

# Double-Acting Hydraulic/Mechanical Drilling Jar

Technical Summary

The NOV Downhole Double-Acting Hydraulic / Mechanical Drilling Jar is a hydraulic delay upstroke and downstroke jar featuring a mechanical latch making it a versatile drilling jar for complex drilling programs.

The Double-Acting HMJ is similar to the HMJ in design and operation; however, it has the benefit of a hydraulic delay downstroke jar making it effective for directional, horizontal, and extended reach drilling. This jar is ideal for compression placement in the drillstring because there is no “bleed through” operation required when tagging or picking up off bottom.

## Features and Benefits

- **Hydraulic delay and mechanical latch**, in both Up and Down jarring directions
- **Mechanical latch** adjustable release settings
- **Jet type metering device** for the hydraulic delay
- **Jar placement can be in tension**, neutral, or compression
- **Simple to operate**; requires no torque application in the jarring procedure
- **No unexpected jarring** while making connections or drilling
- **Continuous and consistent** jarring performance
- **Effective** in high friction directional, horizontal, or extended reach wells

## Technical Specifications

<b>Outside Diameter</b>	4 ¼ in. (108 mm)	4 ¾ in. (121 mm)	6 ¼ in. (159 mm)	6 ½ in. (165 mm)	6 ¾ in. (171 mm)	7 in. (178 mm)	8 in. (203 mm)	9 ½ in. (241 mm)
<b>Inside Diameter</b>	2 in. (50.8 mm)	2 ¼ in. (57 mm)	2 ¼ in. (57 mm)	2 ¼ in. (57 mm)	2 ½ in. (64 mm)	2 ½ in. (64 mm)	2 ⅝ in. (71 mm)	3 in. (76 mm)
<b>Assembly Number</b>	4525	431	442	428	440	480	411	437
<b>Maximum Recommended Hole Diameter*</b>	6 ¼ in. (158.75 mm)	7 ⅞ in. (200 mm)	12 ¼ in. (311 mm)	12 ¼ in. (311 mm)	12 ¼ in. (311 mm)	12 ¼ in. (311 mm)	17 ½ in. (445 mm)	26 in. (660 mm)
<b>Maximum Jar Load (Up/Down)</b>	86,000 lbf (382,000 N)	84,000 lbf (373,600 N)	160,000 lbf (711,700 N)	160,000 lbf (711,700 N)	190,000 lbf (845,100 N)	190,000 lbf (845,100 N)	300,000 lbf (1,334,400 N)	350,000 lbf (1,556,800 N)
<b>Tensile Yield Strength</b>	350,000 lbf (1,550,000 N)	362,000 lbf (1,610,300 N)	755,000 lbf (3,358,400 N)	755,000 lbf (3,358,400 N)	823,000 lbf (3,660,900 N)	1,000,000 lbf (4,448,200 N)	1,000,000 lbf (4,448,200 N)	1,225,000 lbf (5,449,000 N)
<b>Torsional Yield Strength**</b>	11,500 lbf-ft (15,600 N-m)	11,500 lbf-ft (15,500 N-m)	37,500 lbf-ft (50,800 N-m)	37,500 lbf-ft (50,800 N-m)	44,500 lbf-ft (60,300 N-m)	70,000 lbf-ft (94,900 N-m)	73,500 lbf-ft (99,600 N-m)	95,000 lbf-ft (128,800 N-m)
<b>Total Stroke</b>	17.5 in. (445 mm)	19 in. (470 mm)	22 in. (546 mm)	22 in. (546 mm)	20 in. (518 mm)	20 in. (518 mm)	21 in. (533 mm)	21 in. (533 mm)
<b>Standard Up Latch Setting</b>	35,000 lbf (155,700 N)	40,000 lbf (177,900 N)	90,000 lbf (400,300 N)	90,000 lbf (400,300 N)	90,000 lbf (400,300 N)	90,000 lbf (400,300 N)	95,000 lbf (422,500 N)	100,000 lbf (444,800 N)
<b>Maximum Up Latch Setting</b>	50,000 lbf (222,411 N)	55,000 lbf (244,600 N)	140,000 lbf (622,700 N)	140,000 lbf (622,700 N)	140,000 lbf (622,700 N)	140,000 lbf (622,700 N)	150,000 lbf (667,200 N)	155,000 lbf (689,400 N)
<b>Standard Down Latch Setting***</b>	15,750 lbf (70,060 N)	18,000 lbf (80,000 N)	40,500 lbf (180,100 N)	40,500 lbf (180,100 N)	40,500 lbf (180,100 N)	40,500 lbf (180,100 N)	42,750 lbf (190,100 N)	45,000 lbf (200,100 N)
<b>Maximum Down Latch Setting</b>	22,500 lbf (100,085 N)	27,000 lbf (120,100 N)	63,000 lbf (280,200 N)	63,000 lbf (280,200 N)	63,000 lbf (280,200 N)	63,000 lbf (280,200 N)	67,500 lbf (300,200 N)	69,800 lbf (310,400 N)
<b>Pump Open Area</b>	5.4 in <sup>2</sup> (35 mm <sup>2</sup> )	6.5 in <sup>2</sup> (4,200 mm <sup>2</sup> )	9.6 in <sup>2</sup> (6,200 mm <sup>2</sup> )	9.6 in <sup>2</sup> (6,200 mm <sup>2</sup> )	11.0 in <sup>2</sup> (7,100 mm <sup>2</sup> )	11.0 in <sup>2</sup> (7,100 mm <sup>2</sup> )	14.2 in <sup>2</sup> (9,170 mm <sup>2</sup> )	15.9 in <sup>2</sup> (10,260 mm <sup>2</sup> )
<b>Length (Latched Position)</b>	22 ft (6.7 m)	19.8 ft (6.0 m)	22.5 ft (6.9 m)	22.5 ft (6.9 m)	23.0 ft (7.0 m)	23.0 ft (7.0 m)	22.5 ft (6.9 m)	23.0 ft (7.0 m)
<b>Weight</b>	730 lb (330 kg)	850 lb (390 kg)	2,000 lb (910 kg)	2,100 lb (960 kg)	2,300 lb (1,100 kg)	2,500 lb (1,200 kg)	3,100 lb (1,500 kg)	5,200 lb (2,400 kg)

\* Hole openers not recommend

\*\* Torsional Yield Strength rating is based on the yield of the body connections independent of tool joint connections

\*\*\* Down Latch Setting is 45% of the Up Latch Setting and a tolerance of -+5

