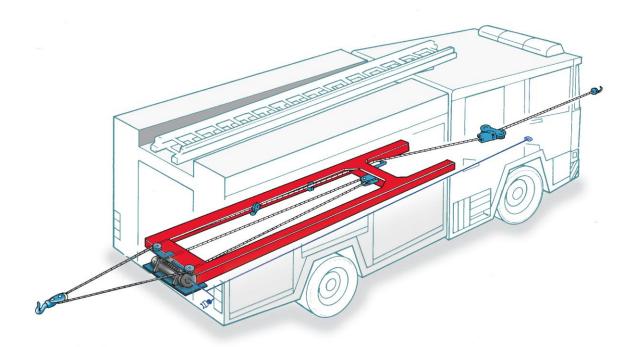


OPERATING INSTRUCTIONS



RESCUE•MASTER

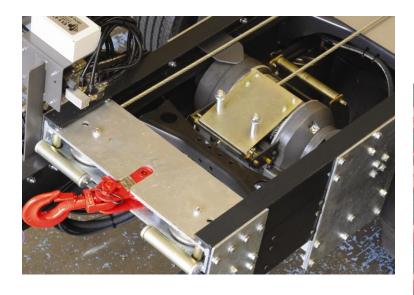
Fire & Rescue Winch System

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



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INTRODUCTION

Thank you for purchasing a RESCUE•MASTER winch system from the BHW Group.

RESCUE•MASTER is a unique, established winch system especially developed by the BHW Group, and is used by several Fire and Rescue divisions nationwide.

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION OF THE SYSTEM.

As the new owner / operator of a vehicle fitted with a RESCUE•MASTER system, it is important that you read and digest the information contained in this handbook. Further help and advice can be obtained from the BHW Group's trained sales engineers.

The RESCUE•MASTER winch system is a high quality recovery winch vehicle installation 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.

PLEASE KEEP THIS MANUAL WITH THE VEHICLE.

WARNING:

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

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

Please note:

• THE OWNING ORGANISATION SHALL ENSURE THAT OPERATING PERSONNEL ARE GIVEN THE NECESSARY TRAINING.

All users of the equipment shall be fully trained in the safe use of winches and the RESCUE•MASTER system. Training shall be conducted by BHW Group or by a competent winch trainer qualified for this system.

- THE OPERATOR MUST ALWAYS WORK IN COMPLIANCE WITH THE OPERATING INSTRUCTIONS.
- WEAR GLOVES AND SUITABLE PROTECTIVE / HI-VIS CLOTHING.
- USE A WEBBING STRAP ATTACHED TO THE SAFETY HOOK(S) FOR MANUAL GUIDANCE OF THE WIRE ROPE.
- KEEP FINGERS AND CLOTHING CLEAR OF THE HOOK AND WIRE ROPE AT ALL TIMES.
- 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 task, the operator must 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 WINCH DRUM MUST BE MAINTAINED TO HOLD THE LOAD. THE WIRE ROPE RETAINER ON THE DRUM IS NOT INTENDED TO HOLD THE LOAD.
- AVOID CONDITIONS WHERE LOAD SHIFTS OR SNATCHES OCCUR.
- EXCESSIVE "INCHING" MUST BE AVOIDED.
- DO NOT USE WINCH TO LIFT, SUPPORT, OR OTHERWISE TRANSPORT PERSONNEL. Any such use will invalidate the warranty.

The BHW Group Limited will not be responsible for any claims arising from such use.



NEW EUROPEAN STANDARDS & BHW GROUP LIMITED

The new 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 organisation operating the product.

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

Our aim at BHW Group Limited is to ensure the correct system specification is supplied to suit the vehicle and its application.

The RESCUE•MASTER system is to be used for the purpose of fire and rescue recovery and is specifically designed for this purpose.

Winches for fire and rescue 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. The RESCUE•MASTER system has been calibrated and is issued with a declaration of conformity.

Maximum wire rope length on drum must leave 1.5 x 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.



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.

Familiarise yourself with Emergency Stop positions located on the vehicle.

The freespool 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.

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. Fit a webbing strap attached to the safety hook or the snatch block hook. Use the webbing strap to handle the wire rope.

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 after being 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, damage the winch or the system.

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.



OPERATING INSTRUCTIONS

The following are operating instructions intended only for Rescue•Master. They do not cover winching techniques and general winching safety procedures. (See previous page on safe winching). The equipment should only be operated by personnel trained in winching procedures.

GENERAL

The Rescue•Master winching system is hydraulically driven with power provided from a power take off (PTO) and pump unit, driven from the vehicle gearbox. The system allows for winching from either the front or rear of the vehicle.

Winching from the front of the vehicle is on a single winch line, the line pull therefore is in direct proportion to the capacity of the winch fitted.

Winching from the rear of the vehicle is on a **double** line utilising a built in snatch block. The rear winching position therefore provides twice the winch line pull to that of the front position. The rear winching facility will therefore move the load at half the speed of the front position.

The hydraulic system is fitted with a pressure relief valve to limit the winching power. Should the winch stop due to this relief valve operating, it means that maximum line pull has been achieved.

DO NOT INCREASE ENGINE SPEED IN AN ATTEMPT TO PROVIDE MORE POWER.

CONTROLS

There are three controls to operate the system, these are:

- 1) Power take off (PTO) engagement / disengagement control is located in the vehicle cab accessible from the driver's position. This control connects the power from the vehicle gearbox to the power take off (PTO) which in turn drives the hydraulic pump.
- 2) Winch 'In'/'Out' control will cause the winch drum to rotate to either wind rope onto the winch drum, winch 'In', or pay rope off the winch drum, winch 'Out'.

This control is provided in two ways:

The first by lever operation located on the hydraulic control valve at the rear of the vehicle. This simple lever control is sprung loaded to winch stop position. The control is progressive, i.e. a small movement of the lever will operate the winch drum slowly and hence the rope will move slowly.

Full movement of the lever will operate the winch drum at maximum speed and hence the rope at maximum speed.

The second means of control is by the wanderlead. This consists of a small hand held control with a winch 'In' control button and a winch 'Out' control button.

Operation of this control will always provide maximum winching speed, as the control is not progressive but 'On' or 'Off.



3) Free spool winch drum disengagement / engagement control is normally situated adjacent to the manual operating lever for winch control. This freespool control will disengage the drive from the winch to provide a free running (freespool) drum. NEVER DISENGAGE THE FREESPOOL WITH A LOAD ON THE WIRE ROPE.

EMERGENCY STOP

In the unlikely even of a system malfunction the winch may be isolated by operating the power take off (PTO) control to disengagement.

There will be an Emergency Stop fitted to the vehicle both at the front and rear winch positions.

IT IS ESSENTIAL WHEN DEPLOYING OR STOWING THE ROPE THAT POSITIVE TENSION IS APPLIED TO THE ROPE.

WHEN WINCHING OUT, IF FOR ANY REASON THE LOAD STOPS – IMMEDIATELY STOP WINCHING AND INVESTIGATE. DO NOT WINCH 'OUT' WITH NO LOAD OR TENSION ON THE WIRE ROPE.



WINCHING FROM THE FRONT OF THE VEHICLE

Position the front of the vehicle in line with the direction of pull and in a way that the departure angle of the wire rope is no greater than 30° in either direction from the line of pull.

Ensure the vehicle is at rest, the hand brake fully applied, gearbox in neutral, engine at idle speed and the vehicle air tanks are fully charged.

ENSURE NO OTHER PERSONNEL ARE ATTEMPTING TO OPERATE WINCH CONTROLS.

Depress vehicle clutch pedal, wait 3 seconds, operate power take off (PTO) control to engage. Wait 3 seconds, lift vehicle clutch pedal. (On vehicle fitted with automatic transmission it will only be necessary to operate the engage control).

When winching from the front. the wanderlead control or the lever control may be used.

If using the wanderlead control, plug it into the front socket position.

Handle the front safety hook using a webbing strap. Do not attempt to handle the safety hook itself.



POWERING 'OUT' THE WINCH FROM THE FRONT OF THE VEHICLE

ENSURE THAT EMERGENCY STOP IS IN 'STOP' POSITION BEFORE ATTACHING WEBBING STRAP TO HANDLE THE SAFETY HOOK

Grasping the webbing strap only, the wire rope may now be powered out in one of two ways:

POWER OUT

With the operator maintaining tension on the webbing strap attached to the front safety hook, operate winch 'Out' control button.

OR

FREESPOOL OUT

Disengage the freespool control on the winch. Operate the freespool disengagement control. This is an operating lever control fitted adjacent to the manual 'winch in' and 'winch out operating lever control.

The rope may now be pulled out from the front roller fairlead position by utilising the webbing strap attached to the front safety hook.

NEVER OPERATE THE WINCH DRUM DISENGAGEMENT CONTROL WITH A LOAD ON THE WINCH ROPE. THE LOAD MAY RUN AWAY UNCONTROLLABLY



WINCHING 'IN' FROM THE FRONT OF THE VEHICLE

Connect hook to load. Ensure safety catch on the hook is fully closed.

The load may now be winched 'In' using the wanderlead control.

If freespool was deployed, re-engage the freespool control to enable power 'In' using the wanderlead control.

On completion of the winching operation, fully power 'In' maintaining tension to the wire rope at all times. When applying tension manually, use the webbing strap attached to the hook.

When hook is approximately 2 metres from the front of the vehicle ensure that the wanderlead control is in possession of the person applying tension to the rope.

When rope hook assembly and the large steel disc are about to contact the roller fairlead, stop winching. Operate winch in by a series of momentary 'blips' on the control and stop as soon as the rope hook assembly and disc contact the roller fairlead.

Operate emergency stop. Remove wanderlead control.

Disengage power take off (PTO) control.

Stow wanderlead for future use.

control).

WINCHING FROM THE REAR OF THE VEHICLE

Position the rear of the vehicle reasonably in line with the intended direction of pull. In practice, this must be within 5° either way. This is necessary to ensure the wire rope does not come in contact with the vehicle bodywork and may vary slightly as a result of varying body configurations.

Ensure the vehicle is at rest, the handbrake fully applied, gearbox in neutral, engine at idle speed and the vehicle air tanks are fully charged.

ENSURE NO OTHER PERSONNEL ARE ATTEMPTING TO OPERATE WINCH CONTROLS

Depress vehicle clutch pedal, hold it down and wait 3 seconds, operate power take off (PTO) control to engage. Wait 3 seconds, lift vehicle clutch pedal. (On vehicles fitted with automatic transmission, it will only be necessary to operate the PTO engage

Ensure that the front hook assembly is fully engaged into the FRONT roller fair lead (shown opposite).

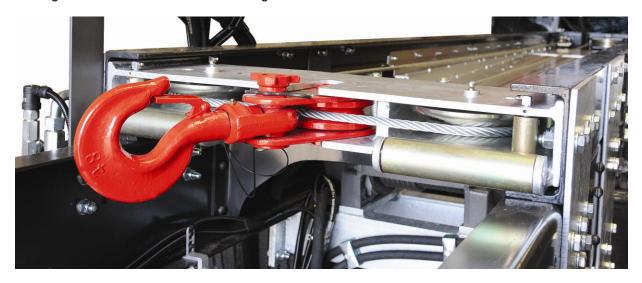
When winching from the rear the wanderlead control or the manual lever control may be used.

If using the wanderlead control, plug it into the rear socket position.



WINCHING FROM THE REAR OF THE VEHICLE continued

To deploy the winch rope, (which is double line at this rear position), remove the security pin holding the rear snatch block in its housing.



IMPORTANT: ENSURE THAT EMERGENCY STOP IS IN 'STOP' POSITION BEFORE REMOVING SECURITY PIN FROM SNATCH BLOCK HOOK

If operating from the front of the vehicle, the wanderlead should be plugged into the socket on the front of the vehicle.

Ensure safety catch on the hook being used is fully closed.

POWERING 'OUT' THE WINCH FROM THE REAR OF THE VEHICLE

The wire rope may now be powered out in one of two ways:

WANDERLEAD WINCH 'OUT'

With the operator maintaining tension on the webbing strap attached to the snatch block hook, operate winch 'Out' control button on the wanderlead to power out the wire rope.

OR

FREESPOOL OUT

Disengage the freespool control on the winch. Operate the freespool disengagement control. This is an operating lever control fitted adjacent to the manual 'winch in' and 'winch out operating lever control.

The rope may now be pulled out from the rear roller fairlead position by pulling on the webbing strap attached to the snatch block hook.

NEVER OPERATE THE FREESPOOL DISENGAGEMENT CONTROL WITH A LOAD ON THE WIRE ROPE. THE LOAD MAY RUN AWAY UNCONTROLLABLY.



WINCHING 'IN' FROM THE REAR OF THE VEHICLE

Connect hook to load. Ensure safety catch on the hook is fully closed.

The load may now be powered 'In' using the wanderlead control.

If freespool was deployed, re-engage the freespool control to enable power 'In' using the wanderlead control.

Before operating the winch 'In' control. Make sure that the wire rope and hook at the front of the vehicle is correctly housed in the front fairlead position.

The wire rope will now power in using the winch 'ln' control on the wanderlead. Remember that tension must always be applied, whether by the load, or manually, for winching in.

On completion of any winching task, once the load has been disconnected, the wire rope can be safely winched 'In' to its stowage position, keeping tension on the wire rope at all times.

When snatch block is approximately 2 metres from the rear of the vehicle, ensure that the wanderlead control is in possession of the person applying tension to the rope.

When snatch block is approximately 300mm from rear of vehicle, stop the winch and apply emergency stop. Fit snatch block into rear fairlead. There will be a small amount of slack rope, ensure this is not entangled with bodywork, fittings etc. Fit snatch block security pin.

Shut enclosure (e.g. roller shutter) over winch roller fairlead assembly. Remove wanderlead control from rear socket. Release emergency stop control.

Go to front winch position. Plug in wanderlead control into front socket provided. Fit a suitable webbing strap to the front hook and pull through remaining slack on wire rope. Operate winch 'In' whilst maintaining tension via the webbing strap. The operator must also be in possession of wanderlead control.

When the front rope / hook assembly and the large steel disc are about to contact the roller fairlead, stop winching. Operate winch in by a series of momentary 'blips' on the control and stop as soon as the rope hook assembly and disc contact the roller fairlead.

Operate emergency stop. Remove wanderlead control. Disengage power take off (PTO) control. Stow wanderlead for future use.





WIRE ROPE REPLACEMENT

NOTE: 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.

WEAR GOOD QUALITY RIGGERS GLOVES WHEN HANDLING THE WIRE ROPE. WHEN FITTING OR REMOVING WIRE ROPE FROM WINCH DRUM ENSURE VEHICLE IS STOPPED, SUITABLY BRAKED AND PTO IS DISENGAGED.

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 reattached 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.

Replacement wire ropes are available from BHW Group.

Please contact our sales engineers on +44 (0)20 8953 6050.

Within the body floor should be two access panels. One is above the winch at the rear and the other is above the return sheave assembly at the front of the body.

Before commencing rope replacement remove these panels, which will allow access to help feed the new rope into position.

It may require two persons to carry out the rope replacement, one to feed the rope and one to pull.

Please refer to replacement information on the following page.



WIRE ROPE REPLACEMENT Continued

REPLACEMENT WHEN ROPE IS INTACT AND STILL REEVED TO FRONT FAIRLEAD

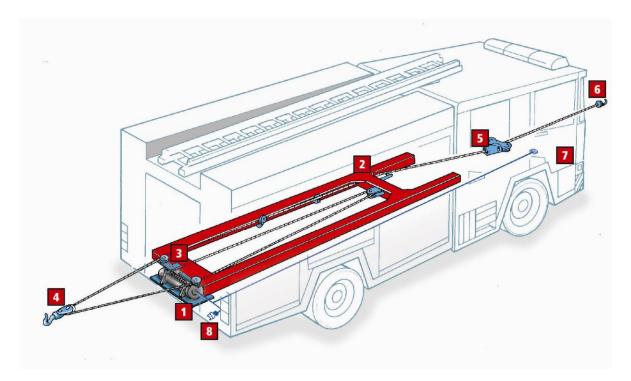
- Cut off end fitting at front position from old rope to be replaced.
 To do this, tightly wrap area to be cut with tape and cut through the tape to prevent rope from unravelling.
- Remove load bearing disc from old rope.
- Thread load bearing disc onto new rope. Ensure that chamfer around the centre hole is towards the fork fitting on the end of the rope.
- "Tie and tape" plain end of new rope to cut end of old rope.
- Operate free spool on winch and pull old rope off of winch drum from rear position until rope is only held onto drum by its anchorage. Be careful at this stage not to pull rope in from the front position.
- From rear position carefully pull old rope so that the attached new rope is pulled from the front position to the rear.
- Release old rope from its drum anchorage, note which direction the rope entered the anchorage.
- Pull the old rope through from the winch position which will also pull through the new rope.
- · When the new rope end is at the winch position, detach old rope and discard.
- Fit new rope end to winch drum anchorage.
- With firm tension applied to new winch rope winch in rope. Check that new rope reeves correctly onto drum.

REPLACEMENT WHEN ROPE HAS BROKEN AT REAR

- Cut fork end fitting at front position from old rope to be replaced. Tightly wrap area to be cut with tape and cut through the tape to prevent rope from unravelling.
- · Remove load bearing disc from old rope.
- Thread load bearing disc onto new rope. Ensure that chamfer around the centre hole is towards the fork fitting on the end of the rope.
- "Tie and tape" plain end of new rope to cut end of old rope.
- From rear position carefully pull old rope so that the attached new rope is pulled from the front position to the rear.
- "Tie and tape" plain end of new rope to broken end of old rope remaining on the winch.
- Operate free spool on winch and pull old rope off of winch drum from rear position until rope is only held onto drum by its anchorage.
- Release old rope from its drum anchorage, note which way the rope entered the anchorage.
- Pull the old rope through from the winch position which will also pull through the new rope.
- When the new rope end is at the winch position, detach old rope and discard.
- · Fit new rope end to winch drum anchorage.
- With tension applied to new winch rope, winch in the rope. Check that new rope reeves correctly
 onto drum.



MAINTENANCE



- HYDRAULIC WINCH
 For detailed instruction on service and maintenance requirements of the particular winch supplied, please refer to the Winch Operations Manual supplied.
- RETURN SHEAVE BLOCK (FRONT)
 Lubricate the sheave block by the grease points provided. Check that it runs freely.
- REAR SHEAVE ASSEMBLY
 Lubricate this arrangement by grease points provided. Check that both rollers run freely and easily.
- 4 HEAVY REAR RECOVERY SNATCH BLOCK WITH HOOK
 Lubricate snatch block at grease points. Check the sheave runs freely. Check that the latch arrangement on the safety hook is in good condition.
- FRONT SHEAVE ASSEMBLY
 Grease at grease points provided. Check that all rollers run smoothly and freelv.
- WIRE ROPE & FRONT HOOK ASSEMBLY
 Carry out a visual inspection of the rope in line with BS6570. Replace if damaged or faulty.
- 7/8 WANDERLEAD SOCKETS
 Check wanderlead control sockets in front and rear to ensure all connections are tight and clean.

ROLLER GUIDES

Check all rollers through the intermediate sheave assemblies and lubricate by grease points provided.

WINCH TENSION PLATE

Check that winch tension plate is correctly adjusted. Adjust spring pressure if required.

HYDRAULIC OIL Check oil level in hydraulic tank and top up if necessary.



WARRANTY

BHW GROUP LIMITED warrants each new RESCUE•MASTER system and ancillary equipment supplied against factory defects in material and workmanship for one year from date of purchase.

Responsibility for returning the fitted vehicle (or ancillary equipment is the owner's together with its return, transportation prepaid) to BHW Group Limited.

BHW Group Ltd 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 Group Limited the damage or failure occurred from misuse, negligence or accident.

THIS WARRANTY EXCLUDES THE WIRE ROPE

BHW Group Limited 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 Group Limited 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 according to the specific vehicle installation as they are dependent on system back pressure, mechanical efficiency of winch motor and length and diameter of hydraulic hoses used.



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RESCUE•MASTER SYSTEM
SERIAL NUMBER
DATE OF PURCHASE