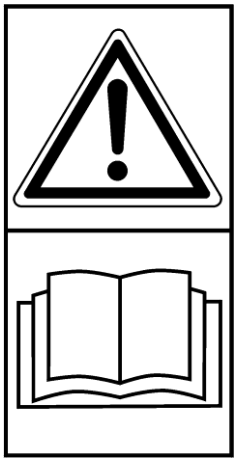
From serial number 0814XXXX

TREJON OPTIMAL

Instructions for Use and Maintenance

U-plough

UP370



Note!
Read instructions before use

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CE

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Dear Customer,

You have made a good choice. We congratulate you to your selection of an OPTIMAL product that offers quality and performance with reliable service.

By reading the manual and following its recommendations you will ensure the long and effective use of the equipment.
We have produced this manual for you to get a good understanding of the functioning of the machine and what safety and maintenance instructions to follow when working with it.
If any question should arise when using the machine or when reading this manual, you are welcome to contact us for further information.

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Honoured retailer,

in order for the guarantee to be valid and to forfill all legal requirements, we ask you to fill out the guarantee form together with the customer and register at **trejon.se**

The guarantee is valid from the day the equipment is handed over to the customer.

Delivery checklist:

Check for damages caused in transporting. Inform the transporting company.	
Check that all packing material has been taken away. Dispose packing material in an environmentally friendly way	
Check that the machine is lubricated, see section “Service and maintenance”.	
Check that all screws are properly tightened, see section “Service and maintenance”.	
Check that all guards and safety shields are properly fastened.	
Make a function test.	
Having gone through and explained to the customer, with the help of the manual, the startup, use and maintenance of the equipment and it’s accessories.	
Fill out the guarantee form with the customer and register at **trejon.se**	
Instruction manual given to the customer.	

Enter the serialnumber of the machine to the right.	S/N:

Introduction

Congratulations on purchasing a new TREJON U-PLOUGH, designed and manufactured by Trejon AB. The U-plough is made of first-rate materials, and features components supplied by well-known manufacturers. Strict quality requirements and quality control criteria have been observed in all phases of design and production. This manual contains the instructions needed to use and maintain the plough in an efficient manner. By following the instructions in this manual carefully, you will ensure a long and trouble-free service life for your plough.
Please make sure that every driver and person in charge of maintenance reads this manual thoroughly before using the plough or starting maintenance work. Attention must be paid to safety factors in all situations. This manual is part of the plough and must be transferred to the new owner upon sale or handover.
Should this manual be lost or become illegible, obtain a new manual immediately from Trejon AB or via the company website at trejon.se
Due to the continuous nature of the product development, Trejon AB reserves the right to make structural and technical changes without advance notification. Therefore, it is possible that some information in this manual may have changed after printing.
Please contact Trejon AB or the retailer of the plough if you require more information on the use or maintenance of the plough.
The content of this manual is based on information available in August 2014.
Trejon AB cannot be held liable for any errors or deficiencies in the manual.

Safety comes first

In the use and maintenance of the U-plough, the effective laws, decrees and regulations must be observed, in addition to the instructions in this manual.
The maintenance and adjustment instructions in this manual must be followed. This ensures that the plough can be used safely and without interruptions.
If a fault occurs in the plough, please contact the retailer's maintenance service. Stop working immediately if there is even the smallest chance of injury.
Do not exceed the manufacturer's recommended operating temperature ranges and pressure levels for the hydraulics.
Never disconnect a hydraulics hose by pulling the hose, never paint a hose and never tighten the hydraulics connectors excessively, in order to prevent damage.

1 Declaration of conformity

EC-Certificate of Conformity

Conforming to EEC Directions 2006/42/EG

We TREJON FÖRSÄLJNING AB
(name of supplier)

SE – 911 35 Vännäsby, Företagsvägen 9

(full address of company – where this concerns authorized agents within the Common Market, also state the company name and manufacturer)

Declare in sole responsibility, that the product

U-plough OPTIMAL UP370-185

(make, model)

to which this certificate applies, conforms to the basic safety and health requirements of EEC Directions 2006/42/EG,
(if applicable)
and to the other relevant EEC Directions.

— — —

(title and/or number and date of issue of the other EEC Directions)

(if applicable)
To effect correct application of the safety and health requirements stated in the EEC Directions, the following standards and/or technical specifications were consulted:

EN ISO 12100-1 : 2010 EN ISO 12100-2 : 2010

(title and/or number and date of issue of standards and/or specifications)

Henrik Johansson
Managing Director

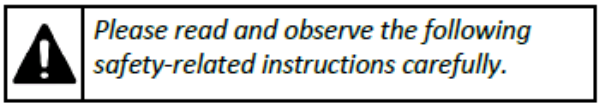
Vännäsby, 2016.12.01
(Place and date of issue)

(Name and job function of authorized person)

2 Purpose of use

Trejon U-ploughs have been designed for ploughing snow in yard and road areas. The U-ploughs feature additional side wings and boast wide turning angles. They are suitable for a variety of environments and provide more efficient and convenient snow removal than any other tool.
The ploughs are not intended for moving earth or any other material heavier than snow. Incorrect use of the products will invalidate the manufacturer's warranty.

3 Safety instructions



3.1 General

 Ensure that a plough of this type and weight can be attached to the tractor/loader in question.

 Only persons who have familiarized themselves with the operation and functions of the plough may operate it.

 Before use, familiarize yourself with the functions and operation of the plough in a safe area where practicing cannot cause hazardous situations.

 Observe all warning and instruction labels on the plough. Do not operate the plough under the influence of alcohol, medication or narcotic substances. Fatigue may also lead to hazardous situations.

 Never get close to the plough when the hydraulic system is connected, as a possible system failure may result in a crushing hazard.

 Ensure before use that all plough maintenance has been conducted correctly and on time.

 Check the wear and adjustment of mechanical parts, and immediately replace any worn and damaged parts. Check the tightness of the bolts and nuts at regular intervals.

 Never position yourself under the plough unless it has been supported or lifted with an appropriate and locked mechanical lifting or support device, as a failure of the vehicle's hydraulic system or some other unanticipated occurrence may result in a crushing hazard.

 Pressure accumulators are available for the hydraulic systems of some ploughs. These accumulators are pre-pressurized. Therefore, if you suspect a failure in an accumulator, take it to an authorized hydraulics repair shop or replace it with a new unit. Do not attempt to disassemble the pressure accumulator, as the discharge of the pressure contained by the device may present a fatal hazard.

 Do not change the structure of the plough as this may lead to unanticipated safety risks.

 Do not let an inexperienced person handle the plough. Any party lending the device is responsible for possible damage and accidents.

3.2 Warning labels

The product features the warning symbols that are described below. Ensure that you know their meaning before beginning use of the product.
Clean/replace any unreadable or missing warning labels. More information on label orders is available from your Trejon retailer.

⚠	**Crushing hazard** Do not enter this area when the machine is running. Beware of placing your hands in this area when the machine is in operation. Keep sufficiently far away from the machine when it is running or in motion. Neglecting this regulation may lead to severe injury or death.	
⚠	**Always read the instructions and safety regulations before use** Do not operate the device before you have carefully studied all instructions and safety regulations, and have ensured that you understand their content. If you do not understand something, please contact your Trejon retailer. Misinterpretations may lead to severe injury or even death.	

4 Identifying information and spare parts

4.1 Type plate

The type plate of the U-ploughs is located on the back of the right-hand wing.

The type plate features the following information:
- Model
- Serial number
- Weight

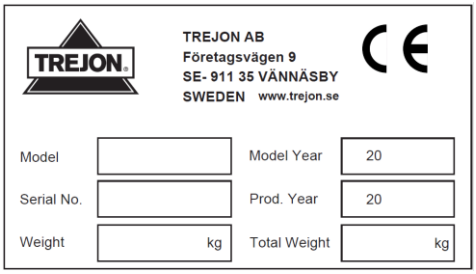


Figure 1

4.2 Spare parts

Only use original spare parts in connection to maintenance and repair, and ensure that the plough stays in its original condition.

Always provide the type and production number of the plough when ordering spare parts. Record the type and serial number of the plough in the space below.

Type _____

Serial number _____

⚠	*Ensure the structural safety and functionality of the plough, and only use original spare parts.*

5 Main components of the plough

5.1 Plough from the front

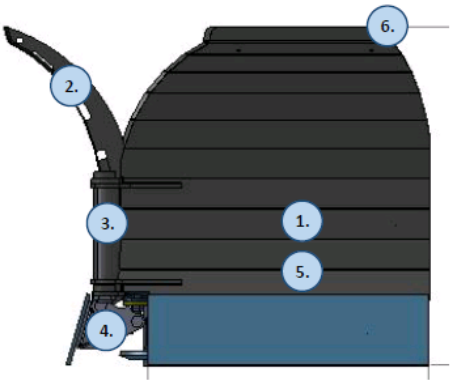


Figure 2

1) Side wing
2) Middle wing
3) Joint dowel
4) Blade frame
5) Blade
6) LED lights (accessory)

5.2 Plough from the top

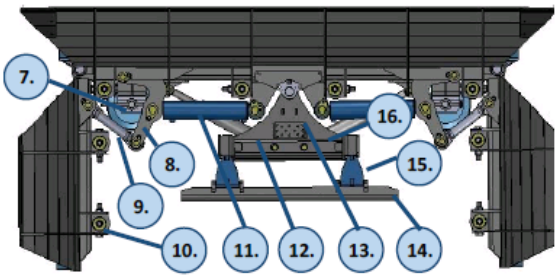


Figure 3

7) Support legs
8) Wing articulation mechanism
9) Push rod of the articulation mechanism
10) Blade frame trigger spring
11) Middle wing and side wing turn cylinders
12) Swivel frame
13) Electrical valve
14) Fitting frame
15) Float bar
16) Pressure accumulator (accessory)

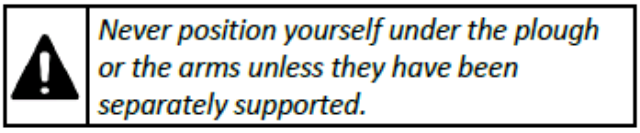
6 Connecting the plough to the vehicle

This section covers the safe attachment and detachment methods for the plough. By observing these instructions, you can safely connect and disconnect the plough.

6.1 Connecting the plough

 It is recommended that you attach the plough on a level surface, as a slanted surface will make the process more difficult and may result in the device being damaged.

 Engage the handbrake for the duration of the connection process in order to ensure that it is safe to position yourself between the plough and vehicle.



 When connecting the device for the first time, ensure that the quick fastening hooks fit their intended slots and that the locking pins can be properly locked into place. In addition, adjust the height limiters at a suitable level. It is advisable to check the connection and the height limiter adjustments before each use.

 Begin connecting the hydraulics by ensuring that the hydraulic system is depressurized.

 Then, clean the quick connectors of the plough and vehicle. Connect the hoses and electrical cables, as shown in section 8 (Technical data). It is recommended to mark the hoses with colors to facilitate reconnection.

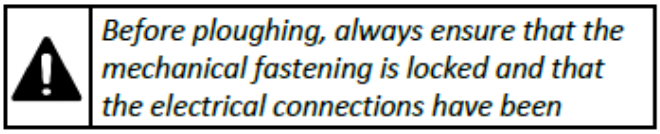
6.2 Disconnecting the plough

 Remember to engage the handbrake for the duration of the connection process. Never position yourself under the plough or the arms unless they have been separately supported.

 First, disconnect the electrical cables and then the hydraulic hoses. Remember to protect the quick connectors and the electrical connector against weather and dirt.

 If the plough is to be stored for an extended period of time, remember to lubricate it according to the weekly maintenance instructions (section 7.2), before disconnection. Use all the device's movements to ensure a thorough lubrication.

6.3 Ploughing



 Also, ensure that the hoses and cables are not subjected to crimping or abrasion.

 Operate all of the movements a few times and check that there are no oil leaks.

 If the device is unfamiliar to you, it is advisable that you take sufficient time to practice the use of the actions and the plough in a closed-off area.

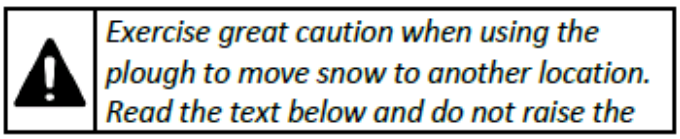
 Rest the plough on its support legs and/or blades in such a way that all sections connect to the ground evenly.

 Set the height of the shaft assembly to allow an upward and downward movement.

 Always maintain the basic settings while ploughing.

 Direct the snow in the desired direction by using the plough's various functions.

6.4 Mowing snow



IMPORTANT: Raise the plough and ensure its condition before setting off. Reduce the speed if the road is uneven. Excessive speed will damage the plough.

7 Maintenance

7.1 General

Observe the following instructions!

When performing maintenance or repair measures, observe all safety-related laws, decrees and regulations, as well as the safety instructions in this manual.

Park the vehicle on an even and firm surface.

Lower the plough to rest on the support discs.

Prevent the vehicle from moving.

Stop the motor of the vehicle and remove the ignition key.

Only use appropriate and suitable tools that are in good condition.

Observe a safe working procedure under all circumstances and dress appropriately for the work tasks.

Wear eye protection and a respirator, if necessary.

Remember to reinstall all covers and safety equipment that may have been removed.

Ensure that all labels of the machine are in good condition after the maintenance work. Replace damaged labels with new ones.

Collect waste oil, liquids and used filters, and deliver them to a processing plant for hazardous waste.

Do not allow oil or other fluids to spill on the ground, and take care of your environment.

7.2 Daily maintenance

It is recommended to check the plough on a daily basis to prevent problems.

The daily maintenance measures encompass the following inspections:

 Check the blade connections and adjustments.

 The blades should also be checked during a work shift to ensure that the plough is not damaged inadvertently.

 Check that there are no leaks in the hydraulics and that the hoses are in good condition.

 Check the general mechanical condition of the plough.

 Adjust the support discs to an appropriate height in relation to the blades.

 Lubricate the float support shafts on a daily basis (four grease nipples in U320-600HD ploughs, two in U280-U300 ploughs) (Figure 5).

7.3 Weekly maintenance

In addition to daily maintenance, conduct the following measures.

 Check the tension of the fastening bolts of the joints and tighten them if necessary.

 Grease all lubrication points in accordance with Figure 4. It is easiest to lubricate the plough when the wings are extended.

 The recommended lubricant is Neste OH GREASE or similar.

 Adjust or replace the blades and support discs.

 Check the tension of the fastening bolts.

In U-ploughs, the lubrication points are located as follows (Figures 4 and 5):
 Lubrication of the floating mechanism two (model U280-U300) or four nipples (U320-U600HD) (see Figure 5)

 A total of eight nipples are located at the ends of the cylinders (no. 2).

 The leg posts contain two nipples (no. 3).

- The wing articulation mechanism contains two nipples (no. 4).

- The wing hinges contain two nipples (no. 5).

- The sleeve of the central swivel mechanism contains one or two nipples (models U540-600 HD) (nro.6).

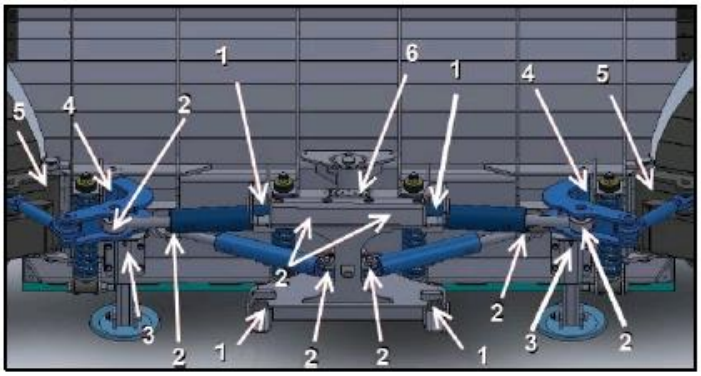


Figure 3

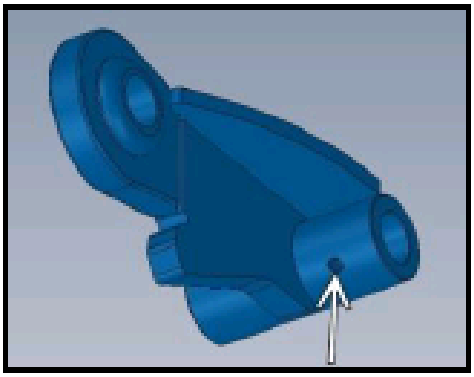


Figure 4

7.4 Maintenance after the ploughing season

After the ploughing season, we recommend that you, at least, perform the measures listed in sections 7.2 and 7.3. In addition, it is advisable to paint and varnish the wings if their paint coating is badly worn. The maintenance should be performed after the ploughing season to prevent situations in which the first snow of the following winter sticks to the rusted plough.

The code for the grey color used on the ploughs is RAL7043 and the code for the blue color is RAL5015. For more thorough painting in the autumn, we recommend a two-component anti-corrosion paint, such as Tikkurila Temadur SC80 or Teknos Teknodur Combi 3430. Please ensure that you clean the surface to be painted with a degreasing agent before painting.
Worn down blades should also be replaced immediately after the ploughing season.

7.5 Spring adjustment

This section covers the changes that can be made through spring adjustment and the effects of these changes on ploughing.

TIGHTENING THE BLADES

1. Loosen the double nut in the lower section of the spring.
2. Tighten the upper nut two rotations at a time and perform a test run. Repeat the process until the appropriate tautness is reached.
3. Tighten the lower nut to lock the adjustment.

Excessively stiff blades may present a risk of injury or equipment damage. Blades that feature springs are safety equipment intended to ensure safe ploughing.

If one of the springs is worn or broken, it is advisable to replace all springs for the blade in question.

LOOSENING THE BLADES

The blade springs can be loosened as follows:
1. Loosen the double nut in the lower section of the spring.
2. Loosen the upper nut two rotations at a time and perform a test run. Repeat the process until the appropriate tautness is reached.
3. Tighten the lower nut to lock the adjustment.

Excessively loose blades yield constantly and bounce off the ground, resulting in unnecessary noise and poor ploughing performance.

CHANGING THE BLADE ANGLE

Tightening the nut on the upper end of the spring reduces the blade angle, while loosening the nut increases the angle. Normally, it is only necessary to adjust the nut after spring replacement.

7.6 Blade installation and adjustment

It is easiest to replace/adjust the blades when the plough has been lifted. However, this requires the plough or the vehicle arms to be firmly supported.

1. Engage the vehicle's handbrake.
2. Lift the plough to the appropriate height.
3. Support the plough or vehicle arms in such a way that the plough cannot collapse.
4. Turn off the ignition.
5. Remove the blade attachment bolts and detach the blades (take care to ensure that the blade does not fall on you).
6. Fasten the blades in the correct location.

The blade is properly adjusted when it is 20 to 50 mm below the blade frame. Do not adjust the blade more than 50 mm below the blade frame, as this makes the blade susceptible to bending. Do not allow the exposed blade to wear excessively (the distance from the bottom edge of the blade frame < 12 mm) as this will begin to wear down the blade frame. Therefore, it is advisable to monitor the condition of the blades and adjust them sufficiently early on.

7.7 Safety valve tightening instructions

If the wings of the U-plough give way too easily when clearing snow in a normal manner, the safety valves must be tightened. The safety valves to be tightened are marked in Figure 6 with the names "Left forwards" and "Right forwards".
The points "Left wing backwards" and "Right wing backwards" adjust the safety valves for driving in reverse.
The valves should only be tightened a little at a time. For this reason, the instructions below illustrate the tightening process by drawing a parallel to the movements of a clock's minute arm (see Figure 7).
Tighten the wing safety valves as follows:
1. Loosen the locking nut of the hex socket screw.
2. Use a hex key to turn the valve tightening screw by 30 degrees clockwise (5 min on a clock dial).
3. Tighten the locking nut.
4. Test the operating of the plough and, if necessary, tighten the valve by another 30 degrees (5 min).
5. Do not tighten the safety valve by more than 120 degrees (20 min).

Tightening the safety valves of the central swivel mechanism:

1. Tighten the safety valve of the central swivel mechanism by 30 degrees (5 min) clockwise.
2. Go for a test drive.
3. If necessary, tighten the valve by another 30 degrees (5 min).
4. Do not tighten the safety valve by more than 120 degrees (20 min).

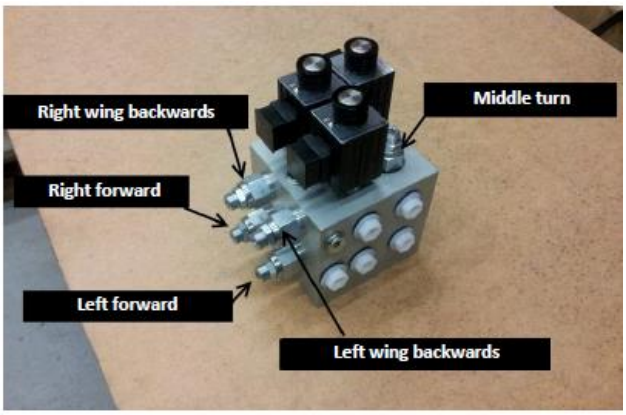


Figure 5

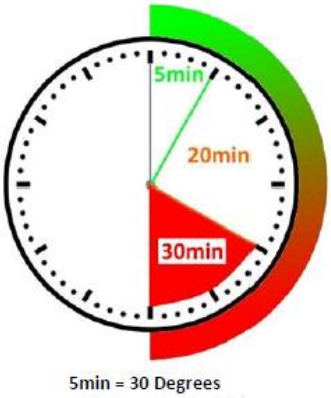


Figure 6

Do not tighten the valve by more than 20/60 of a turn (20 min), as this may cause the plough to be subjected to excessive forces that may break it. Tightening a safety valve always increases the risk of the plough breaking.

8 Technical data

8.1 Hydraulics diagrams

Plough hydraulics vary depending on the vehicle's properties. This section covers the various hydraulic connections of the ploughs.
There are three different hydraulics diagrams for U-ploughs. The following sections present the hydraulic diagrams of the various options and list the kinds of hydraulic arrangements each example requires.

8.1.1 2-3 Hoses

The vehicle must feature a single cylinder hydraulics arrangement and tank line (the tank line can be replaced with a pressure accumulator installed on the plough), as well as two electrical on/off switches in the cabin (Figure 8).

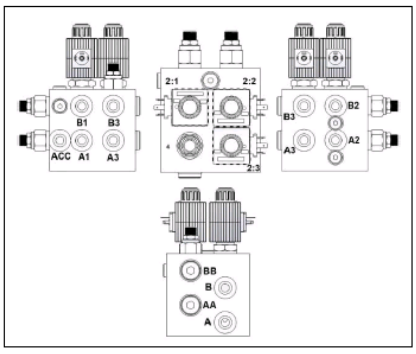


Figure 7

Top side: A and B = feed hoses

Left side (left wing and left cylinder of the central swivel mechanism): B1 = wing arm side and A1 = wing piston side, A3 = central swivel, arm side, B3 = central swivel, piston side, ACC = Tank line/pressure accumulator

Right side (right wing and right cylinder of central swivel mechanism): B2 = wing arm side and A2 = wing piston side, A3 = central swivel, piston side, B3 = central swivel, arm side.

8.1.2 4-5 Hoses

The vehicle must feature two-cylinder hydraulics arrangements and a tank line (the tank line can be replaced with a pressure accumulator installed on the plough), as well as one electrical on/off switch in the cabin (Figure 9). The wing control can also be implemented with two on/off switches. However, in this example, the wings are controlled one at a time.

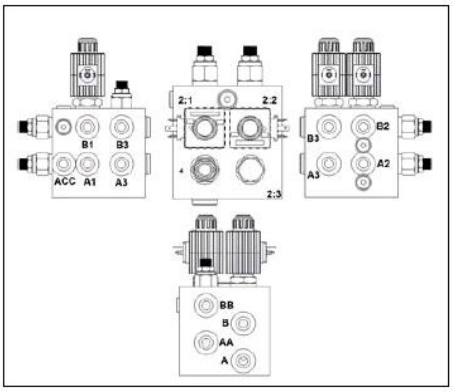


Figure 8

Front page: AA and BB = central swivel hoses, A and B = wing swivel hoses

Left side (left wing and left cylinder of the central swivel mechanism): B1 = wing arm side and A1 = wing piston side, A3 = central swivel, arm side, B3 = central swivel, piston side, ACC = Tank line/pressure accumulator

Right side (right wing and right cylinder of central swivel mechanism): B2 = wing arm side and A2 = wing piston side, A3 = central swivel, piston side, B3 = central swivel, arm side

8.1.2 6-7 Hoses

The vehicle must feature two-cylinder hydraulics arrangements and a tank line (the tank line can be replaced with a pressure accumulator installed on the plough). The position of the tank line or pressure accumulator is marked with a T (Figure 10).

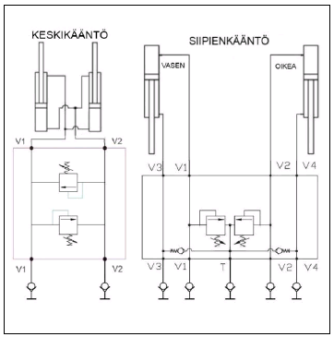


Figure 9

Top side: A and B = feed hoses to the right cylinder, AA and BB = feed hoses to the left cylinder. A and AA are piston side hoses, and B and BB are arm side hoses.

Left side (left cylinder): B2 = wing arm side and A2 = wing piston side, ACC = tank line

Right side (right cylinder): B1 = wing arm side and A1 = wing piston side

8.1.3 2-5 Hose (and Multiconnection)

Through a multi-connection, the plough can be used with either 2–3 hoses or 4–5 hoses, without changing hoses (Figure 11).

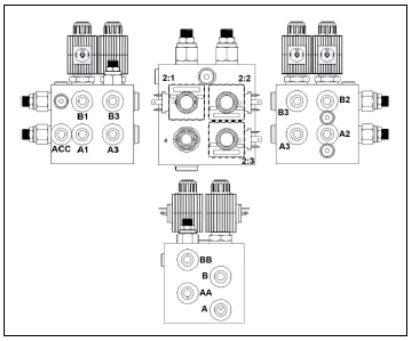


Figure 10

1: The device can feature a single cylinder hydraulics arrangement and pressure accumulator/tank line, as well as two on/off switches in the cabin. The switches are used to select various functions, left wing, right wing or both wings. In this connection, the AA and BB hoses are not connected to the vehicle.

2: The vehicle may also feature two-cylinder hydraulics arrangements and a pressure accumulator/tank line, as well as two on/off switches in the cabin (the switches are used to select whether to turn the left or right wing). In this connection, all hoses are connected to the vehicle, but the 2:3 electrical coil is not used.

Front page: AA and BB = central swivel hoses, A and B = wing swivel hoses

Left side (left wing and left cylinder of the central swivel mechanism): B1 = wing arm side and A1 = wing piston side, A3 = central swivel, arm side, B3 = central swivel, piston side, ACC = Tank line/pressure accumulator

Right side (right wing and right cylinder of central swivel mechanism): B2 = wing arm side and A2 = wing piston side

A3 = central swivel, piston side, B3 = central swivel, arm side

8.2 Electrical diagrams

Figure 12 features an electrical connection diagram for the coil. If there are several coils, a separate connection must be made for each one. It is advisable to place the fuse close to the battery so that the conductor with no fuse is short.

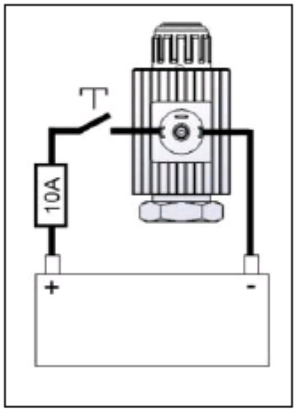


Figure 11

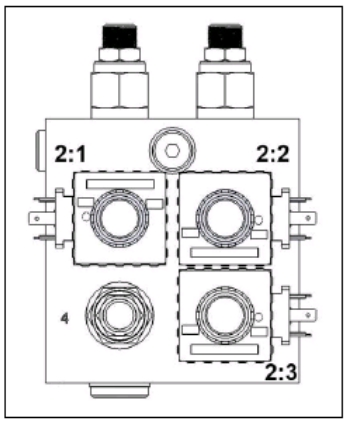


Figure 12

The U-plough valve (Figure 13) features 2–3 electrical coils (three with 2–3 hoses and two with 4–5 hoses). The coil (2:1) is used to switch the left-wing control on. The coil (2:2) is used to switch the right-wing control on. The left and right wing can also be controlled simultaneously by connecting a current to both at the same time. The coil (2:3) is used to control the middle wing (without a current, the middle wing is on).

The U-plough valve can also be connected with 4–5 hoses, in such a way that the right or left wing operate without a current, and a button is used to switch control from one wing to the other. This requires 4–5 hoses and only one on/off switch. In this connection, the wings cannot be controlled simultaneously.

EMDV12-N-4B Without a current, the spindle is off.

EMDV12-N-4C Without a current, the spindle is on.

The connections of the wiring harnesses supplied with the ploughs have been made as follows:

- **Single-coupling cable:** Brown = plus, blue = minus, green-yellow = extra
- **Two-coupling cable:** black = the plus of the plug at the end of the wire, brown = the plus of the other plug, blue = common minus
- **Three-coupling cable:** Wire 1 = plug 1 plus, wire 3 = plug 3 plus, blue = common minus. Connect coupling 1 (2:1), coupling 2 (2:3) and coupling 3 (2:2)

The couplings feature LED lights that are lit when power is supplied to the couplings.

9 Notes

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 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: _____

TREJON AB reserves the right to change or to improve shown models using technical or commercial reasons, without demands to carry out the same improvements on equipment already delivered. Pictures in the manual do not necessarily show the equipment as delivered.

Technical data, weights and measures are without obligation. Reservation for faults.

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