

## WARRANTY INFORMATION

### 1. EXCLUSIVE WRITTEN LIMITED WARRANTY

ALL PRODUCTS SOLD ARE WARRANTED BY THE COMPANY (4B COMPONENTS LIMITED, (4B) BRAIME ELEVATOR COMPONENTS LIMITED, AND (4B) S.E.T.E.M. Sarl HEREIN AFTER REFERRED TO AS 4B TO THE ORIGINAL PURCHASER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE (1) YEAR AFTER DATE OF PURCHASE FROM 4B. ANY PRODUCT DETERMINED BY 4B AT ITS SOLE DISCRETION TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO A 4B BRANCH OR AUTHORIZED SERVICE LOCATION, AS 4B DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT 4B'S OPTION.

### 2. DISCLAIMER OF IMPLIED WARRANTY

NO WARRANTY OR AFFIRMATION OF FACT, EXPRESSED OR IMPLIED, OTHER THAN AS SET FORTH IN THE EXCLUSIVE WRITTEN LIMITED WARRANTY STATEMENT ABOVE IS MADE OR AUTHORIZED BY 4B. 4B SPECIFICALLY DISCLAIMS ANY LIABILITY FOR PRODUCT DEFECT CLAIMS THAT ARE DUE TO PRODUCT MISUSE, ABUSE OR MISAPPLICATIONS, AS AUTHORIZED BY LAW, 4B SPECIFICALLY DISCLAIMS ALL WARRANTIES THAT THE PRODUCT IS FIT OR MERCHANTABLE FOR A PARTICULAR PURPOSE.

### 3. NO WARRANTY "BY SAMPLE OR EXAMPLE"

ALTHOUGH 4B HAS USED REASONABLE EFFORTS TO ACCURATELY ILLUSTRATE AND DESCRIBE THE PRODUCTS IN ITS CATALOGS, LITERATURE, AND WEBSITES, SUCH ILLUSTRATIONS AND DESCRIPTIONS ARE FOR THE SOLE PURPOSE OF PRODUCT IDENTIFICATION AND DO NOT EXPRESS OR IMPLY A WARRANTY AFFIRMATION OF FACT, OF ANY KIND OR A WARRANTY OR AFFIRMATION OF FACT THAT THE PRODUCTS WILL CONFORM TO THEIR RESPECTIVE ILLUSTRATIONS OR DESCRIPTIONS. 4B EXPRESSLY DISCLAIMS ANY WARRANTY OR AFFIRMATION OF FACT, EXPRESSED OR IMPLIED, OTHER THAN AS SET FORTH IN THE EXCLUSIVE WRITTEN LIMITED WARRANTY STATEMENT ABOVE, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

### 4. LIMITATION OF DAMAGES

ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES, OR FOR LOSS OF PROFIT WHETHER DIRECT OR INDIRECT, IS EXPRESSLY DISCLAIMED.



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## Touchswitch™ BELT MISALIGNMENT SENSOR



U.S. Patent #6,731,219  
Other Patents Pending



### INSTALLATION INSTRUCTIONS

## OPERATION MANUAL

BELT MISALIGNMENT SENSOR - PART NO. TS2V4C & TS2V3C

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

Dear 4B Customer:

Congratulations on your purchase. 4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

### ***SAFETY NOTICE TO OUR CUSTOMERS***

- A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.
- B. All installation and wiring must be in accordance with Local and National Electrical Codes and other standards applicable to your industry. (Please see the article "Hazard Monitoring Equipment Selection, Installation and Maintenance" at [www.go4b.com](http://www.go4b.com).) The installation of the wiring should be undertaken by an experienced and qualified professional electrician. Failure to correctly wire any product and/or machinery can result in the product or machine failing to operate as intended, and can defeat its design function.
- C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.
- D. Please see the last page of this manual for all warranty information regarding this product.

### ***CUSTOMER SAFETY RESPONSIBILITIES***

#### **1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT**

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product.

#### **2. YOU BEST UNDERSTAND YOUR NEEDS**

Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please call the 24-hour hotline at 309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.



### 3. SELECT A QUALIFIED AND COMPETENT INSTALLER

Correct installation of the product is important for safety and performance. If you have not asked 4B to perform the installation of the unit on your behalf, it is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent electrical installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with Local and National Electrical Codes, all relevant OSHA Regulations, as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

### 4. ESTABLISH AND FOLLOW A REGULAR MAINTENANCE AND INSPECTION SCHEDULE FOR YOUR 4B PRODUCTS

You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

### 5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call the free 24-hour hotline number (309-698-5611).

### 6. SERVICE REQUEST

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request via fax (309-698-5615), email (4b-usa@go4b.com), or call us via our 24-hour hotline number in the USA (309-698-5611). Please have available product part numbers, serial numbers, and approximate date of installation. In order to assist you, after the product has been placed into service, complete the online product registration section which is accessed via our website [www.go4b.com](http://www.go4b.com).

## GENERAL

The Touchswitch™ from 4B is an electronic limit switch with no moving parts. When a belt misaligns or a pulley moves over and contacts the sensor, the built in solid-state electronic circuitry detects the lateral force of the belt or pulley and activates a voltage free relay contact. This relay contact is used to immediately alarm and shutdown the machine. The face of the sensor is made from hardened stainless steel, so that there is no wear when a belt contacts it. The sensor is not affected by dust or material build up and will still work when completely covered by material. Sensors are normally installed in pairs on opposite sides of the machine. Usually a pair of sensors at each pulley is used, but additional pairs can be installed as required. An external test knob allows for quick and simple sensor / system testing.

## WARNING

- ROTATING MACHINERY CAN CAUSE SERIOUS INJURY OR DEATH.
- ALWAYS LOCKOUT AND TAGOUT THE MACHINE PRIOR TO INSTALLATION.

## INSTALLATION

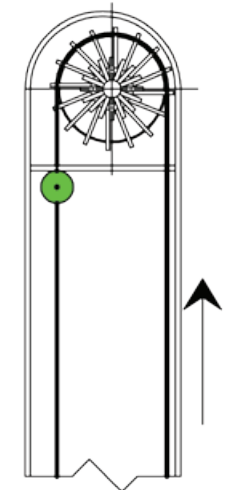
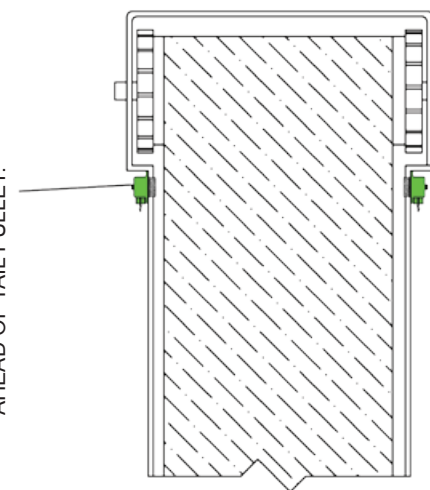
The following are guidelines and suggestions for installing Touchswitches. The installer must take responsibility that the Touchswitches are mounted in a position to be able to detect a belt misalignment condition and or a pulley misalignment condition, whichever it may be.

The Touchswitch hole should be cut into the housing with a 2-1/4" hole saw, centered on the edge of the belt. The hole should be cleaned and de-burred to avoid the Touchswitch puck binding and giving false misalignment alarms. You can mount the Touchswitch with 2 of the 4 flange holes, provided they are across from one another. The Touchswitch needs to be mounted on a flat surface, preferably with the conduit entrance (1/2") at the 3 o'clock to 9 o'clock position to minimize the entrance of water thru the conduit threads. Use 1/4" x 1-1/4" round head machine bolts with lock washers to mount them with the round head inside the leg or conveyor housing, there shall not be any screws or bolts sticking inside of the leg or conveyor housing. When placing flange shims on Touchswitch make certain belt and or pulley contacts Touchswitch face before it can contact any internal surface of leg or conveyor housing. It is best not to be any further away from the pulley than 1- 1/4 to 1-1/2" to the face of the Touchswitch. Make certain both sides are the same distance from pulley.

When mounting on the head section of a leg or belt conveyor try to catch the belt and the pulley. On a leg mount Touchswitch above the center line of the head shaft on the discharge side of the pulley when possible. Sometimes this is not possible due to inspection doors or X-pacs etc. They can be mounted on the top or up side of the head pulley if these are encountered. Try to mount Touchswitches so they are accessible from the head section walkway. Be sure to mount Touchswitches straight across from one another. On a conveyor head section mount Touchswitches forward of the head shaft in order to catch the head pulley and belt if either should become misaligned. On a leg boot mount Touchswitch on the up side of the tail pulley if there are no obstructions. If obstructions are encountered the down side of the pulley will work but be sure to have the switches mounted directly across from one another. When mounting on the boot of a leg, mount Touchswitch above center line of boot shaft at the boot shaft's highest possible position. Note where the shaft is, measure how much higher it can possibly travel or be adjusted, mount Touchswitch that much higher than the shaft is sitting. You will not be able to catch the leg boot pulley in all positions with a Touchswitch. On enclosed belt conveyor tail sections mount Touchswitches to catch top side of belt on movable section just in front of vertical angle just ahead of tail pulley. You will not be able to catch the tail pulley with a Touchswitch on a enclosed belt conveyor due to the flippers on the pulley. Some tail sections have a stud welded to the side of housing just outside of the flippers to mount a lug type temperature sensor. When installing Touchswitches on the tail section of enclosed belt conveyors some tail section adjustment will be sacrificed.

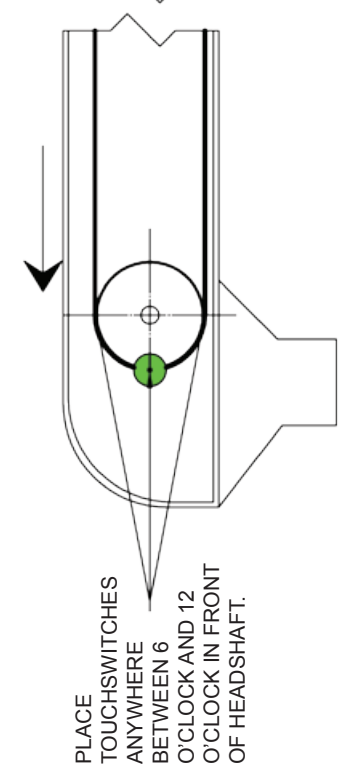
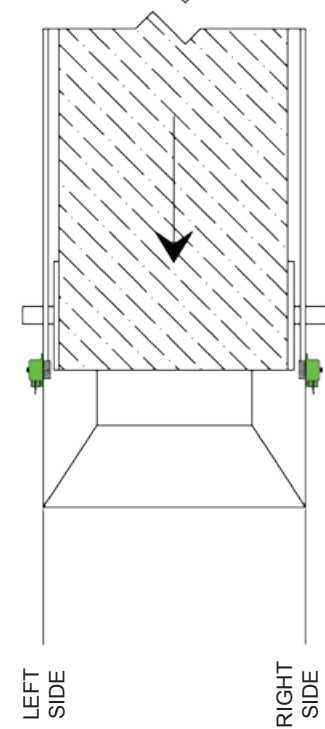
## TYPICAL TOUCHSWITCH MOUNTING POSITIONS ON AN ENCLOSED BELT CONVEYOR:

ON HIGH ROLLER TAIL SECTION MOUNT TOUCHSWITCHES ALIGNED WITH TOP SIDE OF BELT ON MOVEABLE SECTION JUST IN FRONT OF VERTICAL ANGLE AHEAD OF TAIL PULLEY.



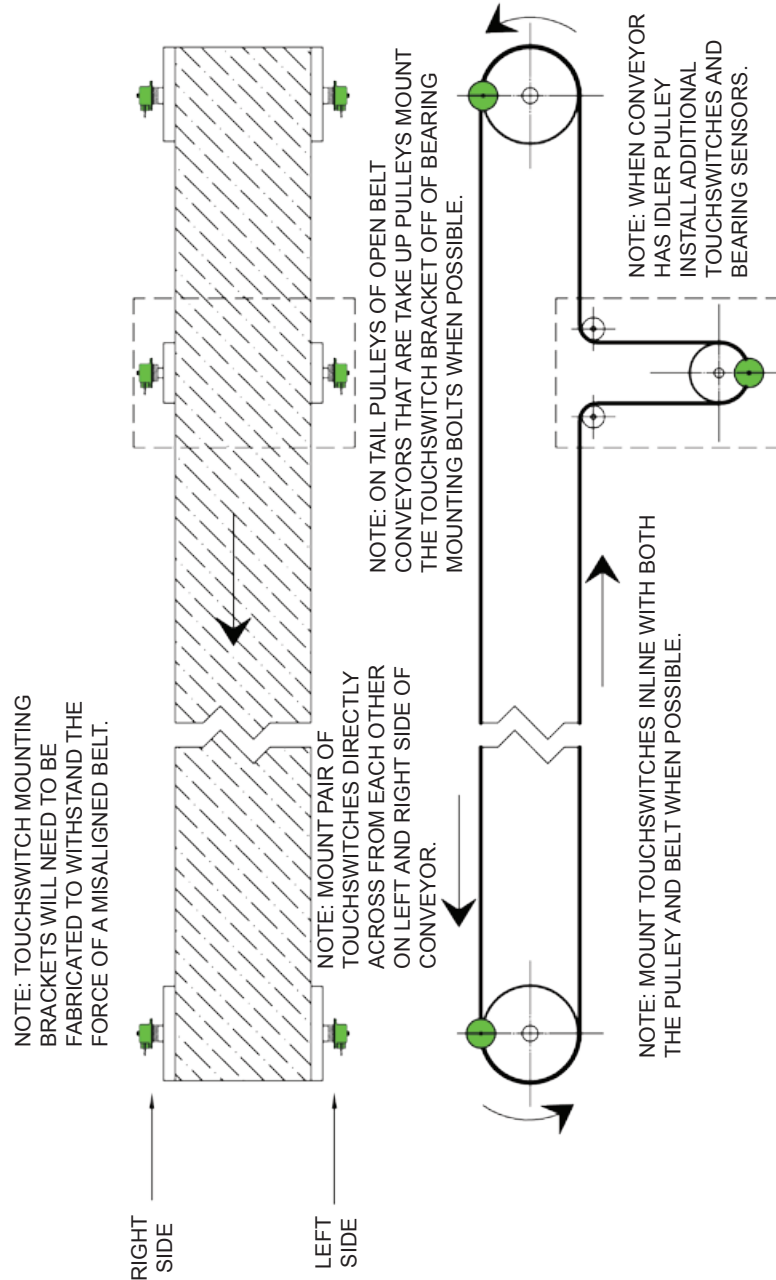
NOTE: MOUNT PAIR OF TOUCHSWITCHES DIRECTLY ACROSS FROM EACH OTHER ON LEFT AND RIGHT SIDE OF CONVEYOR.

NOTE: FOR INCREASED PROTECTION ADDITIONAL TOUCHSWITCHES MAY BE ADDED TO THE HEAD AND TAIL.



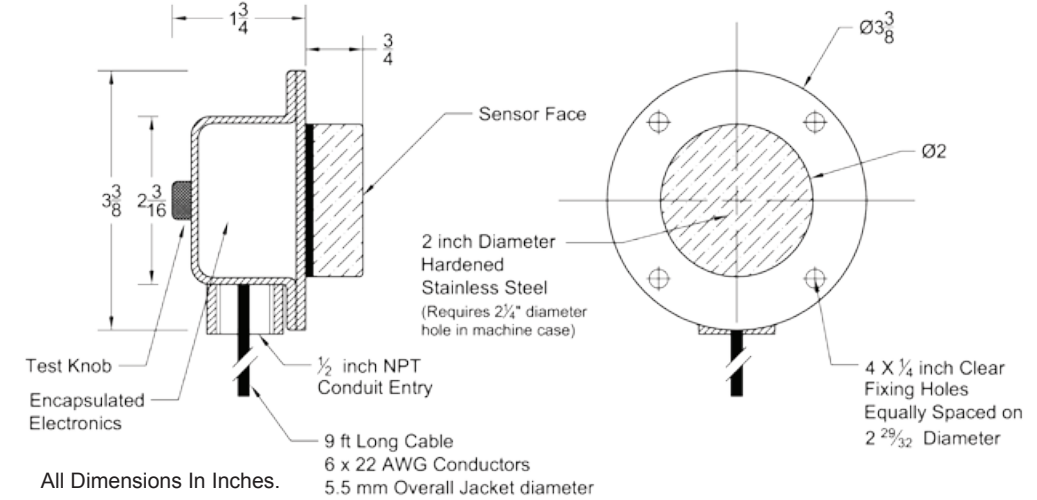
PLACE TOUCHSWITCHES ANYWHERE BETWEEN 6 O'CLOCK AND 12 O'CLOCK IN FRONT OF HEADSHAFT.

**TYPICAL TOUCHSWITCH MOUNTING POSITIONS ON AN OPEN BELT CONVEYOR:**



When mounting Touchswitches on open belt conveyors usually brackets will need to be fabricated. These brackets must be built rigid enough to take pressure from a misaligned belt. It is best if these can be mounted so the Touchswitch can detect if the pulley and or the belt has shifted. On tail pulleys of open belts that are take-up pulleys, it is good if the Touchswitch bracket can be mounted off of the bearing mounting bolts. This allows the Touchswitch to move with the pulley when belt adjustments are made.

When connecting liquid tight to Touchswitches, limit the length to NEC requirements. However, when installed on an adjustable pulley or section be certain enough liquid tight is installed so all adjustments can be utilized.



**ELECTRICAL SPECIFICATIONS**

|                     |  |
|---------------------|--|
| Supply -            | 24 VDC (TS2V4C) / 12 VDC (TS2V3C)  |
| Power Consumption - | 50 mA (TS2V4C) / 60 mA (TS2V3C)  |
| LED Indication -    | Red LED indicates unit is powered up and relay is energized              |
| Adjustment -        | Factory set to 8 lb. (3.6 Kg) approximately                              |
| Output -            | Voltage free changeover relay contact rated at 5A 250 VAC, non-inductive |
| Body Construction - | Pressed seamless steel with epoxy paint                                  |
| Face Construction - | Hardened stainless steel   |
| Conduit Entry -     | 1/2" NPT   |
| Cable -             | 6 conductors 9 ft. long  |
| Weight -            | 3 lbs.   |
| Approvals -         | CSA Class II Div 1 Group E, F, and G (USA & Canada)                      |

**WIRING:**

All Wiring Must Be In Accordance With Local And National Electrical Codes And Should Be Undertaken By An Experienced And Professional, Qualified Electrician.

Always use dust/liquid tight flexible metal conduit with approved fittings to protect the sensor cables. Use rigid metal conduit to protect the cables from the sensors to the control unit. Conduit systems can channel water due to ingress and condensation directly to sensors and sensor connections which over time will adversely affect the performance of the system. As such, the installation of low point conduit drains is recommended for all sensors.

Mount a suitable junction box within 9 ft. of the sensor, and using a suitable conduit to protect the cables, make the necessary wiring connections inside this junction box. A 9 ft. long PVC coated cable connected to the sensor contains the following 22 AWG wires:

|        |   |
|--------|---|
| Red    | 24 VDC                                  |
| Black  | 0 VDC                                   |
| Green  | Ground                                  |
| White  | Relay Common Connection                 |
| Blue   | Relay Contact, N.O.                     |
| Orange | Relay Contact, N.C. (Not Normally Used) |

Note: The Touchswitch contains a non repairable 160 mA fuse and thermal fuses set at 73°C. Should the body of the sensor reach 73°C or higher then the thermal fuses may open.

Note: The relay contact is energized when power is supplied to the sensor and de-energizes when the sensor detects the belt or pulley. Relay contact closed between White and Blue when unit is powered and Led is on.

“Red” LED on: indicates power and relay energized.  
 “Red” LED off: indicates relay de-energized and/or no power.

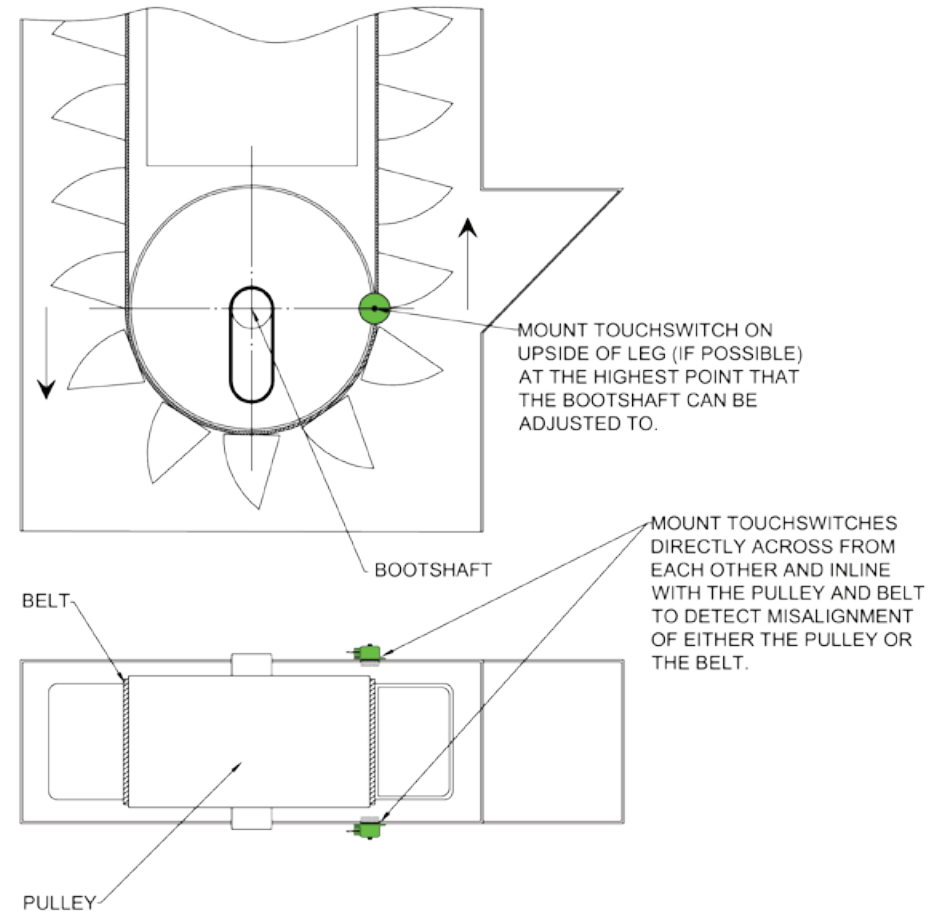
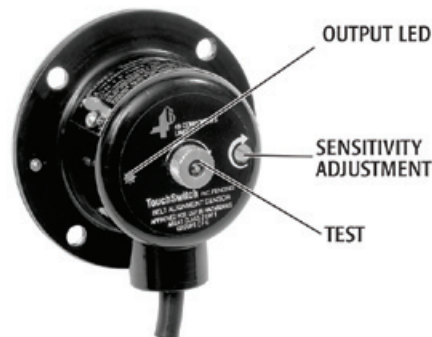
**WARNING**

- TOUCHSWITCH WIRING IS LOW VOLTAGE DC.
- USE SHIELDED CABLE AND KEEP SEPARATE FROM HIGH VOLTAGE CABLES.
- NEVER RUN TOUCHSWITCH CABLES IN THE SAME CONDUIT AS 3-PHASE MOTOR CABLES.
- NEVER WELD NEAR OR AROUND THE TOUCHSWITCH.
- TRACK BELTS AND COMMISSION PLANT PRIOR TO INSTALLING TOUCHSWITCHES.
- ALWAYS INSULATE ANY UNUSED WIRES.

**TESTING:**

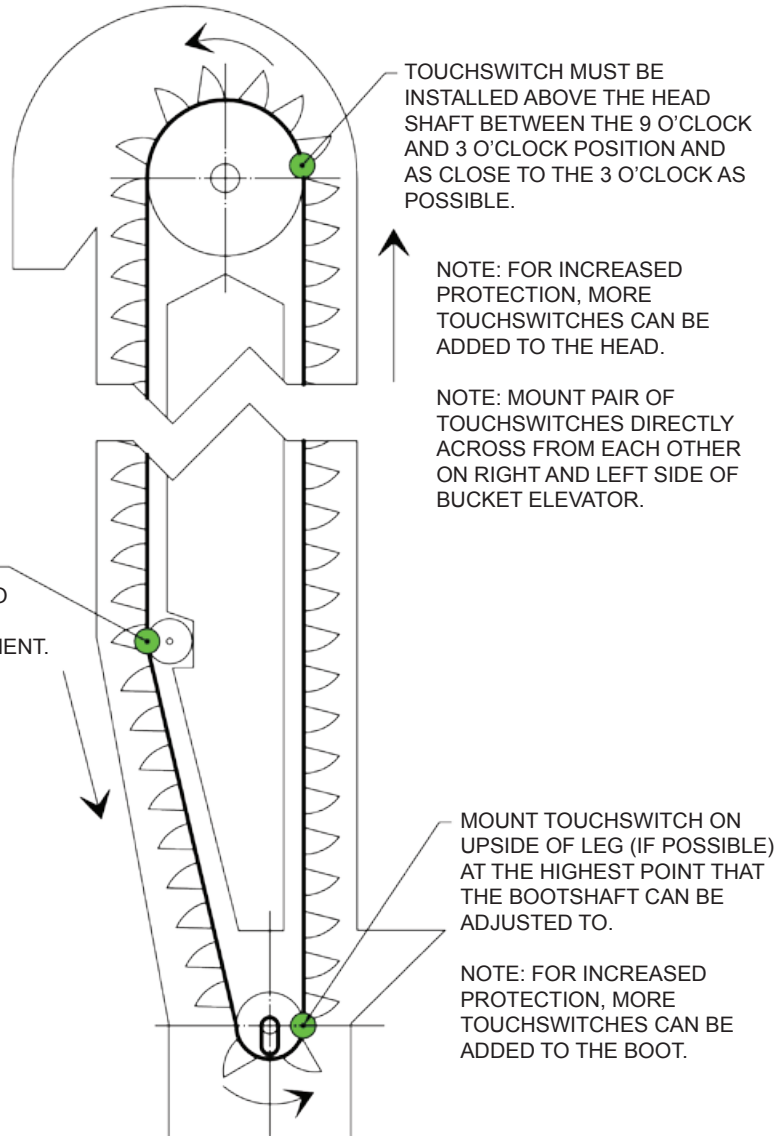
Observe that the red LED on the sensor housing is on and the belt or pulley is not touching the sensor. Slowly turn the test knob clockwise by hand, until the LED goes out. Check that the alarms and shutdowns work as expected. Turn the test knob back to its original position (about 1/4 turn) and make sure that it is loose. Observe that the LED is now on.

Periodically test the sensor and system, and visually inspect the contact surface of the sensor and the sealite, the wires, junction box and conduit.



**TYPICAL TOUCHSWITCH MOUNTING POSITIONS ON A BUCKET ELEVATOR WITH A KNEE OR BEND PULLEY:**

When mounting on the head section of a leg or belt conveyor try to catch the belt and the pulley. On a leg mount Touchswitch just above the center line of the head shaft on the discharge side of the pulley when possible. Sometimes this is not possible due to inspection doors or X-pacs etc. They can be mounted on the top or up side of the head pulley if these are encountered. Try to mount Touchswitches so they are accessible from the head section walkway.



**TROUBLESHOOTING GUIDE**

| FAULT  | CAUSE                                  | REMEDY   |
|--|--|--|
| Touchswitch signalling an alarm condition and / or red led is out on Touchswitch | Belt misaligning                       | <ul style="list-style-type: none"> <li>• Check belt alignment</li> </ul>   |
|  | Touchswitch Binding against leg casing | <ul style="list-style-type: none"> <li>• Check hole diameter is 2-1/4 inches and is de-burred.</li> <li>• Check Touchswitch is centered in the hole</li> </ul> |
|  | Test knob active                       | <ul style="list-style-type: none"> <li>• Loosen knob (rotate counterclockwise 1/4 turn until loose)</li> </ul>   |
|  | No Power                               | <ul style="list-style-type: none"> <li>• Check 24 VDC to Touchswitch</li> <li>• Check orange wire is insulated</li> </ul>                                      |

**WARNING**

- ROTATING MACHINERY CAN CAUSE SERIOUS INJURY OR DEATH.
- IN ALL CASES, STOP MACHINE BEFORE INVESTIGATING ANY PROBLEM.
- ENSURE THAT ALL LOCKOUT AND TAGOUT PROCEDURES ARE ADHERED TO.

**INSTALLATION PHOTOS**



Touchswitch installed at the drive end of an enclosed belt conveyor (inside view)



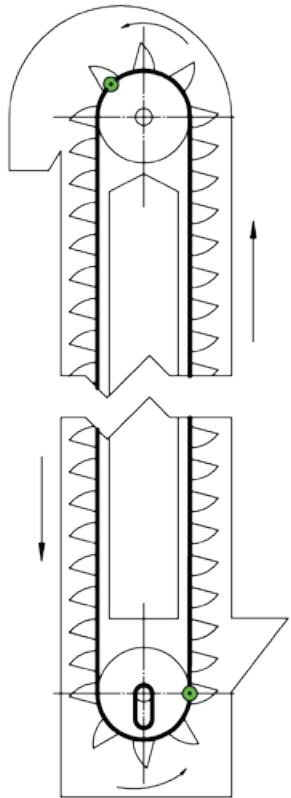
Touchswitch installed on a bucket elevator



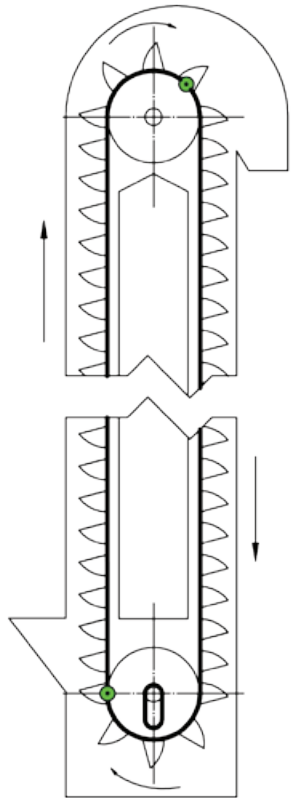
Touchswitch installed at the tail of an open belt conveyor

**DETERMINING LEFT & RIGHT SIDE OF BUCKET ELEVATOR:**

**VIEW OF LEFT SIDE**



**VIEW OF RIGHT SIDE**

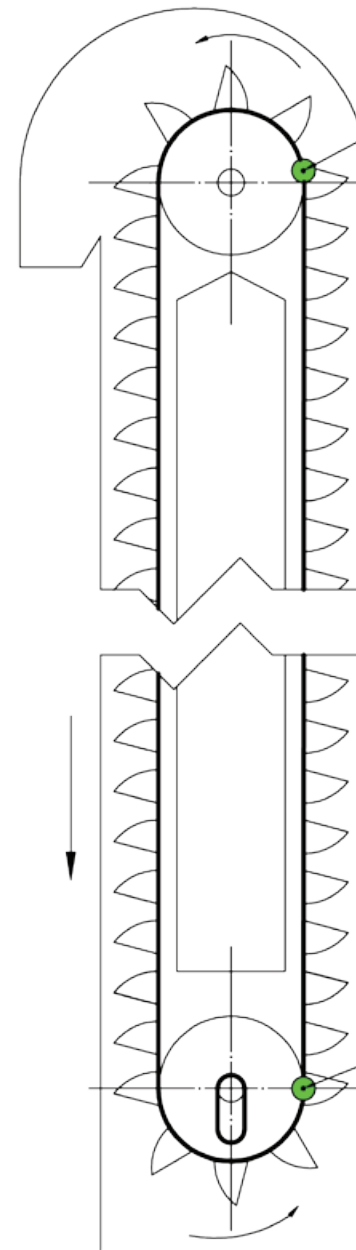


**NOTE:** TOUCHSWITCH PLACEMENT ON THE LEFT SIDE WILL MIRROR THE RIGHT SIDE.

**NOTE:** LEFT AND RIGHT SIDES ARE DETERMINED WHEN FACING THE DIRECTION THE BUCKET ELEVATOR DISCHARGES.

**TYPICAL TOUCHSWITCH MOUNTING POSITIONS ON A BUCKET ELEVATOR:**

When mounting on the head section of a leg or belt conveyor try to catch the belt and the pulley. On a leg mount Touchswitch just above the center line of the head shaft on the discharge side of the pulley when possible. Sometimes this is not possible due to inspection doors or X-pacs etc. They can be mounted on the top or up side of the head pulley if these are encountered. Try to mount Touchswitches so they are accessible from the head section walkway.



TOUCHSWITCH MUST BE INSTALLED ABOVE THE HEAD SHAFT BETWEEN THE 9 O'CLOCK AND 3 O'CLOCK POSITION AND AS CLOSE TO THE 3 O'CLOCK AS POSSIBLE.

NOTE: FOR INCREASED PROTECTION, MORE TOUCHSWITCHES CAN BE ADDED TO THE HEAD.

NOTE: MOUNT PAIR OF TOUCHSWITCHES DIRECTLY ACROSS FROM EACH OTHER ON RIGHT AND LEFT SIDE OF BUCKET ELEVATOR.

MOUNT TOUCHSWITCH ON UPSIDE OF LEG (IF POSSIBLE) AT THE HIGHEST POINT THAT THE BOOTSHAFT CAN BE ADJUSTED TO.

NOTE: FOR INCREASED PROTECTION, MORE TOUCHSWITCHES CAN BE ADDED TO THE BOOT.