Eckels-Bilt

AUTOMATIC BELT TRACKERS, CONVEYOR SYSTEMS, AND SPECIALTY EQUIPMENT

7700 Harwell Street
Fort Worth, TX 76108
Telephone 817-246-4555
Fax: 817-246-7139
1-800-343-9020
www.eckelsbilt.com
HISTORY/PHILOSOPHY

Eckels-Bilt Inc. has been manufacturing automatic belt tracking systems for 40 years. Our experience began in the confection industry and has expanded over those 40 years to any industry that utilizes conveyor belts to move its products. This expansion of our customer base has required that the design of the tracker change from the original light weight electromechanical driven system, to the high strength, high durability, pneumatically driven designs of today.

Stanley Eckels, the inventor of the Eckels-Bilt Automatic Belt Tracking System, knew that “any belt could be tracked with the right tracker in the right location”. Over the years, Eckels-Bilt has developed the know how to properly place the correct tracker at the correct location. That knowledge and the basic philosophy that our job is ultimately to solve the customers’ problems, not create new ones, have led to the success of the Eckels-Bilt automatic belt tracker.

Eckels-Bilt backs its knowledge with a money back guarantee. “Eckels-Bilt Automatic Belt Trackers will track your customer’s belt to within their specification, or they can return the complete unit with a full refund.” We do reserve the right to inspect the unit before return to determine if the unit was installed properly.
WHY CHOOSE ECKELS-BILT AUTOMATIC BELT TRACKERS

- Eckels-Bilt belt trackers save time, save money, and increase productivity by:
  - Increasing belt life
  - Reducing manpower and downtime for belt monitoring, adjustment, and replacement
  - Reducing conveyor cleaning time
  - Decreasing product loss
  - Extending conveyor life by eliminating belt mistracking

- We have successfully tracked:
  - Wide belts - 220” wide
  - Narrow belts - 2” wide
  - Metal mesh belts
  - Solid metal bands
  - Thick belts - 1” thick
  - Thin belts - .006”
  - Dough sheets - .009” thick
  - Short conveyors - 12”
  - Long conveyors - 750 ft
  - High speed - 1500 fpm
  - Low speed - 1” per minute
  - High temperature - 600 degrees F
  - Low temperature - 20 degrees F below zero
  - Reversing conveyors
• Eckels-Bilt belt trackers are the most widely used automatic belt trackers

Industries using our Automatic Tracking System

• Candy
• Baking and Snack
• Automotive
• Tire
• Wood and Paper Products
• Cement
• Plastics
• Non-woven
• Foam
• Metal Stamping and fabrication
• Fiber Glass
• Brick
• Glass
• Cereal and Food Items
• Building Products
• Chemical
• Electronic
• De-Watering
• Medical and Pharmaceutical
• Sporting Equipment
• Pet Food
• Light Bulbs
• Rubber
• Packaging
• Soap
• Candles
• Tobacco
• Produce
• Textiles
• Candles
• Adhesives and Glues
BELT TRACKER OPERATION

The Eckels-Bilt automatic belt tracker is a pneumatically actuated active tracking system. **An active tracking system is in constant control of the belt.** Typical tracking tolerance is plus or minus 1/16” to 1/4” at the end pulleys/ nose bar.

**Sensor**

A single sensor is utilized to sense the edge of the belt. The belt will run plus or minus 1/8 to 1/2 inch from the position of the sensor during operation.

- Standard sensor: 1-1/2” wide paddle operating a mechanical valve
- Other options: 3/16” diameter rod (for light weight belts)
  - 4” paddle (for heavy and metal belts)
  - Photo electric eye operating a solenoid valve

**Tracking Rollers**

The actuator shifts the tracking roller(s) back and forth in a line parallel to the belt direction. This creates an angle between the roller(s) and the conveyor belt. The wrap of the belt over the tracking rollers along with friction, belt tension, and roller angle generate tracking forces in the plane of the belt. The belt is actually “steered” by **traction forces** rather than edge forces or differential tension forces that cause belt edge damage and uneven stretching of the belt.

**Single Cylinder- Single Sensor Operation (Most Common)**

The air cylinder has two positions that correspond to the two positions of the sensor valve. Either extended or retracted. This skews the rollers to either bring the belt toward the sensor or push it away from the sensor. When the belt is not pushing the paddle the valve is not activated and the cylinder will be in the retracted position. This causes rollers to be skewed to bring the belt towards the sensor paddle as shown in Figure 1. When the belt hits the sensor paddle, the valve is activated causing the air cylinder to extend. This skews the rollers in the other direction and the belt responds by moving away from the sensor as shown in Figure 2. The tracker will continue this cycle as the belt moves on and off of the sensor paddle.
Figure 1: The belt is not pushing on the paddle and the valve is not activated; therefore the air cylinder is retracted and rollers are skewed to bring the belt towards the sensor paddle.

Figure 2: The belt is pushing on the paddle so that the sensor valve is activated; therefore the air cylinder is extended and rollers are skewed in a position to direct the belt away from the sensor paddle.
The frequency of this cycle will vary depending upon the belt speed and the response of the belt to the tracking forces. In general, the frequency will range from 1 to 5 cycles in a fifteen-second-time period.

**FAQ:** Does the air cylinder wear out quickly due to the constant cycling?

The Eckels-Bilt belt tracker utilizes a tie-rod type air cylinder. These air cylinders are designed for cyclic type motion. With clean, dry air and a slight amount of lightweight oil, these cylinders will operate for years.

**Leverage**
Leverage is the key ingredient in creating the tracking power required to overcome mistracking forces. That is why location of the belt tracker is so critical. A more specific discussion of location is given in the next section. Generally, leverage is created by locating the tracker as far as possible from other conveyor rollers that have any amount of belt wrap.

Eckels-Bilt engineers can quickly determine the proper location for the belt tracker to achieve maximum tracking power.

**Tracking Tolerance**
In most applications, the belt will move laterally at the tracker plus or minus 1/4 to 3/4 inches. This will translate to plus or minus 1/16 to 1/8 inch at the in-feed roller. These values can change depending on sensor type and other conveyor variables. It is best to find out what your customer’s needs are, i.e. pinpoint accuracy, or keep the belt on the conveyor.

**Other Modes of Operation**

**Dual Cylinder-Single Sensor:**
For special applications conveyor belt trackers will have an air cylinder on both sides of the tracker to increase stroke capabilities. This setup works like the single side setup but with an air cylinder on each side of the tracker. The air cylinders act in opposite directions to increase the amount of roller skew. The advantage to the dual cylinder setup is more tracking force.

**Dual Cylinder-Dual Sensor:**
The dual system has a cylinder and a sensor on each side of the conveyor belt. Each air cylinder has two positions, extended or retracted. If the conveyor belt moves to one side, contacting one of the sensor paddles, the air
cylinder activates creating a skew angle with the rollers. This will cause the conveyor belt to move away from the paddle and when it comes off the paddle the tracker will skew the rollers back to a neutral position. This tracker setup maintains the conveyor belt between two set sensor paddle positions.

**The advantages of each system are:**

- The Single Cylinder-Single Sensor setup offers tighter tracking.
- The Dual Cylinder-Single Sensor setup offers tight tracking with more available stroke or tracking force.
- The Dual Cylinder-Dual Sensor setup offers less active cylinder movement with a neutral position. However this setup does not track as tight as the single sensor setups because the belt is allowed to move between the two sensors.
A good rule of thumb for locating a belt tracker on the conveyor is “feed the conveyor a tracked belt”. This means that the belt must be tracked on the return side before the in-feed roller.

If the conveyor is long (75 feet or longer) or exact tracking of the discharge end is required, a second tracker for the discharge end is recommended.

**NOTE:** You cannot track a belt upstream against a live discharge roller. You can track upstream against a non-rolling dead nose bar.

Being able to properly control a belt is about more than having a tracker. Having the correct tracker placed in the correct position is critical. The first place we look to put a tracker is generally 1-2 belt widths before the tail pulley on the return side of the belt as long as there is more than 1-2 belt widths behind the tracker.
2\textsuperscript{nd} Location

Use if:
- Conveyor is over 80’ long

3\textsuperscript{rd} Location

Use if:
- Conveyor is over 80’ long
- Product delivery tracker will not work
- Must have dead nose bar at discharge end

Must be a dead roller
Eckels-Bilt has developed many different models of belt trackers to address the multitude of applications in the conveyor industry. All of our models fall into four basic types of trackers defined by the number of rollers. These types are:

- Single roll trackers
- Two roll trackers
- Three roll trackers
- Four roll trackers

**Three Roll and Two Roll Trackers**

- Three and two roll trackers are generally used as infeed belt trackers
- The three roll is preferred over the two roll whenever possible.  
  ✓ Roller forces are balanced up and down on the tracking unit resulting in less wear and tear over time.  
  ✓ Higher tracking forces with less stroke
- Advantages of the two-roll tracker  
  ✓ Requires less space  
  ✓ Offers different belt path through tracker
- Generally located a minimum of one belt width back from the tail pulley

**Single roll trackers**

- Usually used for discharge end tracking
- Located on the return side after a dead nose bar
- On product side at a break over (10-20 feet back from discharge)

**Four roll tracker**

- Product delivery side tracker
- Located 10-20 feet back from discharge
- Use weight of belt and product to create tracking forces
- Best method for tracking the discharge end of long conveyors

**Material options**

- Side plates: Stainless steel or painted carbon
- Rollers: Carbon or stainless steel
**Standard equipment:**
All Eckels-Bilt trackers come with the following equipment:
- Tracker assembly with air cylinder
- Rollers
- Filter/regulator unit
- Sensor unit
- Installation instructions

**Air Requirements**
Light duty and standard duty trackers: 0.15 cfm at 40 psi
Heavy duty trackers: 0.60 cfm at 60 psi

**Reversing option**
All Eckels-Bilt trackers can be operated on reversing conveyors by including a reversing solenoid valve into the pneumatics. The reversing switch on the conveyor activates this reversing solenoid.
NOTE: The location of a belt tracker is usually different for conveyors with reversing than for single direction conveyors. It is important that you inform Eckels-Bilt of the reversing capability when providing conveyor information.

Specific tracker applications

- Wash down Trackers
  - All stainless steel construction
  - Stainless steel bearings
  - Round Body stainless steel air cylinder with stainless steel rod

We offer three levels of wash down.

1. **Light Wash Down**: Stainless steel construction with internal bearing rollers. Comes standard with a standard aluminum body air cylinder and carbon internal bearing inserts with an option to upgrade to stainless steel bearing inserts.

2. **Medium Duty Washdown**: Stainless steel bearings, sealed journal rollers, and stainless steel construction.

3. **Full Wash Down**: Stainless steel, round body, wash down air cylinder, stainless steel bearings, sealed journal rollers, and stainless steel construction.

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<thead>
<tr>
<th>Wash Down Levels</th>
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<tbody>
<tr>
<td>• Internal roller bearing with dead axle</td>
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<tr>
<td>• Used for light spray or hand wash applications</td>
</tr>
<tr>
<td>• Sealed rollers with live axle with mounted bearings</td>
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<tr>
<td>• Used for heavy spray (water only)</td>
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<tr>
<td>• Aluminum square body cylinder</td>
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<tr>
<td>• Stainless steel round body cylinder</td>
</tr>
<tr>
<td>• Used for heavy caustic spray/sanitation areas</td>
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- Oven mesh and solid steel band trackers
  - ✓ In-feed and discharge trackers available
  - ✓ Center roller on the in-feed tracker is adjustable to optimize tracking forces.
  - ✓ High temperature upgrades available

Eckels-Bilt can also design custom model to meet any specific requirements that you or your customer may have.
Send us following information to have an Eckels-Bilt engineer select the right tracking solution for your application

➢ Drawings
  ➢ CAD Drawings (SolidWorks/.stp or Autocad 2006 or earlier .dwg format)
  Or
  ➢ Dimensioned Sketch of Belt Path Showing the Following Components
    • Length of conveyor
    • Drive location
    • Location and size of major rollers
    • End views or cross sections showing frame width/construction

➢ Application Information
  ➢ Conveyor Information
    • Product being conveyed ___________________________
    • Conveyor length ___________________________
    • Infeed End (Tail) : Live nose bar □ Dead nose bar □ Roller □
    • Discharge End (Head) : Live nose bar □ Dead nose bar □ Roller □
    • Slider bed □ Roller bed □ Troughed □
    • Bi-directional □
  ➢ Belt
    • Type of belt ___________________________
    • Splice ___________________________
    • Belt width ___________________________
    • Thickness ___________________________
    • Speed ___________________________
  ➢ Environment
    • Temperature of carrying surface of belt ___________________________
    • Temperature of return surface of belt ___________________________
    • Wet □ Dry □
    • Cleaning practices: Light wash □ Heavy wash □ Chemical wash □ N/A □
    • USDA compliant □ FDA compliant □
    • Indoor □ Outdoor □
    • Corrosive □

➢ Additional Comments