

DATA SHEET

35 FRAME PLUNGER PUMPS

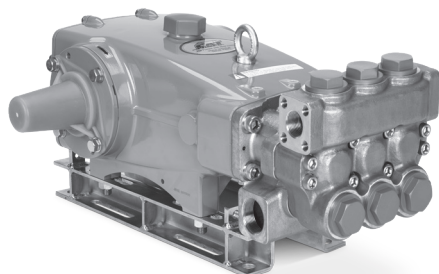


Brass
3535HS

Stainless Steel
3531DHS

**Stainless Steel
Flushed**
3531CHS

**Nickel Aluminum
Bronze**
3537HS



Model 3531DHS Shown
(Shaft protector included, mounting rails sold separately)

FEATURES

- Triplex plunger design ensures high efficiency and low pulsation.
- Advanced connecting rod and plunger rod materials optimize drive-end operation for continuous-duty applications and increase capabilities for intermittent-duty performance.
- V-packings and low-pressure seals are completely lubricated and cooled by pumped liquid, greatly increasing service life.
- Model 3531CHS provides an external flush for high-temperature or low-lubricity liquids.
- Pump comes standard with NBR seals. Alternative seal materials are available for higher temperature or chemical compatibility.

SPECIFICATIONS

	U.S. Measure	Metric Measure
Flow	36 gpm	136 lpm
Pressure Range	100–1200 psi	6.9–83 bar
Pump RPM*	800 rpm	800 rpm
Inlet Pressure Range	Flooded to 70 psi	Flooded to 4.8 bar
Maximum Liquid Temp. (NBR)	160° F	71° C

Alternative seals available for higher temperatures up to 200° F

Bore	1.575"	40 mm
Stroke	1.890"	48 mm
Crankcase Capacity	4.2 qts	4 l
Inlet Ports (2)	1½" NPT(F)	1½" NPT(F)
Flush Ports (2)	¼" NPT (F)	¼" NPT (F)
Discharge Ports (2)	1" NPT(F)	1" NPT(F)
Shaft Diameter	1.378"	35 mm
Pulley Mounting	Either Side	Either Side
Weight	139 lbs	63 kg
Dimensions	24.33 x 18.11 x 9.72"	618 x 460 x 247 mm

ALTERNATE SPECIFICATIONS**

Flow	40 gpm	151 lpm
Pressure Range	100–2000 psi	6.9–138 bar
Pump RPM*	888 rpm	888 rpm

* Pump minimum is 100 RPM.

** Intermittent Duty Cycle Defined As:

Operating pump at maximum rated flow and pressure for no more than 50% of time in any given hour.

ALTERNATIVE SEAL CONFIGURATION

MATERIAL	SUFFIX CODE	MAXIMUM TEMPERATURE
NBR	—	160° F (71° C)
FPM	.0110	180° F (82° C)
EPDM	.0220	160° F (71° C)
FFKM	.0770	200° F (93° C)

See **Tech Bulletin 002** for inlet conditions and RPM at higher temperatures.

DETERMINING THE PUMP RPM

$$\frac{\text{Rated gpm}}{\text{Rated rpm}} = \frac{\text{Desired gpm}}{\text{Desired rpm}}$$

DETERMINING THE REQUIRED HP

$$\frac{\text{hp (Electric Brake)}}{1460} = \frac{\text{gpm} \times \text{psi}}{1460}$$

DETERMINING MOTOR PULLEY SIZE

$$\frac{\text{Motor Pulley OD}}{\text{Pump rpm}} = \frac{\text{Pump Pulley OD}}{\text{Motor rpm}}$$

Refer to pump **Service Manual** for repair procedure and additional technical information.

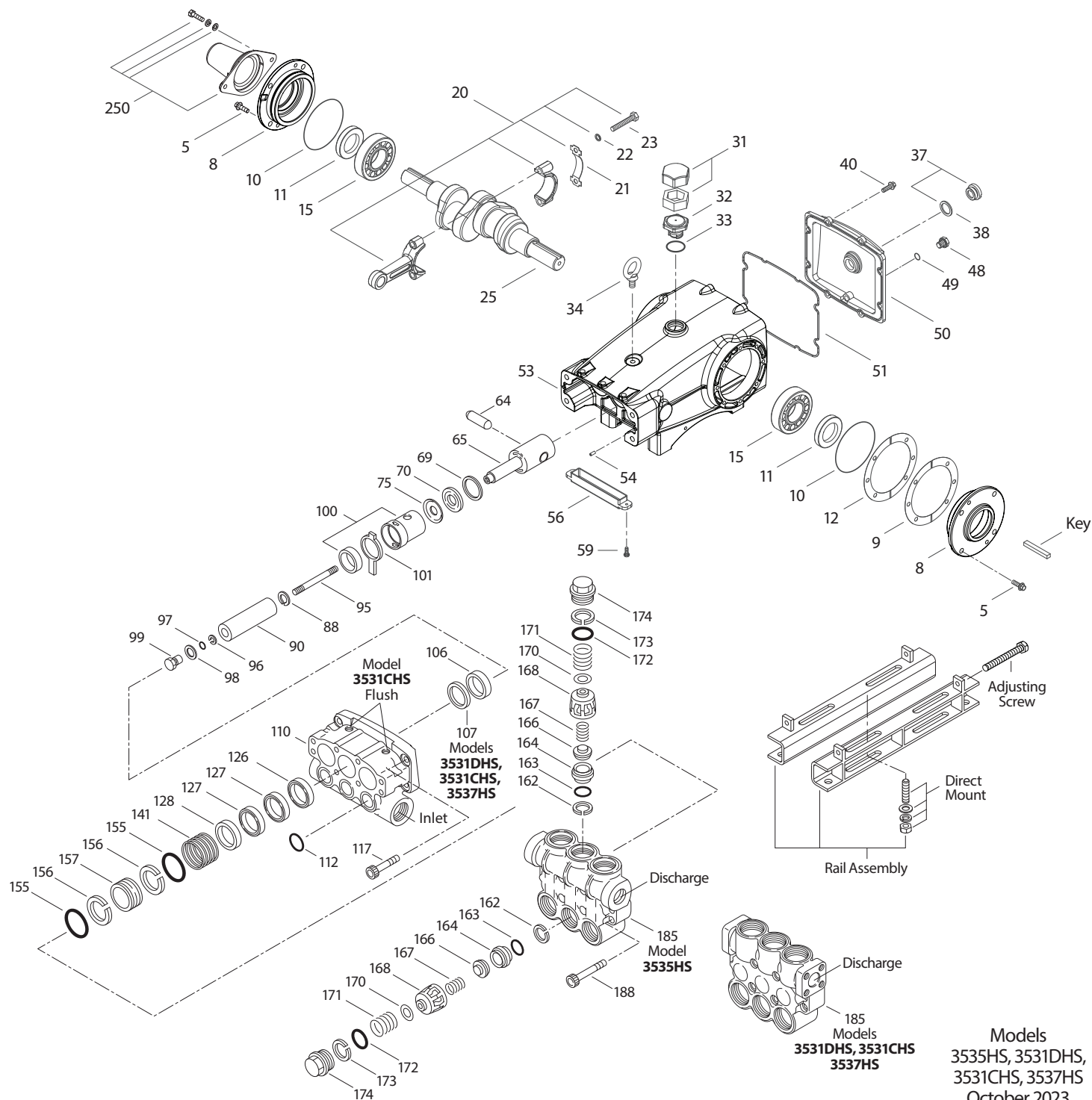
PARTS LIST

ITEM	PART NUMBER						DESCRIPTION	QTY
	3535HS	MATL	3531DHS 3531CHS	MATL	3537HS	MATL		
5	96049	S	96049	S	96049	S	Screw, HHC Sems (M10x25) (See Tech Bulletin 074)	8
8	134604	ALE	134604	ALE	134604	ALE	Cover, Bearing	2
9	815279	FBR	815279	FBR	815279	FBR	Shim, Split 2-Piece	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
12	855049	S	855049	S	855049	S	Shim, Split 2-Piece	0-2
15	29326	STL	29326	STL	29326	STL	Bearing, Roller	2
20	126725	BZ R	126725	BZ R	126725	BZ R	Rod, Connecting Assembly (Includes: 21, 22, 23) (See Tech Bulletin 074)	3
21	126749	STCP R	126749	STCP R	126749	STCP R	Locking Washer (M10)	3
22	126593	STCP R	126593	STCP R	126593	STCP R	Washer, Flat (M10.5)	6
23	122045	STZP	122045	STZP	122045	STZP	Screw, HH (M10 x 55)	6
25	29325	FCM	29325	FCM	29325	FCM	Crankshaft, Dual End (M48)	1
31	828710	PE	828710	PE	828710	PE	Protector, Oil Cap with 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 (M12 x 1.75) (For Lifting Pump Only)	1
37	92241	PC	92241	PC	92241	PC	Gauge, Oil, Bubble with Gasket	1
38	44428	NBR	44428	NBR	44428	NBR	Gasket, Flat, Oil Gauge-80D	1
40	125753	S	125753	S	125753	S	Screw, HHC Sems (M8 x 25) (See Tech Bulletin 074)	8
48	25625	STCP	25625	STCP	25625	STCP	Plug, Drain (1/4" x 19 BSP)	1
49	23170	NBR	23170	NBR	23170	NBR	O-Ring, Drain Plug-70D	1
50	45936	ALE	45936	ALE	45936	ALE	Cover, Rear	1
51	16612	NBR	16612	NBR	16612	NBR	O-Ring, Crankcase Cover-70D	1
53	134784	ALE	134784	ALE	134784	ALE	Crankcase Assembly (Includes: 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 (M6 x 16)	2
64	43864	CM	43864	CM	43864	CM	Pin, Crosshead	3
65	49166	SSHB	49166	SSHB	49166	SSHB	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
75	43865	S	43865	S	43865	S	Slinger, Barrier	3
88	45676	S	45676	S	45676	S	Washer, Keyhole (M16)	3
90	43921	CC	43921	CC	43921	CC	Plunger (M40 x 145)	3
95	† 89778	SS	89778	SS	89778	SS	Stud, Plunger Retainer (M10 x 135)	3
96	20189	PTFE	20189	PTFE	20189	PTFE	Backup Ring, Plunger Retainer	3
97	11345	NBR	11345	NBR	11345	NBR	O-Ring, Plunger Retainer-70D	3
98	44085	SS	44085	SS	44085	SS	Gasket, Retainer	3
99	† 44084	SS	44084	SS	44084	SS	Retainer, Plunger (M10) (See Tech Bulletin 074)	3
100	814279	PVDF	814279	PVDF	814279	PVDF	Retainer, Seal, 2-Piece	3
101	44112	—	44112	—	44112	—	Wick, Long Tab	3
106	† 44113	NBR	44113	NBR	44113	NBR	Seal, Low-Pressure with SS-Spring	3
107	—	—	45381	SS	44115	NAB	Spacer, Low-Pressure Seal	3
110	49464	BBCP R	45365	SS	45124	NAB	Manifold, Inlet	1
	—	—	125397	SS	—	—	Manifold, Inlet, Flushed (Model 3531CHS)	1
112	11379	NBR	11379	NBR	11379	NBR	O-Ring, Inlet Manifold-70D	3
117	44585	S	44585	S	44585	S	Screw, HSH (M14 x 40) (See Tech Bulletin 074)	4
126	46494	BB	48391	D	48391	D	Adapter, Female	3
127	44609	STG	44609	STG	44609	STG	V-Packing	6
128	43928	BB	45368	SS	45368	SS	Adapter, Male	3
141	49519	SS	49519	SS	49519	SS	Spring, Large Coil	3
155	48860	NBR	48860	NBR	48860	NBR	O-Ring, V-Packing Spacer-90D	6
156	48362	D	48362	D	48362	D	Backup Ring, V-Packing Spacer	6
157	49478	BB	49520	SS	49521	NAB	Spacer, V-Packing	3
162	48363	D	48363	D	48363	D	Backup Ring, Valve Seat	6
163	26142	NBR	26142	NBR	26142	NBR	O-Ring, Seat-80D	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 (70 kg), Valve Plug	6
172	89827	NBR	89827	NBR	89827	NBR	O-Ring, Valve Plug-90D	6
173	48364	D	48364	D	48364	D	Backup Ring, Valve Plug	6
174	46444	FBB	49300	SSD	44643	NAB	Plug, Valve	6
185	49465	BBCP R	49299	SSD	76335	NAB	Manifold, Discharge	1
188	89981	S	89981	S	89981	S	Screw, HSH (M12 x 70) (See Tech Bulletin 074)	8
250	855042	NY	855042	NY	855042	NY	Protector, Shaft with Two (2) Screws, Lockwashers and Washers	1

Bold Part Numbers are unique to a particular pump model. *Italics are optional items.* † Production parts are different from repair parts.
 R Components comply with RoHS Directive. For additional technical information see www.catpumps.com/literature/tech-bulletins.
 MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum ALE=Aluminum Epoxy BB=Brass BBCP=Brass/Chrome Plated
 BZ=Bronze CC=Ceramic CM=Chrome-Moly D=Acetal EPDM=Ethylene Propylene Diene Monomer FBB=Forged Brass FBR=Fiber
 FCM=Forged Chrome-moly FFKM=Perfluoroelastomer FPM=Fluorocarbon NAB=Nickel Aluminum Bronze NBR=Medium Nitrile (Buna-N)
 NBRS=Buna, Silicone Free NY=Nylon PC=Poly Carbonate PE=Polyethylene POP=Polypropylene PTFE=Pure Polytetrafluoroethylene
 PVDF=Polyvinylidene Fluoride S=304SS SS=316SS SSHB=316SS/High Strength Brass STCP=Steel/Chrome Plated SFG=Special Blend (FPM)
 STG=Special Blend (PTFE) White SSD=Duplex Stainless Steel STL=Steel STZP=Steel/Zinc Plated ZP=Zinc Plated

Optional Parts and Accessories and Service parts listed on page 3. Standard and Optional Seal and Valve Kits listed on page 4.

EXPLODED VIEW



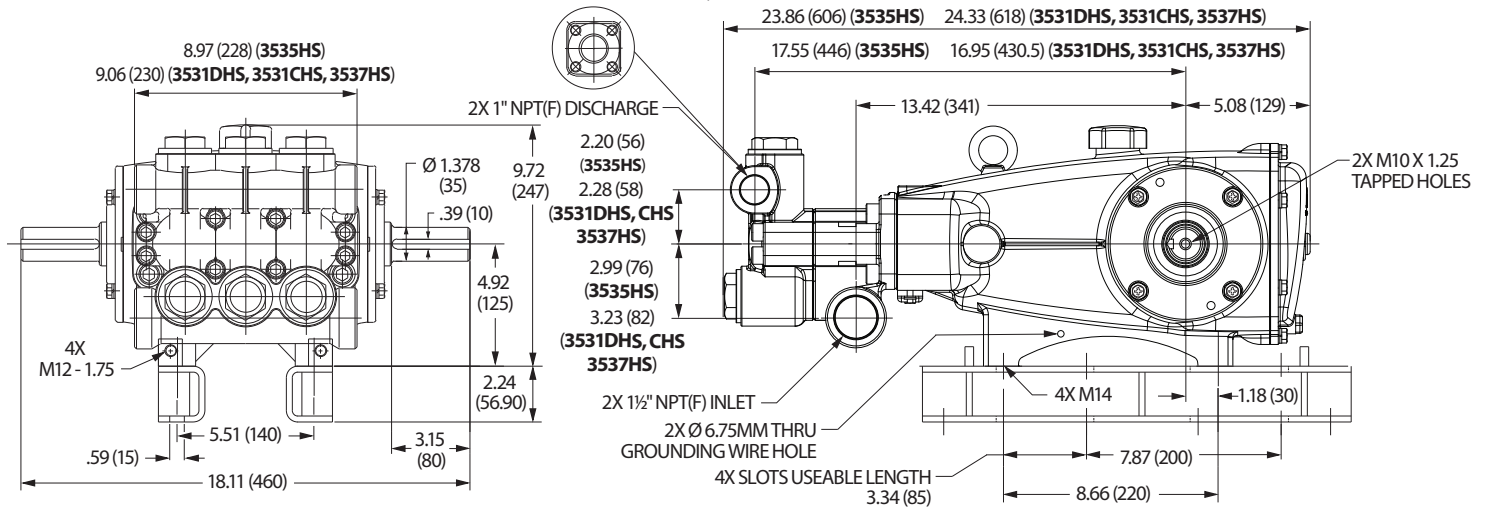
OPTIONAL PARTS AND ACCESSORIES

PART	DESCRIPTION	QTY
34021	Key (M10 x 8 x 70)	1
92674	Rail Assembly (STZP R) (Includes: 34018)	1
34018	Mount, Direct (STZP R)	1
76514	Rail Assembly (S) (Includes: 34039)	1
34039	Mount, Direct (S)	1
990013	Hub, "B", 35 mm (Not Shown)	1
80540	Screw, Adjusting (M12 x 100)	2
30278	Oiler (1 oz) (Not Shown)	3
34314	Kit, Oil Drain (3/8" x 48") (Not Shown)	1
819000	Assembly, Crankcase, Cast Iron Conversion (Not Shown)	1

SERVICE PARTS

PART	DESCRIPTION	QTY
31040	Kit, Seal – Standard NBR	1
34235	Kit, Valve – Standard NBR (Model 3535HS)	2
34017	Kit, Valve – Standard NBR (Models 3531DHS, 3531CHS, 3537HS)	2
6100	Oil, Case (12–21 oz bottles) (Fill to Specific Crankcase Capacity Prior to Start-up)	1
6124	Gasket, Liquid (3 oz)	1
6139	Lubricant, Anti-Seize (8 oz) (Models 3531DHS, 3531CHS)	1
32273	Crankcase Oil Seal Removal and Installation Kit (Not Shown) (Includes: Oil Seals, Guide Tool, Screws, Washers, Driver)	1
30696	Reverse Pliers (Not Shown)	1
818427	Head, Complete with NBR Seals and O-Rings (Model 3535HS)	1
818372	Head, Complete with NBR Seals and O-Rings (Model 3531DHS)	1
814522	Head, Complete with NBR Seals and O-Rings (Model 3537HS)	1

Models 3531DHS, 3531CHS, 3537HS Only



Models 3535HS, 3531DHS, 3531CHS, 3537HS

SEAL KITS

One (1) seal kit required per pump

PUMP MODELS	NBR (STD)	FPM (.0110)	EPDM (.0220) ♦	FFKM (.0770)
3535HS, 3531DHS, 3531CHS, 3537HS	31040 *	33055	33262 *	76948*

ITEM (Included in Seal Kits)					DESCRIPTION	QTY
97	11345	11375	701490	702961	O-Ring, Plunger Retainer	3
106	44113	44740	46955	76398	Seal, Low-Pressure, with SS-Spring	3
112	11379	14183	701491	702705	O-Ring, Inlet Manifold	3
127	44609	44741	44609	76780	V-Packing	6
155	48860	20137	701492	703159	O-Ring, V-Packing Spacer	6
156	48362	48362	48362	202164	Backup Ring, V-Packing Spacer	6

♦ Silicone oil/grease required *Review material codes for individual items (STG generally may be used as alternative)

VALVE KITS

Two (2) valve kits required per pump

PUMP MODELS	NBR (STD)	FPM (.0110)	EPDM (.0220) ♦	FFKM (.0770)
3535HS	34235	31955	31952	76617
3531DHS, 3531CHS, 3537HS	34017	31955	31952	76617

ITEM (Included in Valve Kits)					DESCRIPTION	QTY
162	48363	48363	48363	44614	Backup Ring, Valve Seat	3
163	26142	14330	701493	702808	O-Ring, Valve Seat	3
164	44727	—	—	—	Seat (Models 3535HS, 3535CHS)	3
	—	44612	44612	44612	Seat (Models 3531DHS, 3531CHS, 3537HS)	3
166	43932	—	—	—	Valve (Models 3535HS, 3535CHS)	3
	—	44108	44108	44108	Valve (Models 3531DHS, 3531CHS, 3537HS)	3
167	44109	44109	44109	44109	Spring	3
168	44728	44728	44728	44728	Retainer, Spring	3
170	44729	44729	44729	44729	Washer, Spring Retainer	3
172	89827	11747	701494	703169	O-Ring, Valve Plug	3
173	48364	48364	48364	20388	Backup Ring, Valve Plug	3

♦ Silicone oil/grease required

⚠ 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