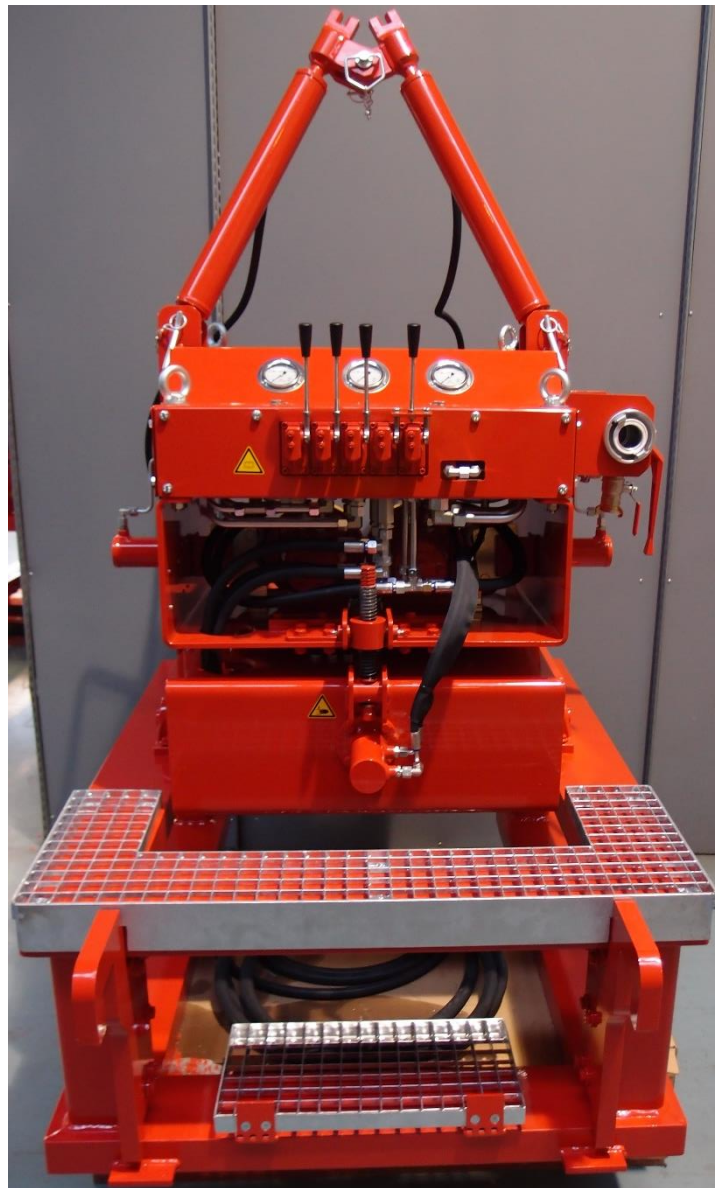




## Operating Instructions Hydrolans®



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# 1 About these Operating Instructions

Before operating the Hydrolans® for the first time or if you are authorized with other tasks on the Hydrolans®, you have to read these Operating Instructions.

In particular, observe chapter 2 „General Safety Regulations“.

## 1.1 General

These instructions are intended to facilitate the familiarization process with and utilizing its intended application capabilities.

The Operating Instructions contain important notes to operate the safely and properly. Their observance helps in:

- Avoiding dangers
- Avoiding repair costs and breakdown times
- Increasing the reliability and life span of the product

These instructions must be read and applied by every person that is authorized with tasks on the .

In addition to these Operating Instructions, the regulations concerning accident prevention and environmental protection applicable in the respective country of use and application site must be observed.

## 1.2 Signs and symbols used

These instructions use the following signs and symbols:

- Action symbol: Text following this sign describes instructions that have to be performed in the given order from top to bottom.
- ✓ Result symbol: Text following this sign describes the result of an action.

## 1.3 Design of warnings

Warning levels

Signal word	Used for ...	Possible consequences if the safety note is not being observed:
<b>DANGER</b>	Personal injuries (imminent threat)	Death or serious injury!
<b>WARNING</b>	Personal injuries (possible dangerous situation)	Death or serious injury!
<b>CAUTION</b>	Personal injuries	Minor injuries!

Tab. 1.1 Warning levels

The warnings are designed as follows:

- Pictogram with signal word according to warning level
- Description of danger (type of danger)
- Description of consequences of the danger (effects of danger)
- Measures (activities) to prevent the danger



**HAZARD!**

**Type of danger**

Effects of danger

- Prevention of danger

**Warning sign**

Special safety notes are listed at the relevant points in each case. They are identified with the following symbols.



**General hazard location**

This sign precedes activities that bear the risk of personal injuries and extensive property damages.

If there is a unique hazard source, it is preceded by one of the following symbols.



**Risk of crushing**

This sign precedes activities that bear the risk of being crushed.



**Suspended loads**

This sign precedes activities where suspended loads could drop and injure persons in the process.

**Hand injuries**

This sign precedes activities that bear the risk of hand injuries.

**Rotating wheels**

This sign precedes activities that bear the risk of hand injuries due to rotating wheels.



## 2 General Safety Regulations

### 2.1 Principles

- Ensure the operator is familiar with the machine and has read this operating instruction thoroughly.
- Ensure the operator is familiar with the water and hydraulic source before connecting the Hydrolans®
- Do not operate the machine when under influence of alcohol or medicine.
- Do not operate the machine when exhausted or ill

### 2.2 Intended use

The Hydrolans® is a solution for installing underground infrastructure without the need for digging.

To achieve this, a curved lance is pressed into the ground and will re-surface at the desired distance away from the Hydrolans®.

Now the desired infrastructure (for example: cables) can be attached to the end of the lance, after which the lance and the infrastructure will be pulled back through the ground.

**THE HYDROLANS® MAY ONLY BE USED FOR ABOVE DESCRIBED PURPOSE.**

## 2.3 Foreseeable misuse

Before use:

- Check if the hardness of the surface and subsurface is suitable for the Hydrolans®
- Check if there are any subsurface infrastructure obstacles.
- Only connect the Hydrolans® to a water and hydraulic source that meets the requirements of the Hydrolans®

During use:

- Never step or climb on top of the machine, only step on the intended grates described in chapter 2.5.

---

### HAZARD!



#### Risk of falling

When standing on top the Hydrolans® a high risk of falling is present. Falling of the Hydrolans® can lead to serious injuries and crushing danger.



- Always step on the intend grates described in chapter 5
- Respect the prohibition sign on top of the hydrolans

- 
- Ensure the operators are capable of lifting the lance in a vertical position
  - To prevent hydraulic lines from crushing; pay close attention when inserting a lance in to the Hydrolans®
  - Always check the correct orientation of the lance when inserting the lance in to the Hydrolans®

## 2.4 Selection and qualification of the personnel

Never allow the following people operate the machine:

- People who have not been trained to operate the machine
- People who are not capable of understanding the safety pictures and labels located on the machine or in this document
- Children

## 2.5 Workstations for the operating personnel

The Hydrolans® must be operated whilst standing on the grates, as seen in figure 2.1, highlighted in light green.

Do not stand anywhere else on the Hydrolans®, as this may result damage the machine.

---

### HAZARD!

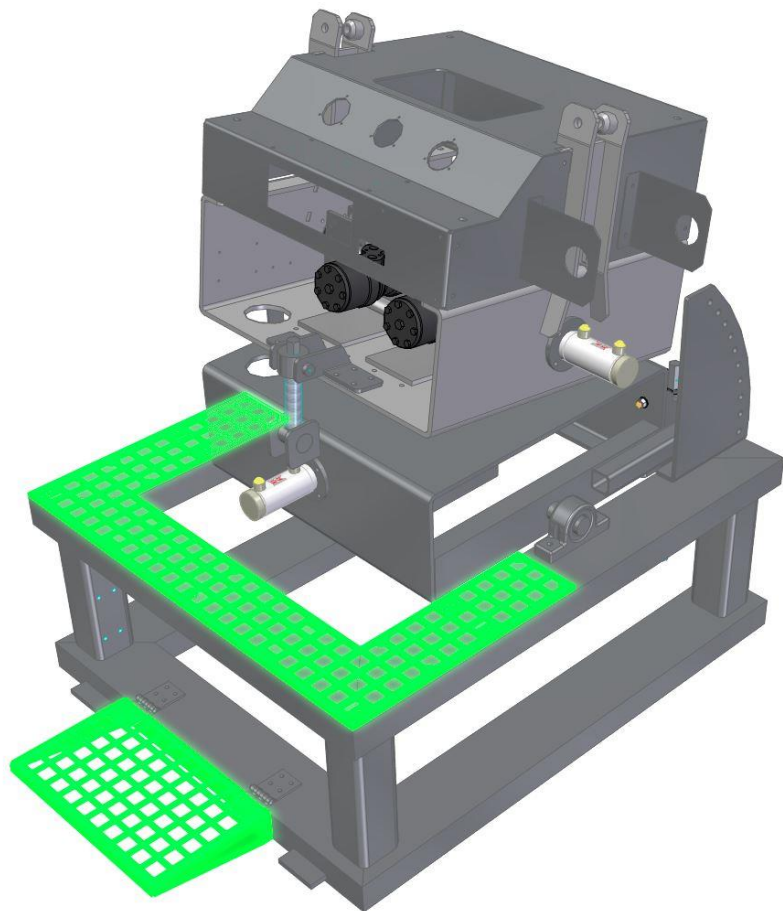


#### Risk of falling

When standing on top the Hydrolans® a high risk of falling is present. Falling of the Hydrolans® can lead to serious injuries and crushing danger.



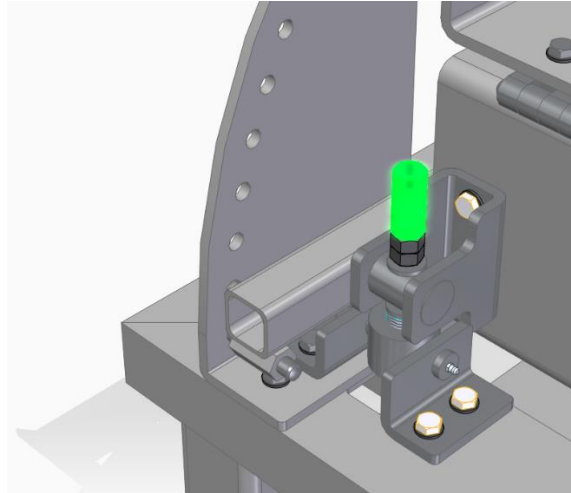
- Always step on the intend grates described in chapter 5
- Respect the prohibition sign on top of the hydrolans



*Fig. 2.1 Workstations*

## 2.6 Safety devices

### Position of safety devices



*Fig. 2.2 Spindle mechanism*

When setting up the machine remove both lock pins and always use the dedicated (highlighted) spindle mechanism to adjust the angle.



*Fig. 2.3 Position of lock pins*

When using the Hydrolans® The lock pins must always be in place as shown in the figure above.

### Function of safety devices

The lock pins make sure the spindle mechanism is free from any sort of load, this increases the longevity and safety of the Hydrolans®.

## 2.7 Safety signs



Fig. 2.4 Safety sign locations

## Meaning



W1:  
**Warning,**  
Crushing hazard.



W2:  
**Warning,**  
Crushing Hazard between rotating wheels.



W3:  
**Warning,**  
Read manual before proceeding.



**Prohibition,**  
Forbidden to stand on.

## 2.8 Protective measure

### Personal protective equipment

Always wear the necessary protective clothing, including helmet, safety goggles, safety shoes and gloves.



Long hair should be tugged away and it is not allowed to wear loose clothing when working with the machine

**MAKE SURE ALL PERSONNEL, INCLUDING SURROUNDERS, WEAR HELMETS DURING FEEDING AND REMOVING THE LANCES.**

## 2.9 Safety regulations

Only trained operators may work with the machine.

It must be ensured that the correct and indicated equipment (excavator) is used to use the machine.

During maintenance or cleaning of the machine, it must be ensured that the machine is shut down and disconnected.

The surroundings of the machine should be shielded in order to ensure that unaware people does not come in the working area of the machine.

During cleaning it must be ensured that the tilting mechanism is locked.

During transport should be ensured that the machine is fastened to the trailer.

Maintenance and repair are only to be carried out by instructed personnel and in accordance with the instructions manual.

Do not disassemble the Hydrolans® on your own initiative. Please contact your distributor before disassembling the Hydrolans®.

Do not dispose of the Hydrolans® on your own initiative. Please contact your distributor before disposal of the Hydrolans®.



## 3 Scope of supply

### 3.1 Parts included

- 1x Hydrolans®
- 2x Auxiliary hydraulic cylinder
- 1x Hydraulic hose set
- 1x Lance water nozzle
- 1x Lance water coupling
- 1x Lance pull adapter
- 25x Lance Bolt

### 3.2 Optional parts

- R3 lance (4x for max distance)
- R4 lance (5x for max distance)
- R5 lance (6x for max distance)
- R5.5 lance (6x for max distance)
- R6 lance (7x for max distance)
- R7 lance (8x for max distance)
- R7,5 lance (8x for max distance)
- R10 lance (11x for max distance)
- R15 lance (16x for max distance)
- R20 lance (21x for max distance)

Other radii available on request.

### 3.3 Parts excluded

- Hydraulic source + appendages
- Water source + appendages
- Transport aids
- Tools

## 4 Technical description

### 4.1 Design of the machine

The Hydrolans® arc sinker is a solution for installing underground infrastructure without the need for digging. To achieve this, a curved lance is pressed into the ground either vertically or at an angle. The lance will resurface up to 2 times the radius of the lance away from the Hydrolans®, see chapter 7 for the exact distances. Now the desired infrastructure (for example: cables) can be attached to the end of the lance, after which the lance and the infrastructure will be pulled back through the ground.

The lance is hollow, allowing for water to be pumped through. This will soften up the ground when pressing the lance through the ground. The ground must be made of peat or (wet) clay for the best results. When pressing the lance through sand or dirt, bentonite must be added to the water.

The lance is split into sections of 3 meter, allowing for easier insertion into the Hydrolans®, as well as easier transport of the lance.

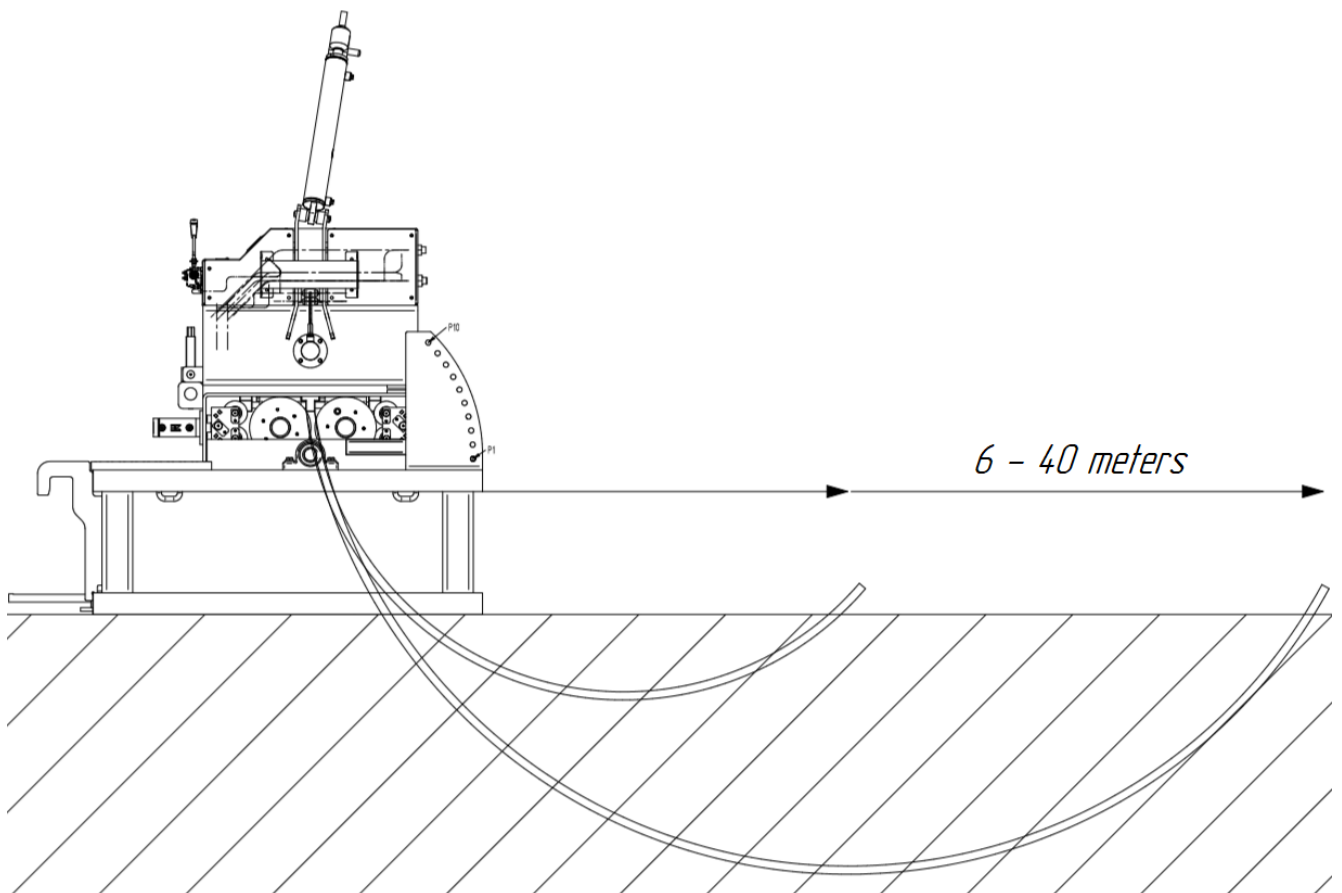


Fig. 4.1 Design of the machine

## 4.2 Interfaces

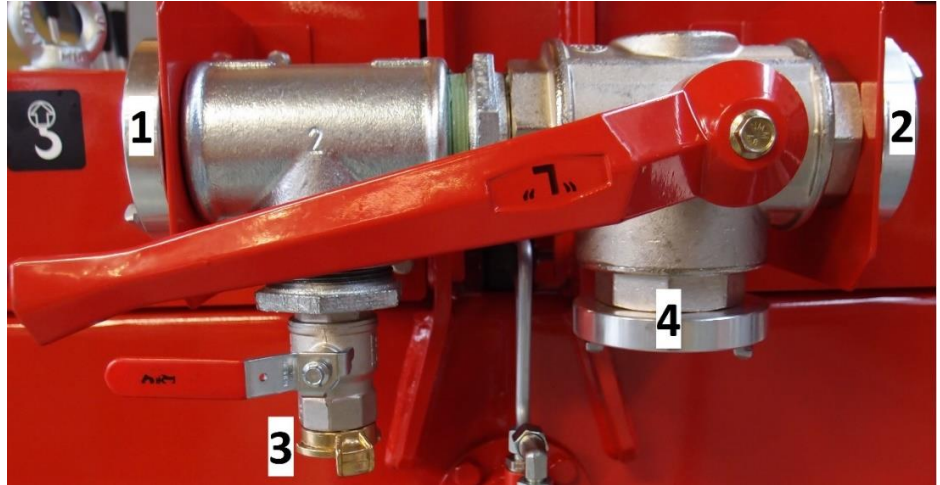


Fig. 4.2 Interfaces Hydrolans®



Fig. 4.3 Interfaces water coupling

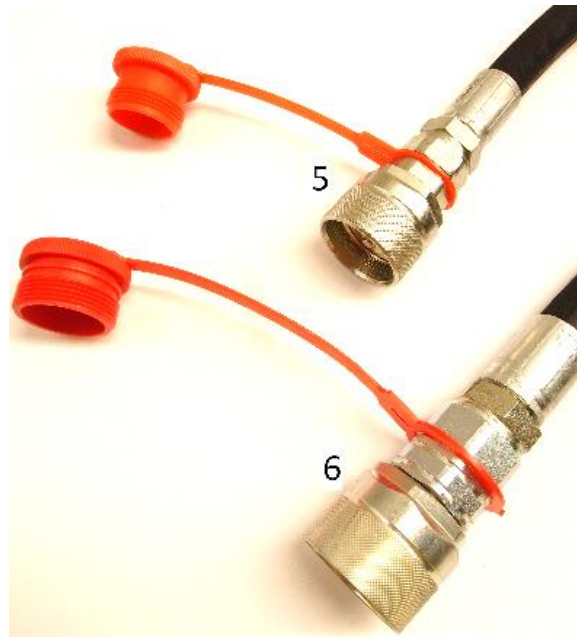


Fig. 4.4 Interfaces hydraulic hose set

1. Storz aluminium coupling 66mm x 2", used for connecting the water hose that feeds the water to the lance.
2. Storz aluminium coupling 66mm x 2", used for connecting the water hose that feeds the water back to the pump/reservoir.
3. Geka Plus messing coupling 1", used for connecting a water hose that feeds the leftover water back to the pump/reservoir.
4. Storz aluminium coupling 66mm x 2", used for connecting the water hose that feeds the water from the pump to the Hydrolans®.
5. SKF308F quick connector, connects to the hydraulic source supply.
6. SKM308F quick connector, connects to the hydraulic source return.

### 4.3 Features of the tools

Following tools are required for operating the Hydrolans®:

1. A 24 mm wrench, used for operating the spindles. Ratchet wrench recommended.
2. A 5 mm hexagonal key, used for connecting and disconnecting the lances.
3. A chain or round sling capable of pulling 3000 kg, used for pulling the lance out of the ground with the auxiliary cylinders.

## 4.4 Type plate

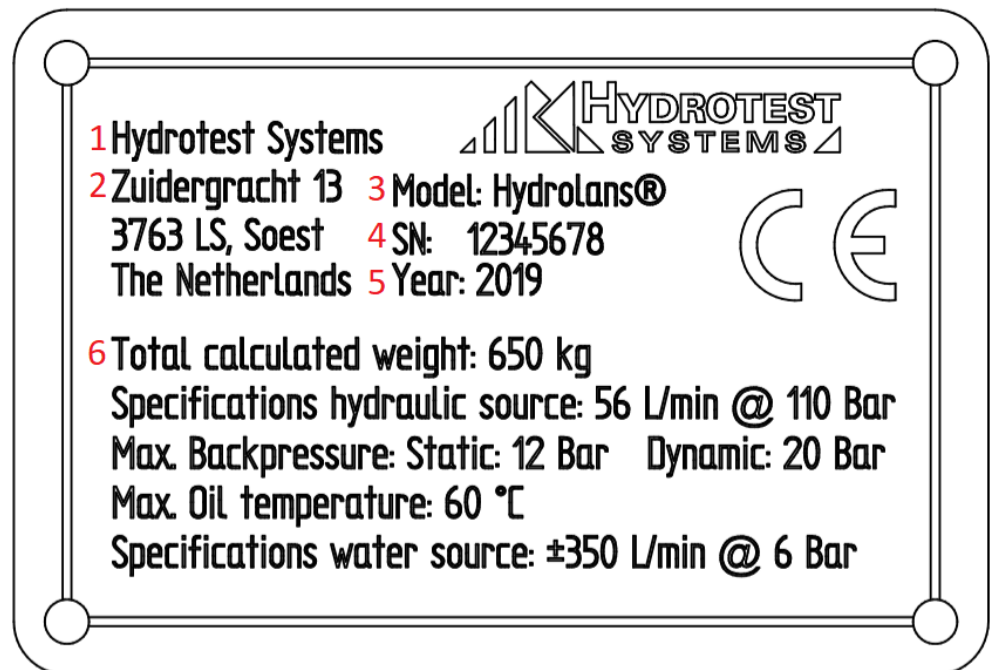


Fig. 4.5 Type plate

1. Manufacturer Name
2. Manufacturer Address
3. Model Name
4. Serial Number (Example)
5. Build Year (Example)
6. Machine specifications

## 5 Transport and storage

### 5.1 Transport

#### Means of transportation

The following factors must be taken into account when picking a vehicle to transport the Hydrolans® with:

- It must be able to support the weight of the Hydrolans®, the lances and any other tools and equipment required for installing and operating the Hydrolans®.
- The Hydrolans® must be placed on a flat surface during transport.
- The Hydrolans® must be tied down during transport.
- It must contain a place to store the lances without them falling of the vehicle.
- It must contain a container to store the remaining tools and equipment in.

## Before the transport

The following tasks must be completed before transporting the Hydrolans®:

- Remove the lance from the Hydrolans®.
- Clean the Hydrolans®.
- Detach hoses using the quick connectors (auxiliary cylinders optional).
- Clean the dust caps and apply them to the quick connectors.
- Set the angle of both spindles to 0.
- Lock the angle with the locking pins.
- Detach auxiliary cylinders



### **CAUTION!**

#### **Spilling oil on motor wheels**

Motor wheel damage

- Make sure to not spill any hydraulic oil on the motor wheels
-

## Transporting the machine

### Lifting the Hydrolans®

The Hydrolans® can be lifted using the 4 lifting points located at the top of the Hydrolans®. The location of the lifting points is marked by the information sign found in figure 5.2.



#### WARNING!

#### Heavy suspended loads

Crushing by falling loads

- Do not stand underneath the suspended load.
- Make sure the hoisting equipment is strong enough to support the suspended load.
- Make sure the hoisting equipment is not damaged.
- Use all 4 lifting points at the same time to lift the Hydrolans®.

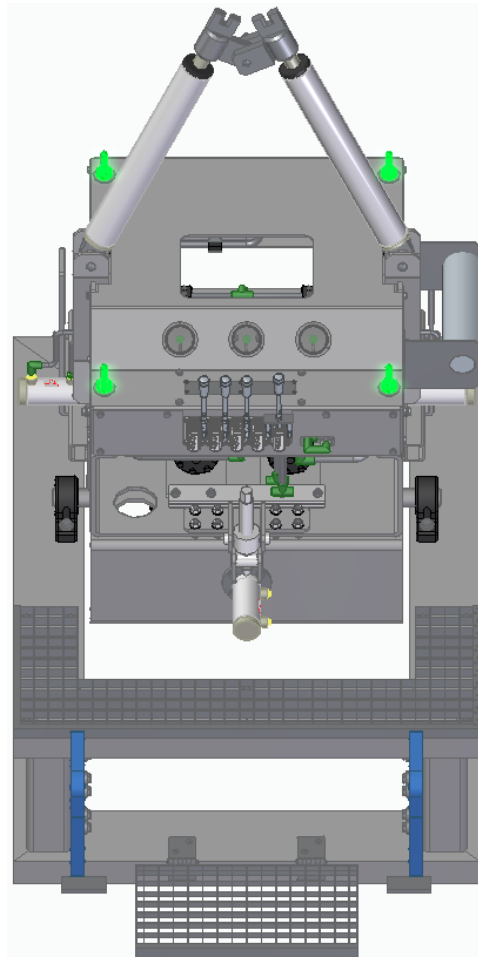


Fig. 5.1 Lifting point locations

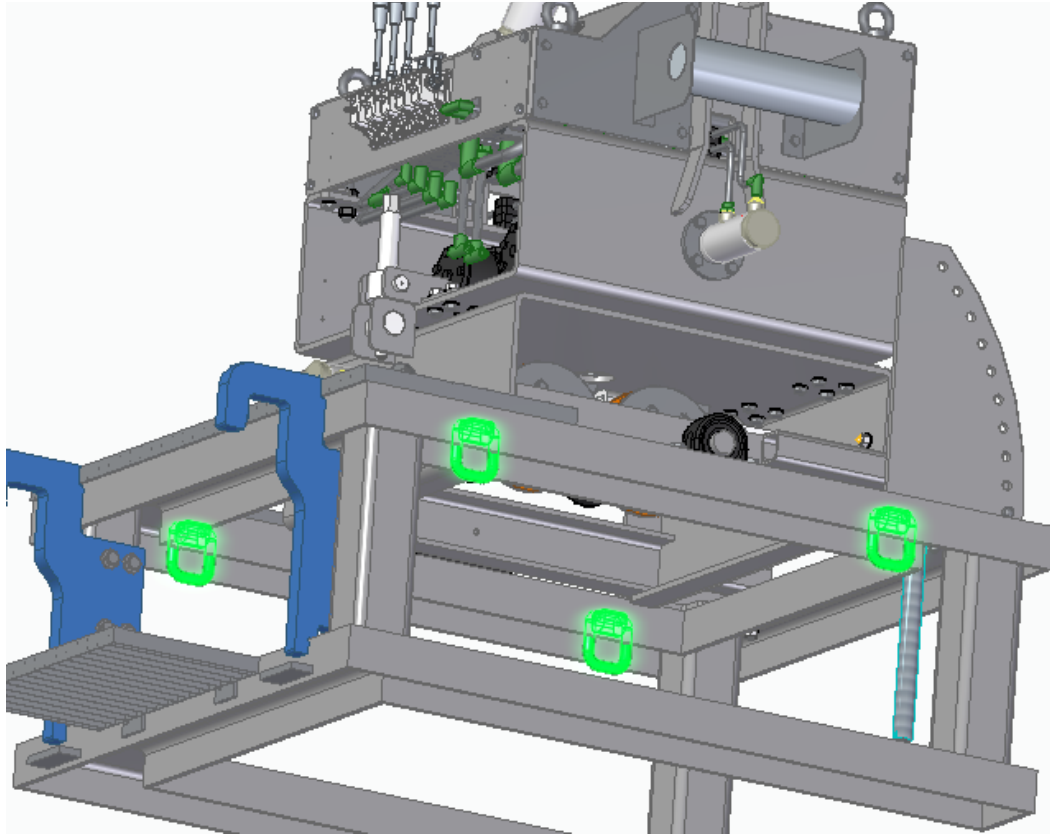


Fig. 5.2 Lifting point



**Transporting the Hydrolans®**

When transporting the Hydrolans®, make sure that the Hydrolans® is properly tied down to the vehicle using the 4 tie down points. These tie down points are located at the bottom of the Hydrolans®, hidden from view unless when crouching down. The location of these points is marked by the information symbol found in figure 5.4.



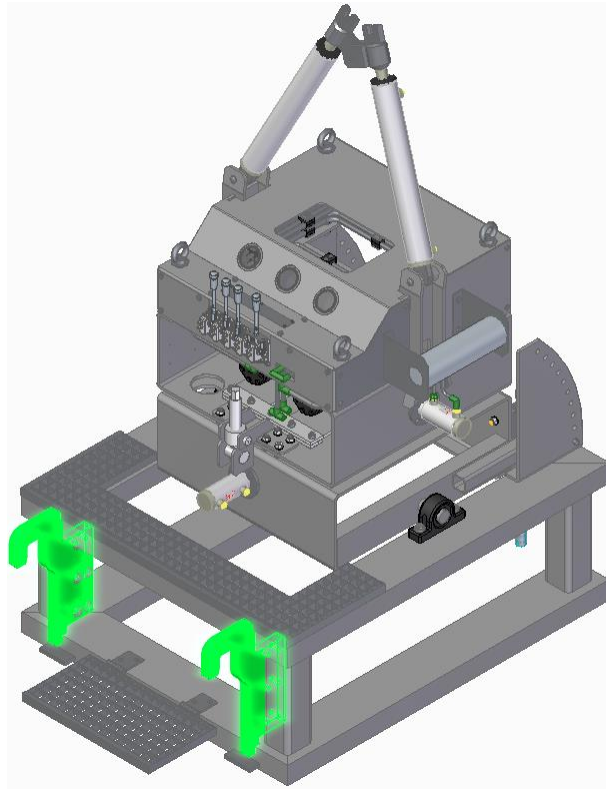
*Fig. 5.3 Tie down point locations*



*Fig. 5.4 Tie down point*

**Positioning the Hydrolans®**

When unloading the Hydrolans®, the 4 lifting points can be used again. However, when positioning the Hydrolans® at the installation site it may be easier to use the lifting plates found at the front of the Hydrolans®, as seen in figure 5.5 (highlighted in light green). These lifting plates can be mounted on the dozer blade of a small excavator. This way the excavator can be used to position the Hydrolans®.



*Fig. 5.5 Lifting plates*

**Unpacking the machine**

No packaging is present when the machine is delivered to the customer.

## 5.2 Storage

### Requirements of the storage site

To prevent unnecessary corrosion, it is recommended to store the Hydrolans® in a frost free, dry, and well ventilated location.

Do not stack anything on top of the Hydrolans®, as this may damage the machine.

### Preparing the machine

The following tasks must be completed when preparing the Hydrolans® for storage:

- Remove the lance from the Hydrolans®.
- Clean the Hydrolans®.
- Detach hoses using the quick connectors (auxiliary cylinders optional).
- Clean the dust caps and apply them to the quick connectors.
- Set the angle of both spindles to 0.
- Lock the angle with the locking pins.
- Detach auxiliary cylinders (optional)
- When leaving the auxiliary cylinders attached, make sure that they, as well as their hoses, are not damaged by other objects.
- Make sure the Hydrolans® is dry before storing it.



#### **CAUTION!**

#### **Spilling oil on motor wheels**

Motor wheel damage

- Make sure to not spill any hydraulic oil on the motor wheels, this will dramatically reduce the life time of the wheels
-

## 6 Installation

### 6.1 Installation of the Hydrolans®

#### Requirements of the installation site

The following factors must be taken into account when picking an installation site:

- The Hydrolans® must be placed on flat, horizontal ground.
- The Hydrolans® must be placed on stable ground.
- No obstacles at the start and endpoint of the lance.
- No underground obstacles that may obstruct the lance.

The ground must be made of (wet) clay, peat, sand or an equally soft material.

#### Required tools

- Ratchet with socket 24  
Hex key size 5
- Hydraulic source
- Water pump

## Safety precautions before the installation

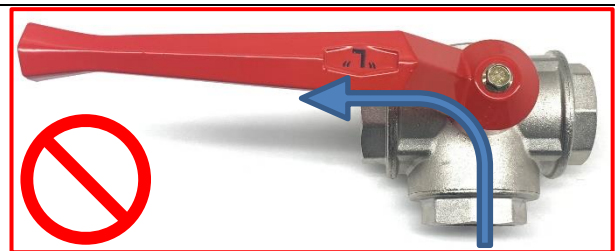


### WARNING!

#### High pressure

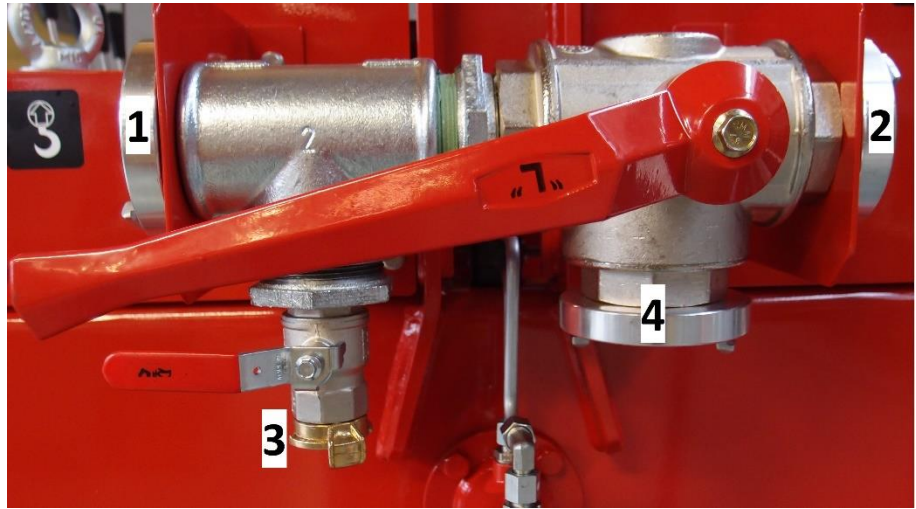
Potential system damage and liquids leaking under high pressure

- Do not leave the hydraulic and water hoses connected when moving or transporting the Hydrolans®
- Before connecting the hydraulic source and water pump, make sure the hydraulic source and water pump are turned off.
- Before turning on the hydraulic source and water pump make sure the Hydrolans® water and hydraulic requirement are not exceeded.
- Before turning on the water pump make sure valve 13 (chapter 8) is in the return position (vertical). So water flows to the water pump's reservoir.



## Performing the installation

Water system:

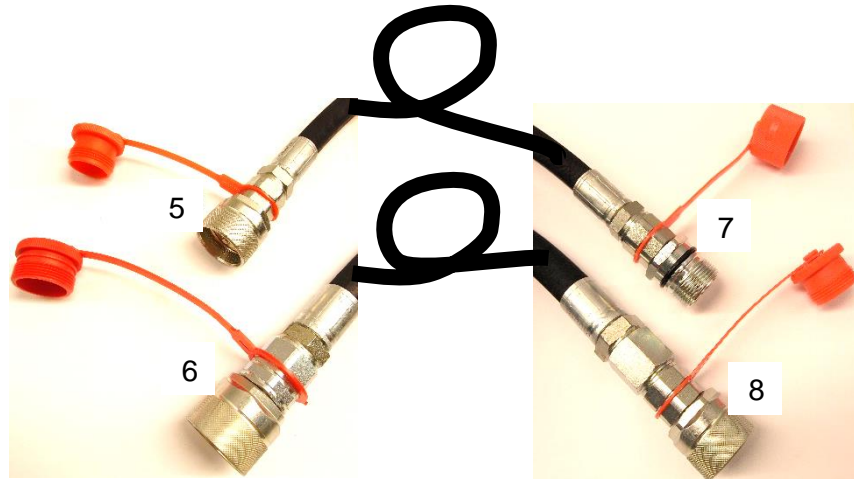


*Fig. 6.1 Water interfaces*

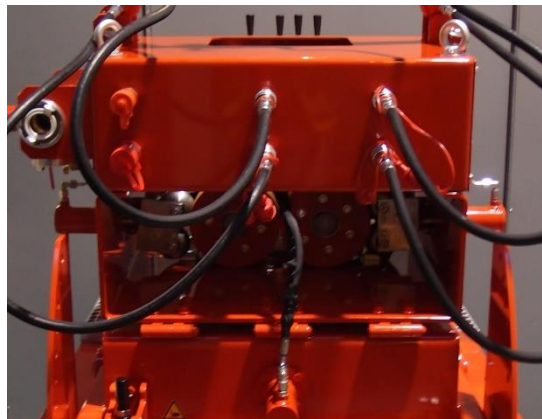
1. Lance water supply, connects to water coupling
2. Water return, connects to water pump reservoir
3. Water drain connects to water pump reservoir
4. Water supply, connects to the water output of the water pump.

The water hoses and appendices are not supplied with the Hydrolans®.

Hydraulic system:



*Fig. 6.2 Hydraulic supply and return hoses*



*6.3 Hydraulic supply and return connections*

- 5. Hydraulic supply, 5 connects to 5
- 6. Hydraulic return, 6 connects to 6
- 7. Hydraulic supply, connects to Hydraulic source supply
- 8. Hydraulic return, connects to hydraulic source return

## 7 Setting up the machine

A set up table is used to determine which set up is needed to sink the desired length (A) and depth (B). See table 1

The Hydrolans® can be adjusted to maximum 45 degrees to decrease the length and depth of the sinking.

This can be adjusted by removing "11. Angle adjustment locking pin " and "12. Angle adjustment locking pin 2". Shown in chapter 8.

After the pins are removed, the desired "P" position can be achieved by using the ratchet with socket 24 on "10. Angle adjustment spindle".



### DANGER

#### Crushing hazard.

During angle adjustment potential crushing risk is present.

- When the desired "P" position is achieved, always reinsert "11. Angle adjustment locking pin " and "12. Angle adjustment locking pin 2", Shown in chapter 8, before operating the machine.

Before sinking, the machine needs to accommodate for to the correct radius lance, this is done by "4. Radii adjustment indicator" and "9. Radii adjustment spindle" displayed in chapter 8.

Using a ratchet with socket 24 on the radii adjustment spindle, the machine can be adjusted. The radii adjustment indicator shows the setting. The picture below shows that the machine is set up for a R5 lance.



Figure 7.1 Radii adjustment indicator



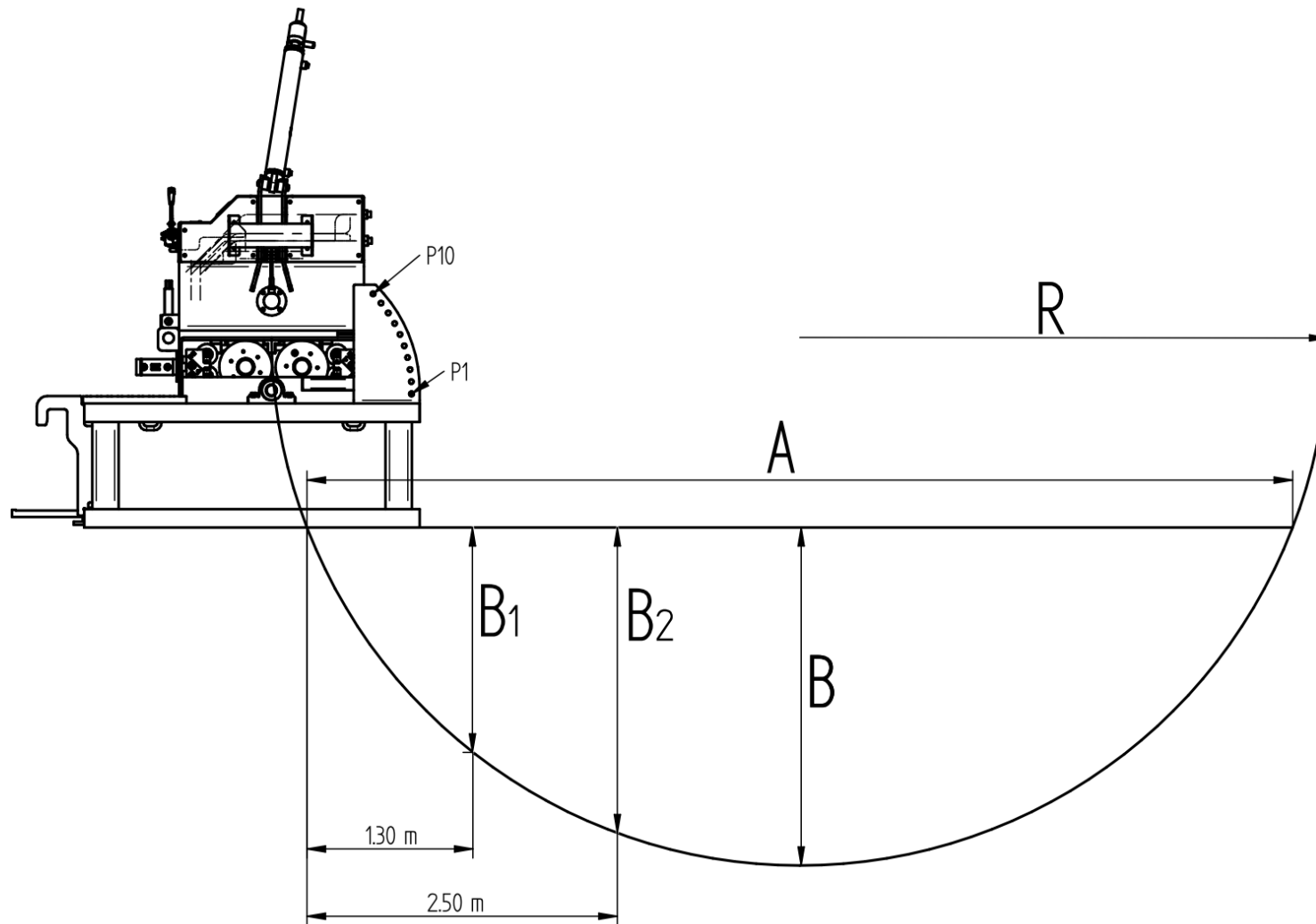


Figure 7.2 Schematic view of lance depth and distance

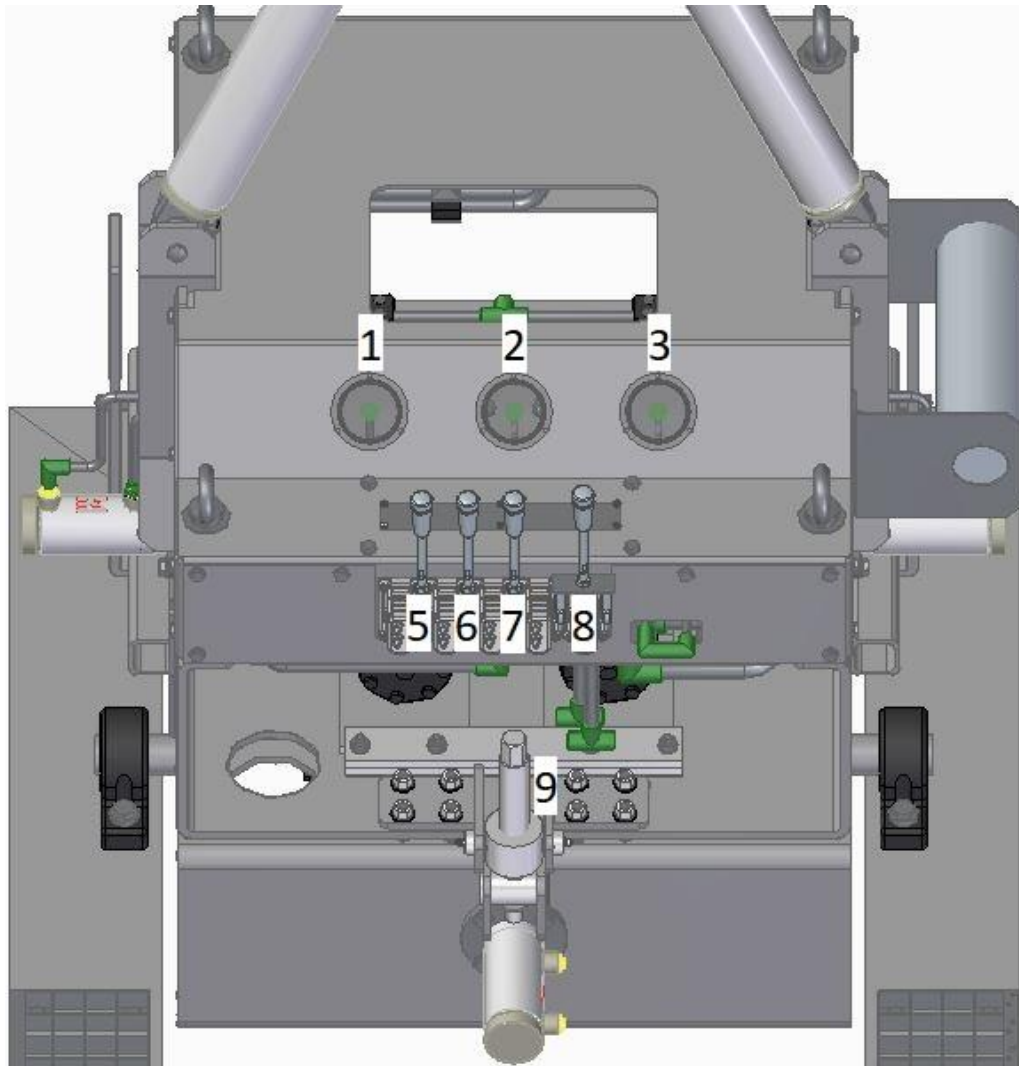
P	R3				R4				R5				R5.5				R6			
	A	B	B1	B2	A	B	B1	B2	A	B	B1	B2	A	B	B1	B2	A	B	B1	B2
1	5.82	2.28	1.80	2.24	7.87	3.28	2.29	3.01	9.90	4.28	2.71	3.65	10.91	4.78	2.90	3.94	11.91	5.28	3.05	4.17
2	5.67	2.02	1.60	2.00	7.71	2.93	2.01	2.70	9.73	3.84	2.35	3.25	10.74	4.30	2.51	3.50	11.74	4.76	2.65	3.72
3	5.47	1.76	1.40	1.76	7.49	2.59	1.76	2.30	9.48	3.41	2.04	2.88	10.48	3.83	2.17	3.10	11.47	4.24	2.28	3.29
4	5.21	1.51	1.21	1.51	7.20	2.25	1.53	2.10	9.16	2.99	1.77	2.54	10.14	3.36	1.87	2.73	11.11	3.73	1.96	2.90
5	4.90	1.27	1.04	-	6.84	1.92	1.32	1.82	8.75	2.58	1.52	2.22	9.71	2.91	1.61	2.39	10.65	3.24	1.69	2.53
6	4.53	1.03	0.87	-	6.41	1.61	1.12	1.54	8.27	2.19	1.31	1.91	9.19	2.47	1.38	2.06	10.10	2.76	1.44	2.19
7	4.09	0.81	0.71	-	5.91	1.31	0.95	1.28	7.70	1.81	1.11	1.62	8.58	2.06	1.17	1.76	9.46	2.31	1.23	1.88
8	3.59	0.60	0.56	-	5.34	1.02	0.78	1.02	7.04	1.45	0.93	1.34	7.88	1.66	0.99	1.47	8.71	1.87	1.04	1.58
9	2.99	0.40	0.39	-	4.68	0.76	0.62	-	6.29	1.11	0.76	1.07	7.08	1.29	0.81	1.19	7.87	1.47	0.86	1.30
10	1.24	0.22	0.21	-	3.91	0.51	0.46	-	5.44	0.80	0.60	0.80	6.18	0.95	0.65	0.92	6.91	1.10	0.69	1.02

P	R7				R7.5				R10				R15				R20			
	A	B	B1	B2	A	B	B1	B2	A	B	B1	B2	A	B	B1	B2	A	B	B1	B2
1	13.93	6.28	3.41	4.69	14.93	6.78	3.55	4.90	19.95	9.28	4.27	5.94	29.97	14.28	5.47	7.64	39.97	19.28	6.36	8.94
2	13.75	5.67	2.92	4.15	14.75	6.13	3.04	4.34	19.75	8.41	3.57	5.18	29.72	12.97	4.37	6.45	39.70	17.54	5.03	7.50
3	13.46	5.07	2.49	3.65	14.45	5.48	2.59	3.81	19.39	7.55	2.98	4.49	29.26	11.68	3.57	5.51	39.11	15.81	3.98	6.25
4	13.06	4.48	2.13	3.20	14.03	4.85	2.20	3.34	18.88	6.70	2.51	3.90	28.56	10.40	2.93	4.70	38.23	14.11	3.21	5.25
5	12.55	3.90	1.82	2.79	13.50	4.23	1.88	2.91	18.22	5.87	2.12	3.38	27.63	9.16	2.43	4.00	37.04	12.45	2.62	4.42
6	11.93	3.34	1.56	2.42	12.85	3.63	1.61	2.52	17.40	5.07	1.80	2.92	26.49	7.96	2.03	3.43	35.56	10.85	2.17	3.75
7	11.21	2.81	1.33	2.08	12.08	3.06	1.37	2.17	16.44	4.31	1.52	2.51	25.13	6.81	1.71	2.93	33.80	9.31	1.82	3.18
8	10.38	2.30	1.12	1.77	11.21	2.51	1.16	1.84	15.33	3.58	1.29	2.14	23.56	5.71	1.45	2.50	31.76	7.84	1.53	2.71
9	9.43	1.83	0.94	1.47	10.21	2.01	0.97	1.54	14.08	2.90	1.09	1.81	21.78	4.68	1.22	2.12	29.46	6.47	1.29	2.30
10	8.37	1.39	0.77	1.18	9.09	1.54	0.80	1.25	12.68	2.27	0.90	1.50	19.80	3.73	1.02	1.78	26.90	5.20	1.08	1.93

Tab. 7.1 Lance distance and depth chart

## 8 Operating controls and display elements

### 8.1 Overview and position



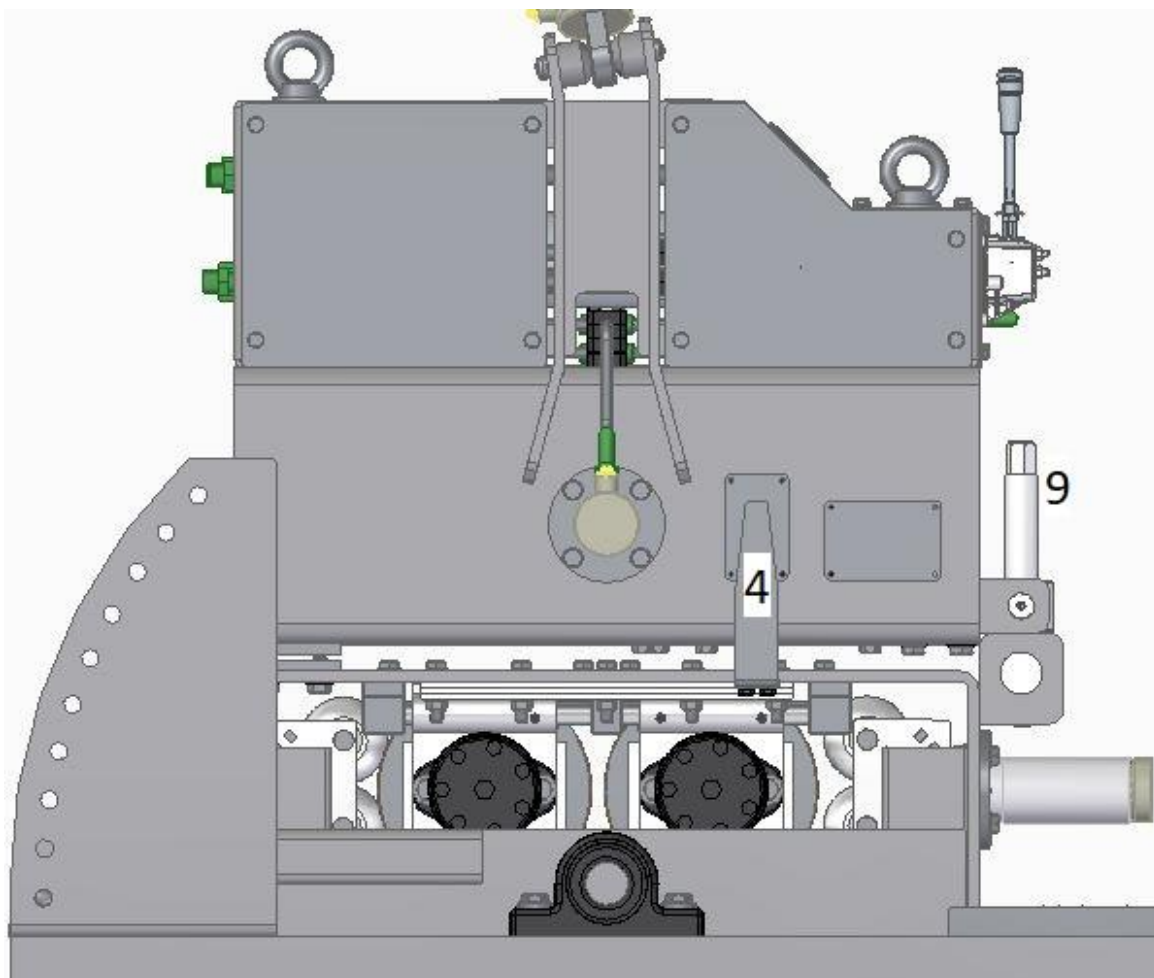
*Fig. 8.1 Position of operating controls and display elements, front view*

**Display elements:**

1. Wheel clamp pressure
2. Auxiliary cylinder pressure left
3. Motor pressure

**Control elements:**

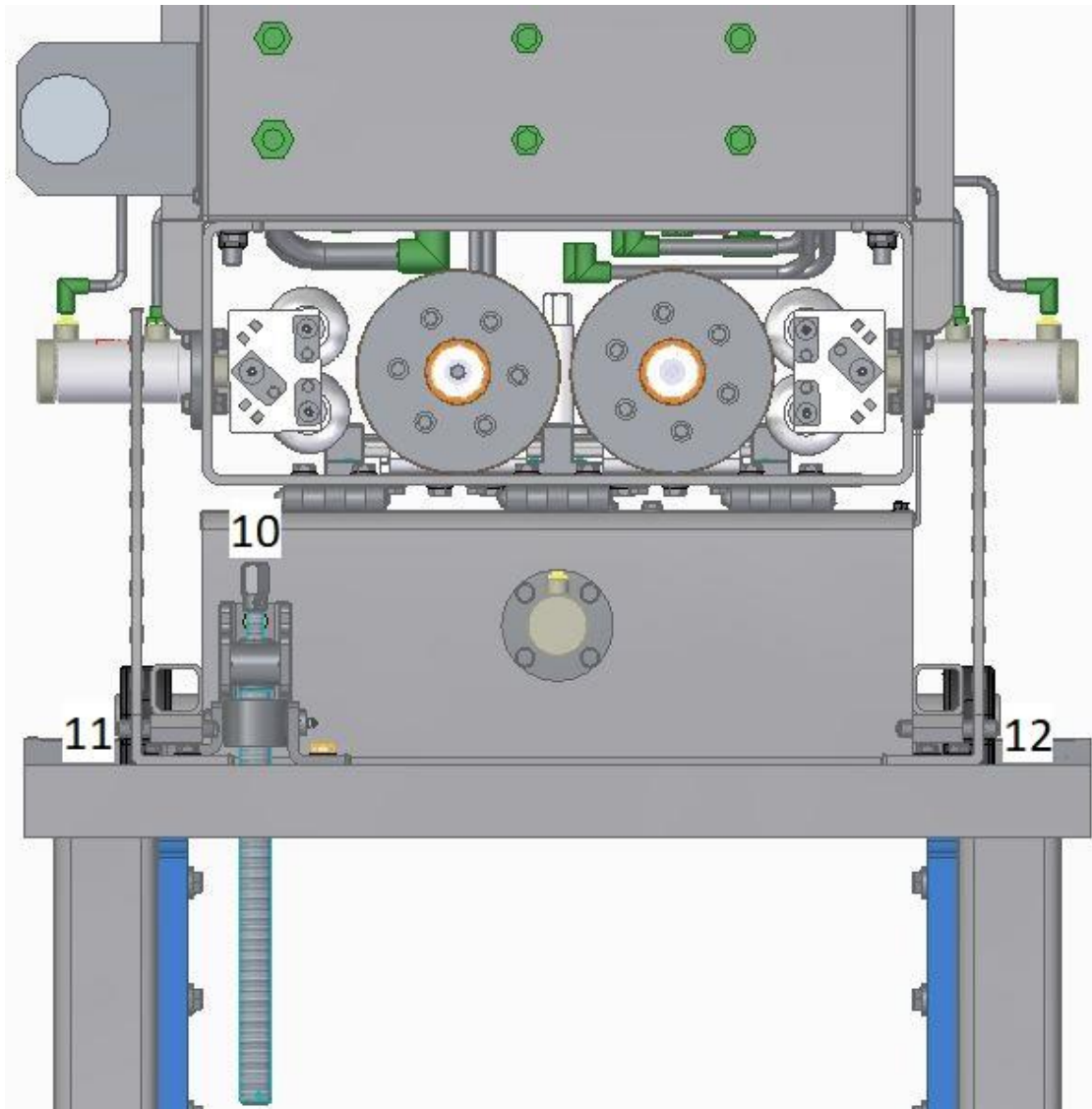
5. Wheel clamp
6. Auxiliary cylinder left
7. Auxiliary cylinder right
8. Motors
9. Radii adjustment spindle



*Fig. 8.2 Position of operating controls and display elements, left view*

Display elements:  
4. Radii adjustment indicator

Control elements:  
9. Radii adjustment spindle



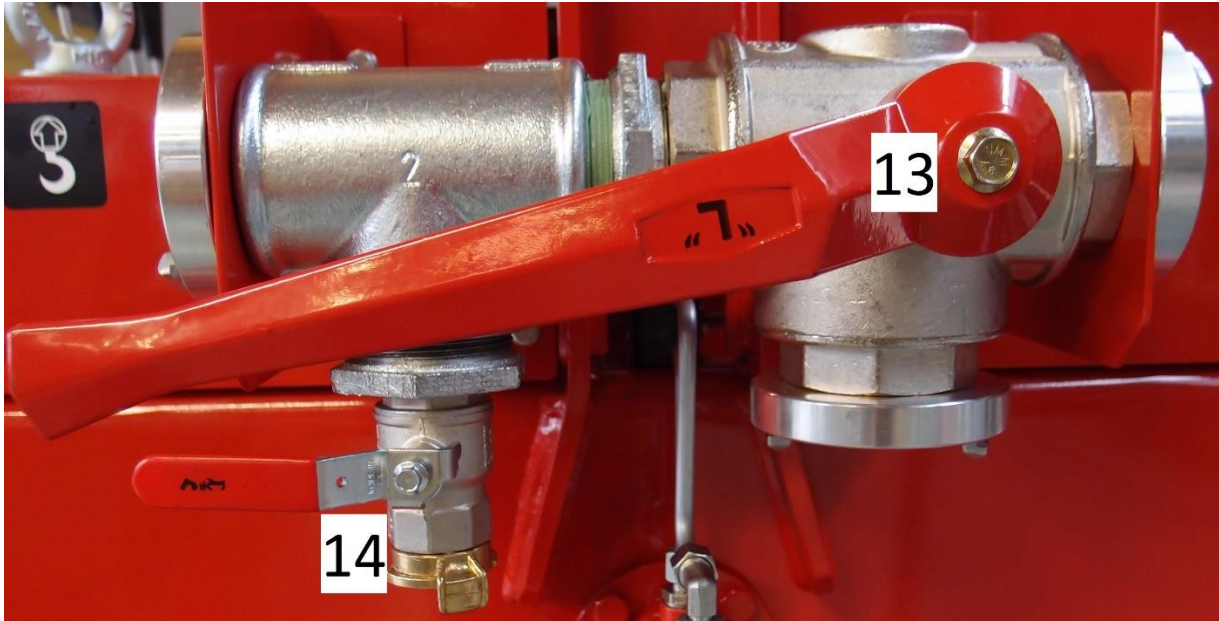
*Fig. 8.3 Position of operating controls and display elements, back view*

Control elements:

10. Angle adjustment spindle

11. Angle adjustment locking pin 1

12. Angle adjustment locking pin 2



*Fig. 8.4 Position of operating controls and display elements, right view*

Control elements:

13. Water flow valve

14. Water drain valve

## 8.2 Design and Function

The list below is a detailed description of all the display and control elements found in chapter 8.1. The numbers correspond with the numbers in 8.1.

1. A pressure-gauge that indicates the wheel clamp pressure on a scale of 0 - 160 bar.
2. A pressure-gauge that indicates the pressure of the left auxiliary cylinder on a scale of 0 - 160 bar.
3. A pressure-gauge that indicates the work pressure of the motors on a scale of 0 - 160 bar.
4. A plate and pointer indicating the angle adjusted by control element 9, on a scale of 0-50. 10 allows for a radius of 10, 15 allows for a radius of 7.5 and 25 allows for a radius of 5.
5. A lever used to operate the wheel clamps. Push forward to tighten the clamps, pull back to loosen the clamps.
6. A lever used to operate the left auxiliary cylinder. Push forward for the cylinder to go down, pull back for the cylinder to go up.
7. A lever used to operate the right auxiliary cylinder. Push forward for the cylinder to go down, pull back for the cylinder to go up.
8. A lever used to operate the motors that move the lance. Push forward for the lance to go down, pull back for the lance to go up.
9. A spindle used to adjust the Hydrolans® to accommodate for a different radius lance. Rotate the spindle clockwise to increase the angle, allowing for a smaller radius lance. Rotate the spindle counter-clockwise to decrease the angle, allowing for a larger radius lance. A 24mm wrench is required to adjust the spindle.
10. A spindle used to adjust the angle at which the lance is pressed into the ground. Rotate the spindle clockwise to increase the angle, reducing the maximum depth and distance reached by the lance. Rotate the spindle counter-clockwise to decrease the angle, increasing the depth and distance reached by the lance. A 24 mm wrench is required to adjust the spindle.
- 11 and 12. A pin used to lock the angle at which the lance is pressed into the ground. Lock both pins before operating the Hydrolans®.
13. A lever used to control the direction of the water flow. When the lever points to the left the water will flow through the lance,



when the lever points down the water will flow back to the water pump.

14. A lever used to drain leftover water from the system. When the lever points up the drain is open, when the lever points to the left the drain is closed.

## 9 Operating the machine

### 9.1 Modes

The Hydrolans® has two operating modes:

- Mode 1:** Press mode  
Used for pressing the lance into the ground. Water is being pumped through the lance to soften the ground.
- Mode 2:** Pull mode  
Used for pulling the lance, and any infrastructure attached to the lance, back through the ground. If the lance gets stuck, the auxiliary cylinders can be used to pull the lance out of the ground.

The Hydrolans® itself does not distinguish between the two operating modes. Therefore there are no settings that need to be changed to switch between the modes.

### 9.2 Switching the machine on

The Hydrolans® does not have an on or off switch. To operate the Hydrolans®, turn on the hydraulic and water source.



#### **WARNING!**

#### **High pressure**

Potential system damage and liquids leaking under high pressure

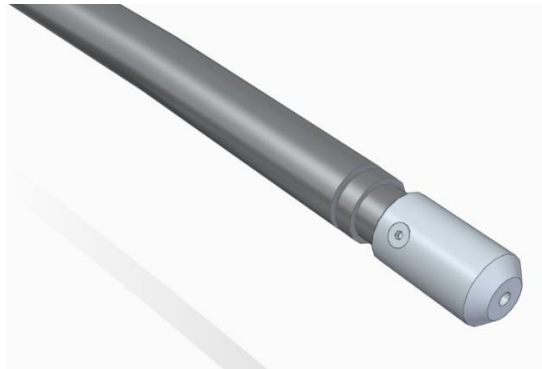
- Check if the Hydrolans®, the Hydraulic source, the water source and the hoses have been properly maintained.
  - Check if the Hydrolans® has been properly installed and set up.
  - Check before and after turning on the Hydraulic source if the feed pressure and backpressure do not exceed the technical specifications of the Hydrolans®.
-

## 9.3 Operating the machine

### Pressing

#### Water nozzle

The first lance in the machines needs to be fitted with the water nozzle, this is done by sliding the water nozzle over the lance and fully tighten the supplied bolt with an hex key. This is shown in the picture below.



*Figure 9.1 Water nozzle attached to lance*

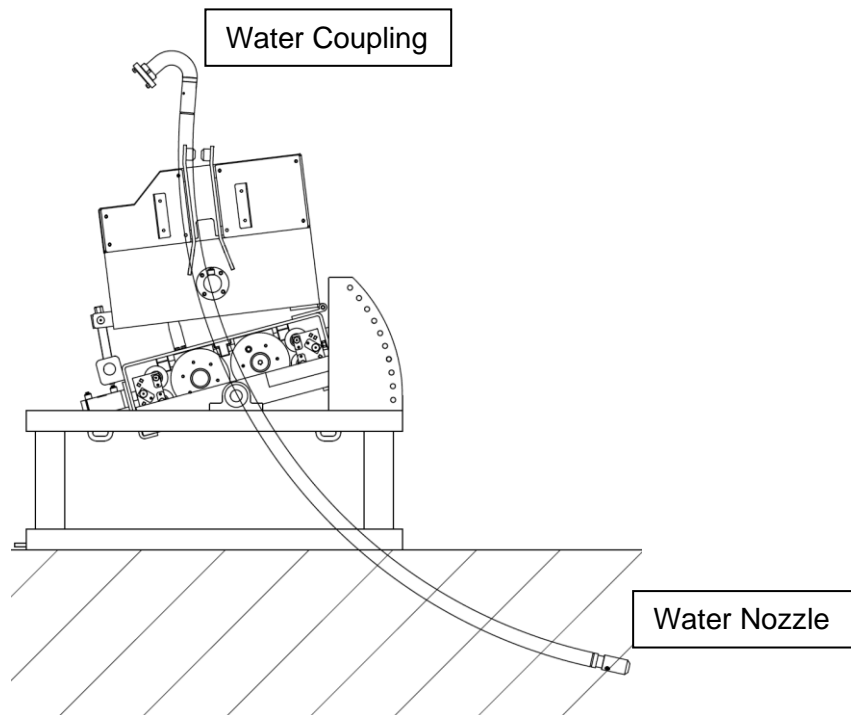
#### Water coupling

To supply the lance with water, the water coupling needs to be fitted to the lance. This is done by sliding the water coupling in the lance and fully tighten the supplied bolt with an hex key. This is shown in de picture below.



*Figure 9.2 Water coupling attached to lance*

When pressing the lance into the ground the first lance is fitted with the water nozzle and the water coupling. This is schematically shown in the picture below.



*Figure 9.3 Pushing the lance into ground*

When the lance is inserted and the water hoses are connected, handle 5 "clamp" (shown in chapter 8) can be pushed forwards to clamp the lance with the desired force. The clamping force is shown in dial 1 (shown in chapter 8).

Push handle 8 "wheels" (shown in chapter 8) forwards, this will push the lance into the ground.

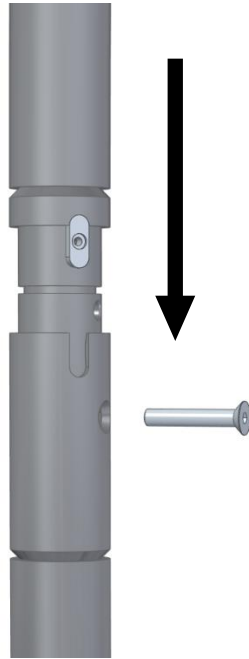
When the lance is pushed into the ground, lever 13 (shown in chapter 8) needs be rotated clockwise. This causes water to flow through the lance.

When the lance is just +/- 20 cm above the machine, rotate lever 13 counter clockwise. This stops water from flowing through the lance.

Rotate lever 14 (shown in chapter 8) in the vertical position, this will drain the hose that is attached to the water coupling.

Remove the water coupling with an allen key, an attach it to a new lance.

The new lance with the water coupling attached can be slide into the lance in the machine. When the lance is slid in, fully tighten the supplied bolt with an allen key.



*Figure 9.4 Lance coupling mechanism*

Rotate lever 14 in the horizontal position, this will stop draining the hose that is attached to the water coupling.

Rotate lever 13 (shown in chapter 8) clockwise. This causes water to flow through the lance.

Push handle 8 "wheels" (shown in chapter 8) forwards, this will push the lance into the ground.

Repeat above steps until the lance comes out of the ground at the desired position.

## Pulling

When the first lance completes the sinking, the lance sticks out of the ground at the desired position. The water nozzle needs to be removed and the pull adapter can be connected to the lance. This is shown in the picture below.



Figure 9.5 Pull adapter attached to lance

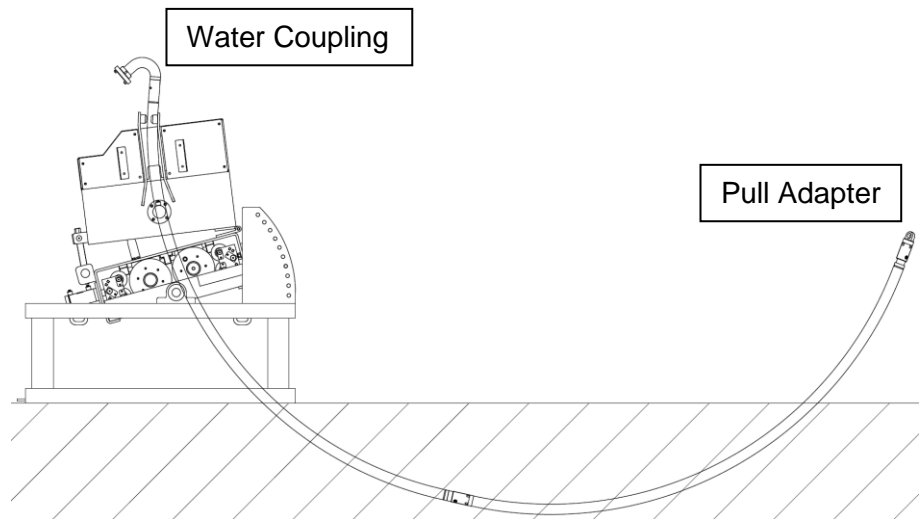


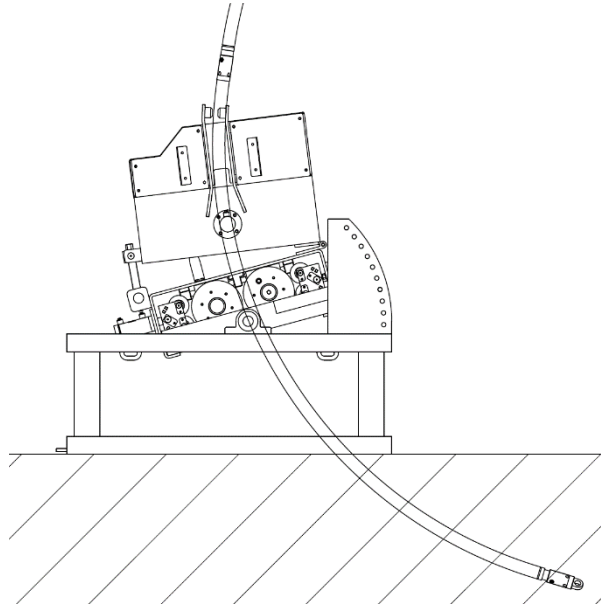
Figure 9.6 Pulling the lance backwards

When the pull adapter is fitted, the desired tube can be attached to the pull adapter.

Pull handle 8 "wheels" (shown in chapter 8) backwards, this will pull the lance with the attached tube into the ground.

When the lance is in the ground rotate lever 13 (shown in chapter 8) clockwise. This causes water to flow through the lance.

Pull the handle 8 until the lance coupling connection just stick out of the machine, shown in figure below



*Figure 9.7 Pulling the lance backwards*

Rotate lever 13 counter clockwise. This stops water from flowing through the lance.

Rotate lever 14 in the vertical position, this will drain the hose.

Unscrew the allen bolt and remove the lance.

Disconnect the water coupling from the lance and mount it to the lance that is located in the machine.

Rotate lever 14 in the horizontal position, this will stop draining the hose.

Rotate lever 13 counter clockwise. This causes water flowing through the lance.

Pull handle 8 "wheels" (shown in chapter 8) backwards, this will pull the lance backwards

Repeat above steps until the tube comes from the ground under the machine.

Disconnect the tube from the pull adapter and remove the last lance from the machine.

## 9.4 Switching the machine off

The Hydrolans® does not have an on or off switch. To disable the Hydrolans®, turn off the hydraulic source and the water source.



## 10 Help in case of faults

If problems occur with the Hydrolans®, please check if all steps have been performed correctly, as described in this manual. If this does not resolve the issue, please contact your distributor.

# 11 Update and monitoring tasks for operators

## 11.1 General notes

WARNING: When carrying out any sort of maintenance it is very important that the hydraulic source is switched off.



### CAUTION!

#### High pressure

Potential system damage and liquids leaking under high pressure

- Check if hydraulic source is switched off
- Use Personal Protective Equipment as stated in 2.8

## 11.2 Update and monitoring schedule

Interval	Update and monitoring activities	Remarks
Before use	Machine check	
Before use	Pressure test	

Tab. 11.1 Update and monitoring schedule

## 11.3 Performing update and monitoring tasks

**Machine check** Check whether any components are deformed, or any welding seams are cracked and whether there is too much play on any of the parts. If anything is detected, these items should be repaired or replaced before proceeding any further.

**Pressure test** Check if all the operating pressures are according the specifications before use of the Hydrolans®.

## 12 Maintenance tasks for technical personnel

### 12.1 General notes

WARNING: When carrying out any sort of maintenance it is very important that the hydraulic source is switched off.



#### CAUTION!

#### High pressure

Potential system damage and liquids leaking under high pressure.

- Check if hydraulic source is switched off
- Use Personal Protective Equipment as stated in 2.8

### 12.2 Maintenance schedule

Interval	Maintenance activity	Remarks
Daily	Machine check	
Daily	Cleaning	
Every 10 hours	Lubricate grease nipples	
Weekly, or every 50 hours	Check hydraulic hoses for damage	
Yearly	Technical safety check	

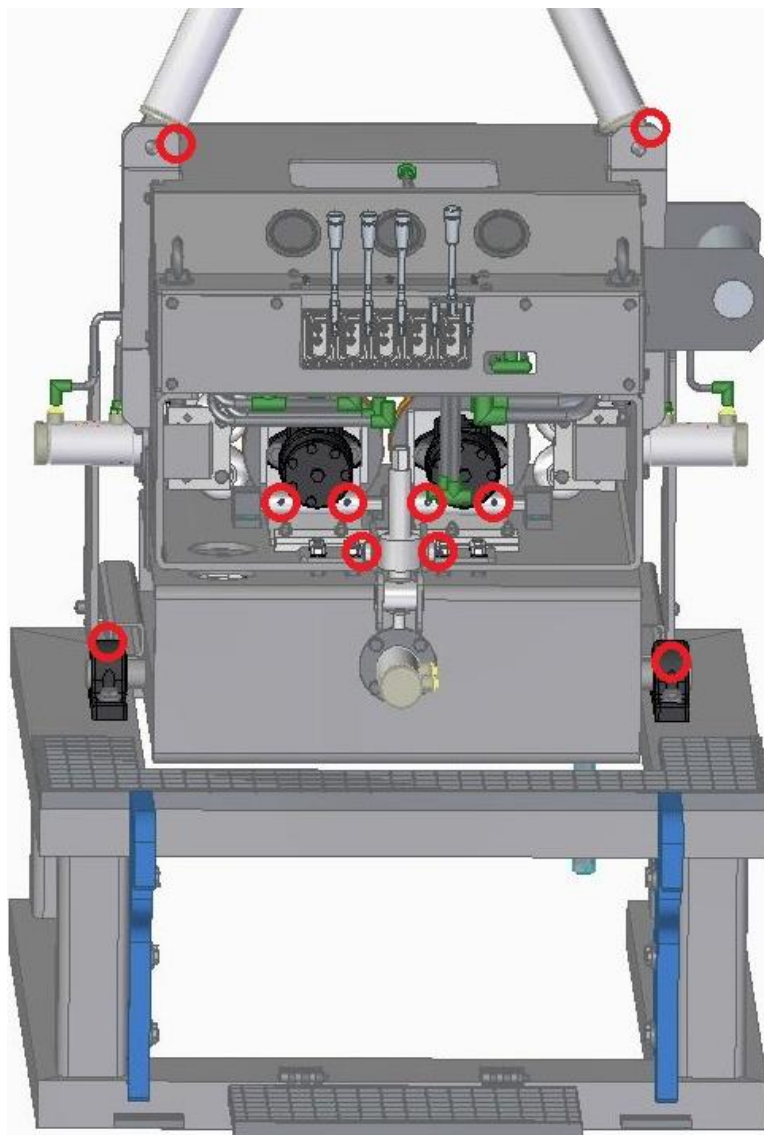
Tab. 12.1 Maintenance schedule

## 12.3 Performing maintenance tasks

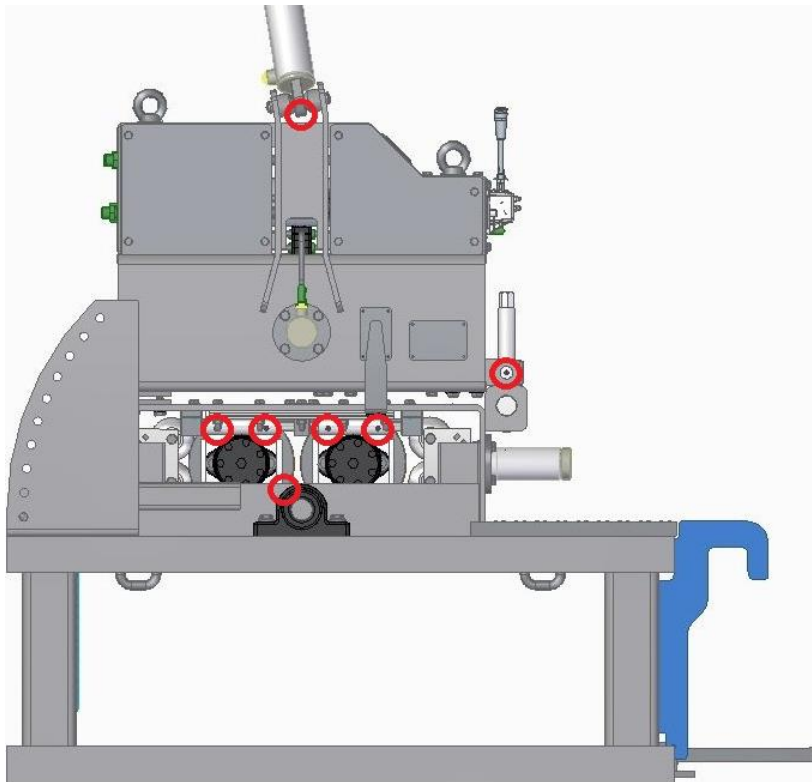
Only trained personnel may perform repair work on the machine.

**Routine maintenance** Check whether any components are deformed, or any welding seams are cracked and whether there is too much play on any of the parts. If anything is detected, these items should be repaired or replaced before proceeding any further. The Hydrolans® should be thoroughly cleaned after every use.

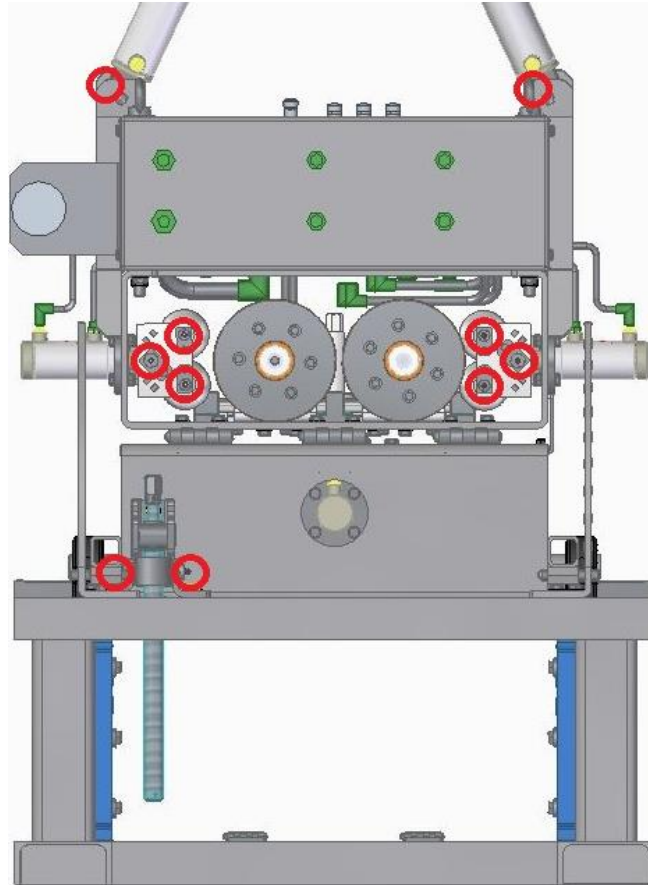
**Lubricate grease nipples** The Hydrolans® is designed to be as maintenance-free as possible. The bearings are maintenance-free where possible. However, the following points have to be lubricated. These are easily accessible and should be lubricated at the frequencies shown in the maintenance schedule. There are 28 grease nipples in total.



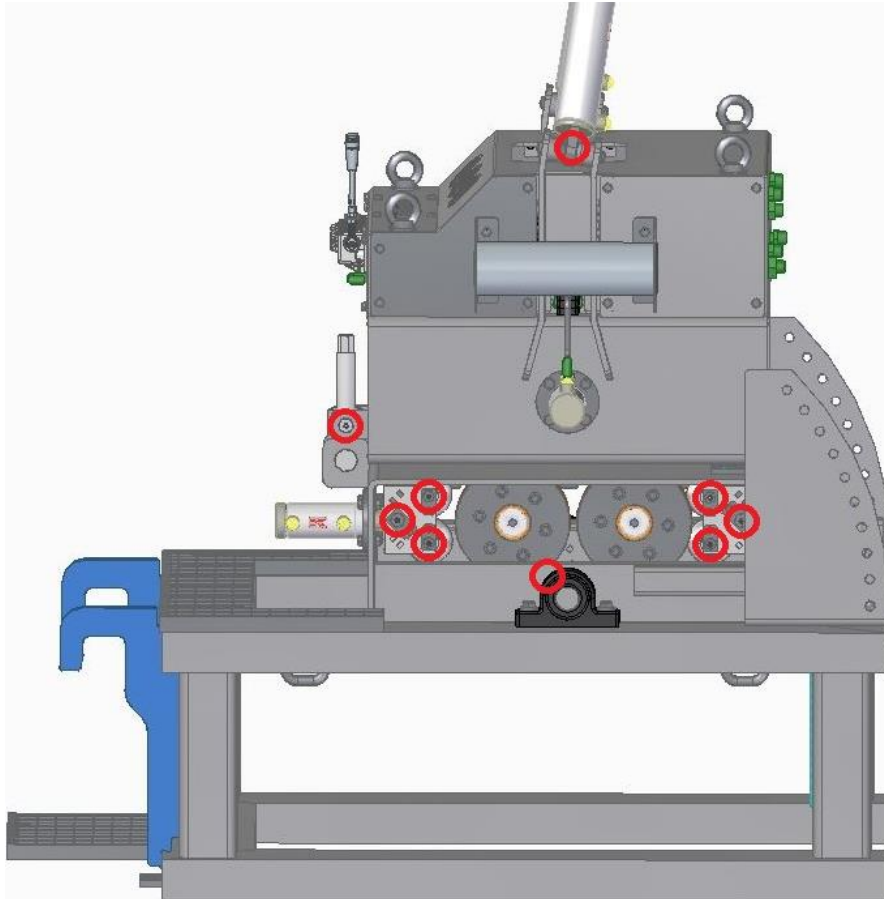
*Fig. 12.1 Position of the grease nipples, front view*



*Fig. 12.2 Position of the grease nipples, left view*



*Fig. 12.3 Position of the grease nipples, back view*



*Fig. 12.4 Position of the grease nipples, right view*

**Check hydraulic hoses for damage**

Check all hydraulic hoses and connections for any deformation, dents, cracks, leakage, and fasteners. Hydraulic hoses should only be replaced by a professional.

## 12.4 Checking the safety devices

**Check safety pressure relief valve**

The hydraulic safety pressure relief valve must be checked for proper function every year. This check should be performed by a professional.

The pressure relieve function should be tested at +10 bar of the stated max. operating pressure.

**Check safety pin angle adjustment**

Check whether the safety pins are deformed, cracked or there is too much play on the application. If anything is detected, these items should be replaced before proceeding any further.

## 13 Technical data

### 13.1 General specifications

Designation		Value	Unit
Mass (calculated)		650	kg
Max. operating temperature		60	°C
Max. operating pressure		110	bar
Max. lance speed		20	m/min
Max. lance force	Press force	5	kN
	Pull force	20	kN
Hydraulic source	Volume flow	56	L/min
	Max. pressure	110	bar
	Max. backpressure static	12	bar
	Max. backpressure dynamic	20	bar
Water source	Volume flow	350	L/min
	Pressure	6	bar

Tab. 13.1 Technical data



## 13.2 General dimensions

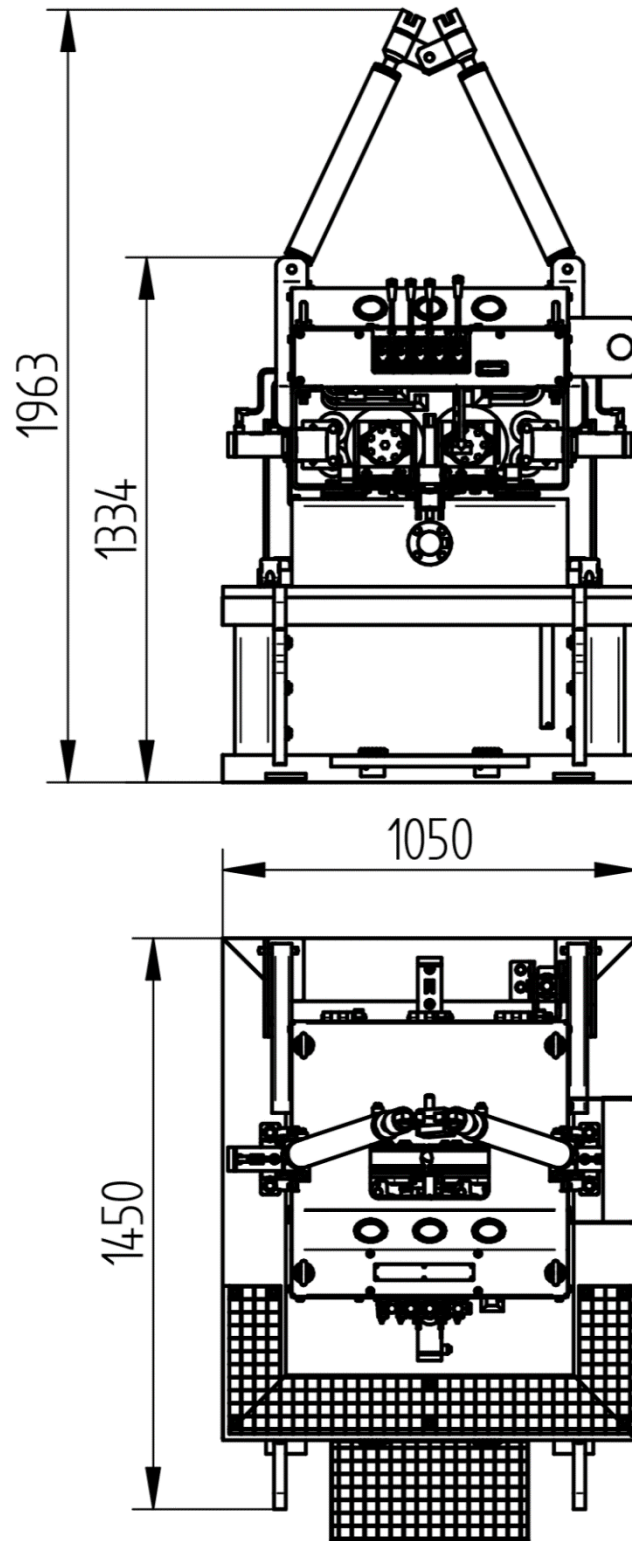


Fig. 13.1 Dimensions in mm

## 14 Appendix

### 14.1 Service address

**Distributor:** Ditch Witch Benelux

**PO box:** Molensteyn 42  
3454 PT, De Meern  
The Netherlands

**Phone:** +31 306394615  
**Email:** [info@ditchwitch.nl](mailto:info@ditchwitch.nl)  
**Website:** <http://www.ditchwitch.nl/>

### 14.2 Spare and wear parts

Please contact your distributor for a complete list of the spare and wear parts.

### 14.3 Auxiliary and operating supplies

Please contact your distributor for a complete list of auxiliary and operation supplies.





PO box:  
Zuidergracht 13  
3763 LS, Soest  
The Netherlands

Phone: +31 35 601 47 87  
Fax: +31 35 602 30 64  
e-mail: [info@hydrotest.nl](mailto:info@hydrotest.nl)  
Website: <http://www.hydrotest.nl/>

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