VIME INDUSTRIAL
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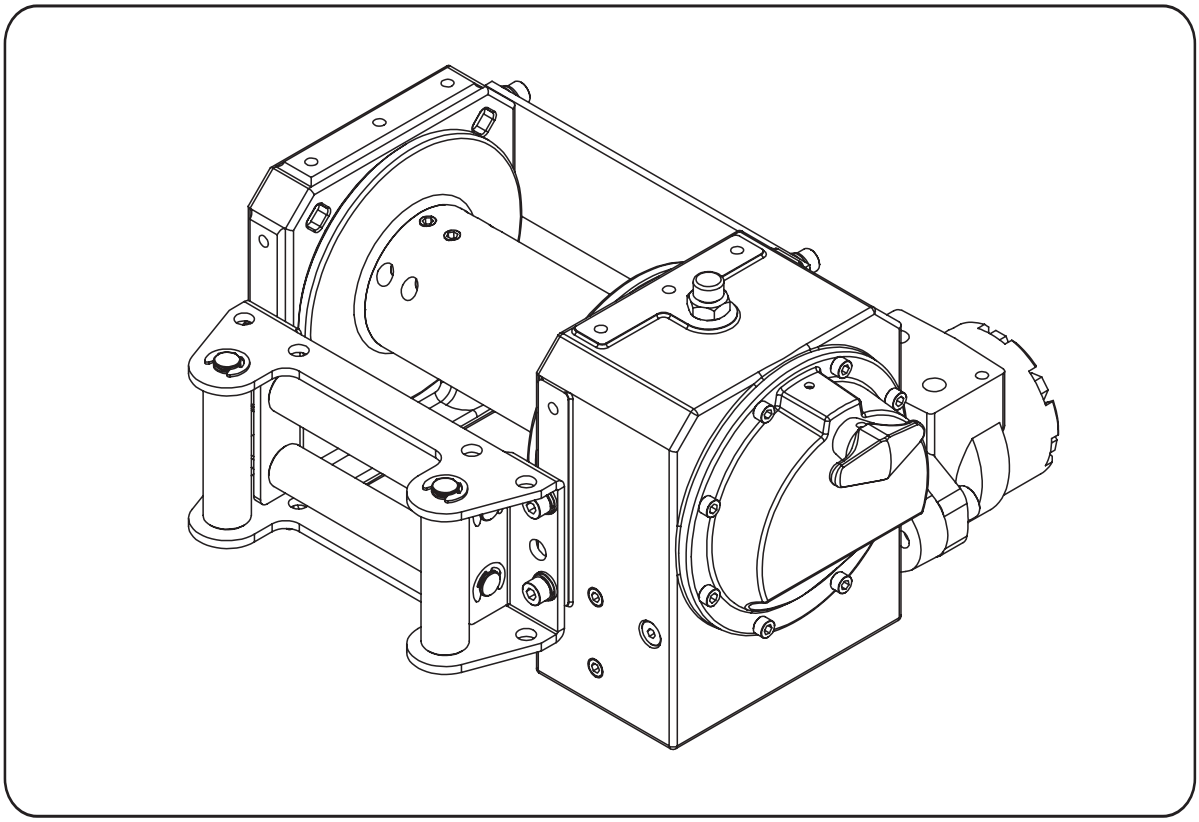
ZH

ENGLISH

OPERATING SERVICE AND MAINTENANCE MANUAL



WORM GEAR HYDRAULIC WINCH

Because of continued product improvement, we reserve the right to make changes without notice.

CE
EN 14492-1

⚠ WARNING

Read and understand this manual before installation and operation of winch.
Keep this manual with the winch at all times.

VIME has no responsibility for physical injury to persons, animals or property damages. That can result from failure to read and apply the instructions contained in the manual supplied with the winch and especially for: Failure with global safety aspects - Not correct linking to the source of energy – Deficiency in the annual and monthly maintenance - Improper uses - Any alteration, repair or modification from unauthorized personnel.

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E-mail: info@vimeindustrial.com / Web site: www.vimeindustrial.it - www.vimeindustrial.com

02/2012 - UK - REV A - 12 - H - EN 14492-1

WARNING

Do not operate this winch until you have fully read this manual.

Many accidents are due for non observance safety procedures. A good reason, most of it can be avoided by knowing causes and taking in advance the opportunity safety.

WARNING

Read and understand this manual before installation and operation of winch.

Model	ZHC 3000 ZHL 3000	ZHC 2200 ZHL 2200
Serial Number		
Manufacture year		
Max. rated line pull	• ZHC 3000 • ZHC 2200 • ZHL 3000 • ZHL 2200	3.000 kg 2.200 kg 3.000 kg 2.200 kg
Wire rope diameter	• ZHC-ZHL 3000 • ZHC-ZHL 2200	Dia. 9 mm Dia. 8 mm
Max. pressure	• ZHC-ZHL 3000 • ZHC-ZHL 2200	130 bar 130 bar
Weight (with roller fairlead and without cable)	• ZHC 3000 - ZHC 2200 • ZHL 3000 - ZHL 2200	26 kg 29 kg

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WARRANTY

V.I.M.E. s.r.l. warrants to the original buyer , all parts and components except the wire rope , to be free from defects in materials and workmanship for a period of (one) 1 year for electrical and mechanical components. The obligation under this warranty , statutory or otherwise , is limited to the replacement or repair at V.I.M.E. s.r.l. , or at a point designated by V.I.M.E. s.r.l. of such of part that shall appear to V.I.M.E. s.r.l. , upon inspection of such part , to have been defective in material or workmanship. This warranty does not obligate V.I.M.E. s.r.l. to bear the cost of labour or transportation charges in connection with the replacement or repair of defective parts , nor shall it apply to product upon which repairs or alterations have been made, unless authorized by V.I.M.E. s.r.l. , or for equipment misused , neglected or which has not been installed correctly. V.I.M.E. s.r.l. whose policy is one of continuos improvement , reserves the right to improve its products through changes in design or materials as it may deem desirable without being obligated to notify of such changes in products prior to manufacture. V.I.M.E. s.r.l. has no responsibility for physical injury to persons , animals or property damage that can result from failure to read and apply the instructions contained in the Manual supplied with the winch and especially for :

- Failure with global safety aspects .
- Incorrect linking to the source of energy .
- Deficiency in annual and monthly maintenance .
- Improper uses .
- Any alteration , repair or modification from unauthorized personnel .

SECTION 1
SAFETY PROCEDURES

1.1 INTRODUCTION

Manual identified by code No. 02/2012-UK-REV A -12-H-EN 14492-1 has 47 pages.

IMPORTANT

At the delivery of this manual checks all data and for possible incongruities.

VIME reserves the right to improve its products through changes in designed or materials as it may seem desirable without being obligated to incorporate such changes in this manual.

This manual contains useful ideas in obtaining the most efficient operation and maintenance from the winch and safety procedures one need to know before operating a winch.

For safety procedures, read carefully safety procedures in chapter 1.7.

Manual has to be kept intact and near to the winch for a prompt reading and consultation.

WARNING

In case of misunderstanding of this manual or parts of it, please contact VIME. For repair service contact VIME.

For a rapid consultations, manual is being shared in 7 sections:

Section 1 Safety procedures
Section 2 Mounting
Section 3 Operation
Section 4 Accessories
Section 5 Maintenance
Section 6 Trouble shooting guide
Section 7 Parts list

Section **1** contains warning symbols, winch description and alls data for **SAFETY PROCEDURES**. Section **2** contains note about road traffic, hydraulic system, winch and cable drum installations. Section **3** contains alls data for winch operations. Section **4** accessories description. Section **5** is referred to the operator in charge of the winch maintenance. In this section are indicated all procedures as well as the maintenance must be executed in winch life. Section **6** is a guide for a trouble shooting should verify in winching operation. Section **7** contains parts list codes and parts drawing. All sections are shared in chapters progressive numbered. Chapters are shared in subsections progressive numbered.

IMPORTANT

For a rapid reading see table of contents.

1.2 SYMBOLS

In this manual there are three different symbols to prevent serious injuries.

• "DANGEROUS " symbol

DANGEROUS

Used to indicate dangerous situation and prevent injury.

• "WARNING" symbol

WARNING

Used to indicate dangerous situation for winch efficiency and for operator safety.

• "IMPORTANT" symbol

IMPORTANT

Used to call attention on important informations which user must knowing.

In addition to all warning symbols has been used a symbol to underline the notes.

• "NOTE" symbol

NOTE

Used to call attention on informations or advices that could help on winching operation.

The various symbols are completed by messages that describe in detail such warnings and dangerous situation, not neglecting to point out the recommended procedures and the useful informations.

1.3 SYMBOLS

According to EEC Directive Machinery 2006/42/CE, on VIME'S winches there are, in a visibile position for the utiliser, the following symbols:

CABLE INJURES KEEP CLEAR
(roller fairlead)

READ CAREFULLY THE OPERATING SERVICE AND MAINTENANCE MANUAL (winch identifica-

KEEP SAFETY DISTANCE
(winch identification decal)

WEAR WORKING GLOVES
(winch identification decal)

IMPORTANT

We recommend to respect the symbols above.
It is necessary to recognize the meaning of symbols and keeping visibile and readable.
If decals are damaged or unreadable replace it.

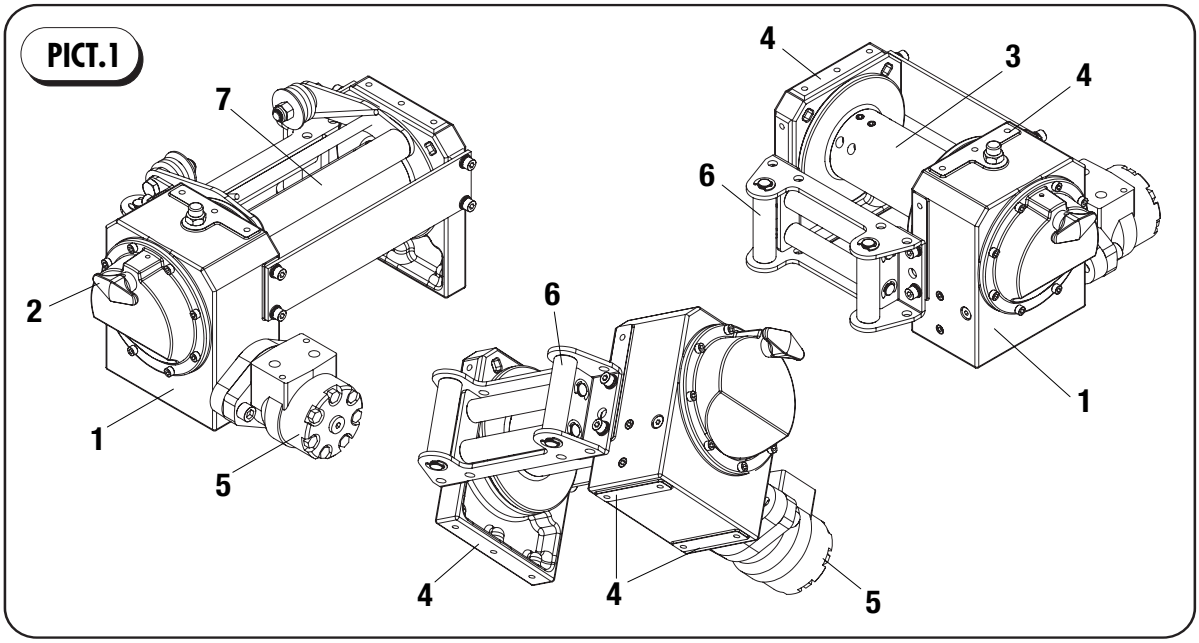
1.4 DESCRIPTION

Model ZH is an hydraulic worm gear winch. Designed for extend life and gives best safe duty. This winch is built according with higher safety standards to complaint with Directive Machinery 2006/24/CE EN 14492-1. The special aluminium alloy bronze gear match to an hardened steel ground polished worm. Worm gear provides load reversing protection. It is suitable for wreckers, carriers and trailers.

WARNING

The winch is built for working on range temperature between –20°C and +50°C. Do not exceed the range temperature it may be cause damage.

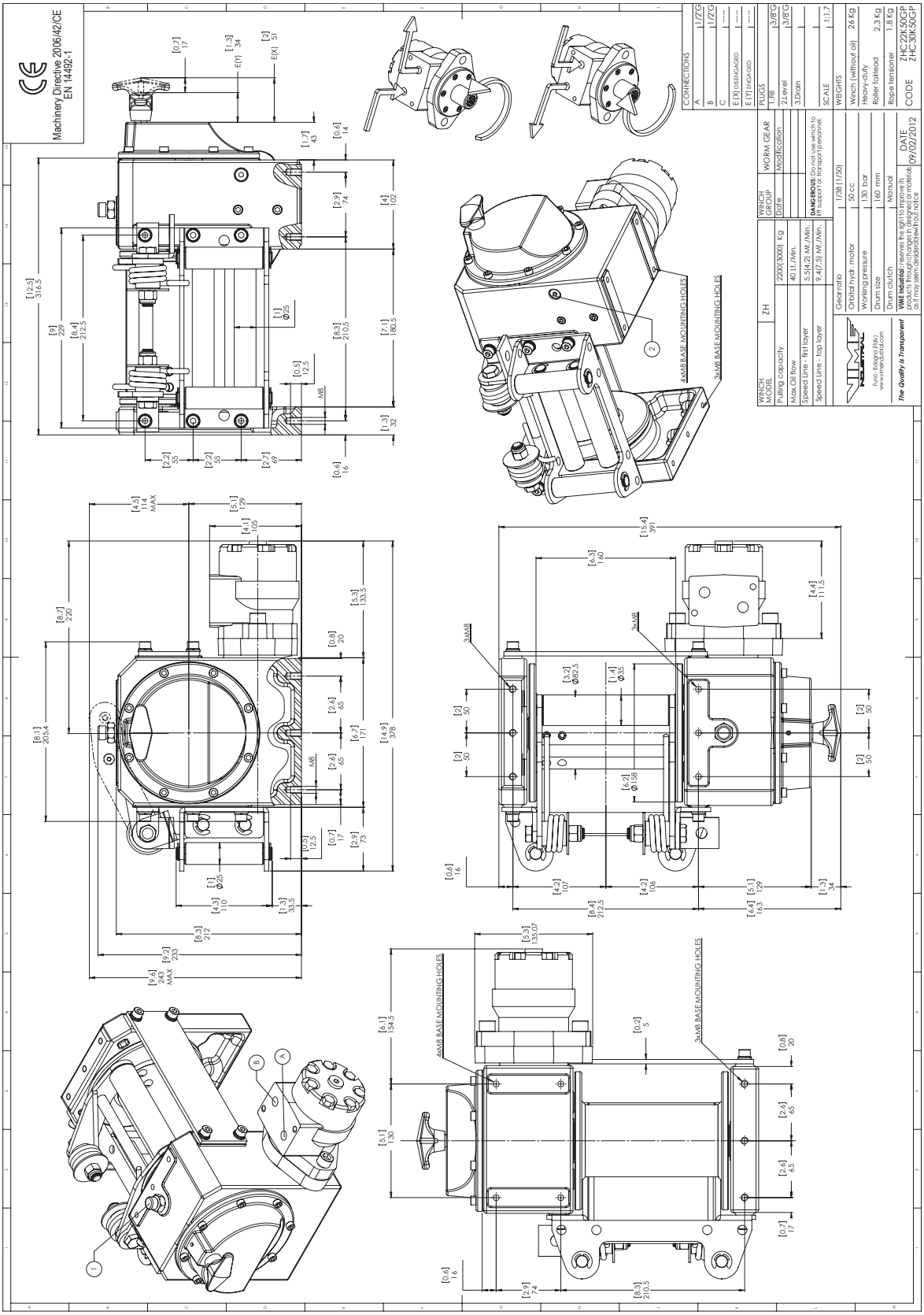
1.4.1 WINCHES DESCRIPTION



Components:

1. Worm gear housing
2. Manual clutch for drum free spooling
3. Drum length, distance between flanges:
   - ZHC (short) = 162 mm/ 6,4 inch
   - ZHL (long) = 211 mm/ 8,3 inch
4. Bases mounting: no 13 holes, M8 capscrews.
5. Orbital hydraulic motor: 50 cc
6. Zinc plated roller fairlead:
   - ZHC (short)
   - ZHL (long)
1. Cable tensioner (Copolymer acetate roller)
   - ZHC (short)
   - ZHL (long)

1.4.2 ZHC 2200/3000 WINCH DIMENSIONAL DATA



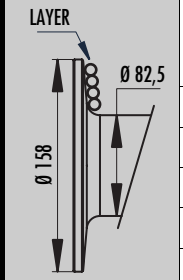
1.4.3 ZHC 2200 WINCH TECHNICAL DATA

RATIO	WIRE ROPE SIZE [MM]	LAYER	LINE PULL [KG]
38:1	8*	1	2.200
		2	1.870
		3	1.625
		4	1.440
		5	1.290

OIL SUPPLY [LT/MIN]	DRUM REVOLUTION [RPM]	LINE SPEED [MT/MIN]				
		1	2	3	4	5
20	8,0	2,3	2,7	3,1	3,5	3,9
30	14,5	4,1	4,8	5,6	6,3	7,0
40	19,3	5,5	6,4	7,4	8,4	9,4

WIRE ROPE MINIMUM BREAKING LOAD EN 14492-1 [KG]	4.400

DRUM SIZE ZHC = 160 MM



LAYER	DRUM DIAMETER [MM]		WIRE ROPE ON LAYER [MT]		WIRE ROPE QUANTITY [MT]	
	00 MM	8 MM	00 MM	8 MM	00 MM	8 MM
5	-	154,5	-	9,2	-	36,6
4	-	138,5	-	8,3	-	27,3
3	-	122,5	-	7,3	-	19,1
2	-	106,5	-	6,4	-	11,8
1	-	90,5	-	5,4	-	5,4
0	-	82,5	-	-	-	-

WIRE ROPE CAPACITY [MT]		MAX. WIRE ROPE CAPACITY EN 14492-1 [MT]		MAX. WIRE ROPE CAPACITY [MT]	
00 MM	8 MM	00 MM	8 MM	00 MM	8 MM
-	15	-	19**	-	36

DESCRIPTION	WEIGHTS [KGS.]
WINCH (WITHOUT CABLE)	26
ACCESSORY : ROLLERFAILREAD	2,3
ACCESSORY : CABLE TENSIONER	1,8

NOTE

Specifications are subject to change without notification and without incurring obligation. Specifications in this publication are theoritical and may vary depending on hydraulic system, enviroment, etc.

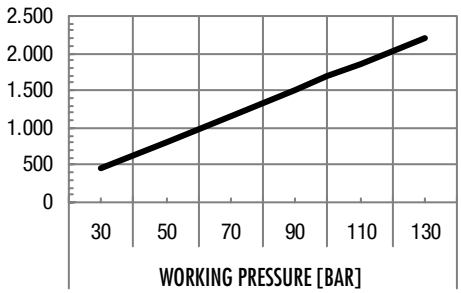
NOTE

*Wire rope size must be respected. Recommended wire rope min. tensile strength 2160 N/mm².
Wire rope minimum breaking load must be at least double of winch max. pulling capacity.

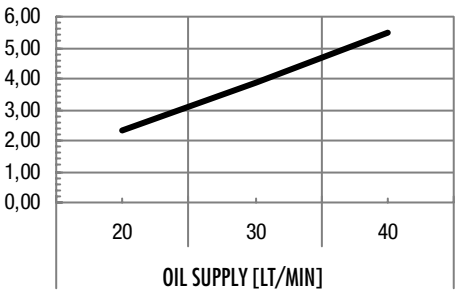
** Max. wire rope capacity according with EN 14492-1.

1.4.4 ZHC 2200 WINCH PERFORMANCE CHARTS AT THE 1ST LAYER

LINE PULL-FIRST LAYER [KG]



LINE SPEED [M/MIN]



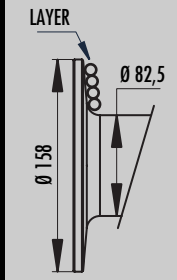
1.4.5 ZHC 3000 WINCH TECHNICAL DATA

RATIO	WIRE ROPE SIZE [MM]	LAYER	LINE PULL [KG]
50:1	9*	1	3.000
		2	2.510
		3	2.155
		4	1.890
		5	1.680

OIL SUPPLY [LT/MIN]	DRUM REVOLUTION [RPM]	LINE SPEED [MT/MIN]				
		1	2	3	4	5
20	6,1	1,8	2,1	2,4	2,8	3,1
30	10,9	3,2	3,8	4,4	5,0	5,6
40	14,7	4,2	5,0	5,9	6,7	7,5

WIRE ROPE MINIMUM BREAKING LOAD EN 14492-1 [KG]	6.000

DRUM SIZE ZHC = 160 MM



LAYER	DRUM DIAMETER [MM]		WIRE ROPE ON LAYER [MT]		WIRE ROPE QUANTITY [MT]	
	00 MM	9 MM	00 MM	9 MM	00 MM	9 MM
5	-	163,5	-	8,6	-	33,7
4	-	145,5	-	7,7	-	25,1
3	-	127,5	-	6,7	-	17,4
2	-	109,5	-	5,8	-	10,6
1	-	91,5	-	4,8	-	4,8
0	-	82,5	-	-	-	-

WIRE ROPE CAPACITY [MT]		MAX. WIRE ROPE CAPACITY EN 14492-1 [MT]		MAX. WIRE ROPE CAPACITY [MT]	
00 MM	9 MM	00 MM	9 MM	00 MM	9 MM
-	15	-	17**	-	26

DESCRIPTION	WEIGHTS [KGS.]
WINCH (WITHOUT CABLE)	26
ACCESSORY : ROLLERFAILREAD	2,3
ACCESSORY : CABLE TENSIONER	1,8

NOTE

Specifications are subject to change without notification and without incurring obligation. Specifications in this publication are theoritical and may vary depending on hydraulic system, enviroment, etc.

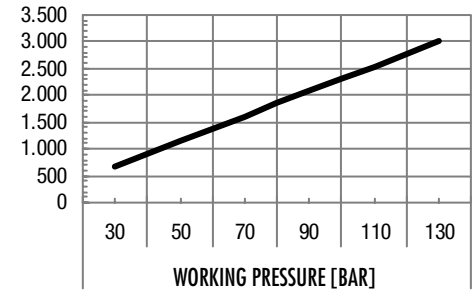
NOTE

*Wire rope size must be respected. Recommended wire rope min. tensile strength 2160 N/mm².
Wire rope minimum breaking load must be at least double of winch max. pulling capacity.

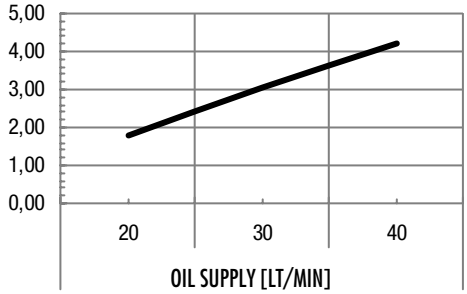
** Max. wire rope capacity according with EN 14492-1.

1.4.6 ZHC 3000 WINCH PERFORMANCE CHARTS AT THE 1ST LAYER

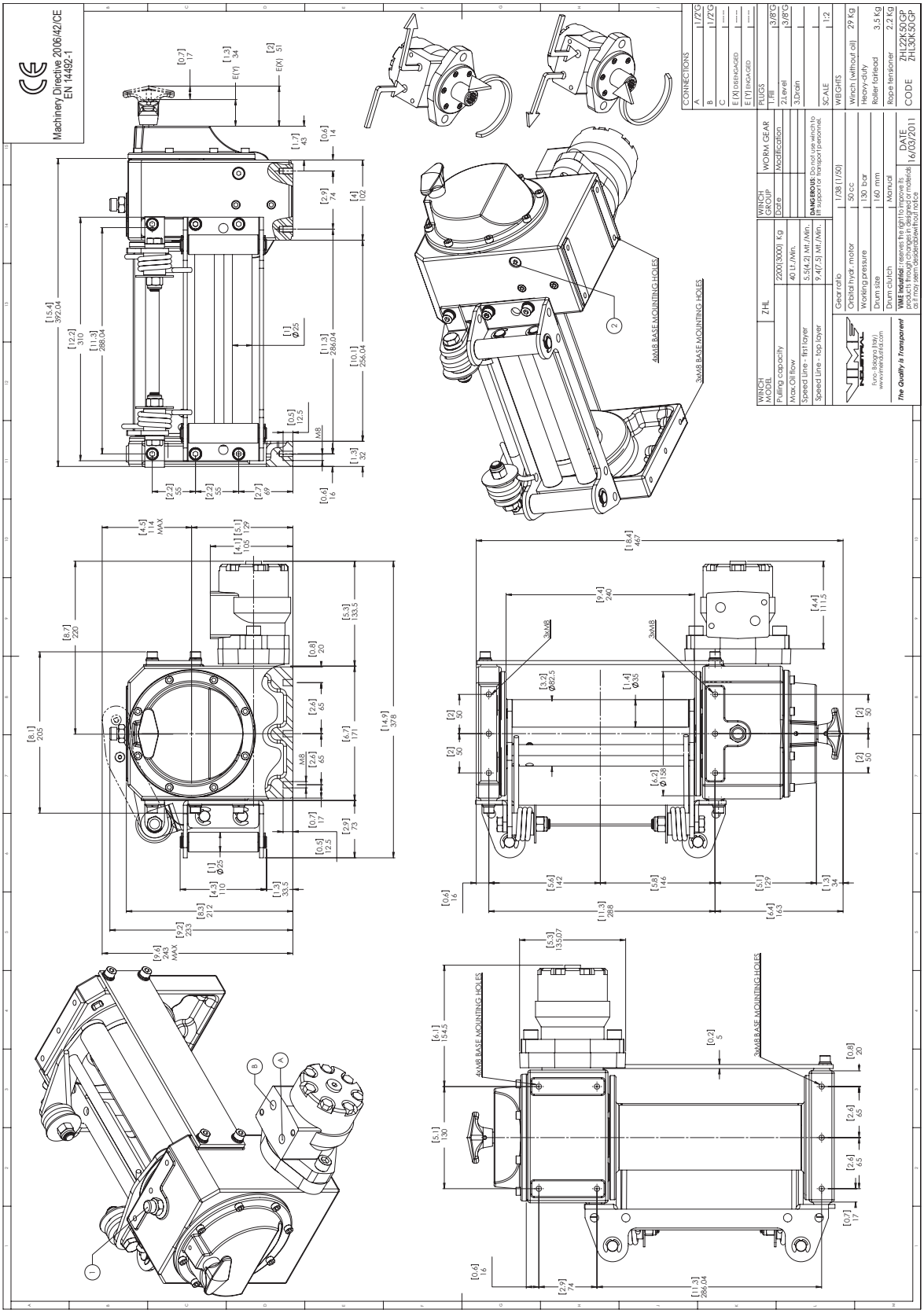
LINE PULL-FIRST LAYER [KG]



LINE SPEED [M/MIN]



1.4.7 ZHL 2200/3000 WINCH DIMENSIONAL DATA



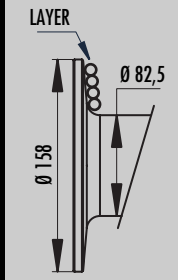
1.4.8 ZHL 2200 WINCH TECHNICAL DATA

RATIO	WIRE ROPE SIZE [MM]	LAYER	LINE PULL [KG]
38:1	8*	1	2.200
		2	1.870
		3	1.625
		4	1.440
		5	1.290

OIL SUPPLY [LT/MIN]	DRUM REVOLUTION [RPM]	LINE SPEED [MT/MIN]				
		1	2	3	4	5
20	8,0	2,3	2,7	3,1	3,5	3,9
30	14,5	4,1	4,8	5,6	6,3	7,0
40	19,3	5,5	6,4	7,4	8,4	9,4

WIRE ROPE MINIMUM BREAKING LOAD EN 14492-1 [KG]	4.400

DRUM SIZE ZHL= 240 MM



LAYER	DRUM DIAMETER [MM]		WIRE ROPE ON LAYER [MT]		WIRE ROPE QUANTITY [MT]	
	00 MM	8 MM	00 MM	8 MM	00 MM	8 MM
5	-	154,5	-	14,1	-	55,8
4	-	138,5	-	12,6	-	41,7
3	-	122,5	-	11,2	-	29,1
2	-	106,5	-	9,7	-	17,9
1	-	90,5	-	8,2	-	8,2
0	-	82,5	-	-	-	-

WIRE ROPE CAPACITY [MT]		MAX. WIRE ROPE CAPACITY EN 14492-1 [MT]		MAX. WIRE ROPE CAPACITY [MT]	
00 MM	8 MM	00 MM	8 MM	00 MM	8 MM
-	25	-	29**	-	55

DESCRIPTION	WEIGHTS [KGS.]
WINCH (WITHOUT CABLE)	29
ACCESSORY : ROLLERFAILREAD	3,5
ACCESSORY : CABLE TENSIONER	2,2

NOTE

Specifications are subject to change without notification and without incurring obligation. Specifications in this publication are theoritical and may vary depending on hydraulic system, enviroment, etc.

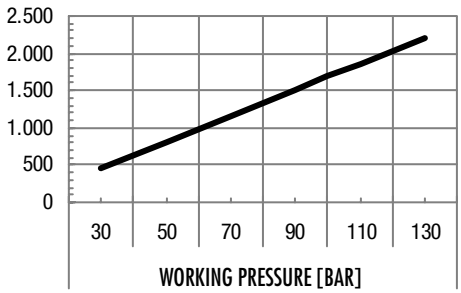
NOTE

*Wire rope size must be respected. Recommended wire rope min. tensile strength 2160 N/mm².
Wire rope minimum breaking load must be at least double of winch max. pulling capacity.

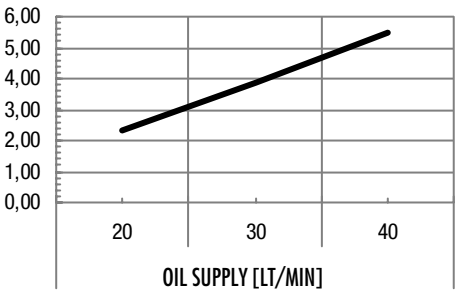
** Max. wire rope capacity according with EN 14492-1.

1.4.9 ZHL 2200 WINCH PERFORMANCE CHARTS AT THE 1ST LAYER

LINE PULL-FIRST LAYER [KG]



LINE SPEED [M/MIN]



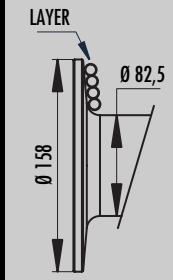
1.4.10 ZHL 3000 WINCH TECHNICAL DATA

RATIO	WIRE ROPE SIZE [MM]	LAYER	LINE PULL [KG]
50:1	9*	1	3.000
		2	2.510
		3	2.155
		4	1.890
		5	1.680

OIL SUPPLY [LT/MIN]	DRUM REVOLUTION [RPM]	LINE SPEED [MT/MIN]				
		1	2	3	4	5
20	6,1	1,8	2,1	2,4	2,8	3,1
30	10,9	3,2	3,8	4,4	5,0	5,6
40	14,7	4,2	5,0	5,9	6,7	7,5

WIRE ROPE MINIMUM BREAKING LOAD EN 14492-1 [KG]	6.000

DRUM SIZE ZHL = 240 MM



LAYER	DRUM DIAMETER [MM]		WIRE ROPE ON LAYER [MT]		WIRE ROPE QUANTITY [MT]	
	00 MM	9 MM	00 MM	9 MM	00 MM	9 MM
5	-	163,5	-	13,2	-	51,4
4	-	145,5	-	11,7	-	38,2
3	-	127,5	-	10,3	-	26,5
2	-	109,5	-	8,8	-	16,2
1	-	91,5	-	7,4	-	7,4
0	-	82,5	-	-	-	-

WIRE ROPE CAPACITY [MT]		MAX. WIRE ROPE CAPACITY EN 14492-1 [MT]		MAX. WIRE ROPE CAPACITY [MT]	
00 MM	9 MM	00 MM	9 MM	00 MM	9 MM
-	25	-	26**	-	51

DESCRIPTION	WEIGHTS [KGS.]
WINCH (WITHOUT CABLE)	29
ACCESSORY : ROLLERFAILREAD	3,5
ACCESSORY : CABLE TENSIONER	2,2

NOTE

Specifications are subject to change without notification and without incurring obligation. Specifications in this publication are theoritical and may vary depending on hydraulic system, enviroment, etc.

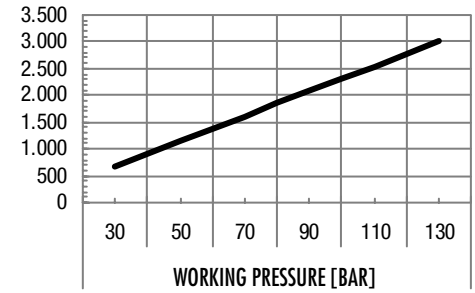
NOTE

*Wire rope size must be respected. Recommended wire rope min. tensile strength 2160 N/mm².
Wire rope minimum breaking load must be at least double of winch max. pulling capacity.

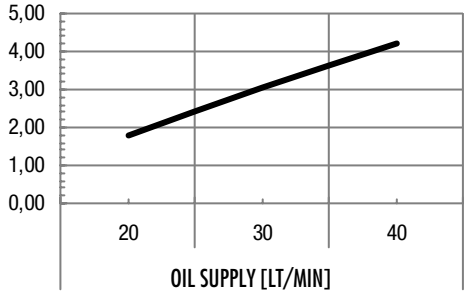
** Max. wire rope capacity according with EN 14492-1.

1.4.11 ZHL 3000 WINCH PERFORMANCE CHARTS AT THE 1ST LAYER

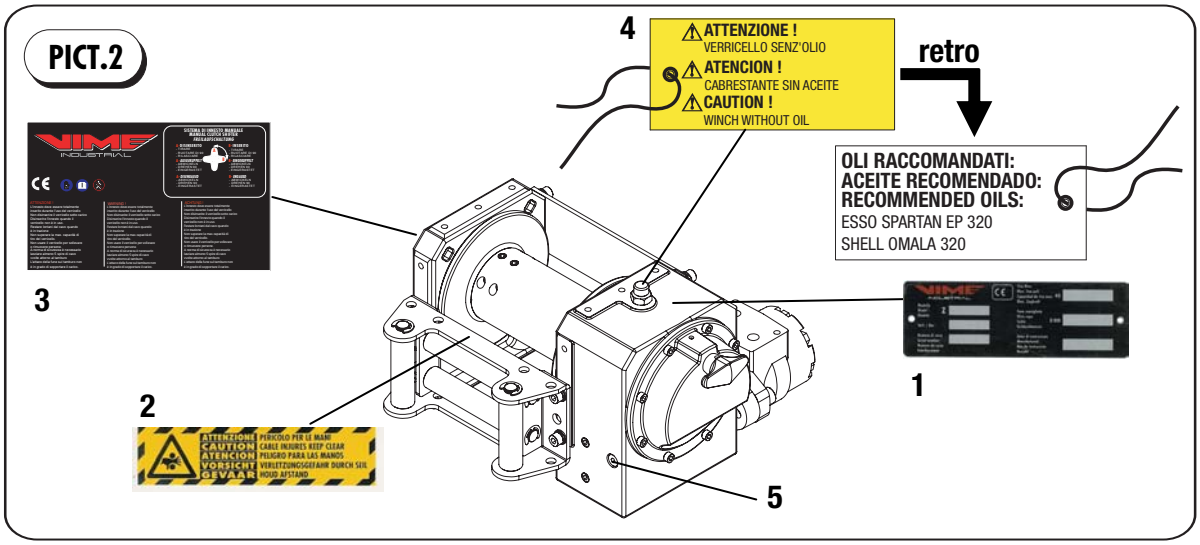
LINE PULL-FIRST LAYER [KG]



LINE SPEED [M/MIN]



1.5 WINCH DECALS. SAFETY ADVICES



A decal (1), onto the top of the clutch housing end gives: winch model, max pulling capacity at 1st layer, wire rope diameter according to the rule, working pressure, serial number and year of built. A yellow sticker (2) onto the roller fairlead, warns about rotating parts. A label (3) onto the support, shows the drum engagement /disengagement procedure.

IMPORTANT

When ordering replacement parts or contact VIME's customers service, please give winch model and serial number.

Winch can be supplied with or without the orbital hydraulic motor. In both ways, if not specified in the commitment , the orbital hydraulic motor or if not included its adapter, are fitted onto the gear housing as shown in winch picture on manual's cover, and without the oil in the worm gear housing as warned by the yellow label (4), who gives in its back the recommended oils. If label (4) is missed, inspect oil level, through oil level plug (5).

IMPORTANT

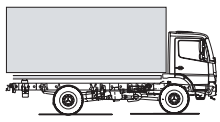
If decals are damaged or unreadable, replace it.

1.6 CONDITIONS OF SALE

The winch, except special customer requirements is delivered assembled and tested. Wire rope and hook are not included in the standard winch version, only if required are included in the commitment. At the delivery, open carefully the packing. Inspect the winch and see if it is free from defects.

IMPORTANT

In case of damages or missing parts, inform transporter immediately.



1.6.1 PACKAGING

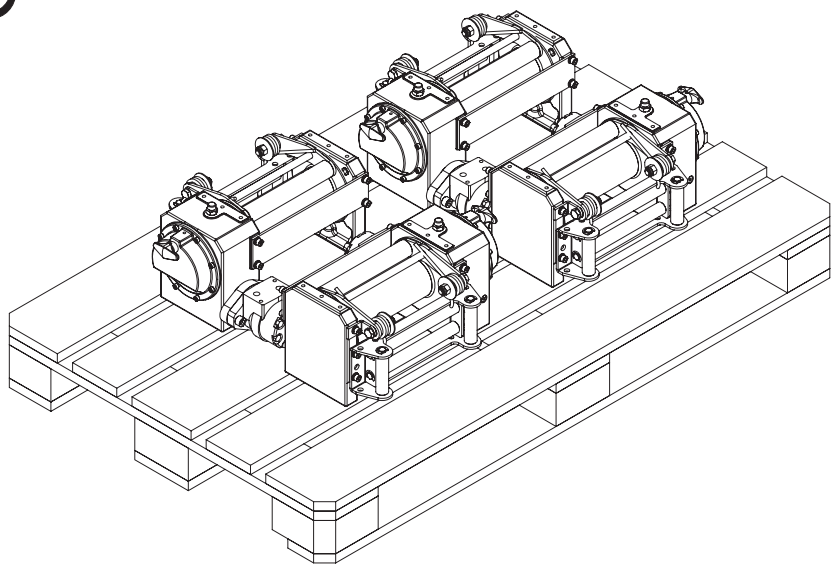
The standard packaging, if supplied, and unless otherwise agreed, is not rainproof and is intended for shipping by ground and not sea, and for areas which are under cover and not humid.

IMPORTANT

Dispose of packaging materials as stipulated by the applicable legislation.

1.6.2 PACKAGING ILLUSTRATION

PICT.3



NOTE

Winches in carton box on pallet are wrapped with plastic film. About its rainproof capacity, refer what indicated above.

1.7 SAFETY PROCEDURES

Do not operate this winch until you have carefully read and understand the warnings operation sections of this manual.

WARNING

Winch use allowed by trained personnel only.

DANGEROUS

When winching is obligatory wear working gloves.

1. Manual or air-clutch must be fully engaged before starting the winch.

2. Do not disengage manual or air clutch under load.

3. Leave the clutch disengaged when the winch is not in use (for manual clutch version only).

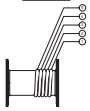
4. Do not exceed maximum line pull ratings.

5. In car carrier applications after pulling vehicle on carrier, be sure to secure vehicle to carrier bed. Do not maintain load on winch cable while transporting vehicle. Do not use winch as a tie down.

WARNING

Do not use winch to lift, support or otherwise transport personnel.

DANGEROUS



A minimum of 5 wraps of cable around drum barrel are recommended.

DANGEROUS

When pulling a load, the suddenly cable failure or either the hook failure gives a dangerous snap back of broken cable. Operators must stay clear of cable when pulling.

DANGEROUS

Accessories such as roller fairlead and cable tensioner are a natural drum protection. A yellow sticker (ref.2 pict.2 chapter1.5) on roller fairlead warns about rotating parts. In case of winch purchasing without accessories, winch drum must be protected by a cover. Protection will be fitted by the installer according to the winch mounting.

SECTION 2
MOUNTING

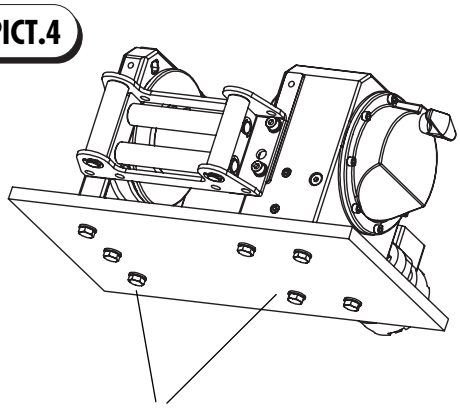
2.1 ROAD TRAFFIC

Winch must be mounted on vehicles in compliance with regulation. Many countries require to keep up to date with traffic card.

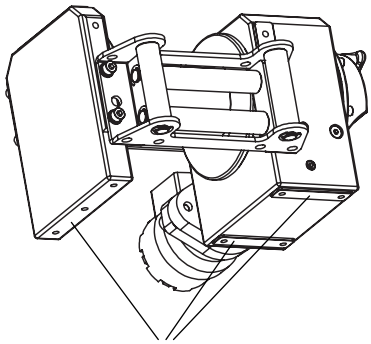
Do not drive vehicle not in compliance with regulation or not up dated traffic card.

2.2 WINCH MOUNTING

PICT.4



No. 7 x M10 screws UNI 5739



BASES MOUNTING

NOTE
The mounting plate is shown just as a demonstration and not present at the delivery.

ZH winches have been designed to be fitted onto the vehicle frame through a base mounting plate who should be securely mounted to the vehicle frame in a manner acceptable to the vehicle manufacturer. It is responsibility of the person(s) installing the winch to make certain that the mounting plate is secured to the vehicle. The winch must be fitted horizontally to give best lubrication and securely mounted on a surface who can resist to the winch pulling, without having any flex within the base and the winch while in use.

ZH winches have bases mounting with capscrews:

- no. 7 capscrews M10 UNI 5739 class 10.9, mod. ZHC 2200/3000, ZHL 2200/3000.

For a proper and safe capscrews tightening it is recommended to use washers and lock washers.

IMPORTANT

All mounting holes patterns should be used to bolt the winch onto the base mounting plate.

WARNING

Winch must no be mounted directly onto the vehicle chassis.

Winch must no be mounted directly onto the vehicle chassis, it should be better mounting a frame adapter brackets who can resist to the winch pulling. Mounting hole locations, size and thread depth are specified for every winch (pict.5).

WARNING

Winch must no be mounted directly onto the vehicle chassis.

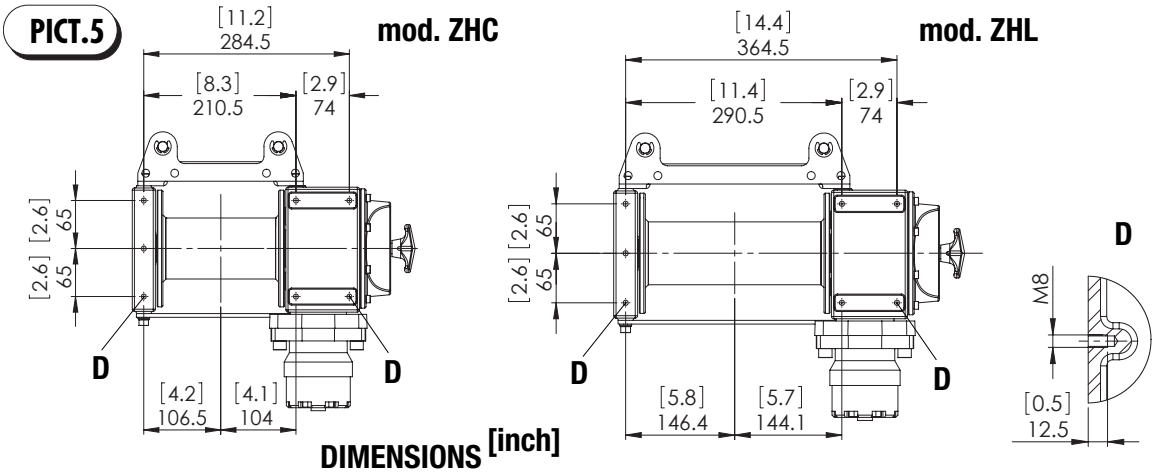
IMPORTANT

All mounting holes patterns should be used to bolt the winch onto the base mounting plate.

WARNING

Use the mounting hole locations provided on the dimensional data pair dimensions of surfaces must be respected. A wrong winch mounting reduce winch performance, cause overheating, excessive wear and could damage the winch.

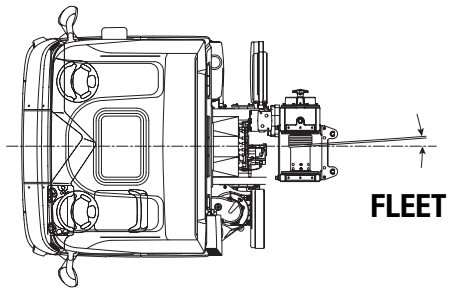
PICT.5



DIMENSIONS [inch]
MM

2.3 FLEET ANGLE

PICT.6



FLEET ANGLE

Winch should be mounted as close to centre and as perpendicular as possible to the direction of the line pull. This will keep the wire rope fleet angle centred onto the drum as small as possible.

DANGEROUS

If the proper fleet angle is not maintained, the wire rope could wind onto one side of the drum. This could cause failure of the winch or wire rope, resulting in damage, injury or death.

WARNING

A wrong or inadequate winch mounting could damage the winch.

2.4 WINCH MOUNTING

Winch base mounting plate must be rigid enough to withstand full rated line pull without distortion. A thickness not under 10 mm is recommended. The winch mounting plate must be flat with a flat surface not superior to 0,1 mm, (pict.7).

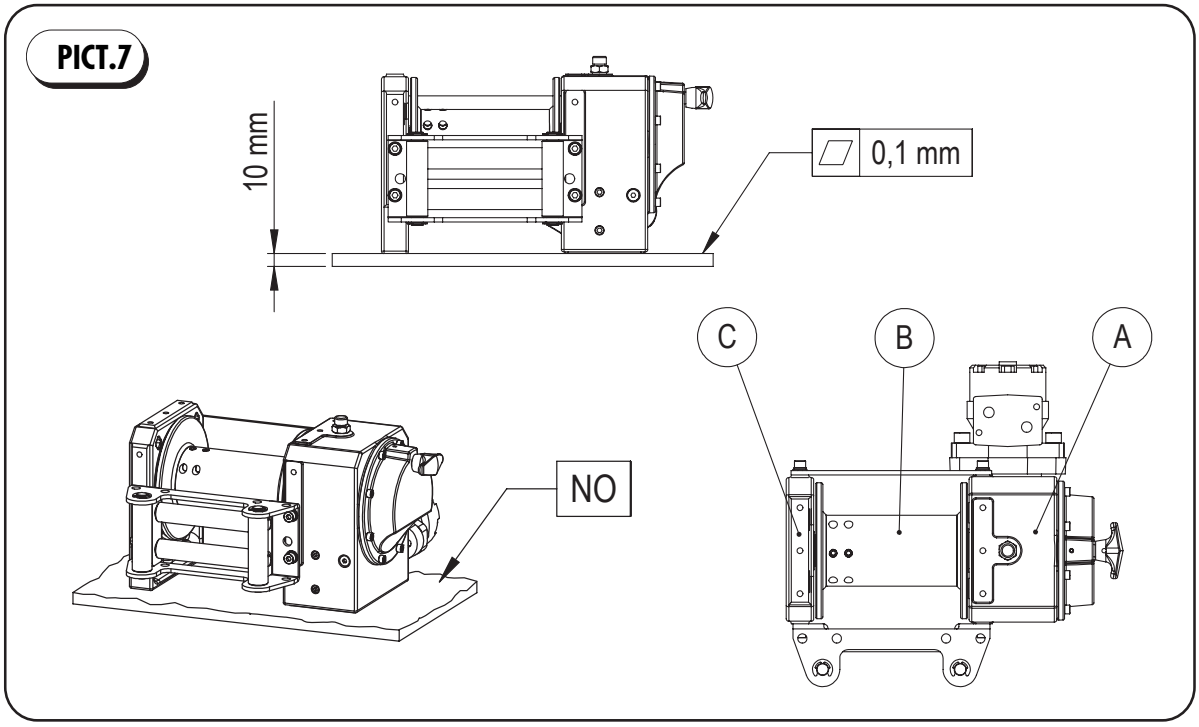
WARNING

Mounting surfaces should be co-planar.

WARNING

Winch base mounting plate must no flex when winch is in use.

PICT.7



2.4.1 UNEVEN MOUNTING SURFACE

ZH winches are manufactured in three main components : gear housing (A), drum (B) and end motor bearing (C), (pict.7). When winch is bolted on uneven surface, components (A,B,C) will be misaligned. A winch damage will occur.

2.4.2 FLEX MOUNTING SURFACE

If winch base mounting surface thickness is not respected as recommended (pict.7), in case of heavy-duty pulling the mounting surface will flex and this would bind working parts (A,B,C), causing winch misalignment who gives as consequence winch damage.

2.4.3 ALIGNMENT CHECK

After having mounted the winch and tighten the mounting feet capscrews (pict.4), run a simple test, to inspect if the winch is aligned.

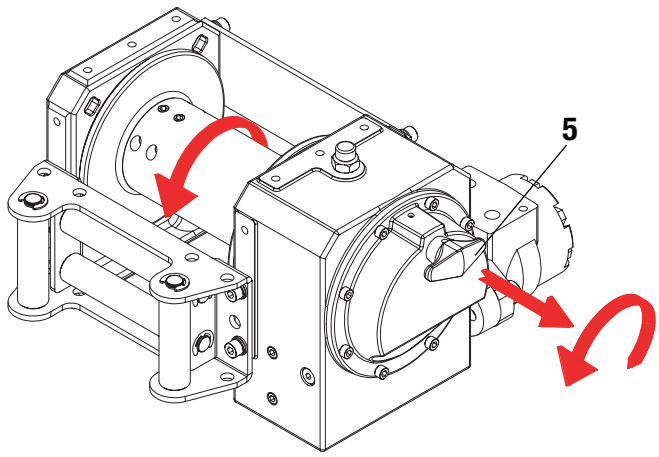
Disengage drum by pulling out and rotating the manual clutch handle (ref.5 pict.8). Turns by hands the drum: a certain resistance will be given by teflon discs (ref.16-17 parts drawing chapter 7.2 page 43) who breaking onto the drum lateral flange, to avoid in the freespooling a cable birdnests. In case of an excessive resistance this is always a symptom of winch misalignment.

If the winch is misaligned, loosen all base mounting capscrews (7 capscrews M10 UNI 5739 class 10.9 pict.4) capscrews must not be fully disassembled to maintain winch bolted at the base mounting plate. Repeat the test again by keeping capscrews loosen. If the winch is aligned, it is necessary replace or modify the base mounting plate, by following specifications indicated in chapter 2.4. If the winch is still misaligned, even with loosen capscrews, it is necessary make the right alignment (chapter. 2.4.4).

IMPORTANT

Check with great care winch alignment for not compromising winch operation.

PICT.8



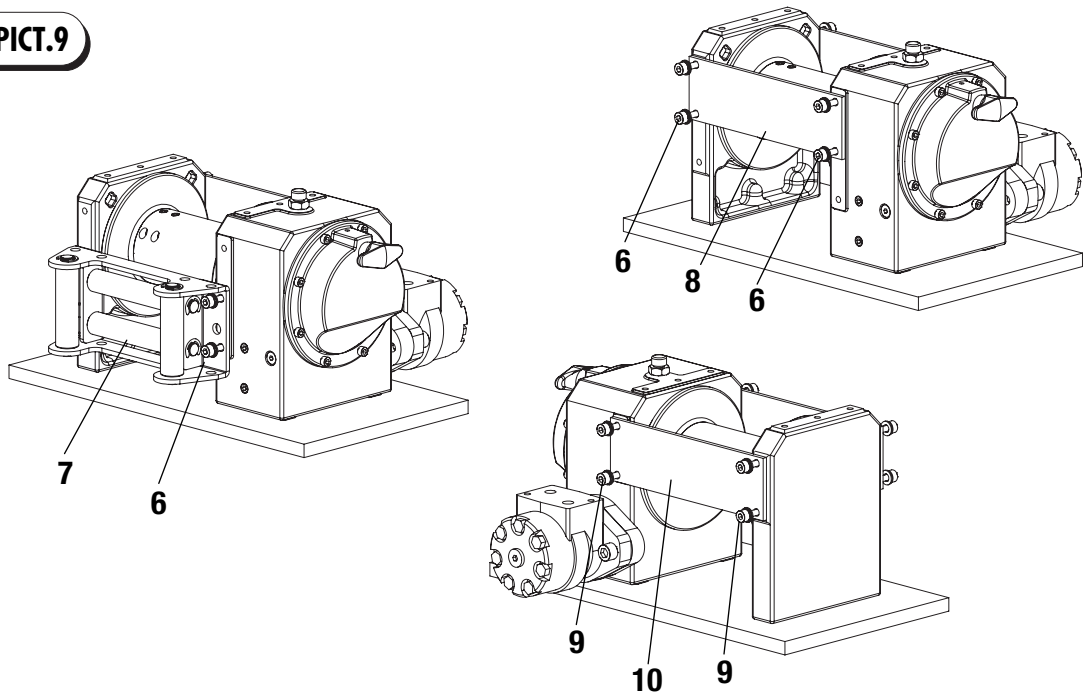
2.4.4 HOW TO GET RIGHT ALIGNMENT

If the winch is misaligned, it is necessary get alignment once again, as follow. Loosen all winch mounting capscrews (pict.4) (no. 7 capscrews M10 UNI 5739 class 10.9) without fully unscrewing to keep winch on mounting plate. Loosen without unscrewing roller fairlead (ref.7 pict.9) mounting capscrews (ref.6 pict.12, n.ro 4 capscrews M8x20 UNI 5931) if mounted, or lateral tie-plate (ref.8 pict.9) capscrews (ref.6 pict.9, n.ro 4 capscrews M8x20 UNI 5931) Onto the opposite side, loosen capscrews (ref.9 pict.9), (n.ro 4 capscrews M8x20 UNI 5931) of the second tie-plate (ref.10 pict.9).

Turns by hands the drum to check once again the right winch alignment (par 2.4.3). Tighten

all winch capscrews (ref. 6, 9 pict.9). Check once again the right winch alignment (chapter 2.4.3), maintaining all mounting plate capscrews loosen. If winch will be not aligned, repeat procedure again (chapter 2.4.4). Tighten all winch capscrews verricello (pict.4) and check once again winch alignment (chapter 2.4.3). If winch will be not aligned, repeat procedure (chapter 2.4.4) .

PICT.9



IMPORTANT

Procedure for winch alignment must done on a base mounting plate who meet with specifications indicated on chapter 2.4.

IMPORTANT

A good winch alignment is necessary for good winch operation.

WARNING

Excessive bushing wear, difficulty in freespooling and lowest winch performance are usually symptoms of misalignment.

WARNING

Run winch not right aligned could damage the winch.

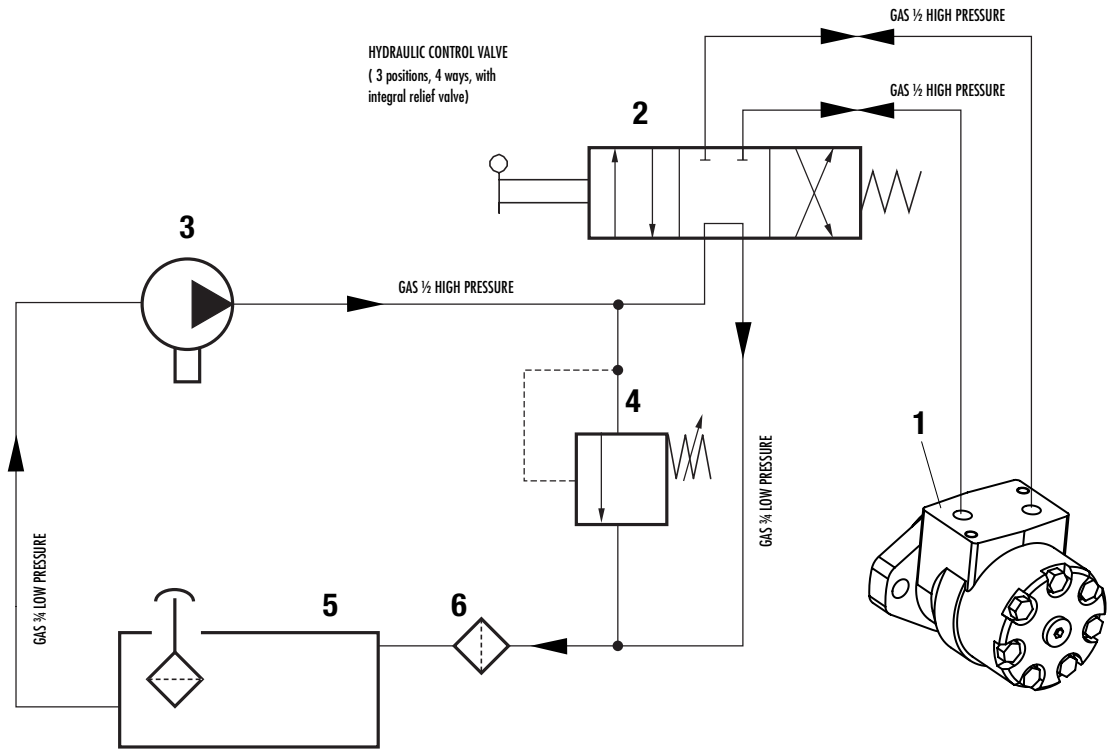
WARNING

VIME has no responsibility in case of winch damages due to a wrong or inadequate mounting.

2.5 HYDRAULIC SYSTEM

Once the winch has been mounted onto the vehicle chassis (chapter 2.2-2.3-2.4), should be connected to the hydraulic circuit according to the typical lay-out shown below. If conditions where the hydraulic system has only a winch which is used intermittently, where ambient temperature are moderate, and where excessive back pressure or internal leakage are not present, a reservoir equal in size to the flow of the system can be used. Hose lengths should be kept as short as possible. Sharp bends in hoses and tubing and 90 degree fittings, should be avoided since they increase back pressure.

PICT.10



NOTE
Hydraulic system shown in pict.10, is not included in winch equipment.

1. ORBITAL HYDRAULIC MOTOR
2. HYDRAULIC CONTROL VALVE
3. HYDRAULIC PUMP
4. RELIEF VALVE
5. FLUID RESERVOIR
6. FILTER: 40 µm / 25 µm - 20 µm / 10 µm

WARNING

Do not exceed 40 Lt/min. If exceeded hydraulic motor may be damaged.

WARNING

The relief valve (ref.4 pict.10) must be set so the pressure supplied to the winch doesn't exceed the pressure rating of the winch. If the pressure or flows exceeds those rated for the winch, it could cause damage to the winch, to the wire rope or damage to property, personal injury or death.

IMPORTANT

Hydraulic pressure or flows lowest than those rated for the winch will result in lower line pull or lower line speed.

WARNING

The hydraulic orbital motor mounted on model ZH no needs any drainage line, even if there is a back pressure in return line, because equipped with high pressure shaft seal.

But in case of excessive back pressure in return line, higher than oil seal tolerable, or rapid drum inversion with load : a drain line directly to oil reservoir is recommended.

WARNING

Rapid drum inversion with load, could damaged the hydraulic orbital motor.

WARNING

Winch control devices should be positioned for safe operation of the winch without hesitation or lost of time.

IMPORTANT

Winch control devices are at exclusive charge of the installer, who will also take care to place all decals, to indicate the different winch function to avoid any misunderstanding to the winch operator while winching.

OIL TYPES: Mineral hydraulic oils are recommended with anti-wear additives, type HLP [DIN 51524 (part.2)] or HM [ISO 6743/4]. The use of different oils, hydraulic motor company must be contacted.

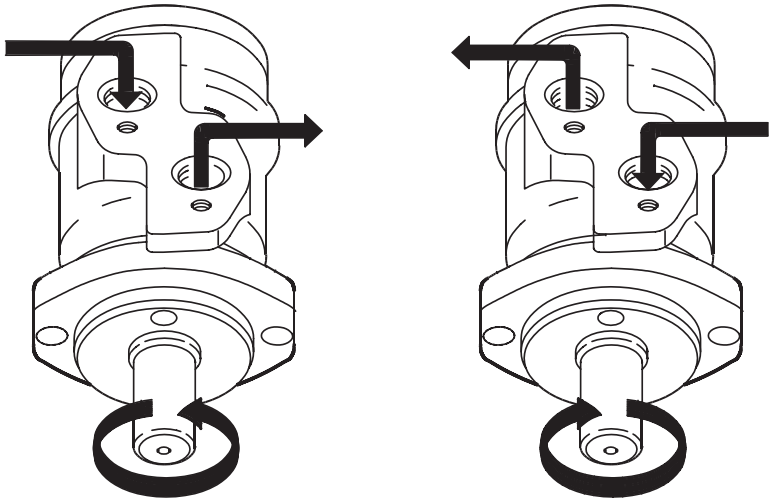
TEMPERATURE: When selecting hydraulic oils , it is very important consider the operating temperature of the hydraulic system. Oil temperature should lie between +30°C [+85°F] ed i +60°C [+140°F]. As a general rule, oil life is halved for each +8°C [+15°F] its temperature exceeds 60°C [+140°].

VISCOSITY: The viscosity of the oil should lie between 20 mm²/S and 75 mm²/S [100 e 370 SUS] when the operating temperature of the system has become stabilized. We recommend the use of an oil type having a viscosity of 35 mm²/S [165 SUS].

FILTERING: It is necessary to keep the level of oil contamination at an acceptable level to ensure problem-free operation. To maintain a correct level of cleaning is necessary a return filter of 40 µm absolute or 25 µm nominal. In very dirty environments, in complex systems, the recommended filtration is 20 µm absolute or 10 µm nominal. In any case should refer to the vehicle hydraulic system designer recommendation where the winch will be mounted, also about maintenance.

2.6 HYDRAULIC MOTOR LINKAGE

PICT.11



According to the orbital hydraulic motor plumbing, its shaft will turns in clockwise or counter clockwise, that's will determine a different winch drum rotation (pict.11).

Winches model ZH are equipped with a worm gear drive train, who doesn't have pre-determined and obligatory drum pulling direction, who can be set in clockwise or counter clockwise direction.

NOTE

If the winch is equipped with accessories such as : Standard roller Fairlead and Cable tensioner, these are fitted, without any indication in the winch order, as shown in this instruction maintenance manual.

2.7 CABLE INSTALLATION EN 14492-1

In the choice of cable to be fitted on drum for first time or to replace the old one, follow what is recommended by EN 14492-1:

- Cable breaking load double to winch max. rated capacity.
- Cable diameter equal to VIME recommended and according to EN 14492-1.

Cable anchor on drum has been designed EN 14492-1 compliant.

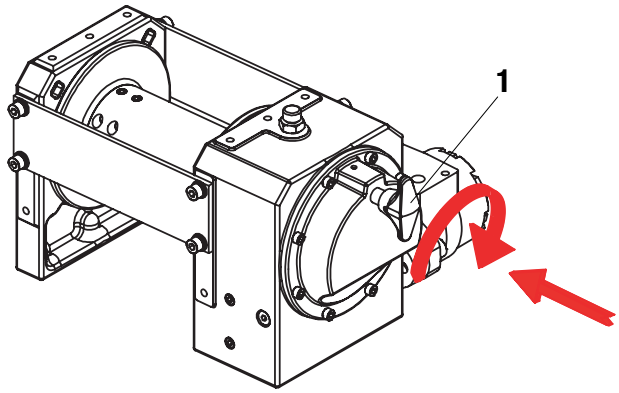
WARNING

Recommended wire rope min. tensile strength 2160 N/mm². Wire rope minimum breaking load must be at least double of winch max. pulling capacity.

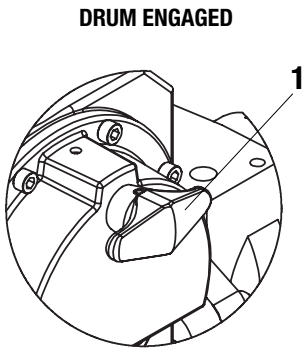
WARNING

VIME has no responsibility for damages to the winch, to the rope or for physical injury to persons, animals or property damages given by unqualified cable use.

PICT.12



PICT.13



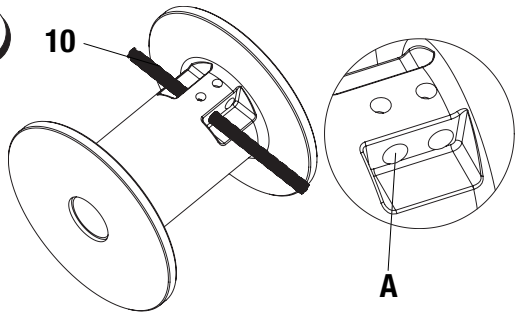
1. Determine the drum rotation. Worm gear winch has not a previous predetermined spooling direction of cable.
2. Check clutch be fully engaged, by inspecting: the handle (1) must be fully in as shown (pict.13); if not, pull the handle out, rotate 90° and release as shown by the arrow in pict.12 (a return spring will help clutch to engage)
3. Unwind cable by rolling it out along the ground to prevent kinking.
4. If the end of cable opposite hook has not been machined, wrap end of cable opposite hook with plastic or similar tape to prevent fraying.

   Follow steps indicated:

STEP 1

Insert the end of the rope (10) opposite the hook, into proper slot (A) as shown in pict.14.

PICT.14



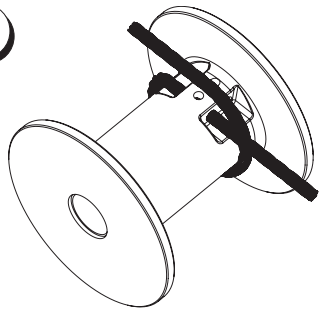
DANGEROUS

When winching is obligatory wear working gloves.

STEP 2

By bringing the end of rope (10) opposite to hook, wrap wire rope around drum barrel as shown in pict.15.

PICT.15



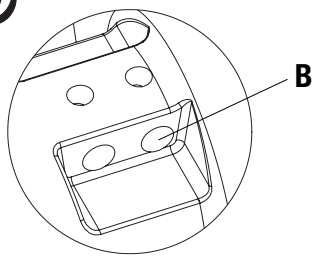
DANGEROUS

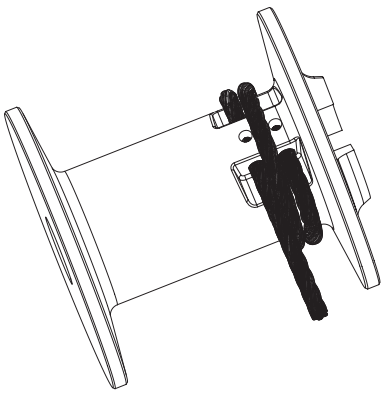
In rope winding be careful especially when hands are closed to drum and roller fairlead.

STEP 3

The end of rope (10) opposite to hook, must be insert in the second slot (B) as shown in pict.16.

PICT.16

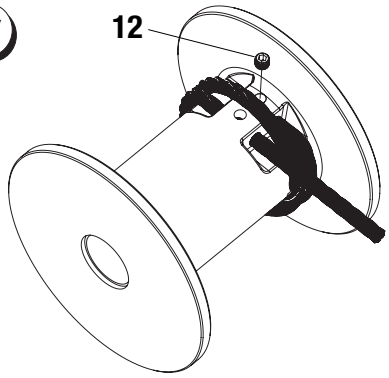




STEP 4

Thread set screw (12) into threaded hole to secure the end rope (10) opposite to hook as shown in pict.17.

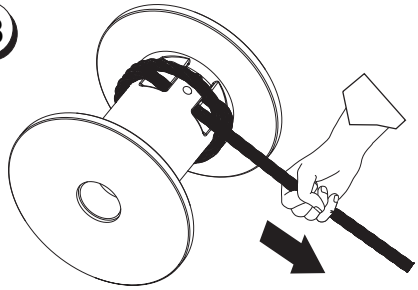
PICT.17



STEP 5

Manually pull the rope out as shown in pict.18 till rope will wrap onto the drum barrel.

PICT.18



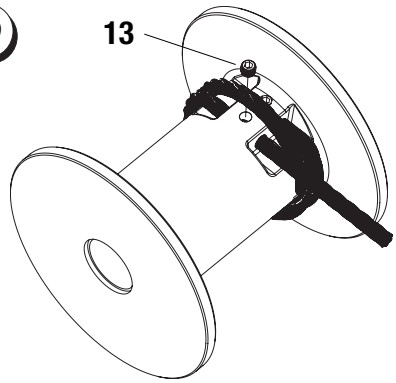
WARNING

When winching is obligatory wear working gloves.

STEP 6

By keeping rope tensioned as shown in pict.18 tighten safety set screw (13) as shown in pict.19.

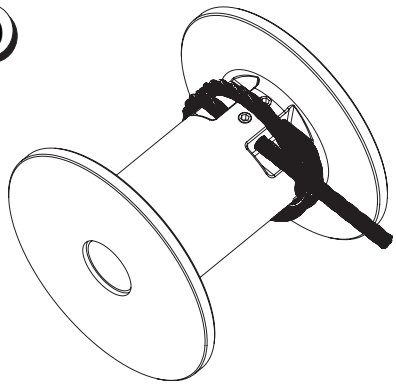
PICT.19



STEP 7

After having tightened safety set screw, start winding the wire rope.

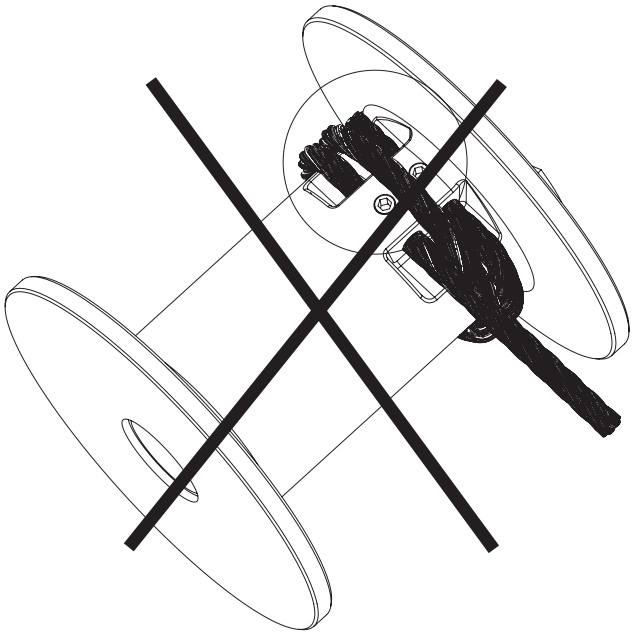
PICT.20



ROPE NOT PROPERLY MOUNTED

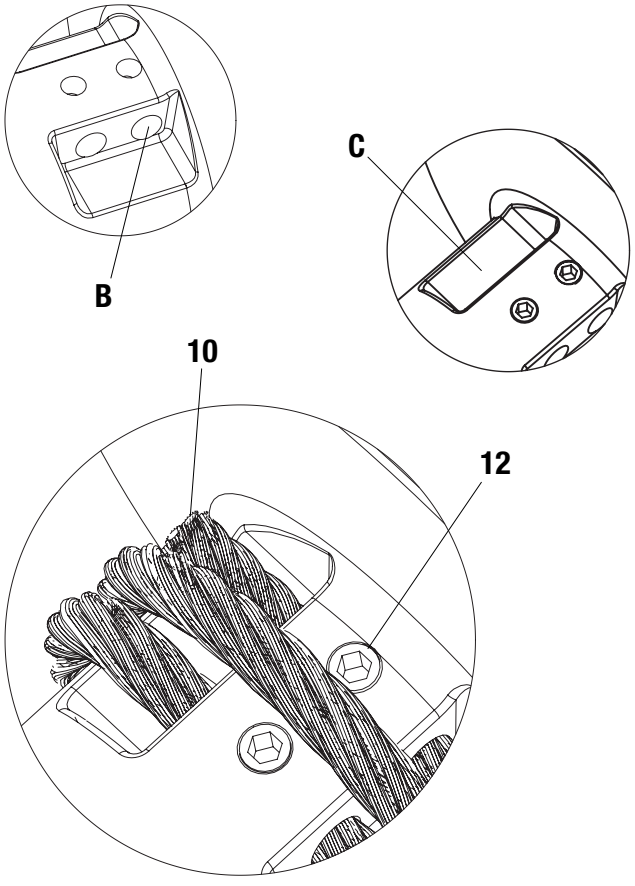
While mounting the end rope (10) opposite to hook, throughout (B) by using set screw (12), take care do not allow wire rope to extend past seat (C) of drum as shown in pict.21.

PICT.21



DANGEROUS

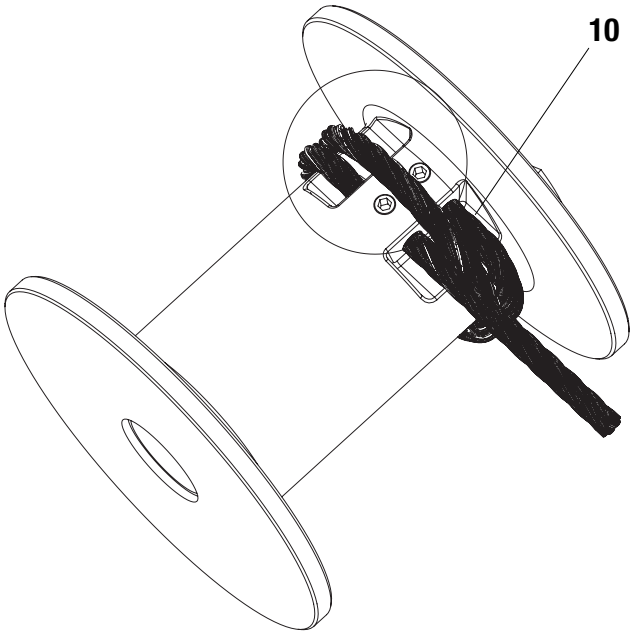
Never try to enlarge drum rope slots. VIME cannot be held responsible of failure to the drum, wire rope caused by this unauthorized intervention.



CORRECT WIRE ROPE MOUNTING

While mounting the end rope (10) opposite to hook, through hole (B) by using set screw (12), take care do not allow cable to extend past seat (C) of drum, as shown in pict.21.

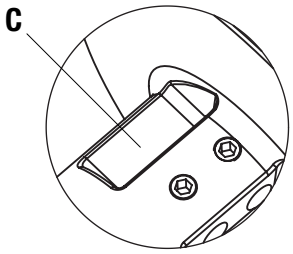
PICT.22



DANGEROUS

In case of installing of a wire rope with end opposite to hook cone tapered, is necessary to use the whole drum seat depth to allow set screw (12) clamp onto the wire rope and not onto the cone tapered.

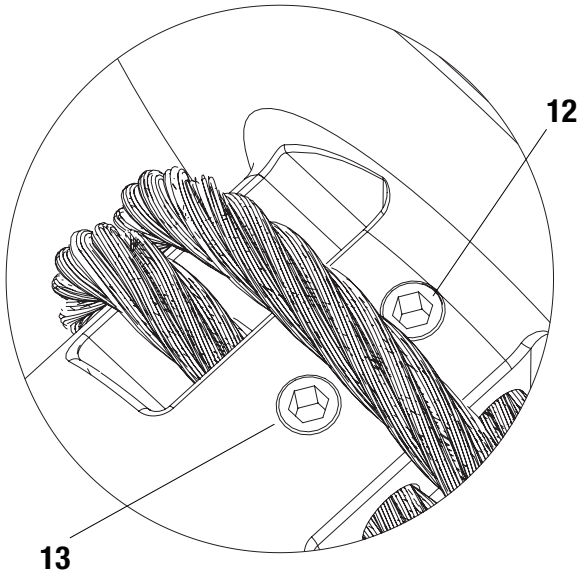
5. Runs winch in the reel in direction. Keeping tension end of cable, spool the cable onto the cable drum taking care to form neatly wrapped layers.



DANGEROUS

When winding all cable onto the cable drum keeping tension on it by hand, when the end of cable is near to the drum, stop winch, disengage drum (chapter 3.1). When the drum is disengaged, turn the drum by hands till the cable is completely winded. Take great care, when hands approach to the drum and roller fairlead.

6. Winch is ready.

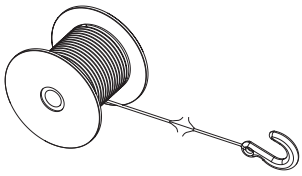


SECTION 3
OPERATION

3.1 OPERATION

DANGEROUS

Before starting winch check cable conditions, if cable becomes frayed with broken strands, replace immediately as described on chapter 2.7.



DANGEROUS

When winching is obligatory wear working gloves.

WARNING

Before operating check oil level and add oil, if necessary as shown in chapter 5.1.1.

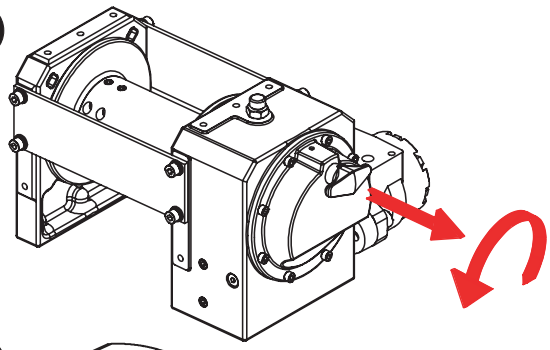
WARNING

Before start winching, check conditions of manual or air clutch system for drum freespooling.

NOTE

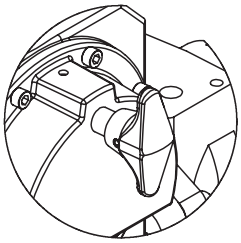
A warm up procedure is recommended at each start up and is essential at ambient temperatures below +40°F (4°C). The prime mover should be run at its lowest recommended RPM, with manual or air clutch shifter disengaged, sufficient time to warm up the system. The winch should be operated at low speeds, forward and reverse, several times to circulate gear lubricant through the worm gear.

PICT.23

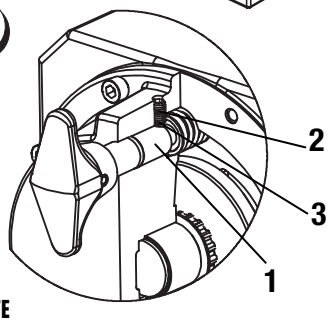


CLUTCH DISENGAGED

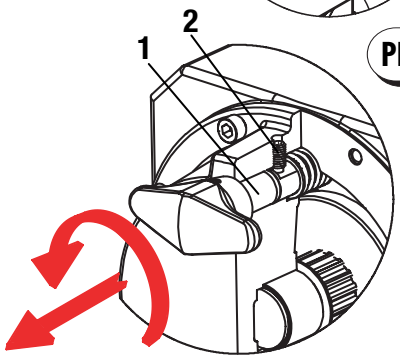
PICT.23a



PICT.24



PICT.24a



NOTE

Pictures shown are just as demonstration. Dog point setscrew is not visible while winch is assembled.

A) For hooking onto the load rapidly:

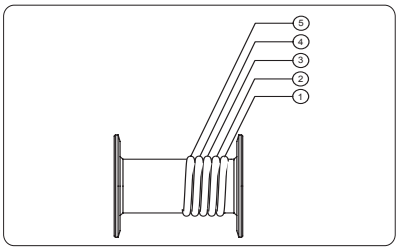
1. Check clutch be fully disengaged, by inspecting: the handle (1) must be fully out as shown (pict.23a); if not, pull the handle out, rotate 90° and release as shown by the arrow in pict.23 (a return spring will help clutch to engage)

IMPORTANT

Onto the clutch axe (1) there is a seat (3) for dog point set screw (2) to hold the handle in the disengaged position. When disengaging rotate the handle in counter clockwise direction to let the dog point set screw (2) fit into the seat (3) (pict.24).

DANGEROUS

A minimum of 5 wraps of cable around drum barrel is recommended.



WARNING

When winching is obligatory wear working gloves.

B) To pull the load:

WARNING

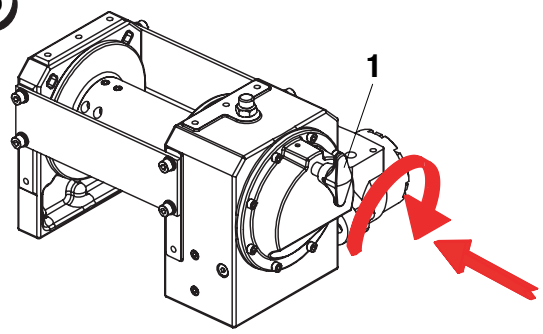
Do not exceed maximum line pull ratings.

1. Check clutch be fully engaged, by inspecting: the handle (1) must be fully in as shown (pict.25a); if not, pull the handle out, rotate 90° and release as shown by the arrow in pict.25 (a return spring will help clutch to engage)

WARNING

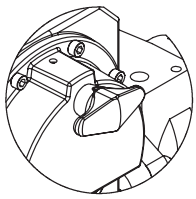
Check the action of the sliding clutch, making sure it is fully engaging with cable drum. Clutch is fully engaged when jaw clutch perfectly match jaw drum (pict.26). To let jaws match together it could be necessary runs drum manually or by spooling out the cable till engaging or powering drum (short intermittence) in winding or unwinding direction. All these operations must be ran with no load.

PICT.25



PICT.25a

DRUM ENGAGED



Dimensions [inch]
MM

DANGEROUS

If clutch has not been fully engaged (pict.27), in winching operation while is pulling a load, can cause the suddenly drum disengagement and as a consequence the load drifts.

WARNING

Check clutch must be fully engaged as shown (pict.26).

NOTE

Illustrations shown (pict.26-27) are just as demonstration. This side of drum is fully hidden when winch is in use.

WARNING

Not proper extended clutch operation, even if doesn't cause a load drifts in a short period, could cause edge wear of sliding jaw clutch an drum clutch (ref.A pict.26), till moment where would be impossible engage drum anymore, or will be not capable to hold the load.

IMPORTANT

Maintenance exigency increase according to the winch working conditions and in case of its occasional use as well.

DANGEROUS

Drum not fully engaged or disengaged gives problem described on pict.27.

2. Act hydraulic control valve or push the radio control button for winding rope onto the winch drum.

WARNING

Winch operator start pulling slowly and only after having keep tensioned cable and verified cable/hook has been securely fastened to the vehicle/load.

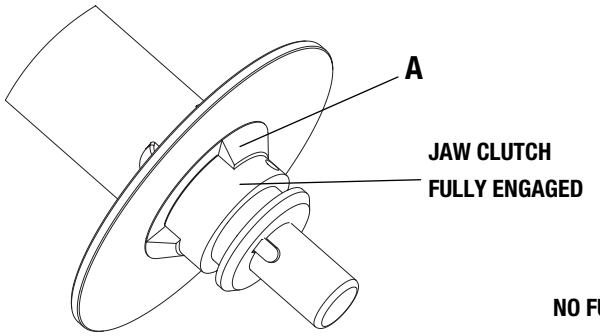
DANGEROUS

The suddenly under load wire rope breaking or any yielding who involve an hook release, causing a dangerous rope stroke. Winch operator or other persons have to keep a safe distance from the working length of the wire rope.

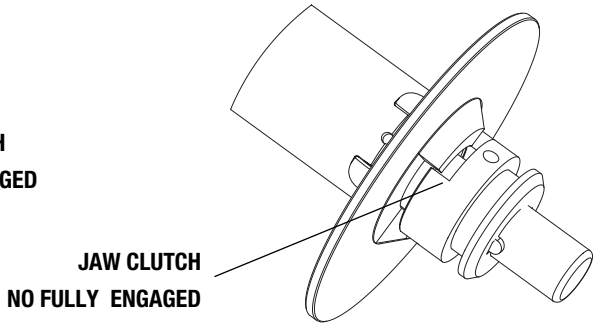
WARNING

In car carrier applications after pulling vehicle on carrier, be sure to secure

PICT.26



PICT.27



vehicle to carrier bed. Do not maintain load on winch cable while transporting vehicle, do not use winch as a tie down (pict.28).

DANGEROUS

Do not disengage clutch under load.

DANGEROUS

Never attempt to pull more than the winch is rated for.

DANGEROUS

Do not move your vehicle to assist the winch in pulling a load. Winch failure, may cause serious injuries

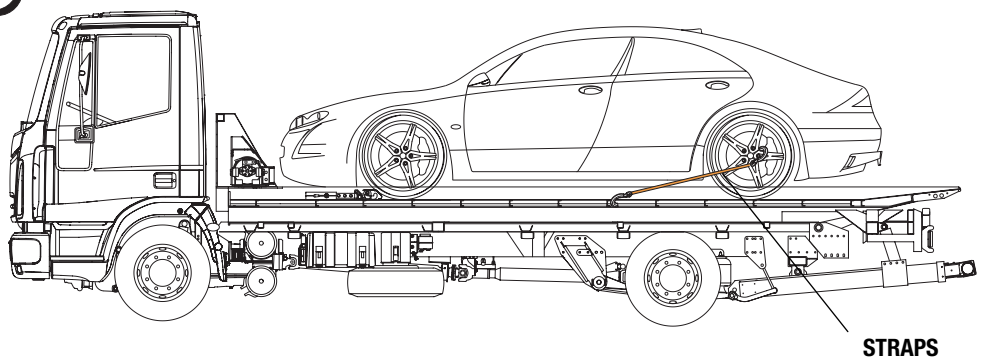
DANGEROUS

Never try to attempt lateral pullings, in reference to the centreline of the vehicle where the winch is installed (pict. 29). Winch and vehicle where the winch is installed could be damaged, and result in serious injury.

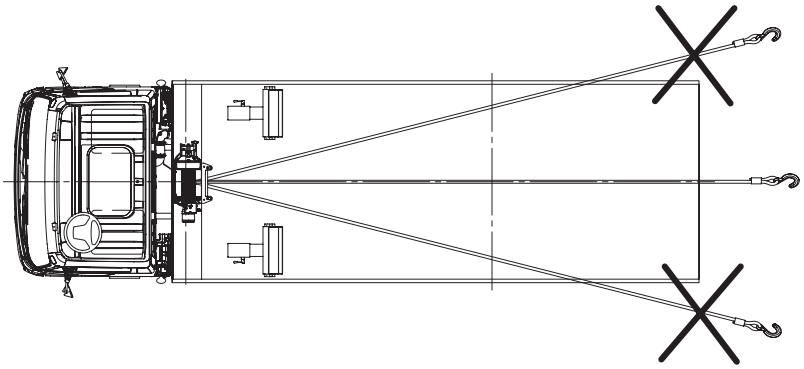
WARNING

Do not use winch to lift, support or otherwise transport personnel.

PICT.28



PICT.29



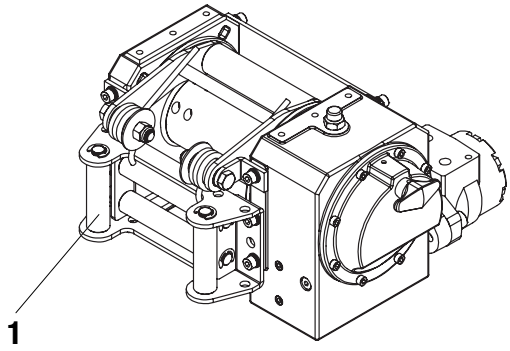
SECTION 4
ACCESSORIES

4.1 ACCESSORIES

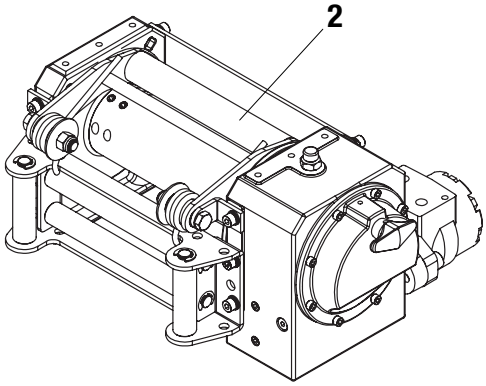
ZH winches have been designed to be equipped with several accessories such as :

- Standard roller fairlead (ref.1 pict.30)
- Cable tensioner (ref.2 pict.31)

PICT.30



PICT.31



4.1.1 ROLLER FAIRLEAD

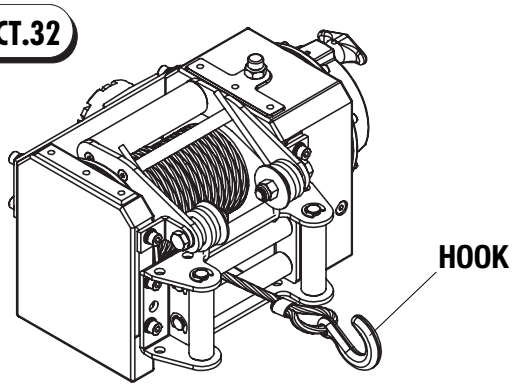
Roller fairlead is made up by 2 horizontal rollers and 2 vertical rollers, used for lateral pullings to avoid cable damages to the vehicle where the winch is installed.

4.1.2 CABLE TENSIONER

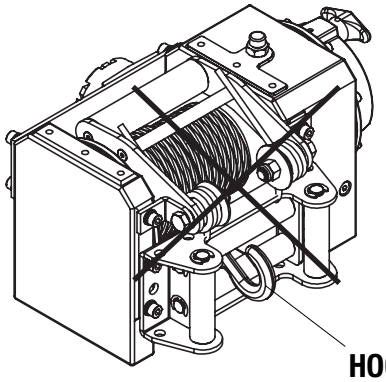
Cable tensioner is used to keep cable tightened on the drum, while the winch is in freespool mode. Cable tensioner does not insure that the cable will wind onto the drum in orderly manner.

4.2 RECOMMENDATIONS FOR USE

PICT.32



PICT.33



4.2.1 ROLLER FAIRLEAD

IMPORTANT

The use of roller fairlead does not insure that the cable will wind onto the drum in an orderly manner.

IMPORTANT

The proper fleet angle must be maintained for the cable to wind onto the drum in an orderly manner as shown in chapter 2.3.

DANGEROUS

Stop reel-in of cable before hook enters fairlead rollers, as shown in pict.32-33. Failure to do so, may cause damage or breakage to the rope, winch, vehicle and serious injuries.

DANGEROUS

Do not put hands or feet near rotating parts or moving wire rope. Wire rope under tension can cause serious personal injury. Before operator power a winch, he is required to check that the area around the winch and load being hauled is clear.

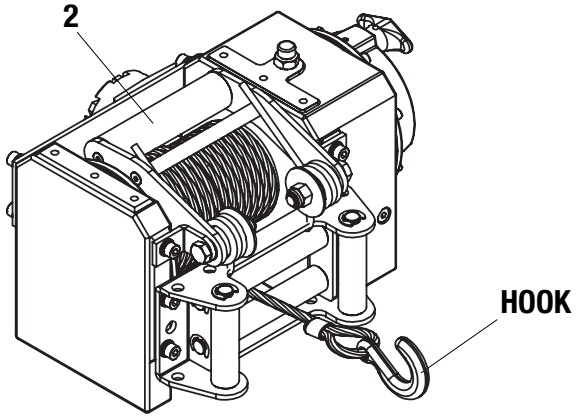
DANGEROUS

Never try to guide cable while winching.

IMPORTANT

In order that accessories such as roller fairlead and cable tensioner, can work properly a maintenance is recommended , as shown in chapter 5.1.1.

PICT.34



4.2.2 CABLE TENSIONER

IMPORTANT

The use of cable tensioner (2) does not insure that the cable will wind onto the drum in an orderly manner.

IMPORTANT

The proper fleet angle must be maintained for the cable to wind onto the drum in an orderly manner as shown in chapter 2.3.

DANGEROUS

Do not put hands or feet near rotating parts or moving wire rope. Wire rope under tension can cause serious personal injury. Before operator power a winch, he is required to check that the area around the winch and load being hauled is clear.

DANGEROUS

Never try to guide cable while winching.

IMPORTANT

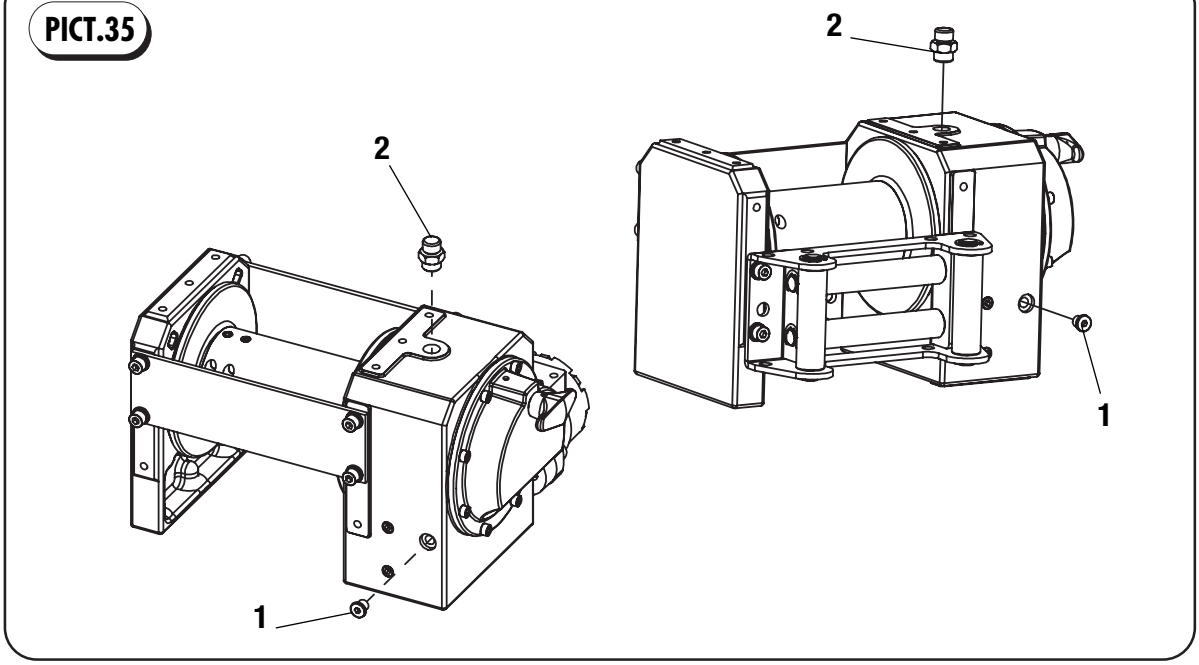
In order that accessories such as roller fairlead and cable tensioner, can work properly a maintenance is recommended , as shown in chapter 5.1.1.

SECTION 5
MAINTENANCE

5.1 MAINTENANCE

Winches mod. ZH are designed to reduce maintenance to wire rope and gear housing oil level only.

PICT.35

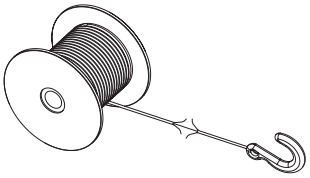


5.1.1 MONTHLY MAINTENANCE

Technical staff required :
Technician or user

Procedure:

1. Inspect the cable for damage and lubricate frequently with viscous oils or light grease with additive adhesive with graphite or bisulfure molybdenum. **If cable becomes frayed with broken strands, replace immediately by following procedure indicated on chapter 2.7.**



2. Worm and gear are bathed in oil. Keep oil to level hole.

3. To check oil level: remove oil level plug (1) and check oil level. Oil level should be kept up to oil level hole. If oil level is below level hole, remove breather plug (2) and add oil **ESSO Spartan EP320** or **IP Mellana 320.** Tightening plugs.

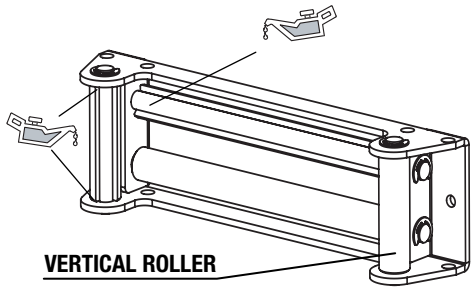
WARNING

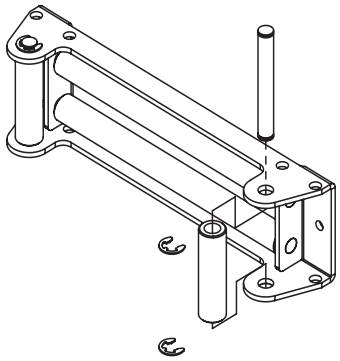
Periodically inspect rope mounting setscrews and tighten if necessary. (ref.12 e 13 page 28).

ZH winches can be equipped with roller fairlead and cable tensioner.

PICT.36

ROLLER FAIRLEAD GREASING





4. The Roller fairlead rollers must roll free to let wire rope slide perfectly. Elements such as: salt, water, oxidation and a bad maintenance can cause the rollers locking, and excessive wire rope wear. The Roller fairlead rollers bad operation, can cause their own rapid wear. We recommend to keep rollers lubricated, with medium dense oil, between axe and roller as shown on pict.36.

IMPORTANT

Fairlead rollers are zinc plated. Treatment with time will be removed by rope sliding.

IMPORTANT

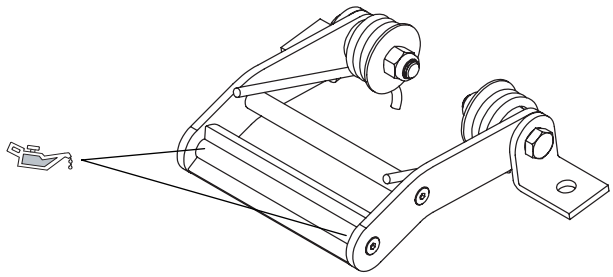
Fairlead rollers sliding on wire rope, when show an excessive wear must be replaced.

WARNING

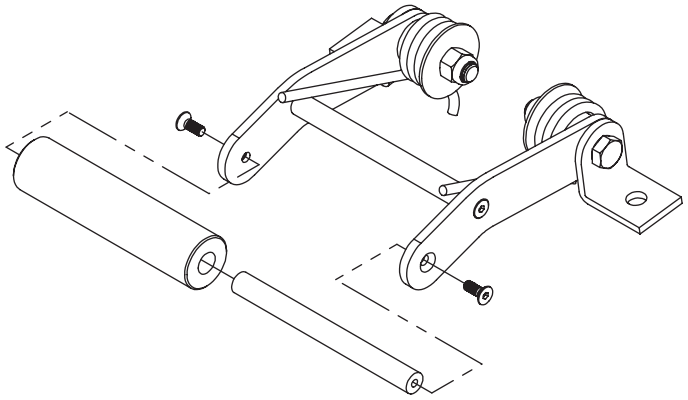
A roller excessively worn , particularly if it has deep stripes, could damage the wire rope.

5. Cable tensioner roller is made in copolymer acetate. This material reduces maintenance. In very dirty environments, we recommend to keep maintenance and roller lubricated, with medium dense oil (pict.37). In case of excessive locking, cable tensioner roller can be disassembled as shown on pict.38.

PICT.37 CABLE TENSIONER GREASING



PICT.38



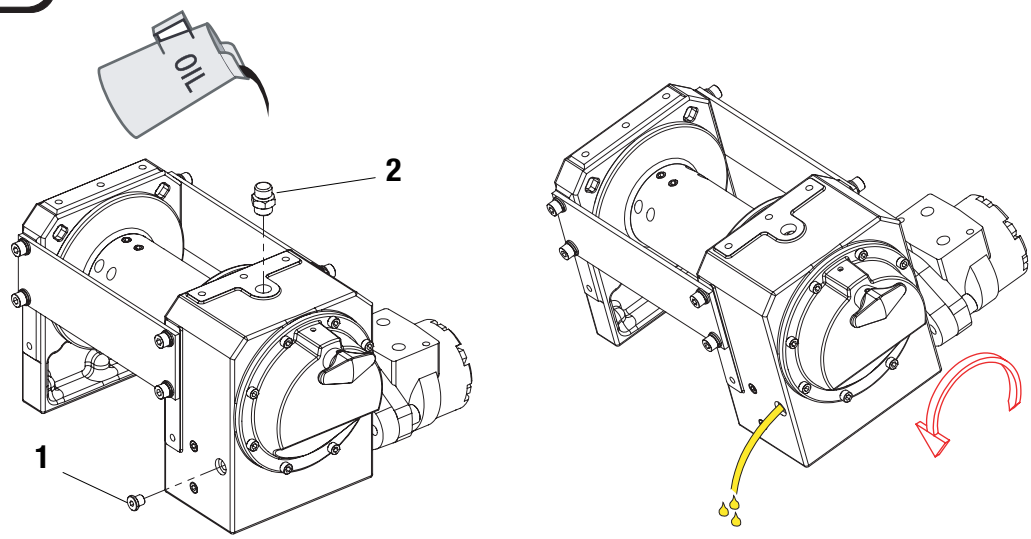
IMPORTANT

Cable tensioner roller sliding on wire rope, when shows an excessive wear must be replaced.

WARNING

A roller excessively worn , particularly if it has deep stripes, could damage the wire rope.

PICT.39



5.1.2 ANNUAL MAINTENANCE

Technical staff required :
Technician or user

Procedure:

At least once a year, it is necessary inspect oil level. To inspect oil level follow instruction as indicated in chapter 5.1.1 step 3. To fully replace the oil do as follow :

1. Remove fill/breather plug (2) and oil level plug (1).

2. Tilt the winch as shown in pict.39 and drain oil taking care to put the oil drained in a container (approx. 1,5 Lt. capacity).

3. Fill up worm gear housing with new oil through fill/breather plug hole (2) till reach oil level hole (1) (see table for oil quantity). Tighten oil level plug (1) and plug (2).

Model	Q.ty
ZHC	700 Gr.
ZHL	700 Gr.

IMPORTANT

To avoid pollution, the oil drained from the winch, must be carried off in compliance with regulation.

WARNING

Inspect mounting capscrews and tighten if necessary.

SECTION 6
TROUBLE SHOOTING GUIDE

6.1 TROUBLE SHOOTING GUIDE

CONDITIONS	POSSIBLE CAUSE	CORRECTION
Drum will not rotate at no load in the free spooling position.	- The winch is misaligned.	- Check winch mounting, chapter 2.2-2.3-2.4 pages 16/20.
Drum will not rotate under load.	- Load greater than rated capacity of winch.	- Check technical data on pages 11-12.
	- Low hydraulic system pressure.	- Check hydraulic system pressure and winch performance charts on pages 11-12.
Winch runs too slow.	- Low hydraulic system pressure.	- Check hydraulic system pressure and winch performance charts on pages 11-12.
	- Motor worn out.	- Replace the motor (ref.21) parts drawing chapter 7.2 page 43.
	- The winch is misaligned.	- Check winch mounting, chapter 2.2-2.3-2.4 pages 16/20.
Drum will not free spool.	Clutch doesn't disengage.	- Check chapter . 3.1 pages 29/32. - Check shaft ref.24/1 parts drawing chapter 7.2 page 43 doesn't lock for a bad maintenance - Check dog point setscrew too tight chapter 3.1, pager 29, pict.24a, ref.2. - Check if keys ref.19 parts drawing chapter 7.2 page 43 are pulled out of shape by overload.
Clutch inoperative or binds up	- Dry or rusted shaft	- Replace or lubricate, ref.24/1 parts drawing chapter 7.2 page 43
	- Dog point setscrew too tight	- Adjust it as shown chap. 3.1 page 29, pict.24a, ref.2.
	- Bent clutch fork	- Replace clutch fork ref.30 parts drawing chapter 7.2 page 43
	- Keys damaged	- Replace keys ref.19 parts drawing chapter 7.2 page 43

6.1 TROUBLE SHOOTING GUIDE

CONDITIONS	POSSIBLE CAUSE	CORRECTION
Oil leakage.	- Damaged oil seals, O-rings.	- Replace gaskets ref.45, oil seals ref.43 , O-rings ref.5-29-46 parts drawing chapter 7.2 page 43.
	- Oil plugs loosens.	- Tighten oil plugs, Section 5 chapter 5.1.1.
	- Excessive oil quantity in gear housing.	- Section 5 chapter 5.1.1-5.1.2.
Oil leakage from gear housing or Fill/breather plug.	- Hydraulic orbital motor shaft oil seal damaged.	- Replace hydraulic orbital motor shaft oil seal or hydraulic orbital
Load drifts.	- Bronze Gear worn out	- Replace bronze gear ref. 6 parts drawing chapter 7.2 page 43.
	- Excessive heavy-duty operation	- Check performance charts, pages 11-12.
	- Drum clutch worn out	- Check drum clutch ref.8 parts drawing chapter 7.2 page 43 and replace it.
	- Drum shaft failure	- Replace shaft ref. 18-18L and keys ref.19 parts drawing chapter 7.2 page 43.
Excessive noise.	- Hydraulic system flow too high.	- Check hydraulic system flow and winch performance charts on pages 11-12.
	- Oil level too low.	- Check oil level, through oil level plug according instructions chapter 5.1.1 .
Cable birdnests when clutch is disengaged.	- Teflon discs worn out.	- Replace teflon discs and springs ref.16 -17 parts drawing chapter 7.2 page 43.
	- Wire rope too hard.	- Replace wire rope. Mount a cable tensioner.

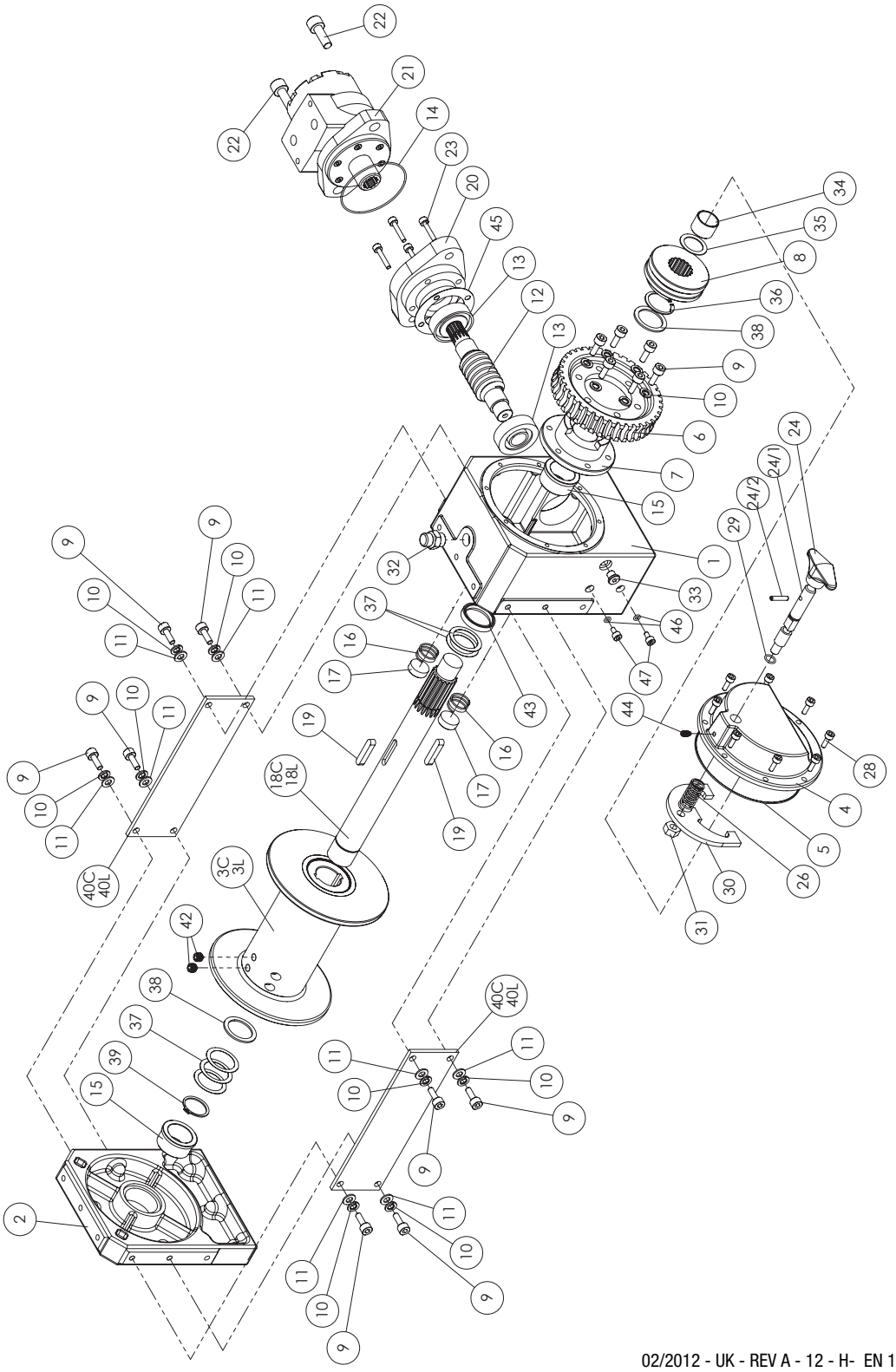
SECTION 7
PARTS LIST

7.1 ZHC 2200/3000, ZHL 2200/3000 WINCH PARTS LIST

COD.	REF.	DESCRIPTION	Q.TY
12.0252	1	GEAR HOUSING	1
12.0251	2	SUPPORT	1
12.0586	3C	SHORT DRUM	1
12.0587	3L	LONG DRUM	1
12.0250	4	GEAR HOUSING COVER	1
*OR2525	5	O-RING 1,78x133,10	1
12.0254	6	GEAR RING Z=38 (ZH 2200)	1
12.0308	6	GEAR RING Z=50 (ZH 3000)	1
12.0255	7	GEAR RING HOUSING	1
12.0256	8	CLUTCH	1
*VTTCE08X20Z	9	CAPSCREW UNI 5931 M8x20	14
*RSTELR8	10	LOCK WASHER UNI 9195B D8	14
*RND8ZUNI6592	11	WASHER UNI 6592 D8	8
12.0153	12	WORM GEAR(FOR GEAR RING Z=38)	1
12.0227	12	WORM GEAR(FOR GEAR RING Z=50)	1
*CSC7304	13	BEARING 7304	2
*OR2325	14	MOTOR O-RING 1,78x82,28	1
01.0009	15	BUSHING 32x42X20	2
*MLL008	16	TEFLON DISC SPRING	2
01.0040	17	TEFLON DISC	2
12.0249	18 C	SHORT SHAFT	1
12.0258	18 L	LONG SHAFT	1
*CHVSF08X07X40	19	KEY 8x7x40	2
12.0260	20	MOTOR COUPLING	1
	21	HYDRAULIC MOTOR 50 CC	1
*VTTCE12X30Z	22	CAPSCREW UNI 5931 M12x30	2
*VTTCE06X30Z	23	CAPSCREW UNI 5931 M6x30	4
	24	CLUTCH HANDLE	1
	24/1	SHAFT	2
	24/2	PIN	2
*MLL019	26	CLUTCH SPRING	1
*VTTCE06X16Z	28	CAPSCREW UNI 5931 M6x16	8
*OR2043	29	O-RING 1,78x10,82	1
01.0028	30	CLUTCH FORK	1

COD.	REF.	DESCRIPTION	Q.TY
*DD10AUTZ	31	LOCK NUT UNI7473 M10	1
*TPPSFVA3/8+GUALL	32	FILL/BREATHER PLUG 3/8" G	1
*TPPESINC3/8	33	PLUG 1/8" G	1
01.0009	34	BUSHING 32x42X20	1
*RSMFE25X40X1	35	THRUST WASHER 25x40x1	1
*SGRE31	36	SANP RING E 31 DIN 471	1
*RSMFE32X45X0,2	37	THRUST WASHER 32x45x0,2	5
*RSMFE32,5X41X2	38	THRUST WASHER 32,5x41x2	2
*SGRAV32	39	SNAP RING AV 32	1
12.0261	40C	SHORT TIE PLATE	2
12.0262	40L	LONG TIE PLATE	2
*VTSTEIPC10X12Z	42	CAPSCREW UNI 5927 M10x12	2
*PRL32X42X7	43	OIL SEAL 32x42x7	1
*VTSTEIPC06X10Z	44	CAPSCREW UNI ISO 7435 M6x10	1
01.0067/03	45	GASKET (0,3)	1
01.0067/05	45	GASKET (0,5)	1
*OR2021	46	O-RING 1,78x5,28	2
*VTTCE06X10Z	47	CAPSCREW UNI 5931 M6x10	2

7.2 ZHC 2200/3000, ZHL 2200/3000 WINCH PARTS DRAWING



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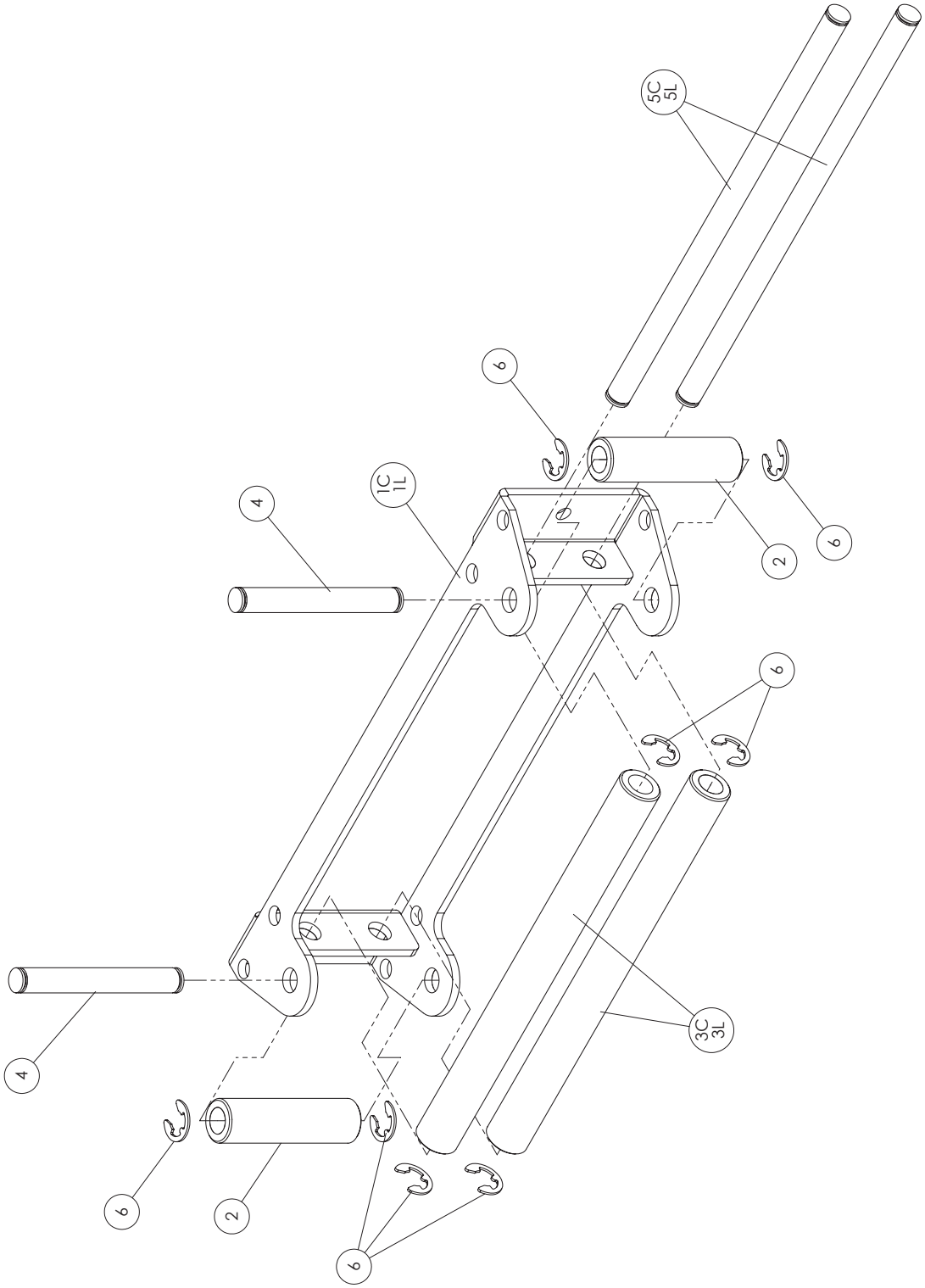
TLV ZH 2236/L R001

7.3 ZHC ZHL ROLLER FAIRLEAD PARTS LIST

COD.	REF.	DESCRIPTION	Q.TY
01.0157/Z	1C	SHORT FRAME	1
01.0158/Z	1L	LONG FRAME	1
01.0161	2	VERTICAL ROLLER	2
01.0162	3C	SHORT HORIZONTAL ROLLER	2
01.0225	3L	LONG HORIZONTAL ROLLER	2
01.0163	4	VERTICAL ROLLER SHAFT	2
01.0164	5C	SHORT HORIZONTAL ROLLER SHAFT	2
01.0224	5L	LONG HORIZONTAL ROLLER SHAFT	2
*SGRE12	6	SNAP RING D12	8
		BOLTS AND NUTS MOUNTING	
*VTTE10X20Z		CAPSCREW UNI 5739 M10x20	2
*DD10BZ		THIN NUT UNI 5589 M10	2
*RSTELR10Z		LOCK WASHER UNI 9195B D10	2

COD.	REF.	DESCRIPTION	Q.TY

7.4 ZHC ZHL ROLLER FAIRLEAD PARTS DRAWING



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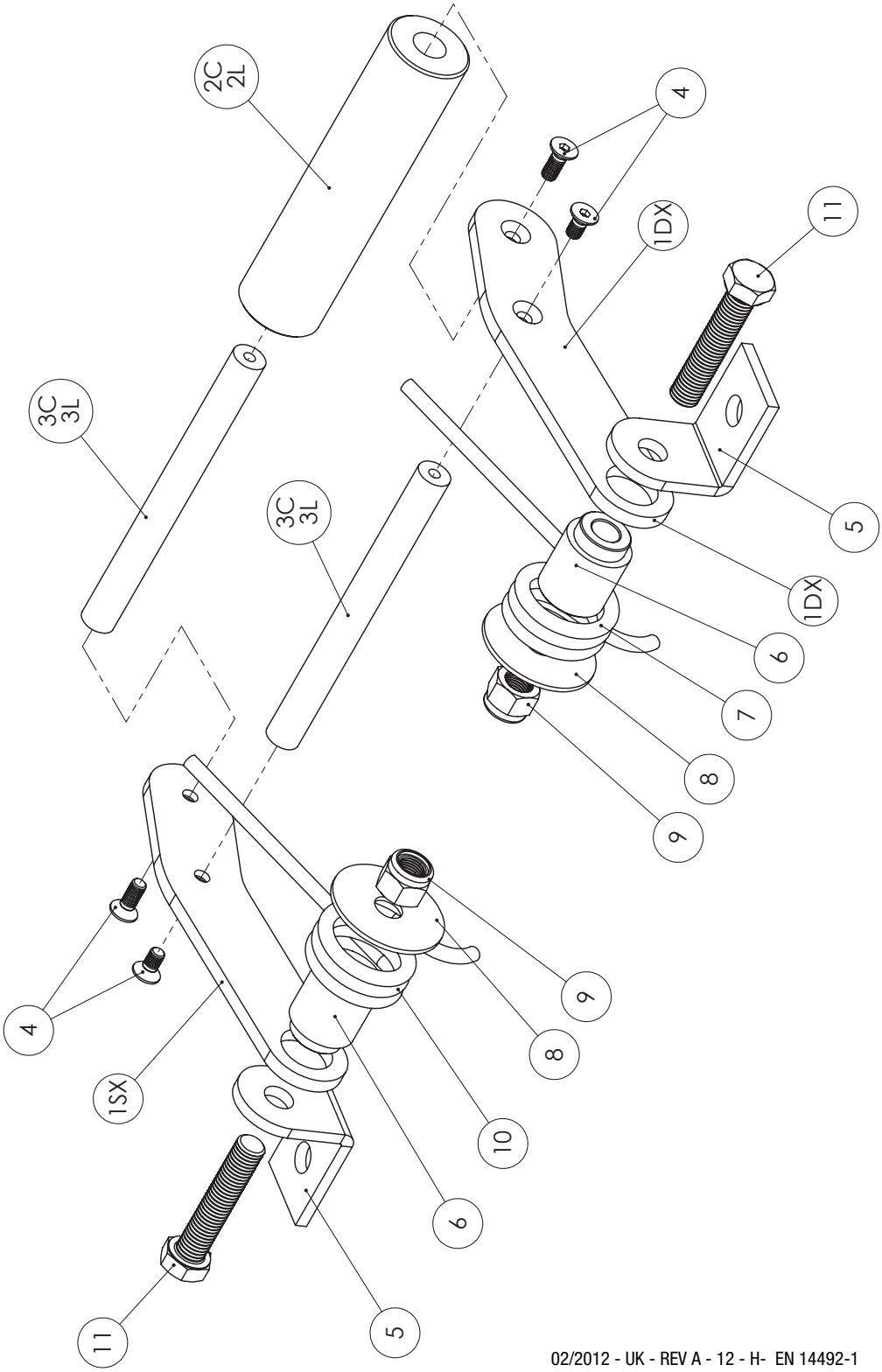
7.5 ZHC ZHL ROPE TENSIONER PARTS LIST

COD.	REF.	DESCRIPTION	Q.TY
01.0389/1DX	1DX	LEVER DX	1
01.0389/1SN	1SX	LEVER SN	1
	2C	SHORT ROLLER	1
	2L	LONG ROLLER	1
	3C	SHORT SHAFT	2
	3L	LONG SHAFT	2
*VTTSE6X16Z	4	CAPSCREW UNI 5933 M6x16	4
01.0372	5	DX SUPPORT	2
11.0373	6	BUSHING	2
11.0215	7	DX SPRING	1
	8	WASHER 12,5x48x2,5	2
*DD12AUTZ	9	LOCK NUT UNI 7473 M12	2
11.0215	10	SN SPRING	1
*VTTE12X60Z	11	CAPSCREW UNI 5737 M12x60	2
		BOLTS AND NUTS MOUNTING	
*VTTCE10X30Z		CAPSCREW UNI 5931 M10x30	2
*RND10ZUNI6592		WASHER UNI 6592 D10	2
*DD10AUTZ		LOCKNUT UNI 7473 M10	2

COD.	REF.	DESCRIPTION	Q.TY

7.6 ZHC ZHL ROPE TENSIONER PARTS DRAWING



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