ETS·LINDGREN®
An ESCO Technologies Company

# Model 2171C Series
## Antenna Positioning Tower
## Installation Manual

1805617 Rev A

June, 2026

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Revision Record
MANUAL, 2171C | Part # 1805617 Rev A

| Revision | Description | Date |
|---|---|---|
| A | Initial Release | June, 2026 |

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## NOTES, CAUTIONS, AND WARNINGS

| | |
|---|---|
|  | **Note:** Denotes helpful information intended to provide tips for better use of the product. |
|   | **CAUTION:** Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures. |
|   | **WARNING:** Denotes a hazard. Failure to follow instructions could result in **SEVERE** personal injury and/or property damage. Included text gives proper procedures. |

# SAFETY INFORMATION

See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

**Refer to Manual:** When product is marked with this symbol, see the instruction manual for additional information. Manuals are available for download at ets-lindgren.com, or contact ETS-Lindgren Technical Support.

**High Voltage:** Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury or death.

**Only qualified personnel** should operate (or service) this equipment. The electrical installation of this product should be accomplished by an individual who is authorized to so do by the appropriate local authority. The installation should be in compliance with local electrical safety codes.

**Heavy Object:** Unassisted lifting can cause injury. Mechanical assistance is required.

**Never rock or tilt.** Rocking or tilting equipment can cause injury and damage equipment.

**Stay clear** of moving components during operation of equipment.

Moving and/or falling equipment can cause serious injury.

**Keep hands clear:** Moving parts can crush and cut.

**Pinch Points:** Keep hands clear during operation.

**Moving Gears:** Do not stick hand in or near machine during operation.

**Do not make any modifications to this unit without consulting the factory directly.**

**Before servicing:** Contact ETS-Lindgren. Servicing (or modifying) the unit by yourself may void your warranty. If you attempt to service the unit by yourself, disconnect all electrical power before starting. There are voltages at many points in the instrument which could, if contacted, cause personal injury. Only trained service personnel should perform adjustments and/or service procedures upon this instrument. Capacitors inside this instrument may still be charged even when instrument is disconnected from its power source.

**Protective Earth Ground (Safety Ground):** Indicates protective earth terminal. You should provide uninterruptible safety earth ground from the main power source to the product input wiring terminals, power cord, or supplied power cord set.

Before power is applied to this instrument, ground it properly through the protective conductor of the AC power cable to a power source provided with the protective earth contact. Any interruption of the protective (grounding) conductor, inside or outside the instrument, or disconnection of the protective earth terminal could result in personal injury.

**LASER WARNING:** Denotes a laser (Class 1) is part of the operating system of the device. Use caution.

**FALL HAZARD:** Do not climb on equipment.

# INTRODUCTION

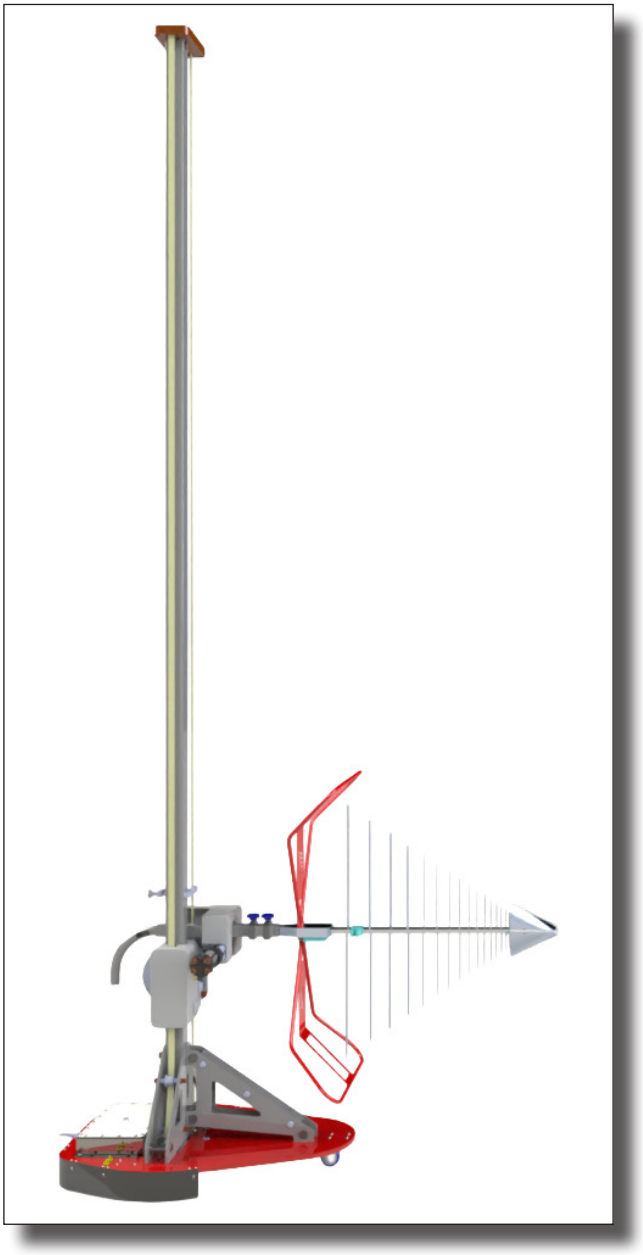
The ETS-Lindgren Model 2171C Antenna Positioning Tower meets ANSI C63.10 requirements for measurements above 1 GHz.

The boresight measurement is required for wireless device testing based on ANSI C63.10 for above 1 GHz measurements.

The 2171C can also be used as a traditional non-boresighting tower that maintains a level boom.

The EUT is nominally situated at 1 m high (above an 0.8 m table), and in some cases the height of the EUT could be at 1.5 m. It is possible that some customers may choose to point to a height of 1.5 m for larger EUTs.

The distance between the antenna and the EUT is typically set to be 3 m, 5 m, or 10 m, depending on the EUT and the facility. In some situations, a test engineer may elect to use a test distance less than 3 m (but no less than 1 m) to improve measurement sensitivity.



## ETS-Lindgren Patented Boresight System

The Model 2171C enables the ETS-Lindgren patented boresight system to provide direct antenna aim on EUT during scanning. This boresight meets the requirements of ANSI C63.10 for compliance with FCC measurements above 1 GHz.

During scans, the boresight system maintains constant directional antenna positioning while varying the angle between the antenna and the mast. This is particularly important when using higher gain antennas of more than 3 dBi. As the antenna is raised above the ground, the tilt of the antenna will maintain the EUT within the half power (-3 dB) beamwidth.

# SPECIFICATIONS

## 2171C

### Electrical Specifications

| | |
|---|---|
| **Voltage:** | 230 VAC |
| **Amp:** | 10.00 |
| **Line Frequency:** | 50/60 Hz |
| **Phase:** | Single |

### Physical Specifications

| | |
|---|---|
| **Polarization:** | 30° per second |
| **Scan Range:** | 1.00 m—4.00 m (39.37 in—157.48 in) |
| **Speed Range:** | 1 cm/sec to 6.2 cm/sec |
| **Weight (approximate):** | 88.50 kg (195.0 lb) (approx.) |
| **Cross Boom Loading** | 8.16 kg (18.00 lbs) |
| **Maximum Overall Height:** | 4.90 m (192.93 in) |
| **Base Dimensions (LxW):** | 1.20 m (47.50 in) x 0.8 m (34.00 in) |

## 2171C-001

### Electrical Specifications

| | |
|---|---|
| **Voltage:** | 230 VAC |
| **Amp:** | 10.00 |
| **Line Frequency:** | 50/60 Hz |
| **Phase:** | Single |

### Physical Specifications

| | |
|---|---|
| **Polarization:** | 30° per second |
| **Scan Range:** | 1.00 m—4.00 m (39.37 in—157.48 in) |
| **Speed Range:** | 1 cm/sec to 6.2 cm/sec |
| **Weight (approximate):** | 76.20 kg (168.0 lb) (approx.) |
| **Cross Boom Loading** | 8.16 kg (18.00 lbs) |
| **Maximum Overall Height:** | 2.60 m (102.38 in) |
| **Base Dimensions (LxW):** | 1.20 m (47.50 in) x 0.8 m (34.00 in) |

# ELECTRICAL INSTALLATION

| | |
|---|---|
| **WARNING** | **Before connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.**<br>**Follow all safety precautions in order to prevent injury and equipment damage.** |
|  | Electrical installation must be performed by a qualified electrician, and in accordance with local and national electrical standards. |
| **WARNING**<br>  | Make sure the power is off and secured before proceeding.. |

## Power Cord

The motor base is provided with a NEMA 6-15P to C13 AC power cord that is approximately 3 m (9.8 ft) long.

# ASSEMBLY INSTRUCTIONS

| | |
|---|---|
| **WARNING** | **Before connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.**<br>**Follow all safety precautions in order to prevent injury and equipment damage.** |
|  | **Stay clear of all moving components on this equipment.**<br>**Never stand beneath the carrier, whether moving or stationary.** |
|  | **Only qualified personnel should operate (or service) this equipment.** If you have any questions concerning assembly, contact ETS-Lindgren Technical Support. |
|  | **Note:** You will require assistance from two or more team members to assemble the Model 2171C. |
|  | **Note:** See the ETS-Lindgren Product Information Bulletin included with your shipment for information on unpacking and acceptance procedures. |

The Model 2171C Antenna Positioning Tower should be assembled in the location where it will be used. If movement to another location is required after assembly, partial disassembly will be required for it to fit through most doorways.

## Included and Recommended Tools

### Included Tools

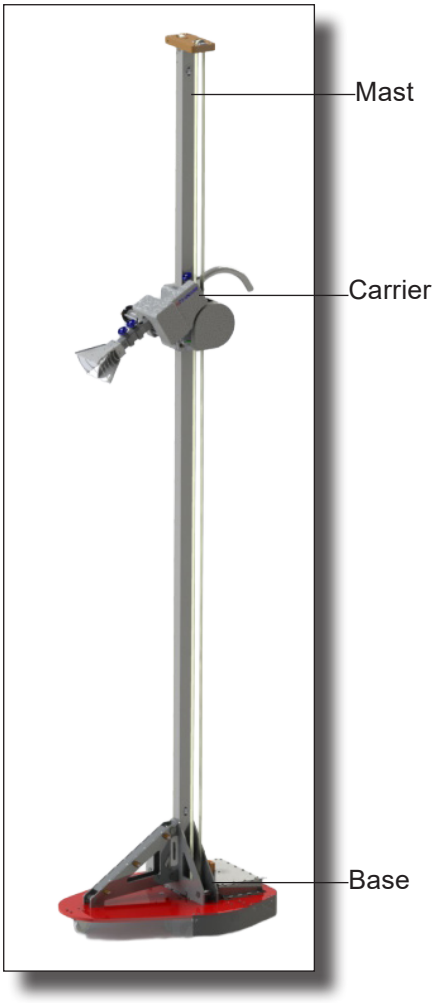
- **Part# 891780:** Adjustable Wrench, 11/8” Jaw (quantity: 2). For all hex nuts.
- **Part# 891781:** Hex Key, 3/16” Hex (quantity: 1). For cam rollers on motor base.
- **Part#1795012**: Calibration Clamp
- **Part# 1793768** Digital Level

### Recommended Tools

- Work bench or two sawhorses

## Parts to Assemble

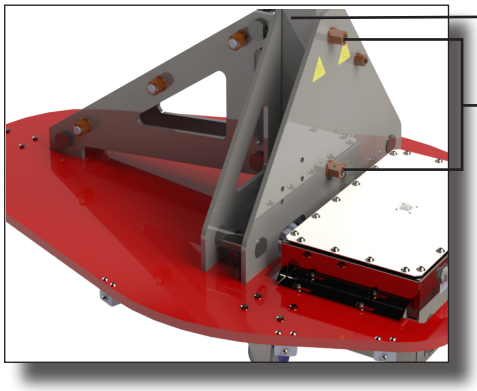
- Mast
- Carrier
- Belt (2)
- Base




Boresight shown; antenna not included

## Overview of Assembly Steps

1. Remove temporary shipping mast from base.
2. Insert mast assembly into base.
3. Install drive belt and pulleys.
4. Install tilt belt.
5. Connect fiber optic cables.
6. Adjust tension belts.
7. Install covers and accessories.

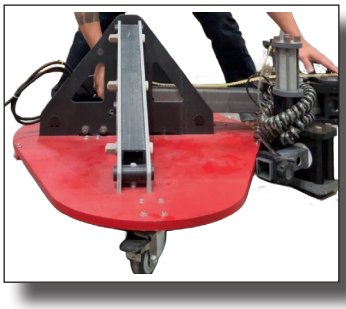



## Remove Temporary Shipping Mast From Base

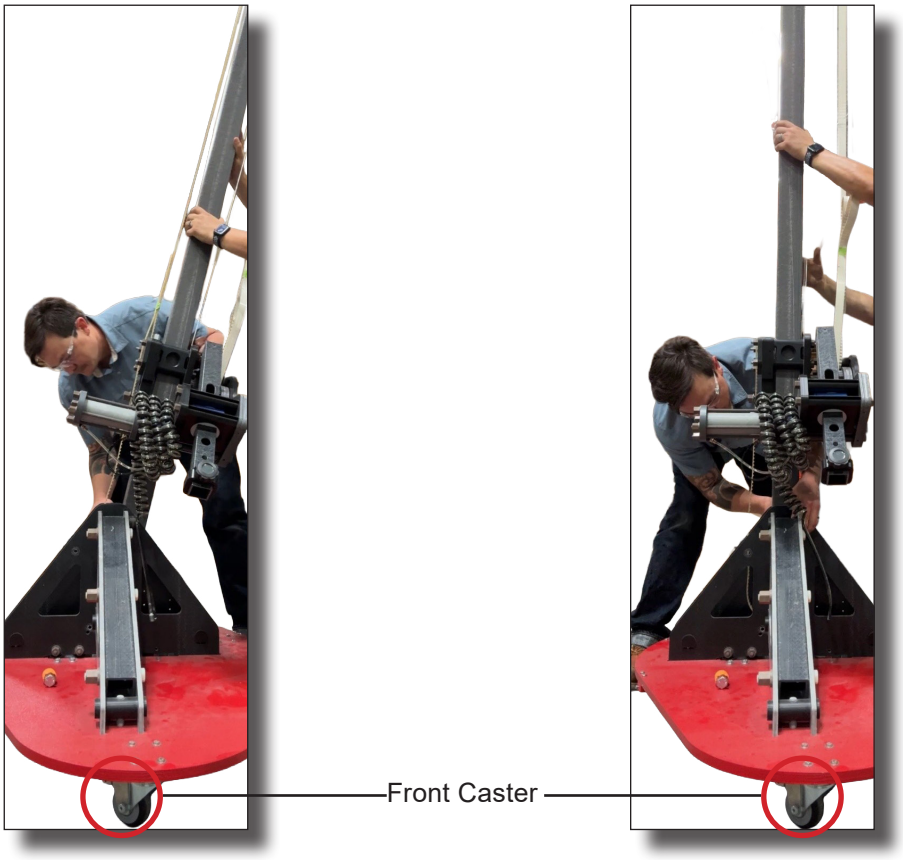
1. Remove both mast bolts to remove shipping mast.
2. Lift the temporary mast out and set it aside.

## Insert Mast Assembly Into Base

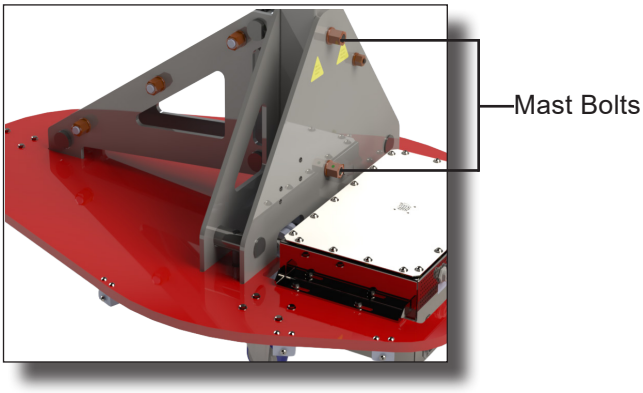
1. Carefully lay the mast assembly on its side with the tilt belt towards the ground.
2. Position the base at the bottom end of the mast assembly.
3. Ensure correct orientation with the tilt boom towards the front caster of the base.
4. Carefully lift and slide the bottom end of the mast assembly into the base (2 people recommended).



5. Align the bottom hole of mast to bottom hole on base support plate and install mast bolt. Do not tighten mast bolt completely.
6. Lock front caster wheel on base to avoid movement while lifting mast assembly.
7. Lift the top end of the mast assembly until the mast is completely vertical and the top mast bolt hole is aligned.

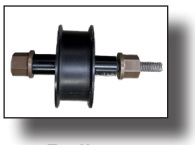



8. Install mast bolts.
9. Tighten both mast bolts completely.

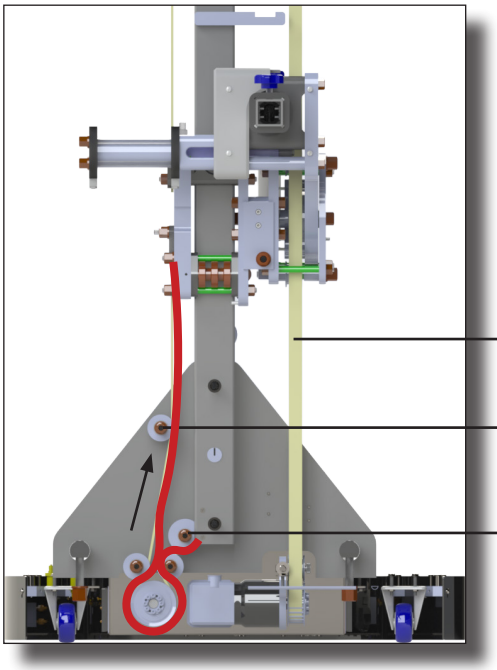


## Install Drive Belt and Pulleys

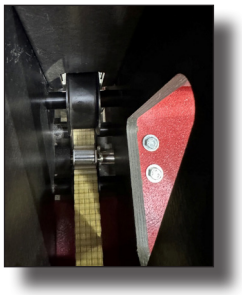
1. Install the large pulley in location shown in section view drawing, with the larger pulley at lower location and the small pulley at top location.



Pulley

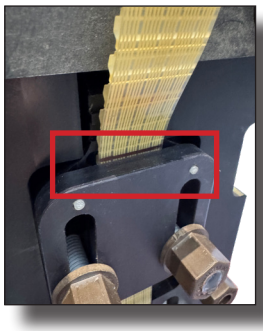



2. Route drive belt. (See arrows on diagram.)

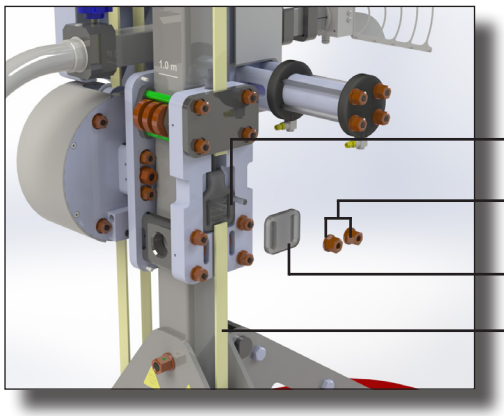


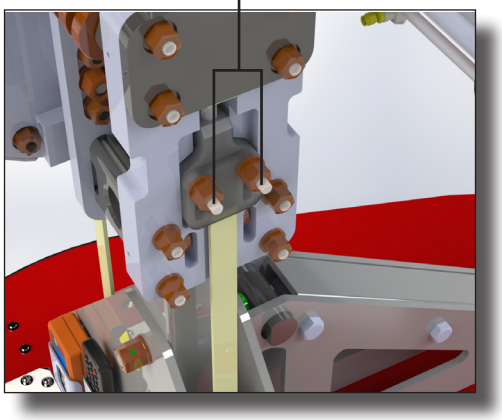
Routed Belt

3. Remove two fiberglass hex nuts on belt clamp to remove belt clamp plate.
4. Pull all slack out of drive belt and position belt teeth into the slots in the belt clamp.
5. Belt should be installed with mark (line) aligned to top edge of belt clamp plate.
6. Install the belt clamp plate with the fiberglass hex nuts.



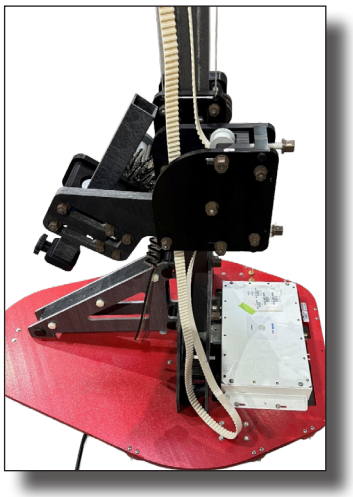
Belt mark aligned with top edge of belt clamp plate



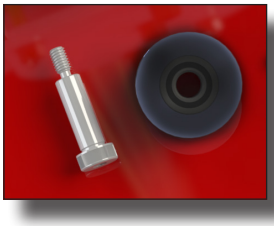



## Install Tilt Belt

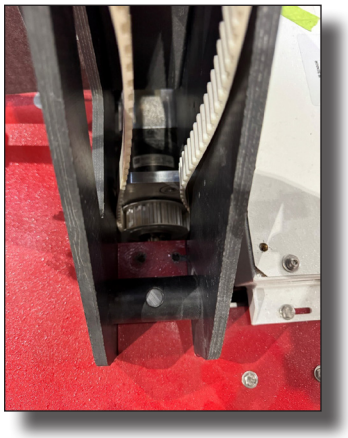
1. Remove tape from tilt belt.
2. Route belt through base opening and onto tilt motor pulley.



Tape on belt

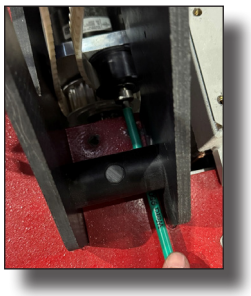


Pulley and Bolt



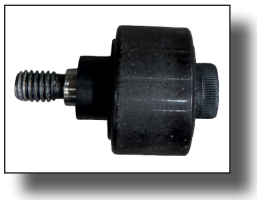
Belt routed onto tilt motor

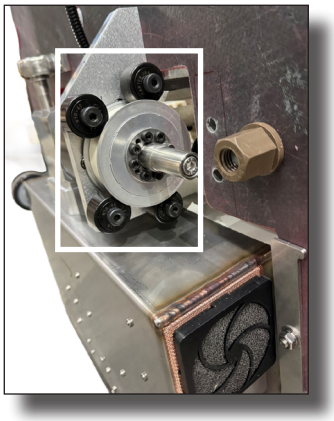
3. Install tilt belt idler pulley using a hex key.



4. Carefully tilt tower assembly as shown (sawhorse or bench recommended).

5. Install idler belt rollers as shown (x4 shoulder bolt, x4 plastic spacer, x4 metal roller).

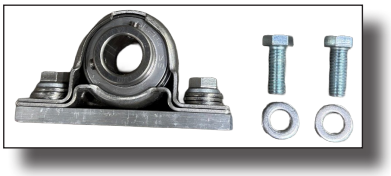




6. Remove fiberglass hex nut at bottom of base.

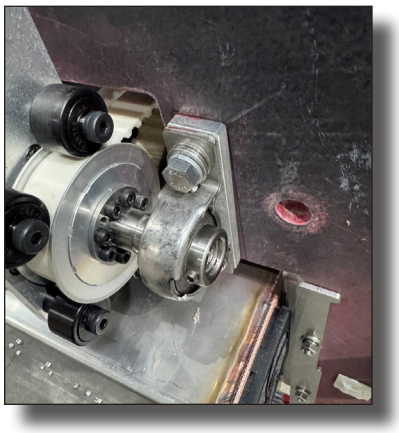
7. Remove fiberglass stud from base.

Components removed from base



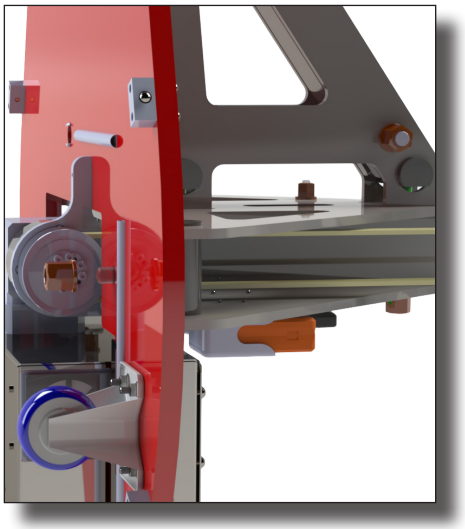
Bearing Support Block and Hardware

8. Slide bearing support block onto tilt motor shaft.



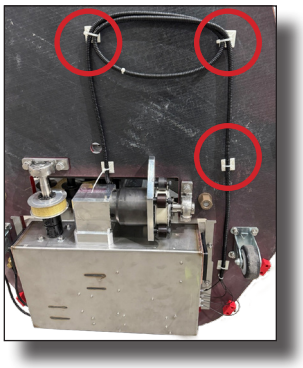
9. Install hex bolts and washers from opposite side.

10. Reinstall the base bolt components in reverse order.
11. Ensure the stud engages with most of the hex nut.

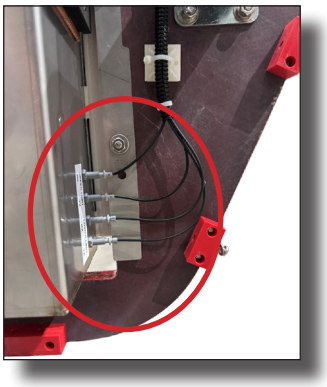


## Connect Fiber Optic Cables

1. Secure fiber optic cables with provided cable ties as shown.



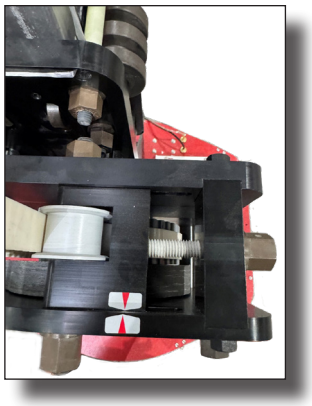
2. Connect fiber optic cables to corresponding connectors on motor box.



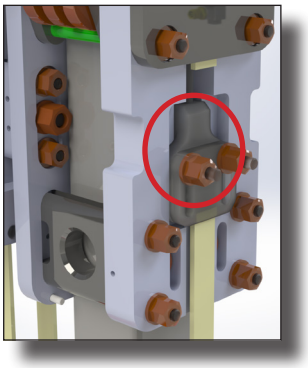
## Install Tension Belts

1. Lift tower to vertical position.
2. Loosen top and bottom tensioning pulley hex nuts (do nut remove).

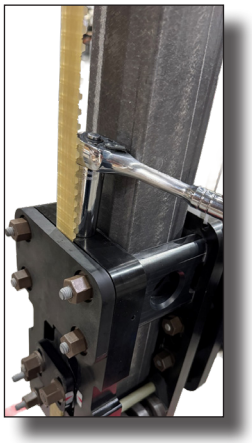
3. Tighten tensioning pulley jack screw to drive the pulley forward until the marks line up.
4. Tighten tensioning pulley hex nut to lock in place.
5. Repeat for bottom tensioning pulley.



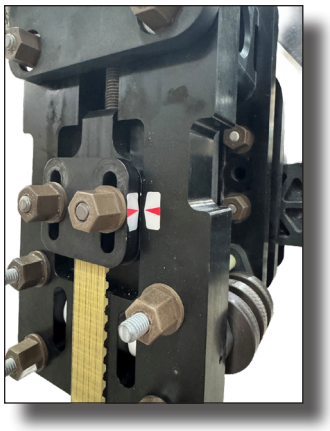
6. Loosen drive belt clamp hex nuts enough to allow the clamp assembly to slide freely but not disengage belt teeth. (Do not remove.).



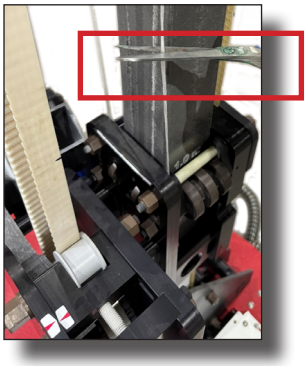
7. Tighten hex located on top of the carrier assembly to pull the drive belt clamp assembly until the marks align.



8. Tighten drive belt clamp hex nuts to lock position.

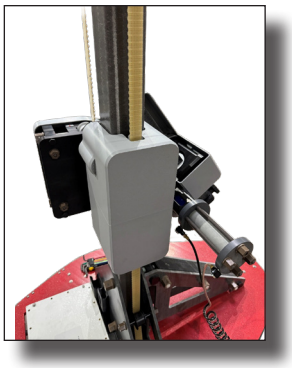


9. Remove shipping safety rope.

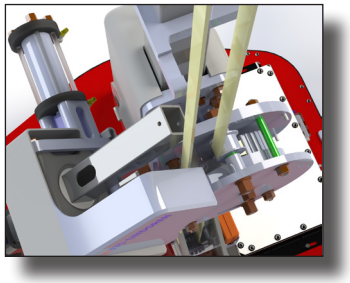


## Install Covers and Accessories

1. Slide carrier cover over carrier.

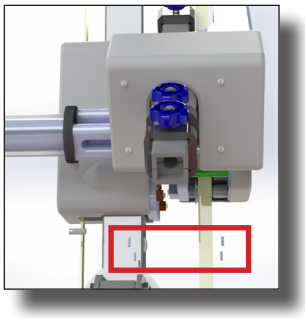


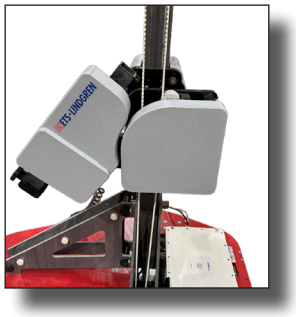
2. Fasten cover from opposite side using four plastic screws provided.



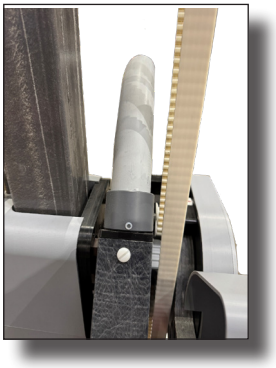
3. Slide tilt plate cover and fasten from opposite side using the provided plastic screws (3x).

4. Slide the tilt boom covers together and onto the tilt boom.
5. Fasten using the provided plastic screws 4x.

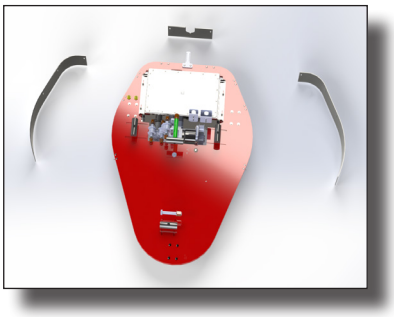




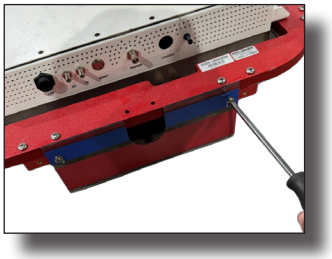
6. Slide the boom tail into the boom and align the threaded hole on the tail to the through hole on the boom.
7. Fasten using the provided plastic screw.



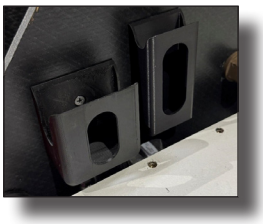
8. Install the skirt using the provided metal screws and washers (10x).



9. Adjust height as needed to allow for about 2mm clearance from the test floor.



10. Install digital level and remote holders using the provided metal Phillips drive screws (4x).



11. Push pneumatic hoses onto corresponding brass hose barbs in base.