

# **IMPORTANT**

## **Engineering Bulletin #102 ETSL Installation & Adjustment**

### **O. Thompson Co.**

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## ETSL Set Up Procedure

ETSL (Emergency Terminal Speed Limiting) is only required where reduced stroke buffers are installed. The purpose of the ETSL system is to slow the speed of the car to a point at or below the buffer's rated striking speed. O. Thompson's ETSL system accomplishes this by opening the safety circuit and dropping the brake.

The O. Thompson ETSL system consists of a sensor board, two memory reed switches, and two magnet bracket assemblies. The sensor board and reed switches are mounted on top of the car. The magnet brackets are mounted at specific distances (based on car speed and buffer stroke) from the top and bottom terminal floors. As the car passes the magnet bracket, the speed of the car must be slow enough that the reed switches are closed for more than 100 milliseconds. If the switches are closed for less than 100 milliseconds, the car is traveling too fast, and the sensor board will open contacts in the safety circuit, initiating an emergency stop.

Before adjusting the ETSL system, the car must be up to contract speed and all motion parameters set to their final values. Failure to do this could cause nuisance trips of the ETSL system.

## ETSL Wiring



J3-9  
J3-8  
J3-7  
J3-6  
J3-5  
J3-4  
J3-3  
J3-2  
J3-1

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The O. Thompson ETSL board will accept 18 -24 volts AC or DC. Power must be wired to terminal J3-8 and J3-9.

The memory reed switches are wired to terminal J1. Switch 1 is wired to J1-1 and J1-2. Switch 2 is wired to J1-3 and J1-4.

In compliance with ANSI code, no single jumper or short can disable the ETSL system. To comply with this, the safety circuit must be opened in two different locations. Wire the sensor board so terminals J3-4 and J3-5 are in series with the stop switch on top of the car. Wire J3-6 and J3-7 so they are in series with the low side of the safety circuit relay, or if this is not possible, it can be wired in series to interrupt the controller feed to the safety circuit.

When power is applied to the board the green LED should flash slowly. This indicates that the board is functioning correctly. There are two red LED's on the board, one indicating that the board has tripped and one indicating a malfunction.

### **Bracket Mounting and Set Up**

Position the magnet brackets at the appropriate distance from the top and bottom terminal floors using the chart below.

<b>Car Speed (FPM)</b>	<b>Buffer Stroke</b>	<b>Bracket 1 Distance</b>	<b>Bracket 2 Distance</b>
<b>500</b>	<b>8.5"</b>	<b>6' 9"</b>	<b>2'</b>
<b>600</b>	<b>8.5"</b>	<b>11' 3"</b>	<b>2'</b>

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<b>600</b>	<b>18"</b>	<b>6' 4"</b>	<b>3'</b>
<b>700</b>	<b>18"</b>	<b>11' 6"</b>	<b>3'</b>
<b>800</b>	<b>39"</b>	<b>6' 6"</b>	<b>4' 4"</b>
<b>1,000</b>	<b>39"</b>	<b>20' 3"</b>	<b>4' 4"</b>
<b>1,000</b>	<b>49"</b>	<b>15' 3"</b>	<b>4' 10"</b>
<b>1,000</b>	<b>59"</b>	<b>10' 0"</b>	<b>5' 4"</b>
<b>1,200</b>	<b>49"</b>	<b>31' 9"</b>	<b>4' 10"</b>
<b>1,200</b>	<b>59"</b>	<b>26' 8"</b>	<b>5' 4"</b>
<b>1,200</b>	<b>74"</b>	<b>19' 0"</b>	<b>6'</b>
<b>1,400</b>	<b>74"</b>	<b>38' 4"</b>	<b>6'</b>
<b>1,600</b>	<b>89"</b>	<b>52' 9"</b>	<b>6' 6"</b>

After the brackets are installed it is necessary to adjust the distance between the magnets. The top magnets on the bracket should be south pole and the bottom magnets north pole.

Using the chart below, adjust both sets of magnets on the bracket so they are the correct vertical distance apart.

<b>Car Speed (FPM)</b>	<b>Buffer Stroke</b>	<b>Distance Between Magnets - Bracket 1</b>	<b>Distance Between Magnets - Bracket 2</b>
<b>500</b>	<b>8.5"</b>	<b>10.5"</b>	<b>8"</b>
<b>600</b>	<b>8.5"</b>	<b>13.5"</b>	<b>8"</b>

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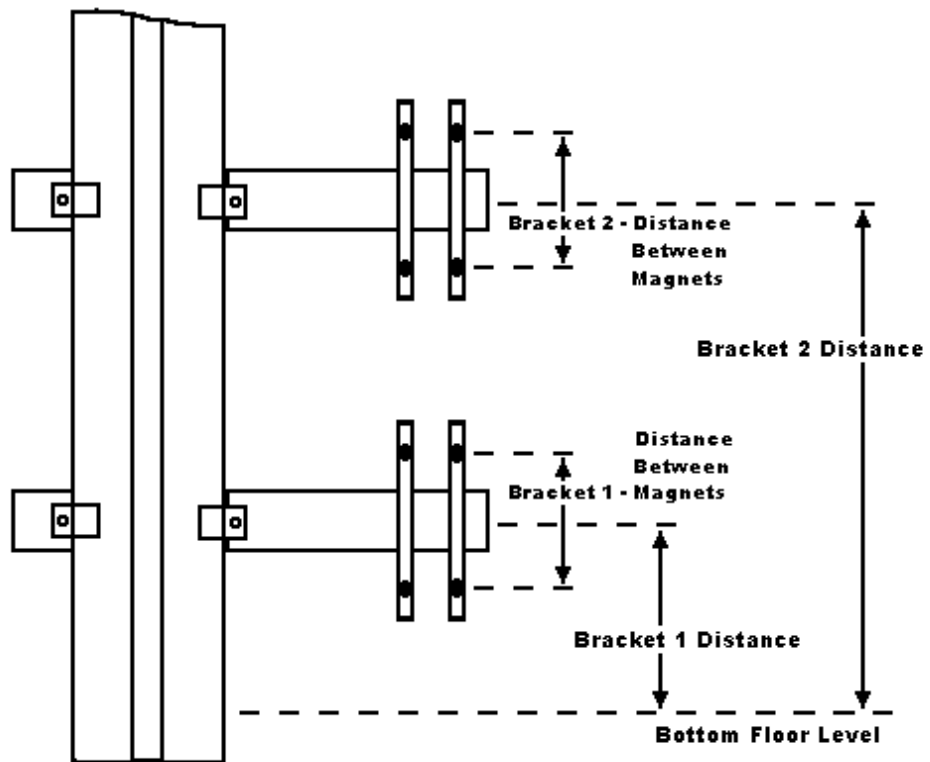
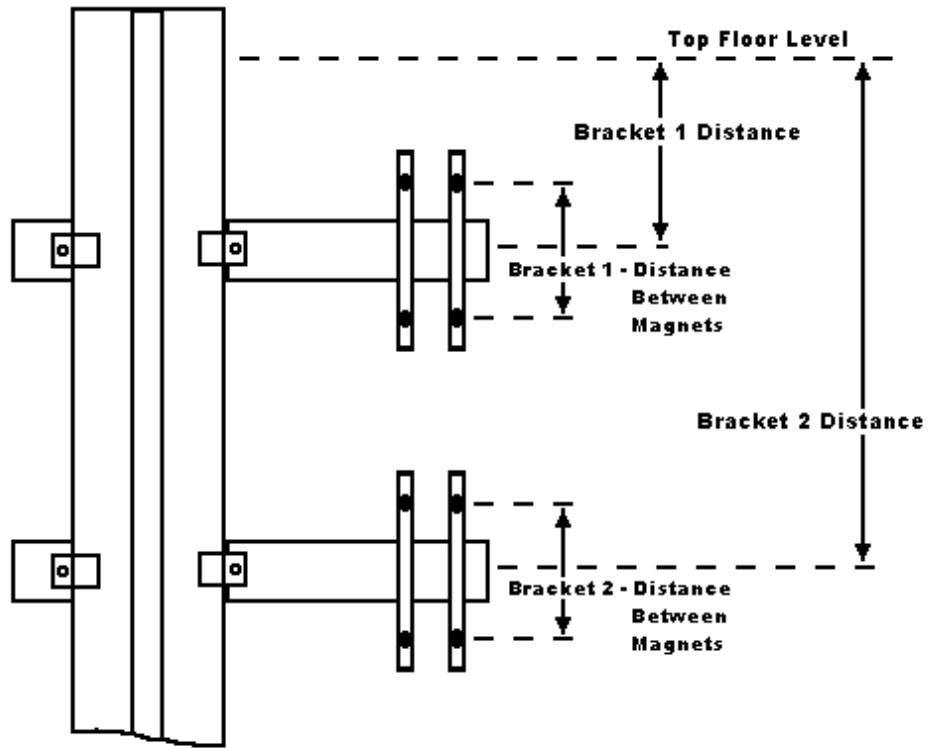
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<b>600</b>	<b>18"</b>	<b>10.25"</b>	<b>12"</b>
<b>700</b>	<b>18"</b>	<b>13.5"</b>	<b>12"</b>
<b>800</b>	<b>39"</b>	<b>10.25"</b>	<b>17"</b>
<b>1,000</b>	<b>39"</b>	<b>17.75"</b>	<b>17"</b>
<b>1,000</b>	<b>49"</b>	<b>15.5"</b>	<b>19.5"</b>
<b>1,000</b>	<b>59"</b>	<b>12.75"</b>	<b>21"</b>
<b>1,200</b>	<b>49"</b>	<b>22.25"</b>	<b>19.5"</b>
<b>1,200</b>	<b>59"</b>	<b>20.33"</b>	<b>21"</b>
<b>1,200</b>	<b>74"</b>	<b>17.25"</b>	<b>24"</b>
<b>1,400</b>	<b>74"</b>	<b>24.5"</b>	<b>24"</b>
<b>1,600</b>	<b>89"</b>	<b>28.5"</b>	<b>26"</b>

Refer to the diagram on the following page for the mounting of the brackets and adjustment of the magnets.

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After the magnets are adjusted, remove any jumpers from the ETSL sensor board contacts. These jumpers may have been placed on the controller.

As the car passes the magnet brackets, the yellow LED's for the reed switches should turn on and then off. Confirm that if the car is stopped with the sensor between the magnets, that the yellow LED is lit. If not, the magnets may be installed incorrectly, or the sensors are installed upside down. If this LED is on for less than 100 milliseconds, indicating the car is traveling at a speed greater than it should be at this distance, the ETSL board will trip, opening the contacts in the safety circuit.

Run the car at contract speed with both full load and no load into the top and bottom floors to ensure that the sensor board does not trip. If the board does trip, confirm that the bracket is the correct distance from the floor and the magnets are the correct distance apart. Also, check the deceleration rate of the car. If the deceleration rate is greater than 3.5 ft/s<sup>2</sup>, then the brackets may need to be relocated closer to the terminal floors. Contact O. Thompson Technical Support for assistance.

Assuming the system does not trip, move the magnets on the top terminal bracket closer together, approximately half of the correct distance. Run the empty car into the top floor at contract speed. As the car passes the bracket, the sensor board will trip, opening the safety circuit and stopping the car. After the board trips, it should automatically reset after 15 seconds. Return the magnets to their correct position and repeat this procedure for the bottom bracket.

The O. Thompson ETSL system is now adjusted. The car should be ready to be turned over to automatic operation.

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