

**FITTING & OPERATING INSTRUCTIONS**  
**ELECTRO PNEUMATIC CONTROL VALVES**  
**WITH PREWIRED LOOMS, WANDERLEAD CONTROL & EMERGENCY STOP**  
Kit Part Nos: 14979, 14980, 14982, 15666, 9586



Part No. 14978 / 01.07.21

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## INTRODUCTION

This manual refers to the installation and operating instructions for the following BHW Electro Pneumatic kits.

**PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLATION OR OPERATION OF THE VALVE CONTROLS. KEEP THIS MANUAL WITH THE VALVE CONTROLS FOR REFERENCE.**

**CONTROL VALVE SYSTEMS MUST BE SPECIFIED WITH OR WITHOUT PRESSURE CARRY OVER. IT IS ESSENTIAL THAT THE CORRECT TYPE IS TO BE USED ACCORDING TO THE APPLICATION. IF IN DOUBT, PLEASE CONTACT BHW GROUP (0)20 8953 6050 or sales@bhwgroup.com.**

### STANDARD KITS FOR A BHW ELECTRO PNEUMATIC CONTROL VALVE:

KIT Part No.	Description
14980	Directional Valve ½" BSP, Single Spool, WITHOUT Pressure Carry Over with wiring loom, blue wanderlead socket and standard emergency stop button
14979	Directional Valve ½" BSP, Single Spool, WITH Pressure Carry Over with wiring loom, blue wanderlead socket and standard emergency stop button
14982	Directional Valve ¾" BSP, Single Spool, WITHOUT Pressure Carry Over with wiring loom, blue wanderlead socket and standard emergency stop button
15666	Directional Valve ¾" BSP, Single Spool, WITH Pressure Carry Over with wiring loom, blue wanderlead socket and standard emergency stop button
9586	Directional Valve ½" BSP, Single Spool, WITHOUT Pressure Carry Over with wiring loom, violet wanderlead socket and standard emergency stop button

A standard kit is illustrated on the front of this manual. It includes facilities for one wanderlead control and one emergency stop. Additions are available and easily installed with the BHW plug in wiring loom system (see page 7).

A standard kit would normally comprise of:

- Electric/ pneumatic control valve with dump section.
- Control system in enclosure with Armaflex connectors for Wanderlead socket and Emergency Stop.
- Prewired loom with connectors for emergency stop and wanderlead cables. (Part No. 20831).
- Plug in wiring loom for 16 amp wanderlead socket (Part No. 12949).
- Plug in wiring loom with emergency stop button (Part No. 12681).
- Armaflex protected power lead 4.5 metre long from control system to connect to vehicle battery.
- Mounting bracket with valve and control system fitted.
- 4 metres x 4mm Ø nylon tubing to connect to air supply at the PTO with the control system.

Wanderleads and emergency stops shown in the kit listings above are those usually supplied as standard. Options are available, please see page 6 for details or refer to the parts section on page 15.

## INSTALLATION

The valve control system is supplied by BHW Group as a fully wired, plug in kit requiring the minimum installation time by the installer. Connections are waterproof and resistant to impact. The cables are sealed in Armaflex sleeving.

Before commencing installation, check that the correct valve has been specified and also that it is being fitted in the correct position within the hydraulic system. It is the installers responsibility to ensure the correct control valve is used to suit the relevant application and that the control valve is correctly installed and tested.

Fitting the wrongly specified valve or positioning it incorrectly within the circuit may cause damage to the valve and other equipment in the circuit. BHW Group is unable to accept any liability for damage resulting from the installation of a wrongly specified valve. Warranty details can be found in the back of this manual.

## SYSTEM REQUIREMENTS

BHW electro pneumatic valve control systems require:

- A protected air supply from the PTO actuating pneumatic cylinder. Maximum pressure 10 bar.
- An electrical supply from the chassis, 24v at 10 amp rating.
- A hydraulic supply. See hydraulic requirements table on page 8.

## FUNCTIONS AND ADVANTAGES

1. To enable the winch to be operated by a wanderlead button control. The system is supplied with one plug in wiring loom with a 16amp socket. This can be positioned as required for the wanderlead to be connected. Additional sockets can be added anywhere on the vehicle using extra BHW wiring looms on to the system. (See following page for details on BHW wiring looms and choices on wanderlead sockets).
2. To provide at least one emergency stop control, which is a legal requirement as, defined in the EU machinery directive on safety. Emergency stop buttons are supplied prewired for connection to the wiring loom so they can be fitted onto the vehicle adjacent to the 16 amp socket. Additional emergency stop buttons can be added with the use of additional BHW wiring looms. (See following page for details on BHW wiring looms and choices on Emergency Stop buttons).

**NOTE: If the control valve includes pressure carry over, then any functions downstream from this valve will also have the benefit of an emergency stop function.**

3. To protect the winch and hydraulic system from being overloaded. The valve includes an adjustable pressure relief. This limits the maximum pressure that can be obtained in the circuit thereby limiting the winch to its maximum designed line pull capacity.

**NOTE: The valve supplied is preset at 176Bar. It may be necessary to adjust this setting to obtain the correct line pull rating for the winch being used. This is the responsibility of the installer.**

## ADDITIONAL OR OPTIONAL EQUIPMENT

### ADDITIONAL WANDERLEAD SOCKETS AND EMERGENCY STOPS

Additional BHW wiring extensions and branch looms can be easily plugged into the standard kit to provide extra wanderlead sockets and emergency stop buttons.

### ALTERNATIVE WANDERLEAD CONTROLS AND EMERGENCY STOPS

The most popular wanderlead and emergency stop controls are listed on page 6.

Alternative wanderlead controls are also available. Please contact the BHW GROUP on +44 (0)20 8953 6050 to discuss alternatives.

### RADIO CONTROL

A radio control unit can be supplied to add to the control valve kit. Please contact the BHW GROUP on +44 (0)20 8953 6050 or [sales@bhwgroup.com](mailto:sales@bhwgroup.com).

### ALTERNATIVE VALVE OPTIONS

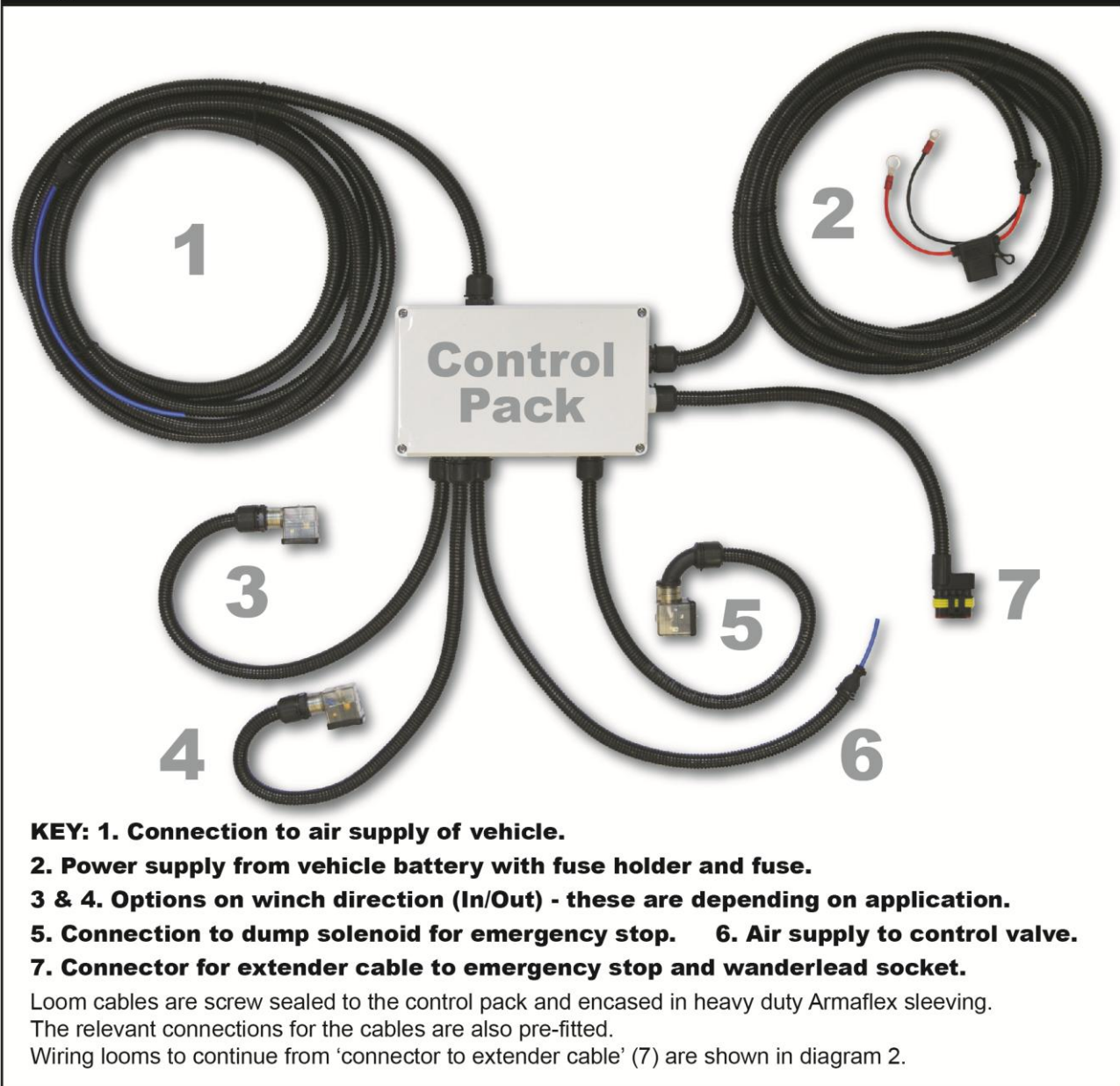
An optional multi sectional valve is also available. Please contact the BHW GROUP on +44 (0)20 8953 6050 or [sales@bhwgroup.com](mailto:sales@bhwgroup.com) to discuss specific requirements.

## BHW WIRING LOOMS FOR CONTROL VALVES

BHW wiring looms for control valves are supplied as complete kits (see kits listing, page 3).

The componentry is shown below. Diagram 1 is the main control pack and diagram 2 on the following page shows the extender cables, branch lines and cables for the wanderlead control and emergency stop. A full picture of a typical kit is shown on the front cover.

**Diagram 1. BHW PREWIRED LOOM COMPONENTS - MAIN CONTROL PACK**



If you require additional components to extend a wiring loom, or replacement parts, please contact the BHW Group sales on +44 (0)20 8953 6050 or [sales@bhwgroup.com](mailto:sales@bhwgroup.com).

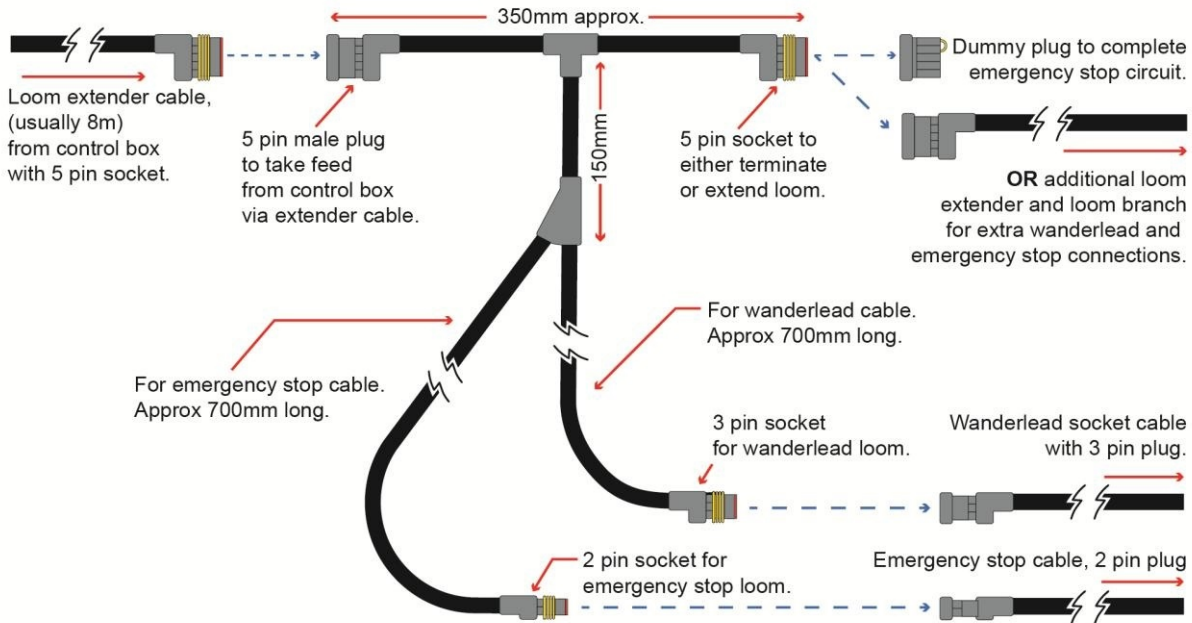


## BHW WIRING LOOMS FOR CONTROL VALVES contd.

### Diagram 2. BHW PREWIRED CABLES, EMERGENCY STOPS & WANDERLEAD SOCKETS

BHW prewired cables have weatherproof, impact resistant plugs and sockets that lock when connected. Loom cables are sealed to the plugs and sockets and encased in heavy duty Armaflex sleeving. Additional looms can easily be added for extra control connections (see below).

#### Part No. 20831 Prewired branch loom with emergency stop and wanderlead connectors



#### Dummy plug

Part No. 20832 - to complete emergency stop circuit at the end of a finished loom assembly.

**Loom extender cables** - prewired with 5 pin plugs and 5 pin sockets.

**Part No. 12682 Loom extender cable x 8 metres** - standard issue, typically to go from the front of the vehicle to the rear. This length is supplied as standard for kits, connecting the control box to the branch loom.



**Part No. 14380 Loom extender cable x 2.5 metres** - typically to go from one side of the vehicle to the other.



#### Cables with wanderlead socket

3 pin plug and 400mm cable



Part No. 12680 Blue, surface mount with cable gland

Part No. 12949 Blue, through panel feed\*

Part No. 12950 Blue, through panel feed\* - lockable

Part No. 14808 Violet, surface mount with cable gland

Part No. 12951 Violet, through panel feed\*

Part No. 12952 Violet, through panel feed\* - lockable

Part No. 20037 Violet, with back box (side exit), cable gland and lockable assembly

\* Through panel feed - the 3 pin connector and cable is fed through a predrilled aperture in the vehicle chassis. The heavy duty socket is then mounted to the surface over the aperture.

#### Cables with emergency stop button

2 pin plug and 400mm cable



Part No. 12681 standard button type

Part No. 16649 with boxed finger guard assembly

Part No. 15629 with metal enclosure

Part No. 7408 with push pull with bellows and wired/terminated superseal

## SPECIFICATION OF VALVES

### VALVES WITHOUT PRESSURE CARRY OVER

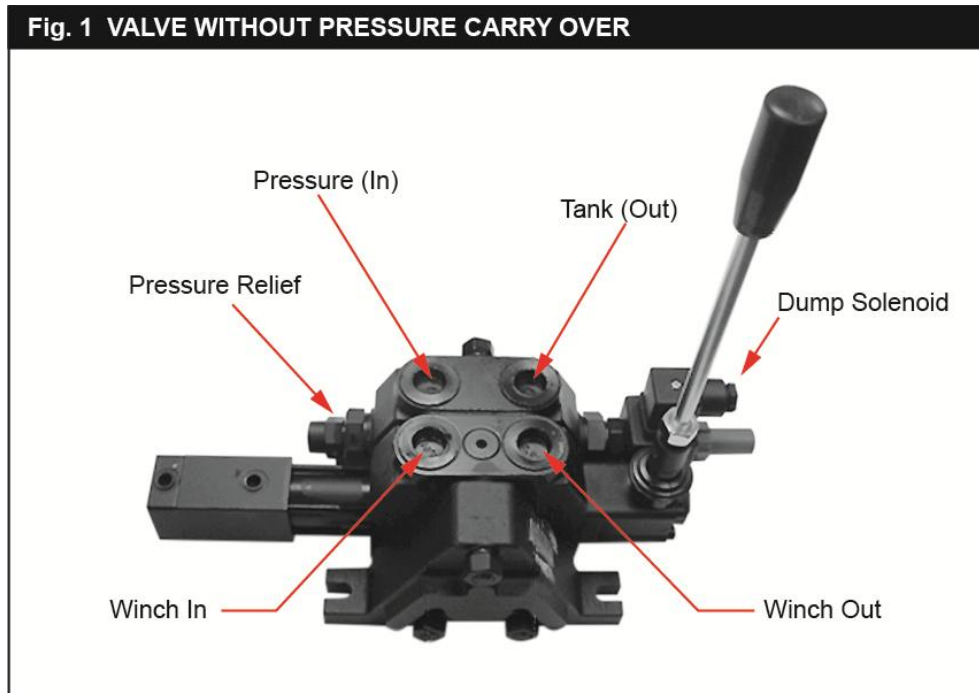
These can only be used in circuits where no other directional valves are fitted beyond this control valve. The return line must go directly to the tank.

OR

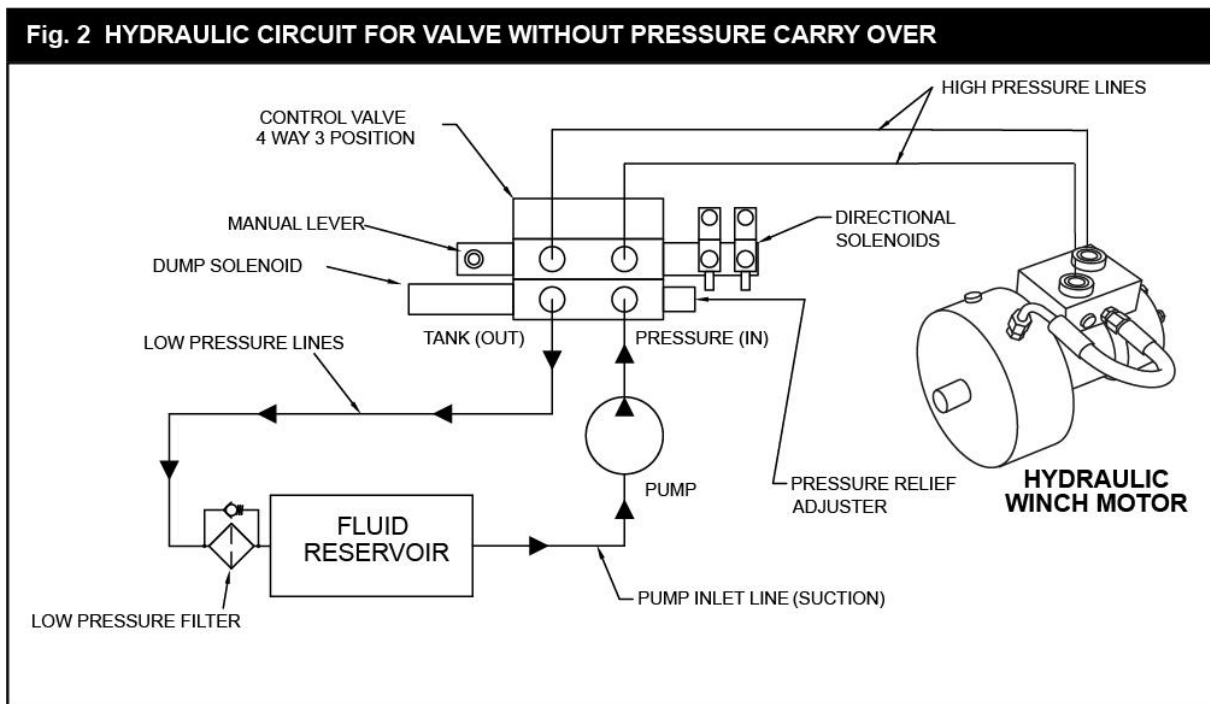
Where other directional control valves are fitted. These must be located in the circuit before the valve supplied by BHW Group and must include pressure carry over. Other valves must be between the BHW Group supplied valve and the hydraulic pump).

See below for winch control valve without pressure carry over detail and its hydraulic circuit layout.

**Fig. 1 VALVE WITHOUT PRESSURE CARRY OVER**



**Fig. 2 HYDRAULIC CIRCUIT FOR VALVE WITHOUT PRESSURE CARRY OVER**



### PLEASE NOTE:

If in any doubt about specification, please contact BHW Group +44 (0)20 8953 6050 prior to installation.

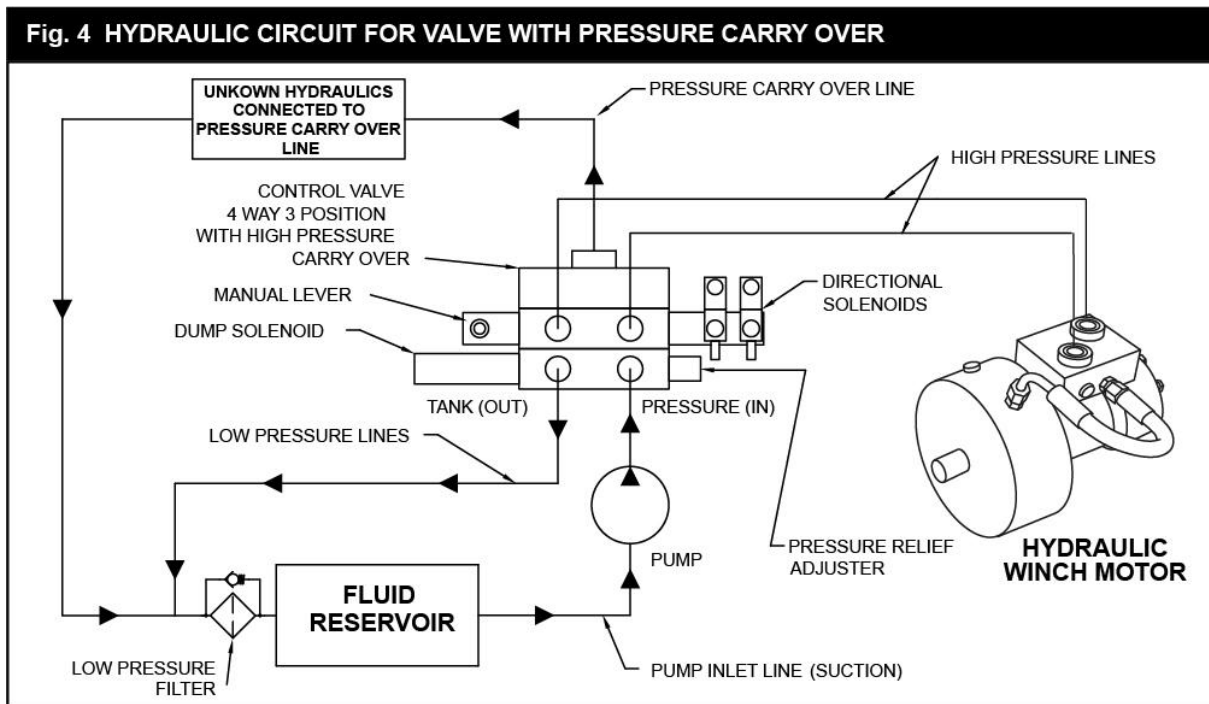
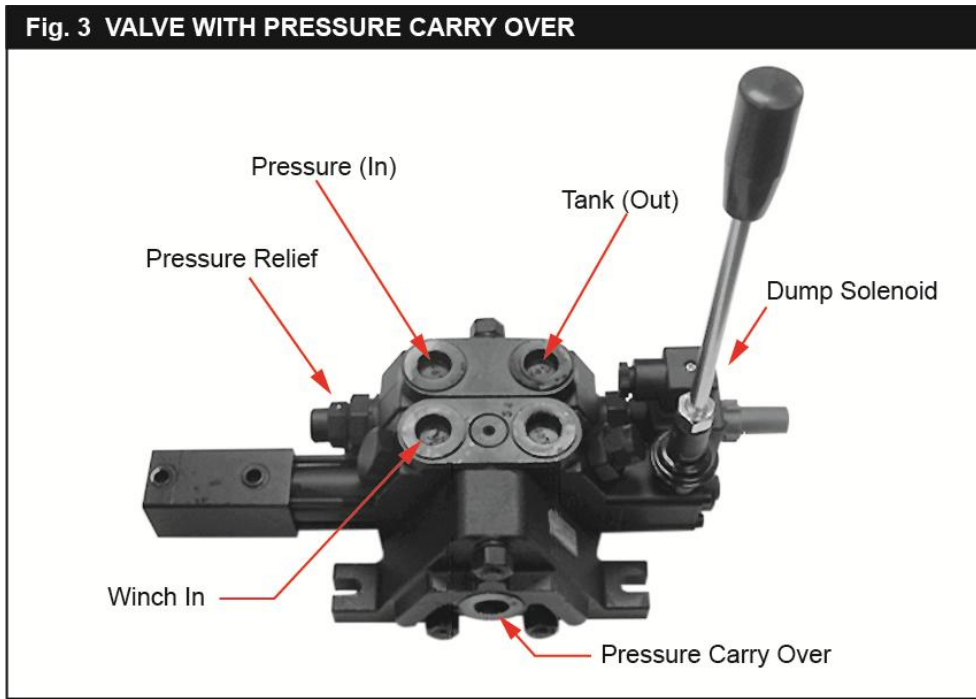
**No liability can be accepted by BHW Group for damage to the valve or associated equipment caused due to incorrect installation or specification of the valve.**

## SPECIFICATION OF VALVES contd.

### VALVES WITH PRESSURE CARRY OVER

These should only be used where other directional control valves are fitted downstream beyond the BHW Group supplied valve.

**THE PRESSURE CARRY OVER PORT MUST UNDER NO CIRCUMSTANCES BE BLANKED OFF.  
A RETURN LINE TO THE TANK MUST BE FITTED.**



### PLEASE NOTE:

If in any doubt about specification, please contact BHW Group +44 (0)20 8953 6050 prior to installation.  
**No liability can be accepted by BHW Group for damage to the valve or associated equipment caused due to incorrect installation or specification of the valve.**



## METHOD OF OPERATION

The control valve is supplied “open” and it will not close to allow it to function until it receives an electrical supply. If a permanent electrical supply were provided there would be a constant current draw on the vehicle battery of around 3 amps causing an unacceptable discharge, resulting in vehicle starting difficulties. To prevent this problem the control system includes a pressure-sensing switch connected to the PTO air supply.

When the PTO is engaged the electrical supply is switched on and this activates the solenoid on the dump section of the valve and it closes to enable the valve to function. The winch will now operate using either the manual lever or by means of the wanderlead buttons. In the case of the wanderlead, this simply operates either the winch “In” or “Out” solenoid.

If an emergency stop button is pressed, this will cut the power supply to the valve dump solenoid so the valve immediately goes “open.” Hydraulic oil then returns immediately through the dump section to tank preventing any operating functions taking place. This method also has the advantage of failing safe if the electrical supply to the valve should fail i.e. if a supply wire broke away from an emergency stop control.

The connectors onto the three solenoids are to IP65 and include LED indicator lights for checking the system is operating correctly. Notes on LED indicator functions can be found in fault finding on page 14.

## HYDRAULIC PUMP REQUIREMENTS

To obtain optimum performance from the winch the pressure and flow available from the pump must be correct and this will depend on the model of winch being installed. (See table below).

If the winch is being fitted in to an existing circuit with a higher flow than the maximum recommended, a priority flow control valve should be installed in the circuit. (Part No.7556).

A filter to achieve a 25-micron level of filtration must be included in the circuit to protect the hydraulic system.

A low pressure return line filter is recommended. (Part No. 4410).

**Table 1 Hydraulic requirements:**

Winch Model	Recommended flow lt/min (optimum)	Maximum permissible flow lt/min	Operating pressure to obtain correct line pull (approximate bar)
T-Max CHW9000	60	75	140
T-Max CHW16500	60	75	140
Ramsey HDP 34.9	35	50	176
Ramsey RPH 42.2	45	57	155
Ramsey HDP 42	57	75	138
Ramsey 53.3	45	57	176
Ramsey 133.4	70	100	176
Ramsey H246	40	50	172
Ramsey BH550 / H49	50	75	176
Ramsey H89	60	100	180
Ramsey Pullmaster R5	50	70	155
Ramsey H246 / HY246	40	50	176

\*A low displacement hydraulic motor is available for the BH 550 / H49 for when oil flows in the system are less than 32lt/min if this motor is used at the pressure requirement of 195 bar.

## SETTING ENGINE SPEEDS

**IMPORTANT NOTE** Modern Commercial vehicles are fitted with electronic Engine Management Systems (EMS). The supplying truck dealer must ensure the engine is set to run at the correct speed automatically when the PTO is engaged. This is carried out by the supplying dealer and generally done at the vehicle PDI. To enable the EMS system to sense the PTO engagement a pressure sensing switch or a microswitch within the PTO will be required. In the case of the pressure switch this should be fitted in the line from the cab switch to the PTO. Many PTO ranges have provision for a microswitch to be fitted quickly and easily and can be supplied with the PTO.

The extent and range of the changes to new vehicle transmissions and their integrated control systems continues to evolve, with ever-more-complex hardware/software control units; some gearboxes even require their own independent CPUs to be re-programmed prior to the installation of a PTO.

In some applications two or three different engine speeds may need to be selected and this facility must be specified at the time the chassis is ordered on the factory. This facility would be required, for example if a crane was fitted requiring 30lt/min and a winch operating from the same PTO required 50lt/min. Each function i.e. crane and winch will need a pressure sensing switch or microswitch so the engine speed automatically sets when the specific equipment is being used.

We recommend these requirements be discussed with the supplying dealer who should also be advised of the correct engine speed settings prior to setting up the speed control.

## FITTING THE CONTROL VALVE

### VALVE LOCATION

When selecting the valve location, the following points must be considered:

- Avoid direct road spray off the vehicle wheels.
- Position to prevent accidental operation of the manual lever.
- Ensure the manual lever is free to move through its full travel.
- Easy access by the operator to the manual lever.
- Access to the control box (to enable parts replacement).
- Access to the pressure relief valve to enable adjustment to be made.
- Access to the hydraulic hoses and air pipes to provide easy connection without severe bending.
- Installation is normally to the nearside of the vehicle.

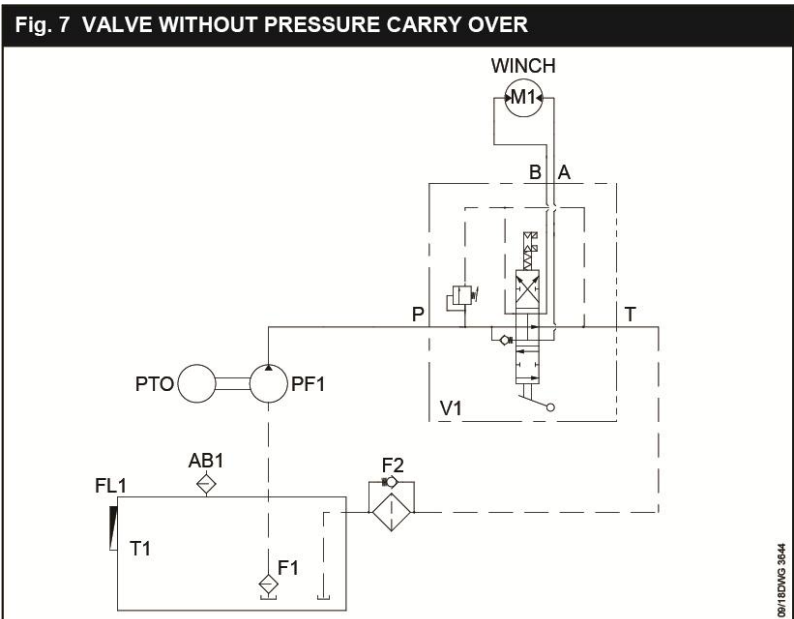
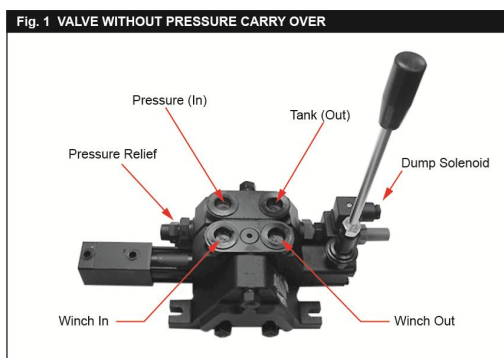
When fitting the valve bracket ensure the valve base remains flat to the mounting. If the valve bracket is distorted due for example to welding, spool “sticking” may impair the action of the valve and cause hydraulic leaks. If the bracket is secured by welding, first remove the control box and the valve to avoid heat damage.

## HYDRAULIC CONNECTIONS

### VALVE WITHOUT PRESSURE CARRY OVER

This has four ports.

An inlet port for connection to the hydraulic pump pressure port, a return to tank which returns the hydraulic oil back to the tank (including when the pressure relief is activated), and two service ports connected to the winch motor.



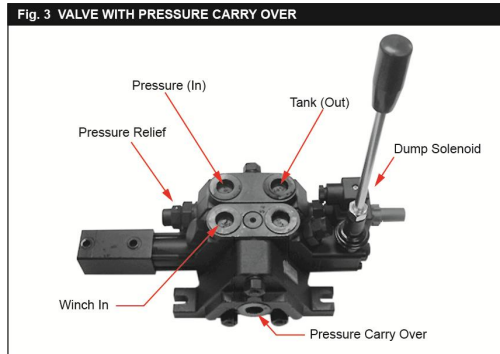
## HYDRAULIC CONNECTIONS contd.

### VALVE WITH PRESSURE CARRY OVER

This valve has an additional port, which must be connected to other hydraulic functions.

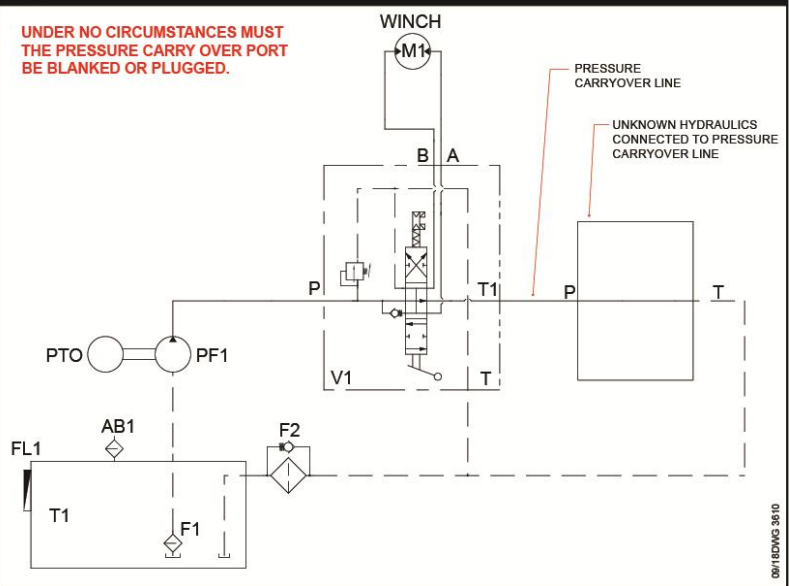
**DO NOT BLANK OFF OR PLUG THIS PORT.**

The air actuator has two air ports, one on each solenoid. There are three electrical sockets, one on the dump valve and one on each of the air actuating solenoids.



**Fig. 8 VALVE WITH PRESSURE CARRY OVER**

**UNDER NO CIRCUMSTANCES MUST THE PRESSURE CARRY OVER PORT BE BLANKED OR PLUGGED.**



### HOSES

To select the minimum diameter hydraulic hose sizes that must be used see table below.

Please note that part numbers on the table below refer to the kits as listed on page 3.

#### Recommended hose sizes (internal diameter)

KIT Part Nos.	Maximum flow (lt/min)	Port size (inches)	Pressure Carry Over (Y/N)	PTO to control valve (inches)	Valve to motor (inches)	Valve to tank (inches)	Tank to PTO (inches)
14980 or 9586	60	1/2	NO	1/2	1/2	3/4	1.1/4
14979	60	1/2	YES	1/2	1/2	3/4	1.1/4
14982	100	3/4	NO	3/4	3/4	1	1.1/4
15666	100	3/4	YES	3/4	3/4	1	1.1/4

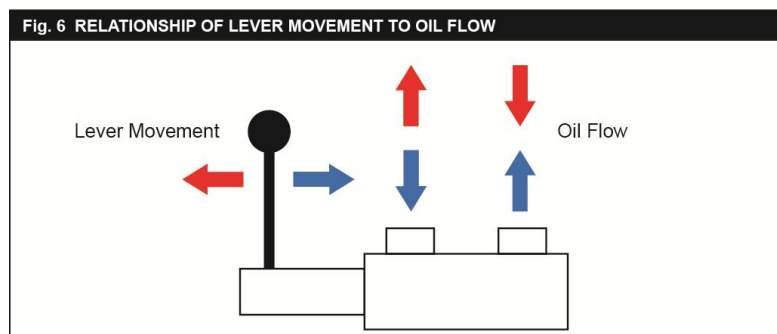
**NOTE:** If smaller bore sizes are used this may result in back-pressure or cavitation that may damage components in the system and can reduce winch performance.

When connecting the hydraulic hoses to the valve ports use either straight connectors or swept elbows and avoid the use of "compact 90 elbows", as they may create excessive back- pressure.

Hydraulic hoses are fitted to the valve ports using male/male fittings. Depending on the hydraulic flow and therefore the hose sizes selected it may be necessary to fit male/male adapters into the valve ports to facilitate fitment.

### RELATIONSHIP OF USE OF LEVER TO OIL FLOW

The relationship between the direction of movement of the manual operating lever "winch in" and "winch out" function is very important. It is accepted practice that pulling the lever towards the operator will perform the "winch in" function and pushing it away will perform the "winch out" function. The relationship between lever movement and oil flow is shown in fig. 6 below.



## HYDRAULIC CONNECTIONS contd.

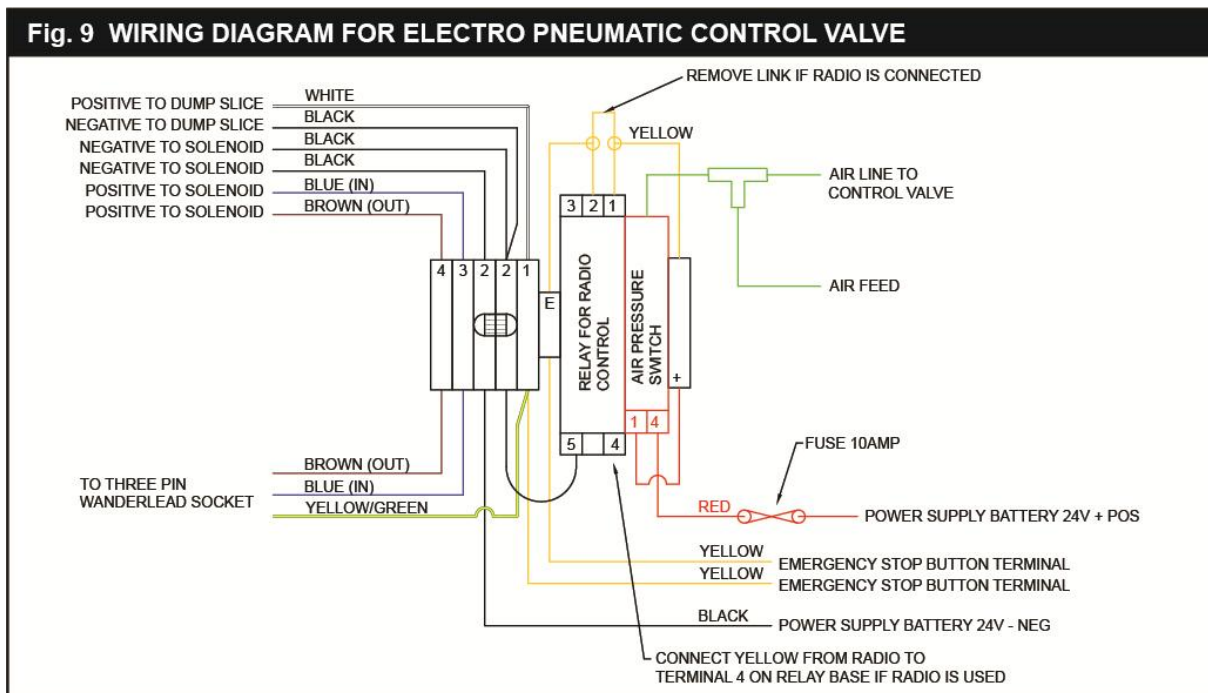
### INSTALLING THE CONTROL VALVE SYSTEM

The valve is used to control the “in” and “out” function of the winch and to control the hydraulic circuit from being overloaded by means of a built in pressure relief valve. In addition, the valve incorporates a ‘dump’ segment which enables an emergency stop control to be fitted. This function is a legal requirement to comply with the EU Machinery Directive. The winch can be controlled by manual control, a wanderlead or radio control if fitted. To facilitate remote wanderlead or radio control, the valve spool is moved by air actuation, which is controlled by two solenoids (‘in’ and ‘out’ function) built into the valve.

**NOTE:** When the valve is operated remotely by wanderlead or radio the manual lever will also move.

## ELECTRICAL CONNECTIONS

The electro pneumatic control system is supplied ready wired for installation using the BHW wiring loom system. Electrical cables must be supported to prevent strain on the terminal ends and to prevent chaffing. Cable routing must also be clear of hot exhaust and exhaust gases. Ensure grommets are used when cables pass through holes in any metalwork or other material.



### AIR ACTUATOR SOLENOIDS AND DUMP SOLENOID CONNECTIONS

There are three sockets solenoids, one to the dump solenoid and the remaining two to the air actuator solenoids. Note: the dump valve socket will not fit the air actuator solenoid connector. It is however possible to interchange the two air actuator solenoid connectors. If these are connected wrongly then when the “winch In” control button on the wanderlead is selected the winch will “winch out”. To remedy this simply change the connectors over.

### WIRING LOOM FOR WANDERLEAD SOCKET AND EMERGENCY STOP

From the control box, there is a wiring loom socket which connects to the loom extender cable, which takes the power feed to the proposed sitings of the wanderlead and the emergency stop. The loom extender cable is then plugged into the branch loom. The branch loom divides for the wanderlead socket and emergency stop. (See page 6 for reference to WIRING loom components).

### WANDERLEAD SOCKET LOOM

The wanderlead control socket requires mounting to the vehicle body or chassis. Determine the most suitable position by ensuring that when the wanderlead is plugged into the socket the operators can position themselves safely to carry out winching operations. In general, the best location for the socket is at the rear of the body on the kerbside but some users prefer the offside and we recommend consulting the user.

The wanderlead socket is prewired on a loom with a 3 pin plug. This plugs into the 3 pin connector on the branch line. Please note that the standard kits use a surface mounted socket. There is also an alternative ‘through panel feed’ version, where the wire enters the back of the socket. This requires the cable to be fed through a predrilled aperture in the chassis before connecting to the branch loom. See page 6 for listings.

## **ELECTRICAL CONNECTIONS contd.**

### **EMERGENCY STOP BUTTON LOOM**

The emergency stop is supplied pre-wired on a loom with a 2 pin plug. The plug attaches to a 2 pin socket on the branch loom.

The emergency stop button should be mounted in a prominent position which is easily accessible and in plain sight. It is usually sighted adjacent to the wanderlead socket.

### **DUMMY PLUG**

The dummy plug supplied is fitted to the open end of the branch loom to complete the emergency button circuit. The emergency stop will not operate unless the dummy plug has been securely fitted. (See page 7 for reference to dummy plug).

### **ADDITIONAL EXTENSIONS**

Extender cables are available for adding further looms to the circuit for additional emergency stop buttons and wanderlead sockets to other sites on the vehicle. Please refer to the wiring looms specifications on page 6.

## **AIR CONNECTIONS** (Reference to air connections are included in circuit diagram on previous page).

An air supply is required at the control junction box. This supply must be from the feed to the air actuator on the vehicle PTO/pump or the PTO switch. This ensures that air is supplied to the system only when the PTO is engaged.

**NOTE:** The control box houses a pressure sensing switch that effectively switches on the electrical supply to the dump solenoid closing the valve enabling it to function. A permanent air supply would result in the dump solenoid remaining permanently live leading to premature solenoid failure.

Ensure that all air pipes are suitably supported to prevent strain on the end fittings and to prevent chaffing. Pipes must be routed to clear hot exhaust and exhaust gases.

## **TESTING AND COMMISSIONING THE SYSTEM**

### **INITIAL CHECKS AFTER INSTALLATION SHOULD BE CARRIED OUT WITHOUT WIRE ROPE ON THE DRUM.**

1. Engage the PTO/Pump, check for hydraulic oil leaks between pump and valve, valve and tank.
2. Check for air leaks in supply feed to control box.
3. Ensure the emergency stop control is not depressed.
4. Operate the manual lever on the valve very slowly and with only the minimum of movement initially and observe rotation of winch. Check for hydraulic oil leaks between valve and winch. Operate the lever in the opposite direction and again check for hydraulic leaks between valve and winch. If winch rotation does not match command by valve lever, i.e. pulling the lever towards the operator should power the winch "in" but if it powers it out then swap pipes over on valve service ports or on the winch motor ports.
5. Plug wanderlead control into socket and press the "winch out" button. Observe rotation of winch. If rotation is in the wrong direction, swap over the solenoids on the valve air actuator. To do this remove screw that retains the electrical connections to the solenoid and swap over and replace. Press "winch in" to confirm rotation of winch drum is now correct.
6. Depress emergency stop control and then check that both manual lever control and wander lead controls are inoperative.

### **ENSURE THE DRUM ROTATION OF THE WINCH IS CORRECT.**

On some winch models the brake is only effective in one direction. Look at the label on the winch or check the manual, if in doubt call BHW Group on +44 (0)20 8953 6050.



## SETTING PRESSURE RELIEF VALVE TO OBTAIN CORRECT WINCH LINE PULL

First ensure the engine speed is at its optimum, which is normally around 1000 rpm. (See setting speed page 8).

Either of the following two methods may be used:

### **METHOD 1 – USING A LOAD CELL PHYSICALLY MEASUREMENT THE WINCH LINE PULL**

During this procedure ensure all winching safety requirements are observed and we recommend a test rope is used and this must be on the bare drum with a minimum of 5 wraps.

With the winch rope on the bare drum and a minimum of 5 wraps around the drum connect the end of the rope to a load cell. (Check rope-breaking capacity is in excess of rated line pull of the winch). Connect load cell to substantial anchor point.

Using the manual lever slowly apply load to the load cell. Stop winching if rated load is achieved and reduce the pressure relief valve setting as described below in "Pressure Relief Valve Adjustment". Continue process until pressure relief valve operates at the same time as the rated winch line pull is recorded on the load cell, i.e. when pressure relief valve operates the winch will stop.

This method will also act as a test to check the integrity of the winch mounting. During the process inspect winch mountings for deformation and in particular check to ensure there is no permanent deformation after the load has been removed.

### **METHOD 2 – MEASUREMENT OF THE PRESSURE**

Remove the hydraulic hoses and adapters in the hydraulic valve service ports that go to the winch motor.

Fit high pressure blanking plugs (1/2" or 3/4" B.S.P. depending on valve size supplied) into the valve service ports.

Fit a pressure gauge (minimum capacity 250 bar), in the line from the pump to the pressure port on the valve.

Slowly operate the manual lever and observe the pressure reading on the gauge.

Stop operation when required pressure + 5% is reached. If this is achieved the pressure relief valve setting requires reducing as described below. If the required pressure is not achieved the pressure relief valve setting requires increasing as described below. Continue process until pressure relief valve operates at the correct pressure setting recorded on the pressure gauge (see table 1 on page 8 for pressure references).

### **PRESSURE RELIEF VALVE ADJUSTMENT**

Remove the "blind" hexagon nut on the pressure relief valve to expose the head of a slotted screw face.

To increase the pressure setting, wind the screw "in" (clockwise direction). To reduce the pressure, wind the screw "out" (anticlockwise).

When carrying out adjustment only wind the screw 1/8 of a turn at a time.

On completion of adjustment replace the "blind" hexagon nut tightening firmly to lock setting.

## FAULT FINDING

If the winch will not rotate in either direction using the wanderlead control buttons then try using the manual lever. If the winch still fails to operate in either direction check to see if the LED on the connector to the dump solenoid is illuminated. If it is not illuminated no power is available so the valve is not closing (see control system: method of operation page 7).

This may be due to a number of factors that should be checked in the following sequence:

1. Ensure the emergency stop button is in the working (out) position
2. Check the in line fuse positioned between the vehicle battery and control box and replace if necessary.
3. Wires from the vehicles electrical supply should be inspected to ensure they are making good connections and there are no broken wires. These wires are usually connected directly to the vehicle battery.
4. The air supply pipe from the PTO to the control box should be checked for good connections and to ensure there are no leaks. (There is a pressure-sensing switch in the control box that switches on the power supply so if air pressure is unavailable the electrical supply to close the valve will not be available.)
5. If air pressure is available at the pressure sensing switch and it is not switching it must be replaced.

If the LED light is illuminated on the connector to the dump solenoid (see fig. 1, page 3 or fig. 3, page 4), and the winch will not rotate in either direction, then replace the dump solenoid coil, stem and cap (Part Nos. 7532, 7588 respectively).

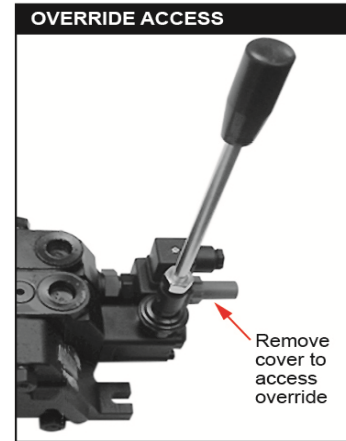
If the winch only operates in one direction check the LED indicator lights on the connectors to each operating solenoid. If they are both illuminated this indicates that there is power supply available indicating a faulty solenoid which should be replaced (Part No. 7592).

## CONTROL OVERRIDE

In the event that the system will not operate due to a system or component failure a 'get you home' override procedure is as follows:

- Locate and unscrew the cylindrical cover on the control valve to the right of the lever, next to the dump solenoid connection.
- This will expose a knurled knob, which should be depressed and turned to a locked position.
- This procedure will allow manual operation of the winch only.

**THIS PROCEDURE MUST ONLY BE USED IN AN EMERGENCY.  
THE SYSTEM MUST BE RETURNED TO NORMAL  
WORKING CONDITION BEFORE FURTHER USE.**



## HYDRAULIC TANK CLEANING PROCEDURE

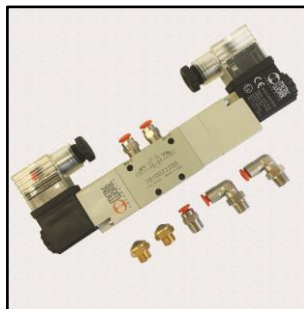
1. Check tank for large foreign objects.
2. Wipe tank with lint free cloth and solvent cleaner.
3. Dry tank out with paper cloth.
4. Using an airline and a clean new Scotch pad, blow the inside of the tank to remove any cloth particles.
5. Clean inside tank with a Tack rag.
6. With clean hands, check inside for any particles.
7. Ensure all holes/ports are blocked until hydraulic hoses are fitted.

## REPLACEMENT PARTS

Should replacement parts be required, please contact sales at BHW Group (0)20 8953 6050 or [sales@bhwgroup.com](mailto:sales@bhwgroup.com), using the references and part numbers shown below.



Part no 7592  
28v Directional  
Solenoid Coil  
(Two per operating  
valve slice).



Part no 14725  
Valve for  
Hydraulic Air  
System.



Part no 14880  
Brass Air Silencer  
1/8" BSP.



Part no 14879  
1/8" BSP 90°  
Mark Elbow Stud  
fitting to 4mm air  
pipe.



Part no 14878  
1/8" BSP Mark Stud  
straight fitting to  
4mm air pipe.



Part no 7590  
Pneumatic Piston  
Kit for directional  
sections.

## REPLACEMENT PARTS contd.



Part no 7587  
Control Lever Base  
Assembly Kit.



Part no 7585  
Control Lever.



Part no 7588  
Stem Kit & Cap  
For dump section.



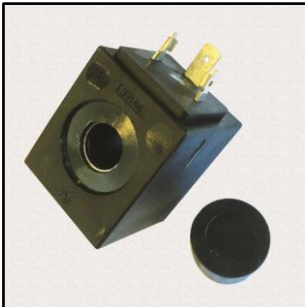
Part no 7593  
Dump Cartridge  
(Second section for  
part no. 7588).



Part no 7584  
Pressure Relief  
Valve Cartridge.



Part no 7436  
Pressure Sensing  
Switch.



Part no 7532  
26v Solenoid Coil  
for dump section  
(One per valve).



Part no 7107  
Square Dumping  
Solenoid Coil  
Connector with  
LED.



Part no 7105  
Rectangular  
Directional Solenoid  
Coil Connector with  
LED.

Please see next page for wanderleads, plugs and sockets.

## REPLACEMENT PARTS – contd.



Part no 3867  
Two Button  
Pendant  
Wanderlead  
Control with  
Emergency  
Stop.



Part no 7392  
Two Button  
Pendant  
Wanderlead  
Control.

### WANDERLEADS prewired with cables and plugs

BHW Group wanderleads are available as standard two button, with or without emergency stop. Complete wanderleads with cable and plugs are listed below. Other wanderleads and lengths are available on request.

BLUE 3 PIN PLUG	
TWO BUTTON ONLY	TWO BUTTON + E/STOP
7743 - 4.5m cable	XXXX - 4.5m cable
7744 - 7m cable	XXXX - 7m cable
7745 - 10m cable	XXXX - 10m cable
VIOLET 3 PIN PLUG	
TWO BUTTON ONLY	TWO BUTTON + E/STOP
7741 - 4.5m cable	9948 - 4.5m cable
7742 - 7m cable	9949 - 7m cable
	9950 - 10m cable

## PLUGS



Part no 6473  
Three Pin  
Blue Plug.



Part no 6474  
Three Pin  
Violet Plug.

## SOCKETS



Part no 7077  
Three Pin  
Blue Socket.  
Surface  
mount.



Part no 7076  
Three Pin  
Blue Socket.  
Through  
panel feed.



Part no 7084  
Three Pin  
Violet Socket.  
Surface  
mount.



Part no 7085  
Three Pin  
Violet Socket.  
Through  
panel feed.

For prewired cables, with sockets and plugs and other prewired cable parts, please refer to the diagram on page 6.

Should you require assistance with parts information, please contact BHW Group sales on (0)20 8953 6050 or email [sales@bhwgroup.com](mailto:sales@bhwgroup.com).

## WARRANTY

BHW GROUP LIMITED warrants each new electro pneumatic control kit and ancillary equipment supplied, against factory defects in material and workmanship for one year from date of purchase.

The responsibility for removing the equipment is the owner's, together with its return, transportation prepaid to BHW Group Limited.

BHW Group Limited 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 produce, 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 stamps has been defaced altered or removed (where this is applicable).

Warranty will also be null and void if in the view of BHW Group Limited the damage or failure occurred from misuse, negligence or accident.

Warranty is also void if the installer has positioned the item in a location contrary to the instructions in the product manual that has resulted in water damage. In the case of hydraulic components, the warranty will also be null and void if damage is caused as a result of contamination within the hydraulic system.

BHW Group Limited reserve the right to change the design of any product without assuming any obligation to modify any product previously supplied.

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.

**BHW**  
**Bushey Hall Winchmaster**  
**www.bhwgroup.com**

Service Department  
Lismirrane Industrial Park  
Elstree Road  
Elstree, Herts, WD6 3EE

Telephone: +44 (0)20 8953 6050  
Email: [sales@bhwgroup.com](mailto:sales@bhwgroup.com)  
Website: [www.bhwgroup.com](http://www.bhwgroup.com)

It is recommended that the type and part number of the kit used is recorded below, along with the date of purchase, so our sales team can assist if help is needed.

### **BHW ELECTRO PNEUMATIC CONTROL VALVE KIT**

**Type.....**

**Kit part no.....**

**Date of purchase ...../...../.....**