



High and Ultra-High Vacuum Stainless Steel Gate Valves

INSTALLATION, OPERATION, and MAINTENANCE INSTRUCTIONS

Models:

(All Versions)

GV-3000
THRU
GV-12000

UNPACKING

Before unpacking, inspect shipping container for signs of damage. Remove valve from plastic bag and inspect carefully. Pay particular attention to flange faces. Do not return damaged equipment from shipment to manufacturer. Report any damage to the shipping company immediately.

INSTALLATION

Before and after installation it is recommended to check the valve actuation to ensure that the valve operates smoothly and freely. This procedure will help determine if the installation was performed correctly. See instructions below for pneumatic hook-up.

Remove the flange covers and wipe flanges with a lint-free dry cloth. If flanges are the O-ring seal type, apply a light film of vacuum grease such as Apiezon L or M to O-ring and install the O-ring in the flange groove.

Install valve with the connecting flanges in-line, parallel, and the correct distance apart. This will minimize strain on the valve body.

Be careful not to allow any foreign material to enter the valve or any part of the vacuum system during installation. Make sure that the valve and adjacent piping are adequately supported.

It is extremely important to only use bolts of the correct length. Bolts longer than the thickness of the connecting flange and the valve port flange will damage the body panels and destroy the seal area for the gate O-ring. With exception to the 5/8" gate valve, use bolts that are at least 1/4" shorter than the thickness of both flanges combined. Refer to the *Del-Seal* Flange Section of the MDC General Catalog for recommended bolt sizes.



Before installation, lightly lubricate flange bolts with anti-seize compound such as Ferro Pro C-100. To ensure uniform pressure around the flange, carefully install bolts finger-tight alternating between bolt holes on opposite sides of the flange. Repeat the pattern with a wrench until the desired torque is achieved. Do not over-tighten bolts. The recommended torques are as follows: for O-ring sealing type flanges 10 FT LBS, 12 FT LBS for metal sealing flanges up to 2 3/4", and 15 FT LBS for metal sealing flanges above 2 3/4".

Valves can be installed and operated with actuator center line located in any position around the flange. Depending upon the valve application, the pressure differential can be applied to either side of the gate and still maintain a vacuum seal.

The advantage of having vacuum on the gate side of the valve is that the vacuum helps maintain the gate seal which will in turn prolong the life of the valve. However, if the gate valve is installed with vacuum on the carriage side, the valve components remain under

vacuum at all times, and the time needed to pump-down the valve components is significantly reduced.

For Electropneumatic Hook-Up: Connect valve to compressed air supply with 1/8" pipe fittings. Use teflon tape or suitable pipe thread lubricant to ensure leak-proof joints. An air filter/lubricator is recommended for use in the air line system to ensure trouble free operation. Refer to the solenoid nameplate for the correct operating voltage when connecting electrical power. To check valve operation, begin with 30 PSIG air pressure. Increase pressure slowly until valve mechanically locks "over-center." Note this pressure and then

DISASSEMBLY/ASSEMBLY PROCEDURES FOR 3" TO 12" GATE VALVES

CAUTION: BEFORE ATTEMPTING ANY DISASSEMBLY, VALVE SHOULD BE IN THE OPEN POSITION. ALSO DISCONNECT ANY ELECTRICAL AND AIR SUPPLY TO VALVE.

ACTUATOR O-RING REPLACEMENT

- (1) Valves equipped with -01 OPTION (Mechanical Position Indicator) requires removal of limit switches prior to disassembly.
 - (a) Remove side screws 96 and cover 86.
 - (b) Remove fasteners 95 and switch stand 87.
 - (c) Unscrew MPI shaft assembly 88.
- (2) Remove bolts 71 on the bottom of air cylinder 59 or 89. Remove air cylinder 59 or 89.
- (3) Replace o-rings as required. Be sure to use an adequate amount of white lithium lubricant on the new o-rings.
- (4) Reassemble in reverse order. Care should be taken not to damage o-rings during reassembly. MPI shaft 88 assembly should be installed thru the top of the air cylinder to prevent cutting of the small o-ring 92.

GATE O-RING REPLACEMENT

- (1) Should have bonnet o-ring 18 or gasket 17, and gate o-ring 12 available and ready before disassembly.
- (2) Remove bolts 73 on bellows assembly 56.
- (3) Slowly remove bellows assembly 56 & carriage assembly from the valve body 1. It is not necessary to remove any of the carriage pins.
- (4) Remove and replace gate o-ring 12.
- (5) Clean sealing surfaces and make sure that there is no lint or debris on sealing surfaces. This is essentially critical with dry o-ring sealing requirements.
- (6) Reassemble valve with new bonnet gasket 17, or o-ring 18.

CARRIAGE PARTS REPLACEMENT

- (1) Basically the same procedure as replacing the gate o-ring, except after removing the carriage from the valve body, the carriage is disassembled as required.
- (2) Care should be taken to keep track of all the parts removed; so, reassembly will be easier and correct.
- (3) Refer to the exploded-view drawing of the valve components for part identification.

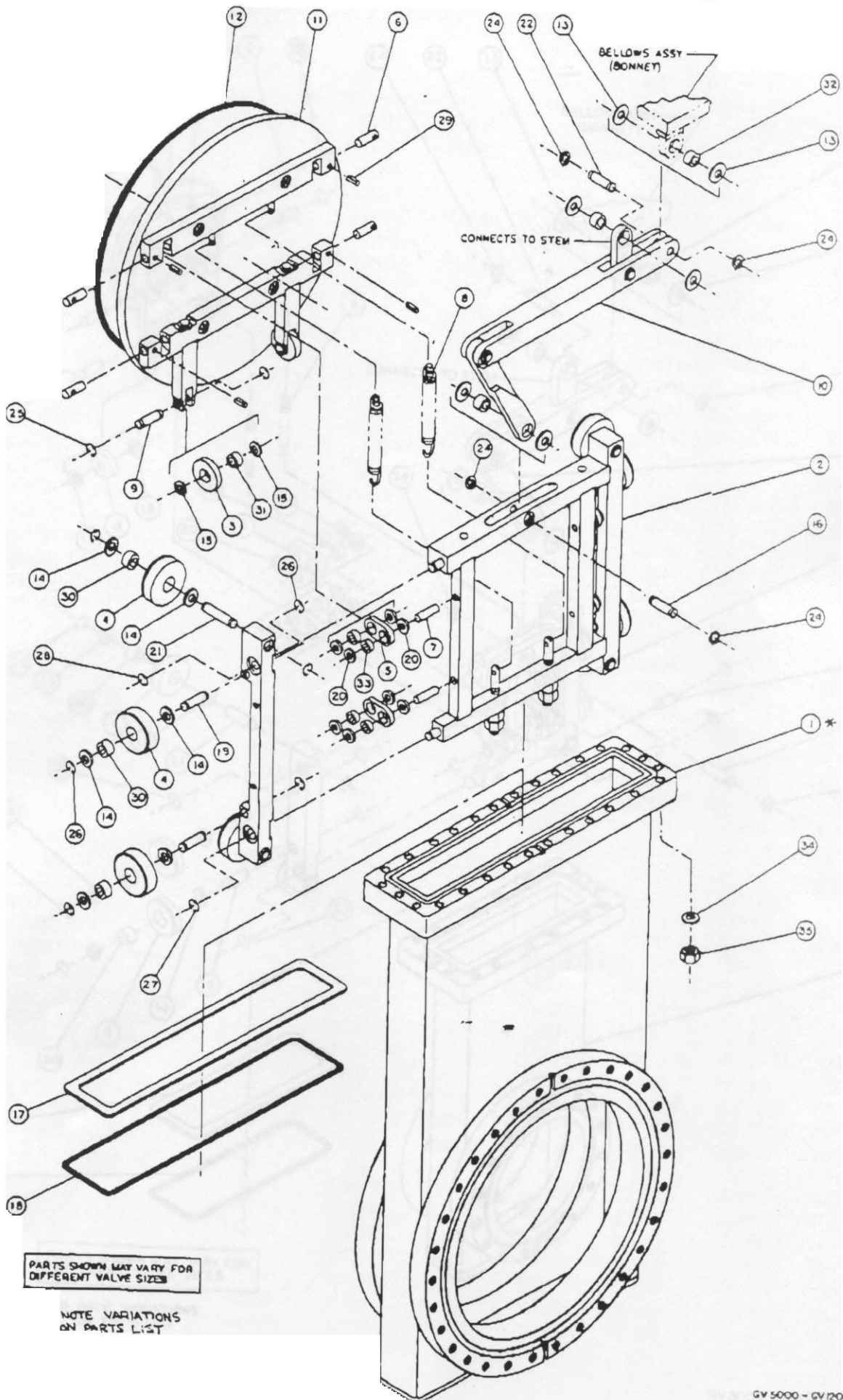
CARRIAGE PARTS LIST

REVISED 1/26/93

*****POR 3" THRU 12"GV*****

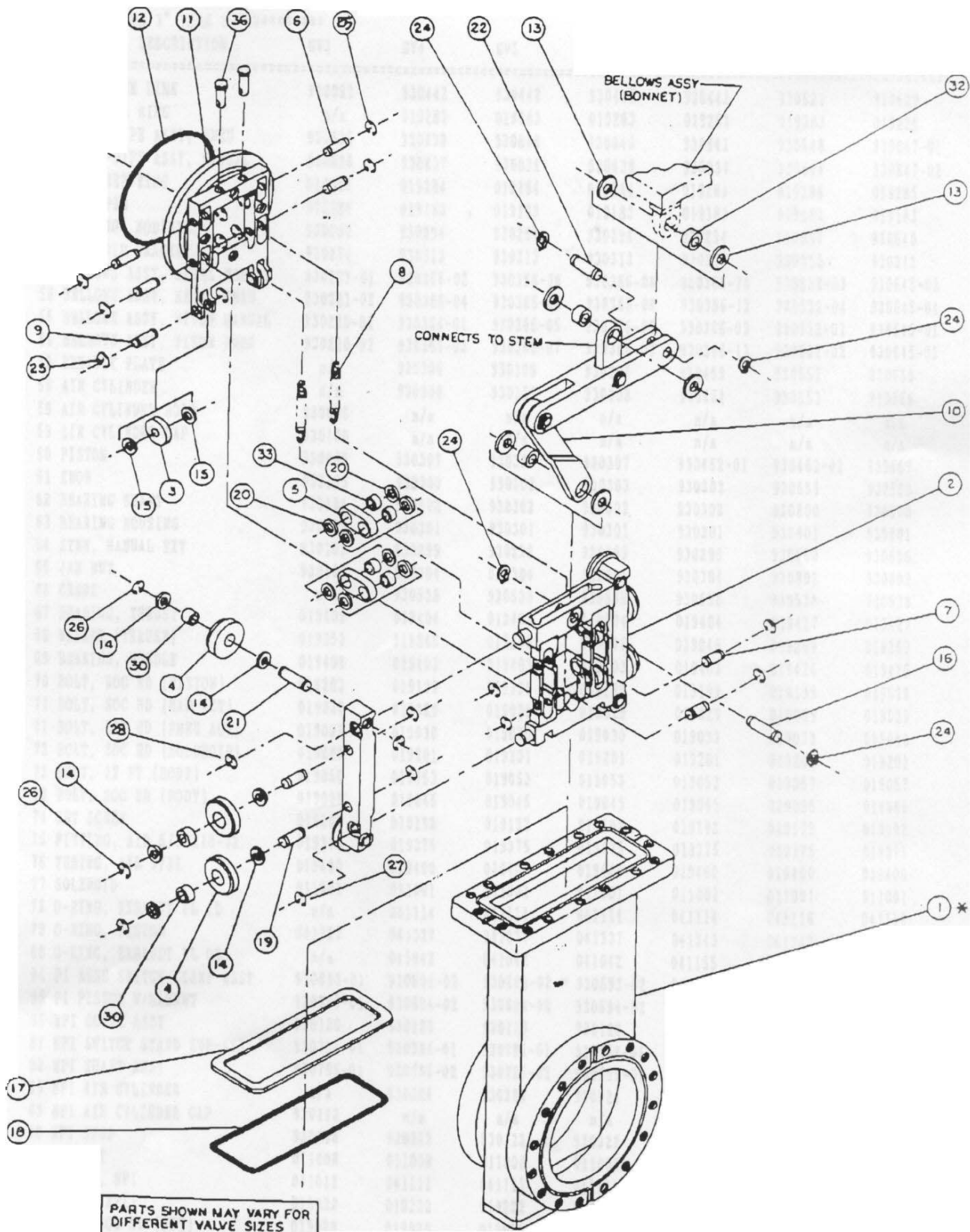
ITEM	DESCRIPTION	GV3	GV4	GV5	GV6	GV8	GV10	GV12
	CARRIAGE ASSY (Items 2-36)	930582	930580	930691	930691	930422	930579	930604
1	BODY ASSY, DEL-SEAL METAL	930201	930251	930331	930376	930409	930484	930590
1	BODY ASSY, DEL-SEAL VITON	930200	930250	930330	930375	930405	930480	930585
2	CARRIAGE SUB-ASSY	930692	930699-01	930699-02	930699-02	930699-03	930699-04	930699-05
3	WHEEL, STOP	930015	930242	930471	930471	930471	930478	930622
4	WHEEL, MAIN & GUIDE	930076-02	930444	930444	930444	930444	930525	930623
5	LINK, GATE	930685	930435	930435	930435	930435	930514	930617
6	PIN, GATE LINK	930687	930310	930364-01	930364-01	930364-01	930626-01	930626-01
7	PIN, CARRIAGE LINK	930014	930310	930364-02	930364-02	930364-02	930626-02	930626-02
8	SPRING	930074	930245-01	930245-02	930245-02	930245-03	930245-04	930245-05
9	PIN, STOP WHEEL	930686	930310	930310	930310	930310	930210	930628
10	LINKAGE ASSY	930692	930697-01	930697-02	930697-02	930697-03	930697-04	930697-05
11	GATE ASSY	930698-01	930698-02	930698-03	930698-03	930698-04	930698-05	930698-06
12	O-RING, GATE	041151	041155	041258	041258	041369	041377	041381
13	WASHER (LINKAGE)	019245	019248	019248	019248	019248	019252	019251
14	WASHER (WHEELS)	019254	019243	019243	019243	019243	019252	019251
15	WASHER (STOP WHEELS)	n/a	019243	019243	019243	019243	019243	019252
16	PIN, PIVOT-CARRIAGE	930068	930442	930442	930442	930442	930523	930679
17	GASKET, CU	930225	930309	930356	930356	930472	930552	930659
18	O-RING, BONNET	041150	041245	041256	041256	041262	041269	041275
19	PIN, MAIN WHEEL	930078	930310	930368	930368	930440	930520	930629
20	WASHER (LINKS)	019255	019247	019247	019247	019247	019249	019249
21	PIN, GUIDE WHEEL	n/a	930440	930440	930440	930440	930521	930625
22	PIN, LINKAGE	n/a	930442	930442	930442	930442	930524	930629
24	RETAINER RING	n/a	019283	019283	019283	019283	019283	019235
25	RETAINER RING	n/a	019277	019277	019277	019277	019277	019286
26	RETAINER RING	019280	019277	019277	019277	019277	019278	019225
27	RETAINER RING	n/a	019277	019277	019277	019283	019283	019225
28	RETAINER RING	n/a	019278	019278	019278	019283	019283	019225
29	ROLL-PIN	n/a	n/a	019198	019198	019198	019198	019183
30	BEARING, NEEDLE	n/a	019401	019401	019401	019401	019406	019407
31	BEARING, NEEDLE	n/a	n/a	019401	019401	019401	n/a	n/a
32	BEARING, NEEDLE	n/a	019402	019402	019402	019402	019406	019407
33	BEARING, NEEDLE	n/a	019405	019405	019405	019405	019406	019406
34	WASHER, PLAT	n/a	n/a	n/a	n/a	n/a	019232	019232
35	HEX NUT	n/a	n/a	n/a	n/a	n/a	019180	019180
36	PIN, SPRING	n/a	930433	930433	930433	930433	n/a	n/a
**	PIN, GATE LINK CARR BOT	930588	n/a	n/a	n/a	n/a	n/a	n/a
**	PIN, PIVOT	930091	n/a	n/a	n/a	n/a	n/a	n/a

** PARTS FOR 3"GV
NOT SHOWN ON DWG



PARTS SHOWN MAY VARY FOR DIFFERENT VALVE SIZES

NOTE VARIATIONS ON PARTS LIST



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* NOTE VARIATIONS ON PARTS LIST

GV3000 - GV4000 GATE VALVE

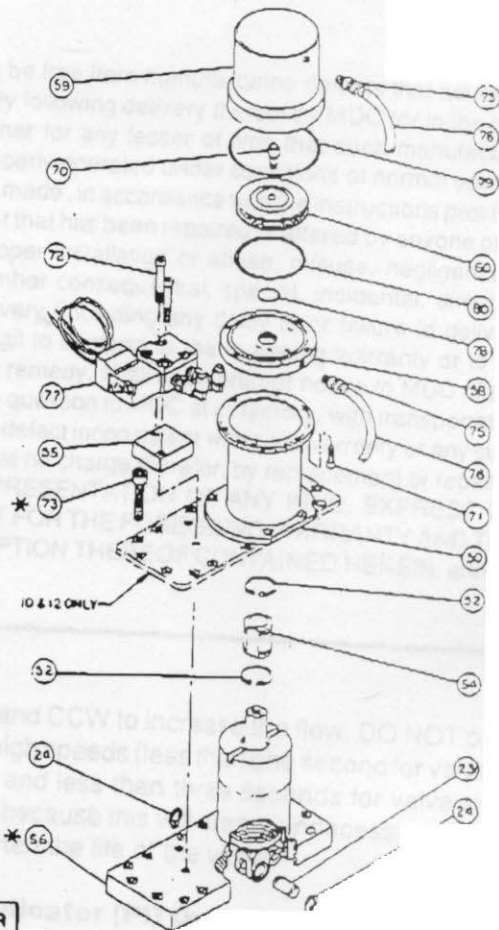
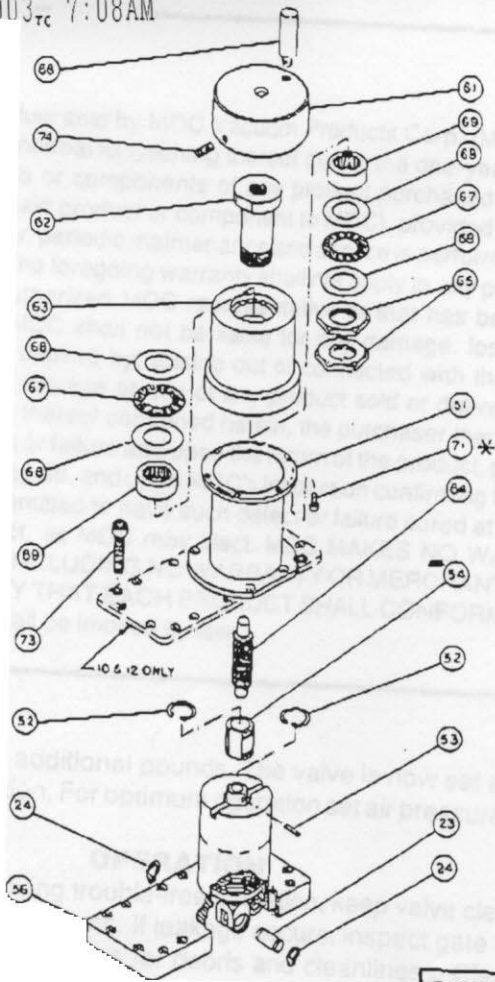
ACTUATOR/BELLOWS ASSY PARTS LIST
 *****POR 3" THRU 12"GV*****

REVISED 2/17/93

ITEM	DESCRIPTION	GV3	GV4	GV5	GV6	GV8	GV10	GV12
23	PIN, STEM LINK	930092	930442	930442	930442	930442	930523	930629
24	RETAINER RING	n/a	019283	019283	019283	019283	019283	019225
50	STAND-PIPB ASSY, PNEU	930836	930838	930840	930840	930841	930548	930647-01
51	STAND-PIPB ASSY, MANUAL	930836	930837	930839	930839	930837	930544	930647-02
52	RETAINER RING	019281	019284	019284	019284	019284	019285	019285
53	ROLL-PIN	019184	019183	019183	019183	019183	019183	019183
54	BUSHING, MODIFIED	930090	930294	930294	930294	930294	930537	930640
55	SOLENOID BRACKET	930174	930313	930313	930313	930313	930313	930313
56	BELLOWS ASSY, METAL MANUAL	930221-01	930366-02	930366-06	930366-06	930366-10	930532-03	930645-02
56	BELLOWS ASSY, METAL PNEU	930221-02	930366-04	930366-08	930366-08	930366-12	930532-04	930645-04
56	BELLOWS ASSY, VITON MANUAL	930220-01	930366-01	930366-05	930366-05	930366-09	930532-01	930645-01
56	BELLOWS ASSY, VITON PNEU	930220-02	930366-03	930366-07	930366-07	930366-11	930532-02	930645-03
58	EXHAUST PLATE	n/a	930306	930306	930306	930459	930551	930658
59	AIR CYLINDER	n/a	930308	930308	930308	930461	930553	930656
59	AIR CYLINDER BODY	930098	n/a	n/a	n/a	n/a	n/a	n/a
59	AIR CYLINDER CAP	930100	n/a	n/a	n/a	n/a	n/a	n/a
60	PISTON	930099	930307	930307	930307	930462-01	930462-02	930657
61	KNOB	930105	930303	930303	930303	930303	930559	930559
62	BEARING SHAFT	930104	930302	930302	930302	930302	930800	930800
63	BEARING HOUSING	930103	930301	930301	930301	930301	930801	930801
64	STEM, MANUAL EXT	930101	930299	930299	930299	930299	930560	930655
65	JAM NUT	930106	930304	930304	930304	930304	930802	930802
66	CRANK	n/a	930538	930538	930538	930538	930538	930538
67	BEARING, THRUST	019409	019404	019404	019404	019404	019427	019427
68	WASHER (THRUST)	019253	019246	019246	019246	019246	019269	019269
69	BEARING, NEEDLE	019408	019403	019403	019403	019403	019426	019426
70	BOLT, SOC HD (PISTON)	019203	019199	019199	019199	019199	019199	019028
71	BOLT, SOC HD (MAN ACT)	019032	019029	019029	019029	019029	019029	019029
71	BOLT, SOC HD (PNEU ACT)	019032	019030	019030	019030	019033	019033	019042
72	BOLT, SOC HD (SOLENOID)	019200	019201	019201	019201	019201	019201	019201
73	BOLT, 12 PT (BODY)	019050	019053	019053	019053	019053	019057	019057
73	BOLT, SOC HD (BODY)	019090	019045	019045	019045	019045	019085	019085
74	SET SCREW	019202	019192	019192	019192	019192	019192	019192
75	FITTING, AIR 5/32X10-32	019375	019375	019375	019375	019375	019375	019375
76	TUBING, AIR 5/32	019400	019400	019400	019400	019400	019400	019400
77	SOLENOID	011001	011001	011001	011001	011001	011001	011001
78	O-RING, EXHAUST PL ID	n/a	041114	041114	041114	041114	041116	041118
79	O-RING, PISTON	041227	041337	041337	041337	041343	041343	041352
80	O-RING, EXHAUST PL OD	n/a	041042	041042	041042	041155	041155	041050
84	PI REED SWITCH CLAMP ASSY	930693-01	930693-02	930693-02	930693-02	930693-03	930693-03	930693-04
85	PI PISTON W/MAGNET	930694-01	930694-02	930694-02	930694-02	930694-03	930694-04	930694-05
86	MPI COVER ASSY	930120	930120	930120	930120	930120	930569	930672
87	MPI SWITCH STAND SUB-ASSY	930794-01	930794-01	930794-01	930794-01	930794-01	930794-02	930794-04
88	MPI SHAFT ASSY	930795-01	930795-02	930795-02	930795-02	930795-02	930795-03	930795-04
89	MPI AIR CYLINDER	n/a	930324	930324	930324	930467	930572	930671
89	MPI AIR CYLINDER CAP	930112	n/a	n/a	n/a	n/a	n/a	n/a
90	MPI STUD	930118	930322	930322	930322	930322	930670	930577
91	GROMMET	011008	011008	011008	011008	011008	011008	011008
92	O-RING, MPI	041012	041111	041111	041111	041111	041116	041118
93	SCREW (MPI)	019222	019222	019222	019222	019222	019296	019296
95	BOLT, SOC HD (MPI)	019029	019029	019029	019029	019030	019038	019038
96	SET SCREW	019205	019205	019205	019205	019205	019205	019206
99	MICRO SWITCH	011007	011007	011007	011007	011007	011006	011006
**	O-RING, AIR CYL BOT	041012	n/a	n/a	n/a	n/a	n/a	n/a
**	O-RING, AIR CYL CAP	041037	n/a	n/a	n/a	n/a	n/a	n/a

** PARTS FOR 3"GV NOT SHOWN ON DWG

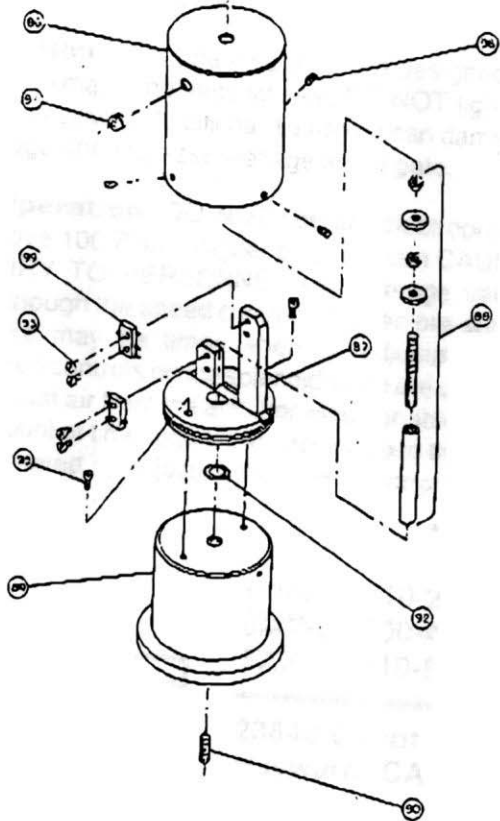
ELECTROPNEUMATIC ACTUATOR ASSY



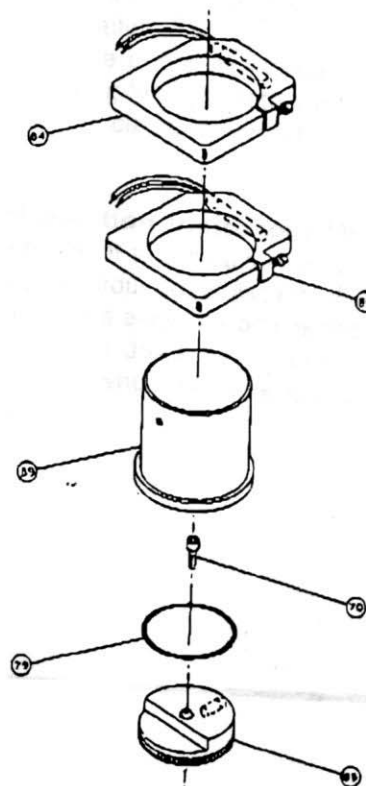
PARTS SHOWN MAY VARY FOR DIFFERENT VALVE SIZES

NOTE VARIATIONS ON PARTS LIST

MECHANICAL PORTION INDICATOR



POSITION INDICATOR



SEP. 4. 2003- 7:08AM

WARRANTY

Each product sold by MDC Vacuum Products Corp. (MDC) 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 MDC (or in the case of products or components of any product purchased by MDC from another for any lesser of time that such manufacturer warrants said product or component to MDC), provided that the same is properly 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 MDC. The foregoing warranty shall not apply to any product or component that has been repaired or altered by anyone other than an authorized MDC representative or that has been subject to improper installation or abuse, misuse, negligence or accident. MDC shall not be liable for any damage, loss, or expense, whether consequential, special, incidental, direct, or otherwise, caused by, arising out of connected with the manufacture, delivery (including any delay in or failure to deliver), packaging, storage or use of any product sold or delivered by MDC 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 MDC of any such defect or failure and upon the return of the product, part or component in question to MDC at its factory, with transportation charges prepaid, and upon MDC'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 MDC's factory and at no charge therefor, by replacement or repair of said product, as MDC may elect. MDC MAKES NO WARRANTY OR REPRESENTATION OF ANY KIND, EXPRESS OR IMPLIED, (INCLUDING NO WARRANTY OR MERCHANTABILITY), EXCEPT FOR THE FOREGOING WARRANTY AND THE WARRANTY THAT EACH PRODUCT SHALL CONFORM TO THE DESCRIPTION THEREOF CONTAINED HEREIN, and no warranty shall be implied by law.

increase it by 5 additional pounds. The valve is now set and ready for operation. For optimum operation set air pressure at 60-70 PSIG.

OPERATION

To ensure continuing trouble-free operation, keep valve clean and free of contaminants. If leakage occurs, inspect gate O-ring and sealing surfaces for debris and cleanliness. Clean surfaces as required. Refer to the disassembly instructions for further details if disassembly is required.

DO NOT operate the valve until the differential pressure across the gate has been equalized.

Manual Operation: The gate mechanism is designed to go "over-center" to make the vacuum seal. DO NOT tighten manual valves excessively. Additional tightening can damage the internal linkage and increase leakage at the gate.

Pneumatic Operation: DO NOT operate electropneumatic valves above 100 PSIG. Higher pressure can CAUSE SERIOUS INJURY TO PERSONNEL and damage valve components. Although the speed control has been pre-set at the factory, there may be times when an adjustment is desired. The speed controls on the solenoid valve are used to regulate the exhaust air from the actuator which enables one to control the amount of time required to open or close the gate valve. This is achieved by adjusting the speed control CW to

reduce flow and CCW to increase the flow. DO NOT operate the valve at high speeds (less than one second for valve sizes under 2-1/2" and less than three seconds for valve sizes 3" through 12") because this will create unnecessary vibrations and can shorten the life of the valve.

Position Indicator (PI) Operation: For adjustments of the magnetic position indicator loosen the reed switch clamp screw and slide the clamp as required up and down or left and right to achieve the maximum sensor reading from the reed switch. The upper clamp assembly is used to detect the fully open valve position, and the lower clamp assembly is used to detect the closed position. The magnet in the piston is located on the opposite side of the air fittings on the air cylinder. Reference PI drawing for magnet to the reed switch orientation. Re-tighten the clamp screw when the adjustment is completed.

Mechanical Position Indicators (MPI): The indicators have been preset at the factory and no further adjustments are usually required. However, if an adjustment is necessary, this can be easily accomplished by loosening the hex nuts and contact disks and re-aligning them with the microswitch plunger when the valve is in the fully open and fully closed positions.



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