



## Putting Metrics

**What is Back Stroke Time?**

Back Stroke Time is the elapsed time it takes to complete a Back Stroke (i.e., address to top of back stroke).

## What should Back Stroke Time be?

### Goal

Back Stroke Time should be approximately 0.60 seconds, or twice as long as Forward Stroke Time, regardless of the length of the putt. Tempo ratio should remain consistent and be approximately 2.0:1.

### Pro Average

0.60 seconds

### Amateur Average

0.40 to 0.80 seconds

## How do you improve Back Stroke Time?

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### Drill: Consistent Timing – Back Stroke

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#### Problem

Back Stroke Time is inconsistent, making it difficult to judge the proper speed and distance.

#### Solution

1. Make putts at various distances (e.g., 3 feet, 10 feet, and 30 feet). Review your Back Stroke Time and analyze your results. The Back Stroke Time should remain the same, even though the distances change.
2. Once you find your signature number, which is generally close to 0.60 seconds, make putts at various distances, attempting to match your ideal Back Stroke Time within 0.05 seconds.

Perform this drill for 10-15 minutes during every training session.

#### Focus Keys

- Focus on the feel of your consistent Back Stroke Time.
  - What does too fast feel like?
  - What does too slow feel like?
- Back Stroke Time should be approximately 0.60 seconds, regardless of the length of the putt.
- Aim to be within 0.05 seconds of your ideal Back Stroke Time.

**Goal**

The goal of this drill is to train your body to create a consistent and repetitive timing pattern in order to consistently and efficiently transfer energy from the putter head to the ball.

## What is Forward Stroke Time?

Forward Stroke Time is the elapsed time it takes to complete a Forward Stroke (i.e., top of Back Stroke to impact).

## What should Forward Stroke Time be?

**Goal**

Ideal Forward Stroke Time should be approximately 0.30 seconds, or half as long as Back Stroke Time, regardless of the length of the putt. Tempo ratio should be approximately 2.0:1.

**Pro Average**

0.30 seconds

**Amateur Average**

0.25 to 0.40 seconds

## How do you improve Forward Stroke Time?

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**Drill: Consistent Timing – Forward Stroke**

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**Problem**

Forward Stroke Time is inconsistent, making it difficult to judge the proper speed and distance.

**Solution**

1. Make putts at various distances (e.g., 3 feet, 10 feet, and 30 feet). Review your Forward Stroke Time and analyze your results. The Forward Stroke Time should remain the same, even though the distances change.
2. Once you find your signature number, which is generally close to 0.30 seconds, make putts at various distances, attempting to match your ideal Forward Stroke Time within 0.05 seconds.

Perform this drill for 10-15 minutes during every training session.

**Focus Keys**

- Focus on the feel of your consistent Forward Stroke Time.
  - What does too fast feel like?
  - What does too slow feel like?
- Forward Stroke Time should be approximately 0.30 seconds, regardless of the length of the putt.
- Aim to be within 0.05 seconds of your ideal Forward Stroke Time.

### **Goal**

The goal of this drill is to train your body to create a consistent and repetitive timing pattern in order to consistently and efficiently transfer energy from the putter head to the ball.

## **What is Total Stroke Time?**

Total Stroke Time is the elapsed time it takes to make a complete putting stroke from the start of the stroke to impact with the ball.

## **What should Total Stroke Time be?**

### **Goal**

Total Stroke Time will be approximately 0.90 seconds, regardless of the length of the putt. Tempo ratio should be approximately 2.0:1.

### **Pro Average**

0.90 seconds

### **Amateur Average**

0.80 to 1.10 seconds

## **How do you improve Total Stroke Time?**

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### **Drill: Consistent Timing – Total Stroke Time**

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#### **Problem**

Total Stroke Time is inconsistent, making it difficult to judge the proper speed and distance.

#### **Solution**

1. Make putts at various distances (e.g., 3 feet, 10 feet, and 30 feet). Review your Back Stroke Time and analyze your results. The Back Stroke Time should remain the same, even though the distances change.

2. Once you find your signature number, which is generally close to 0.60 seconds, make putts at various distances, attempting to match your ideal Back Stroke Time within 0.05 seconds.
3. Repeat step 1 for Total Stroke Time.
4. Once you find your signature number, which is generally close to 0.90 seconds, make putts at various distances, attempting to match your ideal Total Stroke Time within 0.05 seconds. While doing so, aim to keep the timing difference as tight as possible.

Perform this drill for 10-15 minutes during every training session.

### **Focus Keys**

- Focus on the feel of your consistent Total Stroke Time pattern.
  - What does too fast feel like?
  - What does too slow feel like?
- Back Stroke Time should be approximately 0.60 seconds, regardless of the length of the putt.
- Total Stroke Time should be approximately 0.90 seconds, regardless of the length of the putt.
- Aim to be within 0.05 seconds of your ideal Total Stroke Time.

### **Goal**

The goal of this drill is to train your body to create a consistent and repetitive timing pattern in order to consistently and efficiently transfer energy from the putter head to the ball.

## **What is Tempo?**

Tempo is the ratio between Back Stroke Time and Forward Stroke Time.

## **What should Tempo be?**

### **Goal**

Ideal Tempo is 2.0:1

### **Pro Average**

1.8:1 to 2.1:1

### **Amateur Average**

1.5:1 to 2.5:1

### **Metric Tip**

Tempo should be 2.0:1 (Back Stroke Time : Forward Stroke Time)

1. If Tempo is less than 2.0:1, check Back Stroke Time and Total Stroke Time.
2. If Tempo is greater than 2.0:1, check Forward Stroke Time and Total Stroke Time.

## How do you improve Tempo?

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### Drill: Consistent Timing – Tempo

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#### Problem

Tempo ratio is inconsistent or is not equal to the ideal 2.0:1 ratio, making it difficult to judge the proper speed and distance.

#### Solution

1. Make putts at various distances (e.g., 3 feet, 10 feet, and 30 feet). Review your Back Stroke Time and analyze your results. The Back Stroke Time should remain the same, even though the distances change.
2. Once you find your signature number, which is generally close to 0.60 seconds, make putts at various distances, attempting to match your ideal Back Stroke Time within 0.05 seconds.
3. Repeat step 1 for Forward Stroke Time.
4. Once you find your signature number, which is generally close to 0.30 seconds, make putts at various distances, attempting to match your ideal Forward Stroke Time within 0.05 seconds. While doing so, aim to keep the timing difference as tight as possible.
5. Repeat step 1 for Tempo.
6. Once you find your signature number, which should be as close to 2.0:1 as possible, make putts at various distances, attempting to match your ideal Tempo within 0.1:1.

Perform this drill for 10-15 minutes during every training session.

#### Focus Keys

- Focus on the feel of your consistent Timing and Tempo.
  - What does too fast feel like?
  - What does too slow feel like?
- Back Stroke Time should be approximately 0.60 seconds, regardless of the length of the putt.
- Forward Stroke Time should be approximately 0.30 seconds, regardless of the length of the putt.
- Aim to be within 0.05 seconds of your ideal Back Stroke Time and Forward Stroke Time.
- Tempo should be approximately 2.0:1, regardless of the length of the putt.

## **Goal**

The goal of this drill is to train your body to create a consistent and repetitive timing pattern in order to consistently and efficiently transfer energy from the putter head to the ball.

## **What is Impact Stroke Speed?**

Impact Stroke Speed is the speed of the sweet spot of the putter face at the moment of impact, and is measured in Miles Per Hour. Dialing in your ideal Stroke Speed on all putts will help you create predictable Ball Speed and eliminate 3 putts.

Think of the Blast sensor as a speedometer for your putting stroke.

## **What should Impact Stroke Speed be?**

The goal of Impact Stroke Speed is to create the appropriate ball speed for precise distance control.

The ideal Stroke Speed will depend on a few conditions...the stimp of the green, the slope of the green, and the distance of the putt.

For example: On a flat or almost zero degree slope, on a 3 foot putt, an ideal Impact Stroke Speed is around 1.5 MPH, a 6-foot putt requires a Stroke Speed of around 2.0 MPH, and a 12-foot putt requires a Stroke Speed of around 3.0 MPH.

These are great baseline numbers to strive for, but will have to be adjusted if putting on different slopes and different stimp greens. You will need a faster Stroke Speed on slower stimp greens or putting on uphill slopes, and you will need a slower Stroke Speed on faster stimp greens or putting on downhill slopes.

Putts from the same location should have the same Impact Stroke Speed, repeated to within approximately 0.2 MPH.

## **How do you improve Impact Stroke Speed?**

Our favorite Impact Stroke Speed drill is the Impact Stroke Speed Progression Drill. The goal of this drill is to build an efficient and repeatable stroke to become a distance control master.

Find a flat or almost zero degree sloped portion of the green, grab 3 tees and place them at 3, 6, and 12 feet.

First, hit 3 putts at each distance trying to find your baseline Impact Stroke Speed, the speed that is gets the ball to the center of the hole with perfect pace.

Next hit 3 more putts from each distance trying to repeat your ideal baseline Stroke Speed to within 0.2 MPH.

Focus on the feel of your consistent Impact Stroke Speed. What does too fast feel like? What does too slow feel like?

Once you are confident in the first 3 distances, take the drill to the next level by putting on different slopes, breaks, and longer distances.

To become a master at this drill complete it in levels, repeat Stroke Timing on every putt as Level 1, adjusting Back Stroke Length as Level 2, and Stroke Speed as Level 3.

Now that you have a clock, a ruler, and a speedometer with the Blast Sensor, you have all the tools needed to putt better than ever.

## **What is Back Stroke Length?**

Back Stroke Length is the length the putter face travels in the Back Stroke from address to the top of the Back Stroke. Back Stroke Length is measured in inches and is one of the 3 main elements of distance control, along with Stroke Timing and Stroke Speed. A best practice for this metric is to ensure the putter face is close to the back of the golf ball at address before starting your stroke.

Think of the Blast sensor as a ruler for your putting stroke.

## **What should Back Stroke Length be?**

The goal of Back Stroke Length is to make an appropriate sized stroke to hit the ball the correct distance.

Your Back Stroke Length will depend on a conditions... the stimp of the green, the slope of the green, and the distance of putt. On a flat portion of a medium stimp green, on a 3 foot putt, a good Back Stroke Length goal is approximately 4.5 inches. On a 6 foot putt, Back Stroke Length should be approximately 6 inches, and a 12 foot putt should be about 8.5 inches. These are great baseline numbers to strive for, but will have to be adjusted base on the green conditions. Make a longer Back Stroke if putting uphill or on a slower stimp green, and shorter Back Stroke if putting downhill or on a faster stimp green.

Putts from the same location should have the same Back Stroke Length repeated to within 1 inch.

## **How do you improve Back Stroke Length?**



Our favorite Back Stroke Length drill is the Back Stroke Length Progression drill. The goal of this drill is to build an efficient and repeatable stroke to become a distance control master.

Find a flat or zero degree slope, grab 3 tees, and place a tee at 3, 6, and 12 feet.

First, hit 3 putts at each distance finding the Back Stroke Length that gets the ball rolling into the center of the hole with perfect pace.

Next, hit 3 more putts from each distance, trying to repeat your ideal Back Stroke Length to hit the ball the appropriate distance within 1 inch on each putt.

Focus on the feel of your consistent Back Stroke Length. What does too long feel like? What does too short feel like?

Once you are confident in the first 3 distances, take the drill to the next level by putting on different slopes, breaks, and longer distances.

To become a master at this drill complete it in levels, repeating Stroke Timing on every putt as Level 1, and adjusting Back Stroke Length as Level 2.

## **What is Back Stroke Rotation?**

Back Stroke Rotation is the rotation of the putter face during the Back Stroke, measured in degrees.

## **What should Back Stroke Rotation be?**

### **Goal**

Ideal Back Stroke Rotation should equal Forward Stroke Rotation

### **Pro Average**

Equal to Forward Stroke Rotation +/- 0.0-0.5\* open or closed

### **Amateur Average**

Equal to Forward Stroke Rotation - 0.0-1.0\* open or closed

## **How do you improve Back Stroke Rotation?**

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### **Drill: Heavy Bucket Strokes**

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### **Problem**

Back Stroke Rotation open or closed can be caused by an over or under-rotated putter

face on the Back Stroke, or having a concept of needing to forcefully open and close the putter face throughout the Back Stroke motion.

### **Solution**

1. Put approximately 50-100 balls in a large bucket.
2. Place feet in the prescribed Base Platform (see **Base Platform Drill**) and body into proper posture (see **Posture Stick Drill**). This will allow the torso to rotate efficiently around a neutrally aligned spine.
3. Pick up the bucket, place hands at 3 and 9 o'clock (grab the edges of the bucket), and rotate the shoulders and torso back and forth while maintaining a stable lower body and head (hips and head should not rotate and shoulders/torso should rotate approximately 30 degrees in each direction).

This completes 1 repetition. Perform drill 2×10 repetitions.

### **Focus Keys**

- Engage core muscles prior to rotating your torso in the Back Stroke.
- Stabilize hips and head.
- Rotate from your torso, keeping your hands and arms as quiet as possible.

### **Goal**

The goal of this drill is to develop separation between the lower body and upper body during the putting motion, and limit excessive putter face/hand/forearm rotation.

## **What is Forward Stroke Rotation?**

Forward Stroke Rotation is the rotation of the putter face during the Forward Stroke, measured in degrees.

## **What should Forward Stroke Rotation be?**

### **Goal**

Ideal Forward Stroke Rotation will be equal to Back Stroke Rotation

### **Pro Average**

Equal to Back Stroke Rotation +/- 0.0-0.5\* open or closed

### **Amateur Average**

Equal to Back Stroke Rotation – 0.0-1.0\* open or closed

## **How do you improve Forward Stroke Rotation?**

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## **Drill: Heavy Bucket Strokes**

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### **Problem**

Forward Stroke Rotation open or closed can be caused by an over or under-rotated putter face on the Forward or Back Stroke, alignment problems at address, addressing the ball with the putter face too far away from the ball, or having a concept of needing to forcefully open and close the putter face throughout the putting motion.

### **Solution**

1. Put approximately 50-100 balls in a large bucket.
2. Place feet in the prescribed Base Platform (see **Base Platform Drill**) and body into proper posture (see **Posture Stick Drill**). This will allow the torso to rotate efficiently around a neutrally aligned spine.
3. Pick up the bucket, place hands at 3 and 9 o'clock (grab the edges of the bucket), and rotate the shoulders and torso back and forth while maintaining a stable lower body and head (hips and head should not rotate and shoulders/torso should rotate approximately 30 degrees in each direction).

This completes 1 repetition. Perform drill 2×10 repetitions.

### **Focus Keys**

- Engage core muscles prior to rotating your torso in the Back Stroke.
- Stabilize hips and head.
- Rotate from your torso, keeping your hands and arms as quiet as possible.

### **Goal**

The goal of this drill is to develop separation between the lower body and upper body during the putting motion, and limit excessive putter face/hand/forearm rotation.

## **What is Rotation Change?**

Rotation Change is the difference in Rotation (the rotation of the putter face around the shaft) between the start of the stroke and impact with the ball, measured in degrees.

Rotation Change (open) means the putter face was not rotated enough on the Forward Stroke to return to its original starting alignment. Rotation Change (closed) means the putter face rotated past its original starting alignment. Assuming the initial aim of the putter face is directly at the center of the target, Rotation Change of 0.0\* is ideal.

## **What should Rotation Change be?**

## **Goal**

Ideal Rotation Change will be 0\* open or closed

## **Pro Average**

0-0.5\* open or closed

## **Amateur Average**

0.0-1.0\* open or closed

## **Metric Tip**

If the face origin of the putter is aligned at the target at address, Rotation Change should be 0.0\*.

1. Confirm that the face origin of the putter is perfectly aligned at the target at address. (It is best to find a straight putt and/or use a laser, an elastic string, or a chalkline.)
2. Back Rotation and Forward Rotation should be equal numbers. (i.e., If Back Rotation is 4\*, then Forward Rotation should also be 4\*.)
3. Address the putter as close to the ball as possible

# **How do you improve Rotation Change?**

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## **Drill: Heavy Bucket Strokes**

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### **Problem**

Rotation open or closed can be caused by an over or under-rotated putter face on the Forward or Back Stroke, alignment problems at address, addressing the ball with the putter face too far away from the ball, or having a concept of needing to forcefully open and close the putter face throughout the putting motion.

### **Solution**

1. Put approximately 50-100 balls in a large bucket.
2. Place feet in the prescribed Base Platform (see **Base Platform Drill**) and body into proper posture (see **Posture Stick Drill**). This will allow the torso to rotate efficiently around a neutrally aligned spine.
3. Pick up the bucket, place hands at 3 and 9 o'clock (grab the edges of the bucket), and rotate the shoulders and torso back and forth while maintaining a stable lower body and head (hips and head should not rotate and shoulders/torso should rotate approximately 30 degrees in each direction).

This completes 1 repetition. Perform drill 2×10 repetitions.

### **Focus Keys**

- Engage core muscles prior to rotating your torso in the Back Stroke.
- Stabilize hips and head.
- Rotate from your torso, keeping your hands and arms as quiet as possible.

### **Goal**

The goal of this drill is to develop separation between the lower body and upper body during the putting motion, and limit excessive putter face/hand/forearm rotation.

## **What is Lie?**

Lie is the increase or decrease in Lie (the angle between the club shaft and the ground) between the start of a stroke and impact with the ball, measured in degrees.

Assuming the putter face is flush with the ground at the start of a stroke, lifting your hands will increase Lie, spinning the ball away from you. Lowering your hands will decrease Lie, spinning the ball towards you. In a biomechanically efficient putting stroke, there should not be an increase or decrease in Lie.

## **What should Lie be?**

### **Goal**

Ideal Lie will be 0\* increased or decreased

### **Pro Average**

0 to 0.5\* increased or decreased

### **Amateur Average**

0.0 to 1.0\* increased or decreased

### **Metric Tip**

If the sole of the putter is parallel with the ground at address, Lie Change should be 0.0\*.

1. Make sure that the sole of the putter is flush with the ground at address and impact.
2. Maintain body posture throughout the entire stroke. One common cause of Lie Change is poor postural stability, which allows the upper body to raise or lower during the stroke.

## **How do you improve Lie?**

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### **Drill: Reverse Preacher With PedyPods**

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#### **Problem**

Lie increase or decrease can be caused by an improperly fit putter, an unstable spine angle, or unstable arm and hand angles.

### **Solution**

1. Place feet in the prescribed Base Platform (see **Base Platform Drill**) and body into proper posture (see **Posture Stick Drill**). This will allow the torso to rotate efficiently around a neutrally aligned spine.
2. Form a tripod in each foot (known as pedypods): 1-lift toes in the air, 2-put equal pressure on three parts of each foot- A-ball of foot (1st metatarsal-bone below big toe) , B-ball of outer edge of foot (5th metatarsal-bone below pinky toe) and C-center of heel (calcaneous).
3. Cross your target hand above trail hand so that the back of each hand is facing each other.
4. Move your torso and arms into the Back Stroke while the trail hand provides slight resistance to the target hand, keeping hips in a stable and athletic position.
5. Relax the resistance and return the arms to their original address position.

This completes 1 repetition. Perform drill 2×10 repetitions.

### **Focus Keys**

- Maintain spine angle, hand angle, toes off the ground, and pressure on the three pedypod components on each foot (1-ball of foot, 2-ball of outer edge of foot, and 3-calcaneous) throughout the entire putting motion.
- Rotate the ribcage smoothly around the spine.

### **Goal**

The goal of this drill is to train your body to use the torso to dominate the movement in the putting stroke (rotating the ribcage like a wheel spinning around the axle), develop proper pressure in the feet, and eliminate a change in arm and hand angles which will keep the lie angle from changing throughout the stroke.

## **What is Loft?**

Loft is the increase or decrease in Loft (the angle of the putter face relative to the vertical plane) between the start of the stroke and impact with the ball, measured in degrees.

Assuming the putter face is flush with the ground during the start of a stroke, pushing your hands towards the hole will decrease Loft and drive the ball into the ground. Pulling your hands away from the hole will increase Loft and send the ball into the air. In a biomechanically efficient putting stroke, there should not be an increase or decrease in Loft.

## **What should Loft be?**

**Goal**

Ideal Loft will be 0\* increased or decreased

**Pro Average**

0 to 0.5\* increased or decreased

**Amateur Average**

0.0 to 1.0\* increased or decreased

**Metric Tip**

If the sole of the putter is parallel with the ground at address, Loft Change should be 0.0\*.

1. Make sure that the sole of the putter is parallel with the ground at address and impact.
2. Maintain consistent ball position on every putt.
3. Avoid pressing your hands towards or away from the target at address and as you are about to hit the ball.
4. Address the putter as close to the ball as possible.

## How do you improve Loft?

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**Drill: Torso Twist**

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**Problem**

Loft increase or decrease can be caused by an improper ball position, a forward press in the Forward Stroke, or tilting shoulders instead of rotating from the ribcage and mid-spine.

**Solution**

1. Place feet in the prescribed Base Platform (see **Base Platform Drill**) and body into proper posture (see **Posture Stick Drill**). This will allow the torso to rotate efficiently around a neutrally aligned spine.
2. Place each hand on its opposite shoulder (left hand on right shoulder, right hand on left shoulder).
3. Rotate your shoulders and torso back and forth about your spine while maintaining both a stable lower body and head (hips and head should not rotate and shoulders/torso should rotate approximately 30 degrees in each direction).

This completes 1 repetition. Perform drill 2×10 repetitions.

**Focus Keys**

- Engage core muscles prior to rotating your torso.
- Stabilize hips and head.

- Avoid side-bending away from the target on the Forward Stroke.

**Goal**

The goal of this drill is to develop separation between the lower body and upper body during the putting motion, rotation around your spine, and to avoid tilting/rocking of shoulders which can adversely affect Loft angle.