

6.0 Trouble Shooting

SL	Scenario	Possible Cause	Solution
1	Activation ball broken into pieces during surface test	Due to impact of activation ball striking the catcher cage because tool not within fluids.	Ensure tool is within fluids and fill drill string prior to dropping activation ball. The fluid will provide a cushioning effect for deactivated balls.
2	Fluid dripping through closed ports after deactivation on surface test	Possibly the sleeve has not completely closed yet or residual fluid around ports.	Bleed off pressure completely and wait for 10 minutes until there is no fluid dripping from ports.
3	Unable to build pressure to deactivate tool during surface test	Deactivation balls not sealed off ports	Rotate & shake string for the steel balls to engage
4	Dropped Activation ball, pumped more than one string volume, no indication of pressure change	Ball pumped down too fast (at high flow rate/psi), could have blown through the seat.	Complete cycle by dropping 2 x steels balls to confirm activation ball has sheared through seat. Maintain SPP 1000 psi below tool deactivation pressure while dropping activation ball to ensure successful activation.
5	Sudden drop in pressure while drilling ahead	Presence of junk / debris in drilling fluid has restricted flow through the PBL creating unintended activation.	Ensure clear drilling fluid is pumped into the well. Place drill pipe filter in the string.
6	Activation ball dropped, increase in pressure, no sign of PBL activation	Activation ball could have got stuck in the string.	Check ID of string above PBL, shall be less than OD of activation ball.
7	Dropped steel balls for deactivation, no indication pressure build-up	Dropped steel balls together, could be stuck at a change in cross section in the string ID	Rotating and sudden jerking of the string will release the balls. To avoid this from happening, drop steel balls 5-10 seconds apart.
8	No pressure build-up during deactivation	LCM not completely flushed out from tool preventing the deactivation balls from sealing the ports	When LCM has been pumped, clean the drill string (with normal drilling mud, no LCM included) before dropping the de-activation balls.
9	Found LCM particles below PBL	Drilling fluid not clear	Pump the activation ball with a fluid spacer (normal drilling mud, no LCM included) otherwise LCM may pass the ball during the pumping process before the activation ball lands on the seat and LCM gets access to the sensitive BHA.
10	Sudden increase in pressure after spotting LCM & trip out	LCM not completely flushed out from string. Residual LCM settled on top of the activation ball during tripping out or when pumps off and could have plugged the tool	POOH & L/D PBL. Whenever LCM spotting is complete, circulate one full string volume plus an additional 25% of clear drilling fluid to ensure LCM is completely flushed out.
11	Pressure drop even after PBL deactivated downhole	Possible sleeve not fully returned to closed position	Drop another activation ball and switch pump on and off to oscillate the sleeve until change in pressure is noticed. Then, drop steel balls and deactivate tool.
12	Unable to deactivate tool even after exceeding the deactivation pressure of the tool.	Reached the Rig pumps pop off limits	Deactivate the tool by connecting a cementing unit.

7.0 Service cycle guidelines

TOTAL USAGE	<p>300 hours. Time starts from when the PBL goes below Rotary for the 1st run in the hole. The 300 hours includes tripping times and laid down times between runs, hours are calculated from the first time the PBL is run below the rotary.</p> <p>Re-run is <u>NOT</u> permitted in the case of pumping cement, acid, and fluids with gelling properties through the PBL tool, and the tool must be replaced upon POOH.</p>
RERUN AFTER WAIT	<p>Re-run is allowed only once, and this re-run must occur within 72 Hours from POOH provided the tool is flushed out with fresh water at surface when POOH and a successful function test has been conducted prior to the next RIH.</p>
DOWNHOLE VIBRATION	<p>If the BHA is subject to abnormal / excessive downhole vibration, stick-slip vibration, according to the Industry / Operator's best drilling practices, the PBL must be replaced upon next POOH.</p>
IN CASE OF NON-CONFORMANCE	<p>Any PBL Tool to be shipped back for investigation <u>MUST</u> be sent back in its existing state / condition with no alterations by means of readjusting the internal components (all balls <u>MUST</u> be left in the tool as it is, and the PBL Tool <u>MUST NOT</u> be cleaned prior to return to base)</p> <p>Removing the balls & cleaning the internal diameter of the tool will affect the investigation process tremendously.</p>

8.0 PBL Operation Summary

