

## FEATURES

### Superior Design

- Triplex plunger design gives smoother liquid flow.
- V-Packings are completely lubricated and cooled by the liquid being pumped.
- Special flushed inlet manifold lubricates and cools seals for extended life with DI water and high temp liquids.
- Lubricated Lo-Pressure Seals provide double protection against external leakage.
- Oil bath crankcase assures optimum lubrication.
- Close tolerance concentricity of the ceramic plunger maximizes seal life.

### Quality Materials

- Precision design 304 and 316 stainless steel valves and seats are hardened and polished for ultimate seating and extended valve life.
- Forged Brass, 316 Stainless Steel or Nickel Aluminum Bronze manifolds for strength and corrosion resistance.
- Special concentric, high-density, polished, solid ceramic plungers provide a true wear surface and extended seal life.
- Specially formulated, CAT PUMP exclusive, V-Packings offer unmatched performance and seal life.
- Die cast aluminum crankcase provides high strength, minimum weight and precision tolerance control.
- Chrome-moly crankshaft gives unmatched strength and surface hardness.
- Oversized crankshaft bearings with greater loading capacity means longer bearing life.

### Easy Maintenance

- Wet-end is easily serviced without entering crankcase, requiring less time and effort.
- Valve assemblies are accessible without disturbing piping, for quick service.
- Inlet and discharge valve assemblies interchange for easier maintenance.
- Preset packings mean no packing gland adjustment is necessary, reducing maintenance costs.

### **⚠ WARNING**

All systems require both a primary pressure regulating device (i.e., regulator, unloader) and a secondary pressure safety relief device (i.e., pop-off valve, safety valve). Failure to install such relief devices could result in personal injury or damage to the pump or to system components. CAT PUMPS does not assume any liability or responsibility for the operation of a customer's high pressure system.

## 35 Frame Plunger Pump

**Brass**  
Standard and Flushed 3520, 3520C

**Stainless Steel**  
Standard and Flushed 3521, 3521C

**Nickel Aluminum Bronze**  
Standard 3527

## SPECIFICATIONS

	U.S. Measure	Metric Measure
Flow .....	23 GPM	(87 L/M)
Pressure Range .....	100 to 2000 PSI	(7 to 140 BAR)
Inlet Pressure Range .....	Flooded to 70 PSI	(Flooded to 4.9 BAR)
RPM .....	800 RPM	(800 RPM)
Bore .....	1.260"	(32 mm)
Stroke .....	1.890"	(48 mm)
Crankcase Capacity .....	4.2 Qts.	(4 L)
Maximum Liquid Temperature.....	160°F	(71°C)
Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations.		
Inlet Ports (2).....	1-1/2" NPTF	(1-1/2" NPTF)
Flushing Ports (2) (3520C, 3521C) .....	1/4" NPTF	(1/4" NPTF)
Discharge Ports (2) .....	1" NPTF	(1" NPTF)
Pulley Mounting.....	Either Side	(Either Side)
Shaft Diameter.....	1.378"	(35 mm)
Weight .....	139 lbs.	(63 kg)
Dimensions (3520, 3520C, 3527) .....	24.06 x 18.11 x 9.72"	(611 x 460 x 247 mm)
Dimensions (3521 3521C).....	24.13 x 18.11 x 9.72"	(613 x 460 x 247 mm)

## ELECTRIC HORSEPOWER REQUIREMENTS

FLOW		PRESSURE				RPM
		PSI 1200	PSI 1500	PSI 1800	PSI 2000	
U.S. GPM	L/M	BAR 85	BAR 105	BAR 125	BAR 140	
23	87	18.9	23.6	28.4	31.6	800
20	76	16.5	20.6	24.7	27.4	696
18	68	14.8	18.5	22.2	24.7	626

**DETERMINING THE PUMP R.P.M.**  $\frac{\text{Rated G.P.M.}}{\text{Rated R.P.M.}} = \frac{\text{"Desired" G.P.M.}}{\text{"Desired" R.P.M.}}$

**DETERMINING THE REQUIRED H.P.**  $\frac{\text{GPM} \times \text{PSI}}{1460} = \text{Electric Brake H. P. Required}$

**DETERMINING MOTOR PULLEY SIZE**  $\frac{\text{Motor Pulley O.D.}}{\text{Pump R.P.M.}} = \frac{\text{Pump Pulley O.D.}}{\text{Motor R.P.M.}}$

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

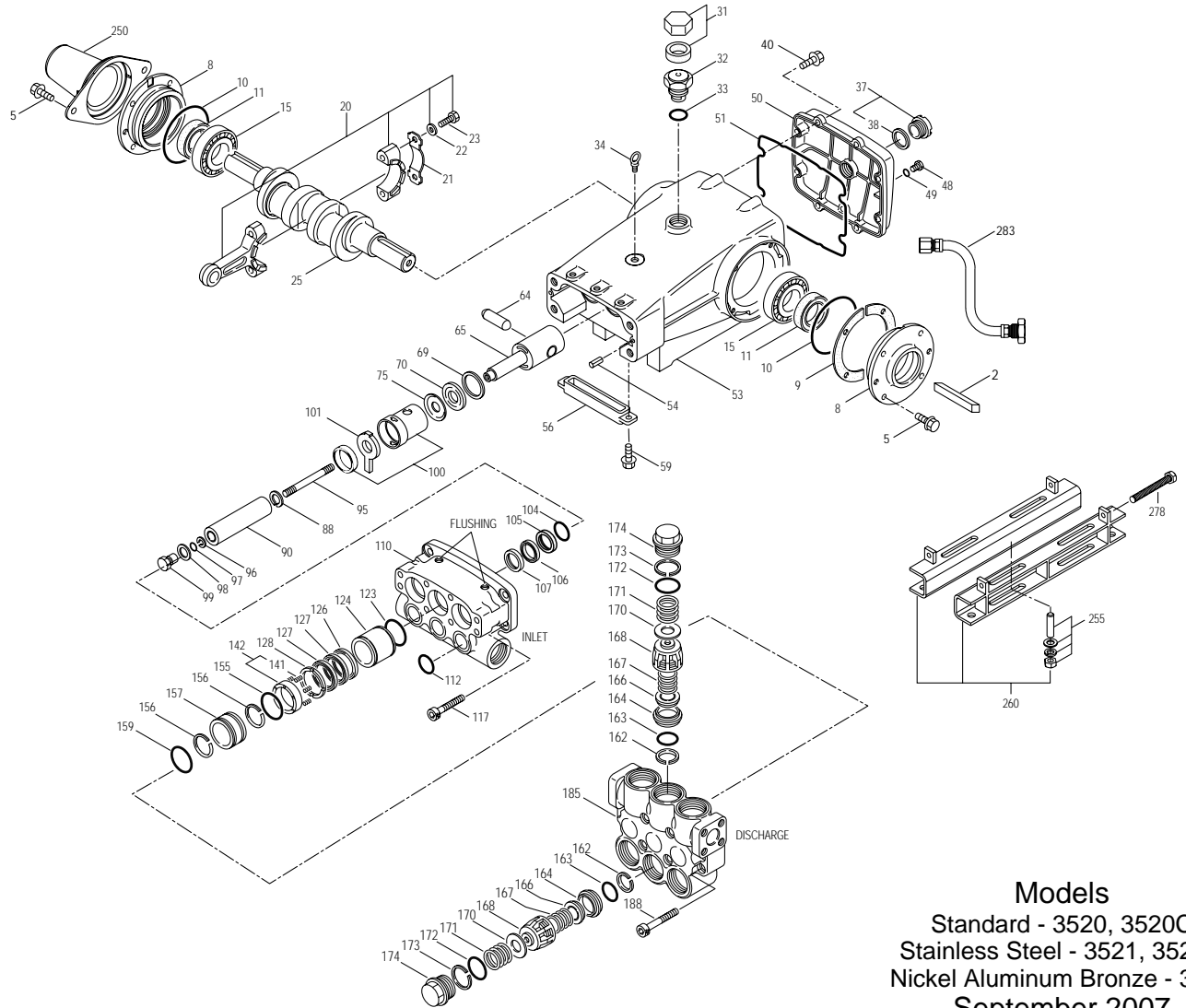
*"Customer confidence is our greatest asset"*

# PARTS LIST

ITEM	PART NUMBER				DESCRIPTION	QTY		
	3520	MATL	3521	MATL	3527	MATL		
2	34021	STL	34021	STL	34021	STL	Key (M10x8x70)	1
5	125753	S	125753	S	125753	S	Screw, HHC Sems (M8x25)	8
8	44542	AL	44542	AL	44542	AL	Cover, Bearing	2
9	815279	FBR	815279	FBR	815279	FBR	Shim, Split, 2-PC	2
10	12398	NBR	12398	NBR	12398	NBR	O-Ring, Bearing Cover - 70D	2
11	13296	NBR	13296	NBR	13296	NBR	Seal, Oil, Crankshaft	2
15	29326	STL	29326	STL	29326	STL	Bearing, Roller	2
20	121467	TNM	121467	TNM	121467	TNM	Rod, Connecting Assy (Incls: 21, 22, 23) [10/00]	3
21	126749	STCP R	126749	STCP R	126749	STCP R	Washer, Locking	3
22	12490	STZP	12490	STZP	12490	STZP	Washer, Flat (M10)	6
	126574	STCP R	126574	STCP R	126574	STCP R	Washer, Flat (M10)	6
23	122045	STZP	122045	STZP	122045	STZP	Screw, HH (M10x55)	6
25	29325	FCM	29325	FCM	29325	FCM	Crankshaft, Dual End	1
31	828710	—	828710	—	828710	—	Protector, Oil Cap w/Foam Gasket	1
32	43211	ABS	43211	ABS	43211	ABS	Cap, Oil Filler	1
33	14177	NBR	14177	NBR	14177	NBR	O-Ring, Oil Filler Cap - 70D	1
34	126743	STCP R	126743	STCP R	126743	STCP R	Bolt, Eye (M12x1.75) (For Lifting Pump Only)	1
37	92241	—	92241	—	92241	—	Gauge, Oil, Bubble w/Gasket - 80D	1
38	44428	NBR	44428	NBR	44428	NBR	Gasket, Flat Oil Gauge - 80D	1
40	125753	S	125753	S	125753	S	Screw, HHC Sems (M8x25)	8
48	25625	STCP	25625	STCP	25625	STCP	Plug, Drain (1/4"x19BSP)	1
49	23170	NBR	23170	NBR	23170	NBR	O-Ring, Drain Plug - 70D	1
50	45936	AL	45936	AL	45936	AL	Cover, Rear	1
51	16612	NBR	16612	NBR	16612	NBR	O-Ring, Cover - 70D	1
53	44487	AL	44487	AL	44487	AL	Crankcase Assy (Incls: 34, 54)	1
54	27488	S	27488	S	27488	S	Pins, Guide	2
56	27790	POP	27790	POP	27790	POP	Pan, Oil	1
59	92538	S	92538	S	92538	S	Screw, HHC Sems (M6x16)	2
64	43864	CM	43864	CM	43864	CM	Pin, Crosshead	3
65	45116	SSZZ	45116	SSZZ	45116	SSZZ	Rod, Plunger	3
69	126587	STCP R	126587	STCP R	126587	STCP R	Washer, Oil Seal	3
70	100488	NBRS	100488	NBRS	100488	NBRS	Seal, Oil, Crankcase	3
	44739	FPM	44739	FPM	44739	FPM	Seal, Oil, Crankcase	3
75	43865	S	43865	S	43865	S	Slinger, Barrier	3
88	45676	S	45676	S	45676	S	Washer, Keyhole (M16)	3
90	43957	CC	43957	CC	43957	CC	Plunger (M32x145)	3
95	89778	SS	89778	SS	89778	SS	Stud, Plunger Retainer (M10x135)	3
96	20189	PTFE	20189	PTFE	20189	PTFE	Back-up-Ring, Plunger Retainer	3
97	11345	NBR	11345	NBR	11345	NBR	O-Ring, Plunger Retainer -70D	3
	11375	FPM	11375	FPM	11375	FPM	O-Ring, Plunger Retainer	3
	701490	EPDM	701490	EPDM	701490	EPDM	O-Ring, Plunger Retainer	3
98	44085	SS	44085	SS	44085	SS	Gasket, Retainer	3
99	44084	SS	44084	SS	44084	SS	Retainer, Plunger (M10)	3
100	814279	PVDF	814279	PVDF	814279	PVDF	Retainer, Seal, 2 Pc.	3
101	44106	—	44106	—	44106	—	Wick, Long Tab	3
104	43875	NBR	43875	NBR	43875	NBR	O-Ring, Inlet Adapter - 70D	3
	44826	FPM	44826	FPM	44826	FPM	O-Ring, Inlet Adapter - 70D	3
	701656	EPDM	701656	EPDM	701656	EPDM	O-Ring, Inlet Adapter - 70D	3
105	43961	BB	45562	SS	45562	SS	Inlet Adapter	3
106	44098	NBR	44098	NBR	44098	NBR	Seal, LPS w/SS-Spg	3
	44827	FPM	44827	FPM	44827	FPM	Seal, LPS w/SS-Spg	3
	48244	EPDM	48244	EPDM	48244	EPDM	Seal, LPS w/SS-Spg	3
107	43962	S	44101	SS	44101	SS	Washer	3
110	46392	BBCP	45365	SS	45124	NAB	Manifold, Inlet	1
	46392C	BBCP	125397	SS	—	—	Manifold, Inlet, Flushed (1/4" Flush Ports)	1
112	11379	NBR	11379	NBR	11379	NBR	O-Ring, Inlet Manifold - 70D	3
	14183	FPM	14183	FPM	14183	FPM	O-Ring, Inlet Manifold	3
	701491	EPDM	701491	EPDM	701491	EPDM	O-Ring, Inlet Manifold - 70D	3
117	44585	S	44585	S	44585	S	Screw, HSH (M14x40)	4
123	12391	NBR	12391	NBR	12391	NBR	O-Ring, V-Packing Cylinder - 70D	3
	13266	FPM	13266	FPM	13266	FPM	O-Ring, V-Packing Cylinder - 70D	3
	701657	EPDM	701657	EPDM	701657	EPDM	O-Ring, V-Packing Cylinder - 70D	3
124	46348	BB	45563	SSL	45563	SSL	Cylinder, V-Packing	3
126	43963	BB	48390	D	48390	D	Adapter, Female	3
	—	—	45564	SS	45564	SS	Adapter, Female	3
127	44608	STG*	44608	STG*	44608	STG*	V-Packing	6
	44829	SFG	44829	SFG	44829	SFG	V-Packing	6
128	43965	BB	45565	SS	45565	SS	Adapter, Male	3
141	45113	SS	45113	SS	45113	SS	Spring, Coil	6/18
142	46349	BB	45566	SS	45566	SS	Spacer, w/Coil Springs	3
155	48861	NBR	48861	NBR	48861	NBR	O-Ring, V-Packing Spacer - 90D	3
	11748	FPM	11748	FPM	11748	FPM	O-Ring, V-Packing Spacer - 70D	3
	701657	EPDM	701657	EPDM	701657	EPDM	O-Ring, V-Packing Spacer - 70D	3
156	48371	D	48371	D	48371	D	Back-up-Ring, V-Packing Spacer	3
157	43966	BB	45674	SS	45674	SS	Spacer, V-Packing	3
158	48362	D	48362	D	48362	D	Back-up-Ring, V-Packing Spacer	3
159	48860	NBR	48860	NBR	48860	NBR	O-Ring, V-Packing Spacer - 90D	3
	20137	FPM	20137	FPM	20137	FPM	O-Ring, V-Packing Spacer - 70D	3
	701492	EPDM	701492	EPDM	701492	EPDM	O-Ring, V-Packing Spacer	3
162	48363	D	48363	D	48363	D	Back-up-Ring, Valve Seat	6
163	26142	NBR	26142	NBR	26142	NBR	O-Ring, Seat - 80D	6
	14330	FPM	14330	FPM	14330	FPM	O-Ring, Seat	6
	701493	EPDM	701493	EPDM	701493	EPDM	O-Ring, Seat	6
164	44727	S	44612	SS	44612	SS	Seat, Stepped	6
166	43932	S	44108	SS	44108	SS	Valve	6
167	44109	SS	44109	SS	44109	SS	Spring	6
168	44728	PVDF	44728	PVDF	44728	PVDF	Retainer, Spring	6
170	44729	SS	44729	SS	44729	SS	Washer, Spring Retainer	6
171	44644	SS	44644	SS	44644	SS	Coil Spring (70kg), Valve Plug	6
172	89827	NBR	89827	NBR	89827	NBR	O-Ring, Valve Plug - 90D	6
	11747	FPM	11747	FPM	11747	FPM	O-Ring, Valve Plug - 90D	6
	701494	EPDM	701494	EPDM	701494	EPDM	O-Ring, Valve Plug - 70D	6

Replace as a set

# EXPLODED VIEW



**Models**  
 Standard - 3520, 3520C  
 Stainless Steel - 3521, 3521C  
 Nickel Aluminum Bronze - 3527  
 September 2007

	<b>3520</b>	<b>MATL</b>	<b>3521</b>	<b>MATL</b>	<b>3527</b>	<b>MATL</b>		
173	48364	D	48364	D	48364	D	Back-up-Ring, Valve Plug	6
174	<b>46444</b>	<b>FBB</b>	<b>49300</b>	<b>SSD</b>	<b>44643</b>	<b>NAB</b>	Plug, Valve [02/06]	6
185	<b>49253</b>	<b>BBCP</b>	<b>49299</b>	<b>SSD</b>	<b>49249</b>	<b>NAB</b>	Manifold, Discharge [02/06]	1
188	89981	S	89981	S	89981	S	Screw, HSH (M12x70)	8
250	44516	NY	44516	NY	44516	NY	Protector, Shaft w/2 Screws Lockwashers and Washers (Included with pump)	1
255	34018	STZP	34018	STZP	34018	STZP	Assy, Direct Mount	1
	34039	SS	34039	SS	34039	SS	Assy, Direct Mount	1
260	92674	STZP	92674	STZP	92674	STZP	Mounting, Box Assy (Incls: 34018)	1
275	990013	STL	990013	STL	990013	STL	Hub "B" 35mm w/Keyway [See Drive Packages, Tech Bulletin 003]	1
278	80540	ZP	80540	ZP	80540	ZP	Screw, HH (M12x100) (Rail Adjusting Screw)	1
279	30278	STZP	30278	STZP	30278	STZP	Oiler (1 oz.)	3
281	30967	—	30967	—	30967	—	Glass, Oiler	3
282	10069	NBR	10069	NBR	10069	NBR	Gasket, Oiler	3
283	34314	—	34314	—	34314	—	Kit, Oil Drain	1
299	<b>814822</b>	<b>BBCP</b>	<b>814797</b>	<b>SS</b>	<b>815438</b>	<b>NAB</b>	Head, Complete	1
300	31039	NBR*	31039	NBR*	31039	NBR*	Kit, Seal (Incls: 97,104,106,112,123,127,155,156,158,159)	1
	33259	FPM	33259	FPM	33259	FPM	Kit, Seal (Incls: 97,104,106,112,123,127,155,156,158,159)	1
310	◆ 33456	EPDM*	◆ 33456	EPDM*	◆ 33456	EPDM*	Kit, Seal (Incls: 97,104,106,112,123,127,155,156,158,159)	1
	<b>34235</b>	<b>NBR</b>	<b>34017</b>	<b>NBR</b>	<b>34017</b>	<b>NBR</b>	Kit, Valve (Incls: 162,163,164,166,167,168,170,172,173)	2
	31955	FPM	31955	FPM	31955	FPM	Kit, Valve (Incls: 162,163,164,166,167,168,170,172,173)	2
	◆ 31952	EPDM	◆ 31952	EPDM	◆ 31952	EPDM	Kit, Valve (Incls: 162,163,164,166,167,168,170,172,173)	2
—	819000	F	819000	F	819000	F	Assy, Crankcase, Cast Iron Conversion	1
390	714500	SS	714500	SS	714500	SS	C.A.T. (Inlet pressure stabilizer for RO and boosted inlet applications)	1
391	714506	SS	714506	SS	714506	SS	Adapter (2 per C.A.T.) (See Data Sheet for complete selection)	2
—	6575	—	6575	—	6575	—	Plunger Pump Service DVD	1
—	6100	—	6100	—	6100	—	Oil, Case (12 Bottles) ISO 68 Multi-viscosity Hydraulic (Fill to specified crankcase capacity prior to start-up)	1
—	—	—	6119	—	—	—	Lubricant, Antiseize (1 oz.)	1

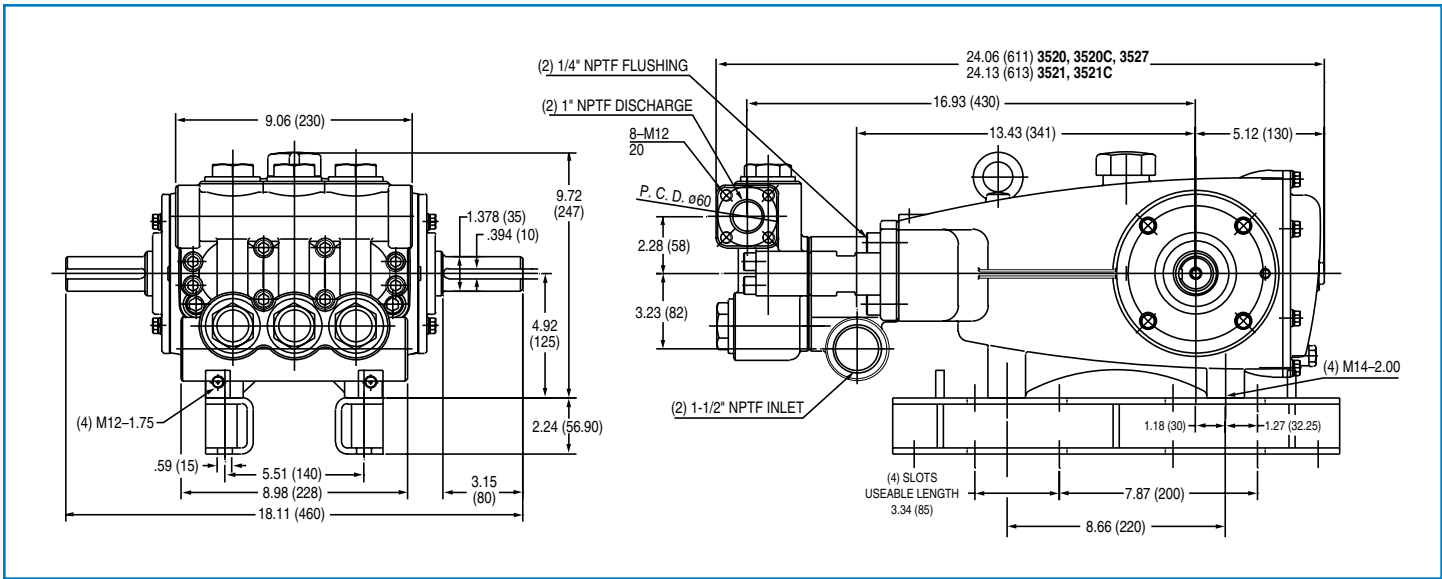
**Bold print part numbers are unique to a particular pump model. Italics are optional items. [ ]** Date of latest production change. ◆ Silicone oil/grease required.

† Production Parts Nickel Aluminum Bronze, Replacement Parts are 316 Stainless Steel. R Components comply with RoHS Directive.

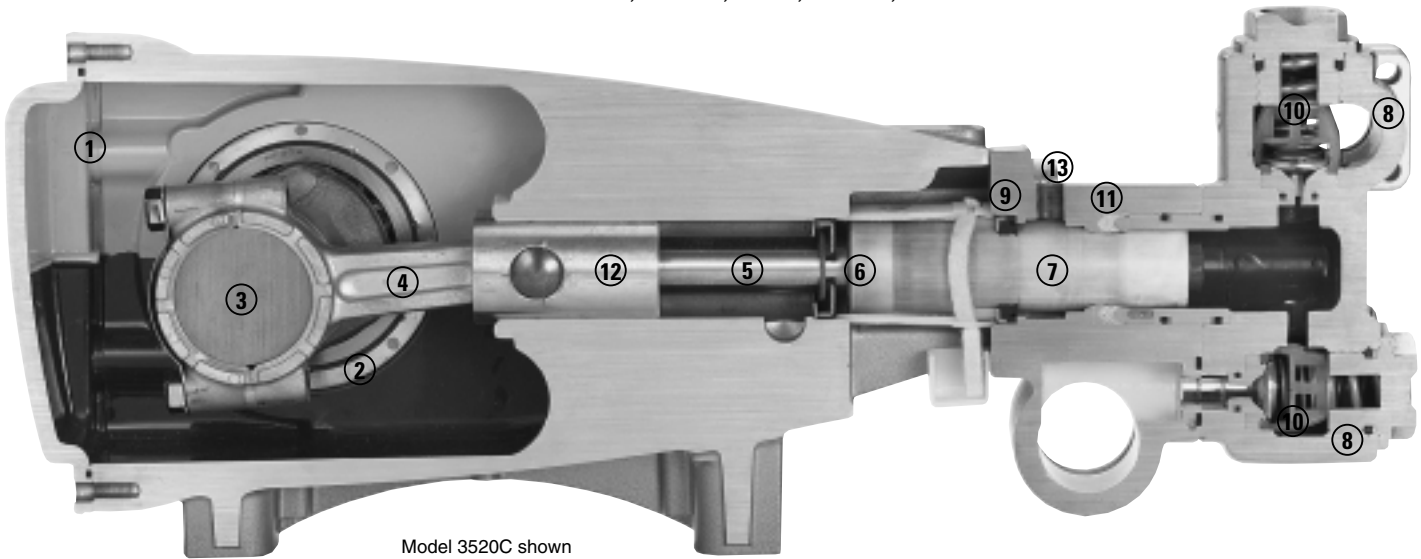
\*Review material codes for individual items (STG generally may be used as alternate). **C.A.T. highly recommended for pressurized inlet, R.O. and industrial applications.**

See Tech Bulletins 002, 003, 024, 040, 041, 050, 052, 053, 064, 069, 074, 077, 083 and 100 for additional information.

MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BB=Brass BBCP=Brass/Chrome Plated CC=Ceramic CM=Chrome-Moly D=Acetal EPDM=Ethylene Propylene Diene Monomer F=Cast Iron FBR=Fiber FCM=Forged Chrome-moly FPM=Fluorocarbon NAB=Nickel Aluminum Bronze NBR=Medium Nitrile (Buna-N) NBRs=Buna, Silicone Free NY=Nylon POP=Polypropylene PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride S=304SS SS=316SS SSD=Duplex Stainless Steel SFG=Special Blend FPM SSL=316SS/Low Carbon STG=Special Blend PTFE White STL=Steel STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated SSZZ=316SS/Zamak TNM=Special High Strength ZP=Zinc Plated



Models 3520, 3520C, 3521, 3521C, 3527



Model 3520C shown

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1 Die cast aluminum <b>crankcase</b> means high strength, light weight, and excellent tolerance control.</li> <li>2 Oversized crankshaft <b>bearings</b> provide extended bearing life and pump performance.</li> <li>3 Chrome-moly <b>crankshaft</b> provides unmatched strength and surface hardness for long life.</li> <li>4 Matched oversized TNM <b>connecting rods</b> noted for superior tensile strength and bearing quality.</li> <li>5 Special stainless steel <b>plunger rods</b> with high strength crossheads for longevity and corrosion resistance.</li> </ol> | <ol style="list-style-type: none"> <li>6 The stainless steel <b>slinger</b> provides back-up protection for the crankcase seal, keeping pumped liquids out of the crankcase.</li> <li>7 Special concentric, high-density, polished, solid ceramic <b>plungers</b> provide a true wear surface and extended seal life.</li> <li>8 <b>Manifolds</b> are a high tensile strength forged brass, 316 stainless steel, duplex stainless or nickel aluminum bronze for long term, continuous duty.</li> <li>9 100% wet <b>seal</b> design adds to service life by allowing pumped liquids to cool and lubricate on both sides.</li> <li>10 Stainless steel <b>valves, seats and springs</b> provide corrosion-resistance, ultimate seating and extended life.</li> <li>11 Specially formulated, CAT PUMP exclusive, <b>V-Packings</b> offer unmatched performance and seal life.</li> <li>12 <b>Crossheads</b> are 360° supported for uncompromising alignment.</li> <li>13 Optional special <b>ported Flushed Inlet Manifold</b> permits external flush for lubricating and cooling seals when pumping low lubricity liquids such as DI water or high temperature liquids.</li> </ol> |
|---|---|

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