Car Wash Reclaim Systems

The Pumps with Nine Lives

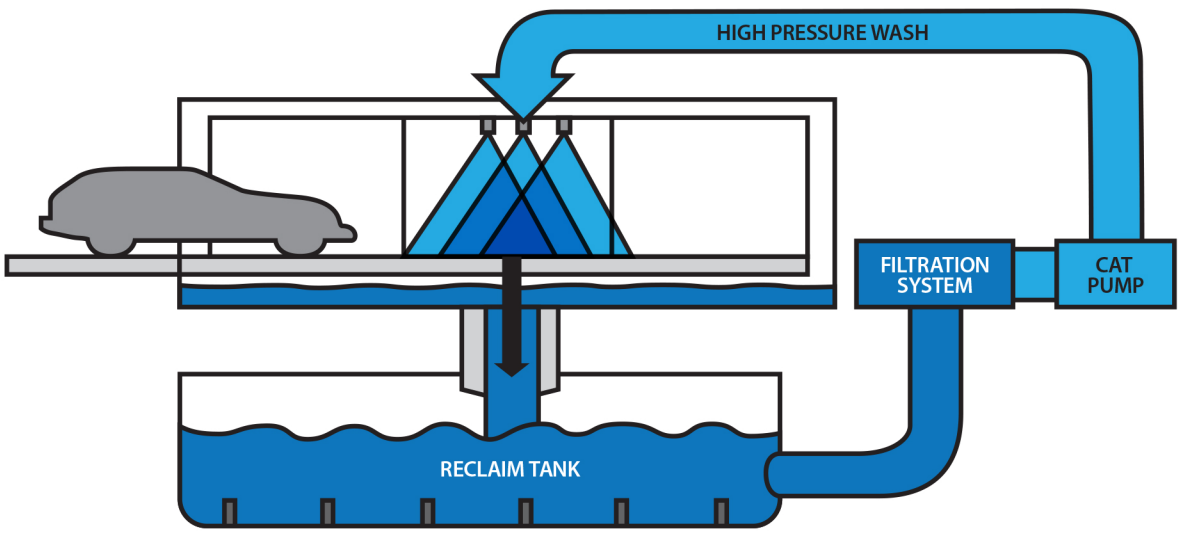
Cat Pumps are found worldwide operating with reclaimed water while continuing to meet the life requirements and provide satisfactory performance for the operator. With decades of proven field experience and internal testing, Cat Pumps is expanding car wash reclaim rating from 10 micron up to 50 micron.

Car wash reclaim systems typically operate in the 5 – 50 micron range, with the majority running 5 – 25 micron range. The water quality and type of particulate does have a direct effect on pump life. As particle sizes increase there is a potential decrease in pump life. Consequently, we do recommend the specifications below for optimum performance and maximum life.

Particle Size	Not to exceed 50 Micron
T S S	Not to exceed 50 PPM
pH	Maintained between 5 and 9
Sediment pits	Cleaned regularly
Reclaim Filtration System	Must be operated and maintained according to requirements provided by manufacturer of reclaim system

It's also important to consider reclaim water quality and the effects it may have on finish of vehicle being washed.

For reclaim use outside of car wash applications contact Cat Pumps Technical Sales.



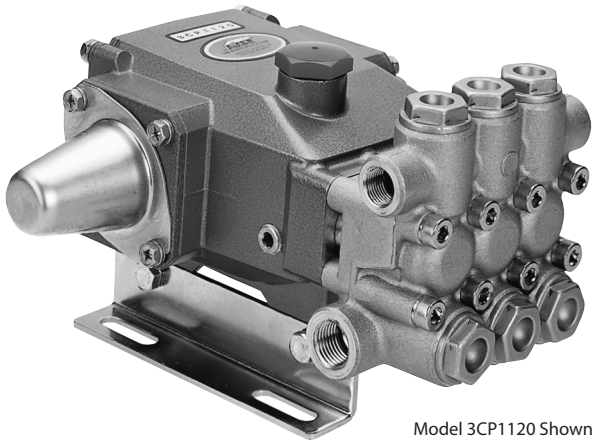
1681 94th Lane N.E., Mpls, MN 55449-4324 P: 763.780.5440 F: 763.780.2958 E: techsupport@catpumps.com

993411 Rev. C

3CP Plunger Pump

Standard Models
3CP1120, 3CP1130 3CP1140

Gearbox Model
3CP1120G



Model 3CP1120 Shown
(Rails and shaft protector sold separately)

FEATURES

- Triplex design offers high efficiency and low pulsation.
- Durable high pressure seals are lubricated and cooled by pumped liquid.
- Pre-set Lo-Pressure Seals provide secondary protection against external leaks and require no packing adjustment.
- Special high-density, polished, concentric plungers provide a true wear surface and extended seal life.
- Specially formulated seals offer unmatched performance and extended life.
- Optional STHT, FPM and EPDM elastomers for compatibility with many liquids and temperaturesup to 200°F.
- Convenient press in style seal case and interchangeable inlet and discharge valves for easy servicing
- Wet-end easily serviced without entering crankcase.

COMMON SPECIFICATIONS

Inlet Pressure Range	Flooded to 70 PSI	(Flooded to 4.9 BAR)
Bore	0.709″	(18 mm)
Crankcase Capacity	12 oz.	(0.35 L)
Standard Liquid Temperature	160°F	(71°C)

Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations.

Inlet Ports (2)	1/2″ NPTF	(1/2″ NPTF)
Discharge Ports (2)	3/8″ NPTF	(3/8″ NPTF)
Pulley Mounting	Either Side	(Either Side)
Shaft Diameter	0.650″	(16.5 mm)
Weight	14.84 lbs.	(6.7 kg)
Dimensions	9.1 x 8.78 x 5.47″	(231 x 223 x139 mm)

⚠ CAUTIONS AND WARNINGS

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WARRANTY

View the Limited Warranty on-line at www.catpumps.com/warranty.

SPECIFICATIONS

	U.S. Measure	Metric Measure
MODEL 3CP1120 DIRECT DRIVE		
Flow	4.2 gpm	(16 lpm)
Pressure Range	100 to 2200 psi	(7 to 155 bar)
RPM	1725 rpm	(1725 rpm)
Stroke	0.500″	(12.7 mm)
MODEL 3CP1120G GEARBOX (2.55 : 1 RATIO)		
Flow	3.5 gpm	(13.2 lpm)
Pressure Range	100 to 2200 psi	(7 to 155 bar)
Pump RPM	1420 rpm	(1420 rpm)
Engine RPM	3600 rpm	(3600 rpm)
Stroke	0.500″	(12.7 mm)
MODEL 3CP1130 DIRECT DRIVE		
Flow	2.4 gpm	(9 lpm)
Pressure Range	100 to 2200 psi	(7 to 155 bar)
RPM	1725 rpm	(1725 rpm)
Stroke	0.276″	(7 mm)
MODEL 3CP1140 DIRECT DRIVE		
Flow	3.6 gpm	(13.6 lpm)
Pressure Range	100 to 2200 psi	(7 to 155 bar)
RPM	1725 rpm	(1725 rpm)
Stroke	0.433″	(11 mm)

ELECTRIC HORSEPOWER REQUIREMENTS

MODELS	FLOW		PRESSURE					MOTOR PULLEY SIZE
			psi 1200	psi 1500	psi 2000	psi 2200	rpm	Using 1750 rpm Motor 5.0″ Pump Pulley O.D.
	gpm	lpm	bar 85	bar 105	bar 140	bar 155		Pulley O.D.
3CP1120	4.2	16	35	4.3	5.8	6.3	1725	Direct Drive
	3.5	13.2	2.9	3.6	4.8	5.3	1531	4.4
	3.0	11.4	2.5	3.1	4.2	4.5	1313	3.8
3CP1130	2.4	9	1.9	2.4	3.2	3.6	1725	Direct Drive
3CP1140	3.6	13.6	3.0	3.7	5.0	5.4	1725	Direct Drive
3CP1120G	3.5	13.2	2.9	3.6	4.8	5.3	1420	Gearbox

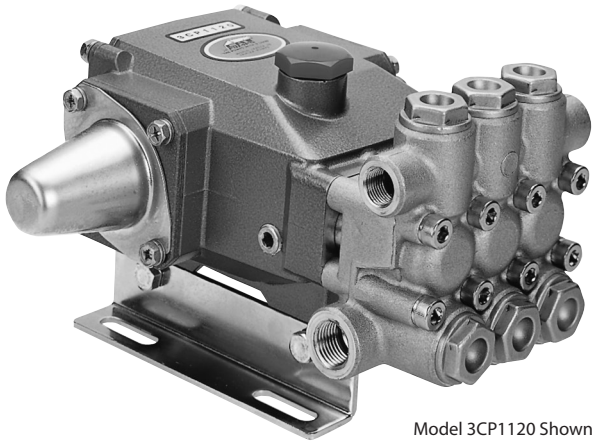
DETERMINING THE PUMP R.P.M.	$\frac{\text{Rated gpm}}{\text{Rated rpm}}$	=	$\frac{\text{“Desired” gpm}}{\text{“Desired” rpm}}$
DETERMINING THE REQUIRED H.P.	$\frac{\text{gpm x psi}}{1460}$	=	Electric Brake H. P. Required
DETERMINING MOTOR PULLEY SIZE	$\frac{\text{Motor Pulley O.D.}}{\text{Pump rpm}}$	=	$\frac{\text{Pump Pulley O.D.}}{\text{Motor rpm}}$

See complete Drive Packages [Inclds: Pulleys, Belts, Hubs, Key] Tech Bulletin 003.
Refer to pump **Service Manual** for repair procedure and additional technical information.

3CP Plunger Pump

Standard Models
3CP1120, 3CP1130 3CP1140

Gearbox Model
3CP1120G



Model 3CP1120 Shown
(Rails and shaft protector sold separately)

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Pressure Range	100 to 2200 psi	(7 to 155 bar)
RPM	1725 rpm	(1725 rpm)
Stroke	0.433″	(11 mm)

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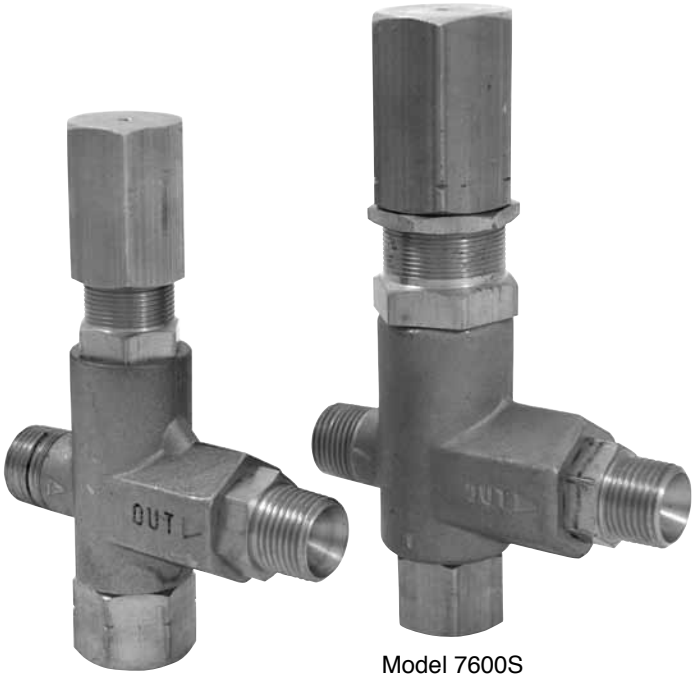

Model 7500S

Model 7600S

Pressure Sensitive
Regulating Unloader

Models 7500S 7600S

FEATURES

- Maintains full system pressure while running in by-pass without full load on pump.
- Offers pump protection against pressure fluctuations and system changes.
- Minimum pressure fluctuations with alternating use of multiple guns.
- Adjusting cap permits easy adjustments of pressure.

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WARRANTY

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SPECIFICATIONS

	U.S. Measure	Metric Measure
MODEL 7500S		
Flow Range	0.5-6.0 GPM	(1.89-23.0 L/M)
Pressure Range	100-2000 PSI	(7-140 BAR)
Weight	14.4 oz	(0.41 kg)
Dimensions	3.0 x 1.0 x 4.25”	(76 x 25x 108 mm)
MODEL 7600S		
Flow Range	2.0-5.0 GPM	(7.6-19.0 L/M)
Pressure Range	700-3500 PSI	(48-245 BAR)
Weight	21.6 oz	(0.61 kg)
Dimensions	3.25 x 1.0 x 5.0”	(82 x 25x 127 mm)
COMMON SPECIFICATIONS		
Max. Temperature	180°F	(82°C)
Inlet Port	3/8” NPTM	(3/8” NPTM)
By-Pass Port	3/8” NPTF	(3/8” NPTF)
Outlet Port	3/8” NPTM	(3/8” NPTM)

For Relief Valve version add .100 to unloader model number.

“Customer confidence is our greatest asset”

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

SELECTION

These are pressure sensitive regulating unloaders, 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.

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

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

INSTALLATION

These unloaders operate properly when mounted in any direction, however, it is preferred to keep the plumbing to a minimum and the hex adjusting cap easily accessible. The best mounting location is directly onto the pump discharge manifold head.

The inlet connection is a 3/8” NPTM sized port located on the back side of the unloader. An arrow is cast into the body indicating the direction of flow through the valve. Liquid from the discharge of the pump goes through this connection.

The discharge connection is a 3/8” NPTM sized port located on the front side (hex end). An arrow and the word OUT is cast into the body indicating the direction of flow. Plumbing for spray guns, solenoid (gate) valves or nozzles is connected here.

The by-pass connection is a 3/8” NPTF sized port located on the bottom. 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

These pressure sensitive regulating unloaders hold 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 off the by-pass and return to established system pressure without delay.

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 cap 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 cap.

Note: Pressure is not set at the factory.

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

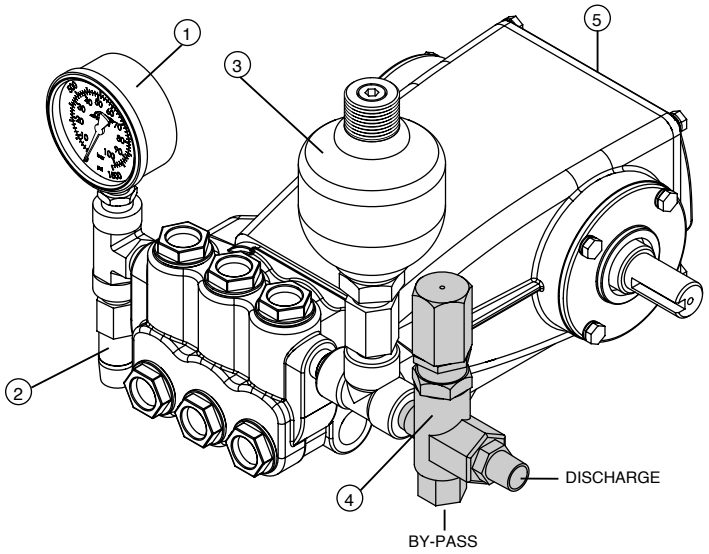
8. If desired system pressure cannot be reached, review TROUBLESHOOTING chart.
9. When servicing existing systems, follow adjustment procedures as stated above for new unloaders.

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 relief device (i.e. pop-off 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 Relief Valve
Shown as a secondary relief valve
3 Pulsation Dampener
4 Pressure Sensitive Regulating Unloader
5 Triplex Plunger Pump



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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 cap facing up.
4. Model 7500S: Remove discharge fitting and o-ring, spring, check valve and o-ring.

   Model 7600S: Remove discharge fitting and o-ring, spring, check valve and o-ring, collar, check valve seat and o-ring.

Note: Seat for check valve will remain in the unloader. Exercise caution in removing to avoid damage to unloader walls and seat.

5. Examine check valve, check valve seat, collar and discharge fitting for wear, spring for wear or fatigue and o-rings for cuts or wear and 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. If supplied with a lock nut, the lock nut does not need to be removed. Turn lock nut down towards unloader body.
7. Remove hex adjusting cap by turning in a counterclockwise direction.
8. Remove spring and spring retainer.
9. Examine spring and spring retainer for scale build up, fatigue or wear and replace as needed.
10. Remove by-pass fitting with o-ring from bottom port.
11. Remove seat with o-ring from the male threaded side of by-pass fitting.
12. Examine seat for scale build up, scoring and wear and replace as needed. Examine o-ring for cuts or wear and replace as needed.
13. Removal of piston stem and valve/ball assembly requires the use of a small hex socket and screwdriver. Insert screwdriver from the top and place in slotted head of piston stem. Insert small hex socket into bottom port and secure valve/ball assembly. Unthread by turning in a counterclockwise direction.
14. Examine piston stem and valve/ball assembly for scale build up, scoring, pitting and wear and replace as needed. Examine o-rings and backup ring for cuts or wear and replace as needed.
15. Remove piston retainer with o-rings and backup rings by turning in a counterclockwise direction.
16. Examine piston retainer for wear. Examine o-rings and back-up-ring for cuts or wear and replace as needed.

Reassembly:

1. Lubricate and install small body back-up-ring and then body o-ring into unloader body.
2. Lubricate and install o-ring over threads of piston retainer.
3. Carefully hand thread piston retainer with small diameter hole facing down into unloader body and tighten with a wrench.
4. Lubricate and install o-ring over piston stem head and then backup-ring into groove of piston stem.
5. Apply Loctite® 242® to the last few threads of the piston stem.
6. Insert piston stem from the top through the piston retainer until seated.
7. Using the same tools in removing the piston stem and valve/ball assembly, place valve/ball assembly into hex socket tool with ball surface facing down into socket. Place screwdriver tip into piston stem slotted head. Thread piston stem into valve/ball assembly.
8. Place by-pass fitting on flat surface with male threads facing up.
9. Lubricate and install o-ring onto seat. Press seat into by-pass fitting. Hand thread by-pass fitting into lower port of unloader body and tighten with wrench.
10. Lubricate and install o-ring on discharge fitting.
11. Model 7500S: Insert spring into discharge filling, then insert check valve with small step end into spring. Hand thread into unloader body and tighten with wrench.

    Model 7600S: Lubricate and install o-ring onto check valve seat. Insert check valve seat with o-ring into unloader body. Install collar with notches facing in towards check valve seat. Insert spring into discharge fitting, then insert check valve with small step end into spring. Hand thread into unloader body and tighten with wrench.
12. Place spring retainer on top of piston stem.
13. Place spring on to spring retainer.
14. Thread hex adjusting cap onto piston retainer.
15. Remove unloader from vise.
16. Re-install unloader onto pump.
17. Reconnect by-pass, discharge and inlet plumbing to unloader.
18. Proceed to PRESSURE ADJUSTMENT.

Loctite® and 242® are registered trademarks of the Henkel Corporation.

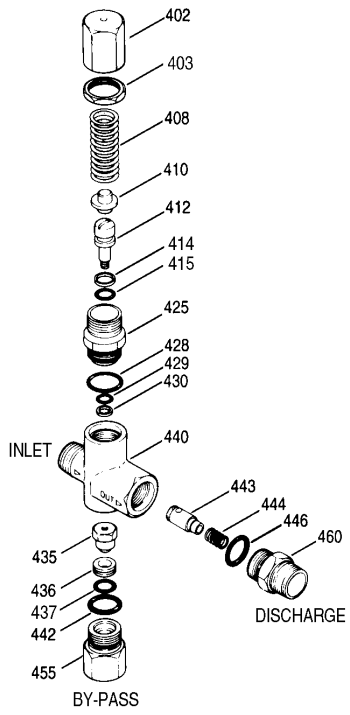
TROUBLESHOOTING

Unloader cycles	• Check for leak downstream of unloader. • Worn O-ring or check valve. • Air in system, poor connection. • O-ring in gun worn. • Insufficient flow through unloader.
Liquid leaking from bottom fitting	• O-ring for fitting cut or worn. • O-ring for seat cut or worn.
Liquid leaking from middle	• O-ring for piston worn or cut. • O-rings for piston stem worn or cut.
Unloader will not come up to pressure	• Not properly sized for system pressure. • Foreign material in unloader. Clean filter. • Piston stem O-rings worn. • Nozzle worn. • Insufficient flow to pump.
Extreme pressure spikes	• Adjusting nut turned completely into unloader. • Restricted by-pass or no by-pass. • System flow exceeds unloader rating.
Filtration	• Clean filter on regular schedule to avoid cavitation.

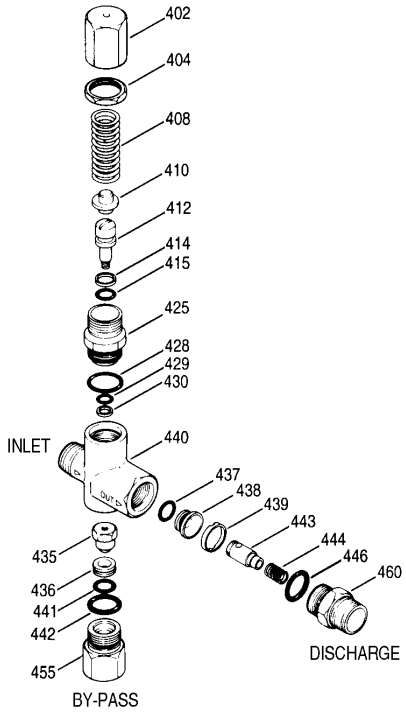
PRESSURE READING

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

EXPLODED VIEW
7500S Unloader



EXPLODED VIEW
7600S Unloader



PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	QTY.
402	540081	BB	Cap, Hex Adjusting	1
403	31047	BB	Nut, Lock (M18 x 1)	1
408	32094	STZP R	Spring, Pressure	1
410	107672	BB	Retainer, Spring	1
412	45694	S	Stem, Piston (M5)	1
414	20184	PTFE	Back-up-Ring, Piston Stem	1
415	14190	NBR	O-Ring, Piston Stem - 70D	1
	14161	FPM	O-Ring, Piston Stem - 70D	1
425	107673	BB	Retainer, Piston	1
428	13969	NBR	O-Ring, Piston Retainer - 70D	1
	14320	FPM	O-Ring, Piston Retainer - 70D	1
429	14759	NBR	O-Ring, Body	1
	14160	FPM	O-Ring, Body - 80D	1
430	107675	PTFE	Back-up-Ring, Body	1
435	45696	BB	Valve and Ball Assembly (M5)	1
436	107680	S	Seat	1
437	13963	NBR	O-Ring, Seat - 70D	1
	14303	FPM	O-Ring, Seat - 70D	1
440	—	BB	Body	1
442	13969	NBR	O-Ring, By-Pass Fitting - 70D	1
	14320	FPM	O-Ring, By-Pass Fitting - 70D	1
443	541060	BB	Valve, Check w/O-Ring	1
444	45924	S	Spring	1
446	13969	NBR	O-Ring, Discharge Fitting - 70D	1
	14320	FPM	O-Ring, Discharge Fitting - 70D	1
455	45695	BB	Fitting, By-Pass (3/8" NPTF)	1
460	107681	BB	Fitting, Discharge (3/8" NPTM)	1
468	32097	NBR	Kit, O-Ring (Incldes: 414,415, 428 - 430, 437, 442, 446)	1
	31627	FPM	Kit, O-Ring (Incldes: 414,415, 428 - 430, 437, 442, 446)	1

Italics are optional items. R Components comply with RoHS Directive.
MATERIAL CODES (Not Part of Part Number): BB=Brass FPM=Fluorocarbon
NBR=Medium Nitrile (Buna-N) PTFE=Pure Polytetrafluoroethylene S=304SS
STZP=Steel/Zinc Plated

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404	45201	BB	Nut, Lock (M25x1)	1
408	45198	ZP	Spring, Pressure	1
410	45199	BB	Retainer, Spring	1
412	45694	S	Stem, Piston (M5)	1
414	20184	PTFE	Back-up-Ring, Piston Stem	1
415	14190	NBR	O-Ring, Piston Stem - 70D	1
425	45200	BB	Retainer, Piston	1
428	26133	NBR	O-Ring, Piston Guide - 80D	1
429	14759	NBR	O-Ring, Body	1
430	107675	PTFE	Back-up-Ring, Body	1
435	45716	S	Valve and Ball Assembly (M5)	1
436	107680	S	Seat	1
437	26127	NBR	O-Ring, Seat	1
438	45206	S	Seat, C-Valve	1
439	45205	BB	Collar	1
440	—	BB	Body	1
441	13963	NBR	O-Ring, Seat - 70D	1
442	26133	NBR	O-Ring, Adapter - 80D	1
443	35203	BB	Valve, Check w/O-Ring	1
444	45924	S	Spring	1
446	26133	NBR	O-Ring, Discharge Fitting - 80D	1
455	45695	BB	Fitting, By-Pass (3/8" NPTF)	1
460	107681	BB	Fitting, Discharge (3/8" NPTM)	1
468	32098	NBR	Kit, O-Ring (Incldes: 414,415,428,429,430,437,441,442,446)	1

Italics are optional items.
MATERIAL CODES (Not Part of Part Number):
BB=Brass NBR=Medium Nitrile (Buna-N) PTFE=Pure Polytetrafluoroethylene
S=304SS ZP=Zinc Plated

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The Pumps with Nine Lives

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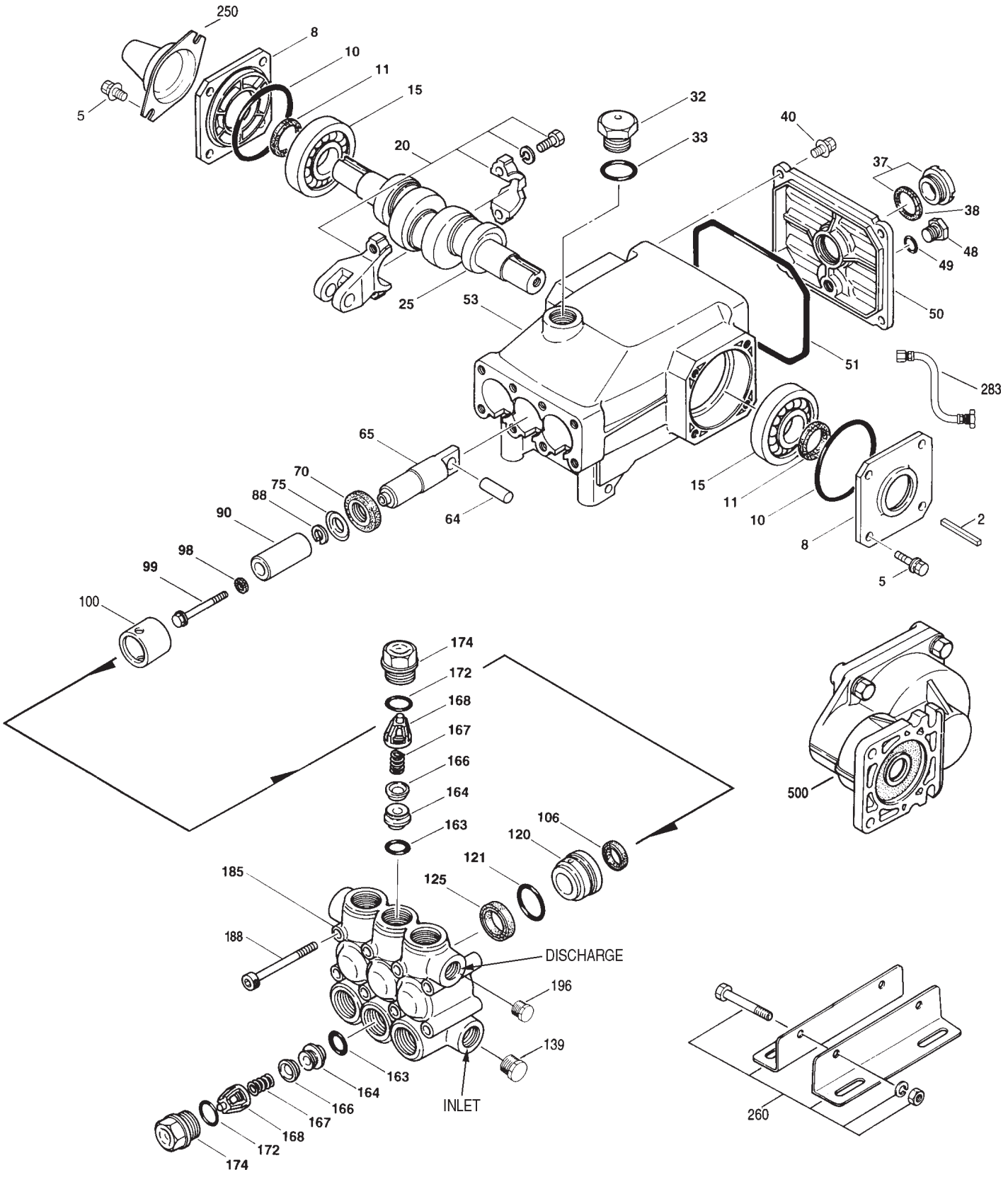
CAT PUMPS DEUTSCHLAND GmbH
Buchwiese 2, D-65510 Idstein, Germany
Phone 49 6126-9303 0 — Fax 49 6126-9303 33
e-mail: catpumps@t-online.de www.catpumps.de

PARTS LIST

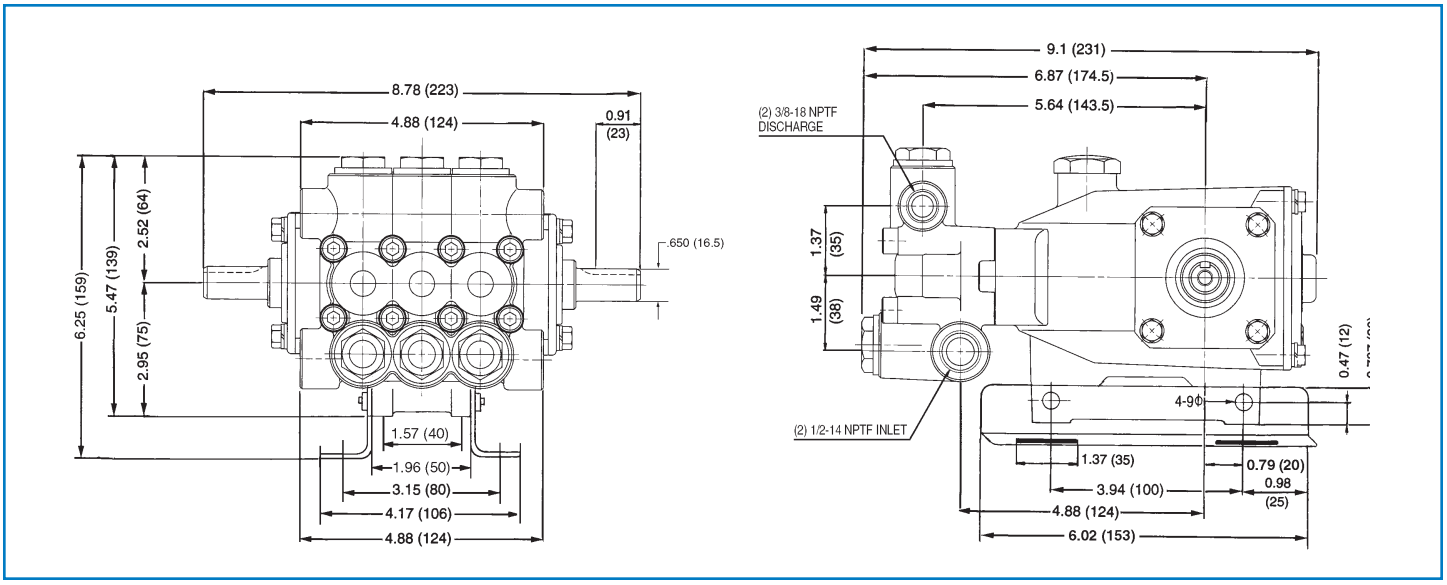
ITEM	P/N	MATL	DESCRIPTION	QTY
2	*30047*	*STL*	*Key (M5x5x24)*	*1*
5	92519	STZP	Screw, HHC Sems (M6x16)	8
	125824	*STCP R*	*Screw, HHC Sems (M6x16)*	*8*
8	46901	AL	Cover, Bearing	2
	48259	**AL**	Cover, Blind - 3CP1120G	1
10	14028	NBR	O-Ring, Bearing Cover - 70D	2
11	43222	NBR	Seal, Oil, Crankshaft - 70D	1/2
15	14480	STL	Bearing, Ball	2
20	48730	TNM	Rod, Connecting, Assembly [5/01]	3
25	**46927**	**FCM**	Crankshaft, Dual End - 3CP1120 (M12.7)	1
	46994	**FCM**	Crankshaft, Dual End - 3CP1130 (M7)	1
	46991	**FCM**	Crankshaft, Dual End - 3CP1140 (M11)	1
	48484	**FCM**	Crankshaft, Single End - 3CP1140CS, (M11)	1
	48257	**FCM**	Crankshaft, Single End - 3CP1120G (M12.7)	1
32	46798	RTP	Cap, Oil Filler	1
33	14179	NBR	O-Ring, Oil Filler Cap - 70D	1
37	92241	—	Gauge, Oil, Bubble w/Gasket	1
38	44428	NBR	Gasket, Flat, Oil Gauge - 80D	1
40	92519	STZP	Screw, HHC Sems (M6x16)	4
	125824	*STCP R*	*Screw, HHC Sems (M6x16)*	*4*
48	25625	STCP	Plug, Drain (1/4"x19BSP)	1
49	23170	NBR	O-Ring, Drain Plug - 70D	1
50	46939	AL	Cover, Rear	1
51	14041	NBR	O-Ring, Rear Cover - 70D	1
53	48644	AL	Crankcase	1
64	46615	CM	Pin, Crosshead	3
65	48459	BBNP	Rod, Plunger	3
70	46839	NBR	Seal, Oil, Crankcase	3
75	43900	S	Slinger, Barrier	3
88	45697	S	Washer, Keyhole (M18 x 10)	3
90	46976	CC	Plunger (M18x43)	3
98	46730	NBR	Washer, Seal - 90D	3
	48394	*FPM*	*Washer, Seal - 90D*	*3*
99	† 48201	SS	Retainer, Plunger w/Stud (M6)	3
100	46541	PVDF	Retainer, Seal	3
106	43243	NBR	Seal, LPS w/S-Spg	3
	44926	*FPM*	*Seal, LPS w/SS-Spg*	*3*
	76243	*ST*	*Seal, LPS w/S-Spg*	*3*
120	46625	BB	Case, Seal (See Tech Bulletin #110)	3
121	13976	NBR	O-Ring, Seal Case - 70D	3
	48522	FPM	O-Ring, Seal Case	3
125	43245	SNG	Seal, HPS w/S	3
	44925	FPM	Seal, HPS w/SS	3
	46652	*HT*	*Seal, HPS "Hi-Temp", 2-Pc w/S-Support*	*3*
139	43448	BB	Plug, Inlet (1/2"NPT)	1
163	17547	NBR	O-Ring, Seat - 85D	6
	11685	*FPM*	*O-Ring, Seat - 85D*	*6*
164	45790	S	Seat	6
166	43723	S	Valve	6
167	43750	S	Spring	6
168	44565	PVDF	Retainer, Spring	6
172	17615	NBR	O-Ring, Valve Plug - 75D	6
	15855	*FPM*	*O-Ring, Valve Plug - 70D*	*6*
174	46756	BB	Plug, Valve	6
185	46616	FBB	Manifold, Head	1
188	126512	STCP R	Screw, HSH (M8x65)	8
196	22187	BBCP	Plug, Discharge (3/8"NPT)	1
250	*118672*	*STCP*	*Protector, Shaft*	*1*
260	*30612*	*STZP*	*Mount, Rail Assy*	*1*
265	*30641*	—	*Mount, Assy (Incld: 30612, 30032, 30047, 118672)*	*1*
270	*30246*	*STL*	*Assy, Pulley & Key (Incld: 30032, 30047) (See Tech Bulletin 003)*	*1*
283	*34334*	—	*Kit, Oil Drain (3/8" x 24") (See individual Data Sheet)*	*1*
	76334	—	*Kit, Oil Indicator (3/8" x 24") (See individual Data Sheet)*	*1*
299	*814841*	*FBB*	*Head, Complete*	*1*
300	*33983*	*NBR*	*Kit, Seal (Incld: 98, 106, 121, 125)*	*1*
	33257	*FPM*	*Kit, Seal (Incld: 98, 106, 121, 125)*	*1*
	31983	*HT*	*Kit, Seal (Incld: 98, 106, 121, 125)*	*1*
	76526	*STHT*	*Kit, Seal (Incld: 98, 106, 120, 121, 125) Prior to 4/10*	*1*
	76983	*STHT*	*Kit, Seal (Incld: 98, 106, 121, 125) After 4/10*	*1*
310	*33062*	*NBR*	*Kit, Valve (Incld: 163, 164, 166, 167, 168, 172)*	*2*
	33258	*FPM*	*Kit, Valve (Incld: 163, 164, 166, 167, 168, 172)*	*2*
350	*30696*	*STZP*	*Plier, Reverse*	*1*
500	*8075*	—	*Gearbox (See Individual Data Sheet)*	*1*
—	*6107*	—	*Oil, Bottle (21 oz.) ISO 68 Hydraulic (Fill to specified crankcase capacity prior to start-up)*	*1*

Bold print part numbers are unique to a particular pump model. *Italics are optional items.* [ ] Date of latest production change.
† Production parts are different than repair parts. R Components comply with RoHS Directive.
View Tech Bulletins 002, 003, 024, 036, 064, 073, 074, 077, 083, and 110 for additional information.
For motorized versions see BD motor data sheet. For Gearbox version see 8075 data sheet.
MATERIAL CODES (Not Part of Part Number): AL=Aluminum BB=Brass BBCP=Brass/Chrome Plated BBNP=Brass Nickel Plated CC=Ceramic
CM=Chrome-moly FBB=Forged Brass FCM=Forged Chrome-Moly FPM=Fluorocarbon HT=Hi-Temp (EPDM Alternative) NBR=Medium Nitrile (Buna-N)
PVDF=Polyvinylidene Fluoride RTP=Reinforced Composite S=304SS SNG=Special Blend (Buna) ST=Polyetheretherketon
STHT=Special PTFE High Temp STL=Steel STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated TNM=Special High Strength

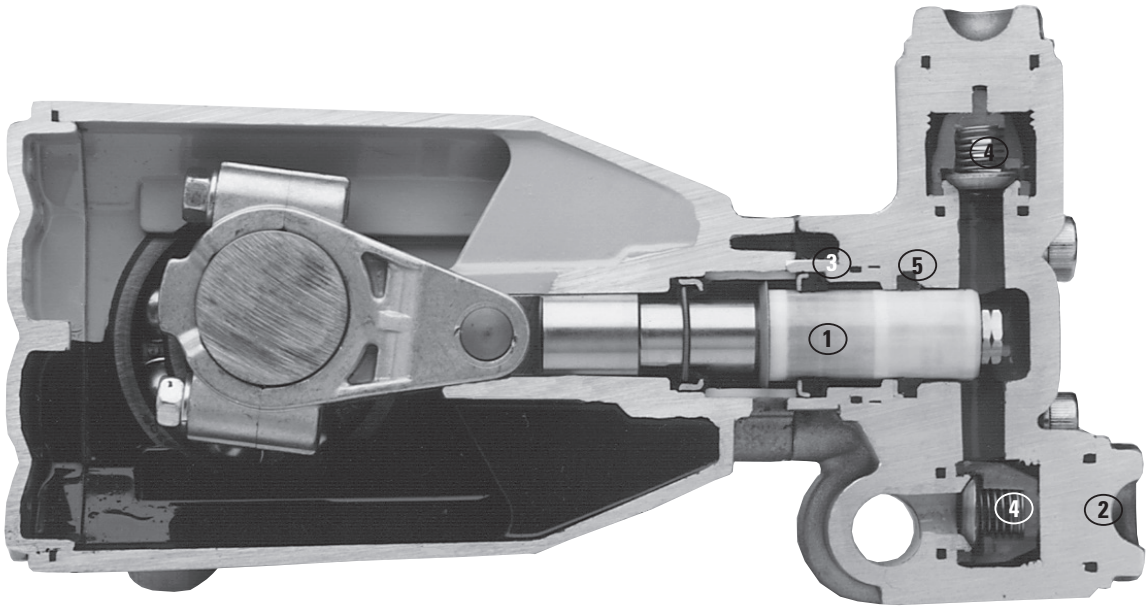
EXPLODED VIEW



Models
3CP1120, 3CP1120G,
3CP1130, 3CP1140
February 2011



Models 3CP1120, 3CP1120G, 3CP1130, 3CP1140



1 Special concentric, high-density, polished, solid ceramic **plungers** provide a true wear surface and extended seal life.

2 **Manifolds** are a high tensile strength forged brass for long term, continuous duty.

3 100% wet **seal** design adds to service life by allowing pumped liquids to cool and lubricate on both sides of the seals.

4 Stainless steel **valves, seats and springs** provide corrosion-resistance, ultimate seating and extended life.

5 Specially formulated, Cat Pump exclusive, **Hi-Pressure Seals** offer unmatched performance and seal life.

The Pumps with Nine Lives

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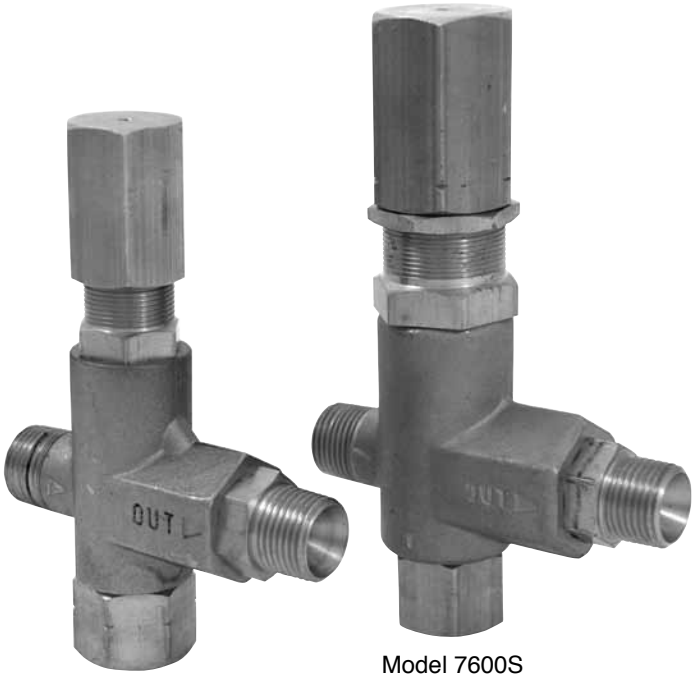
PN 993101 Rev G 2/11 11145



Model 7500S

Model 7600S

Pressure Sensitive
Regulating Unloader

Models 7500S 7600S

FEATURES

- Maintains full system pressure while running in by-pass without full load on pump.
- Offers pump protection against pressure fluctuations and system changes.
- Minimum pressure fluctuations with alternating use of multiple guns.
- Adjusting cap permits easy adjustments of pressure.

⚠ 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 Data sheet. CAUTIONS and WARNINGS can also be viewed online at 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.

SPECIFICATIONS

	U.S. Measure	Metric Measure
MODEL 7500S		
Flow Range	0.5-6.0 GPM	(1.89-23.0 L/M)
Pressure Range	100-2000 PSI	(7-140 BAR)
Weight	14.4 oz	(0.41 kg)
Dimensions	3.0 x 1.0 x 4.25”	(76 x 25x 108 mm)
MODEL 7600S		
Flow Range	2.0-5.0 GPM	(7.6-19.0 L/M)
Pressure Range	700-3500 PSI	(48-245 BAR)
Weight	21.6 oz	(0.61 kg)
Dimensions	3.25 x 1.0 x 5.0”	(82 x 25x 127 mm)
COMMON SPECIFICATIONS		
Max. Temperature	180°F	(82°C)
Inlet Port	3/8” NPTM	(3/8” NPTM)
By-Pass Port	3/8” NPTF	(3/8” NPTF)
Outlet Port	3/8” NPTM	(3/8” NPTM)

For Relief Valve version add .100 to unloader model number.

“Customer confidence is our greatest asset”

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

SELECTION

These are pressure sensitive regulating unloaders, 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.

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

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

INSTALLATION

These unloaders operate properly when mounted in any direction, however, it is preferred to keep the plumbing to a minimum and the hex adjusting cap easily accessible. The best mounting location is directly onto the pump discharge manifold head.

The inlet connection is a 3/8” NPTM sized port located on the back side of the unloader. An arrow is cast into the body indicating the direction of flow through the valve. Liquid from the discharge of the pump goes through this connection.

The discharge connection is a 3/8” NPTM sized port located on the front side (hex end). An arrow and the word OUT is cast into the body indicating the direction of flow. Plumbing for spray guns, solenoid (gate) valves or nozzles is connected here.

The by-pass connection is a 3/8” NPTF sized port located on the bottom. 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

These pressure sensitive regulating unloaders hold 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 off the by-pass and return to established system pressure without delay.

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 cap 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 cap.

Note: Pressure is not set at the factory.

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

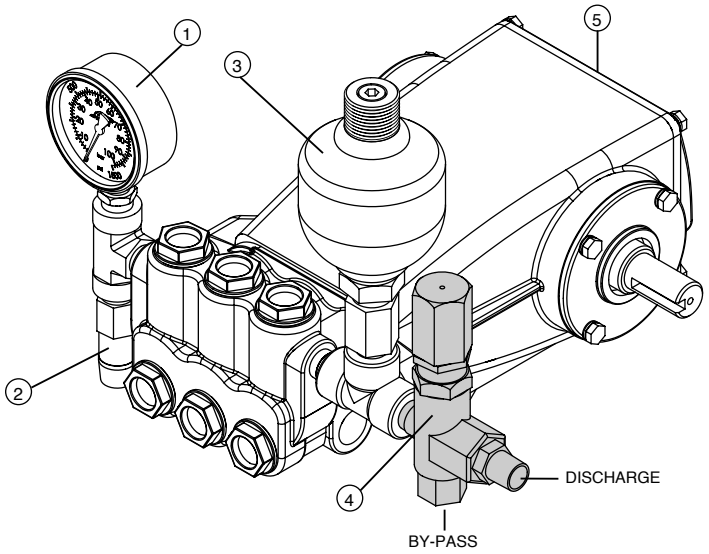
8. If desired system pressure cannot be reached, review TROUBLESHOOTING chart.
9. When servicing existing systems, follow adjustment procedures as stated above for new unloaders.

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 relief device (i.e. pop-off 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 Relief Valve
Shown as a secondary relief valve
3 Pulsation Dampener
4 Pressure Sensitive 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 cap facing up.
4. Model 7500S: Remove discharge fitting and o-ring, spring, check valve and o-ring.

   Model 7600S: Remove discharge fitting and o-ring, spring, check valve and o-ring, collar, check valve seat and o-ring.

Note: Seat for check valve will remain in the unloader. Exercise caution in removing to avoid damage to unloader walls and seat.

5. Examine check valve, check valve seat, collar and discharge fitting for wear, spring for wear or fatigue and o-rings for cuts or wear and 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. If supplied with a lock nut, the lock nut does not need to be removed. Turn lock nut down towards unloader body.
7. Remove hex adjusting cap by turning in a counterclockwise direction.
8. Remove spring and spring retainer.
9. Examine spring and spring retainer for scale build up, fatigue or wear and replace as needed.
10. Remove by-pass fitting with o-ring from bottom port.
11. Remove seat with o-ring from the male threaded side of by-pass fitting.
12. Examine seat for scale build up, scoring and wear and replace as needed. Examine o-ring for cuts or wear and replace as needed.
13. Removal of piston stem and valve/ball assembly requires the use of a small hex socket and screwdriver. Insert screwdriver from the top and place in slotted head of piston stem. Insert small hex socket into bottom port and secure valve/ball assembly. Unthread by turning in a counterclockwise direction.
14. Examine piston stem and valve/ball assembly for scale build up, scoring, pitting and wear and replace as needed. Examine o-rings and backup ring for cuts or wear and replace as needed.
15. Remove piston retainer with o-rings and backup rings by turning in a counterclockwise direction.
16. Examine piston retainer for wear. Examine o-rings and back-up-ring for cuts or wear and replace as needed.

Reassembly:

1. Lubricate and install small body back-up-ring and then body o-ring into unloader body.
2. Lubricate and install o-ring over threads of piston retainer.
3. Carefully hand thread piston retainer with small diameter hole facing down into unloader body and tighten with a wrench.
4. Lubricate and install o-ring over piston stem head and then backup-ring into groove of piston stem.
5. Apply Loctite® 242® to the last few threads of the piston stem.
6. Insert piston stem from the top through the piston retainer until seated.
7. Using the same tools in removing the piston stem and valve/ball assembly, place valve/ball assembly into hex socket tool with ball surface facing down into socket. Place screwdriver tip into piston stem slotted head. Thread piston stem into valve/ball assembly.
8. Place by-pass fitting on flat surface with male threads facing up.
9. Lubricate and install o-ring onto seat. Press seat into by-pass fitting. Hand thread by-pass fitting into lower port of unloader body and tighten with wrench.
10. Lubricate and install o-ring on discharge fitting.
11. Model 7500S: Insert spring into discharge filling, then insert check valve with small step end into spring. Hand thread into unloader body and tighten with wrench.

    Model 7600S: Lubricate and install o-ring onto check valve seat. Insert check valve seat with o-ring into unloader body. Install collar with notches facing in towards check valve seat. Insert spring into discharge fitting, then insert check valve with small step end into spring. Hand thread into unloader body and tighten with wrench.
12. Place spring retainer on top of piston stem.
13. Place spring on to spring retainer.
14. Thread hex adjusting cap onto piston retainer.
15. Remove unloader from vise.
16. Re-install unloader onto pump.
17. Reconnect by-pass, discharge and inlet plumbing to unloader.
18. Proceed to PRESSURE ADJUSTMENT.

Loctite® and 242® are registered trademarks of the Henkel Corporation.

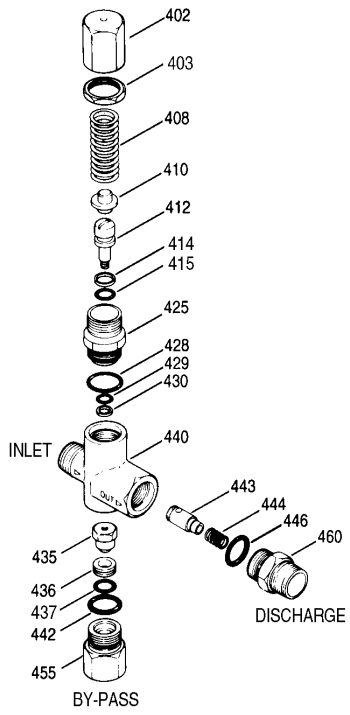
TROUBLESHOOTING

Unloader cycles	• Check for leak downstream of unloader. • Worn O-ring or check valve. • Air in system, poor connection. • O-ring in gun worn. • Insufficient flow through unloader.
Liquid leaking from bottom fitting	• O-ring for fitting cut or worn. • O-ring for seat cut or worn.
Liquid leaking from middle	• O-ring for piston worn or cut. • O-rings for piston stem worn or cut.
Unloader will not come up to pressure	• Not properly sized for system pressure. • Foreign material in unloader. Clean filter. • Piston stem O-rings worn. • Nozzle worn. • Insufficient flow to pump.
Extreme pressure spikes	• Adjusting nut turned completely into unloader. • Restricted by-pass or no by-pass. • System flow exceeds unloader rating.
Filtration	• Clean filter on regular schedule to avoid cavitation.

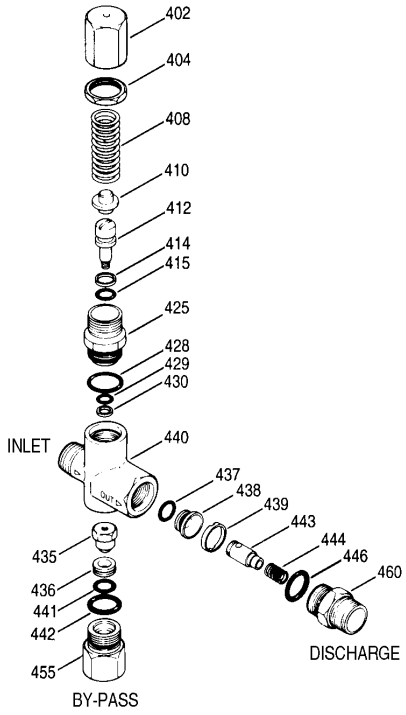
PRESSURE READING

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

EXPLODED VIEW
7500S Unloader



EXPLODED VIEW
7600S Unloader



PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	QTY.
402	540081	BB	Cap, Hex Adjusting	1
403	31047	BB	Nut, Lock (M18 x 1)	1
408	32094	STZP R	Spring, Pressure	1
410	107672	BB	Retainer, Spring	1
412	45694	S	Stem, Piston (M5)	1
414	20184	PTFE	Back-up-Ring, Piston Stem	1
415	14190	NBR	O-Ring, Piston Stem - 70D	1
	14161	FPM	O-Ring, Piston Stem - 70D	1
425	107673	BB	Retainer, Piston	1
428	13969	NBR	O-Ring, Piston Retainer - 70D	1
	14320	FPM	O-Ring, Piston Retainer - 70D	1
429	14759	NBR	O-Ring, Body	1
	14160	FPM	O-Ring, Body - 80D	1
430	107675	PTFE	Back-up-Ring, Body	1
435	45696	BB	Valve and Ball Assembly (M5)	1
436	107680	S	Seat	1
437	13963	NBR	O-Ring, Seat - 70D	1
	14303	FPM	O-Ring, Seat - 70D	1
440	—	BB	Body	1
442	13969	NBR	O-Ring, By-Pass Fitting - 70D	1
	14320	FPM	O-Ring, By-Pass Fitting - 70D	1
443	541060	BB	Valve, Check w/O-Ring	1
444	45924	S	Spring	1
446	13969	NBR	O-Ring, Discharge Fitting - 70D	1
	14320	FPM	O-Ring, Discharge Fitting - 70D	1
455	45695	BB	Fitting, By-Pass (3/8" NPTF)	1
460	107681	BB	Fitting, Discharge (3/8" NPTM)	1
468	32097	NBR	Kit, O-Ring (Incldes: 414,415, 428 - 430, 437, 442, 446)	1
	31627	FPM	Kit, O-Ring (Incldes: 414,415, 428 - 430, 437, 442, 446)	1

Italics are optional items. R Components comply with RoHS Directive.
MATERIAL CODES (Not Part of Part Number): BB=Brass FPM=Fluorocarbon
NBR=Medium Nitrile (Buna-N) PTFE=Pure Polytetrafluoroethylene S=304SS
STZP=Steel/Zinc Plated

PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	QTY.
402	45197	BB	Cap, Hex Adjusting	1
404	45201	BB	Nut, Lock (M25x1)	1
408	45198	ZP	Spring, Pressure	1
410	45199	BB	Retainer, Spring	1
412	45694	S	Stem, Piston (M5)	1
414	20184	PTFE	Back-up-Ring, Piston Stem	1
415	14190	NBR	O-Ring, Piston Stem - 70D	1
425	45200	BB	Retainer, Piston	1
428	26133	NBR	O-Ring, Piston Guide - 80D	1
429	14759	NBR	O-Ring, Body	1
430	107675	PTFE	Back-up-Ring, Body	1
435	45716	S	Valve and Ball Assembly (M5)	1
436	107680	S	Seat	1
437	26127	NBR	O-Ring, Seat	1
438	45206	S	Seat, C-Valve	1
439	45205	BB	Collar	1
440	—	BB	Body	1
441	13963	NBR	O-Ring, Seat - 70D	1
442	26133	NBR	O-Ring, Adapter - 80D	1
443	35203	BB	Valve, Check w/O-Ring	1
444	45924	S	Spring	1
446	26133	NBR	O-Ring, Discharge Fitting - 80D	1
455	45695	BB	Fitting, By-Pass (3/8" NPTF)	1
460	107681	BB	Fitting, Discharge (3/8" NPTM)	1
468	32098	NBR	Kit, O-Ring (Incldes: 414,415,428,429,430,437,441,442,446)	1

Italics are optional items.
MATERIAL CODES (Not Part of Part Number):
BB=Brass NBR=Medium Nitrile (Buna-N) PTFE=Pure Polytetrafluoroethylene
S=304SS ZP=Zinc Plated

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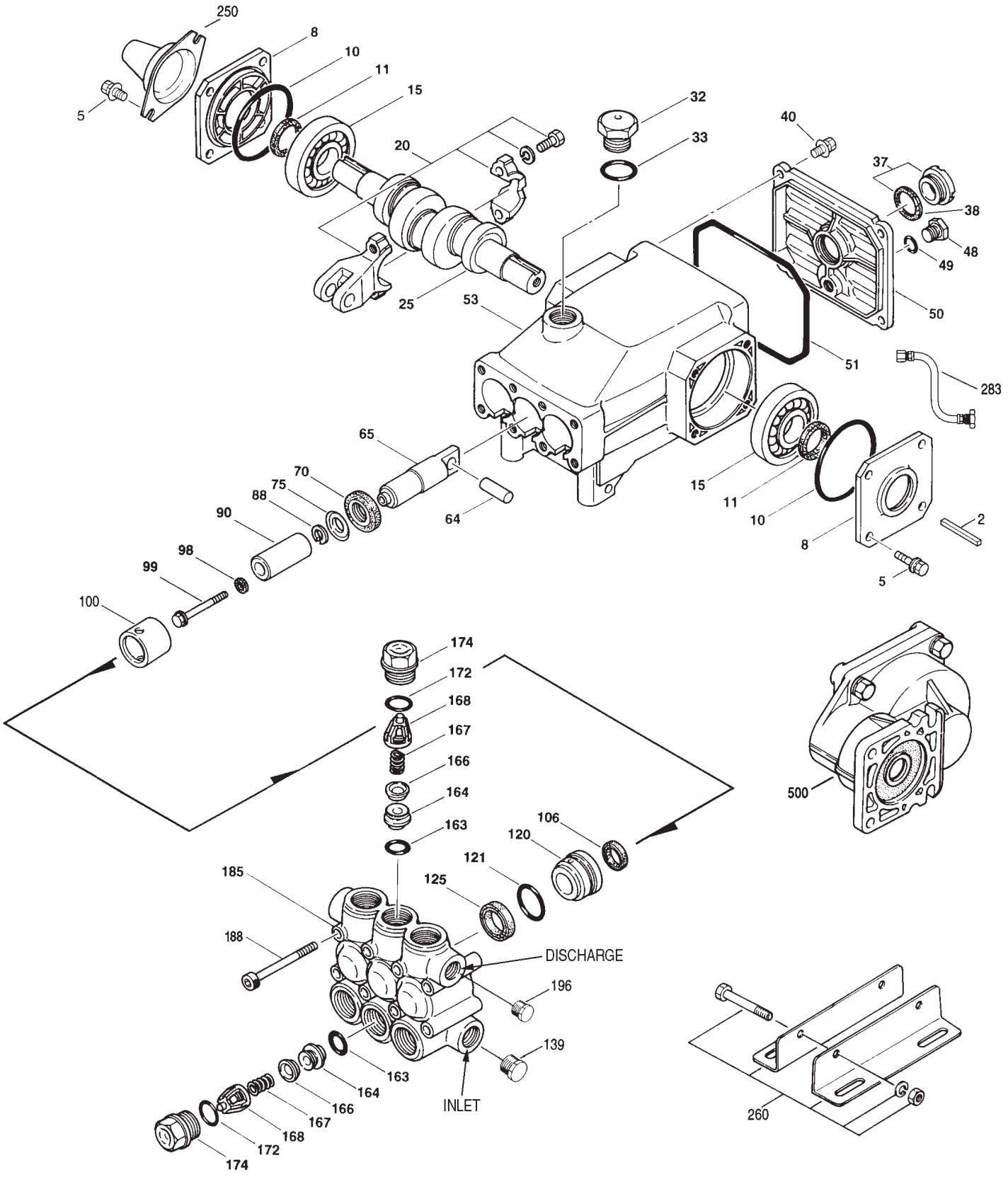
e-mail: catpumps@t-online.de www.catpumps.de

PARTS LIST

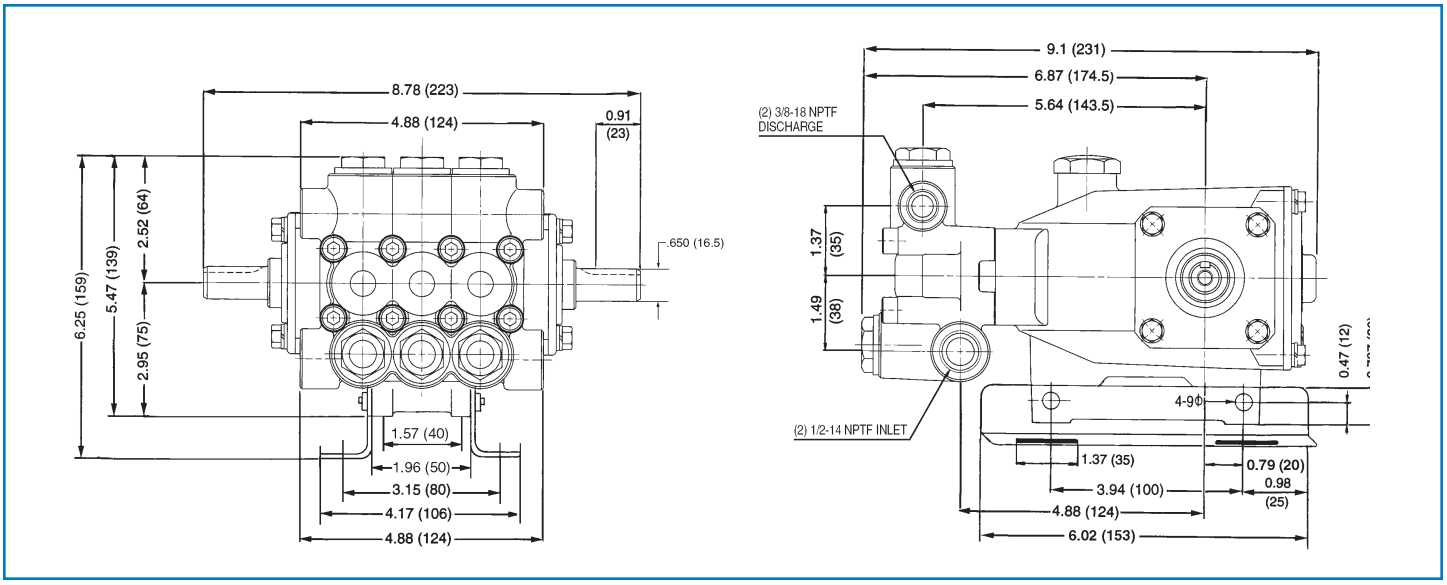
ITEM	P/N	MATL	DESCRIPTION	QTY
2	*30047*	*STL*	*Key (M5x5x24)*	*1*
5	92519	STZP	Screw, HHC Sems (M6x16)	8
	125824	*STCP R*	*Screw, HHC Sems (M6x16)*	*8*
8	46901	AL	Cover, Bearing	2
	48259	**AL**	Cover, Blind - 3CP1120G	1
10	14028	NBR	O-Ring, Bearing Cover - 70D	2
11	43222	NBR	Seal, Oil, Crankshaft - 70D	1/2
15	14480	STL	Bearing, Ball	2
20	48730	TNM	Rod, Connecting, Assembly [5/01]	3
25	**46927**	**FCM**	Crankshaft, Dual End - 3CP1120 (M12.7)	1
	46994	**FCM**	Crankshaft, Dual End - 3CP1130 (M7)	1
	46991	**FCM**	Crankshaft, Dual End - 3CP1140 (M11)	1
	48484	**FCM**	Crankshaft, Single End - 3CP1140CS, (M11)	1
	48257	**FCM**	Crankshaft, Single End - 3CP1120G (M12.7)	1
32	46798	RTP	Cap, Oil Filler	1
33	14179	NBR	O-Ring, Oil Filler Cap - 70D	1
37	92241	—	Gauge, Oil, Bubble w/Gasket	1
38	44428	NBR	Gasket, Flat, Oil Gauge - 80D	1
40	92519	STZP	Screw, HHC Sems (M6x16)	4
	125824	*STCP R*	*Screw, HHC Sems (M6x16)*	*4*
48	25625	STCP	Plug, Drain (1/4"x19BSP)	1
49	23170	NBR	O-Ring, Drain Plug - 70D	1
50	46939	AL	Cover, Rear	1
51	14041	NBR	O-Ring, Rear Cover - 70D	1
53	48644	AL	Crankcase	1
64	46615	CM	Pin, Crosshead	3
65	48459	BBNP	Rod, Plunger	3
70	46839	NBR	Seal, Oil, Crankcase	3
75	43900	S	Slinger, Barrier	3
88	45697	S	Washer, Keyhole (M18 x 10)	3
90	46976	CC	Plunger (M18x43)	3
98	46730	NBR	Washer, Seal - 90D	3
	48394	*FPM*	*Washer, Seal - 90D*	*3*
99	† 48201	SS	Retainer, Plunger w/Stud (M6)	3
100	46541	PVDF	Retainer, Seal	3
106	43243	NBR	Seal, LPS w/S-Spg	3
	44926	*FPM*	*Seal, LPS w/SS-Spg*	*3*
	76243	*ST*	*Seal, LPS w/S-Spg*	*3*
120	46625	BB	Case, Seal (See Tech Bulletin #110)	3
121	13976	NBR	O-Ring, Seal Case - 70D	3
	48522	FPM	O-Ring, Seal Case	3
125	43245	SNG	Seal, HPS w/S	3
	44925	FPM	Seal, HPS w/SS	3
	46652	*HT*	*Seal, HPS "Hi-Temp", 2-Pc w/S-Support*	*3*
139	43448	BB	Plug, Inlet (1/2"NPT)	1
163	17547	NBR	O-Ring, Seat - 85D	6
	11685	*FPM*	*O-Ring, Seat - 85D*	*6*
164	45790	S	Seat	6
166	43723	S	Valve	6
167	43750	S	Spring	6
168	44565	PVDF	Retainer, Spring	6
172	17615	NBR	O-Ring, Valve Plug - 75D	6
	15855	*FPM*	*O-Ring, Valve Plug - 70D*	*6*
174	46756	BB	Plug, Valve	6
185	46616	FBB	Manifold, Head	1
188	126512	STCP R	Screw, HSH (M8x65)	8
196	22187	BBCP	Plug, Discharge (3/8"NPT)	1
250	*118672*	*STCP*	*Protector, Shaft*	*1*
260	*30612*	*STZP*	*Mount, Rail Assy*	*1*
265	*30641*	—	*Mount, Assy (Incld: 30612, 30032, 30047, 118672)*	*1*
270	*30246*	*STL*	*Assy, Pulley & Key (Incld: 30032, 30047) (See Tech Bulletin 003)*	*1*
283	*34334*	—	*Kit, Oil Drain (3/8" x 24") (See individual Data Sheet)*	*1*
	76334	—	*Kit, Oil Indicator (3/8" x 24") (See individual Data Sheet)*	*1*
299	*814841*	*FBB*	*Head, Complete*	*1*
300	*33983*	*NBR*	*Kit, Seal (Incld: 98, 106, 121, 125)*	*1*
	33257	*FPM*	*Kit, Seal (Incld: 98, 106, 121, 125)*	*1*
	31983	*HT*	*Kit, Seal (Incld: 98, 106, 121, 125)*	*1*
	76526	*STHT*	*Kit, Seal (Incld: 98, 106, 120, 121, 125) Prior to 4/10*	*1*
	76983	*STHT*	*Kit, Seal (Incld: 98, 106, 121, 125) After 4/10*	*1*
310	*33062*	*NBR*	*Kit, Valve (Incld: 163, 164, 166, 167, 168, 172)*	*2*
	33258	*FPM*	*Kit, Valve (Incld: 163, 164, 166, 167, 168, 172)*	*2*
350	*30696*	*STZP*	*Plier, Reverse*	*1*
500	*8075*	—	*Gearbox (See Individual Data Sheet)*	*1*
—	*6107*	—	*Oil, Bottle (21 oz.) ISO 68 Hydraulic (Fill to specified crankcase capacity prior to start-up)*	*1*

Bold print part numbers are unique to a particular pump model. *Italics are optional items.* [ ] Date of latest production change.
† Production parts are different than repair parts. R Components comply with RoHS Directive.
View Tech Bulletins 002, 003, 024, 036, 064, 073, 074, 077, 083, and 110 for additional information.
For motorized versions see BD motor data sheet. For Gearbox version see 8075 data sheet.
MATERIAL CODES (Not Part of Part Number): AL=Aluminum BB=Brass BBCP=Brass/Chrome Plated BBNP=Brass Nickel Plated CC=Ceramic
CM=Chrome-moly FBB=Forged Brass FCM=Forged Chrome-Moly FPM=Fluorocarbon HT=Hi-Temp (EPDM Alternative) NBR=Medium Nitrile (Buna-N)
PVDF=Polyvinylidene Fluoride RTP=Reinforced Composite S=304SS SNG=Special Blend (Buna) ST=Polyetheretherketon
STHT=Special PTFE High Temp STL=Steel STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated TNM=Special High Strength

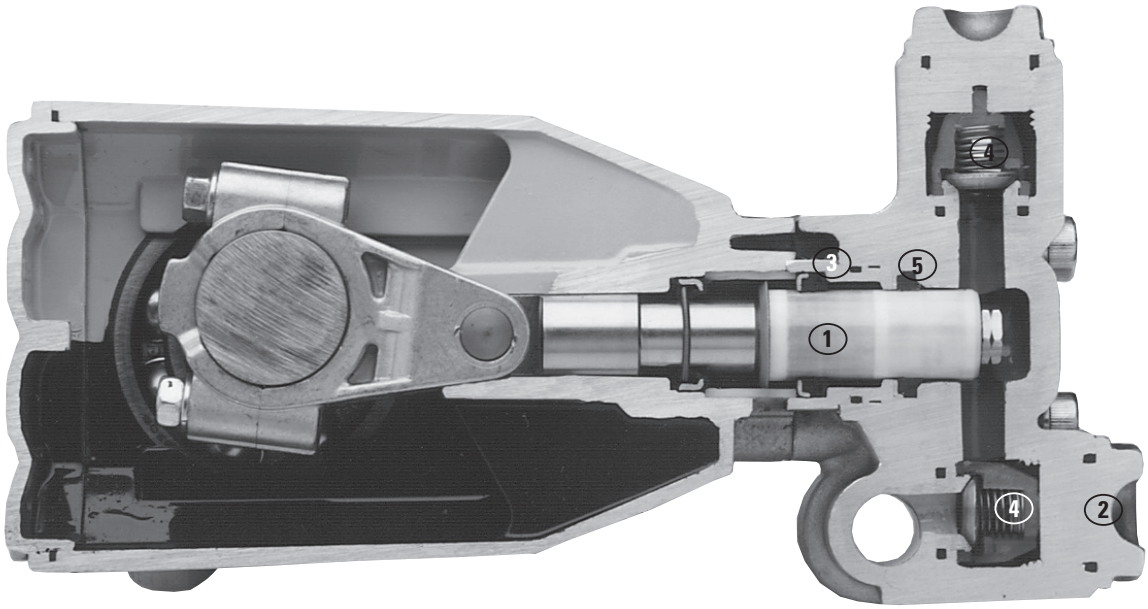
EXPLODED VIEW



Models
3CP1120, 3CP1120G,
3CP1130, 3CP1140
February 2011



Models 3CP1120, 3CP1120G, 3CP1130, 3CP1140



1 Special concentric, high-density, polished, solid ceramic **plungers** provide a true wear surface and extended seal life.

2 **Manifolds** are a high tensile strength forged brass for long term, continuous duty.

3 100% wet **seal** design adds to service life by allowing pumped liquids to cool and lubricate on both sides of the seals.

4 Stainless steel **valves, seats and springs** provide corrosion-resistance, ultimate seating and extended life.

5 Specially formulated, Cat Pump exclusive, **Hi-Pressure Seals** offer unmatched performance and seal life.

The Pumps with Nine Lives

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