



**BOWLING TECHNOLOGIES®**

## **Comprehensive** **Drilling Suggestions**

*These are suggested drilling techniques to help you achieve the ball reaction desired from your **RADICAL BOWLING TECHNOLOGIES** bowling ball. Please feel free to use your favorite layout on any **RADICAL BOWLING TECHNOLOGIES** ball. You may also use the Dual Angle Layout of your choice with confidence. One of the benefits of balls designed for **RADICAL BOWLING TECHNOLOGIES** is their drilling versatility. Choosing the correct drilling technique for your desired ball reaction combined with the correct coverstock surface will strongly enhance your enjoyment of your **RADICAL BOWLING TECHNOLOGIES** ball. These drilling suggestions are separated into two categories, suggested symmetrical and suggested asymmetrical drilling techniques. We recommend you try the factory surface when you first try your new **RADICAL BOWLING TECHNOLOGIES** ball, but don't hesitate to alter the surface to achieve the amount of hook you desire, or the breakpoint distance you're looking for. The surface of your **RADICAL BOWLING TECHNOLOGIES** ball is easily adjusted to achieve your desired final ball reaction.*

### **RADICAL BOWLING TECHNOLOGIES**

#### **Ball Surface Chart**

(Listed from earliest traction to latest traction)

- 240 grit Siaair micro pad
- 360 grit Siaair micro pad
- 500 grit Siaair micro pad
- 800 grit Siaair micro pad
- 1000 grit Siaair micro pad
- 1500 grit Siaair micro pad
- 2000 grit Siaair micro pad
- 4000 grit Siaair micro pad
- 2000 grit Siaair micro pad  
with Brunswick Royal Compound
- 2000 grit Siaair micro pad  
with Brunswick Royal Shine

## Suggested Asymmetrical Layouts for High Track Bowlers

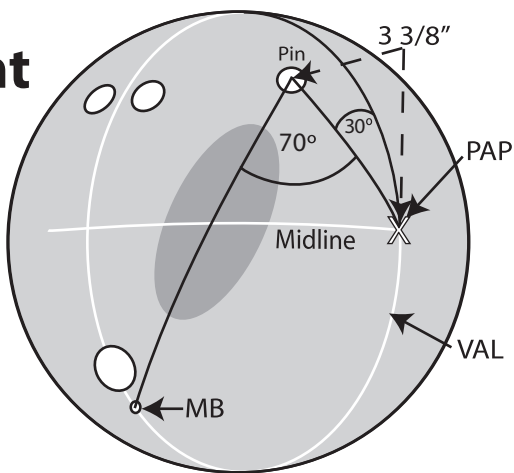
*Bowlers with Less Than 12 Degrees of Initial Axis Tilt*

### Sharper Breakpoint

layout =

**70°** Drilling Angle X **3 3/8"** Pin to PAP X **30°** VAL Angle

Recommended Pin Distance  
2-5.5"



### More Angular Breakpoint

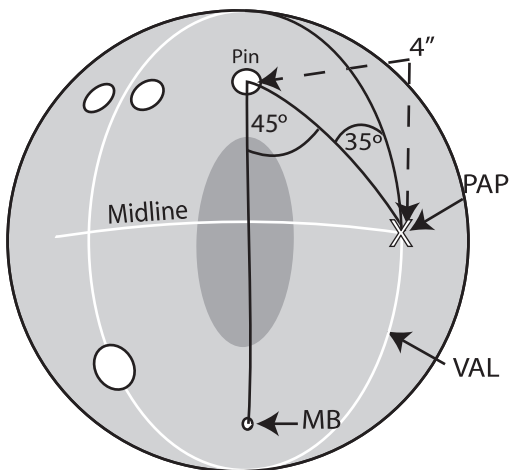
Use for  
most players  
on most patterns

### Midlane

layout =

**45°** Drilling Angle X **4"** Pin to PAP X **35°** VAL Angle

Recommended Pin Distance  
2-5.5"



### Heavy Forward Roll

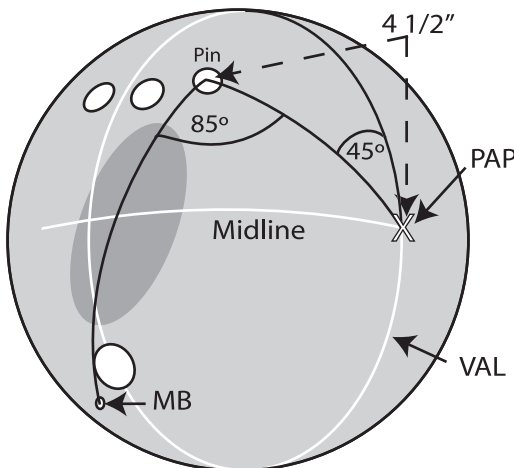
Use for Speed  
Dominant Players  
and/or heavier  
oil volumes

### Control

layout =

**85°** Drilling Angle X **4 1/2"** Pin to PAP X **45°** VAL Angle

Recommended Pin Distance  
2-4"



### Smooth Continuous Hook

Use for Rev  
Dominant Players  
and/or lighter  
oil volumes

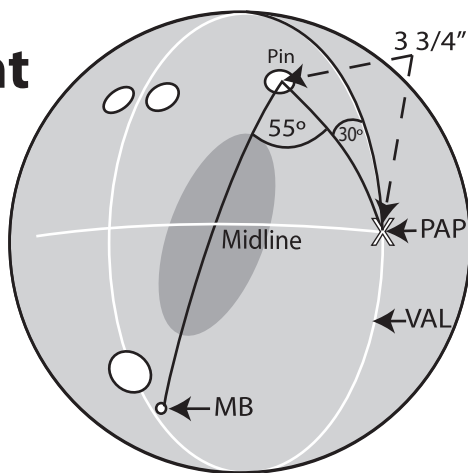
## Suggested Asymmetrical Layouts for Medium Track Bowlers

*Bowlers with 12 to 18 Degrees of Initial Axis Tilt*

### Sharper Breakpoint layout =

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

Recommended Pin Distance  
2-5.5"



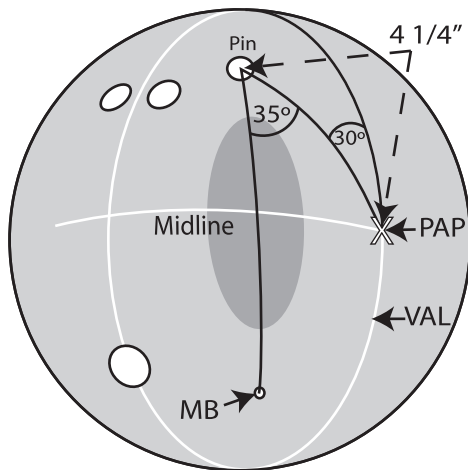
### More Angular Breakpoint

Use for  
most players  
on most patterns

### Midlane layout =

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

Recommended Pin Distance  
2-5.5"



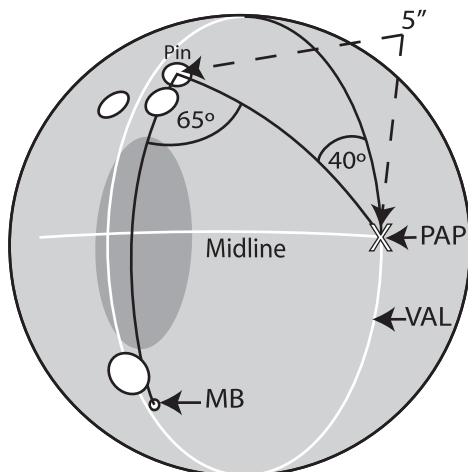
### Heavy Forward Roll

Use for Speed  
Dominant Players  
and/or heavier  
oil volumes

### Control layout =

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

Recommended Pin Distance  
2-4"



### Smooth Continuous Hook

Use for Rev  
Dominant Players  
and/or lighter  
oil volumes

## Suggested Asymmetrical Layouts for Low Track Bowlers

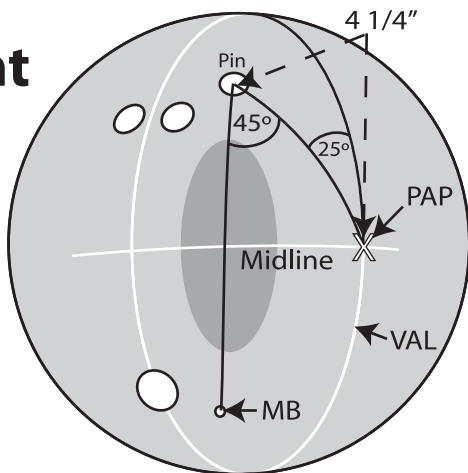
*Bowlers with More Than 18 Degrees of Initial Axis Tilt*

### Sharper Breakpoint

layout =

**45°** Drilling Angle X **4 1/4"** Pin to PAP X **25°** VAL Angle

Recommended Pin Distance  
3-5.5"



### More Angular Breakpoint

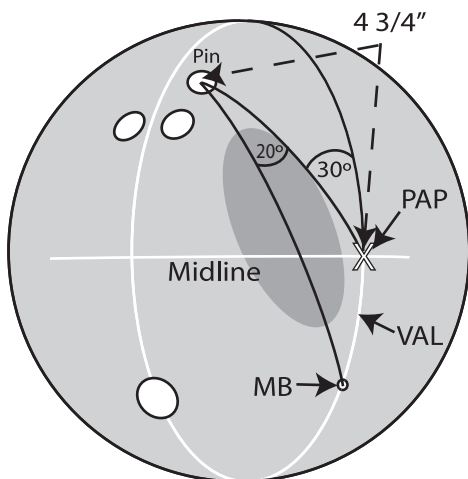
Use for  
most players  
on most patterns

### Midlane

layout =

**20°** Drilling Angle X **4 3/4"** Pin to PAP X **30°** VAL Angle

Recommended Pin Distance  
3-5.5"



### Heavy Forward Roll

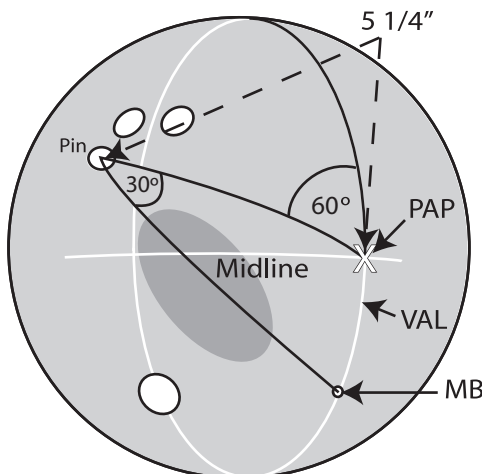
Use for Speed  
Dominant Players  
and/or heavier  
oil volumes

### Control

layout =

**30°** Drilling Angle X **5 1/4"** Pin to PAP X **60°** VAL Angle

Recommended Pin Distance  
1-4"



### Smooth Continuous Hook

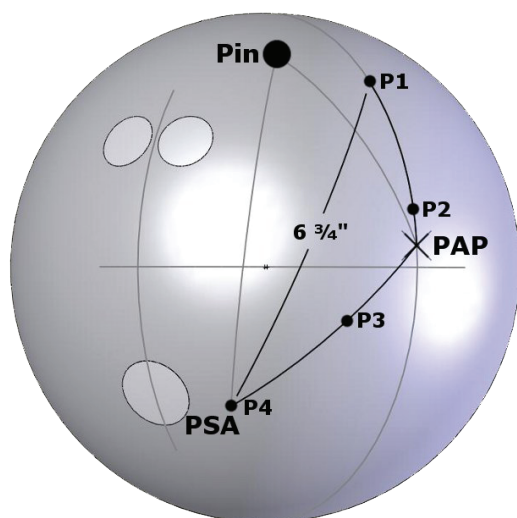
Use for Rev  
Dominant Players  
and/or lighter  
oil volumes

**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  $> 11 \frac{1}{4}$ " ( $< 12$  degrees) indicates a high track bowler. A measurement of  $10 \frac{1}{4}$ " to  $11 \frac{1}{4}$ " (12 to 18 degrees) indicates a medium track bowler. A measurement of  $< 10 \frac{1}{4}$ " ( $> 18$  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   |
|-----------------------|--------------------------------------------------------------------------------------|---------------------------|
| <b>P1</b>             | <b>6 <math>\frac{3}{4}</math>"</b> from the <b>PSA</b> on the <b>VAL</b>             | Weakens ball reaction     |
| <b>P2</b>             | <b><math>\frac{1}{3}</math></b> of the distance from the <b>P1</b> to the <b>PSA</b> | Maintains ball reaction   |
| <b>P3</b>             | <b><math>\frac{2}{3}</math></b> of the distance from the <b>P1</b> to the <b>PSA</b> | Strengthens ball reaction |
| <b>P4</b>             | <b>PSA</b>                                                                           | Maximizes ball reaction   |

### **Legend for the Asymmetrical Layout Pictures:**

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

○ 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

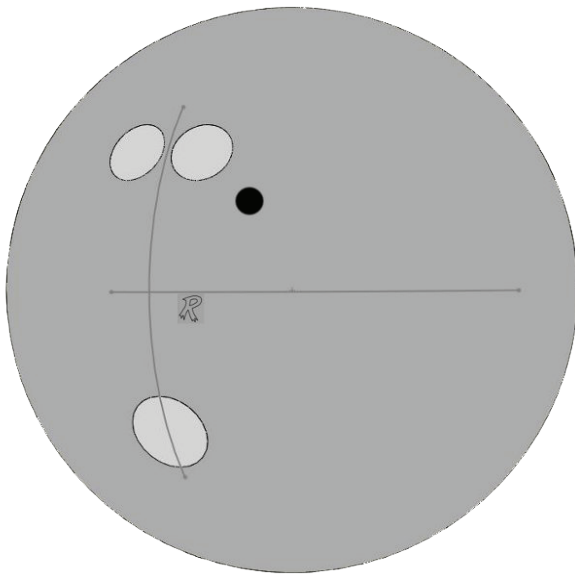
✕ PAP = The positive end of the bowler's axis of rotation at release  
(Positive Axis Point)

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

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

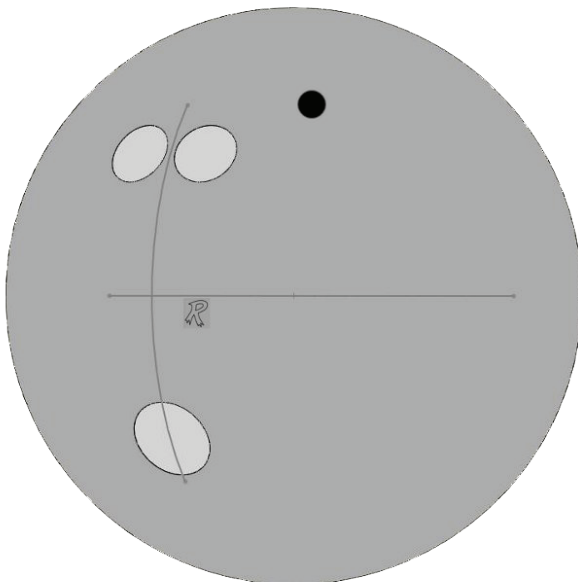
# Suggested Symmetrical Layouts

## **Pin Under – No Balance Hole** - Ultimate Control Layout



*Place pin 3" to 5" from  
PAP for desired flare.*

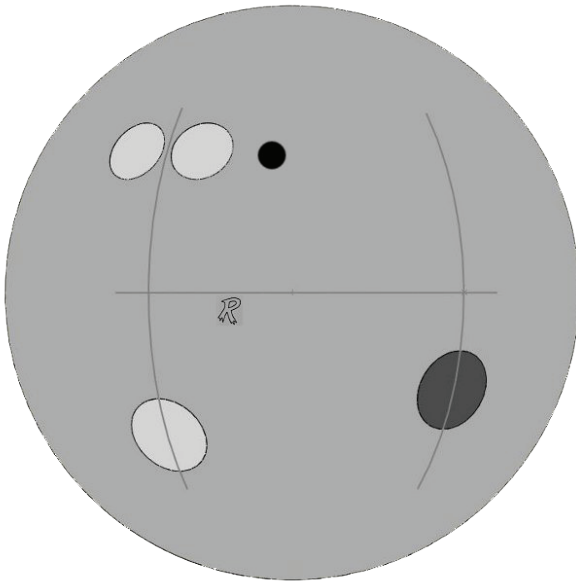
## **Pin Over – No Balance Hole** - Later, Sharper Breakpoint with Control



*Place pin 3" to 5" from  
PAP for desired flare.*

# Suggested Symmetrical Layouts (Continued)

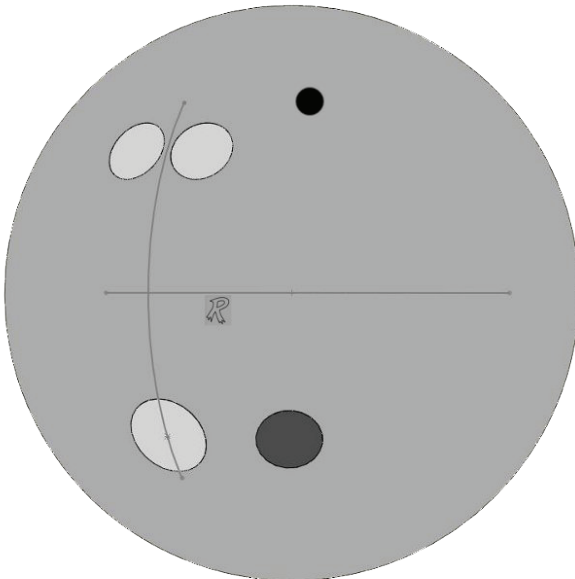
## **Pin Beside with Balance Hole** - Medium Revving with Continuation



*Place pin 3" to 5" from  
PAP for desired flare.*

*Place Balance Hole on the VAL,  
1 1/2" below the midline.*

## **Pin Above with Double Thumb Balance Hole** - Fastest Revving Layout

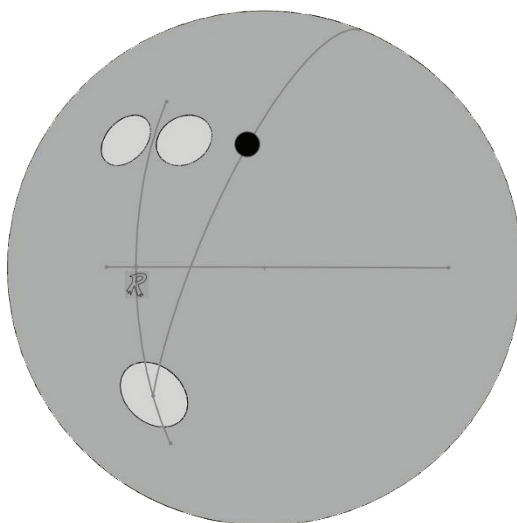


*Place pin 4" from PAP -  
30 degree VAL angle. Place Center of  
Balance Hole 1 3/4" from edge of thumb  
assembly **Pitched** 1 1/4" away from  
the thumb. Drill balance hole 2 3/4" deep.*

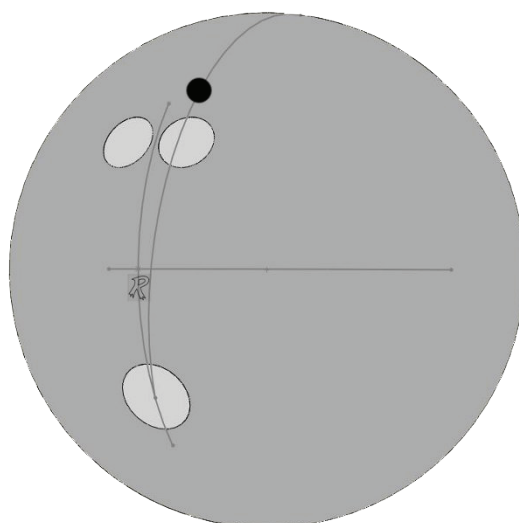
# Suggested Symmetrical Layouts (Continued)

## **NEW Drilling Layout - MOfion Hole Drilling** - Strongest back end reaction

**For PAPs 5" over or more:**



**For PAPs less than 5" over:**



Draw a line on the ball from the center of the thumb hole through the pin. Extend the line 10" past the pin to the bottom of the ball and mark that spot that is 10" from the pin. That is the intended location for the balance hole. Place a piece of white tape on that spot. Bowl with the ball to make sure the ball doesn't flare over the tape. If the ball flares over the tape, move the tape sideways to miss the track flare. Drill the balance hole 4" deep. Start with a  $\frac{3}{4}$ " diameter hole. Increase the diameter of the hole to as much as  $1 \frac{1}{4}$ " to increase the backend reaction, if desired.