



ANOTHER MYTH BUSTED!

“Dart Activation is better than Ball Activation, True or False?”

Introduction

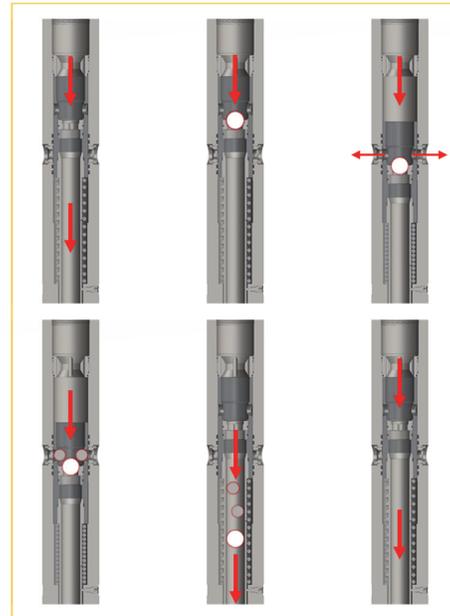
DSI is best known for its Ball Activated PBL Multiple Activation Bypass System. Over the years, many companies have attempted to imitate PBL's design with varying degree of success but not quite as good. Now, there seems to be a misconception or perhaps even a concerted campaign of misinformation in the market claiming that Dart activated circulating tools are somehow better than the Ball activated circulating tools. Ironically, if we prescribe to this notion, what we are saying is that a PBL tool is better than a PBL tool, why? Because PBL tool can be activated by a Dart or by a Ball and the choice of activation medium is that of the customer and based on the prevailing downhole operating parameters.

The purpose of writing this article is not to promote a Ball activated tool by placing such a system on a higher pedestal than a Dart activated tool, simply because DSI PBL offers both systems in one tool. However, our aim is to make it clear to the reader that each has its own merits and we cannot simply and categorically claim that one is better than the other.

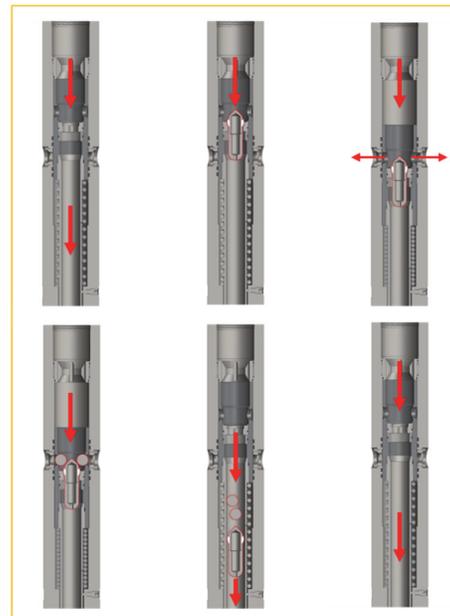
Argument

When considering the use of multiple activation bypass systems in vertical or near-vertical wells, the choice between a ball drop or dart drop system would depend on how fast the Operator wishes to activate or deactivate the tool. If we consider, purely, the gravitational force then, as long as the Dart or the Ball have similar specific gravities (SG), then it does not really matter which system is selected. In most cases, a Dart has a higher SG than a Ball (e.g. Metallic Dart vs. Elastomer Ball), hence the Operator may select Dart activated system especially when heavy muds are used. The choosing of Dart over Ball activation method may become even more crucial if in addition to the use of heavy mud, limited circulation is encountered.

The advantage of using Dart instead of Ball diminishes as the well angle deviates further away from vertical. The higher the well angle, the greater portion of the downward force is wasted in order to overcome the friction between the activation medium and the inner wall of the String. So much so that, in the horizontal or high angle sections of a well, the movement of a Dart, or for that matter a Ball, would almost solely depend on circulation rather than gravity. As a matter of fact, in such circumstances, the gravitational pull is the Dart's worst enemy whereas, under similar conditions the friction between the Ball and the inner wall of string facilitates the rolling of the Ball forward as long as there is circulation. **Therefore, in high angle**



DSI PBL “Ball Drop” System – Activation / De-activation Sequence



DSI PBL “Dart Drop” System – Activation / De-activation Sequence



or horizontal wells, a lot less circulation would be required to “roll” a Ball forward compared to what would be needed to overcome the frictional resistance between the Dart and the inner wall of the String so to “slide” it forward.

Justification / Conclusion

The DSI family of circulating tools are capable of offering **Ball Activation, Dart Activation and Universal Split Flow Dart Activation** features, all of which can be used in the very same tool that may already be downhole. Hence, the Operator has full control on how it wishes to address the **anticipated** or **encountered** well challenges. The operative word here is “**having full control**” rather than using a device in the string whereby its default activation / De-activation mechanism requires the use of Dart and, Dart only. With such limited application devices, only in an emergency situation where all has failed, an “emergency Ball is dropped” after which the tool must be retrieved to surface because, once the “emergency ball” has been deployed, deactivation or further activation of the tool downhole is not possible.

So, the more relevant factor to consider when choosing a circulating tool ought not be whether to use DSI PBL tool or some other less reliable “dart activated” circulating tool. Instead the consideration ought to be the decision on the activation medium to be used with DSI PBL Tool which would be most suited to the anticipated drilling conditions and well parameters.

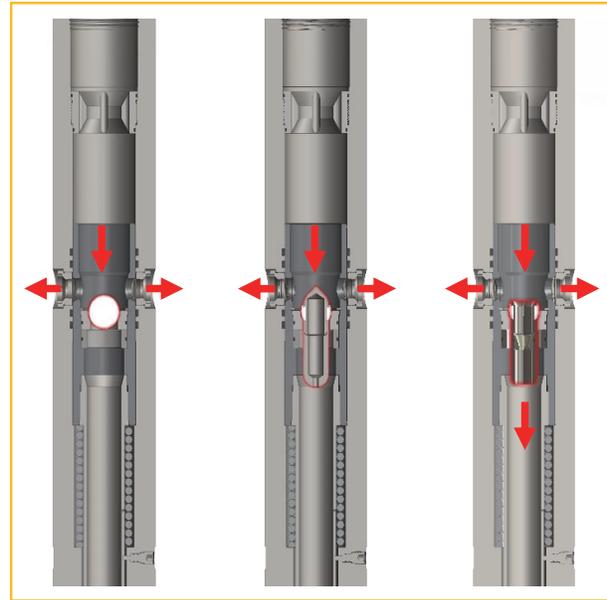
In order to cover all eventualities, DSI PBL tool can be ordered with Extended Catcher Sub and with full kits for Ball Activation, Dart Activation and, USFD Activation options, all of which can be utilised with the exact same tool and no alterations or modifications would be needed.

Such versatility in use is the reason why DSI is known in the market, most notably, for offering complete circulating solutions to the energy industry.

Watch out for our next Myth Busting Segment which will be all about “Balls”, including our new High SG, High Temperature, “Fast Balls”!

For further details, please feel free to contact us on:

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DSI PBL “Ball, Dart and, Universal Split Flow Dart” Drop Systems