



SPIRAL BELT TENSION: OPERATING GUIDELINES

Maintaining proper Belt Tension in your I.J. White System is essential for reliable, long-term operation. The type of product on the belt, the system application, the operating temperature and the system environment are all contributing factors effecting Belt Tension.

LOW TENSION DESIGN

In an I.J. WHITE Low Tension Spiral System, the Main Drive rotates the cage. Friction between the outside surface of the Vertical Cage Bars and the inside edge of the belt creates the edge friction drive which is the main driving force of the Spiral Belt. This edge friction drive along the entire length of the Spiral path limits the Belt Tension to a relatively low level regardless of the belt length. This type of drive is referred to as a Low Tension System.

Maintaining Low Belt Tension will increase System Belt Life.

The Take-Up Drive provides a positive drive to the belt as it leaves the spiral path at the Infeed or Discharge of the Spiral. The Take-Up Drive, as it pulls the belt from the spiral path, produces a slight tension or pull against the Center Cage.

PROPER BELT TENSION

Maintaining correct Spiral Belt Tension is critical for optimal system performance, and will reduce your unscheduled downtime. Proper Belt Tension has the following dramatic effects:

- Increased Spiral Belt Life
- Increased Wearstrip Life
- Reduced Loading on the Drives
- Reduced Unscheduled Downtime
- Reduced Operating Costs

HIGH BELT TENSION

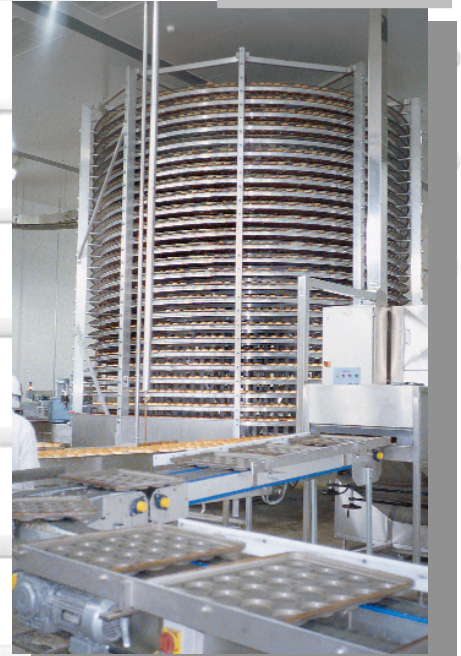
Since a Low Tension Spiral System utilizes friction to drive the belt, increased friction will increase Belt Tension. The primary cause of high Belt Tension is the increase in friction due to dirty Spiral Belts and contaminated Track and Vertical Wearstrips. Please refer to Technical Bulletin No. 1 for Cleaning Procedures.

Key Warning Signs:

- Spiral Cage is Turning, but the Belt is hardly moving
- Belt Lifting on the Outside Edge
- Belt is Tight or Rigid to the Cage
- Inside of the Belt "Christmas Treeing"
- Take-up Motor Amps are Increasing

Be aware of the following conditions.

1. Oil or Grease on the Vertical Cage Bar Wearstrips will reduce the friction between the inside edge of the Spiral Belt and the Vertical Cage Bar Wearstrips, causing high tension.
2. Abrasive materials such as flour, breadings, cornmeal, or any gummy substance such as oxidized oil or grease will build up on the Spiral Belt and eventually on the Track Wearstrip. This will increase the friction between the Spiral Belt and Track Wearstrip, and result in High Belt Tension.
3. Cleaning agents or foams that are left on the belt, Track or Vertical Cage Bar Wearstrips.
4. Worn or Rough Track or Vertical Cage Bar Wearstrips that no longer have a smooth surface.
5. Excessive belt stretch on the outside edge of the Spiral Belt caused by the belt not being flipped at regular scheduled intervals, or running under high tension for extended periods.
6. Damaged sections of belt or links that are allowed to continue to run through the Spiral System.



Try this simple test: With the Spiral "Off and Locked Out" try pulling the Spiral Belt away from the Cage by hand. It should pull away easily without much effort. If the Spiral Belt cannot be moved, if it feels extremely tight, or if it takes a lot of force to move, then the belt is most likely under High Tension.

PM Actions:

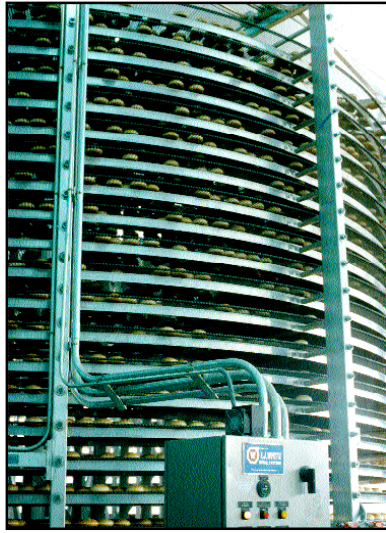
- Inspect and repair the entire belt for any damaged sections. Inspect the inside and outside edges of the belt for any broken links or protruding button heads .
- Inspect and measure the belt for any excessive stretch or elongation.
- Make sure the Vertical Cage Bar Wearstrips and Track Wearstrips are thoroughly cleaned.
- If the product generates excessive residue/oil in the Spiral, then it will be necessary to include wash down in your PM program in addition to the regular sanitation measures.

BELT TENSION

Since the Main Drive Cage travels faster than the Spiral Belt; correct Belt Tension can be determined by measuring the amount of Cage "Overdrive." This is the difference in the distance the cage moves in one revolution compared to the Spiral Belt. Overdrive can be measured as follows.

Proper Belt Tension can normally be determined by measuring the amount of Overdrive that occurs when the belt travels between two points on the spiral. The procedure to do this is:

1. Only with the system turned "OFF" and locked out, mark one of the main frame legs. Also, mark a Cage Bar adjacent to the same leg.
2. Start the spiral.
3. Wait for the marked Vertical Cage Bar to make one revolution.
4. When that Vertical Cage Bar is in line with the marked Main Frame Leg, place an object on the belt, so all 3 markers are in line.
6. Wait until the object comes around again. When it is in line with marked Main Frame Leg, turn the system "OFF" and Lock-Out.
7. Measure the distance between the object on the belt and the Vertical Cage Bar mark at the inside edge of the belt.
 - Do not measure diagonally across the belt, measure along the inside edge of the belt.
 - If space limitations preclude measurement along the inside edge, count the number of Cage Bars and multiply by their center-line distance.
8. Depending on the style of Cage Bar Wearstrip, the Overdrive measurement, in inches, should be equal to approximately:
 - Smooth Style Cage Bar Wearstrips: One (1) times the Spiral Belt width.
 - Grooved Style Cage Bar Wear Strips: One half (1/2) times the Spiral Belt width.



ADJUSTING OVERDRIVE BTC "BELT TENSION CONTROL"

FOR POWERSTATS SYSTEMS:

Never reduce the BTC below 60%. The correct range should be 60% to 90%.

If adjusting the BTC is insufficient to correct over tensioning, then a sprocket change must be made.

1. First set the BTC at 85%.
2. Only with the system turned "OFF" and locked out, remove the Take-up Drive Chain Guard.
3. Disassemble the Torque Limiter on the driven sprocket and replace with the next larger sprocket; i.e., if the driven sprocket is a 50-A-30, then replace it with a 50-A-31 and if necessary, then try the next larger sprocket.
4. Re-assemble the torque limiter and install the Chain Guard.
5. Run the Spiral and measure the Overdrive again.
6. If the Overdrive is still insufficient, then the Drive Sprocket should be changed to the next smaller sprockets.
7. If the overdrive is still not correct, please call our Technical Services Group.

FOR DUAL INVERTER CONTROL:

Please call our Technical Services Group.

SYSTEM UPGRADE PACKAGES

I.J. White Technical Service Group now offers these new Upgrade Packages that can be installed on existing systems:

- **Belt Overdrive System (BOS):** Accurately Measures system Belt Overdrive. Increase belt life and reduce system tension.
- **ABL Package:** Automatic Belt Lubrication Systems.
- **Powerwash 2000:** High Pressure Cleaning Systems.
- **Personnel Safety Alert:** Designed to protect your employees.
- **ABT System:** Designed to automatically lower belt tension.

Technical Service

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Technical Service Group

For information, call
631-293-2211
service@ijwhite.com