



Flow Sensitive Regulating Unloader

Models 7557, 7558
7559, 7560

FEATURES

- Flow sensitive feature eliminates pressure in the line while in by-pass.
- Unique flow calibrated by-pass barb eliminates pressure spikes in by-pass line.
- Provides system pressure setting and protection for single gun and pump — non-weep — installation.
- All stainless steel or brass internal parts and no external moving parts.
- Unique balanced piston permits precise pressure adjustment.

SPECIFICATIONS

	U.S. Measure	Metric Measure
MODEL 7557		
Flow Range	2.5-3.0 GPM	(9.5-11 L/M)
MODEL 7558		
Flow Range	3.0-4.0 GPM	(11-15 L/M)
MODEL 7559		
Flow Range	4.0-6.6 GPM	(15-25 L/M)
MODEL 7560		
Flow Range	6.6-10.6 GPM	(25-40 L/M)
COMMON SPECIFICATIONS		
Pressure Range	100-3000 PSI	(7-210 BAR)
Max. Temperature	160°F	(71°C)
Inlet Port	3/8" NPTF	(3/8" NPTF)
Discharge Port	1/2" NPTF	(1/2" NPTF)
By-Pass Port	3/8" NPTF	(3/8" NPTF)
Weight	4.8 lbs.	(2.16 Kg)
Dimensions	3.5 x 7.5"	(89 x 190 mm)

“Customer confidence is our greatest asset”

SELECTION: This is a flow sensitive **regulating unloader**. It is designed for systems with a **single** pump, solenoid (gate) valve, nozzle, and standard gun. **A weep gun is not recommended with this unloader.**

This unloader maintains established system pressure while the gun, valve or nozzle is open. When the gun, valve or nozzle is closed, the unloader by-passes the unrequired flow. It returns to established system pressure with only a nominal delay.

NOTE: For **multiple pump** systems, it is best to use a pressure regulator not an unloader.

Select the specific model of unloader to meet both the desired system flow (combined nozzle flow rate requirement) and the desired system pressure.

Exercise caution when matching the system requirements to the unloader flow capacity and pressure rating. Operation below the minimum flow of the unloader causes the unloader to cycle. Operation beyond the rated unloader flow causes premature valve wear, unloader cycling and prevents attaining desired system pressure.

Select a high pressure nozzle sized to provide for both the desired **system flow** and pressure and **unloader by-pass**.

CAUTION

A MINIMUM BY-PASS FLOW of 5% of the UNLOADER RATED FLOW CAPACITY is required for proper unloader performance.

When properly set this unloader protects the pump from pressure extremes associated with obstructions in the discharge line, while maintaining the established system pressure. When no flow is required by the system, the unloader by-passes all the system flow and relieves the load on the pump. Minimal pressure is held in the discharge line (between the unloader and gun or solenoid valve). There is a nominal delay to return to high pressure when operation resumes.

INSTALLATION: This unloader operates properly when mounted in any direction, however, it is preferred to keep the plumbing to a minimum and the adjusting bolt easily accessible. The best location is directly on the pump discharge manifold head. Plumbing to and from the unloader should be at least the size of the unloader ports and flexible, high pressure hose (minimum single wire braid) is required.

This is a flow through design unloader. The standard **inlet connection** of this unloader is located at the **back**. This unloader can be mounted directly in the discharge line.

The **by-pass connection** is on the **side** of the unloader and can be plumbed in one of the following methods. Note that prolonged by-pass can result in significant heat build-up and frequent by-pass can result in premature wear to the valve. A **MINIMUM BY-PASS OF 5%** is necessary for the unloader to operate properly.

CAUTION

If the entire output is directed through the unloader (zero by-pass) the "cushioning" feature of the by-pass fluid is eliminated and the unloader can malfunction or wear prematurely.

Check the amount of by-pass by disconnecting the by-pass line and measuring the flow into a graduated container.

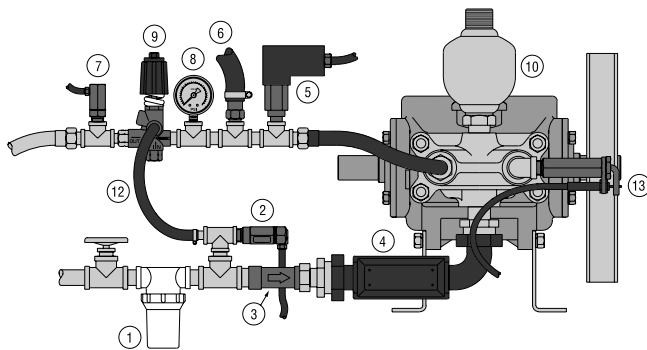
By-Pass to Reservoir: Ideally the by-pass line should be directed to a reservoir with at least one baffle between the supply line to the pump (from the reservoir) and the return by-pass line (from the unloader into the reservoir). This baffle minimizes turbulence and air bubbles that could enter the pump inlet feed line. **The reservoir capacity should be 6 to 10 times the rated system flow per minute.**

By-Pass to Pump Inlet: Although not recommended, by-pass fluid can be returned to the inlet line of the pump or directly to a pump inlet port (**systems up to 10 GPM**). When using this method an *Inlet Pressure Regulator* should be installed on the inlet line to avoid excessive inlet pressure. Be certain the Inlet Pressure Regulator is **between** the pump inlet and the by-pass line connection. When using this method, a *Thermo Valve* should be installed in the by-pass line to protect the pump from temperature build-up and premature seal failure.

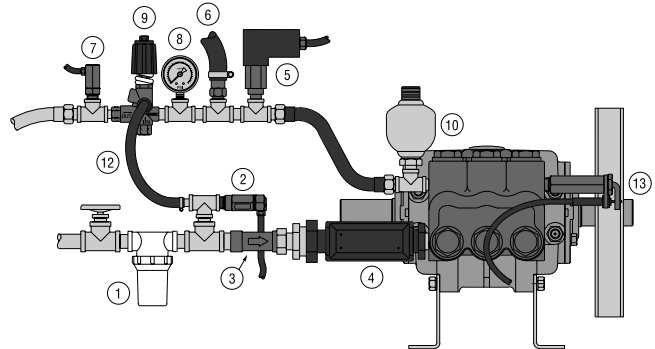
The by-pass line should be **connected to the pump inlet line at a gentle angle of 45° or less and no closer than 10 times the pump inlet port diameter** e.g. 1-1/2" port size = 15" distance from pump inlet port. **Refer to Technical Bulletin 64 for additional information on the size and length of the by-pass line.**

TYPICAL INSTALLATION

Piston Pump



Plunger Pump



By-Pass to Drain: If the by-pass is limited and infrequent, the by-pass can easily drain to an unpressurized drain line (to the ground).

The **outlet connection** is located at the **front** of the unloader. Plumbing for the spray gun, nozzle or solenoid valve should be connected in line from this discharge port.

It is recommended that a secondary protective device such as the *CAT PUMP Pop-Off Valve* be installed to assure pump protection should the unloader malfunction. Refer to Troubleshooting for more information on malfunction of unloader.

Preferred mounting of the *Prrrrr-o-lator* (pulsation dampener) is directly **on the Discharge Manifold Head**. When using the *Inlet Pressure Regulator*, mount the *Prrrrr-o-lator* **downstream from the unloader** to assure optimum performance of the regulator.

CAUTION

Oversizing the *Prrrrr-o-lator* may cause delayed response from the unloader.

PRESSURE ADJUSTMENT: Setting and adjusting the unloader pressure must be done with the system “on”. Start the system with the unloader backed off to the **lowest pressure** setting. Squeeze the trigger and read the pressure on the gauge at the pump. If more pressure is desired, release the trigger, turn adjusting bolt one quarter turn, squeeze the trigger and read the pressure. Repeat this process until desired pressure is attained.

Monitor the by-pass flow at each adjustment. If the by-pass flow, drops below 5% of rated unloader flow, STOP ADJUSTMENT. The nozzle selection is improperly sized to achieve the desired system pressure.

Proceed by accepting the attained pressure OR selecting a smaller nozzle OR increasing the pump RPM providing you stay within specifications.

Once the desired system pressure is reached, stop adjusting and set the top locking nut to hold the system pressure. **Do not read the pressure at the gun or nozzle for setting system pressure.** Check the nozzle as part of regular maintenance and replace if worn. **Do not adjust unloader pressure setting to compensate for worn nozzle.**

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 (guns closed)	low pressure 0-150 PSI	low pressure 0-150 PSI

TROUBLESHOOTING

Unloader cycles	<ul style="list-style-type: none"> ● Not properly sized for system flow. ● Lower piston assembly spring worn or broken. ● Cup worn or cut. ● Insufficient by-pass. ● Air in system
Fluid leaking from bottom of lower body	<ul style="list-style-type: none"> ● Cup seal worn or cut.
Fluid leaking out top adjusting screw	<ul style="list-style-type: none"> ● O-ring around spring guide worn or cut.
Unloader will not come up to pressure	<ul style="list-style-type: none"> ● Not properly sized for system flow. ● Foreign material in flow restrictor. ● Lower piston assembly spring worn or broken. ● Nozzle worn, or not sized properly.
Extreme pressure spikes	<ul style="list-style-type: none"> ● Adjusting bolt turned completely into unloader. ● Insufficient by-pass (a minimum of 5% necessary). ● Restricted by-pass or no by-pass.
Filtration	<ul style="list-style-type: none"> ● Clean filter on regular schedule to avoid cavitation.

NUMBER CROSS REFERENCE

7557	7558	7559	7560
(K7-0)	(K7-1)	(K7-2)	(K7-3)

WARRANTY

90 Day Warranty

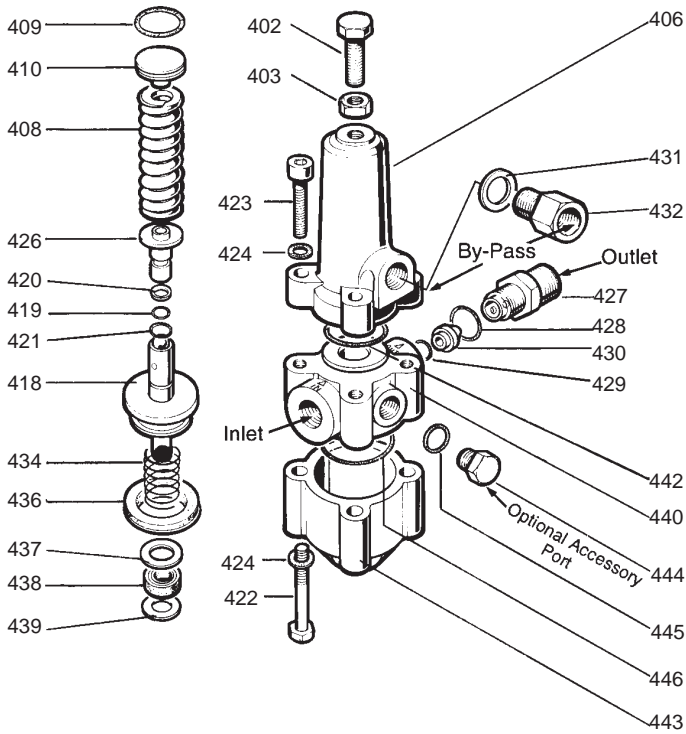
Refer to complete Cat Pump Warranty for further information.

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|--|-------------------------------|
| 1 Inlet Filter | 7 Quick Start Valve |
| 2 Thermo Valve | 8 Pressure Gauge |
| 3 Inlet Pressure Regulator | 9 Pressure Regulator/Unloader |
| 4 C. A. T. Tube
(Captive Acceleration Tube) | 10 Pulsation Dampener |
| 5 Pressure Switch | 11 Chemical Injector |
| 6 Pop-Off Valve | 12 Internal By-pass |
| | 13 Throttle Controller |

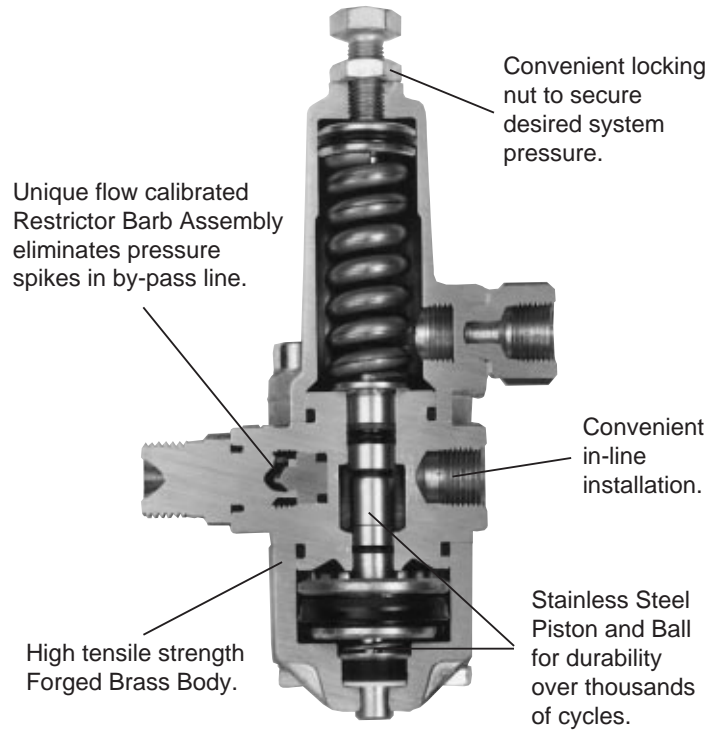
★ Preferred mounting of Pulsation Dampener [Prrrrr-O-Lator] is directly on the discharge manifold of the pump. The preferred mounting of the by-pass hose [when returning to the inlet] is before the Pressure Reducing Valve.

These illustrations show the basic elements for a typical installation of a high pressure piston or plunger pump. **Not all components shown are required for all applications or systems.** Each component presents potential problems that too often are ascribed to a perfectly functioning pump, such as: a clogged strainer, a partially closed shut-off valve, a faulty gauge, or a malfunctioning regulator/unloader. Proper system installation, routine lubrication, monitoring and maintenance of components are your basic guarantees of optimum pump performance. CAT PUMPS does not assume any liability or responsibility for the design or operation of a customer’s high pressure system.

EXPLODED VIEW



CUTAWAY



PARTS LIST

ITEM	DESCRIPTION	MODEL NUMBER				QTY				
402	Bolt, Adjusting (M10x30)	7557	MATL	7558	MATL	7559	MATL	7560	MATL	1
403	Nut, Locking (M10)	—	ZP	—	ZP	—	ZP	—	ZP	1
406	Body, Upper	—	BB	—	BB	—	BB	—	BB	1
408	Spring	33173	S	33173	S	33173	S	33173	S	1
409	O-Ring, Guide	—	NBR	—	NBR	—	NBR	—	NBR	1
410	Spring, Guide	—	BB	—	BB	—	BB	—	BB	1
418	Assembly, Piston (Stem and Ball)	33174	BBS	33174	BBS	33174	BBS	33174	BBS	1
419	O-Ring, Piston	—	FPM	—	FPM	—	FPM	—	FPM	1
420	Back-up-Ring, Piston	—	PTFE	—	PTFE	—	PTFE	—	PTFE	1
421	O-Ring, Piston	—	NBR	—	NBR	—	NBR	—	NBR	1
422	Screw, Hex Cap (M8x45)	—	ZP	—	ZP	—	ZP	—	ZP	4
423	Bolt, Adjusting (M10x25)	—	ZP	—	ZP	—	ZP	—	ZP	4
424	Lockwasher, Knurled	—	—	—	—	—	—	—	—	8
426	Guide, Piston	33170	S	33170	S	33170	S	33170	S	1
427	Barb	33351	BB	33351	BB	33352	BB	33353	BB	1
428	O-Ring, Barb	—	NBR	—	NBR	—	NBR	—	NBR	1
429	O-Ring, Restrictor	—	NBR	—	NBR	—	NBR	—	NBR	1
430	Restrictor, Barb (1/2")	—	S	—	S	—	S	—	S	1
431	Gasket, Compression	33177	CU	33177	CU	33177	CU	33177	CU	1
432	Restrictor, By-Pass	—	BB	—	BB	—	BB	—	BB	1
434	Spring	33175	S	33175	S	33175	S	33175	S	1
436	U-Cup	33183	NBR	33183	NBR	33183	NBR	33183	NBR	1
437	Adapter, Male	—	BB	—	BB	—	BB	—	BB	1
438	Cup, Seal	—	NBR	—	NBR	—	NBR	—	NBR	1
439	Washer	33227	PTFE	33227	PTFE	33227	PTFE	33227	PTFE	1
440	Fluid Chamber	—	BB	—	BB	—	BB	—	BB	1
442	O-Ring, Upper Chamber	—	NBR	—	NBR	—	NBR	—	NBR	1
443	Body, Lower	—	BB	—	BB	—	BB	—	BB	1
444	Plug	—	BB	—	BB	—	BB	—	BB	1
445	Washer, Compression	33176	CU	33176	CU	33176	CU	33176	CU	1
446	O-Ring, Lower Chamber	—	NBR	—	NBR	—	NBR	—	NBR	1
447	Kit, Cup & O-Ring	33178	NBR	33178	NBR	33178	NBR	33178	NBR	1
—	Restrictor & Barb Assembly (Incls: 427,430,432)	33179	BB	33180	BB	33181	BB	33182	BB	1

Italics are optional items.

MATERIAL CODES (Not Part of Part Number): BB=Brass BBS=Brass/304SS CU=Copper FPM=Fluorocarbon (Viton®)
NBR=Medium Nitrile (Buna-N) PTFE=Polytetrafluoroethylene (Teflon®) S=304SS ZP=Zinc Plated

Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, 3930756 and 5035580

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