ASTRA DXL - INSTRUCTIONS FOR USE

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FOREWORD

Dear PERROT customer,

Your new ASTRA – Series "DXL" irrigator will give you full satisfaction for many years if it is used under normal conditions and if it is given the appropriate and regular maintenance.

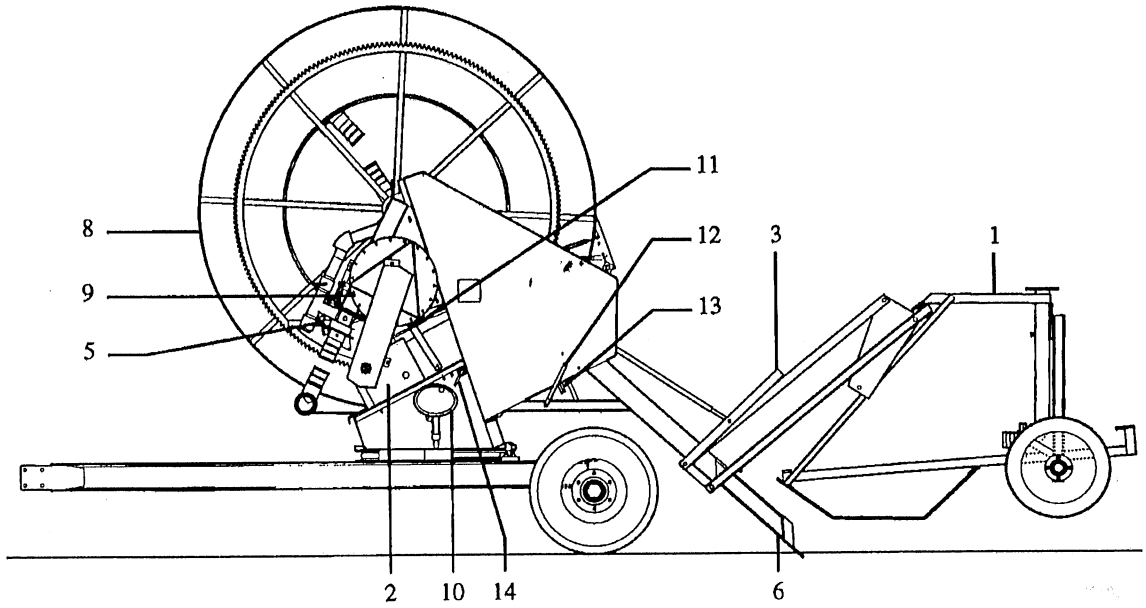
Would you please read carefully these instructions for use and let them know to the other users of your irrigator.

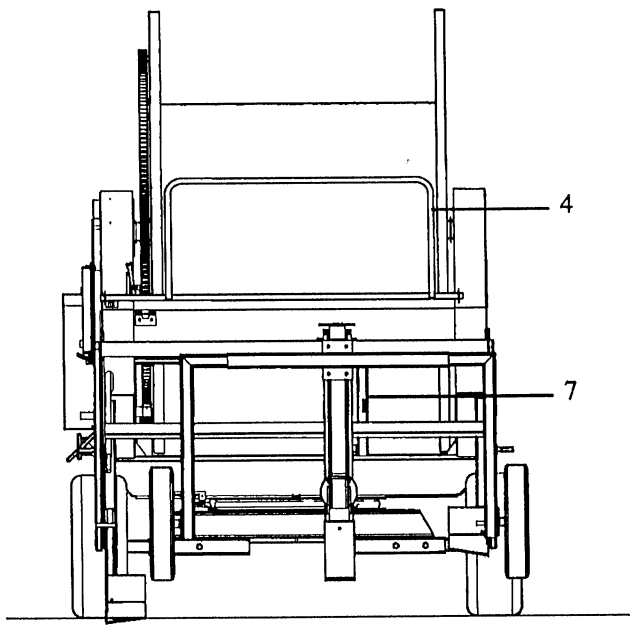
We would advise you more particularly to pay the greatest attention to all the instructions regarding safety.

We shall be pleased to let you have further copies of this manual on request.

By purchasing a PERROT SA irrigator, you will also benefit from the service and support provided by all our staff and network of dealers. Do not hesitate to call us for advice!

GENERAL DESCRIPTION





- 1 Sprinkler cart
- 2 Gearbox
- 3 Stop lever
- 4 Sensor
- 5 Switch-off valve
- 6 Stabilizer
- 7 Pipe guide
- 8 Reel
- 9 Turbine
- 10 Mechanical turning device
- 11 Clutch release lever
- 12 Upward/downward movment lever for stabilizers
- 13 Stabilizer lock lever
- 14 Reverse lock catch

HANDLING – ASSEMBLY

Handling

The ASTRA DXL irrigator is supplied in three parts:

-the winder

-the cart

-the accessories (cart wheels, feed hose...),

Assembly

- Assembly of the sprinkler cart:

Refere to the spare parts manual for the assembly of the different components of the cart.

- Reassembly of the pick-up system.

The pick-up arms are secured with straps for transport. The parts are heavy and may fall suddenly when you cut the straps. So be very careful.

To reassemble the unit, move the stabilizers down and let the pick-up arm rest until it comes to stop on the stabilizers. Reassemble the pick-up flat plates as shown on the spare parts manual. (See page 7-8).

- Unwind the PET hose a few meters and hook it to the cart.

- Rewind the PET hose so as to pick up the cart and couple it automatically to the irrigator.

CAUTION: Do not wind the hose after the release of the stops. Beyond this limit, a strong effort is applied to the sensor. So a breakage may occur.

Figure 1:

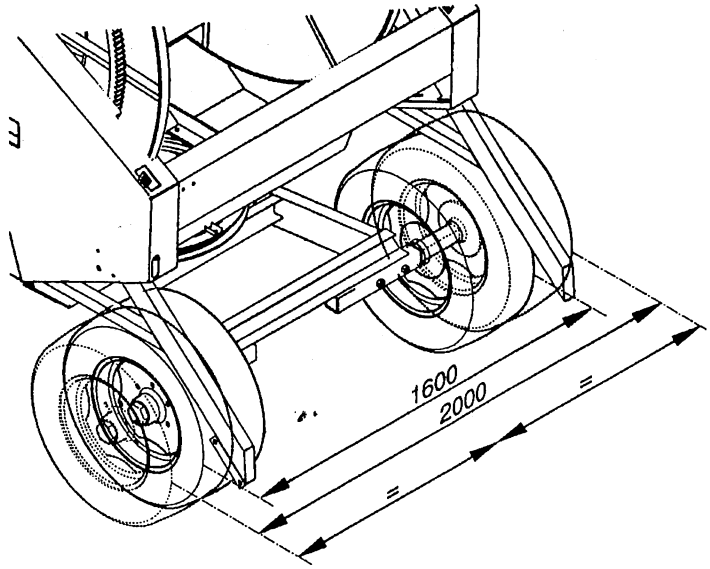


Figure 2:

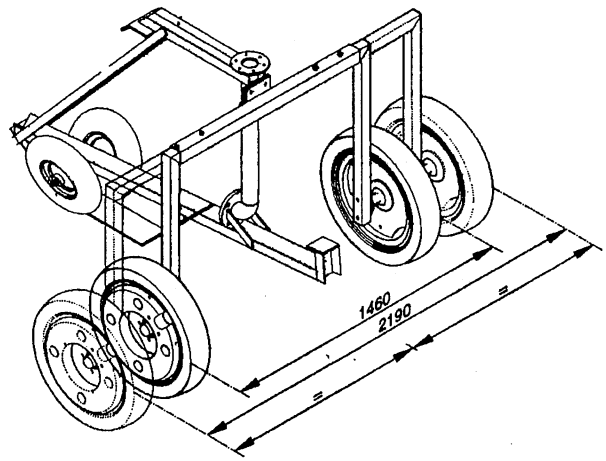
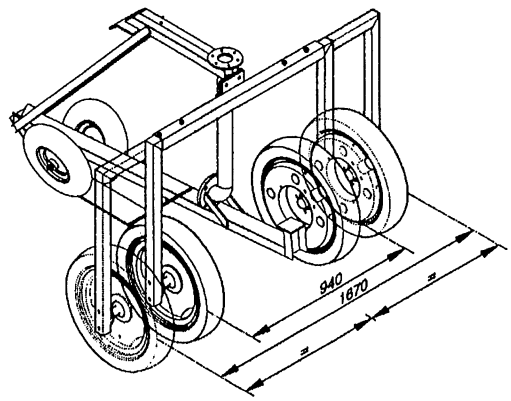


Figure 3:



ADJUSTMENT - INSTALLATION - CHECKINGS

Pressures, protective devices, lubrication values, tension of chains, condition of 12V battery

- Check the following points :

- Tyre pressures of the irrigator and the sprinkler cart
- Tension of each of transmission chains
- Lubrication of all the organs fitted with nipples, and chains.
- The good condition of the regulation battery.

- See chapter "maintenance and servicing" to have pressures and lubrification.

Sprinkler cart and irrigator track widths

- Adjust the track widths of the sprinkler cart and the irrigator according to your needs (See figure 1-2-3).

Table 1:

	Irrigator (Figure 1)	Sprinkler cart with wheels inside (Figure 2)	Sprinkler cart with wheels outside (Figure 3)
Minimum track width	1600	940	1460
Maximum track width	2000	2190	1670

Figure 4:

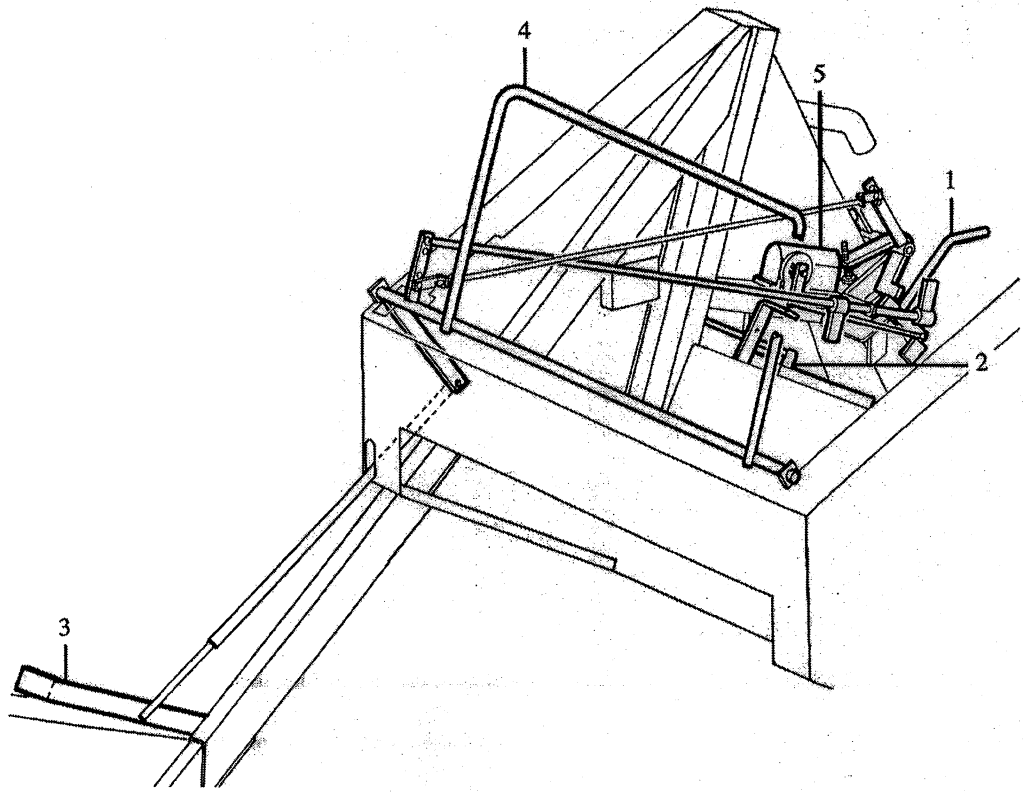
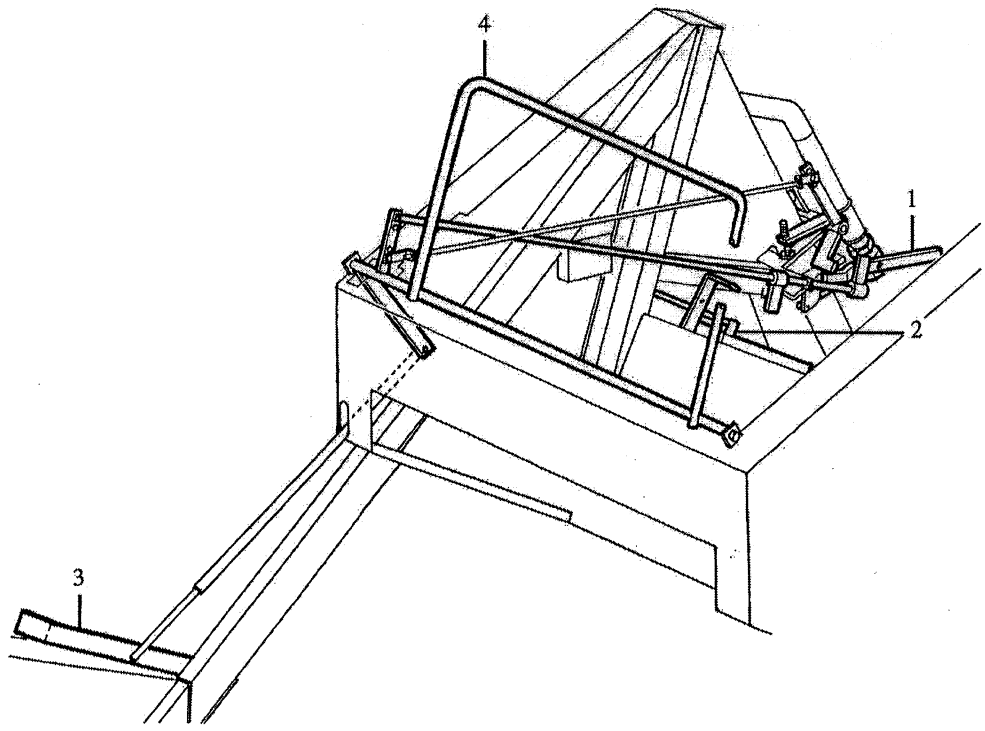


Figure 5:



Switch-off adjustment

High pressure option (See figure 4)

- Lift the stop valve (1) to switch it on and engage the gearbox by operating the lever (2).
- Release the stop valve by pulling the stop lever (3) or the safety sensor (4).
- Declutching of the gearbox must occur after the release of the valve.
  CAUTION : Operating the emergency stop lever (3) after the release of the stops generates big stresses on the sensor which may sometimes break off.
- Check the time required for the valve closure (max. closing time : 1mn30s). This time should be long enough to avoid "hammering" in the water feed pipe.
- Depending on the use, adjust the closing speed by screwing in (slows down the closure) or unscrewing speeds up the closue) the screw located on the brake retarder (5).

Low pressure option (See figure 5)

- Switch on the stop valve (1) and engage the gearbox (2).
- Release the stop valve by pulling the stop lever (3) or the safety sensor (4).
  CAUTION : Operating the emergency stop lever (3) after the release of the stops generates big strsses on the sensor which may sometimes break off.
- Declutching of the gearbox must occur after the release of the valve.
- The opening of the valve must occur quickly and till itxtravel stop.

Figure 6:

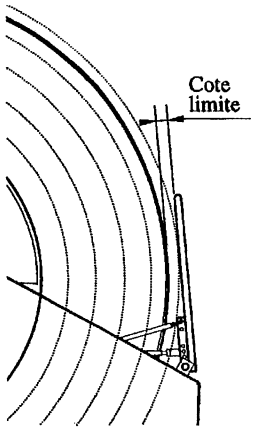


Figure 7:

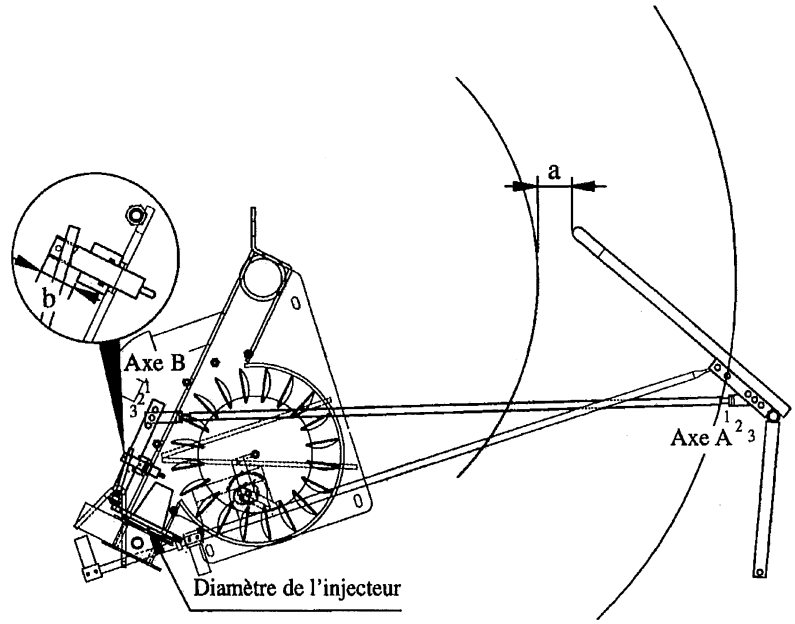
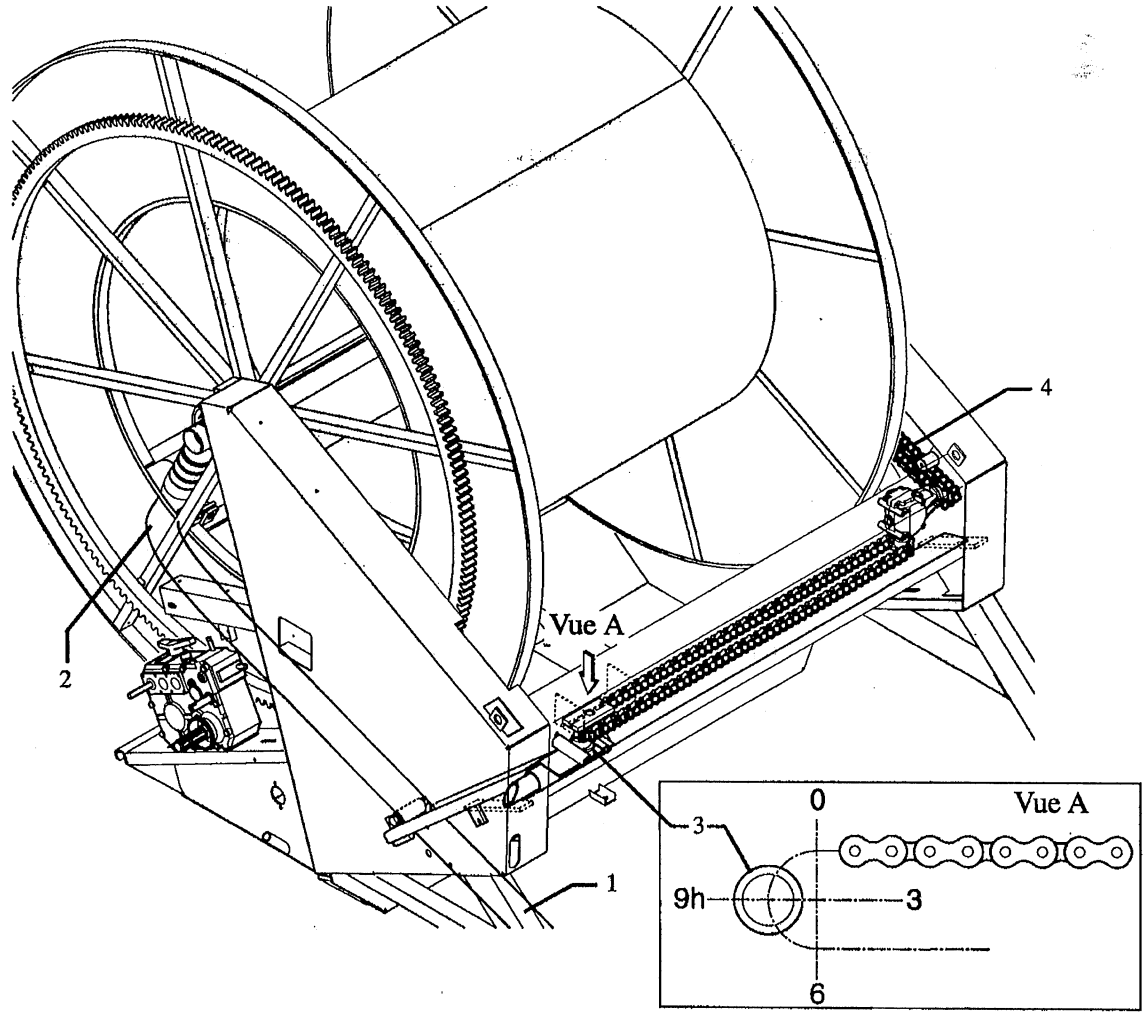


Figure 8:



Reel turning safety – Safety sensor

-In case of a bad winding of the last polyethylen hose layer, the latter is likely to run out of the reel. To avoid this, the safety sensor must stop the reel turning before the polyethylen goes out of the reel. So please check the release of the stop before the limit size is exceeded (See figure 6).

Table 2:

Ø Polyethylen	75	82	90	100
Limit size	37	41	45	50

Regulation adjustment

- Check the different sizes on the deflector and on the sensor. In the case of an electronic regulation system and regardless of the diameter of the PET hose, particular adjustments shall be carried out (See figure 7).

Table 3:

	Ø injector	Dimension a	Axle A	Axle B	Dimension b
DXL Ø100	32	140	3	2	41
DXL Ø90	28	130	3	2	39
DXL Ø82	24	122	3	2	38
DXL Ø75	22	115	3	2	36
DXL with electronic		140	3	1	55

Adjustment of the pipe guide system (See figure 8)

-When starting up the system, polyethylen (1) hose being completely unwound and the reel (2) elbow being vertical to the reducing gear, the pawl (3) shall be in the 9:00 h position (See view A).
-Otherwise disassemble the chain which goes from the reel shaft to the angular gear, move the pawl (3) and reassemble the chain.

Figure 9:

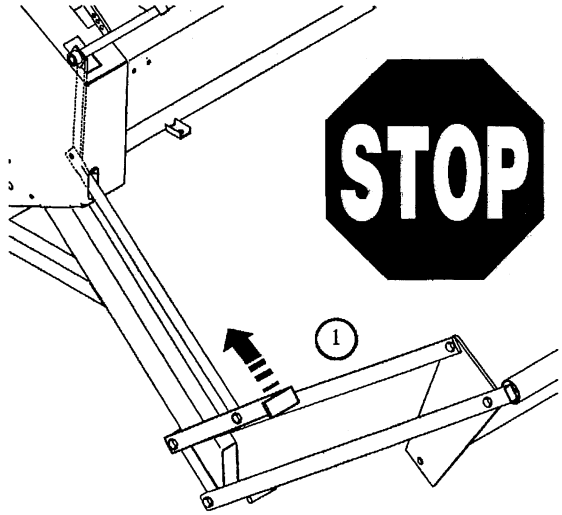
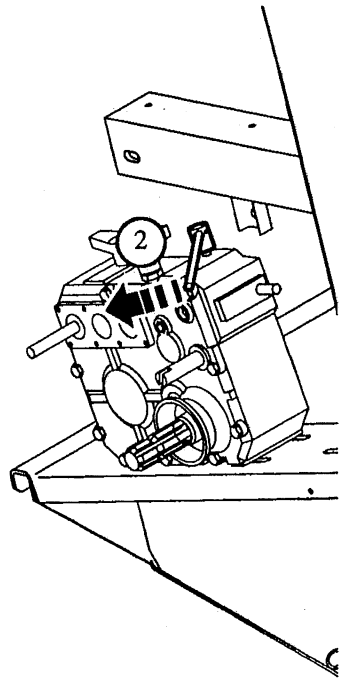


Figure 10:



SAFETY – EMERGENCY STOPS – RESIDUAL RISKS

Description of the possible stops :

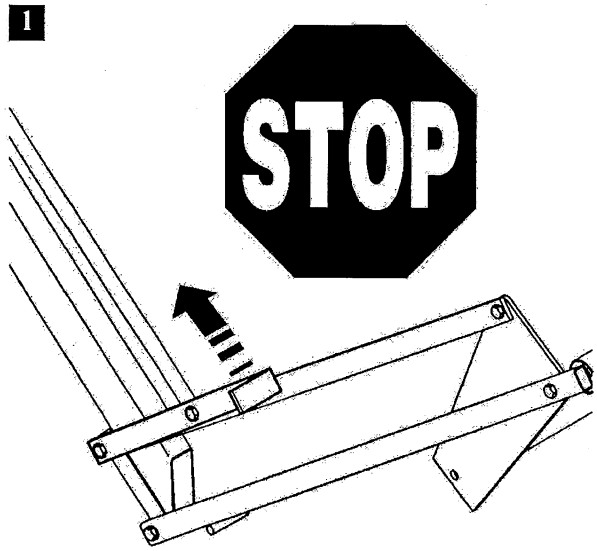
- In case of incidents or when you want to stop the machine voluntarily, there are two possible ways to do it.
- Pull the emergency stop flat piece (1). The shutdown valve operates and the reducing gear is disengaged. Winding and water flow are switched off (See figure 9).
- Operate the clutch release lever (2). In this case, only winding is stopped. However water goes on flowing through the irrigator (See figure 10).

Description of the hazardous areas:

- Although the greatest care has been brought right from the design of the machine and in spite of all the protective devices attached close to the hazardous areas, we would like to draw your attention to certain areas exposed to residual risks. Therefore we request you to locate on the irrigator the hazardous areas which are still accessible in spite of our precautions:

  - Shearing risk for flat parts and pick-up arms.
  - Crushing risk for the gears of all chain drives.
  - Crushing risk for the gearbox output pinion when it catches in the ring gear.
  - Crushing risk for the cart and stabilizers when moved down.

1



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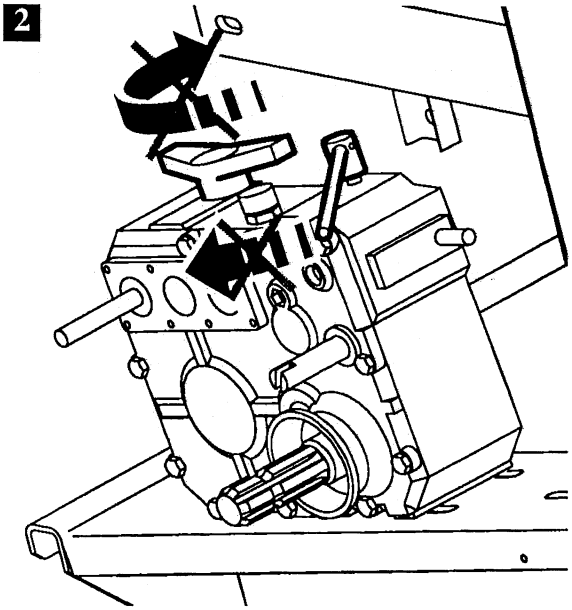

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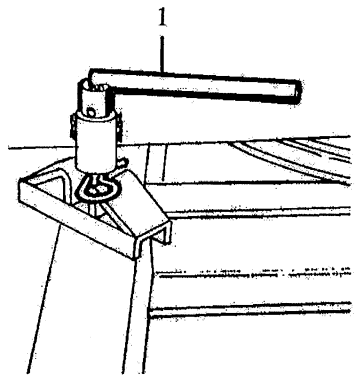

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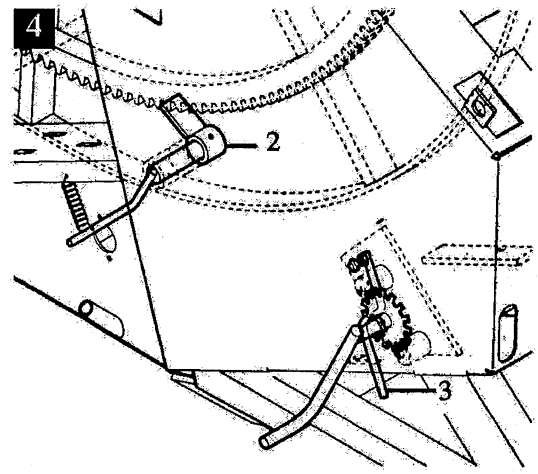

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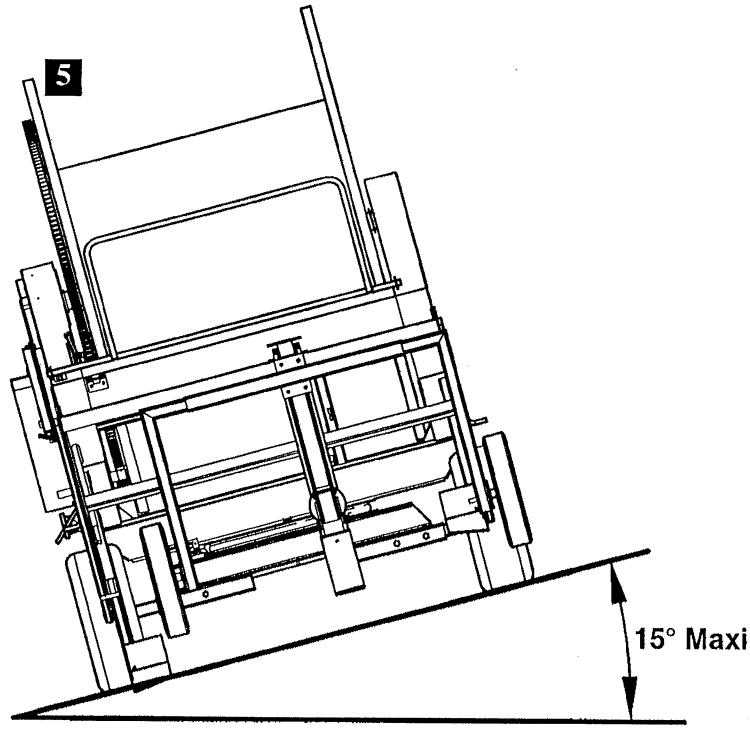


Main safety instructions:

- Do not open water supply systems when the irrigator is under pressure.
- 1 For the emergency stop, pull the emergency stop flat piece.
- 2 During the pulling in, never declutch the reducing gear and near shift gears.
- 3 4 When moving the irrigator, check whether the anchoring system (1) of the turntable is properly located; make sure that the reverse lock catch (2) is correctly engaged and the stabilizers are locked (3).
- 5 Never move the irrigator on slopes with a gradient of more than 15%.
- To move the irrigator, the fixed coupling ring shall not be connected to another fixed element of the tractor (hole bar, fixed flange…).

Figure 11:

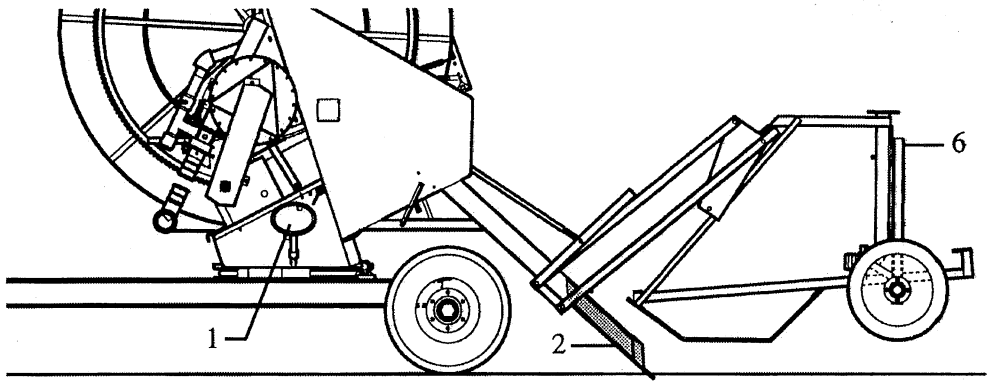


Figure 12:

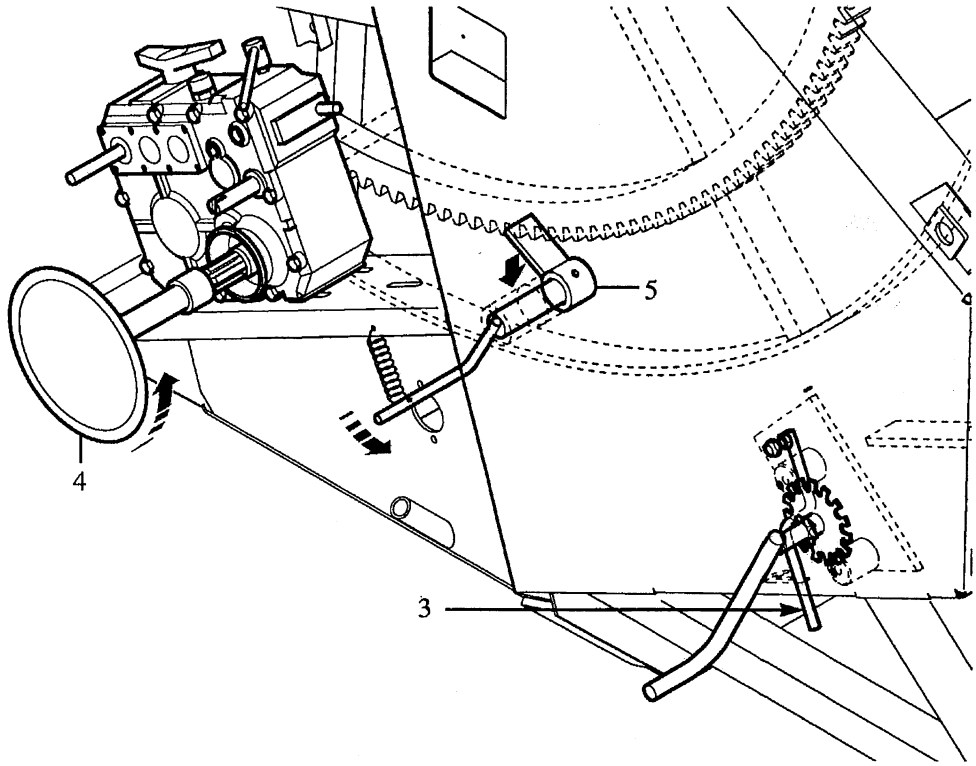


Figure 13:

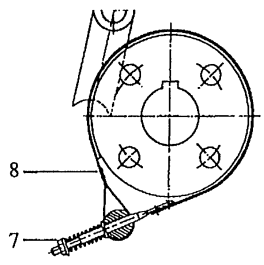
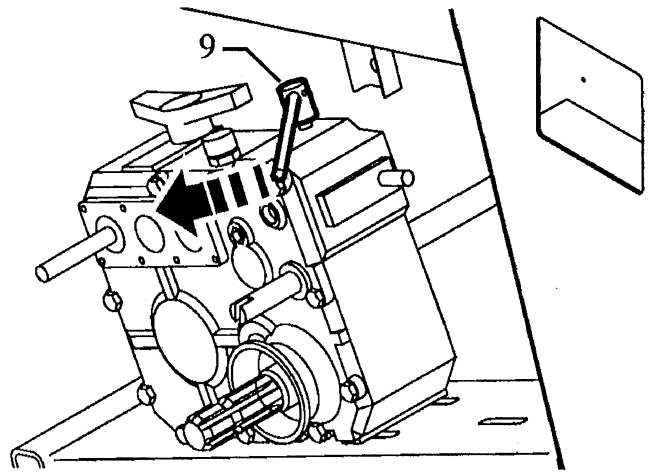


Figure14:



CURRENT USE

Setup (See figure 11-12)

- Place the irrigator on a horizontal and stable ground. On certain slopes, the automatic pick-up may not operate.
- By means of the turntable system, direct the central part of the reel in the pulling direction of the polyethylen hose by turning the control handwheel (1).
- Lock the turntable system by lowering the two stabilizers (2).
- Anchor the stabilizers securely into the ground. If the ground is hard, proceed by jerks. Lock the stabilizers by means of the lever (3).
- Using the crankwheel (4), pull in the polyethylen hose slightly in order to unlock the reverse lock (5) catch and let the sprinkler cart (6) come down slowly to the ground. Le chariot doit toucher le sol, et la barre de relevage pouvoir poursuivre sa course sous la gamelle du chariot.

⚠ **CAUTION :** Make sure that nobody stands near the sprinkler cart or the pick-up system.

Unwinding – laying (See figure 11-12-13-14)

- Check whether the reverse lock catch (5) is not engaged.
- ⚠ **Remove the crankwheel (4) from the P.T.O. shaft.**
- Loosen the set screw of the brake (7) located on the reducing gear until the drum strap (8) is disengaged, then tighten again gently with the hand.
- Disengage the reducing gear by means of the clutch release lever (9).
- Couple the sprinkler cart to the tractor.
- Unwind the hose slowly; max. speed : 2 km/h
- Once the hose has been laid out a few meters, stop unwinding to check whether the brake works properly. No turn of the coil shall be slackened. Tighten the brake if required.
- If the end of the unwinding procedure is difficult, try to loosen the brake.

OBLIGATORY : At the first start-up of the system:

- Unwound the polyethylen hose totally.
- Adjust the direction system of the sprinkler.
- Check whether the pipe guide system is adjusted correctly.

Figure 15:

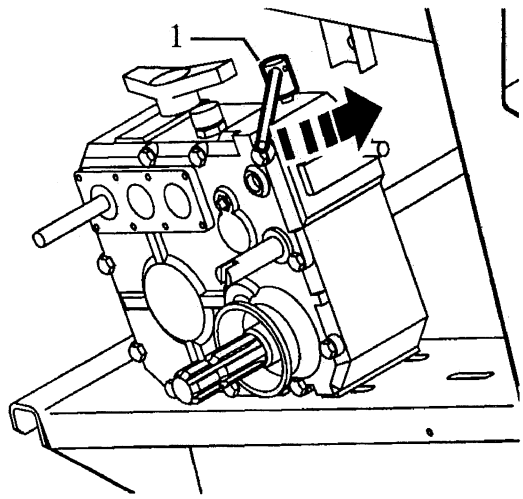


Figure 16:

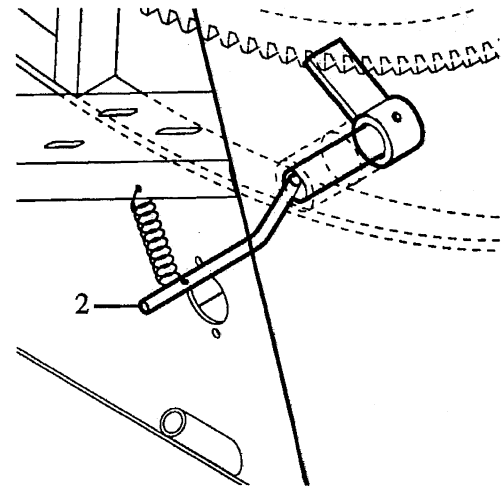


Figure 17:

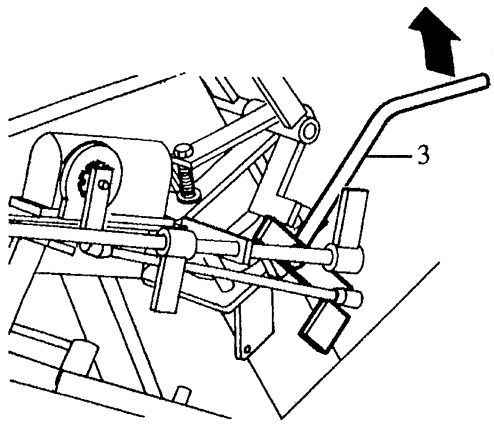


Figure 18:

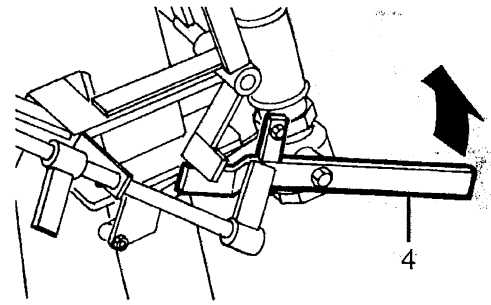
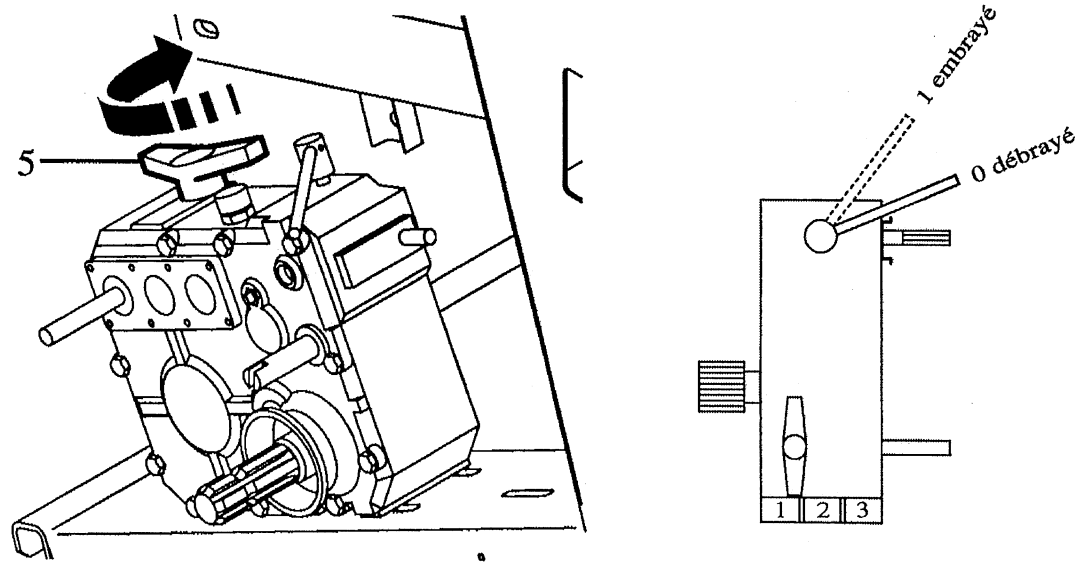


Figure 19:



Winding

- Clutch the reducing gear (1).
- Engege the reverse lock catch (2).
- Engege the switch-off valves (3) and (4).
- Connect the water supply hose.
- Set the pulling-in speed by means of the water quantity sheet (see instructions for use on pages 24-25).
- Select the reducing gear speed wanted (5). Do not modify it when the polyethylen hose is under tension.
- Apply water while increasing the pressure gradually.
- At the initial start-up, carry out the adjustment of the mechanical regulation except when the electronic regulation is used.
- Adjust the travelling speed of the sprinkler cart by means of the by-pass valve in order to obtain the selected rev-counter speed. For this latter adjustment, wait until the speed remains constant.

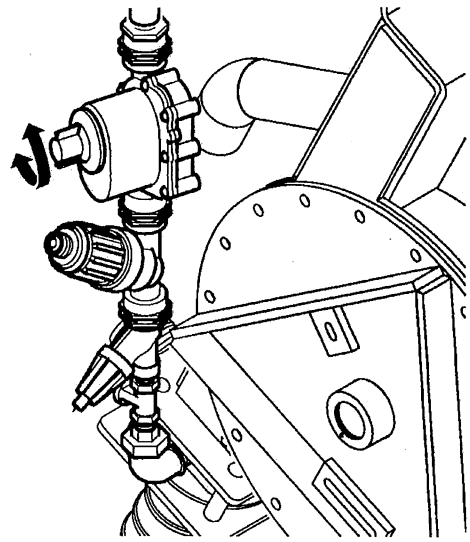
Handling the reducing gear with the crankwheel

A shaft located on the front part of the reducing gear (56) allows to use the crankwheel to handle the reducing gearbox. More particularly the user can :

- Clutch, change gears, engage or disengage easily the reducing gear, using the levers effortlessly
- Tighten up the turns of the reel. To provide a correct piling of the PET hose layers, make sure that the turns still on the reel are pressed contiguously against the ferrule, before starting pulling-in.

CAUTION : Do not leave the crankwheel on the shaft.

Figure 20:



Irrigation compensator

- Program the flowrate valve of the irrigation compensator (See figure 20) by selecting the total discharge according to the water quantity wanted (See table n° 4).

Table 4:

Nozzle Ø (mm)	8 mm		9 mm		10 mm		11 mm	
Pressure (bars)	4	5	4	5	4	5	4	5
Range (m)	21	23	22	24	23	25	24	26
Flow rate (m^3/h)	4,86	5,48	6,16	6,94	7,6	8,57	9,2	10,38
Adjusted volume (m^3)	25	25	25	25	25	25	25	25
Rain quantity (mm)	36	30	33	28	30	25	28	24
Time (h:min)	5:08	4:33	4:03	3:36	3:17	2:55	2:43	2:24

The water quantity has been calculated for a 180° distribution range

IMPORTANT
To display the flowrate wanted :
PRESS THE HANDWHEEL OF THE COUNTER BEFORE TURNING IT
TURN IN THE DIRECTION OF THE ARROW

- Adjust the range system of the sprinkler.

TECHNICAL FEATURES AND LIMITING VALUES

Weight of the irrigator :

Table 5:

In kg	Ø75-420	Ø82-390	Ø90-360	Ø100-330
Without load	2150	2200	2300	2350
With water	3450	3700	3900	4200

Sizes of the irrigator :

Table 6:

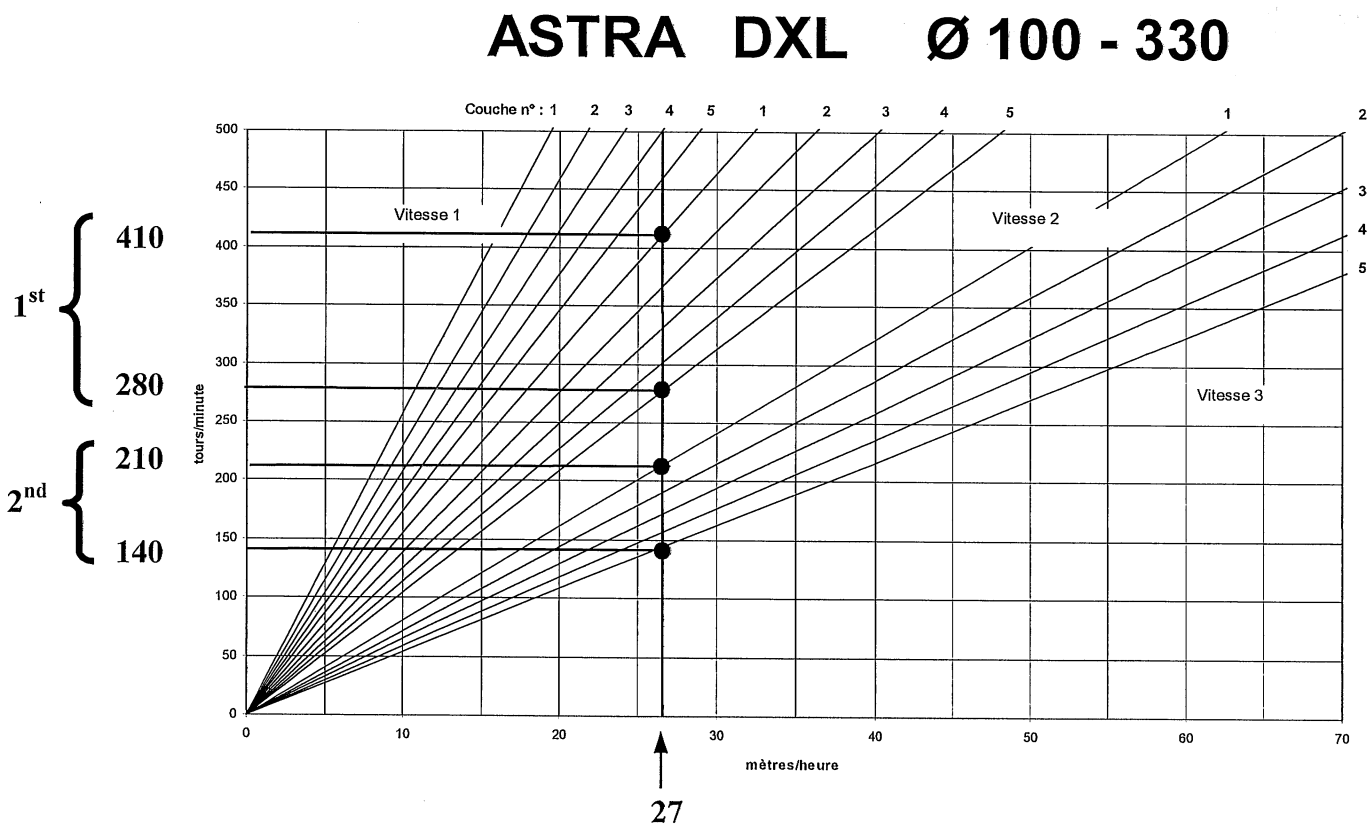
	ASTRA DXL Irrigator
Overall height	3.18m
Overall width	2.28m
Length with sprinkler cart	5.62m
Length without sprinkler cart	4.10m
Clearance under frame	0.32m
Min. & max. height – coupling ring	0.37 to 0.52m (4 positions)
Tyres	275/60R15
Sprinkler cart track	0.94 to 2.19m
Irrigator track	1.6 to 2m

Rain quantity sheets for an ASTRA DXL Ø100-330

Table 7:

Buse conique (mm)	Pression enrouleur (bar)	Pression au canon (bar)	Débit au canon (m3/h)	Ecartement (m)	Surface arrosée (Ha)	PLUVIOMETRIE en millimètres					
						15	20	25	30	35	40
						VITESSE D'AVANCEMENT en mètres par heure					
20.3 (0.8")	5,60	4,00	33	70	2,5	31	23	19	16	13	12
	6,80	5,00	36	75	2,7	32	24	19	16	14	12
	8,00	6,00	39	79	2,8	33	25	20	17	14	13
22.9 (0.9")	6,20	4,00	42	74	2,7	38	29	23	19	16	14
	7,50	5,00	46	80	2,9	38	29	23	19	16	14
	8,70	6,00	51	84	3,0	40	30	24	20	17	15
25.4 (1.0")	6,80	4,00	52	79	2,9	44	33	26	22	19	16
	8,20	5,00	57	85	3,1	45	33	27	22	19	17
	9,60	6,00	62	89	3,3	47	35	28	23	20	17
27.9 (1.1")	7,70	4,00	62	82	3,0	50	38	30	25	22	19
	9,20	5,00	69	89	3,3	51	38	31	26	22	19
	10,80	6,00	76	94	3,5	53	40	32	27	23	20

Table 8:



Water quantity sheets

-To set these water quantity sheets, field tests have been carried out with a speed adjusted to obtain a water quantity of 25 mm; the range is calculated with no wind, a flat relief and a sprinkler yield ranging from 70% to 80% depending on cases. The values of the table corresponding to water quantities other than 25mm have been extrapolated from the measured values. The water quantity sheet of this manual is given for your guidance.
-For the calculation of the speed, please refer to the plastic sheet supplied with the irrigator.

Instructions for use:

Starting from the diameter of the sprinkler nozzle, the pressure onto the irrigator and the wanted water quantity, it is possible to determine a pulling-in speed.

Ex: DXL Ø100-330m see sheet opposite
Data:
Nozzle Ø: 25,4 mm
Irrigator pressure: 8,2 bar
Water quantity wanted: 25mm
The pulling-in speed shall be 27 m/h

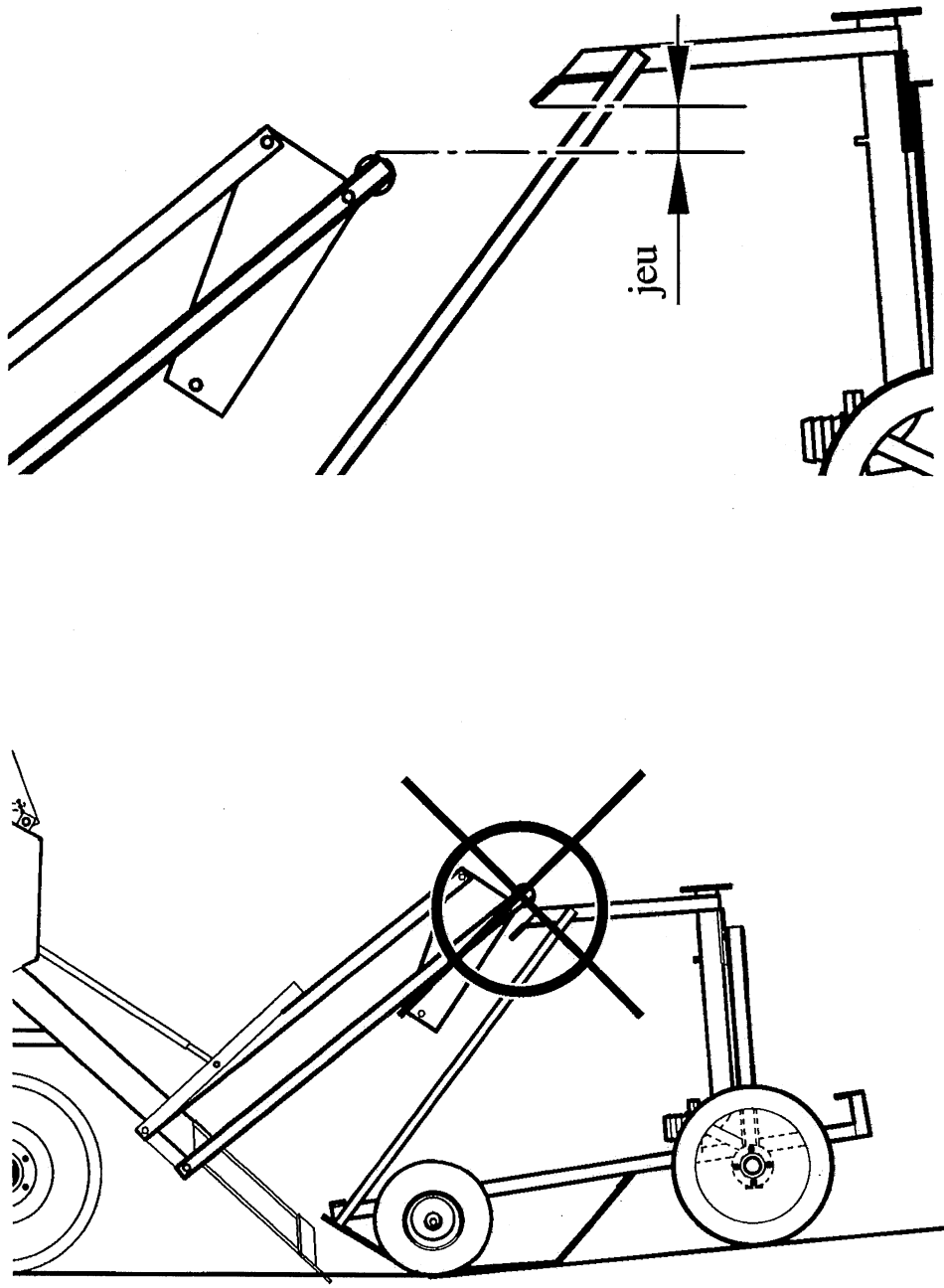
Then by reporting the speed determined on the diagram, it is possible to determine the revcounter speed to be adjusted. It should be noted that depending on the case, several gearbox speeds can be accepted to get the pulling-in speed wanted. In this case, priority shall be given to the one which allows rev-counter speeds ranging from 100 rpm to 350 rpm.

Ex: DXL Ø100-330m see sheet opposite
Pulling-in speed wanted: 27m/h

1st choice: 2nd gear
rev-counter speed to be adjusted in the 1st PET hose layer : 410 rpm
rev-counter speed when winding ends : 280 rpm
2nd choice: 3rd gear
rev-counter speed to be adjusted in the 1st PET hose layer : 210 rpm
rev-counter speed when winding ends : 140 rpm

We choose the 2nd choice.

Figure 21:



Correspondence table - nozzles – injectors

The series-mounted injection nozzle of the turbine enables the most usual irrigation conditions. However for specific uses (high pulling-in speeds, low pressures...) a wide range of injectors is available. Anyway you should know that an optimal injector diameter corresponds to each sprinkler nozzle diameter.

Table 9:

Type of sprinkler	Ø sprinkler nozzle	Sprinkler pressure (bars)	Flow rate (m^3/h)	Injector
Rain Bird SR3003	16mm	5	20.8	22
	18mm	5	26.2	26
	20mm	5	32.4	28
	22mm	5	39	30
	24mm	5	47	34
Rain Bird SR2005	0.8"	5	35.7	28
	0.9"	5	46.2	32
	1.0"	5	56.7	34
	1.1"	5	68.6	36
Nelson SR100	16.5mm	5	23.6	22
	17.8mm	5	27.5	26
	19.1mm	5	31.2	28
	20.3mm	5	34.9	28
	21.6mm	5	40.5	30
	22.9mm	5	45.2	32
	25.4mm	5	55.6	36
Nelson SR150	17.8mm	5	27.5	26
	20.3mm	5	35.7	28
	22.9mm	5	45.2	32
	25.4mm	5	56.0	34
	27.9mm	5	68.2	38

Use limits of the sprinkler cart, pick-up problems (See figure 21)

1- The sprinkler cart as such is designed to operate under the most usual conditions. However under certain circumstances, e.g. use of stand pipe extensions, big flow rates, narrow cart tracks or steep slopes, to prevent the cart from overturning, it may be necessary to add ballasts to the two standards ones.

2- Make sure than when winding is performed, the cart can be coupled automatically to the crossbar. Anyway the "dish-shaped plate" of the cart shall be above the pick-up bar.

Figure 22:

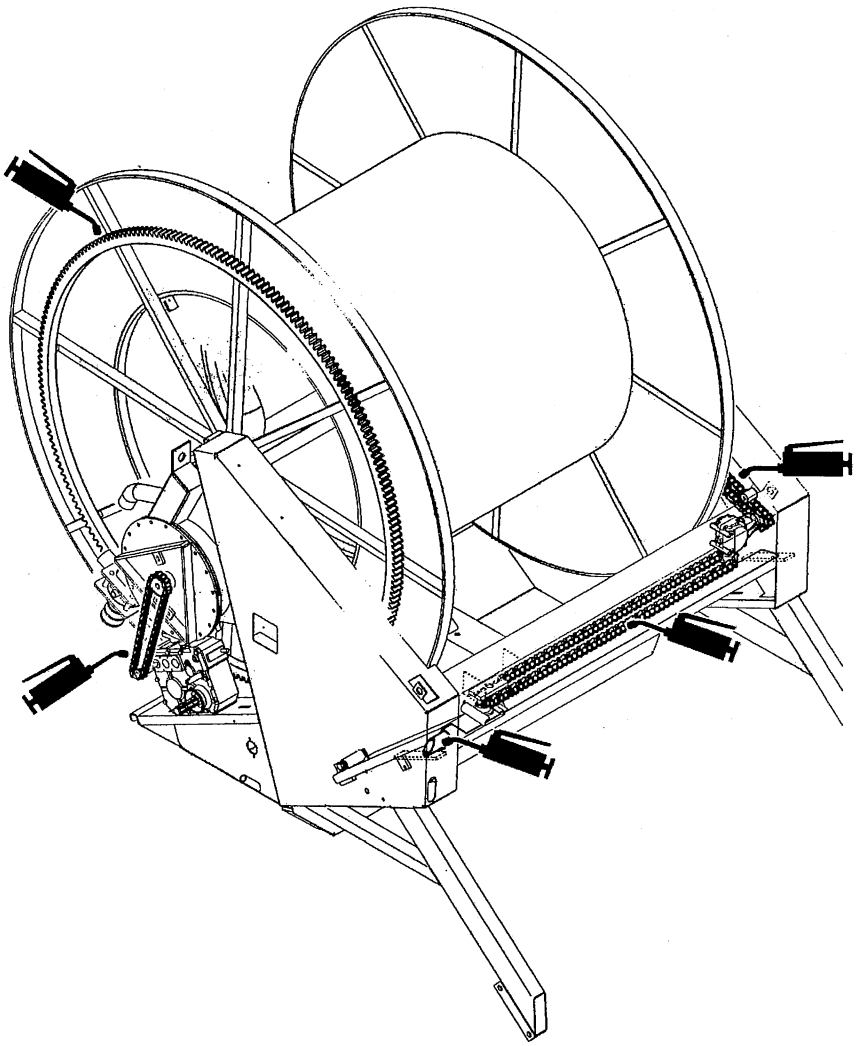
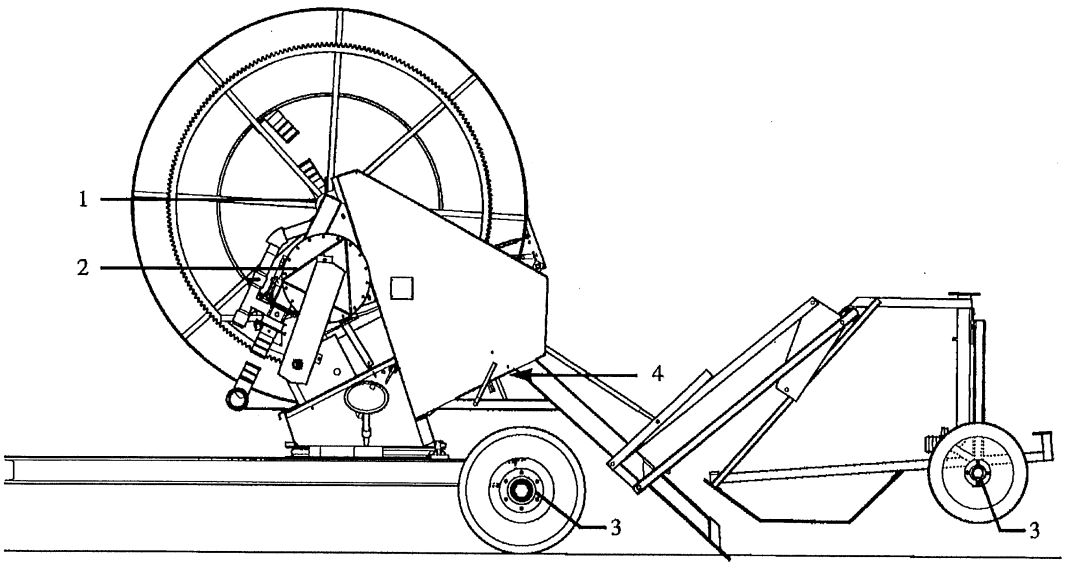


Figure 23:



MAINTENANCE AND SERVICING

Overwintering

- Drain off the water contained in the polyethylen hose : Unwind the polyethylen hose and keep a hose layer on the reel. Pull in the polyethylen hose with the tractor power take-off **at** low speed. An air compressor can also be used to push the water off the hose while keeping it wound around the reel.
- Open the by-pass valve.
- Drain off the cart by unscrewing the flange nuts from the polyethylen hose.
- Loosen totally the set screw of the brake located on the reducing gear in order to release the brake strap from the drum. **Do not forget to tighten it up when starting up the machine.**
- Complete lubrication (nipples + chains + racks of stabilizers + catches + pipe guide).
- Store the ASTRA irrigator away from the bad weather. However in the case of an electronic regulation, the room should be opened to daylight to avoid the output of the battery.
- Place the cart on the ground..
- Check whether the water discharge holes of the frame are not blocked and the water does not stagnate.

Lubrication (See figure 22-23)

- Lubrication every 8 to 10 days' operation.
- Use "mechanical" water proof grease (for example : Multifak EP2).

• Nipples :	Quantity	Position
	4	Forecarriage ball bearing round piece
	2	Reel bearings (1)
	3	Turbine (2)
	2	Axles of the irrigator (3)
	1	Fork of the pipe guide (4)
	as per model	Sprinkler
	1	Reverse lock catch ring
	2	Cart axle

Lubrication of the chains :

- Driving chain of the pipe guide
- Chain of the pipe guide
- Turbine/reducing gear transmission chain
- Lubrication of the upper bar of the pipe guide
- Lubrication of the geared wheel

CAUTION : AFTER THE LUBRICATION OPERATIONS, FIX BACK ALL THE PROTECTIVE CASINGS AND SECURE THEM TIGHTLY WITH THE SCREWS.

Oil change

- Change the oil of the angular gear box of the pipe guide and the reducing gear every 3,000 hours.
- Use oil SAE 90.
  - Quantity : 4,2 L (reducing gear)
  - Quantity : 0,3 L (box 1018)

Tyre pressures

- Irrigator tyres : 4 to 4,5 bar
- Cart rear tyres : 3 bar
- Cart front tyres (small-sized wheels): 4,5 bar

Tension of chains

- Check the tension after the first 100 hours.
- Tighten up every 1,000 hours.

Locking of wheel pins

- Check locking after the first operations.
- Check at regular intervals.