



Elliptical Upper-Body Motion Analysis

Elliptical cross trainers have exploded in popularity over the past decade, primarily because their low-impact, effective and efficient workouts can challenge everyone from beginners to athletes. Plus, some ellipticals with moving handlebars engage the major muscle groups of the upper body and deliver total-body workouts that maximize caloric expenditure.

To date, manufacturers have focused primarily on the lower-body motion, and, as a result, the upper-body handlebars and path of travel have been largely neglected. But now Octane Fitness, a leading brand of elliptical cross trainers with unprecedented innovations, delivers a more comfortable, satisfying and productive exercise experience.

The importance of pivot point and handlebar shape

Quality ellipticals simulate how the body moves naturally and accommodate different size exercisers, so users don't have to compromise their posture, position or movement pattern to fit a machine. Until now, most ellipticals have incorporated simple handlebars that resemble two straight or slightly angled poles, leaving users with virtually no variety in terms of hand placement or path of travel.

The result has been mediocre, uncomfortable or awkward. **Some have criticized that the basic design of cross trainer handlebars has discouraged exercisers from fully engaging the upper body – in essence, that the arms just “go along for the ride” with the legs conducting the bulk of the work.**

After biomechanical research, Octane developed moving handlebars that have **a unique, low pivot point for arm movement, which results in a more comfortable axis of rotation at the shoulder joint, minimizes radial and ulnar deviation at the wrist and transfers the workload more evenly to upper body and core.**

Taking it one step further, the proprietary MultiGrip handlebars are designed with a one-of-a-kind shape to enable exercisers to take advantage of **a variety of hand positions (overhand, vertical, horizontal, wide and narrow) that facilitate superior comfort, variety and effectiveness.**

For instance, a wider overhand grip targets the pectorals and triceps at high resistance levels and longer strides, the narrow vertical grip emphasizes the rhomboids, latissimus dorsi and biceps, particularly at fast paces that simulate running; and the horizontal grip helps propel reverse motion or squatting at shorter strides. Exercisers of all heights

and body types can comfortably and freely move their hands into virtually unlimited positions throughout their routines for the better customization and muscular balance.

MultiGrip handlebars effectively encourage exercisers to emphasize upper-body movement so that they reap the results of efficient, truly total-body routines.

Replicating natural motion

Octane Fitness continually conducts biomechanics and ergonomics testing on its product designs to ensure that all exercisers are safe, comfortable and moving naturally. The company is the first to introduce both the breakthrough MultiGrip handlebars and the unmatched Converging Path handlebars.

Unlike anything available today, the exclusive Converging Path bars follow the natural path of the upper body when striding. Rather than force the arms into a rigid, straight shoulder flexion-extension swing, the Converging Path handlebars move inward as the exerciser presses each forward, just as one's arms naturally move toward the midline when walking, jogging or running. Then they comfortably open up by the same amount on the backswing, again replicating natural locomotion. This incorporates flexion, extension, adduction and abduction in two planes—sagittal and frontal—instead of just the sagittal plane motion of traditional handlebars.

In addition to supreme comfort, the Converging Path handlebars afford exercisers a multitude of valuable benefits:

- **Natural articulation – The Converging Path handlebars are designed to follow the most natural, comfortable motion of the shoulder joint when the body is traveling**—where the arms move medially and laterally. Rather than requiring

users to follow a machine-dictated straight path, which forces exercisers into unnatural upper-body movement, the Converging Path handlebars are so comfortable and natural, users are likely to engage the arms, chest and back even more for greater effectiveness.

- *Joint-neutral position* – By converging as the exerciser pushes forward, these **unique handlebars keep the shoulder, elbow and wrist joints in neutral, safe positions, minimizing torque, repetitive stress and potential to aggravate an existing injury** or create a new one, such as shoulder impingement syndrome and lateral epicondylitis.
- *Greater range of motion* – **Biomechanics dictates that the greater the range of motion, the greater the muscle involvement**, which results in additional challenge, an increasingly stronger performance, higher caloric expenditure and ultimately, more dramatic results. By design, Converging Path handlebars offer exercisers a longer distance to push and pull for a rigorous, customized routine. With their medial movement forward and lateral movement backward, they offer greater range for users of all sizes, particularly on the backswing, where some exercisers are limited by hindrance from their latissimus dorsi.
- *Core recruitment* – Exercisers today understand the importance of the core—essentially the abdominals, hip flexors and lumbar region—that serves as the powerhouse for all movement as well as the body's center for balance and stability. Virtually every dynamic exercise involves the core, and the Converging Path handlebars require **exercisers to recruit their rectus abdominus, internal and external obliques, transverse abdominus, iliopsoas, quadratus lumborum and erector spinae with each arm stroke**. Straight path handlebars generally enable users to simply hang on relatively loosely and just track the prescribed motion—with somewhat minimal effort required from the arms—thereby limiting the necessity to recruit the core to stabilize and balance the body.
- *Open access to the console* – As an additional comfort booster for exercisers of all heights, the Converging Path handlebars optimize ease of access to the display console, which facilitates easier programming, changes on the fly and even convenience in grabbing a water bottle, remote control or MP3 player. Furthermore, individuals who enjoy reading while working out appreciate the unencumbered sight lines to their book or magazine.

Fully engaging the upper body

Any exerciser realizes that **when the upper and lower body are synchronized and the movement is comfortable, he/she feels stable and is likely to work out harder and longer**—ultimately for better results. Conversely, if either the upper-or lower-body motion is awkward or unnatural, typically individuals shortchange their routine and quit early.

The revolutionary MultiGrip and Converging Path handlebars have set the performance standard for comfort, customization and effectiveness of cross trainer workouts.

REFERENCES

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For more information, contact Octane Fitness at www.octanefitness.com or 888-OCTANE-4.