

Brunswick BVP™ Mammoth - Particle

Part Number

60-104699-93X

Coverstock

Activator High Load Particle

Color: Blue / Copper

Hardness: 76-78

Glow Engraving

Factory Finish

400-Grit Wet Sand

Core Dynamics @ 16#

RG Max: 2.544

RG Min: 2.499

RG Diff.: 0.045

Average RG: 3.5

Performance

Hook Potential: 165

Length: 40

Typical Breakpoint Shape: 45

Chart Position: T20

Available Weights

10-16 Pounds



Hook Potential: Low (10)  165 High (175)

Length: Early (25)  40 Long (235)

Breakpoint Shape: Smooth Arc (10)  45 Angular (100)

Flare Potential: Low (0.0)  0.045 High (0.060)

RG-average: Center Heavy (1)  3.5 Cover Heavy (10)

BVP – Brunswick Value Performance – Exceptional Value and Great Performance

The Brunswick BVP™ series has been developed to provide the widest range of reactions available at the popular mid-price point. The BVP series provides any bowler the ball performance they're looking for at a price they can afford.

Technology

The BVP Mammoth brings two new technologies into the BVP line, **Multi-Sided Symmetric Core Technology**, and **Activator High Load Particle Coverstock** to create performance that improves on the reaction of balls such as the BVP Goliath and Swamp Monster.

Multi-Sided symmetric core designs have been used in Brunswick High Performance balls since 2000. Featuring exotic shapes that are easy to drill, the Multi-Sided shape is locked into the outer core, leaving little chance for core separation. The **Rocket Core** used in the 14-16 pound Mammoth pushes the RG to a lower level than previous BVP balls. Brunswick research has shown that lower RG's are a better match for today's lane conditions, which often include: high efficiency lubricants, daily full-lane stripping and longer, higher volume lane oil patterns. In this environment, lower RG's improve mid-lane traction and reduce over/under reactions at the breakpoint.

The Mammoth utilizes a **High Load Particle version of Activator Coverstock Technology**. Activator coverstock technology was introduced into Brunswick High Performance Balls in 2003 and is known for its durability and ball reaction. The Mammoth's Activator high load particle coverstock propels it to the highest hook potential rating ever for a Brunswick ball.

Reaction Characteristics

•**Out of the Box:** with it's out of the Box 400-grit wet sand surface, the Mammoth creates an early rolling, big hooking reaction favored by bowlers who struggle with too much length. This could include any bowler on oily lane conditions, or higher speed and medium to lower rev rate players on medium amounts of oil..

•**When shined:** Dull surface finishes can sometimes hook too early resulting in reduced backend reaction and hitting power. To increase length, polish the surface with either **Brunswick's Factory Finish "High Gloss Polish" or "Rough Buff"**. After polishing your Mammoth will go longer in the oil and react stronger to the dry creating an arc, that while still even in character, is slightly more skid/snap than the "out-of-the-box" reaction. A polished Mammoth has a slightly lower hook potential and is an excellent choice for smoothing the over/under reactions bowlers sometimes see with Reactive coverstock balls. When the dry part of the lane is too dry, either in the track or at the end of the oil pattern, a polished Mammoth can smooth over reactions, maintain good traction in the oil, while retaining the big hook potential associated with Reactive coverstocks.

Drilling and Reaction Setup

The BVP Mammoth can be drilled using the standard drilling techniques developed for two-piece balls, see the included drilling instructions for reaction characteristics and layout details.

Document # 60-900337-273

For the most up to date Product Line Information go to www.brunswickbowling.com

Brunswick BVPTM Mammoth - Particle

Maintaining Your Ball Reaction

Brunswick recommends the following procedures to maintain and restore your Brunswick ball's reaction characteristics:

--Clean your Brunswick ball with **Brunswick Remove All** or similar ball cleaner after every use to reduce oil absorption.

--If you think your Brunswick ball has lost some of its "Out of the Box" reaction, restore the ball to its original factory finish listed on the product information sheet. This is especially important for balls that are highly sanded or polished.

Sand to 400-grit then use **Brunswick's Factory Finish High Gloss Polish** to restore the original factory finish on high gloss polish balls. Sand to 220-grit then use **Brunswick's Factory Finish Rough Buff** to restore the original factory finish on rough buff balls. For dull balls, wet sand with the sandpaper listed on the product information sheet.

--If there is a visible track on your ball have your Pro shop use a Haas or similar resurfacing machine to remove the track then restore the ball to its original factory finish. This service is available, for a fee, at many Pro Shops.

--If your ball has more than 50 games on it, you may be able to increase mid-lane and back-end hooking action by removing oil from the coverstock. Remove the oil from the ball by gently warming it with either the **Revivor** or **Rejuvenator** Pro Shop devices that have been designed for this purpose. The service is available, for a fee, at many Pro Shops.

Brunswick testing has shown that by combining the restoration of the factory finish, resurfacing of the track and oil removal your Brunswick ball can maintain its original "Out of the Box" reaction for hundreds of games.

Do not use a home oven to remove oil. Temperatures cannot be adequately controlled, and the ball may crack.

--Absorbent materials sold by other bowling ball manufactures to remove oil can also be used on Brunswick bowling balls. Information to date seems to indicate that absorbent materials have a more limited ability to remove oil than warming. You may be disappointed with results on heavily oil soaked balls.

Note: Oil soaked balls tend to traction less in the oil and respond less to the dry boards on the lane. If you are matching-up using an oil soaked ball on wet/dry or broken down lane conditions, removing the oil from the ball will significantly change your match-up and possibly create undesirable over reactions.

Ball Comparisons

Want to compare the performance of this ball to other Brunswick balls? Go to our website at www.brunswickbowling.com. Click on **Balls**, then click on **Pro Shop Information**. This page contains a link to the **Brunswick Ball Comparison Chart**. This chart allows you to see, at a glance, the performance of all Brunswick balls relative to each other, defined by their **Hook Potential** and **Arc Characteristics**. There's even an essay to help explain and guide you through the chart.

Lightweight Engineering

At Brunswick the unique core shape of each individual ball is used for weights from 14 to 16 pounds. This approach to lightweight ball engineering provides bowlers with consistent ball reaction characteristics across this weight range.

At 12 & 13 pounds Brunswick uses a generic high performance core shape with a RG-differential of 0.045. This differential is in the same range used by the majority of our high performance designs allowing the use of the same drilling instructions for all balls 12 to 16 pounds..

Weight	16#	15#	14#	13#	12#	11#	10#
Core Shape							
RG-max.	2.544	2.561	2.577	2.660	2.686	2.771	2.802
RG-min.	2.499	2.516	2.532	2.615	2.641	2.769	2.800
RG-diff.	0.045	0.045	0.045	0.045	0.045	0.002	0.002

For the most up to date Product Line Information go to www.brunswickbowling.com

High-Differential Symmetric Core Bowling Balls (12-16 pounds)

Brunswick's ball drilling instructions include eight layouts; one group of four **earlier rolling reactions** (1E-4E), and one group of four **later rolling reactions** (1L-4L). Both groups contain layouts that adjust performance from **high flare and hook potential** to **low flare and hook potential**. Not every layout is appropriate for all types of releases. Brunswick separates bowler's release characteristics by RPM rate and Track position.

- **High-RPM players** and **Medium-Low RPM players**. High RPM players rev the ball at rates greater than 300 RPM. On the men's tour, rev rates range from approximately 250-450 RPM. Most of the men's tour players you see on TV would be considered High RPM players. High RPM players can be sensitive to "over-flaring" which can make the ball hook early and be inconsistent at the breakpoint. Brunswick recommends low to medium flare layouts for High-RPM rate players
- **High-Track players** and **Medium-Low Track players**. High Track players have tracks within 1" of the thumb and finger holes and will usually have a horizontal axis measurement near 6" from grip center. Medium-Low track players have tracks that are greater than 1" from the thumb and finger holes and typically have horizontal axis measurements that are from 3 1/2" – 5".

After determining your bowler type and ball reaction needs, see the table below for recommended layouts. The Symmetric Core Layout sheet is divided into two columns for "**Earlier Rolling**" and "**Later Rolling**" Reactions.

- **Earlier Rolling Reactions** match up best to oilier and wet/dry lane conditions, or for players who have problems with the ball going too long before changing direction. These will typically be players who have high ball speeds and/or medium-low RPM rates
- **Later Rolling Reactions** match up best to shorter patterns and drier lane conditions, or for players who have problems with the ball hooking or changing direction too early. These will typically be players who have medium-slow ball speeds and/or high RPM rates.

<u>Track</u>	<u>RPM rate</u>	<u>Earlier Rolling Layouts</u>	<u>Later Rolling Layouts</u>
High	High	3E	2L,3L,4L
High	Medium-Low	No early rolling reactions	1L,2L,3L,4L,
Medium-Low	High	2E,3E,4E	2L,3L,4L
Medium-Low	Medium-Low	1E,2E,4E	1L,2L,3L,4L

Brunswick recommends positioning the Heavy-Spot / CG to end up with 3/4 -1oz. of positive side weight and a small amount of finger/thumb weight (less than 1/4 oz.) after drilling. This leaves the driller plenty of room to modify the ball reaction with an X-hole, yet doesn't require that an X-hole be used to make the ball ABC legal.

Fine Tuning Ball Reactions with an X-Hole

X-Holes can be used to **increase** or **decrease** track flare.

- **Increasing track flare** in an existing ball will tend to make the ball more aggressive, hook more, hook earlier and react stronger to the dry areas of the lane.
- **Decreasing track flare** in an existing ball will tend to make the ball less aggressive, go longer, hook less and react smoother to the dry areas of the lane (less over reaction).

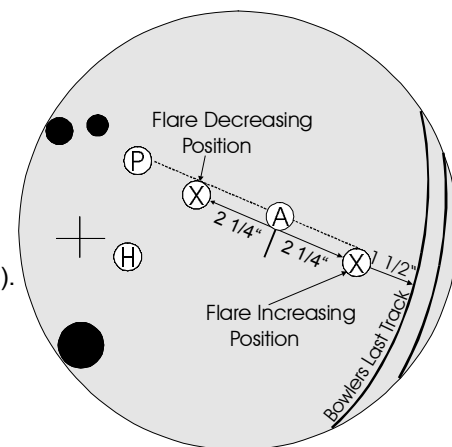
Brunswick is recommending a simplified **one-hole size / two-hole position** technique that covers the vast majority of ball reaction changes that can be accomplished by drilling an X-hole.

- Use a **1" drill bit, 3" deep**, to both increase or decrease track flare.

Note: Larger and deeper X-holes result in only slightly greater increases or decreases in track flare. The one-hole size technique has the added advantage of avoiding problems with illegal static weights. As long as the ball was originally laid out with at least 3/4 oz. of positive side weight and a small amount of finger/thumb weight, the 1" X 3" hole using either of Brunswick's recommended X-hole positions will keep you out of static weight trouble.

Brunswick recommends using a position 2 1/4" **past** the bowlers axis to increase flare, and using a position 2 1/4" **back toward the pin** to decrease flare. Using the line connecting the bowlers "axis" and the "pin" as a reference line (see diagram). The X-holes should be on or slightly below the reference line (holes on the line will sometimes drop the narrow point of the track and cause the track to flare over the finger holes).

Warning: Drilling a "flare increasing" hole can result in the track flaring over the X-hole. After checking the position of the bowlers last track, make sure the "flare increasing hole" is at least 1 1/2" from the bowlers last track (see diagram above). If necessary shorten the distance from axis in order to keep the "flare increasing hole" at least 1 1/2" from the bowlers last track.



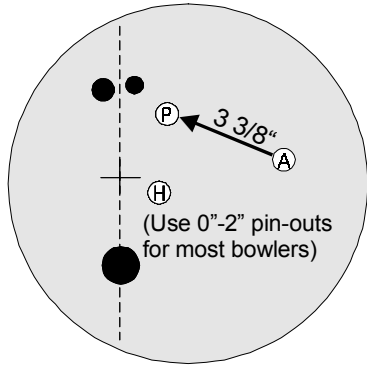
High-Differential Symmetric Core Layout Sheet

(RGdiff. 0.040 and above)

Earlier Rolling Reactions

High Flare High Hook Potential

Later Rolling Reactions



1E (Heavy Oil)

Maximum hook potential for **Medium-Low RPM** players.

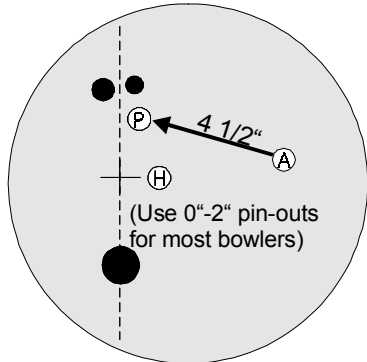
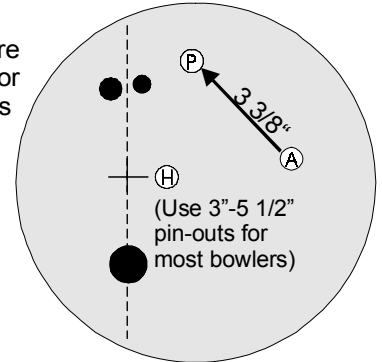
This layout may hook early and be inconsistent at the breakpoint for **High-RPM** players, use layout #2E instead.

This layout may hit the finger holes for **High-Track** players, use layout #1L instead.

1L (Heavy Oil)

Maximum hook potential with less mid-lane and more backend than layout #1E for **Medium-Low RPM** players

This layout may hook early and be inconsistent at the breakpoint for **High-RPM** players, use layout #2L instead.



2E (Medium Oil)

Maximum hook potential for **High-RPM** players

Medium hook potential for **Medium-Low RPM** players

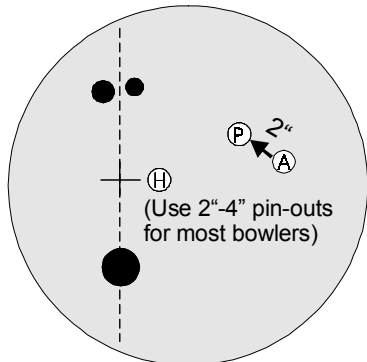
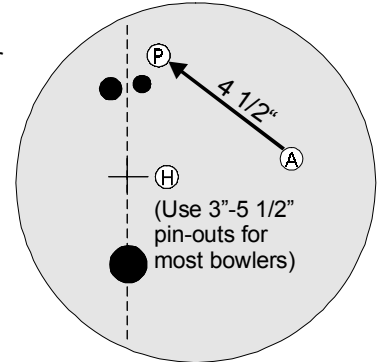
This layout may hit the finger holes for **High-Track** players, use layout #2L instead.

2L (Medium Oil)

Maximum hook potential for **High-RPM** players.

Medium hook potential for **Medium-Low RPM** players

Less mid-lane and more backend than layout #2E.



3E (Oily Wet/Dry's)

Pin between axis and leverage for medium hook potential and early roll.

Helps moderate over reactions.

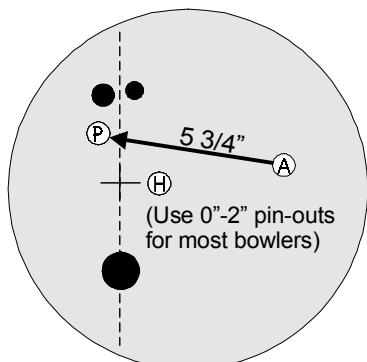
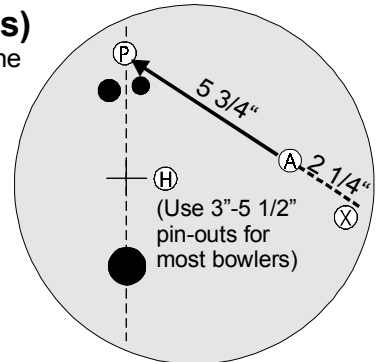
This layout may lack hitting power for **Medium-Low RPM** players.

3L (Hooking heads)

High RG pin position with the pin above the fingers for length. X-hole positioned for increased flare.

Moderate hook potential with skid/snap arc to fight early hook in the heads.

Lower hook potential than layout #2L.



4E (Hooking Wet/Dry's)

Smooth reaction for moderating wet/dry lane conditions

Lower hook potential than layout #3E.

This layout may hit the finger holes for **High-Track** players, use layout #4L instead.

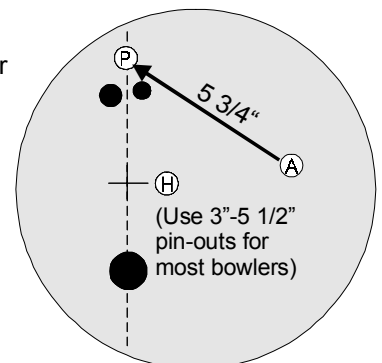
4L (Dry lanes)

Minimum hook potential for dry lanes and moderating over reactions.

High RG pin position with the pin above the fingers for length

Low Flare

Low Hook Potential



Note: Finger, thumb and X-holes must have at least a moderate bevel and the riser Pin (P) must be at least one inch from any drilled hole to comply with the Brunswick warranty