

15 Frame Plunger Pump

Standard Brass Model

Stainless Steel Model

650
651

FEATURES

Superior Design

- Triplex plunger design provides smoother liquid flow.
- V-Packings are completely lubricated and cooled by the liquid being pumped.
- Lubricated Lo-Pressure Seals provide double protection against external leakage.
- Oil bath crankcase assures optimum lubrication.
- Close tolerance concentricity of the ceramic plunger offers perfect alignment and maximizes seal life.

Quality Materials

- All stainless steel valves are heat treated and seats are roller burnished for a positive seal and extended valve life.
- Bronze or Duplex Stainless Steel manifolds are strong and corrosion resistance.
- Special concentric, high-density, polished, solid ceramic plungers provide 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 mean longer bearing life.

Easy Maintenance

- Wet-end is easily serviced without entering crankcase, requiring less time and effort.
- Inlet and discharge valve assemblies interchange for easier maintenance without disturbing piping.
- 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.

SPECIFICATIONS

	U.S. Measure	Metric Measure
Flow.....	7.0 GPM	(27 L/M)
Pressure Range.....	100 to 3000 PSI	(7 to 210 BAR)
RPM	1000 RPM	(1000 RPM)
Inlet Pressure Range.....	-5 to +60 PSI	(-0.35 to +4 BAR)
Bore.....	.787"	(20 mm)
Stroke.....	1.181"	(30 mm)
Crankcase Capacity	42 oz.	(1.26 L)
Maximum Liquid Temperature	160°F	(71°C)
Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations.		
Inlet Ports (2)	3/4" NPTF	(3/4" NPTF)
Discharge Ports (2).....	1/2" NPTF	(1/2" NPTF)
Pulley Mounting	Either Side	(Either Side)
Shaft Diameter	1.181"	(30 mm)
Weight.....	44 lbs.	(19.9 kg)
Dimensions.....	16.28x12.99x6.44"	(413.50x330x163.50 mm)

ELECTRIC HORSEPOWER REQUIREMENTS

FLOW		PRESSURE			MOTOR PULLEY SIZE	
		PSI 2000	PSI 2500	PSI 3000	Using 1725 RPM Motor 10" O.D. Pump Pulley	
U.S. GPM	L/M	BAR 140	BAR 175	BAR 210	RPM	Pulley O.D.
7.0	27	9.6	12.0	14.4	1000	5.7
6.0	23	8.2	10.3	12.4	858	4.9
5.0	19	6.9	8.6	10.3	715	4.1

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.	$\frac{\text{GPM x PSI}}{1460}$	=	Electric Brake H. P. Required
DETERMINING MOTOR PULLEY SIZE	$\frac{\text{Motor Pulley O.D.}}{\text{Pump R.P.M.}}$	=	$\frac{\text{Pump Pulley O.D.}}{\text{Motor R.P.M.}}$

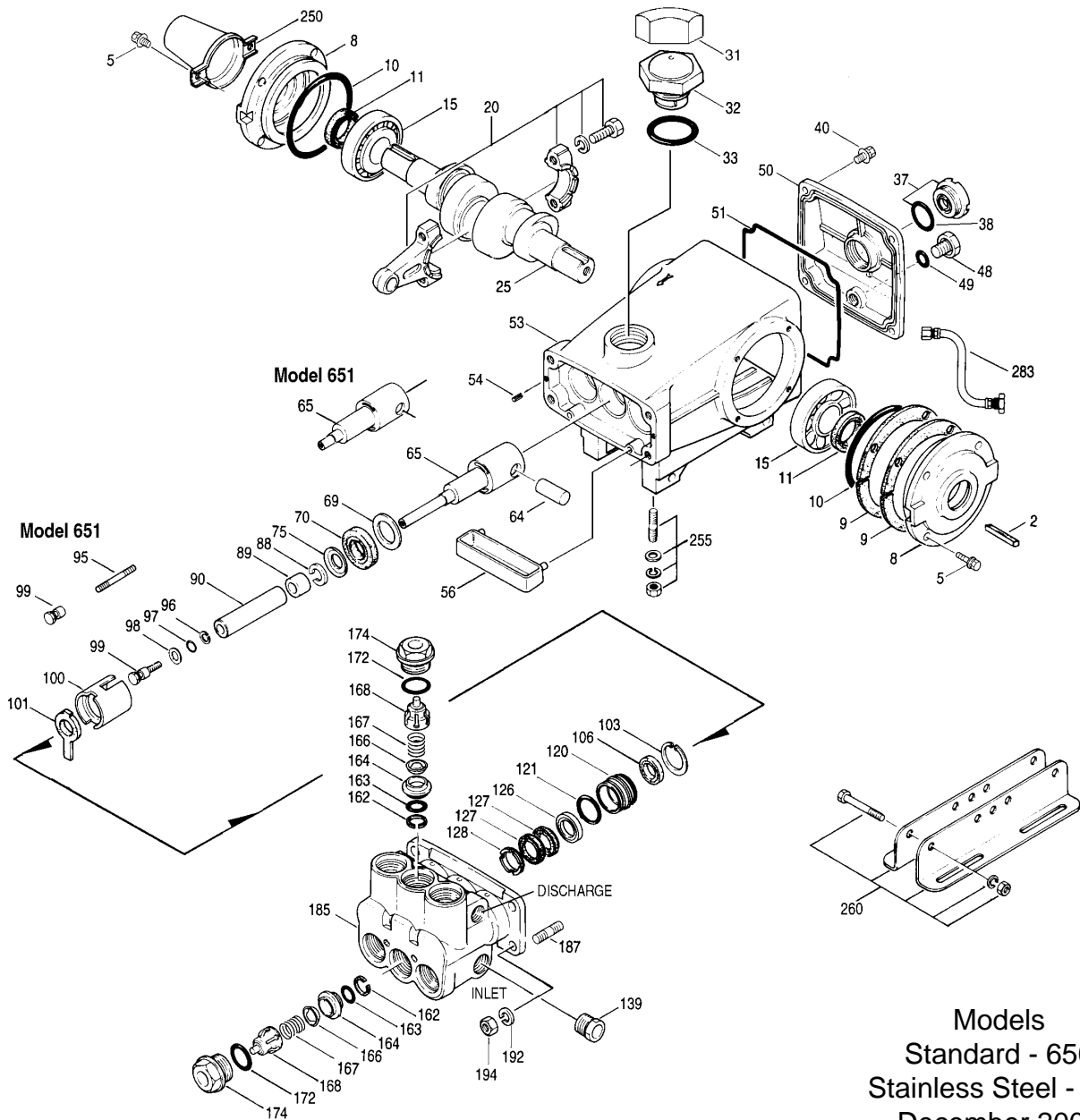
See complete Drive Packages [Incls: Pulleys, Belts, Hubs, Key] Tech Bulletin 003.
Refer to pump **Service Manual** for repair procedure, additional technical information and **pump warranty**.

"Customer confidence is our greatest asset"

PARTS LIST

ITEM	PART NUMBER		DESCRIPTION	QTY
	650	651		
2	30067	30067	Key (M8x7.5x25)	1
5	92519	92538	Screw, Sems, HHC (M6x16)	8
8	43496	43496	Cover, Bearing	2
9	43520	43520	Split Shim, Bearing Cover, 2 Pc.	2
	—	45387	Split Shim, Bearing Cover, 2 Pc.	2
10	11340	11340	O-Ring, Bearing Case - 70D	2
11	43495	43495	Seal, Oil, Crankshaft - 70D	2
15	39060	39060	Bearing, Roller	2
20	48600	48600	Rod Assy, Connecting [11/00]	3
25	43494	43494	Crankshaft - Dual End	1
31	828710	828710	Protector, Oil Cap	1
32	43211	43211	Cap, Oil Filler	1
33	14177	14177	O-Ring, Filler Cap - 70D	1
37	92241	92241	Gauge, Oil, Bubble w/Gasket - 80D	1
38	44428	44428	Gasket, Flat, Oil Gauge - 80D	1
40	92520	92542	Screw, Sems HH (M6x20)	4
48	25625	25625	Plug, Drain (1/4"x19BSP)	1
49	23170	23170	O-Ring, Drain Plug - 70D	1
50	43491	43491	Cover, Rear	1
51	44834	44834	O-Ring, Rear Cover - 70D	1
53	43488	43488	Crankcase w/Guide Pins	1
54	27488	27488	Pin, Guide	2
56	44664	44664	Pan, Oil	1
64	43507	43507	Pin, Crosshead	3
65	43501	—	Rod, Plunger, Long	3
	—	48892	Rod, Plunger, Short [3/02]	3
69	43504	43504	Washer, Seal	3
70	43500	43500	Seal, Oil, Crankcase - 80D	3
75	43506	43506	Slinger, Barrier	3
88	45675	45675	Washer, Keyhole	3
89	43505	45880	Spacer, Plunger	3
90	43300	43300	Plunger (M20x77)	3
95	—	89651	Stud, Plunger Retainer (M6x70)	3
96	43235	43235	Back-up-Ring, Plunger Retainer	3
97	17399	17399	O-Ring, Plunger Retainer - 80D	3
	14160	14160	O-Ring, Plunger Retainer - 80D	3
	◆ 46204	◆ 46204	O-Ring, Plunger Retainer - 70D	3
98	45891	44041	Gasket, Plunger Retainer	3
99	—	44031	Retainer, Plunger (M6)	3
	104360	—	Retainer w/stud, Plunger (M5)	3
100	43509	43509	Retainer, Seal	3
101	43508	43508	Wick, Long Tab	3
103	44036	44036	Ring, Retaining	3
106	44071	44071	Seal, LPS w/SS-Spg	3
	44381	44381	Seal, LPS w/SS-Spg	3
	701974	701974	Seal, LPS w/SS-Spg	3
120	46065	48465	Case, Seal	3
121	14762	14762	O-Ring, Seal Case - 70D	3
	11737	11737	O-Ring, Seal Case - 75D	3
	◆ 46205	◆ 46205	O-Ring, Seal Case - 70D	3
126	43515	48388	Adapter, Female	1
127	44607	44607	V-Packing	6
	44386	44386	V-Packing	6
128	43517	44165	Adapter, Male	3
139	20326	44382	Plug, Inlet (3/4" NPT)	1
162	43248	43248	Back-up-Ring, Seat	6
163	43249	43249	O-Ring, Seat - 80D	6
	44383	44383	O-Ring, Seat - 70D	6
	◆ 46206	◆ 46206	O-Ring, Seat - 70D	6
164	43722	44037	Seat	6
166	43721	48793	Valve	6
167	43751	44039	Spring	6
168	44564	44564	Retainer, Spring	6
172	17617	17617	O-Ring, Valve Plug - 90D	6
	11691	11691	O-Ring, Valve Plug - 90D	6
	◆ 46207	◆ 46207	O-Ring, Valve Plug - 70D	6
174	43851	48463	Plug, Valve	6
	43850	—	Plug, Valve	6
185	45975	48780	Head, Manifold	1
187	14050	44005	Stud (M10x45)	4
192	12503	15847	Lockwasher (M10)	4
194	81048	81258	Nut, Hex (M10)	4
250	30764	30764	Protector, Shaft w/2 Screws	1
255	30264	30264	Kit, Direct Mount	1
260	30613	30613	Mount, Rail Assy - A (30635,30903,30921,30912)	1
	990550	990550	Mount, Rail (Required on Diesel/Gas)	1
269	30206	30206	Pulley (10") AB [See Drive Packages, Tech Bulletin 003]	1
274	30059	30059	Hub, "H" (M30) (Keyway M8) [See Drive Packages, Tech Bulletin 003]	1

EXPLODED VIEW



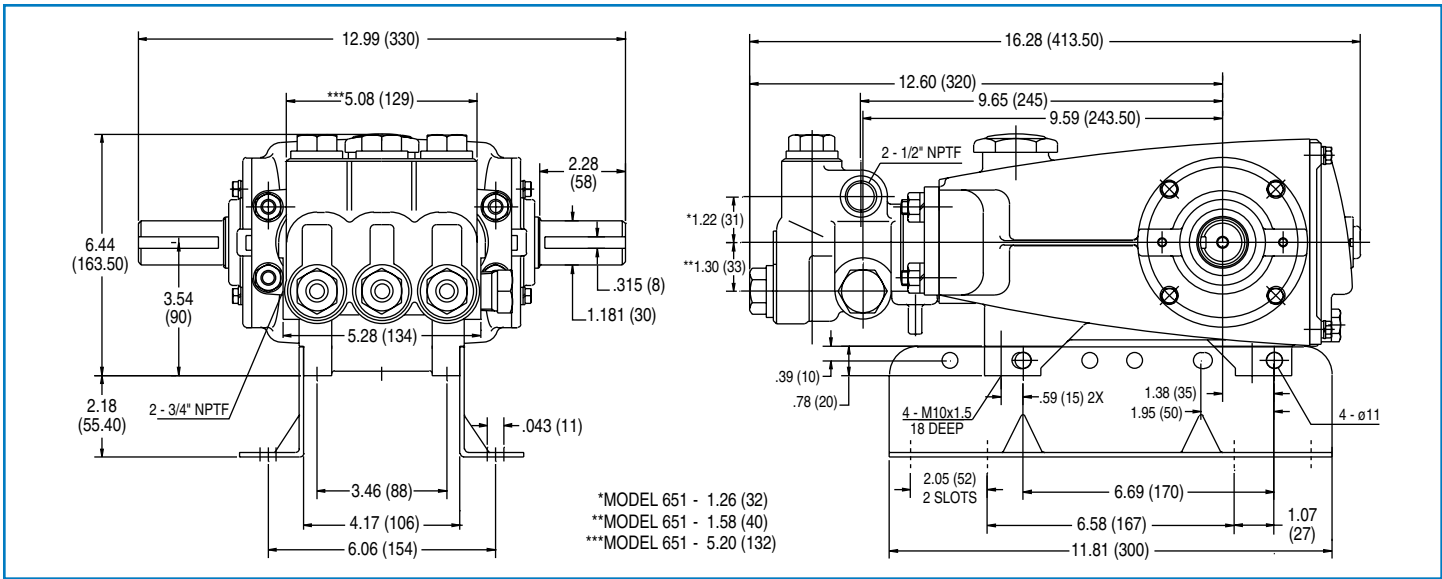
Models
Standard - 650
Stainless Steel - 651
December 2008

	650	MATL	651	MATL		
283	34334	—	34334	—	Kit, Oil Drain	1
299	814561	BB	816780	SS	Head, Complete	1
300	30798	<i>NBR*</i>	30798	<i>NBR*</i>	Kit, Seal (Incls: 97,103,106,121,127)	1
	31033	<i>FPM</i>	31033	<i>FPM</i>	Kit, Seal (Incls: 97,103,106,121,127)	1
	◆ 33919	<i>EPDM*</i>	◆ 33919	<i>EPDM*</i>	Kit, Seal (Incls: 97,103,106,121,127)	1
310	30820	NBR	34387	NBR	Kit, Valve (Incls: 162,163,164,166,167,168,172)	2
	31256	FPM	30987	FPM	Kit, Valve (Incls: 162,163,164,166,167,168,172)	2
	◆ 31253	EPDM	◆ 31258	EPDM	Kit, Valve (Incls: 162,163,164,166,167,168,172)	2
350	30696	<i>STZP</i>	30696	<i>STZP</i>	Plier, Reverse	1
351	43523	<i>STZP</i>	43523	<i>STZP</i>	Tool, Seal Case Removal	1
	33006	<i>STZP</i>	33006	<i>STZP</i>	Socket, Seal Case 1/2" Drive	1
352	44050	<i>STZP</i>	44050	<i>STZP</i>	Tool, Oil Gauge Removal	1
—	6107	—	6107	—	Oil, Bottle (21 oz.) ISO-68 Hydraulic (Fill to specified crankcase capacity prior to start-up)	1
—	6575	—	6575	—	Plunger Pump Service DVD	

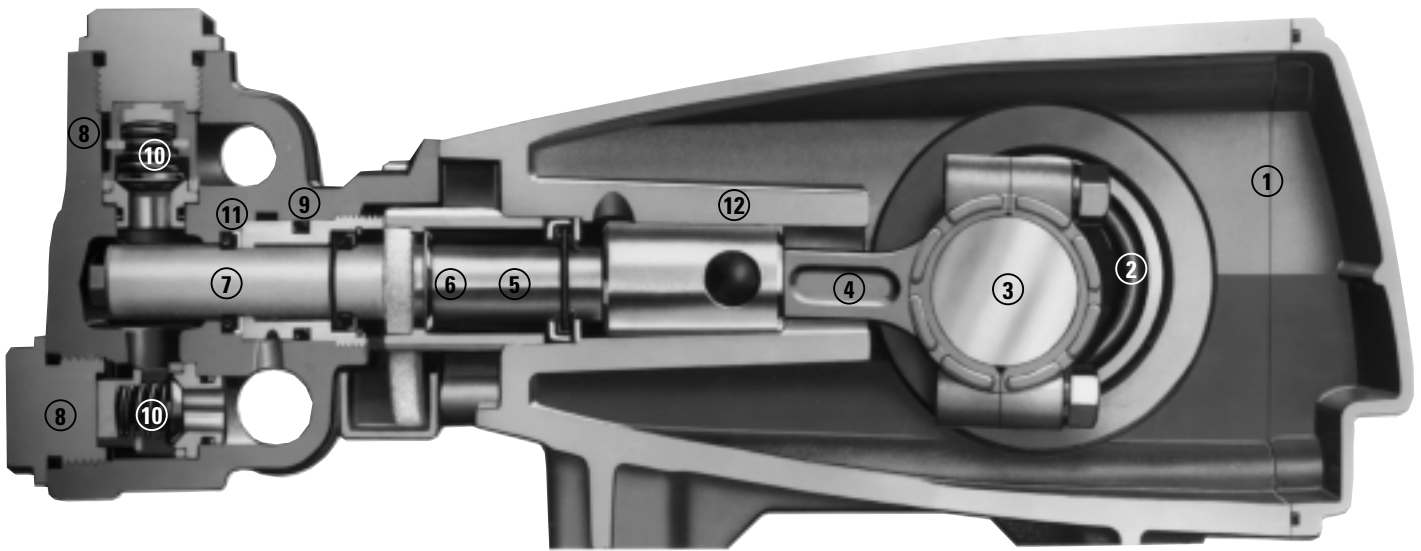
Bold part numbers are unique to a particular pump model. Italics are optional items. [] Date of latest production change.
◆ Silicone oil/grease required. * Review material codes for individual items (HT generally may be used as alternate).
See Tech Bulletins 002, 003, 024, 027, 035, 036, 043, 045, 048, 049, 052, 053, 062, 074, 077 and 083 for additional information.

C. A.T. highly recommended for pressurized inlet, R.O. and Industrial applications.

MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BB=Brass BBCP=Brass/Chrome Plated CC=Ceramic CM=Chrome-Moly CU=Copper
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) NY=Nylon POP=Polypropylene PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride S=304SS
SFTB=Special Blend PTFE Black SS=316SS SSD=Duplex Stainless SSHS=316SS/High Strength SSL=316SS/Low Carbon SSNP=316SS/Nickel Plated
STCP=Steel/Chrome Plated STG=Special Blend PTFE White STL=Steel STZP=Steel/Zinc Plated SZZ=304SS/Zamak TNM=Special High Strength



Models 650, 651



- 1 Die cast aluminum **crankcase** means high strength, lightweight, and excellent tolerance control.
- 2 Oversized crankshaft **bearings** provide extended bearing life and pump performance.
- 3 Chrome-moly **crankshaft** provides unmatched strength and surface hardness for long life.
- 4 Matched oversized high strength **connecting rods** are noted for superior strength and bearing quality.
- 5 Special stainless steel **plunger rods** with high strength crossheads for longevity and corrosion resistance.
- 6 The stainless steel **slinger** provides back-up protection for the crankcase seal, keeping pumped liquids out of the crankcase.
- 7 Special concentric, high-density, polished, solid ceramic **plungers** provide a true wear surface and extended seal life.
- 8 **Manifolds** are a high tensile strength bronze or Duplex stainless steel for long term, continuous duty and corrosion resistance.
- 9 100% **wet seal** design adds to service life by allowing pumped liquids to cool and lubricate on both sides.
- 10 Stainless steel **valves, seats and springs** provide corrosion-resistance, positive seating and long life.
- 11 Specially formulated, CAT PUMP exclusive, **V-Packings** offer unmatched performance and seal life.
- 12 **Crossheads** are 360° supported for uncompromising alignment.

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