BelGAS™
A DIVISION OF MARSH BELLOFRAM

Type P627 High Flow Gas Regulator

Instruction Manual - Look Inside For:

Description
Installation
Remote Vent Line Installations
Startup and Adjustment
Shutdown
Maintenance
Body Maintenance Procedures
Diaphragm & Spring Case Area Maintenance Procedures
Parts Ordering
Parts List

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Instruction Manual

APPLICATIONS

- Farm Tap Regulation
- Monitoring Regulators
- Gate Regulators
- Pressure Reducing Regulators
- Fuel Gas Regulators
- Gas Gathering Regulators

SPECIFICATIONS

Maximum Inlet:
Nylon Seat . . . 2000 PSIG (steel)
. . . 1000 PSIG (ductile iron)
Nitrile Seat . . . . . .1000 PSIG (steel)
. . . 1000 PSIG (ductile iron)

Maximum Inlet Body Pressure:
Steel (NPT) . . . . . .2000 PSIG
Ductile Iron (NPT) . . . . . .1000 PSIG
Flanged Steel . . . . . .1485 PSIG

Outlet . . . . . .5–500 PSIG

Port Sizes
. . .3/4", 1", 2" NPT, 1" CL150RF, 1" CL300RF,
. . .1" CL600RF, 2" CL150RF, 2" CL300RF,
. . .2" CL600RF

Orifice Sizes: 3/32", 1/8", 3/16", 1/4", 3/8", 1/2"

Outlet Range . . . . . .Flow Range *
5–20 PSIG 300–43,000
15–40 PSIG 1,000–71,000
10–95 PSIG 1,000–150,000
35–80 PSIG 1,200–142,000
70–150 PSIG 2,500–172,000
140–250 PSIG 3,200–95,000
240–500 PSIG 4,500–140,000
* (SCFH of 0.6 S.G. Natural Gas)

Temperature Range . . . (Nitrile) –20° to 180°F
(–18° to 82°C)

Approximate Weight . . . . . 1" 5.3 lbs, 2.39 kg
2" 8.8 lbs, 3.96 kg

MATERIALS OF CONSTRUCTION

Body, Bonnet, Diaphragm Case . . . . . .Steel Body, Bonnet and Diaphragm Case
OR . . . . . .Cast Ductile Iron Body/Aluminum Bonnet and Diaphragm Case
OR . . . . . .Steel Body/Aluminum Bonnet and Diaphragm Case (NACE only)

Diaphragm . . . . . .Nitrile (low pressure) or Neoprene (high pressure)
Seat . . . . . .Nitrile or Nylon
Orifice . . . . . .Aluminum or Stainless Steel (NACE units)

P627 Part Number Matrix

P627 1 _ _ _ _ _ _ _

Port Size

06	3/4"
08	1"
16	2"

Spring Range

	PSIG	BAR
020	5 - 20	0.34 - 1.4
040	15 - 40	1 - 2.8
080	35 - 80	2.4 - 5.5
095	10 - 95	5.7 - 6.6
150	70 - 150	4.8 - 10.3
250**	140 - 250*	9.7 - 17.2
500**	240 - 500*	16.5 - 34.5

* Steel Casing/Steel Body Only
NOTE: Nitrile seat is required for 5-20 psi, 15-40 and 10-95 psi ranges. Nylon Seat is recommended for psi above 140. Consult factory for questions.
** P627H or HIGH Pressure Units.

Special Construction

0	None
2	Monitor*
A	150 #RF*
B	300 #RF*
C	600 #RF*
D	Socket Weld*
E	900 #RTJ
W	150 #RF* / Monitor
X	300 #RF* / Monitor
Y	600 #RF* / Monitor
Z	Socket Weld / Monitor

* Steel Casing / Steel Body Only

Versions

0	Standard
N	NACE*
T	ST. ST. Trim

* Available as Steel/Steel or Aluminum/Steel Only

Orifice

0	3/32"
2	1/8"
3	3/16"
4	1/4"
6	3/8"
8	1/2"

Seat Material

0	Nitrile (Buna-N)
1	Nylon

NOTE: Nitrile Seat is required for 5-20 psi, 15-40 and 10-95 psi ranges. Nylon Seat is recommended for psi above 140. Consult factory for questions.

Casing Material

0	Aluminum Casing / Iron Body
1	Steel Casing / Steel Body
2	Alum. Casing / Steel Body*
6	Aluminum Casing / LCC Steel Body
7	Steel Casing / LCC Body
8	Steel Casing / Iron Body

* Supplied only with NACE components, specify 'N' in part number.

DESCRIPTION

The P627 is a self-operated pressure-reducing regulator for both low and high pressure gas applications. These regulators are designed to be used with natural gas, compressed air, and a variety of other gases.

> WARNING!
> **Personal injury and/or property and equipment damage may result from escaping gases if the regulator is installed where the pressures or conditions may exceed the limits of the regulator or the piping and piping connections. Always install the regulator in a safe location.**

It is recommended that a pressure relieving or limiting device be installed as required by any appropriate code, regulation, or standard to prevent operating conditions from exceeding any of those limits.

INSTALLATION

Qualified personnel should perform installation, operation, and maintenance. The regulator can be mounted in any position, however the flow through the body must be in the direction of the arrow cast into the body surface. Also, make sure to position the regulator to prevent any contamination or debris from entering the screened vent. Install a three-way bypass valve should continuous operation be required during maintenance. Prior to installation, inspect the regulator and the piping lines for any debris or contamination. After installation, periodically inspect the regulator for damage, especially after any overpressure condition. The P627 does not have an internal relief. Thus, a pressure relieving or limiting device must be provided to prevent the inlet pressure from exceeding the outlet pressure limit.

> WARNING!
> **It is not unusual for a regulator to vent some gas to atmosphere. In applications involving flammable or hazardous gases, it may become necessary to vent the regulator to a safe, or remote location. These gases may accumulate and cause property damage, or personal injury as a result of a fire or explosion. Periodically check the vent opening and line for any restrictions due to clogging or condensation.**

When installing a P627M or P627HM, make sure the control line is attached before operating the regulator. The control line should have a 3/8" minimum diameter, and be connected to a section of pipe (preferably straight) a distance downstream equivalent to approximately 10 times the diameter of the outlet piping. In certain instances, a hand valve may be needed to dampen pulsations in the control line.

REMOTE VENT LINE INSTALLATION

The P627 is provided with a vent assembly installed in the 3/4" NPT bonnet vent port. For remote venting, use the largest diameter piping possible. For best results, limit the number of bends and keep the line as short as possible. For the regulator to operate properly, the vent opening should remain free of any debris or foreign matter.

STARTUP & ADJUSTMENT

> WARNING!
> **The use of pressure gauges to prevent overpressure conditions, which might cause personal injury or equipment damage, is highly recommended. Before starting up the regulator, relieve the downstream pressure on the diaphragm. Failure to do so may result in personal injury or equipment damage.**

When starting up the regulator, slowly open the upstream shutoff valve, and then slowly open the downstream shutoff valve. Check all piping and connections for leaks before making any final pressure adjustments. The nameplate provides the range of allowable pressure settings. For pressure settings outside the allowable range, change to the appropriate range spring and remember to change the nameplate accordingly.

Note: The use of a pressure measuring device is highly recommended when making any pressure adjustments with the regulator.

To make pressure adjustments, start by removing the adjustment screw protective cap, and loosening the locknut. Increasing the output pressure is achieved by turning the adjustment screw clockwise, while a counterclockwise turn decreases the output. Tighten the locknut and reinstall the adjustment screw cap.

Types P627 & P627M			
Outlet Pressure Range	**Orifice Diameter (In)**	**Maximum Inlet Pressure (PSIG)**	**Maximum Differential Pressure (PSID)**
5-20 PSIG **	3/32	1000	1000
	1/8	1000	1000
	3/16	750	750
	1/4	500	500
	3/8	300	300
	1/2	250	250
10-95 PSIG	3/32	500	500
	1/8	500	500
	3/16	500	500
	1/4	500	500
	3/8	300	300
	1/2	100	100
15-40 PSIG	3/32	2000*	2000*
	1/8	1500*	1500*
	3/16	1000*	1000*
	1/4	750	750
	3/8	500	500
	1/2	300	300
35-80 PSIG	3/32	2000*	2000*
	1/8	1500*	1500*
	3/16	1750*	1750*
	1/4	1500*	1500*
	3/8	1000	1000
	1/2	750	750
70-150 PSIG	3/32	2000*	2000*
	1/8	2000*	2000*
	3/16	2000*	2000*
	1/4	1750*	1750*
	3/8	1250*	1250*
	1/2	750	750

Types P627H & P627HM			
Outlet Pressure Range	**Orifice Diameter (In)**	**Maximum Inlet Pressure (PSIG)**	**Maximum Differential Pressure (PSID)**
140-250 & 240-500 PSIG	3/32	2000*	2000*
	1/8	2000*	2000*
	3/16	1750*	1750*
	1/4	1500*	1000
	3/8	1000	500
	1/2	750	250

P627 Flow Coefficents

Orifice Size		3/4 Inch Body			1 Inch (DIN 25) Body			2 Inch (DIN 50) Body			
Inches	mm	Wide-Open Cg for External Relief Sizing	Wide-Open Cv for External Relief Sizing	C1	Wide-Open Cg for External Relief Sizing	Wide-Open Cv for External Relief Sizing	C1	Wide-Open Cg for External Relief Sizing	Wide-Open Cv for External Relief Sizing	C1	K
3/32	2.4	6.9	0.24	29.2	6.9	0.24	28.5	6.9	0.23	29.7	0.72
1/8	3.2	12.5	0.43	29.1	12.5	0.43	29.4	12.5	0.42	29.5	0.62
3/16	4.8	29	1.01	28.6	29	0.93	31.2	29	1.02	28.5	0.72
1/4	6.4	50	1.63	30.5	50	1.71	29.3	52	1.66	31.3	0.76
3/8	9.5	108	2.99	36.1	108	3.42	31.6	115	3.39	33.9	0.79
1/2	12.7	190	4.87	39.0	190	5.29	35.6	200	5.01	39.9	0.74

* The maximum inlet pressure body rating is 2000 PSIG for steel, and 1000 PSIG for ductile iron.
The maximum valve disk inlet pressure rating is 2000 PSIG for nylon, and 1000 PSIG for nitrile.
** For output pressure under 10 PSIG (0.69 BAR), limit the inlet pressure to 100 PSIG to obtain the setpoint.

SHUTDOWN

WARNING!
It is recommended that downstream pressure be released prior to performing a shutdown. Property damage or personal injury could result from an explosion from an overpressure condition on the diaphragm of the regulator.

Begin the shut down procedure by closing the nearest upstream shutoff valve. Next close the nearest downstream shutoff valve. Open the pressure relief valve located between the regulator and the downstream shutoff valve. On the P627 and P627H, pressure between the upstream shutoff valve and the regulator will relieve through the regulator. The P627M and P627HM require relieving the pressure in the monitor line and downstream of the regulator prior to performing any maintenance.

MAINTENANCE

Severity of conditions and the requirements of both state and federal laws determine the frequency to which the regulators need to be inspected. Debris in the process lines, exterior damage, and normal wear could require the replacement of parts such as the disk assembly, seat ring, and diaphragm. The procedures below will provide assistance when attempting to replace these parts.

WARNING!
When attempting any inspection or disassembly, relieve all pressure from the regulator and its adjacent piping so as to prevent personal injury or equipment damage as a result of an explosion or sudden pressure release.

BODY MAINTENANCE PROCEDURES

Replacing the Seat Assembly and/or Seat Orifice:

1. Remove the build screws (item 37) to separate the body (item 30) from the diaphragm case (item 14), exposing the seat assembly (item 28) and seat orifice (item 29).
2. Inspect the seat assembly (item 28) and the seat orifice (item 29) for damage, and if necessary, replace them.
3. To replace the seat assembly (item 28), remove the pin clip (item 23) which holds the seat assembly in place.
4. Assembly is the reverse of this procedure. If replacing the seat orifice (item 29), apply threadlocker (item 39) to the threads and torque to 25 ft/lbs. **When re-attaching the body to the diaphragm case, the 2 build screws (item 37) must be tightened evenly. Do not fully tighten one build screw without tightening the other.** After both build screws have been tightened, torque both build screws to the following:
   aluminum case - 16 ft-lbs
   steel case - 25 ft-lbs

Replacing the Stem Assembly (P627 & P627H):

1. Remove the boost body (item 26), the nitrile stabilizer (item 27), and the stem guide (item 22).
2. Disconnect the stem (item 24) and remove it from the diaphragm case (item 14).
3. Inspect the stem o'ring (item 19), the stem backup rings (item 20), and the diaphragm case o'ring (item 25) and replace if necessary.
4. Assembly is the reverse of the above procedure.

Replacing the Stem Assembly (P627M & P627HM):

1. Using a straight edge screwdriver, pry the throat block (item 35) out of the diaphragm case (item 14).
2. Inspect the throat block o'rings (item 34), throat block backup rings (item 36), stem o'ring (item 19), and stem backup rings (item 20), and replace if necessary.
3. Assembly is the reverse of the above procedure.

DIAPHRAGM & SPRING CASE AREA MAINTENANCE PROCEDURES

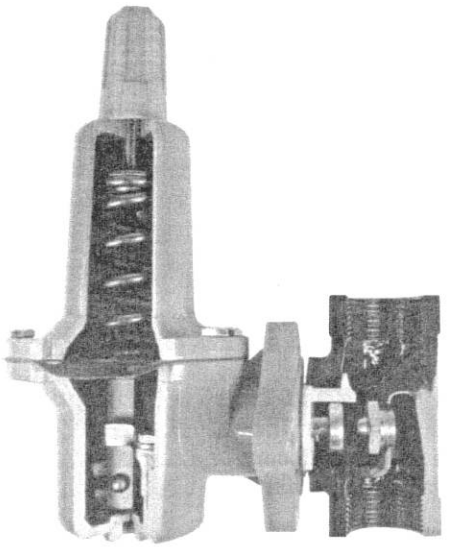
WARNING !
Before performing the following steps, insure that all spring pressure has been released from the diaphragm case.

1. Remove the adjustment screw cap (item 1), loosen the locking nut (item 3) on the adjustment screw (item 2) and by turning counterclockwise release all compression from the range spring (item 7).
2. Remove the bonnet build screws (item 9) and lift off the bonnet (item 4). Range springs may be changed at this time.
3. Slip the pusher post (item 13) out of the groove in the lever (item 15) and remove the diaphragm assembly (items 10, 11, 12, & 13).
4. Remove the lever screws (item 16) and remove the lever (item 15).
5. Remove the diaphragm screw (item 12) to access the diaphragm (item 11).
6. Inspect and replace any worn or suspect parts.
7. Assembly is the reverse of this procedure. Torque the diaphragm screw to 7 ft-lbs. (P627 & P627M) or 14 ft-lbs. (P627H & P627HM). Torque the spring case build screws to 7 ft-lbs.(P627 aluminum), 12 ft-lbs. (P627 steel) or 35 ft-lbs. (for P627 or P627HM).

	Spring & Diaphragm Casing Style	Type P627		Type P627M		Type P627H & P627HM	
		PSIG	BAR	PSIG	BAR	PSIG	BAR
Maximum pressure to spring and diaphragm casing to prevent leak to atmosphere. (internal parts damage may occcur)	Die Cast Aluminum	250	17.2	NA	NA	NA	NA
	Steel	250	17.2	250	17.2	800	55.2
Maximum pressure to spring and diaphragm casings to prevent burst of casings during abnormal operation. (leak to atmosphere and internal parts may occur)	Die Cast Aluminum	375	25.9	NA	NA	NA	NA
	Steel	1200	82.7	1200	82.7	1200	82.7
Maximum diaphragm casing over pressure to prevent damage to internal parts.	All	60	4.1	60	4.1	120	8.3

PARTS ORDERING

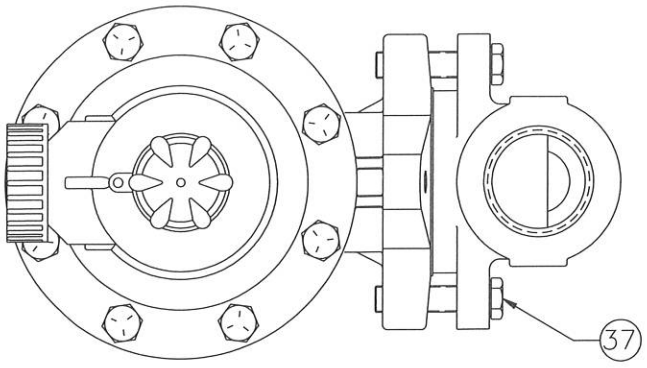
When ordering replacement parts, always reference the Type number, which is found on the nameplate, and the item number of each needed part as found in the following parts list.



P627 Parts

Item	Description	Part Number
1	Cover Adj. Screw, Plastic	610-053-000
2	Adjustment Screw	648-465-000
3	Locknut	634-154-000
4	Bonnet, P627 - Aluminum	604-210-000
	Bonnet, P627M, P627H & P627HM - Steel	604-211-000
5	Vent Screw Assembly	836-005-000
6	Spring Guide, Upper	626-079-000
7	Range Spring	
	5-20 PSIG - Yellow	655-661-000
	15-40 PSIG - Green	655-661-001
	35-80 PSIG & 10-95 PSIG - Blue	655-661-002
	70-150 PSIG - Red	655-661-003
	140-250 PSIG - Blue	655-661-002
	240-500 PSIG - Red	655-661-003
8	Spring Guide, Lower (P627 or P627M only)	643-191-000
9	Build Screw, Spring Case (8 required)	
	P627 - Aluminum	648-466-000
	P627 or P627M - Steel	648-467-003
	P627H or P627HM	648-467-002
10	Diaphragm Piston (P627 or P627M only)	637-306-000
11	Diaphragm P627 & P627M	
	Aluminum / Iron Case (Nitrile)	618-069-000
	Steel Case (Nitrile)	618-070-000
	Diaphragm P627H & P627HM	
	Steel Case (Neoprene)	618-070-001
12	Screw, Diaphragm P627 & P627M	648-466-002
	Screw, Diaphragm P627H & P627HM	648-467-000
13	Post, Pusher P627 & P627M Assy	827-005-000
	Post, Pusher P627H & P627HM Assy	827-005-001
	Post, Pusher P627 & P627M Assy, NACE	827-008-000
	Post, Pusher P627 & P627M Assy, NACE	827-008-001
14	Diaphragm Case P627 - Aluminum	629-202-000
	Diaphragm Case P627 & P627H - Steel	629-203-000
	Diaphragm Case P627M & P627HM - Steel	629-204-000
	Diaphragm Case - Aluminum/Steel	629-215-000
15	Lever	703-004-000
	Lever, NACE	703-005-000
16	Lever Screw (2 required)	648-466-002
	Lever Screw, NACE (2 required)	648-474-000
17	Pin, Lever	635-053-000
	Pin, Lever, NACE	635-057-000
18	Lever Retainer	643-192-000
	Lever Retainer, NACE	643-194-000
19	Stem O-Ring, Nitrile	649-000-003
20	Stem Backup Ring, TFE (2 required)	644-047-000
21	Pin, Groove	635-054-000
	Pin, Groove, NACE	635-058-000
22	Stem Guide	626-083-000
23	Pin Clip	635-055-000
	Pin Clip, NACE	635-056-000
24	Stem, 316 SS	689-005-000
25	Diaphragm Case O-Ring, Nitrile (P627 & P627H)	649-280-000
26	Boost Body P627 or P627H	686-003-000
27	Stabilizer, Nitrile P627 or P627H	649-278-000

Item	Description	Part Number
28	Seat Assembly - Aluminum holder/Nitrile disk	822-019-000
	Seat Assembly - Aluminum/Nylon	822-019-001
	Seat Assembly - 316SS holder/Nitrile (NACE only)	822-020-000
	Seat Assembly - 316SS/Nylon (NACE only)	822-020-001
29	Orifice - Aluminum	
	3/32"	688-013-005
	1/8"	688-013-004
	3/16"	688-013-003
	1/4"	688-013-002
	3/8"	688-013-001
	1/2"	688-013-000
	Orifice - 316SS (NACE units)	
	3/32"	688-014-005
	1/8"	688-014-004
	3/16"	688-014-003
	1/4"	688-014-002
	3/8"	688-014-001
	1/2"	688-014-000
30	Body - Ductile Iron	
	3/4 NPT	664-280-000
	1 NPT	664-280-001
	2 NPT	664-282-000
	Body - Steel	
	3/4 NPT	664-281-000
	1 NPT	664-281-001
	2 NPT	664-283-000
	3/4 NPT LCC	664-325-000
	1 NPT LCC	664-325-001
	2 NPT LCC	664-326-000
	3/4 NPT Socket Weld	664-356-000
	1 NPT Socket Weld	664-358-000
	2 NPT Socket Weld	664-359-000
31	Nameplate (not shown)	632-474-000
32	Diaphragm Spacer (P627H or P627HM only)	654-167-000
33	O-Ring, Spacer (P627H or P627HM only)	649-279-000
34	O-Ring, Throat Block (2 required)	649-281-000
35	Throat Block (P627M or P627HM only)	626-081-000
36	Backup Ring, Throat Block (2 required)	644-048-000
37	Build Screw, 3/4" & 1" Aluminum unit	648-466-001
	Build Screw, All Steel Bodies	648-467-001
	Build Screw 2" Aluminum Unit (2 required) *	648-466-003
	* For 648-466-003 only, order 662-000-023 Lock Washer	
38	Spring Guide, Lower (P627H & P627HM only)	637-307-000
39	Threadlocker	Consult Factory
40	Nameplate Drive Screw (2 required) (not shown)	648-464-000
41	Nace Tag (not shown)	632-503-000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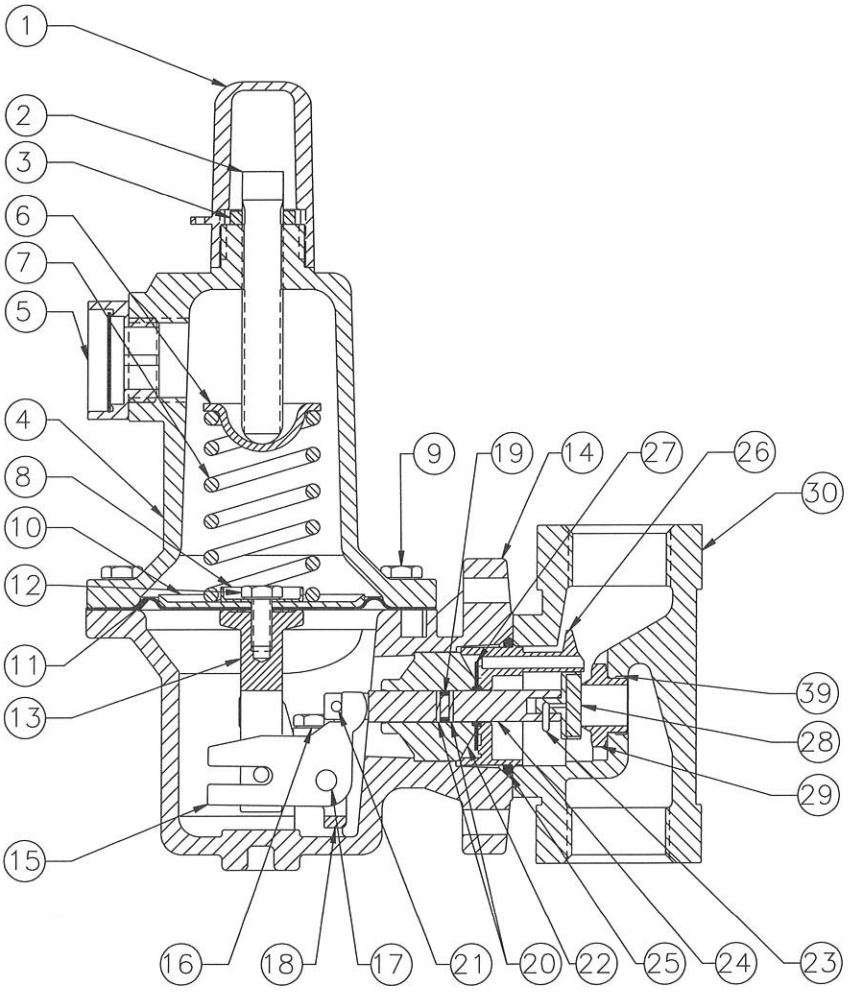
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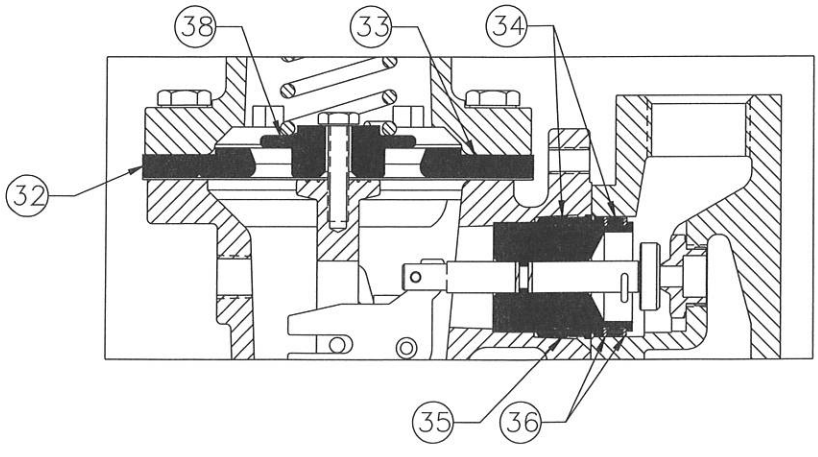
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