From November 2020

Instruction Manual and Maintenance Directions

UPX plough

Important!
Read the Instruction Manual thoroughly before use

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■ CONTENTS

SAFETY SYMBOLS

NOTE! You will find this general warning symbol throughout this Instruction Manual to make you aware of safety instructions concerning yourself, your employees and other persons coming into contact with the equipment. Neglecting these instructions may lead to serious injury and even death.

This symbol has the following meaning:

WARNING!
LOOK OUT!
YOU ARE IN DANGER!

Warning Labels

Be aware of the warning words **WARNING!** and **NOTE!** in safety texts. These words have been chosen based on the following guidelines:

WARNING! Warns of dangerous situations which, unless avoided, could lead to serious injury or even death. This also includes dangers that can occur when protective equipment and/or protective screens are removed. Warning labels can also be used to warn of hazardous use.

NOTE! Highlight risky situations where slight or minor injuries can result if they are not avoided. Used also to warn of machine damage that can arise if the directions are not followed.

Dear Customer!

Thank you for choosing a TREJON OPTIMAL product – we hope you will be pleased.

Reading this manual and following its recommendations will ensure you get the longest possible service life and efficient use of the UPX plough.
We have produced this manual to give you a good overview of how the plough works as well as the safety and maintenance directions that must be followed when working with it.
If any questions should arise when using the plough or reading this manual, you are always welcome to contact us.

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Dear Dealer,

In order for the warranty to come into force and for all legal requirements to be met, we would like you to complete the warranty certificate together with the customer and to register at **trejon.se**

The warranty will come into force on the same day as the plough is transferred to the customer.

Delivery inspection checklist:

Check for any transport damage. Report to carriers	
Inspect the tool thoroughly before use and make sure all packaging has been removed. Dispose of all packing materials in an environmentally responsible manner.	
Check that the delivery is complete in accordance with the machine order/packing note.	
Make sure the machine has been lubricated as described under “Service and Maintenance”.	
Check tightness of all screw unions, see table for tightening torques in Service and maintenance (Section 4).	
Perform function test	
With the assistance of the Instruction Manual, run through and explain commissioning, use and maintenance of the plough and accessories to the customer.	
Complete the proof of transfer together with the customer and register at **trejon.se**	
Instruction Manual handed over to customer.	

Enter the serial number of the plough in the field on the right.	S/N:

Read through the entire Instruction Manual and understand its contents before using the UPX plough.

1 Introduction

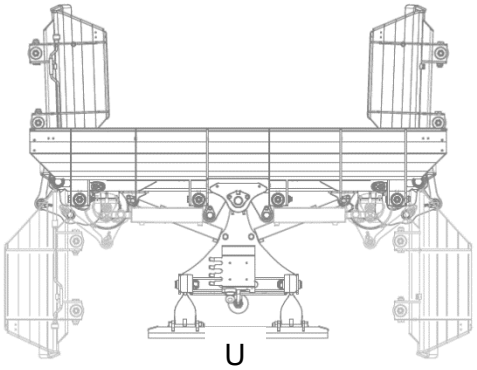
1.1 General

Before starting to use the plough, you are strongly recommended to carefully read through the manual and safety instructions.
The user must be familiar with the UPX plough in order to guarantee safe usage.

1.2 Description of UPX plough

The UPX plough's wings can be adjusted. This means that the plough can be used both as a diagonal blade and as a U plough.

The plough is intended to be connected to the existing attachment for agricultural tractors, loaders and compact tractors, and from now on these will collectively be referred to as 'tool carriers'.
The TREJON OPTIMAL UPX plough can be equipped with an attachment for most tool carriers.
The plough is equipped with a hydraulic valve as standard. This makes it possible to operate each wing independently or both wings at the same time.
The UPX folding plough can be set in a number of different positions, depending on the type of work to be performed.
U-CONFIGURATION, D-CONFIGURATION, S-CONFIGURATION and Z-CONFIGURATION.



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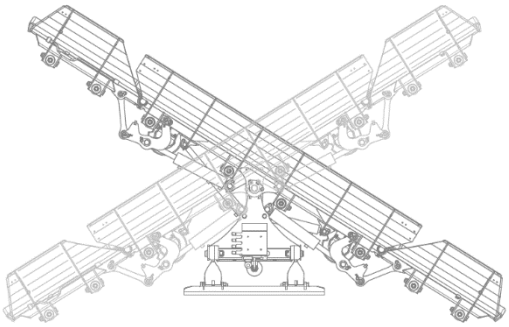

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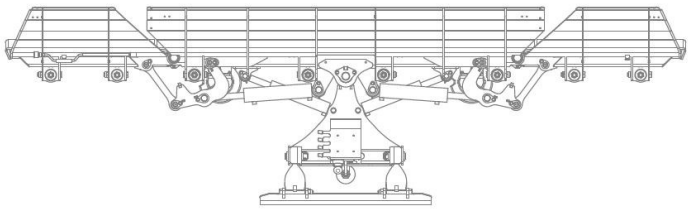

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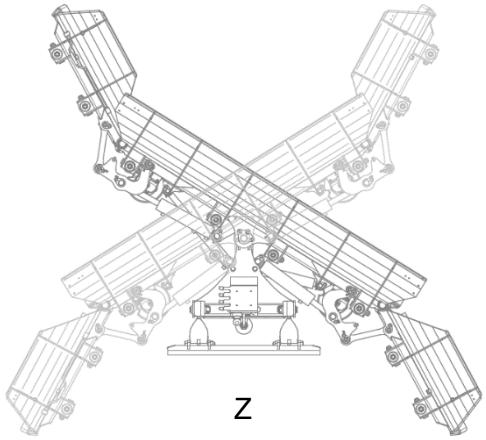

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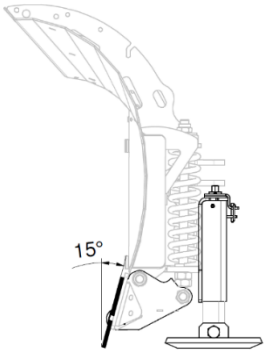
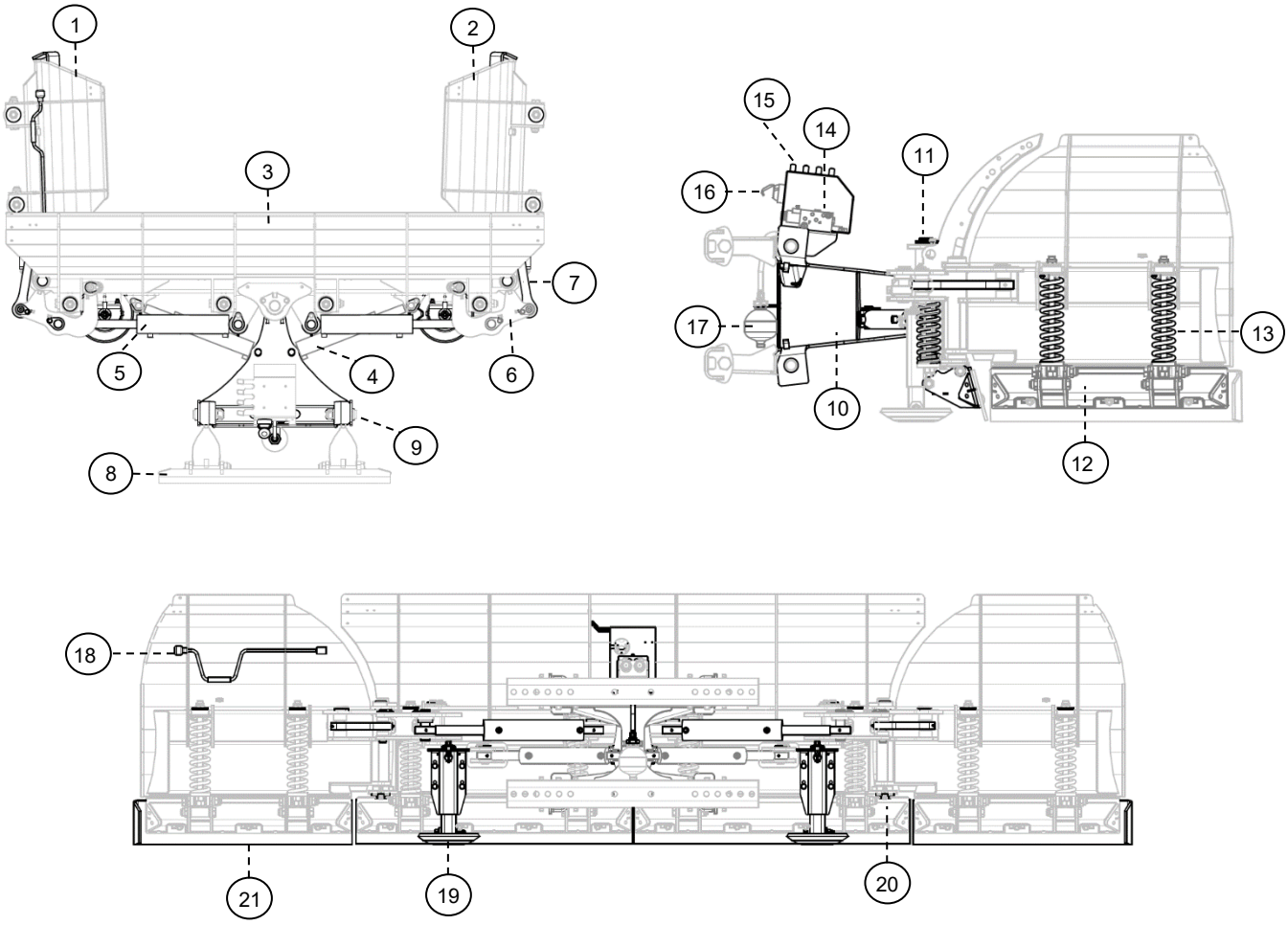


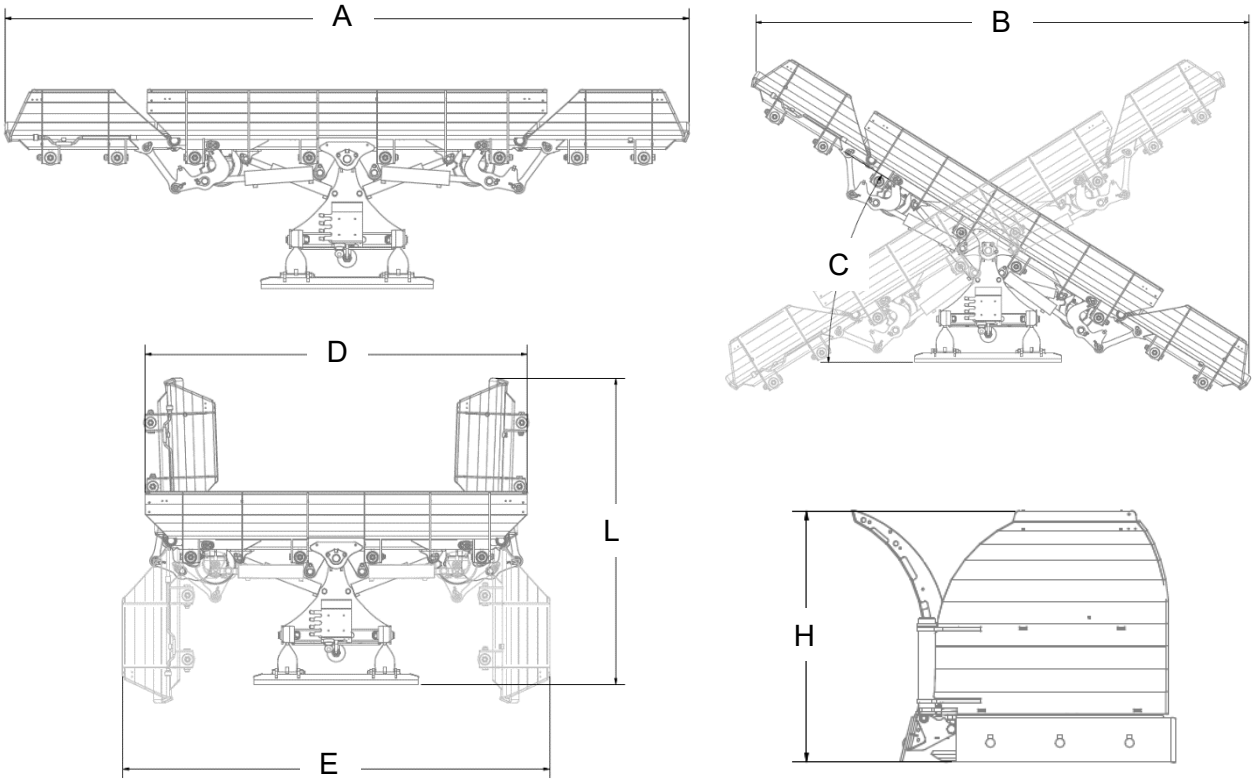
The UPX cutting blades work as standard with a 15° positive cutting angle. This provides an efficient and clean cut, even at high speeds. The power requirement is also reduced.

1.3 Detailed description



1. Left wing	11. Pin (centre frame)
2. Right wing	12. Steel holder
3. Main blade	13. Spring
4. Cylinder (main blade)	14. Hydraulic valve
5. Cylinder (wings)	15. Protective cover (Hydraulic valve)
6. Link	16. 7-pole connector for spiral cable
7. Brace (link-wing)	17. Pressure accumulator
8. Attachment / floating mode	18. Crank (support plate)
9. Pin	19. Support plate
10. Centre frame	20. Pin (wings)
	21. Cutting blade - **option**

1.4 Technical Data



All measurements in the table are for UPX ploughs equipped with a (smooth) cutting edge.

Model	Dimen-sions	UPX300	UPX370	UPX440	UPX500
Tool carrier max. weight[1] [tonnes]		4	7	14	14
Total width, horizontal [cm]	**A**	300	371	440	500
Total width, diagonal [cm]	**B**	265	328	380	432
Diagonal blade angle +/- [°]	**C**	35	35	38	38
Total width, wings forward [cm]	**D**	150	198	258	258
Total width, wings back [cm]	**E**	201	203	288	288
Height [cm]	**H**	72	96	110	110
Length [cm]	**L**	1620	1980	2060	2360
Wing angle [°]		170	170	180	180
Weight[2] [kg]		520	850	1000	1100
Operation		Hydr./Elec.	Hydr./Elec.	Hydr./Elec.	Hydr./Elec.
El. voltage[3] [V]		12	12	12	12
Hydraulic connection		G½" Faster male (x2)	G½" Faster male (x2)	G½" Faster male (x2)	G½" Faster male (x2)

[1] - The weight of the tool carrier in combination with the driving speed is extremely important in the event of a collision. See Chapter 3.8

[2] - The plough is supplied as standard without cutting blades. The cutting blades can be configured when ordering.

[3] - As standard, the plough is supplied for the voltage indicated in the table. If a different voltage is required, contact Trejon or read section 5 – Accessories.

1.5 Attachment with floating mode function

The floating mode attachment is movable for vertical pivoting and twisting (horizontal) (see figures 1, 2 and 3 below for a description of the movement capacity).
It is important to position the floating mode attachment so that it can move freely up and down. Lower the plough to the ground. Lower the attachment to its end position (see Figure 2) and then lift the attachment approximately 70-80 mm. In this position (floating mode), the plough is able to follow the surface optimally.

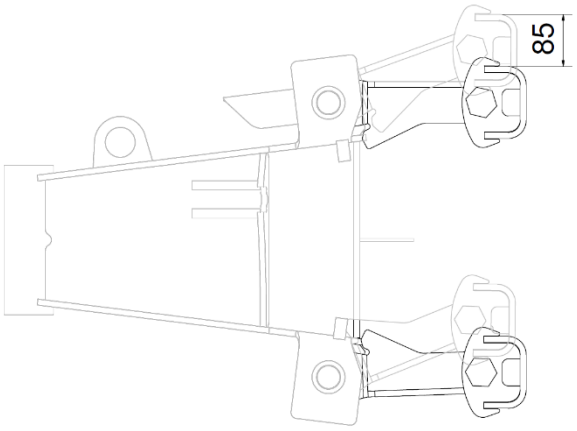


Figure 1 – Vertical movement, up

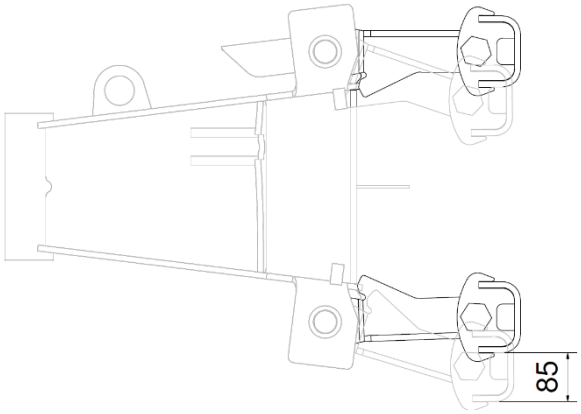


Figure 2 – Vertical movement, down

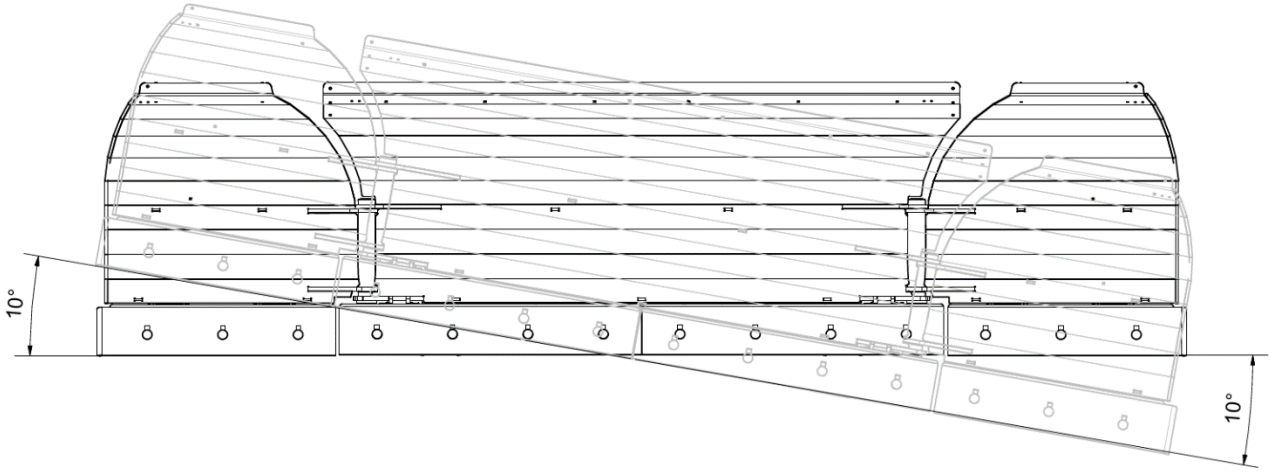


Figure 3 – Rotation

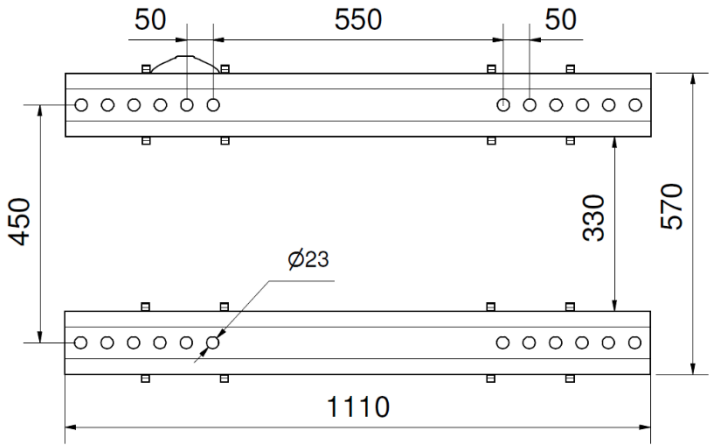


Figure 4 – Hole pattern

1.6 Connection

The type of attachment / hook (1) for the tool carrier's loader (3) or suspension must always be specified when ordering a UPX plough. It is important to use the correct tightening torque: **M20 (420 Nm)** and **M16 (215 Nm)** for all bolts (4) when installing the attachment / hook (1) on the plough's floating bracket (2).

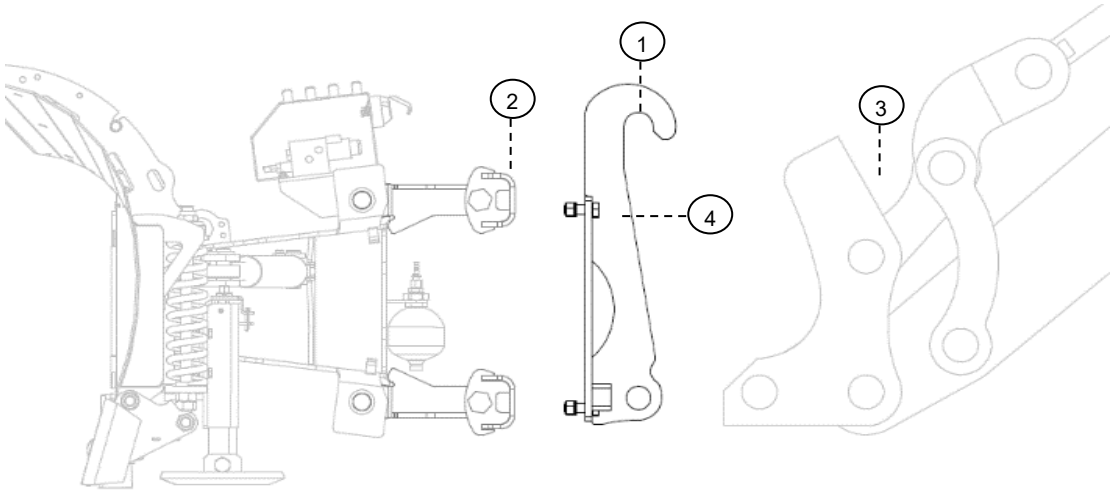


Figure 5

Warning!
Loose or poorly tightened bolts can cause the plough to come loose and cause material damage and/or personal injury!

1.7 Blank attachment

There are many different machines. In those cases where the Trejon does NOT have a ready-made attachment, customers can weld these onto a blank plate themselves. There is a ready-made kit for this, **art. no. 84005** – see Figure 6. Customers can weld attachment hooks for the load carrier themselves. For mounting on a UPX plough, read section 1.6.

Warning!
It is the person who welds/manufactures the attachment who is responsible for any incorrectly performed welding/manufacturing that may result in future injuries or accidents.

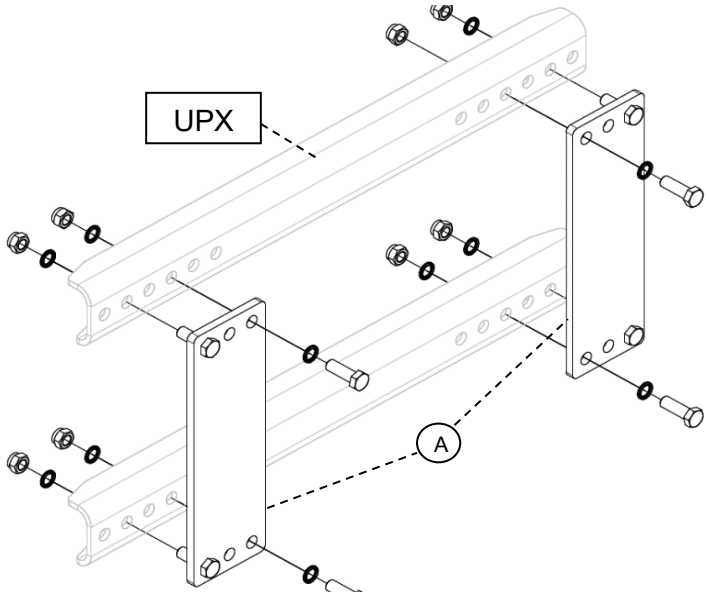


Figure 6

1.8 Trejon Attachment – Table

The UPX plough can be equipped with various attachments. The following table lists Trejon's art. nos. for the most viable alternatives. All these are suitable for the UPX plough's floating mode attachment.

Model	**Kit art. no.**	**C-C [mm] (internal)**	**Figure**	**Location of stop lug** (ST)	**Other**
Volvo BM	**450010**	960	7.1	Outside	-
3-point Cat. 2-3N	**440109**	825	7.2	-	Wider **(W)** side facing inwards
Trima	**450075**	650	7.3	-	Wider **(W)** side facing inwards
Euro	**450084**	995	7.4	Outside	-
Zettelmeyer 502	**60565**	860	7.5	Inside	-
Zettelmeyer 402	**60131**	650	7.6	Inside	-
3-point Cat. 1-2N-2	**84009**	683	7.7	-	Cat.1-2N.
3-point Cat. 1-2N-2	**84009**	825	7.8	-	Cat. 2

It is important to maintain the C-C dimensions (see Fig. 7.1…7.8) when installing the attachments. The location of the stop lug (ST) is also an important part of the installation.

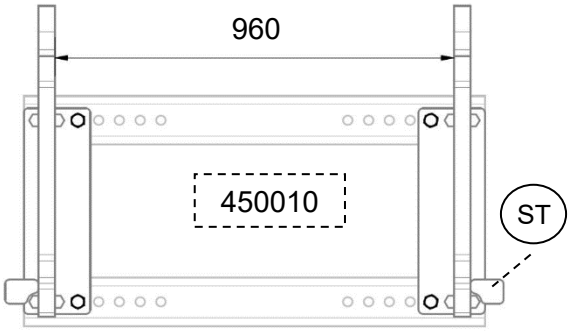


Figure 7.1

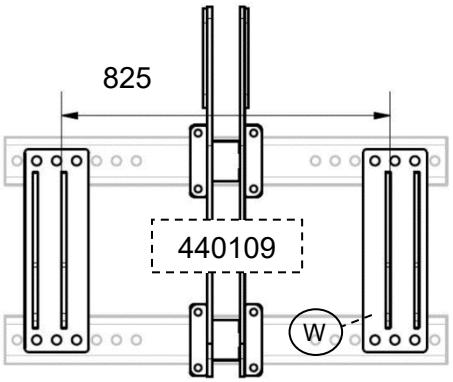


Figure 7.2

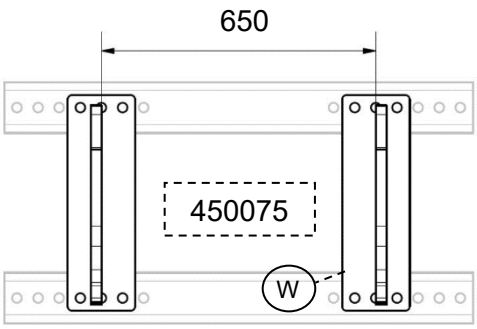


Figure 7.3

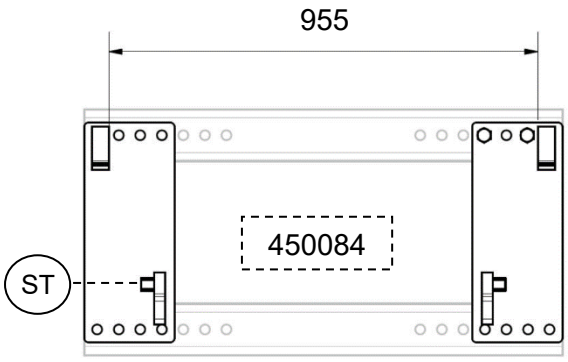


Figure 7.4

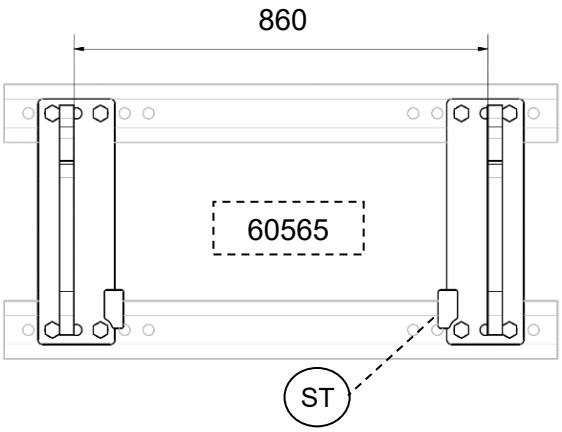


Figure 7.5

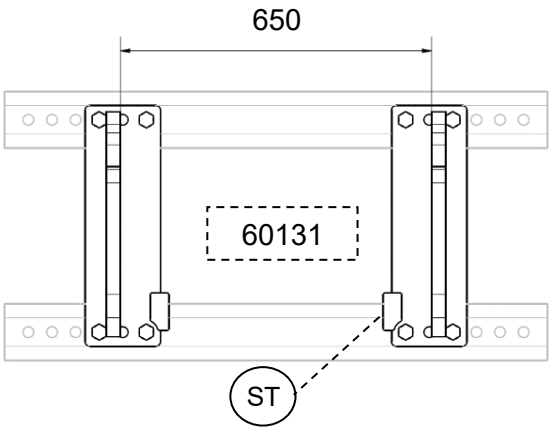


Figure 7.6

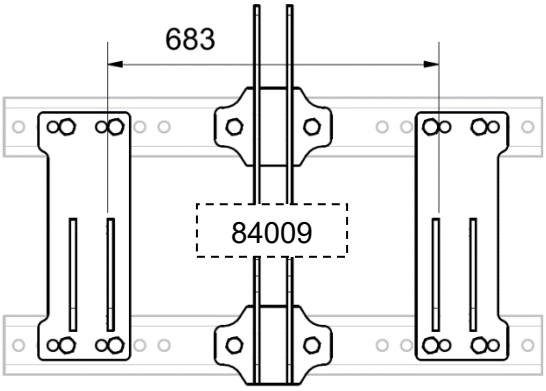


Figure 7.7

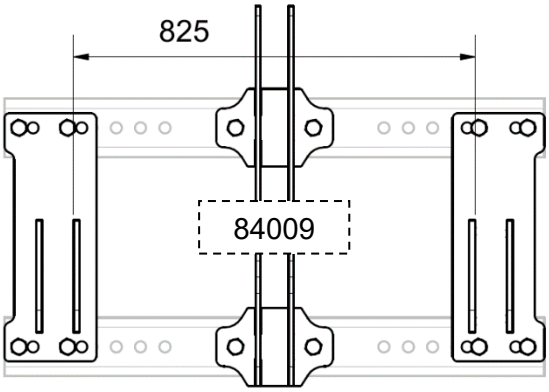


Figure 7.8

1.9 Support plates

The UPX plough is equipped with two support plates, which can be adjusted using a crank (size NV19) to the desired position. Remove the ring pin (1) and lock plate (2) from the adjustment screw (3) before carrying out height adjustment – see Figure 8. Use the crank (4) for height adjustment 360° = 5 mm – see Figure 9. Restore the lock plate (2) and ring pin (1) to lock the adjustment screw (3) following height adjustment – see Figure 10.

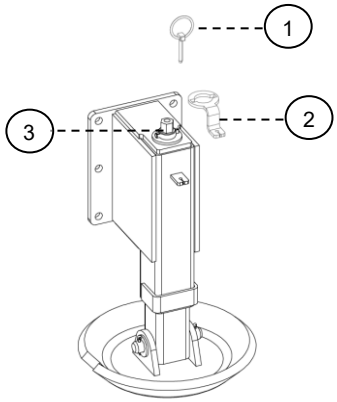


Figure 8

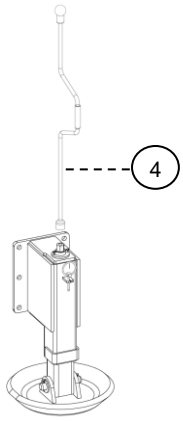


Figure 9

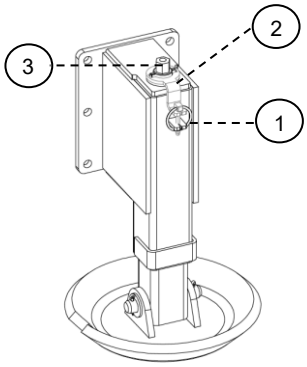


Figure 10

When ploughing for the first time or when the roadway is soft, it can be an advantage to raise the UPX plough (X ≥ 0) (see Figure 11). This is done to prevent unnecessary wear on the cutting blades and to avoid cutting up gravel.

After ploughing a few times or once the roadway has frozen and become hard, you are recommended to lower the UPX plough by adjusting the support plates upwards to the same level (X = 0) as the cutting blades (see Figure 12).
Better ploughing results are achieved once this has been done.

NOTE!
Always replace damaged or worn support plates in time – Trejon art. no. 144636. If the plate comes loose, the support leg will also be damaged. This is NOT covered by any warranty.

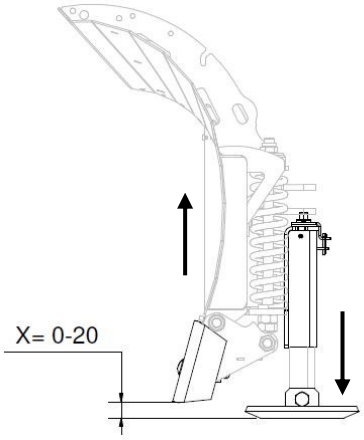


Figure 11

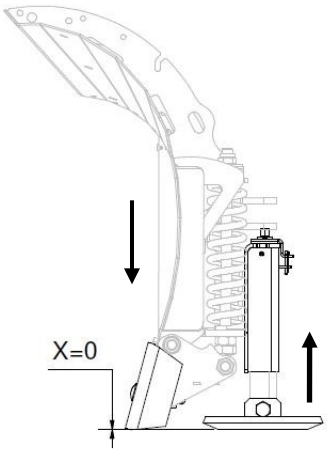


Figure 12

NOTE!
Make sure that the support plates are the same height on both sides. Damage due to incorrect adjustment is NOT covered by any warranty.

1.10 Cutting blades

The UPX plough is not equipped with a cutting blade as standard (see Figure 13). The plough must not be used without cutting blades.

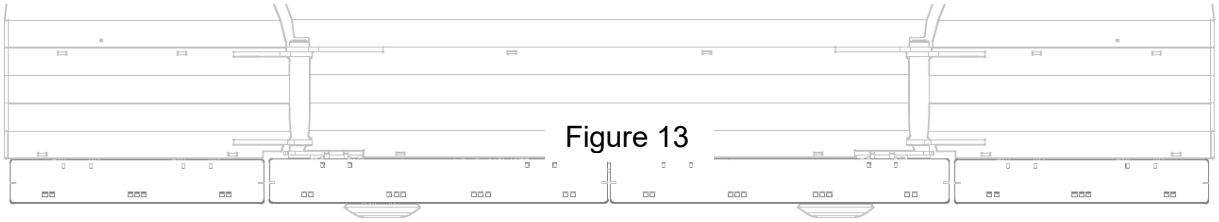
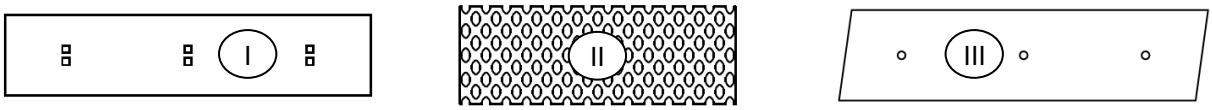


Figure 13

Each UPX plough must be configured with suitable cutting blades. It is possible to choose between different cutting blades: smooth SHARQ (I), perforated SHARQ P300 (II) and wear rubber scraper blades (III).



Use the accompanying (for each UPX plough) fixation components such as screws (S), washers (N) and nuts (M) to mount the cutting blades (see Figure 14).

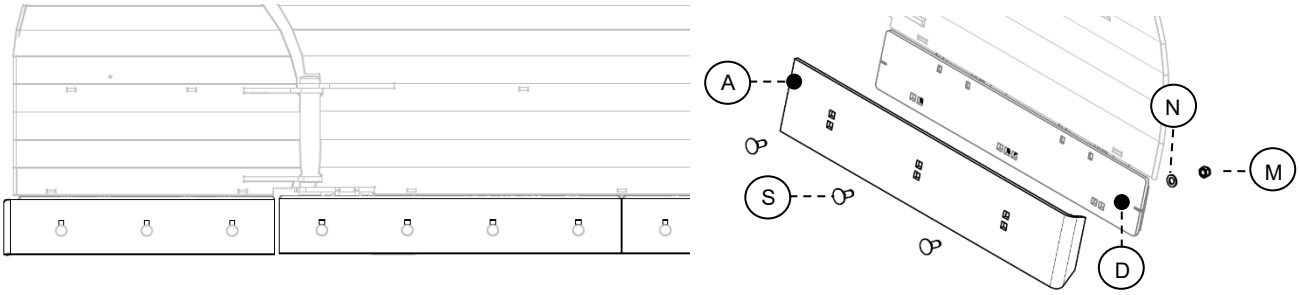


Figure 14

For wear rubber scraper blades (40 mm thickness), longer screws and a fixing plate are required (see Figure 15). These are included in the kit – see options, Chapter 5. When installing these, the same tightening torque must be used for all screws. The fixing plate must be pressed into the rubber scraper blade MAX 2-4 mm.

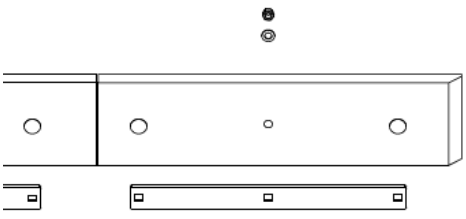


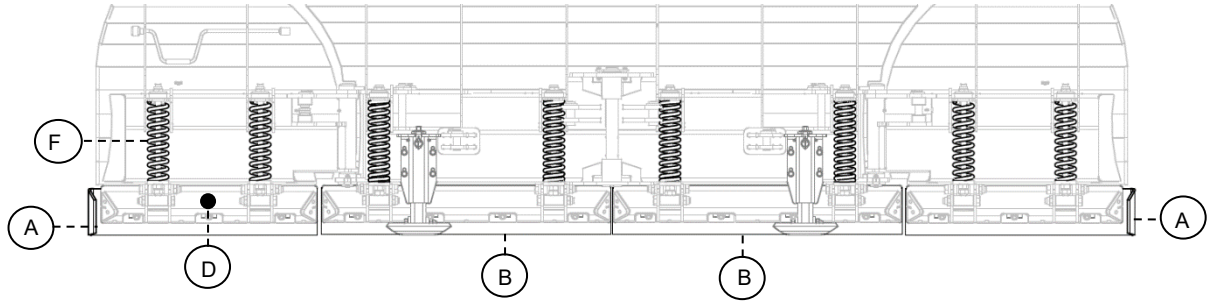
Figure 15

It is easiest to mount the cutting blades when the plough has been raised from the ground. This requires that the plough or the loader arm on the tool carrier is steadily raised and secured.

NOTE!

- **Activate the tool carrier's parking brake.**
- **Raise the plough to the desired height.**
- **Support the plough or the loader arm so that the plough cannot drop down.**
- **Make sure that the surfaces of the steel holders (D) are clean before installing the cutting blades, see Figure 14.**
- **Personal protective equipment: Helmets, protective goggles, safety shoes and gloves must be worn during the installation or replacement of the cutting blades.**

On the back of the plough body are springs (F) that are anchored in the steel holders (D). This means that the cutting blades are sprung. The sprung cutting blades reduce damage in the event of a collision.
The outer cutting blades (A) have a bent edge (not wear rubber) which reduces the risk of becoming stuck in obstacles.



It is important to check wear and tear on the cutting blades daily. There are many factors that affect this. These factors include ploughing speed, substrate, cutting angle, support plates and adjustment of the floating mode. It is therefore important to maintain the distance **W ≥ 10 mm** between the lower edge of the cutting blades (1) and the lower edge of the steel holder (2) (see Figure 16).

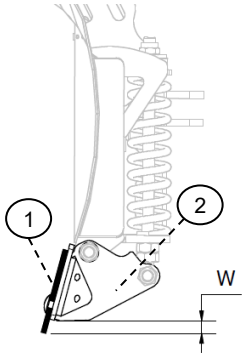


Figure 16

Figure 17

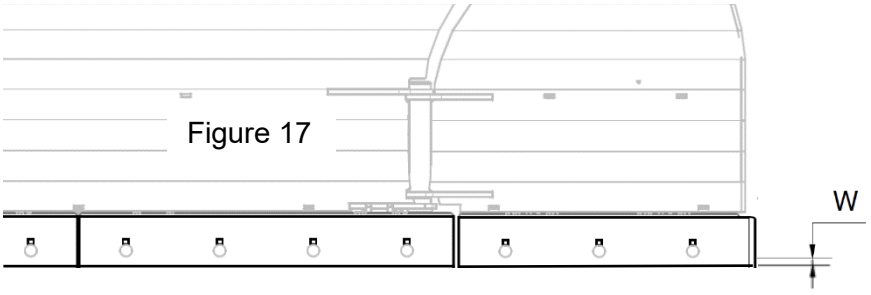
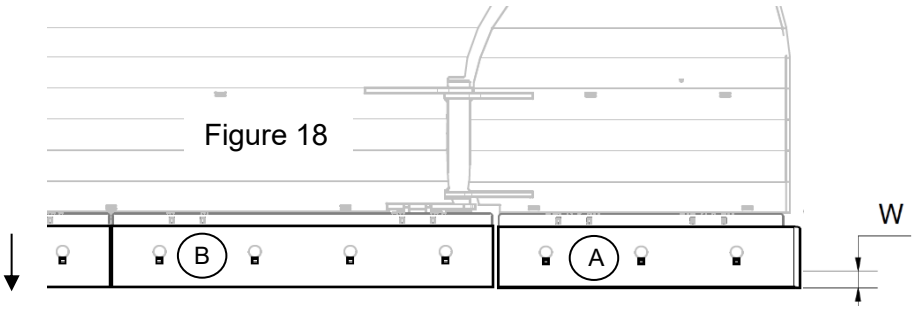


Figure 18



When the wear is significant and the distance **W ≤ 10 mm** (see Figure 17), it is time to move all the cutting blades downwards (see Figure 18). When this position is also worn, the cutting blades (B) are turned or shifted (from left to right and vice versa); this applies to the cutting blades with bent ends (A). It is important that the cutting blades do not protrude downwards more than 60 mm, i.e. **W max. = 60 mm**.

NOTE!
Trejon Optimal cutting blades are made of the highest quality steel to provide a low overall cost. The cutting blades are wear components and their service life CANNOT be determined. The cutting blades are NOT covered by any warranty.

NOTE!
Damage due to the use of other cutting blades is NOT covered by any warranty.

NOTE!
Always replace cutting blades when they have become worn.

1.11 Cutting angle – adjustment

The default cutting angle is 15° (Z = 420 mm) – see Figure 19. In general, cutting angles only need to be adjusted after the springs have been replaced – see section 1.12.

Dimension Z – see Figure 19 – can be used as a control measure. By tightening the nut (M) in the upper part of the spring rod (P), the cutting angle is smaller – for cutting angle 0°, Z = 390 mm. Loosening the nut (M) makes the angle larger.

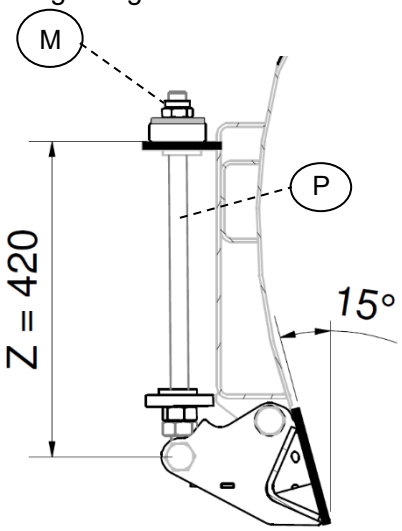


Figure 19

1.12 Springs – pretensioning of cutting blades – adjustment

NOTE!
If the pretension of the cutting blades is too high, there is a risk of accidents and of the device breaking. The sprung cutting blades are a safety arrangement, and they are intended to make ploughing safe. If any of the springs has become deformed or broken off, we recommend that all the springs on the blade be replaced, art. no. 200595.

The default pretension, i.e. spring Y dimension, is 330 mm – see Figure 20.

To increase the pretension, adjust Y dimension as follows:

1) Loosen nuts M1 and M2 in the lower part of the spring – see Figure 20
2) Tighten nut M1 upwards two turns at a time and test operate. Repeat until the tension is just right – see Figure 21
3) Tighten nut M2 against nut M1 to lock the spring – see Figure 22

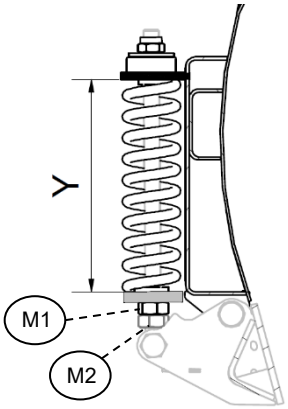


Figure 20

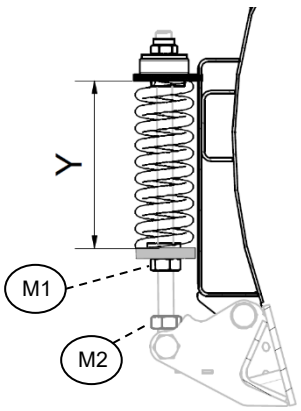


Figure 21

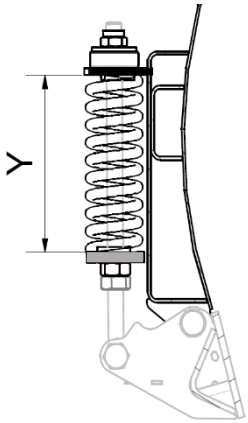


Figure 22

NOTE!
If the pretension of the cutting blades is too low, the cutting blades constantly give way, the ploughing results are poor, the plough jumps and causes unnecessary noise.

To decrease the pretension, adjust Y dimension as follows:

4) Loosen nuts M1 and M2 in the lower part of the spring – see Figure 22
5) Tighten nut M2 downwards – see Figure 21
6) Tighten nut M1 downwards two turns at a time and test operate. Repeat until the tension is just right – see Figure 21
7) Tighten the lower nut M2 against nut M1 to lock the spring – see Figure 20

2 Safety Instructions

2.1 Safety Regulations

Read the manual. All machine operators should read and understand the entire contents of this manual and the safety regulations so there is no uncertainty as to the use of the machine/tool before it is taken into service. Get in touch with your dealer if you have any questions.
Use of the machine is strictly forbidden if the operator is not aware of the risks involved in conjunction with the use of the machine and cannot act correctly if a risk situation should arise.

Read, observe and understand the meaning of all safety, operating, warning and positioning decals on the machine and in the manual.

Actions may occur when using this equipment that cannot be prevented in its design or with the use of mechanical protection.
Unfortunately, human carelessness may cancel the function of our integrated safety features. Accordingly, the prevention of accidents and operating safety features are dependent on the responsible use of the equipment and its integrated safety features.
Only trained personnel should use this equipment.

The machine is intended for snow clearing only.

Operation. Learn and practise the machine's working methods and controls before it is used.

Coupling the Machine. Connect the machine in the correct manner and keep away from the area between the tractor and the machine when coupling.
Make sure the equipment is correctly mounted, adjusted and in working order.

Safe Work Area. Keep unauthorized persons, especially children, away from the working zone of the machine or when it is being repaired.

Be aware of the risk of injury from material that may be ejected by the machine while work is in progress.

Ensure all **warning and operating decals** are in good condition and affixed in the correct manner and replace them if necessary. Write the model and serial number when ordering.

Moving Parts. Keep arms, legs and other body parts as well as clothing away from any moving parts of the machine.

Lifting and lowering of the machine.
Be careful when lifting and lowering the machine/machine part.

Stability. The machine must not be operated with a tool carrier that does not weigh enough over the front/rear axle, such that the stability of the tool carrier is affected. Mount ballast weights if necessary, see the tool carrier's instruction manual.

Operating the Machine. Take great care when working on uneven ground conditions, close to ditches and fences, look out for hidden dangers and adapt your working rate.
Do not reverse with the plough down (the wrong way).
Great care should be observed when working on steep slopes.
Hold onto the steering wheel tightly if the tool carrier should overturn.

Operating at Night. The work area must be illuminated when working in the dark.

Driver. Operators who are tired, intoxicated, drugged or under the influence in any other way so that they cannot control their movements must not use the machine.
The machine may only be operated by one person sitting in the tool carrier, no passengers are allowed.
It is prohibited for people without authorisation to use the machine.

Personal protective equipment. Protective equipment such as helmets, protective goggles, protective shoes and gloves are recommended for personnel during assembly, operation, adjustment and maintenance.

Protective Cab. The machine should only be driven by a tractor equipped with an approved protective cab. Keep doors and windows close while working.
All moving parts, including engine, must be stationary and the handbrake applied before the operator leaves the cab. When travelling on ice-covered water the roof hatch must be kept open.
When travelling on ice-covered water the roof hatch must be kept open.

Maintenance. Inspect, adjust and maintain the machine according to the directions.

Regular Inspection. Inspect the entire machine regularly. Locate any loose, worn and damaged components and leaks.

Safety During Maintenance and Service. The machine must be standing on firm, even ground for maintenance and adjustment. The engine must be shut off, all moving parts stationary, the machine lowered to the ground and the handbrake applied during all cleaning, inspection, adjustment, maintenance and repair work.
Clean the machine thoroughly before repair and storage.
Bearing and hydraulic components should not the cleaned with high-pressure jets.
If excessively high pressure is used for general cleaning, this may damage the paint.
After cleaning, the machine must be lubricated according to the lubrication schedule and a short test run carried out.

Vibration. If any vibration should occur in the machine, it must be shut down immediately and the cause located. Change any damaged parts.

Emergencies. Stop the machine immediately if it should hit an obstruction. Shut off the engine, remove the key, check for and repair any damage before recommencing work.
Make yourself aware of how emergency stops work on the tool carrier and be prepared for how they work in an emergency situation.

Hydraulic hoses. Hydraulic hoses on the machine contain oil at very high pressure. Do not touch hoses or hydraulic components if the system is pressurised. In case of leaks, oil at high pressure may penetrate the skin and cause serious injury. In the event of an accident, contact a doctor immediately.
Check the condition of hydraulic hoses daily with respect to damage. Chafed and leaking hoses should be replaced immediately with new that meet the manufacturer's technical requirements.
When changing tractor, always check the length of hoses. Hoses that are too long or too short may be damaged.
The use of incorrect hydraulic hoses that do not meet with specifications is strictly forbidden.
Hoses can become hot while in operation, with the risk of burn injuries. Do not loosen hoses while the oil is hot, wait for it to cool down.

Welding. Protect bearings, hydraulics and electronic components if welding is being carried out. Before welding commences, electronic components must be disconnected and the welder's ground clamp placed as close to the welding site as possible.

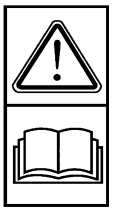
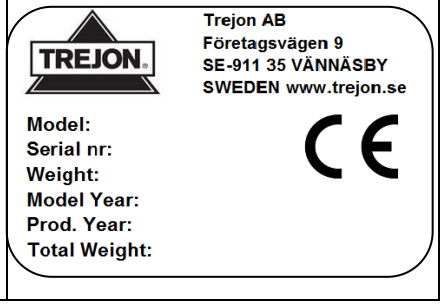
Electrical Lines. Take great care when working close to electrical lines, maintain a safe distance with good margin.
If an accident should occur such that the plough comes into contact with live lines:

- Keep calm, act rationally so as not to worsen the situation and do not touch any metal parts.
- Warn people in the vicinity and make sure they stay outside the risk zone.

Spare Parts. Use only original spare parts on the machine.
If you should have any questions concerning the machine or its function, please get in touch with your dealer or Trejon AB

2.2 Safety symbols

The symbol on the right shows the following:

	Warning! Study the instruction manual carefully before use, so that the user knows the machine well.	
	Warning! Crush risk! Do not stand between machine, machine parts and tool carrier when coupling. Always brake the tool carrier, turn off the engine and remove the ignition key when leaving the cab during coupling or decoupling operations.	
	Indicated lifting point.	
	Machine name plate with CE marking. This includes the model designation, the machine's serial number, weight and year of manufacture.	

NOTE! Safety symbols or reflectors must be replaced if they are damaged. For further information about ordering the decals and reflectors, please contact Trejon or Trejon's dealers.

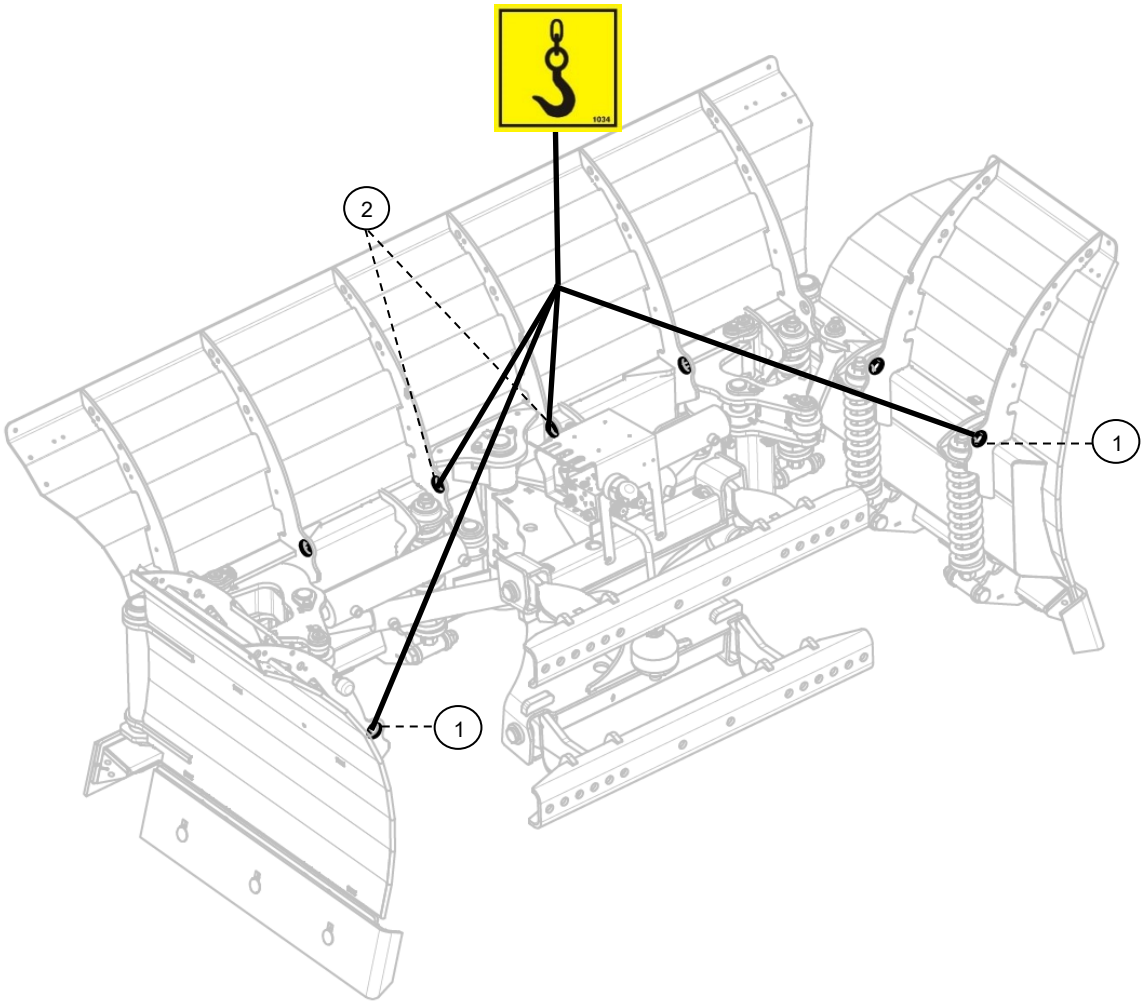
3 Using the machine

3.1 Assembly

The UPX plough is tied to a pallet on delivery.
When the plough is to be lifted from the pallet, this can be done in two ways.

1) Directly to the tractor attachment, after first having installed the attachment system (read Chapter 1.6)

2) With lifting gear such as a chain. The lifting gear is attached to the plough wings' openings (1) and to the lifting eye (2) by the plough's main blade. The lifting gear must be able to cope with a minimum load of 2000 kg. Make sure the lifting chain is long enough to prevent DAMAGE to the sides of the plough wings!



NOTE! ENSURE NO-ONE IS INSIDE THE RISK AREA WHEN LIFTING.

3.2 Coupling the plough to the machine

The UPX plough's attachment is suitable for the tool system specified when ordering the UPX plough.
Check that **the tool carrier's recommended weight** is suitable for the plough, see Technical specifications, Chapter 1.4.
The plough is connected to the tool carrier front lift/boom.

1) Connect the UPX plough to the tool carrier's existing attachment in the same way as specified in the tool carrier's operating instructions.
2) Turn off the engine and apply the parking brake.
3) Check that the tool carrier's hydraulic system is depressurised. The hydraulic hoses must be routed so that they are not damaged by the movement of the plough.
4) Connect the hydraulic hoses to the tool carrier's double-acting outlet.
5) Check that the plough is free from the tool carrier when coupling the plough.

During installation, always check that the quick couplings and the oil are clean, and that the hoses are intact. When installing for the first time, take extra care to ensure that the plough's components do not collide with the tool carrier during movement. **The warranty does not cover damage caused by incorrect installation.**

3.3 Hydraulics

The UPX plough is equipped with two hydraulic hoses (starting from ports marked P1 and P2 on the valve's hydraulic block). These must be connected to double-acting hydraulic outlets on the tool carrier. At ports P1 and P2, there are two throttle adapters that ensure the correct speed of all the plough's functions.

WARNING!
Modifications to the plough's hydraulic system and its connections will result in damage to the plough due to excessive speed or in the event of collisions with solid objects.

If there is any uncertainty regarding the connection of the hydraulics, consult the supplier of the tool carrier.

The plough is equipped with a hydraulic valve as standard. This makes it possible to operate the wings independently or both wings at the same time in parallel.

The hydraulic valve is supplied with 2 solenoid coils adapted for either 12V or 24V – see section 1.4.

The hydraulic valve has built-in shock valves. The hydraulic valve is connected to a pressure accumulator, which reduces the risk of damage in the event of collisions with obstacles.

The hydraulic valve on the plough has a built-in shock function which means that, if the hydraulic pressure on the positive side of the cylinder exceeds the set pressure, the valve opens and releases to the negative side of the cylinder and to the pressure accumulator.

When the cylinder reaches its "mechanical bottom position" (contracted), the collision protection stops working and there is consequently an increased risk of damage to the plough.

3.4 Hydraulic connection diagram

The hydraulic valve has various markings – see Figure 23.

Connect (hoses) ports P1 and P2 to the tool carrier's double-acting outlet.

The UPX plough's hydraulic valve ports (C3; C2) are connected with the left wing's cylinder as standard, while ports (C1; C4) are connected with the right-wing cylinder. The hydraulic valve's ports (C5; C8) are connected with the main blade's cylinders. The valve's T port is connected with the pressure accumulator. Wiring diagram – see Figure 23.

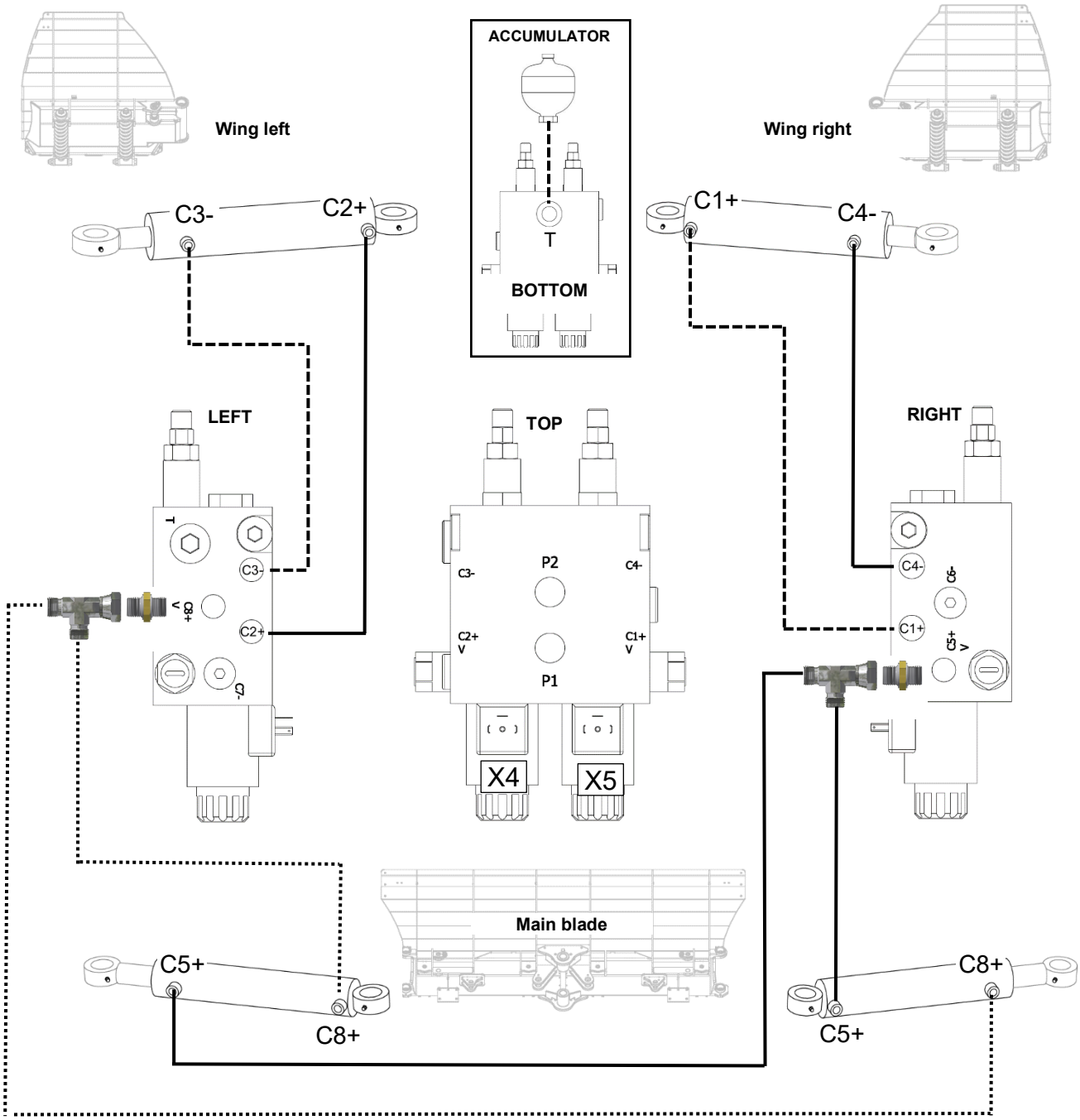


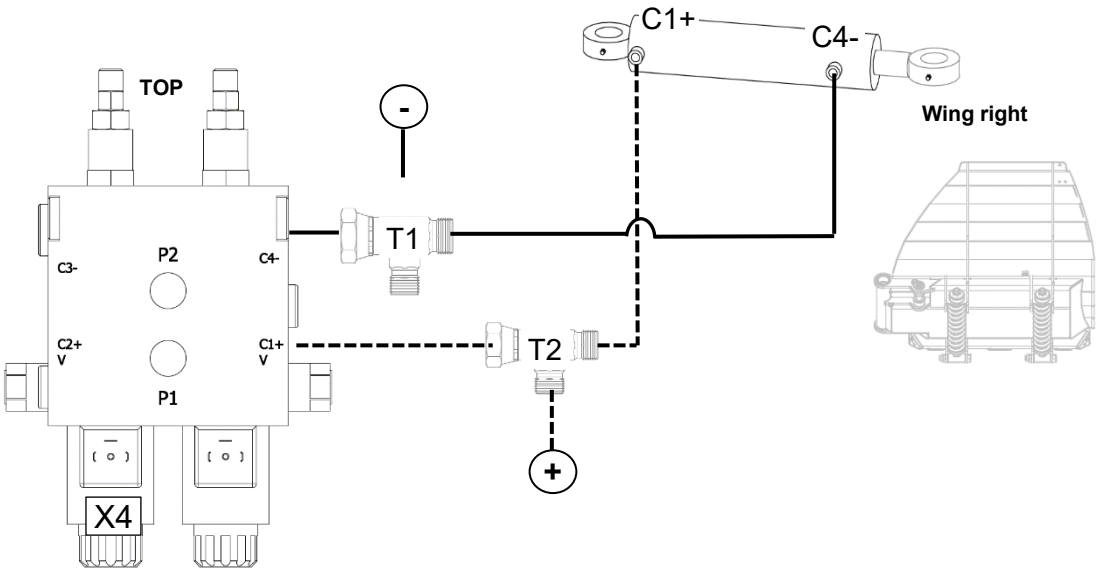
Figure 23

3.4.1 4-Hose – option (Chapter 5)

If you want to operate the plough with two double-acting hydraulic sockets (known as 4-hose), the tool carrier must have at least two double-acting hydraulic outlets. We recommend using one of the following kits:

2020050	Separate operation, right wing, FASTER G1/2 – (4-hose UPX)
2020051	Separate operation, right wing, TEMA G3/4 – (4-hose UPX)

The kit consists of two hydraulic hoses with quick couplings. Install the supplied T-adapters (T1 & T2) as shown below. Then connect the hydraulic hoses to the tool carrier's double-acting hydraulic outlet.



With this connection, the right wing will be operated with the double-acting hydraulic function (+ & -). Diagonal (main blade) and left wing are controlled by the regular hydraulic function from the tool carrier.
The control box is then used to control the choice between diagonal (main blade) and left wing.

If the tool carrier has an electrical function on the loader arm, this can be used to switch easily between the left wing and diagonal (main blade).
There is normally no need to install the supplied control box here, rather you can use the tool carrier's original mounted cabling/switch.
The left wing is activated by energising the left coil X4.

For detailed electrical connection, read Chapter 3.7

3.5 Plough steering – installation

NOTE!
Always check that the operating voltage (12V or 24V) on the hydraulic valve's solenoid coils corresponds with the tool carrier's operating voltage before starting. (12V – Item. No: D15-12 / 24V – Item. No: D15-24)

Warning!
Remove the key from the ignition switch before starting to connect electrical components.

Warning!
Never connect connectors to the tool carrier's electric socket during installation.

The UPX plough is supplied with a control box (**art. no. 330006)** with 3-pole connectors **(DIN 9680).** Cabling (**art. no. 330007)** with 2 x Hirschmann connectors (marked **X4** and **X5**) is already connected to the hydraulic valve, 2 x Deutsch connectors (marked **X6** and **X7**) are plugged (additional information in section 5 – accessories). Spiral cable 3.5 m, 7-pole, male-male (**art. no. TKBL0895**), is used to connect electricity between the tool carrier and the UPX plough.

1. Install the control box (A) in a safe and easily accessible location in the cab. Ensure that cables are not exposed to any crush risk.
2. Screw together attachment (B) with 7-pole connector (C).
3. Select a suitable location on the machine's boom to install the attachment (B). Route and attach the cables securely on the loader/tractor. Ensure that cables are not exposed to any crush risk.
4. After the plough has been coupled, connect the spiral cable (D) between the 7-pole connector (C) and (E).
5. **Finally**, connect the control box's 3-pole connector (F) to the power outlet in the cab.

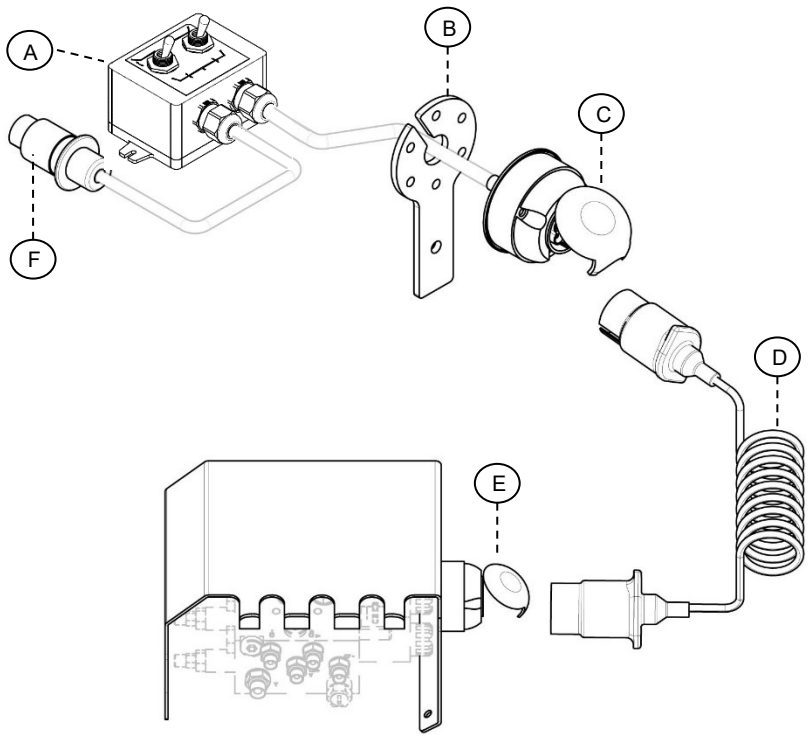


Figure 24

3.6 Control box – function description

The UPX plough is supplied with a control box (**art. no. 330006).** The control box's toggle switch (L) and (R) – see Figure 25 – can be set in four different positions (see the table below).

Figure 25

Depending on the position of the toggle switch, the plough is operated as follows with the double-acting hydraulic outlet on the tool carrier (see the table below):

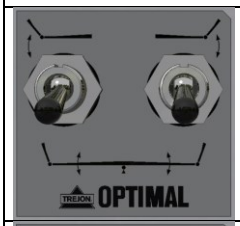
Symbol	Toggle switch position	UPX function	Hirschmann connectors, LED
	L – down R – down	Diagonal position – Operation of the main blade (no valve affected)	X4(A) – off X5(B) – off
	L – up R – down	Left wing active (left X4 valve coil active)	X4(A) – on X5(B) – off
	L – down R – up	Right wing active (right X5 valve coil active)	X4(A) – off X5(B) – on
	L – up R – up	Right and left wing active (both X4 and X5 valve coil active)	X4(A) – on X5(B) – on

Table: Control box – Symbols and functions

3.7 Wiring diagram

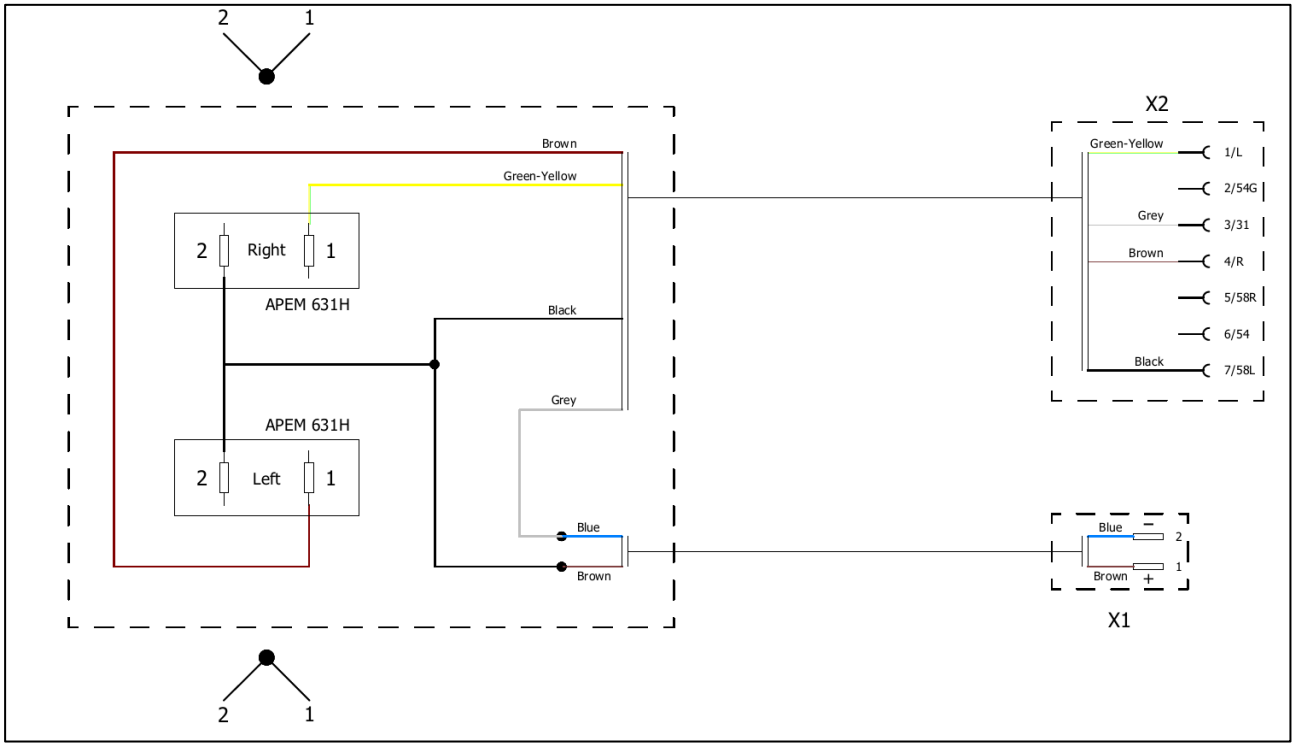


Figure 26: Wiring diagram – Control box art. no. **330006**

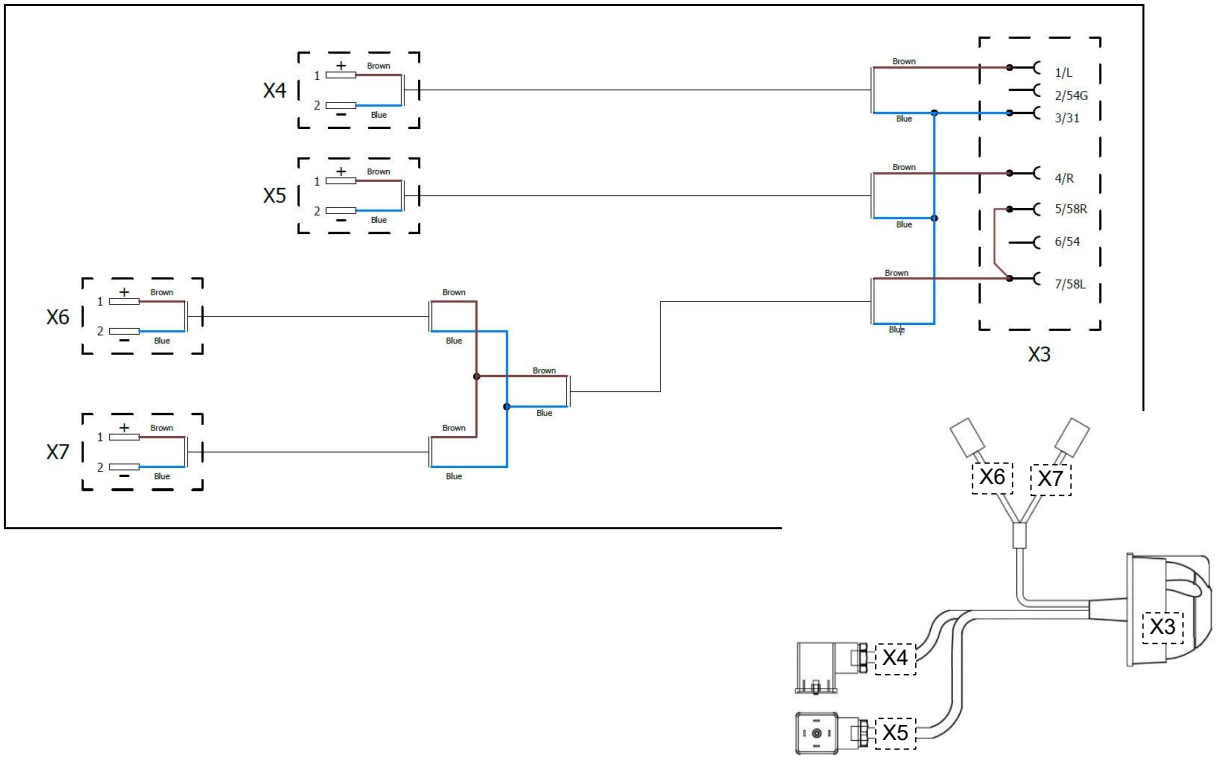


Figure 27: Wiring diagram – Wiring art. no. **330007**

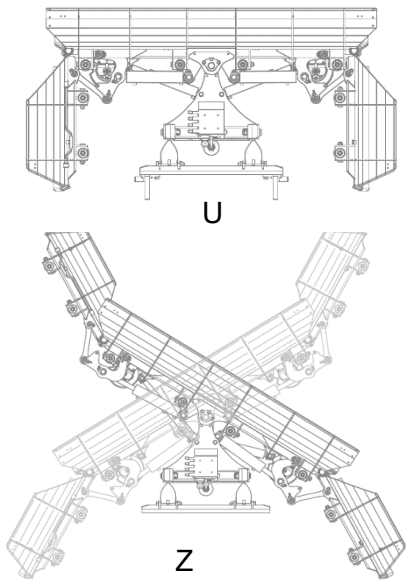
3.8 Operating the Machine

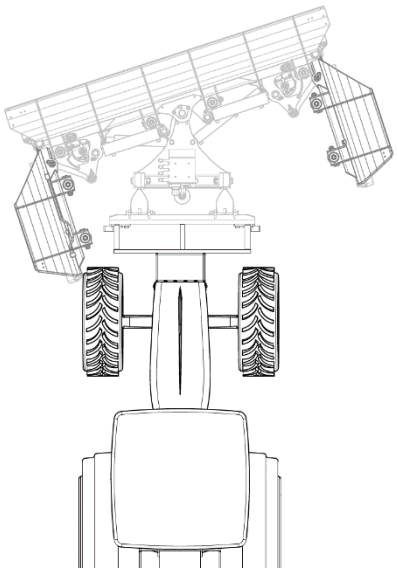
The TREJON OPTIMAL UPX plough is designed for snow clearing.

NOTE!
DO NOT USE FLOATING MODE ON THE MACHINE'S LOADER OR FRONT LIFT!

NOTE!
DO NOT REVERSE WITH THE PLOUGH DOWN!!
WHEN THE PLOUGH IS RETRACTED, THERE IS NO SAFETY SYSTEM PROTECTING THE PLOUGH.

1) In some cases, when the plough is placed in the U-position or Z-position (see the image below), there is a risk of the plough's wings colliding with the tool carrier's chassis or wheels. The operator needs to pay attention and prevent such dangerous situations.





2) As the operator, you are responsible for not travelling at a higher speed than the conditions allow. Doubling your speed quadruples your kinetic energy in the event of a collision. The weight of the tool carrier is also a decisive factor, see Technical specifications, Chapter 1.4.

3) Avoid driving into posts, railings, etc.; the plough is equipped with a shock valve that releases oil from the positive side of the cylinder to the negative side. However, collisions entail an increased load on the plough.

4) When the cylinder reaches its "mechanical bottom position", the collision protection stops working and there is consequently an increased risk of damage to the plough.

5) Watch out for curbs and traffic islands. When equipped with SHARQ or SHARQ P300, the plough is equipped with "pavement steel", which reduces the risk of injury.

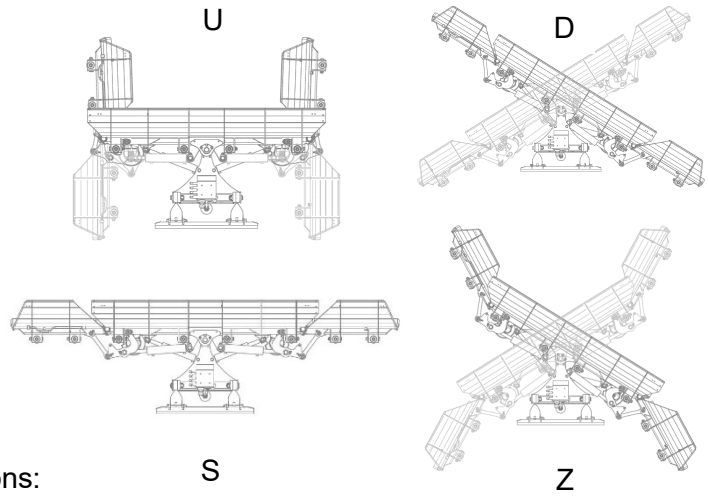
6) Do not press the plough downwards, as this will put strain on and wear the plough excessively.

3.8.1 Please check the following before use:

1) That the equipment has been correctly installed.
2) That all locking pins are in place.
3) That the hydraulic hoses are correctly connected and that these cannot be crushed/damaged when operating the plough in all positions.
4) That the hydraulic hoses are intact and are not leaking oil.

3.8.2 Operating instructions

That all functions are working correctly and that the support feet are set to the correct height in relation to the substrate (see section 1.9) and other conditions.



Operating instructions:

1) U-CONFIGURATION for pavements, street junctions, etc., where you can collect up and remove the snow.
2) D-CONFIGURATION for snow clearing on roads, streets, car parks and similar.
3) S-CONFIGURATION for controlling amounts of snow in front when the ground is uneven. The plough follows the ground better. When the plough is full, the snow will be pushed out into the sides.
4) Z-CONFIGURATION This position is recommended when there are large amounts of snow, for example when opening up a new road. This position provides a good flow through the plough. The right wing can be used as a snow stop when passing intersections.
5) Using the control box in the cab, the operator selects which plough wing(s) is to be operated with the hydraulic fluid flow from the double-acting outlet.
6) The UPX plough is equipped with two support plates or support wheels, which can be adjusted with a crank to the desired height (one turn changes the height by 5 mm). Make sure these are clean and can move freely. Support plates must be flat when the plough is lowered to prevent damage to the attachment.
7) During the first ploughing session of the year, the support plates should ideally be lowered so that the cutting blades do not tear up too much gravel (see Figure 11, section 1.9). During the season, the support plates should be kept at the same level as the cutting blades (see Figure 12, section 1.9).
8) When ploughing on public roads, traffic rules and regulations must be followed. Note that stones and other objects may be ejected during ploughing. Adapt your speed to the vehicle and other traffic.

3.9 Road transport

Warning!
Take great care during road transport.

Warning!
Lift the plough to a sufficient height and check the condition of the plough prior to road transport. Reduce your speed if there are bumps in the road. Too high a speed can damage the plough.

Warning!
It is the operator's responsibility to ensure compliance with the relevant country's traffic regulations and laws.

3.10 Disconnection of the plough

1) Lower the plough onto a flat surface so that it rests on the support plates.
2) Turn off the tool carrier, apply the parking brake
3) Relieve the load on the hydraulic system so that it is depressurised.
4) Disconnect the hydraulic hoses and protect the couplings with plugs. Anchor these in the holder.
5) Disconnect the spiral cable.
6) Loosen the plough's attachment.
7) Back the tool carrier away.

If the plough is to remain unused for an extended period, clean it and lubricate all lubrication points, see section 4.4.

4 Service and Maintenance

Warning!

When some form of cleaning, maintenance, repair or service is to be carried out on the plough, make sure the plough has been lowered to the ground and the tool carrier's engine turned off. Remove the key from the ignition switch. Make sure there is nobody in the vicinity that can be injured.

Warning!

Never rely on the tool carrier's lifting arrangement; support the tool properly on axle stands or similar so that it does not fall down. Always use protective equipment such as goggles and gloves when carrying out maintenance. This is important when working with cutting blades, for example.

4.1 General

Carefully maintain the machine in order to obtain a cost-efficient operation, long service life and retained machine value. Use only effective hand tools. Keep the machine clean under the chassis for good functionality and to prevent corrosion. Never use high-pressure jets when cleaning bearings, electronics and hydraulic components. After cleaning, lubricate the machine according to the lubrication schedule and test run for a brief period.

Use the table below to see the correct tightening torques for screw unions on the machine.

Diameter	Quality 8.8		Quality 10.9	
	Nm	lb.ft.	Nm	lb.ft.
M8	**25**	18	**35**	26
M10	**50**	37	**70**	52
M12	**90**	66	**125**	92
M14	**140**	103	**200**	148
M16	**215**	155	**305**	225
M18	**295**	217	**420**	309
M20	**420**	302	**590**	438
M22	**520**	380	**730**	535
M24	**670**	490	**940**	690
Increase tightening torque by 5 % when a lock nut is used.				

Table – Tightening torques for screw unions

4.2 Maintenance schedule

After the first 4 hours of operation:

- Check and if necessary, retighten screw joints on the machine.

After the first 8 hours of operation:

- Perform the 8 hours service and maintenance according to the schedule below.

Service point	Interval	*Action	Lubricant	Remark
Attachment, Screw unions	Initially 4h, then every 8h	C/A		M20 – 420 Nm; M16 – 215 Nm (see section 1.6)
Screw unions	Initially 4h, then every 40h	C/A		See the table in section 4.1
Support plates	Initially 4h, then every 8h	C/A	NLGI 2 grease	Refer to sections 1.9 and 4.5
Cutting blades	8h	C/A		Check wear, replace if necessary (see section 1.10)
Hydraulic hoses	8h	K		Check wear, replace if necessary (see section 3.4)
Lubrication points	40h	K	NLGI 2 grease	Refer to section 4.5
Spring	40h	C/A		See section 1.12
Cylinders	40h	K	NLGI 2 grease	Refer to section 4.5
Storage of steel holders	After each season	K	NLGI 2 grease	Check M24 bolts, refer to section 4.4

***Action codes: A=Adjust, C=Check, Cl=Clean, R=Replace**

Use NLGI 2 grease with EP features of good quality and which can withstand low temperatures for lubrication. Do not use graphite grease on ball bearings. Clean the grease nipples before applying the grease gun.
These intervals apply to normal operation, continuous operation requires more frequent lubrication. Always lubricate after cleaning with water.

4.3 Before season start

Go through all the above points – see section 4.2. If the machine is serviced well, it will have a considerably longer service life and more carefree use.

4.4 At End of Season

As a minimum, the user is recommended to implement those measures that are mentioned in section 4.2. after the ploughing season.
The plough must be thoroughly cleaned and then lubricated and serviced. Replace worn or damaged parts. When the machine is dry, you are recommended to apply a thin coat of oil in those places where the paint has been worn away.

The piston rods on the hydraulic cylinders must be cleaned and oiled, and then retracted so that the plough is set in U-CONFIGURATION (see Figure 28) to prevent rust damage.

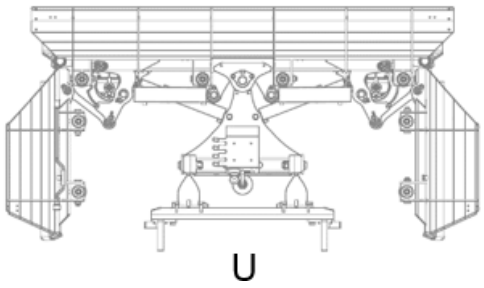


Figure 28

The machine should ideally be stored under cover in a dry area.

It is important to check the steel holder (A) and its screws (E). If these are damaged, they should be replaced; when this happens, they need to be lubricated (see Figure 29).

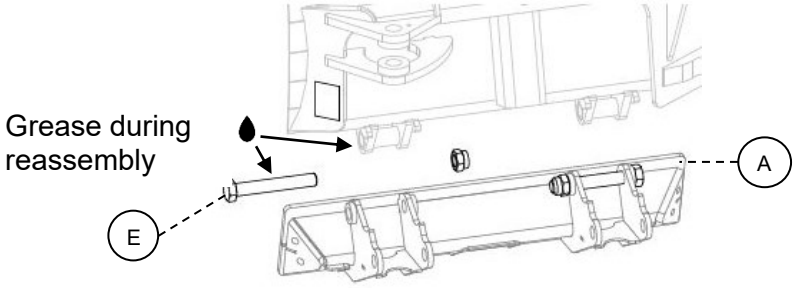


Figure 29

4.5 Lubrication points – location

Nipples marked (X) in Figures 1, 2 and 3 must be lubricated at 40 operating hour intervals or weekly. Pump the grease into the bearing until it comes out at the side of the layer, wiping off the excess.
Rotate the joints (if possible) 180° and repeat. This ensures good distribution of the lubricant.

Some known brands of grease that can be used:
Shell - **SRS 4000**; Esso - **Thermo 30150**; Statoil - **Grease Way CAH92**; Hydro Texaco – **Hydex EP2**

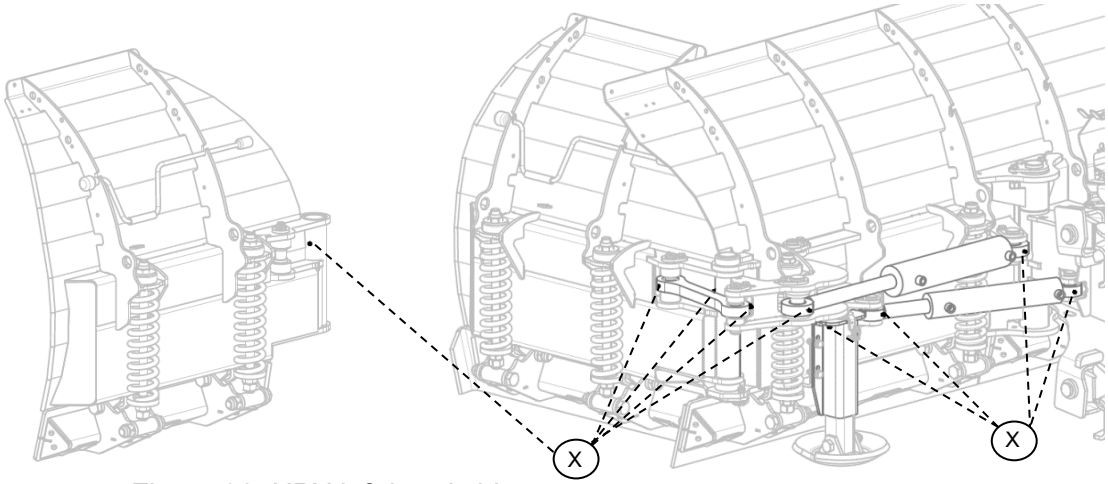


Figure 30: UPX left-hand side

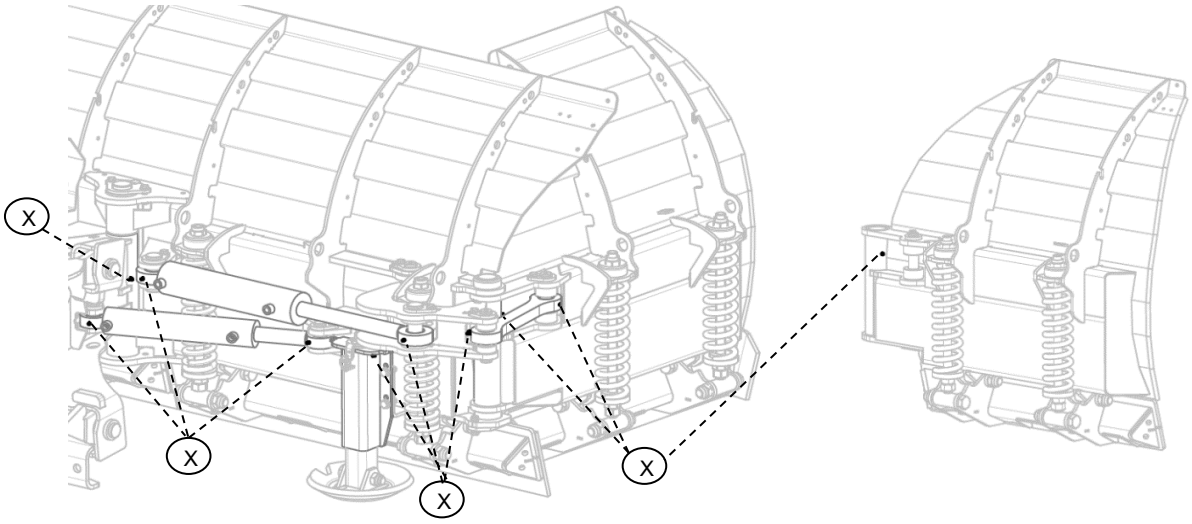


Figure 31: UPX right-hand side

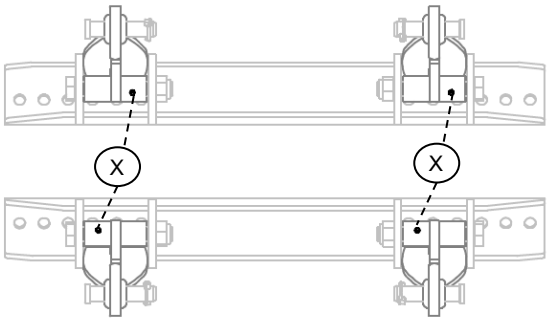


Figure 32: UPX floating mode attachment

5 Accessories

The table below presents a list of accessories for the UPX plough. Check www.trejon.se or contact Trejon for the most up-to-date range of accessories.

Art. no.	Description
D15-12	12V Solenoid – 1 pc.
D15-24	24V Solenoid – 1 pc.
2020060*	LED lighting kit, 4 lamps
440140*	Radio control kit
2020096	Deutsch DT branch 2+1 cable
2020050	Separate operation, right wing kit, FASTER G1/2 – (4-hose UPX)
2020051	Separate operation, right wing kit, TEMA G3/4 – (4-hose UPX)
2021040	Wear rubber, complete kit UPX300
2021033	Wear rubber, complete kit UPX370
440130	Wear rubber, complete kit UPX440
2020092	Wear rubber, complete kit UPX500
433075	Support wheel, pivoting UPX440; UPX500
7511	TEMA connector female 3/4 inch

* - use Deutsch connectors marked **X6** or **X7** for connection.
* - to use **2020060** together with **440140**, branch cable **2020096** is required.

Radio control 440140

This function is suitable when the plough has to be moved quickly from one machine to another. The handset is then easily moved to the other tool carrier. In this case, current is only required up to the plough's 7-pole connector. If the tractor has a 7-pole connector in the front, it is sufficient to connect the spiral cable between these two and to turn on the driving lights on the tractor. Connecting the 7-pole connector follows the standard for this type of connector.

NOTE! Only one transmitter (handset) can work together with the plough's receiver.

6 Spare Parts

6.1 Use original spare parts

You are faced with the choice of “original” and “copy”!
The choice often depends on the price. A “cheap” purchase can often end up being expensive.

Some reasons for choosing TREJON’s original spare parts:

- Quality and fit
- Reliable function
- Longer life and thereby better economy
- Guaranteed availability through TREJON’s sales partners

TREJON original spare parts and accessories are designed especially for these machines. The fitting and/or use of non-original spare parts and accessories can negatively change the technical features of your machine. The manufacturer’s warranty will not apply to any damage caused by the use of non-original spare parts or accessories.

The warranty does not apply to arbitrary modifications that have been made to the machine.

Get in touch with the dealership where you bought your machine when ordering spares or other service.
When ordering spares, always specify the correct model, type and serial number found on the name plate on the chassis.

7 Notes

EC Declaration

according to the Machinery Directive 2006/42/EC

We TREJON FÖRSÄLJNINGS AB
(tenderer's name).....

SE – 911 35 Vännäsby, Företagsvägen 9
.....
(Full Company Address - In case of affiliated partners with registered office within the EC, the manufacturer's company name and address are also stated)

declare with sole responsibility that the following product,

TREJON OPTIMAL UPX plough

UPX300, UPX370, UPX440, UPX500
.....
(make, type)

to which this certificate applies, complies with the current basic safety and health protection regulations in accordance with the Machinery Directive 2006/42/EC,
(if applicable)
and also meets the requirements of other applicable EC standards.

— — —

.....
(title and / or number and publication date of other EC standards)

(if applicable)

The following norm(s) and/or standard(s) and/or technical specification(s) have provided the basis for the professional introduction of the safety and health regulations set out in the EC standards:

EN ISO 12100–1: 2010 EN ISO 12100-2: 2010
.....
(title and/or number as well as publication date of standard(s) and/or technical specification(s))

Henrik Johansson
CEO

Vännäsby, 1 October 2020
.....
Issued (place/date)

.....
(Name, position and signature of authorised employee)

Guarantee- /assignment certificate

Guarantee terms	-	Valid between retailer (Trejon AB dealer) and machine purchaser.
General about guarantee	-	In order to obtain valid guarantee terms set forth below, and the specific guarantee terms set by each provider. These are attached to the user manual for each machine, as appropriate.
Validity of guarantee	-	The guarantee is 12 months from date of purchase. In some cases, the guarantee can be limited by running time.
The guarantee covers	-	Damaged parts, which have broken down because of defective production operations of materials in course of normal use of the machine.
	-	Only the labor cost for replacement of defective warranted part.
The guarantee does not cover	-	Transport costs applicable to the machine or the parts.
	-	Travel costs.
	-	Any resulting costs incurred as a result of damage to the machine.
	-	If the machine has been modified by the owner.
	-	Damage due to normal wear and tear of the machine – Not related to manufacturing defects, poor service, user inexperience or use of spare parts that are not original.
	-	Excessive or inappropriate use of the machine.
	-	The guarantee is not applicable to parts which are subject to wear, for example hoses, sealing, oil, belts, batteries, chains, knifes, glass panes, swords and chains etc
	-	The guarantee period for replaced parts during the guarantee period expires with the machine's guarantee.
	-	Normal adjustments, maintenance or supervision
Guarantee procedures	-	Contact place of purchase as soon as any damage or malfunction is detected. Do not use the machine if the damage can be worse.
	-	Guarantee repairs must be performed by Trejon AB approved workshop.
ATTENTION!		**The guarantee shall enter into force provided that the machine GUARANTEE/ ASSIGNMENT CERTIFICATE has been fully completed and signed by both parties (archived by the seller), and recorded on the Trejon web portal no later than 14 days from date of sale (the seller is responsible for this happening).**

Assignment certificate:
Machine Buyer shall confirm with his signature that he had received manual containing operating instructions, and received information about the operating, security and maintenance requirements described in this and made the final inspection of the machine.

PLEASE FILL IN!

Product: _____ Serialno. _____

Salesman: _____ Company: _____

Signature of salesman: _____ Date of purchase: _____

Name of buyer: _____ Telephone: _____

E-mail: _____

Address: _____ Zipcode: _____

City: _____ Country: _____

Date: _____ Signature of buyer: _____

We store personal data, see our privacy policy: https://www.trejon.se/enu/Dataskyddspolicy/

TREJON AB reserves the right to modify or improve shown models with technical or commercial motivations without the requirement to carry out the same modifications on machines already delivered. Illustrations in this Instruction Manual do not necessarily show the machine that has been delivered.

Technical information, dimensions and weights are not binding. All misprints reserved.

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