


## BEFORE GETTING STARTED

1. A noise one guy calls 'howling' is the same noise another guy calls 'squealing' so unless you are both hearing the noise with your own ears its better to not assume a drive belt is tight or loose based on a descriptive name over the phone or internet.
2. With due respect to everyone, its hard to guess what ten-pounds of force feels like on a drive belt for one motorcycle versus another. Most guys benefit from using a standard 10-pound single-barrel tension gauge the first few times. This avoids variables and assumptions, and candidly it makes the job go faster.
3. Again with respect to everyone, the first time someone sets-up a belt on any motorcycle, including the Warrior, its good to follow the service manual 100% so the experience gained is correct experience and not based on variables and assumptions. The service manual procedure takes longer the first time, but after doing it that way once or twice it goes faster, plus you can try other methods and still know the end-result is the same because you've experienced it by the book.
4. When you read carefully, you'll notice one service manual procedure is to have the rear wheel sitting on the ground, and another is to have it off the ground. No added rider weight is mentioned because its not necessary if all the steps are followed. Page 3-48 states: "Place the motorcycle on the side stand and or on a suitable stand so that the rear wheel is elevated." There are two slack dimensions in the Service Manual to allow for the extra slack when the wheel is off the ground. If you're only re-adjusting tension, then adjusting with the rear wheel on the ground is fine. But when you are adjusting both alignment and tension, its good to have the rear elevated.
5. The Warrior drive belt is 130-tooth, 1-1/8" wide, and 14mm pitch. Some very good aftermarket belts exist, such as the S&S X3N Drive Belt #106-0359, and others.
- 6a. Your Warrior's rear suspension could be raised, lowered, or stock ride height. So its important to hold a piece of string up against the rear axle nut, and stretch it across to the center of the front pulley nut (no need to remove the cover, just guess) and see where the swing-arm pivot pin relates to the string line. Depending on your rear suspension mods and subsequent ride height adjustments, your front pulley nut, swing-arm pivot, and rear pulley nut could all be in a straight line when your bike is on its kickstand (side stand). If they are, then your drive belt is already at its 'tight point' in the swing arm's arc. If the swing arm pivot is not in a straight line with the pulley nuts, then when the swing arm travels through its arc toward the string while riding, the drive belt will get tighter.



## Learning to Set-Up Your Warrior Drive Belt – Arizona Warrior (Rev3a)

A close look at the following pictures will help you visualize the effects of rear-suspension lowering on the swing arm pivot's relationship to the two pulleys. At stock ride height with a stock rear tire, the swing arm pivot is very slightly above a string-line pulled between the two pulleys. Lowered just one inch, the swing arm pivot drops well below the string-line, making it seem a little more important to tension the drive belt within the published tolerances.

Picture Below: stock rear ride height and tire:



Picture Below: stock rear tire with ride height lowered just one inch:



6b. Unless you've hard-tailed your rear suspension, it will fully-extend when the rear wheel is lifted off the floor and that dimension is always 100% repeatable. Notice the slightly longer slack dimension in the service manual for wheel off-the-ground to make-up this difference. If you have modified your rear suspension ride height, its wise to always adjust your drive belt tension with the rear wheel elevated using the matching slack specification. Doing this will also help you learn the 'feel' of ten pounds of tension at (example: ~8mm) deflection.

## GETTING STARTED

In a vacuum, setting belt tension is simple. Of course we are not in a vacuum because we also want to set alignment (the same adjuster screws do both). The best way to learn to do both at the same time is to start by only adjusting belt tension. So put the bike in neutral, support the front wheel if needed, then raise the entire bike or just the rear wheel off the ground with a jack. Stabilize the bike on the jack with tie-downs, then rotate the rear wheel incrementally to find the tightest spot in the belt's rotation. To find the tight spot, check the belt's slack in several places with the 10# belt tension gauge until you identify the spot where 10# on the gauge deflects the belt the smallest measured distance. That is the targeted tight-spot you will use to measure belt deflection at ten pounds of tension. I mark it with a small bit of masking tape at the point the gauge will make contact with the belt in case the rear wheel is rotated during the work. Now adjust the belt tension adjuster screws (see the manual) and when the gauge reads 10# and the belt deflects 7mm ~ 9mm with the rear wheel off the ground (fully extended suspension) then tension is correct. See the manual for how to read the slack-distance markings on the lower chain guard, or use the increments on the gauge.

Now what about belt alignment? You should read the service manual and learn to adjust alignment by-the-book. Its easy. Then, once you know how that works, here's a trick that will save you a lot of time once you understand how the outcome 'feels' as you work. So read the manual first, then while the rear wheel is off the ground anyway, spin the rear wheel forward several rotations and watch the belt's travel on the front pulley and the back pulley to be sure the edges of the drive belt stay away from the pulley edges. Then spin the wheel backwards several times and again watch the belt's travel on the front and back pulleys to be sure it still stays away from the pulley edges. Ideally, the drive belt should not rub the edges of the front pulley in either direction, although it may ride softly against one side of the rear pulley.

Follow the service manual to make alignment adjustments. You'll notice that backing-off one side by a turn then tightening the other side a turn will cause the drive belt to change its path on the front and rear pulleys. With a little practice you'll quickly find the sweet spot, and you might notice that when the belt is running nicely on the front pulley, its automatically also running nicely on the back pulley, however this isn't always the case so watch the belt's tracking on both pulleys.



Your goal is to have the belt running away from the edges of the front pulley when the wheel is rolling forward and backward, and to have the belt running at most 'soft-against' an edge of the rear pulley, all while also arriving at the correct tension while aligning. Do it once and suddenly it becomes easy. Plus, if one day you hear a noise, your mind will see the assembly working and there's things you'll know.

Once happy with alignment and tension, properly torque the adjusters, axle, and brake caliper-to-swing-arm. Adjuster Locknut torque is 11 ft/lbs, so 10" torque wrench and 2" offset Crow Foot = ~9 ft/lbs <http://www.belknaptools.com/extcalc.asp>. A torque wrench is desirable but not required for the adjusters, but is required for the axle and caliper. In any event, don't over-torque the steel threaded fasteners into their aluminum threads. Once the fasteners are tightened, take a moment to find the same tight-spot in the belts rotation and re-check that tension is still 7mm~9mm at 10-pounds with the rear wheel off the ground. Don't skip this step!

Now get the bike back on the floor without letting the rear wheel rotate so you still have the tight-spot within the gauge access area. Remember that another goal we have is to make it easy to periodically check your belt's tension with the bike on the kickstand, so take a moment right now and use the gauge to determine how much deflection you have on the ground at ten pounds and record to your service manual.

Once this is recorded, leaving the bike on the ground, bounce the bike on its suspension a couple times to free the suspension after having been off the ground, then check belt tension again. This will highlight any difference, and understanding this will be handy one day when you're riding and anxious about your belt's condition.

The next step is not necessary for accurate belt alignment and tension, but is very helpful for understanding the effects of added weight on your rear suspension, no matter if stock ride height, lowered, or raised. If you do this simple check now, you'll learn something about your bike that will serve you into the future. Ask an adult to sit on your rider seat, bike on the side stand and feet on the pegs. The person's actual weight is not important. Now duplicate your ten-pound gauge reading and record that dimension. Finally, remove the tape off the drive belt. You're finished.

## YOUR DRIVE BELT SET-UP PROCEDURE IS COMPLETE

Having set-up the belt once, in the future you'll only need to tension-and-align once, in one single step. Boom, done. Plus, once you've done that by-the-book once or twice, you'll have all the inside information you need to periodically check the belt's tension on your specific motorcycle with your specific suspension mods, even with the wheel on the ground. Plus what you learn along the way about the variables, and making assumptions, will serve you well for years as other conditions arise. As a bonus, once your fingers get used to the feel of that 10-pound belt tension, you'll be able to do this without a gauge in an emergency. Not a bad investment of time.

## THINGS TO REMEMBER ABOUT DRIVE BELTS

The factory slack specification and adjustment procedure is based on using the tightest belt condition as your starting point, so following that instruction means momentary over-tightening cannot occur even if you hot-dog some railroad tracks and completely extend the swing arm as you fly through the air. Best done off-the-ground. Procedures have benefits.

One man's squeak is another man's howl. You might find slightly different noises are created by a loose belt, a tight belt, a misaligned belt. Once you know how these procedures work in the real world, the reason for a belt noise might become clear. For example, there's a noise sometimes made by the edge of the belt running hard against the pulley edge. There's a slightly different noise when the belt rides angled against the pulley teeth, still another noise from a loose or damaged belt that is skipping across teeth, and another noise a too-tight belt makes as the belt's teeth un-compress off the pulley teeth. At some point you'll learn what noises your bike makes. But does that translate to other people's bikes? Sometimes. But sounds can differ due to the pulley or belt material composition, general condition, tension, alignment, and if its wet or dry or hot or cold. But in all cases, a belt in good condition that is correctly aligned and tensioned will run quietly, wet or dry hot or cold.

*Remember to use this information in conjunction with the service manual procedures.*

