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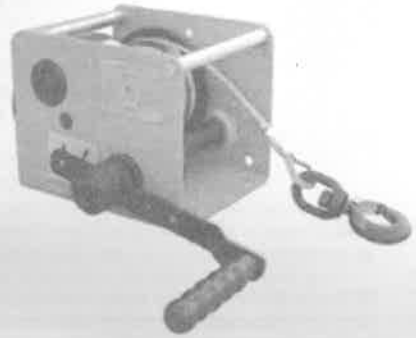
caRol™

2006/42/CE

Treuil manuel à engrenage type TR et à vis sans fin type TS
Manual geared winch, type TR and Manual worm gear winch, type TS
Handmatige tandwieltakel type TR en met wormschroef type TS
Handbetriebene Stirnradwinde TR und Schneckenradwinde TS



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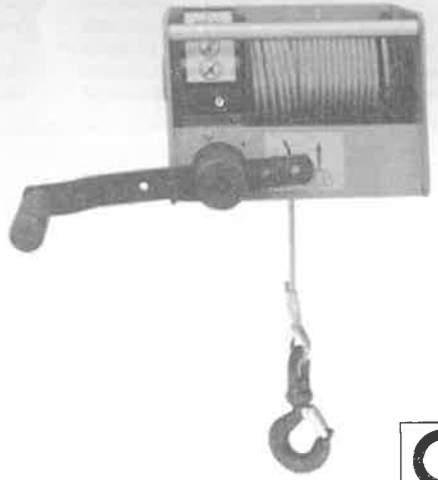

FR **Instructions d'emploi et d'entretien**
Traduction de notice originale

GB **Operation and maintenance manual**
Original manual

NL **Handleiding voor gebruik en onderhoud**
Vertaling van de oorspronkelijke handleiding

DE **Gebrauchs- und Wartungsanleitung**
Übersetzung der Originalanleitung

CE

GB

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To ensure the on-going improvement of its products, Tractel® reserves the right, at any time, to apply any changes which it may deem useful to the winch described in this manual.
The Tractel® group companies and their certified dealers will provide you, on request, with a complete documentation covering the full range of Tractel® products: Lifting and pulling winch, worksite and façade access winch (BMUs), safety devices for loads, electronic load indicators, etc. The Tractel® network also provides after-sales and periodic maintenance services.

⚠ IMPORTANT SAFETY INFORMATION ⚠

1) Before installing and using this winch, you must be perfectly familiar with the information contained in this manual and you must comply with the utilization and safety instructions given to ensure safe use of the winch. A copy of this manual should be available to all winch operators. Additional copies can be provided on request.
2) Do not use the winch if any of the plates mounted on the winch are damaged or illegible, or if any of the markings, as indicated at the end of this manual, are no longer legible. If a damaged information plate is observed, identical plates can be supplied on request and should be fastened to the winch before continuing use of the winch.
3) Make sure that any person to whom you have entrusted use of this winch is perfectly familiar with the information contained in this manual and is able to satisfy the safety requirements involved by the purpose for which the winch is used. This manual should be in the user's possession.
4) This winch must only be used in compliance with the applicable safety standards and regulations concerning installation, use, maintenance and inspection of materials lifting machines.
5) For all professional purposes, this winch must be placed under the responsibility of a person who is perfectly familiar with the applicable regulations and who has the necessary authority to ensure application of these regulations by all operators.
6) Any person using this winch for the first time must check, in a risk-free environment, before applying the load, and on a limited lifting height, that he has fully understood all the requirements for safe, efficient operation of the winch.
7) Setup and operation of the winch must only be performed under conditions ensuring installer safety in compliance with the regulations applicable to the winch category.
8) Each time, before using the winch, visually check that the winch and its accessories are in good condition.
9) Tractel® shall not be held liable for use of this winch in any setup configuration not described in this manual.
10) Any changes to the winch not supervised by Tractel®, including removal of parts from the winch, shall release Tractel® from any liability.
11) Tractel® only guaranties operation of the winch provided it is equipped with a genuine Tractel® wire rope as specified in this manual.
12) Any winch assembly or disassembly not described in this manual, or any repair performed outside Tractel® supervision will release Tractel® from any liability, especially as may concern replacement of genuine parts by parts from another source.
13) Any intervention on the wire rope aimed at modifying or repairing it outside Tractel® supervision will release Tractel® from any liability subsequent to the modification or repair performed.
14) This winch must never be used for any operations other than those described in this manual. The winch should never be used with loads exceeding the working load limits (WLL) indicated on the winch. The winch should never be used in an explosive atmosphere.
15) It is strictly prohibited to use this winch for lifting or moving persons.
16) This manual device must never be used with a motor.
17) When it is necessary to lift a load using several units, a technical study by a qualified technician must first be carried out to ensure proper installation and operation in compliance with the technical study, in particular to ensure an even distribution of the load under appropriate conditions. Tractel® shall not be held liable for use of any Tractel® device in combination with other lifting devices of a different manufacturer.
18) The winch must be anchored to a fixed point and to a structure which is sufficiently strong, consistent with the applicable safety coefficient, to stay within the working load limit (WLL) indicated in this manual. If several units are used, the strength of the structure and the anchor point must be consistent with the number of winches used in accordance with their working load limit.
19) To ensure safe use of the winch, it should be visually inspected and serviced regularly. Depending on the nature of the environment in which the winch is used, check regularly for any signs of corrosion.
20) Never take position or circulate under the load. The area located under the load should be clearly marked out and access-prohibited.
21) Keeping the wire rope in good condition is essential to safety and correct operation of the winch. The condition of the wire rope should be checked each time it is used as indicated in the "wire rope" section. Any wire rope showing any signs of damage must be immediately and definitively removed from use.
22) When the winch is not used, it should be placed out of reach of all persons not authorized to use it.
23) The winch should be inspected periodically by a Tractel®-approved repair agent as indicated in this manual.
24) During use, the user must ensure that the wire rope is constantly tensioned by the load and, in particular, that the wire rope is not temporarily snagged by an obstacle when bringing a load down as this could result in rupture of the wire rope when the load comes free from its obstacle.
25) For definitive removal from use, the winch should be discarded under conditions preventing any future use of the winch. All environment protection regulations must be observed.

IMPORTANT: For all professional uses, especially when the winch is to be used by employee personnel, you must comply with all work regulations applicable to installation, maintenance and use of the winch, in particular as concerns the required inspections: inspection on commissioning by user, periodic inspections, and inspections after disassembly or repair.

1 Terminology

The following terms are used in this manual:

"Operator": Person or department in charge of use of the product for the purpose for which it is intended.

"Installer": Person or department in charge of assembling the component parts of the product received, installing the product so that it is ready for use, and disassembly, deinstallation and transport of the product for storage and warehousing.

"Technician": Qualified person in charge of the maintenance operations described and allowed by the manual; it is understood that the technician has the necessary technical skills and perfectly familiar with the product.

"After-sales service": Company or department authorized by a company of the Tractel® group for after-sales service or repair operations on the product. Contact Tractel®.

" **DANGER**": Indicates remarks intended to prevent mortal, serious or light personal injury.

" **IMPORTANT**": Indicates remarks intended to prevent a failure or damage to the product or the equipment, or the environment, but not directly endangering the life or health of the operator or any other person.

" **NOTE**": Indicates remarks concerning precautions to be taken to ensure efficient, easy, safe installation, utilization and maintenance of the equipment.

Read the operating instructions manual. This symbol must be present on the product as indicated in the "markings" section

Enter the information in the maintenance log book, or the inspection log book, as may be required.

2 Overview

2.1 Operating principle

The caRol™ drum winches are designed to lift, lower and hold a material load secured to a caRol™ wire rope by manual action on a crank.

There are two types of caRol™ winches:
- caRol™ type TR winch, with drum driven by a pair of spur gears, with crank on the side,
- caRol™ type TS winch, with drum driven by a pair of worm gears, with crank on the front.

The caRol™ wire rope is coiled on a drum and is equipped at its end with a swivel hook with safety latch (item 1, fig. 3) by which the material load is fastened.

The caRol™ winch must only be used with a caRol™ lifting wire rope having the indicated diameter (see § Specifications) to ensure safe, efficient use.

The caRol™ drums are equipped with a lever-actuated release function allowing you to easily unwind the winch wire rope.

By acting on the crank (item 5, fig. 1 or item 7, fig. 2), and depending on the direction of rotation indicated (fig. 4), the material load is lifted. If the operator turn the crank in the opposite direction, the material load is lowered. The crank length can be adjusted by means of an automatic locking device (item 7, fig. 1).

The caRol™ winches are equipped with an automatic brake function which stops the load, when moving up or down, as soon as the operator stops applying force on the crank. The brake automatically ensures regular, controlled lowering of the load whatever the position of the load.

The caRol™ winch chassis comprises:
- a structure (item 1, fig. 1) on which the caRol™ winch is mounted
- one or two carrying handles (depending on type) (item 2, fig. 1) for transport of the caRol™ winch
- a protective casing (item 4, fig. 1) protecting the reduction gear against projections and impacts during installation, use, transport and storage of the winch, while ensuring operator safety during use of the winch.

Each caRol™ winch is tested before shipment:
- static test per §6.3.2.2 of standard EN13157:12/2004 at 1.5 times the working load limit.
- dynamic test per §6.3.2.3 of standard EN13157:12/2004 at 1.1 times the working load limit.

2.2 Composition of a caRol™ winch standard delivery

Each caRol™ winch is supplied in a box containing:

1) The winch, equipped with its caRol™ wire rope coiled on the winch drum and its swivel hook with safety latch.
2) A plastic bag, containing:
   - The present operating instructions manual
   - The CE compliance statement
3) A crank.

NOTE: Any delivery not comprising all the components of the standard product composition should be compared against the order.

2.3 Applicable regulations and standards

The caRol™ winch complies with the requirements of the "Machinery" directive No. 98 / 37 / CEE (materials lifting devices) up to 29/12/2009 then with directive 2006/42/CE after this date.

2.4 Description

Figure 3 shows a caRol™ type TS winch in working order in its most frequently used working position.

Each winch carries a serial number on one of the sides of the unit. The complete serial number (including lever) must be indicated for all spare part or repair orders.

Regularly check that all labels are in place and legible.

The length of the caRol™ lifting wire rope is indicated on the cable sleeve (item 6, fig. 7).

NOTE: The "Up" indication is indicated on the unit next to the crank adjustment knob by an arrow pointing in the direction of the controlled movement (see fig. 4).

3 Accessories and spare parts

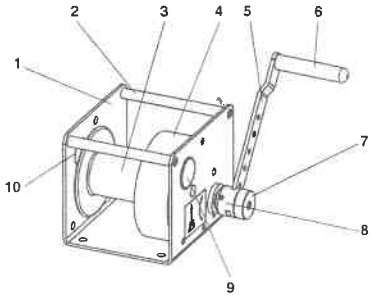
The following spare parts and accessories can be supplied:
- caRol™ wire rope to desired length, equipped with swivel hook with safety latch and cable clamp.
- Control crank.

4) Specifications of caRol™ manual winches

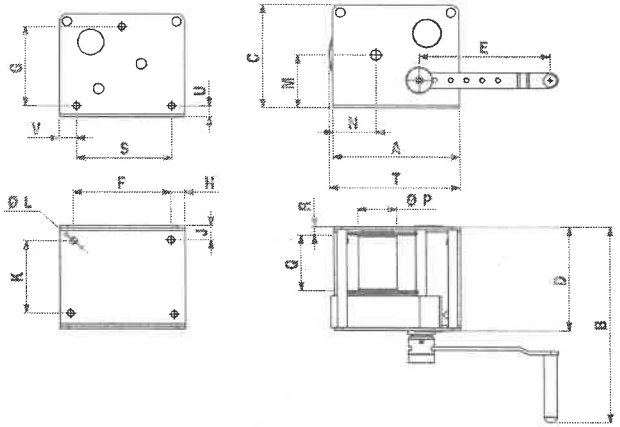
4.1 caRol™ type TR manual winch

4.1.1 Winch

Fig. 1



1 Structure
2 Carrying handles
3 Drum
4 Protective casing
5 Control crank with adjustable length
6 Access cover for drum clutch-release lever
7 Access cover for wire rope clamp screws
8 Crank length adjustment knob
9 Drive hub
10 Crank handle



WLL (kg)	Dimensions (mm)																		
	A	B	C	D	Emax/ Emin (1)	F	G	H	J	K	ØL	M	N	P	Q	R	S	T	U	V
300	225	379	195	200	250/100	200	154	12.5	28	144	7x Ø13	96	77.5	74	107	24.5	184	231.5	22.5	20.5
500	242	380	200	200	250/100	200	154	21	28	144	7x Ø13	102.7	83	74	107	24.5	184	236.5	22	29

(1): in steps of 30 mm

WLL (kg)	Wire rope			Force on crank (kg) (1)	Lifting distance per crank turn (mm) (2)	Weight of winch without wire rope (kg)
	Ø (mm)	Maximum capacity (m)	Number of layers			
300	4.3	40	7	18	70	16.5
500	6.8	20	5	24	50	18.5

(1): at last winding layer and maximum length of crank (Emax)
(2): at last winding layer
WLL: Working Load Limit.

The carol™ winch is designed for use within the following operating temperature range: –10°C to + 50°C.

4.1.2 caRol™ wire ropes

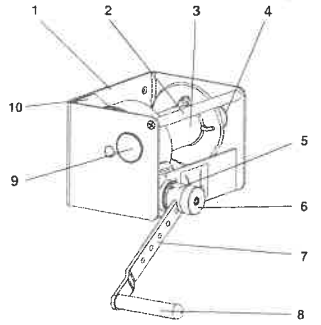
The specifications of the carolTM wire rope are given in the table below:

Winch	TR300	TR500
Nominal diameter of wire rope with no load	Ø 4,3 mm	Ø 6,8 mm
Material	Zinc-plated steel	Zinc-plated steel
Composition	18 x 7	18 x 7
Weight of 10 m equipped wire rope	1350 g	2350 g
Weight of wire rope per additional meter	83 g/m	185 g/m
Tensile strength of wire rope	12 kN	36,3 kN
Maximum length	40 m	20 m

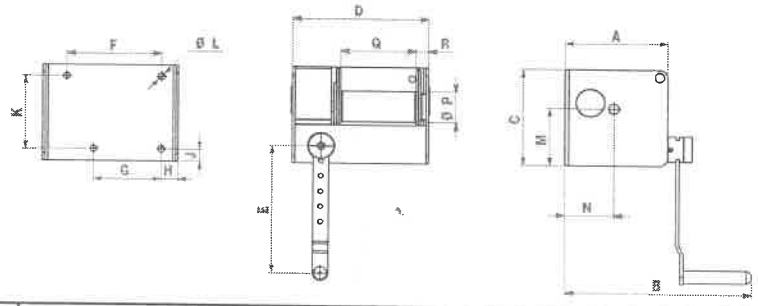
4.2 carol™ type TS manual winch

4.2.1 Winch

Fig. 2



1 Structure
2 Carrying handle
3 Drum
4 Crank handle
5 Crank length adjustment knob
6 Access cover for wire rope clamp screws
7 Control crank with adjustable length
8 Access cover for drum clutch-release lever
9 Drive hub
10 Protective casing



WLL (kg)	Dimensions (mm)														
	A	B	C	D	Emax/Emin (1)	F	G	H	J	K	ØL	M	N	P	Q	R
250	167	332	150	202	250/100	137	100	26	13	118	4xØ11	89	80	60	99	24.5
500	195	360	188	260	250/100	182	130	32	18	142	4xØ13	111.5	93	70	144	36

(1): in steps of 30 mm

C.M.U. (kg)	Wire rope			Force on crank (kg) (1)	Lifting distance per crank turn (mm) (2)	Weight of winch without wire rope (kg)
	Ø (mm)	Maximum capacity (m)	Number of layers			
250	5	20	5	10	21	11
500	6.8	25	5	13.5	17	17

(2): at last winding layer and maximum length of crank (Emax)
(3): at last winding layer
WLL: Working Load Limit.

The caRol™ winch is designed for use within the following operating temperature range: –10°C to + 50°C.

4.2.2 caRol™ wire ropes

The specifications of the caRol™ wire rope are given in the table below:

Winch	TS250	TS500
Nominal diameter of wire rope with no load	Ø 5 mm	Ø 6,8 mm
Material	Zinc-plated steel	Zinc-plated steel
Composition	18 x 7	18 x 7
Weight of 10 m equipped wire rope	1650 g	2350 g
Weight of wire rope per additional meter	111 g/m	185 g/m
Tensile strength of wire rope	22 kN	36,3 kN
Maximum length	20 m	25 m

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5 Installation

5.1 Preliminary checks required for caRol™ manual winches

Check that:

- The caRol™ winch complies with the standard delivery as described in this manual.
- The load or force is less than or equal to the working load limit of the winch.
- The strength of the host structure receiving the mounting plate is sufficient to safely apply a force equal to the working load limit of the winch.
- The rigging is correct.
- The caRol™ wire rope is in good condition (also see §13).
- No obstacle interferes with the user's arm when turning the control crank.
- No obstacle interferes with rotation of the control crank.
- The operator has uninterrupted eye contact with the material load along the entire listing height.
- The work area has been secured in compliance with applicable rules and regulations.
- The length of the caRol™ wire rope must be sufficient to rig the load; the drum must never be completely unwound. Make sure there are 2 to 3 coils of wire rope remaining on the drum.
- The location for placing or setting down the material load(s) to be lifted by the caRol™ winch are compatible as concerns access, strength, horizontality and adherence with the considered loads.
- There are no obstacles against which the load or wire rope may rub laterally or against which the material load may come into contact.
- The hook is in good condition:

o The safety latch must be bearing against the hook nose.

o The suspension hook mounting nut (item 3, fig. 7) must be effectively tightened and the nut locking pin (item 4, fig. 7) must be in place.

- All the safety systems of the caRol™ winch operate correctly (see §12).
- The installation conditions have been carefully studied to limit, to the maximum, the risk of fall by a person, the equipment used or the winch itself.
- The installer has all the necessary personal protective equipment (fall-arrest system, safety gloves, safety shoes, helmet) to safely carry out the installation operations.
- If the installer must use a fall-arrest system as covered by directive 89/656/CEE, he must mandatorily check that the anchor point to which the fall-arrest system is connected is sufficiently strong.
- The environment in which the winch is used carries no risk of explosion (ATEX Directive).
- The environment in which the winch is used is not abnormally corrosive, such as a marine environment, or other.

Additional checks when using idler pulleys

- Check that the axis of rotation of the idler pulleys is perpendicular to the wire rope plane.
- Ensure that the host structures on which the idler pulleys are rigged (figs 16 or 17, items 1 and 2) are sufficiently stable and strong, in compliance with all applicable regulations.
- Check that the idler pulleys have a working load limit which is compatible with the installation configuration and with the working load limit of the winch, in compliance with all applicable regulations.
- Check that the idler pulleys are compatible with the diameter of the caRol™ wire rope, in compliance with all applicable regulations.

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5.2 Mounting the caRol™ winches

DANGER: Ensure that the host structure receiving the mounting plate is sufficiently strong with respect to the force to be applied.

If the winch is to be mounted in a location which is dangerous for the operator, make sure all the necessary safety precautions have been taken in compliance with the applicable work regulations to eliminate any uncontrolled risk during this operation.

IMPORTANT: Make sure there are no obstacles against which the load or caRol™ wire rope may rub laterally or against which the load may snag.

IMPORTANT: Regardless of the assembly configuration, never lift a load which is not placed directly below the winch.

5.2.1 Mounting the caRol™ type TR winch

The winch can be mounted by its base (fig. 5) or by its side opposite the crank (fig. 6).

5.2.1.1 Mounting the winch on its base (fig. 5)

The winch must be secured using bolts as follows:

- The bearing surface must be flat and observe the mounting distances between centers as indicated in §4.1.1.
- Secure the winch with four screws M12 class 8-8 min. and 4 self-locking nuts M12 (screws and nuts not supplied with winch).
- Tighten the four fasteners using appropriate tools.

5.2.1.2 Mounting the winch on its side (fig. 6)

The winch must be secured using bolts as follows:

- The bearing surface must be flat and observe the mounting distances between centers as indicated in §4.1.1.
- Remove the access cover (item 10, fig. 1).
- Secure the winch with 3 screws M12 class 8-8 minimum and 4 self-locking nuts M12 (screws and nuts not supplied with winch).
- Tighten the 3 screw/nut assemblies using appropriate tools.

NOTE: When securing the winch, other fastening components can be considered, for example:

- Tapped holes M12 provided in structure.
- Mechanical or chemical dowel ensuring minimum mechanical strength of 1000 kg in compliance with manufacturer specification.

5.2.2 Mounting the caRol™ type TS winch

The winch is mounted on its base (fig. 19). The winch must be secured using bolts as follows:

- The bearing surface must be flat and observe the mounting distances between centers as indicated in §4.2.1.
- Remove the screw (item 1, fig. 20) using a cross-slot screwdriver.
- Remove the casing (item 10, fig. 2).
- Secure the winch:
- TS500: with 4 screws M12 class 8-8 minimum and 4 self-locking nuts M12.
- TS250: with 4 screws M10 class 8-8 minimum and 4 self-locking nuts M10.

(Screws and nuts not supplied with winch)

- Tighten the 4 fasteners using appropriate tools.
- Place the casing (item 10, fig. 2) in mounting position.

- Secure with screw (item 1, fig. 20) using a cross-slot screwdriver.

NOTE: When securing the winch, other fastening components can be considered, for example:

For TS500:
- Tapped holes M12 provided in structure
- Mechanical or chemical dowel ensuring minimum mechanical strength of 1000 kg in compliance with manufacturer specification

For TS250:
- Tapped holes M10 provided in structure
- Mechanical or chemical dowel ensuring minimum mechanical strength of 700 kg in compliance with manufacturer specification

6 Rigging the load

The load must be rigged using the hook of the caRol™ wire rope (item 1, fig. 7), equipped with its safety latch (item 2, fig. 7).

To rig the load, proceed as follows:

1) Open the hook latch by pressing on the end (hook nose side) and keep it open in this position.
2) Run the external rigging component (which may be a sling, etc.) between the hook nose and the latch.
3) Release the latch to allow it to close (latch in contact with hook nose).

The load should be rigged using a sling of appropriate capacity, dimensions and type for the object to be handled. It is strictly prohibited to use the caRol™ wire rope as a sling by running it around an object with the hook fastened to the wire rope (fig. 8, correct slinging, fig. 9, prohibited slinging).

7 Setup with idler pulleys (fig. 16 or fig. 17)

The winch can be used with two idler pulleys.

NOTE: The diameter of the groove bottom of the pulleys used must be at least 16 times the diameter of the caRol™ wire rope (check applicable regulations as may be required).

NOTE: If setting up with only one idler pulley or with more than two idler pulleys, contact Tractel®.

For the setup, proceed as follows:
- secure the winch (see §5)
- unwind the required length of wire rope to fasten the load by releasing the drum (see §8.4).
- run the cable through the idler pulleys (items 1 and 2, figs.16 or 17).
- fasten the load to the hook (item 3, figs. 16 or 17) on the caRol™ wire rope (see §13).

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8 Commissioning

8.1 Installing the caRol™ wire rope in the winch

To install the caRol™ wire rope on the drum, proceed as follows:

- through the interior of the drum, run the ground end of the caRol™ wire rope through the clamp (item 1, fig. 10) and the hole in the drum (item 2, fig. 10).
- allow the caRol™ wire rope to come out of the exterior side plate of the drum by around 5 mm.
- Remove the access cover (item 10, fig. 1)
- Tighten the two nuts on the cable clamp using a 7 mm tubular socket wrench (fig. 11).
- Reinstall the access cover (item 10, fig. 1).
- Wind the caRol™ wire rope around the drum in the direction indicated by the arrow (fig. 10) so that the wire rope winds regularly on the drum, layer by layer.

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DANGER: Make sure the caRol™ wire rope is wound in the correct direction on the drum as indicated by the arrow shown in fig.10.

NOTE: Optionally, the type TS winches, mounted on TRACPODE™ tripods, are equipped with a second clamp (item 1, fig. 21). To install the caRol™ wire rope, proceed as follows:

- Through the interior of the drum, run the ground end of the caRol™ wire rope through the clamps (items 1 and 2, fig. 21) and the hole in the drum (item 3, fig. 21).
- Allow the caRol™ wire rope to come out of the exterior side plate of the drum by around 5 mm.
- Remove the access cover (item 10, fig. 1)
- Tighten the two nuts on the cable clamp (item 2, fig. 21) using a 7 mm tubular socket wrench (fig. 11).
- Turn the drum by one-quarter turn to bring the cable clamp (item 1, fig. 21) into line with the access hole and tighten the two nuts of the cable clamp (item 1, fig. 21) using an 11mm tubular socket wrench (fig. 11).
- Reinstall the access cover (item 10, fig. 1).
- Wind the caRol™ wire rope around the drum in the direction indicated by the arrow (fig. 21) so that the wire rope winds regularly on the drum, layer by layer.

8.2 Installing the wire rope in the pulleys

NOTE: Tractel® recommendations: two persons required when installing wire rope on pulleys.

- Release the drum (see §8.4).
- Unwind the caRol™ wire rope taking care to keep it tensioned while unwinding. Run the wire rope through the idler pulley winch-side (fig.16 or 17, item 1). Unwind more wire rope taking care once again to keep it tensioned. Run the wire rope through the idler pulley load-side (figs. 16 or 17, item 2).
- Allow the lifting hook to hang (figs. 16 or 17, item 3).
- Engage the drum (see §8.4).
- Lower the hook assembly using the control crank (fig.1, item 5).
- At the end of the unwinding operation, check that there are at least two rounds of wire rope remaining on the winch drum.

8.3 Adjusting the control crank length

This adjustment is required to adapt the effort to be supplied by the user to the load to be lifted (see fig. 12 and fig. 13).

To adjust the crank length, proceed as follows:

- Pull the knob (item 7, fig. 1).
- Slide the rectangular section of the crank in the hub (item 9); the handle (item 10) should be pointing toward the outside of the winch.
- Adjust the length of the control crank (item 5, fig. 1) to the desired length.
- Release the knob (item 7, fig. 1).
- The pin at the center of the knob, and the knob (item 7), should return to their initial position. The pin should not protrude from the knob. If the pin protrudes, this means that the crank is not locked in place.
- Check that the crank is locked by applying a translation movement to the crank.
- If the crank is not locked, apply a light translation movement to the crank to engage the crank translation locking system.

IMPORTANT: Before using the winch, make sure the crank is locked in translation to prevent any unexpected disengagement of the crank.

8.4 Releasing / Engaging the drum

DANGER: This operation must only be performed with no load.

This operation can be useful to quickly unwind the caRol™ wire rope without using the control crank.

To release the drum, proceed as follows:

- Remove the access cover (item 10, fig. 1).
- Turn the crank (item 5, fig. 1) to bring the drum release lever in line with the access hole.
- Remove the control crank (item 5, fig. 1)
- Tilt the lever (item 1, fig. 14) by one-quarter turn in the direction indicated.
- The drum (item 3, fig. 1) is free to rotate; the caRol™ wire rope can be pulled to the desired length.

To engage the drum, proceed as follows:

- Fold in the lever (item 1, fig. 15) by ¼ turn and manually turn the drum (item 3, fig. 1) to allow the lever (item 1, fig. 15) to return to its initial position.
- Reinstall the control crank (item 5, fig. 1).
- Reinstall the access cover (item 10, fig. 1).
- Check that the drum turns in the direction shown, and reciprocally, when the crank is turned.

8.5 Equipment checks without load

Check that:

- No interference is observed between the wire rope, equipped with its hook, and the environment over the entire load lifting height.
- At least two rounds of wire rope remain coiled on the drum at the end of the wire rope lowering limit.

8.6 Equipment checks with load

DANGER: Be sure to strictly observe the direction of the pulling force of the caRol™ wire rope exerted by the load. The two possibilities are shown by two arrows on fig.13 for the type TR winch and on fig. 20 for the type TS winch.

DANGER: If the winch is to be used in a location which is dangerous for the operator, make sure all the necessary safety precautions have been taken in compliance with the applicable work regulations to eliminate any uncontrolled risk during this operation.

IMPORTANT: It is strictly prohibited to use the winch for pulling, slanted lifting, pulling on an inclined surface or any other configuration not described in this manual.

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With the maximum working load fastened, lift the load just slightly off the ground and perform the following checks:

1) When the control crank (item 5, fig. 1) is turned in the up direction, the load should move up and the winch should make a repeated ratchet clicking sound (item 1, fig. 18) on the slotted wheel (item 2, fig. 18).
2) When the control crank (item 5, fig. 1) is released, the load should stop.
3) When the crank is turned in the direction opposite to the up direction, the load should descend gradually. In the lowering direction, the winch does not make any ratchet clicking sound.
4) Check for any signs of deformation, cracks or rupture of the caRol™ winch host structure. If any of these defects are observed, immediately stop the up-movement, set down the load and deinstall the caRol™ winch.
5) Check that there is no interference between the material load and the environment along the entire load lifting height by acting on the control crank.
6) Check that there is no deformation, cracks or rupture where the idler pulleys (fig. 16 or 17, items 1 and 2) are fastened, nor in the immediate environment. If any defects are observed, immediately stop the up-movement, set the load down on the ground and have the pulley anchoring points checked by a qualified technician.

7) Check that there is no deformation on the ground or working platform when the load is set down.

If checks 1) to 7) prove normal, you can proceed with the handling maneuvers. If not, return the winch to a Tractel®-approved repair agent.

9 Handling maneuver

9.1 Preliminary conditions

Before any maneuver using the caRol™ winch, the operator must ensure that:

- The lighting conditions are satisfactory along the entire load lifting height.
- The wind speed is compatible with use of the winch (< 50km/h)
- The load to be lifted is a material load, and not a person.

9.2 Check before use

Before using the caRol™ winch, the operator must ensure that:

- The material load is less than or equal to that of the caRol™ Working Load Limit (WLL).
- There is no risk of interference of the wire rope with an obstacle along the entire lifting height.
- The wire rope is in good condition along its entire length.
- The safety systems operate correctly.
- The work area has been secured in compliance with the applicable regulations.

Additional checks for installation with idler pulley:
Check that the axis of rotation of the pulleys is perpendicular to the wire rope plane.

9.3 Procedure

9.3.1 General

DANGER:

- Make sure the sound environment where the work is to take place will allow the operators to clearly understand the instructions exchanged during all the handling maneuver phases described in this section.
- It is strictly prohibited to take position or work under the load being handled. A prohibited access area should be defined under the load.

9.3.2 Lifting the material load

NOTE: Tractel® recommendation: Two operators required to operate the winch.

The first operator is in charge of slinging the material load.
The second operator is in charge of turning the control crank and setting down the load at the high position.

Description of load lifting phases:

- Sling the load

The operator fastens the material load to be lifted to the lifting hook of the winch (fig. 3, item 1).

- Lift-off of the load

By a slight rotation on the control crank (fig. 1, item 5), the operator slightly lifts off the load from the ground checking that no part of the material load will come unfastened during the lifting operation.

- Lift the load

By turning the control crank (fig. 1, item 5), the operator lifts the material load.

DANGER: The operator must visually follow the material load along the entire lifting height, in particular:

- Do not allow the load to swing or turn.
- Keep all obstacles away from the wire rope and from the material load.
- Do not allow any slack to occur on the loaded strand of the wire rope.
- Stop lifting the load.

The operator releases the control crank. At this moment, the operator must check that the load has actually stopped.

- Position and set the material load down at the high position.

The operator grabs the material load using an appropriate grabbing system and positions it directly above the location where it will be set down. The operator sets down the load by acting on the control crank.

IMPORTANT: When setting down the load, make sure that the material load is stable and that there is no risk of any element detaching from the load.

9.3.3 Lowering a material load

NOTE: Tractel® recommendation: Two operators required to operate the winch.
The first operator is in charge of slinging the load and operating the winch.
The second operator is in charge of setting down the load at the low position.

Description of load lowering phases:

- Sling and lift off the load
- Position the material load directly above the location where it will be set down.

The operator grabs the material load using an appropriate grabbing system, positions the load directly above the location where it will be set down, then lowers the load by rotating the control crank.

DANGER:

- Check that there are no obstacles along the material load descent path.
- Check that the area where the load will be set down has been secured and that the area under the material load is clear of all personnel.
- The operator must visually follow the material load along the entire lifting height, in particular:
- Do not allow the load to swing or turn.
- Keep all obstacles away from the wire rope and from the material load.
- Do not allow any slack to occur on the loaded strand of the wire rope.
- Stop lowering the load.

The operator stops rotating the control crank. At this moment, the operator must check that the load has actually stopped.

- Position and set down the material load at the low position.

IMPORTANT: When setting down the load, make sure that the material load is stable and that there is no risk of any element detaching from the load.

10 Emergency procedure in case of an incident

Stop turning the control crank (fig.1, item 5) to immediately stop movement of the load. Contact the necessary authorities to trigger an operation aimed at setting down the load and intervening on the winch.

DANGER: Immediately set up a safety perimeter around the winch and directly below the load to prevent any unauthorized persons from circulating under the load.

IMPORTANT: Whatever the cause of the blocked wire rope, immediately stop the maneuver without taking any further action on the winch.

11 Removal from service - Storage

Do not disconnect the caRol™ wire rope hook from the load until it is bearing stable on a fixed, sufficiently strong support.

The winch can stay in its working position provided it is sheltered from weather and in a dry location.

Make sure the winch is not accessible to any unauthorized persons.

DANGER: When the equipment shows any signs of obsolescence which may

represent a risk, the user must scrap the equipment in full observance of environmental regulations.

Tractel® recommends storing the winch in its original packaging. The caRol™ wire rope should be correctly coiled on the winch drum.

The caRol™ winch must be stored in a clean, dry location at temperatures of between –10°C and +50°C.

The winch must be transported with the caRol™ wire rope coiled on the drum.

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12 Safety devices

The winches are equipped with the following safety devices (compliant with standard EN13157: Dec. 2004):

- automatic ratchet brake with double spring
- protection of users and gears by a protective, ergonomic cover, removable for servicing (item 4, fig. 1 or item 10 fig. 2)
- a forged steel swivel hook (fig.7, item 1) with safety latch (fig. 7, item 2)
- self-locking crank

13 caRol™ wire rope

The caRol™ wire rope is equipped at one of its ends with a swivel hook with safety latch (fig.7, item 1) mounted on a loop of the caRol™ wire rope equipped with a thimble (item 5, fig. 7) and swaged in a metal sleeve (item 6, fig. 7). The other end of the caRol™ wire rope is welded and ground (see fig. 23).

To ensure safe use of the caRol™ winches, it is essential to only use the winches with a caRol™ wire rope specially designed for these machines.

To ensure safe use of the system, the caRol™ wire rope, like the caRol™ winch, must be in good condition. You should regularly check the condition of the caRol™ wire rope.

⚠ **DANGER**: Use of a caRol™ wire rope which is damaged or not matched to the winch can result in a major accident or failure. You must constantly monitor the condition of the caRol™ wire rope and immediately eliminate any caRol™ wire rope which shows any sign of deterioration (fig. 24).

Never allow a tensioned caRol™ wire rope to rub against an obstacle.

IMPORTANT: Never expose the caRol™ wire rope to mechanical or chemical agents which could damage the wire rope.

14 Unauthorized use of caRol™ equipment

Do not:

- Use the equipment described in this manual to lift or carry persons.
- Use the winch if it has not been inspected over the past year.
- Secure the winch to a support which is not sufficiently strong.
- Secure the winch by any means other than those described in this manual.
- Use the winch for operations other than those for which it is intended.
- Use the winch for any application other than vertical lifting of materials.
- Use the winch beyond its working load limit
- Use the winch in an explosive environment (device not compliant with ATEX directive).
- Use the winch at temperatures below –10°C or greater than +50°C.
- Use the winch when the wind speed is greater than 50 km/h.
- Bring your hand or any other part of the body near to the moving parts of the winch.
- Use the winch without first having performed the preliminary checks detailed in this manual.
- Try to lift loads which are fixed or blocked
- Lower a load by free fall.

- Lift or lower a load without having an uninterrupted view of the entire path.
- Apply any lateral pulling action on the load.
- Drag a load along the ground.
- Allow the load to swing under the winch.
- Take position or circulate under the load.
- Use any wire rope other than the caRol™ wire rope.
- Use a caRol™ wire rope which is in poor condition.
- Use the caRol™ wire rope as a sling.
- Allow a tensioned caRol™ wire rope or a load to rub against an obstacle.
- Use hooks which are in poor condition.
- Perform any modification to the system which is not described in this manual.
- Fully unwind the drum (always keep 2 or 3 coils on the drum when wire rope is fully extended).
- Release the wire rope drum when the system is loaded.
- Use any other crank other than the original crank.
- Use parts or components other than genuine manufacturer's parts or components.
- Secure the winch by its carrying handle.

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15 Malfunctions

Malfunctions	Diagnostics	Corrective actions
When the crank is turned in the "up" direction, the load comes down, and vice-versa	caRol™ wire rope is stuck in drum	Release the caRol™ wire rope taking all the usual precautions. If the wire rope is damaged (per criteria detailed in §13), replace the wire rope.
	The caRol™ wire rope is coiled in the wrong direction	Wind the caRol™ wire rope in the correct direction.
Cable blocked	Load has snagged during up movement	Release the load and check the cable before resuming the movement
During up movement with load, winch does not make repetitive ratchet sound	Ratchet springs broken	Remove the load and return the winch to a Tractel® repair agent
	Ratchet seized on rotation shaft	Remove the load and return the winch to a Tractel® repair agent
The load is not braked either when lifting or lowering as soon as the effort on the crank is stopped	Brake system malfunction	Remove the load and return the winch to a Tractel® repair agent
Effort on crank is abnormally high	Gear system seizure	Generously lubricate gear system (see §18 Maintenance)
	Drum seized on rotation shaft	Remove the load and return the winch to a Tractel® repair agent
With drum release lever in engaged position, and after turning the crank several times in the "up" direction, the load does not move up	Gear/drum link pin seized in its housing	Remove the load and return the winch to a Tractel® repair agent
	Gear/drum link pin spring is damaged	Remove the load and return the winch to a Tractel® repair agent
Control crank does not automatically lock in translation	Return spring broken	Remove the load and return the winch to a Tractel® repair agent
	Pin seized	

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16 Temporary removal from service and deinstallation

16.1 Removal from service

The winch is removed from service in the following cases:

- Detection of winch failure (see malfunctions table).
- Extended non-use of the winch.

In the latter case, the winch can remain in its working position provided it is sheltered from weather and it is in a dry location.

Removal from service procedure

- If the unit is functional:

o Unfasten the load from the lifting hook.

o Fully wind the wire rope on the drum using the control crank.

- If the unit is not functional:

o Recover the load using another appropriate lifting means, taking all the necessary precautions for this type of intervention.

o Wind the caRol™ wire rope on a reel having a diameter equal to or greater than the diameter of the drum (not supplied by Tractel®) taking care not to damage the wire rope.

o Fasten the reel to the carrying handle using an appropriate fastening means.

IMPORTANT:

o Make sure that the wire rope does not accidentally unwind.

o Do not use the wire rope to fasten the reel to the carrying handle.

o Make sure the unit is not accessible to persons not authorized to use it.

16.2 Checks before deinstallation

Before deinstallation, check that:

- The unit is not in service.
- The area directly beneath the deinstallation location has been secured in compliance with the applicable regulations.
- The installer has the appropriate slinging and lifting means to recover the caRol™ winch under safe conditions.
- The installer has the tools required for installation (see §5 depending on type of winch).
- The installer must ensure that the anchor point for the deinstallation lifting device is compatible with the weight of the caRol™ winch in compliance with the applicable regulations.
- The installer must ensure that there are no obstacles against which the caRol™ winch may hit or snag while it is being lowered.

16.3 Deinstallation operations

NOTE: Tractel® recommendation: 2 operators required for deinstallation procedure.

Tools: same tools used for installation (see §5)

For deinstallation, proceed as follows:

- Using a webbing sling, sling the winch by a carrying handle. Sling the caRol™ winch so that it is as stable as possible during and after disassembly.
- Using appropriate tools, one of the two operators loosens the fasteners securing the winch mounting structure while the other operator holds the caRol™ winch to prevent it from swinging or pivoting.
- Using the deinstallation lifting device, the operator in charge of loosening the fasteners slightly lifts the caRol™ winch to separate it from the mounting structure.
- During the removal operation, the operators must check that the wire rope does not get stuck under the winch.

The deinstallation procedure is completed.

17 Regulatory checks

In France, lifting devices are subject to an initial inspection before commissioning, followed by periodic inspections (law dated March 01, 2004).

18 Maintenance

Maintenance of the unit consists in monitoring its condition, cleaning the unit and having it inspected periodically (at least once annually) by a Tractel®-approved repair agent.

The gears must be greased regularly by a technician. For this operation, proceed as follows:

18.1 caRol™ type TR winches

- Unscrew the three screws (item 1, fig. 4) securing the protective casing (item 4, fig. 1) using an Allen key No. 4.
- Push aside the casing drum-side.
- Using a brush, grease the gear teeth using KERNITE LUBRA K AC grease.
- Reinstall the gear casing and secure it with the three mounting screws (item 1, fig. 2) using an Allen key No. 4.

18.2 caRol™ type TS winches

- Unscrew the screw (item 1, fig. 20) securing the protective casing (item 10, fig. 2) using a cross-slot screwdriver.
- Remove the protective casing (item 10, fig. 2).

- Using a brush, grease the gear teeth using KERNITE LUBRA K AC grease.
- Reinstall the protective casing and secure it with the mounting screw (item 1, fig. 20) using a cross-slot screwdriver.

⚠ **DANGER:** Do not turn the control crank during the lubrication operation.

- Make sure that:
- the suspension hook mounting nut (item 3, fig. 7) is efficiently tightened and that the nut locking pin (item 4) is in place.
- the safety latch (item 2, fig. 7) is properly seated on the hook nose.

Replace if necessary.

The inspection and maintenance sheet is located at the end of this manual.

- To clean the unit, use a moist sponge with soap.

If any corrosion appears on the unit, clean the surface using a wire brush or abrasive paper and re-paint the area using rust-inhibiting paint.

- It is strictly prohibited to use corrosive products (acid, chlorinated products) to clean the winch. This type of product will result in perforating corrosion which could fragilize the winch.

Any visible deterioration of the winch or its equipment, particularly its hook, caRol™ wire rope or control crank should be repaired before the winch is used again.

19 Periodic inspections

Maintenance of the unit consists in monitoring its condition, cleaning the unit and having it inspected periodically (see table of periodic check actions) by a Tractel®-approved repair agent.

Any visible deterioration of the unit or its equipment, in particular its hook, wire rope or winch mounting structure should be repaired before the winch is used again.

Only the following persons are qualified to carry out the check operations:

- The operator must carry out the check operations before using the winch as indicated in the table of the next page.
- The installer must carry out the check operations before and after installation of the winch as indicated in the table of the next page.
- The operator must carry out the check operations before commissioning of the winch as indicated in the table of the next page.
- The Tractel® after-sales service must carry out the annual and 10-year inspection operations on the winch as indicated in the table of the next page.

Periodic check actions

	Before commissioning	Before installation	Before each use	Annual	Every 10 years	Type
Up and down movement operation	X	X	X	X	X	FT
Operation of hook safety latch	X	X	X	X	X	FT
Operation of brake for up and down movement	X	X	X	X	X	FT
Condition of wire rope	X	X	X	X	X	VT
Condition of lifting hook	X	X	X	X	X	VT
Wear condition* of brake linings				X	X	VT
Condition of winch mounting structure	X	X	X	X	X	VT
Condition of hook safety latch (deformation, wear, rupture)	X	X	X	X	X	VT
Condition of wire rope drum (crack, rupture)				X	X	VT
Condition of wire rope fastening on drum				X	X	IT
Condition of wire rope (broken wires, corrosion)	X	X	X	X	X	VT
Condition of wire rope sleeve and thimbled loop (crack; wear; corrosion)	X	X	X	X	X	VT
Condition of protective casings (deformation; crack; corrosion)				X	X	IT
Condition of reduction gear					X	IT
Condition of drum bearings					X	IT

*: Acceptable wear of linings

FT:	Functional tests
VT:	Visual inspection without disassembly
IT:	Inspection requiring opening or disassembly of element to be checked

caRol™ winch type	TR	TS
Nbr. of linings	2 (item 3, fig. 18)	1 (item 3, fig. 22)
Thickness of new lining	3 mm	3.5 mm
Thickness of worn lining, min.	2.5 mm	3 mm

IMPORTANT: If the linings show any damage (for example: cracks, coming apart, ...), you must replace them.

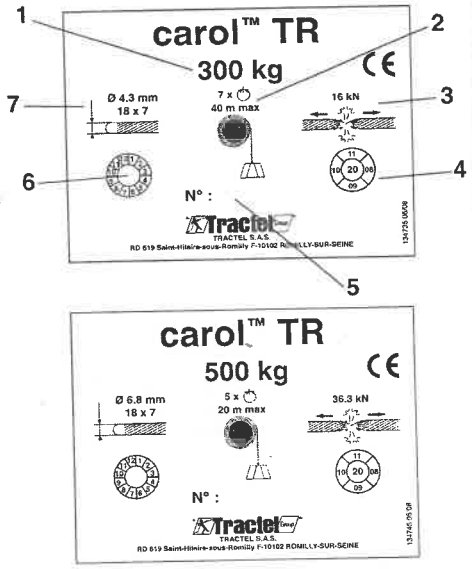
DANGER: Before any intervention on a replacement accessory, including the wire rope, the operator must mandatorily remove the load.

20 Markings and plates on winches

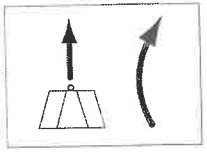
20.1 caRol™ type TR winch

20.1.1 caRol™ winch and wire rope characteristics plate:

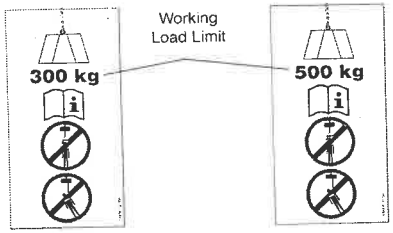
1 Working load limit.
2 Number of winding layers and maximum length of caRol™ wire rope
3 Tensile strength of caRol™ wire rope.
4 Production year.
5 Serial No.
6 Production month.
7 Ø and structure of caRol™ wire rope



20.1.2 Label indicating direction of rotation of control crank for lifting load:



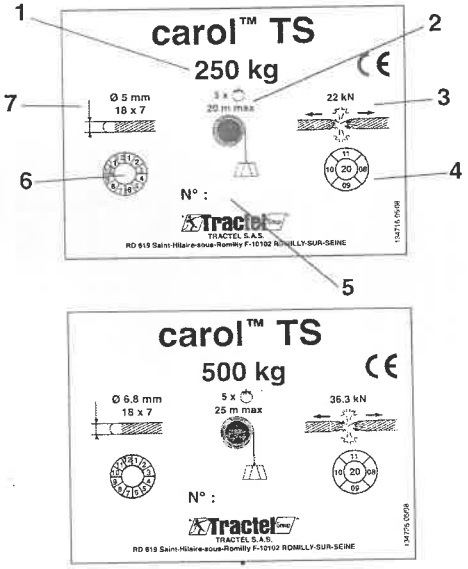
20.1.3 Label indicating it is prohibited to take position under the load or to use the winch to lift a person, and the obligation to read the operating and maintenance instructions manual:



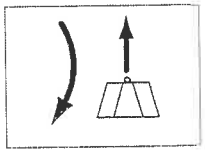
20.2 caRol™ type TS winch

20.2.1 caRol™ winch and wire rope characteristics plate:

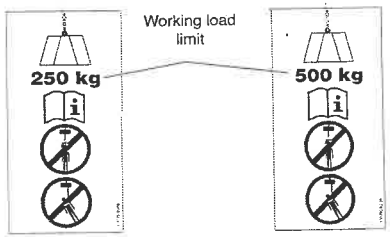
1 Working load limit.
2 Number of winding layers and maximum length of caRol™ wire rope.
3 Tensile strength of caRol™ wire rope.
4 Production year.
5 Serial No.
6 Production month.
7 Ø and structure of caRol™ wire rope



20.2.2 Label indicating direction of rotation of control crank for lifting load:



20.2.3 Label indicating it is prohibited to take position under the load or to use the winch to lift a person, and the obligation to read the operating and maintenance instructions manual:



21 Scrapping and protection of the environment

IMPORTANT: It is strictly prohibited to indiscriminately dispose of old oils and greases, or any part of the caRol™ winch or its accessories.
At the end of the equipment service life, the caRol™ winch must be scrapped in compliance with the applicable environment protection regulations.

INSPECTION AND MAINTENANCE SHEET						
Dates	Supervisor	Reason for inspection	Inspection / Check done	Troubleshooting	Evaluation of risks	Corrective actions

INSPECTION AND MAINTENANCE SHEET						
Dates	Supervisor	Reason for inspection	Inspection / Check done	Troubleshooting	Evaluation of risks	Corrective actions