

UltraForce Jars

These new generation jars are designed and manufactured for the severe drilling conditions encountered in vertical, directional and horizontal wells. The **UltraForce** operates as hydro-mechanical or double-acting hydraulic jar. BHA recovery and reliable jarring operation is assured with the **UltraForce** jars delivering high impact force when required regardless of position of BHA in vertical, deviated or horizontal wells. When operating as a hydro-mechanical jar, it functions with the combination of a hydraulic delay and mechanical latch.

UltraForce jars can be used as hydraulic up and down, mechanical up and down or hydraulic up and mechanical down depending on customer application. **UltraForce** jars performs hydraulic jarring functions with the hydraulic metering valve system for both up-jarring and down-jarring. The magnitude of impact delivered by hydraulic jar is dependent on the magnitude of overpull or slackoff placed on the drillstring provided the maximum jar setting load is not exceeded. **UltraForce** jars performs mechanical functions using the latch/lock mechanism which trips down at a pre-selected compressional force and up at a pre-selected tensile force. torque.



Safety Clamp

The **UltraForce** jars are delivered to the rig in the open position with safety clamp placed around the exposed chrome area. The safety clamp keeps the jar extended while tripping and transporting. Caution: the safety clamp must be removed on the rig floor before the jar is run in the hole; failure to do so could result in damage to the jar and/or rig. There is also a possibility of down hole damages up to and including fishing operations.

Tripping in: After the jar is made up into the drill string and just before the jar is run through the rotary table, simply remove jar safety clamp and store on rig floor. Please handle safety clamp properly as there are charges for damage or loss.

Tripping out: Once the jar passes through the rotary table install the safety clamp onto the chrome area of the jar mandrel, then close, lock and insert safety pin. It is now safe to rack the jar back in the derrick without concern of the jar closing.

Hydraulic Jar Operation

Tension Placement

Jarring Up

When the hydraulic jar is placed in tension or above neutral point, the jar will be in the open or fully extended position. Therefore the jar will have to be cocked down before it can be fired up. To cock down the jar, simply slack off a small amount of weight above the jar or until 10" of free down travel is observed. At this point the jar is cocked and ready to be fired either up or down. To jar up, simply pull the desired amount of overpull above string weight and jar will fire after the time delay specified in the tables below.

Caution: Do not exceed the overpull limit listed per jar size for each jar type in the jar specifications table below.

Jarring Down

When the hydraulic jar is placed in tension or above the neutral point, simply slack off weight above the jar until 10" of free down travel is observed. The jar is now in the cocked position and can be fired up or down. In order to fire down simply slack off desired amount of weight above the jar and wait for the time delay specified in the tables below for each jar type. At this point, the jar will fire down. To re-cock the jar, simply pull up and observe the 10" of free up travel and the jar will be in the cocked position once again and ready to fire either direction.

Compression Placement

Jarring Up

When jar is placed in compression or below the neutral point the jar will be closed when ready to fire. To fire up simply pull drill string; the jar will travel up 10" to the cocked position. At this point pull the desired amount of over pull above string weight and jar will fire after the amount of time delay specified in the tables below.

Caution: Do not exceed the overpull limit listed per jar size for each jar type in the jar specifications table below.

Jarring Down

When jar is placed in compression or below the neutral point and a down impact is desired simply pick up string weight above the jar plus additional drag. At this point the jar will be in the cocked position and ready to fire either direction. To hit down simply slack off weight above the jar and wait for the time specified in the tables below. To re-cock simply pick up string weight above jar plus additional drag again.

Note: Overpull, weight available above the jar, stretch of string and placement will determine the force of impact up. Weight available above the jar and placement alone will determine the amount of impact force down. Whereas, down hole drag, deviation, lack of weight and placement of the jar can detract from the amount of impact force in either direction.

Hydro-Mechanical Jar Operation

Jarring Up

To jar up, apply overpull at the jar as required and wait for jar to fire; the lock will automatically release when lock setting load is exceeded. The more overpull applied on the jar, the greater impact will be achieved. To repeat jarring, reset jar into locked position by slacking-off weight on the jar which then automatically returns to its locked position and again ready to be fired up or down as required. Jar lock load will have to be exceeded for the lock to release and hydraulics to be engaged. Overpull in excess of max pre-jarring load should not be applied as it may damage the hydraulics of the jar.

Jarring Down

To jar down, slack-off weight on the jar as required and wait for jar to fire; the lock will automatically release when lock setting load is exceeded. The more weight is slacked-off on the jar, the greater is the impact achieved. To repeat jarring, reset jar into the locked position by applying overpull at the jar which then automatically returns to its locked position and again ready to be fired up or down as required. Jar lock will have to be exceeded for lock to release and hydraulics to be engaged.



JAR SETTINGS		Tool Size (Nominal)			
		4-3/4" - 5"	6-1/2" - 6-3/4"	8"	9-1/2"
Lock Setting	UP lbs UP tons	30 - 35000 13.5 - 16	60 - 80,000 27 - 36	70 - 90,000 32 - 41	80 - 100,000 32 - 45
	DOWN lbs DOWN tons	10 - 18,000 4.5 - 8	25 - 33,000 11 - 15	30 - 40,000 13.5 - 18	30 - 45,000 13.5 - 20
Hydraulic Delay	UP 50,000 lbs UP 23 tons	1 - 2 mins			
	UP 100,000 lbs UP 45.5 tons		1 - 2 mins	1 - 2 mins	1 - 2 mins
Delay at Maximum Overpull	UP	10 - 40 sec	10 - 50 sec	10 - 50 sec	10 - 50 sec
Hydraulic Delay	DOWN 30,000 lbs DOWN 13.5 tons	2 - 3 mins	2 - 3 mins	2 - 3 mins	2 - 3 mins
	DOWN 50,000 lbs DOWN 23 tons	1 - 2 min	1 - 2 min	1 - 2 min	1 - 2 min
	DOWN 100,000 lbs DOWN 45.5 tons		40 - 60 sec	40 - 60 sec	40 - 60 sec

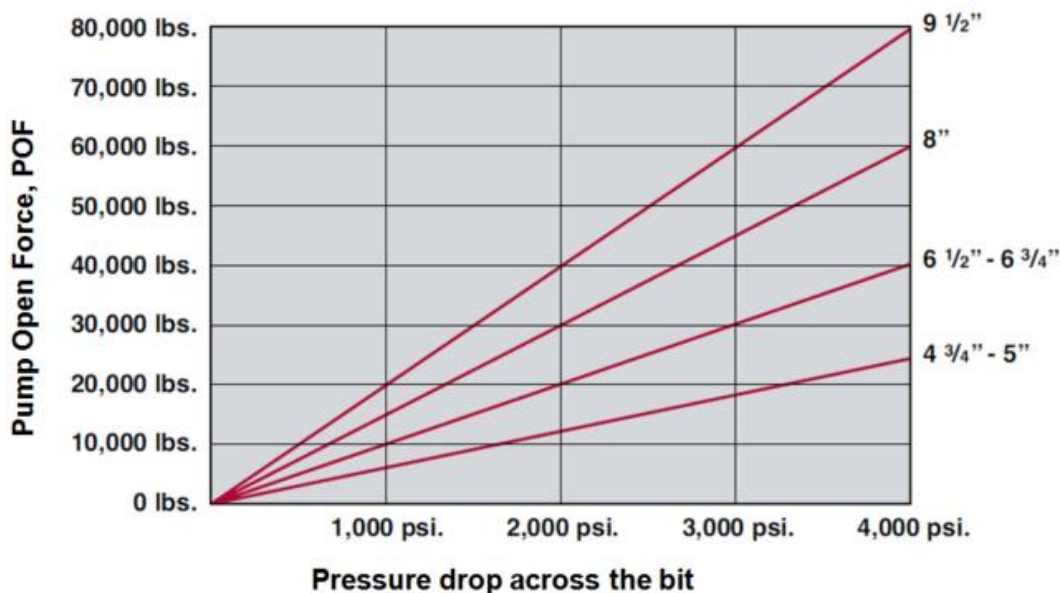
Please note that all loads and time delays shown in table are approximate only.

Specifications

Tool OD (in)	6-1/2"	8"
Bore I.D (in)	2.75	3.25
API Connection	4-1/2 XH	NC56
Overall Length (ft)	34	34
Total Weight (lbs)	2,860	4600
Up Jarring Free Stroke (in)	6	6
Down Jarring Free Stroke (in)	6	6
Maximum Tensile Load (lbf)	921,000	1,564,000
Yield Torque (ft/lbf)	86,400	162,200
Pump Open Area (sq.in)	9.97	15.03
Maximum Overpull (lbf)	190,000	300,000
Maximum temperature (F/C)	275/132	275/132

Pump Open Force (POF)

Pump pressure generates a force called the Pump Open Force (POF) within the jar as a result of the differential pressure between the bore of the jar and the annulus during circulation of drilling fluid. During up-jarring, POF enhances tool opening action (increasing the ease of opening jar lock and hydraulic metering valve) and increases impact. However, POF makes it difficult to cock the jar in preparation for up-jarring. During down-jarring, POF hinders tool opening action (by keeping the tool in the open position) and decreases impact. However, POF aids cocking the jar in preparation for down-jarring. For calculations please refer to Pump Open Force chart.



It is recommended to adjust circulation accordingly depending on up/down-jarring and cocking up and down to control the pump open force.

Typical Up-jarring Calculation (units in lbs)	
Pick-Up Weight before Up-jarring (Total indicator reading: drillstring, block, hook, swivel)	220,000
Estimated BHA weight below jar	42,000
Weight above jar	178,000
Desired Up-jar force (Overpull)	80,000
Load indicator reading before adjustment	258,000
Pump open force effect	13,000
Hole drag effect	20,000
Weight Indicator reading for tripping jar upward	265,000
Increase weight load indicator reading from 178,00 to 265,000 to produce 80,000 up jar force	

Typical Down-jarring Calculation	
Slack-off Weight before Down-jarring (Total indicator reading: drillstring, block, hook, swivel)	220,000
Estimated BHA weight below jar	42,000
Weight above jar	178,000
Desired Down-jar force (down-jar setting)	80,000
Load indicator reading before adjustment	98,000
Pump open force effect	13,000
Hole drag effect	20,000
Weight Indicator reading for tripping jar upward	65,000
Decrease weight load indicator reading from 178,00 to 65,000 to produce 80,000 down jar force	