

**STAINLESS-STEEL
GATE VALVES**

120-SERIES INSTRUCTION MANUAL .625" THRU 6.00"

FAX (415) 732-9853 TWX 910-383-2045

HIGH VACUUM APPARATUS MFG., INC., 1763 SABRE ST. HAYWARD CA 94545 (415) 785-2777

No. 5362 P. 2

Jul 1, 29, 2005 2:50PM HVA RENO 775 359-1369

INSTRUCTIONS

UNPACKING

Inspect container before unpacking to see that no damage has been sustained in transit. Any damage that is visible should be reported to transportation company. Remove valve from container making sure that the flange faces are in good condition and visually inspect the valve.

INSTALLATION

Determine that the valve and adjacent plumbing in the vacuum system will be adequately supported when installed. Make sure that the mating flanges are in line, parallel and the correct distance apart to **minimize straining of valve body**.

Remove the flange cover and wipe the flange and the gaskets with a lint free dry wipe. In case of o-ring seal flanges, apply light film of vacuum grease to the o-ring and install in flange groove.

Proceed with installation making sure that no foreign particles enter the valve. When installing a valve it is imperative that the proper length bolts be used. Bolts longer than the thickness of both mating flanges **will damage the body panels and destroy the seal surface area for the gate o-ring**. For best results, **always use bolts that are at least 1/4 of an inch shorter than the thickness of both mating flanges**. Lightly grease the flange bolts with high temperature non-galling type grease. Carefully tighten around the flange in 180 degree alternating pattern until flanges are metal to metal and bolts are snug approximately 5-10 foot pounds of torque (o-ring seal flanges) or 16 foot pounds of torque (metal seal flanges) up to 2 3/4" O.D. or 26 foot pounds of torque (metal seal flanges) up to 10.0" O.D.

Valves will work equally well with actuation center line located in any position round the flange. In addition, the pressure differential can be applied to either side of the gate and still maintain a vacuum tight seal. However, it is preferable to install the valve with vacuum on the underside of the valve gate so that the valve body remains under vacuum at all times and the pumpdown of the valve body is eliminated.

HAND OPERATED TYPES. Prior to valve installation check to see that the valve actuation works freely.

AIR OPERATED AND SPRING LOADED OPTION TYPES. Connect the compressed air supply to the valve with 1/4" pipe fittings using teflon tape on the threads to insure leak proof joints. **For continued trouble free operation, it is recommended that an air filter/lubricator be used in the air line system.** Refer to the solenoid nameplate for the correct voltage when connecting to the electric service. Check carefully the operation of the valve with 20 PSIG air pressure. Increase air pressure slowly until the valve is heard to mechanically lock over center. At this point, note the pressure, increase the pressure by 5 additional pounds. The valve is now set and ready for operation. See caution for dismantling spring loaded air cylinder assemblies.

POSITION INDICATED TYPES. The standard position indicator switches are preset and will indicate when the valve is fully opened or fully closed. The standard voltage on the micro switches is 28 volts DC at 5 amps.

OPERATION

To ensure trouble free use, keep the valve clean and free of contaminates. **DO NOT operate pneumatic valves above 100 PSIG.** Higher pressures may damage the piston actuator.

DO NOT excessively tighten or adjust the hand operated valve; especially to prevent leakage. The gate mechanism is designed to go "over-center" in order to achieve a seal. Any further tightening of the actuator will only increase the leak rate at the gate and will damage internal linkage of the valve. Check for o-ring damage and cleanliness if leakage should occur at the gate. For special gate valves, see addendum enclosed.

WARRANTY

Each product sold by High Vacuum Apparatus (HVA) is warranted to be free from manufacturing defects that adversely affect the normal functioning thereof during the one-year period immediately following delivery thereof by HVA (or in the case of products or components of any product purchased by HVA from another for any lesser period of time that such manufacturer warrants said product or component to HVA.) Due to the potential danger from a misuse of the goods sold under this agreement, **SELLER'S WARRANTIES OF FITNESS AND MERCHANTABILITY, AS WELL AS ANY OTHER EXPRESS WARRANTIES MADE IN CONNECTION WITH THIS SALE, SHALL NOT BE EFFECTIVE OR ACTIONABLE UNLESS** the product is operated under conditions of normal use and that regular, periodic maintenance and service is performed or replacements made, in accordance with the instructions provided by HVA. **The foregoing warranty shall not apply to any product or component that has been repaired or altered** by anyone other than an authorized HVA representative or that has been subject to improper installation or abuse, misuse, negligence or accident. HVA shall not be liable for any damage, loss or expense, whether consequential, special, incidental, direct or otherwise, caused by, arising out of or connected with the manufacture, delivery (including any delay in or failure to deliver), packaging, storage or use of any product sold or delivered by HVA, whether or not resulting from negligence or from breach of contract except that in the event that any product so sold or delivered by HVA shall fail to conform to the foregoing warranty or to the description thereof contained herein, the purchaser thereof, as its exclusive remedy, shall upon prompt notice to HVA of any such defect or failure and upon the return of the product, part or component in question to HVA at its factory, with transportation charges prepaid, and upon HVA's inspection confirming the existence of any defect inconsistent with said warranty or any such failure, be entitled to have such defect or failure cured at HVA's factory and at no charge therefore, by replacement or repair of said product as HVA may elect. **THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER OR IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS, AND OF ANY OTHER OBLIGATION ON THE PART OF HVA AND NONE SHALL BE IMPLIED BY LAW.**

PARTS LIST

ITEM	DESCRIPTION	.625	1.50	2.00	2.50	3.00	4.00	6.00
BONNET BELLOWS SECTION								
*01b	STAND PIPE ASSY: "STD"	—	B-0063	B-0142	B-0351	B-0144	B-0140	B-0140
	STAND PIPE ASSY: "MSB"	—	B-0065	B-0143	B-0352	B-0147	B-0141	B-0141
*02b	SCREW: "STD"	—	07-023	07-023	07-032	07-032	07-033	07-033
	SCREW: "MSB"	—	07-039	07-039	07-039	07-039	07-050	07-050
*03b	BONNET BELLOWS ASSY: "STD"	—	B-0149	B-0150	B-0597	B-0588	B-0329	B-0333
	BONNET BELLOWS ASSY: "MSB"	—	B-0148	B-0151	B-0598	B-0593	B-0330	B-0334
	BONNET X-BELLOWS ASSY: "STD"	—	B-0353	B-0160	B-0158	B-0156	B-0328	B-0349
	BONNET X-BELLOWS ASSY: "MSB"	—	B-0354	B-0305	B-0159	B-0157	B-0317	B-0321
	BONNET BELLOWS ASSY: "STD H/O"	A-0881	—	—	—	—	—	—
	BONNET BELLOWS ASSY: "MSB H/O"	A-0882	—	—	—	—	—	—
	BONNET BELLOWS ASSY: "STD PNU"	A-1091	—	—	—	—	—	—
	BONNET BELLOWS ASSY: "MSB PNU"	A-1092	—	—	—	—	—	—
04b	EXT RETAINER RING	—	—	—	22-003	22-003	22-002	22-002
05b	—	—	—	—	—	—	—	—
*06b	SOC HD SCR: "STD"	—	—	—	—	—	07-029	07-029
	SOC HD SCR: "MSB"	—	—	—	—	—	07-042	07-042
07b	SOC HD SCR	—	07-024	07-024	07-029	07-029	07-029	07-029
08b	STEM PIN	—	—	—	—	—	A-0823-02	A-0823-02
*09b	SCREW: "STD"	07-025	07-023	07-023	07-032	07-032	07-032	07-032
	SCREW: "MSB"	07-025	07-039	07-039	07-039	07-039	07-048	07-048
*10B	BONNET GASKET: "STD"	24-025	24-033	24-035	24-152	24-153	24-157	24-162
	BONNET GASKET: "MSB"	27-001	27-002	27-003	27-004	27-005	27-006	27-007
11b	FLAT WASHER	—	09-010	09-010	09-010	09-010	09-016	09-016
12b	HEX NUT	—	—	—	—	—	08-012	08-012

CARRIAGE SECTION

01c	PIVOT PIN "UL"	—	A-0170	A-0170	A-0479	A-0479	A-1122-02	A-1122-02
02c	UPPER LINKAGE ASSY	—	B-0047	B-0208	A-0469	B-0136	B-0344	B-0341
03c	RADIAL BEARING	—	—	—	14-008	14-008	14-001	14-001
04c	FLAT WASHER	—	—	—	—	—	A-1045	A-1045
05c	LOWER LINKAGE "UL"	—	—	—	—	—	C-0203	C-0203
06c	COTTER KEY	—	40-019	40-019	40-025	40-025	40-025	40-025
07c	LOCK WASHER	—	—	—	09-015	09-015	09-013	09-013
08c	JAM NUT: "RIGHT HAND"	08-007	A-0742	A-0742	08-011	08-011	A-0926	A-0926
	JAM NUT: "LEFT HAND"	—	—	—	—	—	A-0927	A-0927
09c	THREADED BOLT	—	A-0128	A-0595	A-0886	A-0886-01	A-0894	A-0894
10c	LOWER LINKAGE "SB"	—	A-0127	A-0127	A-1089	A-1089	C-0073	C-0072
11c	PIVOT PIN "SB"	—	A-0139	A-0139	A-0478	A-0478	A-0739-02	A-0739-02
12c	ELBOW PIVOT PIN	—	A-0169	A-0169	A-0476	A-0476	A-0747-02	A-0747-02
13c	STRONG BACK ASSY	C-0105	B-0107	B-0210	C-0195	C-0198	C-0127	C-0206
14c	SET SCREW	07-532	07-526	07-526	07-515	07-525	07-524	07-524
15c	JAM NUT	08-015	08-007	08-007	08-008	08-008	08-011	08-011
16c	LOCK WASHER	—	—	—	09-008	09-008	09-015	09-015
17c	INT RETAINER RING	—	—	—	22-301	22-301	22-201	22-201
18c	STEM PIN	—	A-0140	A-0140	A-0486	A-0486	A-2228-02	A-2228-02
19c	EXT RETAINER RING	—	22-001	22-001	22-003	22-003	22-002	22-002
20c	EXT RETAINER RING	22-001	—	—	22-003	22-003	22-002	22-002
21c	EXT RETAINER RING	—	—	—	22-003	22-003	22-004	22-004
22c	SIDE WHEEL	A-0342	A-0136	A-0136	A-0496	A-0496	A-0728	A-0728
23c	FLAT WASHER	—	09-005	09-005	—	—	09-009	09-009
24c	SIDE WHEEL AXLE	—	A-0137	A-0137	A-0477	A-0477	A-0734-02	A-0734-02
25c	GATE SPRING	17-002	17-002	17-002	17-001	17-001	17-004-01	17-004-01
26c	STRONG BACK LINK PIN	A-0348	A-0138	A-0138	A-0485	A-0485	A-0992-02	A-0992-02
27c	GATE O-RING	24-017	24-029	24-033	24-146	24-151	24-155	24-163
28c	GATE ASSY	C-0494	B-0106	B-0209	B-0131	B-0135	B-0266	C-0172
29c	GATE LINK PIN	A-0347	A-0161	A-0599	A-1027	A-1027	A-0733-02	A-0733-02
30c	LINKS	A-0346	A-0130	A-0130	A-0455	A-0455	A-0109	A-0856
31c	GUIDE WHEEL AXLE	—	—	—	—	—	A-0740-02	A-0740-02
32c	GUIDE WHEEL	—	—	—	A-0285	A-0285	A-0729	A-0729
33c	FWC AXLE	A-0348	A-1041	A-1041	A-1028	A-1028	A-0957-02	A-0957-02
34c	FWC PLATE	—	B-0494	B-0495	B-0513	B-0514	A-0903	A-0905
35c	EXT RETAINER RING	—	—	—	22-009	22-009	22-002	22-002
*36c	BODY ASSY: "STD"	B-0356	B-0358	B-0359	C-0064	C-0066	C-0068	C-0070
	BODY ASSY: "MSB"	B-0355	B-0857	B-0360	C-0065	C-0067	C-0069	C-0071
37c	CARRIAGE ASSY	B-0509	B-0559	B-0560	B-0561	B-0562	B-0563	C-0248

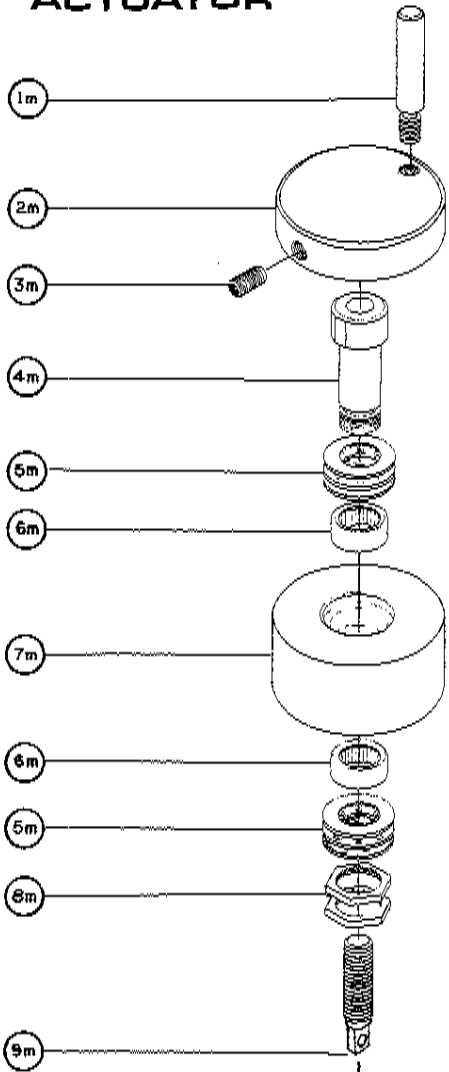
(Items 01c thru 35c)

* INDICATES "STD" & "MSB" VERSIONS

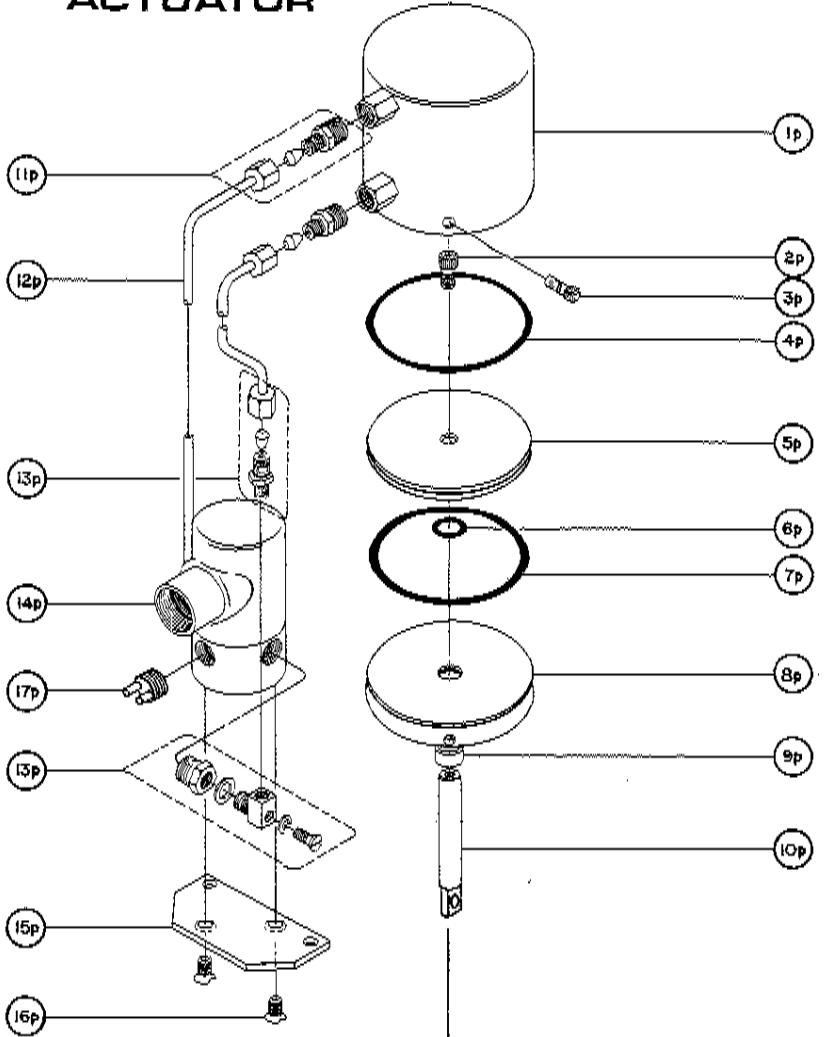
PARTS LIST

ITEM	DESCRIPTION	.625	1.50	2.00	2.50	3.00	4.00	6.00
MANUAL ACTUATOR SECTION								
01m	KNOB HANDLE	—	—	—	A-0077	A-0077	A-0088	A-0088
02m	KNOB	A-0345	A-0143	A-0143	A-0071	A-0071	A-0497	A-0497
03m	SET SCREW	07-511	07-512	07-512	07-512	07-512	07-517	07-517
04m	DRIVE NUT	A-0354	A-0142	A-0142	A-0871	A-0871	A-0041	A-0041
05m	BEARING KIT ASSY	—	—	—	A-1030	A-1030	A-1030	A-1030
06m	RADIAL BEARING	—	—	—	14-006	14-006	14-006	14-006
07m	BEARING BLOCK	—	—	—	A-0870	A-0870	A-0865	A-0865
08m	JAM NUT	—	—	—	A-0662	A-0662	A-0662	A-0662
09m	DRIVE SCREW	—	A-0847	A-0847	A-0916	A-0916	A-1031	A-1031
* 10m	BASE PL ASSY: "STD"	A-0924	—	—	—	—	—	—
	BASE PL ASSY: "MSB"	A-0925	—	—	—	—	—	—
11m	EXT RETAINER RING	22-007	—	—	—	—	—	—
12m	INT RETAINER RING	—	22-101	22-101	—	—	—	—
* 13m	ACTUATOR ASSY H/O: "STD"	B-0551	B-0550	B-0550	B-0549	B-0549	B-0548	B-0548
	ACTUATOR ASSY H/O: "MSB"	B-0552	B-0550	B-0550	B-0549	B-0549	B-0548	B-0548
	<i>(Items 01m thru 12m)</i>							
PNEUMATIC ACTUATOR SECTION								
* 01p	AIR CYL ASSY: "STD"	B-0456	B-0455	B-0455	B-0454	B-0454	B-0453	B-0453
	AIR CYL ASSY: "MSB"	B-0367	—	—	—	—	—	—
02p	SOC HD SCR	07-021	07-024	07-029	07-029	07-029	07-029	07-029
03p	SOC HD SCR	—	07-021	07-021	07-024	07-024	07-029	07-029
04p	PISTON O-RING	23-115	23-131	23-131	23-227	23-227	23-231	23-231
05p	PISTON	A-0883	A-0887	A-0887	A-0888	A-0888	B-0361	B-0361
06p	INTER PL O-RING INT	23-108	23-110	23-110	23-206	23-206	23-206	23-206
07p	INTER PL O-RING EXT	23-115	23-131	23-131	23-227	23-227	23-231	23-231
08p	INTERMEDIATE PL	A-1032	B-0362	B-0362	B-0363	B-0363	B-0364	B-0364
09p	—	—	—	—	—	—	—	—
10p	DRIVE SHAFT	—	B-0530	B-0530	A-1086	A-1086	A-1033	A-1033
11p	AIR CYL FITTINGS	15-002	15-002	15-002	15-002	15-002	15-002	15-002
12p	AIR LINES	20-002	20-002	20-002	20-002	20-002	20-002	20-002
13p	FITTING KIT ASSY	A-1034	A-1034	A-1034	A-1034	A-1034	A-1035	A-1035
14p	SOLENOID	18-007	18-007	18-007	18-007	18-007	18-003	18-003
15p	SOLENOID BASE PL	—	—	—	—	—	A-0092	A-0092
16p	FLAT/HD SCR	—	—	—	07-018	07-018	07-061	07-061
17p	SPEED CONTROL	—	—	—	—	—	18-013	18-013
* 18p	ACTUATOR ASSY PNU: "STD"	B-0553	B-0536	B-0536	B-0544	B-0544	B-0545	B-0545
	ACTUATOR ASSY PNU: "MSB"	B-0554	—	—	—	—	—	—
	<i>(Items 01p thru 10p & 12m)</i>							
19p	SOLENOID KIT	18-501	18-501	18-501	18-500	18-500	18-502	18-502
	<i>(Items 12p thru 16p; 17p optional)</i>							
POSITION INDICATOR SECTION								
01i	PI BOX KIT	B-0490-06	B-0490-01	B-0490-01	B-0490-02	B-0490-02	B-0490-03	B-0490-03
02i	MICRO-S KIT ASSY	A-1044	A-1044	A-1044	A-1044	A-1044	A-1044	A-1044
* 03i	STAND PIPE ASSY: "STD"	—	B-0063-01	B-0142-01	B-0351-01	B-0144-01	B-0140-01	B-0140-01
	STAND PIPE ASSY: "MSB"	—	B-0065-01	B-0143-01	B-0352-01	B-0147-01	B-0141-01	B-0141-01
04i	SOC HD SCR	07-021	07-022	07-022	07-029	07-029	07-030	07-030
* 05i	BONNET BELLOWS ASSY: "STD"	A-1091	B-0149-01	B-0150-01	B-0597-01	B-0594	B-0329-01	B-0333-01
	BONNET BELLOWS ASSY: "MSB"	A-1092	B-0148-01	B-0151-01	B-0598-01	B-0595	B-0330-01	B-0334-01
	BONNET X-BELLOWS ASSY: "STD"	—	B-0353-01	B-0160-01	B-0158-01	B-0156-01	B-0328-01	B-0349-01
	BONNET X-BELLOWS ASSY: "MSB"	—	B-0354-01	B-0305-01	B-0159-01	B-0157-01	B-0317-01	B-0321-01
* 06i	AIR CYL ASSY: "STD"	B-0557	—	—	—	—	—	—
	AIR CYL ASSY: "MSB"	B-0558	—	—	—	—	—	—
07i	PI O-RING	23-010	—	—	—	—	—	—
08i	PI SPACER	A-1055	—	—	—	—	—	—
09i	PI SHAFT	A-1056	—	—	—	—	—	—
10i	PI TRIGGER	A-0794	—	—	—	—	—	—
11i	SOC HD SCR	07-022	—	—	—	—	—	—
* 12i	PI ACTUATOR ASSY: "STD"	B-0555	—	—	—	—	—	—
	PI ACTUATOR ASSY: "MSB"	B-0556	—	—	—	—	—	—
	<i>(Items 01i thru 11i and 04p thru 08p)</i>							

MANUAL ACTUATOR

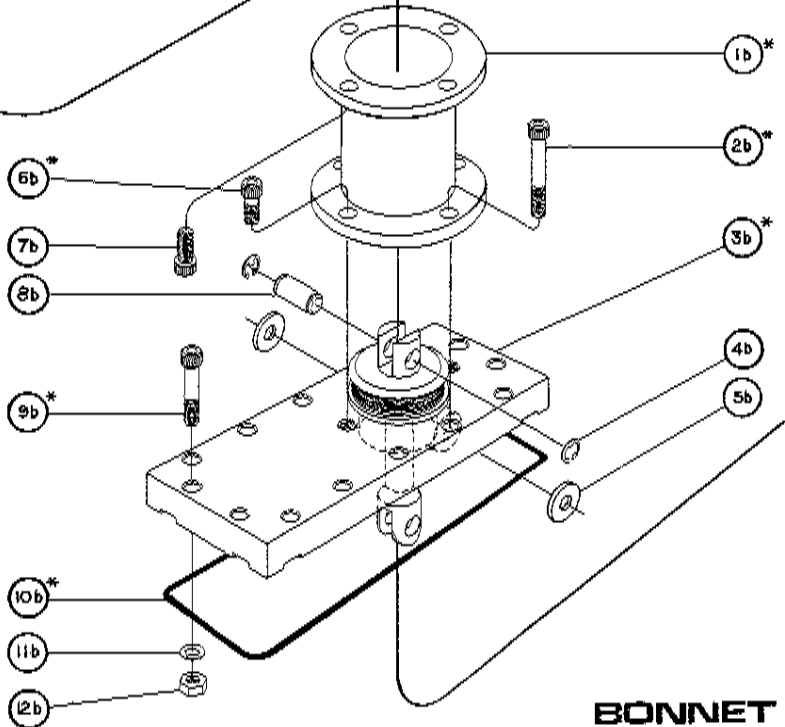
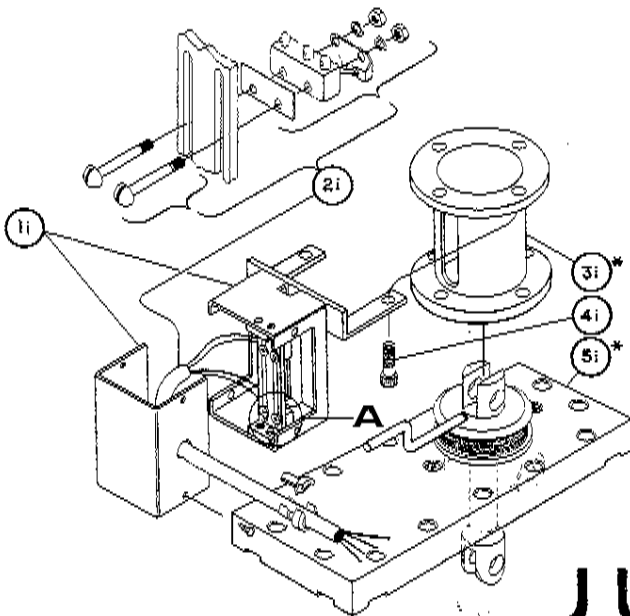


PNEUMATIC ACTUATOR



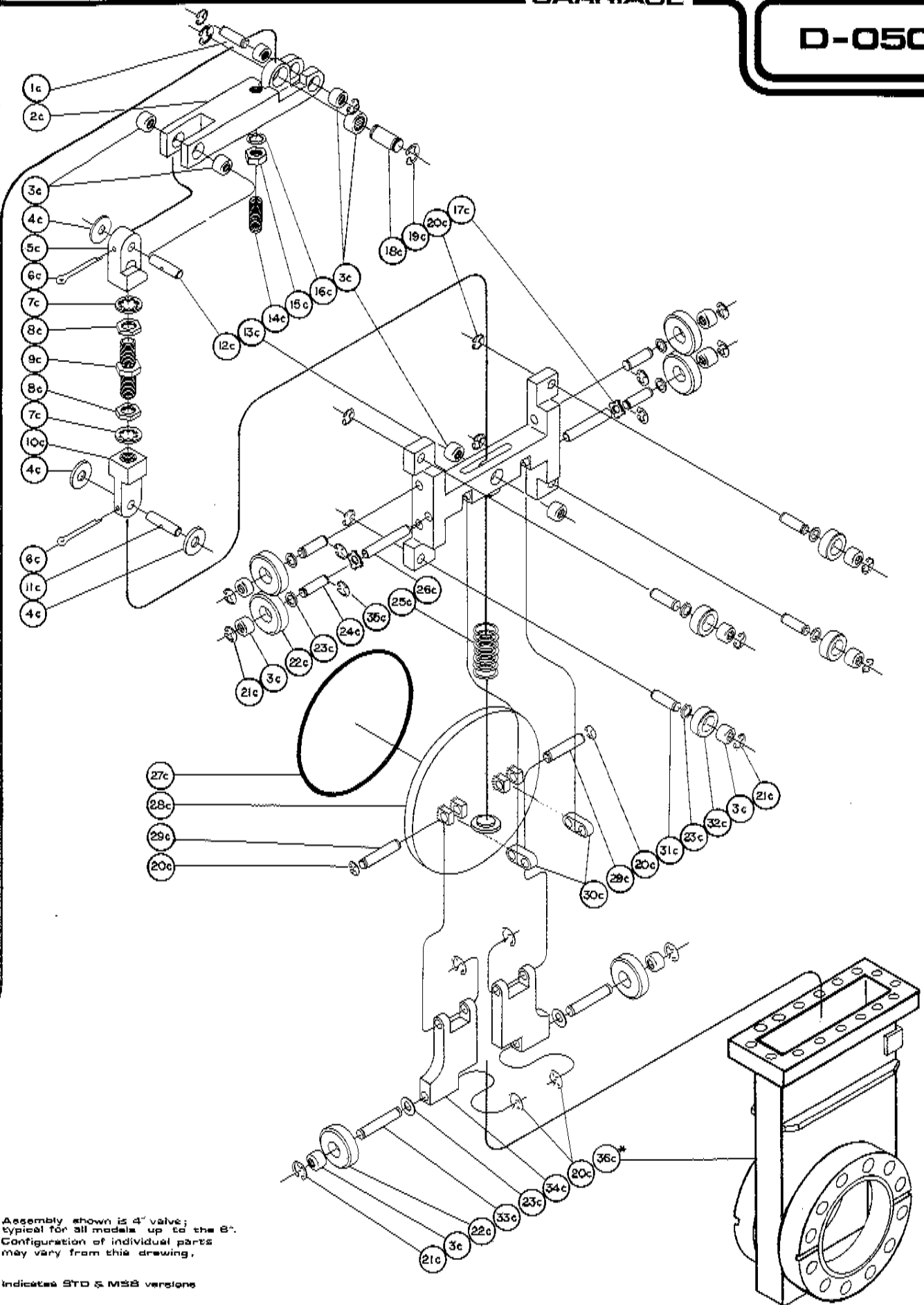
POSITION INDICATOR

VIEW IN CIRCLE 'A'



BONNET BELLOWS

D-0500



Assembly shown is 4" valve;
 typical for all models up to the 8".
 Configuration of individual parts
 may vary from this drawing.

*Indicates STD & MSB versions

Bill of Material Viewer Report

Assembly ID: C-0248
Description: ASY CARRIAGE G 6.0" W/GW

Level	Component ID	Required Quantity	Remark	Description	End Date	Start Date
1	07-524	1.000000		SCR SET .312-24 X 1.000 OVAL PT S/S		
1	08-071	1.000000		NOT .312-24 UNF X .187 THK HEX JAM SS		
* 1	09-013	2.000000		WASHER INTERNAL TOOTH LOCK .375 18-8SS		
* 1	09-015	1.000000		WASHER INTERNAL TOOTH LOCK .312 18-8SS		
* 1	09-212	10.000000		WASHER FLAT .253IDX .468ODX .026T 18-8SS		
* 1	14-001C	17.000000		BEARING #B-44 COATED .250 I.D.		
* 1	14-062	3.000000		BEARING #TRA-411 THRUST RACE NOT COATE		
* 1	17-004-01	1.000000		SPRING G 4.0" 12.0" HEAVY PER B- 0072-03		
* 1	22-002	14.000000		R-RING EXT .172" X5133-17		
* 1	22-004	10.000000		R-RING EXT .250" 5133-25		
* 1	22-201	2.000000		R-RING INT .311" SS 5005-3-H		
* 1	40-025	2.000000		COTTER PINS 5/64" X 1 1/4 " S/S		
1	A-0728-01	2.000000		WHEEL S/W G 6.0" W/GW ONLY (WITH HUB)		
1	A-0728	4.000000		WHEEL G/W G 4.0- 8.0 W/GW		
* 1	A-0733-02	2.000000		GATE L PIN G 4.0"- 6.0" W/GW NI-60 SS		
* 1	A-0734-02	4.000000		AXLE S/W G 4.0"- 6.0" W/GW NI60		
* 1	A-0739-02	1.000000		S.B. PIVOT PIN G 4- 8 W/GW 2.5G.OLD NI60		
* 1	A-0740-02	4.000000		AXLE G/W G 4.0"- 6.0" W/GW NI60		
* 1	A-0747-02	1.000000		ELBOW PIN G 4.8 W/GW 2.5-3 OLD NI- 60 SS		
1	A-0858	2.000000		LINK G 6.0-8.0 W/GW		
1	A-0881	1.000000		7/8 BOLT G 4.0-8.0 W/GW NEW DESIGN		
1	A-0905	2.000000		F.W.C. PEARL G 6.0 W/GW NEW DESIGN		

Bill of Material Viewer Report

Assembly ID: C-0248
Description: ASY CARRIAGE G 6.0" W/GW

Level	Component ID	Required Quantity	Remark	Description	End Date	Start Date
1	A 8966	1.000000		NUT 375 24 PH FOR NUT FOR T/SLIP S 16		
1	A 8967	1.000000		NUT 375 24 PH FOR NUT FOR T/SLIP S 16		
* 1	A-0957-02	2.000000		F.W.C. AXLE G 4.0"- 6.0" W/GW NI-60		
* 1	A-0992-02	2.000000		S.B. LINK PIN G 4.0"- 6.0" W/GW NI-60SS		
1	A 8949	4.000000		WHEEL CAM S 1.6" 6.0 W/GW 60204		
1	B 8944	1.000000		U.L. G 6.0 W/GW .200/PIN		
1	C 8072	1.000000		U.L. STR BAR G 6.0 W/GW SB		
1	C 0172	1.000000		ASY GATE G 6.0 W/GW		
1	C 8203-01	1.000000		L.L. U.L. G 4.0 - 8.0 W/GW UL		
1	C 8206	1.000000		ASY S.B. G 6.0 W/GW NEW DESIGN		

Bill of Material Viewer Report

Assembly ID: 620-0600
Description: KIT, PINS & BEARINGS REPLACEMENT G 6.0"

Level	Component ID	Required Quantity	Remark	Description	End Date	Start Date
1	08003	1.000000		081 RR, 1.000 LG FIT		
1	04238	0.000000		BELLOW STEM PIN		
* 1	09-013	2.000000		WASHER INTERNAL TOOTH LOCK .375 18-8SS		
* 1	09-015	1.000000		WASHER INTERNAL TOOTH LOCK .312 18-8SS		
* 1	09-212	10.000000		WASHER FLAT .253IDX .468ODX .026T 18-8SS		
1	08003	1.000000		081 RR, 1.000 LG FIT		
* 1	14-001C	17.000000		BEARING #B-44 COATED .250 I.D.		
* 1	14-062	11.000000		BEARING #TRA-411 THRUST RACE NOT COATE		
* 1	17-004-01	1.000000		SPRING G 4.0"- 12.0" HEAVY PER B- 0072-03		
* 1	22-002	20.000000		R-RING EXT .172" X5133-17		
* 1	22-004	15.000000		R-RING EXT .250" 5133-25		
* 1	22-201	3.000000		R-RING INT .311" SS 5005-3-H		
* 1	40-025	1.000000		COTTER PINS 5/64" X 1 1/4 " S/S		
* 1	A-0733-02	2.000000		GATE L PIN G 4.0"- 6.0" W/GW NI-60 SS		
* 1	A-0734-02	4.000000		AXLE S/W G 4.0"- 6.0" W/GW NI60		
* 1	A-0739-02	1.000000		S.B. PIVOT PIN G 4- 8 W/GW 2.5G OLD NI60		
* 1	A-0740-02	4.000000		AXLE G/W G 4.0"- 6.0" W/GW NI60		
* 1	A-0747-02	1.000000		ELBOW PIN G 4.8 W/GW 2.5-3 OLD NI- 60 SS		
1	A-0857-02	2.000000		PIN G AXLE G 4.0"-		
1	A-0893-02	2.000000		S.B. LINK PIN G 4.0"-		

