

Brunswick[®] BVP[™] Goliath[™] - Particle

Part Number

60-104144-93X

Coverstock

High Load Particle

Color: Deep Purple Solid

Hardness: 77-79

Glow Engraving

Factory Finish

400-grit wet sand

Core Dynamics @ 16#

RG Max: 2.590

RG Min: 2.546

RG Diff.: 0.044

Average RG: 4.8

Performance

Hook Potential: 160

Length: 45

Typical Breakpoint Shape: 45

Chart Position: S-20

Available Weights

10-16 Pounds



Hook Potential: Low (10)  High (175)

Length: Early (25)  Long (235)

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

Flare Potential: Low (0.0)  High (0.080)

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

BVP – Brunswick Value Performance – Exceptional Value and Great Performance

The Brunswick BVP[™] and Monster[™] ball lines were developed to provide the widest range of reactions available at the popular moderate price point. This line-up provides any bowler the ball performance they're looking for at a price they can afford.

Technology – Hook Potential Scale Expanded

Advanced Particle Technology and a new core system have resulted in the **Goliath**, the highest hook potential ball in Brunswick's history. Brunswick's Hook Potential Scale, formerly 10 – 150, has been expanded to 10 – 175 to accommodate the 160 Hook Potential rating of the **Goliath**.

Medium RG: **Goliath's** new inverted bell core system is a medium RG design that is a perfect match to the **Goliath** high traction coverstock. High traction coverstocks can roll too early when combined with lower RG cores. The **Goliath** core helps create mid-lane recovery and a strong arcing backend reaction.

Medium RG Differential: With an RGdiff. of 0.044 the **Goliath** Inverted Bell Core System will provide plenty of track flare for most bowlers without encountering the problems associated with over-flaring.

New Particle Coverstock: **Goliath's** High-Load Particle coverstock is the result of extensive R&D and six years of particle coverstock development. These experiences have combined to produce a coverstock that significantly improves particle ball performance. Compared to Brunswick's previous mid-price particle offerings the **Goliath** has both a higher hook potential **and** a more skid/snap arc. Bowlers will find that these performance enhancements result in a particle ball with greater room for error and improved pin carry on many lane conditions.

400-grit wet sand finish: **Goliath** is finished dull to increase its hooking action in the oil.

Reaction Characteristics

•**Out of the box:** With its 400-grit wet sand surface the **Goliath** is an ideal heavy oil ball. The high-load particle coverstock increases traction and hooking action in the oil, reducing skid and maximizing playability in heavy oil.

•**When shined:** Using Brunswick's **Factory Finish High Gloss Polish** the total hooking action of the **Goliath** can be reduced to a more moderate hook potential and the arc made more skid/snap. Changing the surface finish in this way allows the **Goliath** to be used to smooth the over/under reactions seen with Reactive coverstock balls on medium volume wet/dry lane conditions. With its new particle coverstock, even high RPM players will be able to use the **Goliath shined** to smooth wet/dry lane conditions while avoiding the early hooking action associated with many high load particle balls.

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

Brunswick[®] *BVP Goliath - Particle*

Drilling & Layouts

The **Goliath** can be drilled using the standard drilling techniques developed for two-piece symmetric core balls. See the included drilling instructions for reaction characteristics and layout details.

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.

Use **Brunswick's Factory Finish High Gloss Polish** to restore the original factory finish on highly polished balls. For dull balls, wet sand with the sandpaper listed on the product information sheet.

--If after restoring the original factory finish you feel your Brunswick ball has still lost some of its hooking action, 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. This service is available, for a fee, at many Pro Shops. Brunswick's testing has shown that by combining the restoration of the **factory finish** with **oil removal** your Brunswick ball can maintain its original "Out of the Box" reaction for hundreds of games.






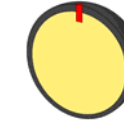
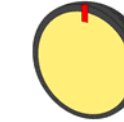
Note: Oil soaked balls tend to traction less in the oil and respond less to the dry boards on the lane. If you are matching-up using an oil soaked ball on wet/dry or broken down lane conditions, removing the oil from the ball will significantly change your match-up and possibly create undesirable over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

Ball Comparisons

Want to compare the performance of this ball to other Brunswick balls? Go to our web site 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 all weights from 12 to 16 pounds. This approach to lightweight ball engineering is unique in the industry and provides bowlers with consistent ball reaction characteristics across this weight range. This approach also allows Pro Shops to drill lighter weight balls using the same layout techniques as heavier balls with confidence that the lighter ball doesn't need special drilling instructions due to the core shape being different.

Weight	16#	15#	14#	13#	12#	11#	10#
Core Shape							
RG-max.	2.590	2.603	2.619	2.638	2.680	2.771	2.802
RG-min.	2.546	2.559	2.575	2.594	2.644	2.769	2.800
RG-diff.	0.044	0.044	0.044	0.044	0.036	0.002	0.002

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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).

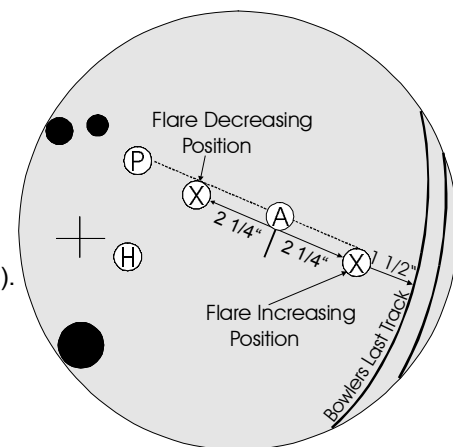
Brunswick is recommending a simplified **one-hole size / two-hole position** technique that covers the vast majority of ball reaction changes that can be accomplished by drilling an X-hole.

- 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.



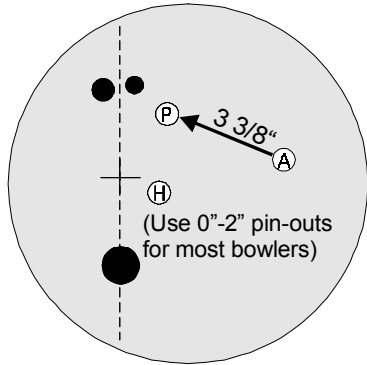
High-Differential Symmetric Core Layout Sheet

(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.

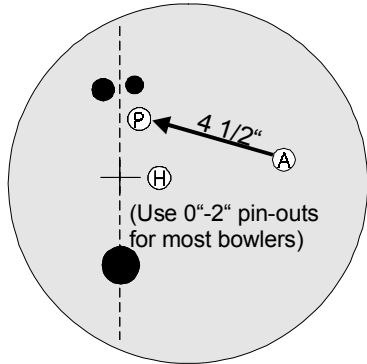
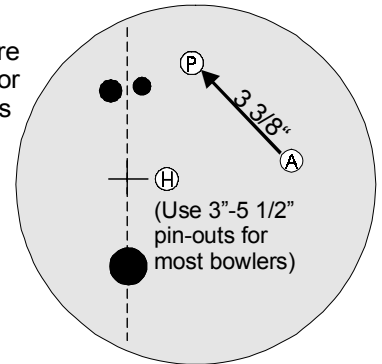
This layout may hook early and be inconsistent at the breakpoint for **High-RPM** players, use layout #2E instead.

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

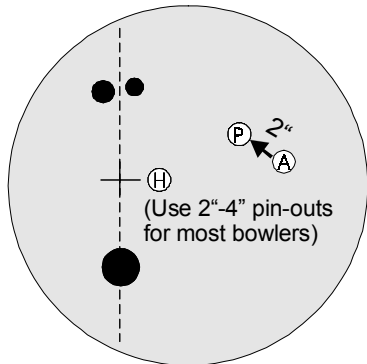
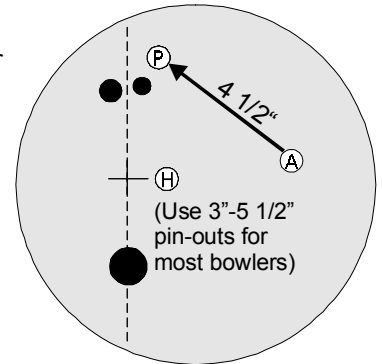
This layout may hit the finger holes for **High-Track** players, use layout #2L instead.

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.

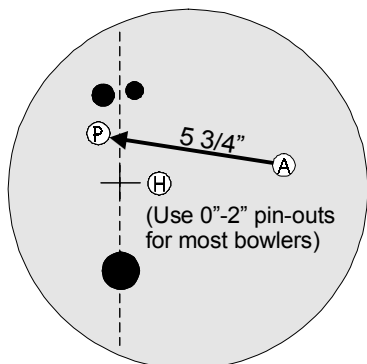
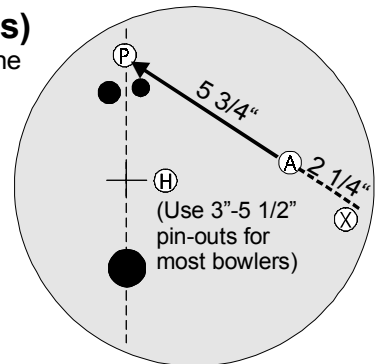
This layout may lack hitting power for **Medium-Low** RPM players.

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.

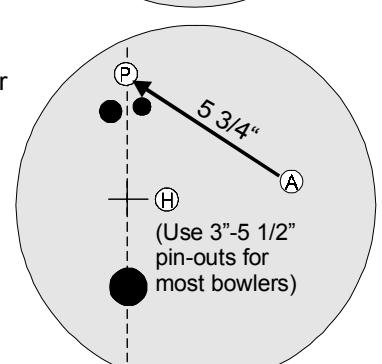
4L (Dry lanes)

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