

SPM" WS335 PUMP

MONOFRAME DESIGN BRINGS MAXIMUM RELIABILITY

With an innovative single-piece cast frame construction and ruggedly engineered components, the SPM™ WS335 pump is built for maximum reliability, safety and structural integrity. Its unique monoframe design eliminates welds, dramatically reducing risk of failure and nonproductive time compared to conventional welded designs.

REDESIGNED CORE COMPONENTS

An optimized lubrication system features an integrated relief valve and on-board pressure regulation and filtration for consistent oil pressure across critical components. A redesigned gear set, including larger pinion bearings, partialgroove journal bearings and an enhanced bull and pinion gear train, feature state-of-the-art design and manufacturing for longer-lasting performance.

FEATURES AND BENEFITS

- Single-piece cast frame improves structural integrity and mitigates common frame failure modes
- Two-piece stay rod design lowers cyclic loading and fatigue stress
- Robust gear system and crankshaft increase run life and reliability
- Optimized on-board oil system avoids lubricationinduced failures
- Functional design and improved access points improve serviceability
- SPM[™] Everbore hardened steel packing bore eliminates the threat of washboarding
- Standardized fluid end components maximize parts interchangeability and operational flexibility
- Optional on-board Pump Electronic Monitoring System (PEMS) helps minimize downtime, preserve equipment and reduce risk of catastrophic failures



SPECIFICATIONS

Max Input: 3,300 bhp Max Speed: 330 rpm Gear Ratio: 6.353:1 Plungers: 5 Bore Centers: 10" Stroke Length: 8" Rod Load: 256,000 lbf Frame Type: One-piece cast Pump Weight: 18,974 lbs

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PERFORMANCE CHART

PUMP PERFORMANCE CHART - WS335 APEX

		DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
PLUNGER	DISPLACE.												
DIAMETER	PER REV	50	318	115	730	163	1035	211	1340	259	1645	307	1950
in	gal/rev	gpm	psi	gpm	psi	gpm	psi	gpm	psi	gpm	psi	gpm	psi
(mm)	(liter/rev)	(lpm)	(MPa)	(lpm)	(MPa)	(lpm)	(MPa)	(lpm)	(MPa)	(lpm)	(MPa)	(lpm)	(MPa)
4	2.18	109	20372	250	20372	354	14364	459	11093	563	9035	668	7622
(101.6)	(8.2)	(412)	(140)	(946)	(140)	(1341)	(99)	(1737)	(76)	(2132)	(62)	(2528)	(53)
4 1/2	2.75	138	16096	316	16096	449	11350	581	8765	713	7139	845	6022
(114.3)	(10.4)	(521)	(111)	(1197)	(111)	(1698)	(78)	(2198)	(60)	(2699)	(49)	(3200)	(42)
5	3.40	170	13038	390	13038	554	9193	717	7100	880	5783	1044	4878
(127.0)	(12.9)	(643)	(90)	(1478)	(90)	(2096)	(63)	(2714)	(49)	(3332)	(40)	(3950)	(34)
INPUT POWER: BHP (kW)		1437 (1071)		3300 (2461)									

 $^{\scriptscriptstyle 1}$ Based on 90% Mechanical Efficiency and 100% Volumetric Efficiency

² Pumps with pressures in excess of 15000 psi require special gauge port and discharge flanges. Contact SPM Engineering for information.

³ Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778 GPM/2945LPM)

PINION TORQUE CURVE



SPM® WS335 APEX PINION TORQUE CURVE





PUMP CURVE 4 INCH PLUNGER

PINION SPEED (RPM) 100 200 300 400 500 600 700 800 900 100 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 0 22000 20,372PSI MAX ■100% HHp 20000 **--** 90% HHp SPECIAL GAUGE AND DISCHARGE 80% HHp 18000 FLANGES ---- 70% HHp REQUIRED IN THIS 60% HHp 16000 ----- 50% HHp 14000 - 45% HHp **PRESSURE (PSI)** • • • 2" Iron Flow Limit 12000 ••••15kpsi 10000 8000 6000 668 GPM MAX 4000 2000 0 0 42 84 126 168 210 252 294 336 378 420 462 504 546 588 630 672 FLOW (GPM)

SPM™ WS335 APEX - 4.00" Plunger Horsepower Curve

PUMP CURVE 4.5 INCH PLUNGER

SPM™ WS335 APEX - 4.50" Plunger Horsepower Curve



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PUMP CURVE 5 INCH PLUNGER

PINION SPEED (RPM) 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 0 18000 17000 **—**100% HHp 16000 **---** 90% HHp 15000 - 80% HHp 14000 13,038PSI MAX ----·70% HHp 13000 — 60% HHp 12000 **BKESSURE (BSI)** 10000 9000 8000 7000 6000 ----- 50% HHp – 45% HHp • • • • 2" Iron Flow Limit ---- 3" Iron Flow Limit 5000 4000 1,044 GPM MAX 3000 2000 1000 0 0 42 84 126 168 210 252 294 336 378 420 462 504 546 588 630 672 714 756 798 840 882 924 966 100810501092 FLOW (GPM)

SPM™ WS335 APEX - 5.00" Plunger Horsepower Curve

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