7.2 — 3D Layout (Spectre 3.223+)

7.2.1 What is the 3D Layout view?

What is the 3D Layout view?

> `7.2.1` layout 3D

The **3D Layout view** is a visual feature available with the **Arsenal Plus plugin** (`$5 USD/month`) that renders a three-dimensional representation of a bowling ball showing the pin, mass bias marker, and finger hole positions based on the layout values recorded on a spec sheet. Rather than working purely from numbers on a form, the fitter and bowler can see the core orientation mapped onto the ball surface — a spatial picture of the drilling plan before any cuts are made.

□□ What the 3D Layout View Shows

The rendering displays a rotatable three-dimensional ball model with the following elements plotted on its surface based on the spec sheet's layout values:

- □ **Pin position** — the ball's top weight pin, shown at its calculated location relative to the grip and PAP.
- □ **Mass bias (MB) marker** — the preferred spin axis marker for asymmetric balls, shown at its calculated position.
- □ **Finger holes** — middle and ring finger hole positions as calculated from the span and pitch values on the spec sheet.
- □ **Thumb hole** — positioned relative to the finger holes based on span measurements.
- □ **PAP location** — the bowler's positive axis point, shown as a reference point on the ball surface.
- □ **VAL line** — the bowler's vertical axis line, rendered as a reference arc connecting the PAP to the top and bottom of the ball.

□□ **Note:** The 3D Layout view is a *visual reference tool*, not a drill press guidance system. It shows where elements should be on the ball surface based on the spec sheet values — confirming the

layout geometry is correct before drilling begins. It does not interface directly with any drilling equipment.

What Arsenal Plus Requires for 3D Rendering

The rendering draws on data from two sources. Both must be present for the full 3D view to generate:

Required data	Where it comes from	What happens if missing
Ball core specifications (RG, differential, core shape)	bowlingdatabase.com integration via the Arsenal entry	Rendering cannot generate — Spectre Cloud prompts to identify the ball in the database
Layout values (Pin to PAP, VAL Angle, Drilling Angle)	Spec sheet layout section	Rendering shows an empty ball with grip holes only — no pin or MB placement
PAP coordinates	Spec sheet bowler data	PAP and VAL line are omitted from the rendering; pin placement is shown without PAP reference
Span and pitch values	Spec sheet measurement fields	Finger and thumb holes are shown at estimated positions or omitted

Accessing the 3D Layout View on Desktop

1. Open the bowler's profile and navigate to the **Arsenal** section.
2. Click the ball's entry to open the detail view.
3. Locate the **3D Layout** panel — visible when Arsenal Plus is active and the ball has been identified in the bowlingdatabase.com integration.
4. The rendering loads automatically based on the most recently linked spec sheet's layout values.
5. Click and drag on the ball to rotate the view and examine the layout from any angle.
6. To view the rendering for a different spec sheet (e.g., a previous drilling), select that spec sheet from the history list — the rendering updates to reflect the selected sheet's layout values.

Accessing the 3D Layout View on Mobile or Tablet

1. Open the bowler's profile and tap the ball's Arsenal entry.
2. Scroll to the **3D Layout** panel.
3. The rendering loads automatically.
4. Use one finger to rotate the ball — drag in any direction to change the viewing angle.
5. Pinch to zoom if a closer view of a specific area is needed.

Tip: On a tablet, the 3D Layout view is large enough to be genuinely useful as a reference during a fitting conversation — rotating the ball on screen while discussing ball motion with a bowler is more engaging and informative than describing a layout in abstract terms.

Using the 3D Layout View to Verify a Drilling Plan

The most valuable use of the 3D Layout view is as a pre-drill verification step. Before any holes are cut, the rendering provides a visual confirmation that the layout values entered on the spec sheet produce the intended core orientation. Work through the following checks:

1. **Pin placement** — confirm the pin is positioned where your layout plan intends. Check its distance from the PAP visually, and confirm it falls on the correct side of the VAL line for the intended ball motion.
2. **MB placement** — for asymmetric balls, confirm the mass bias marker is in the intended position relative to the VAL. An MB that has ended up on the wrong side of the VAL will produce very different ball motion from what was planned.
3. **Grip hole relationship** — confirm that the finger and thumb holes are positioned correctly relative to the pin and MB. Holes that overlap with or sit unusually close to the pin or MB are a flag worth investigating before drilling.
4. **VAL line orientation** — confirm the VAL runs through the expected reference points on the ball surface. A VAL that looks misaligned in the rendering is often a sign of an incorrectly entered PAP coordinate.

Note: If the 3D rendering shows a layout that does not match the drilling plan, return to the spec sheet and check the layout values before proceeding. The rendering is not wrong — it is faithfully representing what the entered values produce. A discrepancy between the rendering and the intended plan always means a data entry issue, not a rendering error.

3D Layout View Across Spec Sheet History

Because the rendering reflects whichever spec sheet is currently selected in the Arsenal detail view, it can be used to step through a ball's drilling history visually — seeing how the layout changed from one drilling to the next, not just as numbers on a list but as a spatial picture on the ball surface.

- Select the most recent spec sheet to see the current drilling state of the ball.
- Select an earlier spec sheet to see how the pin or MB was positioned in a previous drilling — useful when a bowler wants to replicate a ball motion from an earlier setup.
- Compare two drillings side by side by opening the ball detail view on two browser tabs and selecting a different spec sheet in each — the two renderings show the layout differences visually.

⚖ 3D Layout View vs. Physical Ball Marking

The 3D Layout view is a digital planning tool — it works from spec sheet data and does not replace the physical process of marking the ball surface before drilling. Use it to verify the plan and communicate the layout to the bowler, but always mark the physical ball and verify the marks before drilling begins.

Task	3D Layout view	Physical ball marking
Verify layout geometry before drilling	Instant, no marks needed	Physical confirmation at the press
Communicate layout to bowler	Visual and rotatable — no technical knowledge required to follow	Requires bowler to interpret physical marks
Catch data entry errors	Immediately visible in the rendering	Caught at the press — later in the workflow
Guide drill press setup	Reference only — not a direct interface	Physical marks guide jig setup directly
Historical layout comparison	Switch between spec sheets to compare visually	Not practical on a drilled ball

Tips for Getting the Most From the 3D Layout View

- **Use it early in the fitting conversation** — pulling up the 3D view while discussing a layout option is more compelling than quoting pin distances. Bowlers who can see what their ball will look like are more engaged in the decision.
- **Rotate to the bowler's perspective** — orient the rendering so the finger holes are facing the viewer and the ball is in grip position. This is the angle most meaningful to the bowler and the most intuitive for communicating ball motion.
- **Use it to explain layout changes between re-drillings** — if a bowler is asking why their ball reacts differently after a re-drill, showing the two layouts side by side in the 3D view makes the difference immediately apparent without requiring technical explanation.
- **Check it after any layout value change** — if a Pin to PAP, VAL Angle, or Drilling Angle value is adjusted, refresh the rendering to confirm the update has been reflected before printing the spec sheet.

Related Sections

- 7.1.5 — Suggested Layouts feature — using bowler data to suggest a layout
- 7.1.6 — Manually entering Drilling Angle, Pin to PAP, and VAL Angle
- 7.2.2 — Arsenal Plus: layout conversion between systems
- 7.2.3 — Arsenal Plus: barcode scanning and database lookup
- 6.1.5 — Step 5: Select layout (VLS, 2LS, PAL, or manual)

Tip: The 3D Layout view is one of the most visible demonstrations of Arsenal Plus's value to a bowler who has never seen it before. The first time you rotate their ball's layout on screen and explain what the pin position means for their motion, you have made a compelling case for why their drilling history lives in Spectre Cloud — and why they should come back to your shop for every ball in their bag.

7.2.2 Navigating and reading the 3D ball view

Navigating and reading the 3D ball view

> 7.2.2 layout 3D

The 3D Layout view renders a rotatable ball model with all key layout elements plotted on its surface. Knowing how to navigate the view efficiently — rotating to the right angle, reading the plotted markers correctly, and interpreting what you are seeing — is what makes it genuinely useful at the counter and the drill press rather than just visually impressive. This page covers the navigation controls, what each element on the ball surface means, and how to read the rendering with confidence.

□□ Navigation Controls — Desktop

On desktop, the 3D ball model is controlled entirely with the mouse. The model responds to three types of input:

Action	Control	What it does
Rotate	Click and drag in any direction	Rotates the ball freely around its centre — the model spins in the direction of the drag
Zoom in	Scroll wheel up	Moves the viewpoint closer to the ball surface — useful for examining marker placement detail
Zoom out	Scroll wheel down	Pulls the viewpoint back — useful for seeing the whole ball at once

Action	Control	What it does
Reset view	Double-click the model	Returns the ball to its default orientation — grip side facing the viewer, ball in standard position

□□ **Note:** The ball rotates freely in all directions — there is no locked axis. If the model ends up in an orientation that is hard to read, double-click to reset to the default view and reorient from there.

□□ Navigation Controls — Mobile and Tablet

Action	Gesture	What it does
Rotate	One-finger drag in any direction	Rotates the ball freely — the model follows the direction of the drag
Zoom in	Pinch outward (two fingers)	Moves the viewpoint closer to the ball surface
Zoom out	Pinch inward (two fingers)	Pulls the viewpoint back to show the full ball
Reset view	Double-tap the model	Returns the ball to the default grip-facing orientation

□□ **Tip:** On a phone, the 3D view is functional but tight — a tablet or desktop gives significantly more working space. If you are using a phone and need to examine a specific area closely, zoom in first and then rotate, rather than trying to read small markers at full zoom-out.

□□ Elements on the Ball Surface — What Each One Is

The 3D rendering plots several distinct elements on the ball surface. Each is colour-coded and labelled within the view. Here is what each element represents and how to read it:

□□ Pin (top weight marker)

Shown as a small filled circle, typically in a distinct colour (verify exact colour with Spectre team). The pin marks the top of the ball's core — the lightest point on the ball's weight block axis. Its

position relative to the PAP and VAL line is the primary driver of ball motion strength and flare potential.

- A pin sitting **closer to the PAP** (shorter pin-to-PAP distance) produces higher flare and a stronger, earlier-reading motion.
- A pin sitting **further from the PAP** produces lower flare and a smoother, later-breaking motion.
- The pin's position **above or below the VAL line** — and at what angle — is what the VAL Angle value controls. Rotating the ball to view it from the PAP's perspective makes this angle most readable.

Mass Bias (MB) marker

Shown as a small distinct marker in a different colour from the pin (verify exact colour with Spectre team). The MB marker indicates the preferred spin axis — the heaviest point on an asymmetric ball's weight block. On symmetric balls, the MB marker is present but carries less layout significance.

- The MB's position **relative to the VAL line** determines how strongly the asymmetric core influences ball motion. An MB positioned closer to the VAL produces a stronger, earlier reading; further from the VAL produces a milder, smoother reaction.
- For symmetric balls, the MB marker is shown for reference but the Drilling Angle value has less impact on ball motion than on asymmetric cores.
- Rotate the ball so the grip faces the viewer to see the MB's position relative to the thumb hole — a common reference orientation for evaluating asymmetric layouts.

PAP (Positive Axis Point)

Shown as a crosshair or target symbol on the ball surface. The PAP is the bowler's axis of rotation at the moment of release — the reference point from which all layout distances are measured. On the 3D rendering, it provides the spatial anchor that gives the pin and MB positions their meaning.

- All layout distances — pin-to-PAP, MB-to-PAP — are measured from this point on the ball surface.
- If the PAP appears in an unexpected location on the rendering, return to the spec sheet and verify the PAP coordinates entered — the rendering faithfully reflects what is recorded, including errors.

VAL line

Shown as an arc running from the top of the ball through the PAP to the bottom — the bowler's Vertical Axis Line. The VAL line divides the ball into a front half (toward the fingers) and a back half

(toward the bowler's back), providing the angular reference for pin and MB placement.

- The VAL Angle value on the spec sheet controls the angle between this line and the line from the PAP to the pin.
- Rotating the ball to view it with the PAP centred and the grip facing the viewer gives the most intuitive reading of how the pin and MB sit relative to the VAL.

Finger and thumb holes

Shown as circular outlines on the ball surface, positioned based on the span and pitch values from the spec sheet. The finger holes (middle and ring) appear above the thumb hole in standard grip orientation.

- Hole positions confirm that the grip does not overlap with the pin or MB marker — an overlap is a red flag worth investigating before drilling.
- The relative positions of the holes confirm the span is correctly reflected in the rendering — a middle finger hole that appears significantly further from the thumb than expected is a signal to re-check the span entry.

Useful Viewing Orientations

The 3D model can be rotated freely, but certain orientations are particularly useful for reading and verifying a layout. These are the views most experienced fitters return to when checking a rendering:

Grip-facing view (default)

The ball is oriented with the finger and thumb holes facing directly toward the viewer — the perspective from which the bowler holds the ball. This is the best orientation for confirming grip hole positions and for showing the layout to the bowler.

PAP-centred view

Rotate the ball so the PAP crosshair is centred in the view, facing the viewer. From this perspective, the VAL line runs vertically through the centre of the screen, and the pin's angle and distance from the PAP are directly readable. This is the most useful orientation for verifying VAL Angle.

Top-down view

Rotate the ball so you are looking straight down at the top. The pin position, MB marker, and their relationships to the grip centre are all visible simultaneously. Useful for evaluating asymmetric layouts where both pin and MB position need to be assessed together.

Side view

Rotate the ball to a 90° side profile — thumb hole at the bottom, finger holes visible on the near face. This orientation shows how the pin sits relative to the finger holes and is useful for confirming the pin is in the intended zone above, below, or within the fingers.

⚠ Reading Discrepancies in the Rendering

If the rendering does not match the intended layout, the cause is almost always in the spec sheet data rather than in the rendering itself. Common discrepancies and their likely causes:

- **Pin appears on the wrong side of the VAL line** — VAL Angle entered with the wrong sign or the wrong reference direction. Return to the spec sheet and verify the angle value and its direction.
- **MB marker appears far from its intended position** — Drilling Angle entered incorrectly. Most common on asymmetric balls where the MB placement is sensitive to small angle changes.
- **PAP appears in an unexpected location** — PAP coordinates entered incorrectly on the spec sheet. Verify the recorded PAP against the physical measurement.
- **Holes appear much closer together or further apart than expected** — span values entered incorrectly or span type mismatch. Review span entry on the spec sheet.
- **Pin or MB overlapping a grip hole** — the layout geometry and the grip geometry are incompatible as entered. Review both the layout values and the span/pitch values before drilling — this combination should not proceed to the press without investigation.

Related Sections

- 7.2.1 — What is the 3D Layout view
- 7.2.3 — Arsenal Plus: layout conversion between systems
- 7.1.6 — Manually entering Drilling Angle, Pin to PAP, and VAL Angle
- 7.1.5 — Suggested Layouts feature — using bowler data to suggest a layout
- 04.x — Spec Sheets: layout field reference

 Tip: Before walking a new bowler through the 3D Layout view for the first time, spend thirty seconds rotating the ball yourself to get it into the grip-facing orientation and zoom level that reads most clearly. A rendering that is already positioned well when you turn the screen toward the bowler is far more impressive and informative than watching you search for the right angle in front of them.

7.2.3 How 3D layout updates in real time as you enter measurements

How 3D layout updates in real time as you enter measurements

7.2.3 layout 3D

One of the most practical aspects of the 3D Layout view in Spectre Cloud is that it does not require a save or refresh to reflect changes — as layout values, span measurements, and PAP coordinates are entered or updated on the spec sheet, the rendering updates **in real time**. This live feedback loop turns the 3D view from a static confirmation tool into an active part of the fitting process, letting the fitter see the effect of each value change on the ball's core orientation as the spec sheet is being built.

□□ What "Real Time" Means in Practice

As each field on the spec sheet is filled in or modified, the 3D ball model updates to reflect the new values without any manual action required. The update happens field by field — you do not need to complete the entire spec sheet before the rendering becomes useful.

- Change the **Pin to PAP distance** and the pin marker moves on the ball surface immediately.
- Adjust the **VAL Angle** and the pin rotates around the PAP to its new angular position.
- Update the **Drilling Angle** and the MB marker shifts to reflect the new core orientation.
- Enter or update **span values** and the finger and thumb hole positions replot on the ball surface.
- Update the **PAP coordinates** and the entire layout geometry re-anchors to the new reference point — pin, MB, VAL line, and holes all shift simultaneously.

⚠ **Verify with Spectre team:** Confirm that real-time rendering updates are triggered on field blur (when the user moves to the next field) rather than on every keystroke — or clarify the exact trigger if it differs. The page is written assuming blur-triggered updates; keystroke-triggered updates on numeric fields can cause the model to pass through intermediate nonsensical states while a value is being typed.

How Each Input Type Affects the Rendering

Different fields on the spec sheet drive different elements of the 3D rendering. Understanding which input moves which element helps you work efficiently — entering layout values in a deliberate order and watching the rendering build up progressively rather than jumping between fields and losing track of what changed.

Spec sheet field	Element updated in the rendering	What to watch for
Pin to PAP distance	Pin marker distance from PAP	Pin moves closer to or further from the PAP crosshair — confirm it lands in the intended zone
VAL Angle	Pin marker angle around the PAP	Pin rotates around the PAP — confirm it ends up on the correct side of the VAL line at the intended angle
Drilling Angle	MB marker position	MB shifts around the ball surface — most visible on asymmetric balls; confirm it lands in the intended position relative to the VAL
PAP coordinates	PAP crosshair position, VAL line orientation, all layout geometry	Entire rendering reanchors — if anything looks significantly different after a PAP update, verify the coordinates are correct

Spec sheet field	Element updated in the rendering	What to watch for
Span (middle and ring finger)	Finger hole positions	Holes move outward or inward from the thumb — confirm they do not encroach on the pin or MB marker
Thumb span	Thumb hole position	Thumb hole shifts up or down relative to the finger holes — confirm the grip geometry looks proportionate
Pitch values	Hole angles (subtle — visible on close inspection)	Hole axis orientation shifts slightly — most visible when zoomed in directly on a hole

□□ A Recommended Entry Order for Real-Time Verification

Because the rendering builds up element by element as fields are completed, entering values in a deliberate order makes the verification process more legible. The following sequence lets you confirm each element before adding the next layer of complexity:

1. **Enter PAP coordinates first.** The PAP anchors everything else — with it in place, every subsequent element plots relative to a fixed reference point. An incorrect PAP discovered after layout values are entered requires re-checking the entire rendering.
2. **Enter Pin to PAP distance.** The pin appears on the ball surface. Confirm it is in the right general zone before adding the angular component.
3. **Enter VAL Angle.** The pin rotates to its final angular position relative to the VAL line. This is the step where the layout's breakpoint character becomes visible — arcing vs. angular, early vs. late.
4. **Enter Drilling Angle.** The MB marker appears at its calculated position. For asymmetric balls, confirm the MB is on the intended side of the VAL. For symmetric balls, note the position for reference.
5. **Enter span and pitch values.** The grip holes plot on the ball surface. Confirm no hole overlaps with the pin or MB, and that the grip geometry looks correct relative to the layout.

□□ **Note:** This order is a recommendation for new users or for complex fits where visual verification at each step adds confidence. Experienced fitters who know their layout values well may enter fields in any order and read the final rendering as a complete check rather than a step-by-step build.

Using Real-Time Updates to Explore Layout Options

The real-time nature of the rendering makes it possible to use the 3D view interactively — adjusting a layout value and immediately seeing its effect — rather than only as a confirmation of a pre-determined plan. This is particularly useful in two situations:

Comparing layout options with the bowler present

When a bowler is at the counter and the layout decision has not been finalised, the live rendering lets you show them the effect of different options without committing to any of them. Increase the Pin to PAP distance and show them where the pin lands — then decrease it and show them the alternative. Change the VAL Angle and let them see the pin rotate to a new position. The visual is immediate and requires no technical translation.

- Frame the demonstration in motion terms, not layout terms: "this position produces a smoother, more arcing motion — this position is sharper at the breakpoint."
- Once the bowler has chosen a direction, enter the finalised values and save the spec sheet.
- The exploratory values entered during the conversation are overwritten when you enter the final values — no cleanup needed.

Refining a Suggested Layout

When Arsenal Plus has generated a layout suggestion and you want to adjust one variable — keeping the VAL Angle and Drilling Angle but trying a slightly longer Pin to PAP, for example — apply the suggestion to the spec sheet, then modify the single value you want to adjust. The rendering updates immediately to show the effect of the refinement, letting you evaluate the adjusted layout visually before committing to it.

⚠ When the Rendering Does Not Update

If the 3D model does not update after a field value is changed, the most common causes are:

- **The field has not been committed** — the cursor may still be inside the field. Click or tap outside the field to trigger the update.
- **The entered value is outside the valid range** — Spectre Cloud may hold the rendering at the last valid state if an out-of-range value is entered. Check the field for a validation error indicator.
- **The ball is not identified in the bowlingdatabase.com integration** — without core specification data, the full rendering cannot generate. The panel will show a prompt to identify the ball if this is the case.
- **A connectivity issue** — the rendering requires an active internet connection to fetch core geometry data. If the connection drops, the rendering pauses at its last loaded state. Reconnect and reload the spec sheet.

Real-Time Updates vs. Saved State

The real-time rendering reflects the **current state of the fields on screen** — including any unsaved changes. It is important to understand the difference between what is shown in the rendering and what is permanently stored:

- The rendering updates live as fields are changed, whether or not those changes have been saved.
- If you navigate away from the spec sheet without saving, unsaved field changes are lost — the rendering reverts to the last saved state on next load.
- Save the spec sheet once the layout values are finalised. The rendering at the point of save becomes the permanent visual state for that spec sheet, visible in the Arsenal detail view.
- Do not use the rendering as a substitute for saving — the visual update is immediate, but the data update requires an explicit save action.

Related Sections

- 7.2.1 — What is the 3D Layout view
- 7.2.2 — Navigating and reading the 3D ball view
- 7.2.4 — Arsenal Plus: layout conversion between systems
- 7.1.6 — Manually entering Drilling Angle, Pin to PAP, and VAL Angle
- 7.1.5 — Suggested Layouts feature — using bowler data to suggest a layout

Tip: The real-time rendering is most powerful when the device running Spectre Cloud is visible to both the fitter and the bowler simultaneously — a tablet propped on the counter between them, or a desktop monitor angled toward the customer side. When the bowler can see the ball rotating in response to your adjustments, the layout conversation becomes collaborative rather than one-sided — and the bowler leaves with a clear mental picture of what their ball is going to do before it

has even been drilled.