

SWINGAI BIOMECHANICS

Twenty-four dimensions across the swing now built into your SmartPark export.

In the CSV — Each dimension appears as two columns: the raw value and its WIN Score (0–5). Populated on swings only and appended to the SmartPark export. 24 dimensions = 48 columns. Only metrics listed as a core dimension receive a 0–5 score currently.

CORE DIMENSIONS

WEIGHT SHIFT & STRIDE

Negative Move M

Back-hip position vs. the back ankle at the farthest point of the backward move during the load.

Forward Move RATIO

Lead-hip position at swing end relative to its position at foot down.

Stride Length RATIO

The batter's stride length as a ratio of their height.

PELVIS

Pelvis Load DEG

Angular change of the pelvis from stance to max counter-rotation during the load.

Pelvis Direction at Contact DEG

Direction the hip line faces at swing end, relative to facing the pitcher.

Pelvis Total Rotation Range DEG

Total angle the pelvis rotates from max counter-rotation to swing end.

UPPER TORSO

Upper Torso Load DEG

Angular change of the shoulders from stance to max counter-rotation during the load.

Upper Torso Direction at Contact DEG

Direction the shoulder line faces at swing end, relative to the pitcher.

Upper Torso Total Rotation Range DEG

Total angle the shoulders rotate from max counter-rotation to swing end.

HIP-SHOULDER SEPARATION

Max Hip-Shoulder Separation DEG

The maximum angle of the upper torso relative to the pelvis during the swing.

Hip-Shoulder Separation at Foot Down DEG

Angle of the upper torso relative to the pelvis at the foot-down event.

Hip-Shoulder Separation at Contact DEG

Angle of the upper torso relative to the pelvis at swing end.

SWING EVENTS

Load / Negative Move — farthest point of the gather before moving forward.

Foot Down — the moment the front foot plants.

Contact / Swing End — the moment of contact.

EXTENDED DIMENSIONS

POSTURE

Forward Bend at Foot Down DEG

Trunk tilt relative to vertical in the frontal plane at foot down.

Side Bend at Foot Down DEG

Trunk tilt in the lateral plane at foot down.

Forward Bend at Contact DEG

Trunk tilt relative to vertical in the frontal plane at swing end.

Side Bend at Contact DEG

Trunk tilt in the lateral plane at swing end.

Trunk Axis Tilt at Foot Down DEG

Overall trunk tilt relative to vertical at foot down.

Trunk Axis Tilt at Contact DEG

Overall trunk tilt relative to vertical at swing end.

ANGULAR VELOCITY

Pelvis Max Angular Velocity DEG/SEC

Maximum angular velocity of the pelvis during the swing.

Shoulder Max Angular Velocity DEG/SEC

Maximum angular velocity of the shoulders during the swing.

Arm Max Angular Velocity DEG/SEC

Maximum angular velocity of the arm during the swing.

CENTER OF MASS DISTRIBUTION

COM at Negative Move RATIO

Position of the center of mass between the back and lead ankle at the Negative Move event.

COM at Foot Down RATIO

Center-of-mass position (back ankle to lead ankle) at the foot-down event.

Max COM Distribution RATIO

Maximum forward shift of the center of mass between the back and lead ankle.

HOW A SWING IS SCORED — THE 0–5 SCALE

Every dimension is graded on how close it sits to its optimal range.

■ **Excellent (5)** — inside the optimal range.

■ **Satisfactory (3–4)** — a workable deviation, still effective.

■ **Out of Range (0–2)** — a deviation big enough to cost performance.

