

**ESCAPE OCTAGON
LOAD TRAINING.**

**DEVELOPING
SPEED AND
POWER.**



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Power and speed training with the LOAD range brings this important and beneficial component of fitness to a wider population. Both safe and effective routines can be designed to improve power, speed and neuromuscular function.

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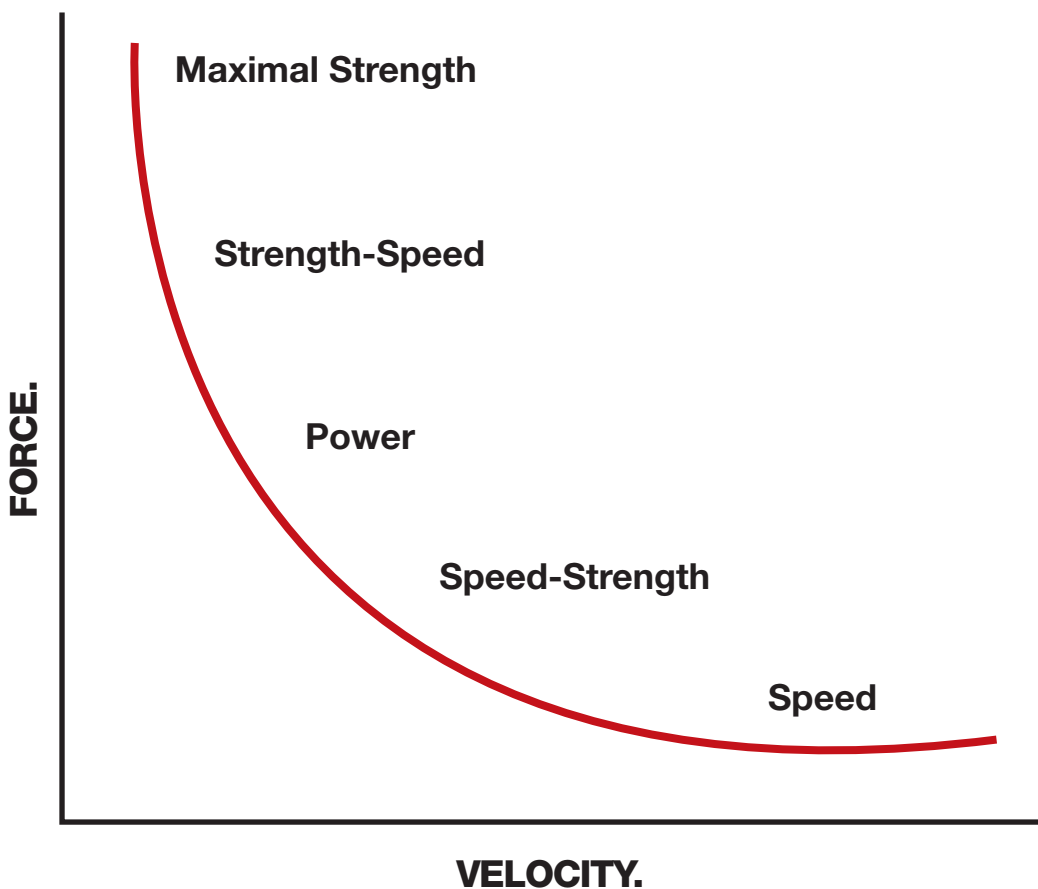
THE FORCE VELOCITY CURVE.

Learning about the relationship between force and velocity is important to understand how best to apply power and speed training.

The Force-Velocity Curve is a graphical representation that illustrates the inverse relationship between force and velocity during muscle contraction. It shows that as the speed of a movement (velocity) increases, the amount of force a muscle can generate decreases, and vice versa.

- **High Force, Low Velocity:** At the left end of the curve, movements involve high force but occur at a slow speed, such as heavy 1 rep max lifts.
- **Low Force, High Velocity:** At the right end, movements involve low force but occur at a high speed, such as plyo jump.

To maximize power, users need to work across the Force-Velocity Curve, training across the spectrum ensures that both strength (force) and speed (velocity) are developed.





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POWER TRAINING WITH THE LOAD RANGE.

Power can be defined as our ability to exert maximum force in the shortest amount of time and is not just the key requirement for elite level athletes. In fact, developing power is hugely important as we get older, losses in strength are well known but in hand with this comes losses in neuromuscular function. Providing older adults with a solution to develop power whilst reducing the risk of injury is essential to maintaining this function. Common methods of power training involve barbells and dumbbells and can not only be complex in nature but also more demanding for the joints involved.

SAFE, EFFECTIVE POWER DEVELOPMENT WITH THE LOAD RANGE.

The LOAD range offers the user a more controlled solution for power training, reducing the additional requirement to stabilise joints across the body that is required during the more common methods of power training.

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TEMPO FOR POWER TRAINING.

As the definition suggests, to develop power the body needs to move at speed to ensure the working muscles can contract forcefully in the shortest time possible. Therefore, slow concentric tempos are not used in this form of training. However, to develop power, an effective eccentric phase is essential.

“YOU’VE GOT TO LOAD TO UNLOAD.”

This term rains true in power training as it’s what’s happening in the eccentric phase that allows us to generate maximal force in the following concentric phase.

THE STRETCH SHORTENING CYCLE AND ELASTIC POTENTIAL.

This process takes place when the muscle is rapidly lengthened during the eccentric phase before immediately shortening during the concentric phase. During the eccentric phase, elastic energy is stored in the muscle-tendon unit which is then used in the concentric contraction to enhance muscular contraction.

Along with this mechanism the muscle spindles detect the rapid change in length and activate a reflexive contraction known as the Stretch Reflex to prevent overstretching, this enhances the force of the subsequent concentric contraction.

MUSCULAR ACTIVATION.

Greater motor unit recruitment is achieved in the eccentric phase offering the subsequent concentric phase the opportunity to utilize this enhanced recruitment. This enhances motor unit recruitment.

PUTTING THIS INTO PRACTICE.

There are two different approaches to the eccentric phase in power development and selecting the appropriate option for the user is important.

Rapid Eccentrics. Using the Stretch Shortening Cycle and Elastic Potential means tempo is not included in this training method as the aim is to move quickly during the eccentric and then transition swiftly to the concentric contraction. Users should focus on rapid deceleration of the load before transitioning quickly and accelerating swiftly. As this process is considered more demanding on the neuromuscular system using it with the older adult population may be less favourable and if used a lower load would be recommended to reduce muscular soreness.

Controlled Eccentrics. Using the concept of increased motor unit recruitment during the eccentric phase a tempo of 2 to 3 seconds in this phase can help to engage more muscle fibers whilst still being safe and appropriate for wider populations or less experienced users.



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SPEED TRAINING WITH THE LOAD RANGE.

Speed development is closely related to power training when working with the LOAD range as improvements in speed will come using the same methods. Speed can be considered as our ability to move all or part of our body as quickly as possible. Our ability to move rapidly requires efficient sequencing of joints and the relative timing of these joints during the movement. This is known as the Relative Timing Profile. By using variable resistance and plate loaded equipment, users can enhance the Relative Timing Profile of joint movements, leading to more effective and efficient speed development.

Speed development is hugely enhanced with the LOAD range due to the inclusion of resistance bands. The intensity of both concentric and eccentric portions of the lift increases as the resistance builds through the range requiring the user to continue to accelerate and work to generate force. In the subsequent eccentric portion, the returning speed is greatly increased as the band is at its highest point of tension and the user must work hard to decelerate the load.

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RELATIVE TIMING PROFILE.

Relative timing profile refers to the precise coordination and sequencing of muscle contractions and joint movements during an action. In speed development, this timing is crucial because it determines how effectively forces are transmitted through the kinetic chain, from one joint to the next.

Proper timing ensures that the muscles and joints work together harmoniously, allowing for the smooth and efficient transfer of energy. Misalignment or poor timing can lead to energy leaks, where force is dissipated rather than directed towards movement, ultimately reducing speed, and increasing the risk of injury.

JOINT SEQUENCING FOR BETTER FORCE TRANSMISSION.

Proper sequencing ensures that the force generated by the larger muscle groups are efficiently transmitted through the smaller joints. For example, in a sprint, the hips generate the initial force, which is then transferred to the knees and finally to the ankles, propelling the athlete forward.

COORDINATION FOR EFFECTIVE RELATIVE TIMING PROFILE.

Neuromuscular Coordination.

Motor Unit Recruitment: Effective speed development requires the coordinated recruitment of motor units across multiple muscle groups. Neuromuscular training, particularly with variable resistance, helps fine-tune the nervous system's ability to activate the correct muscles at the right time.

Rate of Force Development (RFD).

Speed is closely linked to how quickly muscles can generate force. The Variable Resistance System allows users to generate force rapidly when the resistance is lower at the start of a movement and then sustain this as the resistance increases and the body accelerates.

SYNCHRONIZATION OF MUSCLE GROUPS.

Agonist and Antagonist Muscles.

For optimal speed, the timing between agonist and antagonist muscles must be precise. For example, during a sprint, the quadriceps and hamstrings must work in synchrony: as the quads contract to extend the knee, the hamstrings must relax and then contract quickly to flex the knee.

The LOAD range stations Lift, Drive and Overhead provide great transfer to athletic pursuits because they incorporate the need for muscles to synchronize effectively during explosive movements that develop speed.

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BENEFITS OF SPEED DEVELOPMENT FOR ALL USERS.

DAILY ACTIVITIES.

Speed isn't just for athletes; it enhances our ability to perform daily activities. Quick reflexes and fast movements are essential in preventing falls, especially in older adults. Speed development can improve reaction times, balance, and the ability to perform everyday tasks more efficiently.

ENHANCED METABOLIC HEALTH WITH HIGH INTENSITY INTERVAL TRAINING.

Developing speed, coordination and efficient RTP allows users to train more safely and effectively in high intensity interval training sessions. A HIIT session requires the body to move rapidly for short durations to elicit the correct response. Effective HIIT training can therefore improve cardiovascular health and offer better fat loss results with higher caloric burn due to the intensity of efforts.

INJURY PREVENTION.

Speed training, especially when combined with variable resistance, strengthens muscles, tendons, and ligaments. This makes the body more resilient to the stresses of daily life and reduces the risk of injuries, such as sprains or strains. The improvement in coordination helps to reduce acute injury risks associated with trips or falls. Whilst the improvement in relative timing profile helps to improve joint stability further reducing the risk of injury to joints and the surrounding tissues.

IN SUMMARY.

Developing speed using variable resistance and plate-loaded equipment involves optimizing the relative timing profile and sequencing of joints to enhance the efficiency and effectiveness of movement. This requires careful coordination of muscle groups, proper technique, and targeted training methods. The benefits of speed development extend far beyond athletic performance, improving functional fitness, metabolic health, and injury prevention for all individuals.