

Starting Strength

The Belt and the Deadlift

by

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Inertia is the capacity possessed by physical objects that makes them resist any change in their property of motion. “An object in motion tends to stay in motion, an object at rest tends to stay at rest,” you know, that old saying. Inertia also describes the tendency of your typical human being to continue doing exactly the same thing he’s been doing, despite the fact that a moment’s reflection might indicate that this is stupid.

I’m certainly not above the possession of a considerable quantity of inertia myself, although I try to remain open to suggestion, and to continued reflection upon my ingrained habits. I occasionally become aware of a flaw in my thinking, or lack thereof, which merits correction. When I do, I’m compelled to share The Revelation.

Today’s Revelation: Most people have no business wearing a 4-inch power belt for the deadlift. Unless you’re tall or long-waisted, a 4-inch-wide standard power belt is too wide to permit a correct lumbar position at the start of a correct deadlift.

First, the lifter’s belt provides a way to increase the effectiveness of the muscular contractions around the thoracic and abdominal cavities during a heavy lift. It works by giving the muscles around the spine something to contract against, so that they can produce a harder isometric contraction with the belt than they can without it. Like throwing a wiffle ball versus a baseball, or like learning to clean with a piece of PVC instead of a barbell, it is hard to produce force against little or no resistance. The belt provides this resistance to the trunk muscles, and the result is a harder contraction when the belt is worn.

Muscles contract along their length, and the rectus abdominis, the erector spinae, the obliques, the transversalis, and all the small muscles of the pelvic floor are no different in this respect. When they contract isometrically, they brace the skeletal components to which they are attached. The belt enhances this contractile ability.

When your abdominal muscles are not tightened, they hang in a position most graciously described as “convex outward.” They relax away from the spine in a lengthened configuration. When you contract them, they shorten, changing from slightly convex to straight, thereby reducing the volume inside the abdominal cavity somewhat. This reduction in volume results in an increase in pressure. Since your gut contents are mostly water, and since water is not very compressible, the hydrostatic/hydraulic effect of this compression acts across all the margins of the abdominal cavity, in effect stiffening the shape of the chamber.

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The belt provides a restriction to the outside diameter of the gut, and “hoop stress” (like the force applied to the iron hoops of a wooden barrel by the liquid inside) is applied around the circumference of the trunk outward and distributed across the whole belt more or less evenly. When the abdominal contraction occurs the slightly expanding muscle bellies can only expand inward due to the restricting “hoop tension” of the belt, which increases the pressure in the gut. This is why wider belts work better than narrower belts – they cover more of the gut. The belt encircles the muscles around the spine, its purpose being *to not deform at all* under the pressure, and this is why thicker belts work better than thinner belts. Unlike knee wraps or a squat suit, the belt doesn’t act on a flexing joint, storing energy in its material during flexion and giving it back during extension. **The belt doesn’t act at all – you do.**

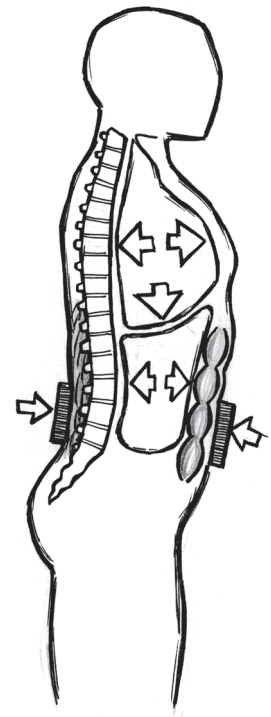
The harder muscle contraction, combined with an increase in pressure within the abdominal cavity provided by the hoop tension from the belt, and “capped” on top by the pressure effects of the Valsalva in the thoracic cavity, provide the rigidity in the trunk that makes it an effective transmitter of force to the bar.

Paul Chek and others have been fond of claiming that the belt deconditions the abdominal muscles, apparently assuming that the belt is a passive device that works all by itself. I remember seeing a rather tasteless photo slide presentation in a video clip of one of Chek’s seminars, that featured a female weightlifter losing bladder control during a clean at what was apparently the 2000 Olympics in Sydney. His claim was that her incontinence was due to wearing her belt. He was apparently unfamiliar with the actual pelvic floor anatomy, the mechanism by which the urethra remains closed, and the possible effects of childbirth, genetics, and hormones in her rather personal, and in fact relatively common, situation. The sycophantic shrieks of agreement from the gals in his front row haunt me to this day.

Anyone who thinks that any part of the trunk musculature is relaxed during a heavy deadlift, belt or no belt – well, I don’t know what to tell you. This essay is by no means a complete examination of the mechanics of belt use in strength training, but one of the ways the belt works is by allowing you to produce a harder muscular contraction against it than you can without it, and anyone who’s paid any attention to what happens under a heavy squat or pull already knows this.

A harder isometric contraction of the abdominal wall prevents any deformation or relaxation of the “pressure vessel” aspect of the system, thus preventing any dissipation of support during the lift. The combination of the harder isometric trunk muscle contraction made possible by the belt and the fact that the heavier weight you’re lifting provides more training stimulus than the lighter weight you’d be lifting otherwise, means that using the belt allows you to get stronger. Depending on your training emphasis, this is probably a good thing.

As a general rule, post-novice lifters use the belt for last warmups and work sets on heavy days, having learned how to use it correctly. Lifters with chronic back injuries may decide to use it for all sets after 135, depending on the nature of their injury. The correct use of the belt involves learning how tight it needs to be to work, experience being the only way to learn this. Too tight, and you’re stretched up too far to make an effective isometric contraction. Too loose, and there’s nothing to push against. A loose belt is merely decorative.



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Once it's tight, take a great big breath, crunch down on *everything* isometrically, forget the belt is there, and do the rep. I disagree with the recommendation to push out against the belt because, strictly followed, this motion will usually produce some degree of lumbar flexion. Better to rely on the correct belt tension and the Valsalva to allow your trunk muscles to do their job better with the feedback about contractile intensity provided by the belt.

If squats or deadlifts are performed for multiple reps, the process is repeated every rep. Presses should be reset at the bottom of each rep, depending on the style of press you're doing. Multiple reps on the bench can be performed on one breath by an experienced lifter wearing a belt.

When you put a wide belt around your natural waist, the bottom edge of the belt may drape down over your ASISs (your Anterior Superior Iliac Spines – your “hip pointers”) on your pelvis, or it may ride a little higher, depending on your natural waist length. If your ribs are close to your iliac crests, like mine, it's going to ride lower, down close to your hip crease.

In this position, when you go into hip flexion to set your back for the pull, the lower edge of the belt usually touches your upper thighs. If it's higher, it won't, and this discussion will not apply to you. But if you're shorter, or short-waisted, or you coach someone who is – and this adds up to *lots of people* – you really need to think about the effect of the belt touching your hip flexor area.

Proprioception is “the sense of the relative position of neighboring parts of the body and strength of effort being employed in movement (from Wikipedia).” Proprioception is the result of all the accumulated “telemetry” gathered about your body's position in space, and the positions of all the parts of your body as they relate to each other. This telemetry is provided to your brain by your sense of position against the floor (your feet), by the tension in your muscles, the sensations around your joints, and through seemingly mundane factors such as pressure against your skin from your clothing. For example, one of the other ways the belt works is by providing proprioceptive feedback to your abs, obliques, and erectors.

We correct high squats caused by proprioception problems all the time. If your sweats are tight on your legs, or if your very fashionable board shorts catch on your knees when you squat, they tighten more as you squat deeper, and at some point this proprioception provides erroneous data about your depth. We correct this by either pulling the sweats up higher into the crotch until the binding against thighs is diminished, or changing the lifter into stretchy sweats or shorts so that the tension from the material against the legs is gone. If tight pants are the problem – and it often is, so think about this when you train – this immediately corrects the situation.

The belt against your thighs does the same thing, but in this case it affects the very critical position of your lower back. After you take your grip on the bar, the hardest part of the deadlift setup is pulling all of the flexion out of your low back. If the lumbar spine is not locked flat in extension, the low back cannot be an efficient transmitter of force between the hips and legs and the arms. The locked lower back is what allows the force generated at the extending knees and hips to move the bar, and any change in lower back position during the pull – like any loss of rigidity in the abdominal support structures – is power lost from the system.

And if the hips lock out in extension before your rounded lower back straightens out, you're probably going to have to hitch the bar to finish the pull. A rounded *upper* back can be an advantage mechanically, by shortening the distance between the hips and the bar and by providing a more extended knee position to start the pull from, but a rounded lower back usually means a missed attempt.

When you set your lumbar spine into extension at the start of the pull, your belly moves down between your thighs, and the belt goes with it. When your back is set, the belly/belt assembly will fit between your thighs with a varying degree of tightness. But if your waist is short and the belt is too

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wide, it touches your upper thighs at the hip flexors during the process of squeezing out the last of the lumbar flexion.

This contact between belt and upper thigh provides incorrect proprioceptive information about the degree to which you have extended your back. The belt is telling your back that it is fully extended when it is not, and this can cause you to pull from a position of incomplete lumbar extension. An inadequately-set low back is not strong for a heavy pull, and is a good way to tweak your back too. I see many contest deadlifts pulled with incomplete lumbar extension using a 4-inch belt.

Some people have already figured this out. Konstantinovs pulls with his belt set in a much higher position, well off the hips. Lilliebridge too, and other examples show that this problem is being addressed, although perhaps not the best way. If the belt is to provide pressure in the abdominal cavity, it must be positioned across the lumbar, under the floating ribs, so that the center of the belt is across the center of the abdominal cavity. This creates the best pressure distribution for support of the lumbar spine.

Konstantinovs can wear his belt any way he wants to – I would never presume to tell any experienced competitor how to wear a belt – but I’m asking you to think about a different approach. I think the main problem is that too many people try to make their 4-inch squat belt work for the deadlift too. The reason: *inertia*. Just plain old never giving it any thought. It just hasn’t occurred to them that maybe the deadlift is sufficiently different from the squat mechanically that a completely different approach to the equipment might be necessary. Advanced lifters consider such details, and you should too.

The squat is quite obviously different from the deadlift. The squat starts at the top, loads eccentrically into the bottom, and rebounds back up, while the deadlift starts from the bottom concentrically. The squatter gets squeezed into the bottom of the range of motion with help from the load, while the deadlifter has to assume the hardest position of the lift unloaded, with no help from the weight at all. If the squatter wears a belt that jams up the bottom of the ROM, *good!* It aids the rebound. But the same jamming can interfere with the deadlifter’s ability to squeeze into the most efficient position to pull from, with no help from a loaded descent, creating an incomplete back-set and a power leak even before the pull begins.

Granted, a wider belt provides better abdominal containment and more uniform hoop tension than a narrower belt. But if it keeps you from getting into the correct position to pull effectively, it hardly matters that it works better for part of the job. If you can’t get set correctly, you can’t pull correctly.



The answer is to stop thinking of your squat belt as “The Belt” and start thinking of the deadlift as different movement that probably needs a different belt. A functional belt must be stiff enough that it doesn’t stretch under the tension applied to it during a heavy pull, so it still has to have some thickness. But it doesn’t need the same width as a squat belt – which was codified at 4-inch/10cm by the IPF in the early days of the organization. A belt for the deadlift works better if it fits better, and this may mean that a 3-inch, 2.5-inch, or even a 2-inch belt at a 10 to 13mm thickness works much better for you as a support that does not interfere with the set-up. And even though it is narrow, it still reinforces the pull quite well.

Right now, few makers offer a selection of narrow belts. Dean Best does, and he does a great job. If more of you ask for them, the market will respond. You may decide to deal with the issue by moving the belt up your waist, and if you’re cheap or just broke, that’s okay too. But give this some

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thought. A narrower belt for the deadlift will fit easily into your gym bag, and it might immediately help your pull.

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A version of this article originally appeared on T-Nation.com 3-31-2014

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