Installation, operation and servicing manual for

HYDRAULIC PULLING WINCHES

Translation of the original manual

This manual MUST always be used in conjunction with the data sheet provided at the time of the order.

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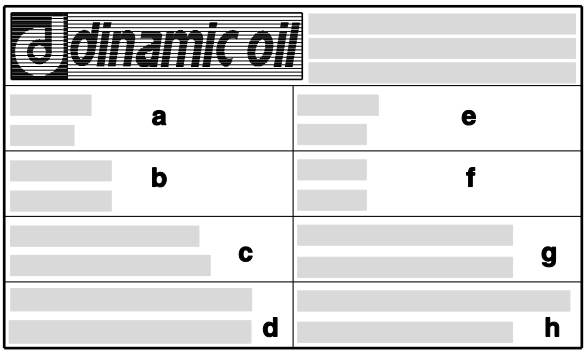
Contents

1 – GENERAL INFORMATION

1.1 – Manufacturer's identification data

DINAMIC OIL S.p.A.
Via Togliatti, 15
41030 Bomporto (MO) – Italy
Telephone: +39 059 812611 – Fax: +39 059 812606
E-mail: dinamicoil@dinamicoil.it

1.2 – Pulling winch identification data



- Plate details
a = Model
b = Serial number
c = Max. capacity
d = Max. pull
e = Code
f = Year
g = Max. speed
h = Pulling pressure

Information
The data shown on the identification plate may not be altered under any circumstances.

1.3 – Using this instruction manual

This manual contains the information required for the operator to understand and correctly use the pulling winch. The manual also refers to it as a machine, although Directive 2006/42/EC classifies the pulling winch as partly completed machinery.
The original instructions are provided by the manufacturer in Italian.
To fulfil legal or commercial requirements, the original instructions may be supplied by the manufacturer in other languages.
The information contained here is intended for qualified personnel (1).
If there are any doubts concerning the correct interpretation of the instructions, the manufacturer should be contacted for any necessary clarifications.
To make it easier to consult, the manual has been divided into chapters relating to the main concepts.
For quick searches, please use the index.

Using this instruction manual for purposes other than those described without written authorisation from the manufacturer is prohibited.
Any violation will be prosecuted according to the law.

(1)Experienced persons with the correct technical ability, knowledge of regulations and laws, capable of carrying out the necessary operations, and identifying and avoiding potential hazards while handling, installing, operating and servicing the machine.

1.4 – Exclusion of liability

The manufacturer is hereby released of any liability deriving from:

- Incorrect installation or installation which is not in accordance with applicable laws
- Use of the machine by untrained and/or unauthorised personnel
- Partial or total disregard of the instructions
- Lack of servicing
- Unauthorised alterations or repairs
- Non-permitted uses
- Use of non-original spare parts and/or parts that are not specific to the model
- Environmental circumstances beyond the manufacturer's control

1.5 – Instructions for requesting technical assistance

In the event of machine malfunction or failure requiring technical assistance from a specialist technician, or to request spare parts, contact the manufacturer or reseller directly by phone or fax.

1.6 – Receipt

If any damages, defects or deficiencies are noted, immediately contact the **Dinamic Oil S.p.A.** Sales Office – Winch Department, tel. +39 059 812611 – fax +39 059 812606.

1.7 – Guarantee

- Dinamic Oil S.p.A. guarantees that its products are free from material or construction defects for the duration of the guarantee period shown on the Dinamic Oil order confirmation at the time of purchase.

- During the guarantee period, **Dinamic Oil S.p.A.** will repair or replace any parts or components that are unserviceable due to ascertained defects in materials or construction.
Under this guarantee, any defective pieces must be sent to **Dinamic Oil S.p.A.**, which will examine them so as to determine the cause.

- This guarantee is strictly limited to the repair or replacement of products. - The manufacturer will therefore not accept claims demanding reimbursement for direct or indirect damages of any nature under any circumstance.
The merchandise may only be sent once authorised by **Dinamic Oil S.p.A.**

- This guarantee does not extend to O-rings or gaskets in general.

- This guarantee does not cover any costs associated with the installation or removal of defective parts from the purchaser's equipment.

- This guarantee does not extend to any products that have been repaired, altered or simply disassembled, even partially.

- This guarantee does not extend to any products that have been subject to misuse, incorrect or careless assembly, or tampering.

- This guarantee, recognised by **Dinamic Oil S.p.A.** through its authorised sellers, excludes and replaces any other guarantee of any nature.

1.8 – Standards and laws in force

The pulling winch has been designed and constructed in accordance with Directive 2006/42/EC and the following reference standards:
ISO 4301/01
FEM 1.001 3rd edition (points 2, 3, 4, 5 and 8)

1.9 – Symbols used in this manual

The following symbols used in the manual highlight operations which are considered safety hazards. It is therefore absolutely essential that the instructions highlighted by these symbols are adhered to.

DANGER !!!

Information and procedures indicated by this symbol which are not strictly adhered to will result in death or serious injury.

ATTENTION !!!

Information and procedures indicated by this symbol which are not strictly adhered to may result in death or severe injury.

CAUTION !!!

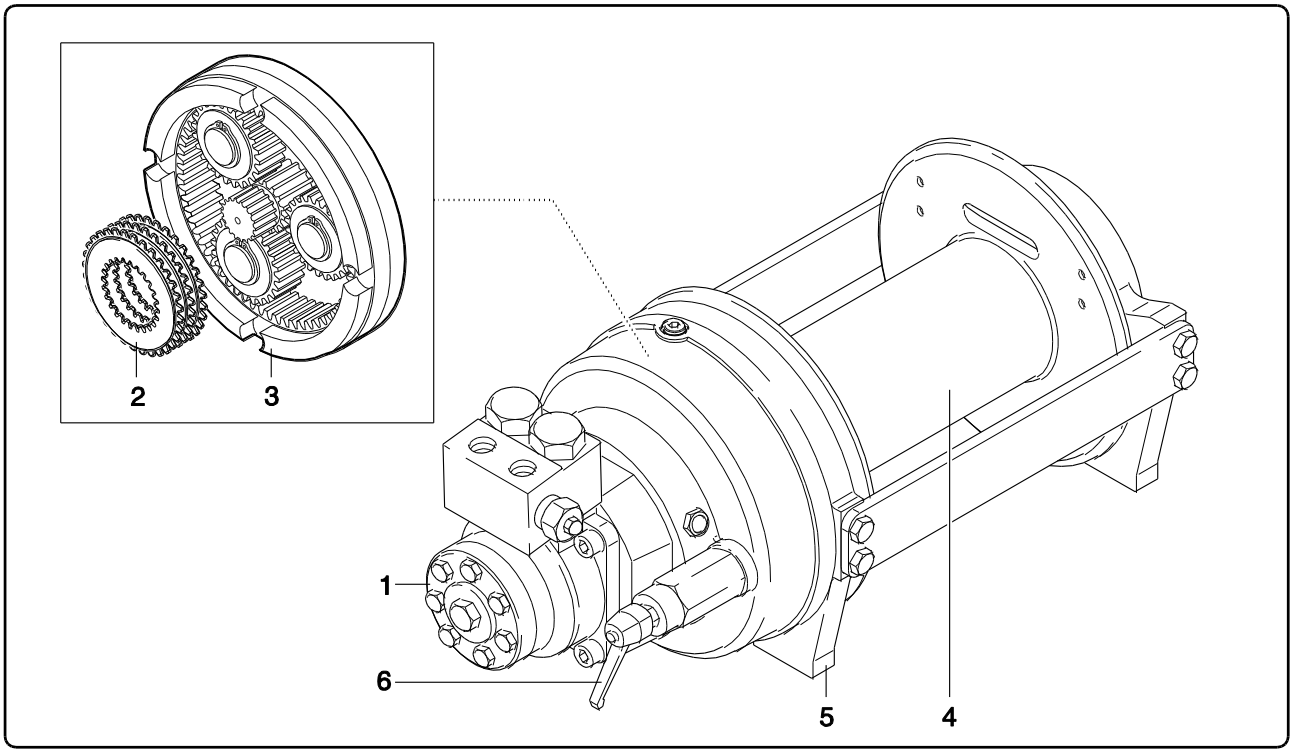
Information and procedures indicated by this symbol which are not strictly adhered to may result in minor injury or damage to the machine.

Information

Important information or procedures.

2 – TECHNICAL INFORMATION

2.1 – Main parts and general description of the pulling winch



1) Hydraulic motor: orbital.

2) Safety brake: composed of bronze disks connected to the motor shaft which alternate with steel disks connected to the pulling winch structure; the pressurised oil which powers the hydraulic motor releases the brake and the brake is locked by the thrust of the Belleville washers which lock the various disks when the motor is not running.

3) Reduction gear: The epicyclical reduction gear makes it possible for the pulling winch to obtain elevated rope speed and to reduce the intervention time.

4) Drum: Two small pads support the drum.

5) Support structure: the support structures are the bolted type which are known for their remarkable compactness.

6) Engaged/disengaged rotation: it allows engaging or disengaging of the drum rotation.

2.2 – Description of functions

The pulling winch is controlled by the distributor of the operating machine that it is installed on. The drum rotates to wind and unwind the cable bearing the load. The brake is released when the motor is started and is activated when the motor is stopped.

2.3 – Intended use

The pulling winch is a device suitable for the handling and hauling of loads by means of the winding and unwinding of the rope on the drum. The use of the pulling winch with superior values to those listed in the technical data is considered **"improper use"** and therefore **"not admitted"**. Under these circumstances, the manufacturer will accept no liability for any damage caused to persons or objects, and will withdraw any kind of guarantee.

2.4 – Non-permitted use

The use of the machine is strictly forbidden for lifting purposes. The use of the machine is strictly forbidden for hauling of persons. The pulling winch must never be put into service before the machine that it will be installed on has been declared compliant with the provisions of Directive 2006/42/EC.

2.5 – Environmental conditions

Ambient temperature for proper use: between −10 °C and +40 °C, unless otherwise specified in the pulling winch data sheet.

2.6 – Safety devices

Hydro-controlled stop-valve, mounted directly on the hydraulic motor, prevents the unwinding of the rope in case of the breakage of a hydraulic pipe.

2.7 – Residual risks

Even if all safety standards have been observed and implemented according to the rules described in this manual, some residual risks may remain. The most recurrent of these include:
- Friction from the cable
- Crushing between cable and drum
- Inverse rotation of the drum due to human error
- Ejection of fluids due to oil leaking under pressure

Keep in mind that operating any machine will carry a degree of risk. Every type of operation should be performed with the utmost attention and concentration.
For the complete table of residual risks, see paragraph 9.

2.8 – Noise

The noise levels emitted are not significant.

2.9 – Electromagnetic fields

They are not present electromagnetic fields

2.10 – Technical data

The pulling winch technical data can be found in the relevant data sheet provided in the proposal. Please check that the code on the identification plate of the pulling winch is the same on the technical datasheet.

3 – SAFETY INFORMATION

3.1 – General safety instructions

- Read this manual carefully before attempting installation, operation or servicing.
- The user must be familiar with applicable standards on safe working practices and know how to use both the operating machine and the installed pulling winch. The user is responsible for his/her own safety as well any other persons present in the vicinity of the machine working area.
- All operators must be suitably trained to assemble, use, adjust and operate both the operating machine and the installed pulling winch.
- Do not allow unauthorised personnel to use the machine.
- Do not start or set the machine in motion if it is faulty.
- Do not attempt to locate hydraulic leaks with bare hands; use a piece of paper or wood instead.
- Fluid escaping through a very small hole might be almost invisible, but still capable of penetrating the skin.
- If fluid comes into contact with the skin, seek medical assistance immediately, as there may be risk of infection or skin disease.
- Before removing any caps, plugs or flexible tubes, ensure there is no pressure in the hydraulic circuit.

4 – TRANSPORT, HANDLING AND INSTALLATION

4.1 – Machine packing

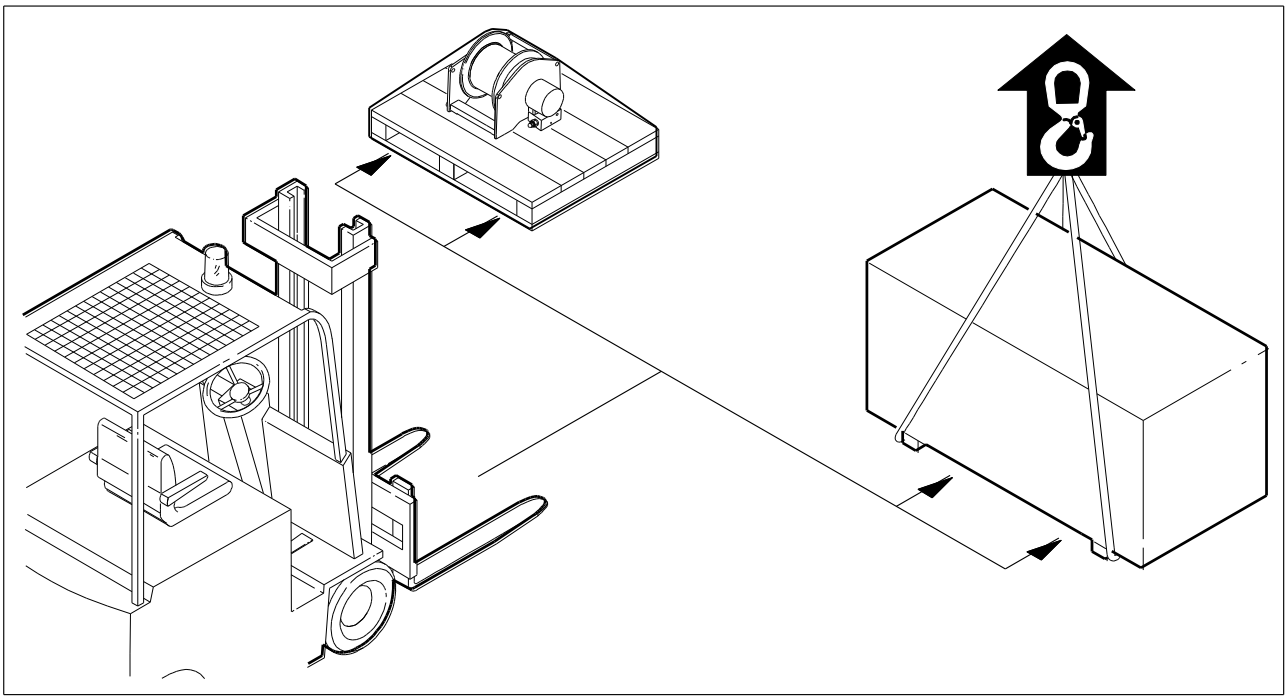
The machine is packed according to the agreements made with the Customer, taking into account the distance and type of transport chosen.
In general the pilling winches are packed in wooden boxes with joists to facilitate harnessing and lifting.
The packaging varies depending on the quantity of merchandise that it contains.
The weight and dimensions are shown on the transport documents or on the packaging itself.

ATTENTION !!!

Do not tilt or overturn the package while lifting or during transport.

4.2 – Handling – storage

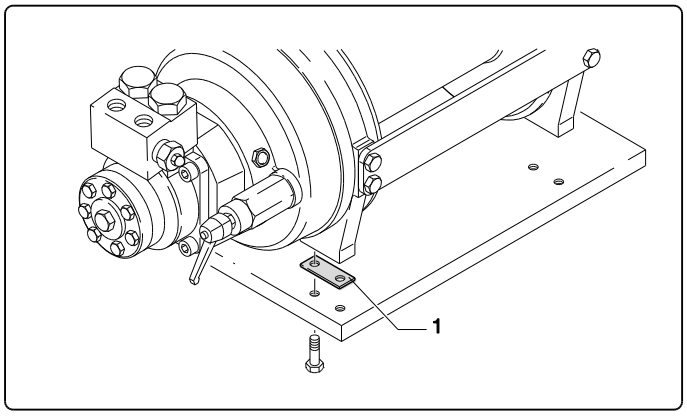
Use a suitable means of transport to lift and move the packed unit, taking into account the type of packaging.
If the package is moved with a fork-lift truck, ensure the weight is balanced on the forks.
If the package is moved with a hoist or hook, ensure the load is balanced in the harness.
Use lifting accessories that are suitable and meet legal standards.
While lifting and positioning the unit, take care not to let it swing too much, to prevent it from hitting something.
The storage area must be protected from atmospheric agents and not be excessively damp or dusty.
The ambient temperature must be between −20 °C and +70 °C with a maximum humidity level of 90 % with no condensation.



4.3 – Pulling winch handling

For lifting procedures, strap the pulling winch using two belts wrapped around the ends of the drum.

4.4 – Mounting on base plate



- Ensure that the plate that the pulling winch will be fastened to is flat and sturdy.
- Place the pulling winch on the plate and check that the fastening plates lie perfectly flat on the anchoring surface.
- If one of the pulling winch's weight bearing points is raised from the plate, insert a shim "A" to prevent undue tension in the unit when the screws are tightened.
- Tighten each screw to the correct tightening torque shown in the "Tightening torques" table.

- Tightening torques

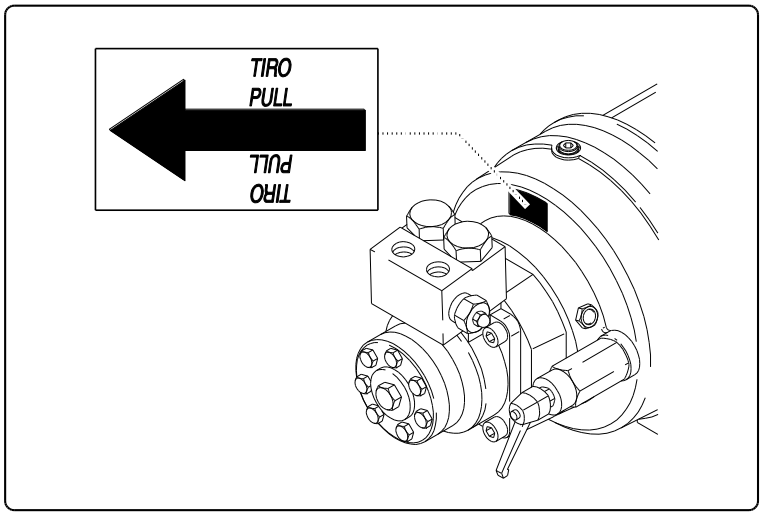
Tightening torque values (Nm)			
	Class 8.8	Class 10.9	Class 12.9
M10	50	73	86
M12	86	127	148
M14	137	201	235
M16	214	314	368
M18	306	435	509
M20	432	615	719
M22	592	843	987
M24	744	1060	1240
M27	1100	1570	1840
M30	1500	2130	2500

4.5 – Installation

4.5.1 – Warnings

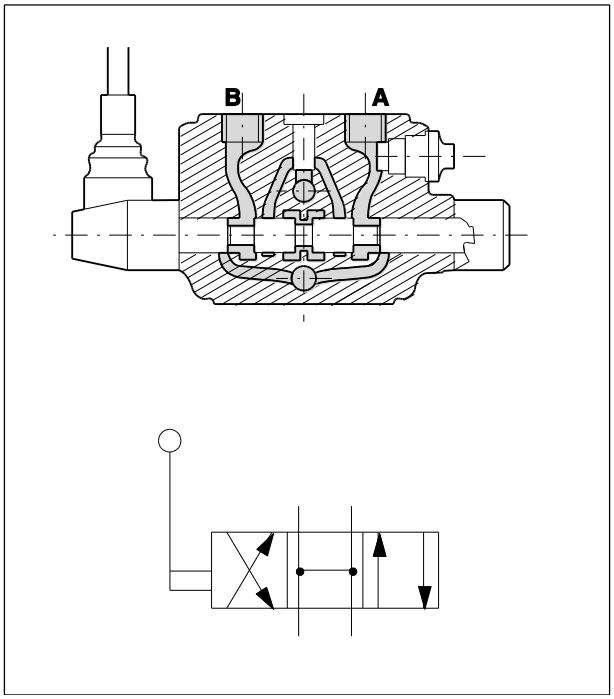
ATTENTION !!!

Pulling winch installation and post-installation checks must be carried out according to applicable legislation in the country where the machine is used.



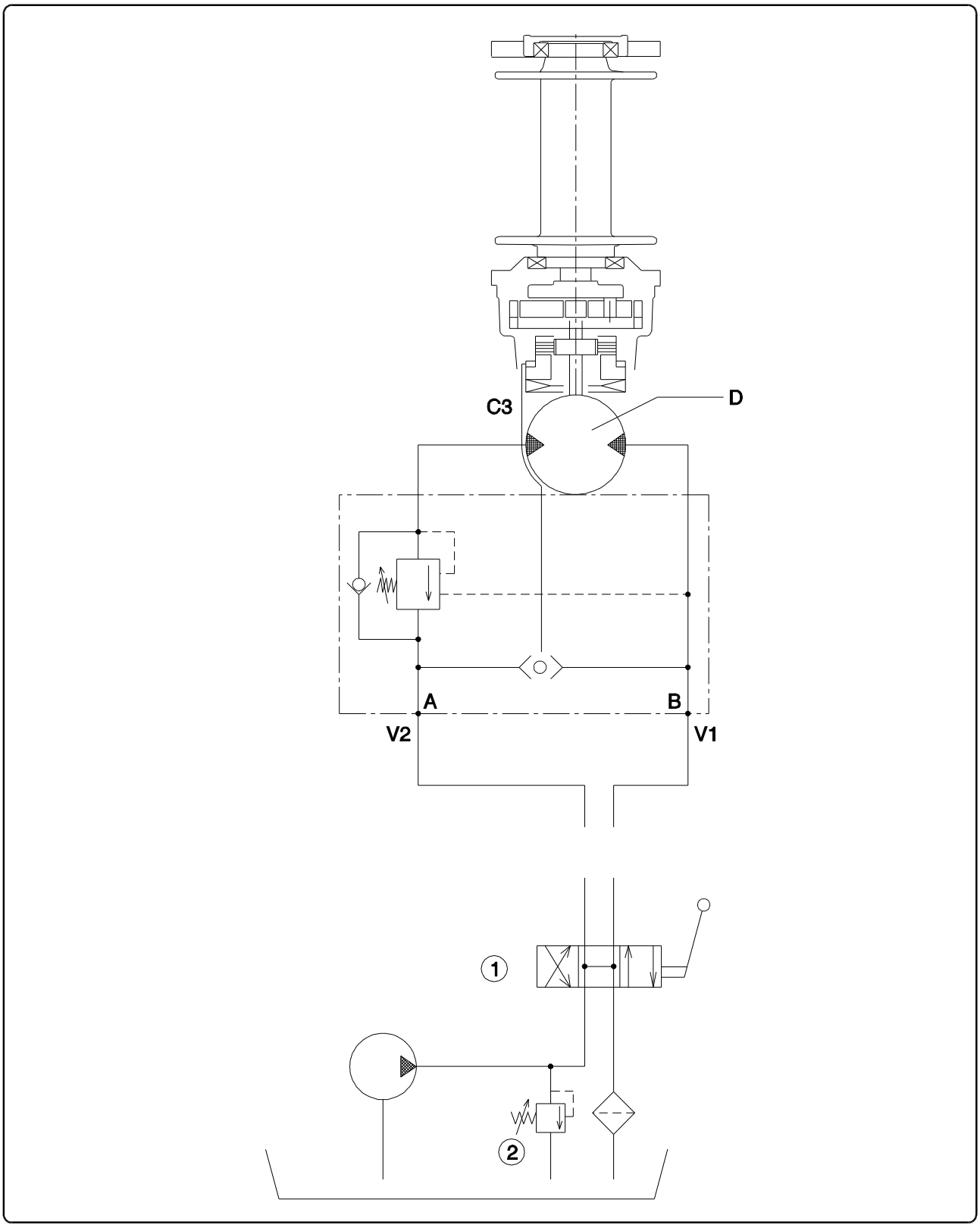
Before mounting, ensure the winding direction of the cable is the same as that shown by the arrow on the pulling winch. Pulling winches which rotate in the opposite direction to the standard can be supplied on request (anticlockwise).The pulling winch can be mounted with the anchoring surface facing downwards, upwards or in any other position between the two.

4.5.2 – Hydraulic system



The distributor must have its gate open and be in an "H" configuration.
If the distributor has multiple elements, connect the pulling winch to the last element closest to the outfeed side.
Connect the delivery opening of the element to the pulling winch motor in position "V2".
The hydraulic system must meet the applicable standards and be made with appropriate hoses, filters and valves.

4.6 – Hydraulic diagram



V1 = Unwinding line
V2 = Winding line
C3 = Connection to brake
1 = Distributor with gate open
2 = Pressure relief valve
D = Connection to drainage

- Distributor
It is essential that the pulling winch controlling distributor, in its central position, activates the discharging of the two lines of the motor. The distributor, therefore, must have an open centre with an "H" configuration and a spring return to the central position. If the distributor, in its central position, were in closed center, it would be impossible to freely connect the two lines of the motor to the tank and the brakes would not lock. The pulling winch could till function but it would be discovered that the load, even if slowly, would be lost.

- Pipes
Check that the diameter of the tubes is not less than the diameter of the connection holes on the valve and the motor. Use tubes with suitable diameters in order to avoid significant pressure losses along the tubes. The values of unctional pressure, reported in the technical dates in part 2.3, refer to use with the return pressure equal to the atmospheric pressure. To avoid malfunctions in the pulling winch, the pressure required to make the oil run along the ubes when the system is stationary should never be greater than 0.4 - 0.5 Mpa.

- Filter
We recommend you use 10 micron filters. Replacing the filter regularly lengthens the life of all the system's components and helps to reduce the circulation pressure of the oil running through the tubes.

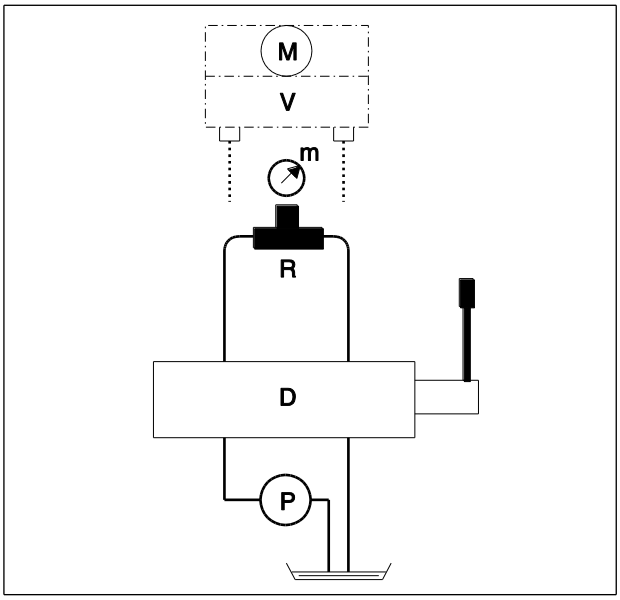
- Maximum pressure valve
It is essential to have a maximum pressure valve in the pulling winch's power supply system. This valve is normally an integral part of the controlling distributor, but if there is not one, it is necessary to install a maximum limit valve in line along the tubes, calibrated at the recommended maximum pressure.

4.7 – Checks

- Check the pressure in the return line of the circuit
This measurement should be made by disconnecting the two tubes from the valve and connecting them with a T-piece that has an attachment for a pressure gauge with a maximum scale of 60 bar.

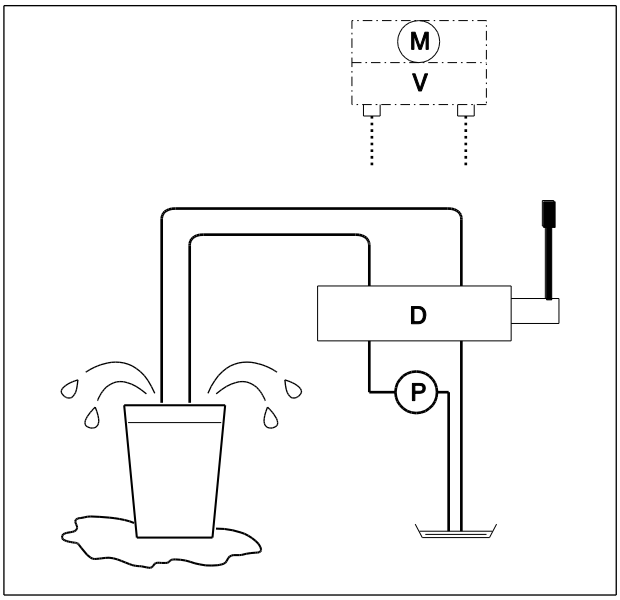
Information
This backpressure must be between 5 and 1 bar.

CAUTION !!!
Backpressure values higher than 5 bar dangerously restrict the braking torque, and values lower than 1 bar could cause insufficient supply to the motor.



D = Distributor
M = Motor
V = Valve
m = Pressure gauge
P = Pump
R = T-piece

- Ensure the control distributor has its gate open



D = Distributor
M = Motor
V = Valve
P = Pump

If you do not have safety instructions, you may proceed as follows:

- Disconnect the tubes from the valve and place their ends in a container large enough for the purpose. Start the pump while keeping the distributor in the centre.

- If the two tubes do not release oil into the container, the distributor has its **gate closed**. If the two tubes do release oil, the **gate is open**.

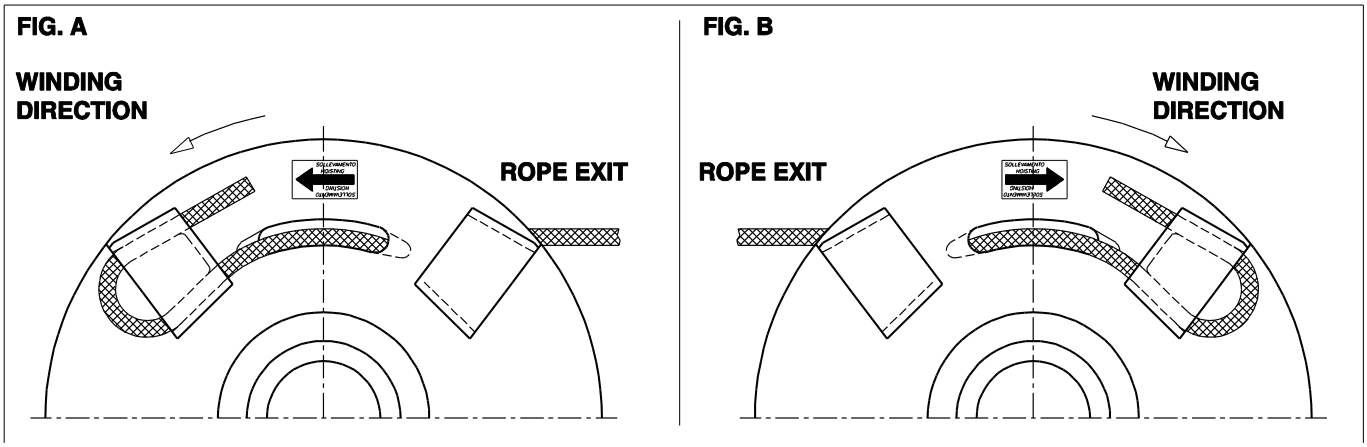
CAUTION !!!
Ensure the oil flow does not cause the container to overflow, wasting oil and releasing polluting substances into the environment. If there is a risk of this occurring, stop the test immediately and only resume once the container has been replaced with a larger one.

Information
Do not release used oil into the environment. Collect it and send it to authorised centres for disposal.

4.8 – Installing the cable

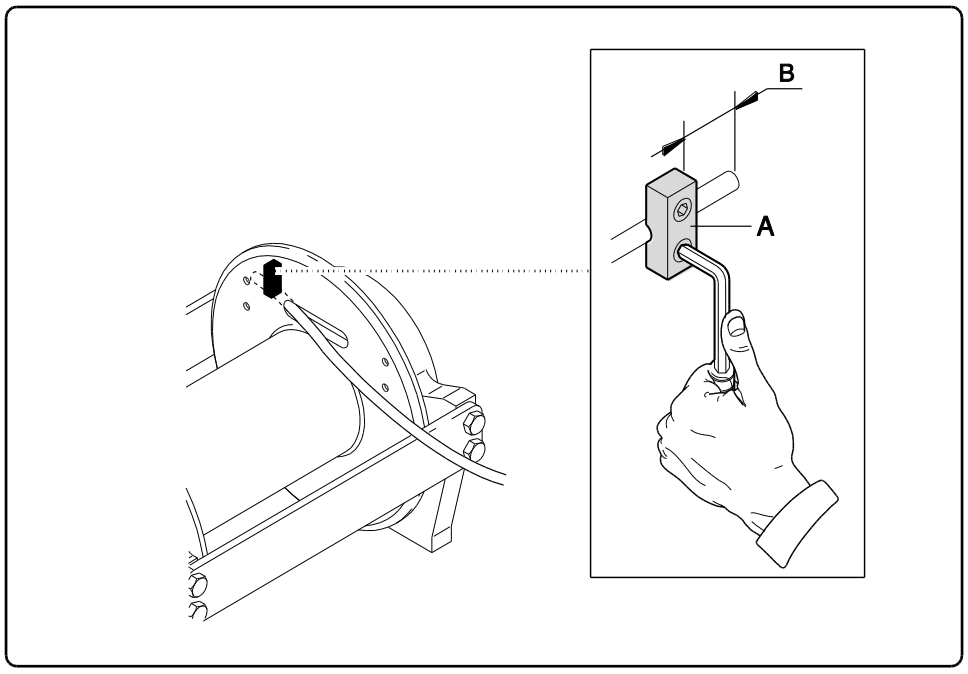
ATTENTION !!!

Make sure the cable hoisting direction matches that of the drum movement as indicated by the arrow on the drum and as seen in the diagram here below.
Ensure that an operator assistant is ready to activate the emergency stop button while assembling the cable on the drum if any situation that could cause personal injury or damage to the cable or winch occurs. Perform all movements slowly and in a safe environment.



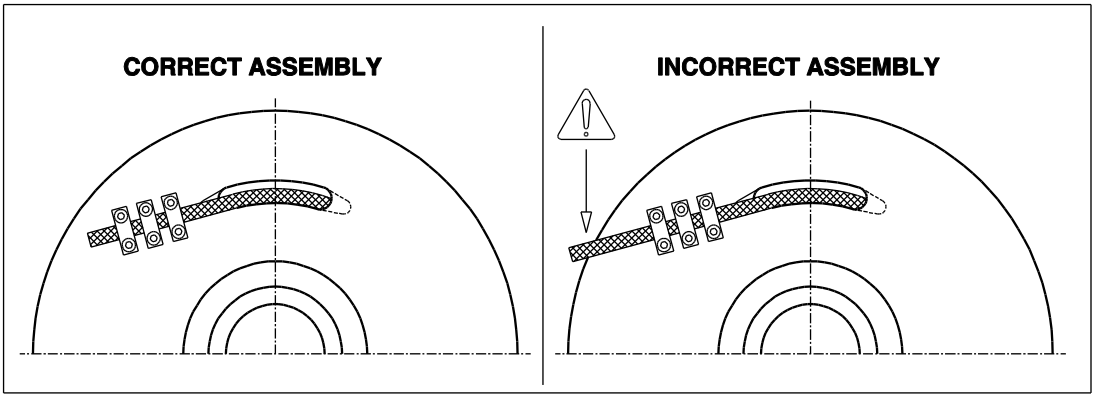
If, during cable assembly, the cable is not sufficiently compact or assembled with insufficient preload, the cable under load could damage the underlying layers. Accordingly, preload the cable as recommended by the cable manufacturer.

1) Prepare the cable dead end as recommended by the cable manufacturer
2) Place the end of the cable in the slot on the edge of the drum and then into the clamps "A". The protrusion "B" from the final clamp must be at least twice the diameter of the cable.
3) Tighten the clamp screws by the same amount.
4) Apply sufficient preload to the cable as it is wound onto the drum.



CAUTION !!!

5) Ensure cable dead end fits nicely inside the indention of the pulling winch side flange (if present) and does not extend outside the drum diameter.



ATTENTION !!!

To ensure a correct cable assembly, a min preload % of the cable breaking strength needs to be applied to the cable (normally 5%). The cable breaking strength varies according to the cable type and diameter therefore please follow the cable manufacturer's recommended instructions.

5 – START-UP INFORMATION

5.1 – Start-up

- Safety instructions

DANGER !!!

Before work commences, signs or other appropriate measures must be in place to warn users that it is forbidden to approach or remain in the danger zone due to loads being lifted. A danger warning plate must be placed on the machine informing users of the danger presented by the running cables wrapped around the pulleys and drum, and forbidding anyone from approaching the moving parts. This plate must be reproduced in the user manual of the crane or the operating machine that it is installed on.

- Check the condition of the lifting parts (cable, hook, etc.) before using the pulling winch.
- When carrying out start-up operations, the operator and any other team members must remain a safe distance from the cable, to avoid injury in the event of it breaking.
- The first few lifting operations should be carried out with a modest load no more than 1 metre from the ground, to check that the lowering operation is controlled.
- Carry out manoeuvres gradually, avoiding sudden movements and swinging.
- Bring the pulling winch to its limit position and gently push the distributor lever to purge any air from the system.

6 – SERVICING INFORMATION

6.1 – Warning

ATTENTION !!!

Ensure that the machine that the pulling winch is installed on is stopped and cannot be started while being serviced.

6.2 – Servicing schedule

Operation	Frequency			Chapter in manual
	8 hours	250 hours	500 hours	
Cable inspection	●			6.3
Oil level check		●		6.4
Cable lubrication		●		6.3
Screw tightness check		●		4.4
Gearbox oil change			●(*)	6.4

(*) Carry out the first change after 500 working hours, and then once per year.

6.3 – Cable

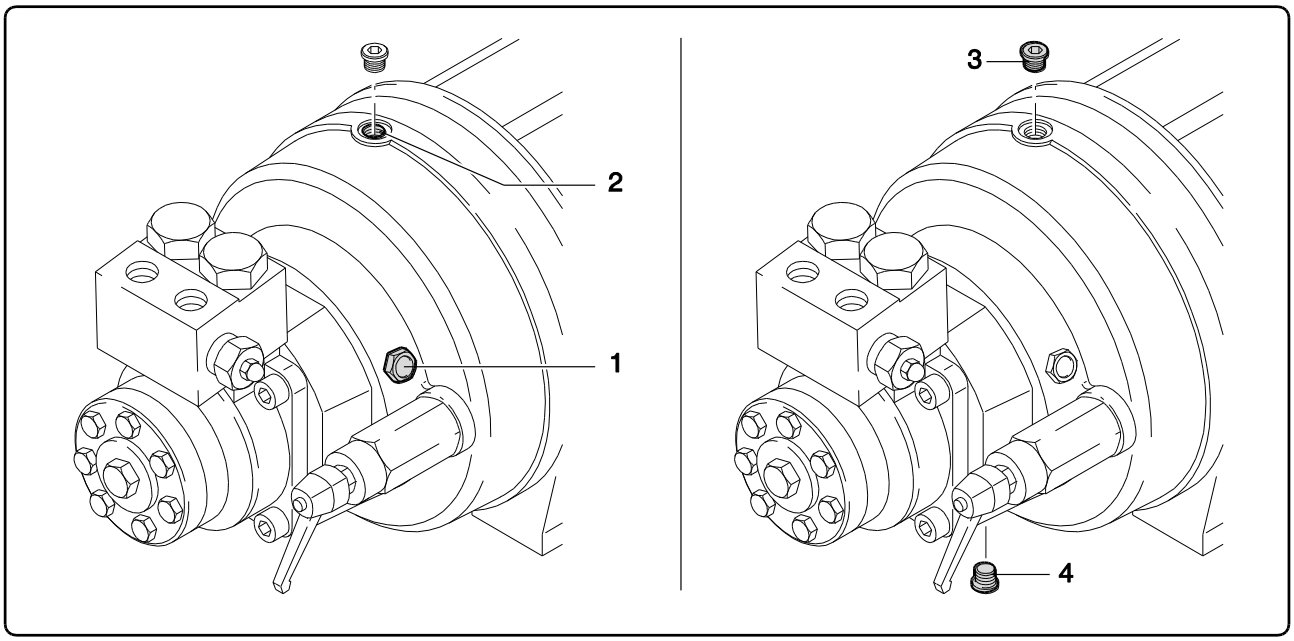
- Cable inspection

- Check the condition of the cable carefully, along its entire length.
If it has any dents, crushed sections, bulges or a number of broken strands, it must be replaced with a cable of the same specifications and length.
- Replace the cable when its nominal diameter has reduced by 10 % due to wear or the elementary strands breaking.
- Replace the cable when corrosion or any kind of warping occurs.
- Replace the cable when the lead coating on the cable lug is damaged.

- Cable lubrication

Clean the cable to remove any traces of dirt, dust or sand.
To reduce corrosion, lubricate the cable with a specialist product.

6.4 – Gearbox lubrication



Information
Do not release used oil into the environment. Collect it and send it to authorised centres for disposal.

Make sue that the indicator level "1" displays the oil level.
In case of lack of oil add the oil through the hole "2".
To replace the oil:
- remove the cap "3";
- remove the drain cap "4";
- let the oil stream in a suitable container;
- put the cap "4" back into position;
- introduce the new oil from the filler;
- tighten the cap "3".

Oil characteristics:
- Q8 - GOIA 15 - ISO 150 or equivalent

6.5 – Cleaning

ATTENTION !!!
Clean the pulling winch with detergents that comply with applicable standards. In order to prevent damage, do not point the jet at the electrical equipment when washing with liquid under pressure.

6.6 – Dismantling and disposal

The machine must be dismantled by technically specialist, qualified personnel with the required knowledge of hydraulics and mechanics. Components must be separated according to the materials they are composed of and sent to authorised collection centres. In accordance with the WEEE Directive (Waste Electrical and Electronic Equipment), the electrical and electronic parts, marked with the relevant symbol, must be disposed of at authorised collection centres.

7 – PROBLEMS AND SOLUTIONS

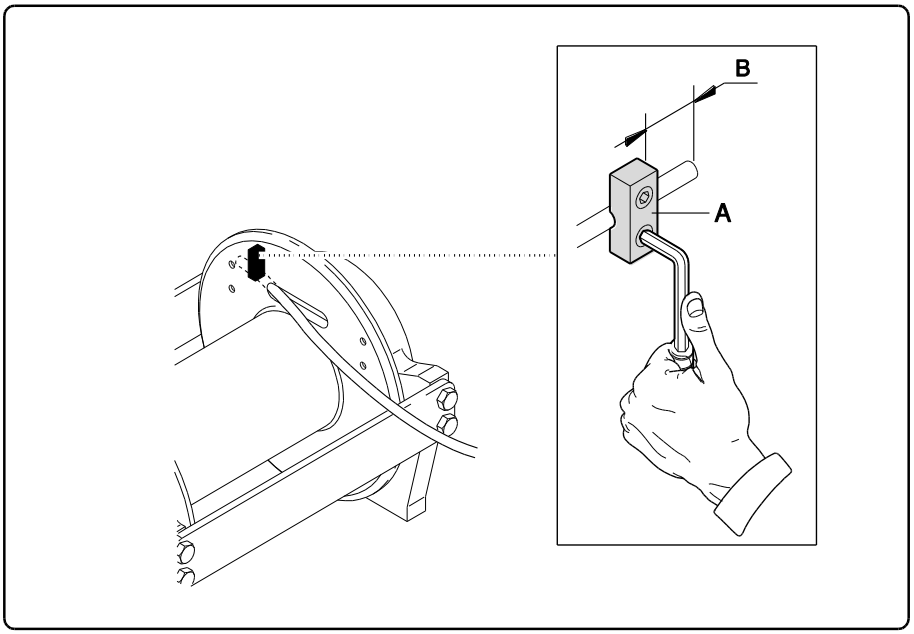
7.1 – Problems, causes and solutions

In the event of the pulling winch malfunctioning, please refer to the table below to identify the problem, its cause and possible solutions. If the problem persists, contact one of the Manufacturer's authorised workshops.

Problem	Possible cause	Solution
With the distributor set in the center the pulling winch does not hold the load	Excessively high counterpressure	Connect the drain of the motor directly to the tank
	Distributor with close gate	Replace the unsuitable distributor with one having an open gate
	Brake springs are broken	Replace springs (operation performed by Dinamic Oil S.p.a)
The drum does not rotate without load	Damaged brake	Check and replace the brake if necessary
	Damaged gears	Check and replace the gears if necessary
The drum does not rotate under load	Load heavier than pulling winch capacity	Check the values on para. 2.10 "Technical data"
	Insufficient pressure in the hydraulic circuit	Adjust the distributor valve capacity
	Damaged motor	Replace the motor
The pulling winch rotates slowly	Insufficient capacity	Check the circuit capacity and replace the pump if necessary
	Damaged motor	Replace the motor
The drum does not work when in neutral position	Damaged coupling	Replace the coupling
Noises in the hydraulic circuit	Presence of air in the circuit	Purge the circuit
Noise level upon winding without load accompanied by jerk rotation	Insufficient circulation of oil in the circuit	Carry out winding operations with growing loads until the pulling winch begins rotating regularlyand the noise disappears. If this condition occurs increase the quantity of oil in circulation. If this is not possible, contact our Technical Office. **ATTENTION !!!** The insufficient circulation might be caused by a pro longed choking of the oil flow by the operator manoeuvring the lever of the distributor. **This operation is dangerous**

8 – REPLACEMENT OF PARTS

8.1 – Cable replacement



1) Completely unwind the cable
2) Loosen the clamp screws "A"
3) Unthread the cable

- Installing

See paragraph 4.8 "Installing the cable".

9 – ANALYSIS OF RESIDUAL RISKS

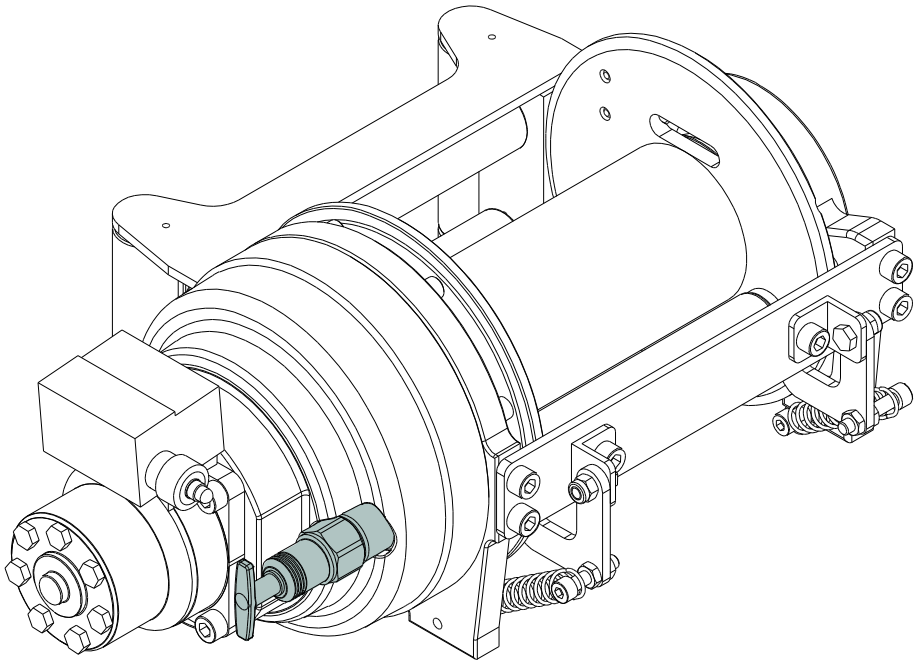
Note	Directive 2006/42/EC Annex I	Description	Remarks
18	1.3.3	Risks due to falling or flying objects	The operation and servicing manual explains how to unpack and handle pulling winches. The customer is responsible for taking these instructions into account while handling.
19	1.3.4	Risks posed by surfaces, edges or angles	The customer is responsible for protecting the operator from risks due to rough surface edges or corners during installation.
22	1.3.7	Risks related to moving parts	The customer is responsible for protecting the operator from potential risks related to moving parts
23	1.3.8	Choice of protection against risks arising from moving parts	The customer is responsible for protecting the operator from potential risks related to moving parts
25	1.4.1	General requirements for guards and protective devices	The customer is responsible for choosing the requirements for guards and protective devices
26	1.4.2.1	Fixed guards	The customer is responsible for fitting any fixed guards
28	1.4.2.3	Adjustable guards restricting access	The customer is responsible for fitting any adjustable guards restricting access
29	1.4.3	Special requirements for protective devices	The customer is responsible for choosing the requirements for guards and protective devices

Nota	UNI EN 14492-1	Descrizione	Commenti
57	5.1	Functional check	The customer is required to test the pulling winch after it has been installed on the machine
58	5.2.1	Control devices	The customer is required to test the pulling winch after it has been installed on the machine
59	5.2.2.1	Load limiter	Unless otherwise specified they are to be provided by the machine producer
77	5.7.9	Pulling winches	The pulling winches are calculated like hoisting winches, the customer is required to carry out the test
103	5.11.6.2	Hydraulic protection	The customer is required to install protection devices
104	5.11.6.3	Mechanical protection	The customer is required to install protection devices
133	5.17.2	Nominal load limiter	The customer is required to require them, if necessary

10 – ACCESSORIES

10.1 – Manual disengaged

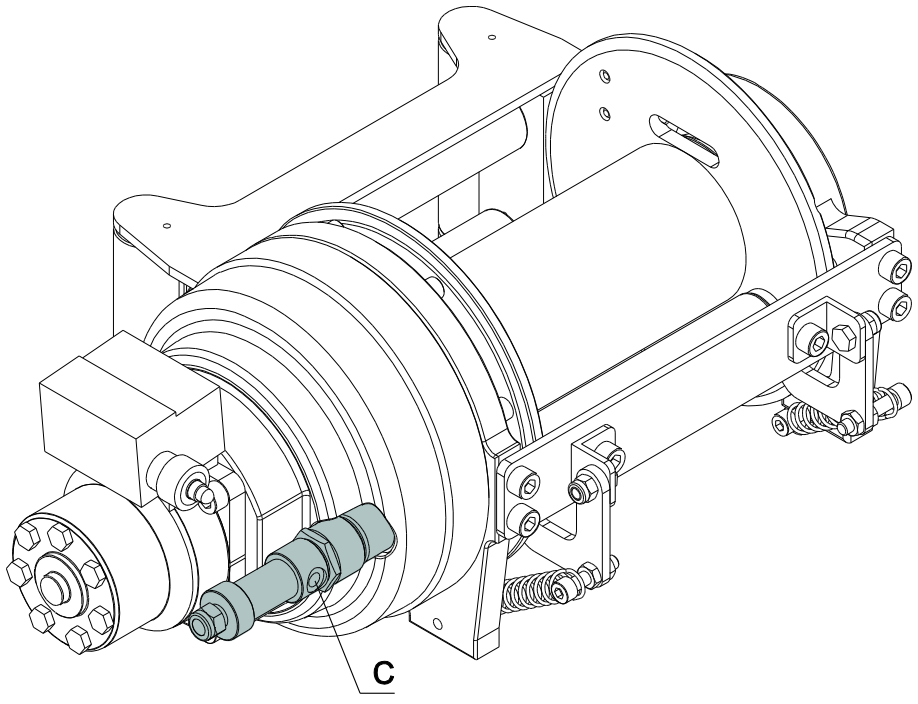
Manually controlled, it renders the drum rotation independent, permitting a manual retrieval of the rope.



10.2 – Pneumetic disengaged

Pneumatically controlled, it renders the drum rotation independent, permitting a manual retrieval of the rope.

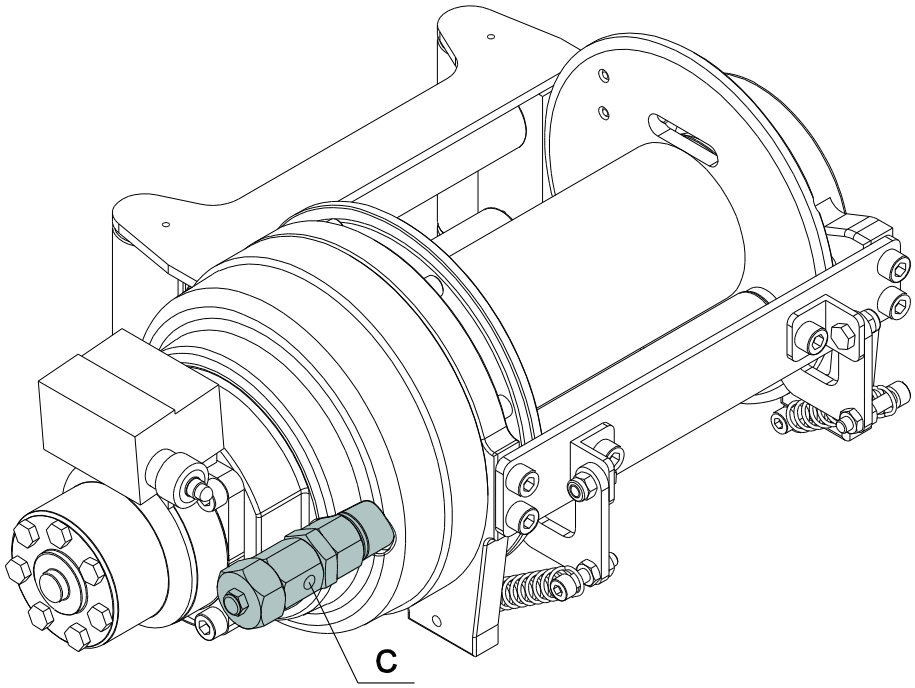
C=1/8”G BSP release pressure 6-10 bar



10.3 – Hydraulic disengaged

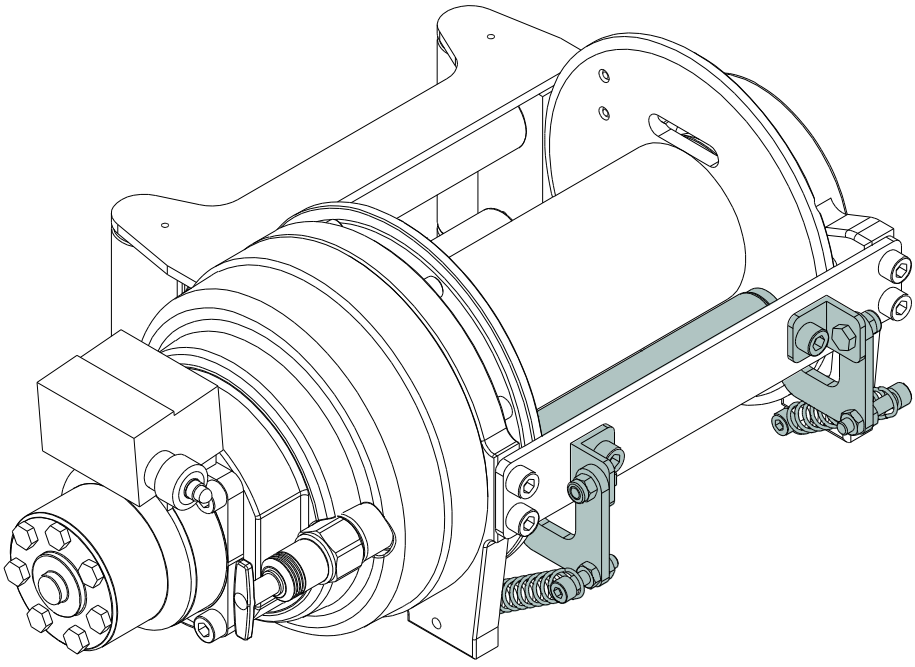
Hydraulically controlled, it renders the drum rotation independent, permitting a manual retrieval of the rope.

C=1/8”G BSP release pressure 15-20 bar



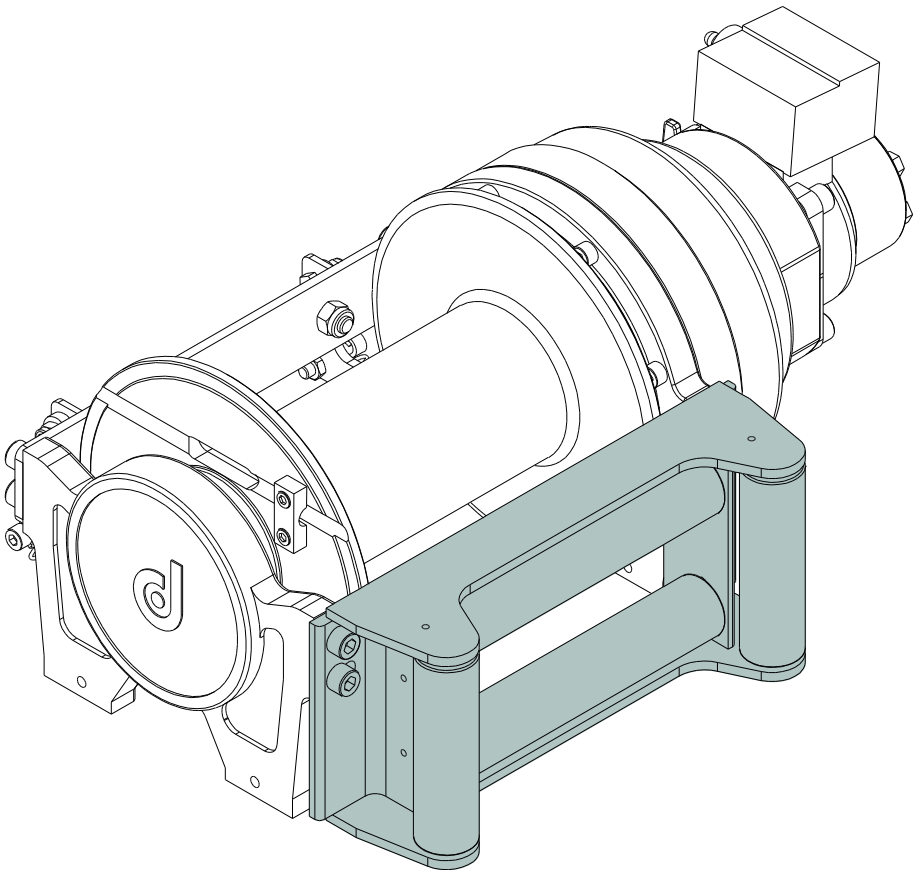
10.4 – Cable press

This device presses the cable onto the drum, so that it can be wound more effectively.



10.5 – Cable guide

This device is used to correctly guide the cable onto the drum.



11 – NOTES

This manual is also available in digital format on our website www.dinamicoil.it