

# **HARKEN<sup>®</sup>**

## **MVP Valve Panel Kit**

Installation and User Manual



MVP1



MVP4

Please read these instructions carefully before using or servicing the equipment.  
This manual may be modified without notice. See: [www.harken.com/manuals](http://www.harken.com/manuals) for updated versions.  
**PLEASE SAVE THESE INSTRUCTIONS**



## INTRODUCTION

This manual gives technical information on installation and use. Installation, disassembly and reassembly by personnel who are not experts may cause serious damage to property or injury to users and those in the vicinity of the product. If you do not understand an instruction, contact Harken. The user must have appropriate training in order to use this product.

Harken accepts no responsibility for damage or harm caused by not observing the safety requirements and instructions in this manual. See limited warranty, general warnings and instructions at [www.harken.com/manuals](http://www.harken.com/manuals).



**WARNING! Strictly follow all instructions to avoid an accident, damage to your vessel, personal injury or death. Hydraulic components are capable of exerting extremely high loads. Failure to inspect and replace faulty components may result in sudden breakage at high loads. Inspect all related equipment to ensure it is free of defects or obstructions prior to use. Before using, make sure all people and objects are clear of the moving components of the system.**

### Description

The Harken MVP Panel Kit is designed for use on sailboats and is sized according to boat and functions to be controlled. When ordering, always have your choice confirmed by a Harken representative or other sailing professional. Other uses of this product besides normal sailboat applications are not covered by the limited warranty.

### Parts sold separately

High-quality, mineral-based, ISO 15 hydraulic oil  
Cylinders to be connected to panel  
High pressure hoses (Harken can supply)  
Fasteners (1/4" or M6)

### Tools Required

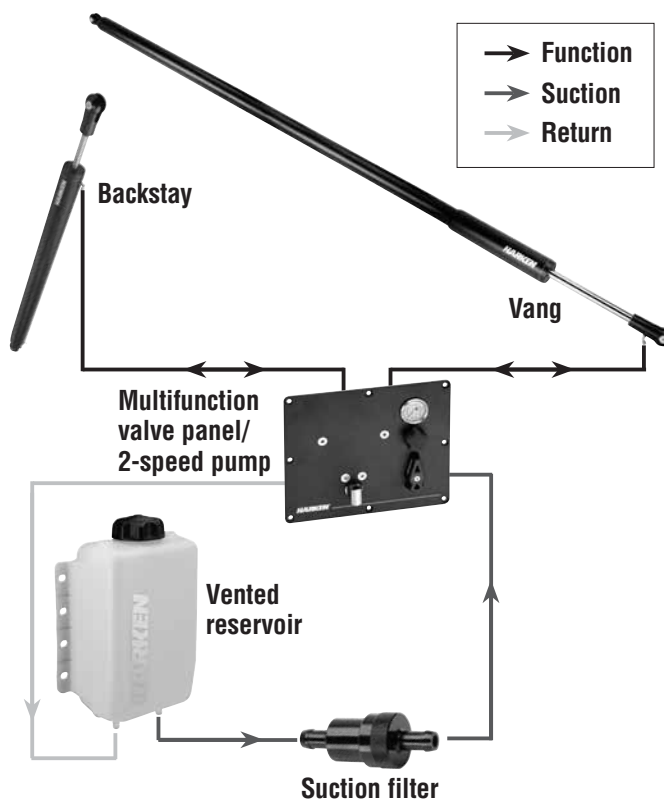
Saw (to cut hole in boat for panel installation)  
Hex driver, 5/32"  
Hex driver, 3/16"  
Drill motor and bits

### Installation Overview

Refer to Overview diagram when planning system installation.

- Use enclosed template to determine optimal panel placement.
- Locate reservoir and panel as close to each other as possible.
- Confirm adequate clearance for pump handle movement prior to installation.
- Confirm clearance for reservoir. Allow room above reservoir cap for access when filling.
- Plan high pressure hose runs from panel to functions (cylinders) and to reservoir.
- Five (5) feet of low pressure hose is included with kit.
- Remember to plan a suitable location for suction filter along suction line between reservoir and pump.

### Overview



### Multifunction System Shown

## INSTALLATION

Harken single and multifunctional valve panels are used on racers and cruisers to control systems like backstays, boom vang and outhauls. Offered as kits, both single and multifunctional panels come with pumps, handles, gauge, pressure relief/release and 2- or 4-liter reservoir.

### Install MVP

Review all instructions carefully prior to installation of your new Harken MVP Panel Kit.

1. Carefully unpack the kit components and check for visible defects. If any signs of damage are present, contact your dealer at point of purchase or Harken.
2. Mount panel in selected location. Panel gaskets and bolt holes are fitted with O-rings preventing water from entering the hull while eliminating the need for sealants.
3. Mount reservoir. If possible, reservoir and panel should be mounted at the same relative height for optimal pump suction.
4. If necessary, perform the following steps to adjust pump handle position.
  - 4.1 Move pump handle so one piston is fully extended.
  - 4.2 Remove external retaining ring and shaft retaining washer from back of pump handle shaft.
  - 4.3 Without moving the pistons, rotate splined shaft until desired handle position is attained.  
**Important:** Shaft is splined in 7° increments to allow for optimal pump handle placement.
  - 4.4 When desired pump handle position is attained, reinstall shaft retaining washer and external retaining ring at back of pump handle shaft.

### Connect Kit Components Using Low Pressure Hose

1. Select section of low-pressure hose for suction line and connect from  $\frac{3}{8}$ " hose barb on pump to either side of suction filter.
2. Select second section of low pressure hose for suction line and connect from other end of suction filter to  $\frac{3}{8}$ " hose barb on bottom of reservoir.
3. Select third section of low pressure hose for return line and connect from other  $\frac{3}{8}$ " hose barb on bottom of reservoir to remaining  $\frac{3}{8}$ " hose barb on relief/release valve.

**Notice:** Filtration is essential to the health and longevity of your hydraulic system. Harken supplies high-quality, cleanable, in-line filters for use with your system. Replacement elements are available if needed.

### Setup Function Selection Handle and Valve Ports

Multi-function MVPs come with a Function Selection Valve. This is used to select the function you want to run. The positions on the handle are marked by a "click" and correlate with the valve ports on the back of the panel.

1. When installing hose lines to functions, select a handle position for each function.
2. Attach end of hose to selected valve port.

**Notice:** Always remember to cap any unused valve ports with pressure caps. The multi-function MVP comes with two pressure caps and two plastic caps.

# INSTALLATION

## Connect Panel to Function(s)

When reservoir is connected to panel, it is time to connect system to function(s).

Remember these important points when measuring the hose run from panel to function:

- Short straight runs between panel and function are best.
- Avoid sharp edges which may chafe the hose.
- Minimize fittings/connections throughout the run to avoid possible leak points.
- Minimize 90° bends which decrease performance.

**Notice:** Hoses from valve to function must be rated to 5000 psi and must be cleaned and flushed prior to installation.

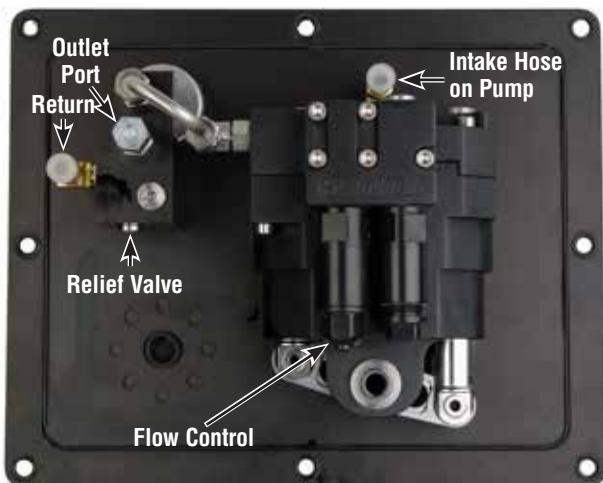
With hose length and path set, connect high pressure hose from pre-determined valve on panel to function. Use the table provided to record Function Assignments for future reference.

## Add Oil

When panel is installed and functions are connected, add filtered oil to the reservoir.

**Oil Specifications:** High quality, mineral based, hydraulic oil, ISO grade 15 (ISO 20 is also suitable).

1. Pump filtered hydraulic oil into reservoir until reservoir is 2/3- to 3/4-full.
2. Screw vented cap onto reservoir.



MVP1

Function Assignment	
Position	Function
0°	
90°	
180°	
270°	

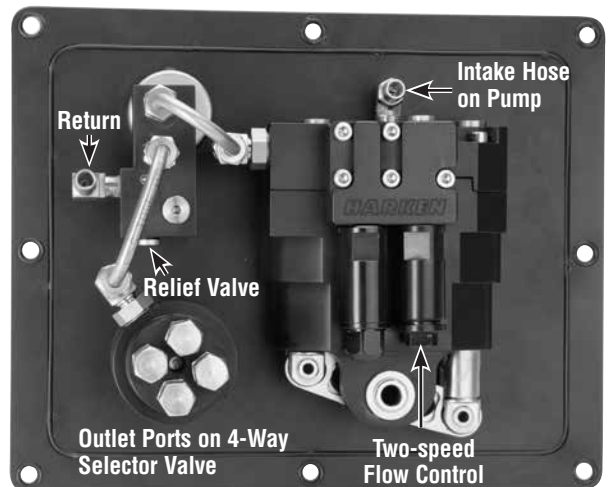
## Bleed System

When reservoir is filled, the MVP system must be bled. For multifunction systems, each function cylinder and line must be bled separately.

**Notice:** Before connecting cylinder, fully extend cylinder, pre-charge with air if required (see manufacturer specs) and detach from rigging.

1. Select first function to be bled by turning function selection handle to the appropriate position.
2. Close release valve.
3. Disconnect hose at function cylinder.
4. Pump oil through hose into suitable container. When oil exiting line is bubble-free and foam-free, reconnect hose to function cylinder.
5. If system is multifunction, repeat Steps 2 - 4 to bleed lines for each remaining function. Otherwise, proceed to Step 6.
6. Pump until cylinder fully retracts, then open release valve and allow cylinder to fully extend.
7. Repeat Step 6 for all functions.

When each function has been bled, and all hoses are securely connected, MVP system is ready for operation.



MVP4

## OPERATION

The Harken MVP Panel system can be selected to operate from one (1) to four (4) functions. Follow these simple steps for cylinder operation:



**WARNING! Hydraulic components are capable of exerting extremely high loads. Inspect all related equipment to ensure it is free of defects or obstructions prior to use. Before using, make sure all people and objects are clear of the moving components of the system.**

### Single-Function System

#### Increase tension

1. Turn pressure release knob clockwise to close. The resting position for the pressure release knob is closed.
2. Move pump handle back and forth until desired tension is achieved.

**Notice:** It is impossible to over-tighten the knob or damage the valve by hand.

#### Decrease tension

1. Turn pressure release knob counterclockwise to open. Release speed depends on how far the knob is turned.

### Multi-Function System

The multi-function MVP Panel selector valve has four (4) positions to control up to 4 functions. Operation of the multi-function system is similar to single-function except that function selection handle must point to desired function before increasing or decreasing tension.

1. To operate function, turn function selection handle toward valve port to which hose is attached. Handle clicks at 0°, 90°, 180° and 270° to indicate when function is selected. (See Setup Function Selection Handle and Valve Ports section for more information.)

2. Refer to tension adjustment steps in Single Function System section to increase or decrease tension.

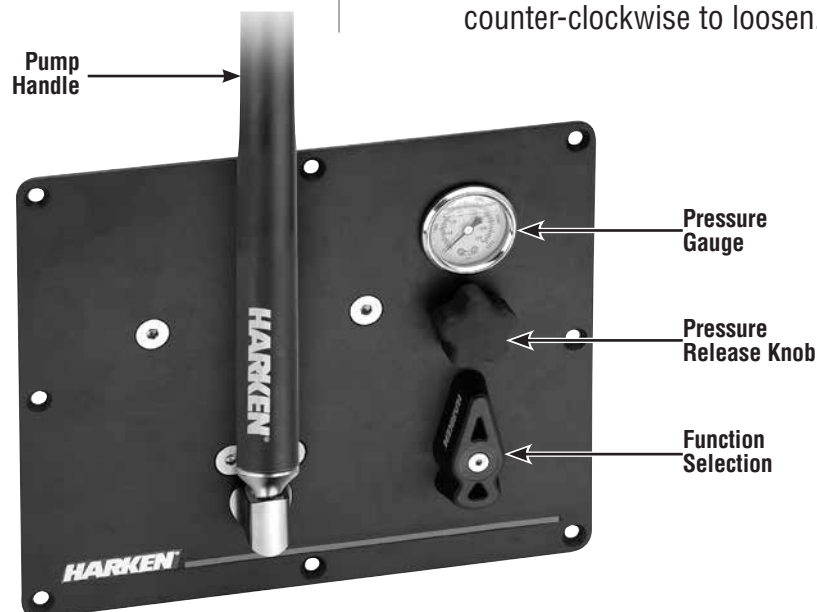
3. Place function labels at appropriate location outside Function Selection Handle.

**Notice:** If additional function labels are required, they are available, at no charge, from Harken.

### Two-Speed Pump Shift

The two-speed pump is factory-set to shift from first to second gear at approximately 1,500 psi.

- To increase shift point, turn flow control clockwise to tighten.
- To reduce shift point, turn flow control counter-clockwise to loosen.





## OPERATION

### Relief Valve Adjustment

The relief valve works by preventing pump pressure from exceeding selected valve pressure and by allowing relief of excess shock load pressure. The standard, factory relief setting is 4,000 psi. Maximum possible relief setting is 5,000 psi. If relief valve requires adjustment, perform the following steps:

1. Locate relief valve plug at bottom of valve.
2. Use  $\frac{5}{32}$ " hex driver to remove plug.
3. Use  $\frac{3}{16}$ " hex driver to turn internal adjustment screw clockwise to increase the maximum relief setting or turn counter-clockwise to decrease maximum relief setting. The adjustment is approximately 1000 psi per complete turn.

**Notice:** Pressure relief adjustments are made in the relief valve and affect all functions equally. However, for multi-function systems, the only function affected by pressure relief adjustment at a given time is the one selected by the Function Selection Valve. To optimize pressure relief, leave Function Selection Valve in position of function which experiences most shock load (Ex.: backstay).

To determine relief setting without tensioning the rig, perform the following steps:

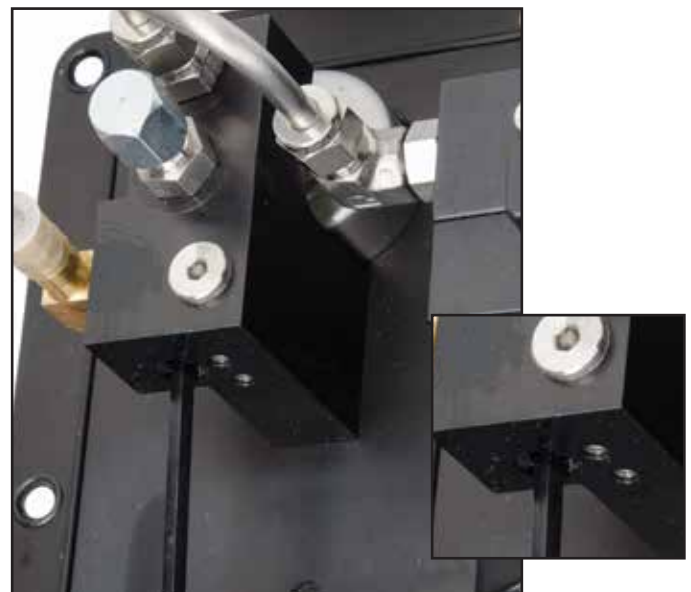
1. Disconnect cylinder from the rigging.
2. Pump cylinder until it bottoms and relief valve opens.
3. When pumping fails to raise gauge pressure, the maximum pressure displayed on the gauge is the relief valve setting.

### Cylinder Gauge

The easy-to-read analog gauge has glow-in-the-dark display and shows oil pressure in thousands of pounds per square inch (psi) and bar. The gauge reads the pressure of the function for which the panel is set. Refer to the Cylinder Force vs Pressure table to convert oil pressure to pull force.



Use  $\frac{5}{32}$ " hex driver to remove plug.



Use  $\frac{3}{16}$ " hex driver to turn internal adjustment screw clockwise to increase the maximum relief setting or turn counter-clockwise to decrease maximum relief setting.

**Cylinder Force vs. Pressure**  
Observed Pressure (gauge reading, in psi)

Size	Cylinder	1000		3000		5000		Vang	1000		3000		5000	
		lb	kg	lb	kg	lb	kg		lb	kg	lb	kg	lb	kg
-6	HYCS02511----	635	288	1905	864	3175	1440	—	—	—	—	—	—	—
-10	HYCS03513----	1289	584	3866	1753	6443	2922	—	—	—	—	—	—	—
-12	HYCS04016----	1460	662	4381	1987	7302	3312	HYCV04022----	106	48	2437	1105	4769	2163
-17	HYCS04516----	2098	952	6295	2856	10492	4759	HYCV04525----	177	80	3416	1550	6656	3019
-22	HYCS05519----	3316	1504	9949	4513	16582	7522	HYCV05525----	718	326	6664	3023	12609	5719
-30	HYCS06522----	4307	1954	12922	5861	21537	9769	HYCV06532----	736	334	8099	3674	15463	7014
-40	HYCS07525----	6283	2850	18850	8550	31416	14250	HYCV07532----	1600	726	13283	6025	24966	11324
-48	HYCS08025----	6855	3123	20654	9368	34423	15614	—	—	—	—	—	—	—
-60/-76	HYCS09032----	8394	3807	25182	11422	41970	19037	HYCV09038----	2081	944	17789	8069	33497	15194

## Inspection

Perform a visual inspection of the MVP Valve Panel prior to each use.

## Care and Maintenance

Harken products should give years of reliable service. If clean oil is used, components are properly connected and system is properly bled, no regular maintenance is required. If you experience any problems with your Harken MVP Panel kit, contact your Harken Service Representative.

## Warranty

Harken warrants that each Harken product, when properly used and maintained, will be free from defects in material and workmanship from the date of receipt of the product by the final customer. Harken products are covered by two different kinds of warranties, on the basis of the purchaser and use made of them.

For complete warranty or for information relating to a specific warranty concern, please refer to the following:

Harken Catalog, [www.harken.com/manuals](http://www.harken.com/manuals)  
Call or Email the Nearest Harken Distributor or  
Harken Corporate Headquarters (Telephone/Email Addresses Below)

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