Infinity

Hydraulic / Mechanical Drilling Jar

Infinity Downhole Tools is a young, aggressive oil and gas supply business operating in Nisku, Alberta. We offer all customers 130+ years of combined experience in the downhole tool business. Our trained service technicians are available 24 hours a day, 7 days a week to provide you with the best and most reliable motors, jars and shocks on the market today. Our technicians service all tools from top to bottom, so that the quality of Infinity's products are never compromised. We proudly claim that we have over 10,000 hours in total on our motors with no failures to date. All of our tools are serviced, repaired and inspected on site at our 7,200 sq. ft. service centre.

The Infinity Drilling Jar operates with a simple up and down motion and is insensitive to right or left hand torque. It is most commonly run as hydraulic over mechanical, but can be run as a straight mechanical by omitting the valve, or as a straight hydraulic by omitting the latch. When run as a hydraulic/mechanical or straight mechanical, it is run in the latched position; this eliminates unexpected jarring and prolongs seal life.

Mechanical Tripping Mechanism

The normal setting for the mechanical latch is the down jarring being 50% of the jarring load. This ratio, along with the tripping load, can easily be altered to suit customer requirements.

DESIGN FEATURES

1. The unique design of the Infinity jar allows the spline drive along with all working components to be housed in one sealed oil chamber, eliminating the need for ports which can fill with cuttings and restrict the down jar stroke. This makes it ideal for air drilling.
2. The collet or tripping mechanism is designed to run in the cocked or latched position, causing the inner mandrel and outer housing to act as an integral part, thereby virtually eliminating seal wear or inner tool wear during normal drilling. This allows the length of the tool runs to be extended.
3. Being designed to run in the latched position eliminated the need to extend or open the jar before running in the hole, as is required with some hydraulic jars. Unexpected jarring while tripping in or out of the hole is also eliminated, as can happen with conventional hydraulic jars. The possibility of the jar firing while tripping in the hole due to drill collar weight below the jar, and tool extension due to pressure drop across the bit, is virtually eliminated.
4. The tool joints can be torqued to the same torques as the drill collars.
5. Standard seals in the tool are effective to 250°F, and the tool can be dressed with seals effective to 400°F.
6. The tool can be run in tension, at the neutral point, or in compression, within the preset latch settings.
7. Only one carbide seal area is exposed to the drilling fluid and this area a secondary seal is incorporated which is lubricated on both sides and is never exposed to the drilling fluids unless the first or primary seal fails.

Jar Size		Mandrel Area	
In.	mm	sq.in.	(mm^2)
3.125	79.4	3.9	2565.2
3.5	88.9	5.9	3806.4
4.75	120.65	10	6451.6
6.25	158.75	16.8	10,838.68
6.5	165.1	16.8	10,838.68
6.75	171.45	19.6	12,645.1
8	203.2	24.8	15,999.9
9	228.6	35	22,580.6

INFINITY
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Tool Size		ID		Tensile Strength Lbs.	Torsional Strength Ft. lbs	Make-Up Torque Ft. Lbs	Length		Max. Mechanical Latch Setting Lbs	Max. Hydraulic Delay Lbs
In	mm	In	mm				In	mm		
3.125	79.4	1.0	25.4	132 000	15 000	5 000	12'9"	3.69	12 000	20 000
3.5	88.9	1.25	31.75	250 000	25 000	7 500	12'3"	3.73	30 000	50 000
4.75	120.65	2.25	57.15	380 000	33 000	10 000	13	3.96	50 000	85 000
6.25-6.5	158.75	2.25	57.15	700 000	60 000	30 000	14	4.26	130 000	160 000
6.75-7	171.45	2.5	63.5	900 000	85 000	35 000	14	4.26	145 000	190 000
8	203.2	2.75	69.85	1 150 000	100 000	50 000	14'6"	4.41	160 000	240 000
9	228.6	2.8125	71.43	1 500 000	120 000	60 000	14'6"	4.41	175 000	240 000

Up (without circulation)

To determine the pull at surface or indicator reading to trip the latch, add the latch tripping load to the total string weight and subtract the weight below the jar. Therefore, 250,000 lbs. string weight plus 100,000 lbs. tripping load, minus 30,000 lbs. Weight below jar equals 320,000 lbs pull at surface to trip the latch.

Down (without Circulation)

To trip the latch down it is necessary to put the jar in compression the amount the latch is set to trip at, so it is necessary to slack off from the total string weight, the weight below the jar plus the tripping load. Therefore, the string will have to be slacked off to 250,000 lbs. minus (50,000 + 30,000) = 170,000 lbs. to trip the latch down.

Up (While circulating with 1000 p.s.i. pressured drop across the bit)

Extending force from pressure drop across the bit = 16.8 x 1000 = 16,800 lbs. Therefore 250,000 lbs. string weight plus 100,000 lbs. tripping load = 350,000 lbs.
30,000 lbs. weight below jar plus 16,900 lbs. hydraulic extending force = 46,800 lbs. = 303,200 lbs, pull at surface or indicator reading to trip the latch up.

Down (while circulating with 1000 p.s.i. pressured drop across the bit)

Extending force= 16,800 lbs.
Therefore the string will have to be slacked off to 250,000 lbs. minus (50,000 lbs.) plus 30,000lbs. Plus 16,800 lbs.) = 153,200 lbs to trip the latch down.

Operation

Jarring Up (Heavy Jarring)

A pull of at least equal to the mechanical latch trip setting must be taken to trip the latch, at this point the hydraulic delay takes over. The jar can be fired at this pull or the pull increased up to the maximum allowable. The jarring cycle is repeated by closing the jar to where the latch resets.

Jarring Up (Light Jarring)

A pull equal to the mechanical latch setting must fire, and then the string can be slacked off to the desired jarring pull, and wait for the hydraulic delay to fire the jar.

Down Jarring

To jar down, the jar is simply put in compression until the preset latch tripping load is reached, at which point the jar will jar down. Picking up on the jar resets it for another cycle.

Straight mechanical

When run as a straight mechanical a jar, a load in either tension or compression equal to the preset latch trip setting will cause the tool to jar.

The extending force is obtained by multiplying the pressure drop across the bit times the cross sectional area of the mandrel.

Example

6.25" jar
1000 p.s.i. pressure drop across the bit
Mandrel area= 16.8
Extending force=1000x 16.8= 16,800 lbs.

Straight Hydraulic

When run as a straight hydraulic jar, its operation is similar to existing hydraulic jars. From a closed position the jar will have a 6.5" free stroke, then the valve will seat causing the hydraulic delay, then the 6" free jar stroke.

Pump Open

Since the jar is basically an unbalanced slip joint, the pressure drop across the bit, while maintaining circulation will have an extending force on the jar. If circulation is maintained while jarring, this extending force will reduce the pull required to jar up and increase the load required to jar down.

Weight Below Jar

This weight must be subtracted from the up latch trip setting and added to the down latch trip setting for determining the up and down latch trip setting while in the hole.

Example:

Pull at surface to trip the latch 6.25" jar
Tripping load 100,000 lbs. up – 50,000 down
16.8 sq. in. mandrel area
250,000 lbs. string weight
30,000 lbs. below jar

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