# Training (Skewing) a Kiln, or Dryer, for Proper Thrust

***There is hardly a mechanical adjustment so simple and yet so often incorrectly made, as the training of trunnion rolls to make a cylinder "float" between the thrust rolls.***

**The Theory…**

As shown on Figure 1A & B, the principle is the same as turning a bicycle to the right or left. If you consider the trunnion shafts as the handlebars, on a bicycle, turn the shaft to go to the right the shell will go to the right. Conversely, turn the trunnion to the left the shell will go to the left. (This example assumes the shell rotation shown below)

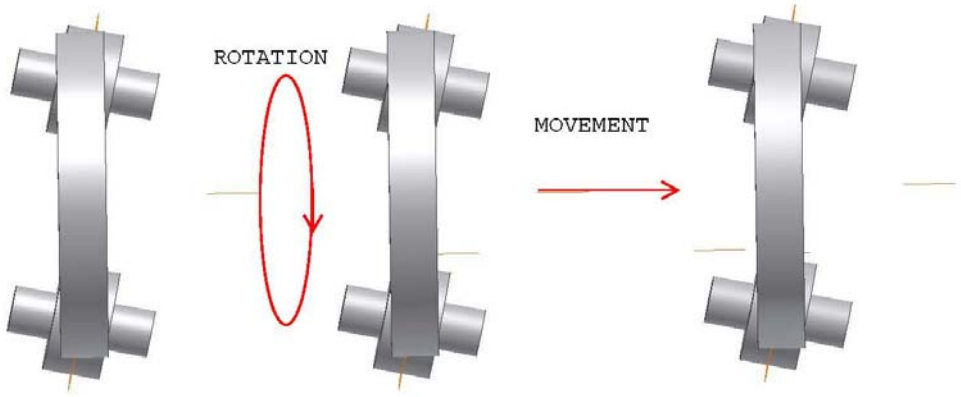


Figure 1A

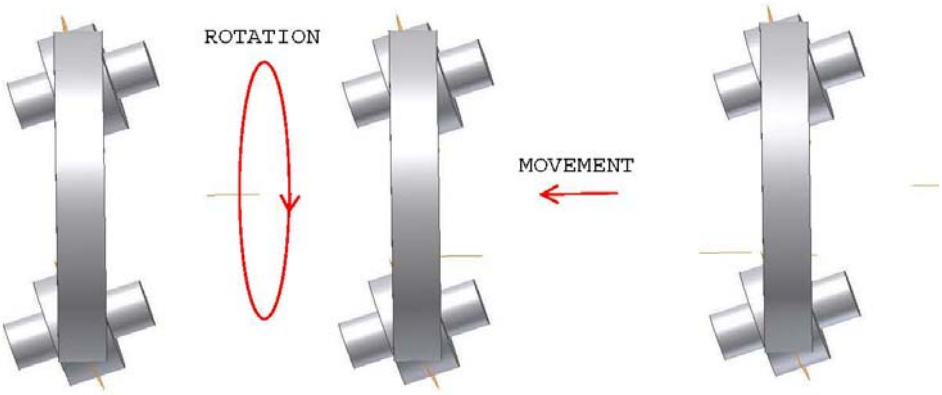


Figure 1B

Both trunnions (roller) must be turned precisely the same amount an in the same direction. The trunnions (rollers) at each tire should be moved the same amount to equalize the load on the bearings.

**Before making any adjustments the general condition of the unit must be considered:**

1) **Are the tires and or rollers tapered or cupped?** If so grinding is required prior to making adjustments.
2) **If the bearings are pillow blocks of similar design, is there enough room in the slots to make adjustments?**
3) **Are the machined surfaces of the bases clean and flat and are all bases on the same slope?**
4) **Are the bearings shimmed?** Determine why they are shimmed prior to making adjustments.

If the kiln (dryer) is on a slope, the weight of the shell, refractory, internals, tires, gear, and material being processed will exert a downhill force tending to slide the rotating parts downhill.

**If :**

WRP = the weight of the rotating parts
S = kiln (dryer) slope = in/in

**Then**, the thrust load downhill equals **F = WRP x S**

**Making adjustments…**

The first step is to put all rollers in the neutral position. That is, dimension XL and XR on Figure 2 below (both uphill and downhill shaft centers) are equally spaced from the scribed centerline on the base, namely, the centerline of the kiln, or Dryer. **Look at the contact between the tire and roller – no significant daylight should exist.**

- Loosen the adjusting screw lock-nuts on all bearings and number bearings at one tire station.
- Make sure the adjusting screw is hard up against the bearing housing.
- If it applies, take the tension off the bearing hold down bolts just enough to allow the adjusting screws to move the bearings.
- Place a dial-indicating micrometer against each bearing housing and zero in.
- Push bearings in or out approximately 0.015” in the correct direction per Figure 5A or 5B. Strike bearing housing with a light sledge to make sure the housing is against the adjusting screw. Snug down bearing hold down bolts if it applies.

- **RECORD THE MOVEMENTS- bearing number, uphill, downhill, right or left-looking uphill or downhill.**
- Repeat at each tire station.
- Now rotate the shell under power for 15 minutes and note the movement of the thrust tire relative to the thrust roller. If no movement occurs repeat the adjustment procedure.
- The amount of process material in the unit, operating temperature, and other factors will require an additional final adjustment under load.
- Under optimum conditions the thrust tire will float between the uphill and downhill thrust roll. Thrust rolls are not designed to operate at the full downhill thrust and can be damaged or catastrophically fail if the unit is not adjusted properly.

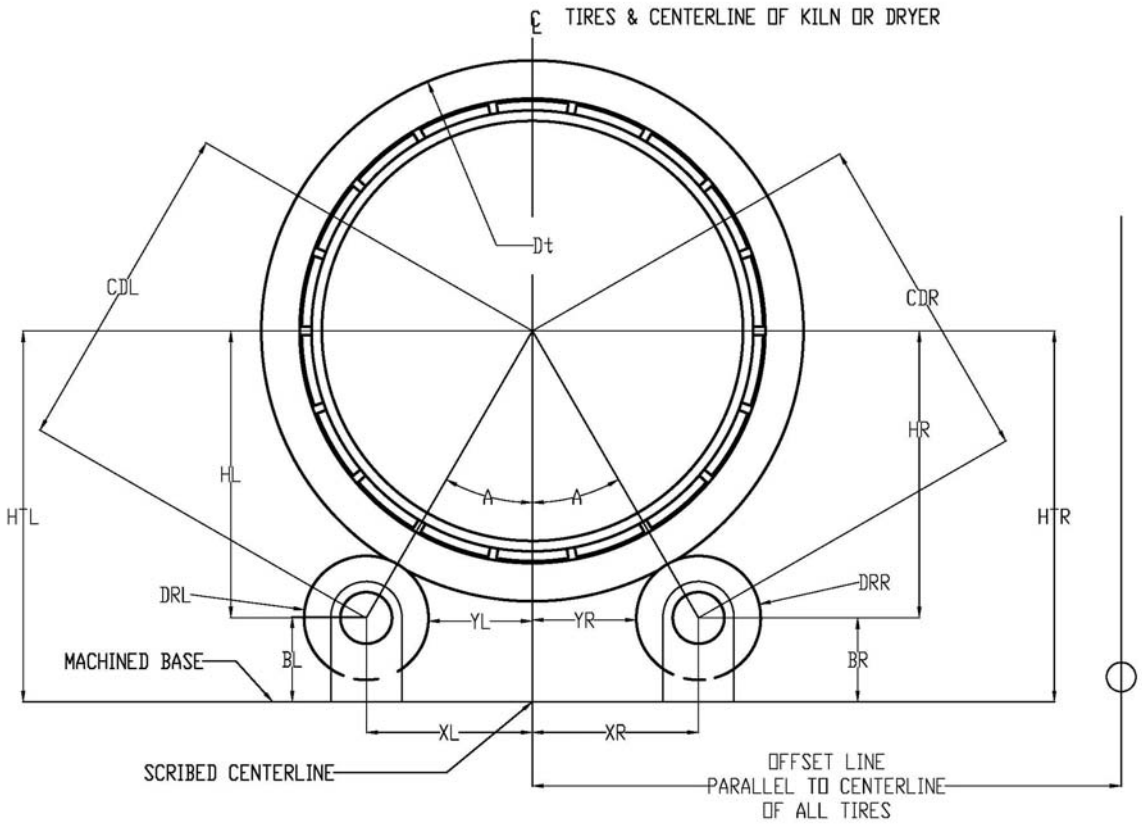


Figure 2