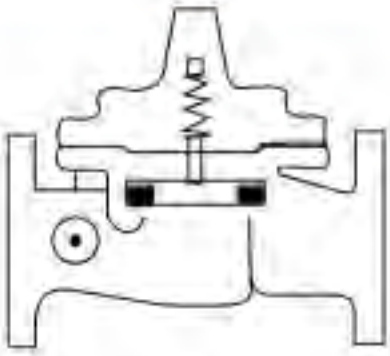
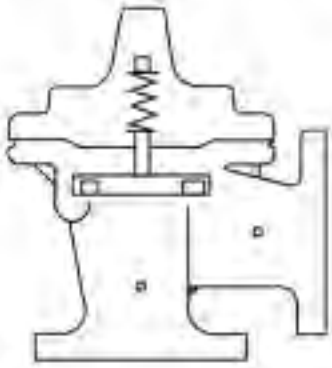
CLA-VAL
AUTOMATIC CONTROL VALVES

790-01

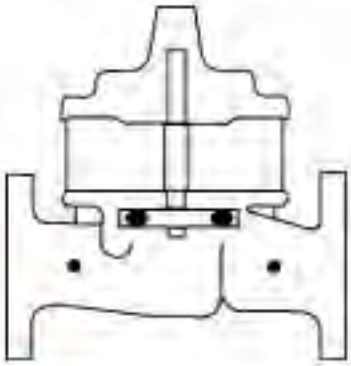
Please fill in manual with personal responsible for maintenance of this valve



INSTALLATION



OPERATION



MAINTENANCE

CVCL 1 (2) 3 4 DIST. CODE 002 SHEET 1 OF 2

CLA-VAL CO.

NEWPORT BEACH, CALIFORNIA

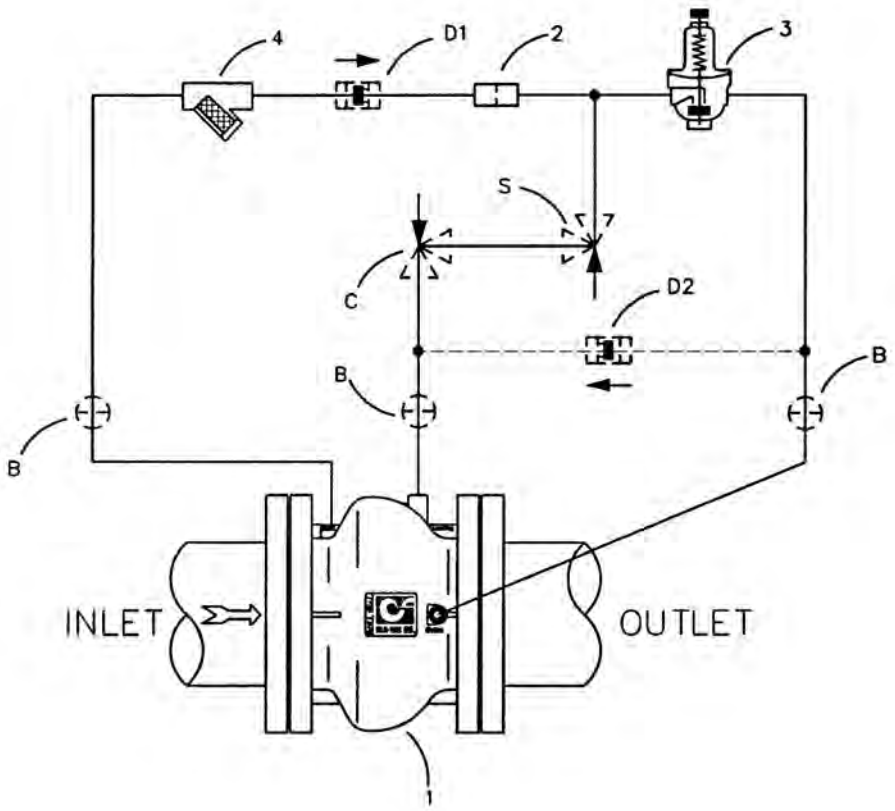
CATALOG NO.	DRAWING NO.	REV.
790-01	29301	A

TYPE OF VALVE AND MAIN FEATURES

PRESSURE REDUCING VALVE

DESIGN		
DRAWN	AK	02-12-98
CHK'D	CE	02-16-98
APV'D	EK	02-16-98

— — — — NOT FURNISHED BY CLA-VAL CO. ------ OPTIONAL FEATURES



ITEM NO.	BASIC COMPONENTS	QTY
1	100-42 ROLL SEAL MAIN VALVE	1
2	X58C RESTRICTION FITTING	1
3	CRD PRESSURE REDUCING CONTROL	1
4	X43 "Y" STRAINER	1

OPTIONAL FEATURE SUFFIX	ADDED TO CATALOG NUMBER	
B	CK2 COCK (ISOLATION VALVE)	3
C	CV FLOW CONTROL (CLOSING)	1
D	CHECK VALVES	1
S	CV FLOW CONTROL (OPENING)	1

CAD REVISION RECORD - DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
-	RELEASED FOR PRODUCTION. (NED 42984)	AK	02-12-98
A	UPDATED CHECK FEATURE CONNECTION. (ECO 17503)	PLF	1-22-99
	& REMOVED D3 IN THE CHECK CIRCUIT (ECO 17524)	AK	02-05-99

CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

CATALOG NO.	DRAWING NO.	REV.
790-01	29301	A

TYPE OF VALVE AND MAIN FEATURES

PRESSURE REDUCING VALVE

DESIGN		
DRAWN	AK	2-12-98
CHK'D	CE	02-16-98
APV'D	EK	02-16-98

CAD REVISION RECORD - DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
	SEE SHEET 1		

OPERATING DATA

I. PRESSURE REDUCING FEATURE:

PRESSURE REDUCING CONTROL (3) IS A NORMALLY OPEN CONTROL THAT SENSES MAIN VALVE OUTLET PRESSURE CHANGES. AN INCREASE IN OUTLET PRESSURE TENDS TO CLOSE CONTROL (3) AND A DECREASE IN OUTLET PRESSURE TENDS TO OPEN CONTROL (3). THIS CAUSES MAIN VALVE LOADING CHAMBER PRESSURE TO VARY AND THE MAIN VALVE MODULATES (OPENS AND CLOSES) MAINTAINING A RELATIVELY CONSTANT OUTLET PRESSURE. PRESSURE REDUCING CONTROL (3) ADJUSTMENT: TURN THE ADJUSTING SCREW CLOCKWISE TO INCREASE THE SETTING.

II. OPTIONAL FEATURE OPERATING DATA:

SUFFIX B (ISOLATION VALVES)
CK2 COCKS (B) ARE USED TO ISOLATE THE PILOT SYSTEM FROM MAIN LINE PRESSURE. THESE VALVES MUST BE OPEN DURING NORMAL OPERATION.

SUFFIX C (CLOSING SPEED CONTROL)
FLOW CONTROL (C) CONTROLS THE CLOSING SPEED OF THE MAIN VALVE. TURN THE ADJUSTING STEM CLOCKWISE TO MAKE THE MAIN VALVE CLOSE SLOWER.

SUFFIX D (CHECK VALVES):
WHEN OUTLET PRESSURE IS HIGHER THAN INLET PRESSURE, CHECK VALVE (D2) OPENS AND (D1) CLOSES. THIS DIRECTS THE HIGHER OUTLET PRESSURE INTO THE MAIN VALVE LOADING CHAMBER AND THE MAIN VALVE CLOSES.

SUFFIX S (OPENING SPEED CONTROL)
FLOW CONTROL (S) CONTROLS THE OPENING SPEED OF THE MAIN VALVE. TURN THE ADJUSTING STEM CLOCKWISE TO MAKE THE MAIN VALVE OPEN SLOWER.

III. CHECK LIST FOR PROPER OPERATION:

( ) SYSTEM VALVES OPEN UPSTREAM AND DOWNSTREAM.
( ) AIR REMOVED FROM THE MAIN VALVE LOADING CHAMBER AND PILOT SYSTEM AT ALL HIGH POINTS.
( ) CK2 COCKS (B) OPEN (OPTIONAL FEATURE).
( ) PERIODIC CLEANING OF STRAINER (4) IS RECOMMENDED.
( ) CV FLOW (C) AND (S) OPEN AT LEAST 1/4 TURN (OPTIONAL FEATURE).

CLA-VAL®

— MODEL — **790-01**

Pressure Reducing Valve

PUB SINGAPORE

Description

The Cla-Val Model 790-01 is a hydraulically operated, pilot actuated automatic control valve for pressure reducing service. The main valve consists of only two parts: a stainless steel body, and an elastomeric liner or control element.

Pressure reducing valves are used to lower pipeline pressure to a predetermined set point. Cla-Val Model 790-01 automatically controls downstream pressure, from no flow to full open flow, without regard to changes in inlet pressure. Outlet pressure control is smooth and precise since the friction and hysteresis of the valve and pilot is negligible.

Because the valve will not chatter or slam under low flow conditions, it is not necessary to parallel Cla-Val Model 790-01 with a second smaller size control valve to obtain accurate pressure control at low flow rates. In any size, Cla-Val Model 790-01 will control pressure right down to shutoff.

Pressure reducing valves can be supplied as a combination with check valve. Control systems are fully piped at the factory and the Cla-Val Model 790-01 is shipped ready for installation.

Performance Specification

Capacity:	See Technical Data Sheet
C_f Factor:	0.9
Cavitation:	See Technical Data Sheet
Rangeability:	500:1
Bearing Friction:	No friction from slip-type bearings

Design Specification

Sizes:	2, 3, and 6 inch wafer style 6, 8, 10, and 12 inch flanged 6, 8, 10, 12 inch Victaulic® Ends
End Detail Wafer:	Fits ANSI B16.5 class 125,150, 250, and 300 flanges
End Detail Flanged:	ANSI B16.5 class 150 (fits class 125) or ANSI B16.5 class 300 (fits class 250)
End Detail Victaulic®:	Fits standard steel pipe
Operating Pressure:	720 psi maximum Victaulic® Ends - 300 psi max.
Maximum Differential:	225 psid For higher differential consult factory
Reverse Pressure:	125 psid maximum
Approvals:	PUB Listed.....Sizes 2" thru 6"
Temperature Range:	32 to 160 degrees F*
Flange Operating Pressure:	Class 125-175 psi maximum Class 150-275 psi maximum Class 250-300 psi maximum Class 300-720 psi maximum
Victaulic® Ends Rating:	300 psi maximum

*Standard natural rubber 65 durometer in water service. Temperature range depends on liner material. Higher differential pressure ratings available.

For other than standard ANSI flanges consult factory

Din drilling available on all sizes

Purchase Specification

Valve and control system shall lower line pressure to a predetermined set point and shall maintain that set point regardless of variations in flow or inlet pressure. Control valve shall be constructed of two parts: a stainless steel body, and an elastomeric liner or control element. Minimum rangeability shall be 500:1 based on capacity at flowing pressure conditions. C_f shall be greater than or equal to 0.9. Valve and control system shall be similar in all respects to Cla-Val Model 790-01 as manufactured by Cla-Val, Newport Beach, California.

Material Specification

Body:	316L Stainless Steel
Liner:	Natural Rubber, 65 durometer (standard) Viton, EPDM, Nitrile, Silicone (available)
Liner Retainer:	316 Stainless Steel

Pilot

Body:	ASTM B62 Bronze*
Spring Cover:	ASTM B62 Bronze*
Wetted Parts:	Bronze/Stainless Steel*, Buna-N®

Accessories

Shut-off Cock:	Brass*
"Y" Strainer:	Bronze*
Speed Controls:	Brass*
Check Controls:	Brass*
Control Piping:	Copper*
Control Fittings:	Brass*

*316 stainless steel available

CLA-VAL®

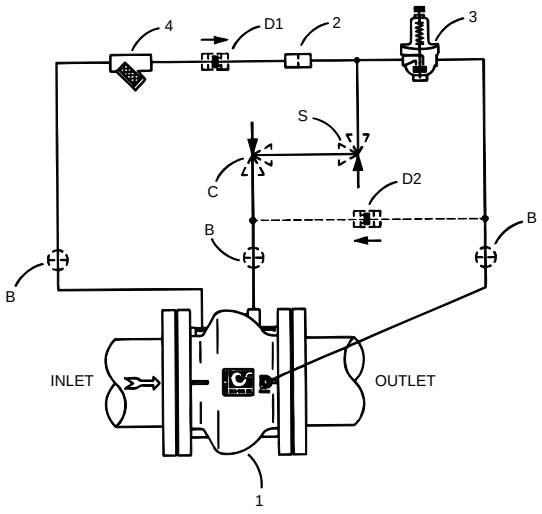
790-01 Basic Components

Item	Description
1	100-42 Roll Seal Main Valve
2	X58C Restriction Fitting
3	CRD Pressure Reducing Control
4	X43 "Y" Strainer

Optional Features

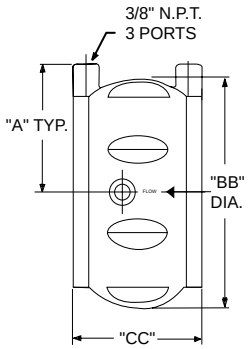
Item	Description
B	CK2 Cock (Isolation Valve)
C	CV Flow Control (Closing)*
D	Check Valves (125 psid max. reverse pressure)
S	CV Flow Control (Opening)*

* The opening & closing speed controls (optional) on this valve should always be open at least 3 turns off their seats.



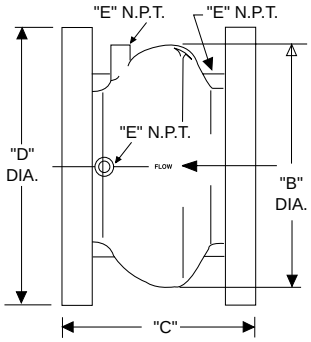
Dimensions (100-42 Main Valve)

Valve Size (Inches)	2	3	4	6	8	10	12
A	2 7/8	3 9/16	4 1/8	5 1/4	—	—	—
B	—	—	—	10 7/8	14 3/8	18	21 5/8
BB	4 3/8	5 7/8	7 3/8	9 13/16	—	—	—
C	—	—	—	9	11	13	15 1/4
CC	2 1/2	3 1/4	4	8	—	—	—
D (ANSI 150)	—	—	—	11	13 1/2	16	19
D (ANSI 300)	—	—	—	12 1/2	15	17 1/2	20 1/2
E (Ports)	—	—	—	3/8	3/8	1/2	1/2
Approx. Wt. (150 lbs.)	4	7 1/2	14	58	115	190	290
Approx. Wt. (300 lbs.)	4	7 1/2	14	87	155	250	375



2", 3", 4" and 6" Wafer Style

VALVE SIZE (mm)	50	80	100	150	200	250	300
A	73	90	105	133	-	-	-
B	-	-	-	276	365	457	549
BB	111	149	187	249	-	-	-
C	-	-	-	229	279	330	387
CC	64	83	102	202	-	-	-
D (ANSI 150)	-	-	-	279	343	406	483
D (ANSI 300)	-	-	-	318	381	445	521
E (Ports) -	-	-	10	10	13	13	
Approx. kg. (150lbs.)	1.81	3.63	6.35	30	54.43	89	151.50
Approx. kg. (150lbs.)with Studs & Nuts	2.72	4.54	10	-	-	-	-
Approx. kg. (300lbs.)	1.81	3.63	6.35	41.73	72.57	116.57	191
Approx. kg. (300LBs.)with Studs & Nuts	5	6.35	11.80	-	-	-	-



6", 8",10" and 12" Flanged Style

When Ordering Please Specify:

1. Catalog No. 790-01 2. Valve Size 3. Fluid Being Handled 4. Fluid Temperature Range 5. Inlet Pressure Range 6. Outlet Pressure Range 7. Maximum Differential Pressure 8. Minimum Differential Pressure 9. Maximum Flow Rate 10. Pilot Set Point

Distributed By:
M&M Control Service, INC.
Phone: 800-876-0036
Fax: 847-356-0747
Email: Sales@mmcontrol.com

CLA-VAL®

— SERIES — 100-42

700 Series Roll Seal

DESCRIPTION

The Cla-Val Model 100-42 Roll Seal valve is a hydraulically operated valve used to control liquid flow by means of a flexible control element, the liner.

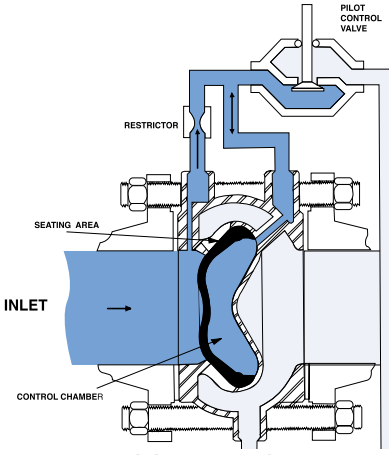
The basic valve consists of only two parts: a one piece, investment cast body and an elastomeric liner. The valve body is constructed with internal ribs and slots forming a grillwork which surrounds the liner to provide support. A normally closed type valve is formed by the installed liner which covers the grillwork and seats against the raised seating surface in the valve body.

Upstream pressure actuates the valve to produce valve opening by rolling the liner off the seating surface and the slotted grillwork.

The valve is actuated by upstream pressure as the loading pressure (pressure supplied to the control chamber) is varied by an external pilot control system.

A typical pilot control system used to operate the Model 100-42 valve consists of a restriction and a suitable pilot connected to the valve.

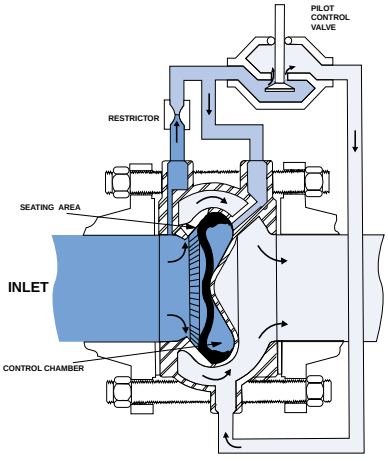
PRINCIPLE OF OPERATION



Model 100-42 Valve in Closed Position

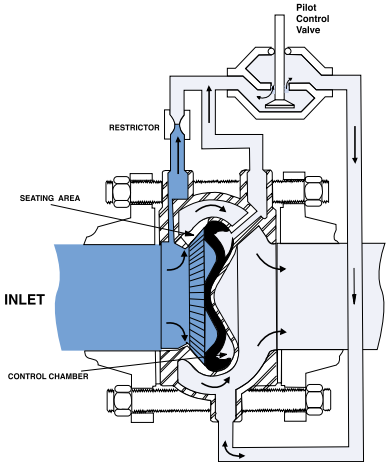
Upstream pressure is introduced to the control chamber (the chamber formed behind the liner) through the control piping and restrictor. When the pilot is closed, full inlet pressure is supplied to the control chamber, thus balancing the force developed by inlet pressure acting on the upstream face on the liner. Under these conditions, the liner remains in the fully closed position.

Since the operating pressure in the control chamber is greater than the outlet pressure, an additional closing force is developed across the liner, pressing the liner against the surrounding slotted grillwork area and seating surface.



Model 100-42 Valve in Partially Open Position

As loading pressure is lowered slightly below inlet pressure, the central portion of the liner is forced to invert and come to rest against the tip of the control chamber cavity. Reducing the loading pressure further (but still higher than outlet pressure) causes the liner to drape over the cone shaped portion of the control chamber cavity. This action causes the outer section of the liner to roll off the seating surface and a portion of the grillwork to partially open the valve.



Model 100-42 Valve in Fully Open Position

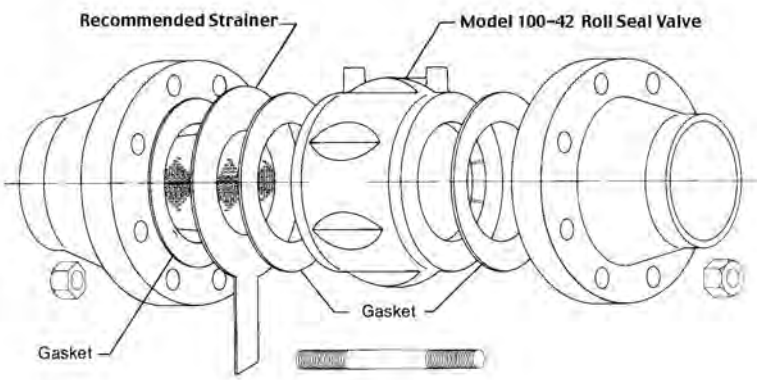
The valve is fully opened when loading pressure is sufficiently reduced to allow the liner to roll back completely and expose the full slot area. Restoring loading pressure reverses the liner rolling action to return the liner to the fully closed position.

INSTALLATION

The Cla-Val Model 100-42 Roll Seal valve in 2", 3", and 4" sizes are designed to mount between standard pipe flanges (ANSI 125, 150, 250, and 300 series) as a wafer type valve. The outer portion of the valve body is constructed with fluted (recessed) sections to provide clearance for the class 125 and 150 flange bolt pattern while the basic outside diameter of the body centers within the class 250 and 300 flange bolt pattern.

The Model 100-42 valve in 6" through 12" sizes are constructed with separable "slip-on" style flanges. Furnished standard in either class 150 or 300 raised face type, the flanges are removable and interchangeable. The class 150 flange may be bolted up to class 125 pipeline flanges and the class 300 flange may be mated against a class 250 flange.

Locate pilot system port connections at the top of valve in pipeline to allow easy air venting. A line size strainer is recommended, mounted on the valve inlet.



PROCEDURE

1. The valve should be given a visual inspection before installation to be sure no foreign materials have collected inside the valve during shipment or storage.

2. Pipelines should be flushed out before the valve is installed in the system. New systems, especially, should be cleaned as contaminates such as welding beads, scale, rocks, etc. are commonly contained within the pipeline.

3. The valve should be installed in a location allowing sufficient working space around the valve to provide easy access for maintenance and removal for servicing.

4. For 2", 3", and 4" sizes only. Insert the lower half pattern of stud bolts through the bolt holes of the upstream and downstream pipeline flanges.

4a. For 2" & 3" valves only. The 125 and 150 series flanges use a different number of bolts than the 250 and 300 series flanges. Hence, the wafer valve body configuration is inherently self centering regardless of the flange used.

4b. For the 4" valve, ANSI pipe flanges use an 8 bolt pattern regardless of pressure ratings, although the 250 and 300 series use larger bolts on a larger bolt circle. The 4" valve can be centered in the larger 250 and 300 class flanges by rotating the valve body into full radial contact with the bolt studs prior to tightening.

5. If an inline basket type strainer is to be included in the installation, insert the strainer into the upstream pipe, making sure a gasket is placed between the strainer and the upstream flange.

6. Install the valve between the flanges being sure to include the appropriate flange gaskets between each end of the valve and the mating pipe flange.

   Note: The valve must be installed with the flow arrow on side of body pointing to the downstream piping section. Cla-Val 700 Series valves may be installed in any position in either vertical or horizontal installations without any effect on valve operation.

7. Insert the remaining stud bolts and nuts and tighten evenly using a diagonal cross-over type pattern.

Liner Installation
6", 8", 10", 12" sizes

1. Tools required: Bottle of drugstore glycerine, 30" crowbar, double headed plastic hammer with 14" handle, rubber mallet and large flat blade screwdriver.

2. Liberally wipe glycerine on the inside of the valve and on the outer edge of the liner. Fold liner in half and insert into valve body.

3. Push liner in as far as possible forcing it out side ways.

4. Place the crowbar at the upper 25% point of the liner. Take your other hand and push on nose of liner to bend the liner over the crowbar. The less material folded over, the easier it will go into the valve. If too much is folded over, it will be difficult to complete liner installation.

5. Continue bending liner nose down into the valve. Use your hands and/or hammer handle to continue forcing it down into valve. It is important to keep the "V" of the bend near the 25% point. If it goes over the center, The liner won't go in, and it will be necessary to start over at Step 3.

6. Use the hammer to force the liner down and out into the valve body.

7. Use the hammer handle for the final insertion. Sometimes it is helpful to beat on the liner with the hammer for the final step.

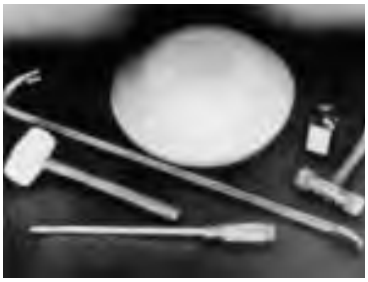
8. To seat the liner on the manifold ring use the hammer handle to push down on the liner near bore of valve inlet and pry handle and liner towards the center. Continue this prying action for 360° around the liner for proper seating.

9. To test for liner seating, push down on the center of liner and close the loading port shut-off cock, or block it with your hand. When you release your hand from the liner, it should remain in the down position until the loading port is opened.

10. If liner appears seated, open loading port cock and liner should pop-up to the closed position. Repeat Steps 6-10 if liner is not seated.

    When the liner is fully seated, the inside diameter of the liner will be seated over the outside diameter of the manifold ring. The manifold ring is a raised circular ridge at the bottom of the open cavity which provides for even distribution of the fluid coming in and going out the loading port.

    Install liner retainer into body.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Liner Retainer Removal 2"-12" Sizes

The 2" and 3" liner retainer is secured to the valve with an Allen screw. Loosen the Allen screw, pull the locking pin back towards center of retainer, and remove the retainer from valve.

To install, insert the retainer, (do not block inlet feed hole), push locking pin into position and tighten Allen screw.

The 4"-12" liner retainers are secured with a snap ring. Remove the snap ring and retainer.

To install, insert retainer and install snap ring into the groove of valve. Be sure snap ring is completely inserted into groove.

Liner Removal 2"-12" Sizes

The tool used for removal should be free of sharp edges to prevent damage to the liner, the valve body seat or control chamber surfaces. A motorcycle tire iron or similar tool works well.

1. Insert the tool between the liner and the valve body as deeply as possible.

2. Using the seat edge as a fulcrum, rock the end of the tool away from the valve in a manner to pull the liner bead out of the body. Grasp the liner and remove from the valve body.

Liner Installation 2", 3", 4" Sizes

Thoroughly clean out the interior of the valve body control chamber cavity.

Liberally apply glycerine inside the control chamber cavity and around the seal bead area of the liner.

DO NOT USE ANY HYDROCARBON OR SILICONE BASED LUBRICANTS ON LINERS AS THESE COMPOUNDS CAN SEVERELY ATTACK THE LINER MATERIAL.

3. Fold the liner as shown and install into the valve body control chamber as deeply as possible.

4. Continuing to force the liner into the control chamber cavity, again fold the liner as shown to insert the liner seal bead section under the valve body seat surface.

5. Work the folded section of the liner into place by pushing against the folded area to slide the seal bead down the conical face of the control chamber.

Liner Seating Instructions 2", 3", 4" Sizes

After installing the liner, it must be seated over the manifold ring in the valve body. The objective of this seating procedure is to place the inside lip of the liner over the outside lip of the manifold ring.

6. 4" valve with liner installed.

7. Pinch, pull and knead the liner 360° around to seat the liner on the manifold ring.

8. Using a dull tool or hammer handle, pry the outer part of the liner towards the center to help "seat" the liner.

9. Now push the liner down into the valve, holding your hand on the depressed liner, seal off the loading port with your finger.

10. Remove your hand from liner and continue holding your finger over the loading port. If liner is seated, it will be held in the open position as long as your finger is over the loading port. When you release your finger, the liner will popup. If not seated, repeat with Step 7.

Install liner retainer into body.

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PLACING VALVE INTO OPERATION

In most instances, the 700 Series Cla-Val Control valves will be shipped complete with a pilot control system mounted on the Model 100-42 valve. Consult the appropriate start up and operation instructions for the pilot control used before pressurizing the system.

Important Procedure for All Installations:

IT IS IMPORTANT THAT THE PRESSURIZATION AND DEPRESSURIZATION OF ALL INSTALLATIONS BE CARRIED OUT IN A MANNER TO PREVENT IMPOSING A REVERSE PRESSURE CONDITION ON THE CLA-VAL MODEL 100-42 VALVE. PRESSURIZATION OF THE SYSTEM SHOULD BE ACCOMPLISHED BY PRESSURIZING THE INLET SIDE FIRST. DEPRESSURIZATION OF THE SYSTEM SHOULD BE ACCOMPLISHED BY DEPRESSURIZING THE OUTLET SIDE FIRST. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN DISLODGEMENT AND/OR DESTRUCTION OF THE RUBBER LINER.

START-UP INSTRUCTIONS

Pressure Reducing 790 Series Valves

The following instructions are for valves equipped with a Model CRD Pressure Reducing Pilot Control.

1. Remove the adjustment cap and back off adjustment screw setting (turn counterclockwise) of the CRD Pressure Reducing Pilot Control to fully relieve all loading on the range spring.
2. Slowly open the **upstream** main line block valve to pressurize the **inlet** section of the valve.
3. Bleed any entrapped air from the control chamber of the valve and tubing sections by loosening fittings at the highest points. Retighten fittings. Install gauge on downstream port of CRD.
4. Slowly increase tension on the range spring, by means of the adjustment screw (turn clockwise) until the desired downstream pressure is attained. Use a gauge.
5. Open the downstream main line block valve.
6. If required, reset the pilot adjustment screw setting to obtain the downstream pressure desired.
7. Tighten the adjustment screw lock nut and replace the adjustment cap.

Back Pressure Control 750 Series Valves

The following instructions are for valves equipped with a Model CRL Back Pressure Pilot Control.

1. Remove the adjustment cap and increase tension on the range spring, by means of the adjustment screw (turn clockwise) until maximum spring load is attained.
2. Slowly open the **upstream** main line block valve to pressurize the **inlet** section of the valve.
3. Bleed any entrapped air from the control chamber of the valve and tubing sections by loosening fittings at the highest points. Retighten fittings.
4. Open the downstream main line block valve.
5. Gradually decrease tension on the range spring by means of the adjustment screw (turn counterclockwise) until upstream pressure decreases to the desired setpoint.
6. Tighten the adjustment screw lock nut and replace the adjustment cap.

Relief Valve Applications 750 Series Valves

The following instructions are for valves equipped with a Model CRL Pressure Relief Pilot Control.

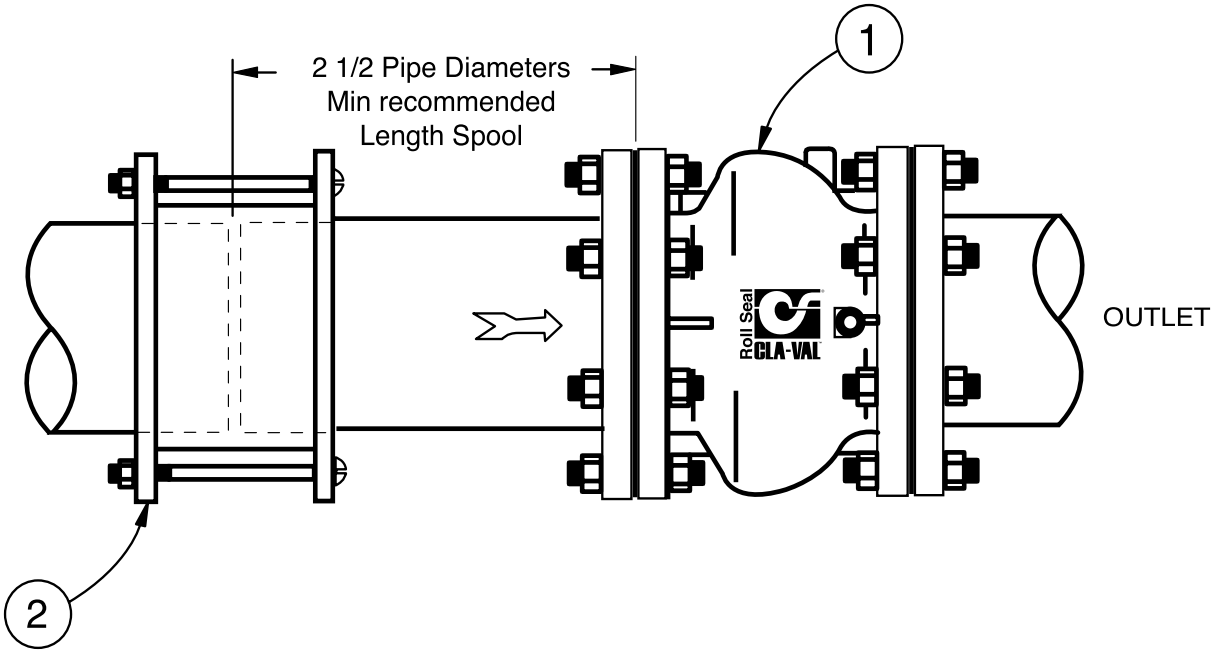
Due to the nature of intended use, the system being protected with the relief valve will most likely not be able to furnish the pressure source needed to establish the proper setpoint of the pilot control. Due to this fact, in most instances, the relief valve setting procedures will either have to be carried out at other locations or an auxiliary pressure source will have to be supplied at the site in order to carry out the following procedure.

1. Remove the adjustment cap and increase tension on the range spring by means of the adjustment screw (turn clockwise) until maximum spring load is attained.
2. Slowly introduce **inlet** pressure to the valve at the desired setpoint value. Bleed all air.
3. Gradually decrease tension on the range spring by means of the adjustment screw (turn counterclockwise) until flow is initiated through the valve.
4. Reduce system pressure back to normal value. Tighten the adjustment screw lock nut and replace the adjustment cap. The valve is now ready for service.

Taking Valve Out of Service

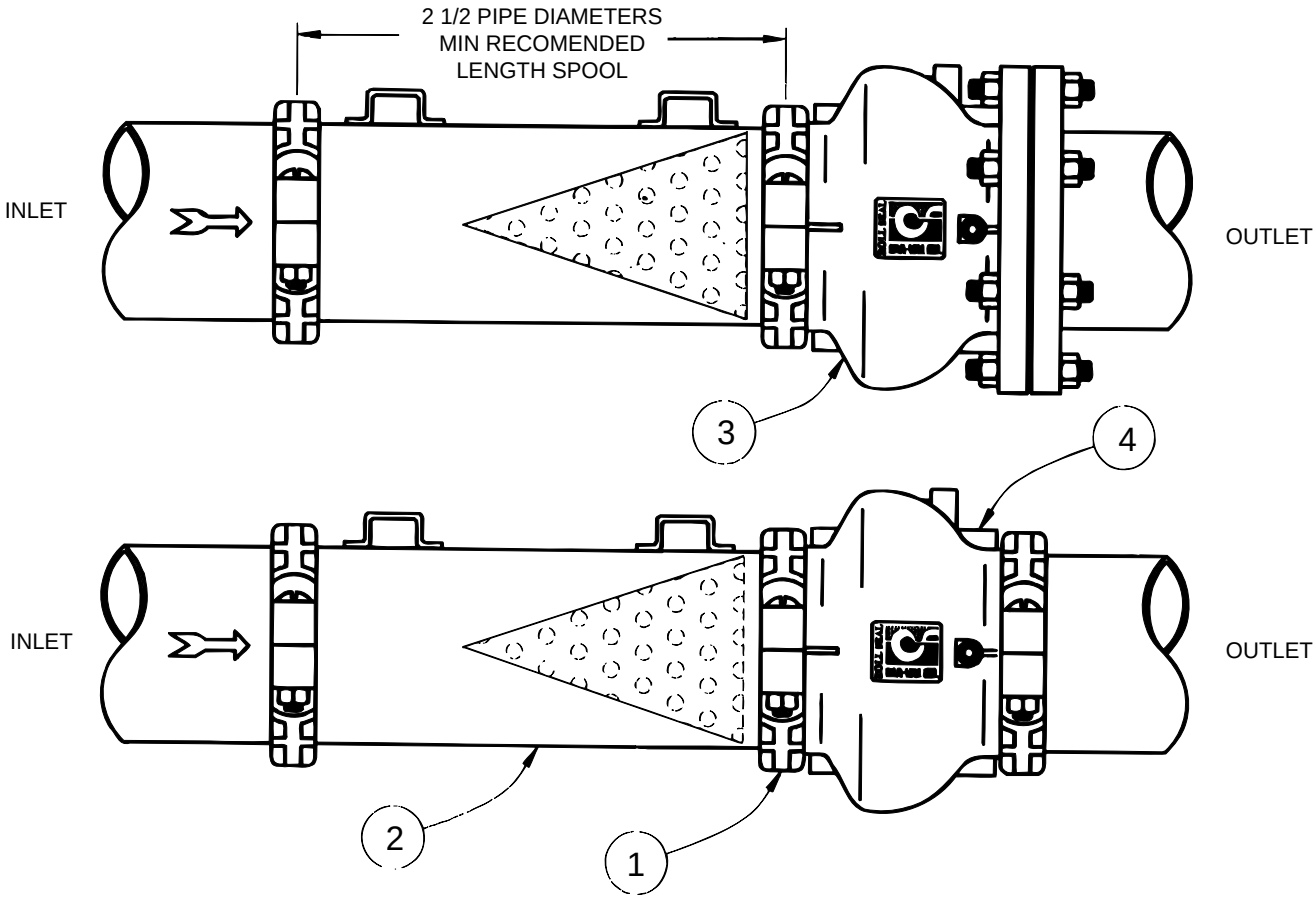
The following procedure should be followed when taking the Model 100-42 valve out of service.

1. Close the upstream main line block valve first. Then close the downstream main line block valve.
2. Vent the **downstream** section to fully relieve pressure in the outlet section of the valve.
3. Vent the **upstream** section to fully relieve pressure in the inlet section and control chamber of the Model 100-42 valve.
4. If the valve liner is to be inspected or replaced, remove the valve from the main line.



Recommended Pipe layout
6" - 12" Flange style 100-42

2 Pipe Coupling (Rubber Gasket Type)
1 100-42 Main Valve, Flange X Flange



Recommended Pipe layout
6" - 12" Grooved style 100-42

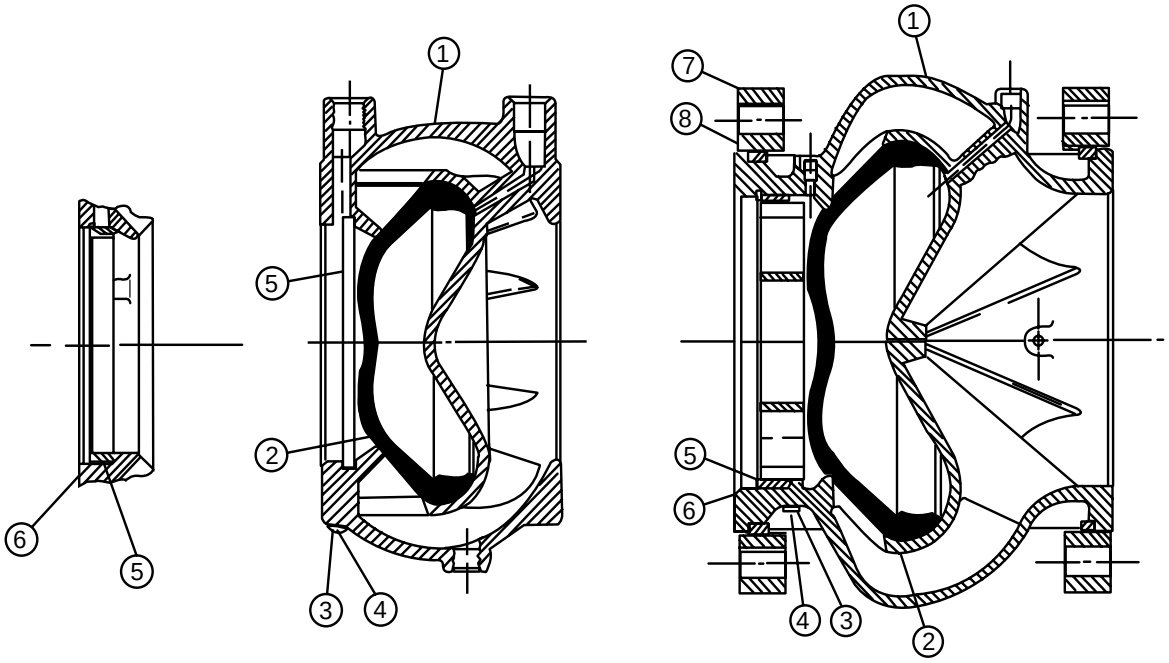
1 COUPLER FOR GROOVED PIPE
2 SPOOL STRAINER ASSEMBLY (WITH CONE)
3 100-42 MAIN VALVE, GROOVE X FLANGE
4 100-42 MAIN VALVE, GROOVE X GROOVE

When ordering please specify:

- All nameplate data
- Description
- Part Numbers
- Item Number
- Material

Item No.	Description	No. Req'd	Material (Standard)
1	Body	1	316L Stainless Steel "L"
2*	Liner	1	Natural Rubber
3	Nameplate	1	Aluminum
4	Drive Screw	2	316L Stainless Steel
5	Liner Retainer	1	316L Stainless Steel
6	Retaining Ring	1	316L Stainless Steel
7	Slip-on Flange	2	Steel-Cad. Pl.
8	Flange Retainer Ring	2	Steel-Cad. Pl.

*Recommended Spare Part



4" Wafer Style Valve 2-3" Wafer Style Valve 6"-12" Flanged Valve

CVCL 1 ② 3 4 DIST CODE 048 SHEET 1 OF 2

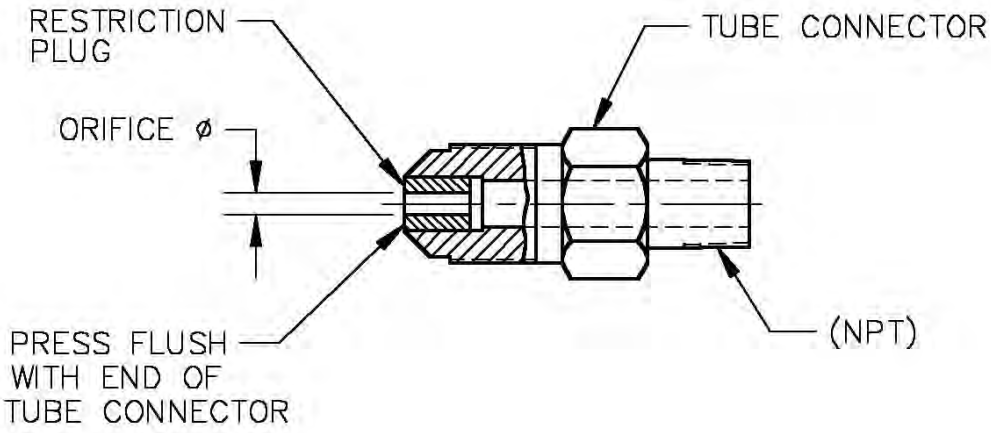
CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

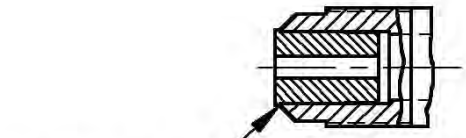
CATALOG NO.	DRAWING NO.	REV
X58C	48834	AN

TYPE OF VALVE AND MAIN FEATURES

X58C RESTRICTION ASSEMBLIES

DESIGN		
DRAWN	JC	12-3-85
CHK'D	JC	12-4-85
APV'D	CH	12-11-85





NOTES:
1. *FOR IDENTIFICATION, THESE STOCK NO'S ARE TO BE STAINED BLUE WITH 74234-03.
2. **FOR IDENTIFICATION, THESE STOCK NO'S ARE TO BE STAINED RED WITH 74234-05.
3. SEE DWG 76740 FOR STAINLESS STEEL X58C.

LTR	DESCRIPTION	BY	DATE
A-AK	SEE REVISION FILE		
AL	REDRAWN ON CAD (ECO 14229)	EK	11-18-93
AM	REINSTATED PN 68565B & 64673H (ECO 15043)	TLC	10-18-94
AN	ADDED PN 48834-05F (NED 43663)	AK	09-15-98

CAD REVISION RECORD - DO NOT REVISE MANUALLY

CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

CATALOG NO.	DRAWING NO.	REV
X58C	48834	AN

TYPE OF VALVE AND MAIN FEATURES

X58C RESTRICTION ASSEMBLIES

DESIGN		
DRAWN	JC	12–3–85
CHK'D	JC	12–4–85
APV'D	CH	12–11–85

X58C STOCK NO.	TUBE CONNECTOR SIZE TUBE X NPT	TUBE CONNECTOR MATERIAL	RESTRICTION PLUG ORIFICE DIA	RESTRICTION PLUG MATERIAL
	37° FLARE			
**44734C	3/8 X 3/8–18 NPT	ALUMINUM	.125 (1/8)	S. STEEL
	45° FLARE			
*37814B	1/4 X 1/8–27 NPT	BRASS	.031 (1/32)	S. STEEL
*80500C	1/4 X 1/8–27 NPT	BRASS	.062 (1/16)	S. STEEL
*67739D	3/8 X 1/8–27 NPT	BRASS	.040	S. STEEL
*64672K	3/8 X 3/8–18 NPT	BRASS	.062 (1/16)	S. STEEL
*99329–01D	3/8 X 3/8–18 NPT	BRASS	.094 (3/32)	S. STEEL
**79730J	1/2 X 1/2–14 NPT	BRASS	.125 (1/8)	S. STEEL
**48834–05F	3/8 X 3/8–18 NPT	BRASS	.125 (1/8)	S. STEEL
*85484E	1/4 X 1/8–27 NPT	BRASS	.031 (1/32)	DELRIN
*85486K	1/4 X 1/8–27 NPT	BRASS	.040	DELRIN
**48834–03A	1/4 X 1/8–27 NPT	BRASS	.125 (1/8)	DELRIN
*48834–04J	1/4 X 1/8–27 NPT	BRASS	.093	DELRIN
*88409–01G	3/8 X 1/8–27 NPT	BRASS	.031 (1/32)	DELRIN
*88409J	3/8 X 1/8–27 NPT	BRASS	.052	DELRIN
*42346H	3/8 X 1/8–27 NPT	BRASS	.062 (1/16)	DELRIN
**48834–01E	3/8 X 1/8–27 NPT	BRASS	.125 (1/8)	DELRIN
*42775H	3/8 X 1/4–18 NPT	BRASS	.062 (1/16)	DELRIN
**63604D	3/8 X 1/4–18 NPT	BRASS	.156 (5/32)	DELRIN
*10253D	3/8 X 3/8–18 NPT	BRASS	.031 (1/32)	DELRIN
*46946A	3/8 X 3/8–18 NPT	BRASS	.062 (1/16)	DELRIN
**64673H	3/8 X 3/8–18 NPT	BRASS	.125 (1/8)	DELRIN
*68565B	3/8 X 3/8–18 NPT	BRASS	.094 (3/32)	DELRIN
**43302K	3/8 X 3/8–18 NPT	BRASS	.188 (3/16)	DELRIN
**12900H	1/2 X 1/2–14 NPT	BRASS	.125 (1/8)	DELRIN
**48834–02C	1/2 X 1/2–14 NPT	BRASS	.188 (3/16)	DELRIN

CAD REVISION RECORD – DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
	SEE SHEET 1		

CLA-VAL

— MODEL — CRD
Pressure Reducing Control

DESCRIPTION

The Cla-Val Model CRD Pressure Reducing Control automatically reduces a higher inlet pressure to a lower outlet pressure. It is a direct acting, spring loaded, diaphragm type control that operates hydraulically or pneumatically. It may be used as a self-contained valve or as a pilot control for a Cla-Val main valve. It will hold a constant downstream pressure within very close pressure limits.

OPERATION

The CRD Pressure Reducing Control is normally held open by the force of the compression spring above the diaphragm; and delivery pressure acts on the underside of the diaphragm. Flow through the valve responds to changes in downstream demand to maintain a pressure.

INSTALLATION

The CRD Pressure Reducing Control may be installed in any position. There is one inlet port and two outlets, for either straight or angle installation. The second outlet port can be used for a gage connection. A flow arrow is marked on the body casting.

ADJUSTMENT PROCEDURE

The CRD Pressure Reducing Control can be adjusted to provide a delivery pressure range as specified on the nameplate.

Pressure adjustment is made by turning the adjustment screw to vary the spring pressure on the diaphragm. The greater the compression on the spring the higher the pressure setting.

1. Turn the adjustment screw in (clockwise) to increase delivery pressure.
2. Turn the adjustment screw out (counter-clockwise) to decrease the delivery pressure.
3. When pressure adjustment is completed tighten jam nut on adjusting screw and replace protective cap.
4. When this control is used, as a pilot control on a Cla-Val main valve, the adjustment should be made under flowing conditions. The flow rate is not critical, but generally should be somewhat lower than normal in order to provide an inlet pressure several psi higher than the desired setting

The approximate minimum flow rates given in the table are for the main valve on which the CRD is installed.

Valve Size	1 1/4" -3"	4"-8"	10"-16"
Minimum Flow GPM	15-30	50-200	300-650

SYMPTOM	PROBABLE CAUSE	REMEDY
Fails to open when deliver pressure lowers	No spring compression	Tighten adjusting screw
	Damaged spring	Disassemble and replace
	Spring guide (8) is not in place	Assemble properly
	Yoke dragging on inlet nozzle	Disassemble and reassemble properly (refer to Reassembly)
Fails to close when delivery pressure rises	Spring compressed solid	Back off adjusting screw
	Mechanical obstruction	Disassemble and reassemble properly (refer to Reassembly)
	Worn disc	Disassemble remove and replace disc retainer assembly
	Yoke dragging on inlet nozzle	Disassemble and reassemble properly (refer to Reassembly)
Leakage from cover vent hole	Damaged diaphragm	Disassemble and replace
	Loose diaphragm nut	Remove cover and tighten nut

MAINTENANCE

Disassembly

To disassemble follow the sequence of the item numbers assigned to parts in the sectional illustration.

Reassembly

Reassembly is the reverse of disassembly. Caution must be taken to avoid having the yoke (17) drag on the inlet nozzle of the body (18). Follow this procedure:

1. Place yoke (17) in body and screw the disc retainer assembly (16) until it bottoms.
2. Install gasket (14) and spring (19) for 2-30 and 2-6.5 psi range onto plug (13) and fasten into body. Disc retainer must enter guide hole in plug as it is assembled. Screw the plug in by hand. Use wrench to tighten only.
3. Place diaphragm (12) diaphragm washer (11) and belleville washer (20) on yoke. Screw on hex nut (10).
4. Hold the diaphragm so that the screw holes in the diaphragm and body align. Tighten diaphragm nut with a wrench. At the final tightening release the diaphragm and permit it to rotate 5° to 10°. The diaphragm holes should now be properly aligned with the body holes.

To check for proper alignment proceed as follows:

Rotate diaphragm clockwise and counterclockwise as far as possible. Diaphragm screw holes should rotate equal distance on either side of body screw holes ±1/8".

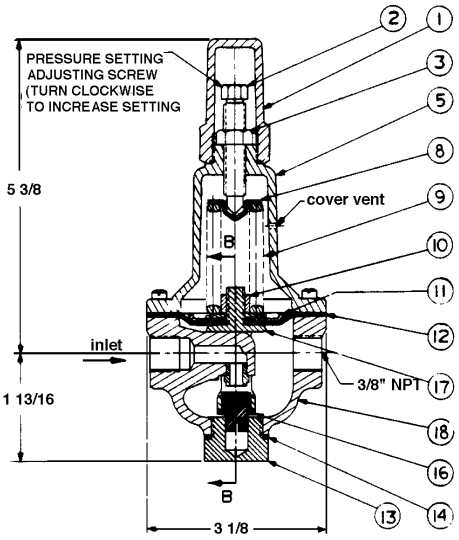
Repeat assembly procedure until diaphragm and yoke are properly aligned. There must be no contact between yoke and body nozzle during its normal movement. To simulate this movement hold body and diaphragm holes aligned. Move yoke to open and closed positions. There must be no evidence of contact or dragging.

5. Install spring (9) with spring guide (8).
6. Install cover (5), adjusting screw (2) and nut (3), then cap (1).

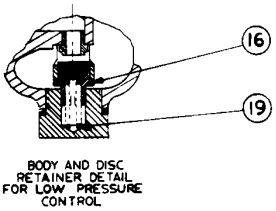
PARTS LIST

CRD

Pressure Reducing Control



SECTION A-A
OPEN POSITION
FOR HIGH PRESSURE CONTROL

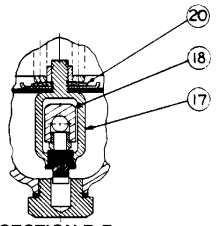


BODY AND DISC
RETAINER DETAIL
FOR LOW PRESSURE
CONTROL

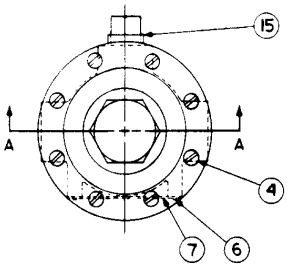
Size (Inch)	Stock Number	Adjustment Range	
		psi	Ft. of Water
3/8	71943-03K	15 - 75	35 - 173
3/8	71943-04H	30 - 300	69 - 692
3/8	71943-07A	2 - 6.5	4.5 - 15
3/8	71943-08J	2 - 30	4.5 - 69

Factory set pressure	PSI * PER TURN
15 - 75 set @ 20 psi	9.0
30-300 set @ 60 psi	27.0
2 - 6.5 set @ 3.5 psi	.61
2 - 30 set @ 10 psi	3.0

*APPROXIMATE- FINAL ADJUSTMENT SHOULD BE WITH A PRESSURE GAUGE AND WITH FLOW



SECTION B-B
CLOSED POSITION



When ordering parts specify: • All nameplate data • Item Description • Item number

ITEM	DESCRIPTION	MATERIAL	PART NUMBER	LIST PRICE
1	Cap	PL	67628J	
2	Adjusting Screw	BRS	7188201D	
3	Jam Nut (3/8 - 16)	SS	6780106J	
4*	Machine Screw (Fil.Hd.) 8 Req'd	303	6757821B	
5	Cover	BRS	C2544K	
6	Nameplate Screw	SS	67999D	
7	Nameplate (15-75 psi)	BRS	C002201G	
8	Spring Guide	302	71881H	
9	Spring (15-75 psi) Spring (30-300 psi) Spring (2-6.5 psi) Spring (2-30 psi)	CHR/VAN CHR/VAN SS SS	71884B 71885J 82575C 81594E	
10	Hex Nut	303	71883D	
11	Diaphragm Washer	302	71891G	
12*	Diaphragm	NBR	C6936D	
13	Plug, Body	BRS	V5653A	
14*	Gasket	Fiber	40174F	
15	Plug	BRS	6766003F	
16*	Disc Retainer Assy. (15-75 psi) Disc Retainer Assy (30-300 psi) Disc Retainer Assy (2-6.5 psi) Disc Retainer Assy (2-30 psi)	BZ/Rub BZ/Rub BZ/Rub BZ/Rub	C5256H C5256H C5255K C5255K	
17	Yoke	VBZ	V6951H	
18	Body & 1/4" Seat Assy	BR/SS	8339702G	
19*	Bucking Spring (2-30 psi) (2-6.5 psi)	302	V0558G	
20	Belleville Washer Repair Kit (No Bucking Spring)	STL	7055007E 9170003K	
	Repair Kit (W/Bucking Spring)		9170001D	

*SUGGESTED REPAIR PARTS

CVCL 1 [2] 3 4
D.C. 027
G:\WP51\ENG\D47117.ENG

DWG. NO. REV.
47117 AC

•REGULATOR SPRING COLOR CODING CHART•

* THESE FIGURES ARE ONLY APPROXIMATE. FINAL ADJUSTMENTS SHOULD BE MADE WITH A PRESSURE GAGE.

WIRE SIZE	SPRING NUMBER	COLOR	WIRE MATERIAL	CATALOG NUMBER	PSI RANGE	*PSI PER TURN
.080 DIA	C0492D	BLUE	S.S	CDB-7 CRL-5A	0-7 0-7	.75 .75
.080 DIA	82575C	--	S.S.	CRD CRD-10A	1.9-6.5 1.9-6.5	.61 .49
.116 DIA	81594E	--	S.S.	CRD CRD-10A	2-30 2-30	3.0 2.4
.120 DIA	V5654J	GREEN	CHR VAN	CRL-5A CRD	5-25 10-40	4.0 4.0
.162 DIA	32447F	NATURAL	S.S.	CDB-7 CRL-5A CRL-13	10-60 10-60 10-60	12.0 12.0 12.0
.162 DIA	V5695B	YELLOW	MUSIC WIRE	CDB-7 CRL-5A CRL-13	20-80 20-80 20-80	14.5 14.5 14.5
.207 DIA	C1124B	CAD PLT	MUSIC WIRE	CDB-7 CRL-13 CRL-5A	50-150 50-150 50-150	29.5 29.5 29.5
.225 DIA	V6515A	RED	MUSIC WIRE	CDB-7 CRL-13 CRL-5A	65-180 65-180 65-180	44.0 44.0 44.0
.115 X .218	71884B	RED	CHR VAN	CRL CRD CRD-10A	0-75 15-75 15-75	8.5 9.0 7.2
.118 X .225	71885J	GREEN	CHR VAN	CRL CRD CRD-10A	20-200 30-300 30-300	28.0 27.0 22.4
.225 X .295	1630201A	CAD PLT	CHR VAN	CRL-5A CRL	100-300 100-300	18.00 18.00
.440 X .219	48211H	CAD PLT	STEEL	CRA-1B CRD-22 CRL-4A	200-450 200-450 100-450	17.0 17.0 17.0

WIRE SIZE	SPRING NUMBER	COLOR	WIRE MATERIAL	CATALOG NUMBER	RANGE FEET	*FEET PER TURN
.080 DIA	C0492D	BLUE	S.S.	CRA CRD-2	4.5-15 4.5-15	.82 .82
.375 DIA	87719B 1 SPRING 2 SPRINGS 3 SPRINGS 4 SPRINGS 5 SPRINGS	EPOXY COATED	CHROME SILICON	CDS-5	 5-40 30-80 70-120 110-120 150-200	 1.0 2.0 3.0 4.0 5.0
.072	V5097A	--	302SS	CVC	1-17	.7
.375 DIA	2933502H 1 SPRING 2 SPRINGS 3 SPRINGS 4 SPRINGS 5 SPRINGS	EPOXY COATED	CHROME SILICONE	CDS-6	 5-40 30-80 70-120 110-160 150-200	 .75 1.50 2.20 3.00 3.70

REV. AC ADDED CDS6, ECO 17770 (6-17-99)

PARTS LIST

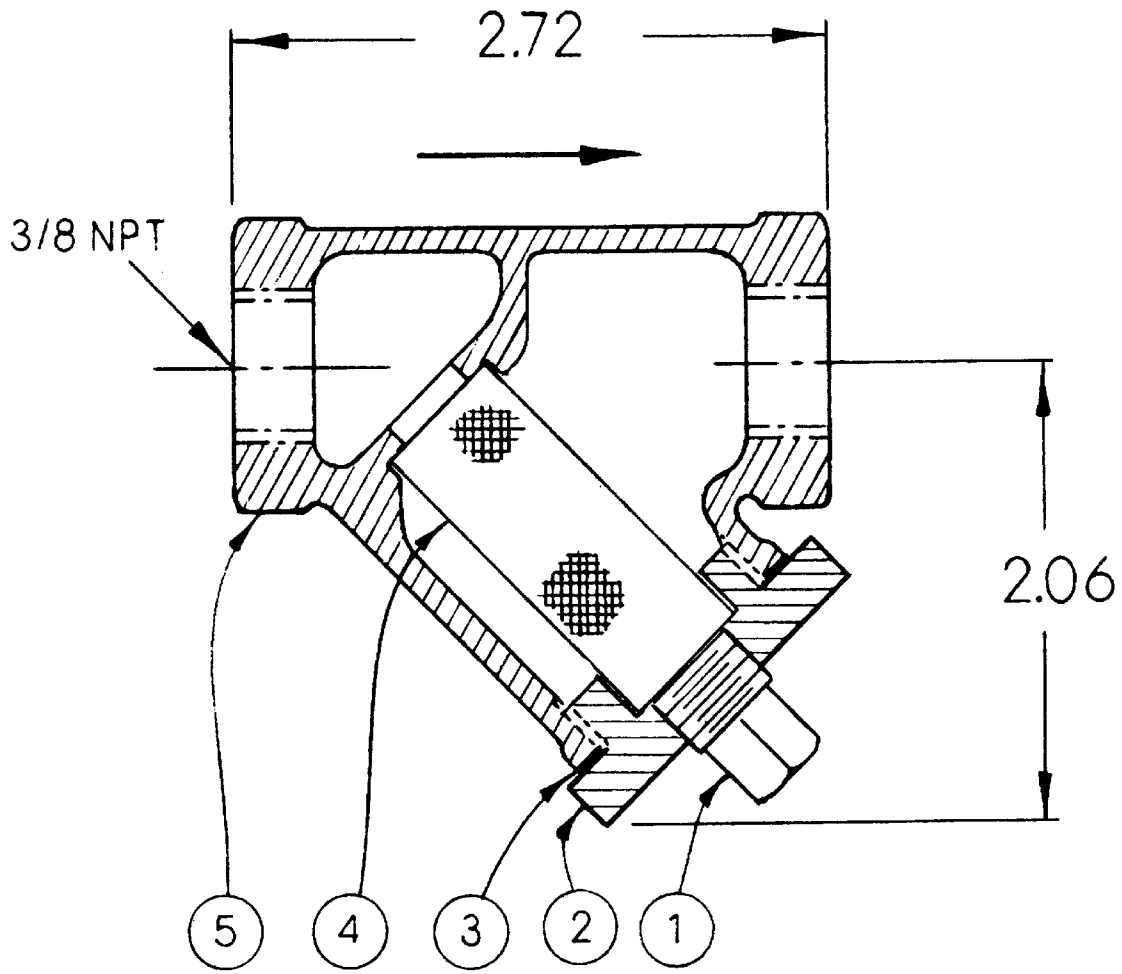
X43
Strainer

ITEM	DESCRIPTION	MATERIAL
1	Pipe Plug	Steel
2	Strainer Plug	Brass
3	Gasket	Copper
4*	Screen	Monel
5	Body	Brass

*Replacement screen stock number 68373A.
All other parts available only in replacement assembly.

Standard 60 mesh pilot system strainer for fluid service.

SIZE	STOCK NUMBER
3/8 x 3/8	33450J



CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

CATALOG NO.

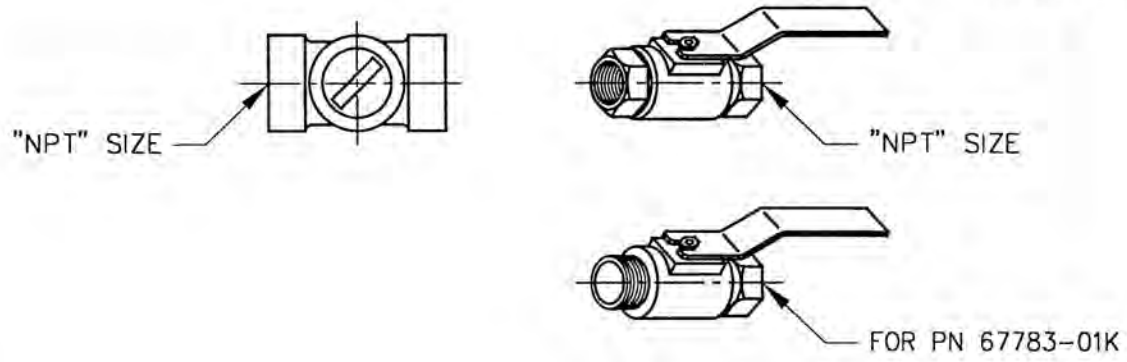
DRAWING NO. 67783 REV AS

TYPE OF VALVE AND MAIN FEATURES

CK2 COCK/BALL VALVE

DESIGN		
DRAWN	MGR	4-02-80
CHK'D	KD	4-03-80
APV'D	CH	4-07-80

SCALE: NONE



CLA-VAL PART NO. AND MATERIAL

BRONZE WITH HANDLE	STEEL WITH HANDLE	IRON WITH HANDLE	316 SST WITH HANDLE	316 SST W/ LOCKING HANDLE	BRONZE WITH HANDLE	MONEL WITH HANDLE	SIZE "NPT"
67783-01K *	-09C	-17F	-25J SUPSD BY-26G		-41F SUPSD BY-01K		1/8"
-02H	-10A	-18D	-26G	-51E SUPSD BY-26G -52C	-42D SUPSD BY-02H		1/4"
-03F *	-11J	-19B	-27E	-46E SUPSD BY-27E -53A	-45G	-48A SUPSD BY-49J	3/8"
-04D	-12G	-20K	-28C	-54J	-43B SUPSD BY-04D	-49J	1/2"
-05A	-13E	-21H	-29A		-44K SUPSD BY-05A		3/4"
-06J	-14C	-22F	-30J				1"
-07G	-15K	-23D	-31G				1 1/4"
-08E	-16H	-24B	-32E				1 1/2"
-50G			-47C				2"

* SEE ENGINEERING APPROVED VENDORS TABLE (SHEET 2 OF 2).

CAD REVISION RECORD - DO NOT REVISE MANUALLY

LTR	DESCRIPTION	BY	DATE
A-AR	SEE REVISION FILE		
AS	ADDED ANDERSON BRASS 1/8 FPT X 1/8 MPT TO SHEET 2 AND ADDED "•" TO PN. 67783-01K TO SH. 1 (ECO 18551)	AK	03-07-01

CLA-VAL

— MODEL — CV

Flow Control

DESCRIPTION

The Cla-Val Model CV Flow Control is a simply-designed, spring-loaded check valve. Rate of flow is full flow in one direction and restricted in other direction. Flow is adjustable in the restricted direction. It is intended for use in conjunction with a pilot control system on a Cla-Val Automatic Control Valve.

OPERATION

The CV Flow Control permits full flow from port A to B, and restricted flow in the reverse direction. Flow from port A to B lifts the disc from seat, permitting full flow. Flow in the reverse direction seats the disc, causing fluid to pass through the clearance between the stem and the disc. This clearance can be increased, thereby increasing the restricted flow, by screwing the stem out, or counter-clockwise. Turning the stem in, or clockwise reduces the clearance between the stem and the disc, thereby reducing the restricted flow.'

INSTALLATION

Install the CV Flow Control as shown in the valve schematic All connections must be tight to prevent leakage.

DISASSEMBLY

Follow the sequence of the item numbers assigned to the parts in the cross sectional illustration for recommended order of disassembly.

Use a scriber, or similar sharp-pointed tool to remove O-ring from the stem.

INSPECTION

Inspect all threads for damage or evidence of cross-threading. Check mating surface of seat and valve disc for excessive scoring or embedded foreign particles. Check spring for visible distortion, cracks and breaks. Inspect all parts for damage, corrosion and cleanliness.

CLEANING

After disassembly and inspection, cleaning of the parts can begin. Water service usually will produce mineral or lime deposits on metal parts in contact with water. These deposits can be cleaned by dipping the parts in a 5-percent muriatic acid solution just long enough for deposits to dissolve. This will remove most of the common types of deposits. **Caution: use extreme care when handling acid.** If the deposit is not removed by acid, then a fine grit (400) wet or dry sandpaper can be used with water. Rinse parts in water before handling. An appropriate solvent can clean parts used in fueling service. Dry with compressed air or a clean, lint-free cloth. Protect from damage and dust until reassembled.

REPAIR AND REPLACEMENT

Minor nicks and scratches may be polished out using a fine grade of emery or crocus cloth; replace parts if scratches cannot be removed.

Replace O-ring packing and gasket each time CV Flow Control is overhauled.

Replace all parts which are defective. Replace any parts which create the slightest doubt that they will not afford completely satisfactory operation. Use Inspection steps as a guide.

REASSEMBLY

Reassembly is the reverse of disassembly; no special tools are required.

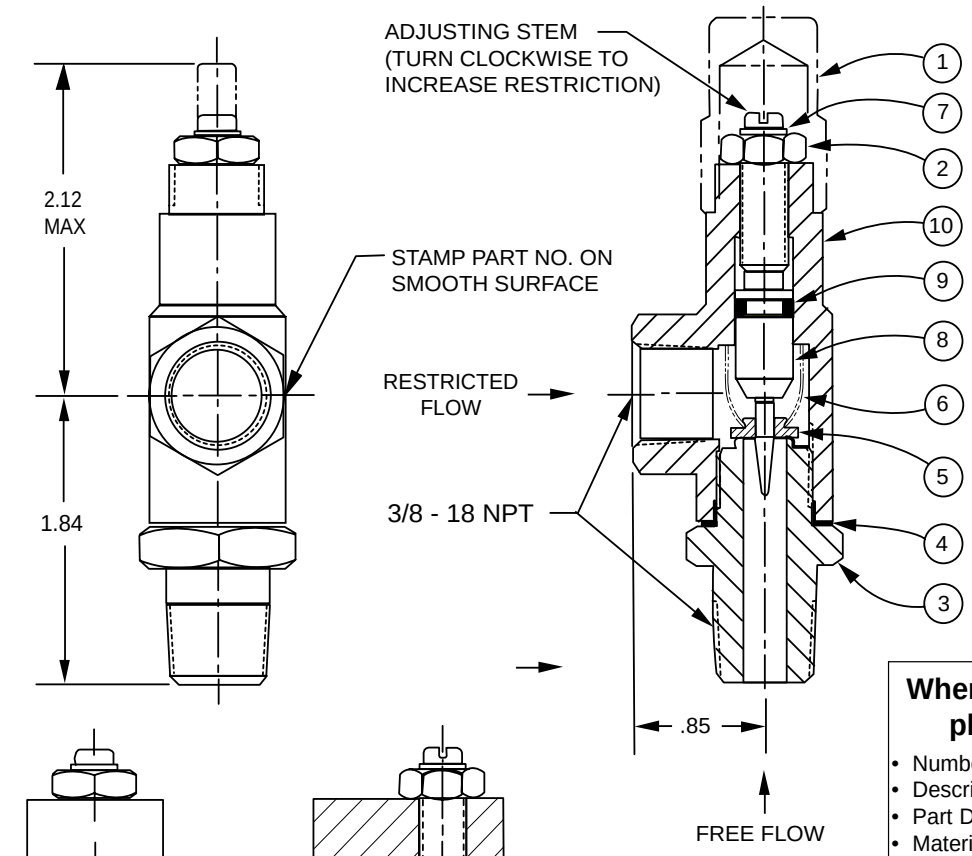
TEST PROCEDURE

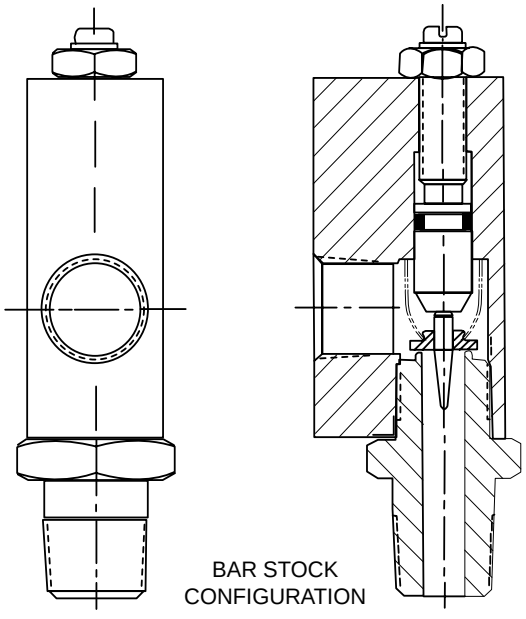
No testing of the flow Control is required prior to reassembly to the pilot control system on Cla-Val Main Valve.

PARTS LIST

CLA-VAL®

CV
3/8" Flow Control





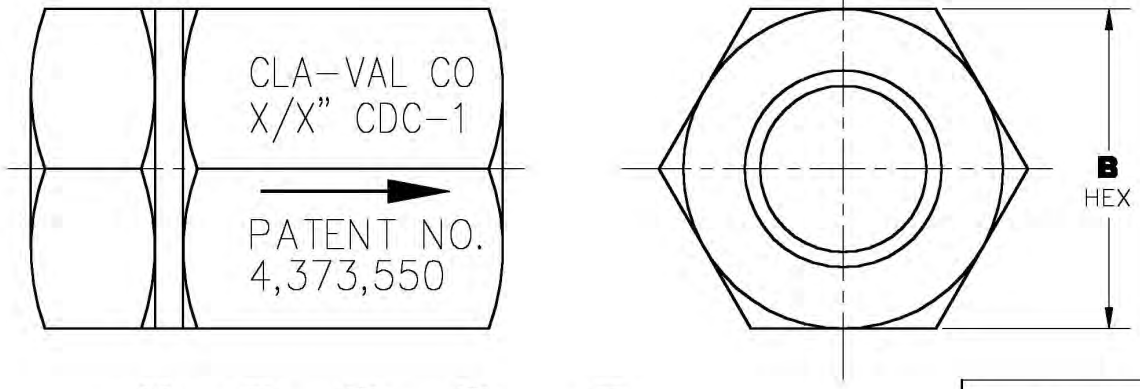
When ordering parts, please specify:

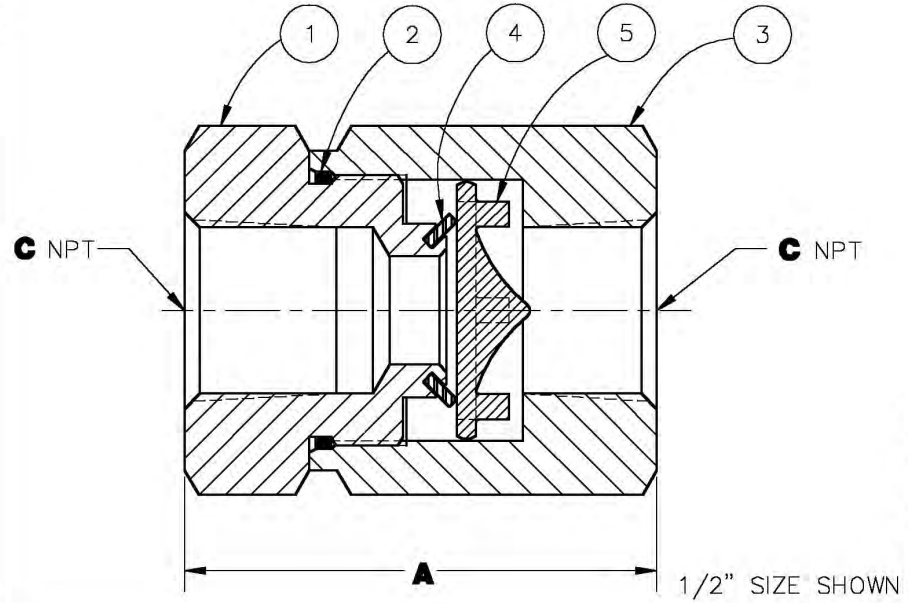
- Number Stamped on Side
- Description (CV Flow Control)
- Part Description
- Material

ITEM	DESCRIPTION	QUAN.
1	Cap (SS only)	1
2	Nut, Jam	1
3	Seat	1
4	Gasket	1
5	Disc	1
6	Spring	1
7	Ring, Retaining	1
8	Stem	1
9	O-Ring	1
10	Housing	1

DWG NO. 98345 | SH 1 | REV E

REVISION			
REV	DESCRIPTION	DATE	APPROVED
A-D	SEE REVISION FILE		
E	REVISED & REDRAWN ON CAD, WAS "D" SIZE (ECO 14229)	11-18-93	EK





1/2" SIZE SHOWN

DESCRIPTION	A	B HEX	C NPT
3/8" CHECK VALVE	2.06	1.06	.38 (3/8)-18 NPT
1/2" CHECK VALVE	2.12	1.38	.50 (1/2)-14 NPT

PARTS LIST

ITEM NO.	QTY REQD	NOMENCLATURE OR DESCRIPTION
5	1	PLATE, VALVE
4	1	SEAL, VALVE RING
3	1	RETAINER, VALVE
2	1	O-RING
1	1	RETAINER, SEAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ±1/32 DECIMALS .XX± .03 .XXX± .010 ANGULAR ± .5°
SURFACE FINISH 125
BREAK CORNERS .010 MAX
--DO NOT SCALE DRAWING--

CONTRACT NO. — — — — —

APPROVALS		DATE
DRAWN	JC	11-30-84
CHECKED	LFH	12-4-84
APPROVED	CH	12-6-84
ENGR		

CLA-VAL CO. NEWPORT BEACH, CALIFORNIA

TITLE: 3/8" & 1/2" CDC-1 CHECK VALVE PATENT NO. 4,373,550

SIZE	CAGE CODE	DWG NO.	REV.
B	86184	98345	E

SCALE 2/1 | SHEET 1 OF 1

DIST. CODE 007A

EK 11-22-93

700 Series Product Identification

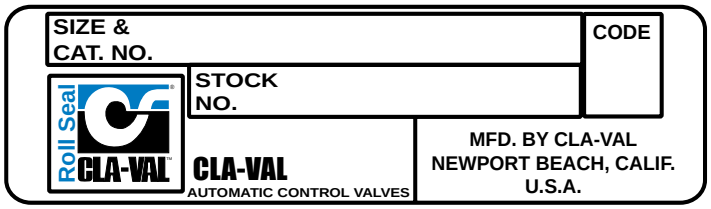
How to Order

Proper Identification

For ordering repair kits, replacement parts, or for inquiries concerning valve operation it is important to properly identify Cla-Val products already in service. Include all nameplate data with your inquiry. Pertinent product data includes valve function, size, material, pressure rating, end details, type of pilot controls used and control adjustment ranges.

Identification Plate

For product identification, cast in body markings are supplemented by the identification plate illustrated on this page. The plate is mounted in the most practical position. **It is extremely important that this identification plate is not painted over, removed, or in any other way rendered illegible.**



Specify when ordering

- Model Number
- Adjustment Range (As Applicable)
- Valve Size
- Optional Features
- Pressure Class

How To Order

There are many valves and controls manufactured by Cla-Val that are not listed due to the sheer volume. For information not listed, please contact your local Cla-Val representative.

Unless Otherwise Specified

- X43 "Y" Strainer is included.
- CK2 Isolation Valves is included in price on 6" and larger valve sizes.

Limited Warranty

Automatic valves and controls as manufactured by Cla-Val are warranted for one year from date of shipment against manufacturing defects in material and workmanship which develop in the service for which they are designed, provided the products are installed and used in accordance with all applicable instructions and limitations issued by Cla-Val.

We will repair or replace defective material, free of charge, which is returned to our factory, transportation charges prepaid, provided that, after inspection, the material is found to have been defective at time of shipment. This warranty is expressly conditioned on the purchaser's giving Cla-Val immediate written notice upon discovery of the defect.

Components used by Cla-Val but manufactured by others, are warranted only to the extent of that manufacturer's guarantee.

This warranty shall not apply if the product has been altered or repaired by others, and Cla-Val. shall make no allowance or credit for such repairs or alterations unless authorized in writing by Cla-Val.

Disclaimer Of Warranties And Limitations Of Liability

The foregoing warranty is exclusive and in lieu of all other warranties and representations, whether expressed, implied, oral or written, including but not limited to any implied warranties or merchantability or fitness for a particular purpose. All such other warranties and representations are hereby cancelled.

Cla-Val shall not be liable for any incidental or consequential loss, damage or expense arising directly or indirectly from the use of the product. Cla-Val shall not be liable for any damages or charges for labor or expense in making repairs or adjustments to the product. Cla-Val shall not be liable for any damages or charges sustained in the adaptation or use of its engineering data and services. No representative of Cla-Val may change any of the foregoing or assume any additional liability or responsibility in connection with the product. The liability of Cla-Val is limited to material replacements F.O.B. Newport Beach, California.

Terms Of Sale

ACCEPTANCE OF ORDERS

All orders are subject to acceptance by our main office at Newport Beach, California.

CREDIT TERMS

Credit terms are net thirty (30) days from date of invoice.

PURCHASE ORDER FORMS

Orders submitted on customer's own purchase order forms will be accepted only with the express understanding that no statements, clauses, or conditions contained in said order form will be binding on the Seller if they in any way modify the Seller's own terms and conditions of sales.

PRODUCT CHANGES

The right is reserved to make changes in pattern, design or materials when deemed necessary, without prior notice.

PRICES

All prices are F.O.B. Newport Beach, California, unless expressly stated otherwise on our acknowledgement of the order. Prices are subject to change without notice. The prices at which any order is accepted are subject to adjustment to the Seller's price in effect at the time of shipment. Prices do not include sales, excise, municipal, state or any other Government taxes. Minimum order charge $75.00.

RESPONSIBILITY

We will not be responsible for delays resulting from strikes, accidents, negligence of carriers, or other causes beyond our control. Also, we will not be liable for any unauthorized product alterations or charges accruing there from.

Risk

All goods are shipped at the risk of the purchaser after they have been delivered by us to the carrier. Claims for error, shortages, etc., must be made upon receipt of goods.

EXPORT SHIPMENTS

Export shipments are subject to an additional charge for export packing.

RETURNED GOODS

1. Customers must obtain written approval from Cla-Val prior to returning any material.
2. Cla-Val reserves the right to refuse the return of any products.
3. Products more than six (6) months old cannot be returned for credit.
4. Specially produced, non-standard models cannot be returned for credit.
5. Rubber goods cannot be returned for credit, unless as part of an unopened repair kit which is less than six months old.
6. Goods authorized for return are subject to a 35% ($75 minimum) restocking charge and a service charge for inspection, reconditioning, replacement of rubber parts, retesting and repackaging as required.
7. Authorized returned goods must be packaged and shipped prepaid to Cla-Val., 1701 Placentia Avenue, Costa Mesa, California 92627-4475.

Roll Seal CLA-VAL

700 SERIES Repair Kits

The Cla-Val 700 Series valve repair kit is the only recommended spare part. The valve series is highly reliable due to fewer parts to create problems.

Valve repair kits are recommended over individual liner sales. Kits offer all essentials for easy installation to include: liner, lubricant, liner retainer hardware, and instructions.

REPAIR KIT PART NUMBERS:

	2"	3"	4"	6"	8"	10"	12"
Natural Rubber 65 Durometer	R2001501A	R2001502A	R2001503J	R2001504G	R2001505A	R2001506A	R2001507K
EPDM 70 Durometer	R2002201J	R2002202G	R2002203E	R2002204C	R2002205K	R2002206H	R2002207F
Nitrile 70 Durometer	R2002301G	R2002302E	R2002303C	R2002304A	R2002305H	R20012306F	R2002307D
Silicone 70 Durometer	R2001401F	R2001402D	R2001403B	R2001404K	R2001405G	R2001406E	R2001407C
Viton 70 Durometer	R2002101A	R2002102J	R22002103G	R2002104E	R2002105A	R2002106K	R2002107H

LINER PART NUMBERS:

	2"	3"	4"	6"	8"	10"	12"
Natural Rubber 65 Durometer	R940001	R940101	R940201	R940301	R940401	R940501	R940601
EPDM 70 Durometer	R940006	R940106	R940206	R940306	R940406	R940506	R940606
Nitrile 70 Durometer	R940007	R940107	R940207	R940307	R940407	R940507	R940607
Silicone 70 Durometer	R940003	R940103	R940203	R940303	R940403	R940503	R940603
Viton 70 Durometer	R940005	R940105	R940205	R940305	R940405	R940505	R940605

When ordering, please give complete nameplate data of the valve and/or control being repaired.
MINIMUM ORDER CHARGE APPLIES.