

## Hydraulic/Mechanical Drilling Jar

The Wenzel Downhole Tools Hydraulic/Mechanical Drilling Jar (HMJ) is a double acting jar, designed to deliver hydraulic delay when jarring in the up direction, and mechanical release when jarring in the down direction. The HMJ incorporates a latch mechanism to keep the jar locked in the neutral position and eliminate unexpected jarring while tripping or racking on the derrick.

### Features and Benefits

- ▶ The HMJ is normally operated in the latched position to reduce unexpected jarring while drilling and eliminate movement between jar components, increasing service life.
- ▶ The HMJ operates with a simple up and down motion and is not affected by torque.
- ▶ The spline drive and latch mechanism are enclosed in a single, sealed oil chamber without ports to the annulus. Such ports on other jars may fill with cuttings and restrict the down jar stroke.
- ▶ The hydraulic delay mechanism is located in a separate chamber to prevent contamination and increase reliability.
- ▶ With the latch mechanism in the latched position, the inner mandrel and outer housing act integrally, virtually eliminating seal and inner tool wear during normal drilling conditions. There is no need to extend or open the jar before running in the hole.
- ▶ Standard seals in the tool are effective to 250°F (120°C). The jar can be dressed with seals effective to 400°F (200°C) for hot hole environments. External sealing surfaces are tungsten carbide-coated to enhance wear and corrosion resistance.
- ▶ The HMJ can be run in tension or in compression within the preset latch setting

## Operation

### Jarring Up

- Jarring up is achieved by applying sufficient overpull to overcome the latch setting, which initiates the hydraulic time delay. During the time delay, the overpull at surface can be adjusted to vary the impact force. See the table for the maximum pull during delay.
- After impact, apply a down force sufficient to close jar and re-engage latch, then repeat the jarring cycle as required.

### Jarring Down

- Jarring down is achieved by applying sufficient downward force to overcome the latch setting and pump open force. At that point, the HMJ will release and jar downward.
- After impact, pick up the work string to re-engage the mechanical latch then repeat the jarring cycle as required.

## Hydraulic/Mechanical Drilling Jar Specifications

### IMPERIAL

| Nominal OD (inch) | Length (feet) | Thru Bore (inch) | Tensile Yield (lbs) | Torsional Limit (ft lbs) | Nominal Up Latch Setting (lbs) | Nominal Down Latch Setting (lbs) | Max Pull During Delay (lbs) | Free Stroke Up (inch) | Free Stroke Down (inch) |
|-------------------|---------------|------------------|---------------------|--------------------------|--------------------------------|----------------------------------|-----------------------------|-----------------------|-------------------------|
| 3.12              | 13.9          | 1.00             | 154 500             | 8 200                    | 25 000                         | 11 000                           | 42 000                      | 5.0                   | 6.5                     |
| 3.50              | 14.9          | 1.25             | 211 500             | 10 300                   | 35 000                         | 15 000                           | 50 000                      | 5.0                   | 7.0                     |
| 3.75              | 15.1          | 1.19             | 214 000             | 11 300                   | 35 000                         | 15 000                           | 65 000                      | 5.0                   | 7.0                     |
| 4.75              | 17.0          | 2.25             | 391 000             | 20 000                   | 55 000                         | 30 000                           | 85 000                      | 5.0                   | 6.0                     |
| 5.25              | 17.9          | 2.25             | 554 100             | 31 000                   | 55 000                         | 30 000                           | 120 000                     | 5.0                   | 6.0                     |
| 6.25              | 18.0          | 2.25             | 777 000             | 48 500                   | 90 000                         | 40 000                           | 160 000                     | 5.0                   | 6.0                     |
| 6.50              | 18.0          | 2.25             | 777 000             | 52 400                   | 90 000                         | 40 000                           | 160 000                     | 5.0                   | 6.0                     |
| 6.62              | 17.9          | 2.75             | 722 500             | 53 800                   | 90 000                         | 40 000                           | 170 000                     | 5.0                   | 6.0                     |
| 6.75              | 17.9          | 2.75             | 907 500             | 48 800                   | 95 000                         | 42 000                           | 190 000                     | 5.0                   | 6.0                     |
| 8.00              | 18.2          | 2.81             | 949 000             | 98 000                   | 100 000                        | 45 000                           | 240 000                     | 5.5                   | 6.0                     |
| 9.00              | 19.1          | 3.00             | 1 221 000           | 162 500                  | 110 000                        | 50 000                           | 240 000                     | 5.5                   | 6.0                     |
| 9.50              | 19.2          | 3.00             | 1 658 500           | 178 400                  | 110 000                        | 50 000                           | 240 000                     | 5.5                   | 6.0                     |

### METRIC

| Nominal OD (mm) | Length (m) | Thru Bore (mm) | Tensile Yield (daN) | Torsional Limit (N·m) | Nominal Up Latch Setting (daN) | Nominal Down Latch Setting (daN) | Max Pull During Delay (daN) | Free Stroke Up (mm) | Free Stroke Down (mm) |
|-----------------|------------|----------------|---------------------|-----------------------|--------------------------------|----------------------------------|-----------------------------|---------------------|-----------------------|
| 79              | 4.2        | 25             | 68 700              | 11 100                | 11 100                         | 4 900                            | 18 700                      | 130                 | 170                   |
| 89              | 4.5        | 32             | 94 100              | 14 000                | 15 600                         | 6 700                            | 22 200                      | 130                 | 180                   |
| 95              | 4.6        | 30             | 95 200              | 15 300                | 15 600                         | 6 700                            | 28 900                      | 130                 | 180                   |
| 121             | 5.2        | 57             | 173 900             | 27 100                | 24 500                         | 13 300                           | 37 800                      | 130                 | 150                   |
| 133             | 5.5        | 57             | 246 500             | 42 000                | 24 500                         | 13 300                           | 53 400                      | 130                 | 150                   |
| 159             | 5.5        | 57             | 345 600             | 65 800                | 40 000                         | 17 800                           | 71 200                      | 130                 | 150                   |
| 165             | 5.5        | 57             | 345 600             | 71 000                | 40 000                         | 17 800                           | 71 200                      | 130                 | 150                   |
| 168             | 5.5        | 70             | 321 400             | 72 900                | 40 000                         | 17 800                           | 75 600                      | 130                 | 150                   |
| 171             | 5.5        | 70             | 403 700             | 66 200                | 42 300                         | 18 700                           | 84 500                      | 130                 | 150                   |
| 203             | 5.5        | 71             | 422 100             | 132 900               | 44 500                         | 20 000                           | 106 800                     | 140                 | 150                   |
| 229             | 5.8        | 76             | 543 100             | 220 300               | 48 900                         | 22 200                           | 106 800                     | 140                 | 150                   |
| 241             | 5.9        | 76             | 737 700             | 241 900               | 48 900                         | 22 200                           | 106 800                     | 140                 | 150                   |

Specifications are based on as new condition and are subject to change without notice