



PAR 18

GOLF

THE COMPLETE

TRACKMAN[®]

PARAMETER REFERENCE

A VISUAL GUIDE TO ALL 65 TRACKMAN DATA PARAMETERS



CLUB DATA

Club & Impact
Parameters



LAUNCH & BALL FLIGHT

Ball Flight
Parameters



SETUP & ALIGNMENT

Address Position
Parameters



3D BIOMECHANICS

Movement & Rotation
Parameters

LEARN | PRACTICE | IMPROVE | PLAY BETTER AT PAR 18

How to use this book

This reference is organized by what the measurement describes. Find a parameter in the table of contents, read its source-based explanation, and use the interpretation note to understand how it fits with the rest of the swing.

Important: These are explanatory notes based on the 65 PDF pages supplied from TrackMan University, not a TrackMan-certified manual. The source printouts sometimes cut off lower sections of the webpage. We preserve the visible definition and reference conventions without inventing missing official guidance.

Angles vs distances vs speeds: Degrees (°) describe an orientation or angle; degrees/second (°/s) describe rotational speed; inches or centimeters describe displacement; mph describes linear speed; rpm describes ball spin.

Signs and directions: For horizontal launch/face/path readings, the source describes right/left relative to the target line. For body rotations and translations, the source frequently uses descriptive labels such as “towards,” “away,” “forward,” and “back.” Do not assume a plus sign always means the same physical direction across all tiles.

Reference position P1: Body translations are measured relative to the segment position at P1 (address). Rotation measures may instead use a vertical or target-line reference.

Practice tip: Compare trends across a series of shots and use impact and ball-flight results to judge whether a change helped. Individual numbers are not universal swing prescriptions.

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01 Club delivery & impact

What the club is doing immediately before and during contact with the ball.

Attack Angle

The up or down movement of the club head's geometric center at the time of maximum compression. Attack angle is measured relative to the horizon at maximum compression (impact). Club Trajectory
Attack Angle Low Point

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



Original illustration from the corresponding uploaded TrackMan University PDF.

Club Path

The in-to-out or out-to-in movement of the club head's geometric center at the time of maximum compression. That is, Club Path is the direction the club head is moving (right or left) at impact and is measured relative to the target line. Club Trajectory Target Line Club Path WHAT IS IT USED FOR?

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Club Speed

The linear speed of the club head's geometric center just prior to first touch with the golf ball. That is, Club Speed is the speed the clubhead is traveling just prior to impact. Club Speed WHAT IS IT USED FOR? Club Speed determines a golfer's potential distance, and is

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Dynamic Lie

The angle of the lower portion of the shaft relative to the horizon at impact. A golf club comes with a Static Lie at purchase, which is the angle of the lower portion of the shaft relative to the horizon. This angle between shaft and horizon can be different at impact depending on how the player delivers the club. The angle measured at impact is Dynamic Lie.

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Dynamic Loft

The vertical angle of the club face at the center- point of contact between the club and ball at the time of maximum compression. That is, Dynamic Loft is the amount of loft on the club face at impact and is measured relative to the horizon. A golf club comes with a Static Loft at purchase, which is the angle of the club face relative to the horizon. For a driver it is usually around 8-12 degrees, a 7 iron is around 34 degrees and wedges usually between 52 and 60 degrees. This angle between face and horizon can be different at impact depending on how the player delivers the club. The angle measured at impact is Dynamic Loft.

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Face Angle

The direction the club face is pointing at the center-point of contact between the club and ball at the time of maximum compression. That is, Face Angle is the direction the club face is pointed at impact and is measured relative to the target line. Often referred to as having an open (positive Face Angle) or closed club face (negative Face Angle) for a right-handed player.

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.

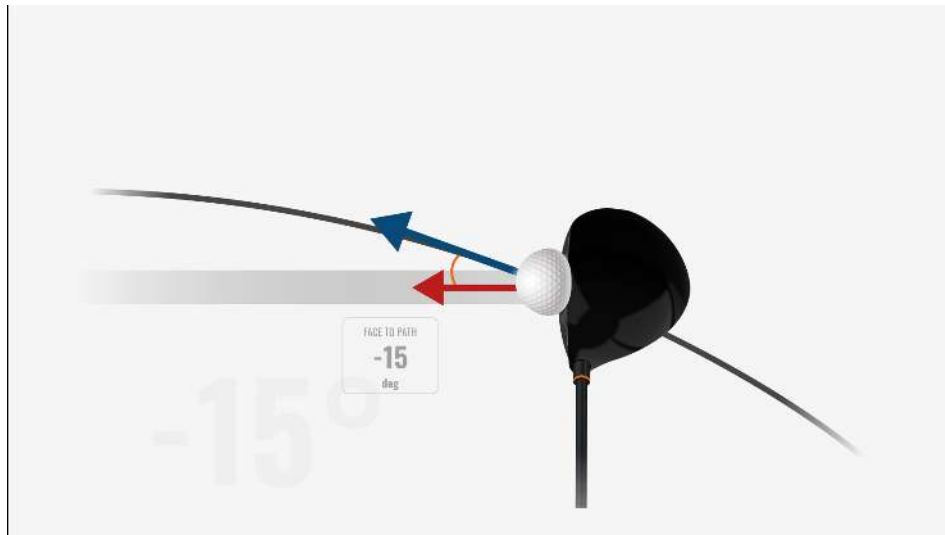


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Face to Path

The angle difference between the reported Face Angle and Club Path. For example, a negative Face to Path would represent a Face Angle that is “closed” to the path and a positive Face to Path would represent a Face Angle that is “open” to the path (for a right-handed golfer). Target Line Club Trajectory Club Path

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Impact Height

The vertical impact location distance relative to the center of the face. That is, Impact Height measures how far the ball is hit above or below the center of the club face. Impact Location WHAT IS IT USED FOR?

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Impact Offset

The horizontal impact location distance relative to the center of the club face. That is, Impact Offset measures how far the ball is hit towards the heel or the toe of the club face. Impact Location WHAT IS IT USED FOR?

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Low Point Distance

Distance from the club head's geometric center to the lowest point on the swing arc at the time of maximum compression. Low Point Distance provides a different way of describing Attack Angle. Club Trajectory Low Point Distance 3D Circle Fit to Pre-Impact Club Trajectory L P i

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.

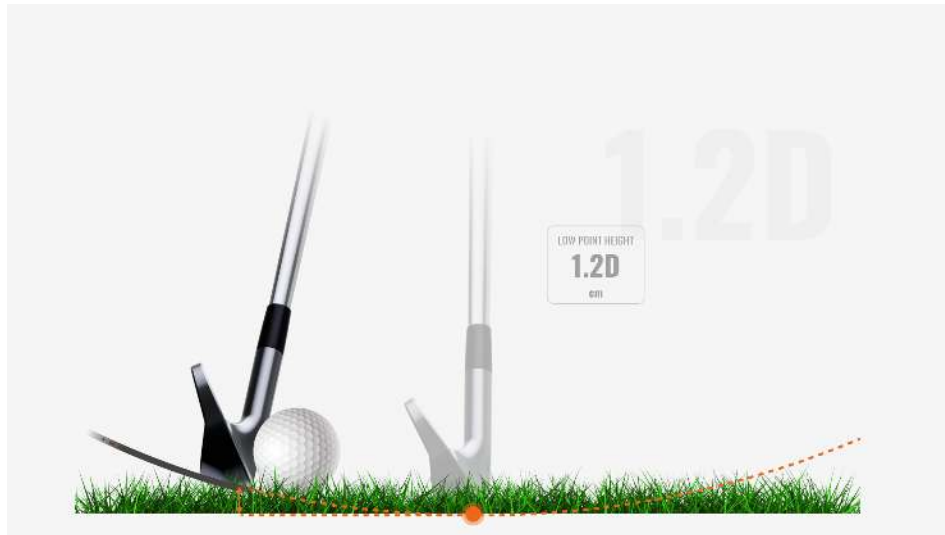


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Low Point Height

The relative vertical distance of the club head position at the time of maximum compression to where the swing would bottom out if there was no interaction between the ball or the ground. Club Trajectory Low Point Height 3D Circle Fit to Pre-Impact Club Trajectory Low Point

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Low Point Side

The relative horizontal distance of the club head measured perpendicular to the target line of the club head position at the time of maximum compression to where the swing would bottom out if there was no interaction between the ball or the ground. Club Trajectory Low Point Side

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Spin Loft

The angle between the direction of the club head's movement and the club face's orientation at the time of maximum compression. That is, Spin Loft is approximately the angle between the Dynamic Loft and Attack Angle. Spin Loft is actually the three-dimensional angle between the direction the club head is moving (both Club Path and Attack Angle) and the direction the club face is pointing (both Face Angle and Dynamic Loft).

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.

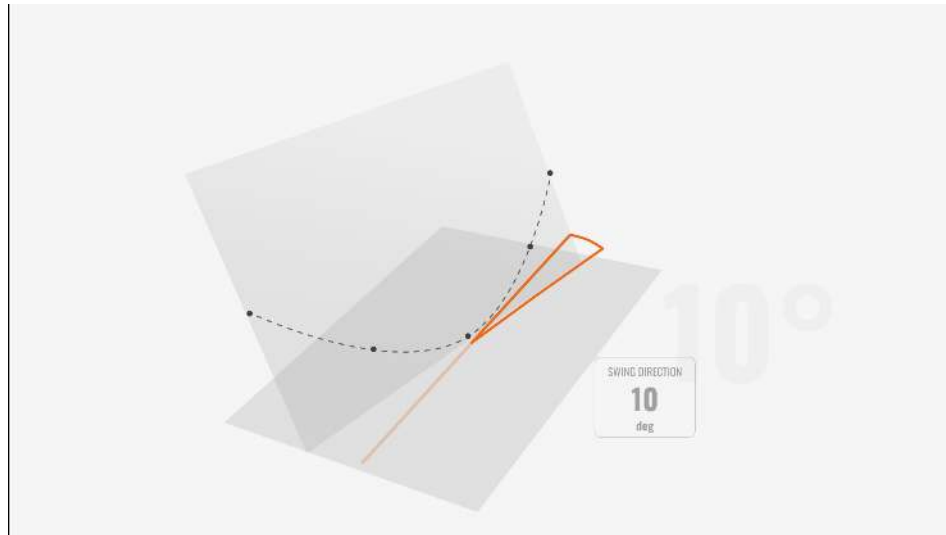


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Swing Direction

The angle between the base of the plane created by the club head's geometric center movement and target line. That is, Swing Direction is the angle between the base (low point) of the "hula hoop" and the target line. Essentially, it indicates whether the overall club trajectory is directed more to the left or right of the target line. Swing Direction uses the three-dimensional position of the club head from approximately knee height in the downswing up until impact and then fitting a plane to it and measuring the direction.

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.

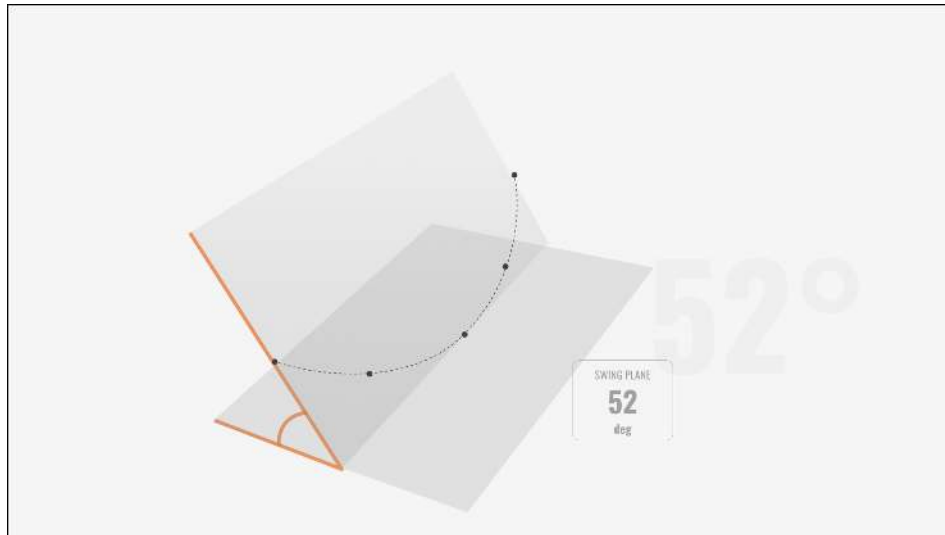


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Swing Plane

The vertical angle between the plane created by the club head's geometric center movement and the horizon. That is, Swing Plane is the vertical angle between the ground and the circle that the club head travels on during the bottom portion of the swing arc. Essentially, the Swing Plane measures how steep or flat the plane is relative to the horizontal line, and captures the tilt of the swing arc. Swing Plane uses the three-dimensional position of the club head from approximately knee height in the downswing up until impact and then fitting a plane to it and measuring the slope relative to the horizontal plane.

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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Swing Radius

Radius of the swing arc, measured at knee height until just before impact, i.e. the club trajectory from about knee height until impact and then fitting a circle to it and measuring the radius. Club Trajectory Swing Radius 3D Circle Fit to Pre-Impact Club Trajectory Center WHAT IS IT USED FOR? Swing radius can be used as a measure when trying to maximize power generation in the swing or to optimize the club trajectory for pitch and chip shots. All else being equal, a longer club will produce a wider radius and potential for more speed. Furthermore, having a consistent Swing Radius on pitch and chip shots may lead to cleaner and more consistent

How to read it: Club-delivery measurement. Compare repeated swings with the same club and target; interpret together with face orientation, strike location and resulting ball flight.



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02 Launch, speed & spin

Ball Speed

The speed of the golf ball's center of gravity immediately after separation from the club face. Ball Speed WHAT IS IT USED FOR? Ball Speed is created by Club Speed and impact. Ball Speed is a result of many factors such as Dynamic Loft, impact location, Club Speed, and more. Higher Ball Speed generally results in longer shots, so Ball Speed is an important measurement, when trying to maximize distance. As a rule of thumb, gaining 1 mph of Ball Speed can increase driver distance by up to 2 yards.

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



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Ball Speed Diff.

Ball Speed Difference is the variation between the measured ball speed and the maximum possible ball speed for the shot. This parameter helps assess energy transfer efficiency and potential distance loss due to off-center strikes, dynamic loft, or spin loft. Zero refers to Smash Index = 100. WHAT IS IT USED FOR? Ball Speed Difference quantifies how much ball speed is lost compared to the maximum potential for a given shot. This parameter directly correlates with Smash Index, which

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.

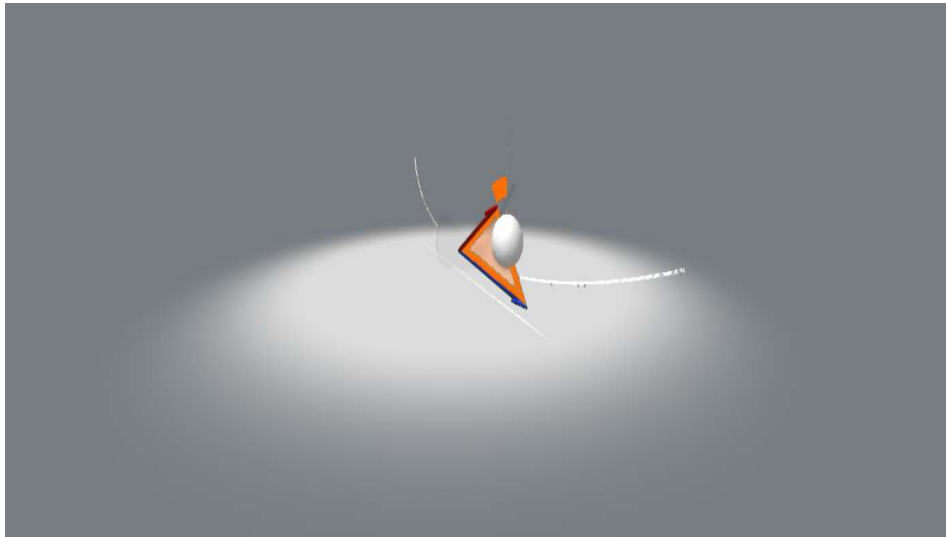


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D Plane Tilt

D Plane Tilt is the tilt of the D Plane relative to the plumb line. D Plane Tilt is the expected spin axis disregarding any gear effect from off-center strike or other factors like ground contact of the club head during the collision with the ball, abnormal friction conditions etc. Thus, if face-to-path is zero, D Plane Tilt will be zero. Target Line Club Trajectory Club Face Orientation (Face Angle and Dynamic Loft) Club Face Direction ('3D' Club Path and Attack Angle)

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



Original illustration from the corresponding uploaded TrackMan University PDF.

Launch Angle

The vertical angle the golf ball takes off at relative to the horizon and measured immediately after separation from the club face. Ball Trajectory Launch Angle WHAT IS IT USED FOR? Launch Angle is the vertical component of where the ball starts relative to the horizon, and the ball will always launch closer to the Dynamic Loft of the club compared to the Attack Angle. Launch Angle is key to optimizing distance. Knowing the Launch Angle for each club in the bag is also helpful,

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



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Launch Direction

The horizontal angle the golf ball takes off at relative to the target line and measured immediately after separation from the club face. That is, Launch Direction is the initial direction the ball starts relative to the target line. A positive Launch Direction indicates a ball that starts right of the target and vice versa (right-handed player). Target Line Launch Direction WHAT IS IT USED FOR? Launch Direction is important when working on start direction

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



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Smash Factor

The ratio between the measured Ball Speed and Club Speed. Smash Factor relates to the amount of energy transferred from the club head to the golf ball. WHAT IS IT USED FOR? Smash Factor indicates the player's ability to create Ball Speed from Club Speed. A low Smash Factor could indicate that the player does not efficiently transfer Club Speed into Ball Speed. Multiple factors play a role in the energy transfer, such as impact location, Dynamic Loft, weight of the club compared to the ball and more.

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



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Smash Index

The ratio of the measured Smash Factor (Ball Speed / Club Speed) to the maximum Smash Factor. Smash Index reveals how solidly a shot was struck for a specific club, reflecting the quality of energy transfer during impact. It helps answer the question: did you make solid contact with the ball? WHAT IS IT USED FOR? A Smash Index of 100% means you hit the ball as efficiently

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.

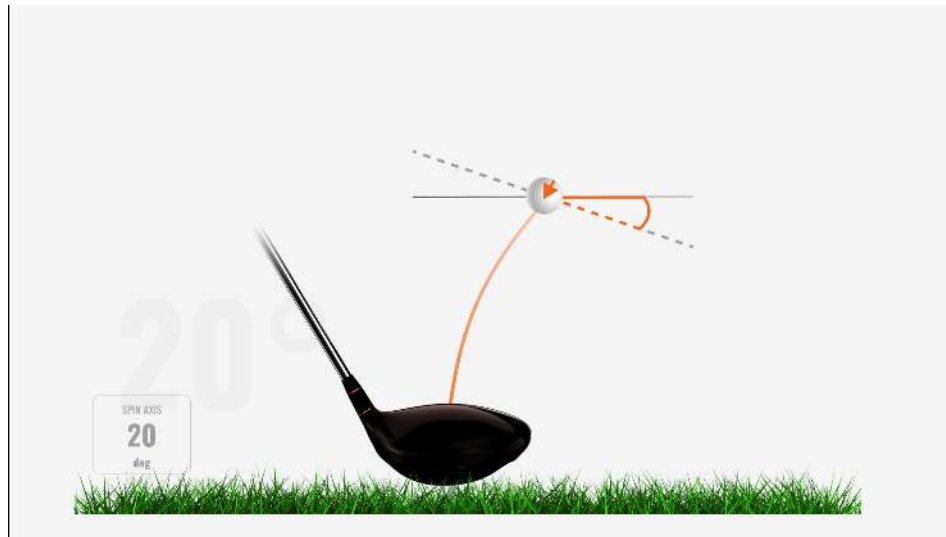


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Spin Axis

The angle relative to the horizon of the imaginary line that the golf ball rotates around and is measured after separation from the club face. That is, Spin Axis represents the amount of curvature of a golf shot. A negative Spin Axis represents a ball curving to the left, a positive Spin Axis represents a ball curving to the right (right-handed player), and a zero Spin Axis represents a shot that has no curvature. Horizontal Line Ball Rotation Axis B I I R i D i i S i A i

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



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Spin Index

The ratio between the measured Spin Rate and the Expected Spin Rate. Spin Index assesses whether the spin rate of the ball aligns with the ideal value for a given shot, offering insights into the shot's spin potential. In simple words, did you get the Spin Rate that you were supposed to? Expected Spin Rate assumes the ball achieves full rolling against the club face without gear effect interference and is calculated for a premium ball.

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



Original illustration from the corresponding uploaded TrackMan University PDF.

Spin Rate

The rate of rotation of the golf ball about the imaginary line the golf ball rotates around measured immediately after separation from the club face. That is, Spin Rate is the amount of spin on the golf ball immediately after impact. Spin Rate WHAT IS IT USED FOR? Spin Rate has a major influence on the height and distance of shots. Spin can be caused by several factors. More loft generally increases the Spin Rate All else equal more Club

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.

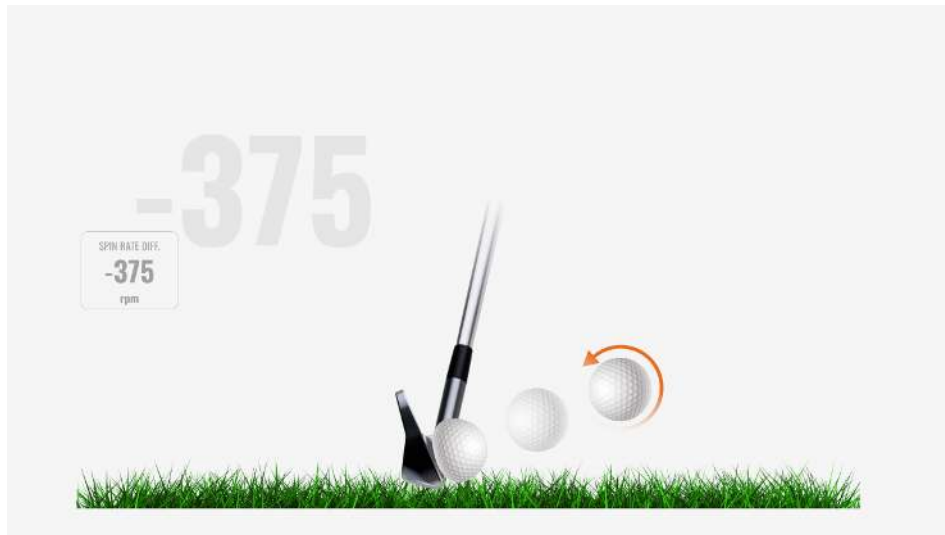


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Spin Rate Diff.

Spin Rate Difference is the deviation between the measured spin rate and the expected spin rate for the shot. This parameter provides insight into strike quality, gear effect, and how well the delivered club dynamics align with optimal spin conditions. Zero refers to Spin Index = 100 WHAT IS IT USED FOR? Spin Rate Difference measures the variance between the

How to read it: Launch measurement. Read this alongside club delivery and the resulting flight; a single number rarely explains the entire shot.



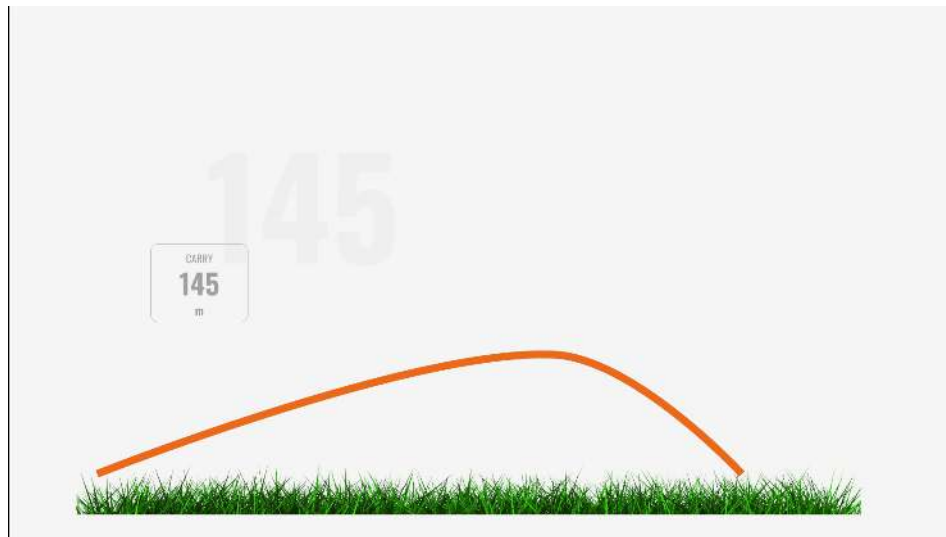
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03 Ball flight & distance

Carry

The straight-line distance between where the golf ball was launched from and where it crosses a point that has the same elevation. That is, Carry is the distance the ball travels through the air. It is important to note that the carry value is given for a landing area that is the same height as where ball is hit from. Therefore, it is also often referred to as “Carry Flat”. Ball Trajectory WHAT IS IT USED FOR?

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.



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Carry Side

The perpendicular distance between the target line and where the trajectory crosses a point that has the same elevation as where the golf ball was launched. That is, Carry Side is the distance from the target line to where the ball lands if the ground was flat. Target Line Ball Trajectory Bounce & Roll Carry Side
WHAT IS IT USED FOR? C Side i f l d i d i f h A

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.

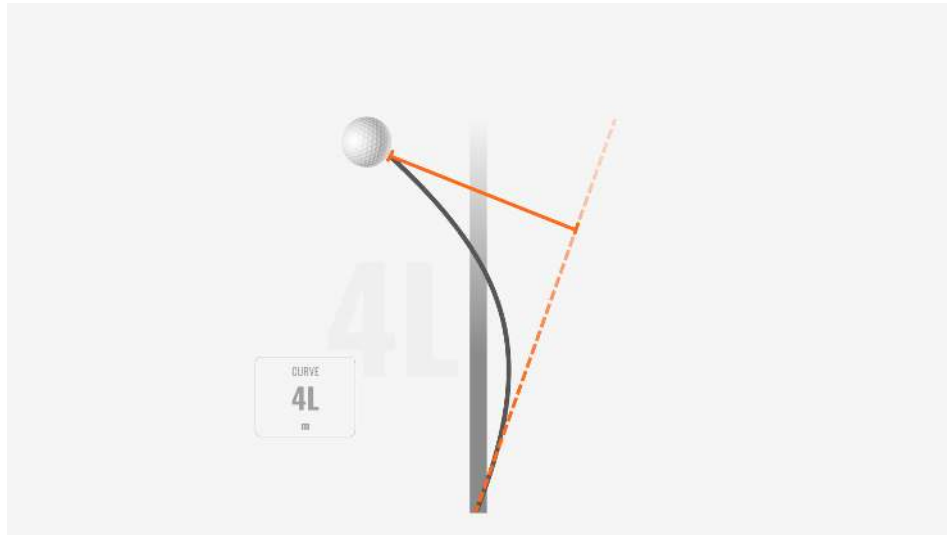


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Curve

The horizontal side movement perpendicular from the Launch Direction to Carry Side. That is, Curve is a measure of how far the ball curved in the air before it landed, assuming the ground was flat. Target Line Launch Direction Ball Trajectory Curve WHAT IS IT USED FOR? Curve provides a numerical value of the distance the ball travelled sideways. Practice hitting different curve distances left and right should make the player better at getting to that

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.

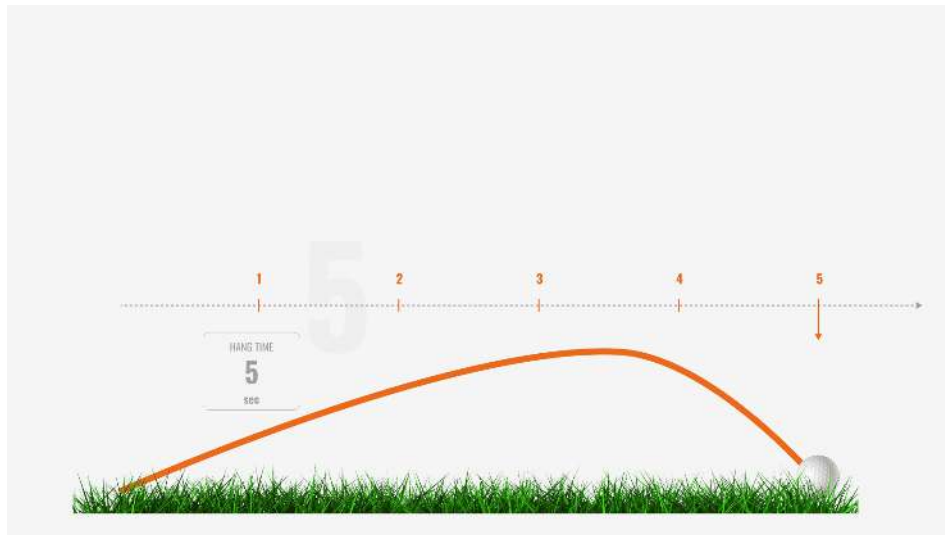


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Hang Time

Time in seconds to Carry flat. That is, how long the ball is flying in the air before it lands, assuming ground is flat. Ball Trajectory WHAT IS IT USED FOR? Hang Time is useful when working on playing in- and adapting to different conditions. For example, in windy conditions, it can be beneficial to try to keep the ball in the air as little time as possible, especially when playing into a strong headwind.

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.

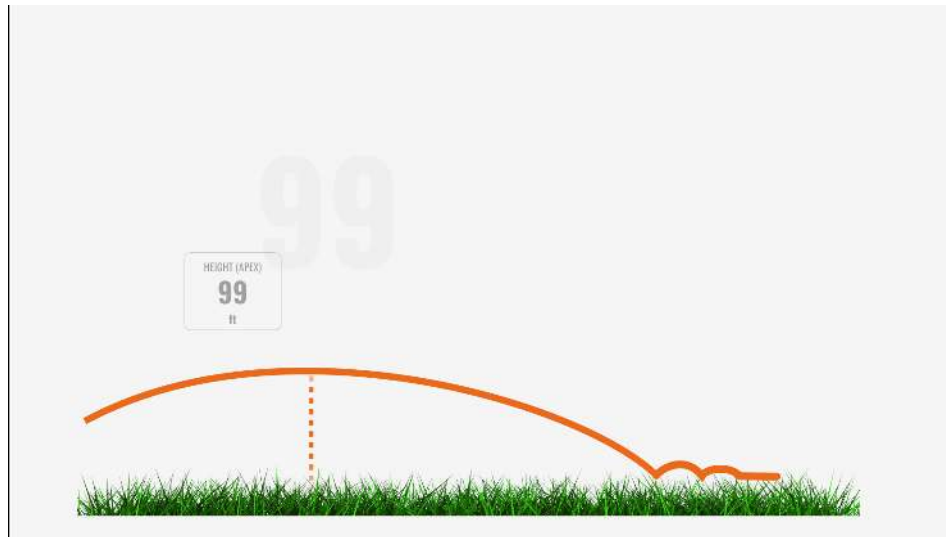


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Height (Apex)

The maximum Height or Apex of the trajectory measured relative to the elevation at which the golf ball was launched. Ball Trajectory Height (Apex) WHAT IS IT USED FOR? Height is useful to look at when optimizing Carry and Landing Angle. For example, a PGA Tour player with a 6-iron Ball Speed of 130 mph should aim to attain a Height of 34 yards, as this combination will produce a trajectory optimized for Carry and Landing Angle. The Height of a shot will vary

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.

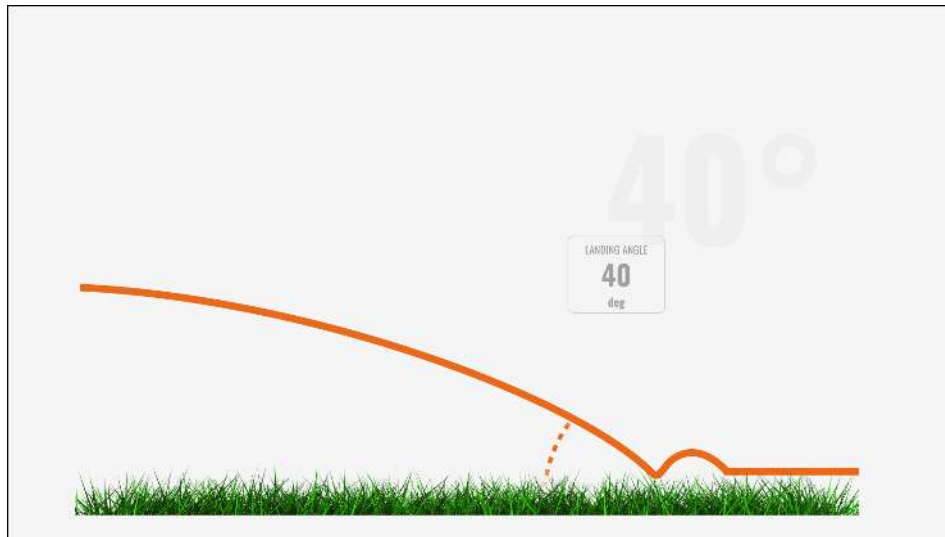


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Landing Angle

The angle the golf ball lands at relative to the horizon and at a point that has the same elevation as where it was launched. Ball Trajectory Landing Angle WHAT IS IT USED FOR? It is important to consider Landing Angle when optimizing trajectory. With a driver, a lower Landing Angle may decrease Carry, but increase Total. However, on approach shots it is important to be able to control how much the ball bounces and rolls after it lands. A Landing Angle

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.

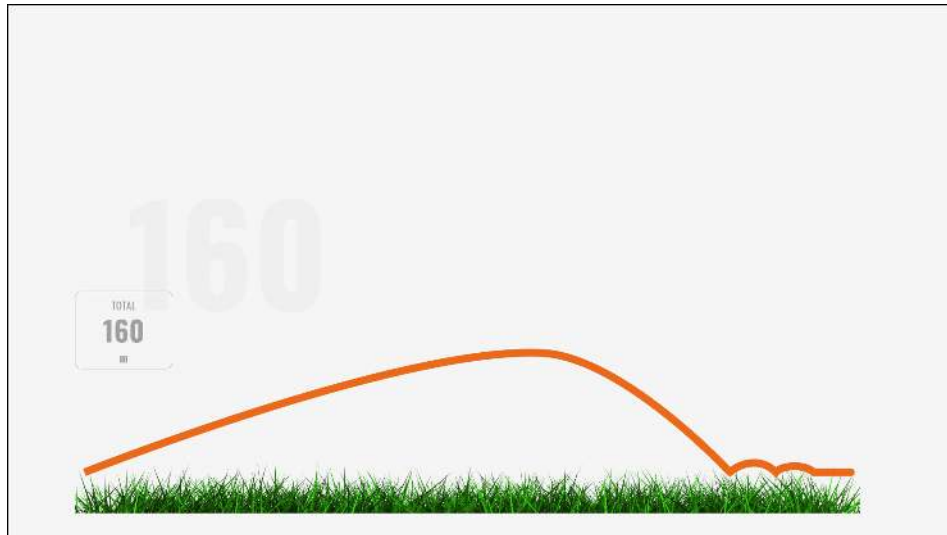


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Total

The straight-line distance between where the golf ball was launched from and its calculated resting position. Total is a calculated value based on the Landing Angle, landing Ball Speed, and Spin Rate. A flat surface and “normal” hardness is assumed to calculate total distance. Ball Trajectory

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.

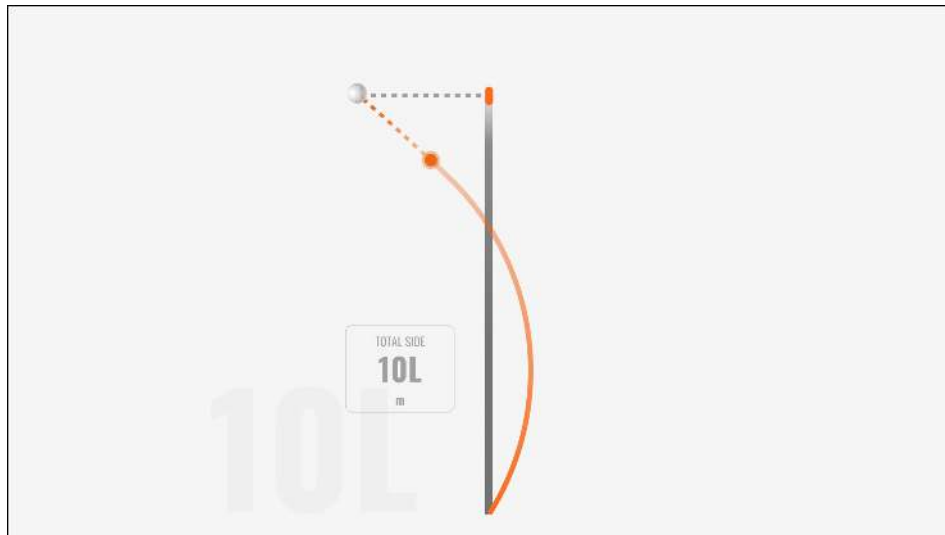


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Total Side

The perpendicular distance between the target line and the golf ball's calculated resting position. The calculated resting position assumes the ball lands at a point that has same elevation as where the ball was launched from. Bounce and roll is calculated based on the Landing Angle, landing Ball Speed, and Spin Rate on a fairway with "normal" hardness.

How to read it: Flight outcome. Compare like-for-like clubs and environmental settings; carry and total are not interchangeable.



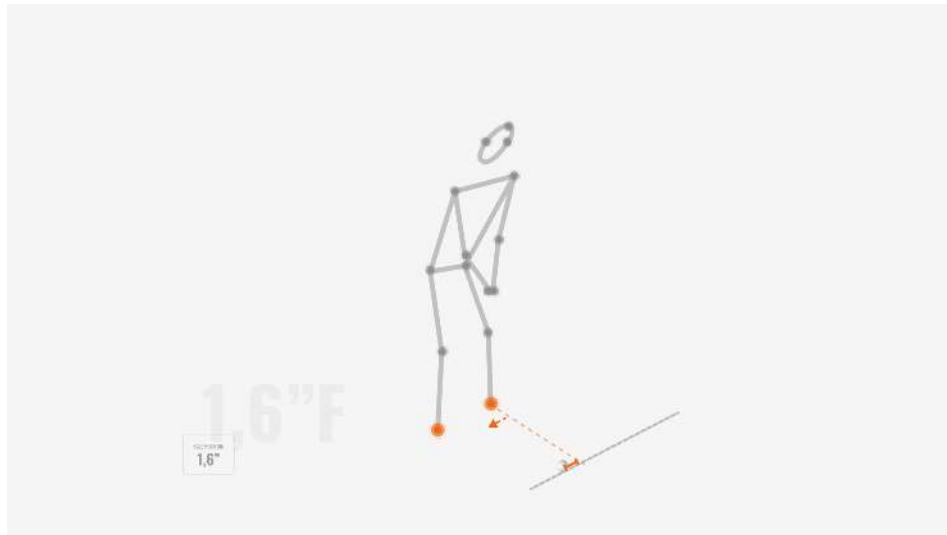
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04 Setup & alignment

Ball Position

The distance between the ball and the lead ankle joint, measured along the target line direction. The ball is forward of the lead ankle when closer to the target; behind the lead ankle when further from the target. Reference / Zero: Zero when aligned with the lead ankle. Direction Convention: Forward relative to lead ankle: toward target. Back relative to lead ankle: away from target

How to read it: Address/setup measurement. Establish a repeatable starting position before comparing changes across swings.



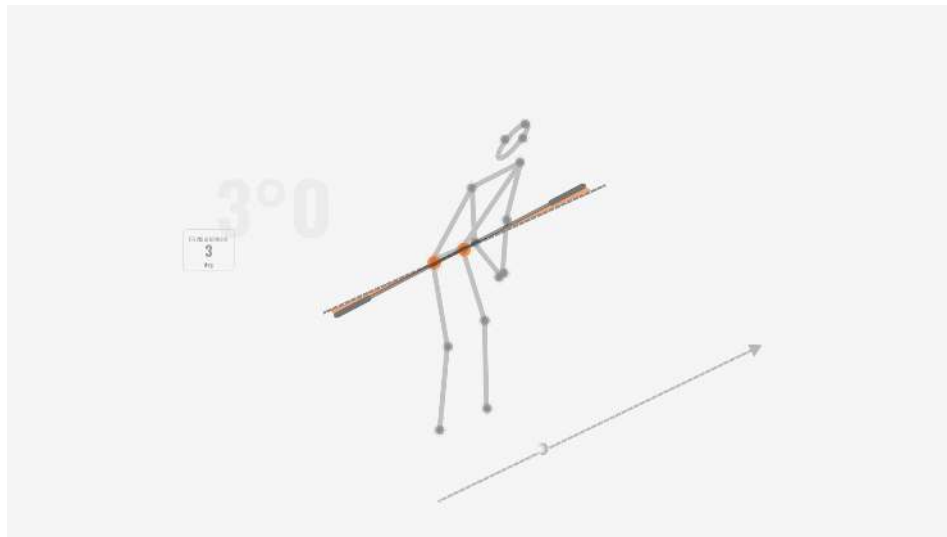
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Pelvis Alignment

The angle between the line connecting the hip joints and the target line. An open pelvis points left of the target line for a right-handed player; a closed pelvis points right. Viewed from the ball toward the target, seen from a top-down perspective, factoring in turn, tilt, and bend as projected down onto the ground.

Reference / Zero: Measured relative to the target line. Direction Convention: Open / Closed relative to target line

How to read it: Address/setup measurement. Establish a repeatable starting position before comparing changes across swings.

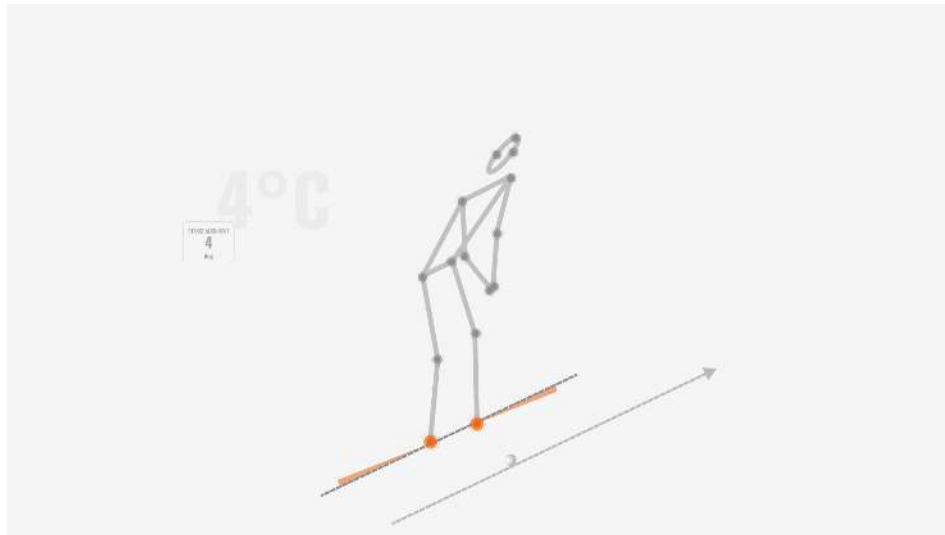


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Stance Alignment

The angle between the stance line — defined by the straight line connecting the centers of both ankle joints — and the target line. An open stance points left of the target line (for a right-handed player), and a closed stance points right, when viewed from the ball toward the target. Stance alignment does not account for any foot flare from toe and heel. Reference / Zero: Measured relative to the target line. Zero represents alignment parallel to the target line. Direction Convention: Open / Closed relative to target line

How to read it: Address/setup measurement. Establish a repeatable starting position before comparing changes across swings.



Original illustration from the corresponding uploaded TrackMan University PDF.

Stance Depth

The distance between the ball position (on the target line) and the midpoint between the ankle joints, measured perpendicular to the target line. Reference / Zero: Measured relative to the ball position.

WHAT IS IT USED FOR? This reflects how far the player stands from the ball at address and can influence the swing plane and the

How to read it: Address/setup measurement. Establish a repeatable starting position before comparing changes across swings.

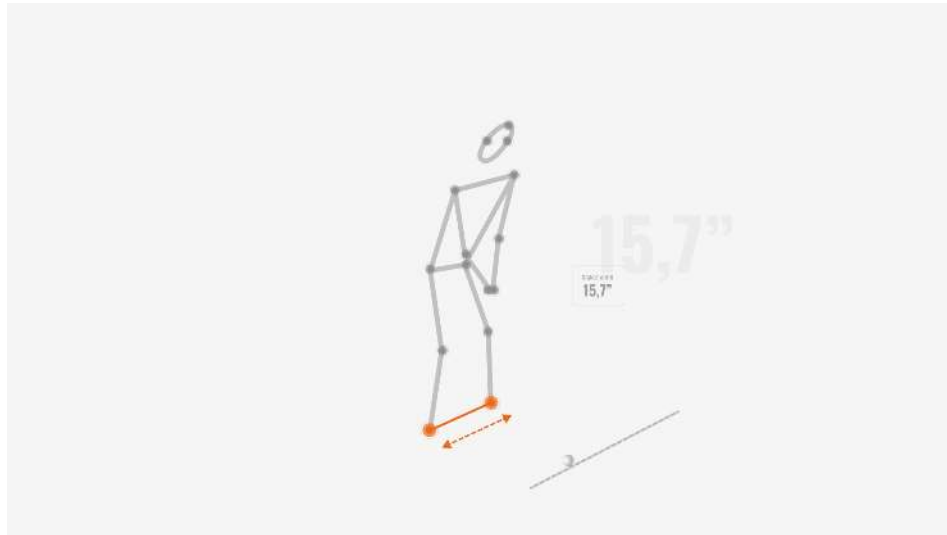


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Stance Width

The distance between the ankle joints measured parallel to the target line. Reference / Zero: Absolute measurement. WHAT IS IT USED FOR? This reflects the width of the player's base from the ankles, excluding foot flare. The stance width parameter helps evaluate the width of the player's base and its relevance for the club being used and the

How to read it: Address/setup measurement. Establish a repeatable starting position before comparing changes across swings.

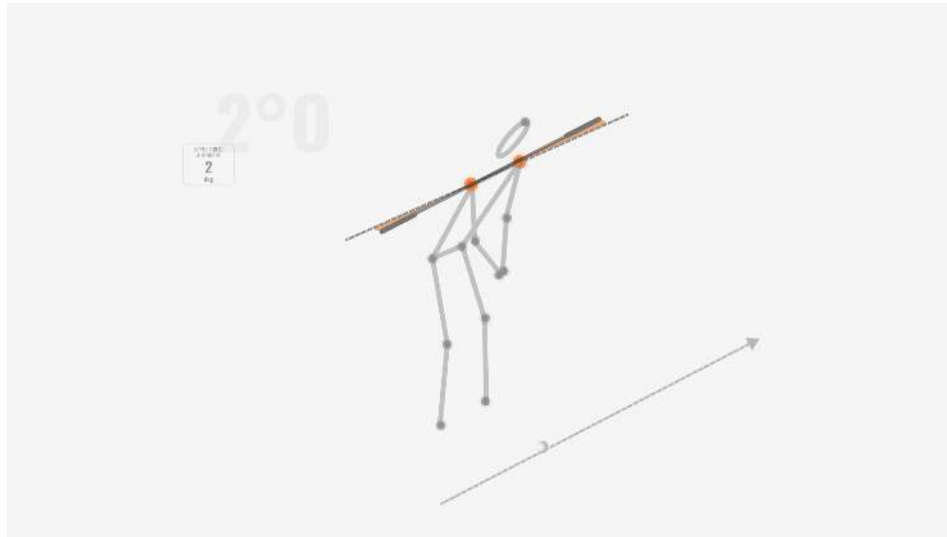


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Upper Torso Alignment

The angle between the line connecting the shoulder joints and the target line. An open upper torso points left of the target line for a right-handed player; a closed upper torso points right. Viewed from a top-down perspective, acting in turn, tilt, and bend as projected down onto the ground. Note that alignment is not equal to upper torso turn, due to the tilt and bend in the upper torso. Reference / Zero: Measured relative to the target line. Direction Convention: Open / Closed relative to target line

How to read it: Address/setup measurement. Establish a repeatable starting position before comparing changes across swings.



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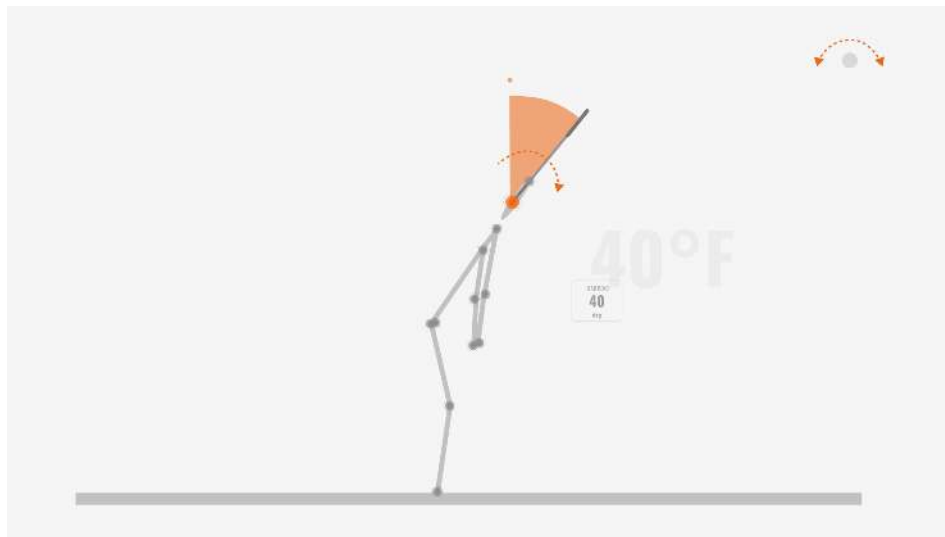
05 Biomechanics: rotations

Rotations describe angular orientation, not movement in inches. Check each parameter's zero reference.

Head Bend

The forward or backward rotation of the head segment around the side-to-side axis. Movement toward the ground (chin toward chest) is Forward Bend; movement away from the ground (chin toward sky) is Backward Bend. Reference / Zero: Vertical — zero means the head is upright with the face pointing straight ahead horizontally. Direction Convention: Forward / Back

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

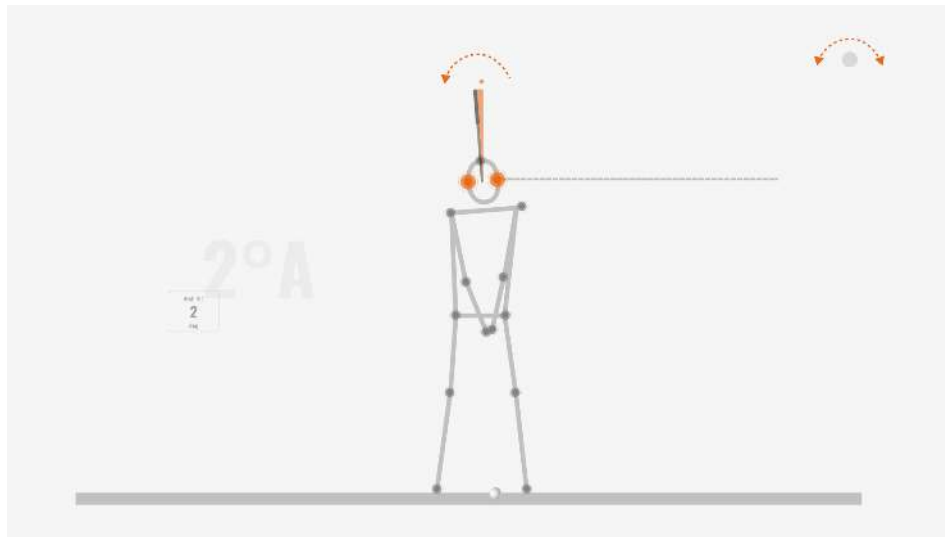


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Head Tilt

The inclination of the head segment around the front- back axis — the sideways tilt of the head toward or away from the target. Reported as Away from target or Towards the target relative to vertical. The head tilts when the eyes are not level. When the lead eye is lower, that is referenced as tilt towards the target. Reference / Zero: Vertical — zero means the head is level with no lateral tilt. Direction Convention: Away / Towards

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

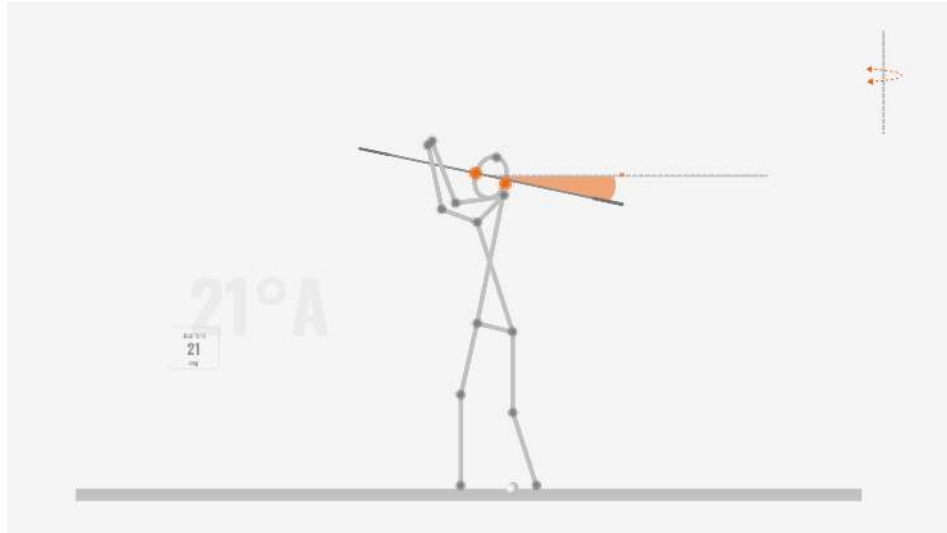


Original illustration from the corresponding uploaded TrackMan University PDF.

Head Turn

The rotation of the head segment around the vertical axis, measured relative to the target line. Reported as Away (turning away from the target) or Towards (rotating toward the target). Reference / Zero: Measured relative to the target line. Direction Convention: Away / Towards WHAT IS IT USED FOR?

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

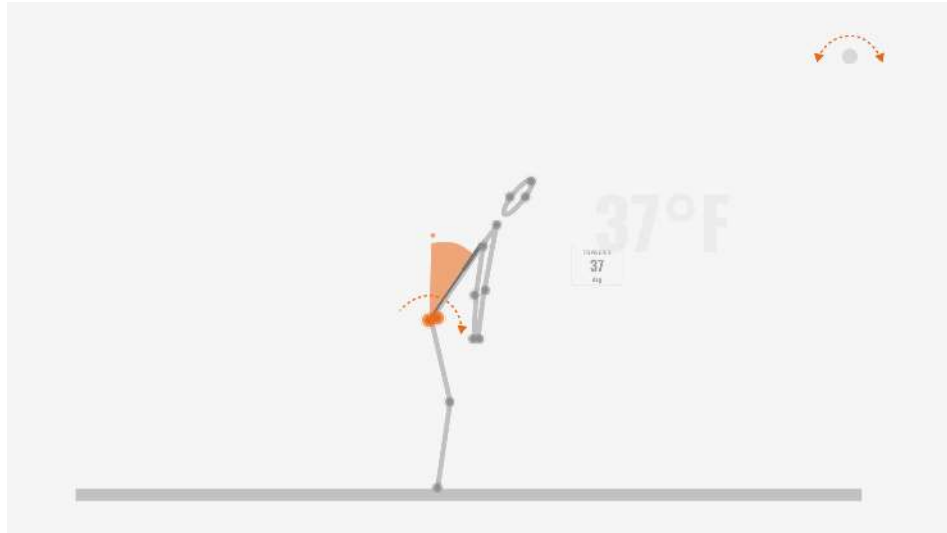


Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Bend

The forward or backward rotation of the pelvis segment around the side-to-side axis. Movement toward the ground is Forward Bend; movement away from the ground is Backward Bend. Reference / Zero: Vertical — zero means the pelvis is in a neutral, upright position. Direction Convention: Forward / Back

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

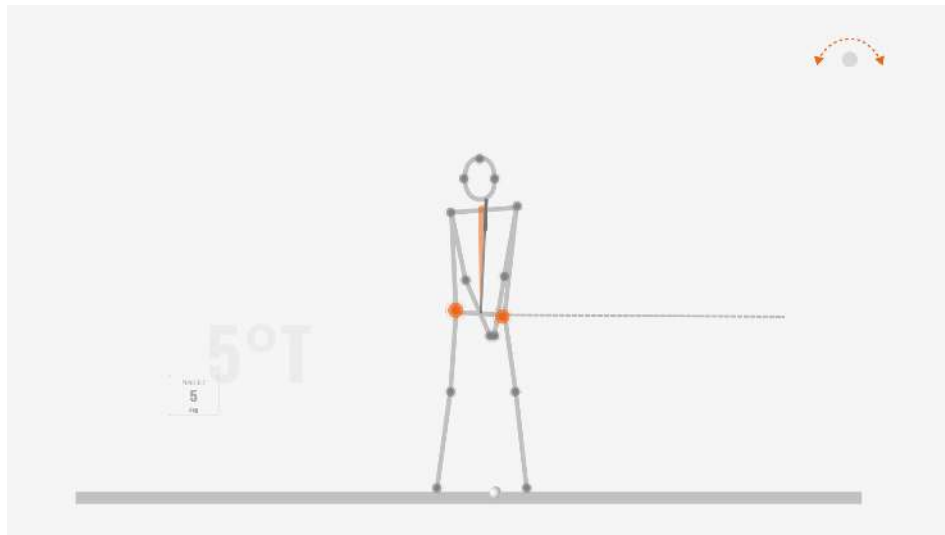


Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Tilt

The inclination of the pelvis segment around the front- back axis — the degree to which the pelvis tilts laterally toward or away from the target. Reported as Away from target or Towards the target relative to vertical. Reference / Zero: Vertical — zero means the hips are level with no lateral tilt. Direction Convention: Away / Towards

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

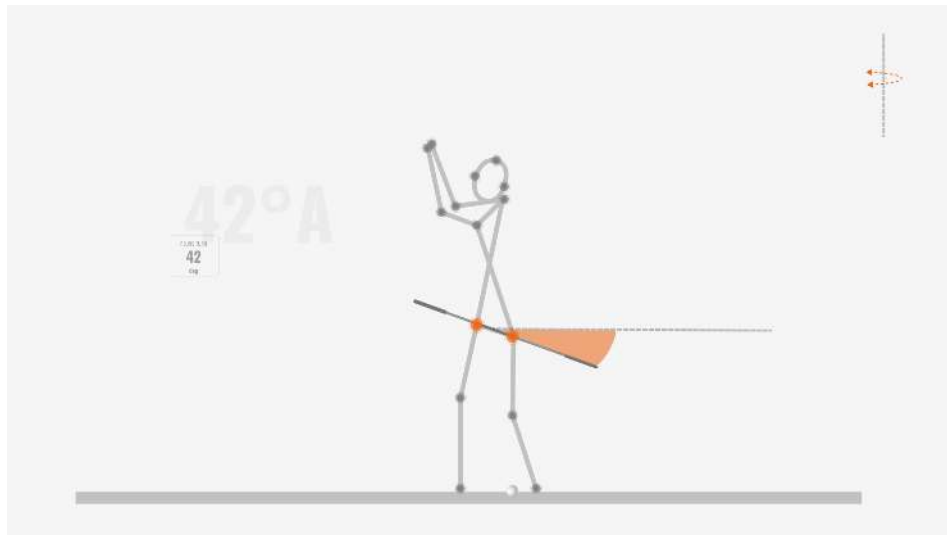


Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Turn

The rotation of the pelvis segment around the vertical axis, measured relative to the target line.
Reported as Away from target (backswing) or Towards the target (downswing and follow-through).
Reference / Zero: Target line (perpendicular) — zero means the pelvis is parallel to the target line.
Direction Convention: Away / Towards

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.



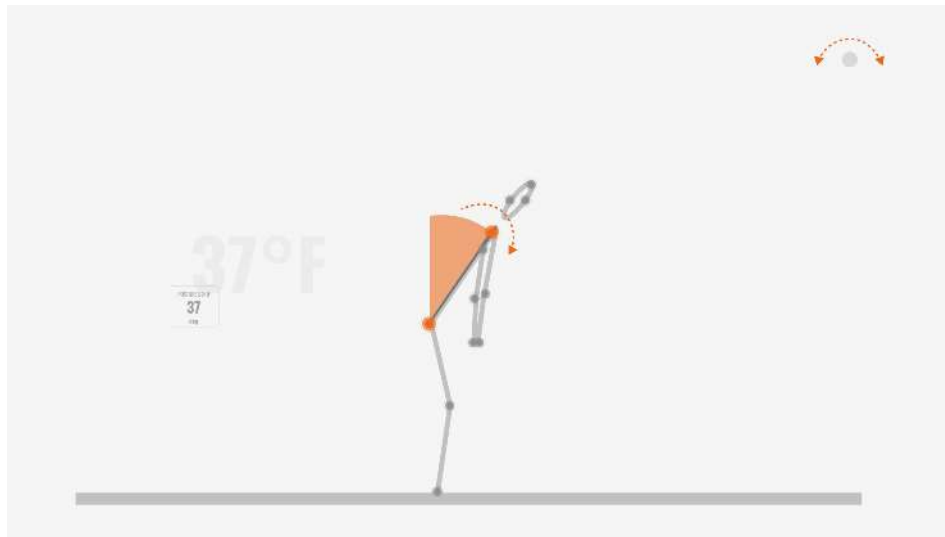
Original illustration from the corresponding uploaded TrackMan University PDF.

Posture Bend

The forward or backward rotation of the posture line around the side-to-side axis. It indicates how much the upper torso midpoint bends toward the ball relative to vertical, measured from the pelvis. Forward bend is a movement toward the ground, and backward bend is a movement away from the ground.

Reference / Zero: Vertical, viewed along the target line — zero means the posture line is perfectly upright when viewed from behind the player. Direction Convention: Forward / Back

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

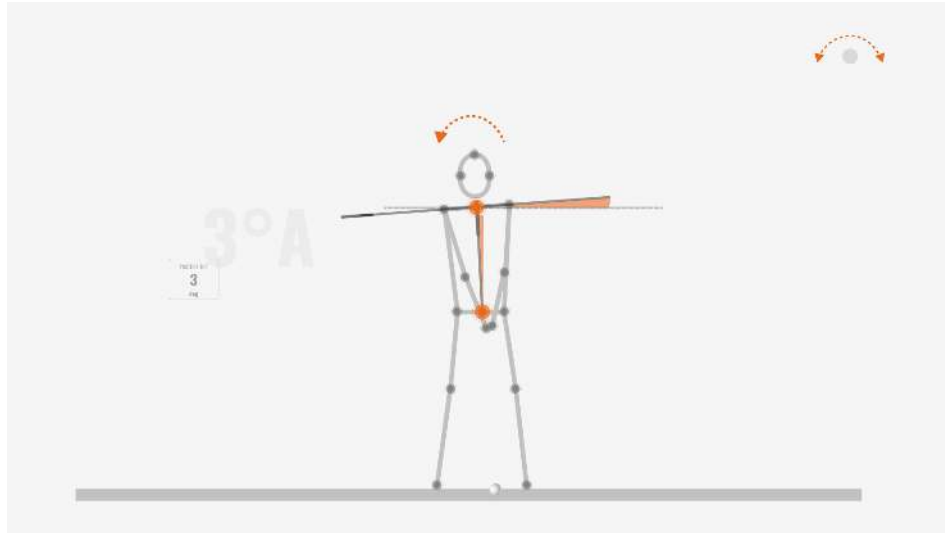


Original illustration from the corresponding uploaded TrackMan University PDF.

Posture Tilt

Rotation of the posture line around the front-back axis. Reference / Zero: Measured relative to vertical.
Direction Convention: Away / Towards WHAT IS IT USED FOR? Describes overall lateral spine tilt. E I A h h
k h t tilt i

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away
or forward/back is not automatically a positive/negative sign.

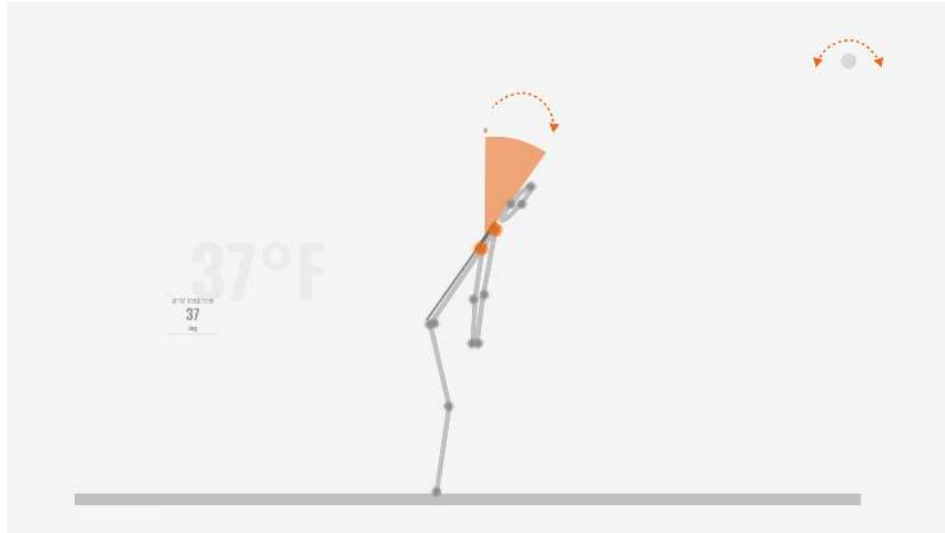


Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Bend

The forward or backward rotation of the upper torso segment around the side-to-side axis. Movement toward the ground is Forward Bend; movement away from the ground is Backward Bend. Reference / Zero: Vertical — zero means the upper torso is perfectly upright. Direction Convention: Forward / Back

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

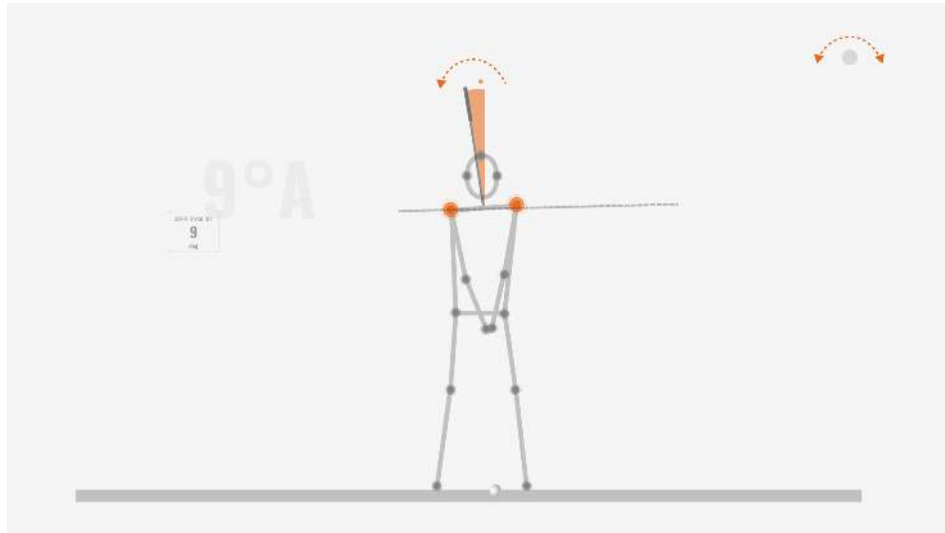


Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Tilt

The inclination of the upper torso segment around the front-back axis — the degree to which the upper body tilts toward or away from the target laterally. Reported as Away from target or Towards the target relative to vertical. Reference / Zero: Vertical — zero means the upper torso is perfectly upright with no lateral tilt. Direction Convention: Away / Towards

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.

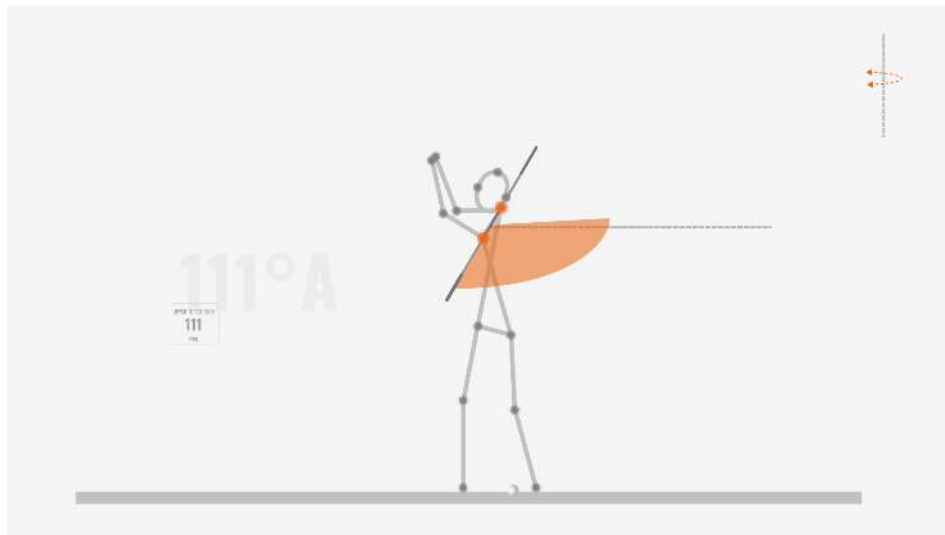


Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Turn

The rotation of the upper torso segment around the vertical axis, measured relative to the target line. Reported as Away from the target (backswing rotation) or Towards the target (downswing and follow-through rotation). Reference / Zero: Target line (perpendicular) — zero means the shoulders are parallel to the target line. Direction Convention: Away / Towards

How to read it: Angular body-position reading. Check the reference axis and directional label; movement toward/away or forward/back is not automatically a positive/negative sign.



Original illustration from the corresponding uploaded TrackMan University PDF.

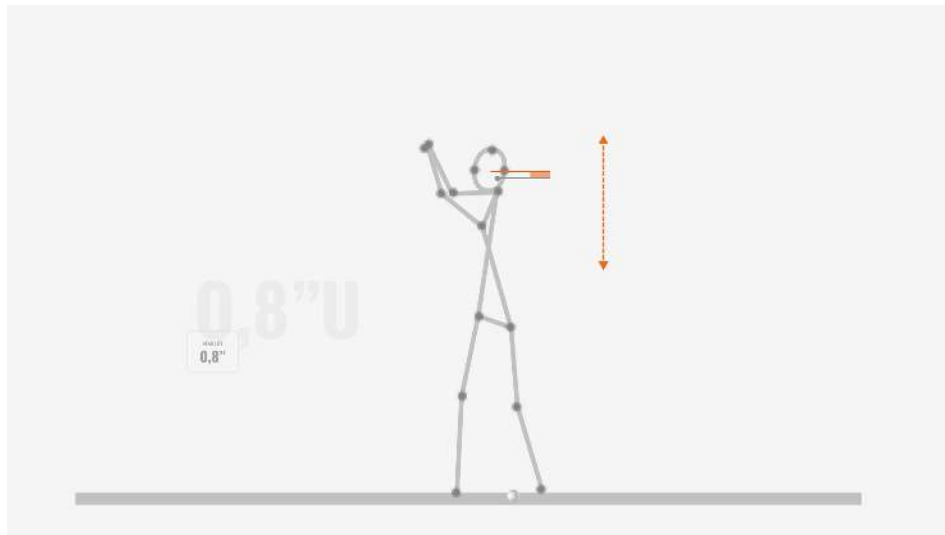
06 Biomechanics: translations

Translations describe the displacement of a body segment from its P1 position.

Head Lift

The vertical movement of the head segment upward or downward. Measured relative to the head's position at P1. Direction Convention: Up / Down Measurement: Centimeter / Inch WHAT IS IT USED FOR? Monitoring vertical movement of the head during the

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.

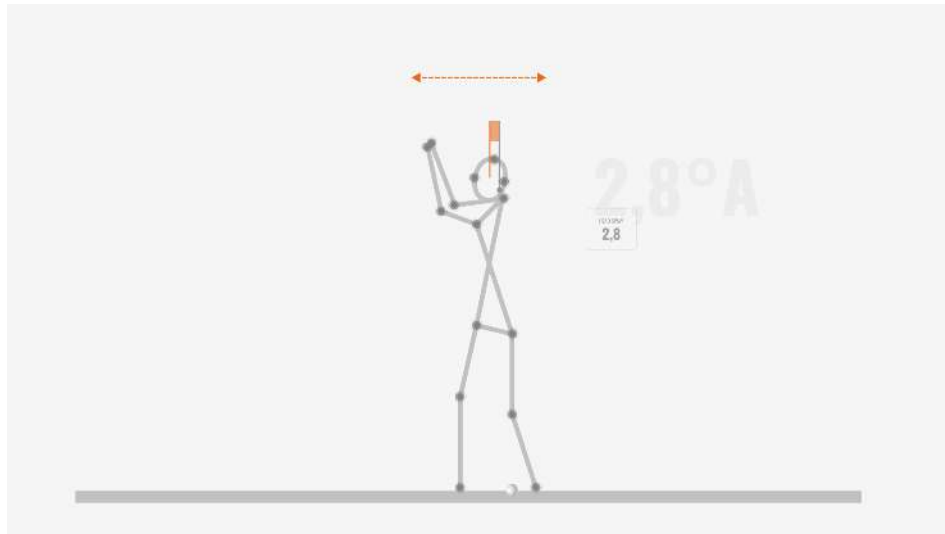


Original illustration from the corresponding uploaded TrackMan University PDF.

Head Sway

The lateral movement of the head segment toward or away from the target along the side-to-side axis. Measured relative to the head's position at P1. Direction Convention: Away / Towards Measurement: Centimeter / Inch WHAT IS IT USED FOR? Detecting lateral movement of the head during the

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.

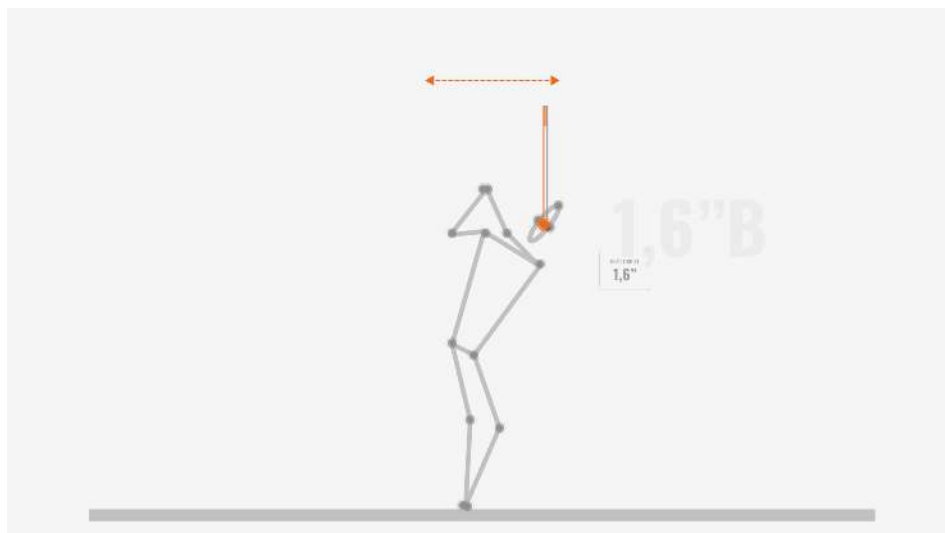


Original illustration from the corresponding uploaded TrackMan University PDF.

Head Thrust

The forward or backward movement of the head segment relative to the target line along the front-back axis. Measured relative to the head's position at P1 Direction Convention: Forward / Back Measurement: Centimeter / Inch WHAT IS IT USED FOR? Tracking whether the head moves toward or away

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.

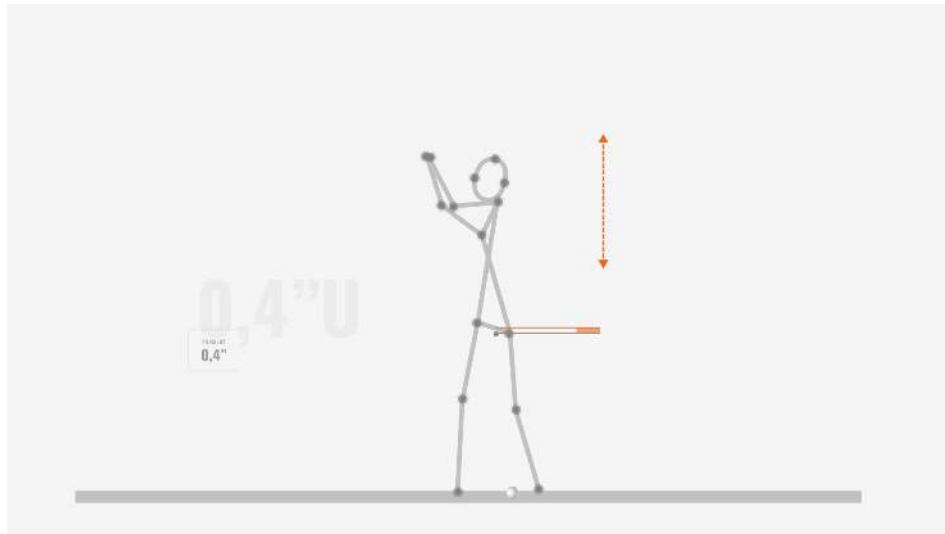


Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Lift

The vertical movement of the pelvis segment upward or downward. Measured relative to the pelvis's position at P1. Direction Convention: Up / Down Measurement: Centimeter / Inch WHAT IS IT USED FOR? Tracking vertical movement of the lower body. The

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.



Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Sway

The lateral movement of the pelvis segment toward or away from the target along the side-to-side axis. Measured relative to the pelvis's position at P1. Direction Convention: Away / Towards Measurement: Centimeter / Inch WHAT IS IT USED FOR? Quantifying lateral lower body movement during the

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.



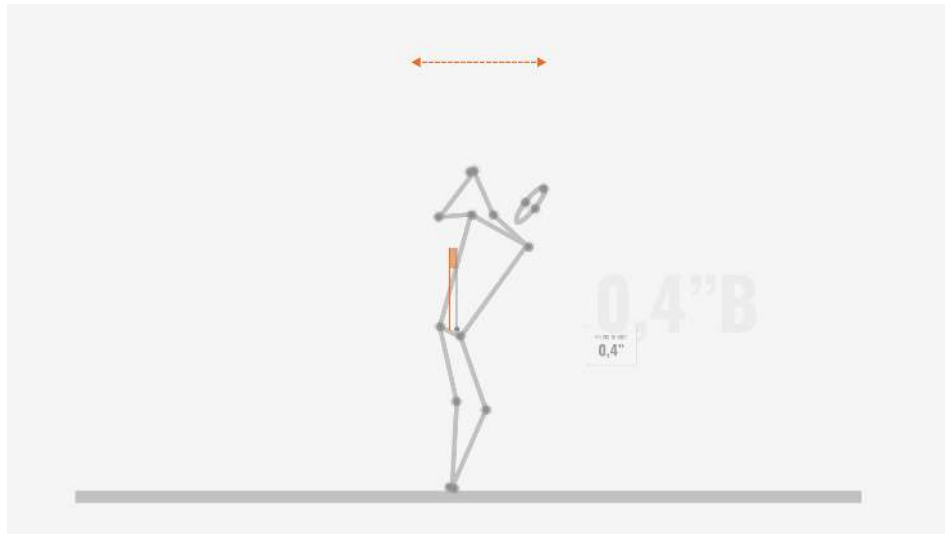
Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Thrust

The forward or backward movement of the pelvis segment relative to the target line along the front-back axis. Measured relative to the pelvis's position at P1. Direction Convention: Forward / Back

Measurement: Centimeter / Inch WHAT IS IT USED FOR? Detecting whether the lower body move forward

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.



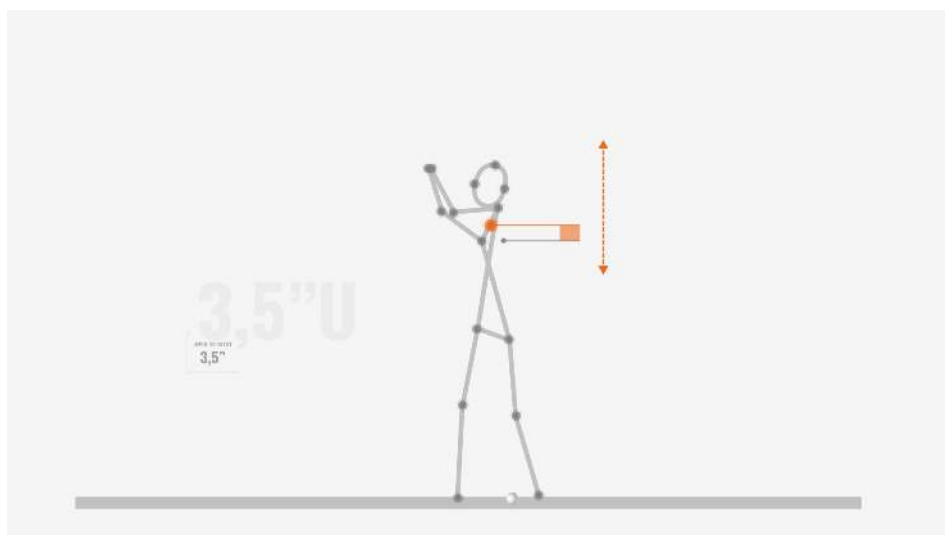
Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Lift

The vertical movement of the upper torso segment upward or downward. Measured relative to the upper torso's position at P1. Direction Convention: Up / Down Measurement: Centimeter / Inch WHAT IS IT

USED FOR? Tracking vertical changes of the upper body. Upper

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.

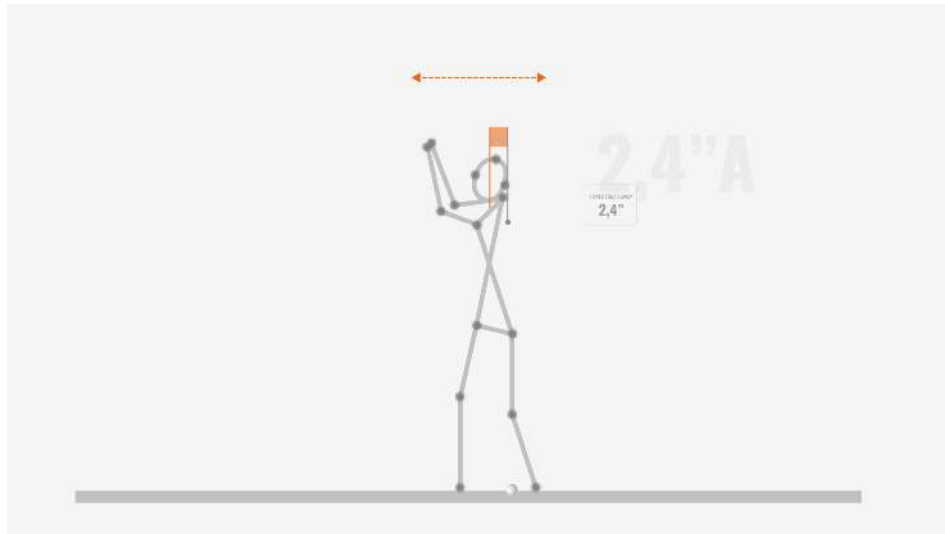


Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Sway

The lateral movement of the upper torso segment toward or away from the target along the side-to-side axis. Measured relative to the upper torso's position at P1. Direction Convention: Away / Towards
Measurement: Centimeter / Inch WHAT IS IT USED FOR?

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.

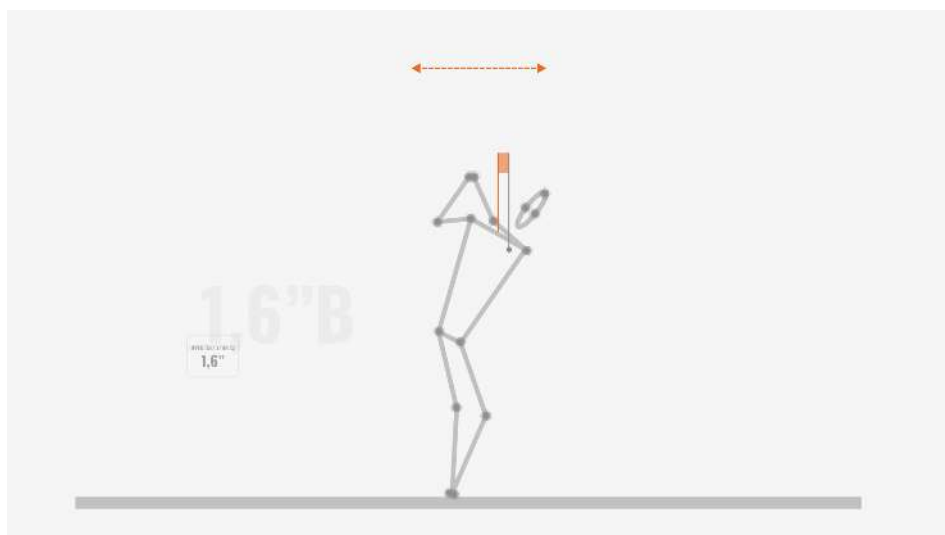


Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Thrust

The forward or backward movement of the upper torso segment relative to the target line along the front-back axis. Measured relative to the upper torso's position at P1. Direction Convention: Forward / Back
Measurement: Centimeter / Inch WHAT IS IT USED FOR?

How to read it: Linear body displacement from the P1 reference position. A distance reading is not a rotation angle.



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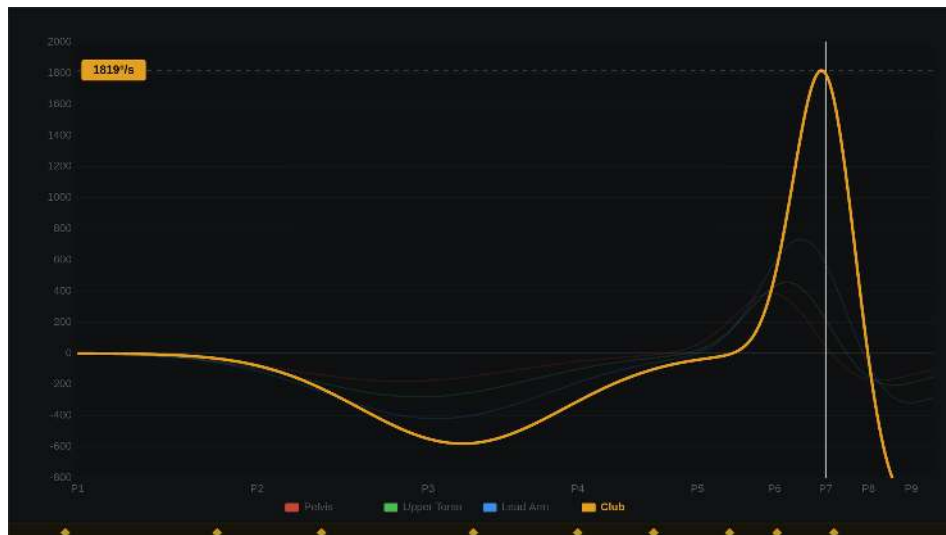
07 Kinematic sequence & speed

Peak angular velocities help describe how speed builds and transfers through the swing.

Club Angular Velocity

The rotational speed of the club around the normal to the instantaneous swing plane during the downswing, measured in degrees per second. The peak value is the maximum speed reached, ideally at or immediately before ball impact. Reference / Zero: Normal to the instantaneous swing plane — the same moving axis used for the lead arm. The club swings within the same inclined, dynamic plane as the arm, so both are measured against the same reference. This ensures the speed comparison between arm and club is geometrically consistent. WHAT IS IT USED FOR? Measuring the final output of the kinematic sequence — how fast the club is rotating at the moment of delivery. If speed gain is the priority, the club should

How to read it: Rotational speed, normally in degrees per second. Peak magnitude and when the peak occurs are both important when reading a kinematic sequence.

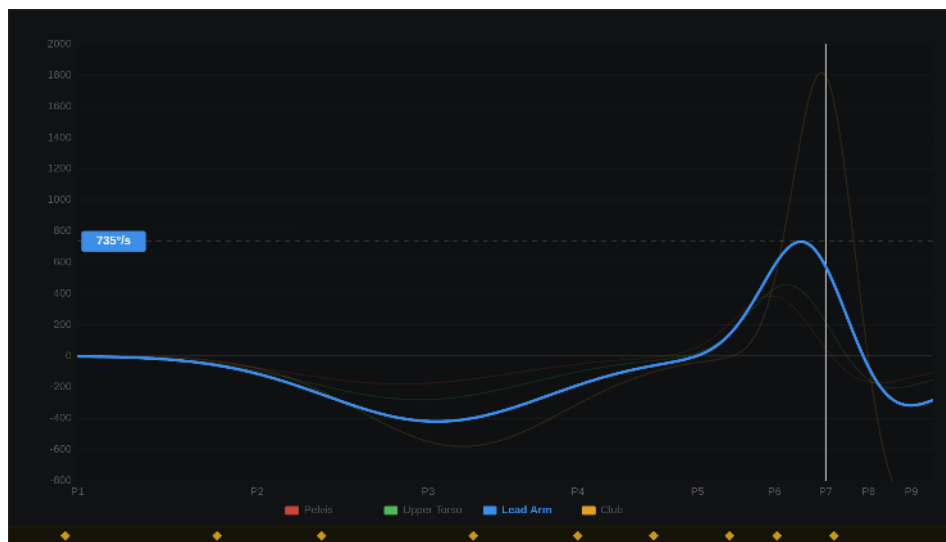


Original illustration from the corresponding uploaded TrackMan University PDF.

Lead Arm Angular Velocity

The rotational speed of the lead arm segment around the normal to the instantaneous swing plane during the downswing, measured in degrees per second. The peak value is the maximum speed reached before the lead arm begins to decelerate. Reference / Zero: Normal to the instantaneous swing plane — an axis perpendicular to the plane the lead arm is swinging in at each moment. Because the swing plane is inclined and moves dynamically, this axis is not fixed to the world. It captures the speed that is directly relevant to club delivery: how fast the arm is swinging within its actual plane of motion. WHAT IS IT USED FOR? Measuring how much rotational speed the arm segment generates and when it peaks relative to the upper torso and club. The lead arm receives the

How to read it: Rotational speed, normally in degrees per second. Peak magnitude and when the peak occurs are both important when reading a kinematic sequence.

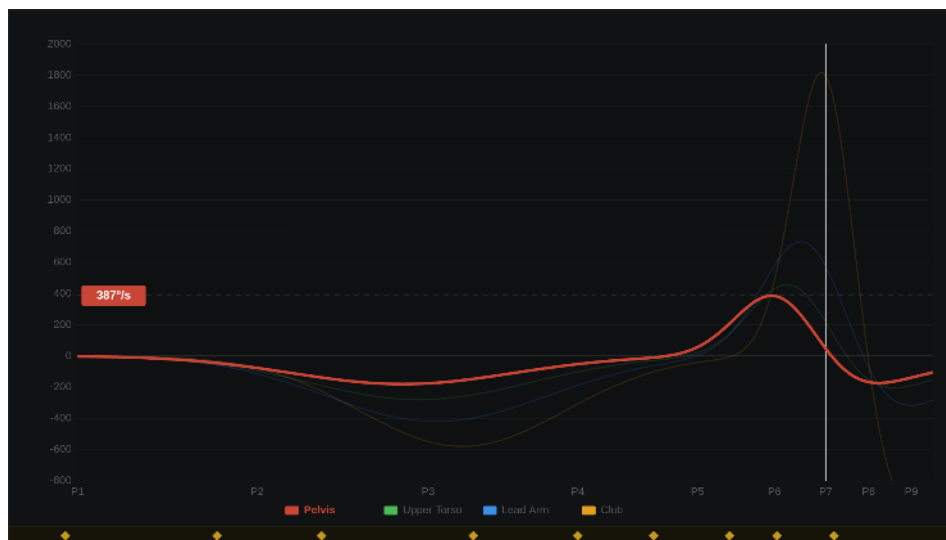


Original illustration from the corresponding uploaded TrackMan University PDF.

Pelvis Angular Velocity

The rotational speed of the pelvis segment around the vertical axis during the downswing, measured in degrees per second. The peak value is the maximum speed reached before the pelvis begins to decelerate. Reference / Zero: Vertical axis — consistent with the pelvis turn parameter. Angular velocity reflects how fast the pelvis is rotating in the horizontal plane. WHAT IS IT USED FOR? Quantifying how much rotational speed the lower body generates in the downswing and when that speed peaks relative to impact. The pelvis is the first segment to peak in an efficient sequence, and its peak velocity establishes the initial conditions for everything above it. A higher peak, achieved earlier, provides a stronger transfer platform for the upper torso.

How to read it: Rotational speed, normally in degrees per second. Peak magnitude and when the peak occurs are both important when reading a kinematic sequence.

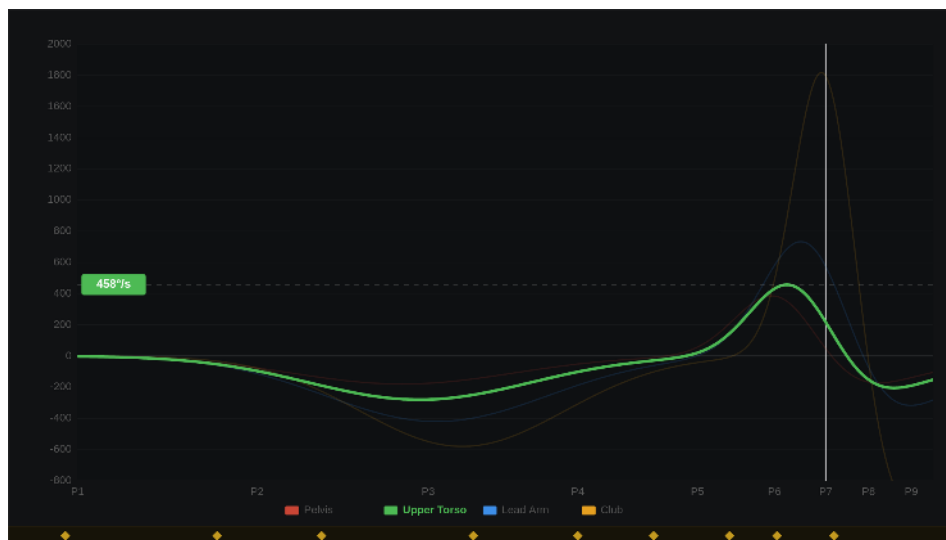


Original illustration from the corresponding uploaded TrackMan University PDF.

Upper Torso Angular Velocity

The rotational speed of the upper torso segment around the vertical axis during the downswing, measured in degrees per second. The peak value is the maximum speed reached before the upper torso begins to decelerate. Reference / Zero: Vertical axis — consistent with the upper torso turn parameter. Angular velocity reflects how fast the upper torso is rotating in the horizontal plane. WHAT IS IT USED FOR? Measuring how much rotational speed the upper body generates and when it peaks relative to the pelvis and lead arm. The upper torso receives and adds to the rotational speed initiated by the pelvis. Its deceleration after peak is what drives the acceleration of the lead arm — so both the magnitude of its peak and the timing of it are important.

How to read it: Rotational speed, normally in degrees per second. Peak magnitude and when the peak occurs are both important when reading a kinematic sequence.



Original illustration from the corresponding uploaded TrackMan University PDF.

Quick-reference relationships

Smash Factor = Ball Speed ÷ Club Speed. Example: 150 mph ball speed / 100 mph club speed = 1.50.

Face to Path = Face Angle – Club Path. Example: face +2° and path +5° yields –3° face-to-path (face left of the path).

Spin Loft is a 3D angle between clubhead motion and face orientation; Dynamic Loft – Attack Angle is only an approximation.

Carry vs Total: Carry ends at the flat-elevation landing point; Total adds a modeled bounce and roll on assumed ground conditions.

Carry Side vs Curve: Carry Side measures landing offset from the target line; Curve measures sideways motion relative to the initial launch direction.

Alignment vs Turn: Upper Torso Alignment and Pelvis Alignment are ground-projected orientations that can differ from pure turn because bend and tilt also affect the projection.

Source & scope

Primary source: 65 individual parameter pages supplied by the user from TrackMan University — Trackman Parameters (trackmanuniversity.com/TrackmanParameters), exported October 20, 2026. Definitions are reorganized and lightly edited for readability; interpretation notes are independently written.

This edition covers the 65 uploaded parameters. It does not claim to include putting parameters or camera-specific video-overlay features that were not among the supplied PDFs.

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