

Multiple Activation Circulation Sub*

When drilling a well, it is often necessary to pump large volumes of drilling fluid or LCM.

To allow this capability it is prudent to run a circulating sub in the BHA. Such subs usually need to be cycled open and closed a number of times, and X Drilling Tools[®] has developed the TAZ[®] circulation sub to provide a truly unlimited number of activations downhole.

The TAZ[®] circulation sub remains dormant in the BHA until opened by dropping an activation ball, which then disappears completely. The resulting pressure drop allows the j-slot mechanism to engage, opening three ports to the annulus. The TFA of the nozzles within the ports can be selected to suit the application, with the percentage of diverted flow being a function of their size and the pressure drop below the tool.

The central feature of the TAZ[®] system is that the ball 'disappears' upon activation, ensuring that a 2" clearance is maintained through the tool at all times. Closing the ports is achieved by pumping down an identical ball, which also 'disappears' upon de-activation, leaving the tool dormant and ready to be activated again in a truly endless cycle.

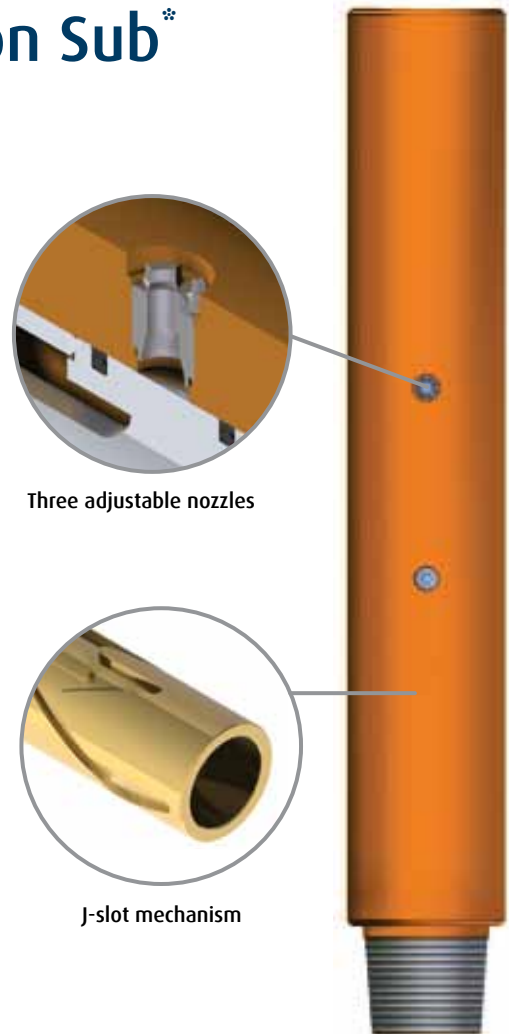
Applications

- Lost Circulation
- Hole Enlargement
- Coring
- Well Cleanout
- Wellhead Cleanout
- Horizontal and Directional Drilling
- Surge Protection

Features and Benefits

- Rugged simple design with proven mechanical concept
- Unlimited number of activations
- No pass through restrictions
- Three adjustable nozzles with size ranges of 9/32 to 22/32
- No need to trip out after single or multiple activations
- Allows activation in any hole configuration or geometry
- Allows the pumping of cement, acid or LCM slug through the tool
- Clear pressure indication of activation or deactivation
- Tool can be run by rig crew (no need for specialised service hand)
- Ability to run through logging tools

* Patent applied for

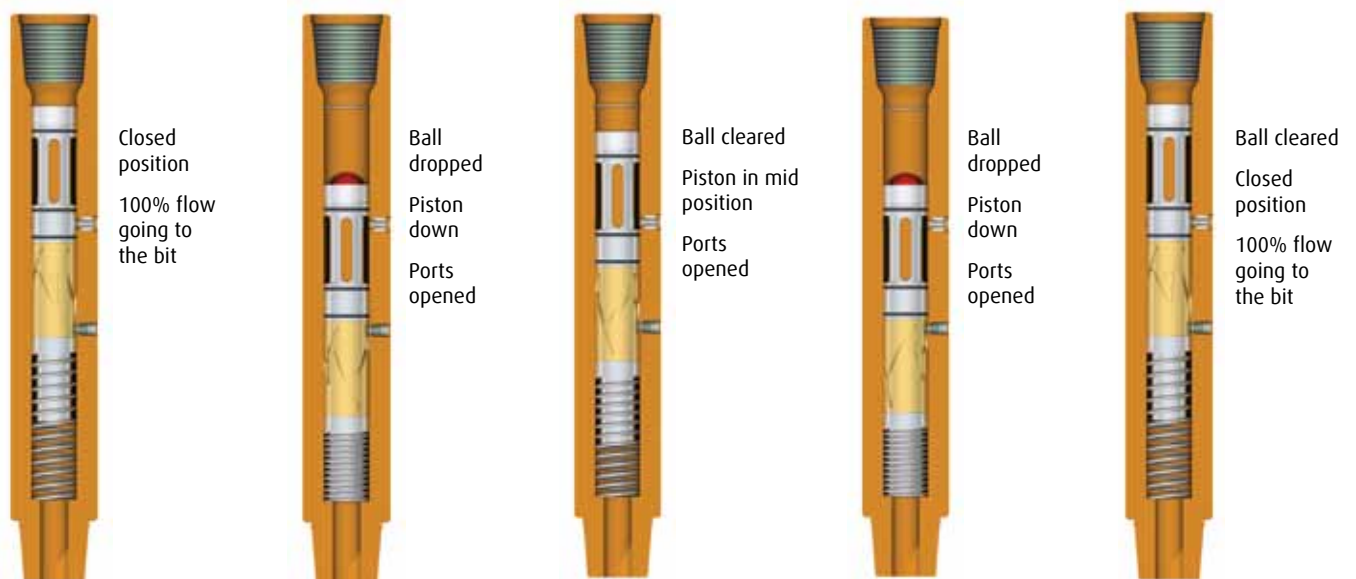


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Specifications

Connection		4.5 IF	Number of Ports		3
Tool OD	in	6.5	Ports TFA	sq in	0.2 - 1.1
Minimum ID	in	2.04	Max Drilling Flow Rate	GPM	700
Tool Length	ft	3.16	Operating Temperature	°C	180
Drop Ball Size	1n	2.125	TFA	sq in	3.3

Activation/De-activation sequence



* Patent applied for