

Nautilus 4-Bar Linkage

Nautilus' patented 4-bar linkage is mechanical technology that automatically adjusts the resistance force to match the changing muscle force throughout the full range of movement of a specific exercise.

Nautilus' 4-bar linkage systems are deployed in 4 primary ways:

1. 4-Bar Linkage As A Generator Of A Changing Axis Of Rotation.

The 4-bar linkage can be applied to movements that have a changing axis of rotation, such as the LOW BACK and ABDOMINAL. When a person rotates around the vertebrae of the spinal column, the axis of rotation is constantly changing due to rotation around multiple vertebrae. A properly designed 4-BAR linkage, like Nautilus' patented solution, mimics the changing axis of rotation thus maintaining the alignment that is critical in these movements also forcing proper form. (Used on 2ST AB, LB; Studio AB; and NITRO AB, LB)

2. 4-Bar Linkage As A Generator Of Controlled Motion.

The 4-bar linkage can be applied to movements that are multi-joint, such as the leg press. These movements require a particular trans-rotational path, produced by Nautilus' 4-bar linkage, in order to be bio-mechanically correct, highly productive, and safe. (Used on 2ST LP, NITRO LP, Studio LP, XPlod LP, and GRAVITRON)

3. 4-Bar Linkage As A Function Generator.

The 4-bar linkage can be applied to machines as a mechanism that can generate a force curve output as a function of a force input. In other words, it acts like a cam. This is useful on multi-joint movements which have radical strength curves like those found on the Overhead Press and Vertical Chest. Positive cams cannot change the resistance curve rapidly enough on a compound movement machine, thus negative cams, at much greater expense, must be applied in order to attain the rapidly changing resistance curves. The Nautilus 4-BAR linkage system, as a function generator, provides for rapidly changing curves like the negative cam, but at much less expense and with high durability and low maintenance. (Used on 2ST VC, OHP, IP, BP, CR and NITRO VC, OHP, IP)

4. 4-Bar Linkage As An Adjustment System.

Nautilus' 4-bar linkage system is also used as an adjustment mechanism, which allows Nautilus machines to maintain a certain angle or plane of movement. An example of this is the seat back adjustment linkage used on the Leg Extension and Seated Leg Curl.