



(Rails and Shaft Protector sold separately)

## 3 Frame Piston Pump

### Brass Models

**280**  
**290**

### Stainless Steel Models

**281**  
**291**

### FEATURES

- Triplex UNIFLOW design provides a smooth, low-pulsation flow with strong suction capabilities.
- Hard chrome-plated 304S cylinders and sleeves provide long life with mild liquids within a range of 5-9 PH.
- Optional 316 Stainless Steel manifolds for added strength and corrosion resistance.
- Optional FPM and PTFE elastomers for liquid compatibility.

### COMMON SPECIFICATIONS

Inlet Pressure Range .....	-8.5 to 40 psi	(-0.6 to + 2.8 bar)
Bore .....	0.787"	(20 mm)
Crankcase Capacity .....	10 oz.	(.3 l)
Maximum Liquid Temperature .....	160°F	(71°C)
Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations.		
Inlet Port (1) .....	1/2" NPTF	(1/2" NPTF)
Chemical Injection Port (1) .....	1/4" NPTF	(1/4" NPTF)
Discharge Ports (2) .....	3/8" NPTF	(3/8" NPTF)
Discharge Port (1) .....	1/2" NPTF	(1/2" NPTF)
Pulley Mounting .....	Either side	(Either side)
Shaft Diameters .....	0.650"	(16.5 mm)
Dimensions (280) .....	10.63 x 8.79 x 5.30"	(270 x 223 x 134.5 mm)
Dimensions (290) .....	10.83 x 8.79 x 5.30"	(275 x 223 x 134.5 mm)

#### ⚠ 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](http://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](http://www.catpumps.com/warranty).

### SPECIFICATIONS

U.S. Measure

Metric Measure

#### MODEL 280 and 281

Flow .....	3.0 gpm	(11.4 l/m)
Pressure Range .....	100 to 1000 psi	(7 to 70 bar)
RPM .....	1330 rpm	(1330 rpm)
Stroke .....	0.394"	(10 mm)
Weight .....	11.7 lbs.	(5.3 kg)

#### MODEL 290 and 291

Flow .....	3.5 gpm	(13.2 l/m)
Pressure Range .....	100 to 1200 psi	(7 to 85 bar)
RPM .....	1200 rpm	(1200 rpm)
Stroke .....	0.472"	(12 mm)
Weight .....	12.1 lbs.	(5.5 kg)

### ELECTRIC HORSEPOWER REQUIREMENTS

MODEL	FLOW		PRESSURE			MOTOR PULLEY SIZE	
	U.S. gpm	l/m	psi 800	psi 1000	psi 1200	Using 1725 Nom. RPM Motor & 5.0" Pump Pulley O.D.	
280	3.0	11.4	1.6	2.1	N/A	1330	3.9
	2.5	9.5	1.4	1.7	N/A	1108	3.2
	2.0	7.6	1.1	1.4	N/A	887	2.8
290	3.5	13.2	1.9	2.4	2.9	1200	3.5
	3.0	11.4	1.6	2.1	2.5	1029	3.0
	2.5	9.5	1.4	1.7	2.1	858	2.5

**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.**

$$\frac{\text{gpm} \times \text{psi}}{1460} = \text{Electric Brake H. P. Required}$$

**DETERMINING MOTOR PULLEY SIZE**

$$\frac{\text{Motor Pulley O.D.}}{\text{Pump rpm}} = \frac{\text{Pump Pulley O.D.}}{\text{Motor rpm}}$$

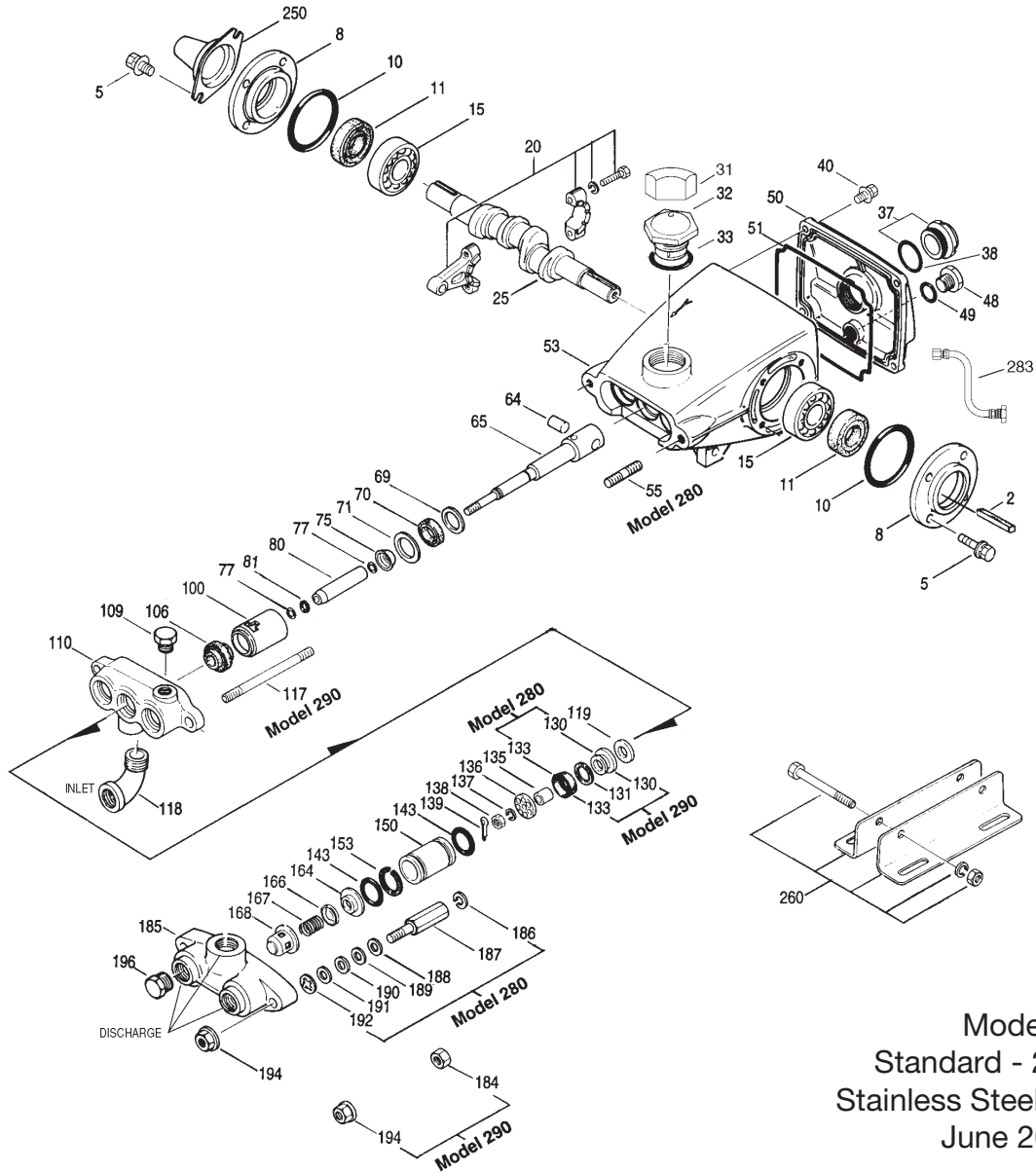
See complete Drive Packages [Incls: Pulleys, Belts, Hubs, Key] Tech Bulletin 003. Refer to pump **Service Manual** for repair procedure and additional technical information.

*"Customer confidence is our greatest asset"*

# PARTS LIST

ITEM	PART NUMBER		DESCRIPTION	QTY		
	<b>280</b>	<b>290</b>				
	<b>281</b>	<b>291</b>	<b>MATL</b>	<b>MATL</b>		
2	30047	STL	30047	STL	Key (M5x5x24)	1
5	92519	STZP	92519	STZP	Screw, HHC Sems (M6x16)	8
	125824	STCP R	125824	STCP R	Screw, HHC Sems (M6x16)	8
8	27950	AL	27950	AL	Cover, Bearing	2
10	26536	NBR	26536	NBR	O-Ring, Bearing Cover - 70D	2
11	24159	NBR	24159	NBR	Seal, Oil, Crankshaft	2
15	14487	STL R	14487	STL R	Bearing, Ball	2
20	<b>122041</b>	<b>TNM</b>	<b>48867</b>	<b>TNM</b>	Rod, Assy Connecting [280-8/02, 290-9/02]	3
25	<b>26239</b>	<b>FCM</b>	<b>43804</b>	<b>FCM</b>	Crankshaft	1
31	828710	—	828710	—	Protector, Oil Cap w/Foam Gasket	1
32	43211	ABS	43211	ABS	Cap, Oil Filler	1
33	14177	NBR	14177	NBR	O-Ring, Oil Filler Cap - 70D	1
37	92241	—	92241	—	Gauge, Oil Bubble w/Gasket - 80D	1
38	44428	NBR	44428	NBR	Gasket, Flat, Oil Gauge - 80D	1
40	92520	STZP	92520	STZP	Screw, HHC Sems (M6x20)	4
	126541	STCP R	126541	STCP R	Screw, HHC Sems (M6x20)	4
48	25625	STCP	25625	STCP	Plug, Drain (1/4"x19BSP)	1
49	23170	NBR	23170	NBR	O-Ring, Drain Plug - 70D	1
50	48772	AL	48772	AL	Cover, Rear (07/08) (See Tech Bulletin 104)	1
51	48773	NBR	48773	NBR	O-Ring, Rear Cover (07/08) (See Tech Bulletin 104)	1
53	128361	AL	128361	AL	Crankcase, 4 Screws (07/08) (See Tech Bulletin 104)	1
55	<b>126546</b>	<b>STCP R</b>	—	—	Stud (M8x41.4)	2
64	16948	CM	16948	CM	Pin, Crosshead	3
65	<b>29612</b>	<b>SZZ</b>	<b>101800</b>	<b>SZZ</b>	Rod, Piston	3
69	126259	STCP R	126259	STCP R	Washer, Oil Seal	3
70	25301	NBR	25301	NBR	Seal, Oil - 80D	3
71	126189	STCP R	126189	STCP R	Washer, Oil Seal	3
75	25327	S	25327	S	Slinger, Barrier	3
77	25392	NBR	25392	NBR	O-Ring, Sleeve	6
	28771	FPM	28771	FPM	O-Ring, Sleeve	6
	28772	PTFE	28772	PTFE	O-Ring, Sleeve	6
80	29614	SCP	29614	SCP	Sleeve	3
	29743	S	29743	S	Sleeve (Unchromed)	3
81	—	—	<b>29003</b>	<b>PTFE</b>	Back-up-Ring, Sleeve	3
100	28597	PVDF	28597	PVDF	Retainer, Seal	3
106	30315	NBR	30315	NBR	Seal, LPS, Prrrrm-A-Lube	3
	30325	FPM	30325	FPM	Seal, LPS, Prrrrm-A-Lube	3
109	22177	BBCP	22177	BBCP	Plug HH (1/4" NPT)	1
110	25128	BBCP	25128	BBCP	Manifold, Inlet	1
	25635	SS	25635	SS	Manifold, Inlet	1
117	—	—	<b>85680</b>	<b>STCP</b>	Stud (M8x99.5)	2
118	22160	BBCP	22160	BBCP	Elbow (1/2" NPT)	1
119	27004	S	27004	S	Valve, Inlet	3
130	<b>22021</b>	<b>S</b>	<b>30543</b>	<b>S</b>	Piston	3
131	—	—	<b>30544</b>	<b>PTFE</b>	Bac-Cup Ring	3
133	43172	FPM	43172	FPM	Cup, Piston	3
133	—	—	<b>43474</b>	<b>FPM</b>	Assy, Bac-Cup (Incls: 130, 131, 133) (290 Only)	3
133	29089	SNG	29089	SNG	Cup, V-Hot	3
	30145	TG	30145	TG	Cup-Piston, w/FPM O-Ring (1000 psi max)	3
135	<b>27003</b>	<b>S</b>	<b>27983</b>	<b>S</b>	Spacer, Piston	3
136	27002	S	27002	S	Retainer, Piston	3
137	27006	S	27006	S	Washer, Conical (M6)	3
138	27000	S	27000	S	Nut (M6)	3
139	14158	S	14158	S	Cotterpin (M1.6x10)	3
143	23172	NBR	23172	NBR	O-Ring, Cylinder -70D	6
	11377	FPM	11377	FPM	O-Ring, Cylinder -80D	6
	26961	PTFE	26961	PTFE	O-Ring, Cylinder	6
150	<b>26112</b>	<b>SCP</b>	<b>101802</b>	<b>SCP</b>	Cylinder	3
	<b>28774</b>	<b>S</b>	<b>43834</b>	<b>S</b>	Cylinder (Unchromed)	3
153	—	—	<b>21985</b>	<b>PTFE</b>	Back-Up-Ring, Cylinder	3
164	43434	S	43434	S	Seat, Q.V.	3
	29487	S	29487	S	Seat, F.V.	3
166	43723	S	43723	S	Valve, Q.V.	3
	22842	S	22842	S	Valve, F.V.	3
167	43360	S	43360	S	Spring, Q.V.	3
	22031	S	22031	S	Spring, F.V.	3
168	43442	S	43442	S	Retainer, Spring, Q.V.	3
	22841	S	22841	S	Retainer, Spring, F.V.	3
184	—	—	<b>126521</b>	<b>STCP R</b>	Nut, Hex (M8)	2
185	24459	BBCP	24459	BBCP	Manifold, Discharge	1
	25634	SS	25634	SS	Manifold, Discharge	1
186	<b>15845</b>	<b>STZP</b>	—	—	Lockwasher (M8)	2
	<b>126232</b>	<b>STCP R</b>	—	—	Lockwasher (M8)	2
187	<b>126565</b>	<b>STCP R</b>	—	—	Bolt, Cylinder (M8x62.5)	2
188	<b>126813</b>	<b>STCP R</b>	—	—	Shim (M8x13x1.0)	2-4
189	<b>126576</b>	<b>STCP R</b>	—	—	Shim (M8x13x0.5)	2-4
190	<b>126590</b>	<b>STCP R</b>	—	—	Shim (M8x13x0.3)	2-4
191	<b>126591</b>	<b>STCP R</b>	—	—	Shim (M8x13x2.0)	2-4
192	<b>26676</b>	<b>S</b>	—	—	Lockwasher (M8)	2

# EXPLODED VIEW



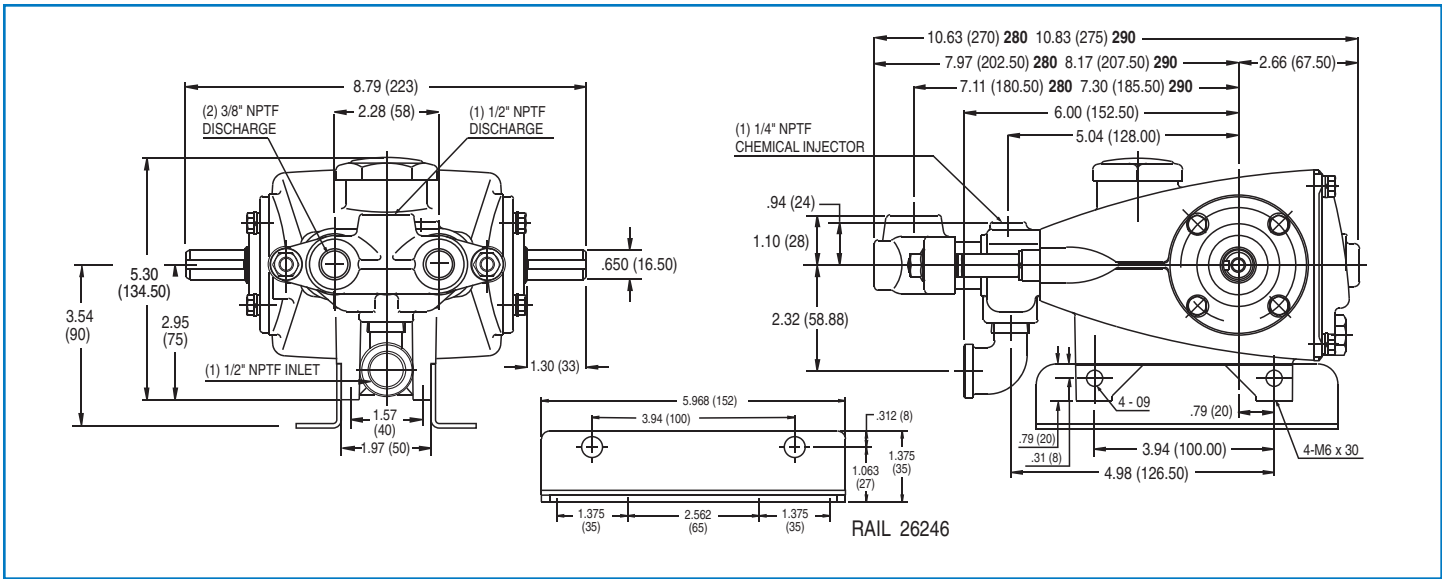
Models  
Standard - 280, 290  
Stainless Steel - 281, 291  
June 2010

	<b>280</b>	<b>MATL</b>	<b>290</b>	<b>MATL</b>			
194	<b>281</b>	126201	STCP R	126201	STCP R	Nut, Hex Flange (M8)	2
196		22187	BBCP	22187	BBCP	Plug HH (3/8" NPT)	1
250		25130	STCP	25130	STCP	Protector, Shaft	1
260		30612	STZP R	30612	STZP R	Assy, Angle Rail	1
270		30246	STL	30246	STL	Pulley Assy (Incls: 30032, 30047)	1
275		30942	STL	30942	STL	Hub & Key Assy (Incls: 30943, 30047)	1
283		34334	—	34334	—	Kit, Oil Drain (3/8"x24") (See Tech Bulletin 077)	1
298		34961	STZP	34961	STZP	Clutch, Assy, Single Groove, 16.5mm, 12VDC	1
		34964	STZP	34964	STZP	Clutch, Assy, Dual Groove, 16.5mm, 12VDC	1
300		<b>30023</b>	<b>FPM</b>	—	—	Kit, Cup (Incls: 133, 139, 143, 355)	1
		—	—	<b>76023</b>	<b>FPM</b>	Kit, Cup (Incls: 131, 133, 139, 143, 355)	1
		701443	TG	701443	TG	Kit, Cup (Incls: 133, 139, 143)	1
302		<b>30202</b>	<b>NBR</b>	<b>30860</b>	<b>NBR</b>	Kit, Piston (Incls: 119-139, 143, 153, 355)	1
304		30272	NBR	30272	NBR	Kit, Hot Cup (Incls: 133, 139, 143)	1
305		30431	NBR	30431	NBR	Kit, Sleeve & Seal (Incls: 75, 77, 80, 106, 139)	1
306		30305	NBR	30305	NBR	Kit, Seal (Incls: 106, 139)	1
310		30686	NBR	30686	NBR	Kit, Valve, Quiet Valves (Incls: 143, 164, 166, 167, 168)	1
		30024	NBR	30024	NBR	Kit, Valve, Flat Valves (Incls: 143, 164, 166, 167, 168)	1
355		22130	NY	22130	NY	Insertor, Cup	1
		6107	—	6107	—	Oil, Bottle (21 oz.) ISO 68 Hydraulic (Fill to specified crankcase capacity prior to start-up)	1

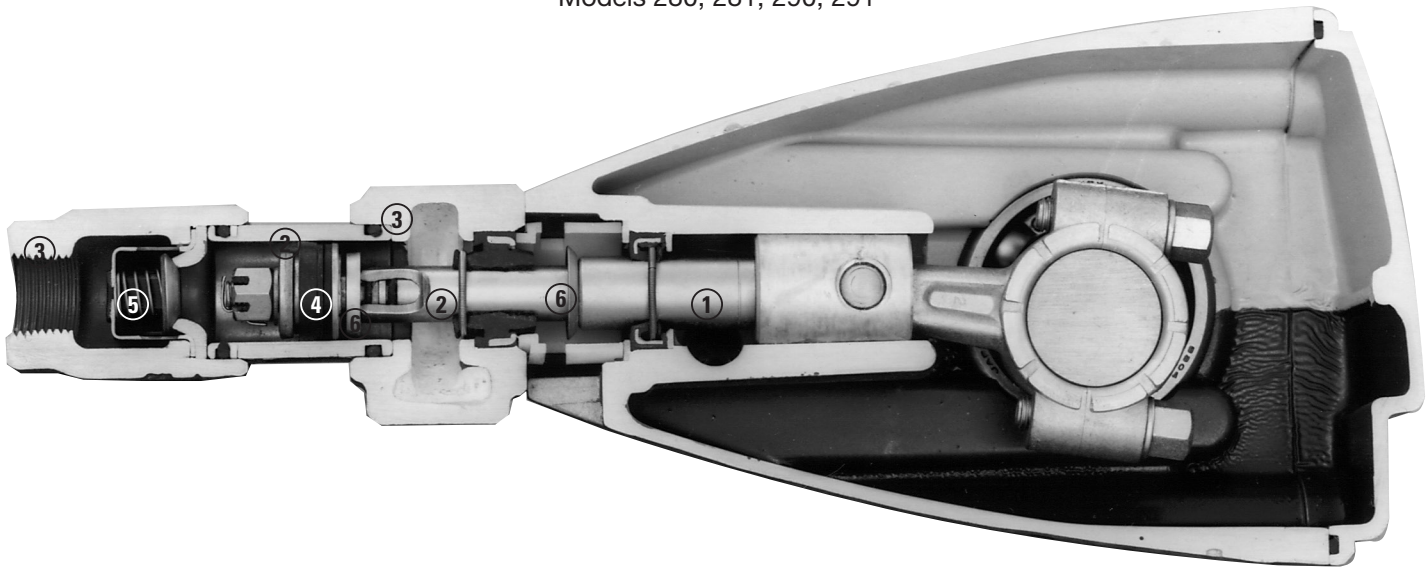
**Bold print part numbers are unique to a particular pump model. Italics are optional items.** [ ] Date of latest production change. R Components comply with RoHS Directive. View Tech Bulletins 002, 003, 012, 016, 017, 020, 024, 026, 030, 033, 034, 036, 074, 077, 083 and 104 for additional information.

All Q.V. parts are necessary for conversions, Q.V. and F.V. parts cannot be mixed.

MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BBCP=Brass/Chrome Plated CM=Chrome-moly FCM=Forged Chrome-moly FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) NY=Nylon PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride S=304SS SCP=304SS/Chrome Plated SNG=Special Blend (Buna) SS=316SS STCP=Steel/Chrome Plated STL=Steel STZP=Steel/Zinc Plated SZZ=304SS/Zamak TG= PTFE Graphite Compound (GIT) TNM=Special High Strength



Models 280, 281, 290, 291



- 1 The **patented stepped piston rod sleeve** provides a durable wear surface and easy wet-end servicing.
- 2 The **cylinder and sleeve wear surfaces** are hard chrome-plated 304 stainless steel for longer service life.
- 3 **Manifolds** are of high tensile strength chrome-plated brass or 316 stainless steel for added corrosion resistance.
- 4 100% wet **cup/seal** design adds to service life by allowing pumped liquids to cool and lubricate the elastomers on both sides.
- 5 304 stainless steel **valves, seats, and springs** provide corrosion-resistance, ultimate seating and extended life.
- 6 Mechanically actuated **inlet valves** provide strong lift and easy prime.

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