

# Ideal and Recommended Joint Positions for TimedStaticContraction<sup>SM</sup> 1.0

by Ken Hutchins, Developer of SuperSlow<sup>®</sup> and SuperStatics<sup>SM</sup> Exercise

Last week (November 10, 2018), John Tatore contacted me and suggested that I do an article recommending joint positions for the various exercises performed TimedStaticContraction<sup>SM</sup> (TSC).

I replied that I had been very clear about using only mid-range positions for all TSC exercises. I could not fathom why this had not been grasped by all who read my writings on the subject.

Then John presented some photographic examples in my books where my broad recommendations were either confusing or outright the opposite of my broad recommendations. Therefore, we must have an article.

## Positioning Principle #1

Always *try* to select a position that is where the target musculature and/or joint is in its mid-range position.

Note the word *try*. The mid-range position principle is not an iron-clad rule for many exercises.

Often, the mid-range position is the position most comfortable and most controllable for the subject. Along this same line of thought, this position is also where the force readout is most reliable on feedback equipment.

However, the midrange positioning is not always possible or desirable.

Also, it is helpful to divide an exercise's range of motion into three more-or-less-equal thirds. For many exercises, consider all the middle third as fertile ground for TSC positioning.

For instance—using the middle third of the range of motion in a subject's leg press—there is a broad selection of acceptable positions useful for TSC. As one closer to the bottom might cause too much belly congestion or as one near the top of that middle third irritates the knees (or a knee), opt for a position with the least aggravation and/or irritation. In this case, it seems to be a position very close to the exact center.

## Positioning Principle #2

Always *try* to avoid a position that is where the target musculature is in its strongest position.

Again, note the word, *try*. There are rare exceptions where the strongest position is most desirable and can be made safe to utilize in an exercise.

The weakest position—almost always the most -contracted position (contrary to Arthur Jones' teachings)—portends that the body is unable to generate self-destructive force.

Recommended in books and articles by the cursorily informed, static exercises are usually applied in positions of great muscular strength and/or great mechanical advantage. Although this massages the ego to allow for great weight to be used and great apparent progress to be celebrated, this positioning is dangerous as hell. As far as I'm concerned, recommending TSC near the lockout of a compound position pushing movement as in leg press, squat, chest press, overhead press, etc, is blatant malpractice.

Before the advent of the computer feedback devices, we employed and recommended a squeeze technique be performed at the top of every dynamic leg press

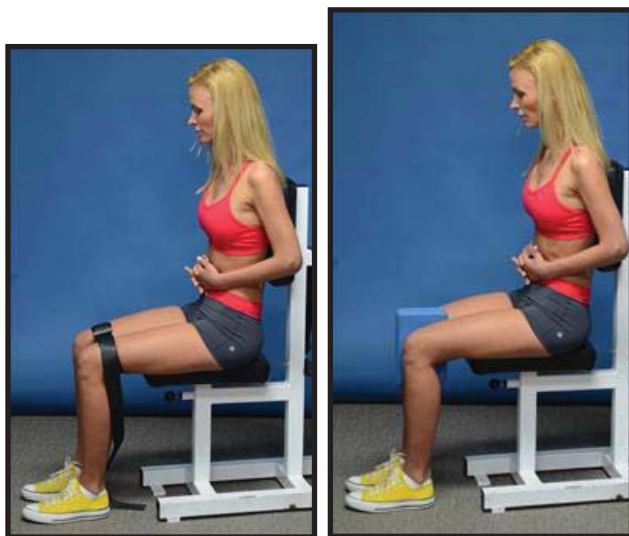
repetition starting with the third repetition. Once we saw the force reach 1500 or more pounds during a normal squeeze, we became instantly alarmed that the machine's upper pulley might explode. A few seconds later, we extended that same and greater fear to the body's joints. Yikes!

Of course, during our days of recommending the squeeze technique for leg press, we were careful not to completely lockout. Of course, we never did it fresh—always insisting that it was performed no earlier than the third repetition of the set. But still, the forces are scary high for this to continue as a practice with any one.

Before observing this we had always recommended that TSC leg press be performed at a position roughly halfway between the bottomout and top-out of the subject's range or motion. Why we (I) had not extended this guideline to the dynamic mode squeeze idea, I cannot explain. This might be the first big mistake of my career? At least, presumably, no one was injured before we applied the brakes to this practice. And I don't see Little and Sisco doing a global recall of their books recommending similar practice. Why? Because they don't know any better...I believe.

### **Exceptions and Apparent Exceptions to the Positioning Principles #1 and #2**

Below, are two apparent exceptions to the mid-range rule:



John Tatore pointed to these as examples of the exercise being performed at or near the contracted position and not in the mid-range as I had believed that I had underscored. At first, I was stunned that John was correct about this and that I was remiss for not explaining the exception to the rule.

Then I noticed something. Both John and I were carelessly considering the "mid-range" as that range of the typical ABduction or ADduction machine and not the mid-range of the hip joints and musculatures so involved. Since the thighs can actually cross each other (cross the body's mid-line) the parallel position pictured herein for these exercises is probably—depending on the subject—within the middle third of these ranges.

But so be it if it is not in the middle third of the ranges... As the knees separate and the thighs become non-parallel, the use of a simple belt or yoga block becomes useless due to severe angles on the belt; and the requirement for the arresting of anteriorly directed reactionary forces on the pelvis become unnecessarily complicated. The great simplification for instructor and subject alike provided by TSC is then forfeited for no good reason.

Also, to load these musculatures—either AD or AB—much closer to hip ABduction is begging for hip joint irritation, spasming, strain and sprain. Don't go there! And the argument posed by some to promote flexibility is vacuous.

Now note the following picture of the TSC shoulder lateral raise exercise. The subject is positioned in what



we usually consider the bottom position of a Lateral Raise machine, but this is not the bottom of the shoulder range. So what is the bottom of this range? I don't really know. I do know that it is possible to push most subjects' upper arms tight to their lateral chest without really stretching the deltoids or impinging some part of the lower glenoid or labrum. If only we could practically get the chest out of the way of the humerus to learn the complete ROM (joking). Therefore, I suppose that the position shown, herein, for lateral raise is much closer to being within the middle third of the range than we automatically consider *mid-range*.

And since I am on the subject of ideal positioning in lateral raise, note two extremes we want to avoid:

As the arms ABduct away from the torso much more than about 20-30 degrees off the vertical, we encounter two completely unnecessary issues. First—just as in hip ABduction—the angles become severe. In other words, we get so far away from the torso that a simple belt or horizontally oriented pad cuts into the arms and tends to translate superiorly. Of course, we can build a device (and I and others have) to pin-lock the device in any possible position within the range. For what beneficial purpose pray tell?

Second, as the arms are positioned further into ABduction, the more the trapezius gets into the act. In other words, we start seeing as much undesirable shoulder girdle elevation tending as is the desirable shoulder ABduction. As a result, we encourage aggravating neck tension and strain and shoulder impingement. Therefore, for all these stated reasons avoid shoulder ABduction much beyond this 20-30-degree-off-the-vertical position for TSC. And if you insist on performing a dynamic shoulder lateral raise beyond this point, you're just asking for joint/neck issues with almost all subjects—either immediately or eventually.

Next note that we have another issue if the shoulders during TSC shoulder ABduction are too close to the torso. If much less than this 20-30-degree position—and especially if the humeri are positioned tightly against the torso—the latissimus dorsi get into the act via their intrinsic function to expand as they contract. This, alone, can push the humeri laterally, thus reducing isolation and confusing the readout of any feedback apparatus.

[*Intrinsic muscular function* is distinguished from *intrinsic musculature* in my book, *Music and Dance*.]



Now note the shoulder shrug exercise. Although neck exercise as traditionally afforded with equipment by Nautilus (Arthur Jones) and SuperSlow Systems (yours truly) has largely been exercises to flex or to extend the neck, TSC shoulder shrug is the all-round best and safest approach. It addresses the

entire neck musculature.

It's impossible to ascertain, but the subject above is performing TSC shoulder shrug in his most-contracted position (greatest shoulder girdle elevation). It avoids almost all spinal compression. This is superior for one of my subject's as it is the only way to strengthen his neck and circumvent his irritation with the hardware in his 78-year-old neck.

Here, we see the subject performing a TSC Chest Fly



(shoulder anterior ADduction). This is another example wherein we are tempted to consider this performance position as near the most-contracted position and not in the middle third of the range. This bias changes completely if we consider that each shoulder can ADduct with the its elbow traveling to the centerline of the body. Again, our

experience with dynamic equipment restricts our thinking about the body's limitations.

Now consider this TSC abdominal exercise. Performed with a belt across the sternum and another belt to anchor a pelvic tilting stabilization for the lower body, it is performed at midrange—i.e., at anatomical



neutral in terms of trunk flexion.

Note that this exercise is accomplished just as well by omitting the upper belt across the sternum, thus allowing the subject to flex the trunk and to depress the chest yet more so in the pelvic-tilting stabilization (explained in *Music and Dance*). This

is usually denoted as being performed in the most-contracted position. (not pictured).

Now here's a somewhat easy one. The TSC compound row offers a rather large range of acceptable positionings. The picture shows the arms at about as straight as I would allow. Certainly, we do not desire more extension as the force capability of the arms rises and the subject's ability to safely control initiation dwindles.



Slightly more elbow flexion and corresponding

shoulder extension would be perfectly mid-range and more appropriate for a TSC chest press position if we had the subject in a proper seat with a seat back rather than a sternal pad. Although not absolutely required for the compound row, placing the chest press closer to mid-range is important, since body compression and pad compression and machine flexion might allow the arms to approach a position of infinite moment arm wherein force can rise exponentially to damage the involved joints.

Noting the TSC pushup performed in the floor, the shoulder positioning is close to or at the bottom (mild stretch) of the dynamic stroke. This is the best compromise in most situations of this floor exercise as we want to avoid lifting the subject off the floor with the accompanying dangers of dynamics and/or a so-called static hold. Try to avoid the so-called static hold in all exercise. They merely invite many of the



same problems as found in the dynamics we are fleeing from.

Below, we observe the TSC pullover exercise performed in the floor. Of course, I would prefer to position the shoulders at mid-range, but we don't have many choices with the floor.



We might put some pads or small blocks under her arms to place the shoulders somewhat closer to mid-range, but then they are a hindrance—even

a danger—to the subject moving briskly between exercises.

As I repeatedly state, performing exercises on the floor are a last resort. Try to avoid this. Do not do floor exercises in the studio as a routine habit. Do it only to teach an appropriate subject how they might perform a few essential exercises on the road or at home when otherwise impossible.

Many subjects must never try to get down into the floor. It is dangerous for them to even try such a maneuver. And getting them down and then back up may endanger others—you, the instructor, or a family member.

Right, is an interesting study of positioning for TSC. In this TSC trunk extension exercise, the subject is in the most-contracted position of the trunk extensors—both the intrinsic extensors as well as the extrinsic extensors. This most-contracted position is the weakest and therefore most-safe position for this exercise. And it is certainly not a mid-range position.



Many thanks from me go to Anastasia Koretskaya (red top), Julie Sterwart (purple top) and to John Daly for their posing contributions.

[Intrinsic and extrinsic musculatures are discussed for various joints of the body in my book, *Music and Dance*.]

Not only is this most-contracted position the best position for almost all subjects performing this trunk extension exercise, it is the only approach to deeply affect these structures through exercise. And strangely, I am currently prototyping and patenting a device that will directly target the trunk extensors or the shoulder depressors depending on the subject's positional degree of trunk extension applied to the same force arm in TSC mode.

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If needed, I will update this article as more questions arise concerning positioning for TSC. Please note that this article is not intended to provide instructional or performance details for any of the mentioned exercises. These are included in my book, *Music and Dance*.