

Self-Aligning Conveyor Belt

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Problem Description:

- Over time, conveyors can become misaligned
- Misalignment can lead to friction, and possibly fire or explosion
- Re-aligning belts can be time consuming and dangerous

Objectives:

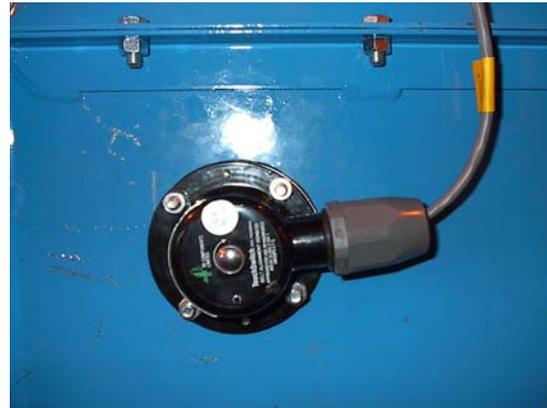
- Construct a Test Stand
- Test Grain Handling Test Stand
- Design Self-aligning system
- Install Self-aligning components
- Test functionality and effectiveness of the Self-aligning conveyor belt

Touch Switches

oThe touch switches are mounted on the boot of the elevator.

oThey are installed so that if the conveyor belt tracks too far to one side or the other, the switch will be activated.

oFrom the touch switch signals, we can determine which way the tail pulley will need to be adjusted to correct the tracking error.



Gear Motor

- The tail pulley on the boot of the elevator is adjusted with a gear motor.
- The gear motor uses the existing threaded rod take-ups to automatically move the tail pulley up or down, thereby changing the alignment of the belt.
- The gear motor is reversible to eliminate the need for adjustment on both sides.

Programmable Logic Controller (PLC)

❖A PLC is really the key component in being able to make the belt aligning process automatic.

❖The PLC receives signals from the touch switches when the belt goes out of alignment.

❖Then, the PLC communicates with the gear motor telling it to adjust the tail pulley up or down, bringing the belt back into alignment.

❖Being able to program the PLC allows us to determine how we want the touch switches and gear motor to interact, to achieve an effective and safe belt re-alignment.





Some Points to Consider

- A conveyor with a self-alignment system has a decreased chance of the belt becoming misaligned, and therefore prevents friction and heat buildup.
- Self-alignment of a belt would end the time consuming process of manual alignment, along with the safety risks associated with it.
- Keeping a belt properly aligned will extend belt life.

Possible Applications

- Horizontal Conveyors
- Bucket Elevators
- Treadmills

Who Could Benefit From This Technology?

- Grain Elevators
- Food Processors
- Stone Quarries/Cement Companies
- Farmers
- Exercise Facilities



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