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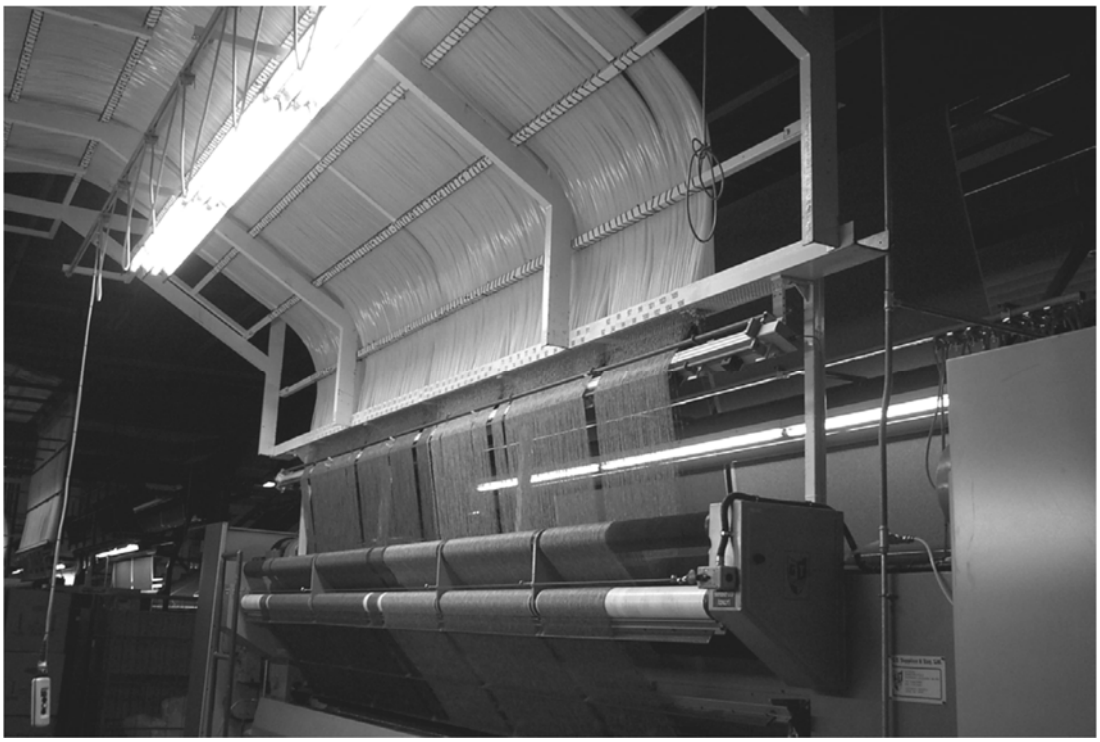
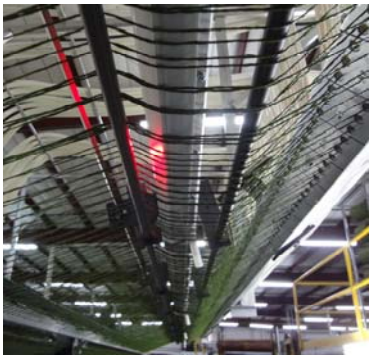




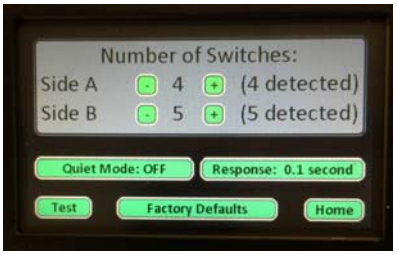
Tuftight LX

Tight Yarn Detection System for Tufting

Installation/User Manual

Components and Specifications

User Interface



Easy to use touch-screen interface.

User selectable time delay for tight end in 0.1 second increments.

English Language Interface. Other languages available on request.

Controller

Rail mounted controller for easy installation and maintenance.

Fully programmable.

Power/Machine Control

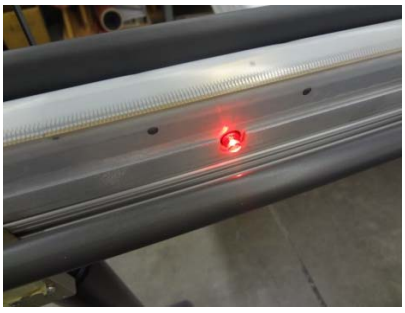
Single box with user interface

Input Power: 100~240VAC, 50/60hz., 200watts

Stop Motion: Relay, NO, COM, NC

Auto Reset signal on machine run = 5~240V AC/DC

Rail



VHV (Very High Visibility) Indicators

Easy Replace Switch Covers and Switches (Change in Minutes)

Designed to provide easy installation, maintenance and trouble shooting.

Optional sensitive switches for scroll machines.

Specifications subject to change without notice.

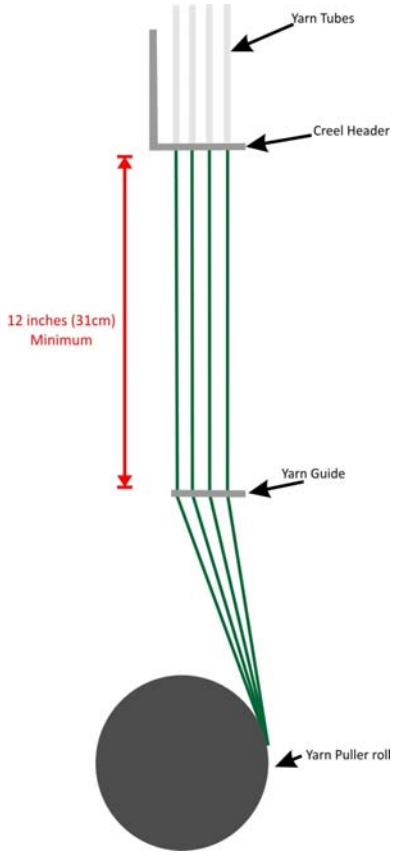
AEI TuftTight LX Theory of Operation

The Tuftight LX has the same detection principle as the industry proven original tuftight, reconfigured in a simpler more integrated and easier to maintain design. Instead of movable switches, the sensitivity is now adjusted by moving the lower bar with a unique rack and pinion mechanical adjustment to set the angle of the yarn contacting the switches. Once this mechanical adjustment is made, the fine sensitivity is set with a programmable stop delay, selectable for the entire rail or for each meter section. This ability to set the sensitivity for each one meter switch section accommodates various creel and header lay-outs by normalizing the tight end response across the machine. Also included is a PLC interface using an Industry Standard RS-232 serial port, which allows connection of the LX to plant data systems. The LX is available in several models. A single-sided version for normal tufting/grass machines and a double-sided version for wide collectors and double-sided machines. The LXg model is a dual-sided system with two single-sided rails connected to one controller for the typical graphics machine. The LXs is like the normal single and double-sided LX, but with sensitive switches. The normal contact pressure for activating the LX switches is 200 grams of direct pressure. The sensitive switches only require 20 grams of direct pressure. The newer scroll machines that rely on stepper motors for individual yarn control do not have enough torque to activate the normal LX switch when a yarn becomes tight.

Installation

Switch Bar Rail

The system is shipped so that most parts are easily interconnected. Nuts, bolts, etc. are either in the location required or labeled.

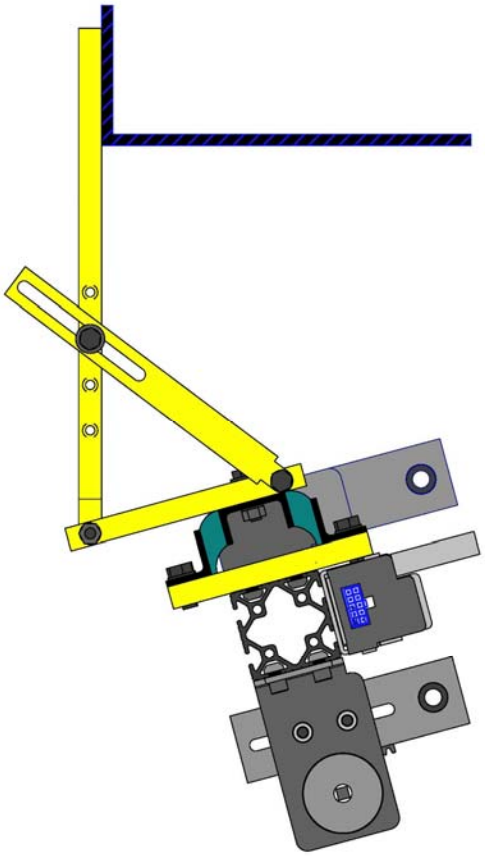


1) Verify there is a minimum of 11 inches of clearance between the creel header and the first yarn guide or yarn pre-tension “S” roll. On certain machines where the creel header is mounted to the machine, modifications to the machine will be required.

2) Mount adjustable brackets to the aluminum extrusion as shown using T-nuts and appropriate bolts with flat and Lockwashers.

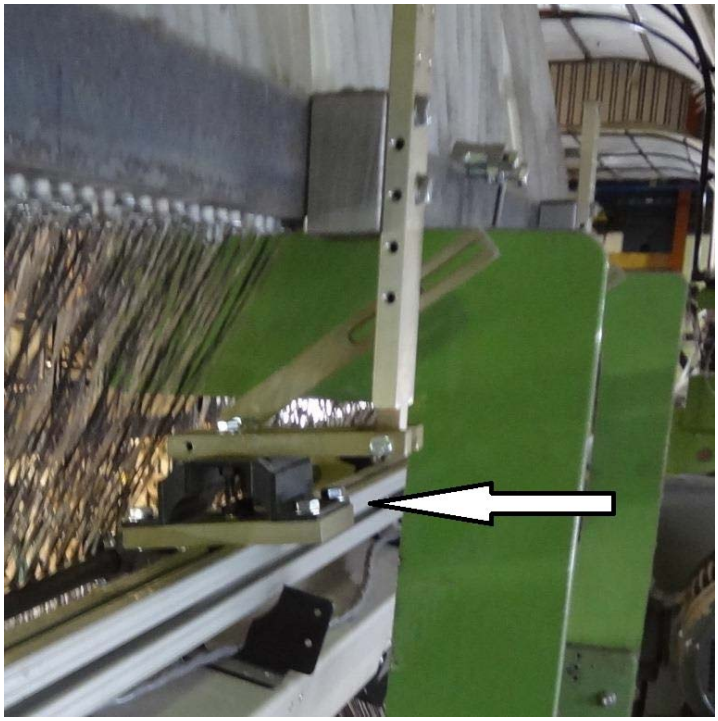
3) Move or tie-off yarn.

4) Attach Universal Brackets and rail to creel header as show in diagram/picture below and attach Tuftight Rail to Universal Brackets

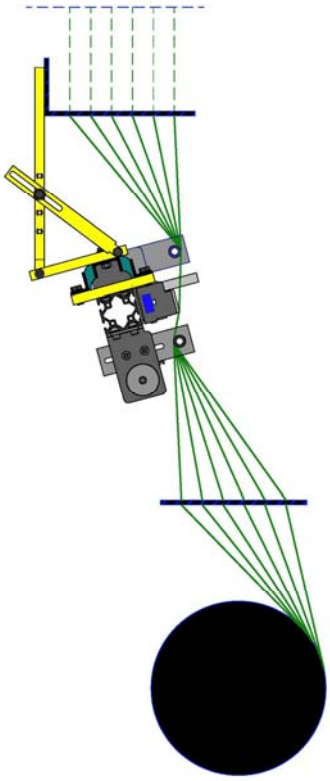


If using “H-brackets” see picture below for bracket configuration.

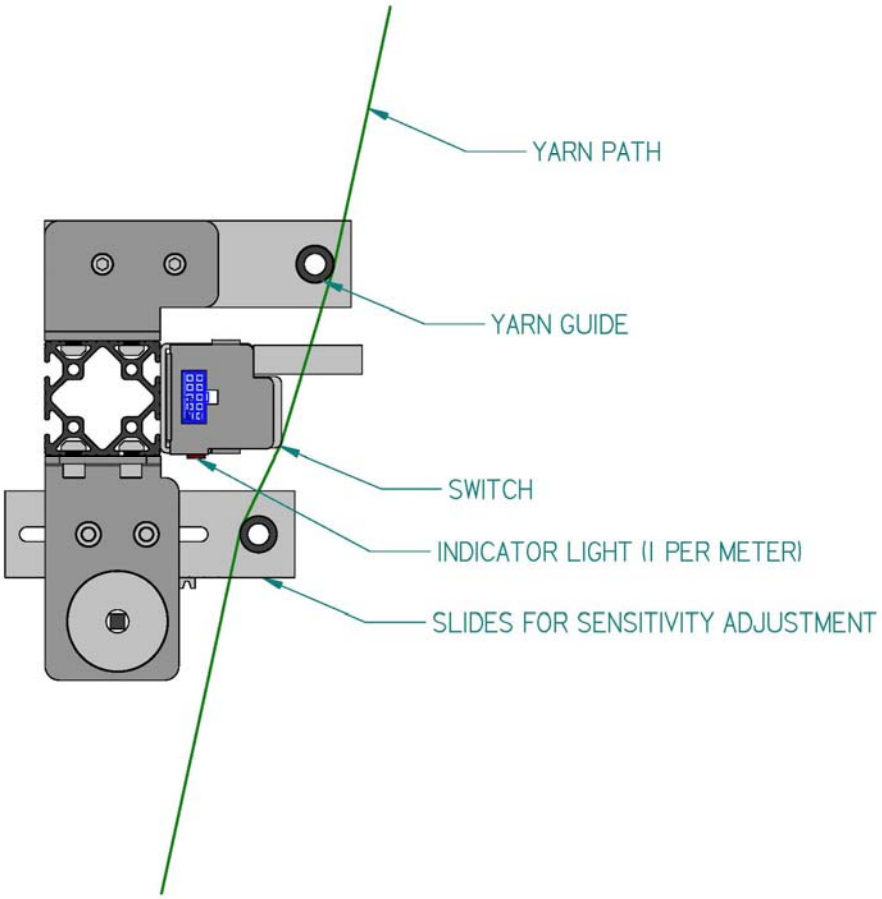
If using Shock Mounts see mounting below.



5) Thread yarn through Tuftight as shown below. ***Be sure the yarn is threaded correctly. This is critical in minimizing switch cover wear! See following for recommended threading.***



NOTE: Some adjustment of the Tuftight LX rail may be required to achieve optimum alignment with the yarn sheet. This adjustment can be made by loosening the fasteners located on the mounting bracket and twisting the rail 45˚ clockwise or counter-clockwise.


YARN PATH
YARN GUIDE
SWITCH
INDICATOR LIGHT (1 PER METER)
SLIDES FOR SENSITIVITY ADJUSTMENT

Connections

1) Connect CAT 5 cable and the 15 DSUB cable between Controller and Power/Machine Control box.

Controller Connections

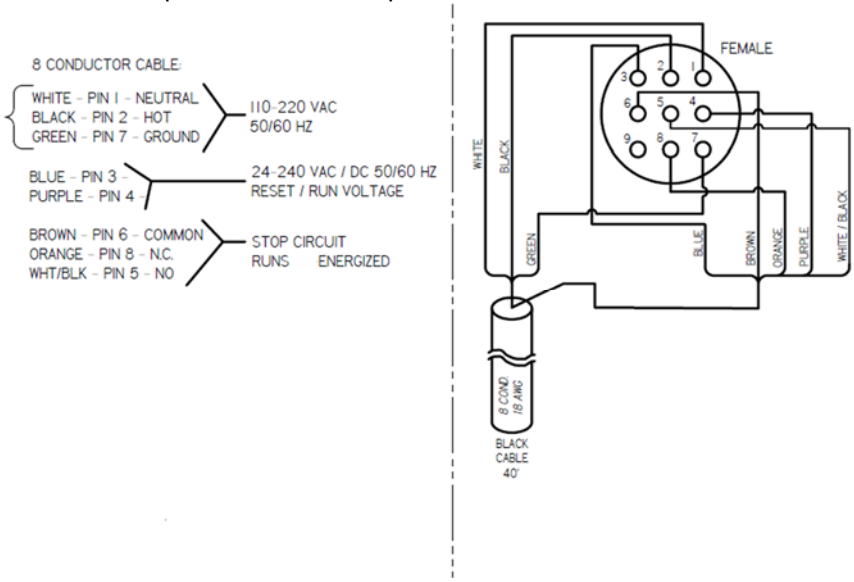
2) Install Power/Machine Control Box in easy access/high visibility location and connect wiring from controller on rail.

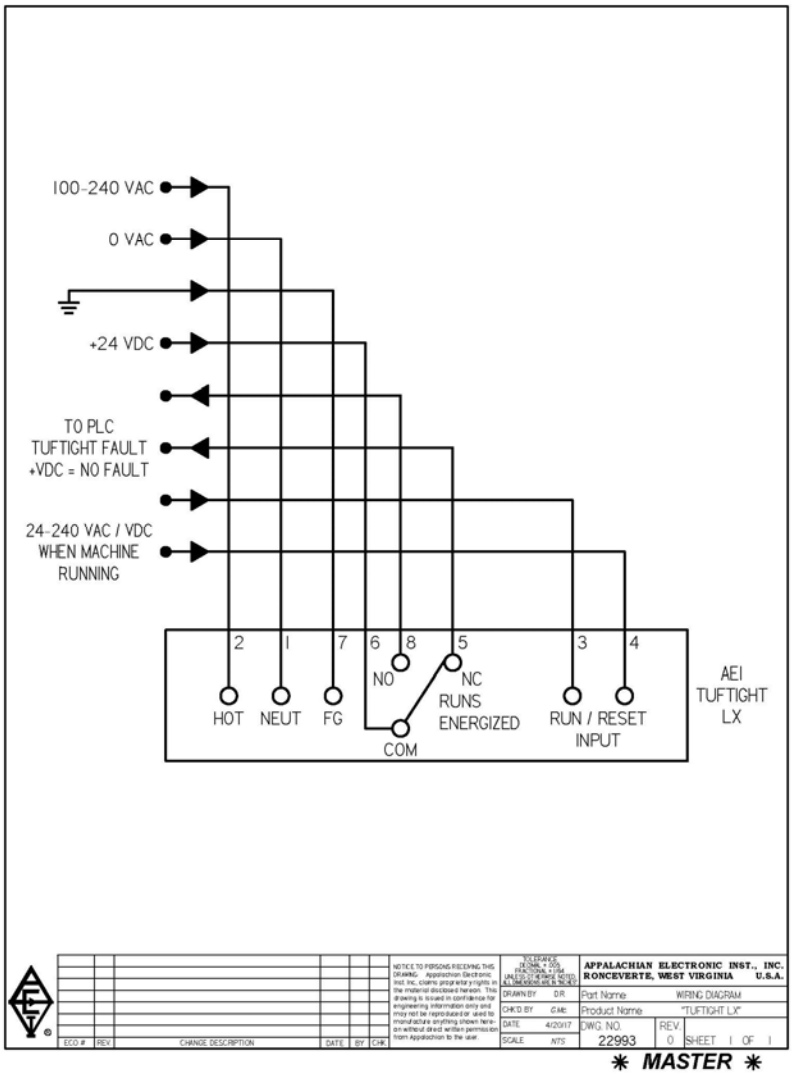
3) Controller and Rail wiring must be secured and routed to not interfere with machine operation.

4) Connect Tuftight LX to machine.

Power, Stop Motion and Reset-Run Connections
AC Power in, Machine Stop Motion and Reset-Run connections are all made available on the control cable pictured below.

Connect cable to LX power/machine control box and wire to tufting machine as shown in diagram below. Connect to COM – NC for “open contact to stop” or COM-NO for “Closed Contact to Stop”



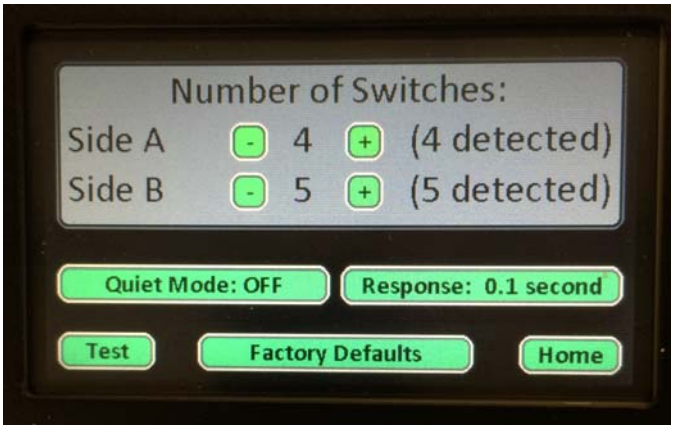


Operation

The Tuftight LX is configured and operated from the touch-screen panel. The Home screen is first displayed at power up and the user need only set the correct number of switches and the correct modes of operation: quiet mode and global or individual switch time delays.

Below the screens are shown and explained.

HOME SCREEN



The number of switches detected for each side is displayed. The user must press the "+" or "-" key to set the correct number of switches. This screen is used to alert the user if there has been a hardware failure.

The system will not run if the correct number of switches are not found.

If a single-sided unit then side B is always "0".

Quiet Mode controls the LEDs on the rail. When ON the LEDs are illuminated when a tight end is present for the set response time. When OFF the LEDs will illuminate each time a contact is closed regardless of the duration.

Factory Defaults clears all the settings back to the original configuration

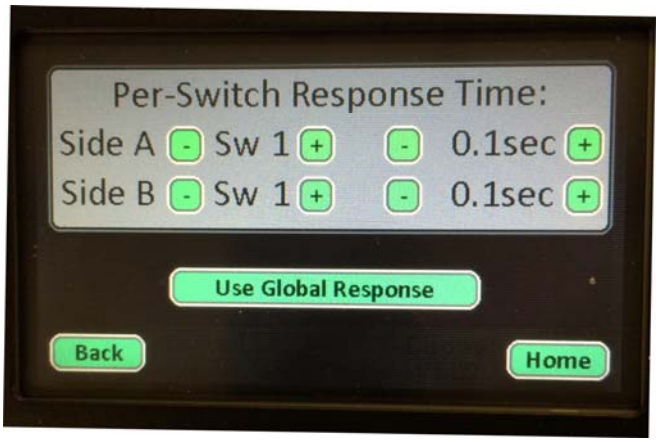
The Response button shows the current global time delay (each switch is set to same time delay in global mode). Press this button to display the Response Time screen which allows the user to set the response time in 1/10 of second intervals.

RESPONSE TIME SCREEN

When the RESPONSE button is pressed this screen is displayed. The response time is the amount of time before the machine will stop when a tight end is detected.

The global response time (each switch is set to same delay in 1/10 seconds) is changed by pressing the button that shows the current response time (or by pressing the "+" and "-"). When pressed, a keypad will be display that allows the user to enter the response time from 0.1 seconds to 30.0 seconds. If the system is dual-sided, then the global response time is the same for all switches on both sides.

If the response time for each 1 meter switch must be set seperately, then press the "Use Per-Switch Response" button. This will display the screen that allows each 1 meter switch for both sides of the LX to be set seperately. Press the "+" or "-" key to select the switch and the "+" or "-" to set the time delay for that switch.



TEST

When the "Test" button is pressed from the Home Screen theTest Screen is displayed

This screen displays all the active switch segments and shows when they close. This allows the setting of the tension to the most sensitive point by adjusting the lower bar until activity is present but no false stops are occurring.

This test mode times out after 5 minutes or when the Home key is pressed.

OPERATION SCREENS

When the LX receives a valid run signal from the tufting machine the display will have a green background and display the word “RUNNING”. When this screen is displayed the LX is monitoring for tight ends.

If the tufting machine is stopped the display will show a red background and display the word “STOPPED”.

When a tight end is detected the LX stops the tufting machine and displays a message that show which side, switch and section caused the tight end. This message, in addition to the LED on the LX rail, will aid the operator in locating the tight end in the creel.

PLC Interface

The LX uses a standard RS-232 serial port to output the status of the system. This can be connected to a plant data system or the PLC on the tufting machine. This connection is available inside the controller box mounted on the side of the rail. A serial interface cable can be ordered from the factory that provides the data on a standard 9 pin DSUB female connector. Ground is on pin 5 of this connector and the data is available on pin 2. The serial interface settings are 9600 baud, No Parity, 8 data bits, and 1 stop bit. If the connect is to be made directly to the 10 pin connector on the controller (mounted on rail) the data is on pin 3 and the Ground is pin 5.

The LX outputs three types of messages.

":STsx.x"

When a tight end occurs this message is sent out the serial port every half second when the machine is stopped for a tight end. The "s" is side A or B. The first x is the switch (1 to 7) where the defect occurred and the second x is the segment on that switch where the defect occurred (1 to 3 starting on left side). For example, a tight end is found on switch 3 segment 2 of side B, so the output message would be ":STB3.2".

":BY"

When the LX is placed in the bypass mode by the switch in the Power/Machine control box this message is output every half second until the unit is taken out of bypass.

:HL"

This message is output every half second to tell the listening device that the LX is on and functioning.

Adjust Sensitivity

The Tuftight LX's sensitivity to a tight end is set by a two-step process. First the lower tension bar is adjusted to set the course sensitivity. Next the time delay is set to adjust the fine sensitivity.

The course sensitivity is set by first loosening the bolts holding the toothed slide in place. Once loosened then turn the adjustment knob with the supplied handle (see pictures below) until the desired yarn angle is achieved. Clockwise (increasing pressure on the yarn) will decrease sensitivity and counter-clockwise (decreasing pressure on the yarn) will increase sensitivity. Tighten the bolts and then repeat on the other side of the rail. Set both sides to the same mark on the slide for uniform response.

STEP 1

STEP 2

Time Delay

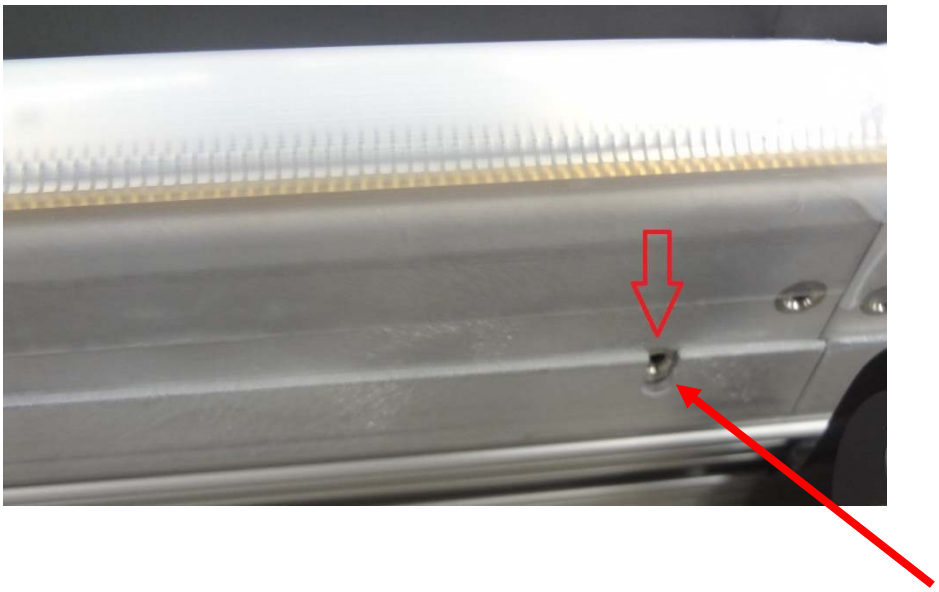
The time delay should be adjusted for the type of yarn being monitored. For yarns with low stretch characteristics such as grass (polypropylene) a very fast response time is required. Slower response times may be used for yarns that have some stretch. Many times the yarn will hang on the bobbin for a short period of time then release without any adverse effect on the fabric. A longer time delay can be used here. The primary concern is to stop the machine BEFORE the yarn breaks.

Once the initial sensitivity is set and power is applied to the system the tufting machine can begin operation. With the tufting machine running check the sensitivity by holding a yarn in various sections of the creel to assure proper tension detection and machine stop. If sensitivity is not correct, readjust sensitivity until Tuftight LX properly responds to a tight end from all representative sections of the creel. When testing for sensitivity the machine should stop before the yarn breaks.

APPENDIX A.

Replacing the Switch Covers

1) Remove the three screws holding the detector switch bar in place.



2) Lift old switch assembly out of rail and replace with new assembly.

3) Remove the old cover and replace with the new cover.

APPENDIX B.

Installing LXg

When installing the rail B for the LXg dual sided model, the designated connector must be connected after the rail is mounted. The cable connecting rail A and B can be secured to either rail or any other tufting machine structure, as long as it is out of the way of the yarn path and access for maintenance.

List of Changes

Changes made	Date
Updated for LXg LXs and added new graphics	7-24-17