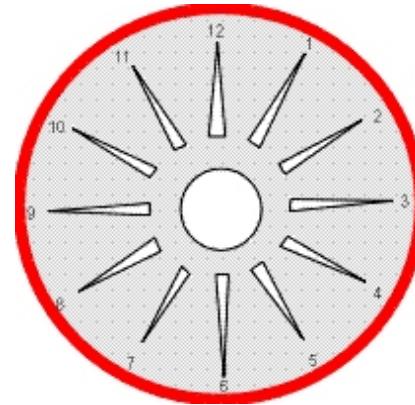


# Using the Revolution ECX Layout Tool

- Step 1

Punch out the circular clock face removing the center circle and triangular shaped cutouts.



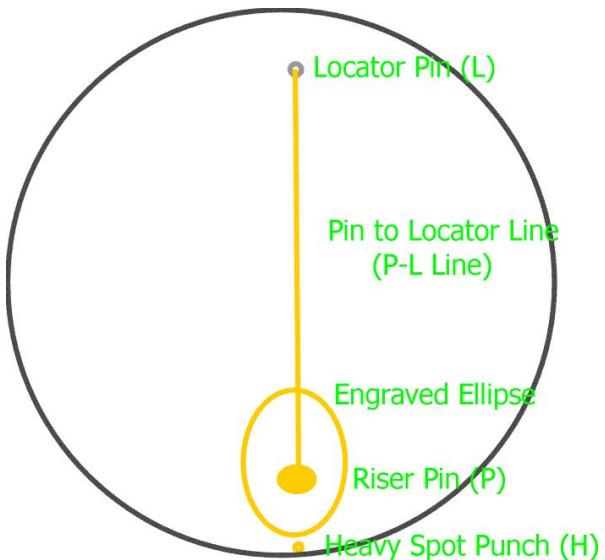
- Step 2

Draw a line on the ball from the riser pin (P) to the locator pin ((L); a small clear circle  $6\frac{3}{4}$ " above the riser pin, in line with the long axis of the engraved ellipse).

The engraved ellipse indicates the general position of the core but can vary slightly due to the engraving process.

The riser pin may not be perfectly centered in the engraved ellipse or the line from the riser pin to the ellipse may not go exactly along the long axis of the engraved ellipse.

However, the line drawn from the riser pin to the locator pin will precisely indicate the orientation of the elliptical core in the ball and should be used for advanced drilling patterns.



# Using the Revolution ECX Layout Tool

- Step 3

Place the tool on the ball so that the riser pin shows through the hole in the center of the layout tool clock face.

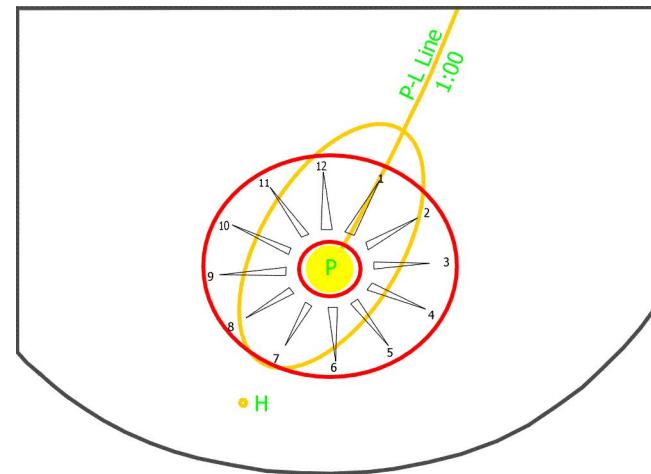
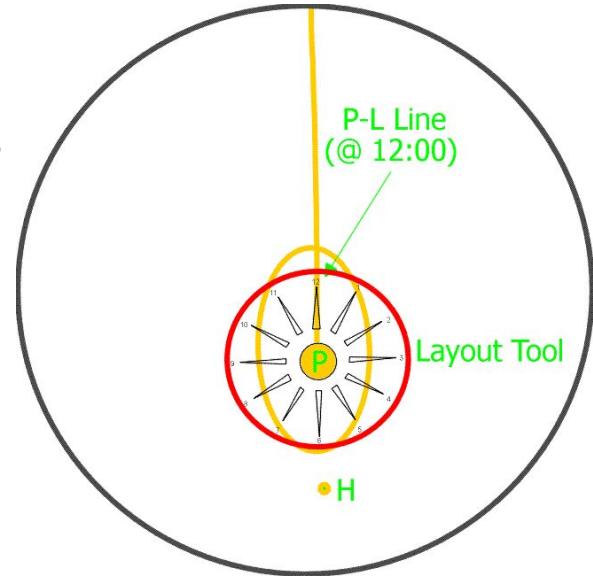
(In this illustration the P-L line is at 12:00)

- Step 4

Rotate the tool so that the riser pin to locator pin line (P-L line) drawn in step #2 is at the time required for the desired drilling. Make sure to keep the riser pin centered in the clock face cut out.

In the example we will be using, the time needed is 1:00. In the illustration to the right the P-L line is set at 1:00 on the layout tool. (Note; for left handed layouts simply mirror the time around 12:00.)

In this example the left handed layout would set the P-L line time at 11:00)



# Using the Revolution ECX Layout Tool

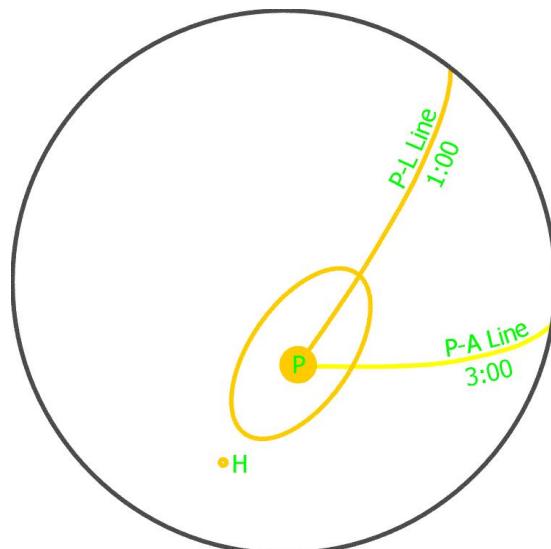
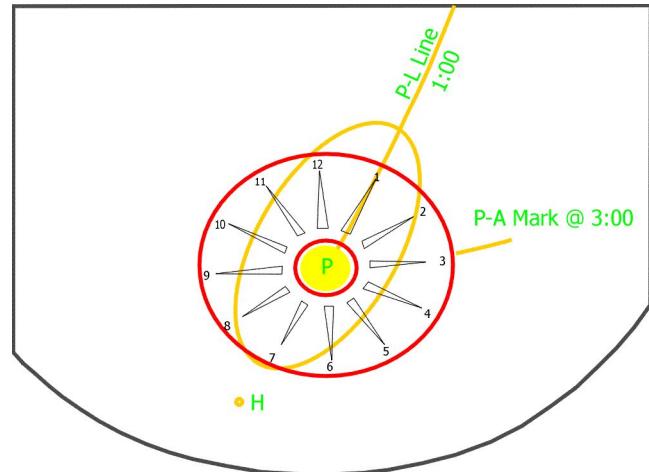
- Step 5

Make a mark on the ball next to the 3:00 position on the tool to indicate the direction towards the bowler's axis. (The mark would be next to the 9:00 position for a lefthander).

The bowler's axis is ALWAYS set in the 3:00 position (9:00 for lefthanders) independent of what time is set for the P-L line. The 3:00 direction is the reference direction for the Pin-Axis line (P-A line) and is the same for every layout.

- Step 6

Remove the tool from the ball and draw the line from the riser pin through the P-A mark drawn in Step #5. Draw the P-A line so that it is 7 or 8 inches long as it extends away from the riser pin (P).



# Using the Revolution ECX Layout Tool

- Step 7

Make a mark on the P-A Line at the required riser pin to axis distance for the desired drilling.  
(In this example we are setting a 6" pin to axis distance.)

Note:

As long as the bowler's axis is on the P-A line, the core will stay at the angle set in Step #4. It doesn't matter if the axis is 1", 3-3/8" or 6" from the riser pin. As long as the axis is on the P-A line, the rotation of the ellipse relative to the bowler's release axis will remain constant.

- Step 8

Using the mark made in Step #7 as the desired axis point, use the bowler's axis co-ordinates to map back to a grip center. (In the example the bowler's axis is 5-3/4" right and 3/8" up from the grip center)

The height of the pin and the position of the heavy spot relative to the grip center can be adjusted by changing the initial direction you move away from the axis point. These adjustments will allow you to make sure that the pin position and static balance are reasonable before drilling the holes.

