

FITTING & OPERATING INSTRUCTIONS



T-MAX CHW16500 Mk2 HEAVY DUTY HYDRAULIC WINCH

5000kgf (49kN) Line Pull Capacity

Part No. 22321

CONFORMING TO
EN14492-1 Cranes – Power driven winches and hoists – Part 1: Power Driven Winches

CONTENTS

INTRODUCTION	3
EUROPEAN STANDARDS & BHW GROUP LIMITED	4
INSTALLER RESPONSIBILITY FOR CE COMPLIANCE	4
GUIDE TO SAFE WINCHING	5
METHOD OF OPERATION	5
FREESPOOL CLUTCH INFORMATION	6
OPTIONAL AIR CYLINDER CLUTCH SHIFTER	6
WINCH SPECIFICATIONS	7
WINCH DIMENSIONS	8
HYDRAULIC PERFORMANCE & SCHEMATIC DIAGRAMS	9
HYDRAULIC SYSTEM SPECIFICATIONS & SETTINGS	10
WINCH RATING	11
DRUM ROTATION	11
WINCH MOUNTING	11
SETTING PRESSURE RELIEF FOR CORRECT LINE PULL	11
WIRE ROPE INSTALLATION	12
AIR CYLINDER CLUTCH SHIFTER OPTION	12
CARE OF THE WIRE ROPE	13
LABELS INFORMATION	13
TROUBLE SHOOTING	14
PARTS DIAGRAM	15
PART NUMBERS LIST	16
MAINTENANCE	16
WARRANTY	17

INTRODUCTION

Thank you for purchasing a T-MAX CHW16500 Mk2 hydraulic winch from the Bushey Hall Winchmaster part of the BHW Group Ltd (BHW). These winches have been specifically selected and tested by BHW to give reliability and good service for commercial vehicle recovery.

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLATION OR OPERATION OF THE WINCH

As the new owner / operator of a T-MAX CHW16500 Mk2 winch, it is important that you read and digest the information contained in this handbook. Further help and advice can be obtained from the BHW trained sales engineers.

This winch is of the highest quality and has been designed to give robust and efficient service for many years if care and attention are given to correct installation, safe operation and maintenance.

WARNING:

YOU SHOULD NOT UNDER ESTIMATE THE POTENTIAL DANGER IN WINCHING OPERATIONS, NEITHER SHOULD YOU FEAR THEM.

RESPECT FOR THE WINCH AND COMMON SENSE IN ITS OPERATION WILL ENSURE SAFETY AND RELIABILITY.

PLEASE NOTE:

- **THE USER SHALL ENSURE THAT THE OPERATING PERSONNEL ARE GIVEN THE NECESSARY TRAINING. All users of the equipment shall be fully trained in the safe use of winches. Training shall be conducted by BHW or by a competent winch trainer qualified for the particular application.**
- **THE OPERATOR SHALL ALWAYS WORK IN COMPLIANCE WITH THE OPERATING INSTRUCTIONS.**
- **A MOTOR SPOOL (OPEN CENTRE) DIRECTIONAL CONTROL VALVE IS REQUIRED FOR BRAKE OPERATION.**
- **CLUTCH MUST BE FULLY ENGAGED BEFORE STARTING THE WINCH.**
- **DO NOT DISENGAGE CLUTCH UNDER LOAD.**
- **STAY OUT FROM UNDER AND AWAY FROM RAISED LOADS.**
- **STAND CLEAR OF ROPE WHILE PULLING. DO NOT TRY TO GUIDE ROPE.**

The winch may be operated by a fixed workstation and / or by a mobile workstation (e.g. wanderlead or radio remote). As the positioning of the winch rope depends on the particular application of the job, the operator shall be aware of the 'Guide to Safe Winching' section to ensure they and others are positioned safely.

- **A MINIMUM OF 5 WRAPS OF ROPE AROUND THE DRUM BARREL IS RECOMMENDED TO HOLD THE LOAD.**
- **AVOID CONDITIONS WHERE LOAD SHIFTS OR SNATCHES OCCUR.**
- **EXCESSIVE "INCHING" SHALL BE AVOIDED.**
- **THE WINCH IS NOT TO BE USED AS A LOAD SECURING DEVICE.**
- **DO NOT USE WINCH TO LIFT, SUPPORT, OR OTHERWISE TRANSPORT PERSONNEL.**

Any such use will invalidate the warranty.

Neither T-MAX nor BHW shall be responsible for any claims arising from such use.

Installers are advised to carry out a risk assessment on each individual application - and the pressure relief valve needs to be adjusted to act as a load limiter following installation.

EUROPEAN STANDARDS & BHW GROUP LIMITED (BHW)

The harmonised European standard: EN14492-1 for power driven winches provide the means for conformity to essential Health and Safety requirements of the EC Machinery Directive.

Conformity to these standards is the joint responsibility of the supplier, the installer and the company operating the product.

BHW products are fully compliant and carry a CE mark. A Declaration of Conformity is also supplied with each winch.

Selecting the correct winch for the application is very important not only from the health and safety aspect, but also to maximise product life and value for money.

Our aim at BHW is to ensure the correct machine is supplied to suit the application and we welcome the opportunity of discussing the proposed application and offer advice. It will help us considerably if information regarding the maximum and average loads to be lifted or pulled - and approximate frequency of use can be provided.

This winch is to be used only for the purpose of vehicle recovery when fitted to equipment designed for the purpose, or the loading of wheeled vehicles upon bodies designed for the purpose, or used for a purpose specifically agreed with the BHW.

For recovery vehicles the permissible standard of wire rope MBF** to winch rating can be a minimum 2:1 and the ratio of wire rope to mean drum diameter* only 10:1. This minimum standard is permitted because the running time is so short and the winch rarely sees maximum load. Whilst this standard is very reduced compared to lifting winches it imposes a much higher standard of safety than on many products currently being supplied.

Winches with capacities over 1000kg must be load limited.

Maximum wire rope length on drum must leave x 1.5 wire rope diameter from the top layer to drum flange.

* Mean drum diameter = the drum diameter plus the diameter of the wire rope.

** MBF = the Minimum Breaking Force of the wire rope.

INSTALLER RESPONSIBILITY FOR CE COMPLIANCE



- 1. VERY IMPORTANT** Use only a motor spool (open centre) control valve as per Hydraulic System Specifications (Page 9). **The use of a closed centre valve may result in damage to the winch.**
2. The winch is operated using a wanderlead or/and a radio control - refer to Hydraulic System Specifications (Page 9) for Emergency Stop components to be installed.
3. Adjust system relief pressure as per Hydraulic System Specifications (Page 9).
4. Mount winch as per winch installation instructions (Page 11).
5. Install 12mm, 1960N/mm² grade, 6 x 36 wire core rope, with minimum breaking strain of 100kN (10200kgf). Maximum recommended rope length 30m (x 4 layers maximum).
6. Attach rope to the drum as per wire rope installation instructions (Page 12).
7. Hook must have a safety latch and a minimum rated capacity of 3 tonne. Use only high tensile grade 80 or 100. These hooks are rated and stamped for lifting and have a safety factor of 4:1. A 3 tonne hook has therefore a minimum yield of 3 x 4 = 12 tonne. For pulling applications with a 2:1 factor of safety they are suitable for up to 6 tonne line pull.

GUIDE TO SAFE WINCHING

The following safety precautions must be observed at all times whilst using the winch. Failure to do so could result in serious injury to personnel or damage to the winch.

Locate position of Emergency Stop before use. The clutch must be fully engaged before starting to haul a load.

NEVER ATTEMPT TO DISENGAGE THE FREESPOOL CLUTCH WHEN WINCH IS UNDER LOAD.

Winches shall only be used by persons trained in their use and in the user's particular application. (BHW Group Limited offer winch courses to suit most user applications.)

Keep yourself and others at a safe distance to the side of the wire rope when pulling under load.

WEAR GLOVES & SUITABLE CLOTHING.
NEVER STEP OVER, STAND NEAR OR GUIDE A ROPE UNDER TENSION.

Always use heavy-duty riggers type gloves when handling the wire rope to protect against cuts or possible burrs. Use the rope handling strop supplied.

Take care of the wire rope. Check regularly for signs of wear in the form of broken strands or severe kinks along its length. If there are more than 10 strands broken in any length of the rope equal to 10 times the rope diameter, then it will be significantly weakened and must therefore be replaced. Wear and tear can be prevented by regular application of rope dressing available in aerosol form from your winch supplier. Oil and grease should never be used.

Always ensure that the rope is rewound neatly back onto the drum after use. If the rope is tensioned whilst unevenly wound, then loose coils can become trapped and badly damaged.

Do not drive the vehicle to pull a load on the winch wire rope, e.g. as a tow rope. Any resulting shock load could break the rope or damage the winch.

If the winch is being operated at maximum capacity, drape a heavy blanket or tarpaulin over the wire rope, halfway along its length. The blanket will reduce the whiplash effect of a failed rope or load attachment point.

When recovering a vehicle, the winch hook should be attached to the towing hitch, if available, or to a strap or chain around a chassis leg or cross member. NEVER anchor the winch hook onto bumpers, or shipping/transit anchorage. It is the operator's responsibility to ensure load attachment points are of sufficient strength to withstand the winch pull.

Do not allow the load to 'snatch' during a pull, as this can momentarily double or even treble the load on the rope.

Try to position either your vehicle or position a snatch block to ensure as straight a pull as possible. Use a snatch block to turn any corners with the rope.

When attaching the hook to the load, always double check that the hook is secure and the safety catch is fully closed. Remember that if the hook breaks away under tension, serious injury can result as the hook will travel through the air at speed.

It is recommended that a minimum of five wraps of rope around the drum is necessary to support the rated load. The rope to drum securing clamp is not designed to hold the rated load.

METHOD OF OPERATION

This is a hydraulic winch, for hydraulic circuit and system components see 'Hydraulic System Specification'. The host chassis engine must be running in order for the winch to operate. Before operating winch ensure host chassis gearbox is in neutral, brakes are fully applied and entry to cab is restricted to persons whilst winch operation is in progress. (Note – The controls mentioned below may vary depending on the specification and system design chosen by the winch installer)

The hydraulic power supply to the winch must first be activated by operating the power take off (PTO) switch in the driver's cab. Note that this item may also be used to isolate the hydraulic power. With the PTO switch in the 'off' mode the hydraulic pump is not being driven and therefore no hydraulic power is being supplied to the winch.

Locate the position of the Emergency Stop, this button requires to be in the 'out' position for the winch to operate.

Note: On some systems there may be more than one Emergency Stop.

The winch system may be fitted with two means of winch operation.

MANUAL LEVER CONTROL

This is a simple lever control, mounted on the hydraulic directional control valve, sprung loaded to the 'stop' position. This will operate to two positions, 'winch in' and 'winch out'. The intermediate sprung loaded position is 'stop'. The manual control is progressive so delicate control of the lever will regulate the speed of the winch.

WANDERLEAD CONTROL

This is a pushbutton control mounted on the end of an electrical wanderlead. Engage the plug on the wanderlead into the mating plug on the socket positioned on the vehicle (usually towards the rear). The control will consist of two buttons, 'winch in' and 'winch out', and may also be fitted with a 'Stop' control. Ensure the Stop control on the wanderlead is pushed in to the 'stop' position. Only twist out clockwise when it is desired to winch in or out. Immediately after a winch operation push in to the stop position. Do not leave the wanderlead unattended unless in the stop position. Operation of the 'winch in' and 'winch out' buttons is not progressive and the winch will immediately operate at its maximum speed.

FREESPOOL CLUTCH

**FREESPOOL CLUTCH MUST BE ENGAGED FOR ANY POWERED WINCHING OPERATION.
DO NOT DIRECTLY HANDLE THE HOOK, USE A WEBBING STRAP AT ALL TIMES.
ALWAYS WEAR PROTECTIVE GLOVES AND CLOTHING.**

The freespool clutch allows rapid unspooling of the rope for hooking onto the item to be winched. When this clutch is disengaged all drive and braking is removed from the winch drum so that it may rotate freely. **ENSURE THE WINCH ROPE HAS NO LOAD ON IT BEFORE DISENGAGING THE CLUTCH. DO NOT ATTEMPT TO FREESPOOL WITH A LOAD ATTACHED TO THE ROPE HOOK.** To operate freespool, disengage the clutch by pulling up the T-Bar on the side of the winch and rotating it anti-clockwise, as far as it will go, to freespool out. (The T-Bar can also be turned clockwise for freespooling in).

Wire rope can now be spooled off of the drum. To re-engage the clutch, pull the T-Bar out and rotate back to centred position. Ensure the T-Bar retracts fully back to the winch body, otherwise clutch will not engage.

Pull firmly on the winch rope to ensure the clutch has fully engaged and that the drum will not rotate. The winch is now ready for pulling. Before commencing winching, position the vehicle so the winch is as square to the point of pull as possible to enable even spooling of the wire rope onto the drum. During winching try and prevent the wire rope becoming slack as this will create loose layers developing.

When returning wire rope to fully retracted position, ensure hands are kept clear of roller guides at all times. If vehicle includes a hook storage point, this should be used. Always operate the stop control before finally stowing winch rope. Never allow hands near the winch or roller guides unless stop control is activated.

When wire rope is wound back onto the drum after use, ensure firm hand tension is applied to the rope, via the stop attached to it, to obtain even layering.

When winch is not in use the Emergency Stop should always be in the "STOP" position.

Details on setting the freespool clutch to initially load the wire rope can be found on page 12.

AIR CYLINDER CLUTCH SHIFTER

The air cylinder pipe fitting is attached to the end of the winch clutch handle. The air pipe required is 8mm diameter.

TO DISENGAGE CLUTCH: Run the winch in the reverse (reel out) direction until load is off the cable. Apply air pressure to the pipe fitting. The minimum air pressure should be 6.5 – 7 Bar, and the **MAXIMUM** should be 8 Bar.

NOTE: AIR PRESSURE EXCEEDING 8 BAR MAY DAMAGE THE WINCH.

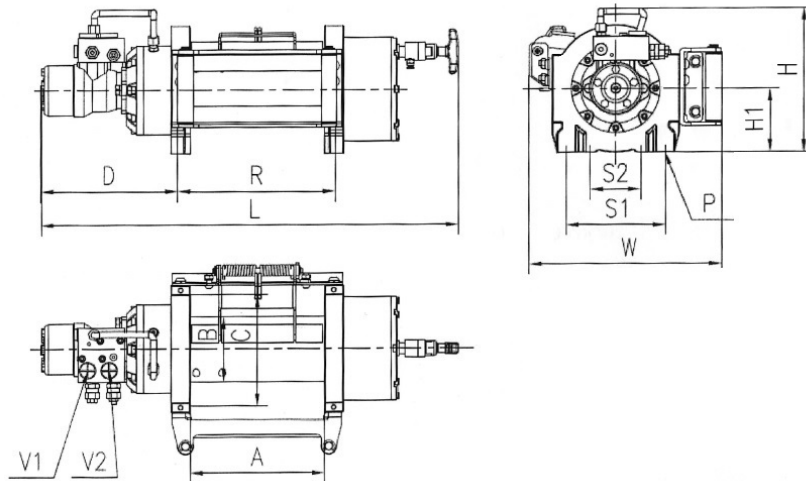
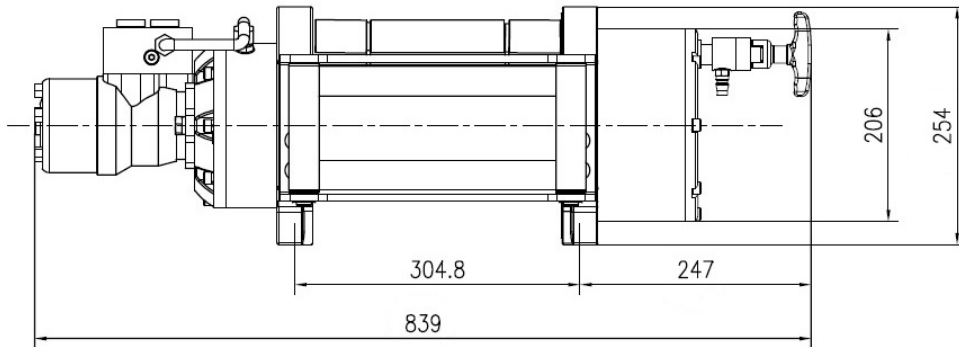
TO ENGAGE CLUTCH: Remove air pressure from the cylinder.



WINCH SPECIFICATIONS

Model	T-MAX CHW16500 Mk2 5 Tonne Planetary Hydraulic Winch EN 14492-1 Compliant																																		
Construction	Cast steel end housing with steel drum.																																		
Gear Type	Two Stage Planetary.																																		
Gear Reduction	23:1																																		
Type of use	Commercial Recovery – Ideal for Heavy Duty Slide Bed.																																		
Motor	Low speed, high torque. 200cc/rev.																																		
Brake	Spring applied hydraulic disc brake and counter balance valve providing full 100% braking.																																		
Freespool Clutch	Spring loaded lever.																																		
Weight	Winch only: 80kg.																																		
Line Pull by Layer	<table><tr><th colspan="2"></th><th colspan="4">LAYER</th></tr><tr><th colspan="2"></th><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>Maximum Rated Line Pull by Layer</td><td>kN kgf</td><td>49 5000</td><td>42 4300</td><td>37 3770</td><td>32 3200</td></tr><tr><td>CHW16500 Rope Capacity Cumulative by Layer*</td><td>m</td><td>9</td><td>19</td><td>30</td><td>42</td></tr><tr><td>*Line Speed at 60 l/min</td><td>m/min</td><td>5</td><td>5.8</td><td>6.6</td><td>7.4</td></tr></table> <p>* Based on recommended 12mm wire rope and 88cc / rev. motor.</p>							LAYER						1	2	3	4	Maximum Rated Line Pull by Layer	kN kgf	49 5000	42 4300	37 3770	32 3200	CHW16500 Rope Capacity Cumulative by Layer*	m	9	19	30	42	*Line Speed at 60 l/min	m/min	5	5.8	6.6	7.4
						LAYER																													
						1	2	3	4																										
Maximum Rated Line Pull by Layer						kN kgf	49 5000	42 4300	37 3770	32 3200																									
CHW16500 Rope Capacity Cumulative by Layer*						m	9	19	30	42																									
*Line Speed at 60 l/min	m/min	5	5.8	6.6	7.4																														
Rope Capacity by Layer																																			
Line Speed at 60 l/min																																			
Recommended Wire Rope	12mm diameter – maximum. 1960N/mm ² grade, 6 x 36 wire core construction. Recommended rope length 30m.																																		
Minimum Breaking Strain	100kN (10,200kgf).																																		
Rope to Mean Drum Ratio	11.8:1																																		
Drum Dimensions	130mm diameter x 267mm length. Flange diameter 240mm.																																		
Drum Rotation	Clockwise and counter clockwise as required.																																		
Grease Type	MOBILITH ZL-24 or equivalent.																																		
Hydraulic Oil Flow	60l/min recommended. 75 l/min maximum. Higher flows will damage motor and winch.																																		
Hydraulic Fluid	Viscosity 20-43 cSt (100-200 SUS). Maximum operating temperature 85°C. Cleanliness level of ISO 17-14 or better.																																		
Operating Pressure	140 bar.																																		
Maximum Back Pressure	at motor ports = 3 bar.																																		
Load Limiter	Hydraulic system must be fitted with hydraulic relief valve to limit winch line pull.																																		
Emergency Stop	Emergency Stop must be fitted to hydraulic system with 'oil dump' to tank between pump and directional control valve. Stop control also on wanderlead if supplied.																																		
Noise Level	79db																																		
Ambient Temperature Range	-28° to 60°C																																		

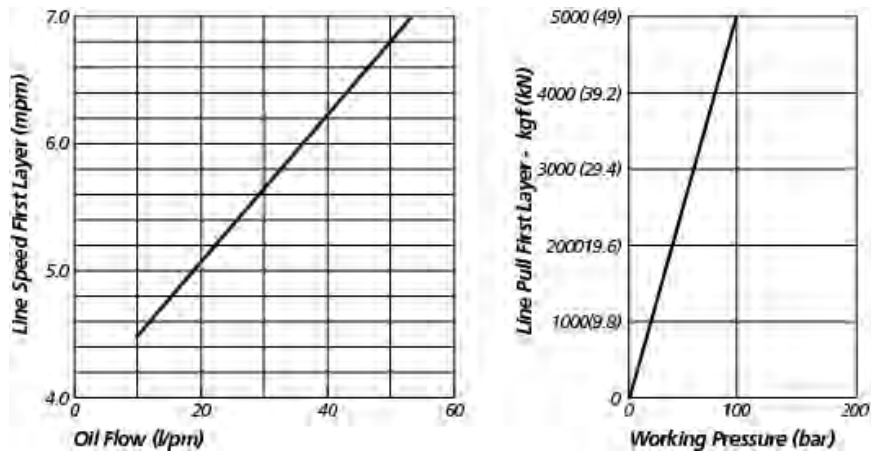
WINCH DIMENSIONS



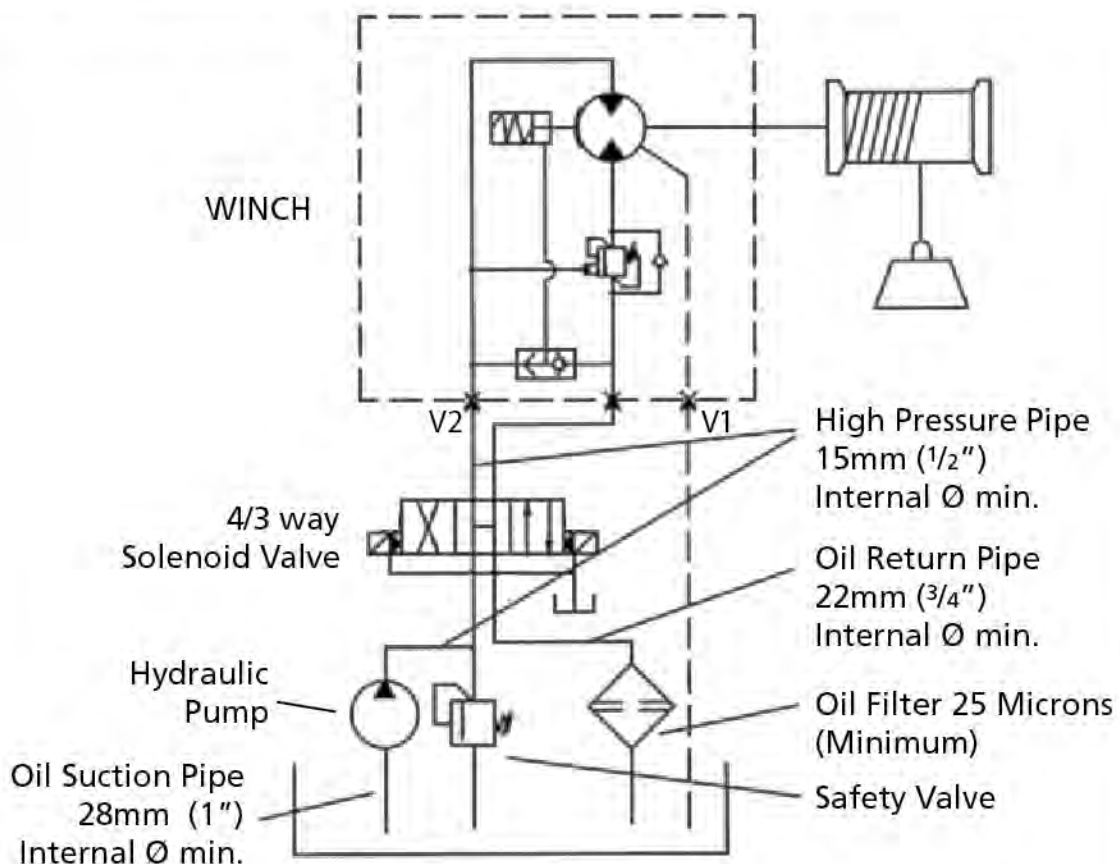
Unit: mm

Model	L	W	H	H1	A	B	C	D	R	S1	S2	P	V1-V2
7133608	839	382	300	127	267	130	240	268	304.80	165.1	114.3	M8-M12 mounting bolts 27depth, 8.8 Grade, torque: 90NM	2-G1/2"

HYDRAULIC PERFORMANCE



T-MAX CHW 16500 - HYDRAULIC LAYOUT



NOTE: MAXIMUM BACK PRESSURE = 0.3MPA

HYDRAULIC SYSTEM SPECIFICATIONS

GENERAL

Open System with low pressure return line filter.

RESERVOIR

Minimum capacity 30 litres. Must be fitted with 250 micron suction strainer, sight gauge and filler breather.

Do not fill the tank, as space must be left for the oil to expand.

HOSES

Working pressure rating of hoses must be a minimum of 250 bar.

Minimum internal diameter of hoses and pipes:

Pressure hoses from pump to control valve and control valve to winch motor = 1/2".

Return to tank = 3/4". Reservoir to pump = 1".

HYDRAULIC MOTOR

7/8" SAE – Straight thread 'O' ring port – use 1/2" BSP with bounded washer.

CONTROL VALVE

4-way, 3-position, self-centring open centre motor spool type must be used with inlet relief. The valve must be specified to ensure it meets the winch operating pressure and maximum flow requirements for satisfactory performance to be achieved.

BHW GROUP CAN SUPPLY A WIDE SELECTION OF CONTROL VALVES INCLUDING:

ELECTRIC AND ELECTRO/PNEUMATIC.

THIS ENABLES THE WINCH TO BE OPERATED WITH A WANDERLEAD OR RADIO CONTROL.

VALVES ARE SUPPLIED FULLY WIRED READY TO INSTALL.

EMERGENCY STOP

To ensure compliance with the EU Machinery Directive an emergency stop must be included.

This will generally be in the hydraulic circuit and take the form of an electrically operated dumping valve.

INCLUDED AS STANDARD ON BHW CONTROL VALVES.

OIL RESERVOIR SUCTION STRAINER	250 microns (Approximately)
RETURN LINE FILTER	25 microns (Approximately).

IMPORTANT: Keep hose lengths to a minimum to reduce backpressure.

If hose lengths exceed 4 metres, increase nominal bore size.

Cleanliness within the hydraulic system is essential to ensure correct function and long life of the winch and all other components.

If other hydraulic equipment, e.g. lorry loader crane, is also being included in the system, the selection of the PTO/PUMP is very important. This should be specified to meet the operating requirements of both the winch and crane. In some installations this will require a dual pump system.

Please contact BHW on +44 (0)20 8953 6050 for further information if required.

CORRECT PRESSURE SETTING OF THE SYSTEM

Whether using a manual or electric control valve it is essential that the hydraulic pressure in the system is set correctly. This will ensure the winch is able to pull to its full rated capacity but without overloading.

To do this secure the wire to a load via a measuring device (load cell) with rope running on the bare drum and operate the winch until the rated pull of the winch is achieved by adjusting the relief valve.

KEEP A MINIMUM OF 5 WRAPS OF ROPE ON THE DRUM.

For adjustment method see valve suppliers instructions.

A 125% proof load test should be carried out on completion to prove the integrity of the installation.

The pressure relief valve must then be adjusted to provide the rated line pull of the winch and tamper proof seals must then be fitted.

WINCH RATING

The winch rating on the T-MAX CHW 16500 Mk2 refers to its maximum rated line pull, measured as the force being applied to the winch in a horizontal plane. As in the case of all winches, this refers to the first layer of rope on the drum.

In most cases, when the winch is being used, there is no way of accurately determining the exact pull being applied. It is important, however, to try and establish that it is within the working capacity of both the winch and wire rope and this can be done by considering the following formulae which applies for gradients up to an angle of 45°. For wheeled vehicles, the pull required to move the load equals:

$$\frac{W}{25} + \frac{(W \times \text{angle of gradient})}{60}$$

Where W = load in tonnes and angle of gradient is in degrees.

EXAMPLE: If W, the weight of the rolling load being recovered is being pulled up skids, which form a gradient of 18°, the force on the rope is:

$$\frac{4}{25} + \frac{(4 \times 18)}{60} = 0.16 + 1.2 = 1.36 \text{ tonne.}$$

NOTE: Ground factors make a significant difference to the force required.

Remember the winch pulling capacity reduces as the number of layers of wire rope increase on the drum.

If it is necessary to work beyond the limits of either the winch or wire rope, it is essential that a snatch block is employed, which will enable the line pull to be nearly doubled.

If you should have any queries regarding the maximum load applied in a particular application, please do not hesitate to contact BHW Group on +44 (0)20 8953 6050 - we will be pleased to offer our assistance.

WINCH MOUNTING

Irrespective of how the winch is mounted it is important that adequate provision is made so that the load is transmitted into the body of the vehicle and then into the chassis. For heavy chassis the winch can usually be mounted by flitch plates direct to the main frame of the vehicle with additional support being obtained from the body subframe. (Never weld to chassis or drill top or bottom flanges, without the manufacturer's approval).

When mounting the winch on to the front of a vehicle it is essential that the chassis can take the loadings applied. In some cases it may be necessary for the chassis to be strengthened. If in any doubt contact our chassis supplier/manufacturer to obtain winch-mounting approval.

It is most important that the winch be mounted securely so that the three major sections (the clutch housing end, the cable drum and the gear-housing end) are properly aligned.

Unlike a worm gear winch, planetary winches do not use a large shaft through the drum, gear housing and motor end.

MISALIGNMENT WILL RESULT IN THE DRUM BINDING, CAUSING EXCESSIVE WEAR OF COMPONENTS WITHIN THE WINCH.

The mounting surface must be flat within 0.25mm and sufficiently stiff to resist flexing. If a steel plate is used for mounting, it should be 20mm thick. If a plate thinner than 20mm is used, it should be strengthened with support members. Mounting requires 8no. x M12 bolts (Grade 8.8) to suitable lengths with lock washers and nuts or washers and Nylock nuts. Torque setting is 90Nm.

Mounting hole locations must be held within ± 0.8mm and the hole size of 13mm diameter must not be oversized.

SETTING PRESSURE RELIEF TO OBTAIN CORRECT WINCH LINE PULL FOR MANUAL AND ELECTRIC / MANUAL LEVER CONTROL VALVES

Two options:

1. Secure the wire rope to a load via a measuring device (load cell) with rope running on bare drum and operate the winch until the rated pull of the winch is achieved by adjusting the relief valve.

ALWAYS KEEP A MINIMUM OF 5 WRAPS OF ROPE ON THE DRUM.

Observe all requirements in 'Guide to safe winching'.

Adjustment is achieved on the manual valve by means of removing the chrome cap opposite 'P' port and winding screw in to increase load and out to decrease load. On the electric/manual valve remove rubber plug next to 'P' port and adjust in same way as described for manual valve with Allen key.

2. Install a pressure gauge into the 'P' port between pump and control valve. Block both motor ports using hydraulic caps.

Operate system and adjust relief valve, as described in 1) to correct pressure setting for winch (see winch specification page 7).

All control valves incorporated in the winch hydraulic system must be of an 'Open Centre' (Motor Spool) type.

WIRE ROPE INSTALLATION

BEFORE COMMENCING ENSURE HOST CHASSIS ENGINE IS STOPPED AND EMERGENCY STOP CONTROLS ARE ACTIVATED. WEAR GLOVES AND SUITABLE PROTECTIVE CLOTHING.

1. Remove rope drum safety guard.
 2. Unwind the cable by rolling it out along the ground with the tapered end nearest to the winch.
 - NEVER wind the cable straight onto the drum from a coil.
 3. Raise the cable tensioner away from the rope drum (if supplied as part of your kit), and lock in position through the corresponding holes in the tensioner frame and bracket using a suitable pin or bolt.
 4. Rotate the rope drum under power until the rope fixing holes run vertically at the front of the winch.
 5. Pass the rope end through the roller fairlead, UNDER the drum and back over the top of the drum to pass through the rope hole furthest way from the drum flange.
- Keep feeding the rope through to wrap around the drum
FOUR TIMES and into the rope fixing hole nearest the

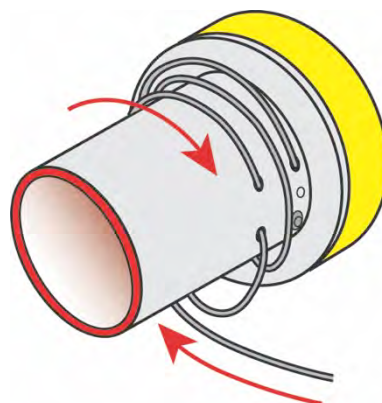


Diagram shows two wraps illustrated for clarity.

- drum flange.
6. Tighten the retaining screw ensuring that the rope end is flush with the exit of the hole and not protruding.
 7. Feed back any excess slack to tighten the four wraps neatly on the drum.
 8. Remove the locking pin from the cable tensioner to allow the rollers to rest on the rope.
- Note: This assembly is under tension. Special care should be taken to avoid trapping fingers, clothing etc.

The freespool clutch now needs to be set to enable the wire rope to be loaded:

AIR CYLINDER CLUTCH SHIFTER OPTION

The air cylinder pipe fitting is already fitted into the side of the T-Bar handle of the freespool clutch. The air pipe required is 8mm diameter.

USING AIR SHIFTER TO DISENGAGE CLUTCH

WITH NO LOAD ATTACHED: Apply air pressure to the pipe fitting.

WITH LOAD ATTACHED: Run the winch in the reverse (winch out) direction until load is off the cable. Apply air pressure to the pipe fitting.

TO ENGAGE CLUTCH: With no load attached, remove air pressure from the cylinder.



The minimum air pressure should be 6.5 – 7 Bar, and the MAXIMUM should be 8 Bar.

**NOTE: AIR PRESSURE EXCEEDING 8 BAR MAY DAMAGE THE WINCH.
THIS WILL INVALIDATE ANY WARRANTY.**

SETTING PRESSURE RELIEF TO OBTAIN CORRECT WINCH LINE PULL FOR MANUAL AND ELECTRIC / MANUAL LEVER CONTROL VALVES

Two options:

1. Secure the wire rope to a load via a measuring device (load cell) with rope running on bare drum and operate the winch until the rated pull of the winch is achieved by adjusting the relief valve.

ALWAYS KEEP A MINIMUM OF 5 WRAPS OF ROPE ON THE DRUM.

Adjustment is achieved on the manual valve by means of removing the chrome cap opposite 'P' port and winding screw in to increase load and out to decrease load. On the electric/manual valve, remove rubber plug next to the 'P' port and adjust in same way as described for manual valve with an allen key.

2. Install a pressure gauge into the 'P' port between pump and control valve. Block both motor ports using hydraulic caps. Operate system and adjust relief valve, as described in 1) to correct pressure setting for winch (see winch specification page 7). All control valves incorporated in the winch hydraulic system must be of an 'open centre' (motor spool) type.

CARE OF THE WIRE ROPE

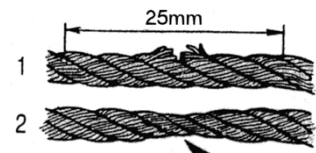
ISO 4309:2004/2010 – WIRE ROPES DIRECTIVE

ISO 4309:2004 / 2010 details guidelines for the care, installation, maintenance and examination of wire rope in service on winches, hoists and cranes, and enumerates the discard criteria to be applied to promote the safe use of the machinery. It is important that these guidelines for safe care, installation and ultimately disposal of wire ropes is strictly adhered to according to this directive.

It is most important that the wire rope is inspected on a regular basis, for kinks, flat spots, broken strands and other damage, and if necessary the damaged sections should be cut away and the rope re-attached or completely replaced.

Check both the rope and the hook and replace under any of the following circumstances:

- 10 strands of rope or more broken within a space of 25mm or more (Fig. 1).
- Rope shows visible signs of wasting (Fig. 2).
- Deformed or excessively corroded rope.
- Twisted rope.
- Bent rope.
- Faulty or damaged hook or safety catch.
- The wire rope is 10% less than original diameter as specified, due to stretch during use.



Wire ropes and safety hooks must be replaced if damaged or worn.

A good habit is to rewind the rope on to the winch drum after it has been used, so that it is evenly layered.

To do this rewind, keeping the wire rope under tension. Normally the tension can be applied by hand.

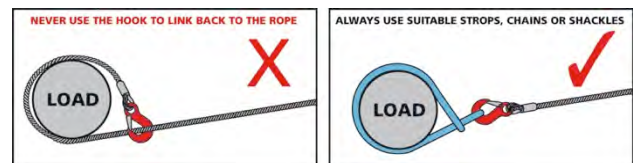
Under no circumstances wrap the wire rope around the load being recovered and then attach the hook back on to the rope. This will result in serious rope damage or breakage.

Always employ a chain or webbing strap from the hook to the load.

WIRE ROPES ARE NOT COVERED BY WARRANTY.

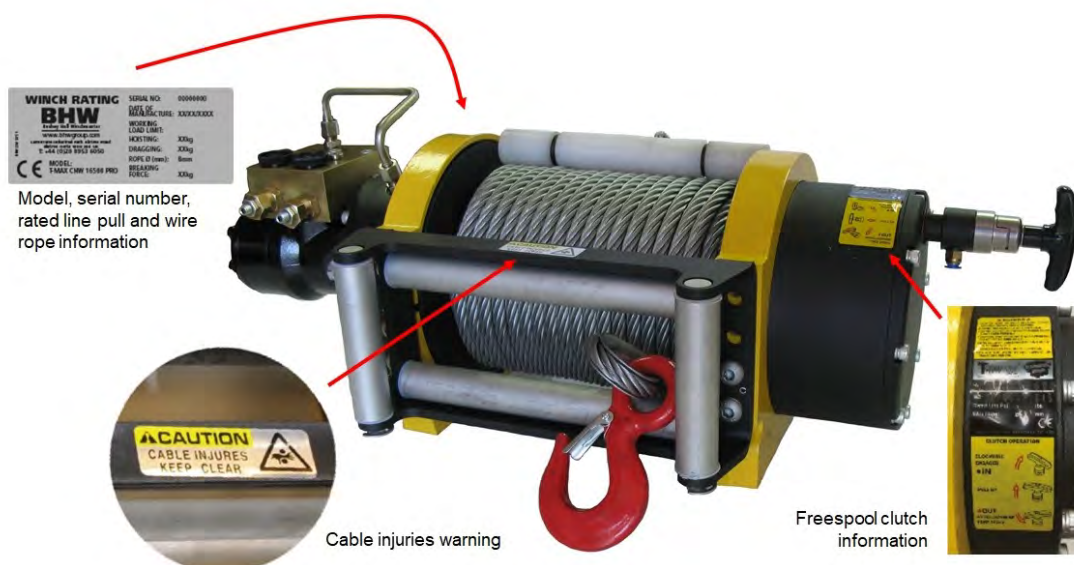
Under no circumstances wrap the wire rope around the load being recovered and then attach the hook back on to the rope. This will result in serious rope damage or breakage.

Always employ a chain or webbing strap from the hook to the load.



If the winch is not being used on a regular basis it should be powered in and out from time to time to minimise corrosion of the internal motor components that may occur due to condensation. Energising the motor will generate heat, which will help dissipate any moisture.

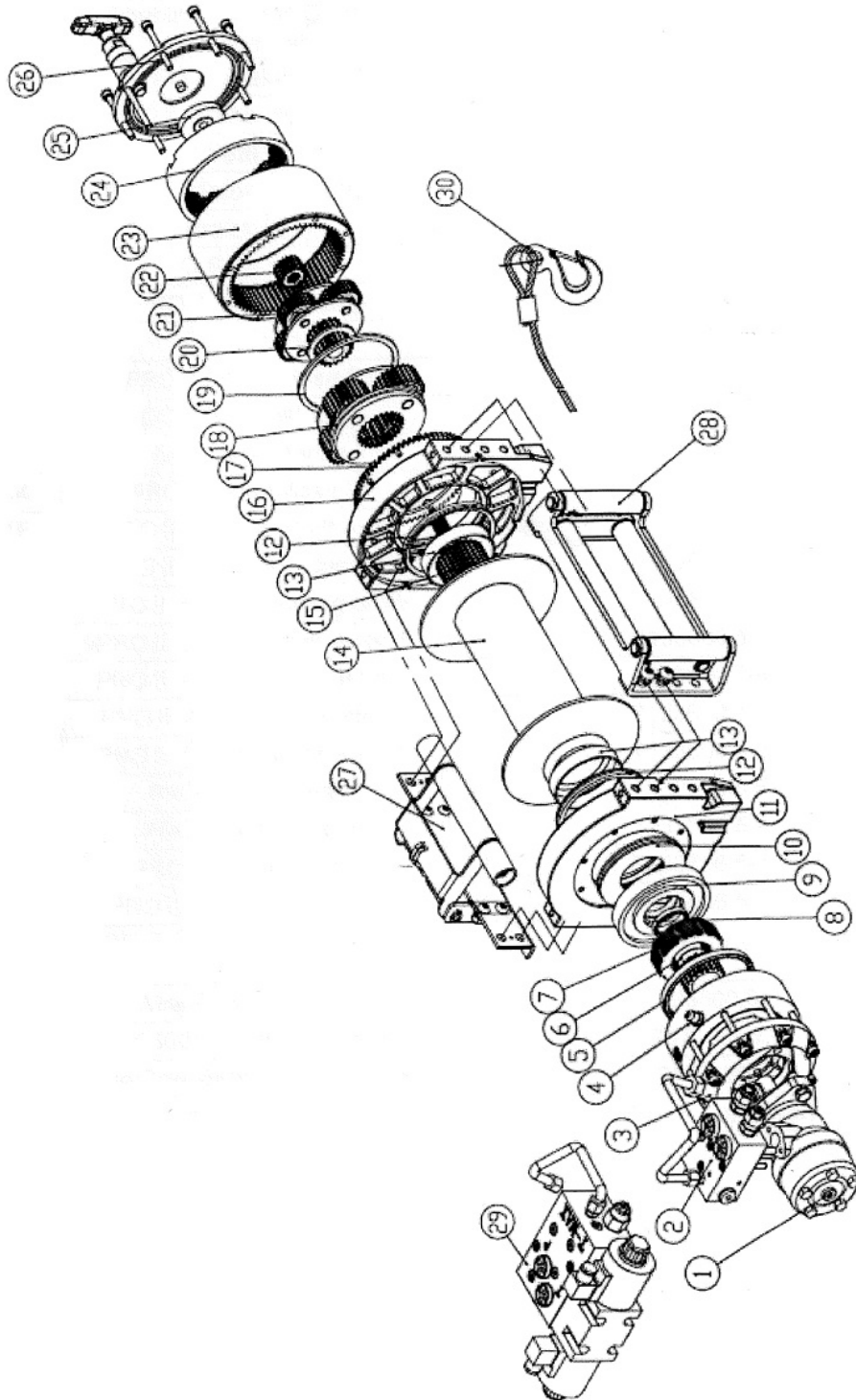
LABELS



TROUBLE SHOOTING

CONDITION	POSSIBLE CAUSES	CORRECTIONS
Drum will not rotate at no load.	Winch not mounted squarely causing end bearings to bind up drum. Brake damaged. Gears damaged. Clutch not engaged.	Check mounting. Refer to winch mounting page 11. Inspect and replace brake. Inspect and replace damaged gears. Engage clutch.
Drum will not rotate under load.	Load greater than rated capacity of winch. Low hydraulic system pressure. Winch not mounted squarely causing end bearing to bind up drum.	Refer to specifications page 6 for line pull rating. Check pressure. Refer to hydraulic systems performance charts page 9. Check mounting. Refer to winch mounting page 11.
Winch runs too slow.	Low hydraulic system flow rate. Motor worn out.	Check flow rate. Refer to hydraulic systems flow charts page 9. Replace motor.
Drum will not freespool.	Clutch not disengaged. Winch not mounted squarely causing end bearings to bind drum. Side-mount bolts too long causing binding of ring gear.	Check operation. Check adjustment. Check mounting. Refer to winch mounting page 11. Check bolt length. Bolt thread must not engage threaded holes in sides of end bearing by more than the 50inch thread depth in the end bearing.
Load drifts.	Excessive back pressure. 6.9 bar (100psi) max.	Check for restrictions in hydraulic system. See Hydraulic System – pages 9-10.
Brake will not hold.	Incorrect directional control valve (cylinder spool closed centre).	Use only a motor spool (open centre) control valve.
Excessive noise.	Hydraulic system flow too high. Drum in bind winch not mounted squarely.	Check flow rate See page 9. Check mounting – see page 11.
Drum chatters in 'Winch In' position.	Low hydraulic system flow rate. Low hydraulic system relief pressure setting.	Check flow rate – see page 9. Check relief valve setting.

PARTS DIAGRAM



PARTS LIST

Item no	Part number	Description	QTY
1	22468	Hydraulic Motor BMR 200	1
2	22469	Double Direction Counter Balance Valve	1
3	19130	PRO II Brake Gland	1
4	20144	PRO II Brake Housing 03	1
5	20145	Y-Type Seal Ring	1
6	20146	PRO II Motor Coupling	1
7	20147	Brake Assembly	1
8	20148	Lip -Type Seal Ring	1
9	20149	PRO II Brake Clamp	1
10	20150	Disk Spring	2
11	20151	PRO II Motor Base 03	1
12	19679	Anti-Dust Nylon Ring	2
13	19678	Anti-Dust Nylon Bearing	2
14	20152	PRO II Drum Assembly 03	1
15	20153	PRO II Transmission Shaft	1
16	20154	PRO II Gear Box Base 03	1
17	20155	PRO II Combined Tooth Plate	1
18	20156	PRO II Gear Carrier Assembly Input	1
19	20157	PRO II Antifriction Washer II	1
20	20158	PRO II Antifriction Washer I	1
21	20159	PRO II Inner Gear	1
22	20160	PRO II Sun Gear - Input	1
23	20161	PRO II Gear Box	1
24	22470	PRO II Inner Gear 06	1
25	22471	PRO II Thrust Washer 06	1
26	20163	PRO II Gear Box Cover Assembly 06	1
27	20162	Wire Rope Tensioner	1
28	20163	DC5000L Roller Guide	1
29	22474	Overflow Balance Valve Assembly	1
30	3469	Wire Rope 12mm x 30m with safety hook	1

MAINTENANCE

REGULAR MONTHLY MAINTENANCE

Externally: The winch should be kept clean in order to prevent any build up of corrosion on external working parts. Inspect roller guides for grooving and if excessive, wire rope life will be reduced. Worn guides should be replaced to ensure wire rope is not damaged.

- Check winch for external damage.
- Check winch mounting for distortion and re-tighten mounting bolts if necessary.
- Operate free spool clutch mechanism to ensure correct operation, giving full engagement and disengagement.
- All external-moving parts should be lubricated with lightweight oil.
- All electrical connections and wiring should be inspected for loose connections, corrosion or fraying.
- Check the tie bars that hold the winch in alignment replace if bent or broken.
- Check the emergency STOP control to ensure it functions correctly by operating the winch and pushing the STOP button.

NOTE: Brake plates should be REPLACED after 800 hours of machine use.

WARRANTY

BHW, as an authorised T-MAX distributor in the UK and Ireland, warrants each new T-MAX CHW16500 Mk2 winch and ancillary equipment supplied against factory defects in material and workmanship for one year from date of purchase. Responsibility for removing the winch or ancillary equipment is the owner's - together with its return, transportation prepaid to BHW.

BHW will, under this warranty, without charge repair or replace at its option, parts, which on inspection are deemed to be defective. The loss of use of the product, loss of time, inconvenience, commercial loss or consequential damages are not covered.

Warranty does not apply where the product has been tampered with or altered in any way, or where the serial number or date stamp has been defaced, altered or removed, or if in the view of BHW the damage or failure occurred from misuse, negligence or accident.

THIS WARRANTY EXCLUDES THE WIRE ROPE

BHW reserve the right to change the design of any product without assuming any obligation to modify any product previously supplied. Fitted vehicles or equipment returned under warranty should be sent to BHW service department at the address indicated below, with full name and address of sender, and a statement detailing the defect.

Winch performance figures may vary from those shown as they are dependent on system back pressure, mechanical efficiency of winch motor and length and diameter of hydraulic hoses used for installation.



Lismirrane Industrial Park,
Elstree Road,
Elstree, Herts, WD6 3EE UK

Telephone: +44 (0)20 8953 6050
Email: sales@bhwgroup.com
Website: www.bhwgroup.com

T-MAX CHW16500 Mk2 HEAVY DUTY HYDRAULIC WINCH

SERIAL NUMBER.....

DATE OF PURCHASE.....