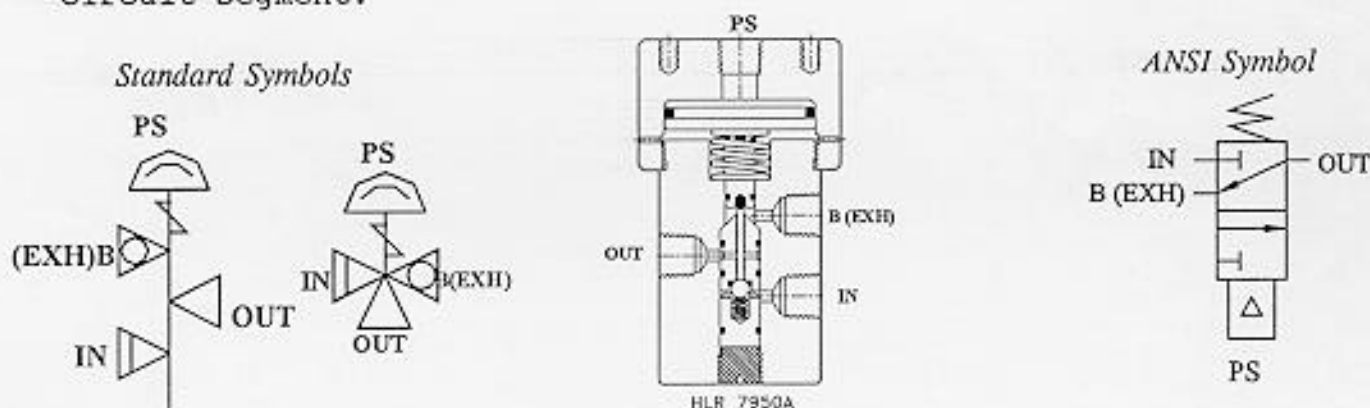


## HYDRAULIC VALVE - HLR 7950A

*Designed* for three way Normally Closed "Block & Bleed", control circuit operation of Surface Controlled Sub-Surface Safety Valves (SCSSV). The assembly is a two position, three way Normally Closed, Pilot Supply pressure operated, automatic reset (spring return), 10,000 PSI, flow control valve. Each On/Off application of Pilot Supply pressure will automatically shift the internal component's placement. Applying Pilot Supply would automatically pressurize the receiving hydraulic control circuit, for normal operation. The subsequent loss of Pilot Supply pressure re-establishes the original Outlet to Exhaust flow path.

*Special Features:* The valve's Upper Seat has dual sealing surfaces. Once the original seal surface becomes worn, the Upper Seat is simply reinstalled with its second side (new) seal surface positioned for usage. The HLR 7950A also has a Ball/Check assembly that instantly seals the valve's Inlet upon Pilot Supply pressure loss.

*Reason To Use:* Three way Normally Closed, "Block & Bleed" hydraulic valve models are generally selected to control the open/close sequence of an individual Surface Controlled Sub-Surface Safety Valve. In multi well applications, other hydraulic valves in parallel operated control circuits are unaffected by the loss of operating pressure in one control circuit segment.



### Characteristics

1. Dimensions: 2.500" Dia. X 4.250"L.
2. Working Pressure:  
Control Ports - up to 10,000 PSI.  
\*Pilot Supply - 250 PSI Max.
3. Connections: 1/4"-18 N.P.T.
4. Material: 316 Stainless Steel
5. Seals: Viton
6. Weight: 4.3 Lb.

**Mounting Details:** Two (2) 1/4"-20 NC Bolt Holes on a 1.750 Inch Bolt Hole Circle.

\* See Chart for Minimum Pilot Supply Operating Pressure and correlated Hydraulic Fluid Pressure applied at Inlet for details.

# **HYDRAULIC VALVE**

## **HLR 7950A**

### **INTRODUCTION**

The HLR 7950A is a two position, three way **Normally Closed**, pneumatic Pilot Supply operated, flow control valve. These valves utilize the application of relatively low pressure pneumatic, Pilot Supply to control high pressure, hydraulic fluid flow within the valve body. It is designed to block the Inlet and exhaust accumulated Outlet pressure, whenever the Pilot Supply pressure decreases below the minimum operating pressure.

Hydraulic control valves are also known as "**Interface**" valves. They are normally utilized to operate (open/close) Surface Controlled Subsurface Safety Valves (SCSSV) in conjunction with a Wellhead Safety System, control circuit. The SCSSV is a Normally Closed, Safety valve, commonly referred to as a "Downhole Ball Valve". It is closed-to-flow during Emergency Shut-In (ESD) operations.

Connections on a HLR 7950 Series Hydraulic Valve and assumed control functions are detailed as follows:

#### **Connection - Assumed Control Function**

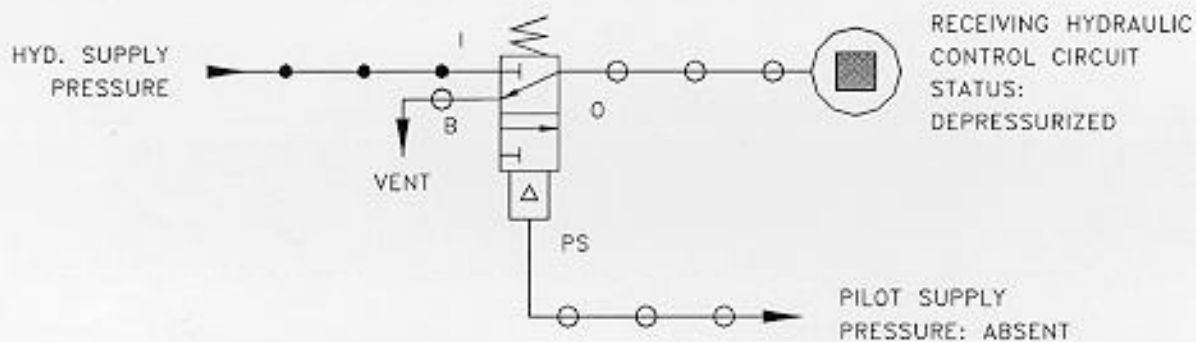
- I (Inlet) - Normally Closed port** (High Pressure, Hydraulic Fluid Operating Supply Inlet)
- O (Outlet) - Common port** (Output to pressurize receiving control circuit)
- B (Exhaust) - Normally Open port** (Exhaust Pressure - Return to Reservoir)
- PS (Pilot Supply) - Operating (On/Off) Pilot Supply Pressure port**

### **SHELF (UNACTUATED) POSITION**

The HLR 7950A Hydraulic Valve is configured for three-way Normally Closed, "Block & Bleed", flow control service. Therefore, in its shelf or unactuated placement, high pressure hydraulic fluid (instrument supply) is prevented from entry into the valve body. The Hydraulic Valve uses a Ball/Check assembly to maintain a sealed inlet during its Shelf placement. High pressure hydraulic fluid exerts force against the Ball to secure its placement against an O-Ring seal. A small internal Spring maintains the Ball in its proper position.

An open-to-flow path exist between the Outlet (O) and Bleed (Exhaust) ports in the unactuated status. The Upper Seat is lifted off of the Lower Seat to maintain the present internal flow path. A large Spring within the Piston Housing section, is decompressed, thus keeping the Piston lifted off of the Upper Seat. This Shelf or unactuated (Out-of-Service) status or component placement as described, will be maintained until operating, hydraulic Pilot Supply pressure is applied to the Pilot Supply port.

An instructional schematic (provided on Page 2), further illustrates the flow paths established for the unactuated or a shelf position.



HYDRAULIC VALVE STATUS: UNACTUATED (SHELF)

As shown, an internal flow path exist between the Outlet and Exhaust ports. The receiving control circuit downstream of the Hydraulic Valve's Outlet port is **depressurized**.

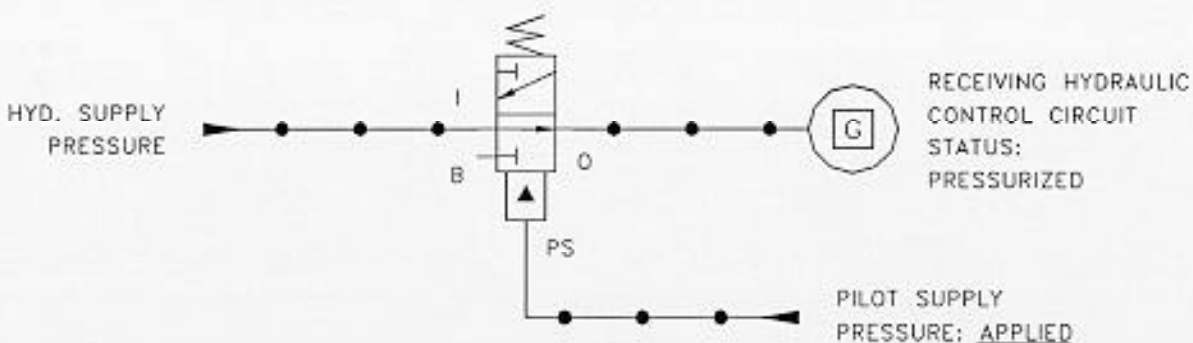
### **ACTUATED (IN-SERVICE) POSITION**

The application of operating Pilot Supply pressure, automatically establishes an internal open-to-flow path between the Inlet (I) and Outlet (O) flow control ports. This is accomplished as Pilot Supply pressure is exerted upon the Piston, to force it against the Upper Seat. The Upper Seat in turn, moves the Pin to dislodge the Ball off its Lower Seat sealing area. A closed-to-flow path is formed by the Upper Seat as it is secured against the Lower Seat. The Bleed (Exhaust) port is blocked to internal or through flow, as it is isolated from the Outlet port.

*Note: The Upper Seat has dual (two) sealing areas or surfaces. Once one seal surface becomes worn, the second, new seal surface is simply inserted for use next.*

The continuous application of operating Pilot Supply pressure, will maintain pressurized hydraulic fluid communication between the valve's Inlet and Outlet ports. In this manner, the SCSSV becomes open-to-flow, since it is receiving high pressure, operating hydraulic fluid for normal operation.

An instructional schematic is provided next, to depict the **actuated (In-Service or Normal Operating)** status of the Hydraulic Valve.



HYDRAULIC VALVE STATUS: ACTUATED (IN-SERVICE) POSITION

A loss or significant decrease of the operating Pilot Supply pressure, will shift the internal components back to the original unactuated or shelf position. Pilot Supply pressure loss to the Hydraulic Valve, is generally the result of a fault monitoring device's control response to an abnormal process condition or fault detection. The facilities operator can also manually initiate an Emergency Shutdown or Safety Valve Closure, in response to a developing emergency situation.

The Inlet port will become isolated or blocked to incoming flow upon loss of operating Pilot Supply pressure. The original Outlet to Exhaust flow path will be re-established. A return to the shelf or unactuated position is denoted by the receiving control circuit's depressurization. Hydraulic fluid from the receiving control circuit is directed to a vented or atmospheric pressure reservoir. A loss of operating hydraulic pressure to the receiving Safety Valve, results in its closure.

## **INSTALLATION**

**WARNING:** The user of HLR Controls, Inc. products must conform to all applicable Mechanical, Piping and other established National Codes in the installation and operation of control valves.

**Do not attempt to install or operate these devices, without proper training in the technique of working on pneumatic, fluid power control systems and other devices.**

Prior to the installation of the HLR 7950 Series Hydraulic Relay, it is recommended that the 1/4" N.P.T. male threads of the Tubing Connections, be carefully Teflon taped. It is also recommended that a light coat of "Swak" (Anaerobic Pipe Thread Sealant with TFE) be applied on the pipe threads of the Stainless Steel components. The Teflon Tape and special Thread Sealant will provide an excellent pressure seal and prevent "galling" or seizure.

## **MAINTENANCE**

The HLR 7950 Series Hydraulic Valves are designed for a service life of over twenty years. Seals used within the control have a shelf life of ten years. These seals are off-the-shelf items, available from sources found worldwide.

Scheduled maintenance is dependent upon the severity, frequency of use and cleanliness of the hydraulic fluid source. Client guidelines established for preventive maintenance and safety system testing, should be followed.

Should the control fail to perform satisfactorily after several years in service, an internal inspection is required.

**CAUTION: BEFORE PROCEEDING WITH THE DISASSEMBLY OF ANY HLR CONTROLS, INC. PRODUCT, STRICT ADHERENCE TO YOUR FACILITIES ESTABLISHED SAFETY PROCEDURE FOR ISOLATING, TESTING OR EXHAUSTING PRESSURE FROM A CONTROL SYSTEM OR DEVICE IS REQUIRED.**



**MEDIA CONTROL SYSTEMS CONTAIN HIGH LEVELS OF STORED ENERGY. DO NOT ATTEMPT TO CONNECT, DISCONNECT OR REPAIR THESE PRODUCTS WHENEVER A SYSTEM IS PRESSURIZED.**

**NOTE: ALWAYS EXHAUST THE PRESSURE FROM THE SYSTEM BEFORE PERFORMING ANY SERVICE WORK. FAILURE TO DO SO CAN RESULT IN SERIOUS PERSONAL INJURY.**

Once the hydraulic control system is properly isolated and depressurized, the valve can be disassembled. The piston assembly and internal bores should be thoroughly cleaned. All seals should be replaced whenever the control is disassembled for maintenance purposes.

A lubricant such as **Dow Corning Molykote 33**, is recommended for maximum seal lubrication efficiency. Care should be taken to lubricate the Seals and internal bores lightly.

Reassemble the control and function test according to established facility test procedures and control circuit requirements.

**REPAIR KIT ITEMS**  
(SPARE PARTS LIST)

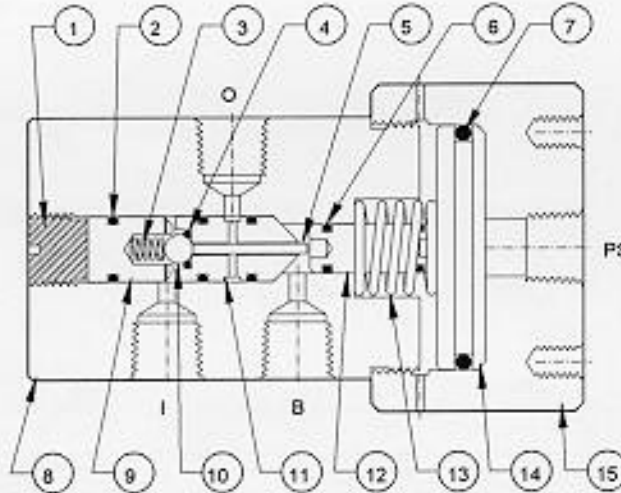
PART NAME	PART NUMBER	MATERIAL	QTY
O-Ring	AS-008A80	Aflas	1
O-Ring	AS-010V75	Viton	2
O-Ring	AS-012V95	Viton	3
O-Ring	AS-223V75	Viton	1
Upper Seat	7895A	316SS	1
Lower Seat	7897B	316SS	1
Pin	.078X.875	316SS	1
Spring	.210X.375X22	316SS	1

**NOTE:** Use our Order Number: **HLR 7950A-RK** for a complete Repair Kit, whenever it is necessary to replace all of the Seals and items listed above.

## HYDRAULIC VALVE - HLR 7950A

The HLR 7950A is a two position, three way Normally Closed, pilot supply pressure operated, spring return, hydraulic flow control valve. These Hydraulic Valves are generally used to operate Surface Controlled Sub-Surface Safety Valves (SCSSV).

The application of Pilot Supply pressure automatically shifts the internal component's placement to achieve an Inlet to Outlet flow path. In this manner, the receiving hydraulic control circuit is pressurized for normal operation. The subsequent loss of Pilot Supply pressure reestablishes the original Outlet to Exhaust flow path.



### BILL OF MATERIAL

ITEM	PART NAME	PART NUMBER	MATERIAL
1.	Screw	7954	316SS
2.	O-Ring (3)	AS-012V95	Viton
3.	Spring	.210X.375X22	316SS
4.	O-Ring	AS-008A80	AFLAS
5.	Pin	.078X.875	316SS
6.	O-Ring (2)	AS-010V75	Viton
7.	O-Ring	AS-223V75	Viton
8.	Body	7953	316SS
9.	Seal	7898A	316SS
10.	Ball	7/32 TC	Tungsten Carbide
11.	Lower Seat	7897B	316SS
12.	Upper Seat	7895A	316SS
13.	Spring	.72X1X35	302SS
14.	Piston	7952	316SS
15.	Cap	7951	316SS

### FEATURES

1. Dimensions: 2.500" Dia. X 4.250" L.
2. Working Pressure: Pilot Supply - Recommended 100 PSI  
250 PSI Max.  
Hydraulic Supply - 10,000 PSI Max.
3. Connections: 1/4" - 18 NPT.
4. Weight: 4.3 lbs.
5. Bolt Holes: 2 Places - 1/4"-20NC on 1 3/4" bolt hole
6. Upper Seat: Item #12 has dual sealing surfaces.

# INSTRUCTIONAL SCHEMATIC

## ANSI Symbols

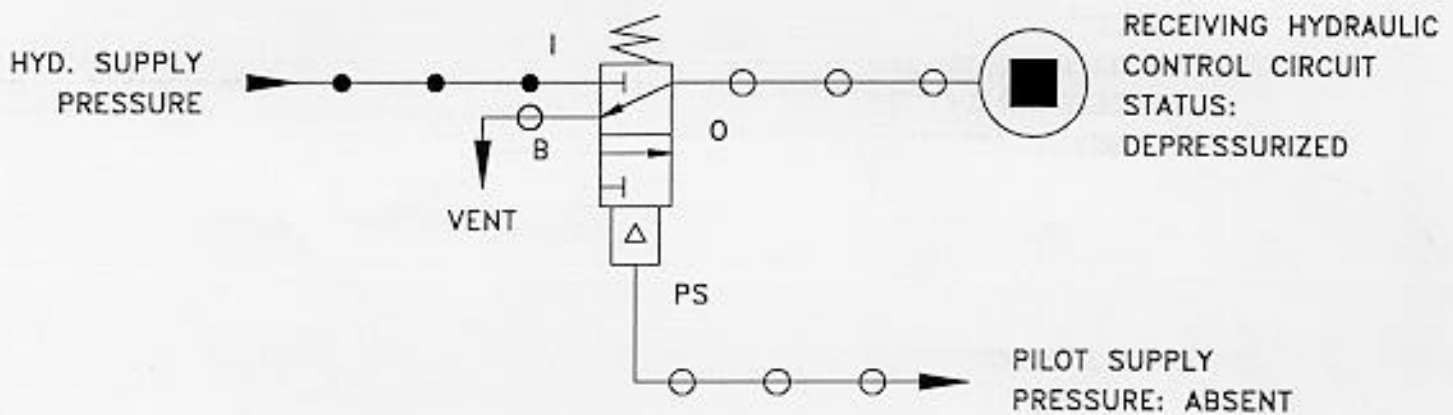
For

HLR 7950 SERIES - 3 WAY, N.C. HYD. VALVE  
10,000 PSI W.P.

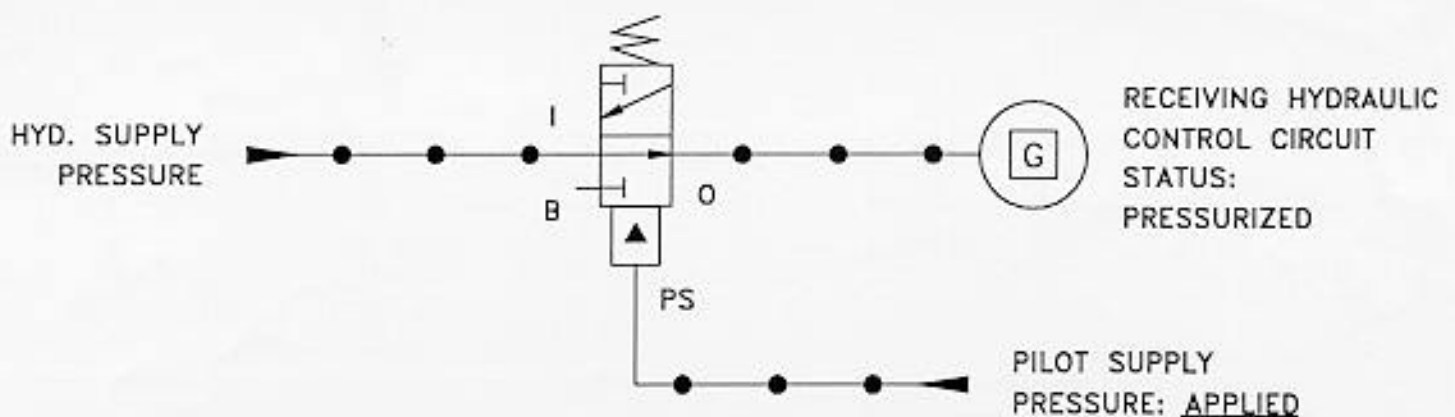
HYD. CIRCUIT APPLICATION: NORMALLY CLOSED

### CONNECTION - FUNCTION ASSUMED

- I - HYD. SUPPLY INLET
- O - OUTLET TO ACTUATOR
- B - EXHAUST TO HYD. RETURN
- PS - PILOT SUPPLY



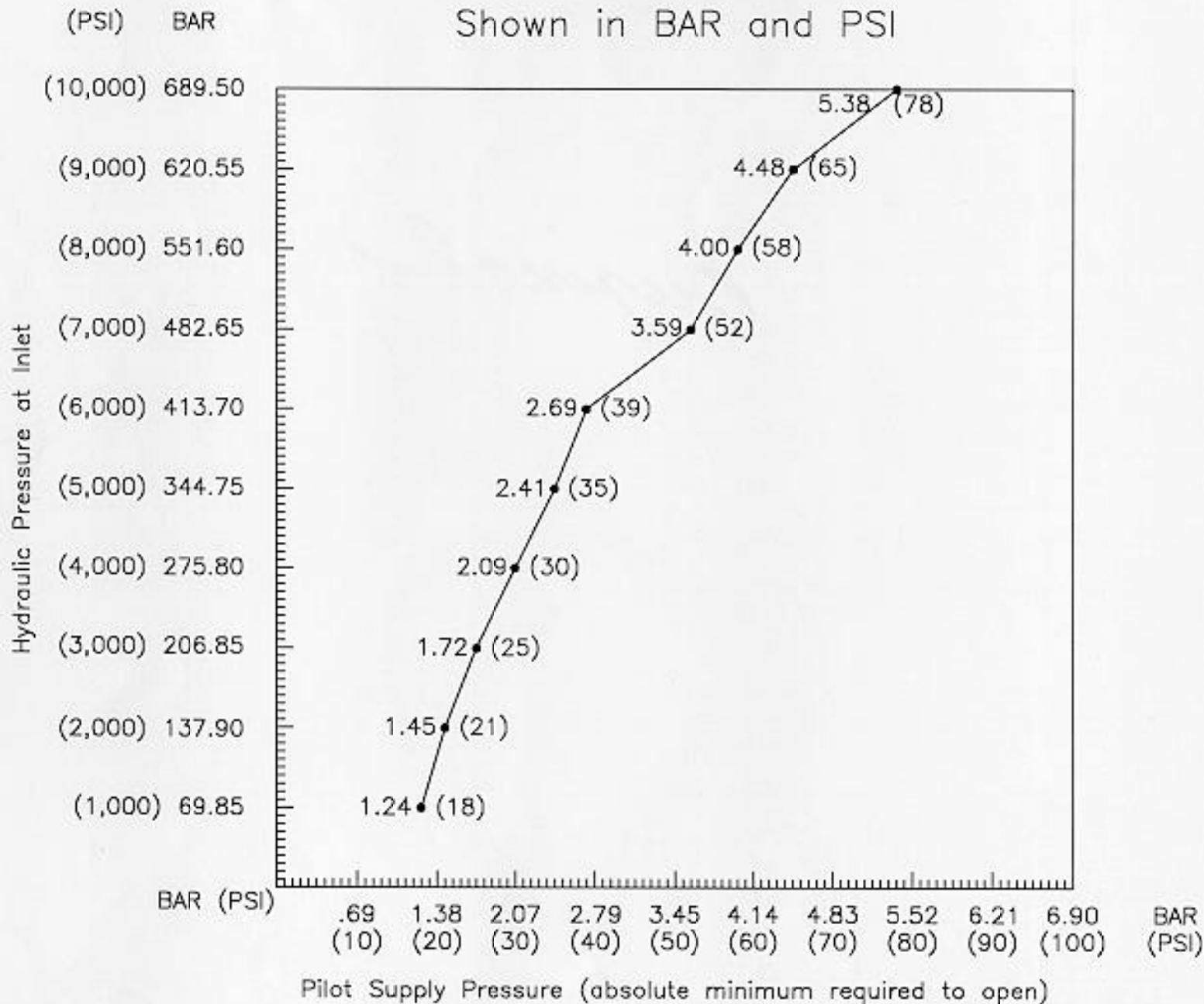
HYDRAULIC VALVE STATUS: UNACTUATED (SHELF)



HYDRAULIC VALVE STATUS: ACTUATED (IN-SERVICE) POSITION

# Inlet Hydraulic Fluid/Pilot Supply Pressure Pressure Chart

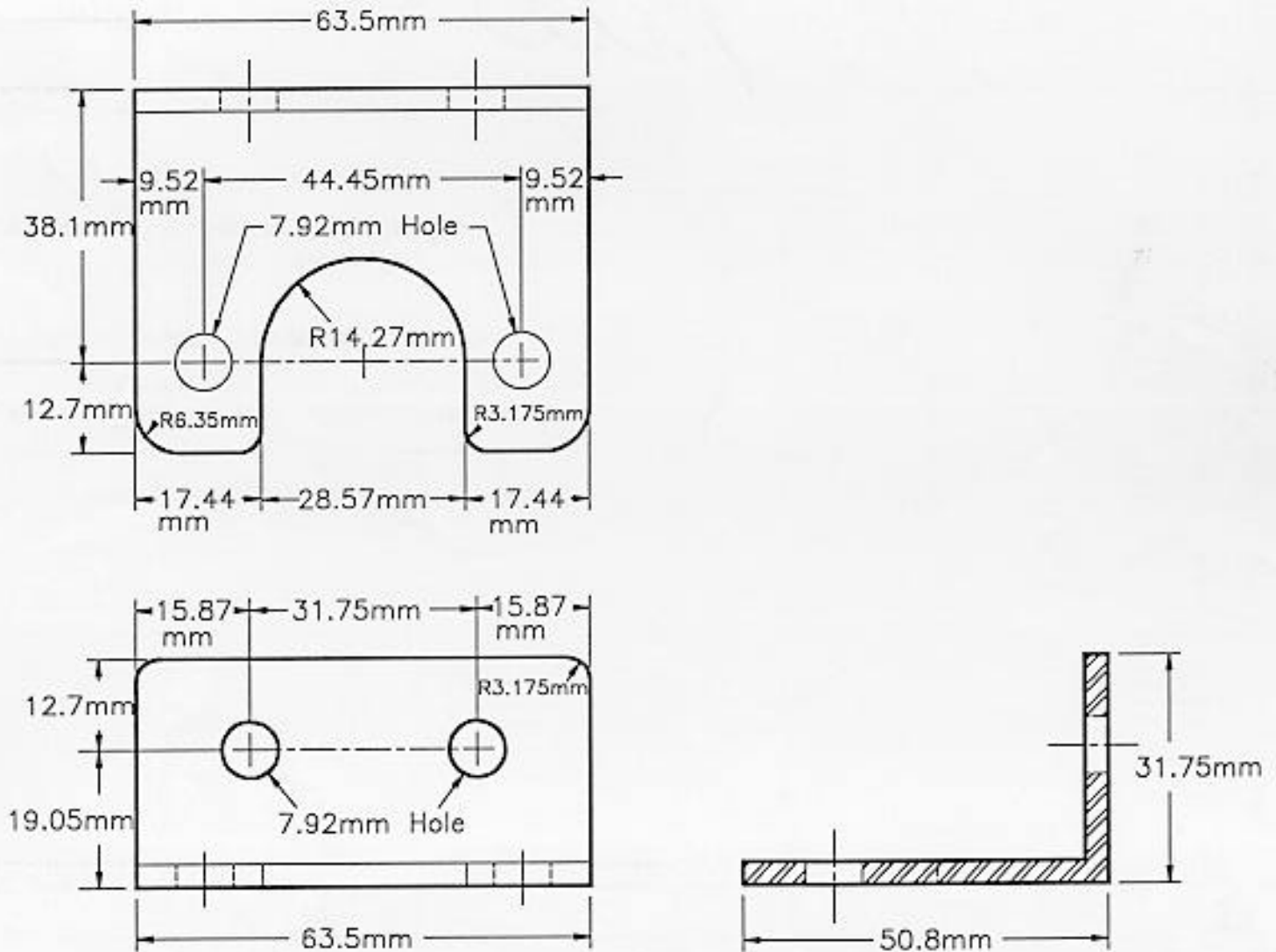
Shown in BAR and PSI





# SUPPORT BRACKET FOR HLR HYDRAULIC VALVES

Suggested for use whenever Valves are mounted within the Control Panel



PART NUMBER - HLR 25HVB

Material: 12 GA.(3.175mm Thickness) 316SS

File: 12-35 6-17-93

NOTE: All Dimensions in Millimeters