

DATA SHEET

RELIEF VALVE



Brass Model: 7595



FEATURES

- Functions as a secondary pressure relief valve to either an unloader or regulator for optimum system over pressure protection.
- Heavy-duty, high-flow design quickly and conveniently mounts directly into discharge line.
- Bypasses unused flow to avoid excessive pressure on the pump when set relief pressure is reached.
- Relief valve comes standard with NBR O-rings. Alternate O-ring materials are available for higher temperatures and chemical compatibility.

SPECIFICATIONS	U.S. Measure	Metric Measure
Flow Range	0–53 gpm	0–200 lpm
Pressure Range	290–2900 psi	20–200 bar
Maximum Relief Setting	3190 psi	220 bar
Max Temperature (NBR)	140° F	60° C
Inlet Port	¾" NPT(F)	¾" NPT(F)
Bypass Port	½" NPT(F)	½" NPT(F)
Weight	29.0 oz	0.82 kg
Dimensions	6.25 x 2.05 x 1.46"	159 x 52 x 37 mm

Use only at above specifications to ensure proper regulator life and performance.

ALTERNATIVE O-RING CONFIGURATION

MATERIAL	SUFFIX CODE	MAXIMUM TEMPERATURE	
NBR	—	140° F	(60° C)
FPM	.0110	240° F	(115° C)
EPDM	.0220	160° F	(71° C)

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

SELECTION

Select a relief valve to meet or exceed the flow and pressure requirements of the system. This valve is to be used as a secondary pressure control device and does not replace a primary pressure control device like a regulator or unloader.

INSTALLATION

The relief valve should mount to the pump manifold's discharge port opposite the primary pressure control valve. If unavailable, plumb the relief valve parallel to the high-pressure line upstream from the primary pressure control valve.

The inlet connection is a 3/4" NPT(F) port. There is an arrow and the word IN marked on both sides of the body, indicating the flow direction. Liquid from the discharge of the manifold goes into this connection.

The bypass connection is a 1/2" NPT(F) port. There is an arrow and the word OUT marked on one side of the body, indicating the flow direction. The bypass flow from the Relief Valve should be left open or drained to the floor. Do not route the bypass flow back to the inlet of the pump.

OPERATION

The primary function of this relief valve is to relieve system pressure and bypass pumped liquid in the event the primary control valve fails.

Note: The relief valve is a secondary pressure control device. It does not replace a primary pressure control device like a pressure regulator or unloader.

PRESSURE ADJUSTMENT

Setting the Primary Pressure Regulating Device

Note: Pressure is not set at the factory

1. Setting and adjusting the primary pressure regulating device and relief valve must be done while the system is running.
2. Start the system with the primary pressure regulating device backed off to the lowest pressure setting (counterclockwise direction) and the relief valve set at the highest pressure setting (clockwise 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.

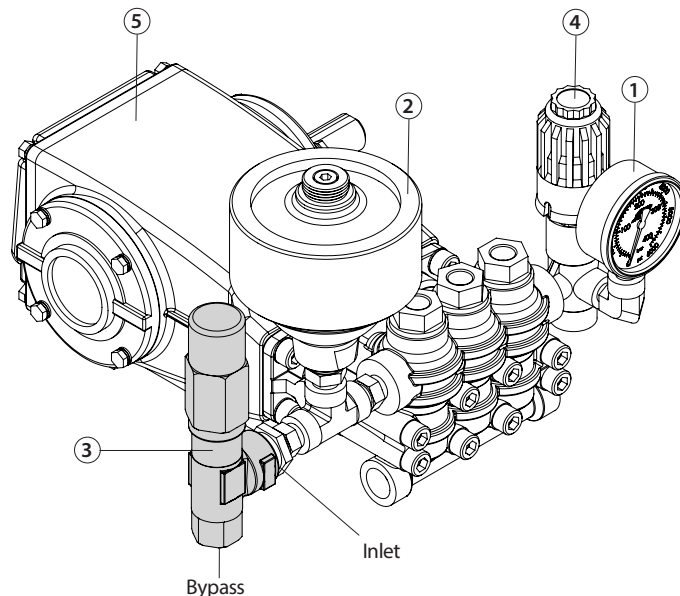
4. If more pressure is desired, release the trigger, adjust primary device by turning in a clockwise direction.
5. Squeeze the trigger and read the pressure.
6. Repeat this process until desired system pressure is attained.

Setting the Relief Valve

1. Use a wrench to turn the adjusting cap on the top of the relief valve in a counterclockwise direction until there is some visible liquid coming out of the bypass port.
2. Turn adjusting cap on the top of the relief valve in a clockwise direction until the visible liquid stops coming out.
3. Final adjustment for the relief valve should relieve at 200 psi above the system operating pressure.

TYPICAL RELIEF VALVE INSTALLATION

1. Pressure Gauge
2. Pulsation Dampener
3. **Relief Valve**
(Secondary Pressure Relief Device)
4. Pressure Unloader
(Primary Pressure Regulating Device)
5. Triplex Plunger Pump



SERVICING

Disassembly:

1. Disconnect bypass and inlet plumbing from relief valve.
2. Remove relief valve from pump.
3. Secure relief valve in a vise with adjusting cap facing up.
4. Turn locking nut down towards body but leave on main body.
5. Use a wrench to loosen and remove adjusting cap.
6. Remove spring from main body.
7. Remove spring retainer and seat ball from main body.
8. Examine spring, spring retainer and seat ball for scale build up, fatigue or wear. Replace as needed.
9. Remove relief valve from vise and tap open end on flat work surface to loosen piston.
10. Remove piston by hand, backup rings and O-ring may stay in main body.
11. Use a pick to remove backup rings and O-ring.
12. Secure relief valve with bypass port facing up.
13. Remove bypassing fitting with O-ring.
14. Remove seat with O-ring from bypass port.
15. Using a pick remove the O-ring from seat.
16. Examine seat, piston and bypass fitting for scale build up, fatigue or wear. Replace as needed.
17. Examine seat and bypass fitting O-rings and backup rings for cuts or wear. Replace as needed.

Reassembly:

1. Secure relief valve in vise with bypass port facing up.
2. Lubricate and install O-ring into outside groove of seat.
3. Insert non-chamfered side of seat down into the main body.
4. Lubricate and install O-ring onto bypass fitting.
5. Hand thread in bypass fitting with O-ring into main body. Tighten with a wrench.
6. Remove relief valve from vise and re-secure with bypass port facing down.
7. Lubricate and install first backup ring, then second backup ring and O-ring over small diameter up to stepped level of piston.
8. Insert piston with small diameter into main body, press into place.
9. Install seat ball on top of piston.
10. Install spring retainer on top of seat ball with raised surface facing up.
11. Install spring onto spring retainer.
12. Hand thread adjusting cap into main body.
13. Remove relief valve from vise.
14. Re-install relief valve onto pump.
15. Reconnect bypass and inlet plumbing to the relief valve. Proceed to PRESSURE ADJUSTMENT section.

TROUBLESHOOTING

Excessive Pressure Fluctuations	<ul style="list-style-type: none"> • Valve is improperly set Repeat adjustment procedure • Air in system, check connections
Valve continually bypasses	<ul style="list-style-type: none"> • Seat or piston valve is worn Replace as needed • O-ring on seat is damaged Replace as needed
Leaking out the top of valve	<ul style="list-style-type: none"> • Worn or cut O-ring around the piston stem

PARTS LIST

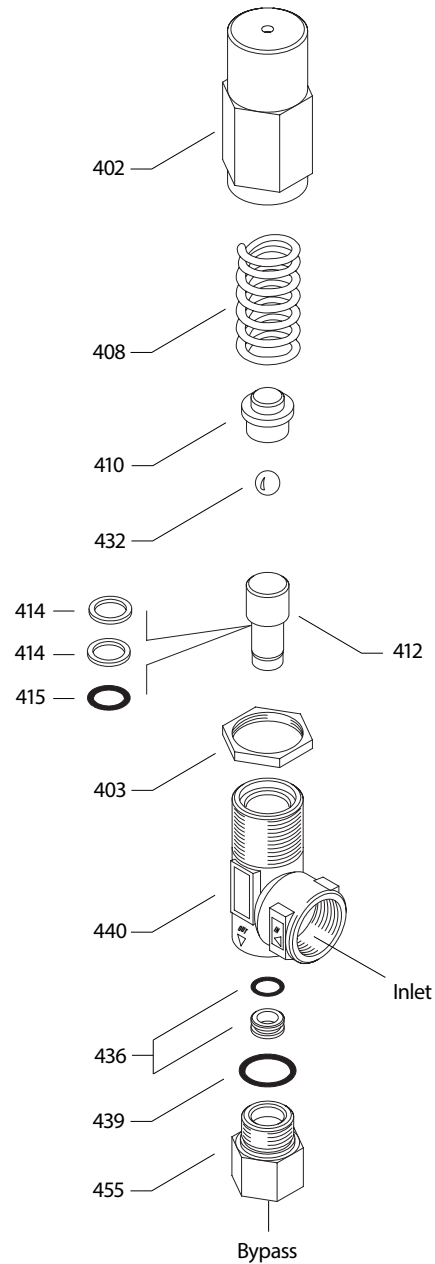
ITEM	P/N	MATL	DESCRIPTION	QTY
402	—	BB	Cap, Adjusting	1
403	—	BB	Nut, Locking	1
408	—	STL	Spring	1
410	—	BB	Retainer, Spring	1
412	701601	S	Piston	1
414	—	PTFE	Backup Ring, Piston	2
415	—	NBR	O-Ring, Piston-70D	1
	—	FPM	O-Ring, Piston	1
	—	EPDM	O-Ring, Piston	1
432	31075	SSSS	Ball, Seat (1 $\frac{3}{32}$ ")	1
436	33806	NBR	Seat, with NBR O-Ring	1
439	—	NBR	O-Ring, Bypass Fitting-85D	1
	—	FPM	O-Ring, Bypass Fitting	1
	—	EPDM	O-Ring, Bypass Fitting	1
440	—	BB	Body with Port (3/4" NPT[F])	1
455	39634	BB	Fitting, Bypass (1/2" NPT[F])	1
468	39078	NBR	Kit, Repair (Standard) (Includes: 412, 414, 415, 432, 436, 439)	1
	76078	FPM	Kit, Repair (.0110) (Includes: 412, 414, 415, 432, 436, 439)	1
	76178	EPDM	Kit, Repair (.0220) (Includes: 412, 414, 415, 432, 436, 439)	1

Italics are optional items.

MATERIAL CODES (Not Part of Part Number):

BB=Brass EPDM=Ethylene Propylene Diene Monomer FPM=Fluorocarbon
 NBR=Medium Nitrile (Buna-N) PTFE=Pure Polytetrafluoroethylene
 S=304SS SSSS=440SS STL=Steel

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