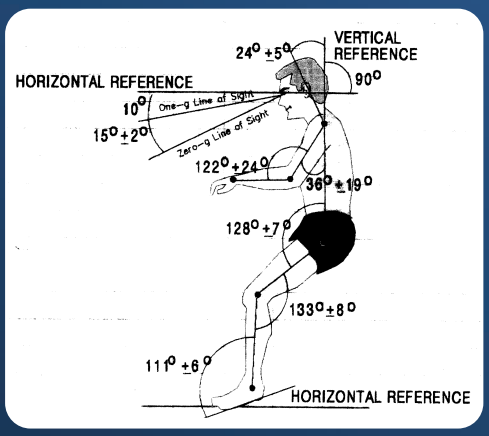
High & Mighty Seating

- O N T H E T E C H N I C A L S I D E -

FORWARD TILT POSTURE

In a previous Technical Side, we discussed positioning in the seat. At that point, we emphasized the typical 90-90-90 positioning… but what about forward tilt? What is the origin of the forward tilt positioning? Are there any benefits to forward tilt positioning?

Forward tilt positioning, by definition, involves having the seat pan tilted forward of 90 degrees, i.e. the back of the chair is higher than the front of the chair with the resultant positioning of the worker such that the worker's hips are higher than their knees. (The pictures to the right are from OSHA's computer workstation e-tools website)



Where did the concept of this positioning come from? As man ventured into space and experienced the lack of gravity, an interesting piece of trivia was realized. In zero gravity, man's posture assumed a very characteristic positioning – not 90-90-90 as one might expect, and not a true standing position. On the contrary, the position assumed in zero gravity was that of about 128 degrees at the thigh-torso angle. That's why this is also known as the zero gravity posture.

Why is this positioning important? It is in this positioning that the ligaments and muscles are at their most relaxed position.

How do we position someone in this posture? As pictured above, start from the 90-90-90 posture. Slowly tilt the seat of the chair forward. As the chair tilts forward, the back of the chair will push the torso forward. Release the back tilt paddle and slowly adjust the back to a vertical position. Adjust the angle of the seat to the point where the person's knees are greater than 90 degrees. Because we deal with gravity, the 128 degree angle assumed in zero gravity is too great for the person to stay in the chair without significant effort from the leg muscles – for that reason, we typically compromise to a 100 to 110 degree angle at the thigh-torso angle and at the knee for a forward tilt posture. The majority of the person's weight should be borne by the butt, not at the knee and leg.

What are the benefits of the forward tilt posture? The benefits are as follows:

1. Better circulation to the lower extremities – A greater than 90 degree angle at the hip and at the knee reduces the potential for occlusion of the blood vessels leading to the lower extremities.
2. Better digestion – with the open trunk/thigh posture, there is less pressure on the stomach and intestines.
3. Easier breathing – less pressure on the abdominal cavity also means easier breathing.
4. Easier to sit and stand – the forward tilt positioning means less effort to sit and to stand.
5. For shorter statured individuals, this positioning may place them at a better position at a standard height workstation.

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