

OXWELD® HYDRAULIC BACK-PRESSURE VALVES

H-2, H-4 AND H-9 ACETYLENE
H-18 AND H-19 OTHER FUEL GASES

! CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for oxy-fuel gas equipment, we urge you to read our booklet "Precautions and Safe Practices for Welding, Cutting and Heating", Form 2035. Do not permit untrained persons to operate this equipment. Do NOT attempt to operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information.

The hydraulic back-pressure valves covered by these instructions are listed by Underwriter's Laboratories only when using parts manufactured to ESAB Welding & Cutting Products specifications on file with Underwriter's Laboratories, Inc., and when they are used in the gas service for which they are designed and listed. The use of other parts voids the manufacturer's warranty.

SPECIFICATIONS

Hydraulic Back-Pressure		Relief Valve	Liquid Capacity	Maximum Recommended Gas Flow Rate Capacity @ Various Inlet Pressures in Cubic Feet Per Hour (m ³ /hrs.)							
				3 psi 0.21 bars	5 psi 0.35 bars	10 psi 0.69 bars	15 psi 1.04 bars	25 psi 1.73 bars	50 psi 3.45 bars	75 psi 5.18 bars	100 psi 6.90 bars
Valve Model	Part No.										
For Acetylene											
H-2	04B13	RV-28	7.1 pints (3.4 liters)	300 (8.5)	350 (10)	400 (11.3)	500 (14.2)	-	-	-	-
H-4	04B84	RV-28	19.8 pints (9.4 liters)	600 (17)	700 (19.8)	800 (22.7)	1000 (28.3)	-	-	-	-
H-9	03P78	RV-28		1800 (51)	2000 (56.6)	2500 (70.8)	3000 (85)	-	-	-	-
For Fuel Gases other than Acetylene											
H-18	12P02	RV-28		600 (17)	700 (19.8)	800 (22.7)	1000 (28.3)	-	-	-	-
H-19	11P99	RV-28	19.8 pints (9.4 liters)	1800 (51)	2000 (56.6)	2500 (70.8)	3000 (85)	-	-	-	-
H-18	09P68	22X56		600 (17)	700 (19.8)	800 (22.7)	1000 (28.3)	1400 (39.6)	2200 (62.3)	3100 (87.8)	3900 (110)
H-19	09P69	22X56		1800 (51)	2000 (56.6)	2500 (70.8)	3000 (85)	4000 (113)	6500 (184)	9000 (255)	11500 (326)

NOTES:

1. The pressure drop through the hydraulic back pressure valves will vary between 0.5 and 1.0 p sig at maximum flow rate capacity, the actual pressure drop depending upon the type of fuel gas and the inlet pressure.
2. Flow rates given for 25 through 100 psi may tend to draw liquid from the seal. Check input level frequently when operating at these pressure or with high flow rates.

Be sure this information reaches the operator.
You can get extra copies through your supplier.



ESAB Welding &
Cutting Products

INTRODUCTION

These hydraulic back-pressure valves are for use on medium-pressure piping systems between the main supply line and the branch service lines. These valves should not be used as station hydraulic valves. Detonation pressure wave fronts resulting from a backfire at this point may be too severe to be stopped by a branch line type hydraulic valve.

For use with acetylene there are three different sizes: H-2 with a flow capacity of 500 cfh (14m³/h), H-4 with a flow capacity of 1000 cfh (28 m³/h) and H-9 with a capacity of 3000 cfh (85 m³/h). Except for the size of the hydraulic tanks and outlet piping (see Fig. 1) these two are identical.

For use with fuel gases other than acetylene there are also two different sizes: the H-18 with capacity of 1000 cfh (28 m³/h) and the H-19 with capacity of 3000 cfh (85 m³/h). Except for the different nameplates the H-18 and H-19 are identical to the H-4 and H-9 respectively . All

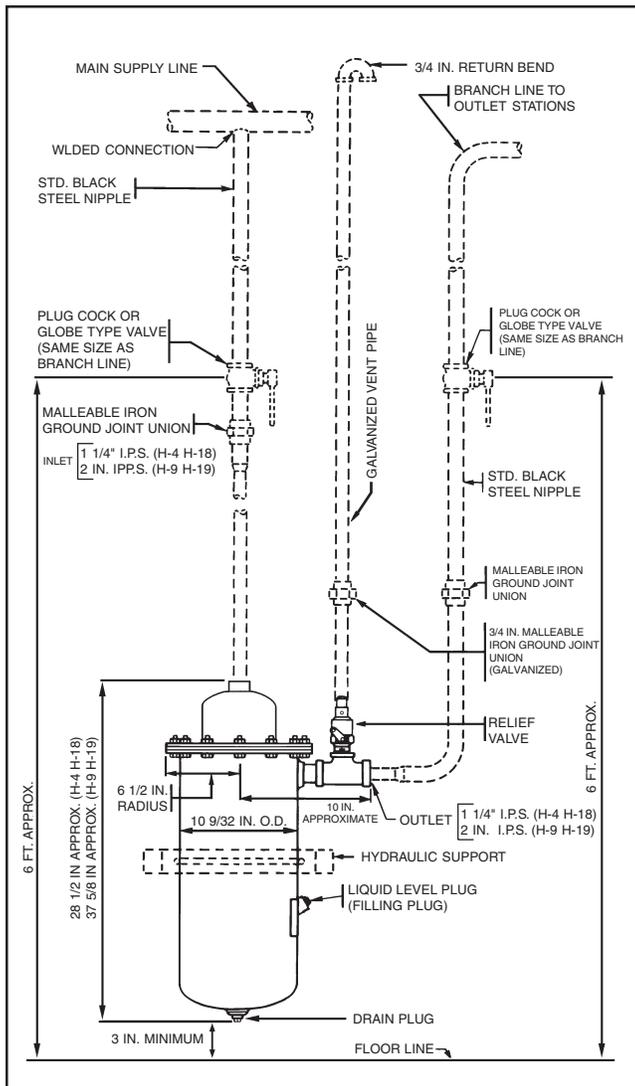


Fig. 1 - Installation Drawing
(parts shown in solid outline furnished with the equipment).

but two of these hydraulics are equipped with RV-28 relief valves which are set to relieve at 20 psi (1.4 bars). However, since fuel gases such as hydrogen, propane and natural gas are sometimes used at pressures in excess of 20 psi, there is an H-18 (Part No. 09P68) and H-19 (Part No. 09P69) equipped with relief valve Part No. 22X56 which is set to relieve at 125 psi (8.6 bar).

IMPORTANT!! In addition to this booklet (9528), you will find with your hydraulic another booklet, "Cold Weather Care of Acetylene Generating and Distributing Equipment" (F-3088). Although it deals primarily with the installation and maintenance of acetylene equipment the information also applies to fuel gases other than acetylene. You are urged to read it carefully before attempting to install your hydraulic.

II. PIPING AND FITTINGS

A. Piping

The size of the supply line piping from the manifold (or acetylene generator) and the size of the branch line to the service stations should be calculated for the operating flow leads and length of piping required. Consult your ESAB representative for advice on this matter.

B. Valves, Union, and Connections

Valves, unions, and connection nipples on both the inlet and outlet sides of the hydraulic should be the same pipe size as the branch service line. Swage or bush from this size to fit the inlet and outlet connections (3/4-in. on the H-2, 1-1/4-in. on the H-4 and H-18, 2-in. on the H-9 and H-19).

C. Vent Pipe

This pipe must be galvanized and have galvanized fittings. It must be at least 3/4-in. in diameter. It should be connected to the outlet on the side of the relief valve with a 3/4-in. street elbow. It must be run separately to out of doors and must be connected to vent pipes from any other hydraulic. It should terminate outside the building not less than 12-ft. above the ground, remote from windows or openings in the building and as far as possible from flues or chimneys. Its end must be fitted with a return bend or elbow opening downward, preferably screened to prevent obstruction. The vent pipe must be installed without low points where moisture can collect.

III. INSTALLATION

IMPORTANT: Before the hydraulic is connected to a service line that has previously contained fuel gas, the service line must first be completely shut off from the source of fuel gas, vented, and then purged of all traces of fuel gas. Only carbon dioxide or nitrogen should be used for purging.

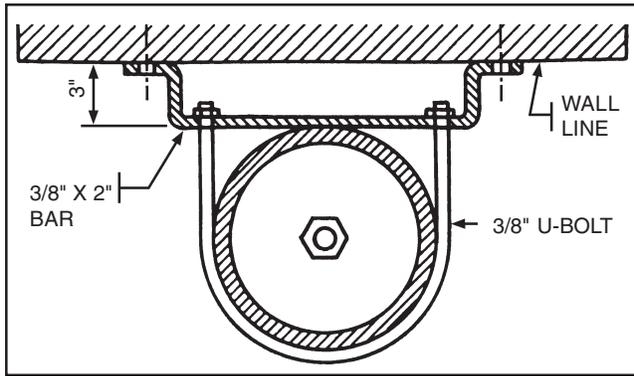


Fig. 2 - The sketch above shows the detail of the hydraulic support and the method of installing it. Note that about 2 or 3 inches clearance between the hydraulic and the wall or supporting structure should be provided.

1. Install the hydraulic in a true vertical position with the shut-off valves and union connections shown in Fig. 1. Fit the connection nipples accurately so that the union joints can be made up without straining the connection joints at the hydraulic.
2. Support the hydraulic from a wall, building column, or other rigid structure by means of a U-bolt or band clamp placed around the lower chamber of the hydraulic. Use a spacer block or bracket to allow 2 or 3 inches clearance between the hydraulic and the wall or supporting structure.
3. Remove the liquid-level plug and fill through this opening to the indicated level. NOTE: For instructions as to the correct liquid to use, see the paragraph, "Preferred Solutions for Filling" below.
4. After installing the hydraulic, leak test all joints at a pressure of 20 psi with soapy water. The joints to be tested include all joints of the hydraulic itself and all joints made in fitting up and connecting the assembly to the fuel gas service lines. On new piping systems, the test should be applied with compressed air or nitrogen before fuel gas is introduced into the system. Nitrogen only should be used if the hydraulic was installed in piping previously in use for fuel gas service. **Never test for leaks with an open flame.**

If the test pressure causes the relief valve to vent enough to reduce the test pressure, release the pressure, remove the vent pipe connection, and plug the relief valve outlet until the test has been completed.

IV. OPERATION

1. **To Admit Fuel Gas to the Hydraulic Back-Pressure Valve and to the Branch Line**, open the shut-off valves at the hydraulic inlet and at the hydraulic outlet. **TO SHUT OFF THE HYDRAULIC BACK-PRESSURE VALVE, CLOSE BOTH SHUT -OFF VALVES.**

2. **To Fill the Hydraulic Back-Pressure Valve or to Check the Liquid Level**, close both the inlet and outlet shut-off valves. Operate the relief valve to relieve any pressure in the hydraulic through the vent pipe. Remove the liquid-level plug and fill to the indicated level. Replace the liquid-level plug. Open the shut-off valves.
3. **The Liquid Level Should Be Checked Regularly**, and the correct liquid level maintained at all times. The frequency with which the level should be checked depends upon the conditions of service and the liquid used in the hydraulic.
4. **Preferred Solutions for Filling** - These hydraulics have a liquid capacity of 19.8 pints. The H-4 and H-9 may be used with "wet" gas from an acetylene generator or with "dry" gas from acetylene or piped natural gas. The preferred filling solution for each situation is fully described in the booklet "Cold Weather Care of Acetylene Generating Equipment", packed with each hydraulic. These instructions apply equally to all types of fuel gases.
5. **If a Flashback Should Occur**, check the liquid level before resuming service, making sure that the liquid is at the correct level, and refill if necessary.

V. MAINTENANCE

Before making any adjustments or repairs on the hydraulic, close the shutoff valves at the hydraulic inlet and outlet. Relieve the pressure in the hydraulic by venting it through relief valve.

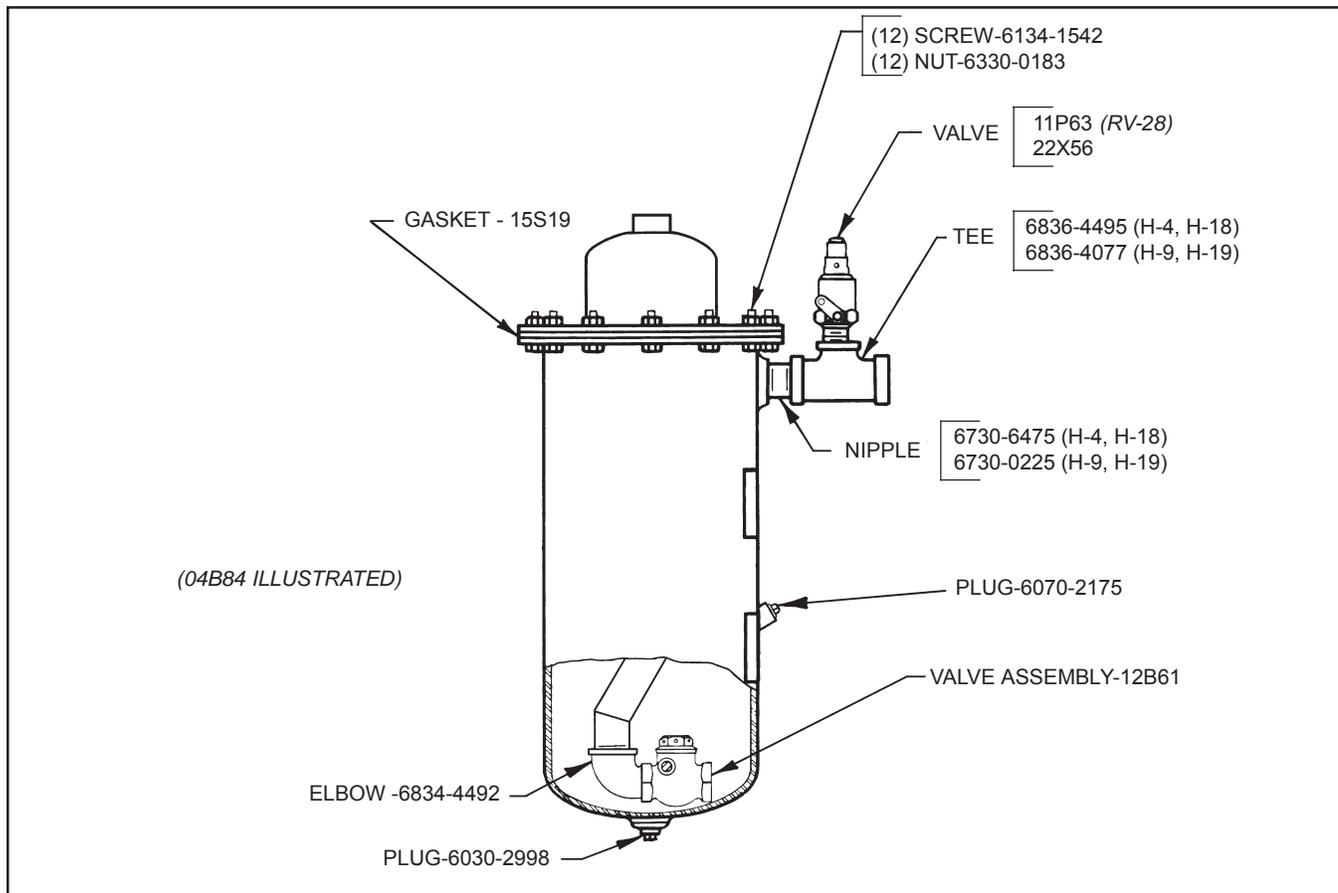
No repairs should be made to the hydraulic back-pressure valve proper except those which can be made by simple replacement of parts. Only standard parts as listed should be replaced. If any other parts require replacement, contact your ESAB representative.

1. **To Drain the Hydraulic**, remove the drain plug at the bottom of the hydraulic.
2. **Clean and Inspect the Swing-Check Valve at Regular Intervals.** When necessary, replace the valve. To disassemble the hydraulic for such an inspection or replacement, make sure that the shut-off valves at the hydraulic inlet and outlet are closed. Then disconnect the unions in the vent pipe and in the outlet connection. Remove the hex nut and bolts that hold the cover plate and gasket to the hydraulic shell. The shell can then be lowered away from the inlet pipe, exposing the swing-check valve. Manually operate the swing-check valve to see that it opens and closes freely. If necessary, wipe the valve out with a clean cloth.

3. **Open the Relief Valve Regularly** at least once a week by lifting the relief valve operating lever for an instant to permit gas to escape through the vent pipe. This guards against sticking of the valve.

NOTE: Relief valve, Part No. 22X56 is used in place of RV-29. The two valves are similar in function, but Part No. 22X56 is preset to 125 PSI and is not adjustable.

4. **Clean and Inspect the Relief Valve Regularly.**



Hydraulic Back-Pressure Valve Assembly:

H-2 Part No. 04B13
H-4 Part No. 04B84
H-9 Part No. 03P78

H-18 (RV-28) Part No. 12P02
H-18 (22X56) Part No. 09P68

H-19 (RV-28) Part No. 11P99
H-19 (22X56) Part No. 09P69

HARDWARE

Part No.	Description
6030-2998	1/2" Square Head Cast Iron Pipe Plug, Galvanized
6134-1542	1/2" — 13 x 1-1/2" Lg. Hex Head Steel Cap Screw (Cad. Pl.)
6330-0183	1/2" — 13 Hex Steel Nut (Cad. Pl.)
6730-6475	1-1/4" Short Steel Pipe Nipple, Galvanized
6836-4495	1-1/4" x 1-1/4" x 3/4" Std. Mall. Iron Banded Reducing Tee, Galvanized
6836-4077	2" x 2" x 3/4" Std. Mall. Iron Banded Reducing Tee, Galvanized
6834-4492	1-1/4" x 1" x 90° Galvanized Std. Banded Reducing Street Elbow

NOTE:

H-4, H-9, H-18, and H-19 hydraulic back-pressure valves manufactured before 1987 have a surge tank mounted to the top of the back-pressure valve tank. Units made after 1987 do not have this tank.



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