



## Elgo Sensor Mounting

### Motion High Speed Landing/Positioning System

The encoded tape used for the landing system is suspended between two mounting brackets that attach to the car rail using forged clips and hardware. If the job uses 8#, 23#, or 30# rail, you will need an additional kit for the proper size hardware: LS-ELGO-RAIL-08#, LS-ELGO-RAIL-23#, or LS-ELGO-RAIL-30#. **The high speed Elgo positioning system sensor and tape are not compatible with earlier versions.** Contact MCE if you have questions.

This instruction is specific to Elgo-240 standard and NEMA 4X landing systems. To be certain you are following the correct instructions:

- Described in this instruction:
  - Sensor Head about 19 inches (483mm) long
  - Head label starts with LIMAX2 followed by additional characters
  - Tape labeled AB20-80-10-1-R-D-15 and has arrows and UP label
- NEMA 4X systems are specifically labeled “NEMA TYPE 4X”
- NEMA 4X systems use stainless steel hangers and hardware for corrosion resistance and a NEMA 4X rated tape switch

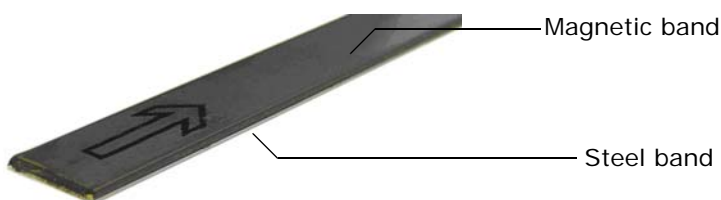


#### Caution

**Improper installation could result in tape failure, mounting hardware, and reader. Please read instructions before installing!**

The Motion high speed positioning system uses a permanently encoded tape running the length of the hoistway. The tape is about 1/2-inch wide and consists of two bands; a metal band for strength and a dark, magnetic material band that carries the actual encoding.

- The encoded side of the tape (dark side) must face the elevator car.





**Caution**

**The arrows on the magnetic side of the tape must point in the up direction and face the car.**

TOP

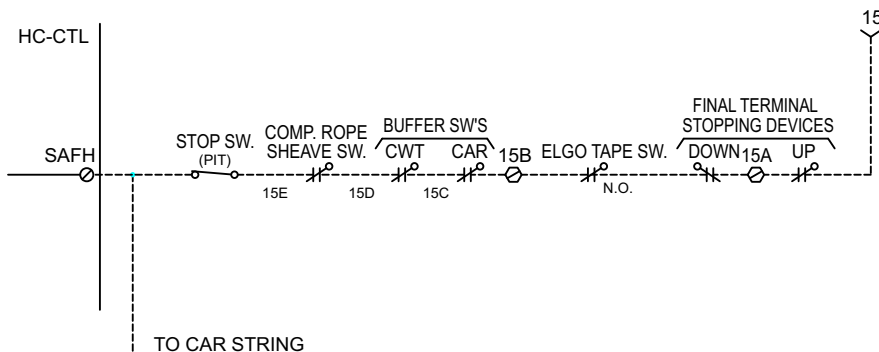


The "UP" label on the tape is an additional indicator that the arrow must be pointing UP when the tape is installed.

## Safety String Connection Information

The switch on the bottom tape mount must be connected in the hoistway safety string as shown in your job drawings. If the switch is not shown in your drawings, connect it as shown below.

**Figure 1 Tape Switch Connection**



## Recommendations

If you install the bottom hanger and safety switch before hanging the tape, go ahead and test the switch function. When opened, the switch should shut off power to the machine and the brake causing the elevator to immediately stop.

After testing switch functionality, use a piece of wire or string to temporarily hold the switch in the closed position so that you can run the car on car top inspection to hang the tape.



**Caution**

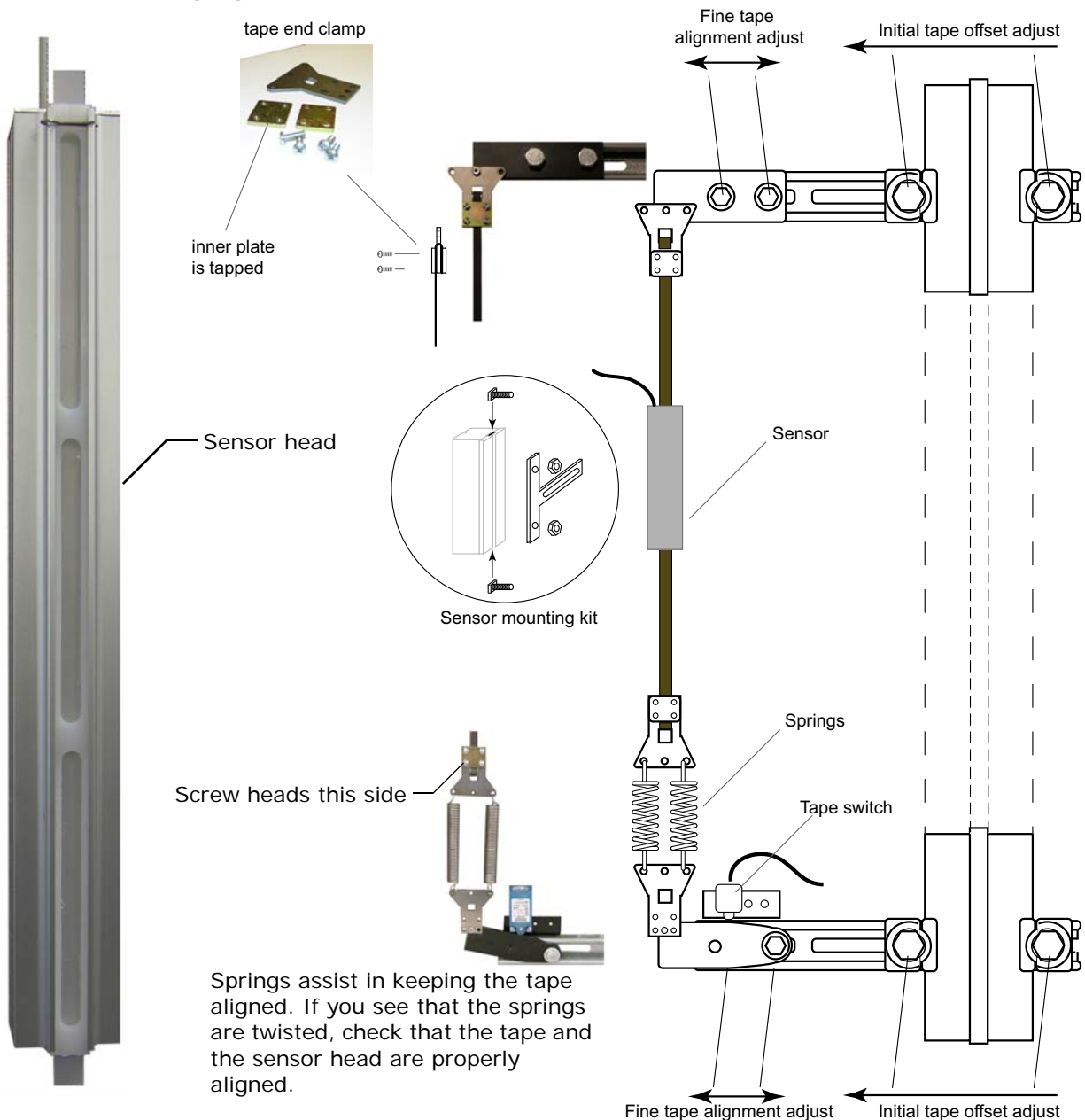
**Do not temporarily jumper the switch. It is far too easy to forget and leave the jumper in place.**

## Installation

This kit is configured to mount the sensor head on the left side of the rail (as you face the rail blade). If necessary, you can change this to right side mounting. [Please refer to “Left to Right Rail Side Reversal” on page 13.](#) Tape hangers are steel channels that clamp across the back of the car rail using forged rail clips. The tape hangs directly from the top hanger and connects through a tensioning spring to a switch pivot on the bottom hanger. With the tape properly hung, spring tension keeps the pivot held against the switch, keeping it closed. If tension is lost due to a tape failure, the switch will open the safety string and bring the car to a stop.

1. Attach top and bottom hangers to the rail lightly using clips and hardware provided.
2. Use a tape measure to adjust the hangers to provide equal offset from rail edge to encoding tape. Tighten the retaining hardware.

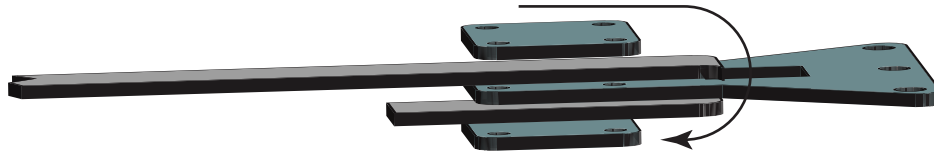
Figure 2 Tape Hanging Hardware



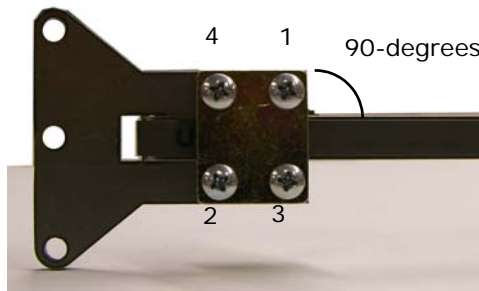
## Tape End Pieces

Tape end clamps are loosely assembled using 1-inch, 8x32 screws so that you can simply loosen them up, weave the tape through, and tighten the screws down. It may be easiest to attach just the top end piece now and then attach the bottom end piece after hanging the tape.

1. Loosen the screws on a tape end clamp. Slide the tape through between the center piece and the top clamp, magnetic band up, down through the square hole and back through between the center piece and the bottom clamp. See the figure below.



2. Gently tighten the screws in the order shown below. Square up the end clamp and the tape.

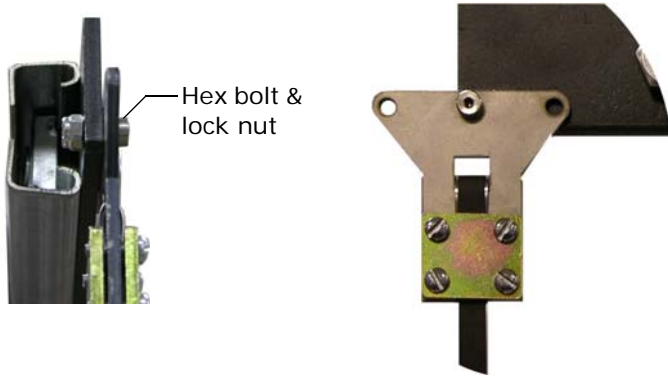


Side View

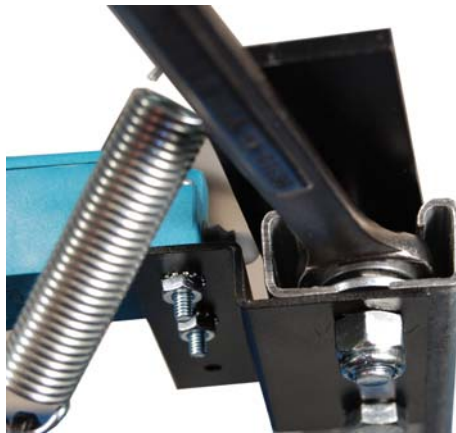
3. In the same 1, 2, 3, 4 order, make several passes, tightening each screw just a little each time. Finally, torque each screw to 14 in-lb. or 224 in-oz. (depending on the units on your torque driver).

### Hanging Tape

With the hangers in position on the rails such that the tape will hang approximately vertically, connect the tape to the top hanger using the hex bolt and locking nut provided. Make certain the arrow on the tape is pointing up and that the magnetic surface is facing the car. Begin unreeling tape toward the bottom of the hoistway:



1. Move slowly down the hoistway and unroll the tape from the carrier.
2. Attach the bottom end of the tape using the hanger parts kits and the tensioning springs. Fine tune proper vertical alignment (both front-to-back and side-to-side) — the hanger bracket ends are adjustable to provide fine side-to-side alignment (step 3). At proper tension (about 16 lbf.), the springs will be stretched about 3.0" (75 mm) beyond their relaxed length.
3. The assemblies to which the tape attaches, both top and bottom, allow fine alignment adjustment without having to work with the heavy, rail clamp hardware. After adjustment, torque the 3/8 bolts/nuts to 10 ft lbs.

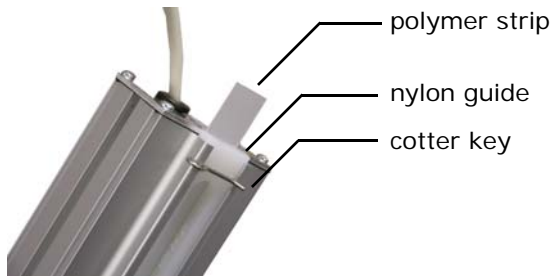


#### Note

Check that the elevator car does not rock excessively. If necessary, adjust roller or other guides until excessive rocking is eliminated. The Elgo reader will track with the car. Excessive lateral car movement will translate into reader/tape alignment movement.

## Sensor Mounting

1. Lay the sensor head on a flat surface with the tape guide facing up.

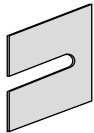


**BE CAREFUL** not to lose these pieces, you will need to use them to guide the tape past the sensor.

2. Remove the cotter key retaining the nylon guide using a pair of needle nose pliers. Note the groove in the nylon guide that the key rests in for proper orientation later.
3. Slide the nylon guide out, then remove the polymer strip that sits between the nylon guide and the sensor body.
4. Move the car to the middle of the hoistway. Attach the sensor to the car. The head must be positioned such that the CAN cable exits the top of the sensor head.

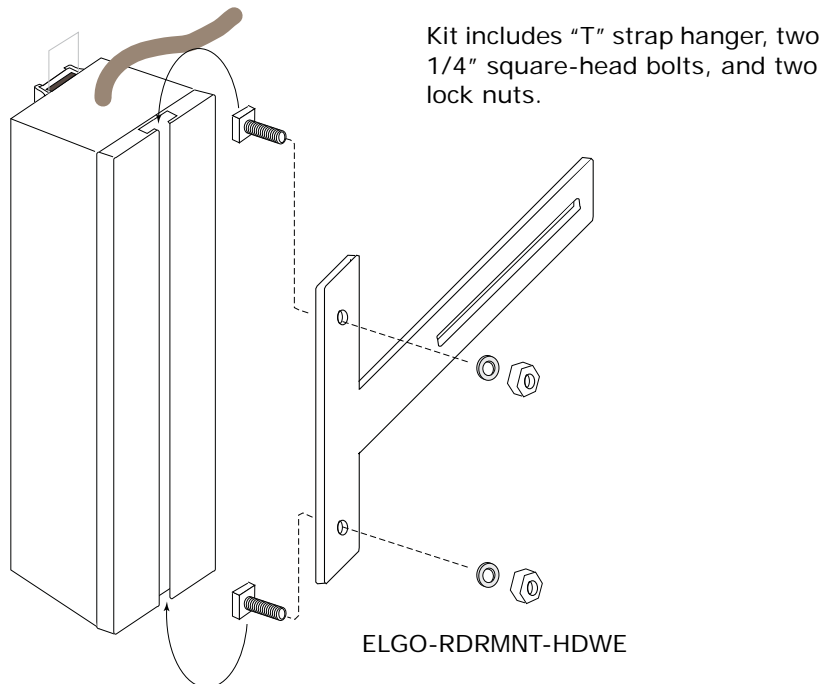
How you mount the sensor head will depend on the structure of the car and sling and the position of the tape. Because there is so much variation between jobs, sensor head mounting brackets are usually fabricated on site. Three examples follow.

**Note**



**Shims.** Four shims are provided. Once you have attached the sensor, if you find you are slightly out of plumb, loosen a bolt or nut and insert a shim to correct. If a component is out more than may be corrected by two or three shims, correct the basic installation.

**Figure 3 Sample Mount A (available option from MCE)**



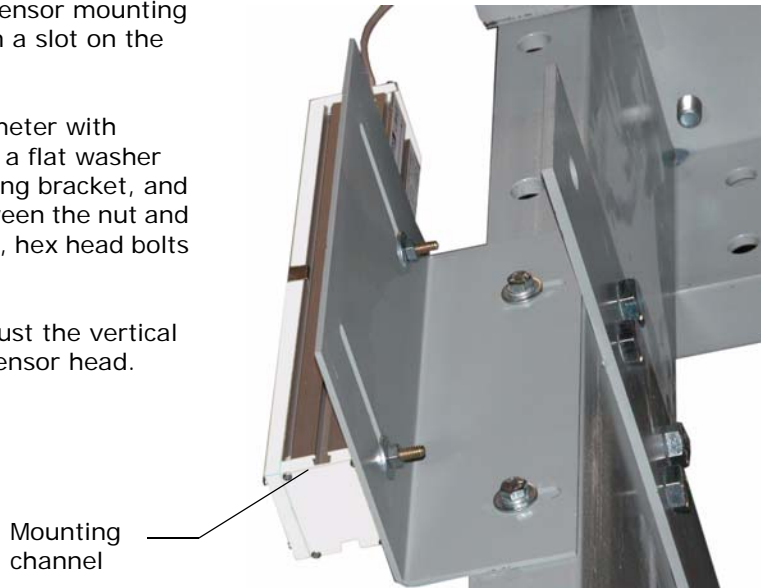
## Figure 4 Sample Mount B

Slotted mounting holes on bracket allow adjustment.

The heads of the sensor mounting bolts are captive in a slot on the sensor body.

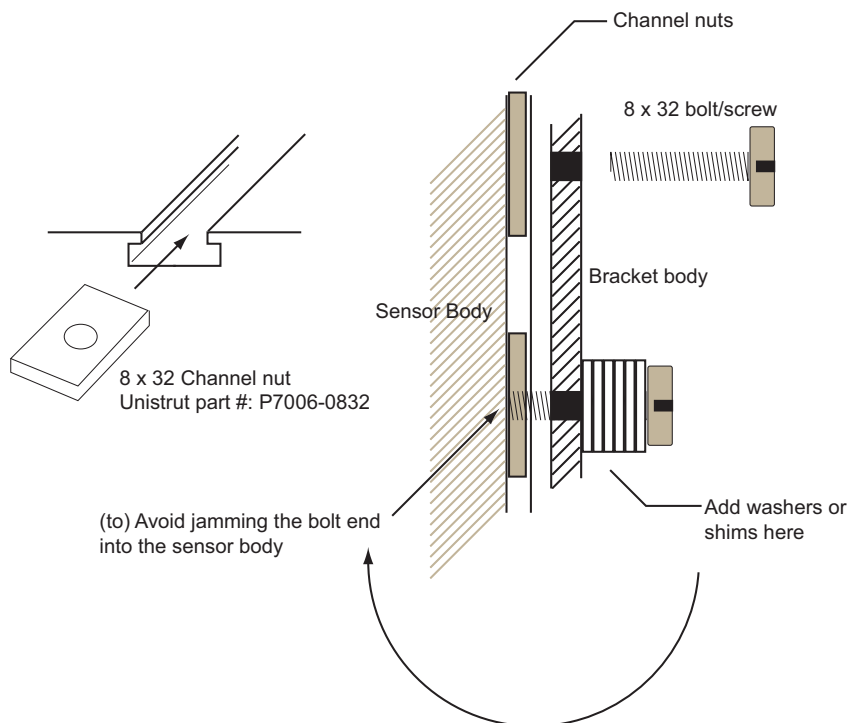
Bolts are 1/4" diameter with square heads. Use a flat washer against the mounting bracket, and a lock washer between the nut and the flat washer. M6, hex head bolts may also be used.

Use spacers to adjust the vertical alignment of the sensor head.



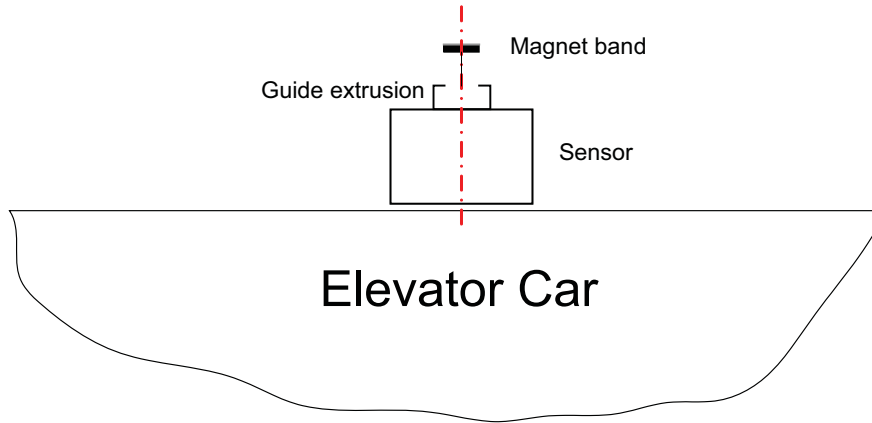
Alternatively, you can use 8 x 32 channel nuts and screws or 1/4" square head bolts and nuts. However, if you are inserting the screws toward the body of the sensor, you must be very careful that you position spacers to prevent the screw from damaging the sensor.

## Figure 5 Sample Mount C



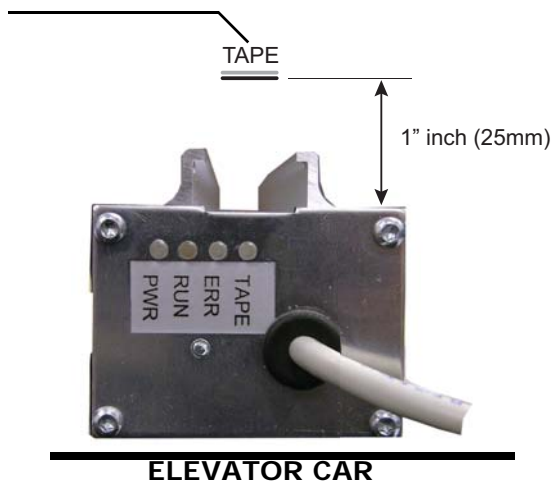
**Tape Must Be Plumb and Under Tension Before Completing the Following Steps**

1. Adjust the sensor to tape centerline alignment using the plumb tape as a reference as shown below.



2. Adjust the distance between sensor and tape. Up to a travel height of 110 meters, we recommend an offset of 1 inch (25 mm). (See the illustration below.) Verify that the offset measures 1.0 inches at both the top and the bottom of the sensor. This will ensure steady, even contact between the steel side of the tape and the polymer guide of the sensor.

Be certain the **magnetic tape layer** is facing the sensor body. NOT the **steel layer**.

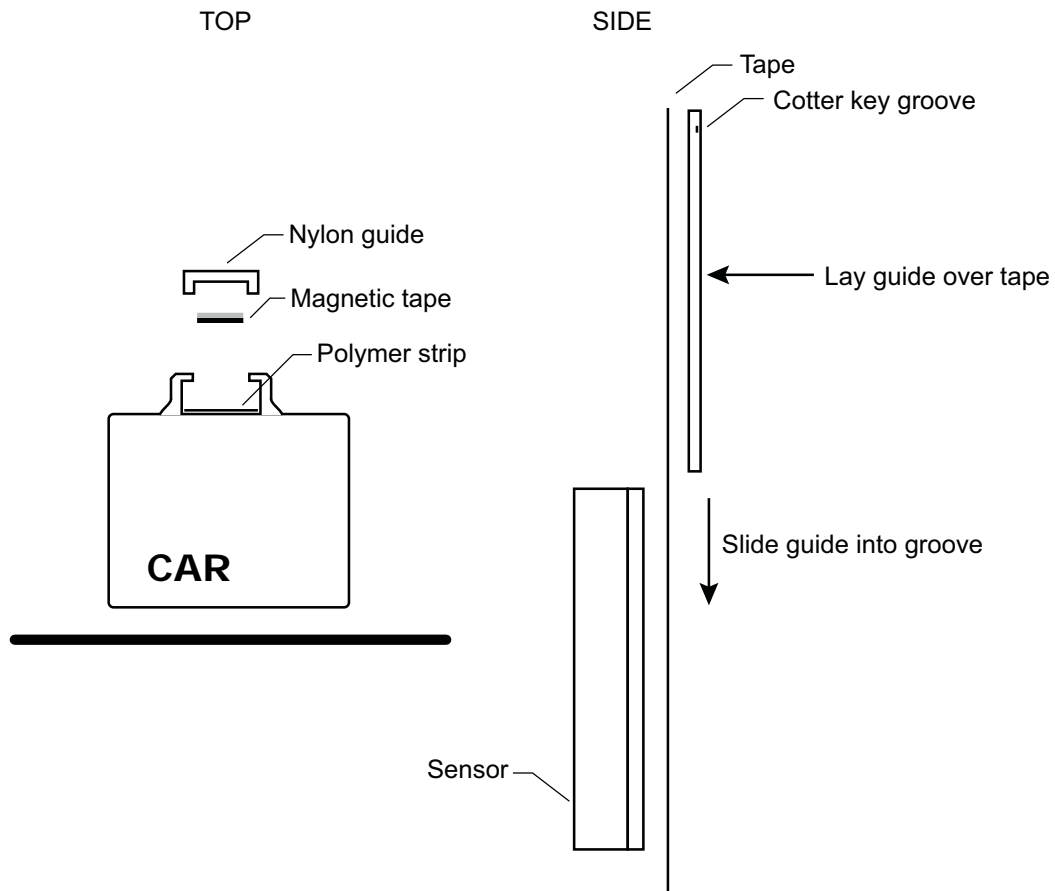




## Motion High Speed Landing/Positioning System

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3. Replace the polymer strip in the sensor "groove." Be careful it does not fall down the hoistway. (Use a bit of tape to stick the back of the polymer to the top of the sensor head if you want.)
4. Making sure the cotter key groove is at the top, lay the nylon guide over the tape above the sensor head.
5. Pressing the tape gently toward the sensor, slide the nylon guide into the groove, retaining the tape. Install the cotter key, making sure it rests in the groove in the guide. If you used tape or adhesive to hold the polymer strip in place, remove it now.

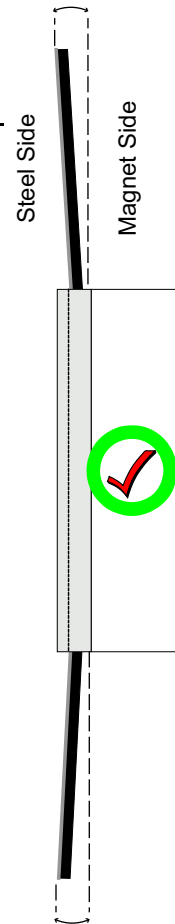
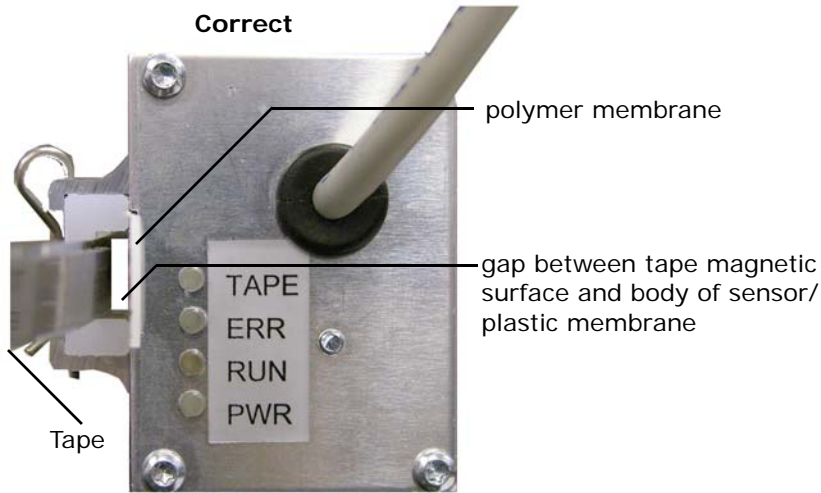




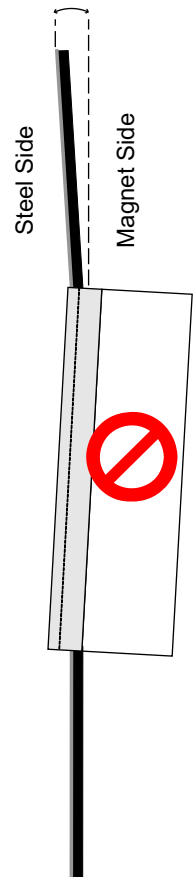
**Caution**

It is critical to ensure that the sensor is installed so that any mechanical contact between tape and sensor head is between the tape steel band and the interior-back of the nylon guide.

When properly installed, looking at the top of the sensor, there will be a slight gap between the magnetic band and the body of the sensor. Refer to the illustration below.



With the sensor guide re-installed, the tape should arc gently away from the car at the top and bottom, forcing the steel side of the tape firmly against the polymer guide.

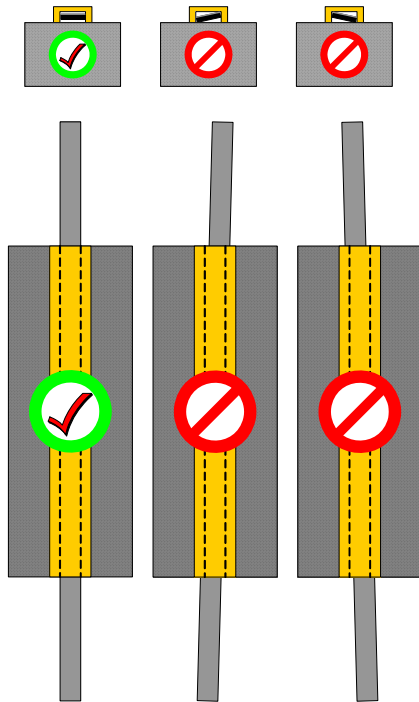


Be certain that the sensor head is plumb with the tape. Check top and bottom to be certain it is not out at the bottom while appearing correctly offset at the top.

A rocking car with roller guide or isolation mount problems can exhibit sensor head alignment issues at different points in the hoistway.

6. Check proper alignment of tape vs. sensor. Correct any angular offset.

Figure 6 Positioning Tape Longitudinal Alignment



7. On cartop inspection, move the car to several points in the hoistway. Verify that tape-to-sensor alignment remains satisfactory in each position.
8. After completing installation, clean the tape. Beginning at the top of the hoistway, move down the full travel distance pulling the tape through a soft, dry cloth. Repeat this process before putting the elevator into service after completing installation



Caution

### Periodic Maintenance Required

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Inspect the sensor and encoded tape as part of your car top routine.

1. Check that the sensor is properly aligned and that the tape is running through the reader slot with the polymer guide pressing firmly against the steel backing and with no contact on the magnetic material, as described in this instruction.
2. Check for abnormal wear on both the tape and the guide.
3. Check for debris in the sensor guide-way.
4. Check that the bottom spring attachment provides adequate tape tension (spring stretched about 2" (50 mm) beyond its relaxed length, about 16 lbf.).
5. Clean the tape as in step 8 above.

## Configuration

A new landing system parameter has been added to the F7 parameters on the Motion 4000 controller HC-MPU board to accommodate newly available positioning systems.

- LANDING SYSTEM:
  - ELGO-160: Standard ELGO system.
  - ELGO-240: Elgo system documented in this instruction.
  - LS-EDGE: Magnet/vane system.



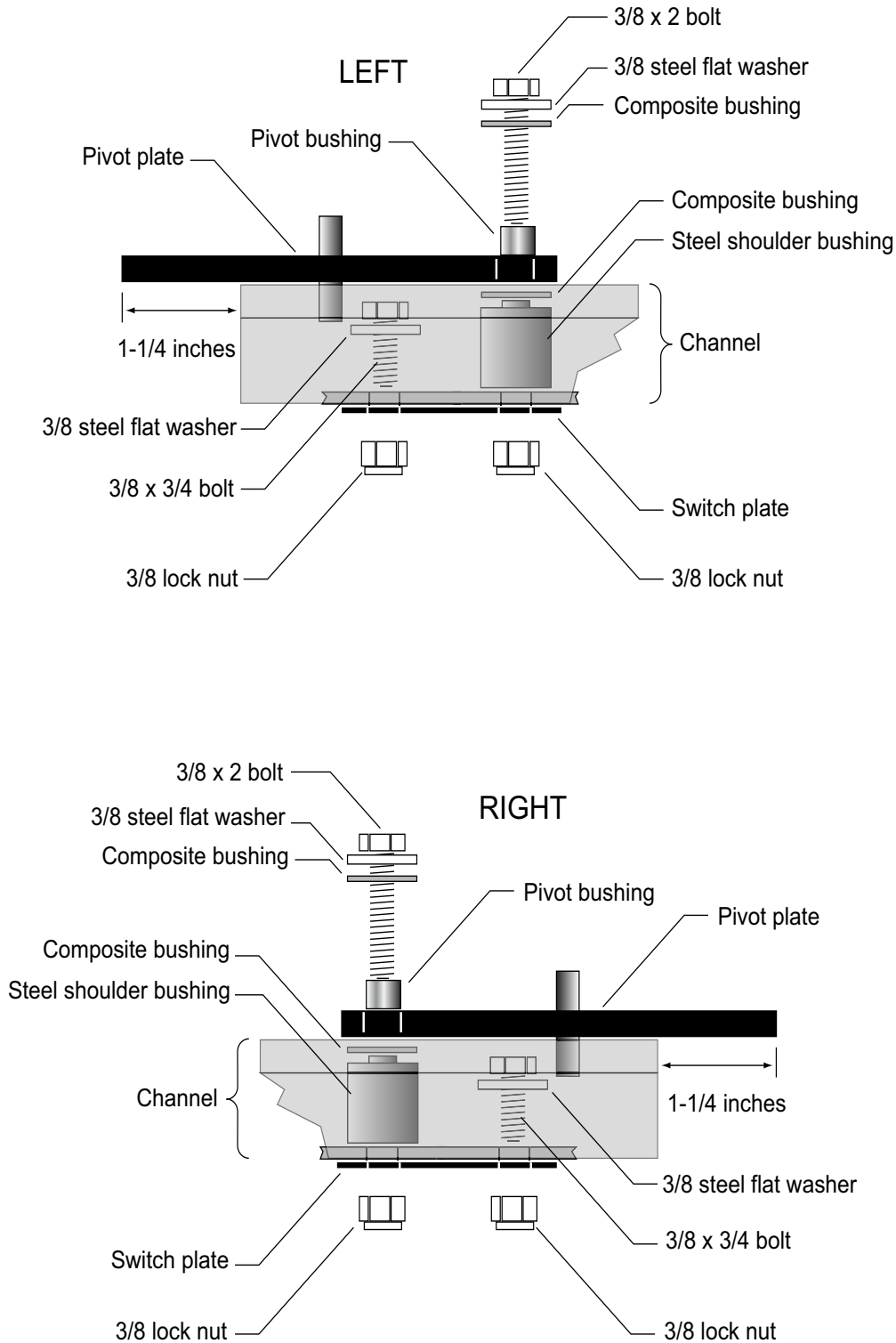
**Note**

The 160 and 240 designations refer to the distance between the individual sensors in the Elgo sensor head. One is 160mm; the other is 240mm.

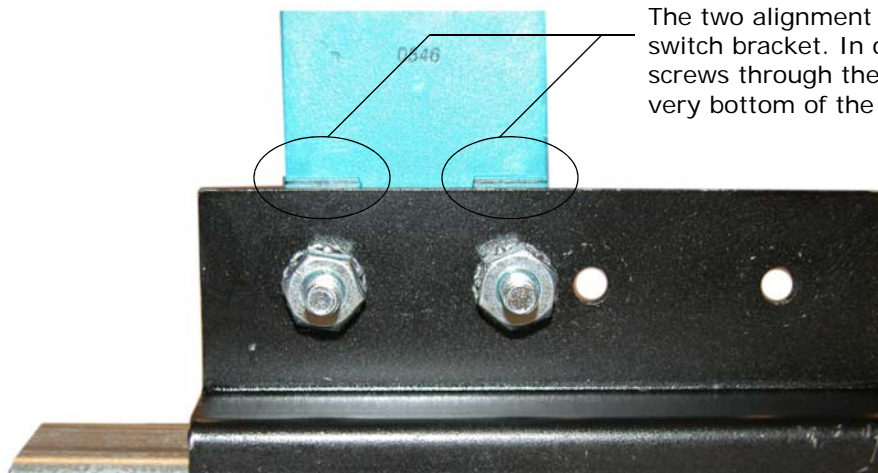
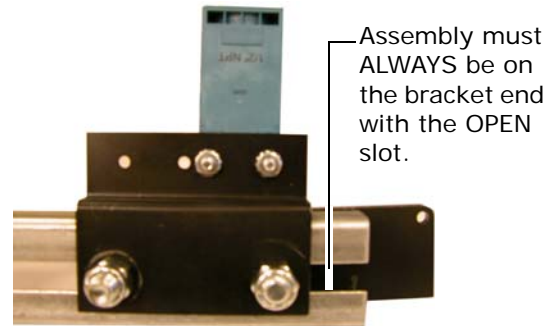
## Left to Right Rail Side Reversal

As shipped, the kit is configured to mount the sensor head on the left side of the rail (as you are facing the rail blade). The kit can be reconfigured for right side mounting as described here. The illustration shows the components as if you were looking “through” the bottom of the bracket.

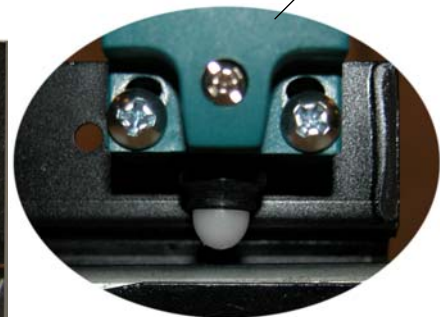
Figure 7 Side Reversal, Bottom Mount



1. Place the mounting arm assembly on a working surface so that the pivot/switch assembly is on your right but upside down. (The pivot/switch assembly must always be located on the end of the angle bracket with the open-ended slot so that it has enough adjustment.
2. On the back of the mounting arm, remove the two lock nuts that secure the pivot/switch assembly in place.
3. Remove the components. Flip the switch plate and switch so that they are now on the top of the mounting arm.
4. Refer to the preceding illustration for reassembly order. Check that the pivot extends about 1—1/4" beyond the end of the mounting arm.
5. With the unit reassembled, torque the 3/8" bolts/nuts to 10 ft-lbs.
6. Remove the #8 Phillips screws, star washers, and nuts that hold the switch in position.
7. Move the switch to the outer mounting position. The switch must be properly aligned and the mounting screws torqued to 15 to 17 in-lbs.



The two alignment tabs must rest on the top lip of the switch bracket. In order to do this, the two mounting screws through the front of the switch must be at the very bottom of the oblong screw holes.



8. Once the switch is in position, rotate the pivot until it closes the switch. With your free hand, press the switch and note that it still has about 1 mm (1/25 in) of travel. This ensures that the pin on the pivot is contacting the inside of the mounting arm and protecting the switch from being damaged by excessive force.
9. Verify that the pivot moves smoothly and will drop when released.
10. When making electrical connections to the switch, note the torque settings for the connection screws and the switch cover screw.
  - Cover screw: 15 in-lbs
  - Normally Open connection screws: 15 in-lbs

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To change the top mounting arm from left to right side:

1. Set the hanger arm assembly on a working surface so that the hanger plate is on your right.
2. Remove the two 1/2" bolts that secure the top hanger plate.
3. Flip the plate top-to-bottom so that the tape attachment hole is on the bottom.
4. Reassemble with the hanger plate extending beyond the end of the bracket by about 1 and 1/4 inches.
5. Torque the 1/2" bolts to 20 ft-lbs.

**Figure 8 Changing the Top Mounting Arm from Left to Right Side**

