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Quick Guide to Race Walking © Jeff Salvage, 2009

This quick primer on race walking technique defines proper textbook form and is an excerpt from the book *Race Walk Clinic - in a Book* available at www.racewalk.com.

The following is the definition of race walking:

- Race walking is a progression of steps so taken that the walker makes contact with the ground so that no visible (to the human eye) loss of contact occurs.
- The advancing leg must be straightened (i.e., not bent at the knee) from the moment of first contact with the ground until in the vertical upright position.

POSTURE



Figure 1

A race walker's posture is quite simple. An elite race walker maintains an upright posture throughout the stride. The torso should not swing forward or back, nor should it twist as the hips rotate forward. Leaning forward or backward restricts hip rotation and places an incredible strain on the lower back.

Observe Figure 1 showing Jared Tallent walking to a silver medal in the 2008 Olympics 50km race. Tallent's posture is straight up and down, leading to more graceful and efficient technique, as well as the proper stride ratio. Race walkers should have more of their stride behind them than in front of their body. Estimates vary between a 60-40 split and a 70-30 split. Tallent's sweet spot is directly in between at 64/36.

Observe Figures 2 to 7. They illustrate the correct positioning of the legs from the instant Tim Seaman's left leg strikes the ground, as his body passes directly over the leg and beyond, until his left foot is about to leave the ground behind his body. Observe Figure 2, where his heel has just made contact with the ground. A few things happened simultaneously. Just before contact, as his leg was swinging forward, it straightened, with toes pointed up (between 30 to 45 degrees from the ground). Nearly simultaneously with those actions, his heel struck the ground. Achieving this smooth synchronized action is the key to success.

Between Figure 2 and 7, the body moves forward, over the left leg. This is where walkers tend to violate the definition of race walking. The leg must remain straightened until it is in the vertical position as shown in Figure 4. Once the left leg is beyond the vertical position, as in Figure 5, it may bend. However, when it comes time to lift your left foot off the ground, if your left leg is still straightened, you get an extra thrust forward by pushing off your rear foot (Figure 6). With proper flexibility and strength your leg stays straightened longer giving you this extra thrust. Ideally, the leg remains straightened until the heel of your rear foot lifts off the ground.

Figure 7 is just after your effective push off and just before rear-foot toe off, with an obvious bend in the leg. It is impossible to race walk with any efficiency and keep the leg straight as it swings forward. Notice that as his rear (left) leg leaves the ground, his front (right) leg is already in position. Also, note (as we observed with Jared Tallent) that the legs do not create a symmetrical triangle. More of Tim's stride is behind his body than in front. This is achieved through proper hip action. Figures 8 through 11 shows the foot swinging through as low to the ground as possible. This averts loss of contact problems that might occur if you drive your foot too high coming through your stride. If your foot is too high, you might have a propensity to drive the leg up instead of forward, thus making you at risk of visible loss of contact and getting disqualified.

Figures 8 through 11 show Tim's progression as his rear foot leaves the ground (Figure 8) until just after the same foot strikes the ground in front of the body. When his rear foot leaves the ground, it swings forward with the leg flexed at the knee (Figure 8 - 10). Note the constant angle between his upper and lower leg during this phase. Once he begins straightening his leg, he uses his quadriceps to extend it (Figures 10, 11, and 2). Finally, his foot makes contact with the ground and his leg is straightened and no longer flexed at the knee (Figure 2).



Figure 8



Figure 9



Figure 10

To remain efficient, race walkers must pay careful attention to how their legs swing forward after push off. Your leg should move forward with the knee as low to the ground as possible. This motion stems from proper hip action, explained later. While some upward motion is necessary to lift the foot off ground, it should be minimized. Therefore, when the rear foot lifts up, it rises only an inch or two off the ground. This is seen throughout Figures 8 to 11. By the time your foot swings in front of your body, it is almost parallel with the ground (Figure 11).



Figure 11



FOOT PLACEMENT

A race walker's feet land in an almost exact straight line. After you learn to use your hips efficiently, your foot placement changes slightly to imitate this near straight-line placement.

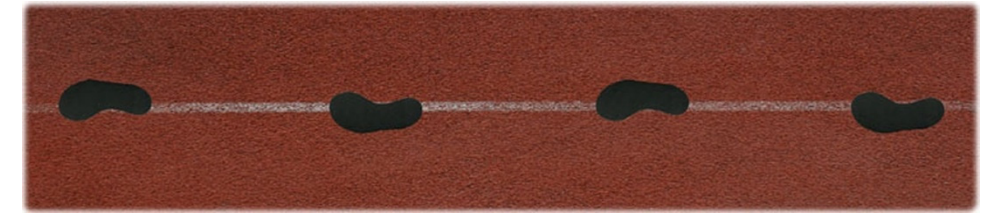


Figure 12



THE REAR FOOT

Many race walkers do not hold their rear foot on the ground long enough. The longer you leave your rear foot on the ground, the more efficient your stride. Leaving the rear foot on the ground longer stretches your hip muscles like a sling shot and the resulting reflex pulls the swing leg forward faster, gaining you even more speed. In addition, your body exerts a force against the ground due to gravity. When you stand with your foot beneath your torso, this force is completely vertical. By keeping the foot on the ground longer, the ground's reactive force of the body's weight becomes more horizontal than vertical when you lift your heel and move to toe off. This force helps maintain contact with the ground while contributing to forward body propulsion.



FOOT STRIKE

When your foot strikes the ground, land on the back of your heel and point your toes upward at an angle between 30 and 45 degrees with the ground (Figure 2 & 13). Once your foot makes contact, roll it forward, keeping your toes pointed up and off the ground until the entire leg supports your body's weight. After heel strike, smooth your stride by rolling onto the midsection of your foot and through to your big toe. Avoid slapping your foot against the ground. If you feel or hear a slap, stop, stretch your shin, and start again. When you walk with your toes pointed up, you use your shin muscles more. How long you keep your toes off the ground is directly related to the strength and flexibility of your shin. Proper planting of the foot with a smooth roll through also helps to avoid premature knee bending.



Figure 13

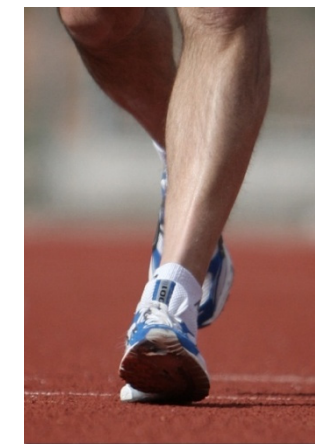


Figure 14

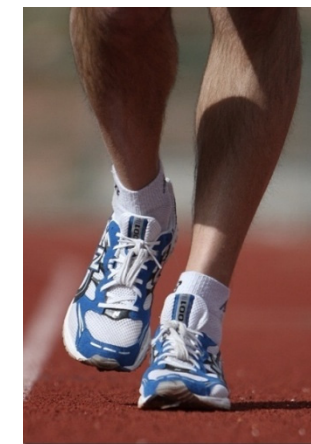


Figure 15

LEGS



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



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TOE OFF AND A FINAL PUSH

Efficient race walkers do not let their feet lift passively off the ground; instead, just before the rear foot breaks contact with the ground, they actively push the big toe against the ground. Done properly, overall race walking technique becomes less mechanical and movements feel as if they are flowing together in a forward motion. Done improperly, an overly hard push off causes over-striding and flagrant loss of contact with the ground. Care must be taken to carry your foot forward in a relatively straight line after you push off. When your foot leaves the ground and is swinging forward, try not to twist the foot to the side as your leg progresses.



Figure 16

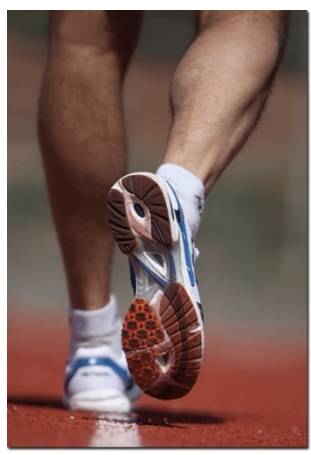


Figure 17



Figure 18

HIPS



Denis Nizhegorodov demonstrated excellent forward hip rotation

Elite race walkers generate their primary source of forward locomotion from rotating the hips forward. By repeatedly pivoting the hips forward, they act as the body's motor, propelling it forward one step at a time. Actively swinging the hip forward lengthens the stride from the top of the legs, while increasing stride length behind the body. In a flexible race walker, the gain can be as much as six inches per stride. If you add as little as 1 inch to a typical 1 meter race walking stride, the net gain is approximately 10 meters per lap on a track.

Look back to Figure 1. Notice again how Tallent's stride is distributed more behind the torso than in front of it. This is directly due to hip rotation. Good forward hip rotation is a key solid race walking technique. The hip rotates forward at the same time as the leg swings forward. The leg does not swing forward before the hip rotates. Since the two motions occur simultaneously, any reduction in cadence is minimal and greatly outweighed by the increase in stride length.

The exact motion of the hips during race walking is a bit complicated. The hip moves in three dimensions; its primary movement is forward, but it also must move slightly in and out as well as up and down. To further understand proper technique, observe the following three figures which show the hip motion from varying perspectives.

Imagine a small circular sticker being placed on the outside of the center of the race walker's hip. This sticker represents the center point of the hip in the following figures as the hip moves through key points of the walker's stride. Figure 19 shows this center point of the right hip as a race walker completes one stride when walking on a road or track as viewed from the side. The walker's right heel strikes the ground at (A) as the center point of the hip is in the neutral position. As the body moves forward over a straightened leg, the center point of the hip rises until the straightened leg passes directly beneath the body.

From the moment when the leg passes under the body (B) until the right foot's toe pushes off the ground, the center point of the hip moves downwards. As the right foot starts to swing forward (C), the leg must be bent. This bent leg swings forward as the hip continues to lower slightly. This is known as "hip drop" and, while necessary, is a minimal action. After the knee of the swing leg passes under the body (D), the center point of the hip rises to the neutral position for heel strike (A).

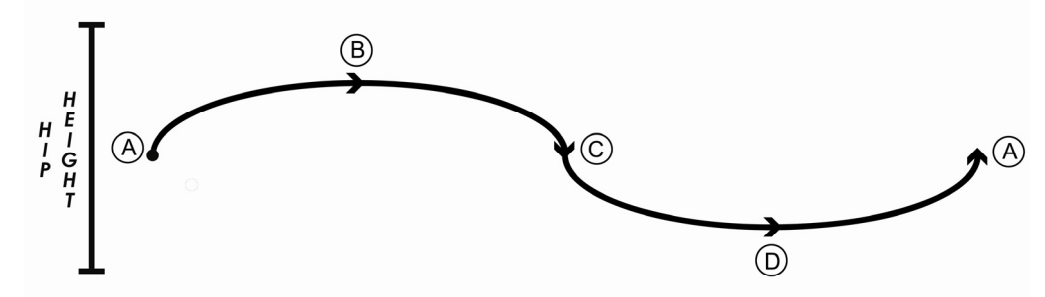


Figure 19, View of elevation of the center point of the hip from the side, while race walking on the road

Figure 20 shows the center point of the right hip of a race walker's stride as viewed from the side while the race walker is on a treadmill. The walker's heel right strikes the ground at (A) as the center point of the hip is in the neutral position. As the treadmill carries the straightened leg backwards, the center point of the hip rises. From the moment when the straightened leg passes under the body (B) until the right foot's toe pushes off the treadmill, the center point of the hip moves down. As the right foot begins to move forward (C), the leg must be bent. While it does, the hip continues to lower. After the knee of the swing leg passes under the body (D), the center point of the hip rises to its starting position for heel strike (A). The more elongated this oval, the better hip rotation a walker exhibits.

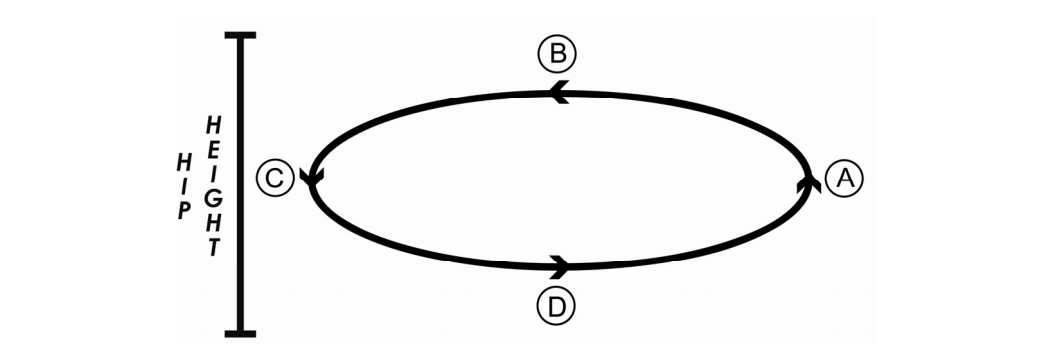


Figure 20 - View of the hip from the side as a race walker walks on a treadmill

Finally, to show how the hip arcs out slightly at parts of the stride, observe Figure 21. Note that the outward sway is minimal and not a forced action. Instead, the hips sway in or out due to the forces subjected to it by the legs, arms, and torso.

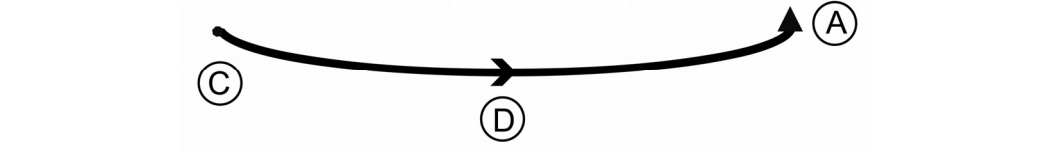


Figure 21 - View of the right hip from the top as a race walker walks on the road

As the walker's right foot is about to leave the ground with the right hip behind the body (C), the right hip begins moving forward. As it does, it arcs out slightly. Once the knee swings under the body (D), the hip continues forward while arcing inward back to the starting position (A).

ARMS AND SHOULDERS

An elite race walker synchronizes arm and hip motion to maximize efficiency and speed. While the exact range of motion for the arm varies slightly with speed and effort, each arm travels from a couple of inches behind the hip to just above the chest line. The primary power for arm movement is derived on the backward swing of your arm. It is not a wild pumping action and does not require much effort to thrust the arm forward. The shoulder acts as a fulcrum with the arms swinging like a pendulum. With the proper angle, when you drive

back, the arm swings to the proper position a few inches behind your hip. With a relaxed shoulder, your arm recoils forward to the correct location. The cycle repeats with another drive of the arm backward. With a relaxed shoulder and proper angle, little effort is required to move your arm backward. Your arms move only as fast as your hips and legs; it's all about synchronicity. The ratio of upper and lower arm length varies from walker to walker. If you feel you are swinging your arms too far in front of your body, reduce the angle between your upper and lower arms. Similarly, if you have too short an arm swing, increase the angle.

Observe the Figure 2. The length of the arm swing is directly related to the angle between Tim's upper and lower arm. As the angle increases, so does the length of arm swing. If the arm swing is too long, you will overstride, causing too much of your stride to be in front of your body. In contrast, if your arms are too short, the stride is not long enough behind your body. With the proper arm swing, Tim exhibits the proper triangle with his legs. You can also see how the shoulders and torso move slightly forward as the opposite hip rotates forward. In Figure 2 Tim's right shoulder is slightly in front of his left. You can also notice the forward presence of the right side of his torso as it counters the left hip's forward progression. Proper arm swing must also take into account how the arm crosses in front of the body. Observe Figures 22 through 24. The arm swings forward as if shaking someone's hand. Moving directly across the body or bringing the arm forward too straight inhibits forward hip rotation. One key to good arms is to relax the shoulders. While the shoulders do move slightly forward and back, counteracting the forward hip rotation, they should remain relatively still.



Figure 22



Figure 23



Figure 24

Looking For Information on Race Walking?

Race Walk Like a Champion Book - is the single best compilation of information on the technique, training, and history of race walking. It combines approximately 400 photographs with charts and diagrams to explain every detail of race walking. (Available at www.racewalk.com)

Race Walk Like a Champion DVD/CD Set - Spanning a DVD and a CD for your computer, the set brings the descriptions from the book to life while explaining all aspects of race walking. Its friendly menus allow you to watch exactly the section you wish, over and over, with no rewinding! (Available at www.racewalk.com)

Race Walk Clinic - in a Book - beautifully illustrates textbook techniques while it catalogs typical mistakes race walkers make that can rob them of a legal race and speed. It explains why these problems exist and prescribes critical solutions to correct them. (Available at www.racewalk.com)

BoomerWalk - convinces you (and your baby boomer friends) to take up the highly aerobic and low-impact sport of race walking. Photos illustrate the details of race walking technique, and profiles of race walkers from their 50s to their 90s inspire you. (Available at www.boomerwalk.com)

Racewalking! Fun? - introduce elementary school kids to race walking with this fun colorful animated children's book about a class learning to race walk. (Available at www.racewalk.com)

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