QuickCut™ Casing Exit System PakLatch™ Permanent Seal-Bore Packer

Weatherford's *QuickCut* casing exit system with *PakLatch* permanent seal-bore packer is a high-performance, permanent, big-bore packer anchor that is set separately and independently of the whipstock assembly. Providing a permanent, known datum point for re-entry, multiple laterals, or re-entry and multiple laterals cut from the same target, as well as production flow-through ability, this system is the foundation for multilateral applications.

A survey tool is run downhole to determine the orientation of the packer. An orienting latch assembly is made up to the bottom of the concave, having been adjusted to the required direction from the information provided by the wireline survey. The *QuickCut* milling and whipstock assembly are run in the hole and latched into a matching profile inside the casing packer. After the assembly is latched into the packer, the whipstock face is automatically oriented to the required direction.

Applications

- Level 2 multilateral wells
- Wells with high dogleg-severity-buildup rates
- Wells in which the bottom trip orientation is hindered because of rotational or torque challenges
- Exits through multiple strings of casing

Features, Advantages and Benefits

- The packer can be set by a wireline or hydraulically activated pipe, providing flexibility in the field.
- The assembly enables multiple sidetracks from one parent wellbore location, promoting operational flexibility.

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Features, Advantages and Benefits (continued)

- High-torque packer assembly can withstand mill-loading thrust and rotational torque, ensuring the tools stay in place during the milling operation.
- The packer anchor enables 360° whipstock orientation (adjustable in 4° increments), increasing the capability to hit the target, reducing the drill time to reach target and saving time and costs.
- The assembly provides re-entry access to the laterals, enabling future remediation.
- The unique lug technology protects the whipstock during cutout, while accurately directing the mill into the casing wall, allowing more accurate drilling windows.
- The *QuickCut* milling assembly provides improved penetration and gauge retention to complete the task in one trip, reducing time and costs.
- The large packer ID and accessories enable lower zonal production, providing isolation from below.
- The assembly provides a straight overpull to release the whipstock and latch assembly from the packer, simplifying operations.
- *PakLatch* packer is designed for hostile environments, making it capable of withstanding hydrogen sulfide, high pressures, and high temperatures as required by ISO 14310, V3.
- The system can be retrieved through multiple methods, promoting operational flexibility.

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Specifications

Mill Specifications

Casing OD (in./*mm*)	Casing Weight (lb/ft, *kg/m*)	Concave OD (in./*mm*)	Lead Mill OD (in./*mm*)	Lead Mill Pilot OD (in./*mm*)	Flex Mill OD (in./*mm*)	Lead Mill Connection (in.)	Flex Mill Connection (in.)
5-1/2 *139.7*	20.0 *29.8*	4-1/4 *108.0*	4-5/8 *117.5*	3-3/8 *58.7*	4-5/8 *117.5*	2-7/8 (pac box)	2-7/8 (AOH box) 2-7/8 (pac pin)
	23.0 *34.2*		4-1/2 *114.3*		4-1/2 *114.3*		
6-5/8 *168.3*	17.0 *25.3*	5-1/2 *139.7*	5-7/8 *149.2*	4-5/8 *117.4*	5-7/8 *149.2*	3-1/2 (reg box)	3-1/2 (IF box) 3-1/2 (reg pin)
	20.0 *29.8*						
	24.0 *35.76*	5-1/4 *133.3*	5-3/4 *146.0*	3-7/8 *98.4*	5-3/4 *146.0*		
	28.0 *41.72*		5-5/8 *142.8*		5-5/8 *142.8*		
	32.0 *47.6*		5-1/2 *139.7*		5-1/2 *139.7*		
7 *177.8*	23.0 *34.2*	5-1/2 *139.7*	6-1/8 *155.6*	5 *127.0*	6-1/8 *152.4*	3-1/2 (reg box)	3-1/2 (IF box) 3-1/2 (reg pin)
	26.0 *38.7*						
	29.0 *43.2*		6 *152.4*	4-5/8 *117.5*	6 *152.4*		
	32.0 *47.6*		5-7/8 *149.2*		5-7/8 *149.2*		
9-5/8 *244.5*	40.0 *59.5*	8 *203.2*	8-5/8 *219.1*	7 *177.8*	8-5/8 *219.1*	4-1/2 (reg box)	4-1/2 (IF box) 4-1/2 (reg pin)
	43.5 *64.7*		8-1/2 *215.9*	6-3/8 *161.9*	8-1/2 *215.9*		
	47.0 *69.9*						
	53.5 *79.6*						

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Specifications (continued)

Packers

Pressure and Temperature Ratings				
Ratings	**Packer Size (in.)**			
	5-1/2	**6-5/8**	**7**	**9-5/8**
Pressure from above (psi, *kg/cm²*)	5,000 *352*			
Pressure from below (psi, *kg/cm²*)				
Temperature minimum (°F/°C)	150 *66*			
Temperature maximum (°F/°C)	275 *135*		350 *177*	275 *135*

Axial Release Pressure[a]				
Packer size (in.)	**5-1/2**	**6-5/8**	**7**	**9-5/8**
Shear-ring part number	00745017		00741257	00281305
Nominal shear value (lbf/*daN*)	60,000 *26,689*			
Piston area (in.²/*cm²*)	11.0 *71.0*		19.7 *127.1*	44.2 *285.2*
Pressure rating from below with standard shear ring[b] (psi, *kg/cm²*)	5,435 *382.1*		3,049 *214.4*	2,263 *159.1*
Maximum shear value[c] (lbf/*daN*)	74,000 *32,917*		90,000 *40,034*	100,000 *44,482*

[a] Values represent axial release using a standard shear mechanism. Axial release can be increased or decreased by adjusting the thickness of the shear mechanism.

[b] Pressure from below, working against the piston area, determines the axial release. This value is determined by dividing the nominal shear value by the piston area. Example: 100,000 lb/44.2 in.² = 2,263 psi (15,603 kPa).

[c] Maximum shear value can only be achieved with a special-order shear ring.

Formula for Determining Overpull Required for Releasing the Tool		
Step	**Formula**	**Example for Reservoir with Pressure of 1,000 psi (*69 Bars*)**
1	Reservoir pressure from below × piston area = shear load resulting from pressure	1,000 psi x 44.2 in2 = 44,200 lbs *6,895 kPa x 0.01 x 285.2 cm2 = 19,664 daN*
2	Shear value − shear load resulting from pressure = overpull	60,000 lb – 44,200 lb = 15,800 lb overpull *26,689 daN – 19,664 daN = 7,025 daN*

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Specifications (continued)

Packers

Casing size (in./*mm*)	**5.500** ***139.700***	**6.625** ***168.200***	**7.000** ***177.800***	**9.625** ***244.475***
Casing weight (lb/ft, *kg/m*)	20.0 to 23.0 *29.8 to 34.2*	17.0 to 32.0 *29.8 to 34.2*	23.0 to 32.0 *34.2 to 47.0*	40.0 to 53.5 *59.5 to 79.6*
***PakLatch* Packer**				
Maximum OD (in./*mm*)	4.44 *112.7*	5.49 *139.4*	5.87 *149.0*	8.25 *209.5*
Minimum ID (in./*mm*)	2.68 *68.2*	3.00 *76.2*	4.00 *102.3*	6.00 *153.1*
Maximum torque (ft-lb/*N•m*)	5,000 *6,779*	7,500 *10,169*	7,500 *10,169*	10,000 *13,558*
Maximum pressure differential (psi/*kPa*)*	5,000 at 275°F *34,470 at 135°C*	5,000 at 275°F *34,470 at 135°C*	5,000 at 350°F *34,470 at 177°C*	5,000 at 275°F *34,470 at 135°C*
***QuickCut* Whipstock**				
Mill-range OD (in./*mm*)	4.500 to 4.625 *114.300 to 117.475*	5.500 to 5.875 *127.000 to 149.200*	5.875 to 6.250 *149.225 to 158.750*	8.375 to 8.625 *212.725 to 219.075*
Shear value (lbf/*daN*), mill from whipstock	14,000 *6,228*	28,000 to 43,000 *12,455 to 19,127*	28,000 to 43,000 *12,455 to 19,127*	40,000 to 59,000 *17,793 to 26,245*
***PakLatch* Latch Assembly**				
Stab-in force (lbf/*daN*), latch into packer	< 500 *< 200*			
Shear-release nominal force (lbf/*daN*), unlatch from packer	60,000 *26,689*	60,000 *26,689*	60,000 *26,689*	60,000 *26,689*
Pressure rating from below with standard shear ring (psi, *kg/cm²*)	5,435 *382.1*	5,435 *382.1*	3,049 *214.4*	2,263 *159.1*
Maximum OD (in./*mm*)	4.43 *112.6*	5.00 1 *27.0*	5.87 *149.0*	8.24 *209.4*
Minimum ID (in./*mm*)	1.75 *44.4*	1.75 *44.4*	2.69 *68.3*	3.75 *95.2*
Re-Entry Guide				
Minimum ID (in./*mm*)	1.50 *38.1*	1.50 *38.1*	2.50 *63.5*	2.25 *57.1*
Maximum OD (in./*mm*)	3.45 *87.6*	3.45 *87.6*	4.65 *118.1*	6.50 *165.1*
Face angle	6°			
Running tool OD (in./*mm*)	4.50 *114.3*	4.50 *114.3*	5.75 *146.0*	8.13 *206.5*

* Maximum pressure differential can be 80% of the casing pressure rating, if values are less than listed. The latch shear-ring value can reduce maximum pressure differential.

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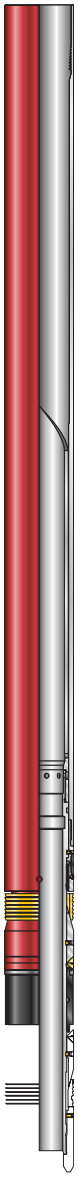
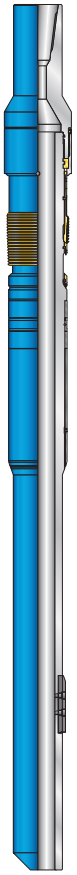
Specifications (continued)



Permanent seal-bore packer



Releasable-type anchor