

**Gradient Line
Balance Hole
Placement™**

developed by

MoRich

Balance Hole location on the Gradient Line

Balance hole Position	Location	Change in Ball Reaction
P1	6 ³ / ₄ " from the PSA on the VAL	Weakens ball reaction
P2	1/3 of the distance from the P1 to the PSA	Maintains ball reaction
P3	2/3 of the distance from the P1 to the PSA	Strengthens ball reaction
P4	PSA	Maximizes ball reaction

Gradient Line Balance Hole Analysis

Asymmetrical ball with RG 2.516", 0.015" Int. Diff., 0.048" Total Diff.

Balance holes are 1" dia., 3" deep, except "Double Thumb" balance holes (1 1/4" dia.)

30° x 4.25" x 20°

Balance Hole	Low RG in "	Int Diff in "	Total Diff in "	Ratio	RG of PAP in "	Top Wt. in oz.	Pin Out in "
Undrilled	2.516	0.015	0.048	0.32	2.516	2.51	3.48
No BAL Hole	2.518	0.02	0.052	0.38	2.543		
P1	2.531	0.019	0.037	0.51	2.549		
P2	2.524	0.019	0.047	0.40	2.553		
P3	2.519	0.025	0.057	0.43	2.554		
P4	2.517	0.03	0.064	0.48	2.549		

50° x 4.25" x 20°

Undrilled	2.516	0.015	0.048	0.32	2.516	2.51	3.48
No BAL Hole	2.518	0.026	0.055	0.48	2.542		
P1	2.529	0.025	0.044	0.57	2.548		
P2	2.522	0.023	0.053	0.44	2.552		
P3	2.519	0.032	0.062	0.51	2.551		
P4	2.516	0.037	0.067	0.55	2.547		

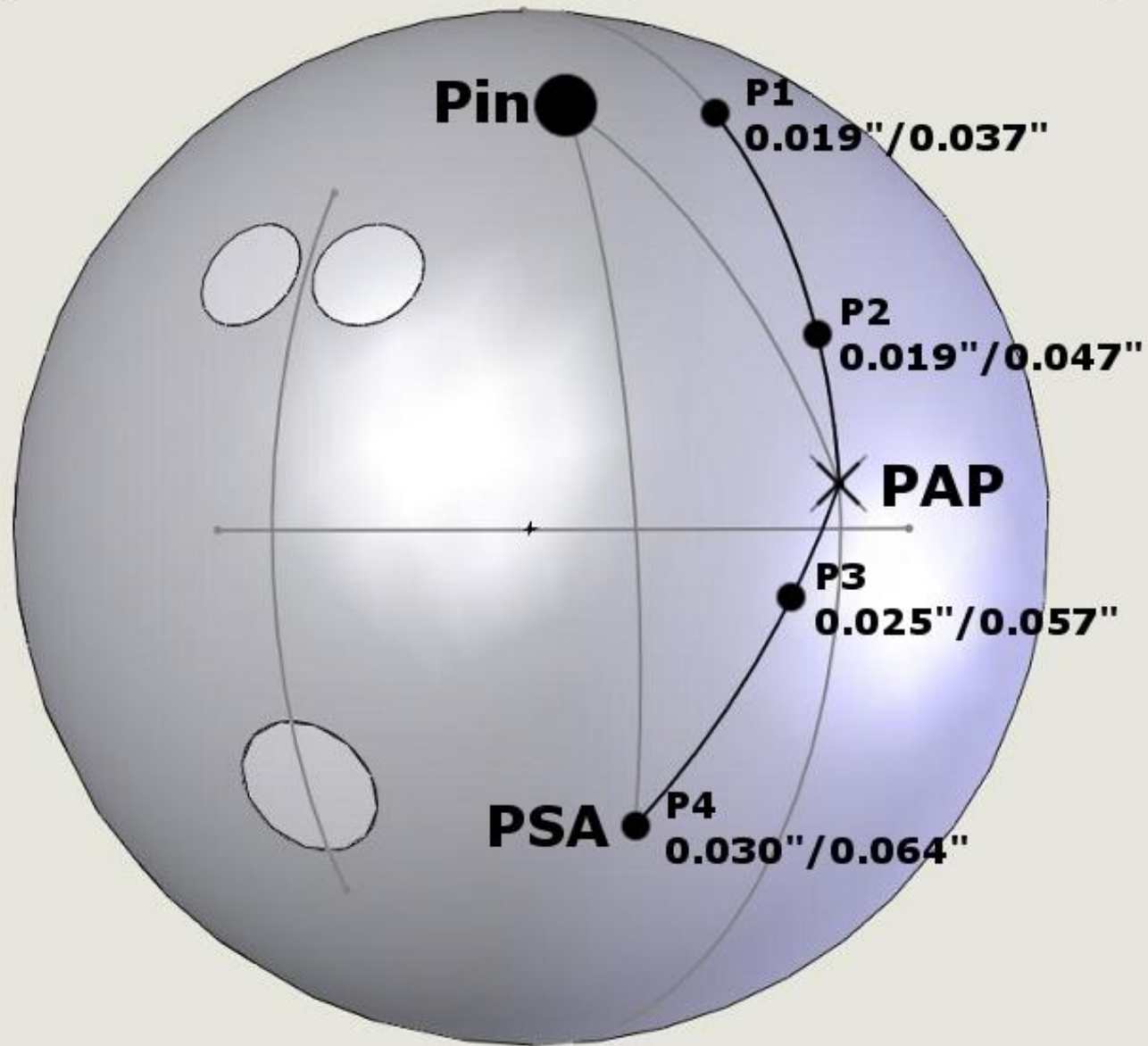
70° x 4.25" x 20°

Undrilled	2.516	0.015	0.048	0.32	2.516	2.51	3.48
No BAL Hole	2.518	0.029	0.056	0.52	2.539		
P1	2.526	0.026	0.049	0.53	2.547		
P2	2.520	0.025	0.057	0.44	2.55		
P3	2.518	0.036	0.065	0.56	2.545		
Double Thumb	2.515	0.04	0.072	0.56	2.545		

90° x 4.25" x 20°

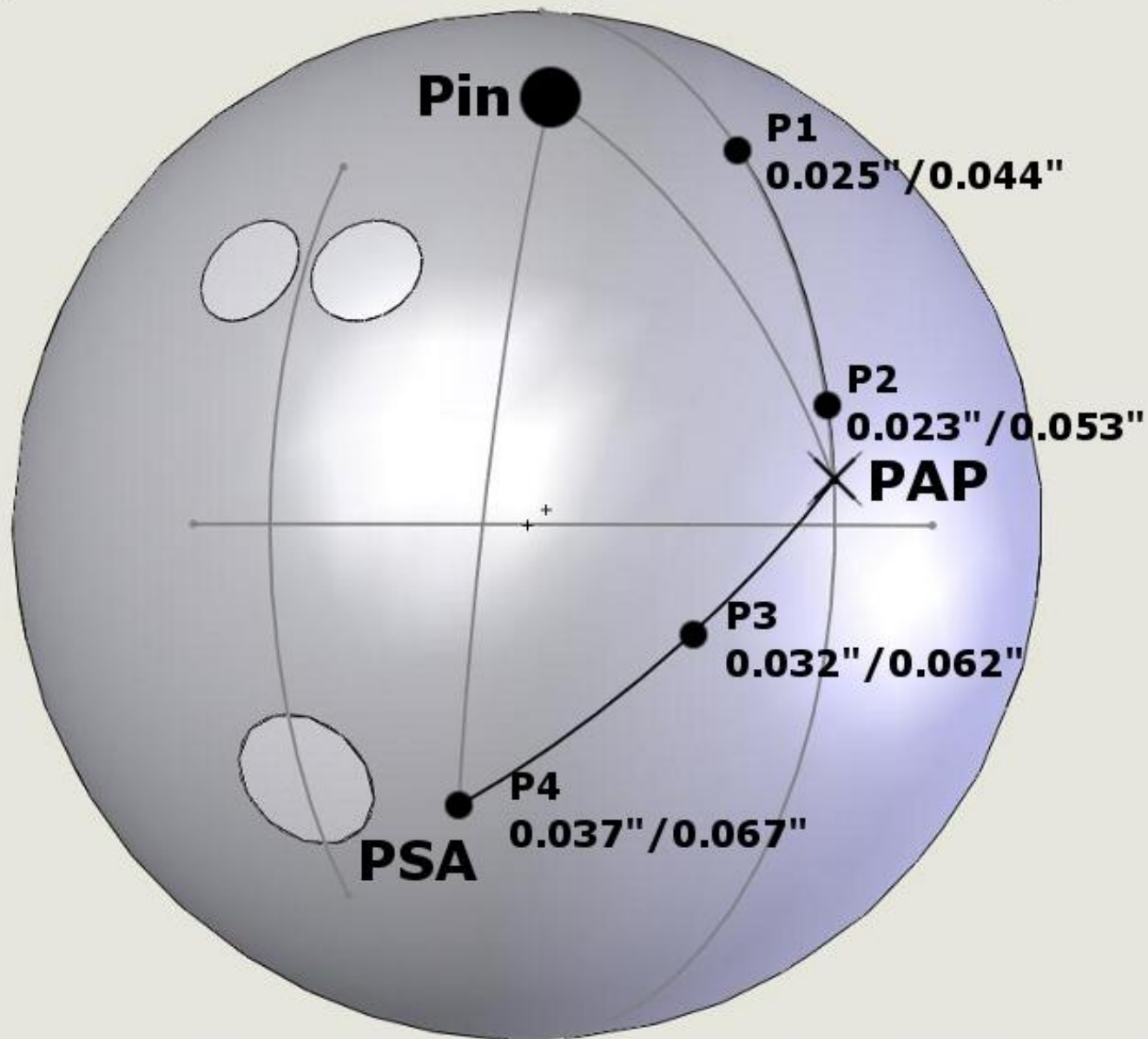
Undrilled	2.516	0.015	0.048	0.32	2.516	2.51 oz.	3.48
No BAL Hole	2.518	0.028	0.056	0.500	2.538		
P1	2.520	0.02	0.054	0.37	2.549		
P2	2.519	0.029	0.060	0.48	2.546		
P3 pitched	2.518	0.036	0.064	0.57	2.540		
Double Thumb	2.514	0.034	0.069	0.49	2.545		

Asymmetrical Ball 30 deg. x 4.25" x 20 deg.



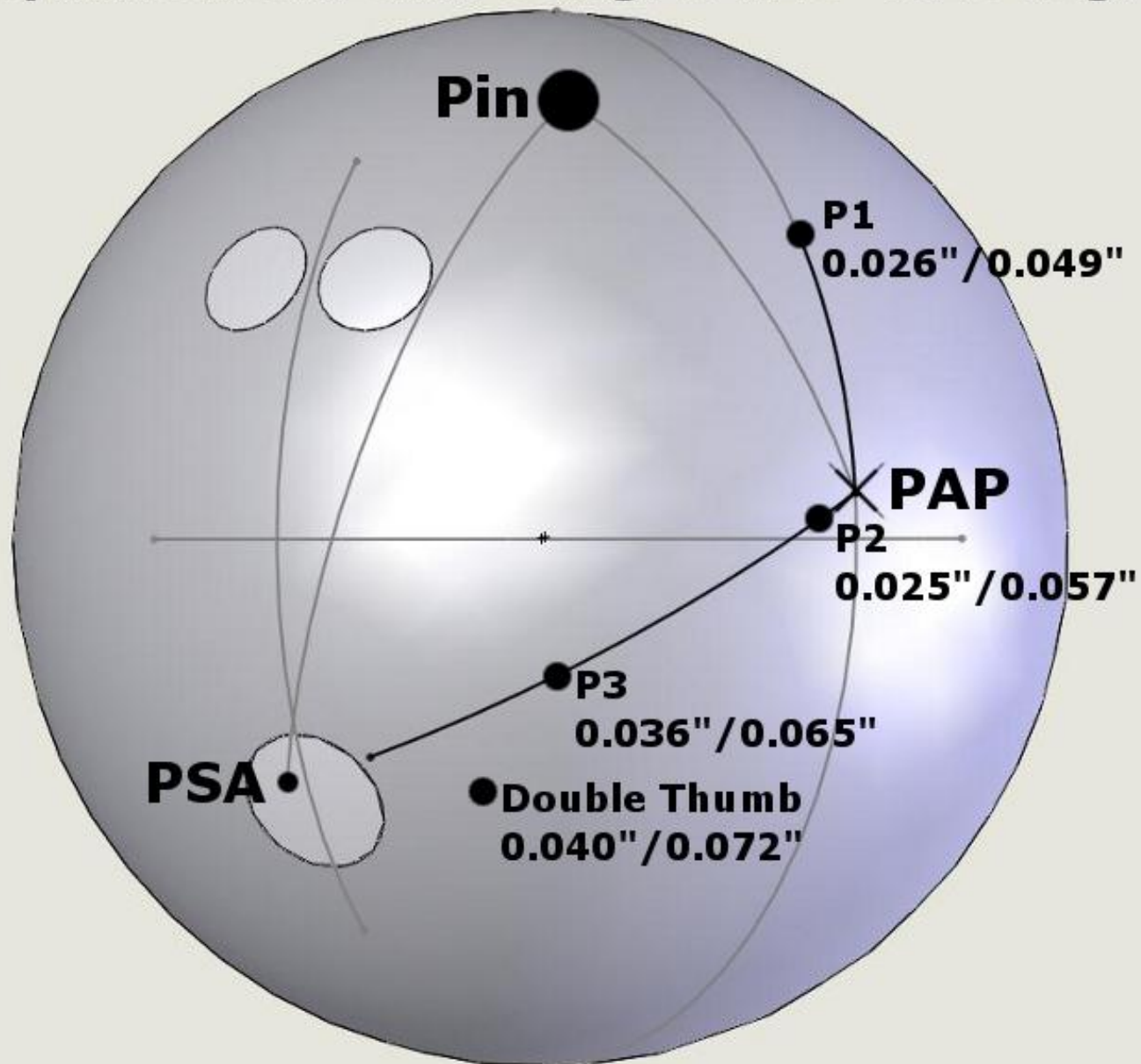
No Balance Hole: 0.020" int. diff., 0.052" total diff.

Asymmetrical Ball 50 deg. x 4.25" x 20 deg.



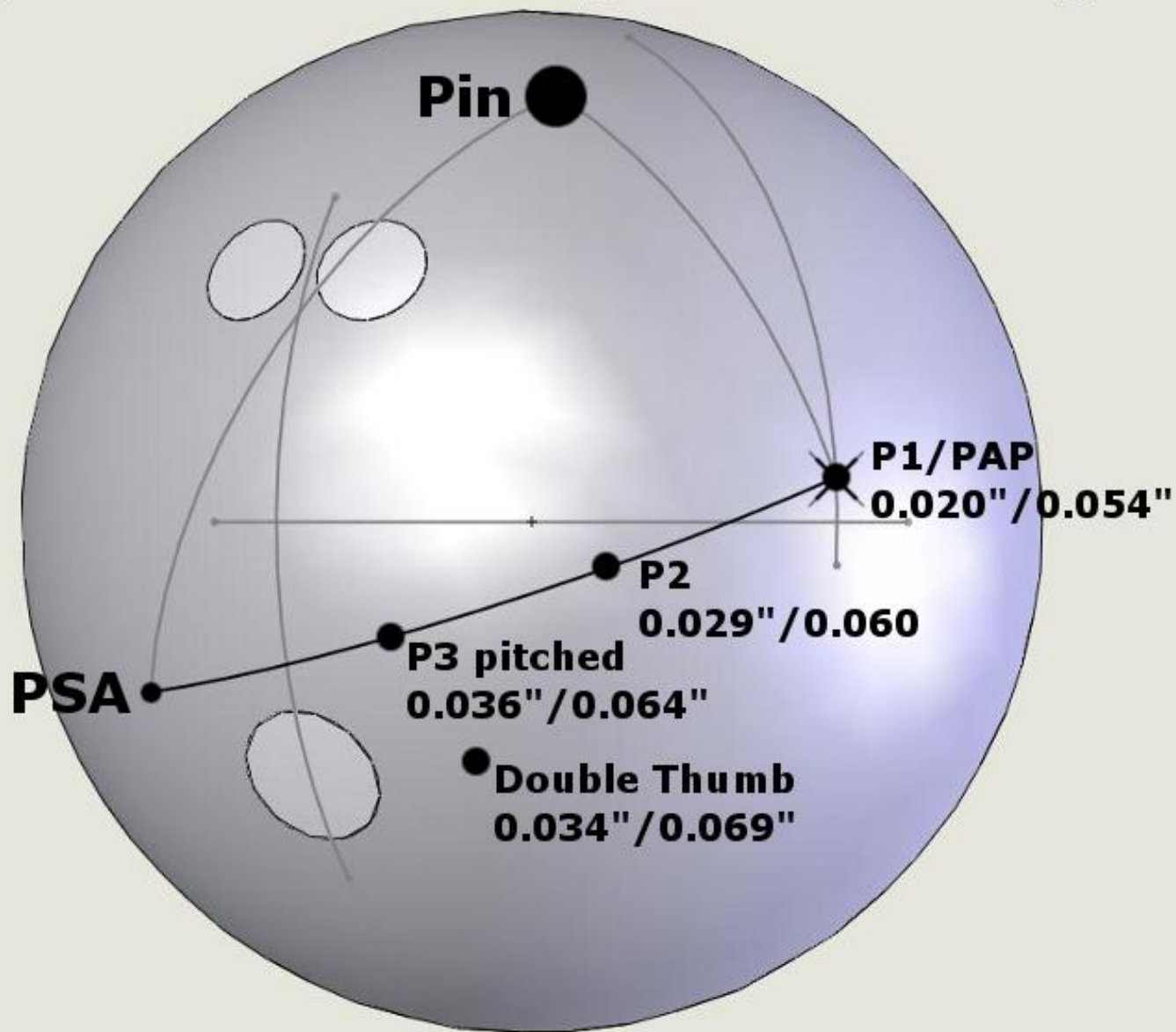
No Balance Hole: 0.026" int. diff., 0.055" total diff.

Asymmetrical Ball 70 deg. x 4.25" x 20 deg.



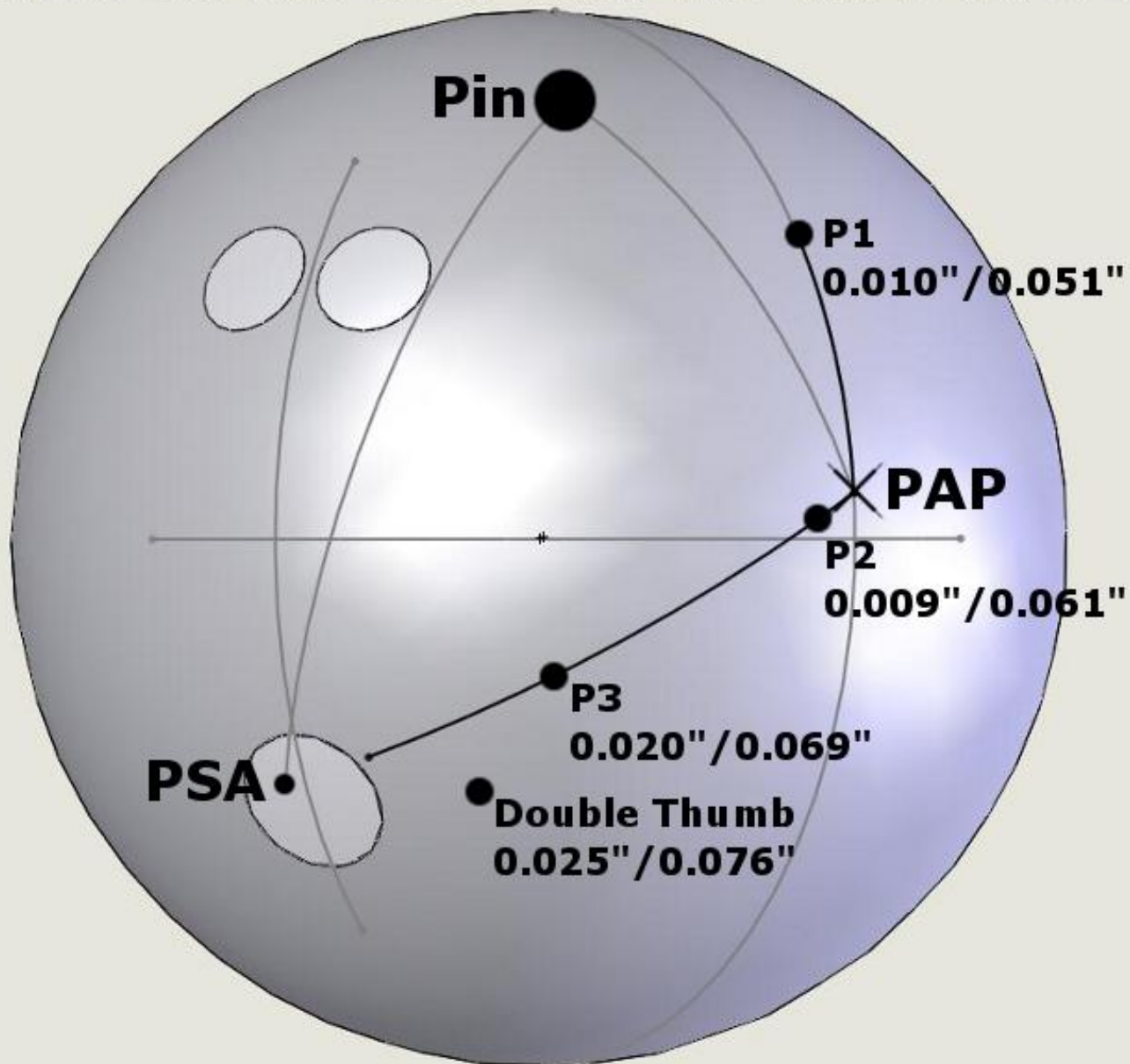
No Balance Hole: 0.029" int. diff., 0.056" total diff.

Asymmetrical Ball 90 deg. x 4.25" x 20 deg.



No Balance Hole: 0.028" int. diff., 0.056" total diff.

Symmetrical Ball with 0.054" Diff.: 4.25" Pin to PAP x 20 deg.



No Balance Hole: 0.013" int. diff., 0.061" total diff.

By choosing a **drilling technique**, the location and the size of the **balance hole**, a ball driller can now **reduce** the strength of the drilled ball's **reaction** by as much as **29%** or **increase** it by as much as **55%** using current USBC specifications.