



## Pressure Sensitive Multiple Gun Regulating Unloader

Brass  
Model

# 7576

### FEATURES

- Maintains full system pressure while running in by-pass without full load on pump.
- Easy external pressure adjusting hex nut to prevent over pressure.
- Full pressure regulation with either single or multiple pumps, multiple nozzles, solenoid or gate valve systems.

### SPECIFICATIONS

	U.S. Measure	Metric Measure
<b>MODEL 7576</b>		
Flow Range .....	1-21 gpm	(3.8-80 lpm)
Pressure Range.....	1500-7250 psi	(105-500 bar)
Maximum Operating Temperature:		
Standard Buna O-ring.....	140°F	(60°C)
Standard Buna O-ring (Intermittent).....	195°F	(90°C)
Inlet Port (Back).....	1/2" BSPF	(1/2" BSPF)
Discharge Port (Front) .....	1/2" BSPF	(1/2" BSPF)
By-Pass Port (Side).....	1/2" BSPF	(1/2" BSPF)
Gauge Port (Side) .....	1/4" BSPF	(1/4" BSPF)
Weight.....	7.6 lbs.	(3.45 kg)
Dimensions.....	9.23 x 5 x 2.85" (234.5 x 127.5 x 72.5 mm)	

Unloader is stamped with European safety pressure.  
Use only at above specifications to assure proper unloader life and performance.

#### ⚠ CAUTIONS AND WARNINGS

All High Pressure Systems require a primary pressure regulating device (i.e. regulator, unloader) and a secondary pressure relief device (i.e. 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/cautions-warnings](http://www.catpumps.com/cautions-warnings) or can be requested directly from CAT PUMPS.

#### WARRANTY

View the Limited Warranty on-line at [www.catpumps.com/warranty](http://www.catpumps.com/warranty).

## 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 and standard guns.

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

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

**NOTICE:** Operation below the minimum flow of the unloader causes the unloader to cycle. Operation above the maximum flows of the unloader causes premature unloader wear, cycling and prevents attaining desired system pressure.

### INSTALLATION

This unloader operates properly when mounted in any direction, however, it is preferred to keep the plumbing to a minimum and the hex adjusting nut is easily accessible. The best mounting location is directly on the pump discharge manifold head.

There is one (1) inlet connection on this unloader. It is a 1/2" BSPF port and located on the short extension side. An arrow and the word IN is cast into the body indicating the direction of flow. Liquid from the manifold discharge goes through this connection.

The discharge connection is a 1/2" BSPF hex fitting. An arrow and the word OUT is cast into the body indicating the direction of flow. Discharge plumbing for the spray guns, solenoid (gate) valves or nozzles are connected to this port.

The by-pass connection is a 1/2" BSPF port located on the side of the body. The word BY-PASS is cast into the body. By-Pass liquid is directed out of this port and can be routed to a reservoir (preferred method), or to a drain or to the 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 by-passing all unrequired flow. Squeezing the trigger gun or opening the solenoid (gate) valve will close the by-pass and return to established system pressure.

### PRESSURE ADJUSTMENT

1. Setting and adjusting the unloader pressure must be done with the system "on".
2. Start the system with unloader backed off to the lowest pressure setting (counterclockwise direction).
3. Squeeze the trigger and read the pressure on the gauge at the pump.

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

4. If more pressure is desired, release the trigger, turn hex adjusting nut one quarter turn in clockwise direction.
5. Squeeze the trigger and read the pressure.
6. Repeat this process until desired system pressure is attained.
7. Once the desired system pressure is reached, stop turning the hex adjusting nut.

**Note:** Pressure is not set at the factory.

**Notice:** A minimum by-pass flow of 5% of the unloader rated flow capacity is required for proper unloader performance. If the entire flow is directed through the nozzle (zero by-pass) the "cushioning" feature of the by-pass liquid is eliminated and the unloader can prematurely wear or malfunction.

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

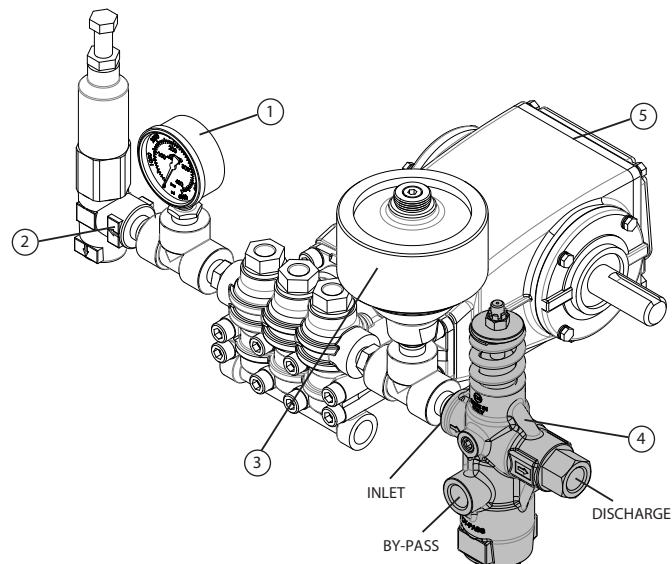
**Note:** Do not adjust unloader pressure setting to compensate for a worn nozzle. Check the nozzle as part of the regular maintenance and replace if worn.

**Note:** A secondary pressure safety relief device (i.e. pop-off valve, safety 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.

**Note:** By removing the check valve and spring, these unloaders can function as a secondary relief valve.

### TYPICAL UNLOADER INSTALLATION

- 1 Pressure Gauge
- 2 Relief Valve  
Shown as a secondary safety relief valve
- 3 Pulsation Dampener
- 4 Pressure Regulator Regulating Unloader
- 5 Triplex Plunger Pump



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

**SERVICING**

**Disassembly**

1. Disconnect by-pass, discharge and inlet plumbing from unloader.
2. Remove unloader from pump.
3. Secure body of unloader in a vise with hex adjusting nut or adjustment handle facing up.
4. Remove discharge fitting and o-ring, spring, and check valve with o-ring.
5. Examine check valve seat, check valve and discharge fitting for wear, spring for wear or fatigue. Examine o-rings and backup-rings for cuts or wear and replace as needed.

**Note:** While the discharge fitting is removed, inspect sealing area where the check valve seat 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 hex adjusting nut by turning in a counterclockwise direction.
7. Remove spring retainer and spring. Examine for fatigue or wear and replace as needed.
8. Drive out locking pin from upper piston stem. Examine for fatigue or wear and replace as needed.
9. Remove unloader from vise and reposition so bottom plug is facing up.
10. Remove plug with backup-ring and o-ring. Examine for fatigue or wear and replace as needed. Examine o-ring and backup-ring for cuts or wear and replace as needed.
11. Remove spring, ball retainer, ball, seat with o-ring and backup-ring. Examine for scale build up, fatigue or wear and replace as needed. Examine o-rings and backup-rings for cuts or wear and replace as needed.
12. Remove seat retainer with o-ring and backup-ring, seat retainer spring, lower piston, inner spacer and outer spacer. Examine for scale build up, fatigue or wear and replace as needed. Examine o-rings and backup-rings for cuts or wear and replace as needed.
13. Use wrench to unthread and remove hex nut from bottom of upper piston stem.
14. Remove seat/valve with backup-ring and o-ring, along with piston spacer. Examine for scale build up, fatigue or wear and replace as needed. Examine o-rings and backup-rings for cuts or wear and replace as needed.
15. Remove upper piston with o-rings and backup-rings. Examine upper piston for scale build up, scoring, pitting and wear and replace as needed. Examine o-rings and backup rings for cuts or wear and replace as needed.
16. Remove piston spacer with o-rings and backup-rings. Examine piston spacer for scale build up, scoring, pitting and wear and replace as needed. Examine o-rings and backup-rings for cuts or wear and replace as needed.

**Reassembly**

1. Lubricate and install o-ring and then backup-ring onto outside diameter of piston spacer.
2. Place piston spacer with o-rings and backup-rings into unloader body.
3. Lubricate and install o-rings and backup-rings onto upper piston.
4. Insert upper piston through piston spacer until properly seated.
5. Slide piston spacer with o-rings and backup-rings over upper piston.
6. Place seat/valve with o-ring onto piston spacer.
7. Apply Loctite®242® to the bottom threads of the upper piston.
8. Thread hex nut onto upper piston.
9. Insert outer spacer and then inner spacer over hex nut.
10. Place seat retainer spring onto inner spacer.
11. Lubricate and install backup-ring and then o-ring onto seat retainer. Slide over seat retainer spring.
12. Insert lower piston through seat retainer with threaded end facing up.
13. Lubricate and install backup-ring and then o-ring onto seat. Slide seat over lower piston.
14. Install ball and then thread ball retainer into lower piston.
15. Apply Loctite®242® to the bottom threads of the lower piston.
16. Position piston spring onto ball retainer.
17. Lubricate and install o-ring and then backup-ring onto plug.
18. Thread plug into unloader body.
19. Remove unloader from vise and reposition in vise with bottom plug facing down.
20. Lubricate and install o-ring and then backup-ring onto check valve seat. Place in discharge port with o-ring facing in.
21. Lubricate and install o-ring onto check valve. Place check valve with o-ring facing in. Install check valve spring into check valve.
22. Lubricate and install backup-ring and then o-ring onto discharge fitting. Thread discharge fitting into unloader body.
23. Drive in locking pin.
24. Place pressure spring onto unloader body. Position spring retainer over spring.
25. Thread hex adjusting nut onto upper piston.
26. Remove unloader from vise. Re-install unloader onto pump. Reconnect by-pass, discharge and inlet plumbing to unloader. Proceed to PRESSURE ADJUSTMENT.

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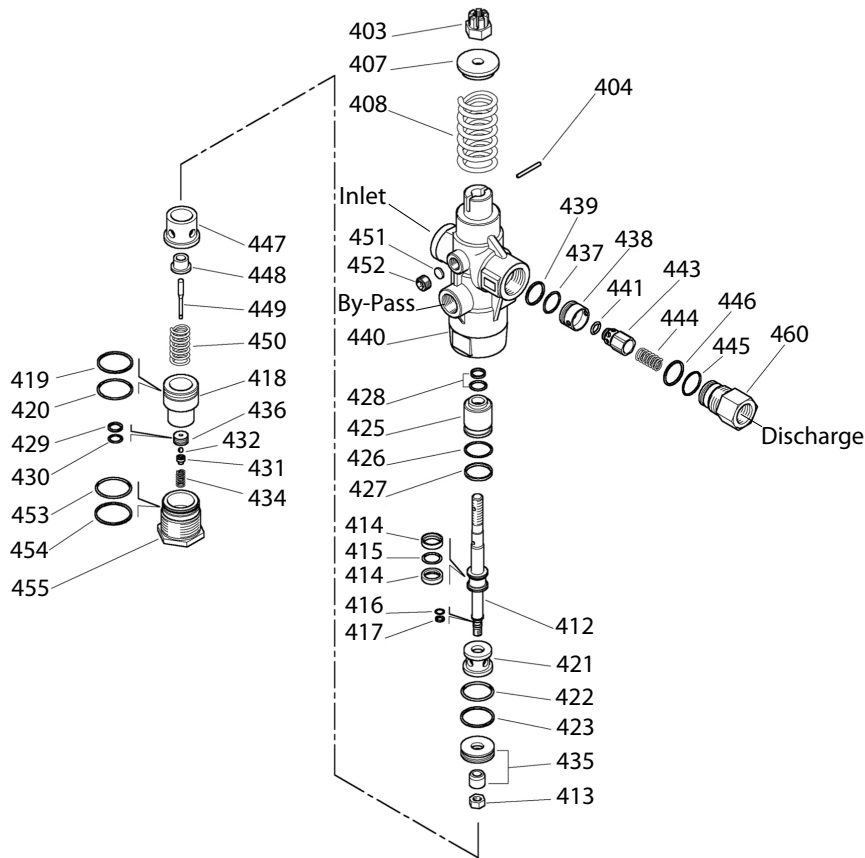
**PRESSURE READING**

Approximate Pressure Reading at Gauge	Gauge Between Pump/Unloader	Gauge Between Unloader/Gun-Nozzle-Valve
System in operation (gun open)	system pressure	system pressure
System in by-pass (all guns, valves closed)	low pressure 0-150 PSI	system pressure +200 PSI

**TROUBLESHOOTING**

Unloader cycles	<ul style="list-style-type: none"> <li>● Check for leak downstream of unloader.</li> <li>● Worn O-ring or check valve.</li> <li>● Air in system, poor connection.</li> <li>● O-ring in gun worn.</li> <li>● Insufficient flow through unloader.</li> </ul>
Liquid leaking from bottom fitting	<ul style="list-style-type: none"> <li>● O-ring for fitting cut or worn.</li> <li>● O-ring for seat cut or worn.</li> </ul>
Liquid leaking from middle	<ul style="list-style-type: none"> <li>● O-ring for piston worn or cut.</li> <li>● O-rings for piston stem worn or cut.</li> </ul>
Unloader will not come up to pressure	<ul style="list-style-type: none"> <li>● Not properly sized for system pressure.</li> <li>● Foreign material in unloader. Clean filter.</li> <li>● Piston stem O-rings worn.</li> <li>● Nozzle worn.</li> <li>● Insufficient flow to pump.</li> </ul>
Extreme pressure spikes	<ul style="list-style-type: none"> <li>● Adjusting nut turned completely into unloader.</li> <li>● Restricted by-pass or no by-pass.</li> <li>● System flow exceeds unloader rating.</li> </ul>
Filtration	<ul style="list-style-type: none"> <li>● Clean filter on regular schedule to avoid cavitation.</li> </ul>

## EXPLODED VIEW



## PARTS LIST

ITEM	PN	MATL	DESCRIPTION	QTY	ITEM	PN	MATL	DESCRIPTION	QTY
403	30729	STZP	Nut, Hex Adjusting	1	435	39327	SSS	Seat/Valve	1
404	39295	S	Pin, Locking	1	436	31633	SSS	Seat	1
407	31518	BB	Retainer, Spring	1	437	in kit	NBR	O-Ring, Check Valve Seat - 85D	1
408	31500	STZP	Spring, Pressure	1	438	76731	S	Seat, Check Valve	1
412	39326	S	Piston, Upper	1	439	in kit	PTFE	Backup-Ring, Check Valve Seat	1
413	39299	S	Nut, Hex (M8)	1	440	—	BB	Housing	1
414	30579	PTFE	Backup-Ring, Upper Piston	2	441	in kit	NBR	O-Ring, Check Valve - 85D	1
415	in kit	NBR	O-Ring, Upper Piston - 85D	1	443	31550	S	Valve, Check	1
416	in kit	NBR	O-Ring, Upper Piston - 85D	1	444	31486	S	Spring, Check Valve	1
417	in kit	PTFE	Backup-Ring, Upper Piston	1	445	in kit	PTFE	Backup-Ring, Discharge Fitting	1
418	30734	BB	Retainer, Seat	1	446	in kit	NBR	O-Ring, Discharge Fitting - 85D	1
419	in kit	PTFE	Backup-Ring, Seat Retainer	1	447	30745	S	Spacer, Outer	1
420	in kit	NBR	O-Ring, Seat Retainer - 85D	1	448	31551	BB	Spacer, Inner	1
421	30568	BB	Spacer, Piston	1	449	30562	SSS	Piston, Lower	1
422	in kit	NBR	O-Ring, Seat/Valve - 85D	1	450	39503	S	Spring, Seat Retainer	1
423	in kit	PTFE	Backup-Ring, Valve	1	451	31487	CU	Plug	1
425	76005	S	Spacer, Piston	1	452	76733	BB	Screw, Grub 1/4" BSPM	1
426	in kit	NBR	O-Ring, Piston Spacer - 85D	1	453	in kit	NBR	O-Ring, By-Pass Fitting - 85D	1
427	in kit	PTFE	Backup-Ring, Piston Spacer	1	454	in kit	PTFE	Backup-Ring, By-Pass Fitting	1
428	76011	—	Seal, Piston, W/O-Ring	1	455	31490	BB	Plug, 1/2" BSPF	1
429	in kit	PTFE	Backup-Ring, Seat	1	460	76728	BB	Fitting, Discharge 1/2" BSPF	1
430	in kit	NBR	O-Ring, Seat - 85D	1	468	31660	NBR	Kit, O-Ring (Includes 415, 416, 417, 419, 419, 420, 422, 423, 426, 427, 429, 430, 437, 439, 441, 445, 446, 453, 454)	1
431	30567	S	Retainer, Ball	1					
432	76744	TC	Ball, 5/32"	1					
434	31586	S	Spring, Piston	1					

MATERIAL CODES (Not Part Of Part Number)

BB=Brass CU=Copper NBR=Medium Nitrile (Buna-N) PTFE=Pure Polytetrafluoroethylene  
S=304SS SSS=416SS STZP=Steel/Zinc Plated TC=Tungsten Carbide



### CAT PUMPS

1681 - 94TH LANE N.E. MINNEAPOLIS, MN 55449-4324  
PHONE (763) 780-5440 — FAX (763) 780-2958  
e-mail: techsupport@catpumps.com  
www.catpumps.com