DATA SHEET

PRESSURE-SENSITIVE REGULATING UNLOADER

The Pumps with Nine Lives

Brass Model: 7636

SPECIFICATIONS	U.S.	Metric
Flow Range	5.0–21.0 gpm	18.9–80 lpm
Pressure Range	400–4000 psi	28–275 bar
Maximum Temperature (NBR)	140° F	60° C
Maximum Temperature (Intermittent)	195° F	90° C
Inlet Port	½" NPT(F)	½" NPT(F)
Discharge Port	½" NPT(F)	½" NPT(F)
Bypass Port	½" NPT(F)	½" NPT(F)
Auxiliary Port (Optional)	¼" NPT(F)	¼" NPT(F)
Weight	2.47 lbs	1.12 kg
Dimensions	6.5 x 4.0 x 1.1"	165 x 100.5 x 27 mm

FEATURES

- Provides system pressure control and protection for single or multiple gun applications.
- Compact size allows for easy installation.
- Adjusting cap permits easy adjustments of pressure.
- Maintains full system pressure while running in bypass with minimal load on pump.
- Auxiliary port accommodates convenient gauge installation.

Read all CAUTIONS and WARNINGS before commencing service or operation of any high-pressure system

SELECTION

This pressure-sensitive regulating unloader is designed for systems with single or multiple pumps, solenoid (gate) valves, nozzles, standard or weep guns.

Note: For multiple-pump systems, it is best to use a pressure regulator, not a pressure-sensitive regulating unloader.

This unloader should meet both the desired system flow (combined nozzle flow rate requirement) and the desired system pressure.

Notice: Operation below the minimum rated flow of the unloader causes the unloader to cycle. Operation above the maximum rated flow of the unloader causes cycling and premature wear, preventing achievement of the desired system pressure.

INSTALLATION

This unloader operates properly when mounted in any direction. However, keeping the plumbing to a minimum and the black handle cap easily accessible is preferred. The preferred mounting location is directly onto the pump's discharge manifold.

The inlet connection is a ½" NPT(F) port. An arrow and the word IN are cast into opposite sides of the body indicating the direction of flow. Liquid from the discharge of the pump goes into this connection.

The discharge connection is a ½" NPT(F) port (located on the hex end of the body). An arrow and the word OUT are cast into opposite sides of the body indicating the direction of flow. Plumbing for spray gun, solenoid (gate) valves or nozzles connects here.

The bypass connection is a ½" NPT(F) sized port located on the bottom. An arrow and the word BY-PASS are cast into opposite sides of the body. Bypass liquid is directed out of this port and can be routed to a reservoir (preferred method), drain or pump inlet.

OPERATION

This pressure-sensitive regulating unloader holds established system pressure in the discharge line when the trigger gun is closed or solenoid (gate) valve is closed or the nozzle is clogged, thus bypassing all unrequired flow. Squeezing the trigger gun or opening the solenoid (gate) valve will close off the bypass and return to established system pressure.

PRESSURE ADJUSTMENT

Note: Pressure is not set at the factory.

1. Setting and adjusting the unloader pressure must be done while the system is running.
2. Start the system with unloader backed off to the lowest pressure setting (counter-clockwise direction).
3. Increase the unloader pressure setting by turning the black handle cap clockwise.
4. Squeeze the trigger and read the pressure on the gauge at the pump.

Note: Do not read the pressure at the gun or nozzle.

5. If more pressure is desired, release the trigger, turn black handle cap one quarter turn in a clockwise direction.
6. Squeeze the trigger and read the pressure.
7. Repeat this process until desired system pressure is reached.

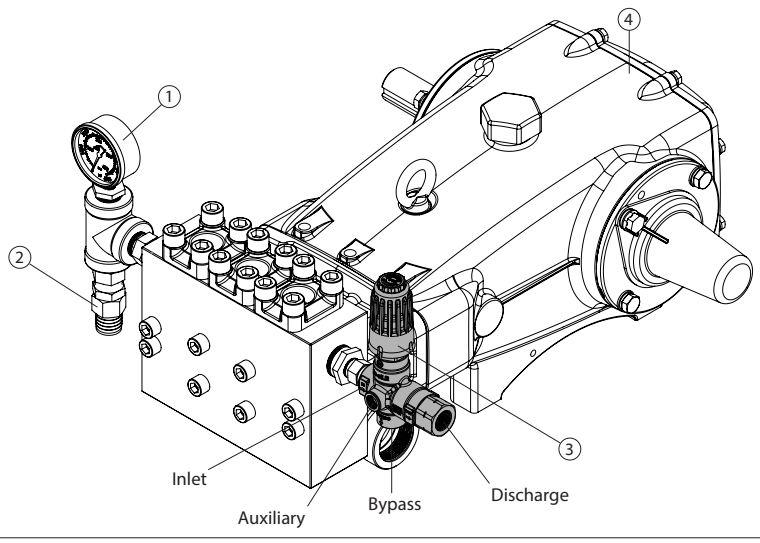
Notice: A minimum bypass flow of 5% of the unloader rated flow capacity is required for proper unloader performance. If the entire unloader flow pumps through the nozzle (zero bypass), the valve can easily be set for pressure higher than the desired pressure, causing a malfunction or premature wear.

8. If desired system pressure cannot be reached, review TROUBLESHOOTING chart.
9. When servicing existing systems, follow adjustment procedures as stated above for an unloader.

Note: A secondary pressure relief device (e.g. pop-off valve, relief valve) should be used along with this pressure-sensitive regulating unloader. Final adjustment for the relief valve should relieve at 200 psi above the system operating pressure.

TYPICAL UNLOADER INSTALLATION

1. Pressure Gauge
2. Pop-Off Valve (Secondary Pressure Relief Device)
3. **Pressure-Sensitive Regulating Unloader** (Primary Pressure Regulating Device)
4. Triplex Plunger Pump



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SERVICING

Disassembly

1. Disconnect bypass, discharge and inlet plumbing from unloader.
2. Remove unloader from pump.
3. Secure body of unloader in a vise with black handle cap facing up.
4. Remove discharge fitting and O-ring, spring, check valve and O-ring.
5. Examine check valve, discharge fitting and spring for wear or fatigue and O-rings for cuts or wear. Replace as needed.

Note: While the discharge fitting is removed, inspect sealing area where the check valve makes contact within the internal body of the unloader for grooves, pitting and wear. If damage is found, stop the repair and replace with complete new unloader. If not, proceed with disassembly.

6. Remove black handle cap by turning counter-clockwise. Please note the brass adjusting cap will stay in the black handle cap.
7. Remove spring, spring retainer and ball.
8. Examine spring, spring retainer and ball for scale build up, fatigue or wear. Replace as needed.
9. Loosen set screw in the lock nut. Turn lock nut counter-clockwise (away from the body) to allow a wrench to be used on the piston retainer.
10. Use a wrench to remove piston retainer. Pull upwards to remove the piston retainer along with the piston stem, spacer ring and valve.
11. Remove body from vise and reposition so the bypass port is facing up.
12. Use the end of a small, deep-wall socket to push the valve seat with O-ring out through the bypass port.
13. Examine seat for scale build up, scoring and wear. Replace as needed. Examine O-Ring for cuts or wear. Replace as needed.
14. Remove unloader body from vise and place the piston retainer assembly into the vise.
15. Removal of piston stem and valve from the piston retainer requires the use of an M16 wrench and 6mm Allen wrench. Place M16 wrench onto hex surface of valve and then insert 6mm Allen wrench from the top and place into head of piston stem. Unthread by turning in a counter-clockwise direction to separate.
16. Examine piston retainer, piston stem, spacer ring and valve for scale build up, scoring, pitting and wear. Replace as needed. Examine all O-rings and backup rings for cuts or wear. Replace as needed.

Reassembly

1. Place unloader body in a vise with bypass port facing down.
2. Lubricate and install O-ring on valve seat. Insert and press the valve seat into place.
3. Lubricate and install O-ring onto piston retainer.
4. Lubricate and install O-ring and backup ring onto piston stem.
5. Lubricate and install O-ring and backup ring into counter-bored end of spacer ring.
6. Lubricate and install O-ring onto outside diameter of spacer ring.
7. Insert threaded end of piston stem into piston retainer and press into place.
8. Apply a drop of Loctite® 242® to the first few threads of the piston stem.
9. Place counter-bored end of spacer onto piston retainer.
10. Hand thread the valve onto the piston stem.
11. Using the same tools from the disassembly, place 6mm Allen wrench through the top of the piston retainer and into head of piston stem. Then use the M16 wrench on the hex surface of the valve and tighten.
12. Insert complete assembly into unloader body and thread into place.
13. Lubricate and install O-ring on discharge fitting.
14. Insert spring into discharge fitting, then insert check valve with large opening facing the spring. Hand thread into unloader body and tighten with a wrench.
15. Place spring retainer on top of piston stem.
16. Place spring on to spring retainer.
17. Hand thread black handle cap onto piston retainer.
18. Remove unloader from vise.
19. Re-install unloader onto pump.
20. Reconnect bypass, discharge and inlet plumbing to the unloader.
21. Proceed to PRESSURE ADJUSTMENT

TROUBLESHOOTING

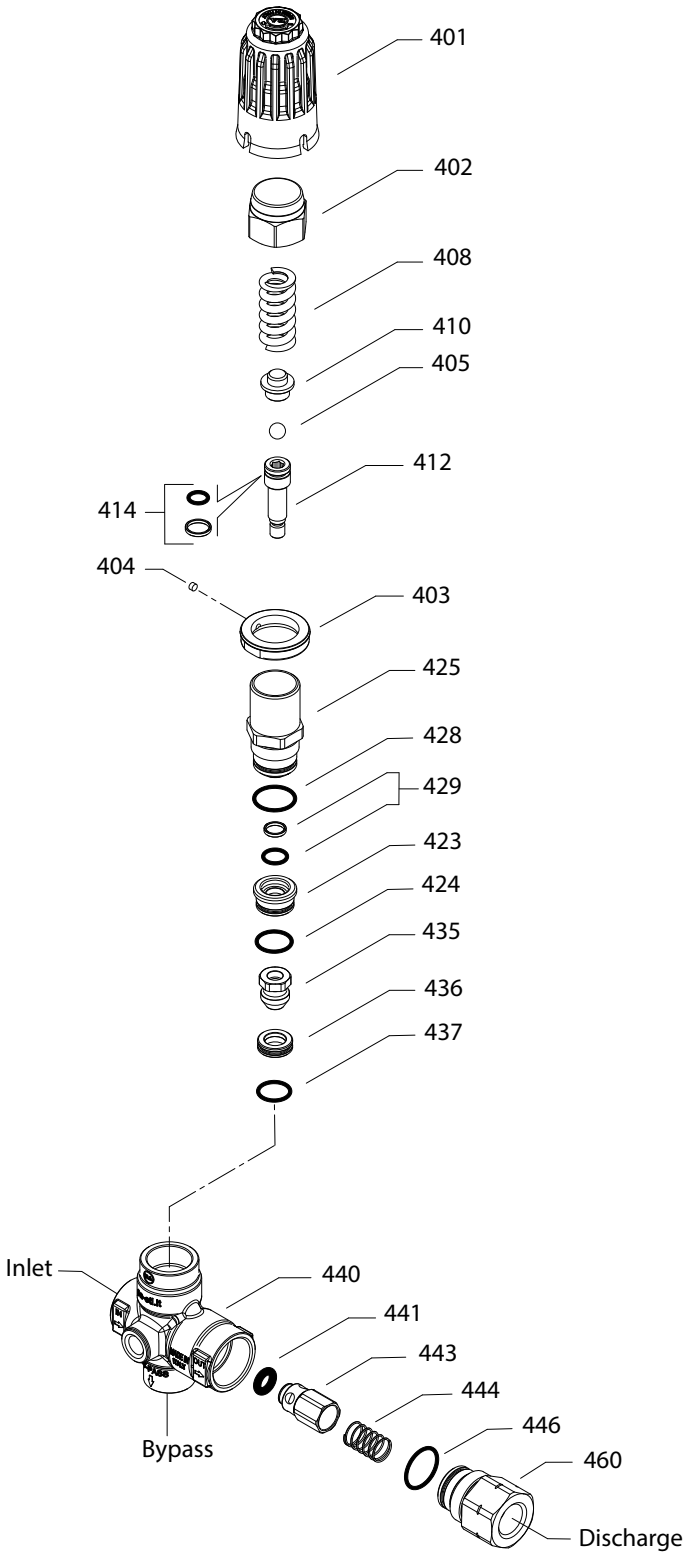
Unloader cycles	• Worn O-ring or check valve • Fitting leaking downstream • Air in system, poor connection	• O-ring in gun is worn • Insufficient flow through unloader
Liquid leaking from bottom	• O-ring for seat or inlet fitting is cut or worn	
Liquid leaking from middle	• O-ring for piston cut or worn • O-rings for piston stem cut or worn	
Unloader will not come up to pressure	• Not properly sized for system pressure • Foreign material in unloader • Piston stem O-rings are worn	• Nozzle worn or sized incorrectly • Insufficient flow to pump
Extreme pressure spikes	• Adjusting handle turned completely into unloader • Restricted bypass or no bypass	• System flow exceeds unloader rating

PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	QTY
401	—	NY	Cap, Handle, Black	1
402	31167	BB	Cap, Adjusting	1
403	—	BB	Nut, Locking	1
404	33061	STZP	Screw, Set (M4 x 4)	1
405	32289	SSSS	Ball (11/32")	1
408	34587	STZP	Spring	1
410	34574	BB	Retainer, Spring	1
412	34571	SS	Stem, Piston	1
414	—	NBR	Piston Seal with O-Ring	1
423	34582	BB	Spacer	1
424	33043	NBR	O-Ring, Spacer	1
425	—	BB	Retainer, Piston	1
428	32926	NBR	O-Ring, Piston	1
429	—	NBR	Stem Seal with O-Ring	1
435	34581	SS	Valve	1
436	34575	SS	Seat	1
437	34503	NBR	O-Ring	1
440	—	BB	Housing	1
441	33582	NBR	O-Ring, Check Valve	1
443	76721	BB	Check Valve	1
444	76722	S	Spring	1
446	—	NBR	O-Ring, Discharge Fitting	1
460	76024	BB	Fitting, Discharge (½" NPT[F])	1
468	32223	NBR	Kit, Repair (Includes: 414, 424, 428, 429, 435, 436, 437, 441, 446)	1

Italics are optional items.
MATERIAL CODES (Not Part of Part Number): BB=Brass
NBR=Medium Nitrile (Buna-N) NY=Nylon S=304SS SS=316SS
SSSS=440SS STZP=Steel/Zinc Plated

EXPLODED VIEW



⚠ CAUTIONS AND WARNINGS
All high-pressure systems require a primary pressure regulating device (e.g. regulator, unloader) and a secondary pressure relief device (e.g. pop-off valve, relief valve). Failure to install such relief devices could result in personal injury or damage to pump or property. Cat Pumps does not assume any liability or responsibility for the operation of a customer's high-pressure system.

Read all CAUTIONS and WARNINGS before commencing service or operation of any high-pressure system. The CAUTIONS and WARNINGS are included in each Service Manual and with each Accessory Data sheet. CAUTIONS and WARNINGS can also be viewed online at www.catpumps.com/dynamic-literature/cautions-and-warnings or can be requested directly from Cat Pumps.

WARRANTY
View the Limited Warranty online at www.catpumps.com/literature/cat-pumps-limited-warranty

CAT PUMPS 1681 94th Lane N.E., Minneapolis, MN 55449-4324 P: (763) 780-5440 F: (763) 780-2958 E: techsupport@catpumps.com www.catpumps.com

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