

OPERATIONAL GUIDE

Proper Operation of the Sup-R-Jar Drilling Jar

The Logan Rentals Sup-R-Jar™ Drilling Jar is a double acting hydraulic jar designed for use during drilling operations to apply an intensified force either up or down against a stuck portion of the drilling string.

Following these standard procedures will ensure proper operation of the jar while drilling, tripping in and out of the hole, jarring up or down and while racking back in the derrick.

JAR PLACEMENT GUIDELINES AND RECOMMENDATIONS

Avoid placing the jar at a cross over between BHA components of different diameters, such as drill collars and heavy weight drill pipe. The jar should be placed a minimum of two joints above or below any crossover sub. Never run the jar below a reamer, stabilizer, or any other tool with a larger O.D. than the jar. The jar should never be run at or near the neutral point in the string and should be kept at least 5,000 lbs. away from this weight transition zone. See figure 1 for recommended jar versus hole size.

The Sup-R-Jar™ Drilling Jar should never be run in close proximity to another Sup-R-Jar Drilling Jar or any other type jar.

The Sup-R-Jar™ Drilling Jar can be run in tension or compression. Below is a list of the differences.

Sup-R-Jar™ Drilling Jar Run in Tension	Sup-R-Jar™ Drilling Jar Run in Compression
The neutral point is below the jar	The Neutral point is above the jar
Normally incorporated in low angle wells where there is sufficient weight below the jar	Unavoidable in highly deviated wells where there is insufficient weight below the jar
Eliminates the chance of the jar firing when picking up off bottom	Jar must be picked up off bottom and allowed to bleed off before tripping out of hole or setting the slips to avoid premature firing
Ensures the jar stays open and ready for down jarring	Jar stays closed and ready for up jarring
The pump open extension force will help keep the tool extended	The jar may fire inadvertently if picked up off bottom too fast

OPERATION

No Lift Sub is required. Hoist the Sup-R-Jar™ Drilling Jar into the elevators. Remove the Safety Clamp prior to running in the hole.

The Sup-R-Jar™ Drilling Jar must be installed in the drill string with the box end up. Prior to makeup, a suitable thread compound meeting A.P.I. Spec. 7, such as Kopper Kote, should be applied to the end connections.

In order to protect the polished mandrel sealing surface from possible damage during handling or storage, never apply tongs, slips, chains, or slings to this area.

When Making up and breaking out the jar, the rig tongs should be placed immediately adjacent to the top and bottom connections to avoid breaking or torque being applied to the jar body connections. All internal body connections are torqued to specifications at the service center. Avoid breaking these internal connections on the rig.

JARRING UP

To jar upward while drilling in tension (tool fully extended), lower the drill string until the weight indicator reads 15,000 lbs. less than the free string weight (*due to static friction in some cases more than 15,000 lbs. will be needed to cock the jar*). Pick up string and apply the desired overpull (*within the safe working loads outlined in figure 3*) and set the draw-works brake. After approximately 30-50 seconds, the jar will fire up. To jar again simply repeat the same process or resume normal drilling operations.

JARRING DOWN

To jar downward while drilling in tension (*tool fully extended*), lower the drilling string until the desired slack off weight is obtained, (*within the safe working loads listed below, see figure 3*) after a time delay of approximately 40-60 seconds, the jar will fire down. To re-cock the jar, raise the drill string until the weight indicator shows a 15,000 lbs. increase above free string weight (*due to static friction in some cases more than 15,000 lbs. will be needed to cock the jar*). This indicates that the jar is ready for another jarring cycle. One jarring is complete the jar must be picked up off bottom and allowed to bleed off to avoid premature firing before resuming drilling operations. It may be necessary to reduce the pump pressure to overcome the pump open force on the jar created by the pressure drop across the bit when attempting to jar down. See figure 2.

It is not necessary to “warm up” or circulate to cool off the Sup-R-Jar™ Drilling Jar during jarring. Torque can be applied while jarring without affecting impact or time delay of the jarring action. (*See Chart – Max Allowable torque while jarring*)

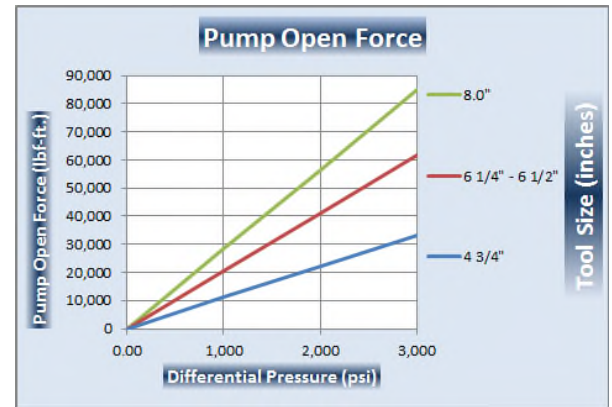
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Figure 1: Recommended Jar Size For Applicable Hole Size

4 3/4"	6 1/4"	6 1/2"	8.0"
6 1/8"	7 7/8"	8 1/2"	9 7/8"
6 3/4"	8 1/2"	9 7/8"	12 1/4"
7 7/8"	9 7/8"	10 5/8"	13 3/8"
	10 5/8"	12 1/4"	22.0"

Maximum Allowable Dogleg (deg./100ft.)			Max Allowable torque while jarring (lbf-ft.)	
Tool Size (in)	Sliding	Rotating	Tool Size (in)	Torque (lbf-ft.)
4 3/4"	12	6	4 3/4"	5,000
6 1/4"	10	4	6 1/4"	11,000
6 1/2"	9	4	6 1/2"	14,000
8.0"	7	3	8.0"	26,000

Figure 2:



RACKING BACK

When the jar comes through the rotary, install the safety clamp while the tool is still in tension. With the safety clamp installed, the jar can be racked back in any position within the stand.

RECOMMENDED MAINTENANCE AND STORAGE

New tools are shipped painted and ready to run. The threaded ends are coated with rust preventative coating and heavy duty thread protectors are installed to eliminate mechanical damage. On each round trip the jar should be visually inspected for any indication of damage, excessive wear, or leakage.

- On each trip out of the hole, wash all external mud from the OD of the tool and flush ID with fresh water before racking back in the derrick.
- Before the jar is laid down, flush all drilling fluid from the bore and wash all external surfaces of the tool. Apply thread compound and protectors to the end connections.
- Install the safety clamp before racking the jar back in the derrick.

Figure 3:

Specifications

	Units				
Tool Size O.D. (New)	Inches (mm)	4 3/4" (120.65)	6 1/4" (158.75)	6 1/2" (165.1)	8.0" (203.2)
Bore (I.D.)	Inches (mm)	2 1/4" (57.15)	2 3/4" (69.85)	2 3/4" (69.85)	3.00 (76.20)
Overpull Max (pre-jarring at jar)	lbf (kn)	90,000 (400)	185,000 (823)	185,000 (823)	300,000 (1,334)
Tensile Yield	lbf (kn)	452,737 (2,014)	761,980 (3,390)	916,152 (4,075)	1,302,363 (5,793)
Torsional Yield	lbf-ft. (N-m)	19,116 (25,918)	41,315 (56,016)	56,395 (76,461)	102,056 (138,369)
Pump Open Area	Sq. in. (sq. mm)	11.13 (7,181)	20.60 (13,290)	20.60 (13,290)	28.27 (18,239)
Total Stroke	Inches (mm)	30.35 (771)	26.16 (665)	26.16 (665)	26.07 (203)
Max Temp (standard)	°F (°C)	350 (176)	350 (176)	350 (176)	350 (176)
Max Temp. (high)	°F (°C)	450 (232)	450 (232)	450 (232)	450 (232)
Max Drilling Hrs. Up to 350° F	Hours	300	300	300	300
Max Drilling Hrs. Up to 450° F	Hours	150	150	150	150
Length Approx.	Feet (m)	31 (9.4)	33 (10.1)	33 (10.1)	34 (10.4)
Weight Approx.	lb. (kg)	1,800 (816)	2,400 (1,089)	2,600 (1,179)	3,800 (1,723)

Contact your Logan International or Logan Rentals representative if assistance is required concerning the proper operation of the Logan Sup-R-Jar™