

The Phasic Structure of the Jerk

The jerk is divided into five phases, combined into three periods. (recovery from split and final fixation of bar are not included).

The *first period* consists of one phase, the half squat. **Phase one** begins the instant the knees begin to flex and ends the instant the barbell reaches its maximum downward velocity. This period contains only one phase because at the start, the bar is already bent. The bar straightens as its center is lowered, so the "athlete-barbell" system is already moving. This obviates the need for an additional phase. The objective of phase one (as in the snatch and clean) is to create a rigid interaction between the links of the "athlete-barbell" kinematic chain and to lower the bar vertically.

The *second period* consists of two phases; the "braking" (phase two) and the final acceleration or thrust (phase three). **Phase two** begins the instant the bar reaches its maximum downward velocity and concludes with the largest degree of flexion in the knee joints. At the end, the bend in the bar is maximum. The objective of phase two is to switch from flexing the knees to straightening them as quickly as possible and to maintain support in the middle of the feet.

Phase three lasts from maximum knee flexion to maximum extension in these same joints. The object of phase three is to create maximum speed of leg and arm extension.

The third period includes two phases, the squat under (non-support and support phases).

Phase four is the time period from maximum extension in the knees until the bar reaches its maximum speed. The athlete vigorously rearranges the legs in the sagittal plane (fore and aft) during this phase. The object of phase four is to rearrange the legs with maximum speed and to correctly position the arms, torso, and legs.

Phase five lasts from the instant the barbell reaches its maximum speed up until it is fixed in the squat under position. The object of phase five is to switch from extension to squat under as quickly as possible and to create a rigid interaction between the links of the "athlete-barbell" kinematic chain, to land with the support uniformly on the legs and to solidly fix the barbell in the squat under position.

Some additional comments on the jerk:

Phase two, the "braking" phase is the key to a

successful jerk. The faster one switches from the half squat to the thrust, the greater the elastic potential created in the muscles and consequently the higher the working effect. The greater the vertical support reaction, the greater the maximum barbell speed which ultimately enables one to jerk the weight to a greater height.

The most basic requirement during the execution of the half squat is not to "separate" from the barbell but rather become a unified whole with it. However, one should not slow down this part of the movement. The artificial slowing of phase one will not allow the bar to bend sufficiently but on the other hand, executing phase one with excessive speed will cause the "unified interaction" of the athlete and the barbell to be lost. This in turn will result in a prolonged execution of the braking phase, insignificant forces against the support, and a low barbell speed. Consequently, the speed of the half squat should be optimized for each athlete.