

## Fuel Gas/ Starting Air Valve 85380 - Series

### GENERAL DESCRIPTION

The 85380-Series valve is designed for use either as a fuel gas valve or a starting air valve. Pneumatically actuated, the vent port will close before the main port will open as pressure is applied to the actuator diaphragm. As pressure is removed, the main port will close before the vent port will open.

The characterized stainless steel trim provides a narrow throttling region which permits very close control of the flow during the middle of the valve stroke. This feature is especially useful for accelerating an engine at a controlled rate at startup and for controlling the rate at which gas or air is admitted to expander motor starters used on pinion and flywheel starting arrangements.

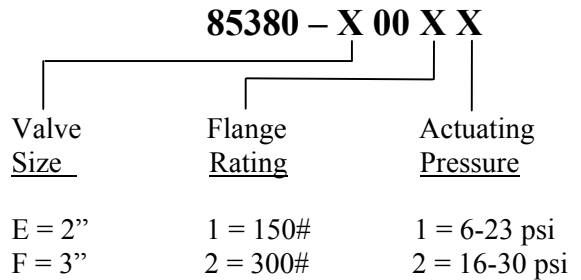
The extremely compact integral actuator design permits mounting the valve in relatively high vibration environments generally encountered on piping associated with rotating engines - especially reciprocating engines. The valve can be completely overhauled without removal from the process piping.



### SPECIFICATIONS

- Body Material:** ..... Cast Steel
- ANSI Flanges:** ..... 150# or 300# Class Rating
- Body Rating:** ..... 285 psi max. with 150# flanges  
 350 psi max. with 300# flanges
- Max. Pressure Drop:** ..... 285 psi with 150# flanges  
 350 psi with 300# flanges
- Cage Trim:** ..... Stainless Steel
- O-Ring:** ..... Buna-N
- Diaphragm:** ..40 sq. in. Buna-N reinforced with Nylon
- Vent:** ..... 3/4" NPT
- Cv:** ..... See graphs 1, 2 and 3
- Actuating Signal:** ..... See "Models Available"
- Maximum Diaphragm Pressure:** ..... 50 psi

### MODELS AVAILABLE



### Approximate Shipping Weights:

85380-E0011	65lbs.
-E0012	65lbs.
-E0021	70lbs.
-F0011	75lbs.
-F0021	80lbs.

### ORDERING INFORMATION

**Specify:**  
 Model number

## DIMENSIONS

Valve Size	Model No.	Flange Rating	Dimensions							
			A	B	C	D	E	F	G	H
2"	85380-E-0011 85380-E-0012	150	10	5/8	12-1/8	9-9/16	3-11/16	3-5/8	6	3/4
2"	85380-E-0021	300	10-1/2	5/8	12-1/8	9-9/16	3-11/16	3-5/8	6-1/2	3/4
3"	85380-F-0011	150	11-3/4	7/8	13-21/32	9-3/32	4-9/32	5	7-1/2	3/4
3"	85380-F-0021	300	12-1/2	1-1/8	13-21/32	9-3/32	4-9/32	5	8-1/4	7/8

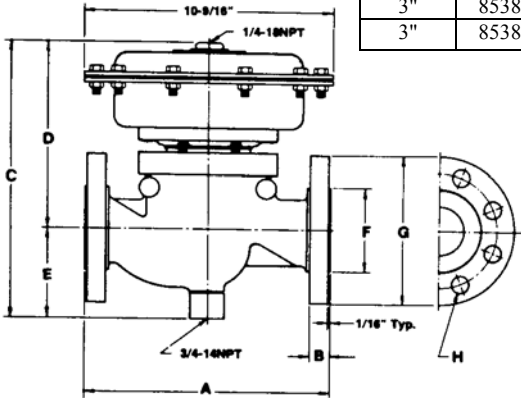


Figure 1

## INSTALLATION

### General:

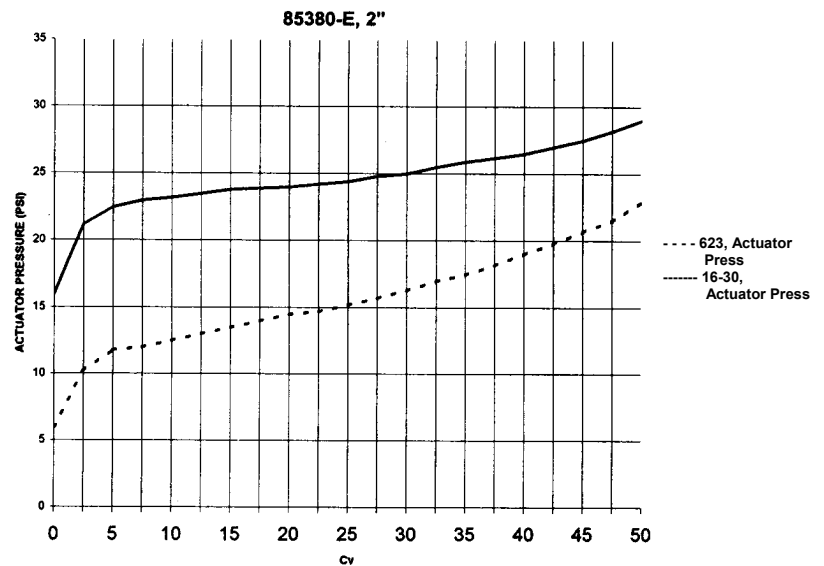
Inspect for shipping damage. If damaged notify shipper immediately. Remove packing materials, plugs and any other obstructing matter from valve.

### Location:

The 85380 Series valve may be installed indoors or out where the ambient temperature does not exceed -30° and 160°F. Make sure valve is mounted in piping for flow in direction of arrow on side of valve.

### Position:

The 85380 Series valve will operate in virtually any position; however, be sure clearance allowance is made for vent piping when installing. Also clearance should be allowed to facilitate removal of valve upper works for service.



85380-F, 3"

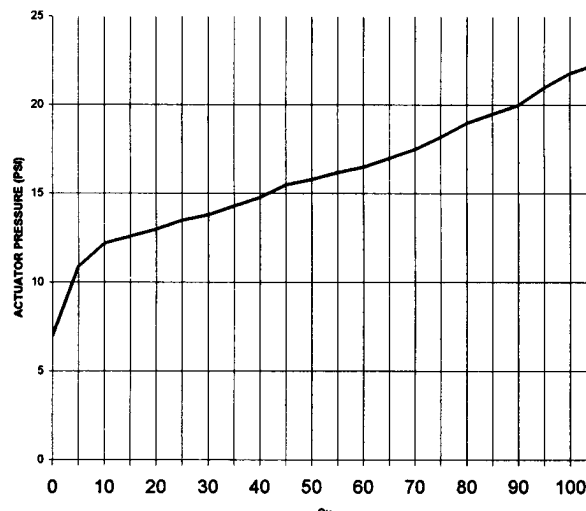


Figure 2

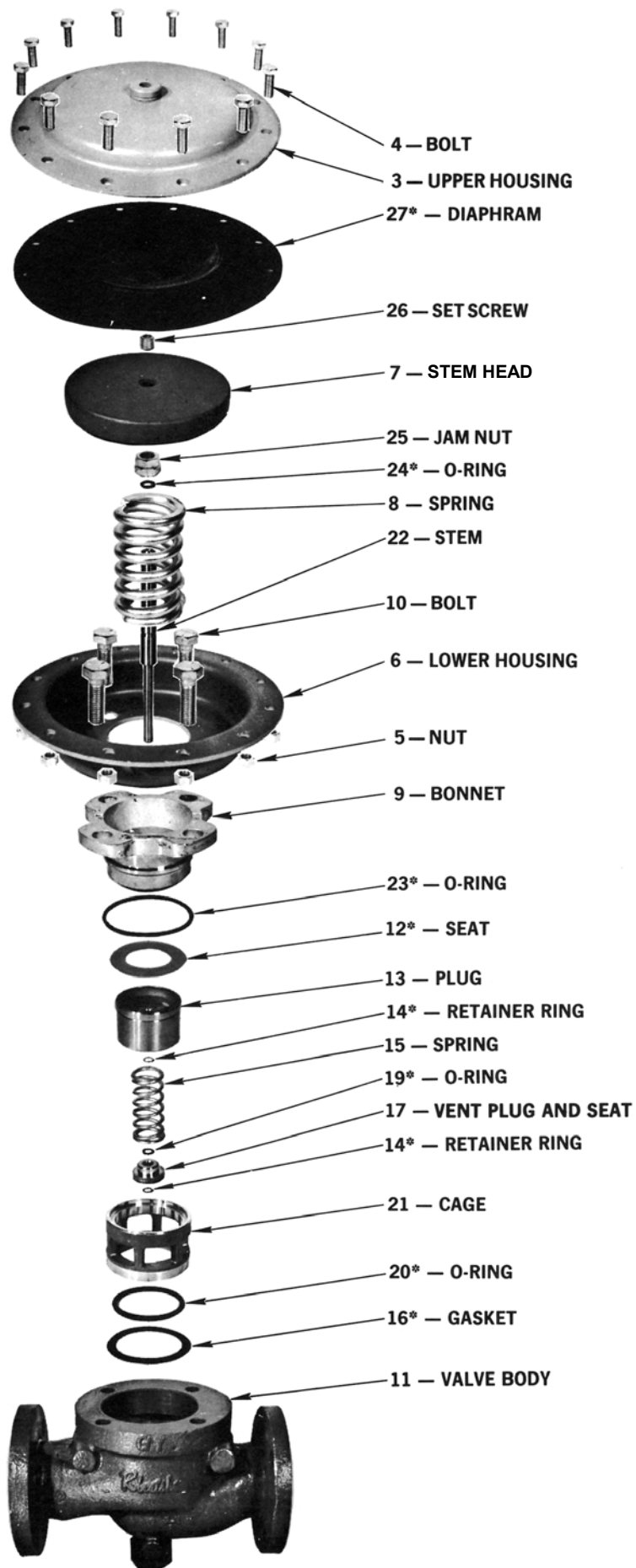


Figure 3

## MAINTENANCE

While the 85380 Series valve was designed for long life, it does contain elastomers that change characteristics with age. For that reason the 85380 should be put on a preventative maintenance schedule. To shorten downtime, valve does not have to be removed from piping to repair. (*Note: Be sure piping has been depressurized before disassembling. WARNING: Explosive gases may still be present in piping.*)

**WARNING: Disassemble carefully - spring forces present.**

### Disassembly (Refer to Figure 3)

Remove actuator housing bolts (4) and lift off upper housing (3). Remove diaphragm (27).

Remove set screw (26) and then unscrew stem head (7) from stem (22). [It will be necessary to hold the jam nuts (25) on the stem (22) with tool provided in repair kit to prevent stem (22) from turning with stem head (7)]. Lift out actuator spring (8).

Remove the four bolts (10) holding the lower actuator housing (6) and bonnet (9) to valve body (11). Remove lower housing (6). Pull bonnet (9) from valve body (11) with main plug assembly (13) attached.

Turn bonnet and main plug assembly so that plug assembly is on top. Remove retaining ring (14) from end of stem (22) and remove vent plug (17) and spring (15). Remove second retaining ring (14) and pull the main plug (13) from stem (22). Remove polyurethane seat (12) from bonnet.

Remove cage (21) from valve body and lift out gasket (16) from cage seat in valve body.

Remove O-rings from cage (21), vent plug (17), bonnet (9) and stem (22). Wipe all surfaces clean.

### Reassembly:

*Note: Where O-ring lube is called for, use Parker O-ring lube or equivalent.*

Fill groove in bonnet (9) with O-ring lube. Lube bonnet O-ring (23) and slip into groove. Position new polyurethane seat on bonnet.

Fill groove on large diameter of stem (22) with O-ring lube. Lube second smallest O-ring (24) from repair kit and slip into groove.

Lube stem bore in bonnet (9). Ease stem (22) in from bottom of bonnet (9) to prevent snagging of O-ring (24), (Figure 4). Turn bonnet upside down until stem (22) is protruding upward.

Slip main plug (13) over stem (22) with the stepped edge of plug (13) facing the bonnet (9). Position plug retaining ring (14) in groove in stem closest to the bonnet being sure that rounded edges of retaining ring (14) face the plug (13).

Slide vent spring (15) over stem (22) and seat it against plug.

Lube the vent plug O-ring (19), slide it inside of vent plug (17) and position it in O-ring groove with slim rounded object such as ballpoint pen. Slide vent plug (17) on stem (22). (See figure 5). Hold plug (17) against spring



Figure 4

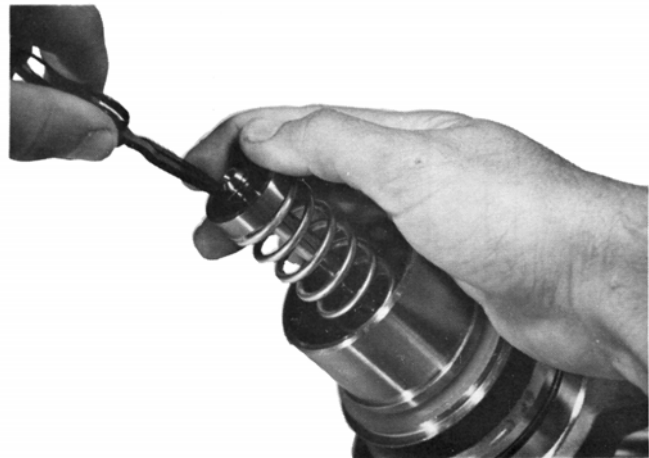


Figure 5

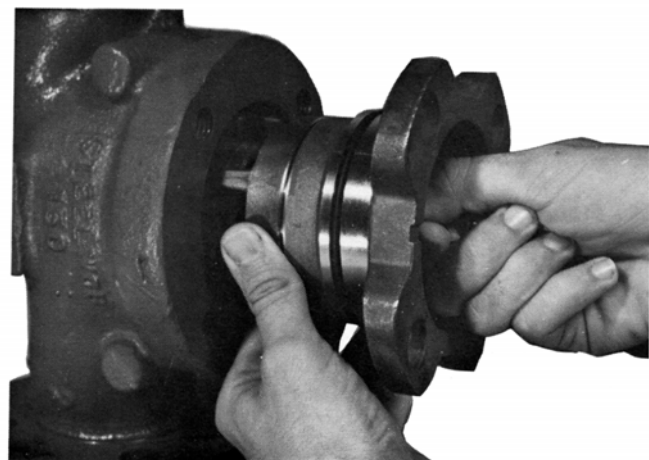


Figure 6



Figure 7

force and install retaining ring (14). *(Again, be sure rounded shoulder of retaining ring faces the plug.)*

**CAUTION: Do not let vent plug (17) push back up the stem once it is over the retaining ring groove. O-ring (19) in vent plug may be cut by sharp edge of groove if this occurs.**

Position gasket (16) on cage seat inside valve body (11).

Lube inside of cage (21) and the cage O-ring (20). Slip O-ring into cage. Slip cage (21) over main plug (13) and make sure it seats over plug (13). Slide entire assembly (bonnet, plug, etc.) into valve body (11) making sure cage seats in valve body (see figure 6). Check that there is no binding by pushing and pulling on the stem to assure smooth action.

Place lower actuator housing (6) on bonnet (9) and install four bolts (10) through housing (6) and bonnet (9) into valve body (11). Torque bolts to 30 ft. lbs. on 2" valves and 40 ft. lbs. on 3" valves. (Figure 7).

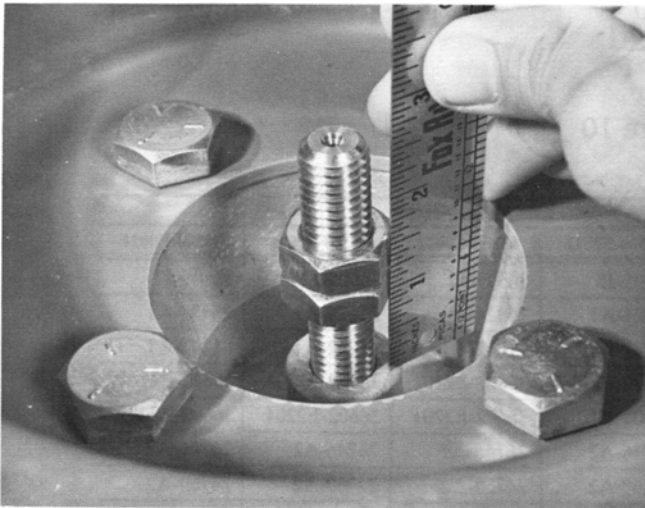


Figure 8

Push stem (22) down until it bottoms or until stiff resistance is felt. (This means that vent plug (17) is on seat and spring force is the only resistance felt.) Measure 7 / 8" (11/16" on 85380-E0012) from top of stem boss inside bonnet (9) to bottom of lower jam nut (25). (See figure 8). Tighten top jam nut (25) against bottom nut as tightly as possible and recheck measurement. Readjust if necessary.

Place actuator spring (8) over stem (22).

While holding bottom jam nut (25) in position with tool provided in repair kit (figure 9), screw stem head (7) onto stem. Jam nuts should not turn on stem.

Turn set screw (26) into stem head (7) and tighten down. Hold diaphragm shoe to prevent rotation while tightening. Set screw should be flush with or one thread below the diaphragm shoe surface.

Seat diaphragm (27) over stem head (7) and align bolt holes with lower housing (6). Replace upper housing (3) and reinstall bolts (4). Torque nuts (5) to 14-16 ft. lbs. alternating from one side of housing to the other to ensure proper sealing.

**DO NOT USE GASKET CEMENT ON DIAPHRAGM.**

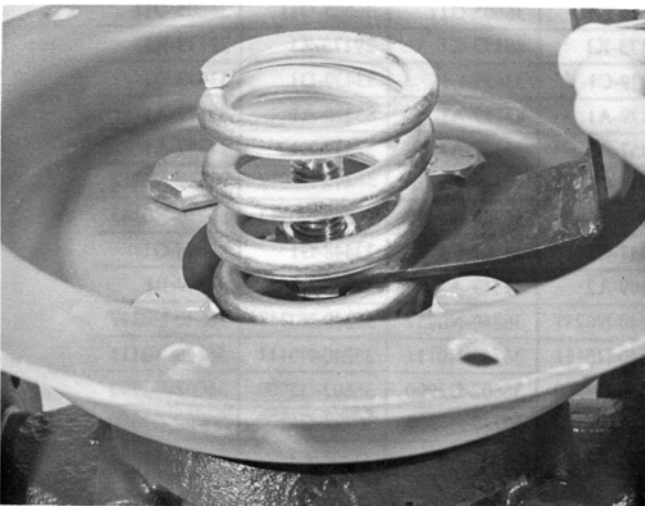


Figure 9

**PARTS LIST**

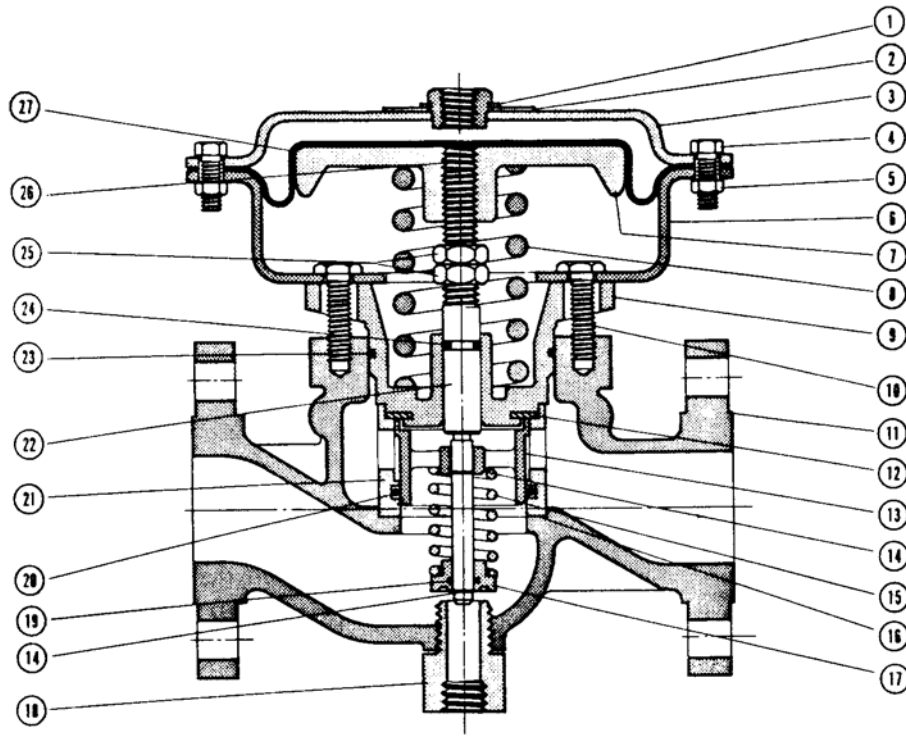


Figure 10

Det. No.	No. Req'd	Description	Model No.				
			85380-E0011	85380-E0012	85380-E0021	85380-F0011	85380-F0021
1	1	Retainer Ring	36605-J2	36605-J2	36605-J2	36605-J2	36605-J2
2	1	Serial Plate	25424-A1	25424-A1	25424-A1	25424-A1	25424-A1
3	1	Upper Housing	81242-A1	81242-A1	81242-A1	81242-A1	81242-A1
4	12	Bolt	36622-E2101	36622-E2101	36622-E2101	36622-E2101	36622-E2101
5	12	Nut	36602-E2201	36602-E2201	36602-E2201	36602-E2201	36602-E2201
6	1	Lower Housing	26746-A2	26746-A2	26746-A2	26746-A2	26746-A2
7	1	Stem Head	24760-A2	24760-A2	24760-A2	24760-A2	24760-A2
8	1	Spring	26201-J1	26201-E1	26201J1	26201-J1	26201-J1
9	1	Bonnet	37348-A1	37348-A1	37348-A1	37348-C1	37348-C1
10	4	Bolt	36629-B2923	36629-B2923	36629-B2923	36629-B2923	36629-B2923
11	1	Valve Body	33444-J10	33444-J10	33444-K10	33444-N10	33444-P10
*12	1	Seat	37350-A1	37350-A1	37350-A1	37350-B1	37350-B1
13	1	Plug	37351-A1	37351-A1	37351-A1	37351-C1	37351-C1
*14	2	Retainer Ring	36605-G11	36605-G11	36605-G11	36605-G11	36605-G11
15	1	Spring	29173-K1	29173-K1	29173-K1	29173-K1	29173-K1
16	1	Gasket	39385-G2	39385-G2	39385-G2	39385-G1	39385-G1
17	1	Vent Plug & Seat	85379-A1	85379-A1	85379-A1	85379-A1	85379-A1
18	1	Connector	37357-A1	37357-A1	37357-A1	37357-A1	37357-A1
•19	1	O-Ring	36240-N2012	36240-N2012	36240-N2012	36240-N2012	36240-N2012
*20	1	O-Ring	36240-N0333	36240-N0333	36240-N0333	36240-N0343	36240-N0343
21	I	Cage	33447-C3	33447-C3	33447-C3	33448-G1	33448-G1
22	1	Stem	37349-A1	37349-A2	37349-A1	37349-B1	37349-B1
*23	1	O-Ring	36240-N0237	36240-N0237	36240-N0237	36240-N0247	36240-N0247
*24	1	O-Ring	36240-N0111	36240-N0111	36240-N0111	36240-N0111	36240-N0111
25	2	Jam Nut	36602-G2900	36602-G2900	36602-G2900	36602-G2900	36602-G2900
26	1	Set Screw	36729-G1300	36729-G1300	36729-G1300	36729-G1300	36729-G1300
*27	1	Diaphragm	24708-A1	24708-A1	24708-A1	24708-A1	24708-A1

\* Included in Repair Kit. Repair Kit contains enough parts to rework one valve. When ordering Repair Kit, specify 84420-T22 (2") or 84420-T23 (3"). Kit also contains special tool 37582-A1 necessary for assembly.

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