



# THE SCOOP

ISSUE 7 WINTER 2003

## Bucket Elevators... Exposing some myths II



In the last issue we talked about the head discharge area of a bucket elevator. For this issue we will look at the other problem area, the boot or inlet section.

A common misconception about bucket elevators is that there are different forces at work in the boot... it isn't so. Centrifugal forces are acting on the buckets rounding the bottom pulley in the same manner as the head pulley. In the "Centrifugal" discharging elevator this is counter to what we actually want to happen, these forces work against "loading" the elevator buckets.

The situation is not so pronounced in the "Gravity" discharge model, but never the less the same forces will be acting on the bucket rounding the boot pulley or sprocket as it does in the head. Also, it is often the case that a smaller diameter pulley or sprocket is used at the bottom, which will in fact increase the centrifugal force above that found at the head.

To have the elevator perform efficiently, we need to overcome this and force-feed the product into the buckets, and because elevators can be fed "up-side" or "down-side", this is not always as easy as it may seem. Additionally, other factors can affect the ability of the bucket to pick up the material in the boot, these are:

**Type of bucket. • Bucket spacing... closeness. • Belt or chain speed. • Boot design. • Product being elevated.**

There are two feed positions available in a bucket elevator, "Up-leg" or front feed and "Down-leg" or back feed. Sometimes these feeding positions are chosen, as an example for a specific material and sometimes due to orientation there is no choice.

### "Up-leg" feeding

Ideally, the buckets should be fed on the straight part of the belt or chain, above the horizontal center line of the shaft where no centrifugal forces are acting. To do this the inlet pocket must be placed in a suitable position as to chute the material directly into the ascending buckets. 4B generally recommends that the pocket is placed a certain related dimension above the center line of the boot shaft. Contact us for help with your specific application.

### "Down-leg" feeding

The down-leg inlet pocket should be placed high enough in order to flood the material across the elevator boot, to the up-side, but not so high as to cause problems with material becoming trapped between the belt and the pulley or sprocket and chain. When feeding a bucket elevator like this, on the down-side, it should be expected that a small percentage reduction in capacity may occur.

It is important to understand that what we have discussed here is very general in nature. If you have any questions about this article or have problems with a specific bucket elevator, we encourage you to contact us at 4B.

*Note: If you did not have the opportunity to read the first issue of "Bucket Elevators"... Exposing some myths (Head Discharge), back issues are available by contacting Mark Middleton at 309-698-5611 or visit our web site at <http://www.go4b.com>*

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Please call for in-depth product information, or visit our website at:

# [www.go4b.com](http://www.go4b.com)

## Employee Profile



**Amy Crotts**  
Administrative  
Assistant

Hi, my name is Amy Crotts, and I have been with 4B for 5 years. I graduated from East Peoria Community High School in 1996 and am currently attending various computer courses at Illinois Central College in order to fulfill my career goals. In my spare time I enjoy going on the occasional "Harley" ride, shopping, spending time with friends and doing home improvements around the house. During the spring and summertime, you can catch me traveling around the US to see my favorite band, Widespread Panic, jamming to the ears of sold out shows. +



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with us!**

# Looking For Stainless Steel Elevator Bolts? Look no further!

4B Components is your one stop source for stainless steel elevator bolts and hardware. All our stainless steel elevator bolts are manufactured from high tensile strength coil, per ANSI/ASME B18.5-1978 standard, and threaded UNC.

The head diameters are held to exacting tolerance, and are designed for maximum anti pull through strengths for today's thinner belts. 4B stainless steel bolts are manufactured in all popular sizes from 1/4" x 1" up to 5/16" x 2" and are available from stock. Look for 3/8" diameters to be introduced in the near future, as well as the ever popular "fanged" style.

In recent years, many users have chosen not to use stainless bolts and hardware because of higher costs. You won't find the 4B bolts to be overpriced! They are attractively affordable for your application. If your elevator legs are handling materials such as fertilizers, salts and chemicals, and you require corrosion resistant components, installing stainless

steel bolts and hardware in leg buckets and belts can save you costly down time. Carbon steel bolts in these environments will rust and corrode, which can cause bolts to become loose, allowing buckets to escape the belt, creating expensive down time maintenance. Dollar for dollar, you will be ahead of the game when you select 4B stainless steel bolts.

And if you are real creative, elevator bolts are not necessarily used just for industrial purposes. We have supplied these bolts to the furniture manufacturing business and have even supplied these for manufacturing entertainment pieces, such as rare but unique, chess game pawns. How about that for creativity!

Give 4B a call when you need stainless steel bolts, we "outshine" the competition on pricing and availability, and you will be pleasantly surprised with affordability. +

See everyone  
in Columbus  
March 2,3&4  
Booth #405-407



### 2003 DEDICATED TRADE SHOWS

Show	Location	Date	Booth #
IL GRAIN & FEED	ST. LOUIS, MO	FEB.16-18	20
SME Booth	CINCINNATI, OH	FEB. 24-26	612
GEAPS Booth	COLOMBUS, OH	MAR. 2-4	405-407
AFIA AGRO.	GUADALAJARA, MEXICO	MAR. 4-9	629
AFIA FEED SHOW	MINNEAPOLIS, MN	MAY 5-7	828

## 4B Introduces new Magnetic Division.

4B Components Ltd. has increased its product range to include Magnets! Magnetic separation equipment has been supplied to the Food industry since the early 1940's and is used to eliminate the hazardous metal contamination being present in the product. It provides producers with security against repairs to expensive process equipment, costly waste or rejected product and damage to reputation. Regardless of your manufacturing or processing technique, there is a magnetic separator available to suit your requirements.

Please call Mark Middleton at 4B for all your magnetic questions.

**Applications include: removing tramp metal from**

**Flour milling • pet food • pharmaceutical • milk formula • cereal and other grain handling.**



# European ATEX approval "Atmospheres EXplosives"



ATEX-100A-Directive (94/9/EC): "Equipment and protective systems intended for use in potentially explosive atmospheres"

Just as the US and Canada have standards for electrical and electronic equipment for use in hazardous locations, so do countries in Europe. However, unlike the US and Canada, there is now a single harmonized standard for all of the countries in the European Union. This standard is ATEX-100A and it goes into effect on July 1st 2003. From this date, only ATEX approved equipment can be sold or installed.

As a major supplier of electronic equipment to the European market, 4B Components has many products already approved to ATEX and many more products in the process of being approved. If there is a project in Europe please contact 4B for all your electronic hazard, speed and level monitoring requirements.



*A subsidiary division of 4B in France*

Employees at the 4B Setem office pictured below are listed from left to right: Gérard Caffin, Eric Sara, Brigitte Bailleul, Laurent Pirez, Dominique Prevost, Antoine Vandemoortele, Nicholas Braime, Bénédicte Tirmant and Laurent Duval



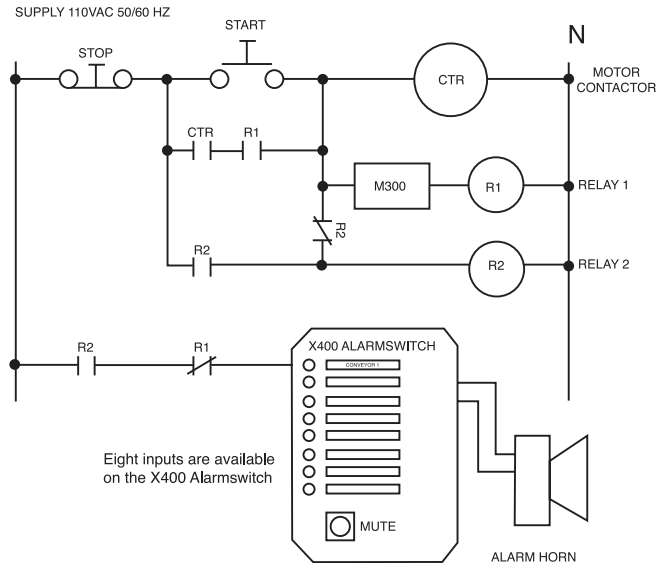
## SPARKY'S SHOCKERS



**Johnny Wheat**  
Vice President  
Electronic Products

**Question:** I am using your M300 Slipswitches to monitor the belts in my enclosed belt conveyors for slippage. I have the M300's wired to automatically shutdown the conveyors at 20% slippage and they work great. The problem is that my operators have no indication that the M300 has stopped the conveyor. Is there a product I could install that would let them know that the belt was slipping and the M300 had shutdown the conveyor?

**Answer:** If you connect your M300's as shown in the wiring schematic below and use an X400 Alarmswitch then whenever the M300 shuts down the conveyor, the Alarm horn connected to the X400 will sound and the lamp on the X400 will illuminate. When the X400 mute push button is pressed then the alarm horn will stop sounding and the lamp on the X400 will flash to indicate that the belt had been slipping. Up to eight (8) M300's could be connected to one X400 Alarmswitch.



The relay R1 is held in during normal operation. If the speed falls by 20% or more the relay R1 will drop out, the machine will stop and there will be an input to the X400. The alarm lamp for the X400 input will turn on & the alarm horn will sound. The horn can be muted by pressing the push button on the X400 (or via an external push button if installed.) When muted, the alarm lamp will flash to indicate that the machine had a slowdown. The flashing lamp will stop when the machine is re-started



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