

ADJUSTING PNEUMATIC FINGER TRACKERS

Rolls that tear on rewind are caused by a multitude of things, and seldom the geometry of the spool box or its components. I do not recommend modifying the spool box because you are tearing rolls. I also do not recommend taking off the rewind brake-- on any but the worst players with the worst tracking mechanisms. And I definitely do not recommend shortening the takeup spool! The takeup spool powers the roll through during play, and sideways force of the flanges on the takeup spool cannot straighten crooked paper that is pulling the roll through. They will only feather or tear the paper edges, making them impossible to play again.

The first thing to do is to rebuild the tracker and initially regulate it such that it will be able to be finely adjusted and to track well.

We will assume that your player has a pair of tracking fingers and that it is an air tracker. In this setup, the important finger is the one on the left. Your player would actually play most rolls well with only this finger operating, if you regulated it correctly. We are also assuming that the tracking mechanism and the tracking fingers are airtight. The way you check the airtightness is this:

1. Remove a tube off the tracking bellows and suck very lightly on the finger pad pallet. If it is airtight, then put a test tube on the bellows nipple and suck on it, clamping off the supply tube with your fingers. If you suspect a leak, blow on it and see if you can feel air or hear it escaping. Fix it first.

2. Next thing is, cover the trackerbar with tape and any other rewind holes, and watch the double bellows center itself. Does it favor one side or the other-- without the roll chuck spring? If not, you have a leak somewhere. Fix it. Do the covers get taut when one side or the other is opened with a tracking finger? That's bad. Does it move back and forth easily, without much effort? Or do you have to push a little? If it binds, fix it first. That requires new covers.

3. Do the tracking fingers open with almost no pressure, and do they close smartly, with no friction? Test it with a 3/8" wide strip of a 3" long Post-It note. Each finger should easily open. If one or the other seems harder, and bends the paper more, even them up first. They should be very lightly sprung so that just a whisper of force will open them, and they close smartly and surely each time. This is why you suck very gently on their tube to test them. You don't want your mouth vacuum closing them tighter.

4. Check the linkage from the tracking bellows to the transmission. Especially check for guides with broken wooden joints, loose glue joints that move slightly, and stripped screw holes in wood. Everything has to be precision and the guides cannot be wiggling even a tiny bit.

5. Turn on the vacuum to center the bellows pair with the fingers closed. Get a couple of leather nuts and jam them down between the leaves of the tracker bellows in order to hold that spacing

firm when you turn off the vacuum. Now if the roll chuck is operated by a cam arrangement at the transmission, set the cam to the exact center of it's travel when the bellows are centered perfectly. If you feel any sort of play or springiness, be suspect that this is going to act as lost motion.

6. Now remove the leather nuts and operate the bellows back and forth to check your adjustment. If you are too much left or right, do it again and keep adjusting maximum travel until the tracker is centered. Tighten things up now and leave it. Don't mess with that any more! If you have a problem, it should not be that problem, so don't goof up your full travel center adjustment. If you've done it right, that part will be just fine and the only problem left will be the setting of the tracking fingers to the roll, or an off-center takeup spool, or both.

NOTE: Check down the list to item 9, and make sure this will not be a problem before continuing.

7. Begin with a new roll, new roll paper, from someone who cuts a perfect roll, like the Tonnesons or Dave Saul, or Rob Deland, or any other roll you know you can trust. But it has to be brand new, with good clean holes, preferably full size holes, like a Keystone Roll (or a perfect original Ampico roll). Disconnect the air motor chain so you can drive the takeup by hand, at first. If you can disable the right hand finger, do so. Some fingers will swing out of the way with a screw adjust or you can put a thicker leather punching under its air nipple temporarily, raising the finger away from the paper edge on the right.

8. Adjust the left finger to just touch when the bass note trackerbar holes (not sustain pedal hole) are perfectly under the holes in the note sheet. A full sized hole should be aligned so that its left edge is even with the left edge of the trackerbar hole. Be careful about this. Ignore all holes to the right of the first 30 note holes. That's paper expansion or shrinkage. All tracking is done on the left side of the note sheet first. If the holes are not quite full-size, then center the holes in the paper with the trackerbar holes on the left end of the trackerbar only. Ignore the rest.

9. Spin the takeup spool and check its alignment while this is going on. And if it's off center, don't continue until you center it enough to check tracking. Then continue with the tracking fingers. Let the vacuum move the roll to the right, as the roll naturally drifts left. Now make any corrections you need to make, using just the left tracking finger on a new roll. You should see the tracker bellows making small adjustments as that roll is now powered by the air motor. If your new roll tends to drift right by nature, get another one. Nothing especially wrong with the roll. Not all new rolls are good rolls to test the tracking with, either. The left chuck spring is your player's return spring to the right during reroll. It exerts a slow restoring force and adds into the tracking centering device. The right bellows (if a vertical unit) usually drives the roll to the right.

As you watch one finger controlling the roll path, make sure the paper never goes beyond the line you've set. It cannot go further left than what you want it to go.

10. Now add in the right finger. The right finger is set when the left finger is contacted but not quite activated. Put about a paper's width distance between the right roll's edge and the right

finger to start with. Test this out thoroughly.

NOTE: Check out the alternate comments below before finishing. You will want to help your tracker to track both narrow and wide paper. This is the basis of an initial tracker setting, but not the final word. So read on down, and you will see another method that involves changing the tracking finger leather pads to enable better tracking.

11. Now with the air motor, start testing wide and narrow paper on it. If you have done this right, you will only have to adjust your right tracking finger. You should not have to adjust the left one.

12. If the roll tends to crowd the left or right flange on reroll, That means that your bellows tracker is still not centered pneumatically. It doesn't mean that the tracking fingers are wrong, but the bellows didn't come to the center where you thought they should. All tracking units are supposed to center themselves on reroll. So go back and see where it tends to naturally rest during reroll, put your leather jam nuts in that bellows while it is rerolling, without moving the leaves, and readjust the center position to that position. Leave the fingers where they are. Notice, we are working back and forth, and no particular adjustment is inviolable. You may not even be able to see yourself making a change, but it will change.

This is only one way of adjusting them. It isn't the only way, and I use a half-dozen ways to do it, but this is what I do for a living. I am telling those who do it only occasionally how they might attack the problem. For instance, I never disable the right finger, but it's best to know that the left finger is the control finger. Please do not put your takeup spool on the lathe and modify it just to get rid of a problem that may be due to a poorly adjusted tracking system.

Consider the first way correct for restored tracking systems that are perfectly airtight. But use the first 6 setup steps given and then go to a new roll and the two tracking fingers method (one way to do it). New paper rolls from a good roll company don't need a tracker. This is why we begin with paper we can rely on to adjust our tracker to, initially. Then we make small adjustments.

7a. Begin with a new perfect roll, preferably with full size holes, like Keystone or Klavier perforated for Ampicos and Duo-Arts. It doesn't matter that your piano is something else. Many players also require you to merely bend the tracking finger instead of a screw adjust. Let the air motor take the roll through very slowly as you first watch the tracking bellows to see if it's close enough to center the roll somewhat. If both fingers contacts the paper, you will have to widen the right finger. Once the paper is traveling only on the left finger, see where the paper goes. Watch the bellows also when you have the paper traveling straight and the note holes on the far left are exactly aligned with the trackerbar holes. The bellows, at this point should be almost equally centered. Don't make hasty judgments, especially at the beginning of a roll. See how it tends to travel and don't jump to conclusions.

8a. If you don't see the bellows making hardly any corrections as the paper travels along, possibly you are not close enough with the tracking finger. A very tiny adjustment inboard is all that's

needed now, to watch the bellows barely budge back and forth. If the finger has to be bent to make the adjustment, as, for instance the upright Amphion player, take a plier, snip a piece of 1/8" welding rod and epoxy it vertically, temporarily to one inside jaw of the plier. Then two more to the other jaw so the single piece is centered in-between with space when the plier is closed. That's one way to make a "bender." Now you can gently bend things, if you need something like that.

9a. Once a new roll is tracking and barely correcting itself on the left finger, bend or adjust the right finger back to within 1/64" of the right edge of the roll. (This depends on the overall width of the roll, which varies, as we said. See below about how to make the tracking more proportional).

10a. If you want the system to track wide rolls (rolls which have swollen after they were perforated), you will have to give the right finger more clearance and then allow a little extra tracking error for normal and narrow rolls. This can usually be compromised easily enough, but now is the time to start adjusting the tracking system to all sorts of old and battered rolls in your collection to see how it works, and to "tweak" it to a good compromise adjustment. Do not worry about the position of the bellows on these rolls, unless they are all travelling too far in the same direction all the time. Then your new control roll was probably tracking off to the opposite side. (See the finger pad modification, below)

11a. If, as you watch rolls being tracked, the bellows either do not center themselves on reroll or after doing so, crowd the left or right roll flange, feathering or tearing the old rolls, then your bellows alignment adjustments are either off (last case), or your tracking system isn't centering itself as it should (first case). That has to be fixed, as it is on reroll that rolls get torn up.

Note: Standard actions (which are not tracking finger actions) have a "centering spring" under their left-pushing horizontal bellows (the lower one) that's supposed to counteract the roll chuck spring and roughly center the system slowly and gently. If everything else works well, then the small flat spring under the bellows pair should be adjusted, or your roll chuck spring needs to be looked at. It might just be too strong, as it tends to drive the roll chuck end right, to "screw" on the cam blade and precess it so that rolls tend to rip on the left roll flange.

MAKING THE SYSTEM MORE RESPONSIVE TO VARYING WIDTH ROLLS

One nice little trick you can use to make trackers more "proportional" is to recover their tracking pads with a soft, long nap leather, like heavy cabretta. The long nap "cones" inside the pallet's nipple, and as it is withdrawn, it gives that side more and more air, instead of being either just on or off. What this does for you is to make a perfect tracking system for narrow and wide paper. Instead of a tracking system that just doesn't know what to do on wide rolls and which lets narrow rolls bump in between two closed tracking fingers, you will now be able to set your fingers on narrower paper (to a degree) and still track normal and wide rolls. This if

course depends on the leverages afforded by the manufacturer, too. It doesn't work on some systems as well as others.