

Introduction

This document describes how to install StableTrac successfully to your Furio Dolly system.

The retrofit process requires **two people** at minimum, and takes approximately **2 hours** per dolly.

CAUTION: Ensure the Dolly is **OFF** before starting the retrofit process.

IMPORTANT: StableTrac is not suitable for VR1 dollies.

Retrofit Kit Contents

Retrofit Kit **#FRO-DLY-ST-UPG** includes enough materials to retrofit either the **Furio SE or S2** dollies.

The Kit contains the following items:

- StableTrac Arm (5110AR-136-xx)
- Direction Module Assembly (5110AR-138-xx)
- Fixed Direction Shaft (5110AR-541-xx)
- Loctite® adhesive

Required Tools

In addition to the Retrofit Kit contents, the following tools are required:

- 17 mm open-end wrench
- Hexagonal wrench set including:
 - › 2 mm (x1)
 - › 2.5 mm (x1)
 - › 3 mm (x1)
 - › 4 mm (x1)
 - › 5 mm (x2)
 - › 6 mm (x1)
 - › 8 mm (x1)
- Wire cutters
- Grease pencil
- A protective pad to protect the dolly base when it's inverted

Process Summary

This document provides detailed instructions to help you complete the following sections and steps:

1. Disassembling the Dolly
 - › **“Step 1: Removing the Wiredraw Cable”** on **page 2**
 - › **“Step 2: Removing the Robotic Head and Payload”** on **page 3**
 - › **“Step 3: Removing the Robotic Lift Column”** on **page 3**
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2. Installing StableTrac Retrofit Kit Components
 - › **“Step 1: Removing the Side Cover Plate”** on **page 6**
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- › “Step 4: Replacing the Passive Wheel Post” on page 8
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 - › “Step 12: Attaching the Wheel Units to the Dolly Base” on page 17
 - › “Step 13: Securing StableTrac and the Wheel Sets” on page 18
3. Reassembling the Dolly
- › “Step 1: Reinstalling the Stability Wheels” on page 19
 - › “Step 2: Installing the Main FRU” on page 20
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Disassembling the Dolly

Before You Begin:

- Move the dolly to a location that allows easy access to the drive wheel side.
- Ensure the dolly is on a straight portion of the track that allows ample space to work.
- Lower the lift completely, turn the dolly off, and disconnect the dolly power cable.
Note: Record the position of each cable as you remove it so you can later restore them to their original positions.
Tip: Don't forget to reconnect the power cable when you are finished servicing the dolly.

Step 1: Removing the Wiredraw Cable

Remove the Wiredraw Cable

1. Move the dolly as close to the wiredraw as possible before detaching the cable.
2. Use a 6 mm hexagonal wrench to remove the bolt that secures the wiredraw cable to the dolly while holding the wiredraw.
Note: Grasp the cable end tightly, but do not wrap it around your hand or bend it.
IMPORTANT: Handle the wiredraw cable with care to avoid permanently damaging the cable and wiredraw unit. NEVER allow the cable to snap back into the wiredraw unit. If you release the cable and it snaps back into the wiredraw unit, the unit may be irreparably damaged.
3. Hold the cable close to the floor and parallel to the track to avoid rubbing of the steel cable against the wiredraw enclosure box, protecting the cable from damage.
4. Slowly walk the cable back to the wiredraw unit. Do not allow it to snag or rub against anything, except the part of the rail it normally contacts (curved tracks only).

Step 2: Removing the Robotic Head and Payload

Remove the Payload

1. Disconnect all cables from the payload and the robotic head, noting the position of each cable as you remove it so you can later restore them to their original positions.
2. Use the grease pencil to mark the position of the payload on the camera cradle (refer to **Figure 1**), and then remove the payload. Marking the payload position enables you to return it to its exact original position, which is especially important if it is part of a Virtual Studio / Augmented Reality (VS/AR) solution.

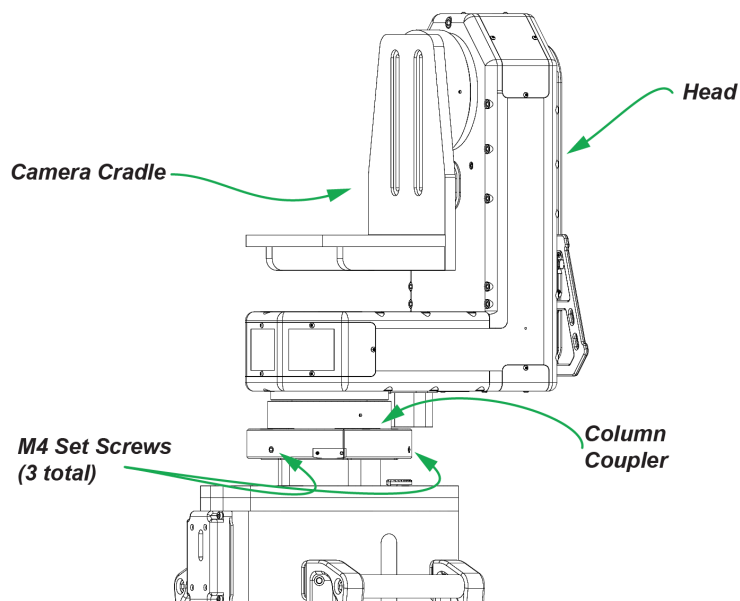


Figure 1 - Robotic Head

Remove the Robotic Head

1. Use the grease pencil to mark where the head/column coupler meets the top of the lift column so you can later realign them.
2. While another person holds the head steady, use the 4 mm hexagonal wrench to loosen the three M4 set screws along the edge of the head/column coupler, until the head is loose enough to remove from the lift column. Refer to **Figure 1** above.
3. Remove the head by lifting it straight up.

Step 3: Removing the Robotic Lift Column

Remove the Lift Column

1. **For a Robotic Lift Column:** Using the 8 mm hexagonal wrench, remove the four M10 base plate bolts that fasten the lift to the dolly base, as shown in **Figure 2**.
2. **For a Fixed Column:** Using the 6 mm hexagonal wrench for the fixed column, remove the M10 Flat Head base plate bolts.
3. Using the handles, lift the robotic lift column straight up until all of it is above the dolly, and then move the lift column aside and lay it down gently on its side.

CAUTION: The lift column is heavy. Get help when handling heavy items.

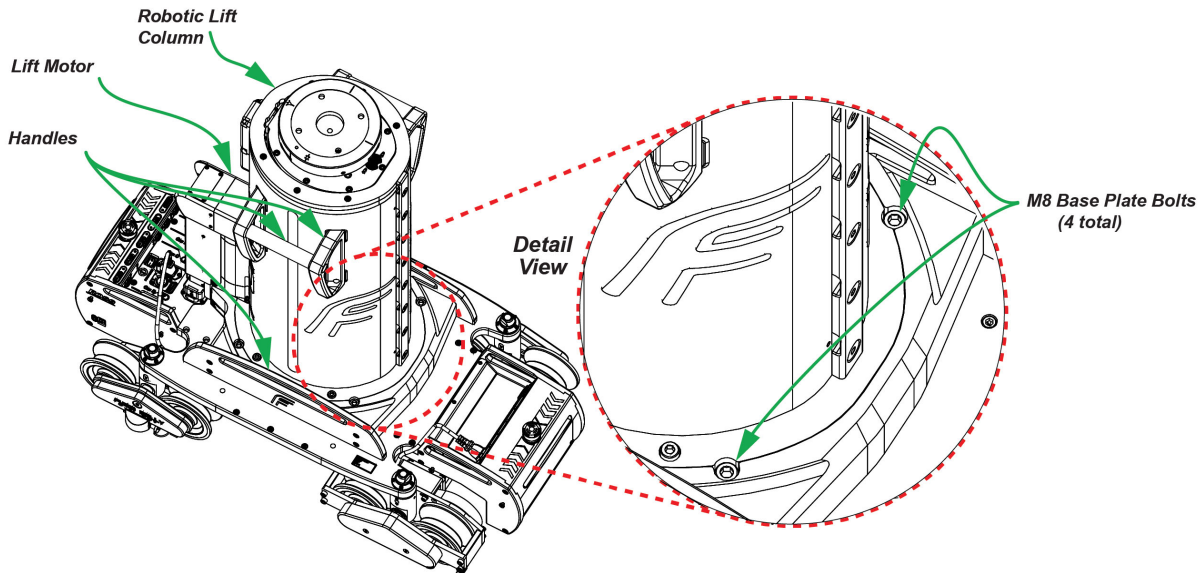


Figure 2 - M10 Base Plate Bolts Connecting the Lift to the Dolly

Step 4: Removing the Stability Wheels

Removing the Stability Wheels

There are two sliding passive wheel sets on the dolly, each containing stability wheels, which ensure the wheels are securely fixed to the track. Refer to **Figure 3**.

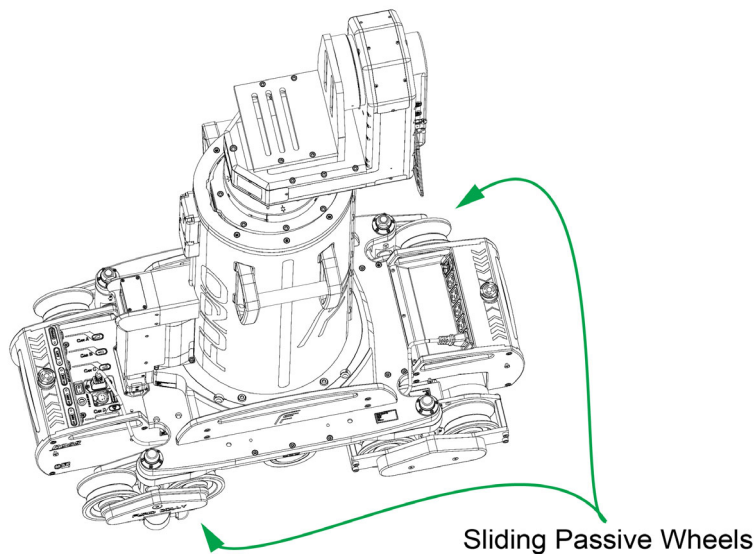


Figure 3 - Sliding Passive Wheels with Stability Wheels

Removing these wheels allows the dolly to be lifted from the track.

Remove the Stability Wheels

For the two sliding passive wheel sets, complete the following:

1. Locate the stability wheel.
2. Remove the locking pin by pressing and holding the pin lock button while sliding the locking pin out. Refer to **Figure 4**.

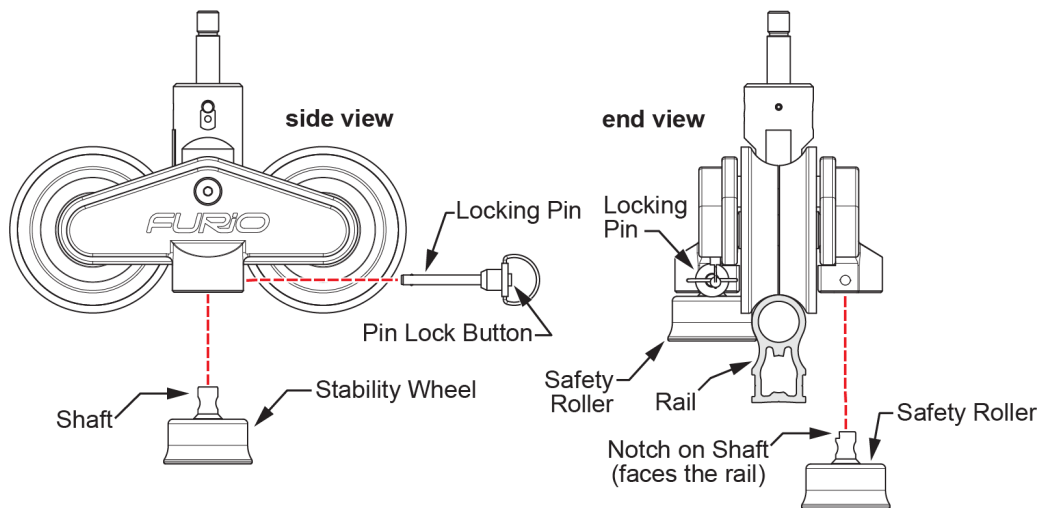


Figure 4 - Removing Stability Wheels

Installing StableTrac Retrofit Kit Components

Step 1: Removing the Side Cover Plate

Remove the Side Cover Plate

1. Locate the side cover plate on the same side as the drive wheel.
2. Using a 5 mm hexagonal wrench, remove the three screws securing the side cover plate as shown in **Figure 5**.
IMPORTANT: Removing the base plate requires breaking the Loctite® seal. New Loctite® adhesive is provided in the Retrofit Kit.
3. Remove the side cover plate and store it nearby for reassembly.

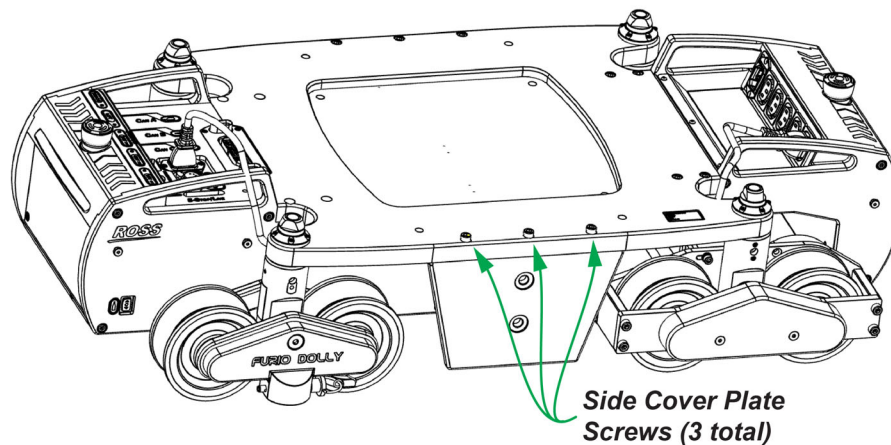


Figure 5 - Dolly Base Side Cover Plate

Step 2: Removing the Main FRU

Remove the Main Field Replaceable Unit (FRU)

1. Disconnect all cables from the Main FRU.
Tip: Ensure that each cable is labeled, so they're easy to reconnect later.
2. Use a 5 mm hexagonal wrench to remove the four screws that secure the Main FRU to the dolly.
Note: **Figure 6** shows the four mounting screws.

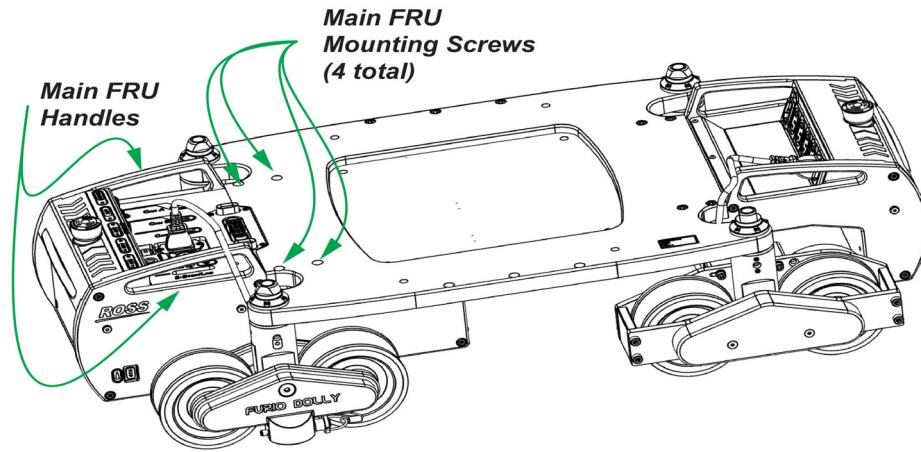


Figure 6 - Furio SE Dolly, Showing Four Mounting Screws that Secure the Main FRU

3. Grasp the handles on the Main FRU, and then slowly slide it out from the body of the dolly.

Tip: The Main FRU has two runners that ride on guide rails within the body of the dolly. Be prepared to catch the Main FRU as it disengages from the body of the dolly.

Step 3: Removing the Passive Wheels

Remove the Passive Wheels

1. Use a 17 mm open-end wrench to remove the nut above the passive wheel set (see **Figure 7**) on the same side as the drive wheel set.

Tip: If the nut spins without coming off, insert a narrow tool into the **locking hole** in the side of the shaft. The tool locks the shaft as you turn the wrench, enabling you to remove the nut.

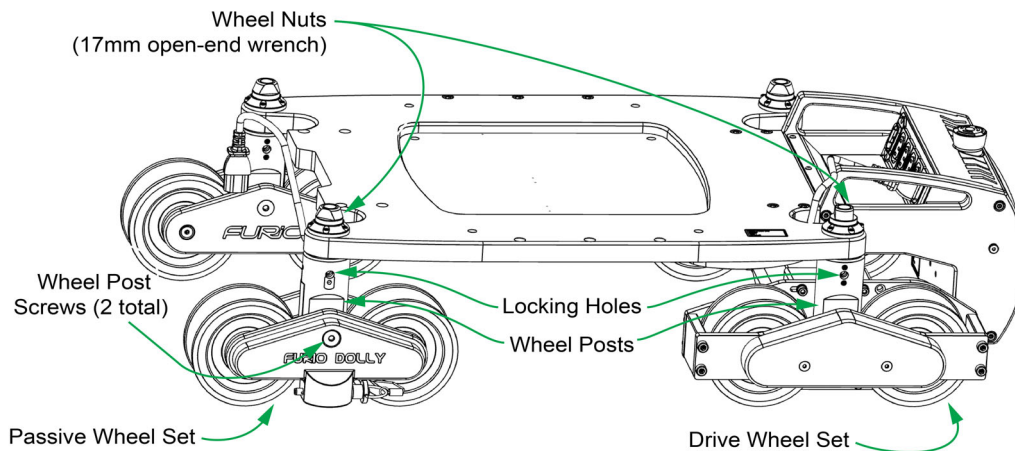


Figure 7 - Removing a Passive Wheel Set

Step 4: Replacing the Passive Wheel Post

Remove the Old Passive Wheel Post

1. Use two 5 mm hexagonal wrench to remove the wheel post screws (one on either side), as shown in **Figure 8**.

Note: Set these screws aside as they're needed to install the new post.

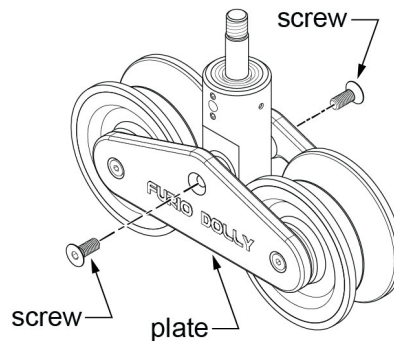


Figure 8 - Removing the Passive Wheel Post Screws

2. Remove the wheel post from the passive wheel set.
3. Remove the shaft from inside the old post, as shown in **Figure 9**.

Note: This shaft will be reused in the new post provided in the Retrofit Kit. These wheel posts can be stored away or discarded once the StableTrac arm installation is complete, as the Retrofit Kit contains new wheel posts.

IMPORTANT: Do not attempt to pull the side plates apart, as the wheel post provides tension to this wheel unit

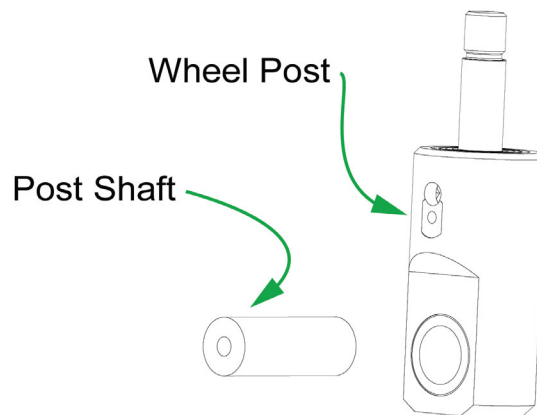


Figure 9 - Separating the Post Shaft from the Old Passive Wheel Post

Install the New Passive Wheel Post

1. Insert the shaft from the old post into the new post.
2. Place a small drop of Loctite® on the thread at the end of the screw that secures the new wheel post in place.

Note: Loctite® is advised so that torque requirements aren't necessary.

- Use a 5 mm hexagonal wrench to secure the two screws into the new post, as shown in **Figure 10**.

Note: The Loctite® securing the post might inhibit you from screwing one side if the shaft is spinning. If this is the case, secure one 5 mm hexagonal wrench into one screw, and another 5 mm hexagonal wrench in the opposite side. Rotate only one hexagonal wrench while the other anchors the shaft, allowing you to tighten the screws into position.

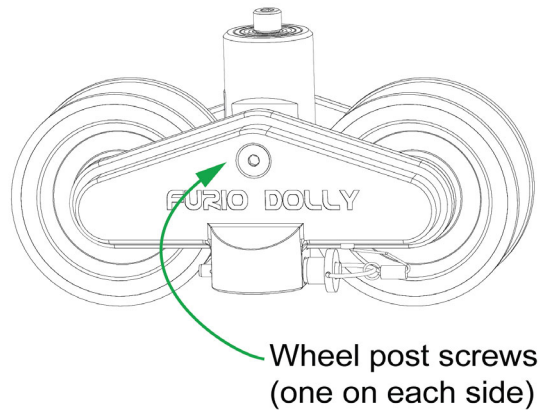


Figure 10 - Passive Wheel Post Screws

Remove the Passive Wheel Nut

- Use a 2.5 mm hexagonal wrench to remove the five screws on the old passive wheel nut.

Note: Do not discard these screws as they'll be used again for the new wheel brushing.

- Dispose of or store the old passive wheel post nut shown in **Figure 11**.

Note: New wheel post bushings are provided in the Retrofit Kit.

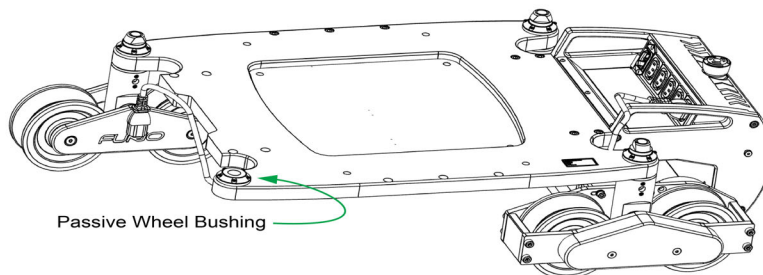


Figure 11 - Replacing the Passive Wheel Bushings

Step 5: Inverting the Dolly Base

Invert the Dolly Base onto its Back

1. Use a 17 mm open-end wrench to loosen the drive wheel nut.

Tip: Loosen the nut enough that you can remove it by hand at a later step, but ensure it's secure enough to stay in place without falling when the dolly is inverted.

Note: Do not remove the drive wheel before inverting the dolly.

2. Remove the five screws that secure the drive wheel nut shown in **Figure 12**.

Note: Do not discard these screws, they'll be used again for the new wheel brushing.

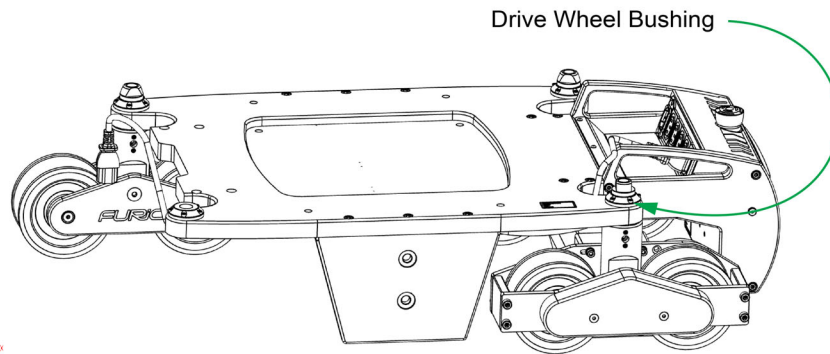


Figure 12 - Removing the Drive Wheel Nut Screws

3. Have one or two people lift and hold up the end of the dolly while another guides it on its back, as shown in **Figure 13**.

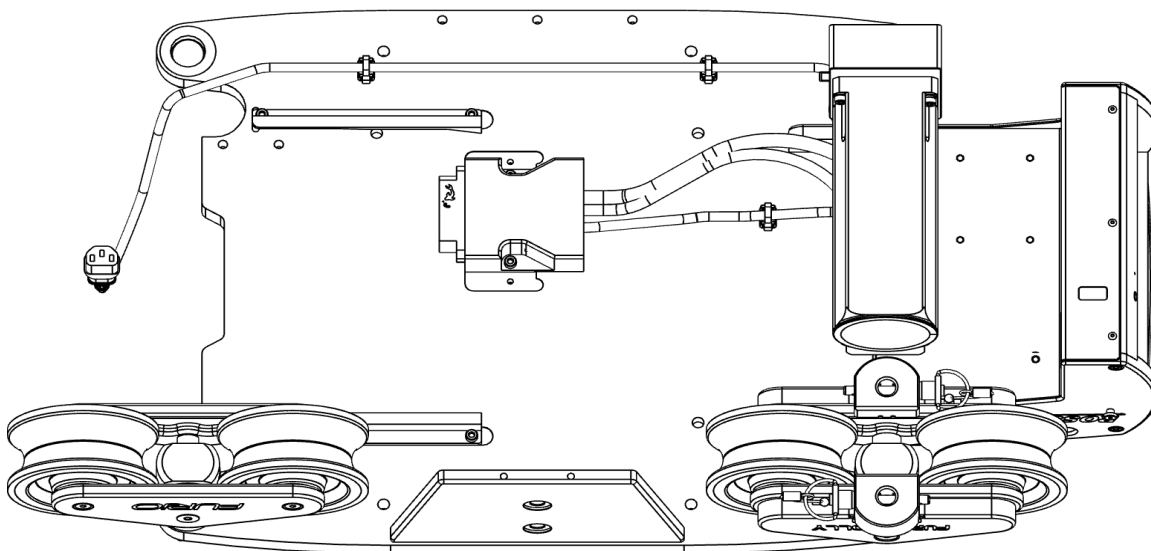


Figure 13 - Inverted Dolly Base Placed on its Back

4. Place a protective pad under the dolly base to prevent scratching or marking.

IMPORTANT: The dolly is heavy. Get help and follow workplace safety rules. Be careful not to tip or drop the dolly.

Step 6: Removing the Drive Wheel Set

Remove the Drive Wheel Set

1. Use the 4 mm hexagonal wrench to remove the four screws that attach the drive wheel set to the motor unit (see **Figure 14**).

Tip: Each screw has a flat washer and a lock washer. Do not lose the washers.

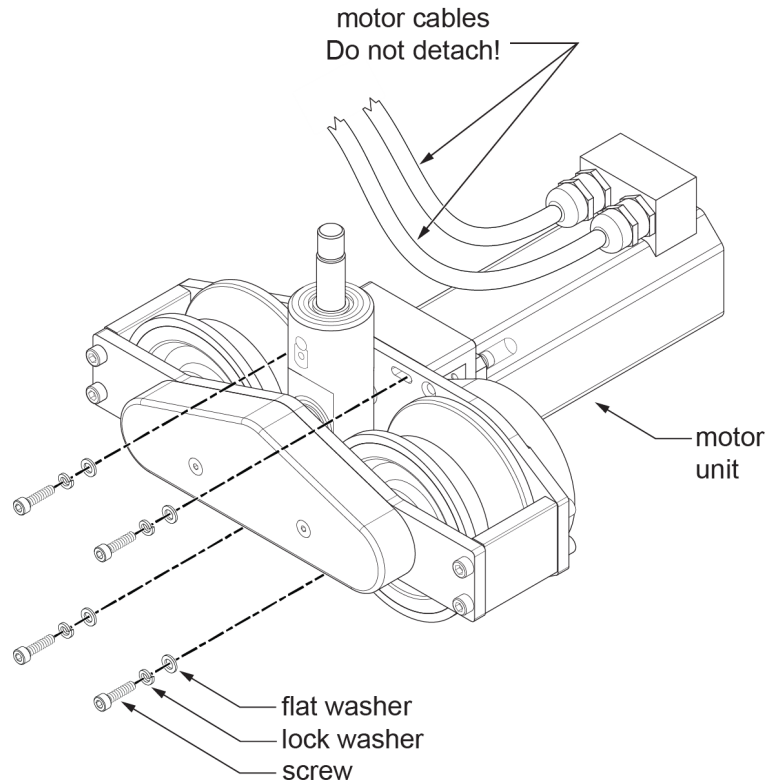


Figure 14 - Removing the Motor Unit from the Drive Wheel Unit

2. Detach the motor unit as shown in **Figure 15**.

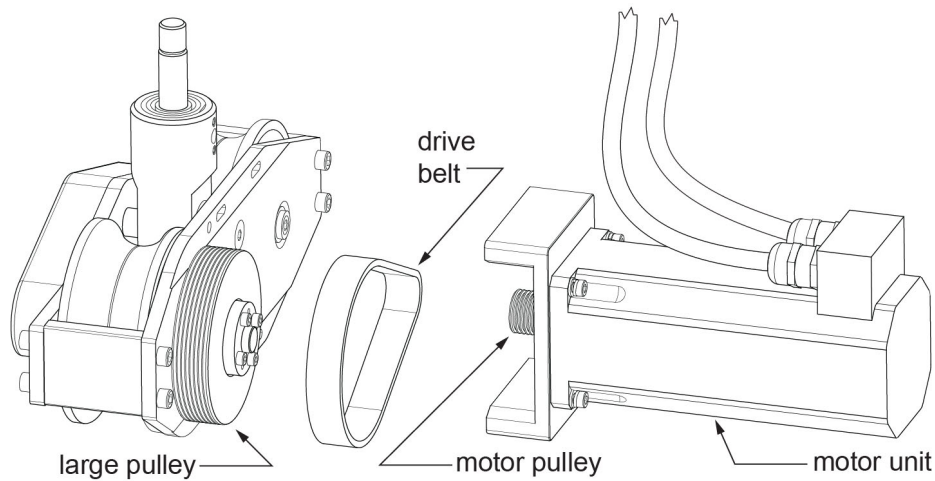


Figure 15 - Detaching the motor unit from the drive wheel set

Step 7: Replacing the Drive Wheel Post

Remove the Old Drive Wheel Post

1. Use a 3 mm hexagonal wrench to remove the two screws on the outer drive wheel cover, as shown in **Figure 16**.

Note: The drive wheel cover might be a snug fit onto the wheel assembly.

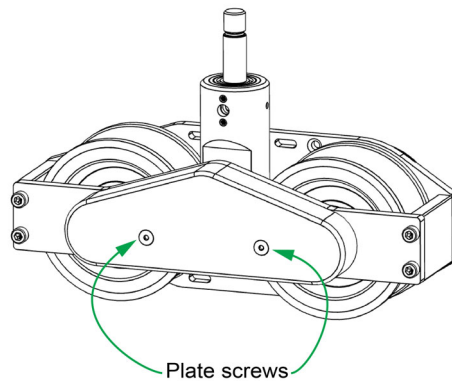


Figure 16 - Removing the Drive Wheel Post Screws

2. Use two 5 mm hexagonal wrench to remove the wheel post screws (one on either side), as shown in **Figure 17**.

Note: Set these screws aside as they're needed to install the new post.

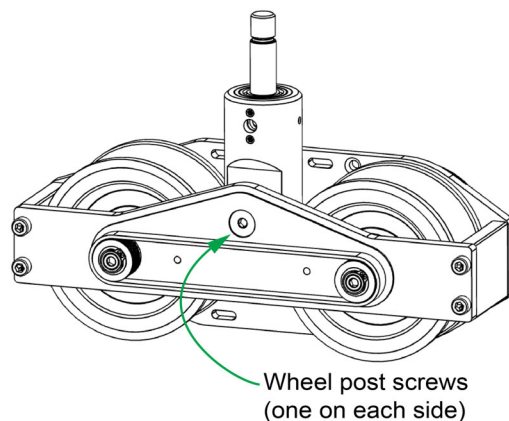


Figure 17 - Removing the Drive Wheel Post Screws

Note: The Loctite® securing the post might inhibit you from unscrewing one side if the shaft is spinning. If this is the case, secure one 5 mm hexagonal wrench into one screw, and another 5 mm hexagonal wrench in the opposite side. Rotate only one hexagonal wrench while the other anchors the shaft, allowing you to remove the spinning screw from its position.

3. Remove the wheel post from the drive wheel set.

Install the New Drive Wheel Post

1. Insert the new drive wheel post from the Retrofit Kit and insert it between the drive wheels.
2. Place a small drop of Loctite® on the thread at the end of the screw that secures the new wheel post in place.

Note: Loctite® is advised so that torque requirements aren't necessary.

3. Use a 5 mm hexagonal wrench to secure the two screws into the new post, as shown in **Figure 18**.

Note: The Loctite® securing the post might inhibit you from screwing one side if the shaft is spinning. If this is the case, secure one 5 mm hexagonal wrench into one screw, and another 5 mm hexagonal wrench in the opposite side. Rotate only one hexagonal wrench while the other anchors the shaft, allowing you to tighten the screws into position.

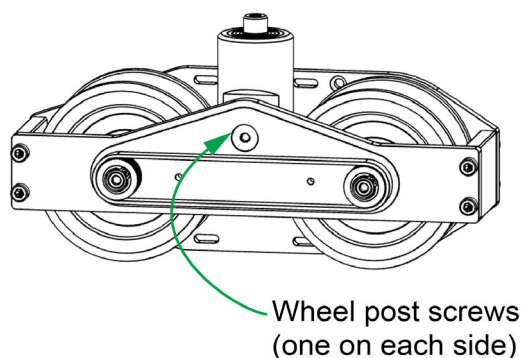


Figure 18 - Exposed Drive Wheel Post Screws

- Use a 3 mm hexagonal wrench to attach the two screws on the drive cover wheel plate, as shown in **Figure 19**.

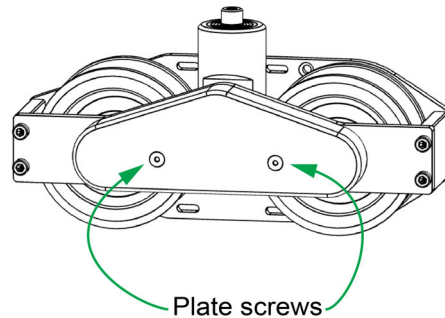


Figure 19 - Attaching the Drive Wheel Plate Screws

Step 8: Attaching the Drive Wheel Set to the Motor Unit

Attach the Drive Wheel to the Motor Unit

- Align the motor unit to the drive wheel unit, placing the drive belt over the motor pulley. Ensure the belt is centered on the motor pulley and that the motor unit is oriented as shown in **Figure 20**.

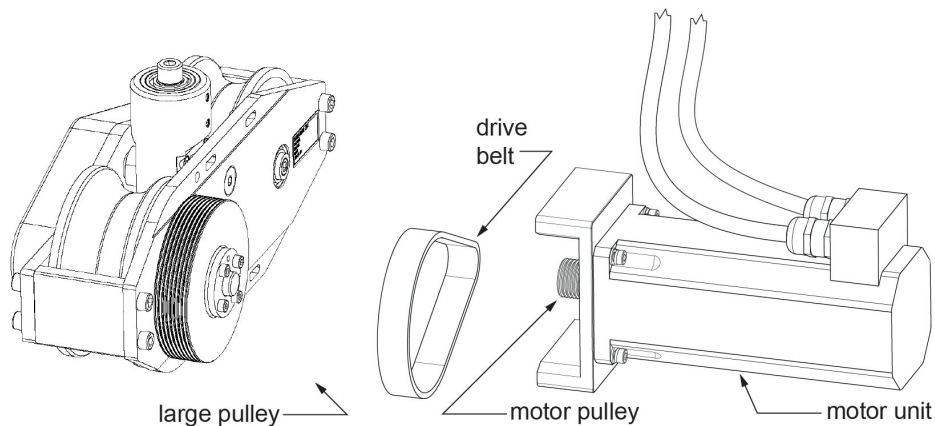


Figure 20 - Attaching the Drive Belt

- Have one person slide the motor unit away from the large pulley, to apply firm tension to the belt, while another person inserts and tightens the four screws on the motor side you removed in **"Remove the Drive Wheel Set"** on **page 11**.

Tip: Each screw has a flat washer and a lock washer. Position the lock washer between the screw head and the flat washer.

- Use the 4 mm hexagonal wrench to secure the four screws that attach the drive wheel set to the motor unit, as shown in **Figure 21**.

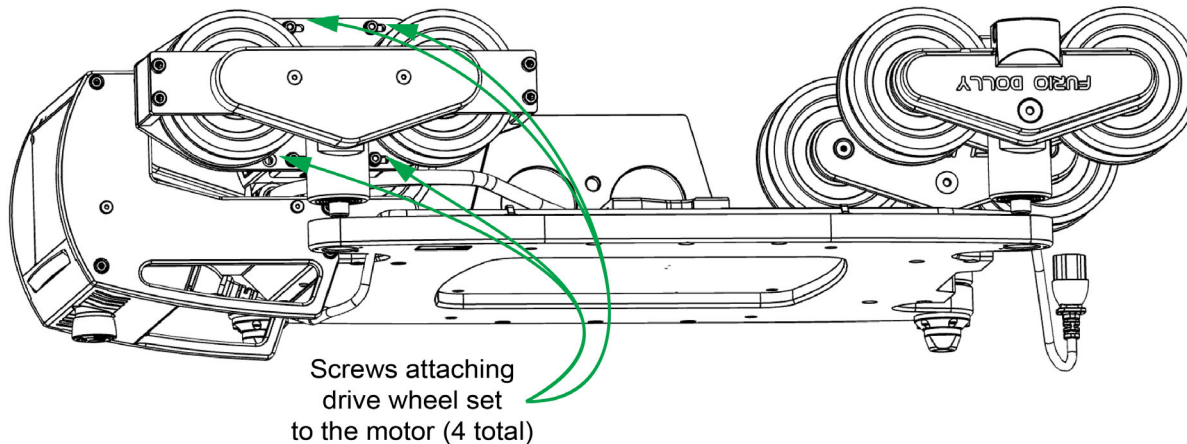


Figure 21 - Attaching Drive Wheel Set to the Motor Unit and Dolly Base

4. Turn the wheels a few times and observe the drive belt to ensure that it remains centered on the pulleys.

Step 9: Replacing the Cable Tie Mounts

Remove the Old Cable Tie Mounts

1. Use the wire cutter to cut the tie wraps shown in **Figure 22**.
2. Use a 2 mm hexagonal wrench to remove and dispose of the cable tie mounts.

Note: The Retrofit Kit provides new adhesive cable tie mounts.
3. Remove the FRU power cable and set it aside.

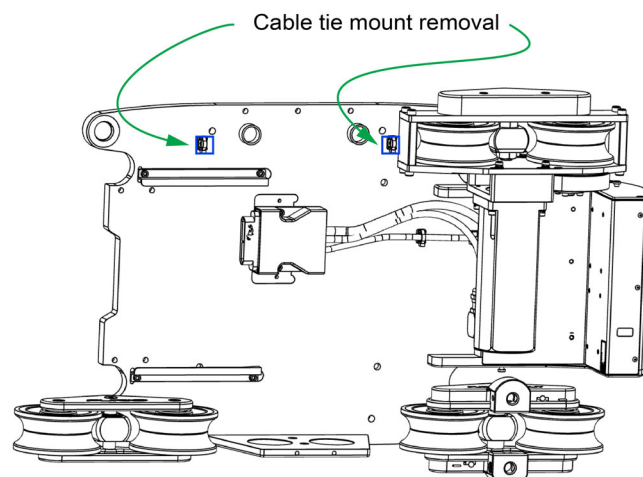


Figure 22 - Cable Tie Mounts on Dolly Base

Install the New Cable Tie Mounts

1. Place one adhesive cable tie mount from the Retrofit Kit against the dolly base shown in **Figure 23**.

Tip: Ensure the mount is pressed directly against the rail, as it could get stuck beneath the StableTrac arm if positioned inaccurately.

- Place the other adhesive cable tie mount just above the hole shown in **Figure 23**, ensuring both mounts are perfectly in line with one another.

Tip: Position the adhesive cable tie mounts directly in line with the screw heads as shown in **Figure 23**, ensuring there is enough room for the StableTrac arm and that they **do not** rest underneath it.

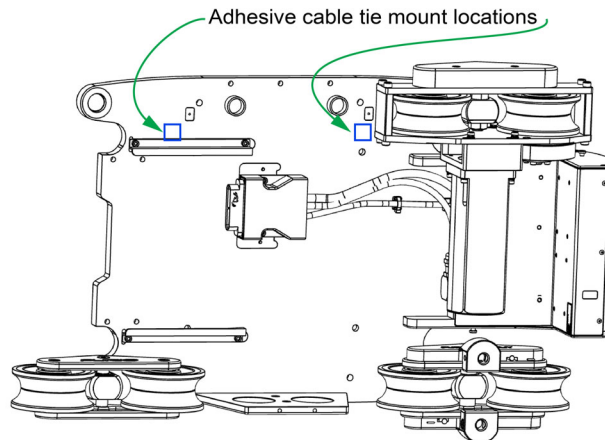


Figure 23 - Adhesive Cable Tie Mount Locations

- Insert cable ties through the cable tie mount loops.
- Place the FRU power cable on top of the newly placed adhesive cable mounts.
- Tighten the cable ties around the FRU power cable.

Step 10: Attaching the StableTrac Arm

Attach the StableTrac Arm to the Dolly Base

- Remove the two screws near the StableTrac center that contain the two alignment rings.
- Set the alignment rings aside as they're needed in a later step.
- Use an 8 mm hexagonal wrench to loosely tighten the two screws that mount the StableTrac arm as shown in **Figure 24**.

Note: Ensure that the StableTrac arm orients with the three screws facing outwards.

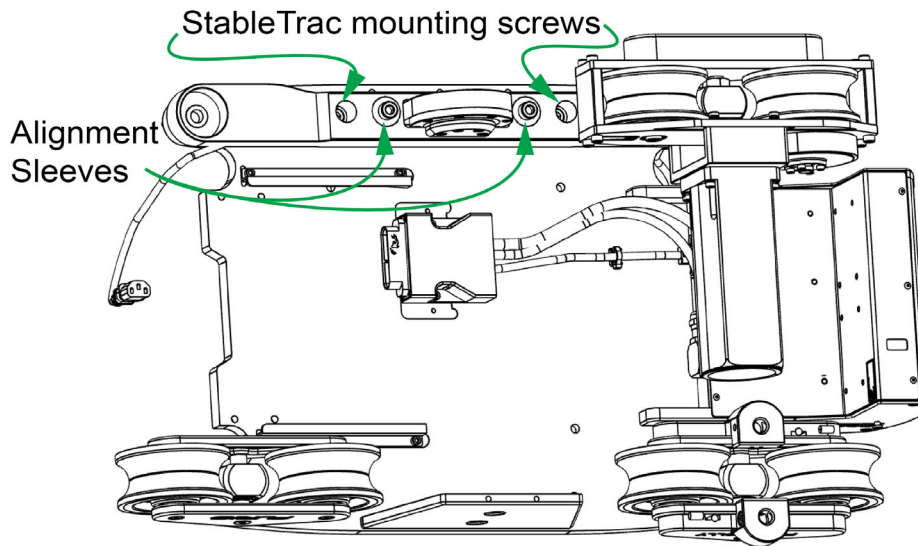


Figure 24 - StableTrac Mounting Location

4. Move the arm back and forth, ensuring it is secured to the dolly base, but still has range of movement.
Note: The StableTrac arm will be fully tightened at a later step.
5. Slide the vertical post of the drive wheel set through the hole in the StableTrac arm.

Step 11: Reverting the Dolly Base Upright

Revert the Dolly Base on Its Wheels

1. Have one or two people lift and hold up the end of the dolly while another guides it on its wheels.
2. [Optional] Place wooden blocks under the dolly to prevent it from tipping on one side.

IMPORTANT: The dolly is heavy. Get help and follow workplace safety rules. Be careful not to tip or drop the dolly.

Step 12: Attaching the Wheel Units to the Dolly Base

Attach the Passive Wheel Set to the Dolly Base

1. Have one or two people lift and hold up both ends of the dolly.
2. Thread the vertical post of the passive wheel set into the threaded hole on the StableTrac arm (refer to **Figure 25**).

Note: There is no fixed orientation for passive wheel attachment. The sides are functionally interchangeable.

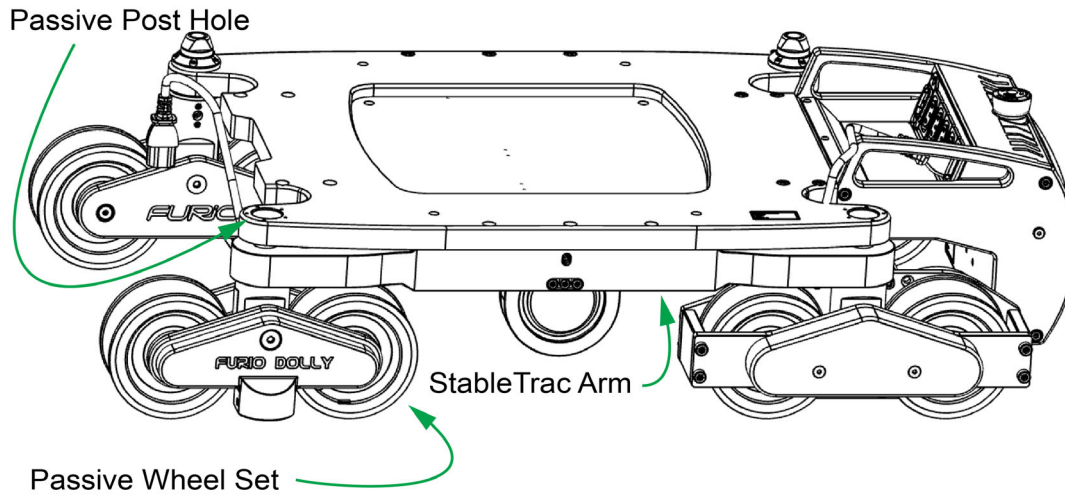


Figure 25 - Passive Wheel Attachment with StableTrac

Step 13: Securing StableTrac and the Wheel Sets

Move the Dolly Base on the Track

1. Have two people lift the dolly base up.
IMPORTANT: The dolly is heavy. Get help and follow workplace safety rules. Be careful not to tip or drop the dolly.
2. Place the dolly base onto the track, ensuring all wheels align and make contact with the rails.
IMPORTANT: When working on a track, the dolly **must** be lifted over a straight track, not a curved one.
3. Move the base back and forth to ensure all wheels rest completely on the track.

Secure the StableTrac Arm and Align the Dolly Base

1. Obtain the alignment rings that were removed during “**Step 10: Attaching the StableTrac Arm**” on **page 16**.
2. Insert both rings into the passive and drive arm boss features, as shown in **Figure 26**.
Note: Wiggle the StableTrac arm and ensure the alignment rings are fully seated on the arm.

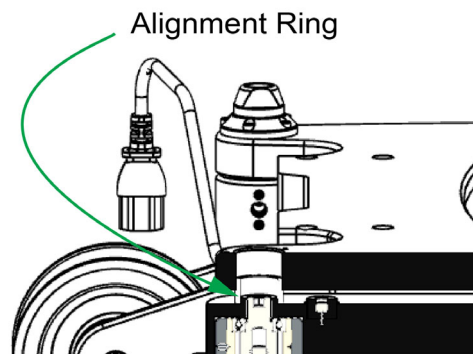


Figure 26 - Alignment Ring Location in Dolly Base

3. Use an 8 mm hexagonal wrench to tighten the two screws that mount the StableTrac arm, as shown in **Figure 24** on **page 17** above.

IMPORTANT: Do not put your hand on top of the dolly base while tightening, as this can change the alignment. Instead, place your hand on top of the wheel plate.

4. Move the dolly base back and forth along the track, ensuring there are no vibrations when gliding.

IMPORTANT: The dolly base should move smoothly on the track. If any vibrations occur, loosen the screws that mount the StableTrac arm, move the base back and forth, then re-tighten again.

5. Remove the alignment rings from the boss features once the StableTrac arm is secure.
6. Place the alignment rings back into their original locations.
7. Use an 8 mm hexagonal wrench to tighten the two screws near the center of the StableTrac arm that provided the alignment ring from **"Step 10: Attaching the StableTrac Arm"** on **page 16**.

Attach New Bushings

1. Obtain the ten screws removed from the old passive and drive wheel bushings.
2. Attach the new passive and drive wheel bushings.

Note: Each bushing requires five screws.

Attach the Side Cover Plate

1. Apply one small drop of Loctite® toward the end of the screw shank on the three screws securing the side cover plate.
2. Use a 5 mm hexagonal wrench to tighten the three screws securing the side cover plate as shown in **Figure 27**.

IMPORTANT: Attaching the base plate requires adding the Loctite® seal. New Loctite® adhesive is provided in the Retrofit Kit.

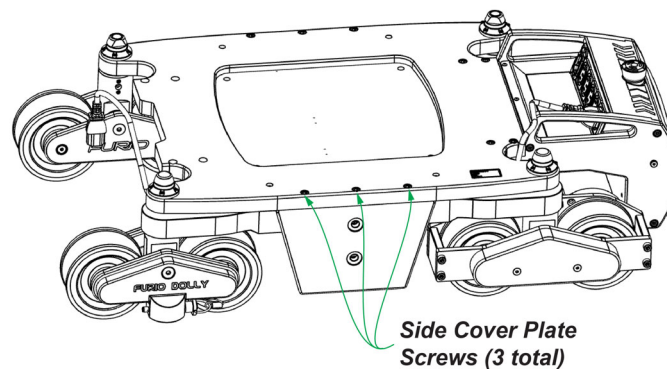


Figure 27 - Side Cover Plate Screws on Dolly Base

Reassembling the Dolly

Step 1: Reinstalling the Stability Wheels

Attach the Stability Wheels:

For both of the sliding passive wheel sets, complete the following:

1. Insert the shaft of the stability wheel into its hole.
2. Rotate the stability wheel shaft so the notch on the shaft faces the drive wheel set.
3. Pull and hold the pin lock button, then slide the locking pin into its hole, as shown in **Figure 28**.

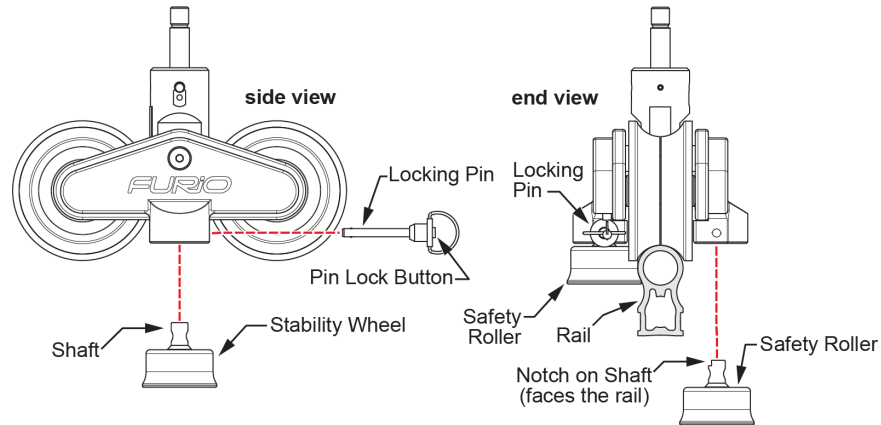


Figure 28 - Attaching Stability Wheels

Step 2: Installing the Main FRU

Install the Main FRU

1. Align the runners of the new Main FRU with the guide rails within the body of the dolly, and then slowly slide the Main FRU into place. Continue until the Main FRU is fully inserted.
Tip: When the main FRU is fully inserted, the four mounting holes on the top of the dolly base align perfectly with the mounting holes on the Main FRU.
2. Insert and tighten the four mounting screws you removed in **“Step 2: Removing the Main FRU”** on **page 6**, using a 5 mm hexagonal wrench, as shown in **Figure 29**.

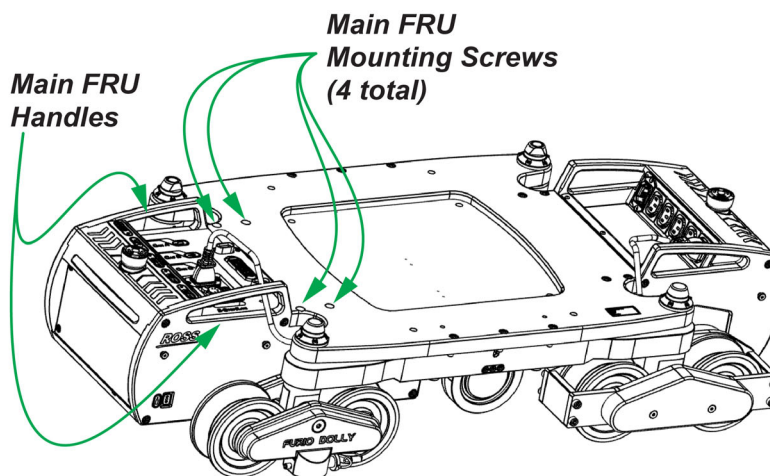


Figure 29 - Furio SE Dolly Base, showing Four Mounting Screws that Secure the Main FRU

3. Reconnect all cables to the Main FRU.
IMPORTANT: Ensure that all cables are reconnected to their original positions.

Step 3: Attaching the Wiredraw Cable

Attach the Wiredraw Cable

1. Obtain the wiredraw cable from the wiredraw unit and hold it.

Note: Grasp the cable end tightly, but do not wrap it around your hand or bend it.

IMPORTANT: Handle the wiredraw cable with care to avoid permanently damaging the cable and wiredraw unit. NEVER allow the cable to snap back into the wiredraw unit. If you release the cable and it snaps back into the wiredraw unit, the unit may be irreparably damaged.

2. Hold the cable close to the floor and parallel to the track to avoid rubbing of the steel cable against the wiredraw enclosure box, protecting the cable from damage.
3. Slowly feed the cable into the wiredraw mount. Do not allow it to snag or rub against anything, except the part of the rail it normally contacts (curved tracks only).
4. Use 6 mm hexagonal wrench and associated bolt to attach wire draw to the bracket.

Step 4: Installing the Lift

Install the Lift

1. Using the handles, lift the robotic lift column straight up until all of it is above the dolly.

CAUTION: The lift column is heavy. Get help when handling heavy items.

2. **For a Fixed Column:** Using the 6 mm hexagonal wrench for the fixed column, tighten the M10 Flat Head base plate bolts.
3. **For a Robotic Lift:** Using the 8 mm hexagonal wrench for the lift, tighten the four M10 base plate bolts (shown in Figure 30).

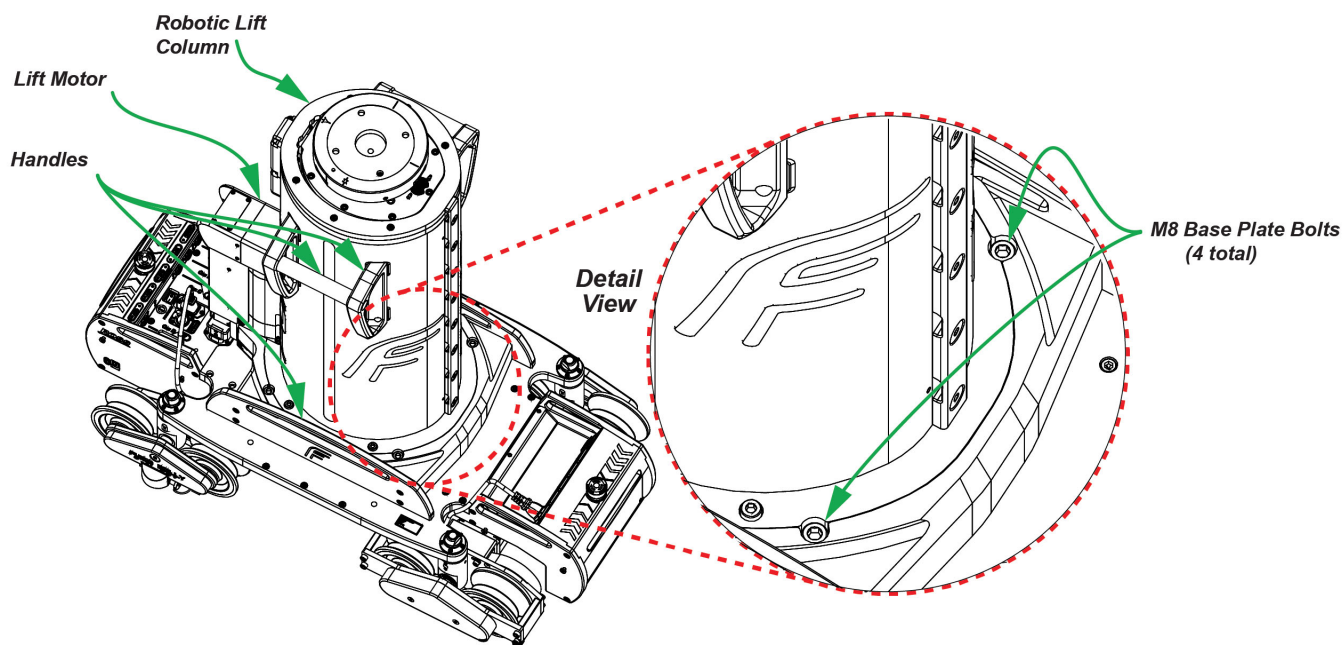


Figure 30 - M8 Base Plate Bolts Connecting the Lift to the Dolly

Step 5: Installing the Robotic Head and Payload

Install the robotic head

1. Use the mark made in **“Remove the Robotic Head”** on **page 3** as a guide for where the head/column coupler meets the top of the lift column to align them.
2. While another person holds the head steady, use the 4 mm hexagonal wrench to tighten the three M8 set screws along the edge of the head/column coupler, until the head is secure, as shown in **Figure 31**.
3. Attach the payload components.
4. Connect all cables from the payload and the robotic head, noting the position of each cable as you remove it so you can later restore them to their original positions.

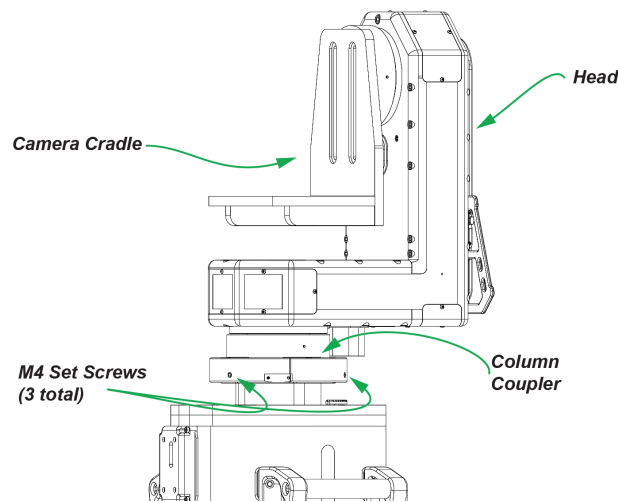


Figure 31 - Robotic Head

Install the payload

1. Move the dolly to a location that allows easy access to all sides of the dolly.
2. Use the grease pencil mark from **“Remove the Payload”** on **page 3** as a position marker for the payload and then add the payload, as shown in **Figure 31**.

Note: Using the marked payload position enables you to return it to its exact original position, which is especially important if it is part of a Virtual Studio / Augmented Reality (VS/AR) solution.

3. Connect all cables from the dolly's connection panel, noting the position of each cable as you've added and referring to their original positions documented from **“Remove the Payload”** on **page 3**.