

HYDROMECHANICAL™

Innovation revealed

The Hydromechanical™ Setting Tool is utilized to set composite cement retainers and circulate cement without the need for rotation or multiple trips. Setting is accomplished by applying a combination of hydraulic pressure and upstrain. The setting tool is deployed into the well using coiled tubing, tubing, or drill pipe.

Features

- Automatically balances with wellbore fluid
- Hydraulically activated by applied pressure
- Can set retainer, test, and circulate cement in a single trip
- No rotation required
- No ballistics required
- Patent Pending Technology
- Coiled tubing, tubing, or drill pipe conveyed
- Redress kits available
- Can be used with Collet or Poppet-Style Magnum Series Retainers
- No wet string pull-outs
- Single stage hydraulic piston
- Can withstand high tensile loads

Operations

While running into the well, the tool automatically fills with well bore fluid and remains balanced. When setting depth is reached, a ball bearing is released down the work string. A circulation rate can then be established to aid in pumping the ball bearing down into its mating seat inside the setting tool. When the ball bearing is fully seated, a pressure buildup will be noted. Pressure is increased to a predetermined amount until both the upper and lower slips have deployed. Then, while maintaining pressure, upstrain is applied to the work string until shear-off occurs. The retainer is now set.



The Hydromechanical™ is utilized to set composite cement retainers and circulate cement without the need for rotation or multiple trips.

4.50 Hydromechanical Setting Tool

Magnum Series Composite

Cement Retainers supported: 4.00", 4.50", and 5.00"

Piston Area: 4.71 in² effective surface area

Activation Screw Shear Value: 295 PSI/screw

Ball Seat Screw Shear Value: 650 PSI/screw

Requirements for setting: 2 7,000 lbs (shear off force) - (Applied PSI @ surface X piston area) = Upstrain at tool

Example: Assume: Shear off force = 27,000 lbs; Max applied surface pressure = 3,000 PSI

27,000 lbs - (3,000 PSI X 4.71 in²) = 12,867 lbs (required upstrain at tool)

5.50 Hydromechanical Setting Tool

Magnum Series Composite

Cement Retainers supported: 5.50"

Piston Area: 6.88 in² effective surface area

Activation Screw Shear Value: 490 PSI/screw

Ball Seat Screw Shear Value: 1,085 PSI/screw

Requirements for setting: 40,000 lbs (shear off force) - (Applied PSI @ surface X piston area) = Upstrain at tool

Ball Seat Screw Shear Value: 4 stage: 275 PSI/screw; 5 stage: 225 PSI/screw

Example: Assume: Shear off force = 40,000 lbs; Max applied surface pressure = 3,000 PSI

40,000 lbs - (3,000 PSI X 6.88 in²) = 19,357 lbs (required upstrain at tool)

7.00 Hydromechanical Setting Tool

Magnum Series Composite

Cement Retainers supported: 6.625", 7.000", and 7.625"

Piston Area: 6.88 in² effective surface area

Activation Screw Shear Value: 490 PSI/screw

Ball Seat Screw Shear Value: 690 PSI/screw

Requirements for setting: 45,000 lbs (shear off force) - (Applied PSI @ surface X piston area) = Upstrain at tool

Example: Assume: Shear off force = 45,000 lbs; Max applied surface pressure = 3,000 PSI

45,000 lbs - (3,000 PSI X 6.88 in²) = 24,357 lbs (required upstrain at tool)

Tool Size inch (mm)	Standard Connection inch (mm)	Overall Length of Collet Style inch (mm)	Overall Length of Poppet Style inch (mm)	O.D. inch (mm)	Ball Size inch (mm)	Ball Seat ID inch (mm)	Stroke Length inch (mm)	Temperature Rating
4.500 (114.3)	2-3/8 (60.3) EU 8RD	60.29 (1,531.4)	50.09 (1,272.3)	3.570 (90.7)	0.625 (15.9)	0.438 (11.1)	8.95 (227.3)	400°F (204°C)
5.500 (139.7)	2-3/8 (60.3) EU 8RD	69.38 (1,762.3)	65.73 (1,669.5)	4.380 (111.3)	0.875 (22.2)	0.625 (15.9)	10.21 (259.3)	400°F (204°C)
7.000 (177.8)	2-7/8 (73.0) EU 8RD	75.62 (1,920.7)	69.87 (1,774.7)	5.750 (146.1)	0.875 (22.2)	0.625 (15.9)	10.21 (259.3)	400°F (204°C)

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