Dailey® CBC-Thruster™ Tool

Weatherford's patented *Dailey CBC-Thruster* tool is uniquely designed for running low in the bottomhole assembly (BHA) to apply hydraulic weight on bit (WOB) during drilling operations by taking advantage of the naturally occurring effect of pump-open forces (POF). The *CBC-Thruster* tool also absorbs weight transfer from the drillstring and prevents the positive-displacement motor (PDM) from stalling.

Applications

- Any drillstring in which a drilling motor will be used.

Features, Advantages and Benefits

- Simple construction, with minimal moving parts, reliably keeps the bit on bottom for better rate of penetration (ROP).
- Involute spline design ensures that torque from the drillstring is transferred to the lower portion of the BHA so as not to hinder drilling operations.
- Tandem designs provide increased POF over the standard-size tool at the same differential pressure for operations that require a greater force or WOB.

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Specifications

Standard Version, Standard Stroke

Dimensional Data					
OD (in./*mm*)	3-1/8 *79.38*	4-3/4 *120.65*	6-1/4 *158.75*	6-1/2 *165.10*	7-3/4 *196.85*
ID (in./*mm*)	1-1/4 *31.75*	2-1/4 *57.15*	2-1/4 *57.15*	2-3/4 *69.85*	3 *76.20*
Tool joint (API)	2-3/8 Reg	3-1/2 IF	4-1/2 XH	4-1/2 IF	6-5/8 Reg

Yield Values*					
Tensile (lbf/*kN*)	250,000 *1,112*	500,000 *2,224*	832,000 *3,701*	934,000 *4,155*	1,600,000 *7,117*
Torsional (lbf-ft/*kN•m*)	5,000 *6.8*	20,000 *27.1*	49,300 *66.8*	56,200 *76.2*	100,000 *135.6*

Operational Data					
Circulating pressure (psi/*bar*)	5,000 *345*				
Hydrostatic pressure (psi/*bar*)	None				
Total travel (in./*mm*)	16.0 *406*	15.0 *381*	16.5 *419*	17.0 *432*	19.5 *495*
Approximate length closed (ft/*m*)	9.25 *2.8*	11.85 *3.6*	12.00 *3.6*	14.33 *4.4*	15.71 *4.8*
Approximate weight (lb/*kg*)	190 *86*	475 *215*	1,000 *454*	1,200 *544*	1,600 *726*
Maximum bottomhole temperature (°F/°C)	400° *204°*				
Pump-open area (in.^{2}/*cm*^{2})	4.0 *26*	10.3 *66*	15.9 *103*	19.6 *126*	28.3 *183*

*Tensile and torsional yield values are calculated per API RP7G, based on nominal dimensions and the published yield strength of the material used, and do not constitute a guarantee, actual or implied.

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Specifications (continued)

Standard Version, Long Stroke

Dimensional Data			
OD (in./*mm*)	4-3/4 *120.65*	6-1/2 *165.10*	7-3/4 *196.85*
ID (in./*mm*)	2-1/4 *57.15*	2-3/4 *69.85*	3 *76.20*
Tool joint (API)	3-1/2 IF	4-1/2 IF	6-5/8 Reg

Yield Values*			
Tensile (lbf/*kN*)	500,000 *2,224*	934,000 *4,155*	1,600,000 *7,117*
Torsional (lbf-ft/*kN•m*)	20,000 *27.1*	56,200 *76.2*	100,000 *135.6*

Operational Data			
Circulating pressure (psi/*bar*)	5,000 *345*		
Hydrostatic pressure (psi/*bar*)	None		
Total travel (in./*mm*)	36.0 *914*		
Approximate length closed (ft/*m*)	18.85 *5.7*	21.00 *6.4*	22.00 *6.7*
Approximate weight (lb/*kg*)	756 *343*	1,900 *862*	2,400 *1,089*
Maximum bottomhole temperature (°F/°*C*)	400° *204°*		
Pump-open area (in.^{2}/*cm*^{2})	10.3 *66*	19.6 *126*	28.3 *183*

*Tensile and torsional yield values are calculated per API RP7G, based on nominal dimensions and the published yield strength of the material used. These values do not constitute a guarantee, actual or implied.

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Specifications (continued)

Tandem Version

Dimensional Data		
OD (in./*mm*)	4-3/4 *120.65*	6-1/2 *165.10*
ID (in./*mm*)	2-1/4 *57.15*	2-3/4 *69.85*
Tool joint (API)	3-1/2 IF	4-1/2 IF

Yield Values*		
Tensile (lbf/*kN*)	500,000 *2,224*	934,000 *4,155*
Torsional (lbf-ft/*kN•m*)	20,000 *27.1*	56,200 *76.2*

Operational Data		
Circulating pressure (psi/*bar*)	5,000 *345*	
Hydrostatic pressure (psi/*bar*)	None	
Total travel (in./*mm*)	15.0 *381*	17.0 *432*
Approximate length closed (ft/*m*)	14.83 *4.5*	17.75 *5.4*
Approximate weight (lb/*kg*)	600 *272*	1,600 *726*
Maximum bottomhole temperature (°F/°C)	400° *204°*	
Pump-open area (in.^{2}/*cm*^{2})	16.4 *106*	31.7 *205*

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Operation

Placing the Tool in the String

Run the *CBC-Thruster* tool as close as possible to the bit to take full advantage of the POF that the tool generates. If drilling with a PDM, place the *CBC-Thruster* tool in the string, directly above the motor.

POF is determined by multiplying the differential pressure across the tool by the pump-open area of the *CBC-Thruster Tool*.

The final WOB produced is equal to the POF less the frictional drag of the BHA between the *CBC-Thruster* tool and the bit. The WOB applied by the tool can be adjusted by varying the flow rate, the bit flow area, and type of PDM used.

Balancing nozzle size and flow rates is important for enhancing bit hydraulics. Doubling the bit differential pressure drop will double the POF and increase the ROP and sliding efficiency.

Running the Tool

If running the *CBC-Thruster* tool, use the standpipe pressure gauge—not the hook load—while drilling. Standpipe pressure will increase after the drillstring has been lowered to bottom, drilling has begun, and when the *CBC-Thruster* tool nears its *closed* position. The tool is fitted with a *closed* position indicator (telltale), which causes a sharp pressure increase. When the increase in standpipe pressure is noted, set the break to allow the motor to drill ahead. When the *CBC-Thruster* tool reaches its full stroke length, the motor will stop drilling, creating a noticeable standpipe pressure drop as a result of motor torque reduction. The break is released, and the operation is repeated. For continuous drilling, note the time to drill the full stroke length of the *CBC-Thruster* tool and close the tool before the end of the stroke.

The *CBC-Thruster* tool can be easily adjusted by selecting telltales of varying sizes as needed for specific flow rates. This feature ensures that the variations in standpipe pressure can be noted at the surface. Weatherford can provide assistance in selecting the optimal size.

If running the tool above a retrievable measurement-while-drilling (MWD) tool, remove the telltale before operation. Running the tool without the telltale removes the *closed* position indication and the tool is then operated with the motor indication only.

Maintaining the Tool

Each trip out of the hole, wash the mud from the polished mandrel and from inside the bottom connection. Check the polished mandrel carefully for any sign of corrosion, pitting, or flaking of the plating.

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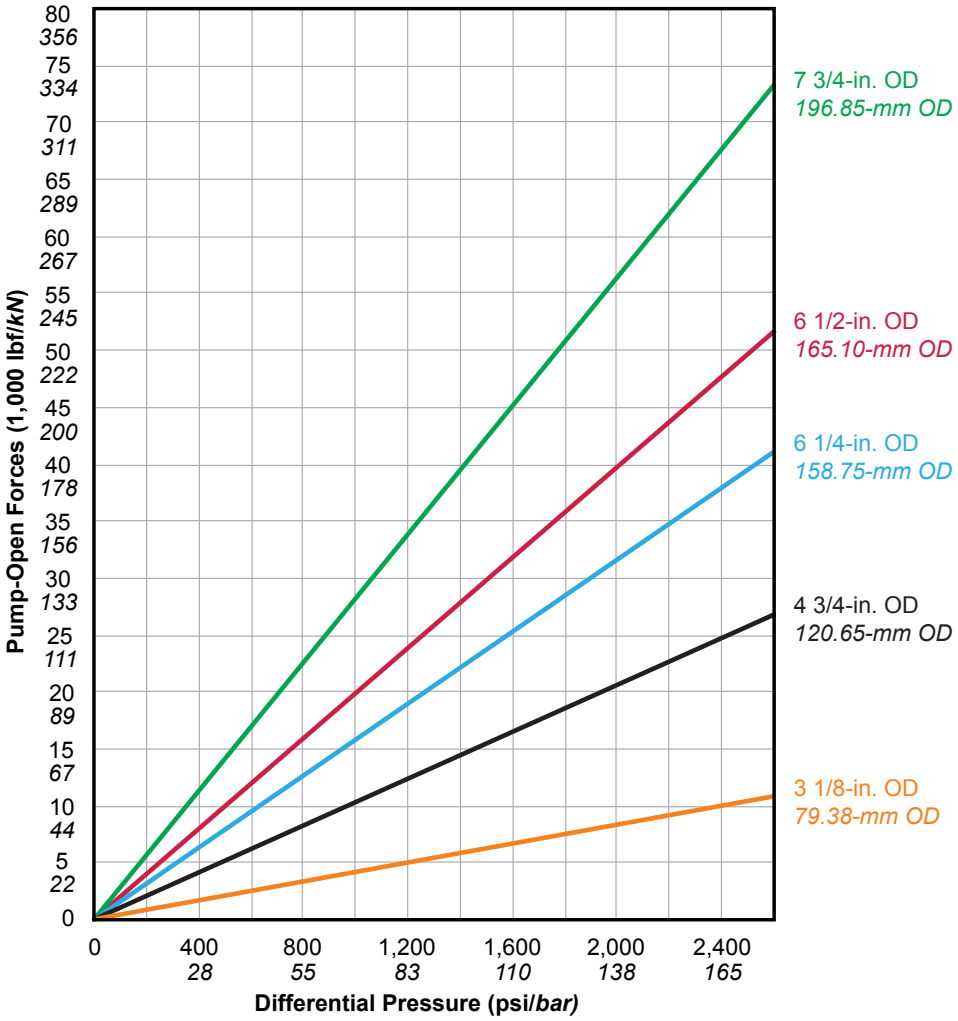
Pump-Open Force Chart

Standard Version



Pump-open force is created by pressure drop across the bit. The pump pressure creates a reaction force in the tool that tries to force it open. Reduce the pump to idle before attempting to jar.

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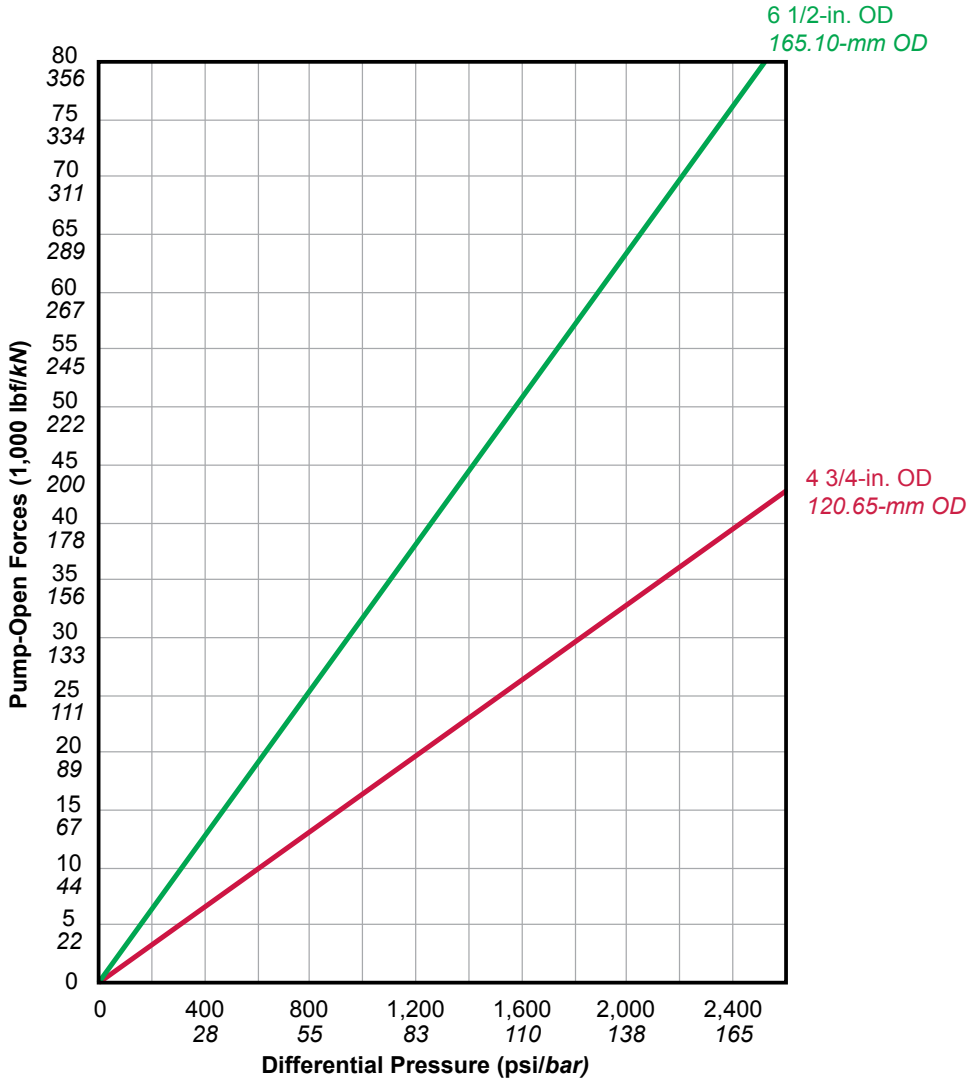
Pump-Open Force Chart (continued)

Tandem Version



Pump-open force is created by pressure drop across the bit. The pump pressure creates a reaction force in the tool that tries to force it open. Reduce the pump to idle before attempting to jar.