PERROT

ENROULEUR

PEROMAT EXPERT

User's Manual
Maintenance and Guarantee

This manual is an integral part of the machine and thus be handed over to the new owner. Prior to any operation, the operator shall read carefully and comply strictly with the data and instructions provided in this manual.

LINDSAY EUROPE

PERROT IRRIGATION

72 300 La Chapelle d'Aligné – France **Tel +33 (0)2 4348 0202**
E-Mail : info@lindsay-europe.com **Fax +33 (0)2 4348 0200**

DECLARATION OF CE COMPLIANCE

LINDAY EUROPE L'Epinglerie **72 300 La Chapelle d'Aligné – France ,**

Hereby declares that the product as stated hereafter :

Hard Hose Traveler PEROMATEXPERT-TR Series : **10,20,30,40,50, 60,70,80**

As above declared complies with the Machinery Directive as amended 2006/42/CE dd. May 17th, 2006 and with the transposing national laws.

In order to implement the safety provisions and checkings for the design and construction of irrigation hard hose travelers as specified in the European guidelines, the NF EN 908 standard of March, 1999 related to the below stated French standards has been taken into account :

- NF EN 292-1 (classification index E 09-001-1)
- NF EN 292-2 (classification index E 09-001-2)
- NF EN 294 (classification index E 09-010)
- NF EN 953 (classification index E 09-060)
- NF EN 1553 (classification indexU 02-001)

Made out in La Chapelle D'Aligné, on May 15th, 2010

Ramon Jaen

INTRODUCTION

DEAR CUSTOMER,

LINDSAY EUROPE and its technicians have made their best efforts to provide you with a top quality and seamless product. Help maintain this level of quality by a careful maintenance. To ensure the highest performance of the hose traveler and the long life of its components, **IT IS ESSENTIAL TO FOLLOW STRICTLY** the instructions for use and maintenance specified in this manual.
Not all the equipment described in this manual is series mounted on the hose traveller.
In its ongoing effort to enhance its products, **LINDSAY EUROPE** may bring some technical modifications during the production ; therefore the technical specifications and features of the hose traveler may be subject to changes without previous notice.

To ensure a safe use both for the operator and anyone who might access to the machine, the operator itself shall read carefully this manual very carefull and pay extreme attention to the safety instructions.

Provided that the main technical and safety features remain unchanged, the manufacturer reserves the right for the purpose of a permanent development of its production to modify its machines as it deems it appropriate without incurring any penalty therefrom.

This symbol corresponds to a safety warning and shows that instructions should be complied with to prevent any physical damage or injury.

Not complying with the instructions as stated in the manual can lead to serious injuries and even to fatal consequences.

General description :

The hose reels are irrigation system with drum and soft hose. They are called “Hose reel” because of their principle of operation. Sure enough, gun carriage it is placed at the one of the ends of the flexible device and the other end is fixed on the drum on which it is rolled up. Thus, the irrigation is carried out little by little, on a tape, pulling the gun carriage. The hose reel is a motorized machine available in several sizes; the length and the flexible diameter of pipe can respectively vary. The hose reel is consisted of the following elements: the drum, the frame, the mechanism of rolling up, the gun and gun carriage, the

soft hose device out of polyethylene, a system of regulation rate of advance, and a system of safety of race end.

TERMS OF GUARANTEE

LYNDSAY EUROPE hard hose travelers are guaranteed against any construction or material defect for a 24 months' period after the date of delivery for the Lindsay parts and for a 12 months' period for the parts bought (gearbox, valves, hydraulic accessories...)

The polyethylene pipe is guaranteed for two irrigation seasons.

This guarantee covers :

- The repair or exchange of parts recognized as defective by our approved technicians or agents.

- **The guarantee is granted to the buyer provided that :**

  - The unit has been repaired by the dealer from whom the buyer has purchased its equipment.
  - All the instructions stated in the start-up and maintenance note of the machine have been strictly followed.
  - The genuine parts have not been dismounted or replaced by other ones and the machine has not been modified or transformed.
  - The certificate of warranty is duly validated by the resaler and returned to LINDSAY EUROPE within 15 days following the delivery to the final customer.

The guarantee does not cover obviously :

- Any failure due to a careless or improper use of the equipment or to a lack of maintenance.
- The change or repair resulting from the regular maintenance or the normal wear of parts.
- The costs arising from the stoppage of the equipment and consequently any claim for damages for whichever reason.
- The damage due to natural events, e.g. hailstorm, flood.

Any intervention under the guarantee will not lead to its extension.

Any part thecost-free change has been requested shall be returned free of charge.

The statement of defects will not release the buyer from any outstanding payment.

This guarantee is the sole applicable excluding any other oral or written guarantee which might have been granted previously.

CERTIFICATE OF GUARANTEE

LINDSAY EUROPE

PERROT IRRIGATION

72 300 La Chapelle d'Aligné – France **Tel +33 (0)2 4348 0202**
E-Mail : info@lindsay-europe.com **Fax +33 (0)2 4348 0200**

Prior to any claim for guarantee to your dealer, please note the following information :

Seal and signature of the dealer

- Type :
- Registration number :
- Delivery date :

To be entitled to the GUARANTEES as below, please fill in the following coupon and return it to **LYNDSAY EUROPE** 72300 La Chapelle d'Aligné **FRANCE**

LINDSAY EUROPE

Registration number :	**Type :**
Holder :	
Street :	
Zip Code :	**Final delivery date :**
City :	**Country :**

For acceptance of the guarantee

Signature of the purchaser **Seal and signature of the dealer**

MARKING AND IDENTIFICATION

On receipt of the hose traveler, make sure that the registration numbers comply with those stated on the guarantee coupon (Page 7)

For any needed assistance or spare parts, you shall always specify the type, registration number and date of construction.

CONDITIONS OF OPERATION AND LIMITS

- This machine has been designed and constructed for the irrigation of land areas. In the event that the machine is equipped with a thermal or hydraulic motor to pull in the polyethylene hose, the machine can be used for the supply of slurry or waste water. **Any other use is prohibited**.

- It is strictly forbidden to use the machine to transport or tow people or other objects even for short distances. The machine shall be transported to the site by a tractor with appropriate power. There is no braking system on the hose traveller. So you should check the maximum weight to be towed by the tractor (see the towing power in the tractor booklet). The highest travel speed shall not exceed **10 km/ph** to be reduced on sloping or uneven ground to avoid rocking or loss of balance of the machine. The machine is not approved for traffic on public ways.

- No handling, change or repair (other than as allowed to the operator) shall be carried out which may affect the operation of the machine and/or its safety components.

- During the irrigation, the machine when operated makes a noise lower than 70 dB. However it is advisable to wear ear protection devices when you stay near the hose traveler for a long time.

- Before using the machine, the operator shall wear the following protective clothes and items :

GLOVES

SHOES

EAR PROTECTION DEVICES

(machine with thermal motor)

- It is stricly forbidden to use the machine with loose clothes or items such as scarves, ties, etc…

- The machine has been designed and constructed to be used by one operator.

- Before using the machine, make sure that all the protective devices are properly installed.

- Any maintenance and/or repair shall be carried out while the hose traveler is off.

- After any mechanical or cleaning work performed on the hose traveler, check that screws are tightened and protective casings are properly fastened.

- Comply strictly with the recommendations given in the operation and maintenance instructions.

- Before starting the machine, make sure that roads or overhead lines cannot be reached by the water jet.

- While the hose traveler is working and moving, make sure that nobody stays within the range of operation of the machine.

- Be careful with the water jet to your face (machine under pressure)

PRECAUTIONS FOR USE

- **To move the PEROMAT TR :**

  - **The non-return ratchet is in the locking position**
  - **Lock the cart on the pick-up bar**

- **Never unreel totally the polyethylene pipe ; allow keep one turn on the reel (except for first start-up).**

  Whenever the polyethylene pipe gets stuck in a wet ground, release it all over its length by slipping a cord along it in order to avoid excessive pull-off efforts.

- **Never disengage the gearbox when operating except for an emergency stop.**

- **Never use synthetic oil in the hydraulic circuit.**

- **Max. pull-out speed = 2 km/hr. An excessive speed can wear prematurely the brakeband or involve its**

- **Completely lubricate every 8 to 10 days.**

- **Never forget to disengage the gearbox (photo 12 p. 21) and to release/take off the brakeband before pulling out the PET hose. (photo 13 p 22).**

- **The max. travelling speed of the hose traveler is limited to 10 km /hr. This speed must be reduced on a loping or uneven ground.**

- **The tractor must be dimensioned with the weight of the machine. The plate of series mentions the tare weights and full of water of the hose reel. The point of anchoring of the tractor must be able to support a vertical static effort of at least 1000kg.**

- **In the case of a depression stop, to make sure that the water which evacuates hose reel does not compromise the operations to be carried out on the machine by the operator (mud, stability…). If not, to put a pipe so that water runs out with at least 5 meters of the hose reel.**

SAFETY

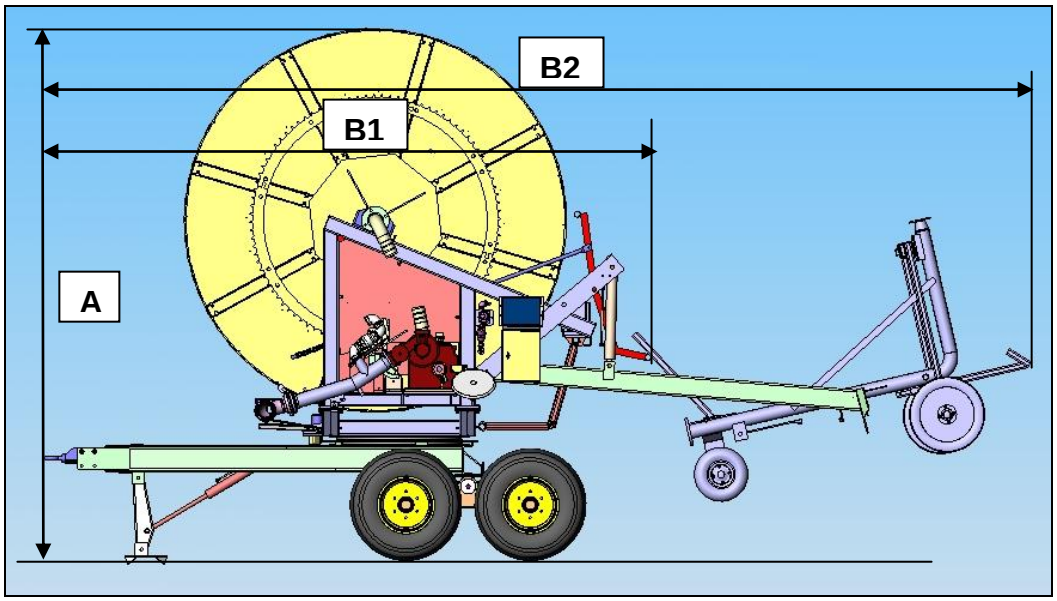
- **Never remove the protective casings during operation.**
- **Make sure that all protective casings are securely fastened with screws.**
- **In the working position :**

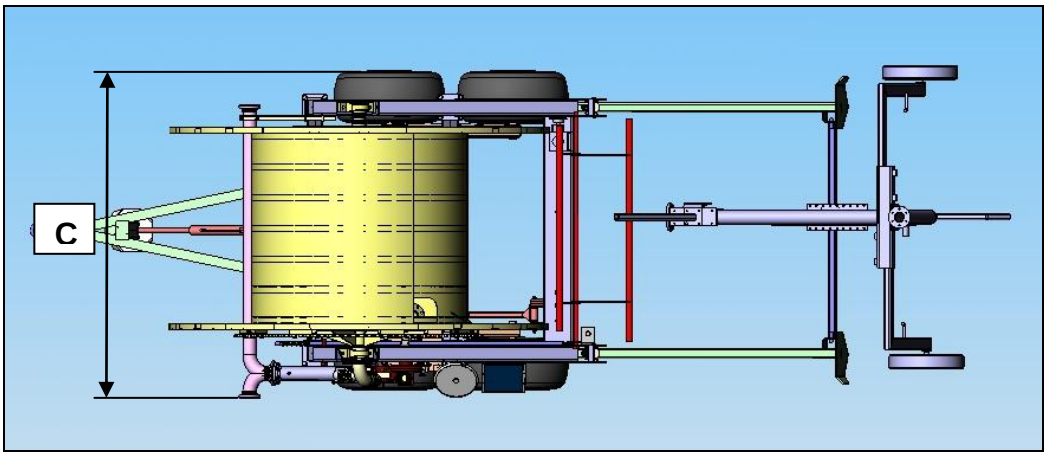
  - **Place the hose traveler on a horizontal and stable ground.**
  - **Anchor securely the stabilizers.**

- **Do not move the hose traveler along slopes over 15 %.**
- **When the cart is lifted, check that it is properly locked on the pick-up bar.**
- **Before moving down the cart, make sure that nobody stays in the close area.**
- **Do not leave the crank on the PTO shaft of the gearbox.**
- **Place the pin on the lever of the fitting of the supply hose and plug.**
- **For maintenance, follow all the relevant safety instructions.**

IN CASE OF EMERGENCY :
TO STOP WINDING-IN :
PUSH THE SAFETY SENSOR
OR
ZEROIZE THE CONTROL OF THE GEARBOX

SIZES AND WEIGHT OF THE MACHINE





	TR10 Ø100-270	**TR20** Ø100-350	**TR25** Ø100-350	**TR30** Ø100-400	**TR35** Ø100-450	**TR40** Ø100-520	**TR45** Ø110-440	**TR50** Ø120-470	**TR60** Ø110-600	**TR80** Ø125-630
A mm	3000	3190	3300	3310	3700	3700	3700	4120	4300	4630
B1 mm	3700	3700	3700	4050	4500	4500	4500	4800	5700	5800
B2 mm	5600	5600	5600	6750	7200	7200	7200	7500	8400	8500
C mm	2300	2300	2300	2300	2450	2450	2500	2500	2620	2840
KG w/o water	2300	2450	2550	2660	3900	3900	4200	5195	5900	7600
KG with water	3850	4450	4550	5000	5600	6515	7100	8900	10000	12000

INSTRUCTIONS FOR LOADING AND UNLOADING THE MACHINE

- Loading and unloading are required whenever the machine has to be moved by trucks or farm trucks.
- To move the machine, use lifting means the power of which is adapted to the weight of the machine, as specified on the rating plate attached to the frame.

⚠ **Flat-web slings shall be designed to bear a minimum load of 5 tons for hose travelers TR10,20,30/40/50.**

Flat-web slings should be fastened to the points indicated on the machine.
(Photo **1**)

Photo 1

If the machine is loaded with wheels up, stabilize the hose traveler by locking the wheels by means of 4 wedges fixed to the platform. (Photo **2**)

Photo 2

INSTRUCTIONS FOR THE ASSEMBLY OF COMPONENTS AS DELIVERED MOUNTED

When the machine is delivered with a cart and/or anchoring stabilizers and/or wheels and/or landing gear, and/or the pick-up bar dismounted, the assembly procedure is as follows :

Lift the machine and raise the wheels by means of the locking screws and nuts (Photos **3 and 3 bis**) .

Photos 3

Lift the landing gear (outrigger) and the dual feed unit (Photos **4 and 4 bis**).

Photo 4

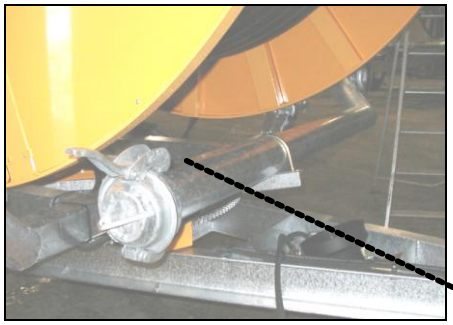


Photo 4 bis

During the assembly of the dual feed unit and whenever you place the plug on the unused water inlet, the locking lever shall always be positioned upwards

After this prior assembly, place again the machine on the ground and raise the anchoring stabilizers and the pick-up bar (Only for TR30/40/50 Photos 5-6).

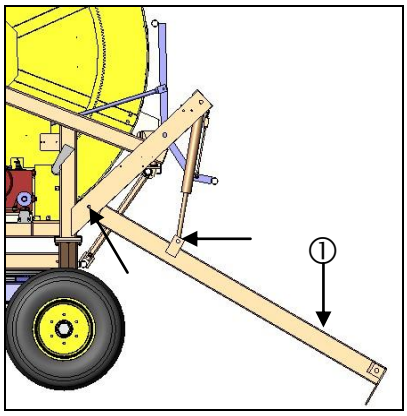


Photo 5

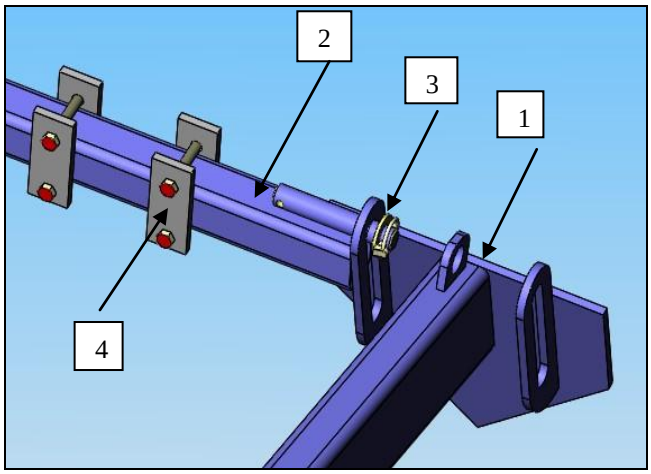


Photo 6

Detail :

- Fasten stabilizers to the movable frame and to the cylinder.
- Lock nylstop nuts and then loosen ¼ turn.
- Mount the pick-up bar between the two stabilizers then place the pins.
- Mount the positioning stops of the cart according to the position of the cart at pulling-in end.

1 – Anchoring stabilizer

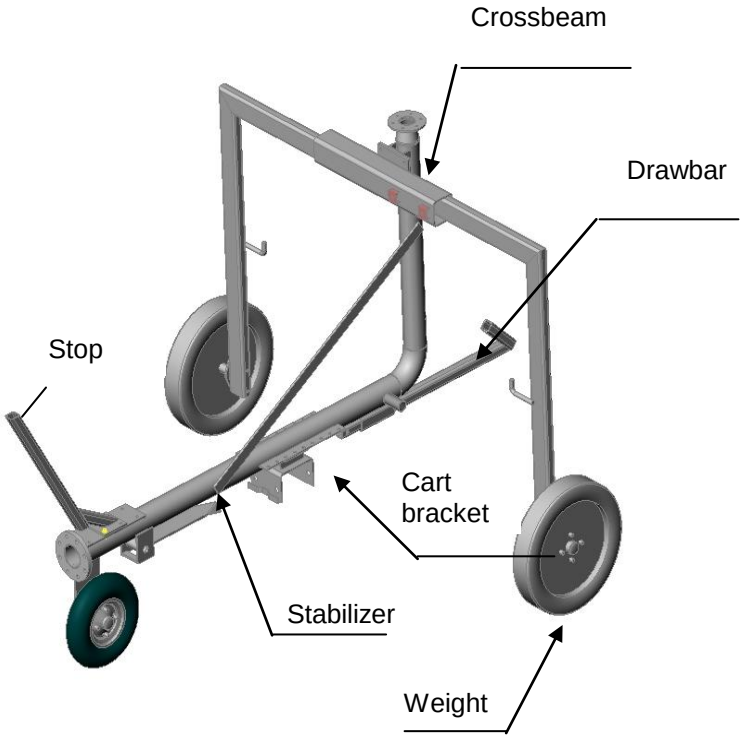
2 – Pick-up bar

3 – Pin

4 – Cart positioning stop

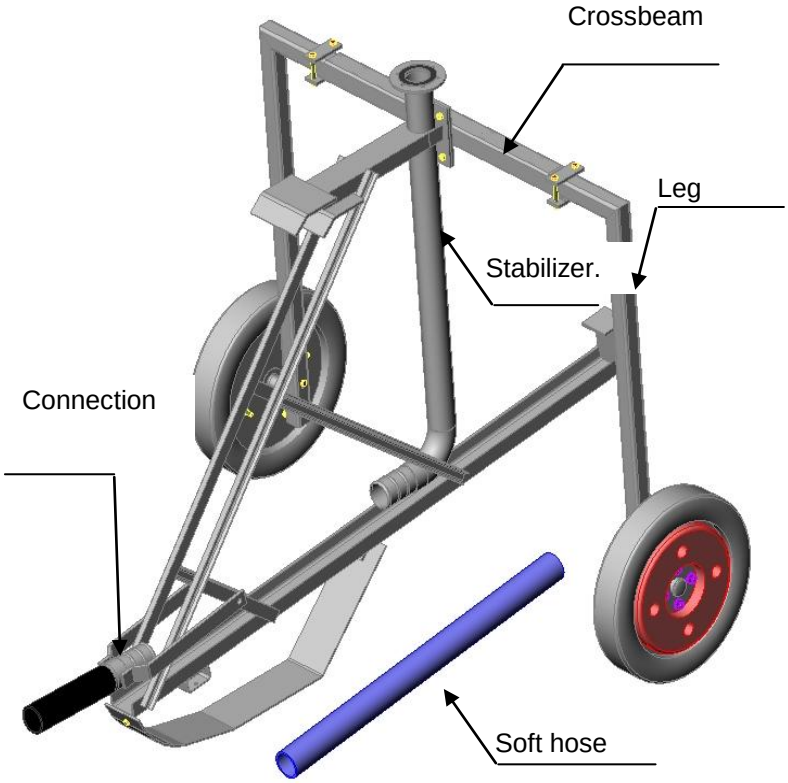
Assemble the cart (Photo 7),

TR30/40/50



Details :

- Attach the cart stabilizer to the polyethylene pipe, screw home the 8 bolts
- Connect the hydraulic feed pipes to the tractor
- Raise the two stabilizers using the hydraulic controls
- Lock the stabilizer onto the pick-up bar with the pins
  - When needed, adjust the cart bracket so that the stabilizer can be locked onto the pick-up bar, then screw home the bolts
- Mount the crossbeam and check that it is at a 90° angle to the stabilizer
- Mount the legs
- Mount the wheels
- Adjust the wheel gauge of the cart; each leg must be equidistant from the stabilizer
- Check that the wheels are parallel to each other
  - Measurements must be taken on the following :
    - the median axis
    - the inside edge of the axles
    - Max. tolerance = +/- 2 cm
- Mount the drawbar
- Mount the drain valve
- Mount the wheel tuning weights
- Mount the stop



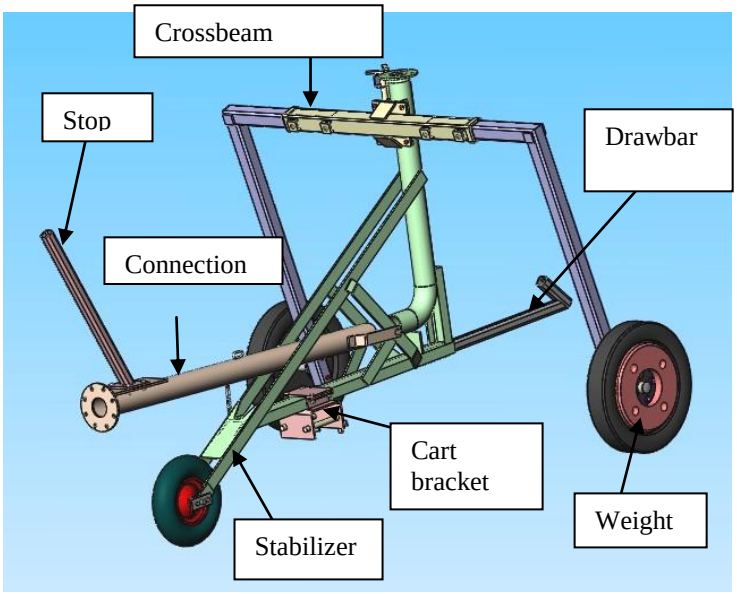
Details :

- Mount the wheels or the skid oh the stabilizer
- Mount the crossbeam and check that it is at a 90° angle to the stabilizer
- Mount the legs and the wheels
- Adjust the wheel gauge of the cart; each leg must be equidistant from the stabilizer
- Check that the wheels are parallel to each other
  - Measurements must be taken on the following :
    - the median axis
    - the inside edge of the axles
    - Max. tolerance = +/- 2 c
- Mount the wheel weights
- Attach the connection to the cart and the flexible hose to the the connection and the cart.

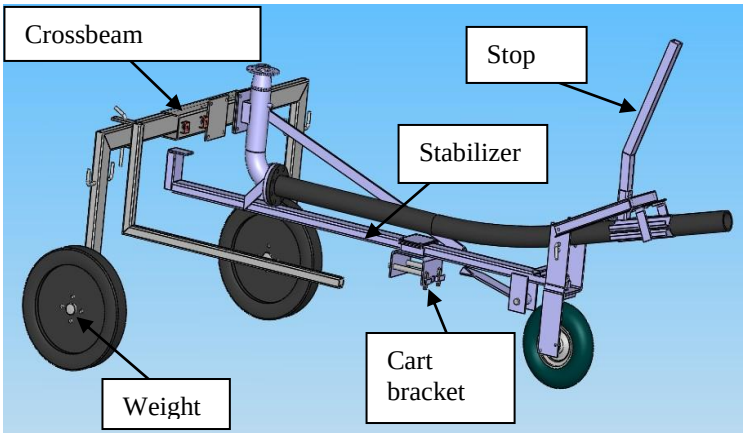
Assemble the articulated cart,

TR30/35/40/45/50/60/80

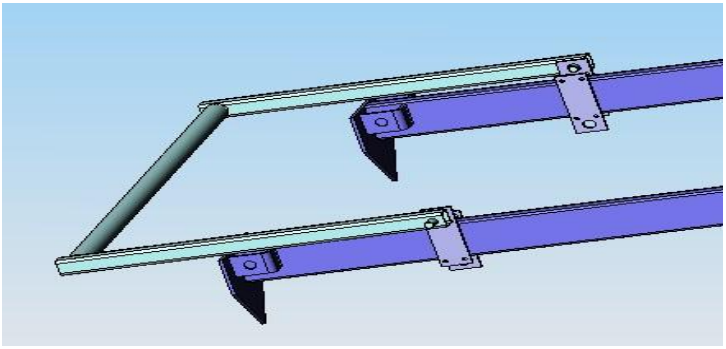
Articulated cart high



Articulated cart Low



Raise the low articulted cart for the **TR30 only**



Details :

- Attach the cart stabilizer to the connection, and then attach the flange of the connection to the flange of the polyethylene pipe with the 8 bolts.
- Connect the hydraulic feed pipes to the tractor
- Raise the two stabilizers using the hydraulic controls
- Lock the stabilizer onto the pick-up bar with the pins
  - When needed, adjust the cart bracket so that the stabilizer can be locked onto the pick-up bar, then screw home the bolts
- Mount the crossbeam and check that it is at a 90° angle to the stabilizer
- Mount the legs
- Mount the wheels
- Adjust the wheel gauge of the cart; each leg must be equidistant from the stabilizer
- each other
  - Measurements must be taken on the following :
    - the median axis
    - the inside edge of the axles
    - Max. tolerance = +/- 2 cm
- Mount the drawbar
- Mount the drain valve
- Mount the wheel tuning weights

Mount the stop

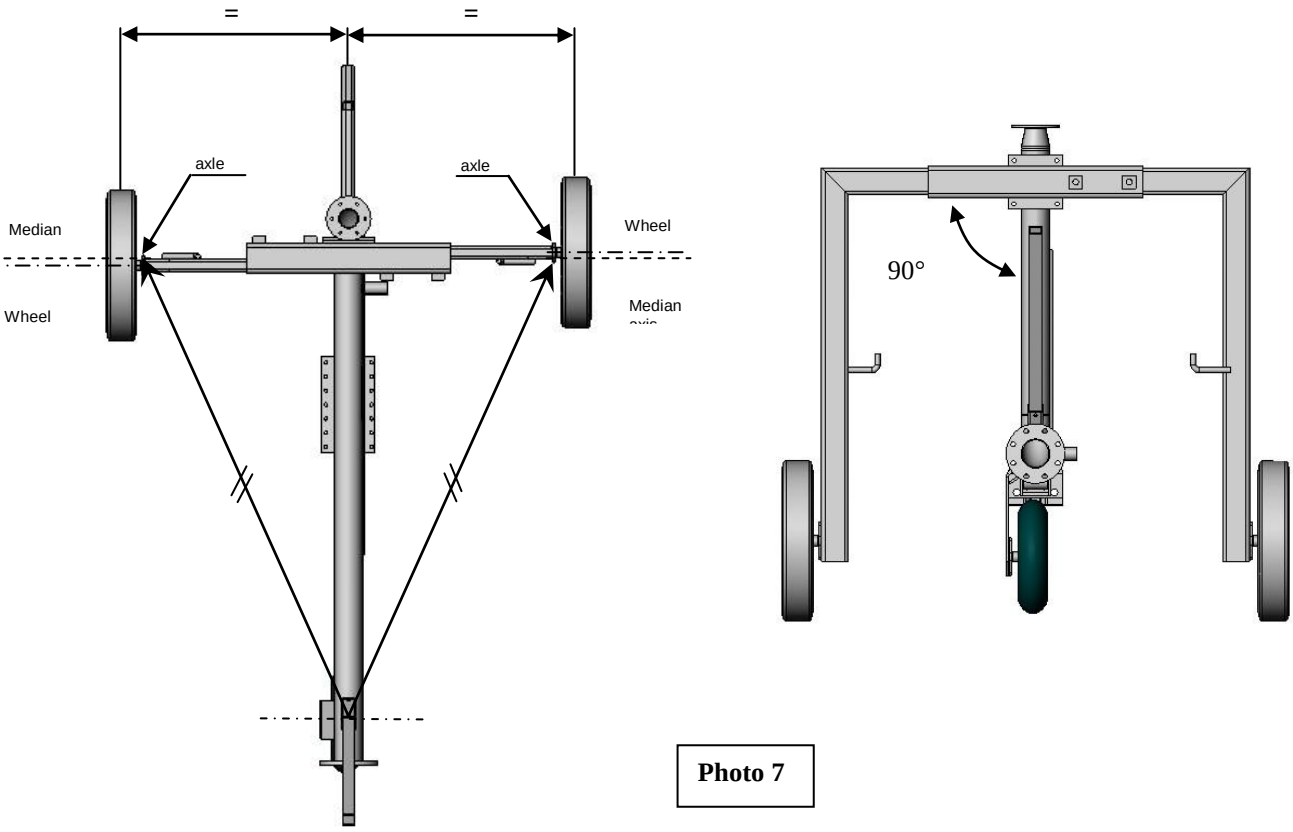


Photo 7

Mount the sprinkler onto the cart (Photo **8**)
Adjust the return stops so that the irrigation angle can be approx. 240°.

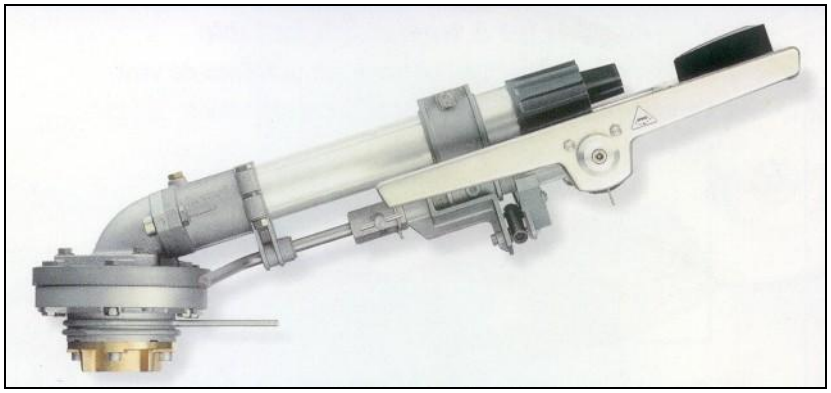
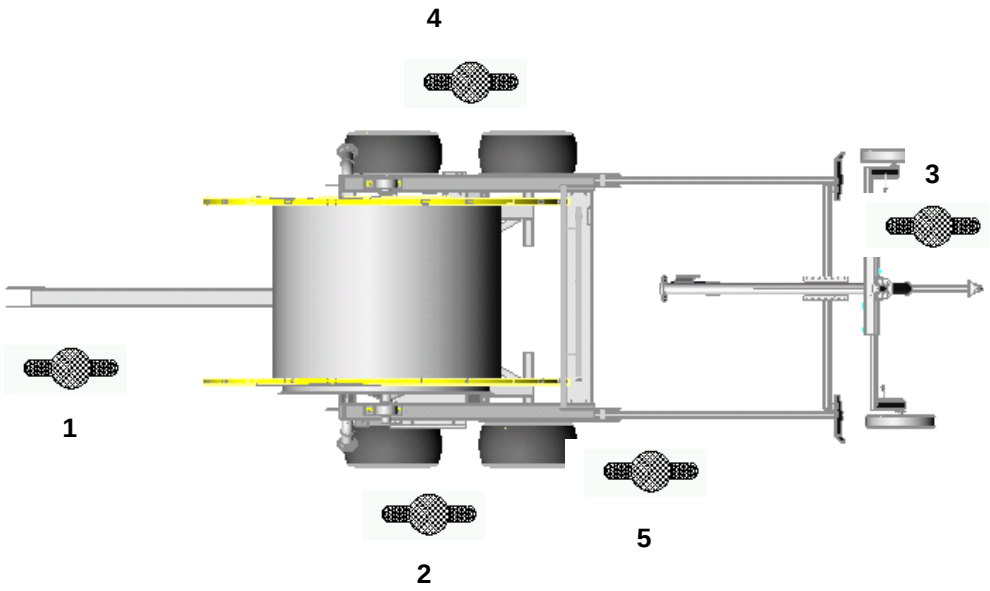


Photo 8

⚠ And finally check that all the screws and safety protective devices are properly and firmly secured .

OPERATOR'S POSITION AT WORK



Position **1** to :

- Hook and unhook the tractor from the machine
- Lower and raise the the safety leg (outrigger)
- Hook and unhook the pipe to/from the water supply connector
- Place the plug onto the unused water inlet

Position **2** to :

- Prepare the machine for pulling-out and pulling-in of the polyethylene pipe
- Adjust the pulling-in speed
- Lower and raise the stabilizers (TR10/20)

Position **3** to :

- Lock and unlock the stabilizer to and from the pick-up bar

Position **4** to :

- Lower and raise the stabilizers and the cart
- Direct the reel in the pulling-out axis
- Remove and put the locking pin in rotation
- Place the plug onto the unused water inlet
- Hook and unhook the pipe to/from the water supply connector

Position **5** to :

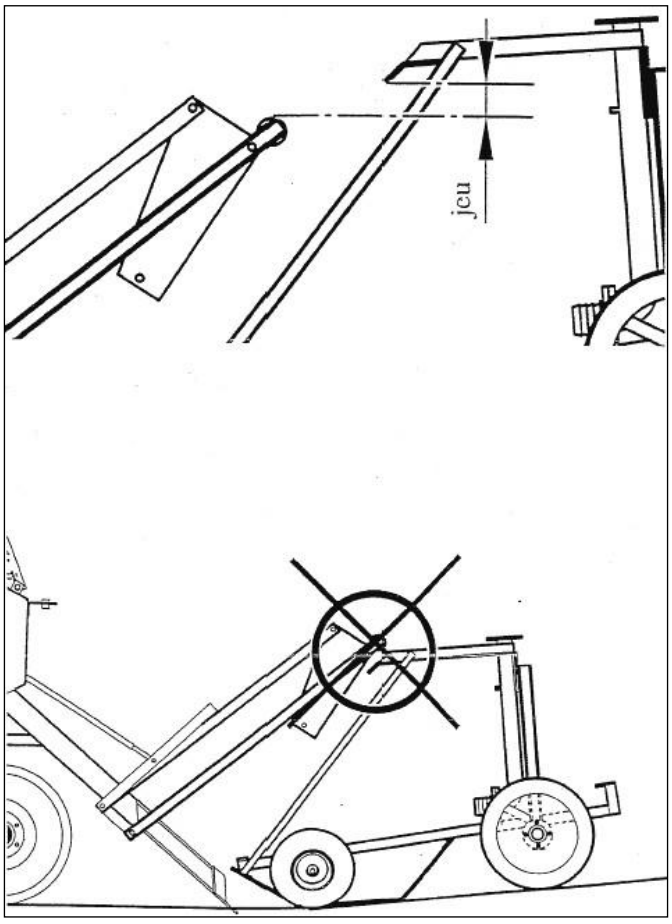
- Operate the safety sensor

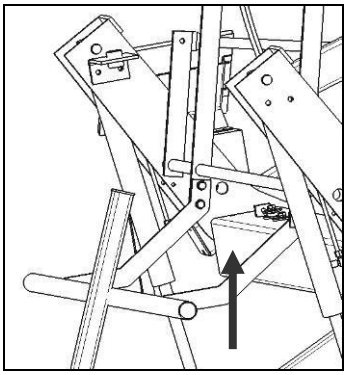
OPERATING THE HOSE TRAVELER

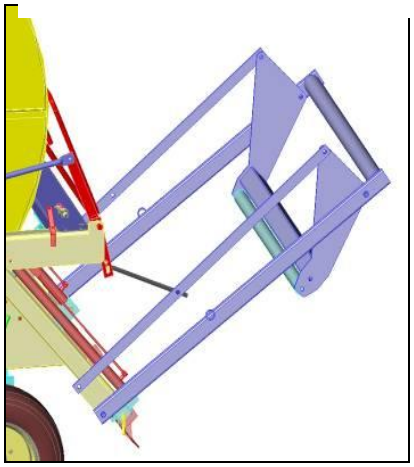
- 1 - CHECKING BEFORE THE FIRST RUNING SEASON

- Unfold the sensor and assemble the two safety sensor parts together as shown in the picture or unfold the pick-up arm which are fixed onto the machine.

  ⚠ Be careful because the parts are very heavy and can suddenly fall.
- Check that the cart automatically hooks at the end of the pulling-in on the lifting device. In any case, cart hook must be higher than the pick up bar (see details below)
- Check the adjustment of the safety stops system (see page 24)
- Check the synchronization of the pipe guiding system (see page 22)
- Check the oil level (see oil level on gearbox).
- Check the tires pressure (see page 34)







- 2 - PULLING-OUT

Note* : *Operations in italics shall be mainly carried out on initial start-up.

⚠ **Place the hose traveller on a horizontal and stable ground.**
Do not move the traveller on slopes superior to 15 %

, with the middle of the reel in line with the pulling-out direction for models not fitted with a hydraulic rotation system.
For models equipped with a hydraulic rotation system, remove the locking pin of the turntable system and turn the reel in line with the pulling-out direction by using the distributor.

- *For hydraulic rotation of the turntable system (optional), adjust the rotational speed using the flow limiter located on the hydraulic motor (Photo **9**).*
- Lower the stabilizers using the hydraulic controls in order to anchor them securely. Proceed without raising the wheels and and operate by jerks on hard soils. If required, release the pressure to lay the wheels on the ground *(Photo **12**).*
- Unlock the stabilizer by removing the holding pins.
- *Adjust the lowering speed using the flow limiter located at the inlet of the distributor on the drawbar (Photo **11**).*

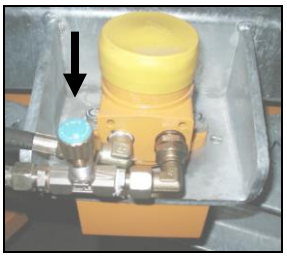


Photo 9

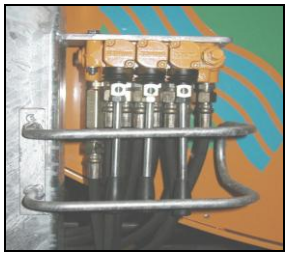


Photo 10

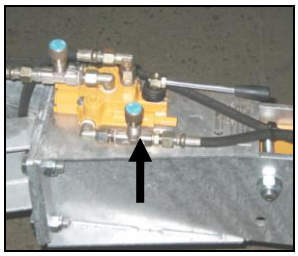


Photo 11

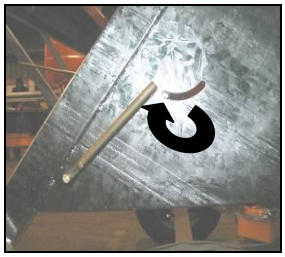


Photo 12

- Disconnect the 2 hydraulic feed pipes from the tractor.
- *Check the oil level of the gearbox and angle transmission.*
- Disengage the gearbox : central position **0** (Photo **13**).
- Release the non-return lock catch turning it counter-clockwise manually (Photo **14**).
- *Loosen totally the brake on the gearbox in order to release the brake belt from the drum, then retighten moderately by hand* (Photo **15**).
- Attach the tractor to the cart by using the drawbar.

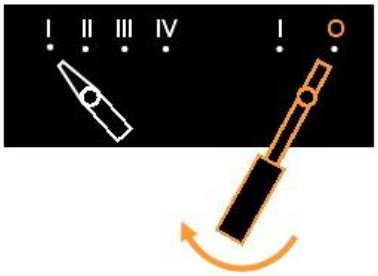


Photo 13

Photo 14

Photo 15

Nota : Operating the hose traveller on openfield intensive farming lands should be scheduled basing on the seeding so that appropriate strips in the land can be prepared and allow the pipe to be laid. In this way the car will be moved on a stable ground and irrigation will be carried out in optimal conditions.

- Pull out the reel slowly– **Max. speed : 2 Km/h** (Photo **16**).

An excessive speed can wear prematurely the brakeband

-
- After a few meters, check that the brake is working properly by stopping the pull-out slowly :
  - no turn on the polyethylene pipe should get loose
  - if necessary, reduce the speed

CAUTION : Excessive tightening of the brake belt results in early wear or removal of the lining.

Excessive pull-out speed results in an early wear of the brake lining.

- When pulling out the pipe, avoid any sudden deceleration or acceleration. This might cause the pipe to go out from the reel and then result in serious damage. For the same reason, reduce gradually the tractor speed at the end of the pull-out operation.

⚠ During this operation, the operator shall make sure that nobody is in the vicinity of the machine, otherwise the pull-out must be stopped immediately.

To avoid any breakage at the end of the pipe (attachment between PET and reel groove), it is advisable to lower the speed so as to reach slowly the start-up position (Photo **17**).

⚠ **Always 1 turn hose on the reel whenever the machine is used, except on the first pull-out .**

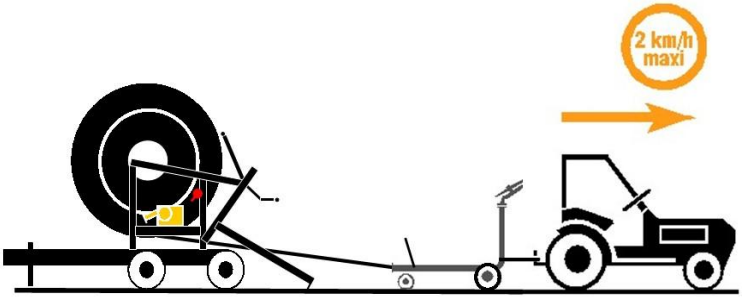
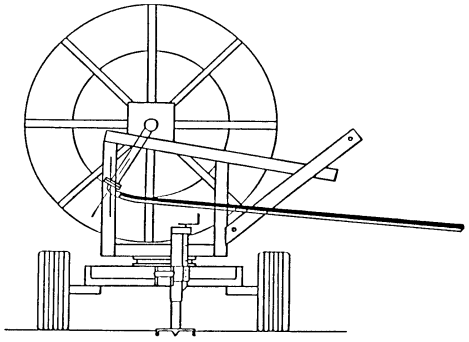


Photo 16

COMPULSORY :

For the initial start-up, pull out the complete polyethylene pipe and provide enough room for this operation.

Photo 17

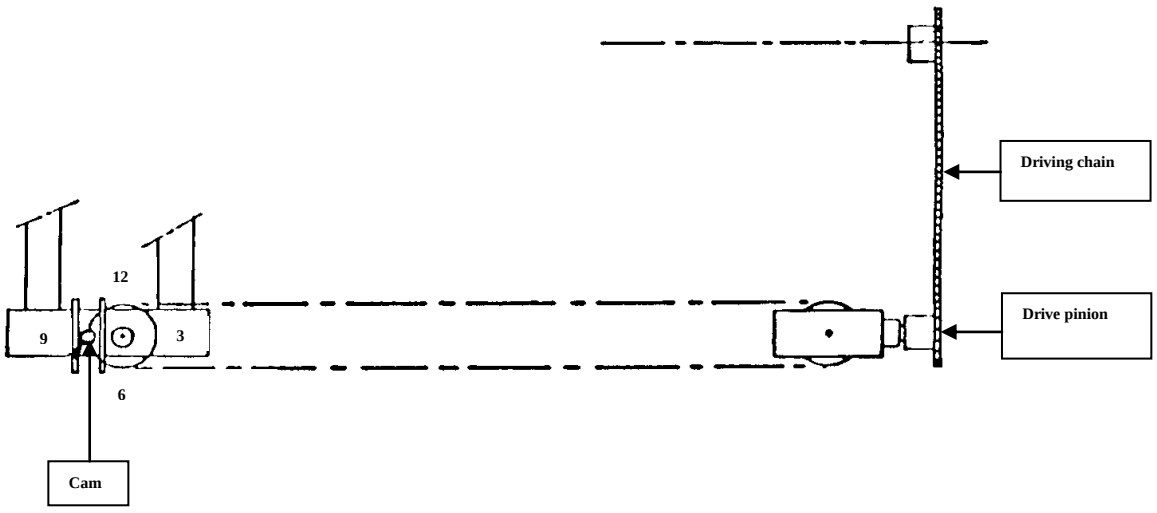


Attention :
Slow down pull-out speed before the end of the operation to prevent the polyethylene pipe from driving out from the reel.

- Unhook the tractor from the cart
- Adjust the water pipe guide system
- *Check the synchronization of the guiding system of the hose traveller :*

* Detail fig 17

- *The pipe guide cam must be at « 9 o'clock » when the reel is pulled out* (when comparing with a clock face) ; if it is not, dismount the driving chain by removing the snap link and turn the driving sprocket until the pipe guide cam comes to the « 9 o'clock » position ; put the driving chain back on.*



Whenever the polyethylene pipe gets stuck (e.g. after a rainfall when the pipe is pulled out), release it all over its length by slipping a cord along it by means of the tractor. Failing to do so, this could damage mechanical parts and the polyethylene pipe when being pulled in.

- 3 - SELECTING THE SPEED

Determine the cart travel speed according to :
1/The diameter of the nozzle 2/The hose traveller inlet pressure
3/The water application required

See the following table :
(this table is given as an example ; for real values, please refer to the water application sheet supplied with the hose traveler).

EX : Hose traveler 110/510 m Nozzle : Ø16
Hose traveler inlet pressure : 5 bar Water application : 20 mm

The cart travel speed will be 17 m/hr

Ø PE (mm)		Length of the pipe (m)		Thickness of the pipe (mm)		Dose mm				
110		510		12.3		10	15	20	30	40
Ø Cone-shaped nozzle (mm)	Hose traveller pressure (bar)	Jet pressure (bar)	Jet flowt m3/h	Spacingt (m)	Irrigate area (ha) for 450m	Travel speed meters per hour				
12	3.0	3.1	9.6	44.6	2.28	22	14	11	7	5
	4.0	4.2	11.1	49.8	2.54	22	15	11	7	6
	5.0	5.2	12.4	54.1	2.76	23	15	11	8	6
	6.0	6.3	13.6	58.1	2.96	23	16	12	8	6
14	2.0	2.2	10.6	41.6	2.12	25	17	13	8	6
	3.0	3.2	13.0	48.5	2.47	27	18	13	9	7
	4.0	4.3	15.1	54.1	2.76	28	19	14	9	7
	5.0	5.4	16.8	58.9	3.00	29	19	14	10	7
	6.0	6.5	18.4	63.0	3.22	29	19	15	10	7
16	2.0	2.3	13.9	44.6	2.28	31	21	16	10	8
	3.0	3.4	17.0	52.2	2.66	33	22	16	11	8
	4.0	4.5	19.7	58.1	2.96	34	23	17	11	8
	5.0	5.6	22.0	63.2	3.22	35	23	**17**	12	9
	6.0	6.7	24.1	67.8	3.46	36	24	18	12	9
18	2.0	2.4	17.6	47.5	2.42	37	25	19	12	9
	3.0	3.6	21.6	55.5	2.83	39	26	19	13	10
	4.0	4.8	24.9	61.9	3.16	40	27	20	13	10
	5.0	5.9	27.8	67.4	3.44	41	28	21	14	10
	6.0	7.1	30.5	72.2	3.68	42	28	21	14	11
20	2.0	2.6	21.7	50.4	2.57	43	29	22	14	11
	3.0	3.8	25.6	58.7	2.99	44	29	22	15	11
	4.0	5.1	30.7	65.6	3.35	47	31	23	16	12
	5.0	6.4	34.4	71.4	3.64	48	32	24	16	12
	6.0	7.6	37.6	76.5	3.90	49	33	25	16	12
22	2.0	2.9	26.3	53.0	2.70	50	33	25	17	12
	3.0	4.2	32.2	61.9	3.16	52	35	26	17	13
	4.0	5.6	37.2	69.0	3.52	54	36	27	18	13
	5.0	6.9	41.6	75.0	3.83	55	37	28	18	14
	6.0	8.2	45.5	80.5	4.10	57	38	28	19	14
24	2.0	3.2	31.3	55.5	2.83	56	38	28	19	14
	3.0	4.7	38.3	64.8	3.30	59	39	30	20	15
	4.0	6.1	44.3	72.3	3.69	61	41	31	20	15
	5.0	7.6	49.5	78.7	4.01	63	42	31	21	16
	6.0	9.1	54.2	84.3	4.30	64	43	32	21	16

NOTA :

To minimize the pressure losses in the turbine, you should select the highest possible gearbox speed while making sure that the pull-in speed required is stable.

The hydraulics characteristics of the end gun are those of Komet end gun. A different end gun will give results sightly different.

When needed, you can ask your dealer to give you a free water application sheet.

- 4 - START-UP PROCEDURE

- Connect the water feed hose to the irrigator with the **hooking lever always positioned upwards** (Photo **18**).
- Put the cap on the unused water inlet.
- **Put the safety pin on the lever of the feed fitting and the cap.**
- Select the speed of the gearbox : position 1/2/3/4 (speed 1/2/3/4) (Photo 13 Page 22).
- Insert the non-return lock catch .
- Tighten the PET (see p 30 "handling with crank ")
- Switch-off valve, depending on the option selected :
    - Mechanical low pressure : Close the valve using the lever (Photo **19**).
    - Mechanical high pressure : Open the valve using the lever (Photo **20**).

Photo 18

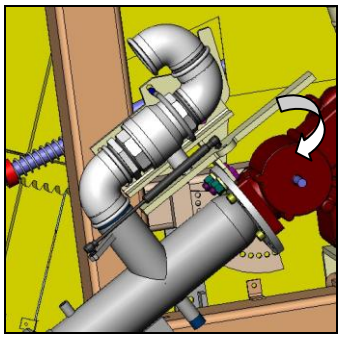


Photo 19

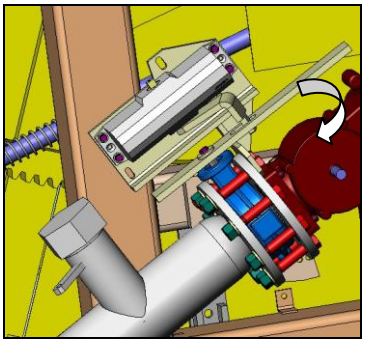


Photo 20

- *Engage the gearbox using the upper gear box control* (Photo **23**).
- *Check that the switch-off valve or the disengaging unit of the gearbox work properly by pulling the safety sensor outwards* (Photo **21** p 25) *:*
    - *The switch-off valve should always be opened before disengaging the gearbox.*
    - *The clutch release fork lever of the gearbox should always be released before the polyethylene pipe can leave the reel (maximum tolerance = ½ diameter of the polyethylene pipe).*
    - *Otherwise, adjust the switch-off valve stop and the gearbox clutch release stop until correct operation is achieved.*

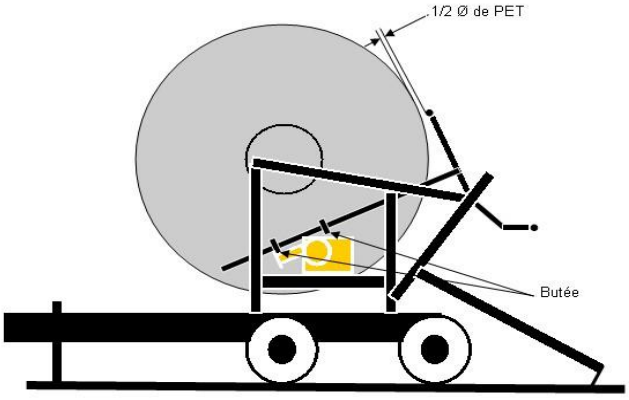


Photo 21

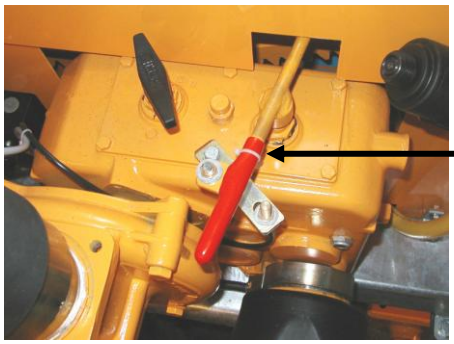
* *Check the time required for the valve to close*

* *Depending on the requirement, adjust the valve closing speed using the screw at the back of the hydraulic brake draulique (Photo **21**) :*

Max. closing time : 1 min 30 s
Screw on = slower closing
Screw on = faster closing

Photo 22

Turn on the switch-off valve again



Upper control lever

1- ON (CCW)
2- OFF (CW)

Photo 23

⚠ **IMPORTANT : Check that the gearbox is disengaged (upper control of the gearbox) before supplying water.**

- Make sure that there is nobody but the operator close to the machine at the start-up.

- Turn on water, increasing pressure slowly.
- Engage the gearbox by pulling the upper control lever (CCW direction) (Photo **19** p 24) .
- *For hose travelers equipped with high pressure switch-off valves (optional) :*
  * *Open the valve by pulling the safety sensor (Photo **20**) .*

To change gears during the operation, proceed as follows :

- Zero/stop on CR5/PR10
- Pilot motor 1 on CR5/PR10 to open by pass
- Disengage
- Change the gear by turning the gearbox with the crank to change the gear easily, then engage and restart pull-in.

- At the end of the irrigation, raise the cart using the hydraulic lifting unit (stabilizers + pick-up bar). Once the cart is raised, lock it with the pins on the pick-up bar ; open the draining valve of the frame checking that there is no more pressure in the hose so that it can be removed (Photo **22**) . Turn the machine into transport position, engage the turntable rotation stop device and the locking pin.

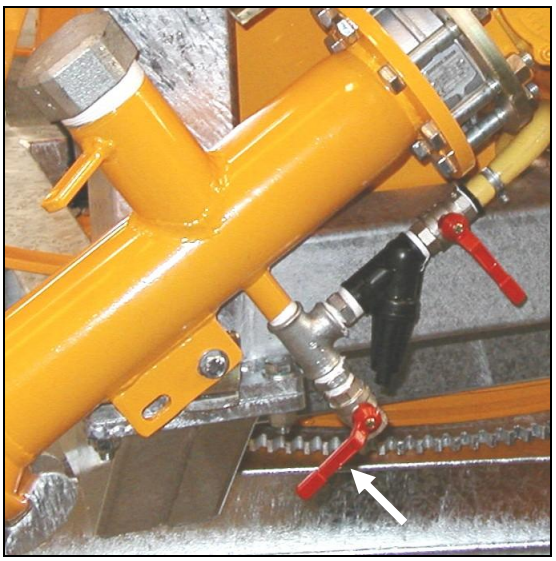


Photo 24

- Attach the hose traveler to the tractor and raise the safety leg (outrigger).

Max. travel speed : **10 Km /hr**. The machine is not approved to circulate on the public highway.

- 5 - OPTIONAL EQUIPMENT

Irrigation volume compensator (Photo **23**)

- Set the metering valve of the irrigation compensator by selecting the total flow rate corresponding to the water application required – see below.

IMPORTANT

To display the flow rate required :

- PRESS THE HANDWHEEL OF THE METER BEFORE TURNING IT
- TURN IN THE DIRECTION OF THE ARROW
- Adjust the irrigator sector system.
- Table : the water application has been calculated for a 180° rotating irrigation

Nozzle Ø (mm) – Pressure (bars) - Distance (m) - Flow rate (c.m/hr) – Water application (mm) – Time (hr :min)

Ø Nozzle (mm)	Pressure (bars)	Distance (m)	Irrigated Area(m2)	Flow rate (m3/h)	Water application (mm)	Volume (m3)	Time (h:min)
6.4x3.2	5.17	19.51	598	4.324	8	5	1:09:23
					17	10	2:18:46
					25	15	3:28:08
					33	20	4:37:31
7.1x3.2	5.17	21.64	736	5.125	7	5	0:58:32
					14	10	1:57:04
					20	15	2:55:37
					27	20	3:54:09
7.9x3.2	5.17	22.25	778	5.945	6	5	0:50:28
					13	10	1:40:56
					19	15	2:31:23
					26	20	3:21:51
8.7x3.2	5.17	22.56	799	6.67	6	5	0:44:59
					13	10	1:29:57
					19	15	2:14:56
					25	20	2:59:55
9.5x3.2	5.17	23.2	845	7.737	6	5	0:38:46
					12	10	1:17:33
					18	15	1:56:19
					24	20	2:35:06

Photo 23

- Set the electrovalve and select the irrigation time required.

IMPORTANT : Record the local time before setting the electrovalve.

- Press ENTER : the display unit on the lower right corner shows OK. Set the time with left and right arrows, then confirm the scheduled time pressing ENTER (OK disappears).

1/ Daily setting :

Irrigation start time :

- Press the right arrow : the page of the first irrigation start is displayed (OPEN) ; press ENTER : the display unit on the lower right corner shows OK. Set the start time with the arrows, then confirm the scheduled start time pressing ENTER (OK disappears).

Irrigation end time:

- Press the right arrow : the second page of the first irrigation end is displayed (CLOSED) ; press ENTER : the display unit on the lower right corner shows OK. Set the end time with the arrows, then confirm the scheduled end time pressing ENTER (OK disappears).

By pressing the right arrow, you can set up to 6 irrigation ranges. To do so, repeat the operations as above.

⚠ **When setting the time, always set the time in the increasing order as the first irrigation.**

Ex : Start N°1 /06:00; Start N°2 /22:00
Never the contrary (22:00 before 6:00) otherwise the start setting would be stopped at 23:58 min.

2/ Weekly setting :

When pressing the right arrow several times, the display unit shows the weekly setting range.
The display unit in the lower part of the page shows numbers for the days of the week. Number 1 corresponds to the **first setting day.**
Ex : If setting is performed on Thursday, the program sets Thursday as day n° 1.

- Press ENTER : the display unit on the lower right corner shows OK.
- Move the cursor with the arrows under the day you want to remove it from the irrigation time.
- Confirm the removal by pressing ENTER (same operation to display it again), then align the cursor under Exit and press ENTER to confirm the setting.

2/ Manual setting :

When pressing the right arrow several times, the display unit shows the manual setting range.
The display unit in the left upper part shows MANUAL.

- To operate the valve, press ENTER ; The system displays OK down in the right corner.
- To open the valve, press the left arrow : the system displays OPEN.
- To open the valve, press the right arrow : the system displays CLOSED.
- Leave the page from CLOSED by pressing ENTER (OK disappears).

⚠ Failing to operate manually to stop the irrigation, the valve is switched off automatically after 15 min.

Photo 26

- 5 - TURBINE INJECTOR

The turbine preassembled on your machine allows the most usual irrigation conditions with no injector required.(**$Q > 36m^3/hr$**)
However for particular applications (high pull-in speeds, low flow rates…) a wide range of injectors is available.

TO BE NOTED :
If **$27 < Q < 36m^3/hr$,** the upper thread in the inlet pipe of the turbine must be opened and the lower thread closed with a cap.

If **$Q < 27m^3/hr$**, the upper thread in the inlet pipe of the turbine must be closed with a cap and the lower thread must be fitted with an injector.

HANDLING THE HOSE TRAVELER WITH THE CRANK

The shaft on the front of the gearbox allows to use the crank to handle the gearbox housing (Photo **25**) . More particularly the user can :

- Engage, change the speed, disengage the gearbox easily without having to operate levers with force. **(when the PET is totally pulled in on the reeel)**
  Never operate the levers with force : engaging gears, clutching or declutching shall be carried without effort.
- Tighten turns again. To ensure correct laying of the PET hose, check before starting pull-in, that the remaining turns are properly laid and close to each other on the reel.

<u>CAUTION :</u> Do never leave the crank on the shaft when the machine is working.

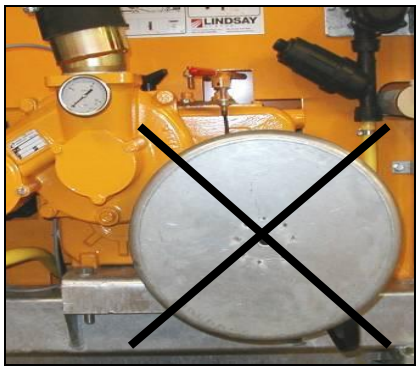


Photo 27

P.T.O. PULL-IN

For quick pull-in with the tractor p.t.o., you should follow the following instructions :

- 1 - Connect cardan to p.t.o. (cardan joint must be marked CE and provided with its operation and maintenance manual to be followed)

- 2 - Check that the gearbox inlet shaft is disengaged.

- 3 - Make sure that the locking pawl of the rack is engaged (Photo **25**).

- 4 - Start pull-in driving the cardan joint via the tractor **(540 rpm max.)** while checking the right rotation direction of the reel (the cardan joint turns counter-clockwise). (Photo **26**)

- 5 - Quick pull-in must be performed with pressure inside the pipe otherwise this could get out-of-round and result in pull-in failures during the irrigation step.

- 6 - Pull-in with p.t.o. **is not protected by an automatic travel end stop.** Therefore the cart must be stopped before it gets to the machine and pull-in must be finished using the crank.

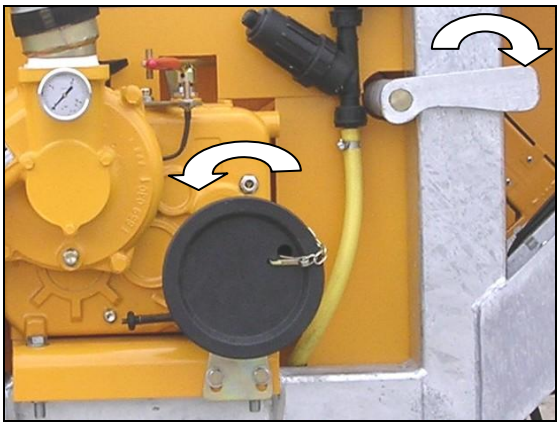


Photo 28

Off-season storage

- Open the by-pass valve at 45°.
- Remove the cap from the second feed pipe of the hose traveler.
- Open the switch-off valve (high or low pressure) using the control lever.
- Open the bleed valve of the low column at 45°.
- Drain the turbine.
- Open the valves of the irrigation compensator.
- Drain the cart via the bleed valve at 45°.
- Loosen totally the setting screw of the brake located on the gearbox in order to release the brake belt from the drum. Do not forget to tighten it again when you re-start.
- Lubricate the whole unit (bearings + chains + forecarriage round piece + pipe guide).
- Put the hose traveler in a sheltered place.
- Put the cart on the ground.
- Store the feed hose on the reel but do not fold it.
- Disconnect the battery.

Lubrication

- Lubricate every 8 to 10 days of operation.
- Use « mechanical » grease.

- Nipples :	Qty	Location
	2	Reel bearings (Photo **27**)
	4	Forecarriage round bar (Photo **28**)
	2	Hose traveler axles (Photo **33**)
	1	Pipe guide fork (Photo **32**)
	3	Cart (Photo **34**)
	1	Outrigger (Photo **31**)
	According to model	Sprinkler

Lubrication with brush :

- Transmission chain gearbox/reel TR50
- Reel rack and hydraulic rotation TR30/40 (Photo **29/30**)
- Drive chain reel/pipe guide
- Chain of pipe guide
- Hydraulic rotation chain

⚠ **CAUTION : after lubrication mount again and secure all protective casings with screws.**

Photo 29

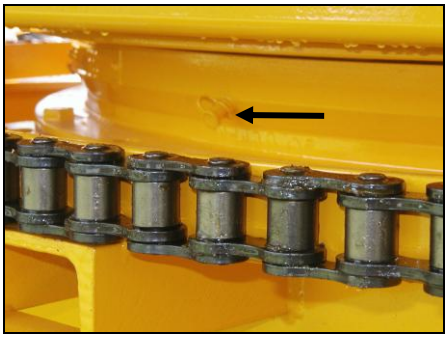


Photo 30

Photo 31

Photo 32

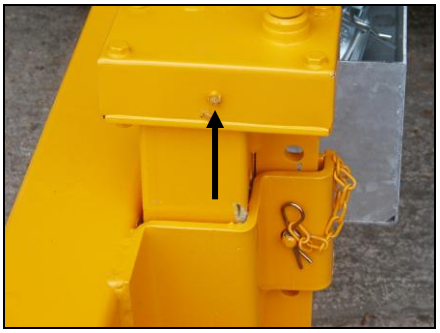


Photo 33

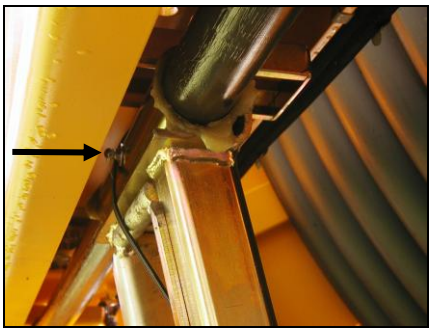


Photo 34

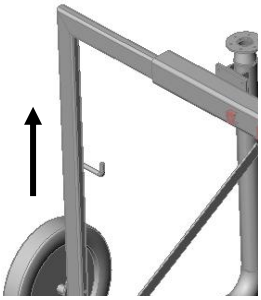


Photo 35

Photo 36

Oil change

- Change the angle transmission box of the tube guide every 3,000 hours or 3 years
- Empty out the gearbox after the first running season, then, for the following years, oil must be added in order to maintain the level at the height required. Empty totally out every 3 years
- Use oil SAE 90.

Tyre pressure

- Hose traveler tyres :

- 10.0/80/12.0	10 plys	3.90 bar
- 10.0/75/15.3	12 plys	4.75 bar
- 10.0/75/15.3	14 plys	5.50 bar
- 11.5/80/15.3	12 plys	4.00 bar
- 11.5/80/15.3	16 plys	6.00 bar
- 340/55/16	14 plys	4.00 bar
- 400/60/15.5	14 plys	3.50 bar
- 15.0/55/17	10 plys	2.80 bar

- Cart rear tyres : 2 Bar
- Cart front tyres (small wheels): 4 bar

Chain tightening

- Check tightening after the first 100 hours.
- Tighten again every 1,000 hours.

Locking lug studs

- Check locking after the first operation hours.
- Then check periodically.

Shaft turbine bearing

- Shaft turbine bearings are designed for a life of 5000 hours.

TROUBLES - CAUSES - SOLUTIONS

POTENTIAL TROUBLES	CAUSES	SOLUTIONS
1 - PULL-IN SPEED TOO LOW	**A** - Flow rate or pressure too low **B** - by-pass valve open **C** - hose traveler injector and/or sprinkler nozzle too small	**a** - Check pumping system and feed line for efficiency **b** - Check that the by-pass valve is closed completely (**Photo 35**) **c** - Too low water flow rate results in too low rotation of turbine and consequently low pull-in speed of hose. The only possible solution is to change the injector of the turbine. An injector with a smaller hole will provide higher speeds but also a higher head loss in the turbine.
2 - PULL-IN SPEED TOO IRREGULAR	**A** - Water flow rate or pressure variable during the operation cycle. **B** - Water flow rate or pressure variable during the operation cycle.	**a** - Check pumping system and feed line for efficiency. Check electronic control engine for efficiency. **a** - Engage slower gear on gearbox.
3 - HOSE TRAVELER STOPPED WHEN PULLED IN : GEARBOX IS DISENGAGED	**A** - Engaging lever not properly engaged when starting irrigation **B** - Pull-in safety device not adjusted properly	**a** - Engage gearbox lever making sure that full travel is reached. **b** - Check that the pull-in safety device operates only when the hose is pulled in badly on the reel. For this purpose, place the hose sensor in the maximum hose coverage position on the reel (**Photo 36**) and make sur that disengaging starts only beyond this position. If it does not, adjust accordingly by modifying the position of the disengaging cursors.

POTENTIAL TROUBLES	CAUSES	SOLUTIONS
4 - HOSE TRAVELER STOPPED WHEN PULLED IN : TURBINE DOES NOT TURN	**A -** Foreign matter in feed line or turbine cone **B -** Foreign matter in turbine **C -** Significant drop in water pressure or flow rate	**a -** Drain off before connecting hose traveler to feel line to avoid this trouble. **b -** To unlock turbine, rotate the blade wheel manually in the reverse direction. If still in trouble, disengage gearbox, take down cover and remove troublesome elements. Depending on the frequency of failures due to sandy water, mount a stone filter. **c -** Check pumping system and feed line for efficiency.
5 - WATER DOES NOT FLOW OUT FROM NOZZLE	**A -** Foreign matter in supply piping or injector **B -** Water supply pressure cannot face air back pressure forming inside the polyethylene pipe still wound on the reel. **C –** Valve closed	**a -** To avoid this inconvenience, drain off before connecting the hose traveler to the supply piping. Depending on the frequency of failures due to sandy water, mount a stone filter. **b -** In this case if it is not possible to increase water pressure to face air back pressure, the polyethylene hose shall be pulled out completely from the reel. **c -** Open the valve.
6 - WATER LEAKS FROM TURBINE COVER	**A -** Seal inside the turbine is damaged or worn.	**a -** Remove turbine cover to change seal.
7 - IRREGULAR PULL-IN OF HOSE ON IRRIGATOR : HOSE GUIDE PHASE BAD	**A -** Wrong ratio between pinions on angle transmission and pinion on reel. **B -** When hose guide is out of phase, pull-in can cause irregular overlapping on the reel **C –** Pull-in without pressure.	**a -** Check number of teeth on pinions and change them it necessary. Check the guiding chain length. **b -** See hose traveler in-phase procedure, page 22 **c -** Always pull in hose under pressure.

POTENTIAL TROUBLES	CAUSES	SOLUTIONS
8 - WHEN OPERATING HYDRAULIC DISTRIBUTORS, ADJUSTMENTS AND SETTINGS CANNOT BE CARRIED OUT AS REQUIRED	**A -** Flow limiter of distributors may be defective **B -** Lack of oil in the system **C -** Pump damaged due to lack of oil or overheating faute d'huile ou pour sur chauffage	**a -** Increase the operating pressure of the hydraulic system by tightening the setting screw of the flow limiter on distributor (see pager 19), checking every half-turn the operation of the unit and taking care not to lock it at the travel end **b -** Check oil level and if needed add hydraulic oil (grade **ISO 22**) **c -** Check pump for efficiency and change it if necessary.
9 - WATER LEAKS BETWEEN TURBINE AND GEARBOX (**Photo 37**)	**A -** Mechanical seal inside the turbine damaged or worn (use of sandy water !)	**a -** Change mechanical seal by dismounting the turbine of gearbox. Under normal conditions of use, the mechanical seal should not be changed. When sandy water is used, it is advisable to change the sealing system after three years' service.

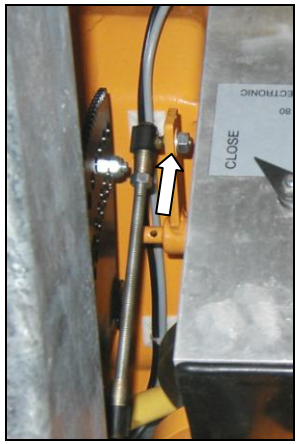


Photo 35

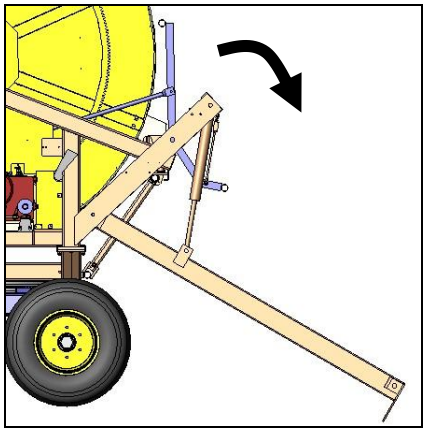


Photo 36

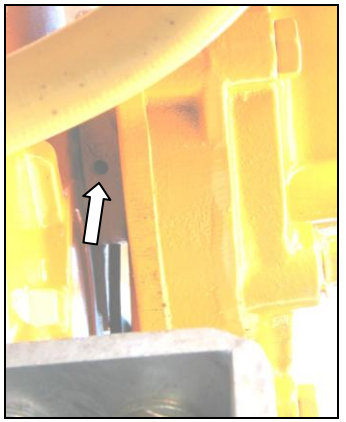
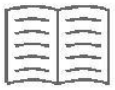


Photo 37

SAFETY



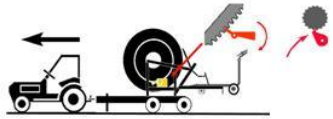
Before using the hose traveler, please read the relevant instructions carefully..

Never operate the water feed hoses/pipes when the irrigator is under pressure.

EMERGENCY STOP :

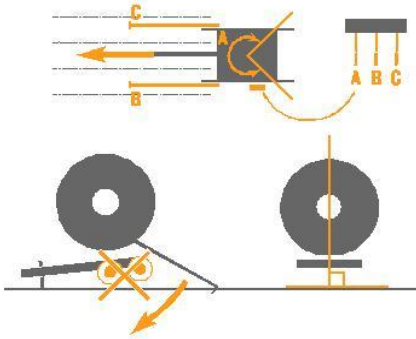
Pull sensor towards yourself.

Do not disengage or change a gear during pull-in.



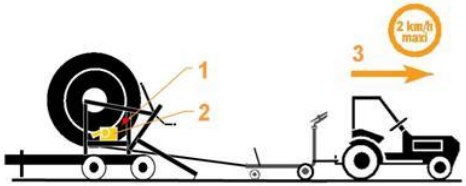
To move the hose traveler, make sure that the non-return pawl is properly engaged.

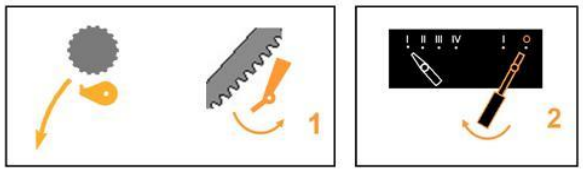
PLACING THE HOSE TRAVELER



Place the machine perfectly square and vertical with the centre of the reel in the pull-out axis. Anchor solidly the two stabilizers into the ground without releasing the wheels of the travaler.

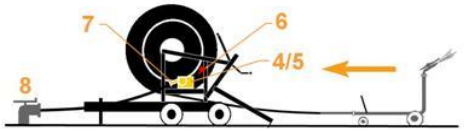
PULLING OUT THE HOSE TRAVALER





1 Remove the non-return pawl
2 Disengage the turbine and gearbox
3 Pull out the polyethylene pipe at 2 Km/hr max.

PULL-IN WITH TURBINE



4 Engage the turbine
5 Select gearbox speed
6 Engage non-return pawl
7 Open or close the switch-off valve
8 Feed water gradually
9 Adjust water quantity

HAND OR PTO-OPERATED PULL-IN

- Disengage turbine and gearbox
- Pull in with crank
- **CAUTION**: For pto pull-in, please comply carefully with the user's manual.

LINDSAY EUROPE

PERROT

Program Rain 10

User's manual

Version 6.50 & 6.51

FEATURES:

- Speed regulation by speed or dose adjustment
- Pre- and post-irrigation – Suggested delay or programmable directly in minutes
- 4 different speeds
- Clock
- Start time is adjustable
- Stop time is shown in the display
- Length of the pipe
- Actual speed
- Battery voltage
- Charge regulation
- Pressure sensor
- Stop sensor
- Speed sensor
- Motor 1, regulation motor
- Motor 2, stop motor
- Slowly start of turbine
- Slowly opening for inlet of water
- Radio output for pipe reel empty, machine stopped
- Radio input for start, stop of the machine
- Metre or foot

DISPLAY :

SPEED	29.2m/h
DOSE	30mm
TIME	10:24
STOP	14:50

Menu 1
Standard readout
Press MENU to show second menu

DISTANCE	163m
BATTERY.	12.7V
CHARGE	OFF
PRE. 25	POST. 25

Menu 2

Press Menu for showing menu 3

PRESS SENSOR ▓
STOP SENSOR
SPEED SENSOR
MOTOR1 ▓ MOTOR2

Menu 3
When ▓ sign appears, the corresponding feature is ON or activated
Press Menu for showing menu 4

A.SPEED	000m/h
WORKING H	00000h
CODE STOP	9
START	18:29

Menu 4
Press Menu for showing menu 5

000m	30.0	000m
000m	30.0	000m
000m	30.0	000m
000m	30.0	000m

Menu 5

Press Menu to go back to first Menu.

.

MENU 1 :

SPEED	29.2m/h
DOSE	30mm
TIME	10:24
STOP	14:50

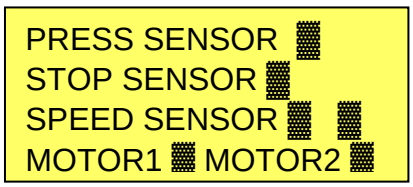
- The 1'st line shows the speed, it can be changed at any time during the irrigation with up and down arrows. If display shows LOW BAT instead of SPEED, it means the battery voltage is too low and battery has to be charged again.
- The second line shows the corresponding dose. After having entered the flow and spacing in the constants, a calculation links speed and dose. By adjusting speed, dose is adjusting accordingly.
- The third line shows the time. To set the time: first set the speed to 11.1 m/h, and then press the " PROG " key 3 times, the time can then be set with the arrow keys. When the battery has been removed the time is 00:00, and is remaining zero until it is set.
- The 4'th line shows the time when the irrigation is finished including pre- and post-irrigation. If the time is not adjusted, the total run duration is displayed.

MENU 2

DISTANCE	163m
BATTERY.	12.7V
CHARGE	OFF
PRE. 25	POST. 25

- First line shows length of hose unwound in the field. If, after a wrong utilisation, the unwound length is reset to zero, then you can adjust it again from this menu by pressing 3 times the PROG key and by pressing then the arrow keys.
- Second line shows battery voltage in Volts.
- Third line indicates if the battery is charged by solar panel or not. ON : the solar panel is charging the battery, OFF : Solar panel does not have enough voltage to charge the battery. Battery is full when its voltage reaches 14.0V.
- Fourth line shows PRE and POST irrigation delays. When the duration is blinking, it means the delay is counting down. In order to adjust the PRE irrigation duration, press PRE. A suggested duration is shown but you can easily adjust this duration by pressing the arrow keys right after having pressed the PRE key. The POST irrigation adjustment is made exactly the same way.

MENU 3 :



- The 1'st line shows if the pressure is high enough. When pressure switch is activated (enough pressure), the sign ▓ shows on the screen. If the machine is not equipped with a pressure switch, the machine data must be set to zero. And the computer works then considering the pressure is always sufficient.
- The 2'nd line shows if the stop switch is activated, the marker is on when the stop switch is on (gearbox engaged, sensor close to the magnet). The machine can only work when the stop switch is on. The stop switch has 3 functions:
  1: Resets the distance counter when the end gun carriage reaches the hose reel.
  2: Start Post-irrigation when hose is completely wound on the drum.
  3: Inhibits the pulses to the regulator-motor.
-

- The 3'rd line is for testing the speed sensor, the markers is on when the magnets activates the speed sensors. Speed sensors have two integrated sensors allowing the system to know direction of movement. Each sign ▓ corresponds to one sensor.
- The 4'th line shows if the motors have stopped, because they have reached their mechanical stops. If the marker is on and the motor has not reached their end position, there is a blocking inside the valve. The motor is stopped and the marker is set on, when the current exceeds 4.7 Amp.

MENU 4

A.VITESSE	000m/h
DUREE	00000h
CODE STOP	9
START	18:29

- The 1'st line shows the actual speed that the machine is running now. This can be used to check the maximum running speed for the machine, if the Program Rain is set to a much higher speed than the machine can run. The actual speed can differ from the set speed, especially in the start, this is not an error because the Program Rain ensures that the average speed over 10 meters is correct. That is precisely the regulation utility.
- The 2'nd line shows the total working hour since the electronic was started the first time. This value cannot be reset to zero.
- The 3'rd line shows the cause for the machine has stopped.
  - Code 0 = Running
  - Code 1 = Stopped by low pressure.
  - Code 2 = Stopped by supervision.
  - Code 3 = Stopped by stop key.
  - Code 4 = Stopped by stop sensor.
  - Code 5 = Stopped by battery voltage is below 11,2 V.
  - Code 6 = Stopped by TELE RAIN.
  - Code 7 = The current has been interrupted or there is a lose connection.
  - Code 8 = Not used.
  - Code 9 = The timer is adjusted to start the machine later on.
- The fourth line shows starting up time. Start up can be postponed by up to 24 hours. In order to adjust start time, press STOP to close water inlet. Press PROG key 3 times and then adjust start time with the up and down arrow keys.

MENU 5

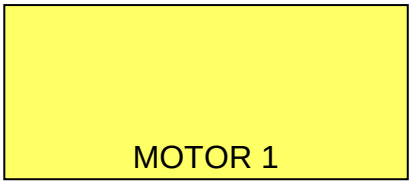
000m	30.0	000m
000m	30.0	000m
000m	30.0	000m
000m	30.0	000m

This is for irrigation with 4 different speeds in the retraction.
Press the " PROG " key 3 times for programming the zones.

See later in this paper for more details.

DIFFERENT READOUTS :

When the display shows a flashing Motor 1, it means that the regulator motor is running, while the motor is running no keys can be activated. The motor runs for max. 26 seconds.



When the display shows a flashing Motor 2, it means that the motor for stopping is running, while the motor is running no keys can be activated. The motor runs for max. 26 seconds.

START:

The turbine can only start if the magnet activates the stop sensor (or stop sensors), see menu 3 for controlling the stop sensor. When the " START " key is pressed, the main valve opens. Next the by-pass valve closes (the turbine starts). If the magnet does not activate the stop sensor, it is only the main valve that opens; this is used if the pressure should be released before disconnecting the hose at the hydrant.

DELAYED START TIME OF IRRIGATION:

First press ”STOP” key for closing for inlet of water. Next press ”PROG” key 3 times and you can set the start time. At last choice Pre– and Post irrigation if wanted.

STOP :

When the magnet is removed from the stop sensor, the turbine stops and the main valve closes (opens at low pressure stop). If post-irrigation is chosen, the turbine stops and after the post-irrigation time, the main valve closes. If the key " STOP " is pressed the turbine stops and the main valve closes, regardless if post-irrigation is programmed or not.

SUPERVISION:

The PROGRAM RAIN has a built in system for supervision. The supervision starts to work, if for some reason the machine irrigates at the same place longer than a specified time. This time is factory adjusted to 20 minutes, see programming for changing this time. If it is set to 0 there is no supervision.

Supervision of correct speed.

If machine data no.17 is set to 1, the supervision will also stop the machine if it is not running at the chosen speed, if there is more than 40 % error. If it is set to 0 there is no supervision of speed. That possibility is not recommended. If the machine is stopped for one time in the future of this reason nobody can remember or understand the reason. Actually, the CODE STOP does not list this specific stop.

SPEED:

The speed is adjusted with the arrow keys, the speed first changes by steps of 0.1 m/h, then after 10 steps it changes by 1.0 m/h. The speed can be changed at any time, even whilst the machine is running. If the time is checked it shows the new time for the remaining irrigation. The speed cannot be changed whilst any of the motors are running. It is shown in the display as: MOTOR 1 or MOTOR 2.

PRE-IRRIGATION:

In order to setup a PRE irrigation delay, when you are in menu 2, press the PRE key.
The suggested time for pre-irrigation is calculated by the Program Rain as 8 x the time for running 1 metre at the actual speed. The constant n°1 is setup at 8 by default but can be changed for PRE irrigation delays.
As an example, let's take a hose reel whose winding speed is adjusted at 20m/h and whose end gun throw is 40m. A crop in the middle of the field is going to receive water during 2 hours. The constant 1 adjusted at 8 will give a suggested PRE irrigation delay of 24 minutes because it takes 3 minues to wind up 1 meter of hose. (8x3=24)
If we modify the winding speed to 10m/h, it is normal that the PRE irrigation delay doubles which is made automatically by the PR10.
However, if you want to manually modify the suggested time, you have two seconds after having pressed the PRE key to adjust the delay with the up and down arrow keys.
If the pre-irrigation is on, the machine starts and run 1/2 metre, then it stops for the pre-irrigation time.
In menu 2, the time shown corresponds to the remaining time before the end of the PRE irrigation delay.
To stop the PRE irrigation delay during the count down, press START/RESET key. PRE and POST irrigation delay are then cancelled and turbine starts.
Stop sensor must be activated (gearbox engaged) to be able to setup PRE or POST irrigation delays.

POST-IRRIGATION:

In order to setup a POST irrigation delay, when you are in menu 2, press the POST key.
The suggested time for post-irrigation is calculated by the Program Rain as 8 x the time for running 1 metre at the actual speed. The constant n°2 is setup at 8 by default but can be changed for POST irrigation delays.
The post-irrigation starts to count down when the stop sensors moves away from the magnet (when the gearbox disengages). The regulation motor opens the bypass and the turbine stops.
When POST irrigation delay is complete, the main inlet valve closes (or opens in low pressure shut down configurations).
To stop POST irrigation during count down, press START/RESET key.

When the hose reel is not equipped with an electric main valve but with a valve closed or opened mechanically, it is possible to start the POST irrigation delay few meters before the end gun trolley reachs the hose reel. This distance is adjusted in constant 6. When the remaining distance is the one adjusted in constant 6, the by-pass opens, the turbine stops and winding up stops. Then the POST irrigation count down stops. After the POSt irrigation delay, the by pass closes again to start

the turbine and the hose reel winds up the hose till the end. The manual main valve will then close (or open) when the gearbox will disengage.

CAUTION : On some hose reels, it is not possible to use this feature because it is not always possible to stop the wind up when the almost complete hose is already wound up. Actually, even when the bypass is fully opened, water is still going through the turbine and can make it turning. As torque needed to wind up the hose is very low, winding up goes on. This particular situation is all the more true when the hose reels have high flow rates.
For this reason and to avoid future disapointment, we prefer to consider this feature is not available on PERROT hose reels.

RADIO CONTROL:

A radio transmitter and a radio receiver can control the Program Rain 10.

Output: There is a output from the Program Rain that can be used to give signal to a radio transmitter mounted on the irrigator. The output is terminal no. 17 and 18, and it delivers 12 Volt and max. 4.5 Amp for 12 sec. The output is only working when constant no. 8 is not zero.

This signal is sent when:

1: The pipe is pulled out to the distance as set in the constant no. 8.
2: The machine is stopped because of low pressure.
3: The machine is stopped because of the stop sensor is activated.
4: The machine is stopped because of the supervision has stopped the machine.
5: The machine is stopped because of low battery

Input: There is an input to the Program Rain that can be used to start and stop the machine, when connected to a radio receiver.

The input is terminal no. 15 and 16; the machine starts when the terminals are connected. The input is only working when machine data no. 14 = 1.

If the machine is also mounted with a pressure switch, there are 2 possibilities:

1: The signal is send by the radio transmitter back to the farm, it is then possible to see if the pressure is high at home. It is then necessary to send a signal back to the machine in order to start it.
2: The radio receiver and the pressure switch is connected in series, so the machine will only start if there is a signal from the radio receiver and the pressure is high.

Be careful when connecting a radio receiver or transmitter, because they normally use at least 10 times so much power from the battery as the Program Rain.

Solar panel:
Regularly clean up the solar panel so that full voltage flows out of the solar panel.
On the display menu 2 is shown if the solar panel is charging. Be aaware that by pressing power off the charging is interrupted.

CONSTANTS :

SPEED	29.2m/h
DOSE	30mm
TIME	10:24
CONST. 00	TIME

Constants can be modified in a hidden menu. These constant will be saved for years even if the battery is disconnected.
In order to enter this hidden menu, the speed should be adjusted to 11.1 m/h (or to 11 f/h) to reach the constants. Press rapidly the "PROG" key 3 times and the screen will be like the one show above. By subsequent pressing on the "PROG" key the constant no. will step forward.
With the arrow keys the constant value can be changed. The PROGRAM RAIN goes back to normal and saves the constant by pressing the key "MENU".
If the key " MENU " is not pressed the Program Rain switches back to normal after 1 minute, and the changes of the constants are not saved.

Const no.	Min. Value	Max. Value	Description
0	00:00	24:00:00	The time in line 2 is set.
1	1	15	Post irrigation coefficient
2	1	15	Pre-irrigation coefficient
3	0	99	Supervision time
4	1	7	1 English, 2 Danish, 3 German, 4 French 5 Dutch, 6 Swedish, 7 Spanish
5	0	2	0 = Stop for high pressure, Slow shut-down 1 = Stop for low pressure, 1 long pulse and motor 2 runs in the opposite direction also set machine data 12 = 2 2 = motor 2 stopping is disconnected
6	0	15	Distance to POST irrigation
7	0	1000	Length of PE hose unwound in the field
8	0	1000	Distance for bipper (0 = no bip)
9	5	120	Hose reel flow rate in m3/h
10	5	100	Spacing between two run in m
11	0	0	Code to reach machine data

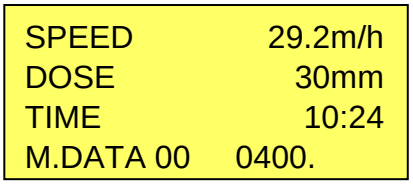
Constants programmed for PERROT hose reels given their configuration are listed in the following chart :

PR10	PR10 with mechanical shut off
PR10D	PR10 with electrical low pressure shut off
PR10S	PR10 with electrical high pressure shut off
PR10SP	PR10 with electrical high pressure shut off and pressure switch
PR10DP	PR10 with electrical low pressure shut off and pressure switch
PR10DS	PR10 with both electrical high and low pressure shut off

Valeur	PR10	PR10D	PR10S	PR10SP	PR10DP	PR10DS
0	Time adjustment					
1	8	8	8	8	8	8
2	8	8	8	8	8	8
3	20	20	20	20	20	20
4	4	4	4	4	4	4
5		1	0	0	1	0
6						
7						
8						
9						
10						
11	Set to 111 to enter Machine Data menus					

MACHINE DATA

To enter the machine datas menus, you need to set the constant 11 to 111 and press 3 times the PROG key. The first machine data is displayed like shown here.



Const no.	Min. Value	Max. Value	Description
0	0	1000	Pipe length m
1	40	200	Pipe diameter mm
2	500	3000	Reel drum diameter mm
3	5.00	30.00	Windings pr. Layer
4	50	1000	Large drive sprocket no. of teeth
5	5	40	Small drive sprocket no. of teeth
6	1	20	Number of magnets
7	0.70	1.00	Ovality
8	0	45	First pulse to main valve sec
9	0	300	Short pulses to main valve msec
10	1	5	Time between short pulses sec
11	0	250	Number of short pulses
12	0	2	Shut-down system, 0 = Only regulator motor 1 = 2 Motors, inlet valve closes at low press 2 = 2 Motors, inlet valve opens at low press 3 = 2 Motors, the same as when 1, but there is a delay of 8 sec. after the stopsensor is activated.before the speed regulator stops the turbine. 4 = 2 Motors, the same as when 2, but there is a delay of. 8sec. before the speed regulator stops the turbine, after the stopsensor is activated
13	0.9	26.1	Closing pulse length to the regulator motor
14	0	2	0 = No pressure switch mounted 1 = Pressure switch mounted (start / stop) 1 = Start and stop by radio transmitter 2 = Pressure switch mounted (only start)

15	0	160	Distance between pulses mm 62.5 = Running with a roller Ø 80 mm 0.0 = Running by the formula
16	0	1	Opening of the main valve 0 = Fast opening. 1 = Slow opening
17	0	1	Supervision of the right speed 0 = Supervision off. 1 = Supervision on
18	0	1	Meter or foot readings in the display 0 = meter. 1 = foot

Constants programmed for PERROT hose reels given their configuration are listed in the following chart :

PR10	PR10 with mechanical shut off
PR10D	PR10 with electrical low pressure shut off
PR10S	PR10 with electrical high pressure shut off
PR10SP	PR10 with electrical high pressure shut off and pressure switch
PR10DP	PR10 with electrical low pressure shut off and pressure switch
PR10DS	PR10 with both electrical high and low pressure shut off

Valeur	PR10	PR10D	PR10S	PR10SP	PR10DP	PR10DS
0	Polyethylene hose length in meter					
1	PE hose diameter in mm					
2	Drum internal diameter in mm (see chart below)					
3	Number of turn per layer (see chart below)					
4	Drum crown gear – nb of teeth (see chart below)					
5	Gearbox gear – nb of teeth (see chart below)					
6	Magnet number (see chart below)					
7	Ovality of PE hose 0.89					
8		3	3	3	3	5
9			160	160		160
10			2	2		2
11			100	100		100
12	0	2	1	2	2	1
13	26.1	26.1	26.1	26.1	26.1	26.1
14	0	0	0	1	1	0
15	0 or 62.5	0 or 62.5	0 or 62.5	0 or 62.5	0 or 62.5	0 or 62.5
16		0	0	0	0	0
17	1	0	0	0	0	1
18	0	0	0	0	0	0

Number of turns per layer depends on hose reel model. The correct number is given in the following chart :

Ø PE	TR10	TR20	TR25	TR30	TR40	TR45	TR50	TR60	TR70	TR80
75	16.08									
82	14.92	14.92	14.92	15.723						
90	13.40	13.40	13.40	14.295	14.295	15.88				
100	12.15	12.15	12.15	12.866	Lg<465 12.866 Lg>465 13.122	14.58	14.370			
110					11.806	13.12	13.064	13.07	14.37	14.8
120							12.025	12.06	13.27	13.6
125							11.496	11.51	12.66	13.23

	TR10	TR20	TR25	TR30	TR40	TR45	TR50	TR60	TR70	TR80
Drum diameter	1300	1300	1500	1350 ou 1430 en Ø110	1430	1430	1700	1625	1625	2100
Drum crown Nb of teeth	228	228	216	228	285	285	192	240 (before serial n° 11/220) ; 256	256	334
Gear's nb of teeth	10	10	11	10	10	10	10	10	10	10
Magnet nb	4	4	4	4	4	4	6	6	6	6

PROGRAMMING OF 4 DIFFERENT SPEEDS :

The display should be set to the 5'th menu.
The pipe should be pulled out before programming, so the computer knows the distance of the field to be irrigated.

In the following it is assumed that the field length is 400 m.

Press the " PROG " key 3 times so the display show view 1.
The desired speed can now be set, here 25.0 m/h, then press the" PROG " key once, and the display will show view 2.
The desired distance can now be set, here 300 m, then press the " PROG " key once, and the display will show view 3.

Now the first zone is programmed, and the procedure is continued for all 4 zones.
Zone 4 automatic ends at 000m.

View 1 :

400m 30.0 000m
000m 30.0 000m
000m 30.0 000m
000m 30.0 000m

View 2 :

400m 25.0 000
000m 30.0 000m
000m 30.0 000m
000m 30.0 000m

View 3 :

400m 25.0 300m
000m 30.0 000m
000m 30.0 000m
000m 30.0 000m

View 4 :

DEL PRESS MENU
SAVE PRESS PROG

When zone 4 is programmed press again the " PROG " key and the display will show view 4.
If the " PROG " key is pressed the program is saved and the watering is carried out according to the program.
If the " MENU " key is pressed the program is deleted and the speed is the same for the whole field.
When the program is used it is saved so it can be reused after the machine is moved to a new field.
The program can always be checked at the 5'th menu.

SPEED SENSORS :

Program Rain 10 can be equipped with two different type of speed sensors.
One is a round sensor 60 mm in diameter and 4 sensors inside; this is only for rollers with one magnet rolling directly on the PE hose.
If this sensor is used the 3 jumpers near the display on the printed circuit should be placed in a row at the round symbol.
When the battery is connected, the display for 2 sec. shows " VERSION 6.50 ".

The other is a square sensor, with 2 separate sensors molded together. This sensor is usually located behind the gearbox in line with a disk supporting 4, 6 or more magnets.
If this is used the 3 jumpers near the display on the printed circuit should be placed in a row at the 2 line symbol.
When the battery is connected the display for 2 sec.showed " VERSION 6.51 ".

ELECTRONIC REGULATION WIRING INSTRUCTION :

Wire the different sensors, actuators, solar panels or battery to the electronic board terminal following the indications below :

Terminal nb	Peripheral descritpion	Wire color
1	+ battery	Brown 12 V
2	- battery	Blue
3	+ Solar panel	Brown
4	- Solar panel	Blue
5	Motor 1	Speed regulation
6	Motor 1	Speed regulation
7	Speed sensor 1	Blue*
8	Speed sensor 1	Black*
9	Speed sensor 2	Yellow/Green*
10	Speed sensor 2	Brown *
11	Stop sensor	Blue or Brown
12	Stop sensor	Blue or Brown
13	Motor 2	Stop motor
14	Motor 2	Stop motor
15	Pressure switch	Blue or Brown
16	Pressure switch	Blue or Brown
17	BIP-	

18	BIP+	

When a roller on the PE hose is used and if distance is counted the wrong way, invert wires from terminals 8 and 9.
When a square sensor is used and if the disctance is counted the wrong way, invert wires 7&8 with wires 9&10.

TROUBLE SHOOTING :

1. **The turbine can not start by pressing START. Pre-and post-irrigation can not take place.**

Answer: Magnet for stop-sensor is not on its place, or cable or sensor is damaged.
Stop sensor: The mark ▓ must be on when the magnet is in place, and it disappears when the magnet is removed. See menu 3.
A damaged cable can be repaired but absolutely watertight. At least encapsulated in epoxy.
But a new sensor and cable is recommend.

If pressure sensor is used there must be pressure on the water. The mark ▯▯for pressure must be on.

2. **Blank screen.**

Answer: Battery interrupts. Fuse inside the box is blown. The fuse is for wrong connection of + and - . From the factory there are an extra fuse on a single fuse-holder on the printed circuit.
Fuse 5 A. Battery electric voltage 12 V. See menu 2.

3. **The clock shows 00:00.**

Answer: If the power has been interrupted the clock will go to zero. Therefore in stead of showing the finish time it is the number of hours and minutes to the irrigator is finish that is showed. Set the clock and the time to the irrigator is finish will be showed. See setting the clock.

4. **Distance meter is not correct and the speeds not correct.**

Answer: Look for damaged cable or sensor. The 2 marks ▓ must appear during pulling out the tube in order from the left as following: The first appears, the second appears, the first disappears, the second disappears. During retraction it must go in opposite order. See menu 3 speed sensor.
It is the same if a roller running on the tube measures the speed.

5. **Only maybe the half or 2/3 of the real length is counted up.**

Answer: The stop mechanism can be activated a short time by hopping of the tube or if the windings around the drum are losing. It can cause the magnet removed from the stop sensor a short moment. It will set the counter to zero.
In spite of the pullout distance of the tube is incorrect, the irrigator will run to the end and stop normal. But incorrect speed depends of the incorrect registration of the actual layer. If required the correct number of metres can be set in. See CONSTANT no 7.

MOST FREQUENT COMBINAITION OF CONSTANTS :

With constants factory adjusted the machine always will run. But there are different conditions from farm to farm and there are also different wishes from the farmer. Therefore some constants can be adjusted for local wishes.

1. Slowly start of turbine. Machine data no. 13. Adjust the to value to 4 sec to start.
Now the valve for control of speed will close about half and continue stepwise until the adjusted speed are reached. Correct adjustment is: Continuously closing of the valve until the turbine is start running and stepwise until adjusted speed are reached.

2. Slowly opening for inlet of water. Machine data no. 16. Set the value to 1. =
Opening for the water stepwise.

3. Only 1 motor for speed regulation. Machine data no. 12. Value 0.
Post irrigation must take place as following: When the stop sensor is activated, only the retraction stops. After the time for post irrigation the machine start again and run to the mechanic stop.

4. Start up of no. 2 machine when no. 1 machine reaches the stop.
Machine data no. 14. Value 2.
The machine must be equipped with adjustable pressure switch. Adjust the pressure switch to a point between the normal pressure and the pressure when the pump will stop.
For instance: Normal pressure 7 bar and pressure for pump stop is 9 bar. Adjust the pressure switch to 8 bar on both the machines. Start no. 1 machine as normal by pressing start. Set up no. 2 machine but press stop. When no. 1 machine comes to slowly close down no. 2 machine will start up when the pressure reach 8 bar. Be aware on that 10 m different on the field level is 1 bar.

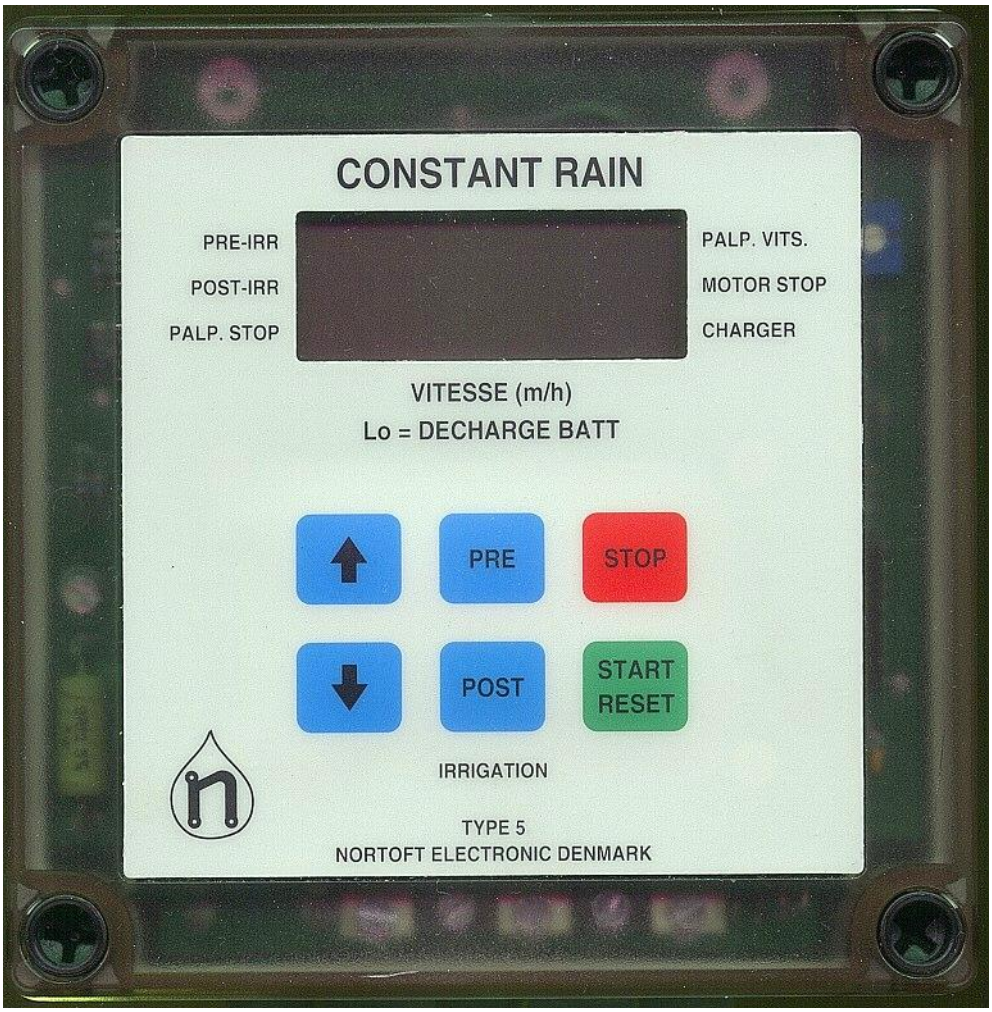
5. Stop with low pressure and pressure switch mounted. Constant no. 5. Value 1.
Machine data no. 12 must be value 2.
Stop motor turns in opposite direction. It means that with the same cable connection to the motor the valve will open for stop. After 2 minute the valve close again Stop-sensor, stop-button and supervision can open the valve. But the pressure switch can not open the valve.

6. Pre-irrigation before the gun reaches the stop.
Constant no 6 can be set to the number of metres where it is wanted that the post irrigation should take place.
Max 15 metre.

CONSTANT RAIN 5

User's Manual

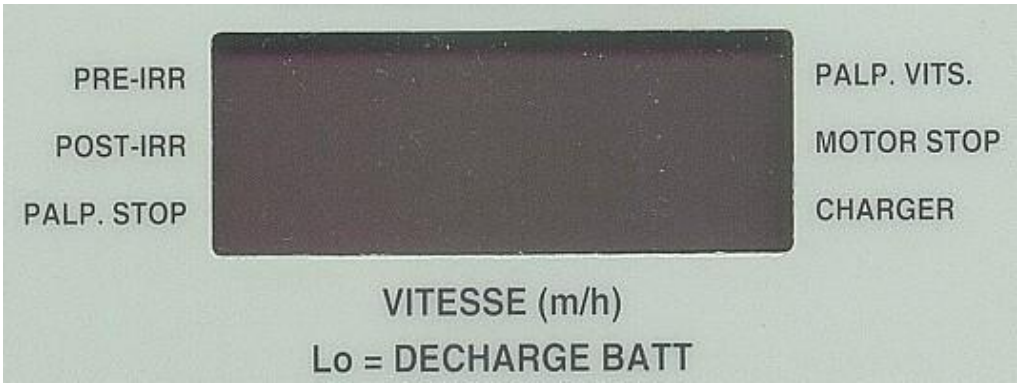
10-03-03



Features:

- Speed regulation.
- Pre- and post- irrigation.
- Battery Lo.Bat.
- Charger on/off. Solar panel.
- Speed sensor.
- Stop sensor.
- Motor 1, regulation motor.

Display



If the display shows Lo. in stead of speed, the battery voltage is lower than 11.8 V and the battery need to be charged.

Start:

Constant no 5 = 1

When the ”START” key is pressed, the by-pass valve closes (the turbine starts).
The turbine is automatic in start position if the rolle has not turned for some minutes.
About 5 min depending of the speed

Stop:
Constant no 5 = 1

When the magnet is removed from the stop sensor and post-irrigation is not chosen, nothing will happen, and the pipe is pulled in to mechanical stop.
If post- irrigation is chosen, the turbine stops when the magnet is removed from the stop sensor, and after the post-irrigation time the turbine starts and the pipe is pulled in to the mechanical stop. If the key ”STOP” is pressed the turbine stops, but the turbine will slowly speed up again independed of the position of the magnet at the stop sensor.
If post irrigation is not wanted, mounting of stop sensor is not necessary.

SPEED:

The speed is adjusted with the arrow keys, the speed first changes by steps of 0.1 m/h, then after 10 steps it changes by 1.0 m/h.
The speed can be changed at any time, even whilst the machine is running.
The speed cannot be changed whilst the motor are running.
It is shown in the display by a flashing bar to the right in the middle.

PRE-IRRIGATION:

Pre-irrigation can be activated by pressing the key " PRE ".
The time for pre- irrigation is calculated by the Constant Rain as 8 x the time for running 1 metre at the actual speed.
The constant " 8 " (constant no. 1) can be changed, see programming.
If the pre-irrigation is on, the machine starts and run 1/2 metre, the n it stops for the pre- irrigation time.
By pressing the key " START/RESET " the pre- irrigation is cancelled.

POST-IRRIGATION:

Post-irrigation can be activated by pressing the key " POST "
The time for post-irrigation is calculated by the Constant Rain as 8 x the time for running 1 metre at the actual speed.
The constant " 8 " (constant no. 2) can be changed, see programming.
The post-irrigation starts to count down when the magnet is removed from the stop sensor.
When the magnet is removed, the motor for speed regulation stops the turbine. After the post irrigation time the turbine starts and run to the mechanical stop.
By pressing the key " START" the post-irrigation is cancelled.
The magnet at the stop sensor should be in place, before activating the post- irrigation.

Start: If constant no. 5 = 2
The turbine can only start if the magnet activates the stop sensor.
When the ”START” key is pressed, the by-pass valve closes (the turbine starts)
If the stop sensor is not activated by the magnet the motor does not turn.

Stop: If constant no. 5 = 2.
When the magnet is removed from the stop sensor, the turbine stops and remain stop as long as the magnet is removed.
If the key ”Stop” is pressed the turbine stops, but the turbine will slowly speed up again as long as the magnet at the stopsensor is activated.
There are different constants that can be set by the user.
These constants will be saved for years even if the battery is disconnected.

Programming procedure:

Press rapidly the "POST" key 3 times to gain access to change the constants.
By subsequently pressing on the "POST" key the constant no. will step forward.
With the arrow keys the constant value can be changed. The Constant Rain 5 goes back to normal and **saves the constant by pressing the key "PRE".**
If the key "PRE" is not pressed the Constant Rain 5 switches back to normal after 1 minute, and the changes of the constants are not saved.
The constants are saved, even if the battery is disconnected for a longer period.

Const no	Note	Fact adj	Min value	Max value	Description
1		8	1	15	15 Pre-irrigation
2		8	1	15	15 Post irrigation
3		100	-	-	- Code to program constant 4 and 5 is (111).
4		63	40	160	160 Distance between pulses.
5		1	1	2	2 Stop system: 1 = Stop sensor mounted, post irrigation. 2 = Stop sensor mounted, the turbine stops when the magnet is removed from the stop sensor. No post irrigation possible

Constant Rain 5. Cable connection

1	+ Battery	Brown	12 V
2	- Battery	Blue	
3	+ Solar Panel	Brown	
4	- Solar Panel	Blue	
5	Motor		Speed Regulation
6	Motor		Speed Regulation
7	Speed sensor	Blue or Brown	
8	Speed sensor	Blue or Brown	
9	Stop sensor	Blue or Brown	
10	Stop sensor	Blue or BrownBlue or Brown	

FUSE 5 Amp FAST

NOTES