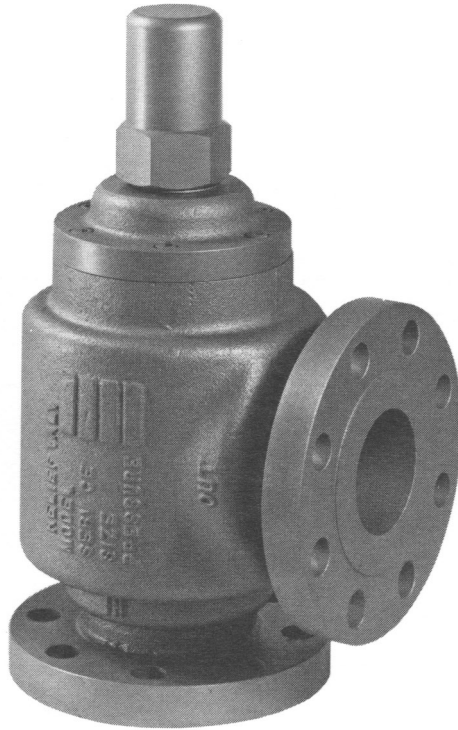


# A-SERIES VALVES



## APPLICATION

The Fulflo "A" Series feature both direct acting and internal pilot operated models with either screw or flange type connections. The threaded valves are available in both 2½" and 3" sizes in either cast iron or steel. The flange type valves also include a 4" model and may be specified with 150#, 300# or 600# ANSI flanges.

The direct acting valves operate at pressures to 150 P.S.I.; the internal pilot operated models at

pressures to 500 P.S.I. Both types handle large flows of liquid of all viscosities encountered in industrial practice.

The "A" Series valves may be used in a variety of applications including hydraulic and lubrication systems for load regulation and system protection.

Unusual applications and special or stainless steel requirements should be referred to our engineering staff for recommendation.

## INSTALLATION

Fulflo valves can be mounted in any position. A tee may be inserted in the pump discharge line to mount the valve. The pipe lines carrying the heavy valves must be well supported and overhung weights avoided. The correct size of valve must be used, preferably equal to the size of the pipe line to which they are connected. Threaded valves (AAD and ACD) may be

threaded into pipe nipples. Overhung weights on threads should be avoided. Flanged valves (AADF and ACDF) are bolted to the companion flange which may be threaded or welded to the pipe. The outlet of the valve should be piped to the supply tank, unless specific applications call for alternate piping of return lines. Care must be taken to have the discharge well below the oil level in the tank to prevent air entrainment and erratic operation.

## SETTING VALVES

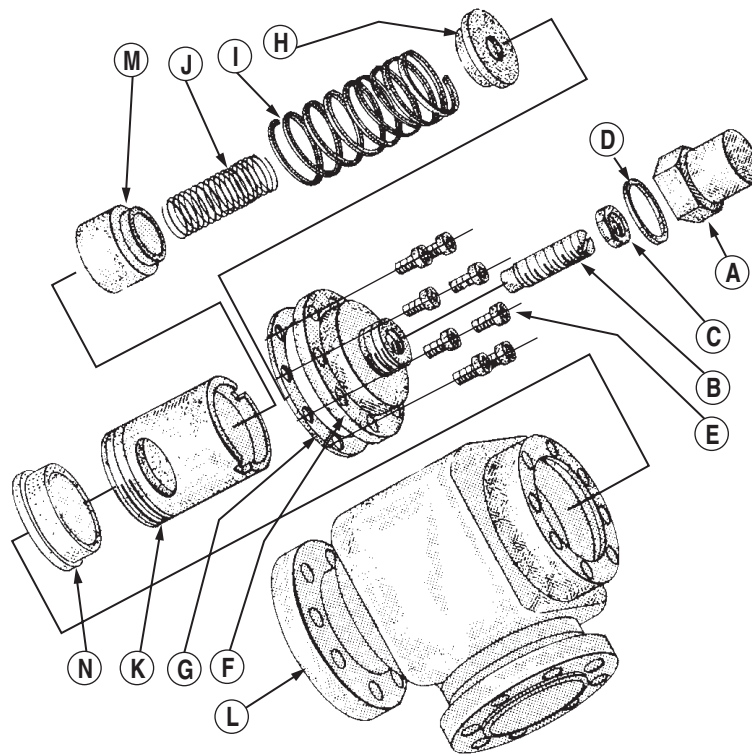
Valve may be set with a hydraulic hand pump for cracking pressure. If a test stand is available, valve should be connected to the discharge header with the pump bypass open, and the bypass gradually closed until the desired pressure registers on the gauge. **“Direct”** Adjust valve adjusting screw until valve slightly bleeds at the set bypass pressure and lock adjusting screw. **“Pilot”** Adjust valve adjusting screw until approximately 5-7 GPM is flowing through the valve, at that point the main piston will open and then the valve will be considered at the cracking point, then lock adjusting screw. If a valve is required to bypass a given amount of fluid at a

given pressure, a test stand having a flow meter in the pump discharge line must be available. With a valve adjusting for cracking pressure as above, continue closing bypass until the required flow registers on the flow meter and observe pressure. Readjust pressure, if necessary, to obtain desired pressure at desired flow.

## MAINTENANCE

Fulflo valves provide reliable “chatter-free” operation when the system is free of abrasives and foreign matter. Continuous filtration of the liquid used is strongly recommended.

## DISASSEMBLY OF DIRECT ACTING VALVES



To dismantle the valve for inspection or cleaning:

1. Remove cap “A” and gasket “D”
2. Remove lock nut “C”
3. Remove adjusting screw “B”
4. Remove cap screws “E”
5. Remove bonnet “F”
6. Remove gasket “G”
7. Remove spring retainer “H”
8. Remove spring or springs “I” and “J”
9. Remove piston “M”
10. Unscrew and withdraw cylinder “K”

11. Remove retaining bushing “N” if necessary

Inspect cylinder bore and piston for wear or scoring. Replace broken or damaged parts. Clean all parts thoroughly and re-assemble as follows:

Reverse process of disassembly from operation 11 to 6, then thread adjusting screw “B” into bonnet “F” so that it may be guided into the recess of spring retainer “H”, while re-assembling bonnet “F” to body “L”. Then proceed with steps 5, 4, 2, 1, in reverse order.

## ASSEMBLY NUMBER IDENTIFICATION CHART

Symbol No.	Designation	Code	Description
1	Series	A	
2	Material	A C	Cast Iron Cast Steel
3	Type	D P	Direct Acting Internal Pilot Operated
4 & 5	Size	09 10 11	2 1/2" 3" 4"
6	Connection	None F	Screw Type Flange
7,8,9	ASA Flange Rating	150# 300# 600#	
10	Flange Style Only	A B C D	Raised Face, Staggered Bolt Centers (Standard) Smooth Face, Staggered Bolt Centers Raised Face, Bolts on Valve Centerline Smooth Face, Bolts on Valve Centerline
11	O-Ring Material	R RV RS RT RA	Buna O-Ring Cap Seal (Standard) Viton O-Ring Cap Seal Silicone O-Ring Cap Seal Teflon O-Ring Cap Seal Atlas O-Ring Cap Seal

### EXAMPLE:

<b>ACP09</b>			
A	C	P	09
Series	Steel	Pilot Operated	2 1/2"

NOTE: Special valves are prefixed by numbers assigned by the factory.

### EXAMPLE:

Specify:

1. Valve Model Number
2. O-Ring Identification Number
3. Piston Material
4. Spring Part Number
5. Spring pressure range or desired pressure setting.

### SERIES "A" VALVES (Direct Acting) PRESSURE RANGE CHART

Valve Size	Symbol	Spring Part No.	Pressure Range
2 1/2"	I	A0960D	7-57 P.S.I.
	I	A0961C	8-75 P.S.I.
	I & J	A0960D and A0970D	14-115 P.S.I.
	I & J	A0961C and A0971C	16-150 P.S.I.
3"	I	A1060D	5-50 P.S.I.
	I	A1061C	5-67 P.S.I.

NOTE: Springs suffixed with "C" are Chrome Vanadium, "D" indicates Stainless Steel. For pressures other than listed, consult factory.

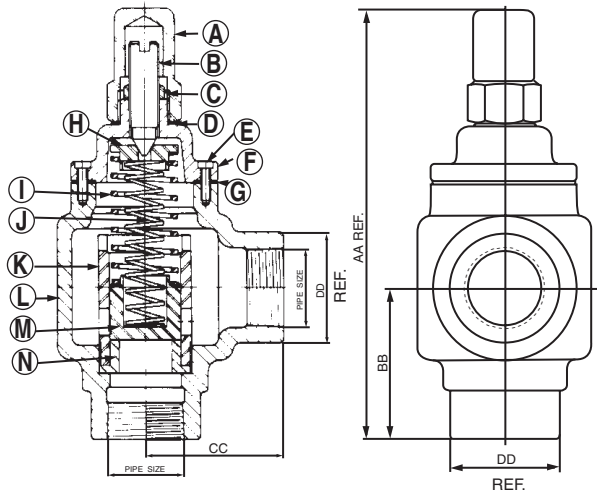
### (Continued)

3"	I & J	A1060D and A1070D	10-100 P.S.I.
	I & J	A1061C A1071C	10-135 P.S.I.
4"	I	A1160D	2-37 P.S.I.
	I & J	A1160D and A1170D	4-75 P.S.I.

### SERIES "A" VALVES (Pilot Operated) PRESSURE RANGE CHART

Valve Size	Symbol	Spring Part No.	Pressure Range
2 1/2"	O & J	A0980D and A1190D	50-500 P.S.I.
3"	O & J	A1080D and A1190D	50-500 P.S.I.
4"	O & J	A1181D and A1190D	50-500 P.S.I.

## DIMENSIONS



Valve Size	DIMENSIONS IN INCHES			
	AA	BB	CC	DD
2½"	15 <sup>9</sup> / <sub>16</sub>	5½	5 <sup>1</sup> / <sub>16</sub>	4
3"	17½	6 <sup>5</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>

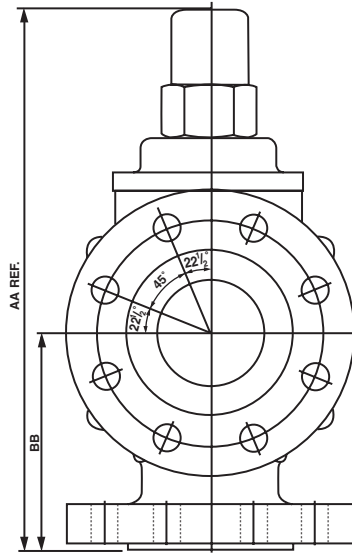
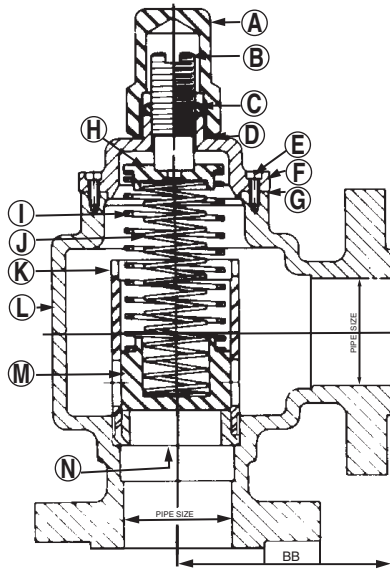
## PARTS LIST

Symbol	NAME	VALVE SIZE	
		2½"	3"
A	Cap	A1101CR	A1013CR
B	Adjusting Screw	A0922C	A1022C
C	Lock Nut	605-S	705-S
D	O-Ring †	604-R	704-R
E	Cap Screw	3/8 x 1 SHCS	3/8 x 1 SHCS
F	Bonnet Cast Iron Steel	A0909A A0909C	A1009A A1009C
G	Gasket †	A0903E	A1003E
H	Spring Retainer	A0916C	A1016C
I	Spring †	See Chart	See Chart
J	Spring †	See Chart	See Chart
K	Cylinder †	A0908C	A1008C
L	Body Cast Iron Steel	A0900A A0900C	A1000A A1000C
M	Piston † Hardened Steel Stainless Steel	A0906C A0906D	A1006C A1006D
N	Retaining Bushing	A0911C	A1011C

† Recommended spare parts

# A-SERIES 2½", 3" and 4" (Direct Acting)

## DIMENSIONS



DIMENSIONS IN INCHES

Valve Size	Flange Rating	AA	BB
2½	150# 300#	15 <sup>12</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>
2½	600#	16 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>
3	150# 300#	17 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>4</sub>
3	600#	17 <sup>1</sup> / <sub>2</sub>	6 <sup>5</sup> / <sub>8</sub>
4	150# 300#	20	7 <sup>15</sup> / <sub>16</sub>
4	600#	20 <sup>3</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>8</sub>

Note! Refer to Page 10 for Flange and Drilling Dimensions.

## PARTS LIST

Symbol	NAME	VALVE SIZE			
		2½"	3"	4"	
A	Cap	A1101CR	A1013CR	A1113CR	
B	Adjusting Screw	A0922C	A1022C	A1122C	
C	Lock Nut	605-S	705-S	805-S	
D	O-Ring †	604-R	704-R	804-R	
E	Cap Screw	3/8 x 1 SHCS	3/8 x 1 SHCS	3/8 x 1 SHCS	
F	Bonnet Cast Iron Steel	A0909A A0909C	A1009A A1009C	A1109A A1109C	
G	Gasket †	A0903E	A1003E	A1103E	
H	Spring Retainer	A0916C	A1016C	A1116C	
I	Spring †	See Chart	See Chart	See Chart	
J	Spring †	See Chart	See Chart	See Chart	
K	Cylinder †	A0908C	A1008C	A1108C	
L	Body	Cast Iron 150# 300# 600# Steel 150# 300# 600#	A0900AF150A A0900AF300A A0900AF600A A0900CF150A A0900CF300A A0900CF600A	A1000AF150A A1000AF300A A1000AF600A A1000CF150A A1000CF300A A1000CF600A	A1100AF150A A1100AF300A A1100AF600A A1100CF150A A1100CF300A A1100CF600A
M	Piston † Hardened Steel Stainless Steel	A0906C A0906D	A1006C A1006D	A1106C A1106D	
N	Retaining Bushing	A0911C	A1011C	A1111C	

† Recommended spare parts

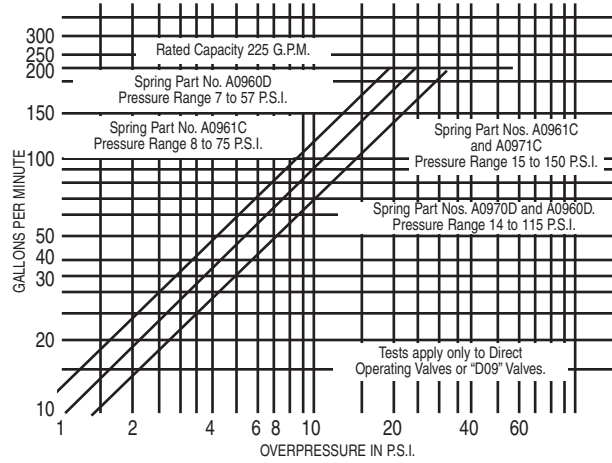
A-SERIES  
VALVES

# A-SERIES PERFORMANCE CHARTS

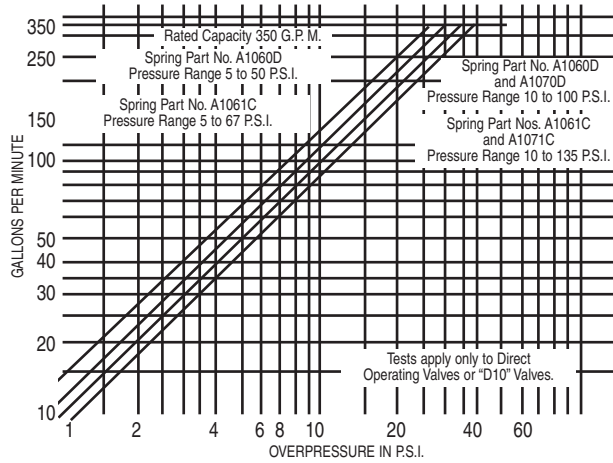
(Direct Acting)

All valve tests 110°F. to 120°F. Oil Viscosity 150 S.S.U. at 100°F.  
(Charts good from 30 to 500 S.S.U.)

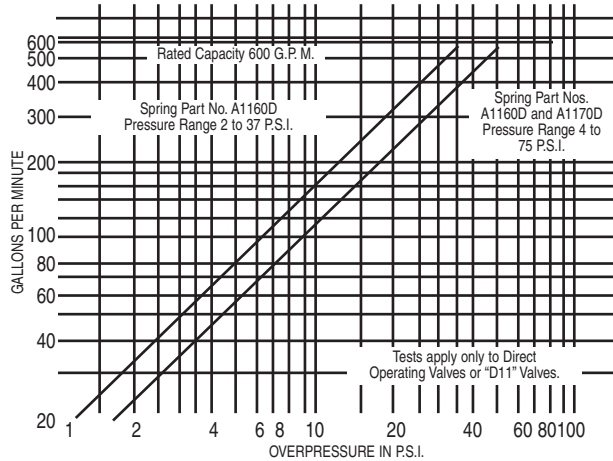
2 1/2" VALVE TESTS



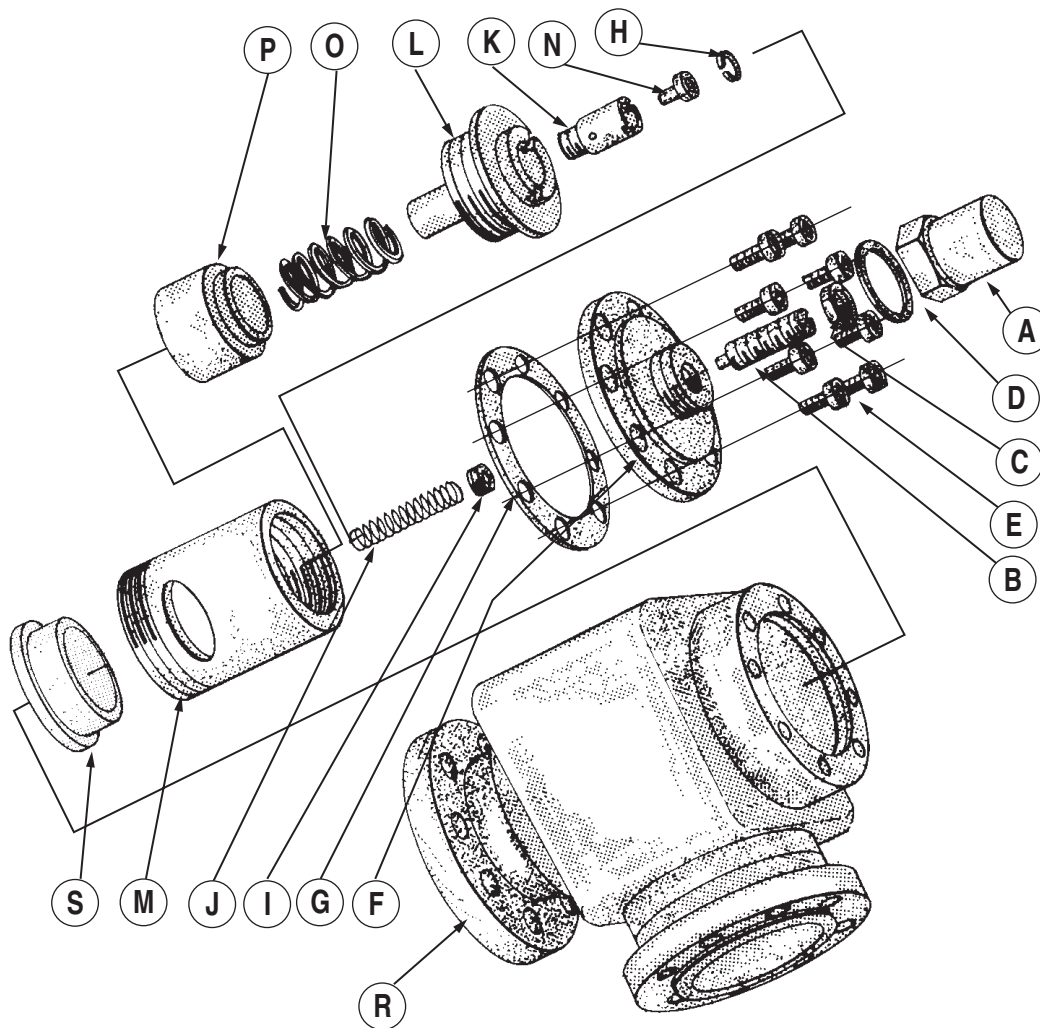
3" VALVE TESTS



4" VALVE TESTS



A-SERIES VALVES



## DISASSEMBLY OF INTERNAL PILOT OPERATED VALVES

To dismantle the valve for inspection or cleaning:

1. Remove cap "A" and gasket "D"
2. Remove nut "C"
3. Remove adjusting screw "B"
4. Remove cap screws "E"
5. Remove bonnet "F"
6. Remove gasket "G"
7. Remove spring retainer "I"
8. Remove pilot spring "J"
9. Unscrew and withdraw cylinder "M" (do not unscrew cylinder retainer "L")
10. Unscrew and remove cylinder retainer "L", after removing cylinder "M".
- Caution:** hold in vise. Balance spring "O" under heavy compression.
11. Unscrew and remove piston retainer "K"

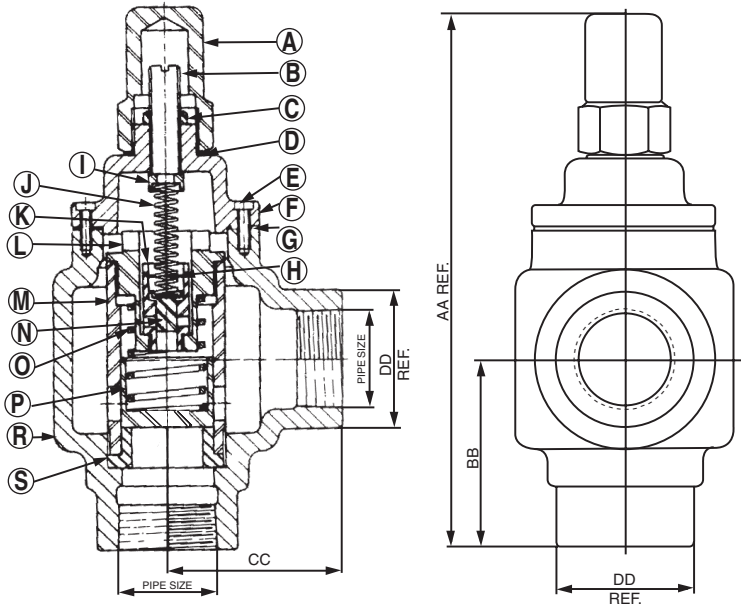
12. Remove retaining ring "H"
13. Remove pilot piston "N"
14. Remove balance spring "O"
15. Remove piston "P"
16. Remove retaining bushing "S" if necessary

Inspect bores of both piston retainer "K" and cylinder "M". Inspect pistons "N" and "P" for wear or scoring. Replace broken or damaged parts. Clean all parts thoroughly and re-assemble as follows:

Reverse process of disassembly from operation 16 to 6, then thread adjusting screw "B" into bonnet "F" so that it may be guided into the recess of spring retainer "I", while re-assembling "F" to body "R". Then proceed with steps 5, 4, 2, 1 in reverse order.

# A-SERIES 2 1/2" and 3" (Internal Pilot Operated)

## DIMENSIONS



Valve Size	DIMENSIONS IN INCHES			
	AA	BB	CC	DD
2 1/2"	15 <sup>5</sup> / <sub>8</sub>	5 1/2	5 1/16	4
3"	16 1/2	6 <sup>5</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	4 <sup>7</sup> / <sub>8</sub>

## PARTS LIST

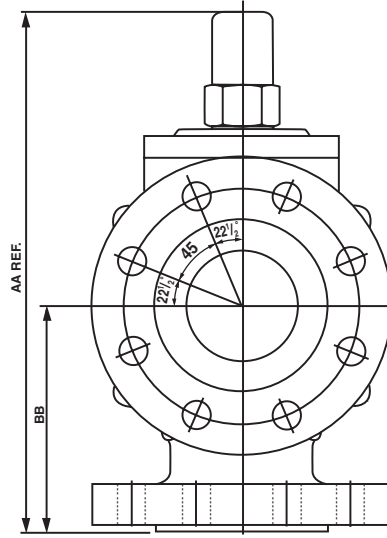
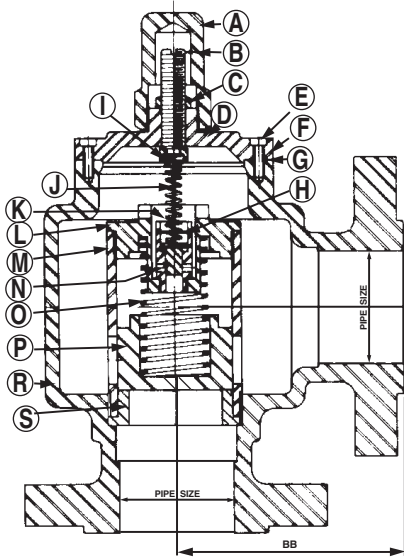
Symbol	NAME	VALVE SIZE	
		2 1/2"	3"
A	Cap	A1101CR	A1101CR
B	Adjusting Screw	A1102C	A1102C
C	Lock Nut	505-S	505-S
D	O-Ring †	604-R	604-R
E	Cap Screw	3/8 x 1 SHCS	3/8 x 1 SHCS
F	Bonnet Cast Iron Steel	A0919A A0919C	A1019A A1019C
G	Gasket †	A0903E	A1003E
H	Retainer Ring †	A1120D	A1120D
I	Spring Retainer	A1126C	A1126C
J	Pilot Spring †	A1190D	A1190D
K	Piston Retainer †	A1118C	A1118C
L	Cylinder Retainer	A0912C	A1012C
M	Cylinder †	A0928C	A1028C
N	Pilot Piston † Hardened Steel Stainless Steel	A1115C A1115D	A1115C A1115D
O	Balance Spring †	A0980D	A1080D
P	Piston † Hardened Steel Stainless Steel	A0936C A0936D	A1036C A1036D
R	Body Cast Iron Steel	A0900A A0900C	A1000A A1000C
S	Retaining Bushing	A0911C	A1011C

† Recommended spare parts



# A-SERIES 2½", 3" and 4" (Internal Pilot Operated)

## DIMENSIONS



DIMENSIONS IN INCHES

Valve Size	Flange Rating	AA	BB
2½	150# 300#	15 <sup>7</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>
2½	600#	16 <sup>1</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>8</sub>
3	150# 300#	16 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>4</sub>
3	600#	16 <sup>1</sup> / <sub>2</sub>	6 <sup>5</sup> / <sub>8</sub>
4	150# 300#	18 <sup>3</sup> / <sub>16</sub>	7 <sup>15</sup> / <sub>16</sub>
4	600#	18 <sup>3</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>

## PARTS LIST

Symbol	NAME	VALVE SIZE		
		2½"	3"	4"
A	Cap	A1101CR	A1101CR	A1101CR
B	Adjusting Screw	A1102C	A1102C	A1102C
C	Lock Nut	505-S	505-S	505-S
D	O-Ring †	604-R	604-R	604-R
E	Cap Screw	3/8 x 1 SHCS	3/8 x 1 SHCS	3/8 x 1 SHCS
F	Bonnet Cast Iron Steel	A0919A A0919C	A1019A A1019C	A1119A A1119C
G	Gasket †	A0903E	A1003E	A1103E
H	Retainer Ring †	A1120D	A1120D	A1120D
I	Spring Retainer	A1126C	A1126C	A1126C
J	Pilot Spring †	A1190D	A1190D	A1190D
K	Piston Retainer †	A1118C	A1118C	A1118C
L	Cylinder Retainer	A0912C	A1012C	A1112C
M	Cylinder †	A0928C	A1028C	A1128C
N	Pilot Piston † Hardened Steel Stainless Steel	A1115C A1115D	A1115C A1115D	A1115C A1115D
O	Balance Spring †	A0980D	A1080D	A1181D
P	Piston † Hardened Steel Stainless Steel	A0936C A0936D	A1036C A1036D	A1136C A1136D
R	Body Cast Iron Steel	150# 300# 600# 150# 300# 600#	A0900AF150A A0900AF300A A0900AF600A A0900CF150A A0900CF300A A0900CF600A	A1000AF150A A1000AF300A A1000AF600A A1000CF150A A1000CF300A A1000CF600A
S	Retaining Bushing	A0911C	A1011C	A1111C

† Recommended spare parts

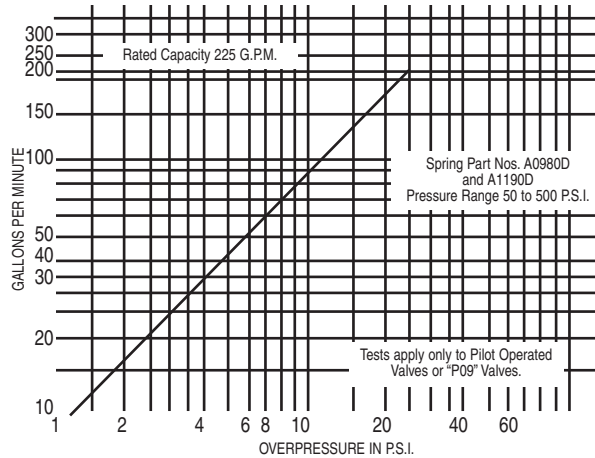
A-SERIES  
VALVES

# A-SERIES PERFORMANCE CHARTS

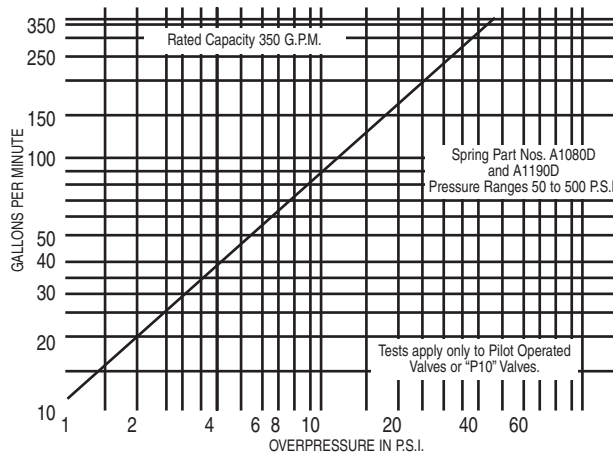
(Internal Pilot Operated)

All valve tests 110°F. to 120°F. Oil Viscosity 150 S.S.U. at 100°F.  
(Charts good from 30 to 500 S.S.U.)

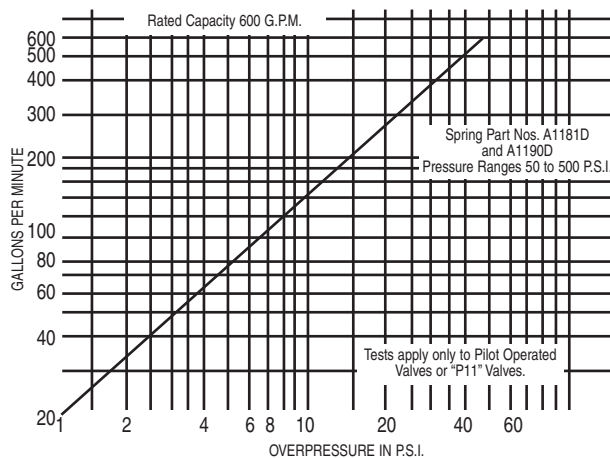
2 1/2" VALVE TESTS



3" VALVE TESTS



4" VALVE TESTS



A-SERIES VALVES