines

The tractor should stand on a hard and plain surface in order to connect the plough to the tractor in a correct and safe way.

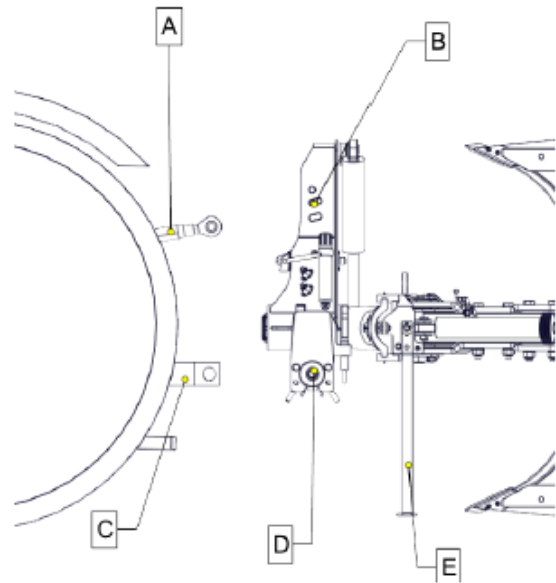


Fig.:5 Connecting the machine

a) Connection

- shift the tractor hydraulics to the position control
- disconnect the hitch axle (D) from the plough and put it on the tractor lower link (C)
- back the tractor to a distance that allows connection of the hitch axle (D) to the beam plates and the upper link (A) of the tractor
- secure the hitch axle (D) in the beam plates with bolts and cotter pins
- connect the upper tractor link (A). Select position of the upper bolt (B) in the lifting rod acc. to the requirements and terrain. During work of the plough, the upper fixing point should be located higher than the point of fixing this lifting rod to the tractor
- fold the support (E) to the transport (horizontal) position
- lift the plough and check whether the load on the front axle is sufficient (taking into account future operating conditions, especially inclines)
- check the plough reversing mechanism by rotating the plough through 180 ° and back

b) Disconnection

- lower the machine onto a flat and hard surface
- reduce the pressure in the machine hydraulic system using the free (floating) position of the hydraulic levers of the tractor
- unfold the support (E) to the parking (vertical) position
- disconnect the tractor upper link (A) and the hitch axle (D)

3.4 Transport on highways

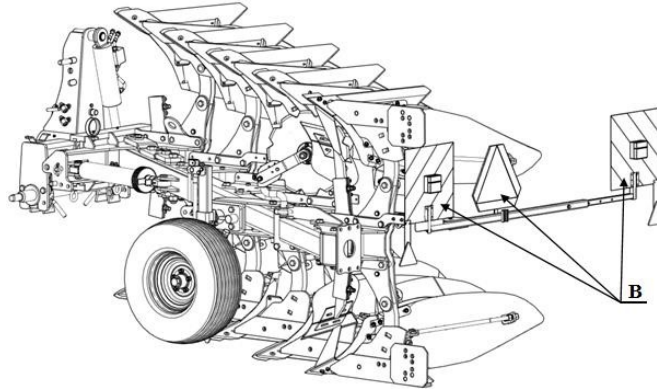


Fig:6 Transport

- the unit consisting of a tractor and agricultural machine connected to it must meet the same requirements as the tractor alone
- driving the unit (i.e. tractor + machine) on highways without proper marking (B) is forbidden
- adjust the chains tensioning the side links (stabilizer arms) of the tractor accordingly before driving; they should limit the excessive side movements of the machine
- disassembly the warning plates (B) with lamps before beginning work in the field in order to protect them and secure them with pins

3.5 Adjustments

3.5.1 Hitch Axle Adjustment (Ploughs With Increased Clearance Under the Beam)

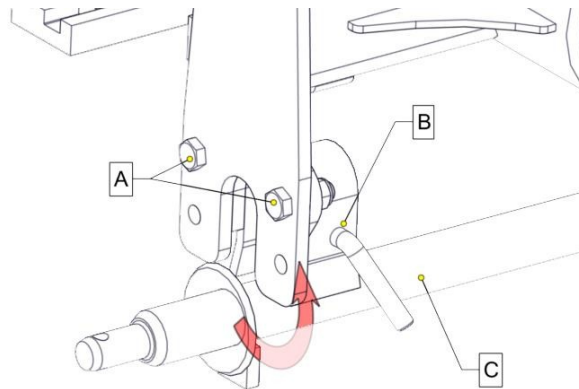


Fig.:7 Hitch axle

- The adjustment is performed in order to change (increase) the lifting height of the machine; it is necessary for the machines of the **PLUS** Class or in order to improve comfort during transport of the machine (applies to small tractors)
- In order to change height of the hitch axle, remove bolts from the top holes (**A**) and replace them into the lower holes, together with the clamping ring (**B**)
- Rotate the hitch axle (**C**) by 90 ° at the same time so, that the rotation limiting stops were at the top, in the cut of the fore-plough plate

3.5.2 Coulter Disc Adjustment

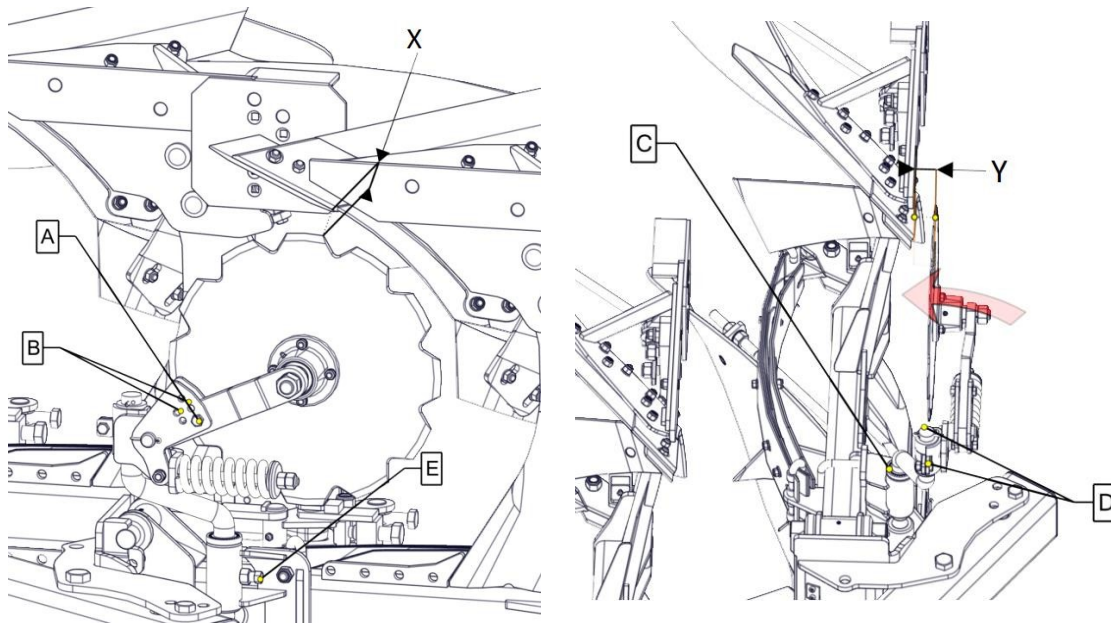
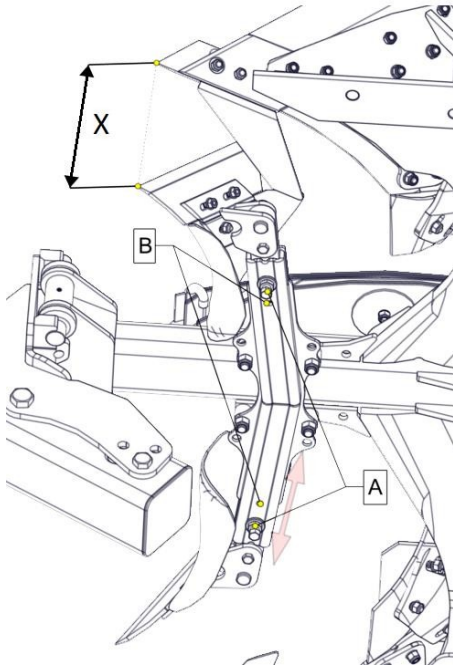


Fig.:8 Coulter disc

- Adjustment of the coulter disc is to be carried out in two planes in relation to the plough body
- Set the working depth (in the coulter disc plane) with the bolts **(A)** by replacing them to the holes **(B)** depending on the depth of ploughing. The optimum setting is when 1/3 of the coulter disc is in the soil; min distance between the plough body and the coulter disc **(X)** is **5 cm**
- Set the lateral distance between the coulter disc and the plough body by changing the position (i.e. rotation) of the coulter disc shank **(C)**. In order to do it, loose the set screw **(E)** and replace the shank **(C)**. The recommended distance to the plough body (Y) is **1÷2 cm**
- Correct the position of the coulter disc rotation stop **(D)** each time after resetting the coulter disc so, that the limit position of the disc would not interfere with the plough body

3.5.3 Skim Coultter Adjustment



Caution. Risk of personal injury when setting the skim coultters

Fig:9 Skim coultter

- Skim coultter should operate at a depth of **5÷10 cm**
- Distance to the ploughshare should be less than:

X = assumed working depth – 5cm

- Set the skim coultter position by unlocking the nut and loosening the set screw (A)
- Slide the skim coultter in the desired direction and lock it again with the set screw and the nut
- There are special cut-outs (holes) made on the skim coultter shank, where you can lock the screw
- Inspection holes (B), through which you can observe notches when the shank moves, facilitate adjustment of the skim coultters. Once you notice a notch on the shank in the hole, lock the component with the screw (A)

3.5.4 Body Setting

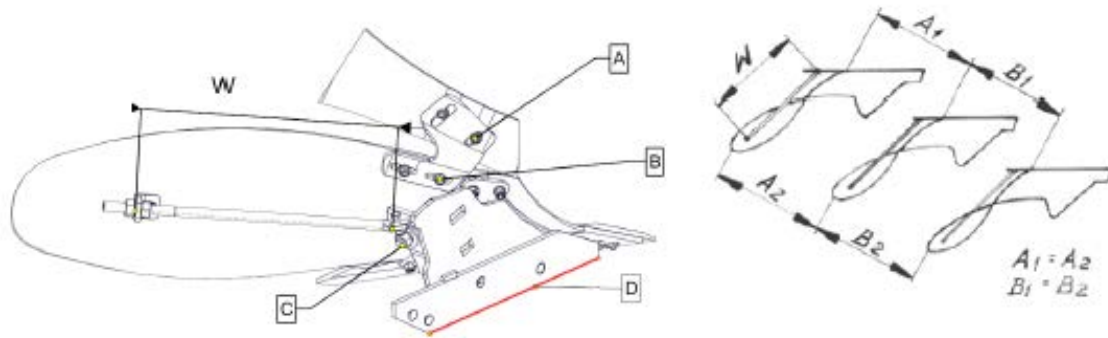


Fig:10 Body

- Difference in the height of bodies (i.e. distance between the skid line and the beam) (D) should not exceed 10 mm.
- You can adjust the angle of inclination of the body within narrow limits with the screw (C)
- At the nominal setting of the rear body, distance between the end of the soil shoe (cover plate) and the ground should be 5÷15 mm.
- Mouldboard working angle is determined by the adjustment screw (W).
- New ploughs are delivered with properly aligned bodies. The use of the plough can gradually cause a change in the alignment. Therefore, check the body alignment after each ploughing season.
- The bodies are properly aligned, when:

$$; A_2 = A_1; B_2 = B_1; A_2 = B_2$$

- Max permissible deviation between A1 and A2 is 5 mm. Align the bodies when this value is larger.
- Check also whether the RH and LH bodies are parallel.

3.5.5 Skimmer Adjustment

- Adjust the skimmer with the screws (A/B) mounted in the skimmer holder slots.
- The skimmer bar has to be mounted so that its front edge was at the mouldboard (adjustment with the screw [B]) and the rear edge has been adjusted to the ploughing depth (screw [A]).

3.5.6 Stone-Reaction System (Protection)

a. Bolt Protection



Use only genuine safety devices made by UNIA Grudziądz

Lift the plough above the ground after the bolt has been sheared – the body should spontaneously fall to its operating position; otherwise, loose the screw (2) with caution. Do not stay in the crushing area when the plough body falls down or put any parts of your body or objects there. Then, remove parts of the broken bolt and install a new one. Tighten the screws (1/2).

For the tightening torque values, see the Bolt and nut tightening torque table, later in this Manual.

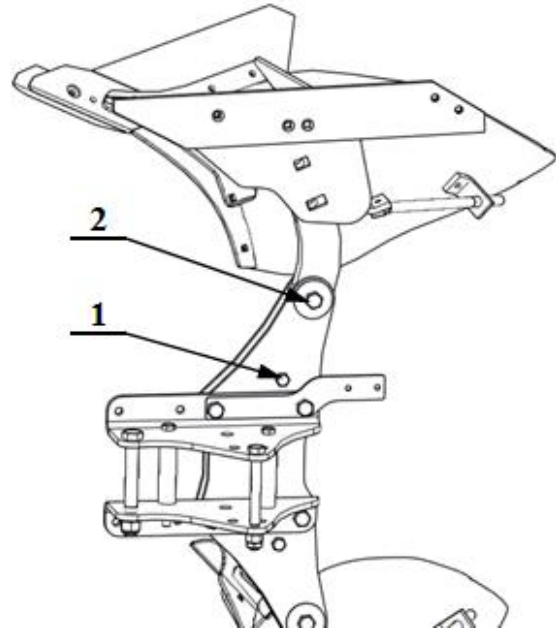


Fig.:11 Bolt protection



Insert the bolt from the beam side for XM and from the mouldboard side for VARIO.

Bolt protection tightening torque values:

IBIS XM - M12 (40 Nm);

VARIO - M16 (70 Nm);

b) Spring protection (spring leaf):

5-spring leaf version,

IBIS XM

7-spring leaf version (enhanced),

VARIO

Enhancement to 7-spring leaf version for IBIS XM and 9-spring leaf version for VARIO is allowed

The spring length measured between the bolts should be **L=700 mm**. This length can be adjusted with the screw (1).

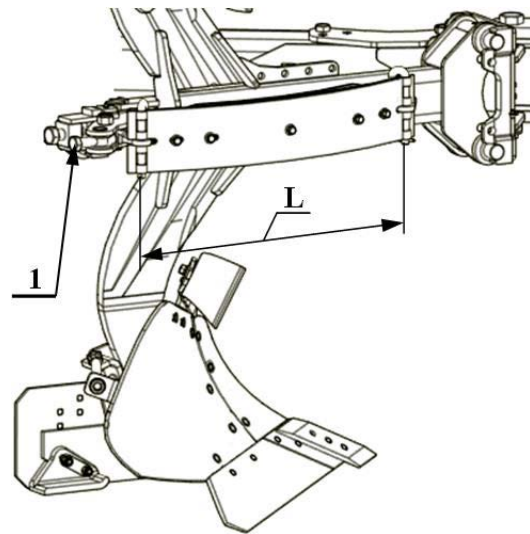


Fig.:12 Leaf spring



Changing the leaf spring length does not change the release force – this can only be achieved by adding or removing the spring leaves.

c) Hydraulic Protection



CAUTION! HYDRAULIC SYSTEM IS PRESSURIZED!



Do not manipulate the gas supply valve!

Do not disconnect any hydraulic connections when the system is pressurized!

The membrane accumulator is filled with nitrogen. Max filling pressure is marked on the label attached to the accumulator housing.

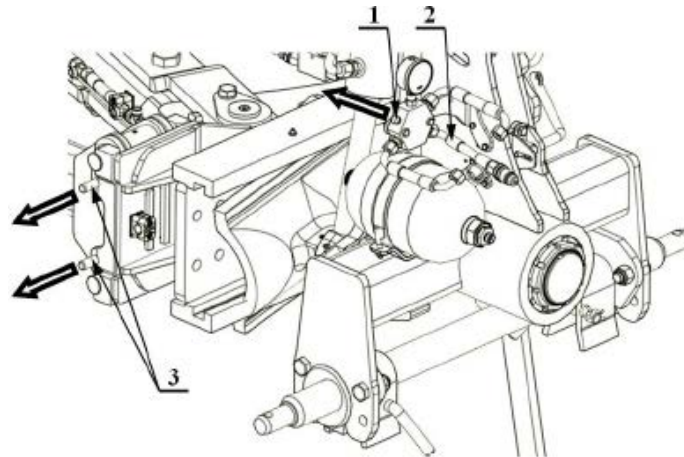


Fig.:13 Hydraulic system

Filling the tank to a correct operating pressure (**70 bar÷120 bar**) and bleeding the system:

- connect the hose **(2)** to the tractor
- turn back the screw **(1)** for at least one turn
- fill the hydraulic system of the plough to the correct operating pressure (observe the pressure gauge) and tighten the screw **(1)**
- remove the protective bolts **(3)** from each plough beam and save them – they will be required for further work
- in order to bleed the hydraulic system, lift the plough above the ground with the valve block open and drain and fill the system with oil several times (until the plough bodies fall down completely). Do not forget to tighten the screw **(1)**
- disconnect the hose **(2)** from the tractor

Increase pressure depending upon the soil conditions, however not exceeding 120 bar. The protective bolts **(3)** have to be installed each time when the oil pressure is to be dropped down to 0 bar, e.g. at any repair of the hydraulic system and before winter storage.

Pressures on a chisel:

IBIS XM/ VARIO

75 bar - 800 kg (lighter soils)

120 bar - 1100 kg (heavier soils)

The spring leaf and 'non-stop' hydraulic protection allow:

- automatic lifting of the plough body (i.e. stop its operation) after collision with an obstacle
- automatic return of the plough body to its working position after passing the obstacle

3.5.7 Ground-Following Wheel

The plough is available with two types of the ground-following wheels, i.e. side and rear wheels. They differ in their location on the machine and the method of adjustment. The wheel holder is one of the components that allow setting the machine working depth.

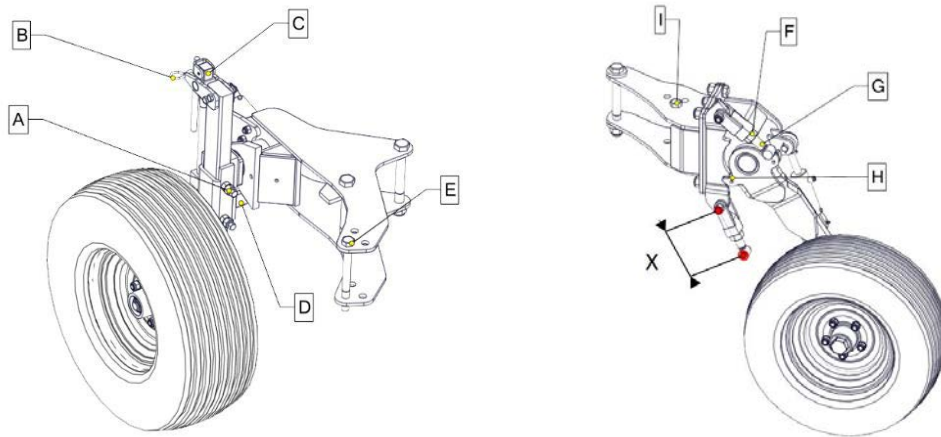


Fig.:14 Ground-following (support) wheel

For the side wheel, set the working depth by adjusting the position of the wheel holder in relation to the stop (D). The system is symmetrical, therefore adjustment is performed on both sides simultaneously, in the following way:

- Check the pressure in the wheel:
 - 200/60-14.5 – 4.1 bar
 - 10.0/80-12 – 3.9 bar
 - 320/60-12 – 2.5 bar
- Loosen the nuts and remove the set screws (A)
- Release the lever (B)
- By turning the screw (C), move the wheel holder in the desired direction in the guide
- Tighten the screw (A)

For the rear wheel, set its position by changing lengths of the stop bolts that operate with the handle (H) and set the wheel position under the plough operation:

- Check the pressure in the wheel:
 - 200/60-14.5 – 4.1 bar
 - 10.0/80-12 – 3.9 bar
 - 320/60-12 – 2.5 bar
- Loosen the lock-nuts (F)
- By turning the screw (G), change the length of the stop (X)
- Set both stops to the same length (X)
- Tighten the lock-nuts (F)

3.5.8 Transport and Ground-Following Wheels

The plough is available with two types of the transport and ground-following wheels, i.e. side and rear wheels. They differ in their location on the machine and the method of adjustment. The wheel holder is one of the components that allow setting the machine working depth.

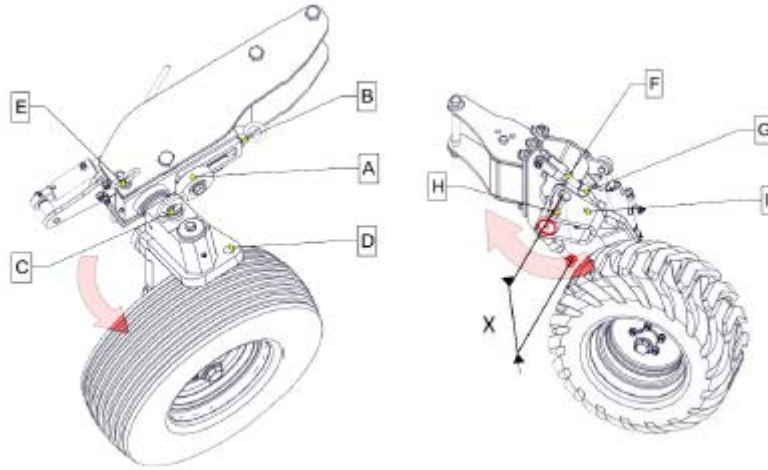


Fig.:15 Transport wheel

For the side wheel, set the working depth by adjusting the position of the stop (A) in relation to the wheel holder. The system is symmetrical, therefore adjustment is performed on both sides simultaneously, in the following way:

- Check the pressure in the wheel:
 - 200/60-14.5 – 4.1 bar
 - 10.0/80-12 – 3.9 bar
 - 320/60-12 – 2.5 bar
- By turning the screw (B), move the stop in the desired direction in the guide

For the rear wheel, set its position by changing lengths of the stop bolts, that operate with the handle and set the wheel position under the plough operation:

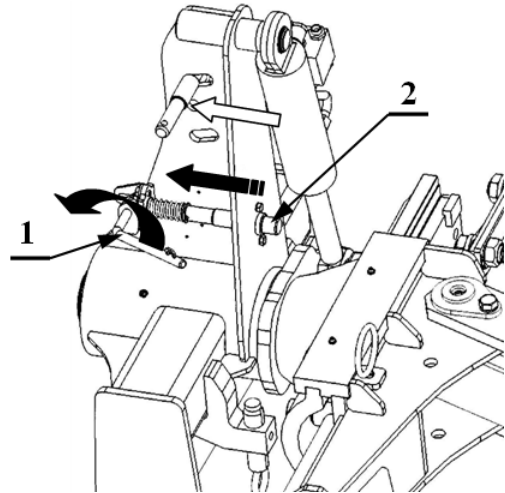
- Check the pressure in the wheel:
 - 200/60-14.5 – 4.1 bar
 - 10.0/80-12 – 3.9 bar
 - 320/60-12 – 2.5 bar
- Loosen the lock-nuts (F)
- By turning the screw (G), change the length of the stop (X)
- Set both stops to the same length (X)
- Tighten the lock-nuts (F)

a) Setting the plough in the transport position

Transport the plough on its transport and ground-following wheel when the load on the tractor front wheels is not sufficient enough and adequate machine steerability and balance cannot be ensured.

Preparation of the plough for transport position:

- set the lift hydraulics to the position control
- lift the plough slightly and extend the side cylinder decreasing the plough width
- for the rear wheel, disconnect the shock absorber (i.e. remove its head from the journal) and secure it in the transport holder
- release and remove the pin (C/H)
- turn the wheel arm by approx. 90° until it will be possible to insert the pin (C/H) in the hole (D/I, accordingly) and secure it with the cotter pin
- release the lock lever (2) to its transport position (1)
- lift the plough to its max upward position and turn it by 90° until the locking pin snaps into the hole in the roll over device. Lower the plough onto the wheel.



Rysunek:16 Interlock

b) Shifting the wheel from its transport position to the operating position

Shift the plough from its transport position to the operating position by carrying out the above steps in reverse order.

3.5.9 Reversing the Plough



- The plough is correctly connected to the tractor (three-point hitch/linkage of the machine and the tractor are identical) and all pins are secured
- All connecting hoses are connected to the tractor and their routing ensures safety during rotation
- Always lift the plough before rotating it and ensure that the clearance obtained allows rotation without contacting the ground
- Never rotate the plough before you are sure that all cylinders are filled with oil (otherwise, the plough can be damaged)
- Rotate the plough only while driving forward or parking
- Always and every time ensure that no bystanders or other objects are present within the rotation zone
- Release the lock lever (only refers to the machines with transport wheels)
- Arm of the TERRA H cultivating roller is spread (option)
- Transport lightning has been removed

Positions of the tractor external hydraulics control lever:

- N – Neutral (plough rotation cylinder locked)
- B – Plough reversing (to the right or left side independently)
- A – Return (after a stop in the course of rotation)

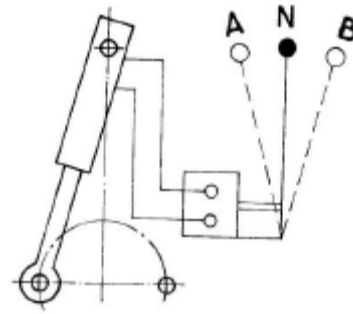


Fig.:17 Reversing

3.6 Setting the Machine in the Field

3.6.1 Top Link.

Length of the top link (1), should be such that the plough beam was always set parallel to the ground.

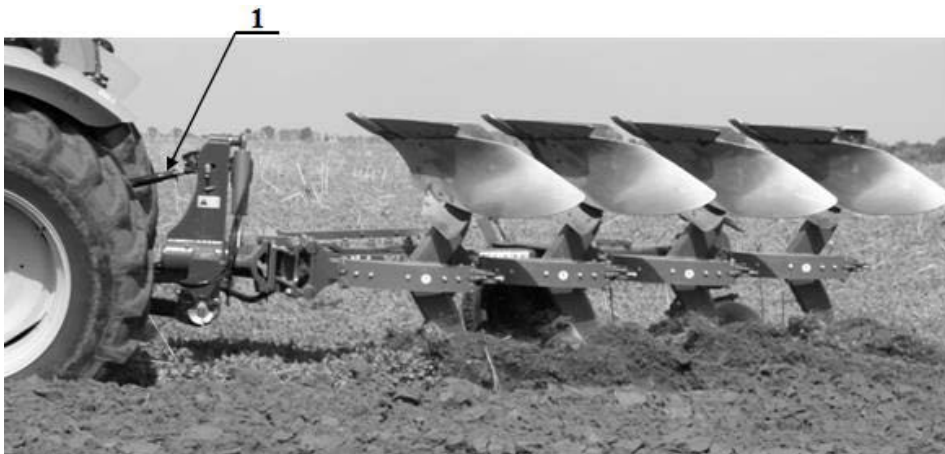


Fig.:18 Top link

3.6.2 Working Depth

You can set the machine working depth at three mutually interacting points and therefore, you should always correct the setting of the remaining values after changing at least one of them. The points are located at:

- the tractor feet – pay special attention to the lifting height allowing the safe plough reversing (see par. 3.5.1)
- the wheel (see par. 3.5.7/3.5.8)
- the top link (see par. 3.6.1)

3.6.3 Stop Screws (Tilting of the Machine)

- Rotate the plough slightly before beginning adjustment in order to move away the cylinder head from the stop
- Set the stop screws so, that the plough angle at work is 90° to the ground
- Set both screws to the same length
- Length of the screws should be equal, however minimum deviations are allowed

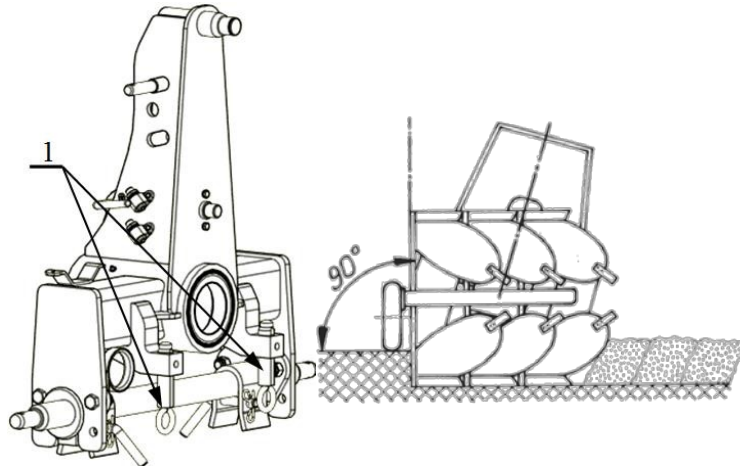


Fig.:19 Stop screws

3.6.4 Longitudinal Adjustment

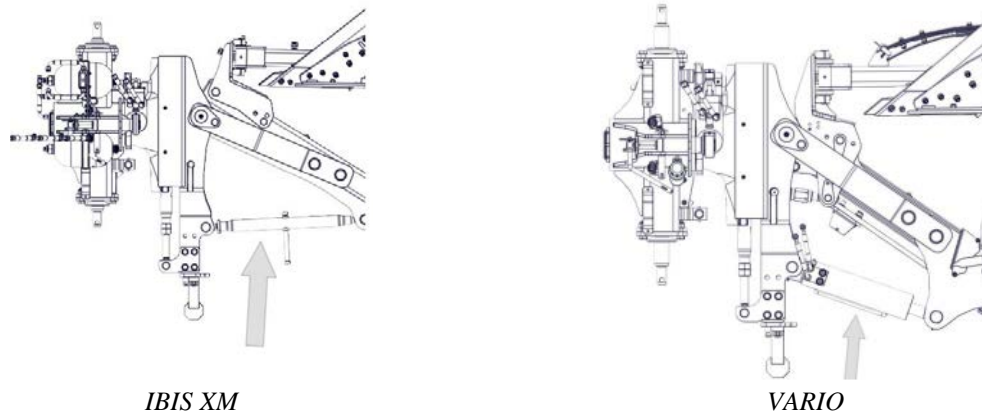


Fig.:20 Adjustment

It is carried out in order to change the ploughing width.

With the turnbuckle

- release the lock-nut and rotate the spindle changing the length of the top link

With the cylinder

- pressurize the cylinder extending it to its limit position
- rotate the stop to change its length
- pull the cylinder in, to the stop
- measure the length and repeat the steps above as required, until obtaining the desired working width

IBIS XM – with turnbuckle

VARIO – with beam tilting cylinder (option in IBIS XM)

3.6.5 Ploughing Width

a) Spot Adjustment (IBIS XM)

IBIS XM Series ploughs feature a spot adjustment of the ploughing width, which can be changed with screws on each plough body.

In order to change the width:

- remove the screw **(2)**
- loosen the screw **(1)**
- reset the holes in the holder to a desired point **(A, B or C)** in relation to the holes in the beam
- reinsert the screw **(2)** in the desired hole and tighten it together with the screw **(1)**
- adjust each body in the same way
- adjust the machine in the longitudinal direction (see par. 3.6.4)
- reset the width of the first furrow-slice
- reset the draw line
- adjust the coulter disc
- when changing the body position, if it is fixed to the wheel holder, reset the holder too

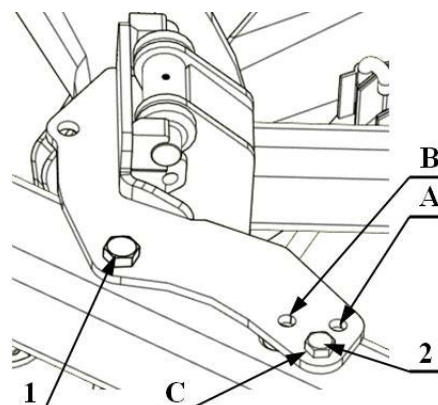


Fig.:21 Ploughing width

The table below shows the plough body working widths in relation to the adjustment hole and length of the spindle [(cylinder), measured from the centres of the clamping bolts] for the longitudinal adjustment (see par. 3.6.4)

Type	Hole	Width [cm]	Length of spindle (cylinder) [mm]±2 mm
XM	A	35	844
XM	B	40	812
XM	C	45	779
XM PREMIUM	A	35	844
XM PREMIUM	B	40	812
XM PREMIUM	C	45	779

Table 3 Working width

b) Variable Adjustment (VARIO)

VARIO ploughs feature a variable adjustment of the ploughing width.

In order to change the plough working width, pressurize the CP cylinder (a 'memory cylinder'). Extension of the cylinder decreases the working width.

The memory cylinder allows the following:

- setting the correct working width from the tractor **(AB)**
- plough reversing in auto mode and stretching the beam without resetting the working width **(MS)**.

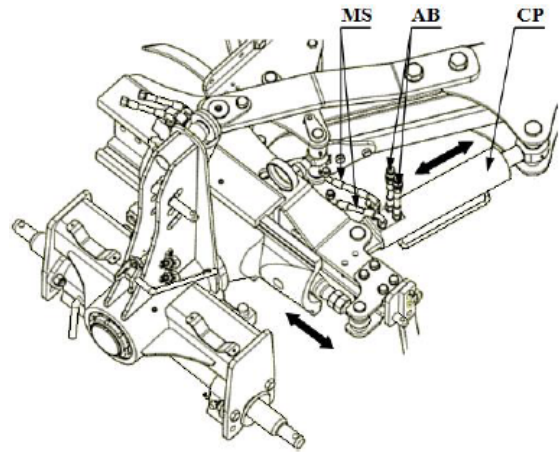


Fig.:21 VARIO

c) Link (VARIO)



Ploughs of the VARIO Series are delivered from the factory with correctly set angle of operation (i.e. the body line is perpendicular to the driving direction)

Never rearrange position of the link (A) (i.e. change its length) on your own without the explicit manufacturer's consent

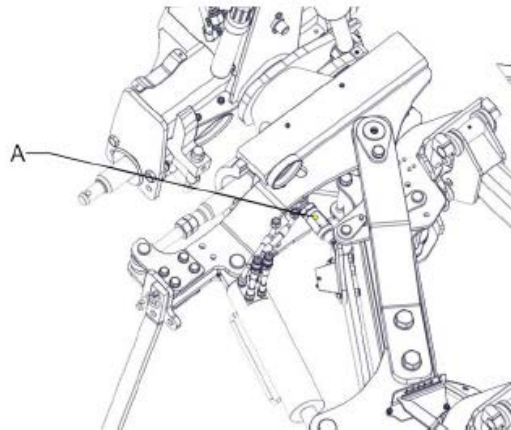


Fig.:21 Link

d) Plough Reversing Cycle (VARIO)

- straightening the beam for reversing
- reversing the plough
- return of the beam to its original position (i.e. nominal working width)

Hold the hydraulic lever long enough to allow the complete beam reversing cycle

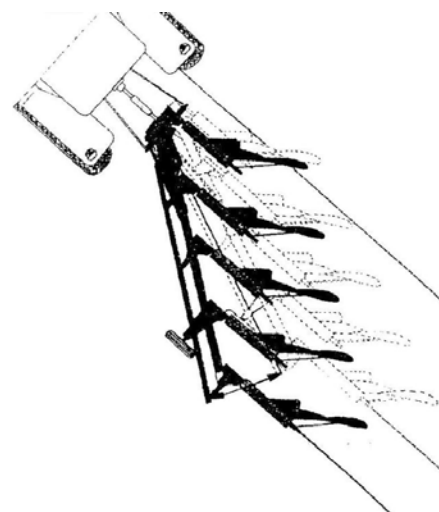


Fig.:21 Change of width

e) Change of Ploughing Width (VARIO)

- without changing the body orientation (i.e. angle of skids)
- with the memory cylinder
- no need to 'adapt' the angle of work as is the case for other plough types

3.6.6 Width of the First Furrow-Slice

Adjust the width of the first furrow-slice each time after adjusting the machine working width.

IBIS XM / VARIO – with turnbuckle (A)

- lift the plough above the ground
- loose the turnbuckle lock-nut
- by turning the turnbuckle, shift the beam in relation to the roll over device, increasing or decreasing the first body working width, as required
- tighten the lock-nut

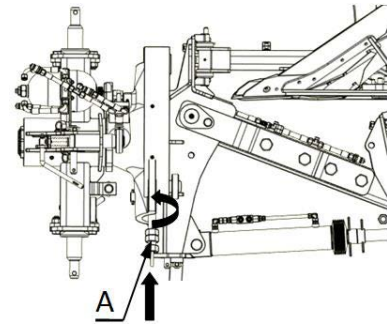


Fig:22 First body turnbuckle

IBIS XM / VARIO – with cylinder (option) (B)

Pressurize the cylinder changing its length, which shifts the beam with bodies parallel to the driving direction, which in turn, changes the working width of the first body.

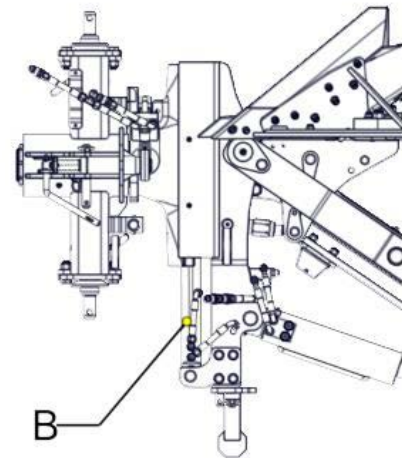


Fig.:22 First body cylinder

In principle, width of the first furrow-slice should match the widths of the remaining ones, however remember that:

- when using wide tyres in the tractor, you decrease the width of the first furrow-slice in order to maintain good connection with the previous passage of the machine
- you can compensate for the gravity of the plough on slopes

3.6.7 Beam For Secondary Tillage Tool

For the reversible ploughs, special cultivating rollers are available, fitted with special hitches allowing detachment of the roller at the end of bed and its re-attachment after turning the plough on the headland. When working with a plough with such a tool, draw it at a distance of two furrow-slices of the current passage, which improves the effects of your work.

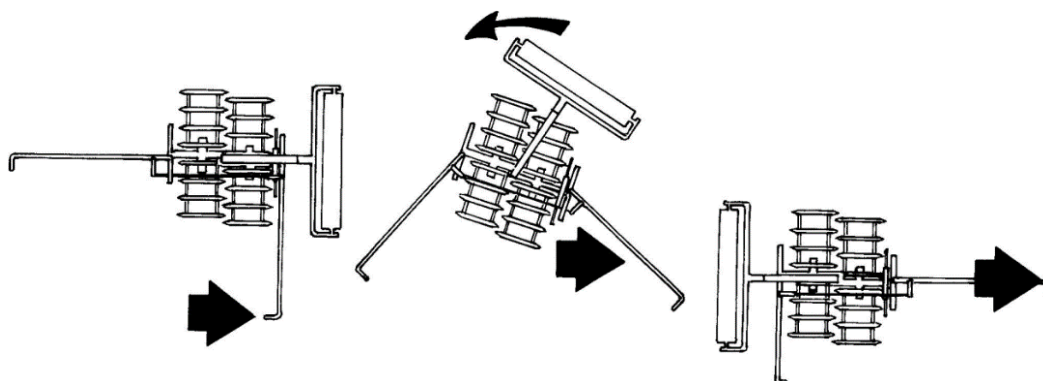


Fig.:23 Secondary tillage tool



Weight of any secondary tillage tool may not exceed 2000 kg

In order to change position of the holder (C), replace the bolt (A) to a desired hole, changing position of the arm in relation to the bodies. Then, align the angle of the holder with the turnbuckle (B)

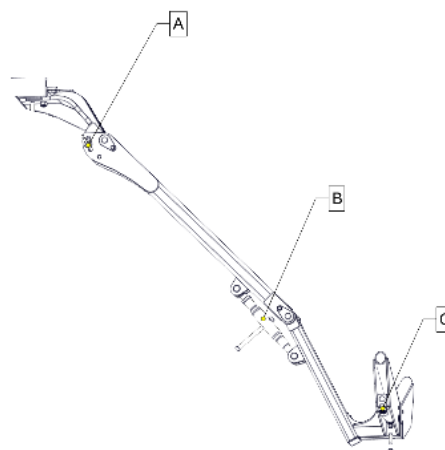


Fig.:24 Secondary tillage tool beam

3.6.8 TERRA H Cultivating Roller

With a hydraulic control system with which you can fold the tool for transport and adjust the pressure by shifting the weight of the plough to the working sections. It is used for soil compaction during ploughing. It is integrated with the plough when accessing the field and at work, when reversing.

If the TERRA roller would not dampen the swinging movement after 5 swings, tighten the brake screw (D).

Both cylinders are connected to one pair of hydraulic outputs – toggling between them can be obtained through a 3-way valve located in the front section of the arm.

Unfolding:

- unfold the roller when the machine stands on the ground
- select the cylinder (B) with the valve and open the beam by extending the cylinder
- select the cylinder (A) with the valve and lower the roller onto the ground
- the roller has to be set perpendicularly to the driving direction when working, which can be achieved with the cylinder (B), by setting its length accordingly, and with the stop
- set the pressure force with the cylinder (A) as well as by shifting the bolts in the regulator (C). Too high pressure force can cause deviation of the plough in the opposite direction, which significantly deteriorates the effects of work

Folding:

- fold the roller when the machine stands on the ground
- clean the roller and the entire jib of any collected material (e.g. soil, stones, etc.)
- select the cylinder (A) with the valve and lift the roller up
- select the cylinder (B) with the valve and pull the roller above the machine



Readjust the stop screws (see par. 3.6.3) after the installation of the TERRA cultivating roller.

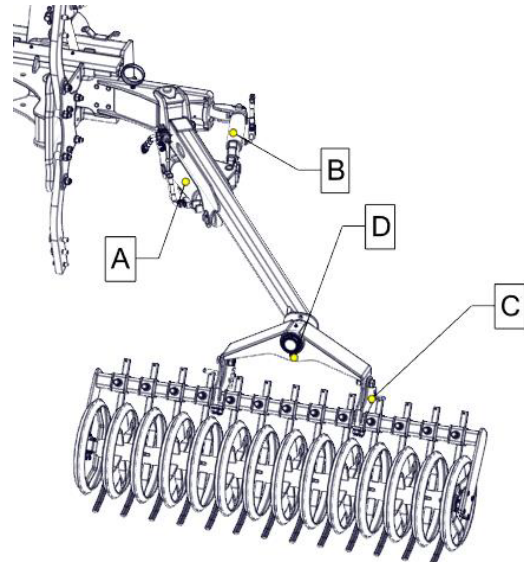


Fig.:25 TERRA roller

3.6.9 Operating Tips

- depending upon the size of the tractor and plough, as well as upon the unit reversing method, width of the reversing area is from 10 to 20 m. Width of the headland must be a multiple of the working width of the plough
- when beginning ploughing from the edge of a field, turn the first furrow-slice to the inside of the field. This way, you begin ploughing during the second passage, when you turn back in the first furrow-slice. This way, the whole area will be ploughed completely.
- make the first passage with the plough set at $\frac{1}{3}$ of the working depth and the second one at $\frac{2}{3}$ of the working depth. This way, the tractor runs in the furrow at the correct depth during the third passage and you can finally set the plough then



Skew furrows increase load on the plough and tractor

3.6.10 U-Turn

- Three-point U-turn – lift the plough at the end of bed, reverse it by 180° and turn round on the foreground in the direction of the not ploughed field, and drive the tractor front to the furrow, lowering the plough at the beginning of bed.
- Turning round by 180° (turn round by 180° at the end of bed on the foreground after having lifted up the plough). Reverse the plough by 180° when you drive along a curve.
- Turning round by 180° is quicker and less laborious, however it requires wider foreground.

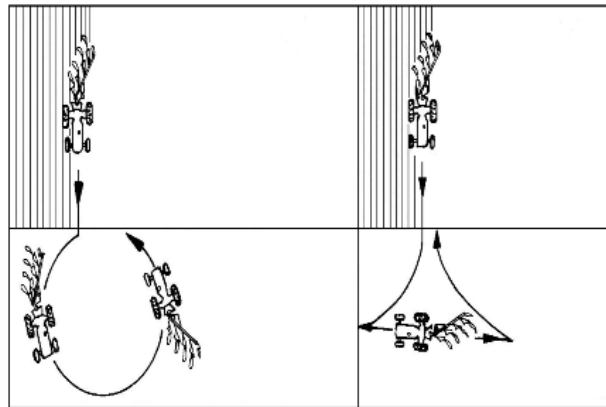


Fig.:26 U-turn

3.7 Work With the Plough

You can adjust the plough correctly after some initial passages and after having entered the tractor to the furrow of the desired working depth. Correctly suspended and adjusted plough should move evenly behind the tractor when ploughing and maintain this position to provide equal widths of the furrows and operation of the plough bodies at the same depth (see Fig. 32)

- Avoid sudden jerks when ploughing.
- Neither reverse nor turn back with the plough bodies sunk in the ground.
- Make the turns smoothly without the use of the tractor independent brakes.
- Always reverse the plough when driving forward or standing still.

4. Servicing and Maintenance

4.1 General

Always use the genuine spare parts since they are of the proper quality and fit the plough correctly. Besides, it is one of the warranty conditions.

4.2 Replacement of Working Parts



Replace all working parts (wearing parts) in due time to protect the other, more expensive assemblies against wear.



Contact the manufacturer's service department in order to replace any component of the hydraulic system and springing.

4.2.1 Bolt, screw and nut tightening torques (Nm)

		Fastener class			
Size	pitch	6.8	8.8	10.9	12.9
M4	0.7	2.4	3.2	4.5	5.2
M5	0.8	4.5	6	8.4	10
M6	1	8	11	15	17
M8	1.25	18	27	34	40
	1	16	21	30	35
M10	1.5	35	46	65	76
	1.25	31	41	57	67
	1	27	36	50	59
M12	1.75	59	79	111	129
	1.25	49	65	91	107
M14	2	92	124	174	203
	1.5	76	104	143	167
M16	2	127	170	237	277
	1.5	104	139	196	228
M18	2	194	258	363	422
	1.5	135	180	254	296
M20	2.5	250	332	469	546
	1.5	172	229	322	375
M22	2.5	307	415	584	682
	1.5	212	282	397	463
M24	3	432	576	809	942
	2	322	430	603	706
M27	3	640	740	1050	1250
	2	480	552	783	933
M30	3.5	755	1000	1450	1700
	2	560	745	1080	1270
M36	4	980	1290	1790	2020
	2	730	960	1340	1500

Table 4 Tightening torques

4.3 Lubrication

Use mineral oils for lubrication. Clean the lubrication points before lubricant injection. Lubricate at the points marked and specified in Table below.

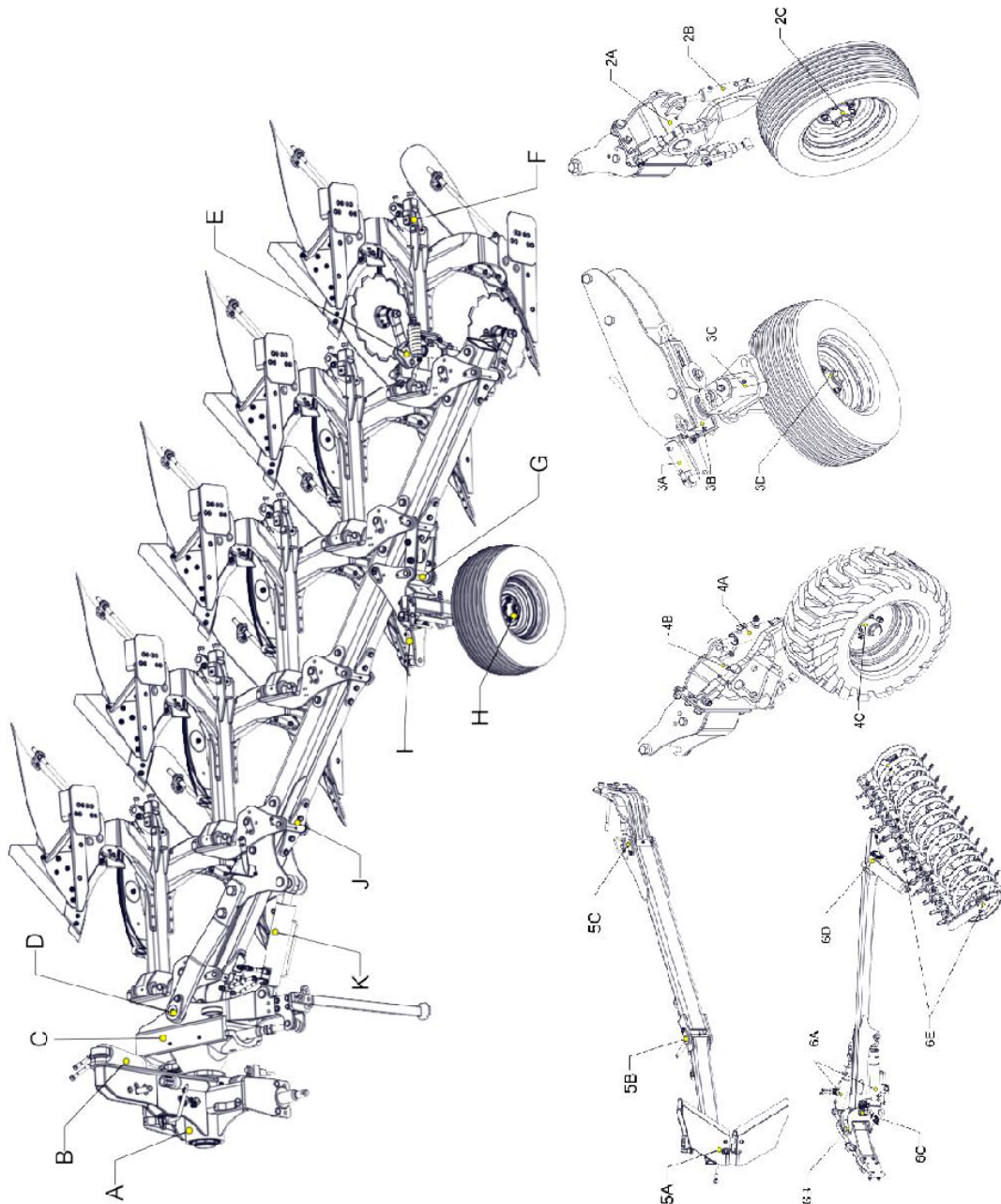


Fig.:27 Lubrication

4.3.1 Lubrication Points

Item	Designation	Specification	Lubricant grade	Lubrication interval (ha)
1	A	Roll over device axle	ŁT-4S-3 grease	every day
2	B	Reversing cylinder	-II-	every 100 ha
3	C	Slide	-II-	every day
4	D	Bolt	-II-	every day
5	E	Coulter disc hub	-II-	every day
6	F	NON- STOP mechanism	-II-	every day
7	G	Support wheel axle	-II-	every day
8	H	Wheel axle	-II-	every 100 ha
9	I	Shock absorber	-II-	every 200 ha
10	J	Alignment cylinder	-II-	every 100 ha
11	K	VARIO system	-II-	every 100 ha
12	2A	Support wheel axle	-II-	every day
13	2B	Shock absorber	-II-	every 200 ha
14	2C	Wheel hub	-II-	every 100 ha
15	3A	Shock absorber	-II-	every 200 ha
16	3B	Axis of rotation	-II-	every day
17	3C	Axis of rotation	-II-	every day
18	3D	Wheel hub	-II-	every 100 ha
19	4A	Shock absorber	-II-	every 200 ha
20	4B	Axis of rotation	-II-	every day
21	4C	Wheel hub	-II-	every 100 ha
22	5A	Cylinder (bolt)	-II-	every day
23	5B	Bolt	-II-	every 200 ha
24	5C	Bolt	-II-	every 200 ha
25	6A	Cylinder	-II-	every 200 ha
26	6B	Bolt	-II-	every 100 ha
27	6C	Bolt	-II-	every 100 ha
28	6D	Axis of rotation	-II-	every day
29	6E	Bearings	-II-	every day

Table 5 Lubrication

- If required, lubricate all not specified items once a week.
- Lubricate all lubrication points after each washing of the machine.
- Before putting into operation.
- After any overhaul or repair.

4.4 Storage

Each time after finishing work clean the machine from soil and then inspect all its parts and assemblies. Replace any worn or damaged parts with new ones. Tighten any loosen screw connections. Store the machine on hardened surfaces.

After the season:

- clean the machine thoroughly
- lubricate the machine at all lubrication points
- wash the working surfaces of the tine cultivator points, coulter discs, rollers/plough bodies* skimmers* (ploughs) and hitch axle pivots with kerosene and then protect them against corrosion by applying grease with brush
- repair spot defects of the paintwork by repainting
- when the machine is to be stored outdoors in winter – disassembly the hydraulic cylinder from the machine together with the hoses and keep them in a dry, well ventilated and possibly dark room

4.5 Disassembly and Disposal

After its working life, the cultivator is to be scrapped. Disassembly should be performed by a specialized company.

4.6 Warranty Conditions and Warranty Services

Agricultural machinery is warranted to the provisions specified in the Instruction Manual for proper operation and maintenance. Under the warranty period, only the genuine parts made by 'UNIA' Grudziądz may be used.



Any modifications or repairs made by the user are not allowed. This may lead to loss of warranty. For more detailed information on how to file a complaint, see the Warranty Card attached to each machine together with its Operating Manual.

The warranty services are performed by: the supplier (dealer) entered to the Warranty Card when buying the machine.

Specify the following if ordering parts or assemblies from our catalogue:

- the exact address of the ordering party
- name, symbol and factory No. of the machine, its year of manufacturing and the manufacturer's name
- item, and ordering No. of the part or assembly
- quantity

4.7 Troubleshooting

Defect	Possible cause	Remedy
1. The plough does not rotate	<ul style="list-style-type: none"> - Too low oil level or pressure - Incorrect operation of quick-connectors - Damaged actuator block - Dirty strainer in the actuator control block - Damaged socket in the tractor 	<ul style="list-style-type: none"> - Refill oil, check pressure in the tractor hydraulic system - Check condition and connection of the quick-connectors - Replace - Clean
2. The plough rotates only once and no more	<ul style="list-style-type: none"> - Too cold oil in the system - Leak in the hydraulic distributor 	<ul style="list-style-type: none"> - Wait for approx. 15 s between the subsequent rotations
3. During ploughing, the rotation cylinder does not lock the frame in the end position	<ul style="list-style-type: none"> - Damaged rotation cylinder block 	<ul style="list-style-type: none"> - Replace
4. Tractor front trends to lift up	<ul style="list-style-type: none"> - Too light front. Note: Never allow the tractor to drive only on the rear wheels (with its front up) 	<ul style="list-style-type: none"> - Install the weights
5. Tractor turns to one side and it is necessary to compensate it with the steering wheel	<ul style="list-style-type: none"> - Faulty adjusted plough 	<ul style="list-style-type: none"> - Reset individual components of the plough, see the basic settings: i.e. width of the first furrow-slice and the angle of inclination of the frame - Check wheel track of the front and rear wheels - Check, whether the tractor stabilizers are not tensioned
6. First plough body cuts the furrow-slice of different widths during LH and RH ploughing	<ul style="list-style-type: none"> - Incorrect adjustment of the first furrow-slice 	<ul style="list-style-type: none"> - Readjust with the spindle of the first plough body

Table 6 Defects

UNIA Sp. z o.o.

st. Szosa Torunska 32/38, 86-300 Grudziadz

QUESTIONNAIRE

Please read the entire questionnaire and write a short answer:

- 1. Machine serial number
received on.....
- 2. Have any deficiencies or damages occurred during the transport? If so, please specify what :
- 3. When did you start work with the machine.....
- 4. How many [ha] have you worked with the machin.....
- 5. Tractor power (HP).....
- 6. Which damages occurred.....
- 7. What is your general opinion about machine's work
- 8. What difficulties occur during the operation of the machine
- 9. Your comments regarding changes, improvements of construction and machine operation
- 10. Your remarks concerning this manual.....

User address : Name & surname

 Place

 Postal code

 Province



.....
Date

.....
Signature

UNIA Sp. z o.o.

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