How Does the PIN to VAL Distance Impact Ball Motion?

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Ebonite International recently explored the relationship of the distance of the PIN to VAL (vertical axis line) on ball motion. Specifically, would the ball motion be changeg significantly if the PIN to PAP distance but the PIN to VAL distance was altered? The results are interesting and offer coaches, players and ball drillers options to match-up layouts with players.

How Does the PIN to VAL Distance Impact Ball Motion?READER'S NOTE: The Vertical Axis Line (VAL) is a line drawn through the bowler's PAP that is perpendicular (90 Degrees) to the midline. This line will extend around the entire ball intersecting both the Positive Axis Point and Negative Axis Point.As the recent USBC research indicates, the primary factor of a bowling ball's axis migration is the initial Radius of Gyration value in which the bowling ball is rotating around the PAP. As USBC states, in their ball motion studies, independent of layout, cover or core, "[w]hile the approved ball is on the lane, the bowling ball flared and created an axis migration to yield approximately the same RG value that the ball was initially rotating on from the bowlers PAP." This finding sheads further light on the recent Ebonite results of a study of the distance of the PIN to the Vertical Axis Line (VAL) published in the Winter 2007 Pro Shop Insider.Ebonite International recently conducted a test of the affect of altering the distance of the PIN to VAL and the subsequent change in ball reaction. Specifically, they drilled 4 NV bowling balls, each with the same PIN to PAP distance of 3.5 inches. In addition, they angle between PAP to PIN to MB was held constant at 90 Degrees on all four bowling balls. This kept the distances of the PIN to PAP and PAP to MB distances the same on each bowling ball. As many of you know, the angle between the PAP-PIN-MB impacts length and backend motion shape. To measure ball motion change, the only difference between the 4 bowling balls was the PIN to VAL distances. From 0 to 3 inches, the 4 balls motion were charted and analyzed for differences. Here is the data from this research. PIN to VALDISTANCE BREAKPOINTHOOKOUT HOOKIN TOTALMOVE ENTRYANGLE 0 INCHES2.533 RG Plane46.2 13.20 7.10 20.30 4.16 1 INCHES2.528 RG Plane 46.1 14.29 8.03 22.32 4.62 2 INCHES2.522 RG Plane 46.9 14.80 6.59 21.39 3.99 3 INCHES2.519 RG Plane 46.3 14.10 7.63 21.72 4.51(Ebonite International, 2007). So, as the data reveals, you can alter the ball motion by changing the initial RG plane in which a bowling ball will rotate around at release. As you see from the data table, the most overall ball reaction will be realized when the PIN to VAL distance is 1 inch. This created the highest entry angle. Although, the 3 inch distance was also strong. In addition, the least aggressive layout was a ball with the PIN on the Verical Axis Line. But, the length of each bowling ball was approximately the same.This information can help you add or reduce reaction for those who need it. As Ron Hickman, Ball Design Engineer @ Ebonite, writes, "The VAL style layout is a way to put the bowler's axis point on a different RG plane and keep the PIN and MB the same distance fromt the axis point."READER'S NOTE 2: On a special note of interest, Ebonite reveals that Tommy Jones favors the 1 inch, PIN to VAL distance.