Suggested Asymmetrical Layouts for Medium Track Bowlers

Bowlers with 12 to 18 Degrees of Initial Axis Tilt

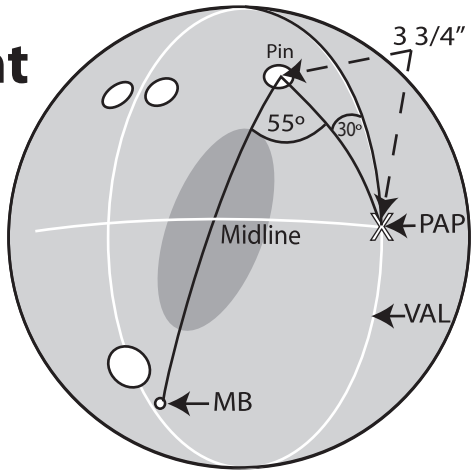
Sharper Breakpoint

layout =

55°	3 3/4"	30°
Drilling Angle	X Pin to PAP X	VAL Angle

Recommended Pin Distance
2-5.5"

A



More Angular Breakpoint

Use for most players
on most patterns

High Track Bowlers
Less Than 12 Degrees of Initial Axis Tilt
Use: 70° X 3 3/8 " X 30°
Recommended Pin Distance 2-5.5"
Low Track Bowlers
More Than 18 Degrees of Initial Axis Tilt
Use: 45° X 4 1/4" X 25°
Recommended Pin Distance 3-5.5"

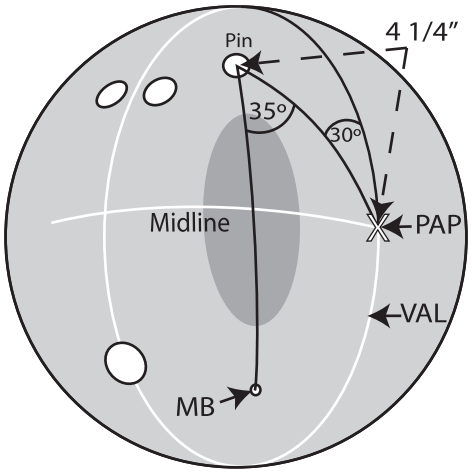
Midlane

layout =

35°	4 1/4"	30°
Drilling Angle	X Pin to PAP X	VAL Angle

Recommended Pin Distance
2-5.5"

B



Heavy Forward Roll

Use for Speed Dominant Players
and/or heavier oil volumes

High Track Bowlers
Less Than 12 Degrees of Initial Axis Tilt
Use: 45° X 4" X 35°
Recommended Pin Distance 2-5.5"
Low Track Bowlers
More Than 18 Degrees of Initial Axis Tilt
Use: 20° X 4 3/4" X 30°
Recommended Pin Distance 3-5.5"

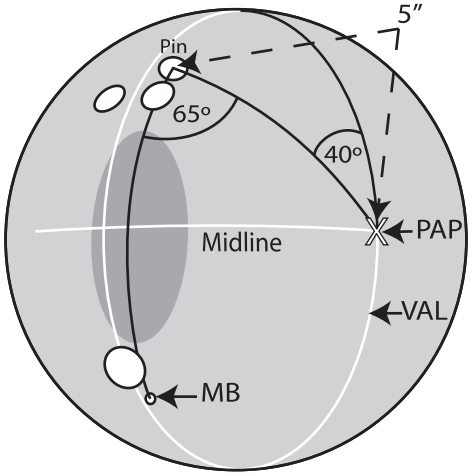
Control

layout =

65°	5"	40°
Drilling Angle	X Pin to PAP X	VAL Angle

Recommended Pin Distance
2-4"

C



Smooth Continuous Hook

Use for Rev Dominant Players
and/or lighter oil volumes

High Track Bowlers
Less Than 12 Degrees of Initial Axis Tilt
Use: 85° X 4 1/2" X 45°
Recommended Pin Distance 2-4"
Low Track Bowlers
More Than 18 Degrees of Initial Axis Tilt
Use: 30° X 5 1/4" X 60°
Recommended Pin Distance 1-4"

*Note - Sample Diagrams use a PAP of 4 3/4" over by 0 ↕ Actual Layout may appear different depending upon the bowler's PAP

Suggested Asymmetrical Layouts for Medium Track Bowlers

Bowlers with 12 to 18 Degrees of Initial Axis Tilt

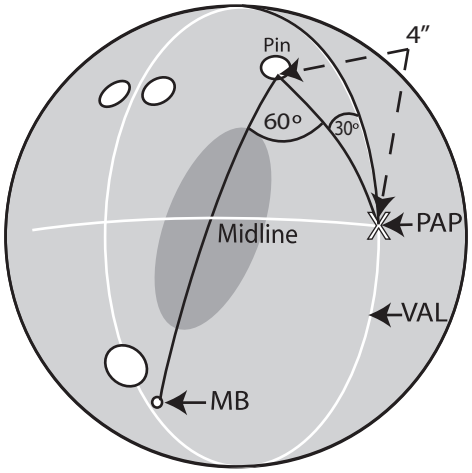
Maximum Flare

layout =

60°		4"		30°
Drilling Angle	X	Pin to PAP	X	VAL Angle

Recommended Pin Distance
3-6"

D



Most Aggressive Layout

Use for lower rev rate players and longer heavier oil patterns

High Track Bowlers
Less Than 12 Degrees of Initial Axis Tilt
Use: 70° X 4" X 30°
Recommended Pin Distance 3-6"
Low Track Bowlers
More Than 18 Degrees of Initial Axis Tilt
Use: 50° X 4 " X 30°
Recommended Pin Distance 3-6"

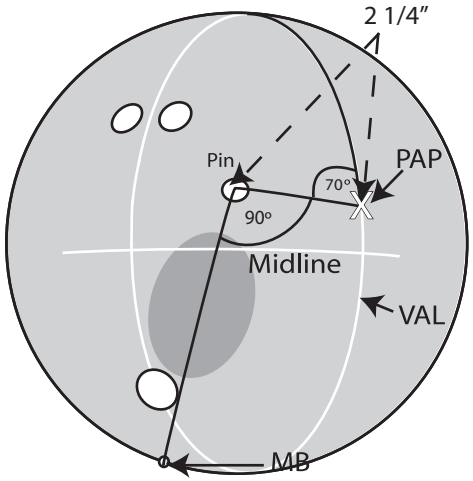
Reduced Flare

layout =

90°		2 1/4"		70°
Drilling Angle	X	Pin to PAP	X	VAL Angle

Recommended Pin Distance
2-4"

E & F



Least Aggressive Layout

Use for Rev Dominant Players and shorter, lighter oil volumes patterns

Use this layout for ALL BOWLERS

*Note - Sample Diagrams use a PAP of 4 3/4" over by 0 ↕ Actual Layout may appear different depending upon the bowler's PAP

Determining the Bowler's Initial Axis Tilt:

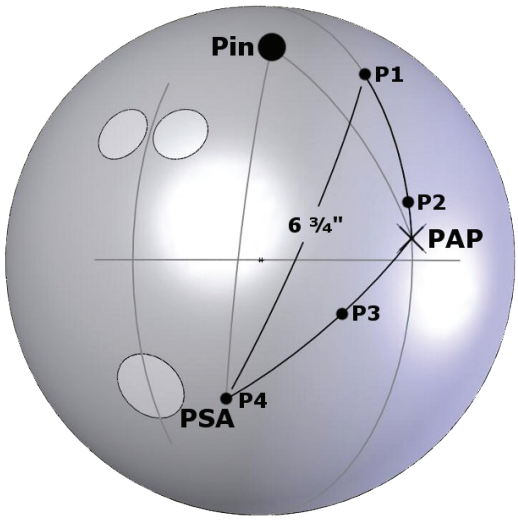
Initial Axis Tilt is best determined by measuring the distance across the bowler's initial ball track on the surface of the ball. A measurement of > 11 1/4" (< 12 degrees) indicates a high track bowler. A measurement of 10 1/4" to 11 1/4" (12 to 18 degrees) indicates a medium track bowler. A measurement of < 10 1/4" (> 18 degrees) indicates a low track bowler.

Ball Surface & Cleaning:

***RADICAL** bowling balls are manufactured with a predetermined surface preparation. With the assistance of a qualified pro shop, sanding, scuffing, or smoothing the surface texture may be needed to optimize performance for different styles of players on different lane conditions. We cannot overemphasize the importance of regularly cleaning your **RADICAL** ball with a quality bowling ball cleaner IMMEDIATELY AFTER each use. Doing so will insure a more consistent reaction and maximize the life of your **RADICAL** bowling ball.*

Balance Holes for Asymmetrical Layouts:

If, and when, a balance hole is needed, we recommend using the "Gradient Line Balance Hole System". The Gradient Line extends from the PSA to P1 passing through the PAP.



Balance Hole Locations on the Gradient Line

Balance hole Position	Location	Change in Ball Reaction
P1	**6 ¾"** 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

Legend for the Asymmetrical Layout Pictures:

○ Pin = The spot marking the top center of the core of the ball

o MB = The locator pin marking the position of the Mass Bias

The area on the surface of the ball in which the center of gravity (CG) mark should appear

X PAP (Positive Axis Point) = The positive end of the bowler's axis of rotation at release

VAL (Vertical Axis Line) = A Vertical line drawn through the bowler's PAP

Midline = A horizontal line drawn midway between the thumb and finger holes