



# BHW

Bushey Hall Winchmaster

[www.bhwgroup.com](http://www.bhwgroup.com)



## FITTING & OPERATING INSTRUCTIONS



## RAMSEY HYDRAULIC WINCH MODEL RPH-42.2

**4,300kg Line Pull Capacity**

Part No.9945

**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 RAMSEY HYDRAULIC WINCH from the BHW Group. Ramsey winches are recognised as being the finest in their class and widely used for commercial purposes throughout the world.

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

As the new owner / operator of a Ramsey 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 Group's 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.

### **PLEASE KEEP THIS OWNERS MANUAL WITH THE WINCH.**

### **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 Group 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 shall invalidate the warranty.  
Neither Ramsey nor BHW Group Limited 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.

## 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 company operating the product.

BHW Group Limited 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 Group Limited 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 Group Limited.

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 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.

## INSTALLER RESPONSIBILITY FOR CE COMPLIANCE



**1. VERY IMPORTANT** Use only a motor spool (open centre) control valve as per Hydraulic System Specifications (Page 10). **The use of a closed centre valve may result in damage to the winch.**

**2.** If the winch is operated using a wanderlead or/and a radio control - refer to Hydraulic System Specifications (Page 10).

**3.** Adjust system relief pressure as per Hydraulic System Specifications (Page 10).

**4.** Mount winch as per winch installation instructions (Page 13).

**5.** Install 11mm, 1960N/mm<sup>2</sup> grade, 6 x 36 wire core rope, with minimum breaking strain of 84.4kN (8600kgf). Maximum rope length of 24m for Short Drum and 36m for Long Drum – both x 4 layers maximum.

**6.** Attach rope to the drum as per wire rope installation instructions (Page 13).

**7.** Hook must have a safety latch and a minimum rated capacity of 2.5 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 2.5 tonne hook has therefore a minimum yield of 2.5 x 4 = 10 tonne.

For pulling applications with a 2:1 factor of safety they are suitable for up to 5.0 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.

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, the 'stop button requires to be in the out position for the winch to operate. Note that 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

The winch 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 out the 'T' bar handle on the side of the winch and rotating it 90°. Wire rope can now be spooled off the drum. Attach a stop to the winch rope hook to handle the rope. Do not grip the hook directly with hands. Always wear protective riggers type gloves when handling winch rope. To engage the clutch, pull the 'T' handle out slightly and rotate back 90°. Ensure the 'T' handle retracts fully back to the winch body. 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. If manual shift indicator light is present, the green light is lit when clutch is fully "ENGAGED". DO NOT attempt to pull a load unless the green light is lit. To hook up light to the vehicle electrical system, refer to the Electrical Schematic on page 18.

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 fairleads at all times. Attach a stop to the winch rope hook to handle the rope. Do not grip the hook directly with hands. 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 to winch or guide rollers unless Stop control is activated.

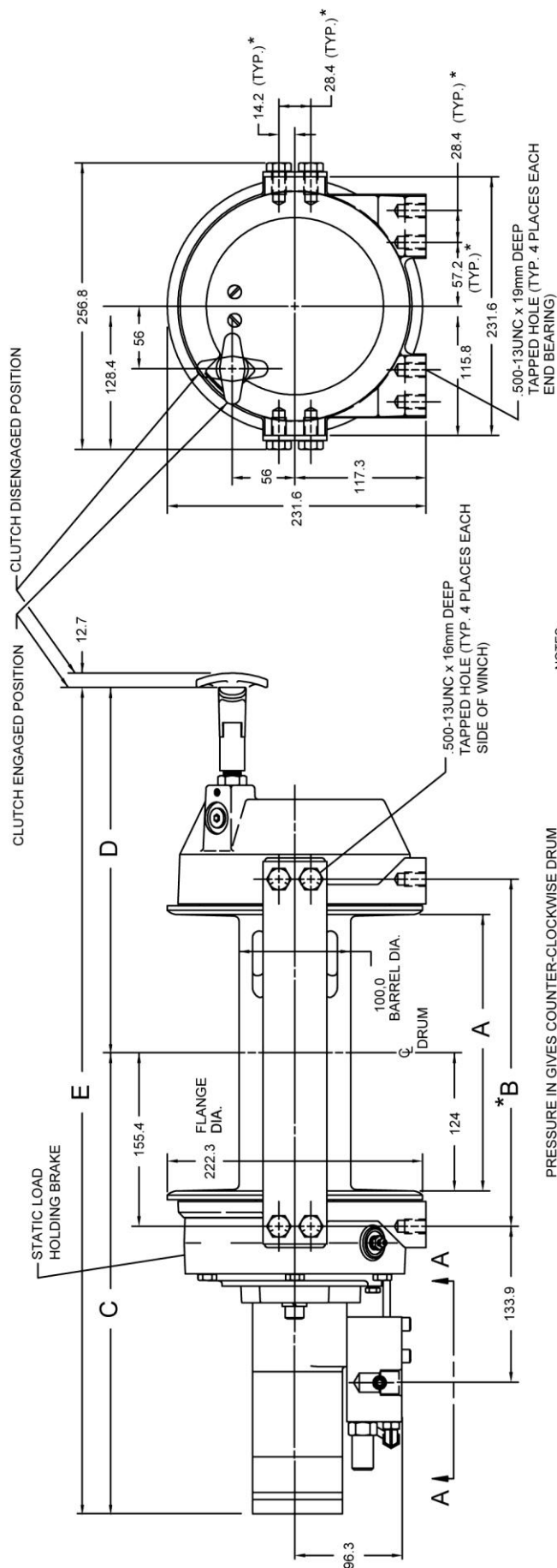
When wire rope is wound back onto the drum after use, ensure firm hand tension is applied to the rope, via a stop attached to it, to obtain even layering.

When not in use the Emergency Stop should be placed in the "STOP" position.

## WINCH SPECIFICATIONS

<b>Model</b>	<b>Ramsey RPH 42.2 – 4.3 Tonne Planetary Hydraulic Winch EN 14492-1 Compliant</b>		
<b>Construction</b>	Die cast aluminium end housing with steel drum		
<b>Gear Type</b>	Single Stage Planetary		
<b>Gear Reduction</b>	5.1:1		
<b>Type of use</b>	Intermittent commercial recovery and load pulling		
<b>Motor</b>	Low speed, high torque. 409cc/rev.		
<b>Brake</b>	Disc brake and counter balance valve providing full 100% braking		
<b>Freespool Clutch</b>	Spring loaded lever Optional air activated clutch using remote switch		
<b>Weight</b>	Winch only: 49kg With roller guides, mounting kit and wire rope: 76kg		
<b>Rated Line Pull and Line Speeds at 50 l/min. (Standard Drum)</b>	<b>Layer 1</b>	42.2kN (4300kgf)	<b>Speed:</b> 8 m/min.
	<b>Layer 2</b>	35.2kN (3590kgf)	<b>Speed:</b> 9m/min.
	<b>Layer 3</b>	30.2kN (3080kgf)	<b>Speed:</b> 10 m/min.
	<b>Layer 4</b>	26.4kN (2690kgf)	<b>Speed:</b> 12m/min.
	<i>Based on recommended 11mm wire rope and 408cc / rev. motor</i>		
<b>Recommended Wire Rope</b>	<b>Short Drum:</b> 11mm dia. (max.) x 24m, 1960N/mm <sup>2</sup> grade 6 x 36 wire core. Standard rope length supplied 20m. <b>Long Drum:</b> 11mm dia. (max.) x 36m, 1960N/mm <sup>2</sup> grade 6 x 36 wire core. Standard rope length supplied 30m.		
<b>Minimum Breaking Strain</b>	84.4kN (8,600kgf)		
<b>Rope to Mean Drum Ratio</b>	10:1		
<b>Drum Dimensions</b>	<b>Short Drum:</b> 100mm diameter x 165mm length <b>Long Drum:</b> 100mm diameter x 248mm length Both have flange diameter of 222mm. Both supplied with cable wedge pocket anchor for improved load holding.		
<b>Drum Rotation</b>	Clockwise and counter clockwise as required.		
<b>Gearbox Oil Type</b>	Transmission fluid		
<b>Hydraulic Oil Flow</b>	60 l/min maximum, 50 l/min recommended		
<b>Hydraulic Fluid</b>	Viscosity 20-43 cSt (100-200 SUS) Maximum operating temperature 85°C. Cleanliness level of ISO 17-14 or better.		
<b>Operating Pressure</b>	140 bar		
<b>Load Limiter</b>	Hydraulic system must be fitted with hydraulic relief valve to limit winch line pull.		
<b>Emergency Stop</b>	Emergency Stop must be fitted to hydraulic system with 'oil dump' to tank between pump and directional control valve. Stop control on wanderlead if supplied.		
<b>Roller Guides (optional)</b>	Extra Heavy Duty with greaseways and large diameter rollers		
<b>Noise Level</b>	75db		
<b>Ambient Temperature Range</b>	-28° to 60°C		





- NOTES:
1. WINCH MOUNTING CAP SCREWS MUST MEET OR EXCEED SAE GRADE 5 SPECIFICATION.
  2. \* THESE HOLE LOCATIONS MUST BE HELD WITHIN  $\pm 0.8$  mm OF TRUE POSITION. RECOMMENDED MOUNTING HOLE DIAMETER IS 13.5 mm.
  3. "A" ROTATION SHOWN.

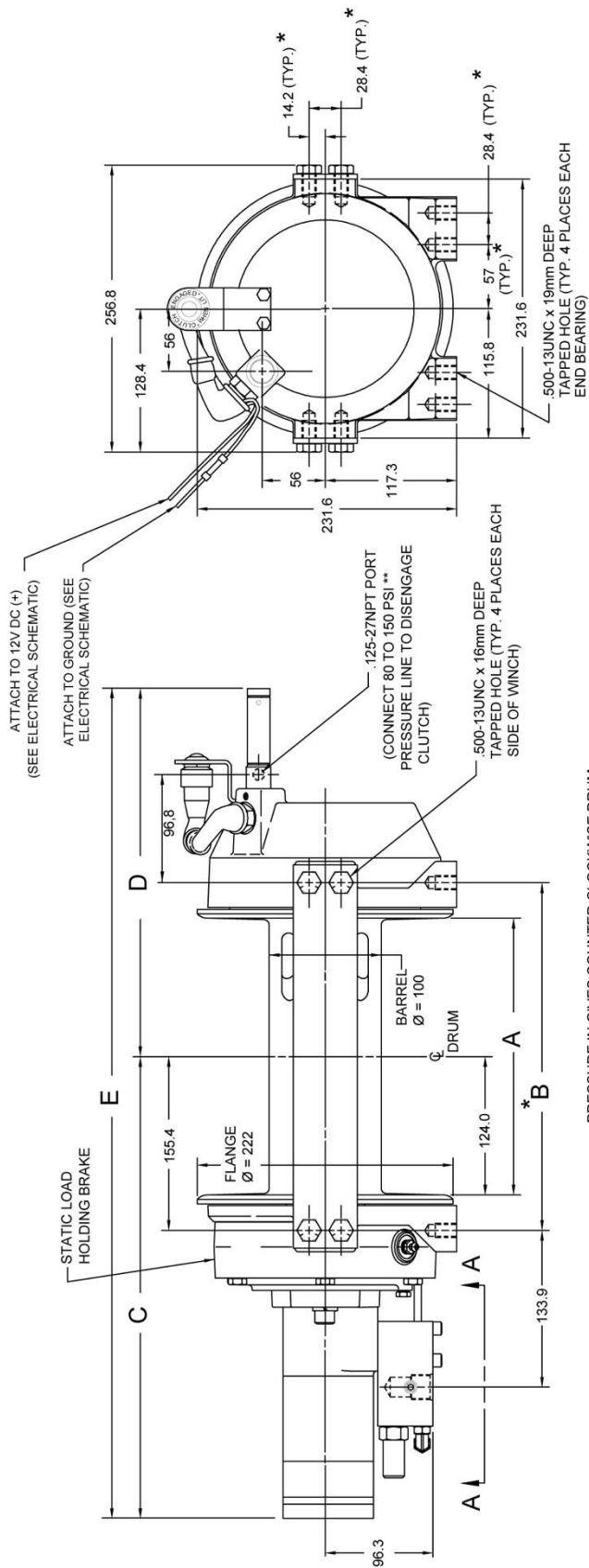
	LAYER LONG DRUM			
	1	2	3	4
Maximum Rated Line Pull by Layer	42.2 kN 4300 kgf	35.2 kN 3590 kgf	30.2 kN 3080 kgf	26.4 kN 2690 kgf
RPH 42.2 Rope Capacity Cumulative by Layer (11mm Dia. Wire Rope)	6 m	15 m	24 m	36 m
*Line Speed at 50 l/min	8 m/min	9 m/min	10 m/min	12 m/min

\* Based on recommended 11mm wire rope, 1960N/mm<sup>2</sup> grade and 408cc / rev. motor.

RP42.2 WINCH DRUM TYPE	A	B	C	D	E
SHORT DRUM	165	229	357	296	643
LONG DRUM	248	311	396	337	726

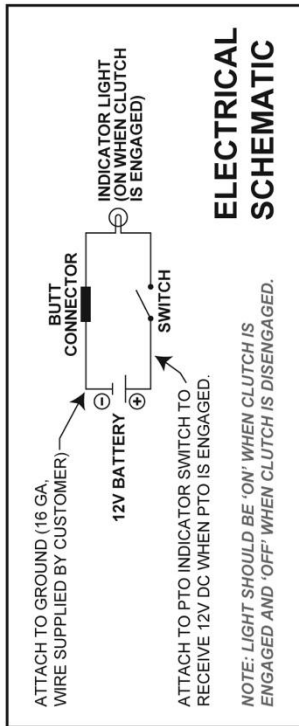
**RP42.2 MANUAL SHIFTER**





NOTES:

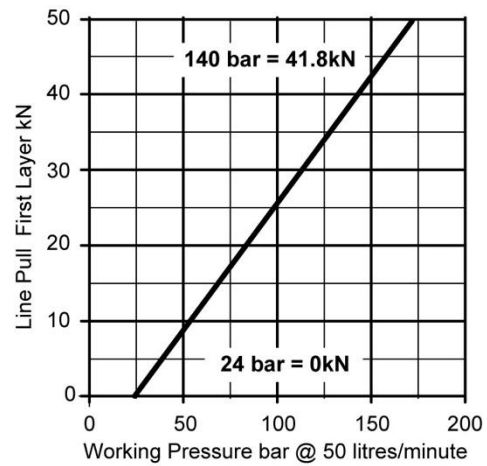
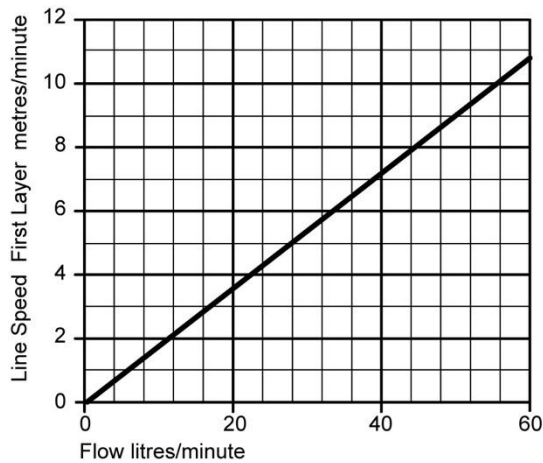
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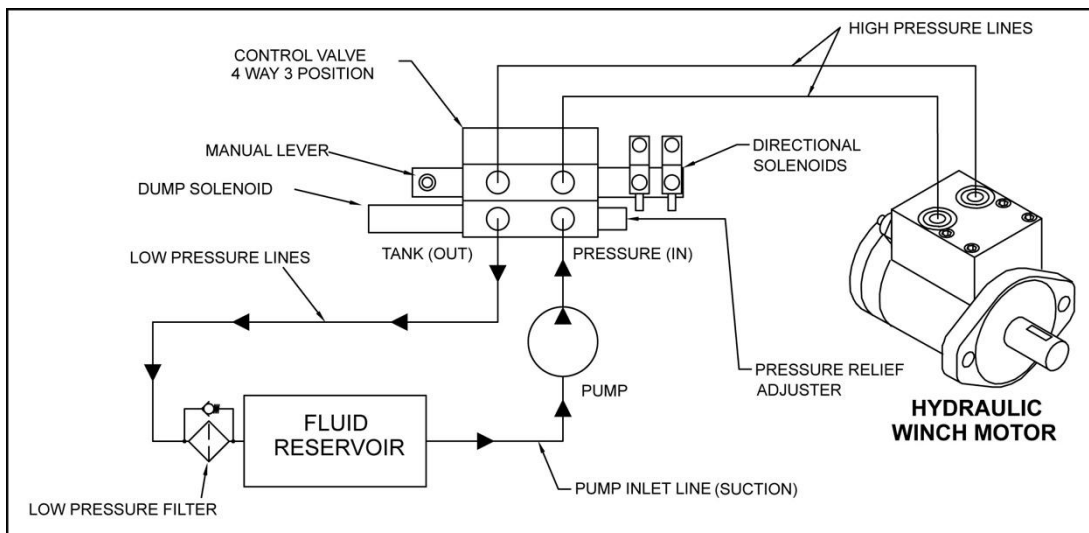
**RPH 42.2 AIR SHIFTER**

## HYDRAULIC PERFORMANCE

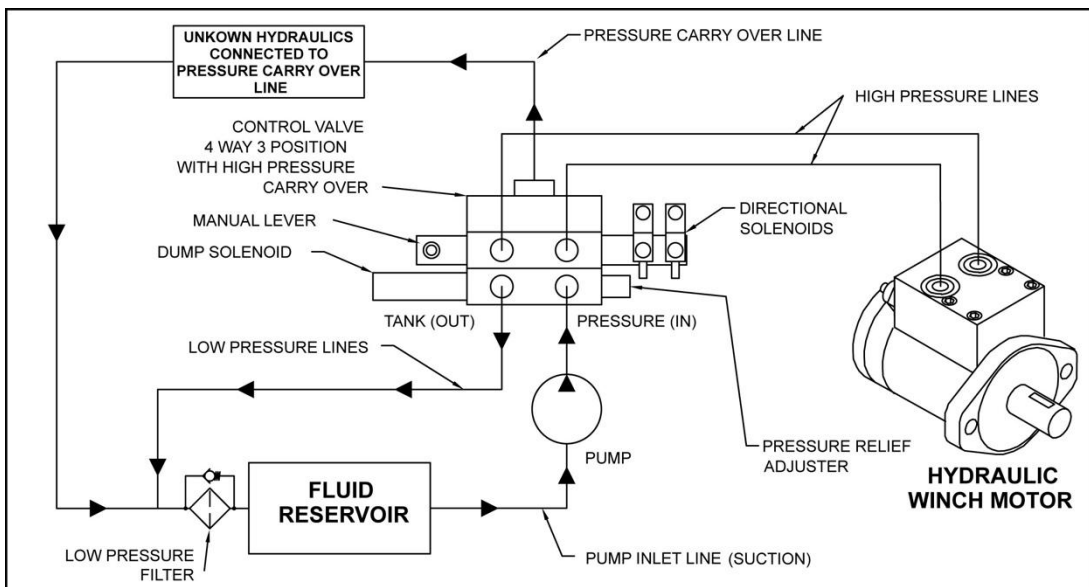


BASED ON 408cc MOTOR

## HYDRAULIC SCHEMATIC - VALVE WITHOUT PRESSURE CARRY OVER



## HYDRAULIC SCHEMATIC - VALVE WITH PRESSURE CARRY OVER



## HYDRAULIC SYSTEM SPECIFICATIONS

General	Open System with low pressure return line filter.
Reservoir	Minimum capacity 35lt. 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 ½". Return to tank ¾". Reservoir to pump 1"
Hydraulic Motor	.875-14 SAE straight thread 'O' ring port – use ½" adaptor.
Control Valve	4-way 3-position self-centring type. Open centre 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. <b>INCLUDED AS STANDARD ON BHW GROUP CONTROL VALVES.</b>
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 Group 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.

**CAUTION: IT IS RECOMMENDED TO 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.

The winch may be used with a snatch block so it is essential that provision is included for securing the rope hook adjacent to the winch. Note this provision must never be on the winch or winch frame as it would cause overloading.

## WINCH RATING

The Ramsey winch rating on this model 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 5 tonne, and is being pulled up skids, which form a gradient of 18°, the force on the rope is:

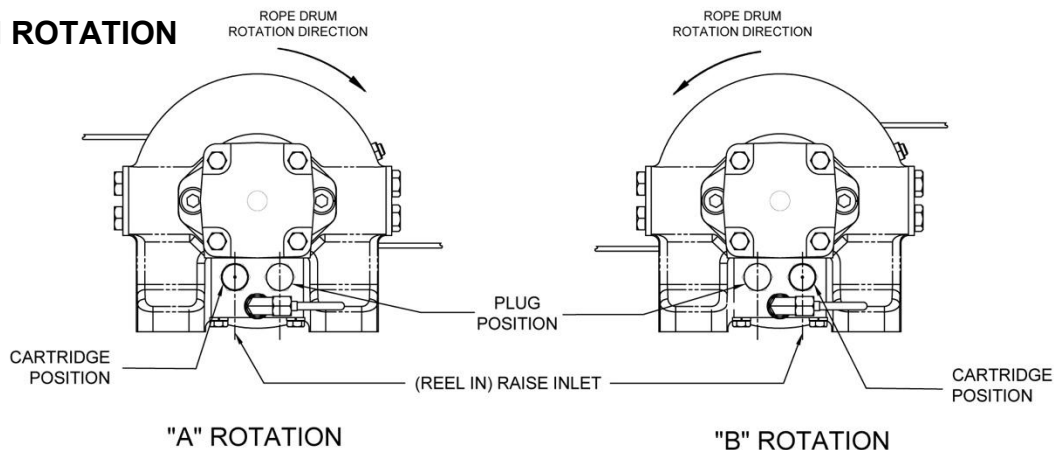
$$\frac{5}{25} + \frac{(5 \times 18)}{60} = 0.20 + 1.5 = 1.7 \text{ tonne.}$$

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 us and we will be pleased to offer our assistance.

## DRUM ROTATION



## 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.

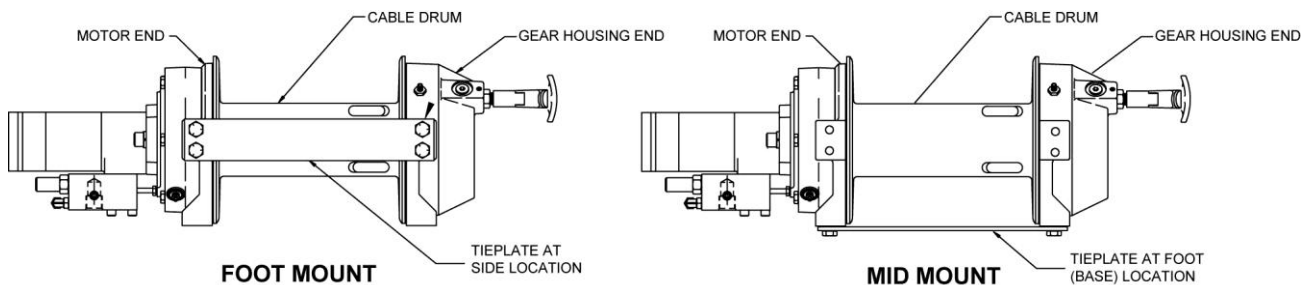
Unlike a worm gear winch, planetary winches do not use a large shaft through the drum, gear housing and motor end. **MISALIGNMENT WILL RESULT IN THE DRUM BINDING, CAUSING EXCESSIVE WEAR OF COMPONENTS WITHIN THE WINCH.**

If foot mounting the winch the following must be observed: The mounting surface must be flat within 0.4mm (.015") and sufficiently stiff to resist flexing. If a steel plate is used for mounting, it should be 19mm (.750") thick. If plate thinner than 19mm is used this should be strengthened with support members. In this application eight (8) ½" UNC 1 3/4" long H.T. socket set screws with lock washers will be needed to mount the winch.

Cap screws should be torqued to (235Nm) 173 Ft.lb.

Mounting hole locations must be held within  $\pm$  (0.8mm) 1/32" and the hole size of 13mm diameter must not be oversized.

**NOTE:** When mounting winch the tie plates provided with winch are to be re-bolted to the remaining mounting pads on the winch, whether they be side or foot mounting.



## 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.

**CAUTION - 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).

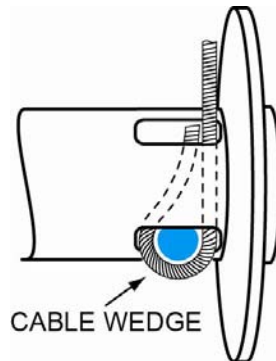
All control valves incorporated in the winch hydraulic system must be of an 'Open centre' (Motor Spool) type.

## WIRE ROPE INSTALLATION

**BEFORE COMMENCING ENSURE HOST CHASSIS ENGINE IS STOPPED AND EMERGENCY STOP CONTROLS ARE ACTIVATED.**

Unwind rope by rolling it out along the ground to prevent kinking. Securely wrap plain end of rope (other end to hook), with plastic or similar tape to prevent fraying.

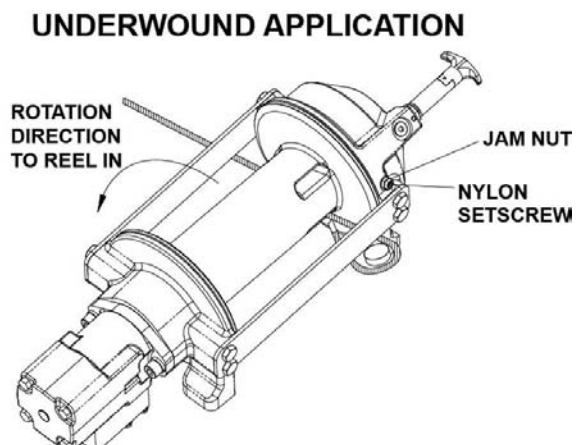
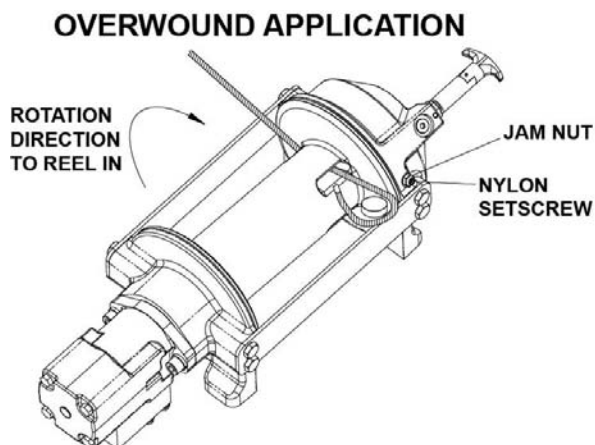
Pass plain end of rope through any guide rollers or fairleads that may be fitted to the system towards the drum. Pass rope around drum, ENSURE IT IS PASSED AROUND THE DRUM IN THE RIGHT DIRECTION FOR CORRECT ROTATION. Place plain end of rope into tapered hole in winch drum. Then double it back through the hole, fitting the securing wedge in the loop formed by the rope and pulling it back into the tapered hole.



Carefully run winch in the "winch in" direction. Keeping tension on end of cable, spool all the cable onto the cable drum, taking care to form neatly wrapped layers. Keep hands away from drum and guide rollers. Do not allow rope to slide through hands.

After installing cable, check freespool operation. Disengage clutch and pull on cable at a walking speed. If cable "bird nests", loosen jam nut and turn nylon setscrew clockwise to increase drag on drum. If cable pull is excessive, loosen nylon setscrew by turning counter clockwise. Tighten jam nut when proper setting is obtained.

**CAUTION: Over-tightened of jam nut may strip nylon setscrew.**





## CARE OF THE WIRE ROPE

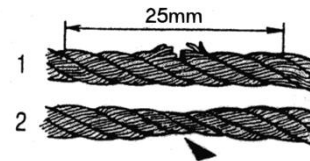
### **NOTE: ISO 4309:2004/2010 – WIRE ROPES DIRECTIVE**

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.

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.**

## **CLUTCH - WARNING: DO NOT DISENGAGE CLUTCH UNDER LOAD**

### **MANUAL CLUTCH SHIFTER**

**TO DISENGAGE CLUTCH** Run the winch in the reverse (reel out) direction until load is off the cable. Pull handle out and rotate 90°. With handle in the "DISENGAGED" position cable may not be free-spoiled from drum.

**TO ENGAGE CLUTCH** Pull handle out, rotate 90° and release handle. Run the winch in reverse until the clutch handle snaps fully into the "ENGAGED" position. DO NOT attempt to pull a load unless the handle is fully at the "ENGAGED" position. If manual shift indicator light is present, the green light is lit when clutch is fully "ENGAGED". DO NOT attempt to pull a load unless the green light is lit.

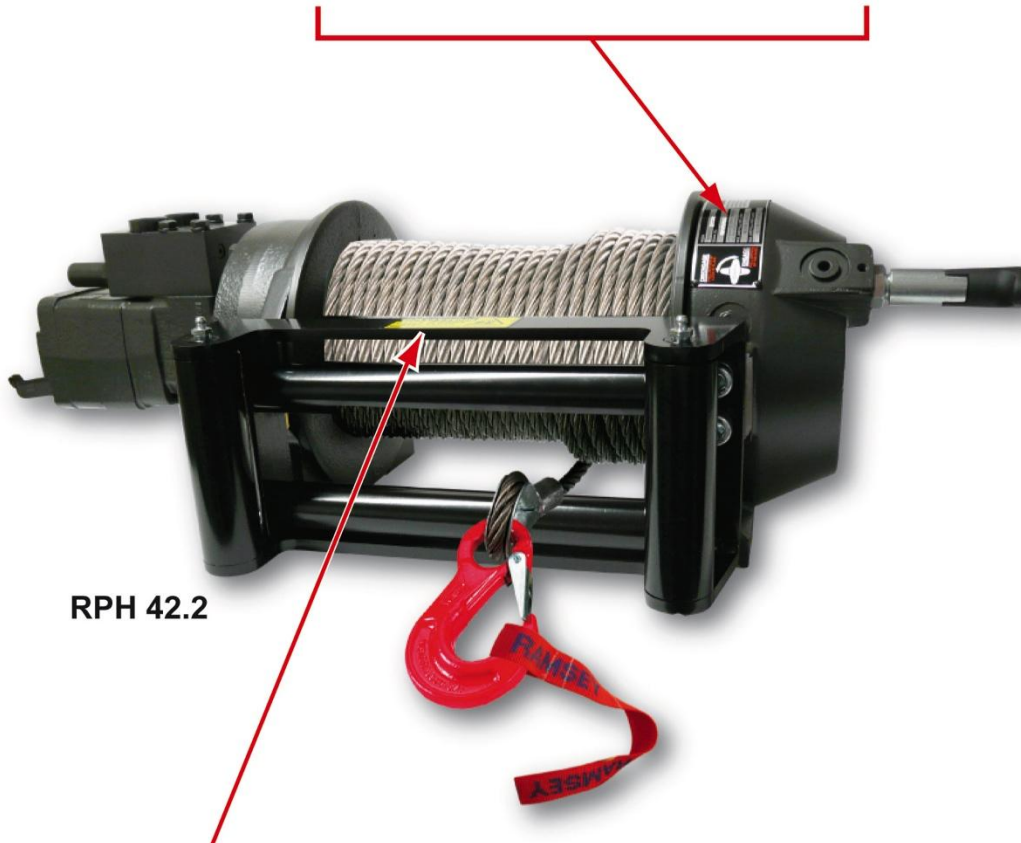
### **AIR CYLINDER CLUTCH SHIFTER (OPTION)**

**TO DISENGAGE CLUTCH** Run the winch in the reverse (reel out) direction until load is off the cable. Apply air pressure to the .125-27 NPT port 80 PSI (min), 150 PSI (max). **CAUTION** Pressure must not exceed 150 PSI.

**TO ENGAGE CLUTCH** Remove air pressure from the cylinder (a return spring engages the plunger). Run winch in reverse until the clutch engagement indicator light (green light) is lit. DO NOT attempt to pull a load unless the green light is lit.



## WINCH LABELS



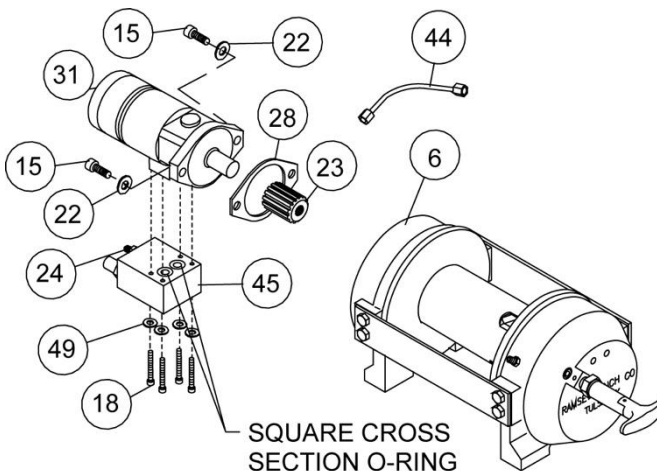
## TROUBLE SHOOTING

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.	Check mounting. Refer to winch mounting page 11  Inspect and replace brake. Inspect and replace damaged gears.
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.
Oil leakage from breather vent under motor end bearing	Damaged brake 'O' rings, back up rings or sealing surfaces.	Dis-assemble brake and inspect. See overhaul instructions.
Load drifts	Excessive back pressure. 6.9 bar (100psi) max.	Check for restrictions in hydraulic system. See System Requirements and Typical Layout – pages 9-10
Brake will not hold	Incorrect directional control valve (cylinder spool closed centre)	Use only a motor spool (open centre) control valve
Wire rope "bird nests" when clutch disengaged.	Drag screw improperly adjusted.	Adjust nylon drag screw.
Excessive noise	Hydraulic system flow too high. Drum in bind winch not mounted squarely.	Check flow rate See page 9 Check Mounting – see page 12
Drum chatters in 'Reel In' position	Low hydraulic system flow rate Low hydraulic system relief pressure setting	Check flow rate – see Page 9 Check relief valve setting

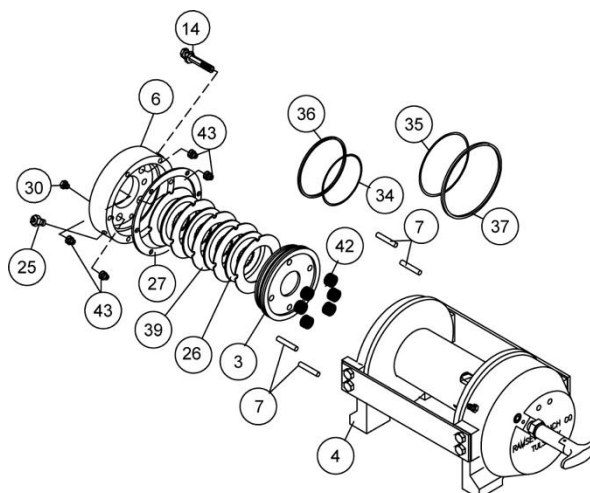
## OVERHAUL OF RAMSEY MODEL RPH 42.2

Take note of mounting configurations for proper mounting of parts during re-assembly. Replace all gaskets, O-rings, and seals during re-assembly.

Disconnect tube (No.44) from elbows (No.24) on bottom of brake (No.6) and valve (No.45). Remove motor (No.31) from brake housing (No.6) by unscrewing cap screws (No.15). Tap motor lightly to disengage. Replace all gaskets, O-rings and seals with new ones during re-assembly. Remove coupling (No.23) from brake housing. Examine coupling for signs of wear, replace if necessary. If necessary, remove valve (No.45) from motor by removing cap screws (No.18) and lock washers (No.49). If valve is removed make sure two square cross section O-rings remain seated in their counter bores in valve.

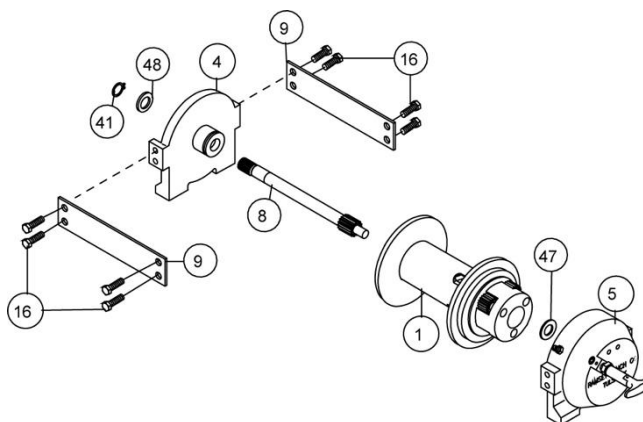


Remove brake housing (No.6) from end bearing (No.4) by unscrewing x 6 cap screws (No.14) in a criss-cross pattern (2 turns each) until all cap screws are removed from brake housing. Remove brake parts from brake housing. Examine brake discs (No.26) for signs of wear, and replace if necessary. Examine O-rings (Nos.34 & 35) and backup rings (Nos.36 & 37) for signs of wear. Remove O-rings and backup rings from grooves in brake piston (No.3). Remove and examine springs (Nos.42 & 43) for damage, replace if necessary. Examine fitting (No.30) to assure that fittings are in proper working condition, replace if necessary.

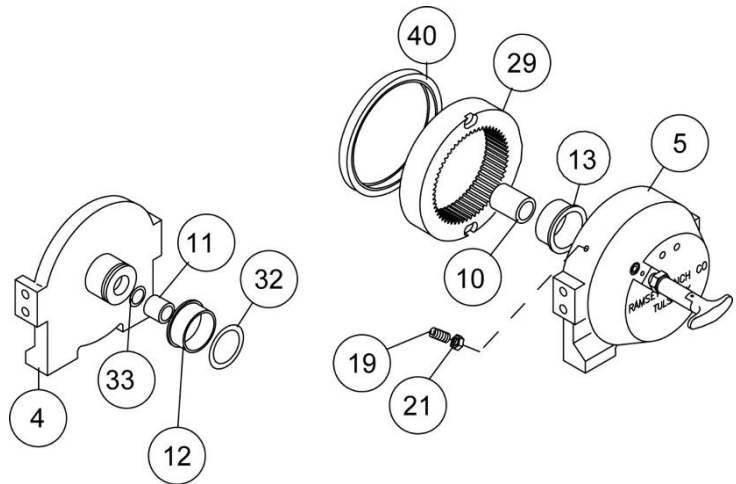


Remove tie plates (No.9) from end bearings (Nos.4 & 5) by unscrewing cap screws (No.16), as shown. Remove snap ring (No.41) and thrust washer (No.48) from shaft. Slide motor end bearing (No.4) from drum (No.1) and drum from gear housing end bearing (No.5).

Remove input shaft (No.8) and thrust washer (No.47) from end bearing. Inspect gear teeth and splined end of shaft for signs of wear. If damaged, it will be necessary to replace the shaft.



Remove O-ring (No.32), bushing (No.12) from outside of motor end bearing (No.4), remove o-ring (No.33), bearing (No.11) from inside of motor end bearing (No.4). Place new, well oiled, o-ring (No.33) into groove inside of end bearing and press new bearing (No.11) into end bearing. Press bushing (No.12) onto end bearing and dip O-ring (No.32) in oil and seat into groove of end bearing. Remove seal (No.40) from gear housing end bearing (No.5). Loosen nut (No.21) and remove nylon setscrew (No.18) and remove ring gear (No.29) from gear housing end bearing, if necessary. Remove bushing (No.13) and bearing (No.10) from gear housing end bearing (No.5). Press new bushing (No.13) and bearing (No.10) into place in end bearing. Install ring gear and nylon setscrew and nut. Ring gear must be fully seated in gear housing end bearing (No.5) and slot in ring gear must NOT be aligned with clutch shifter hole. Install new seal in gear housing end bearing, with sharp edge of seal outward.



Generously apply grease (MOBILITH SHC 007) to teeth of ring gear (No.29), teeth of planet gears in drum (No.1) and to bushing in gear housing end bearing (No.5). Apply a small amount of grease to base of bushing on motor end bearing (No.4). Apply grease to teeth of gear and short end of shaft (No.8). Place gear end of shaft through thrust washer (No.47) and into bearing in end bearing (No.5). Place drum over shaft and rotate drum to engage planet gears with output gear on shaft and with ring gear in end bearing. Assemble end bearing (No.4) to drum assembly and use tie plates (No.9) and cap screws (No.16) to hold both end bearing together. Tighten cap screws to 75 Nm (55 ft-lb). Slide thrust washer (No.48) over end of shaft and against end bearing (No.4). Place snap ring (No.41) into groove in splined end of shaft.

If necessary, remove and replace appropriate shifter assembly (Nos.2 or 3), as follows:

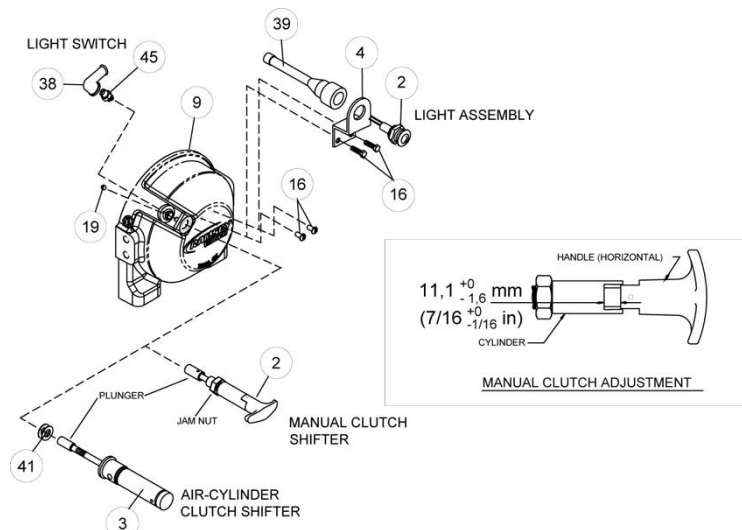
## MANUAL CLUTCH SHIFTER ASSEMBLY

Loosen setscrew (No.19) and jam nut, then unscrew shifter assembly (No.2). Be sure slot in ring gear is not aligned with clutch shifter hole. Rotate drum, if necessary, to ensure hole and slot are not aligned. Reinstall shifter assembly with plunger, jam nut, and handle positioned in gear housing as shown below. Thread assembly (with handle engaged in cylinder slot) into the gear housing. Pull drum toward the gear end bearing housing to remove play. Hold drum in position and continue threading the shifter assembly in until the gap between the end of the handle and cylinder is 7/16 +0 -1/16 inch and handle is in the horizontal position (see below). Note: This gap will vary with drum endplay. With the drum pulled against the motor end housing, the gap should be 3/8 inch. Lightly tighten jam nut. Rotate drum until handle snaps fully into the engaged position. Pull handle out and rotate 90°.

Verify that drum can be rotated freely (at least one full revolution) with clutch shifter at the DISENGAGED position. Securely tighten jam nut while holding the handle. Tighten setscrew (Item No.19) securely. Re-check clutch operation as described on page 5.

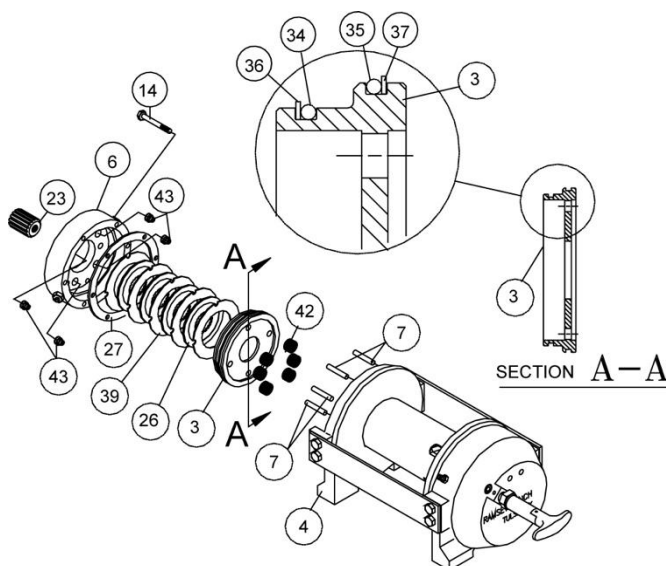
## AIR CYLINDER SHIFTER ASSEMBLY

Loosen set screw (No.19) to remove shifter assembly (No.3). To reinstall, place 1 or 2 shims (No.41) over plunger and thread shifter assembly into gear end housing. Add or remove shims to orient ports for pneumatic connections. Ports should point down (below horizontal). Tighten setscrew. Check for clutch operation as described on page 5. If the light assembly (No.2) or light switch (No.48) needs to be replaced, refer to the schematic below for electrical connections- and disassemble and reassemble as shown.





Set winch on gear housing end with motor end bearing (No.4) up. Insert (6) springs (No.42) into pockets of motor end bearing (No.4), as shown, leaving top and bottom pockets empty. Install coupling (No.23) over splined end of shaft (No.8). Put (4) brake pins (No.7) into x 4 holes in motor end bearing. Install well-oiled O-ring (Nos.34 & 35) and backup rings (Nos.36 & 37) into grooves in O.D. of piston (No.3). Place O-rings into portions of grooves nearest to centre of piston in both cases. See SECTION A-A below.



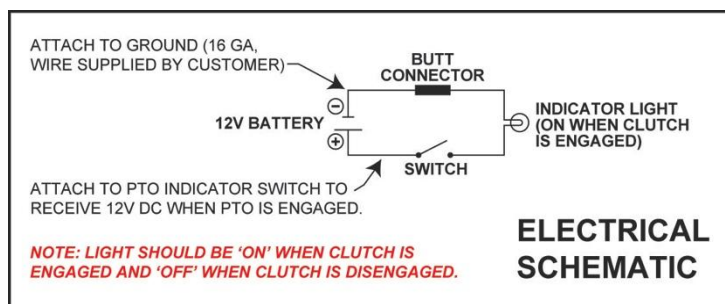
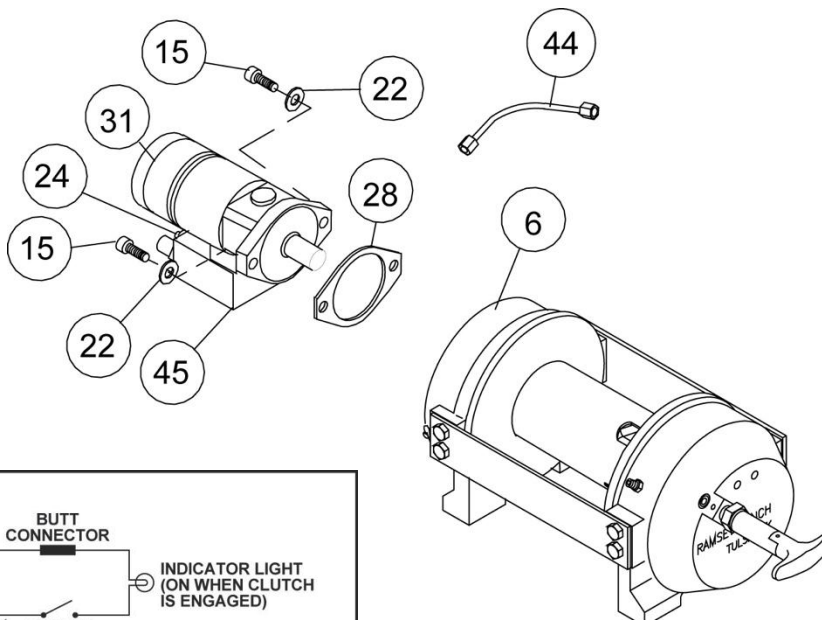
Piston (No.3), brake disc (No.26) and separator plates (No.39) must be clean and free of grease and oil. Place piston over pins (No.7) and on top of springs (No.42). Place separator plates (No.39) and brake disc alternately on top of piston, as shown below.

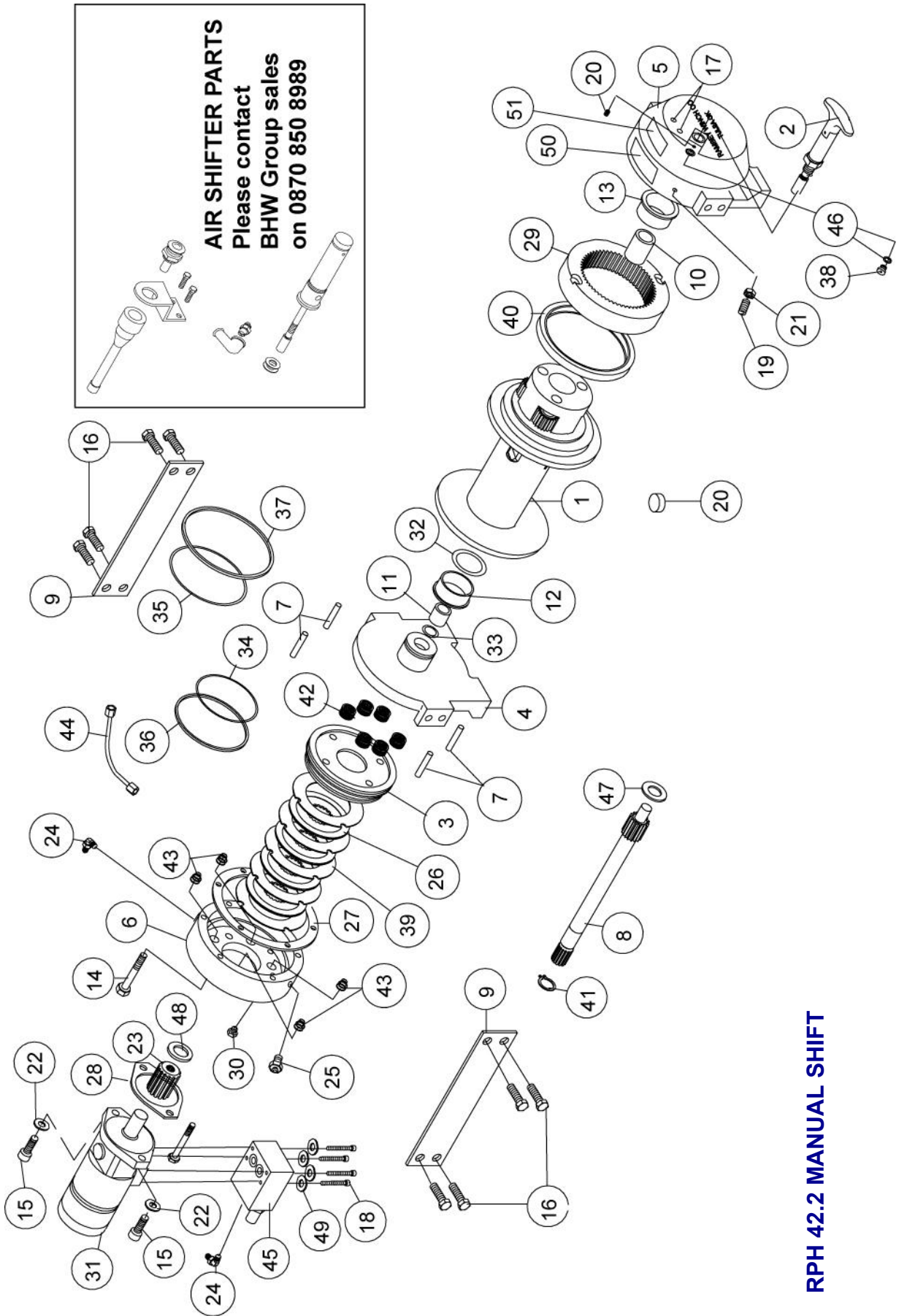
Press larger diameter end of x 4 springs (No.43) into pockets in brake housing (No.6). Place gasket (No.27) on top of end bearing (No.4). Place brake housing over brake parts with fitting ports downward toward mounting feet.

Align mounting holes and force brake housing down onto end bearing (No.4). Apply 271 Loctite to 6 cap screws (No.14) and finger tighten until flush with surface of brake housing. Torque cap screws (2 turns each) in a criss-cross pattern until a torque of 41 Nm (30 ft-lb) per cap screw, is achieved.

Place gasket (No.28) into position on mounting surface of motor (No.31). Slide motor shaft into coupling and attach motor to brake housing (No.6). Use x 2 cap screws (No.15) with lock washers (No.22) and torque to 118 Nm (87 ft-lb) each. Securely connect tube (No.44) to elbows (No.24) in valve (No.45) and in bottom of brake housing (No.6).

Apply at least 37,9 bar (550 PSI) hydraulic system pressure to release brake and verify that brake releases, by observing that the winch drum rotates.





**RPH 42.2 MANUAL SHIFT**

## RPH 42.2 PARTS LIST

Item No.	Qty.	Part No.	Description	Item No.	Qty.	Part No.	Description
1	1	10393	DRUM ASSEMBLY STANDARD	26	4	10404	DISC - BRAKE
2	1	10394	DRUM ASSEMBLY "Y"	27	1	9605	GASKET - BRAKE
3	1	5045	SHIFTER ASSEMBLY MANUAL	28	1	8941	GASKET - MOTOR
4	1	10395	PISTON - BRAKE	29	1	10405	GEAR - RING
5	1	5194	END BEARING - MOTOR	30	1	8952	FITTING - VENT
6	1	5195	END BEARING - GEAR HOUSING	31	1	5414	MOTOR - HYDRAULIC
7	1	10396	HOUSING - BRAKE	32	1	5424	O - RING - DRUM
8	4	10397	PIN - BRAKE	33	1	5427	O - RING
9	1	10398	SHAFT - INPUT / SUN GEAR STANDARD	34	1	10406	O - RING
10	2	8928	SHAFT - INPUT / SUN GEAR "Y"	35	1	10407	O - RING
11	2	8929	TIE PLATE STANDARD	36	1	10408	O - RING BACK UP
12	1	10400	TIE PLATE "Y"	37	1	10409	O - RING BACK UP
13	1	5274	BEARING - GEAR HOUSING	38	1	5448	PLUG
14	1	5295	BEARING - MOTOR END	39	5	10410	PLATE - SEPARATOR
15	1	5296	BUSHING - DRUM - MOTOR END	40	1	5474	SEAL - GEAR HOUSING
16	6	10401	BUSHING - DRUM - GEAR HOUSING END	41	1	5484	SNAP RING
17	2	8934	CAP SCREW 3/8 - 16NC x 2 1/2" LG HX HD GR5 PLTD	42	6	10411	SPRING - BRAKE
18	2	8931	CAP SCREW 1/2 - 13NC x 1 1/2" LG SOC HD	43	4	10412	SPRING
19	8	8932	CAP SCREW 1/2 - 13NC x 3/4" LG HX HD GR5 PLTD	44	1	10413	TUBE ASSEMBLY - PORTS UP
20	2	5306	CAP SCREW 1/4 - 20NC x 1/2" LG RD HD SLOT PLTD	45	1	10414	TUBE ASSEMBLY - SIDE PORTS
21	4	10402	CAP SCREW 5/16 - 18NC x 1 1/2" LG HX HD GR5 Z/P	46	1	10415	VALVE - MOTOR CONTROL - A ROTATION
22	4	8933	CAP SCREW 5/16 - 18NC x 3/2" LG HX HD GR5 Z/P	47	1	10416	VALVE - MOTOR CONTROL - B ROTATION
23	1	10403	SET SCREW 3/8 - 16NC x 1" LG SOCKET NYLON	48	1	10417	VALVE - MOTOR CONTROL - A ROTATION SIDE PTS
24	1	8936	ROPE ANCHOR	49	1	5520	THRUST WASHER
25	1	8938	NUT 3/8 - 16NC HEX JAM	50	1	5522	THRUST WASHER
	2	5336	LOCK WASHER 1/2 ID MED SECT	51	1	5523	THRUST WASHER
	2	8940	COUPLING - MOTOR		4	8937	LOCK WASHER - 5/16 MED SECT Z/P
			FITTING 7/16 ELBOW		1	10418	NAM TAG
			NOT USED		1	5341	TAG - A ROTATION



## WARRANTY

BHW GROUP LIMITED, the authorised Ramsey Servicing Distributor in the UK and Ireland warrants each new 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 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 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.

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**RAMSEY RPH 42.2.....**

**SERIAL NUMBER.....**

**DATE OF PURCHASE.....**