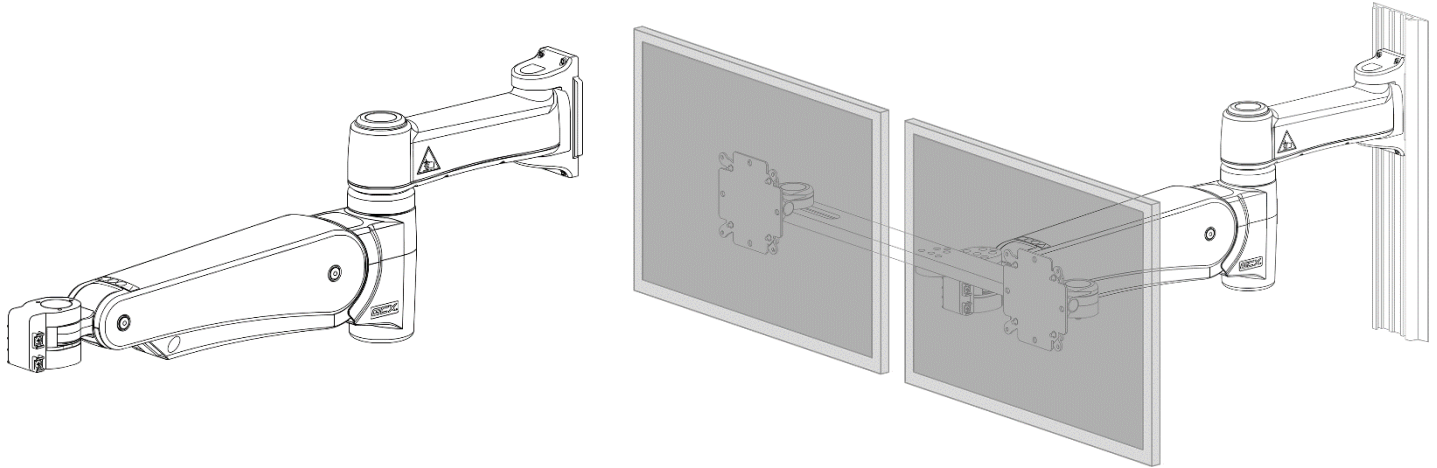


**VHM-P (Non-Locking) Variable Height Arm with 8”/20.3cm or 14” 35.6cm Extension
for Suspension/Dual Display
Front End**

(Refer to qualified personnel)



VHM-P (non-locking)

Dual Display Mount and Channel sold separately – Shown for reference only



Ensure that the weight of the Device and mounting hardware does not exceed the load rating of the Arm. Check the bottom surface of the Arm for the "Load Range" label.

Counter Balance Load Ranges:

- 25 - 45 lbs / 11.3 - 20.4 kg
- Or
- 15 - 30 lbs / 6.8 - 13.6 kg

Installation Time

Approximately 10-15 minutes

The purpose of this manual is to describe general installation, operation, and adjustment procedures for the VHM-P Series Arm with Suspension/Dual Display Front End. This manual should be used in conjunction with any instrument-specific installation guides. Please read this manual and all instrument-specific installation material before installing or using this product.

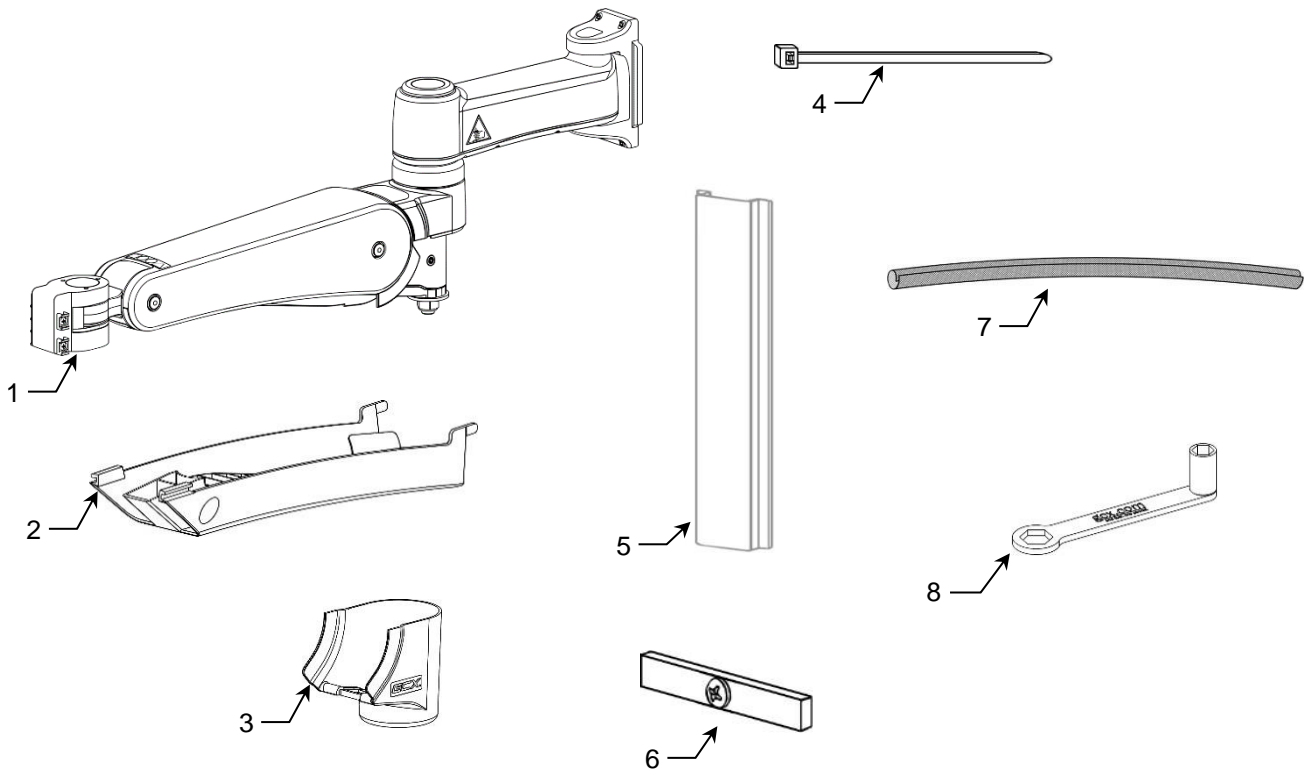
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1.0 Parts Reference

The following parts and hardware are included and labeled accordingly:

Item #	Description	Quantity
1	VHM-P Series Channel Mount Arm with Extension	1
2	Cable Cover	1
3	Lower Pivot Cover	1
4	Cable Tie	8
5	16" (40.6 cm) Channel Cover	1
6	Adjustable Stop	1
7	30.5" (77.5 cm) Cable Sleeve	2
8	1/2" (13mm) x 3/4" (19mm) Wrench	1
9	1/8" Hex Wrench (<i>not shown</i>)	1
10	5/32" Hex Wrench (<i>not shown</i>)	1



2.0 Tools Required

The tools listed below are required to install and adjust the Arm.

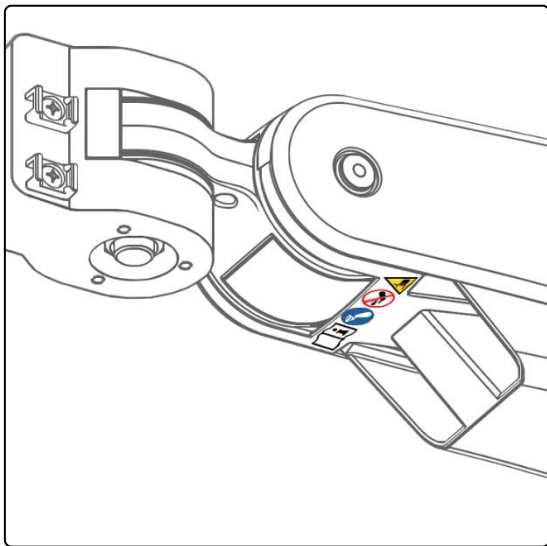
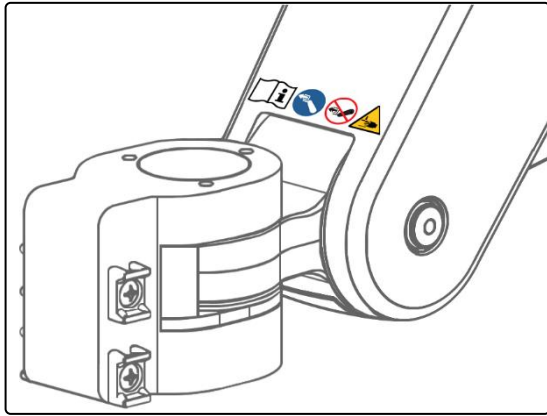
Provided

1. 1/8" Hex Wrench
2. 5/32" Hex Wrench
3. 1/2" (13mm) / 3/4" (19mm) Combination Wrench

Not Provided

4. #2 Phillips Screwdriver
5. Scissors, utility knife or similar cutting tool
6. Wire Cutters (for cable ties)
7. 3/4" (19mm) Socket Wrench (for front end pivot tension)

3.0 Product Warning / Safety Labels



Refer to Installation Guide for additional information.



Remove the Device only when the Arm is at the highest position.



Do not remove device when arm is in a lowered position.



Potential pinch points that may cause personal injury.

Counter Balance Load Range:
25 - 45 lbs / 11.3 - 20.4 kg
or
15 - 30 lbs / 6.8 - 13.6 kg

4.0 Installation, Operation, and Maintenance Warnings

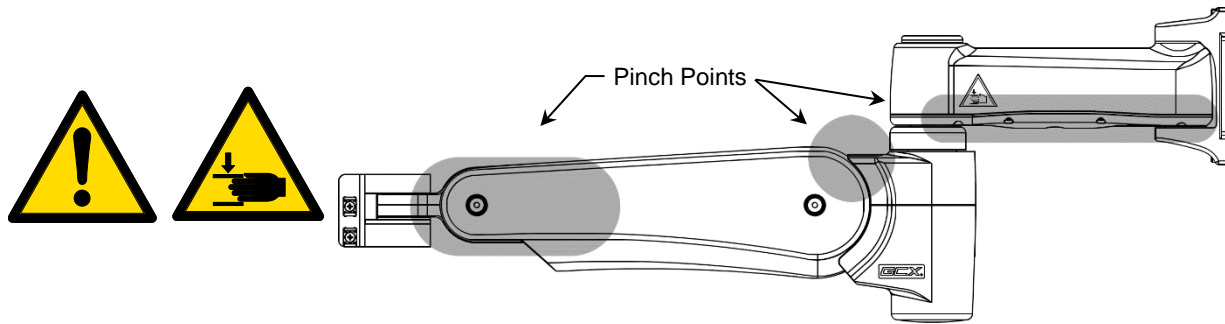
This section contains warnings regarding the installation, operation, and maintenance of the Arm. This section must be read in its entirety before installing, operating, and maintaining the Arm. Failure to follow these warnings may result in damage to equipment or injury to personnel.



Warnings

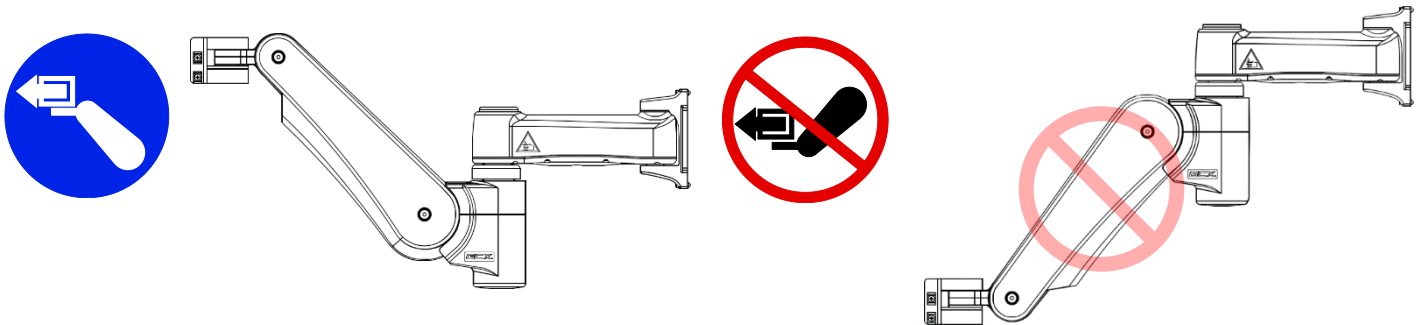
- Do not position the Arm or mounted Device above a patient. Note that the Arm has a wide range of motion both up/down and side to side. Please consider carefully the Device being mounted and the proximity of the mounting assembly to other equipment, hospital personnel, and the patient. GCX recommends that the hospital's risk management personnel verify that the application is appropriate prior to installation and use of this Arm.
- Before the Arm is channel mounted, verify that the channel has been installed and approved in accordance with the channel installation guide. Documents are available on our website: [www.gcx.com / support](http://www.gcx.com/support).
- Ensure that the weight of the Device and Brackets being mounted does not exceed the load rating of the Arm. Check the bottom surface of the Arm for the "Load Range" label. Refer to Section 3.0.
- Do not use power tools to make any adjustments on Arm.

- The mounted device or arm may move suddenly due to normal wear or improper adjustment of the, swivel, and pivot functions (see Sections 7.2, 7.3 and 7.4), improper counterbalance (Section 7.1) or ultimately, gas spring end of life. The gas spring has a limited life span and will lose some strength over a long period of time. **The Arm must be inspected and maintained at least once a year.** This inspection must include the steps outlined in Section 10.0.
- Failure to periodically inspect and adjust the Arm as instructed may result in damage to equipment or injury. If you are unable to adjust the arm or require service, contact GCX technical support at 800.228.2555 or + 1 707.773.1100.
- Note that the VHM-P Arm has a wide range of motion both up/down and side to side. Please consider potential pinch points that may cause personal injury.



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- Remove the Device only when the Arm is at the highest position. Due to the counter balance function, the Arm will naturally rise to the highest position when weight is removed. This can happen suddenly if the weight is removed at any height other than the highest point.



- Due to risk of personal injury or damage to the Arm, the Arm housing must never be disassembled by non-GCX personnel. Failure to comply will void the warranty.

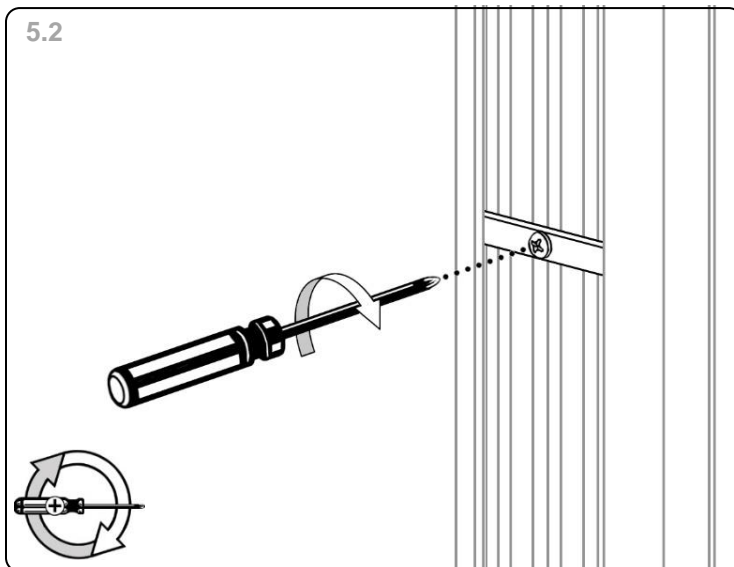
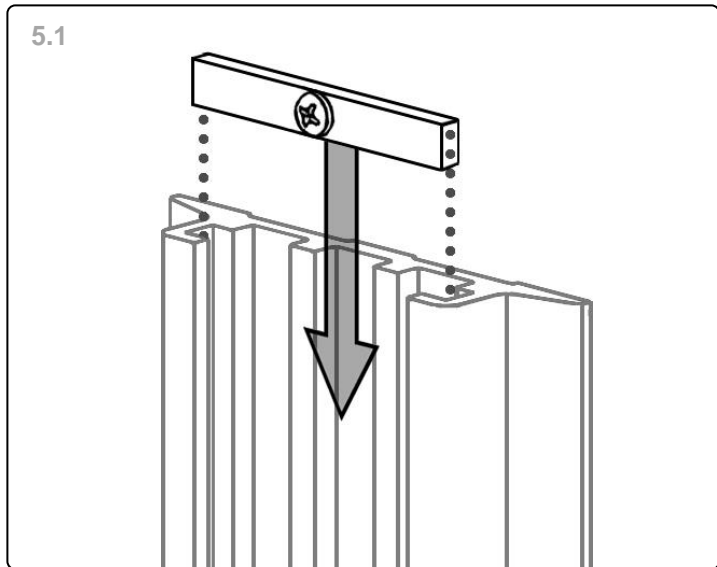
5.0 Installing the Arm in Channel



Before mounting the Arm, verify that the channel has been installed and approved in accordance with the channel installation guide included with the channel.

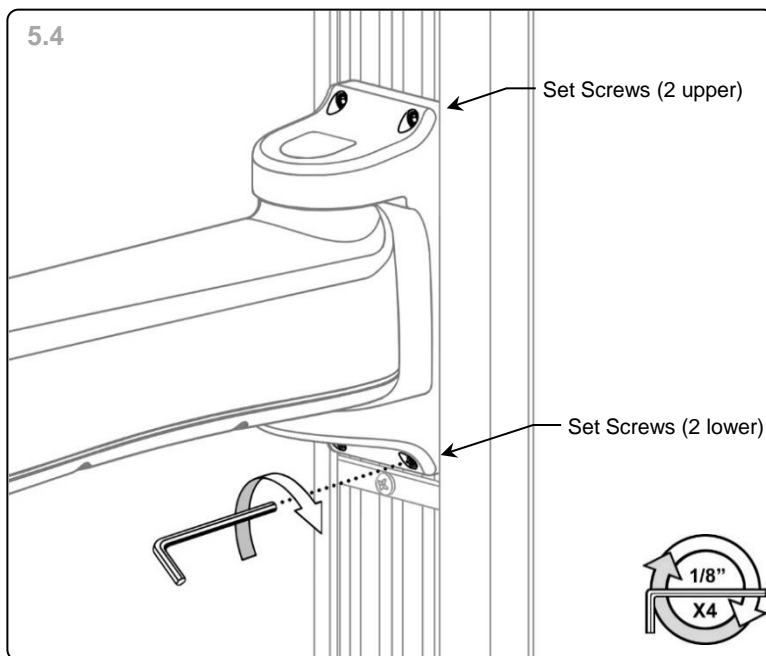
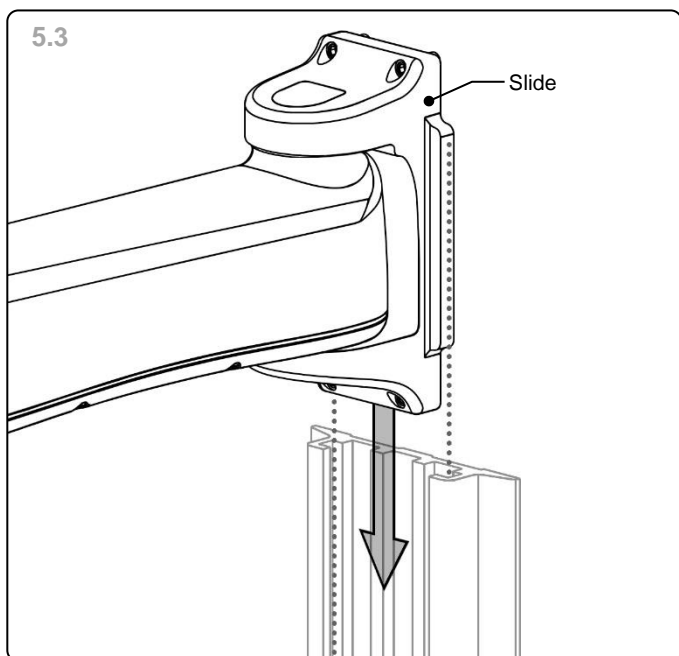
5.1 Insert Adjustable Stop into top of channel and slide to desired mounting position.

5.2 Using a #2 Phillips screwdriver, tighten the center screw to secure position.



5.3 While supporting the Arm, guide the Slide into the top of the channel and position onto the Adjustable Stop.

5.4 Using the 1/8" hex wrench provided, tighten the (2) upper and the (2) lower set screws in Slide to secure position of Arm.



6.0 Mounting the Device

Mounting hardware and all device(s) and accessories must be installed on the Arm prior to counterbalance. Install Mounting Hardware and device(s) in accordance with separate Installation Guide(s) provided with the Mounting Hardware (ordered separately).

7.0 Adjusting the Arm

Installation Note: Adjustments are factory pre-set. However, adjustments to counterbalance, swivel tension, and pivot tensions may all be required to achieve optimal arm performance. Detailed instructions for making adjustments follow in the section below. When properly adjusted the mounted device will move easily throughout the arms full range of motion. Refer to the Routine Maintenance Check List in Section 10 for a quick guide to these functional checks.

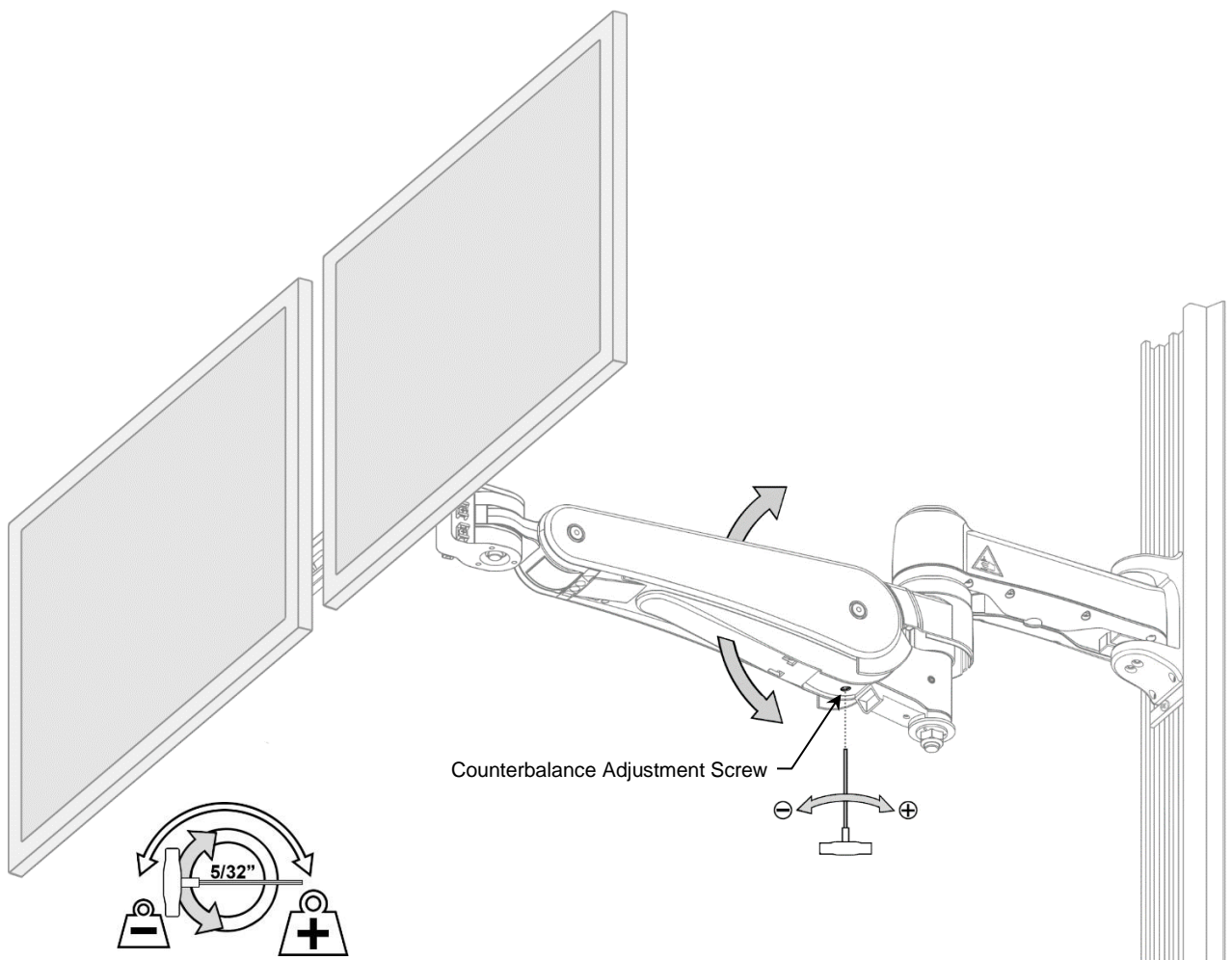


Caution: Use caution as it may be necessary to support the weight of the arm/mounted device(s). This process may require an additional person. Use caution while performing this procedure.

7.1 Adjusting Counterbalance

Counterbalance Adjustment –

The Counterbalance Adjustment Screw is located under the Arm in front of the center pivot assembly. Grasp the mounted device and move the Arm to a level horizontal position. Using a 5/32" hex wrench, tighten (+) or loosen (-) the Counterbalance Adjustment Screw. Counterbalance is correctly adjusted when the mounted device can be moved up or down with minimal force and does not rise or fall after releasing the Arm.

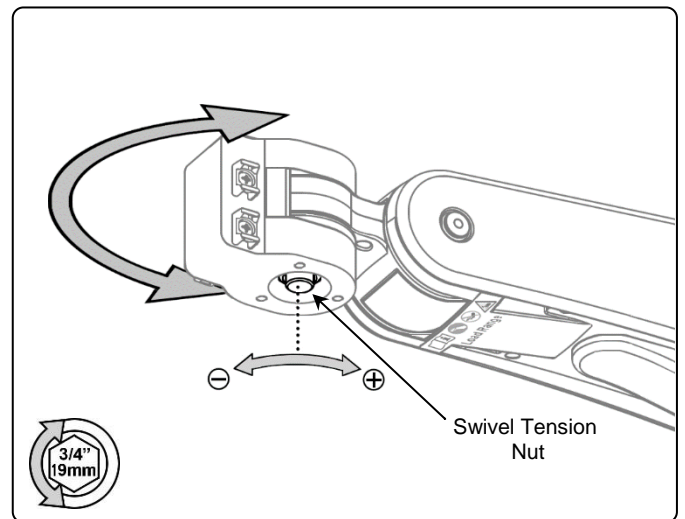


7.2 Swivel Tension Adjustment

To adjust the tension at the front end:

1. Tighten (+) or loosen (-) the Swivel Tension Nut with a 3/4" (19mm) socket wrench until desired tension is achieved. Total adjustment is approximately 1/4 to 1/2 turn.

Caution: Do not remove the Swivel Tension Nut.

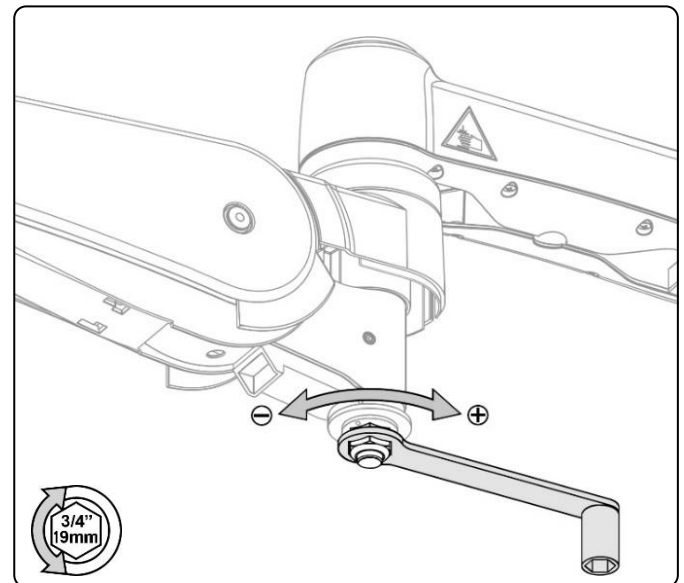


7.3 Center Pivot Tension Adjustment

To adjust the center pivot tension:

1. Tighten (+) or loosen (-) the Pivot Tension Nut with a 3/4" (19 mm) wrench until desired tension is achieved.

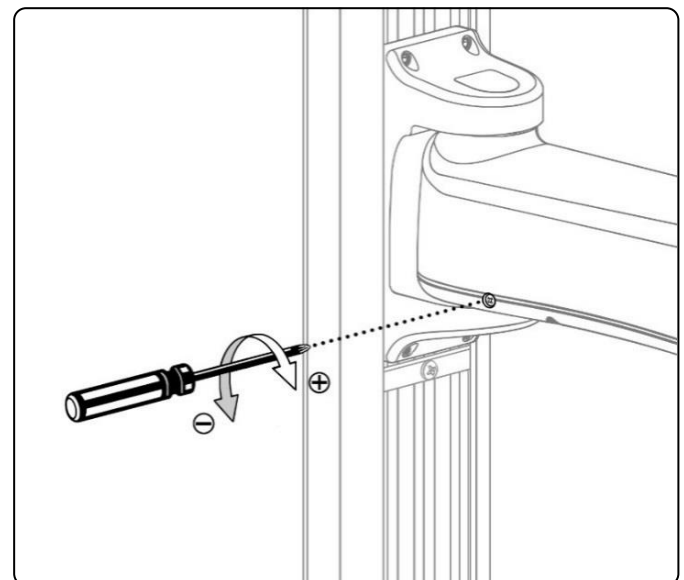
Caution: Do not remove the Pivot Tension Nut.



7.4 Rear Pivot Tension Adjustment

To adjust the rear pivot tension:

1. Tighten (+) or loosen (-) the Pivot Tension Screw with a Phillip's screwdriver until desired tension is achieved.



8.0 Cable Management

Cable Routing

Cables are routed from the front of the arm to the channel to provide an organized installation. Proper installation of the cabling will ensure the arm operates correctly through its full range of motion and that there are adequate service loops for the cables to avoid damage to cables or the mounted device. Cables are anchored at the front of the arm (after service loop to device is determined), routed into the cable cover, through the center pivot assembly and through the extension.

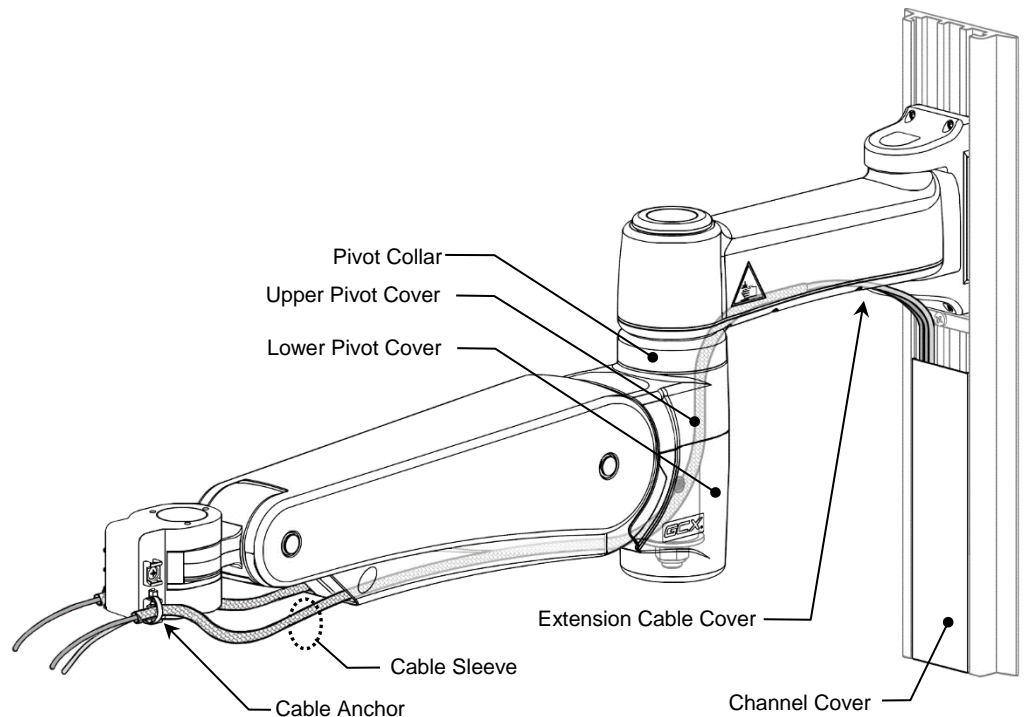
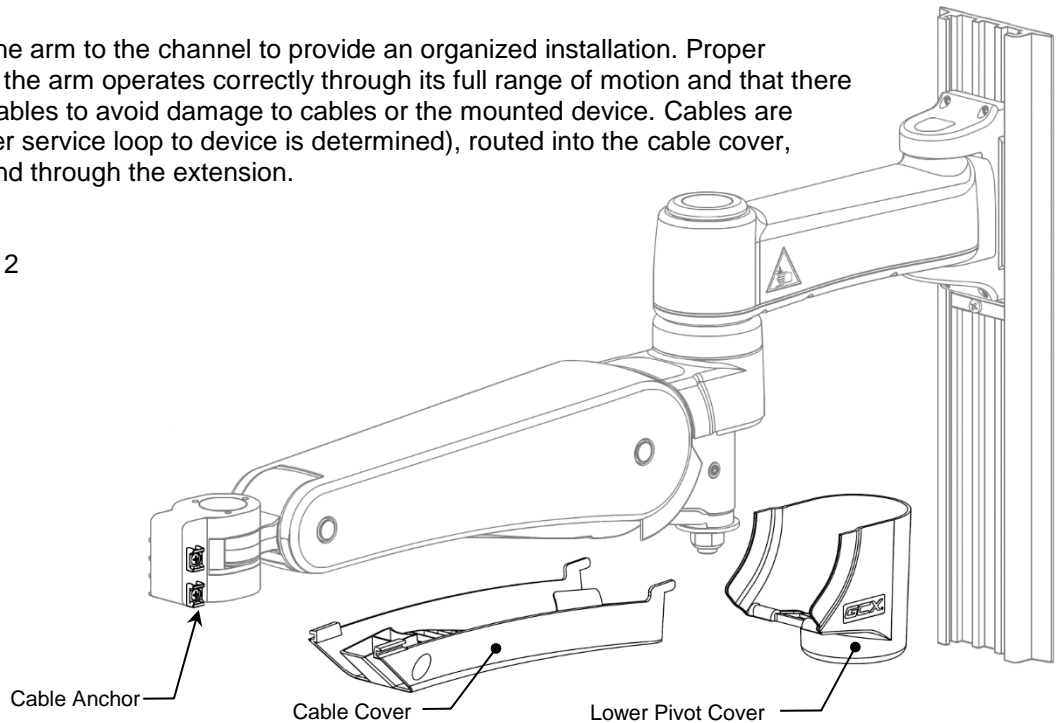
Parts included for cable routing:

Cable Sleeves, 30.5" (77.5cm) long: 2

Cable Cover

Lower Pivot Cover

Cable Ties: 8



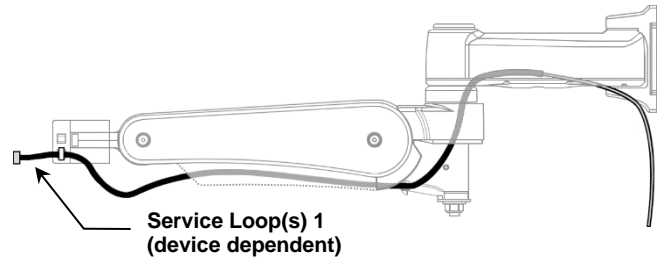
Four (4) cable anchors are provided at the front of the arm to secure cables and create the correct service loop. Cables are secured to the anchor points using plastic cable ties included with the arm. If replacement cable ties are required, standard commercial cable ties can be used.

Two (2) cable sleeves are provided to assist in determining service loop 2 and to help protect / organize the cables as the arm is moved throughout its range of motion. Each cable sleeve will hold three (3) small cables or one (1) large and one (1) small cable. Use of the cable sleeves is optional.

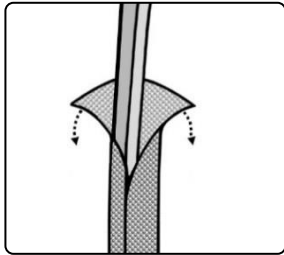
Organize Cables and Determine Cable Service Loop 1

Use of Cable Sleeves is optional but recommended.

Organize the cables. Identify all cables that need to route through the Arm / Extension to the Channel and ensure they are long enough. Insert cables into Cable Sleeves if they are being used (see diagram below). Connect all cables to the device and organize them so those on the left side of the device route to the left side anchor points and those on the right side route to the anchor points on right side of the arm.



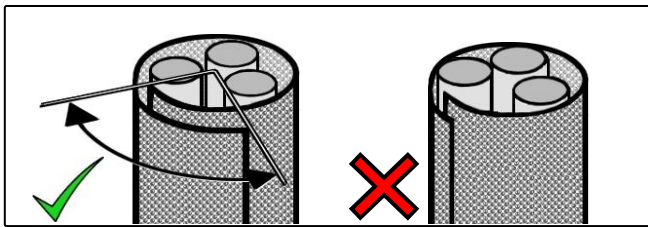
Determine Service Loop 1. Determine the service loops needed from connections on the device to the front anchor points. Do this by tilting the device all the way forward (when appropriate), to create the longest path from device connections to anchors. Then assure there is an adequate service loop (length of cable) to avoid damage to cables and connectors or unintended disconnection of cables.



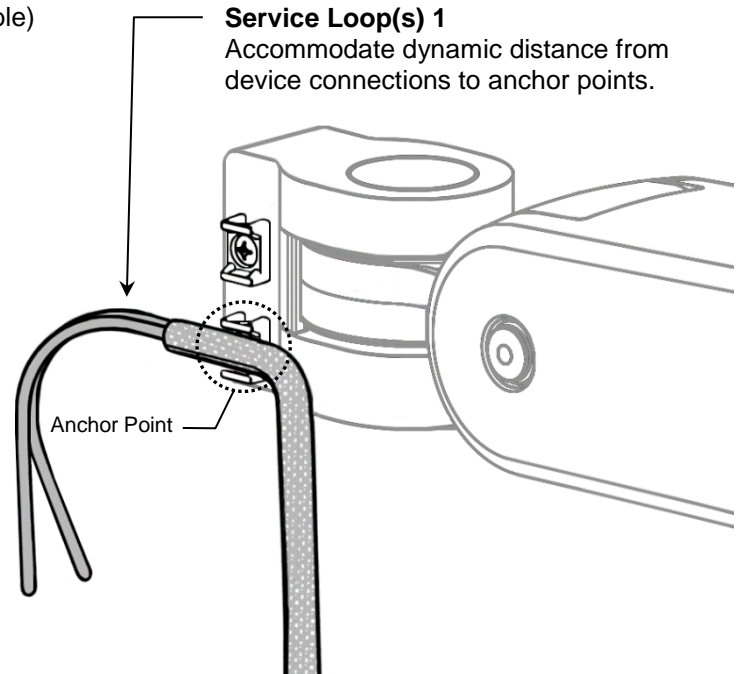
Insert cables into sleeve



CAUTION: Cable sleeve material other than that supplied with the arm (or equivalent) should not be used without verification of function.

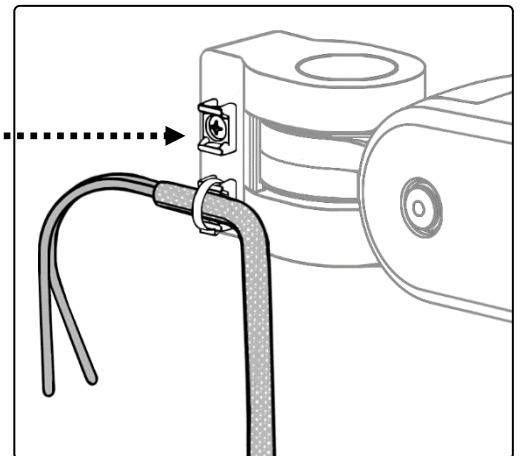
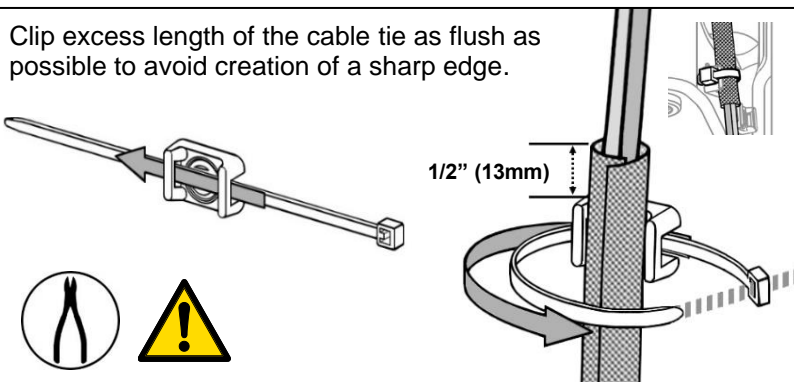


Cable Sleeve must have a 1/4 rotation overlap minimum.



Anchor Cable Bundles. After Service Loop 1 is determined adjust the Cable Sleeve and secure each cable bundle to a Cable Anchor using a cable tie around 1/2" (13mm) from the end of the Cable Sleeve. Before securing the cable tie, ensure the service loop to the device is still correct and secure only one bundle per anchor.

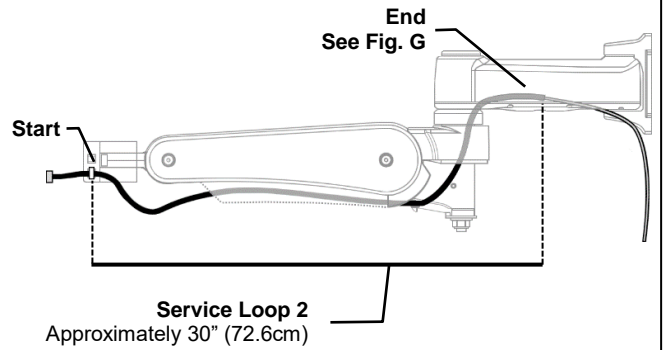
Best use of Cable Ties. Position the female receptacle of cable tie against the Arm before tightening. Secure cables by pulling on the cable tie until the cable bundle does not move. Use of pliers may assist in providing enough cable tie tension on the cable bundle. Clip excess length of the cable tie as flush as possible to avoid creation of a sharp edge.



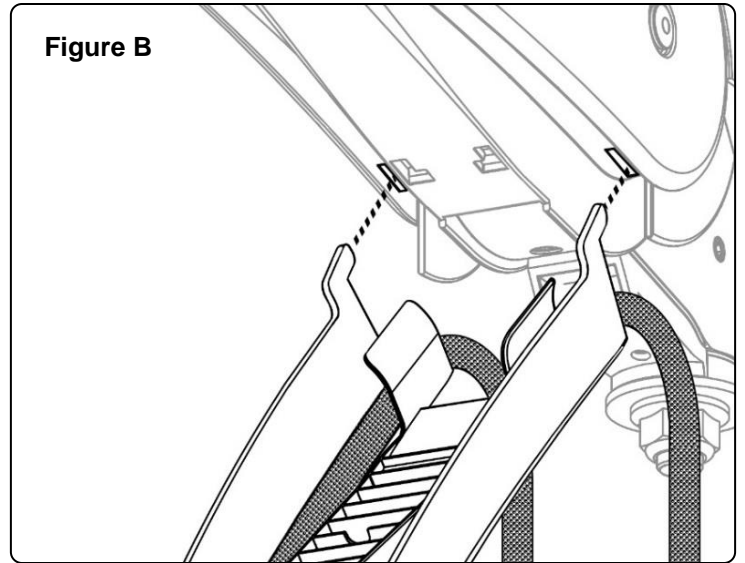
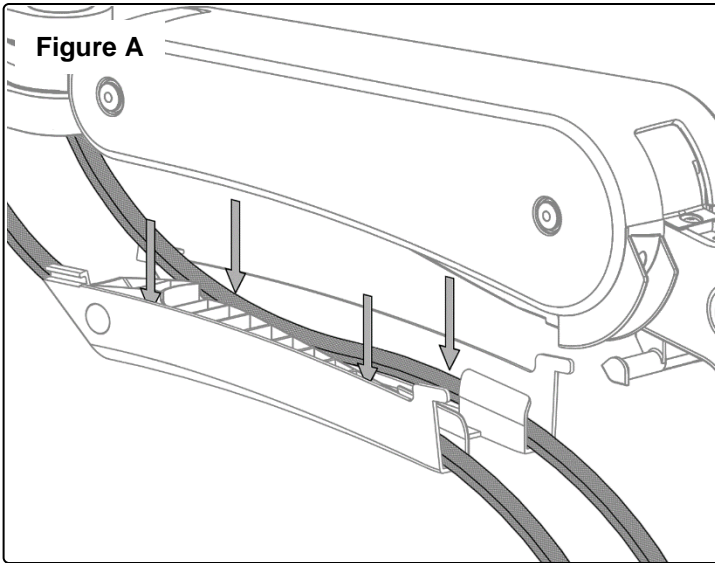
Service Loop 2

Determine Service Loop 2. Using the provided lengths of cable sleeves will facilitate setting Service Loop 2. The end of Service Loop 2 is simply the end of the cable sleeve. If the provided cable sleeves are not being used, then measure and mark the cables appropriately. The start of Service Loop 2 is the front-end Cable Anchor point and the end is approximately 30" (76.2cm) from the start.

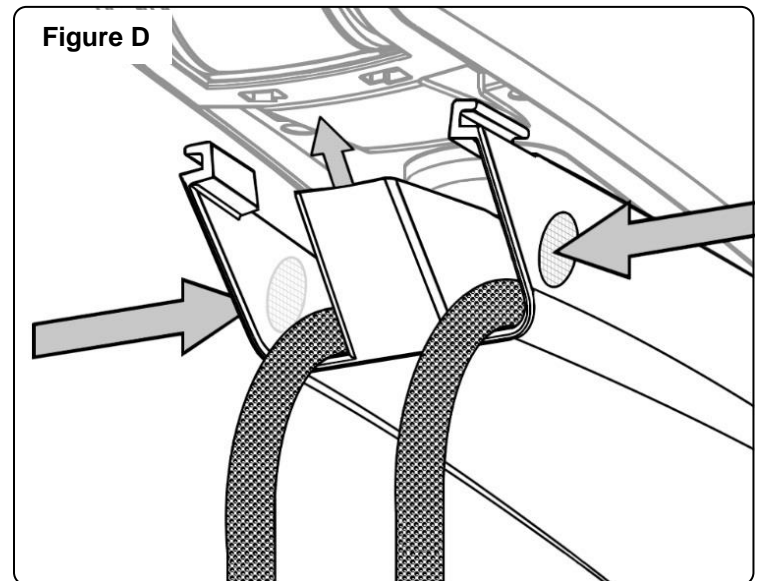
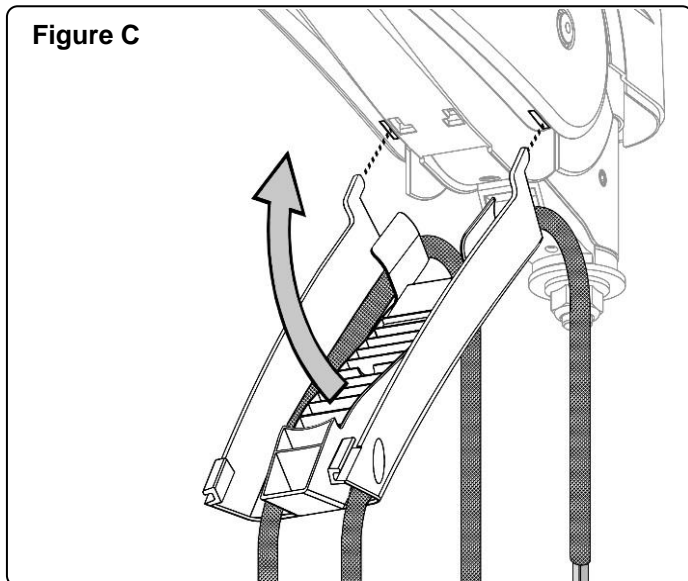
The end of Service Loop 2 will be about 1.5"-3.5" (38-89mm) inside the cable cover on the underside of the extension (there is no anchor point at the end of Service Loop 2).



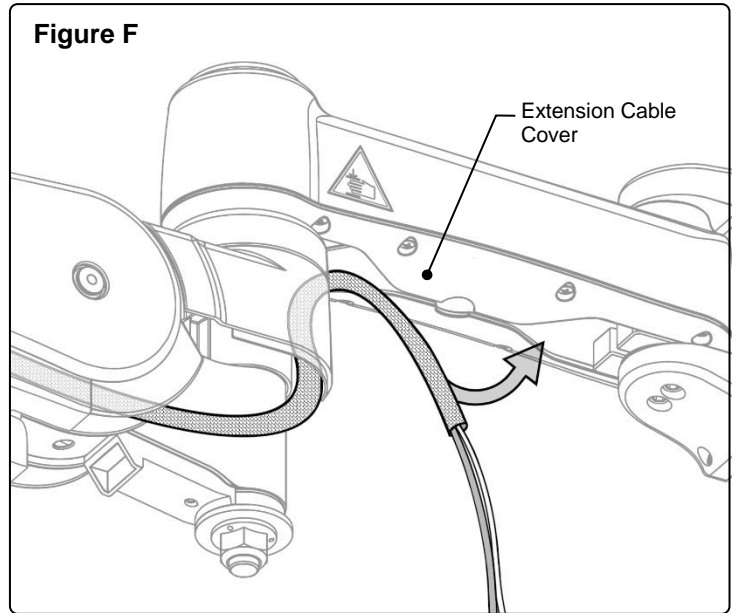
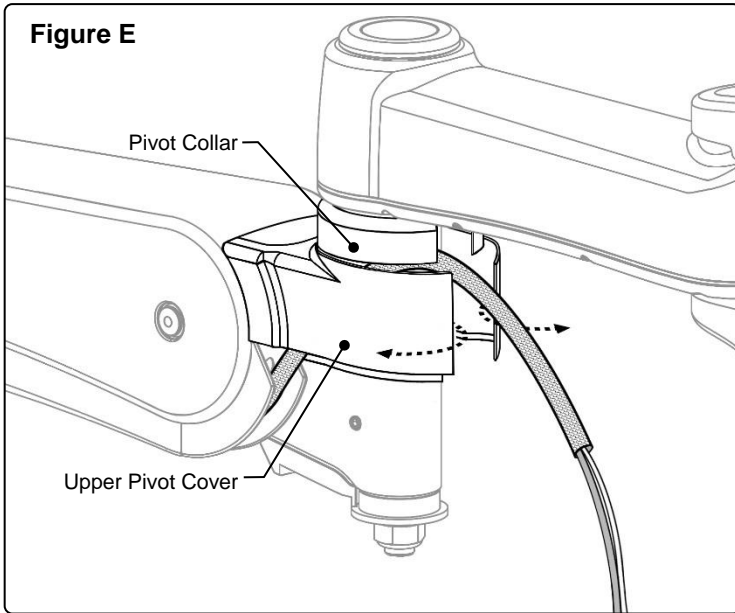
Place the left and right cable bundles into the corresponding track of the Cable Cover (Note: Larger Cables should be placed in first) – **Figure A**. Insert the rear end of the Cable Cover into the two (2) mating slots located below the Arm – **Figure B**.



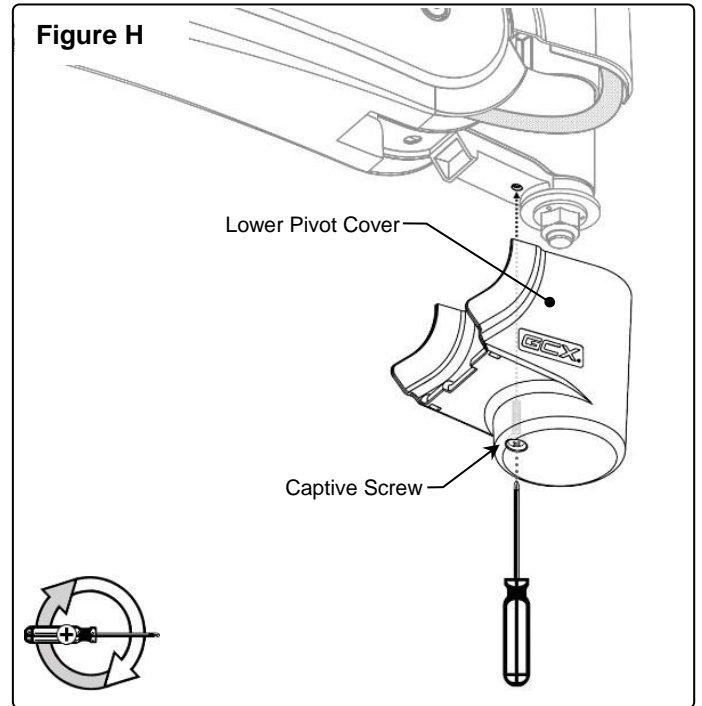
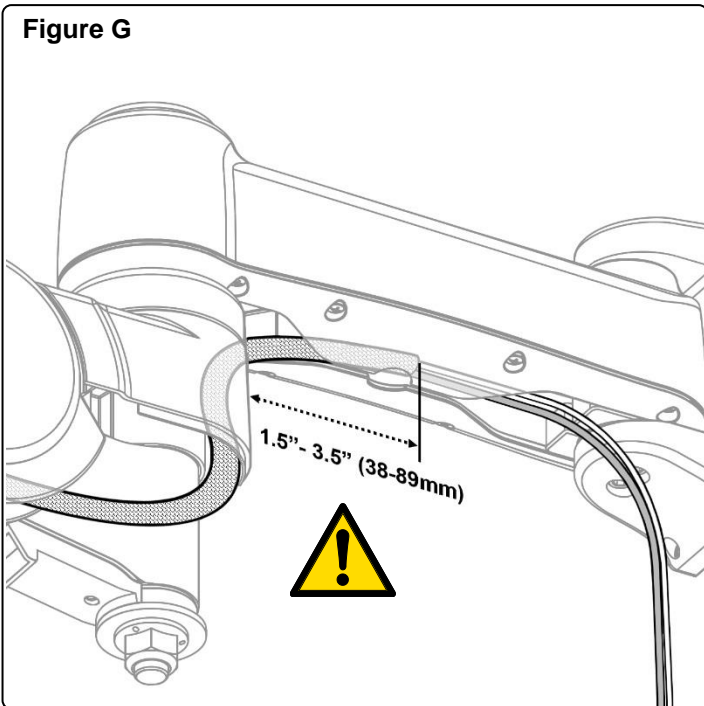
Pivot the Cable Cover up towards the Arm – **Figure C**. Gently squeeze the front of the Cable Cover and insert tabs of the Cable Cover into the mating slots to secure the Cable Cover – Ensure the Cable Cover is engaged in the mating slots – **Figure D**.



Rotate the pivot collar so that the gap is positioned in line with the seam in the Upper Pivot Cover. Spread the Upper Pivot Cover at the seam and guide the cable sleeve / cable bundle upwards past the pivot collar and into the extension Cable Cover opening – **Figure E**. Feed the cable sleeve / cable bundle through the extension to the channel– **Figure F**.

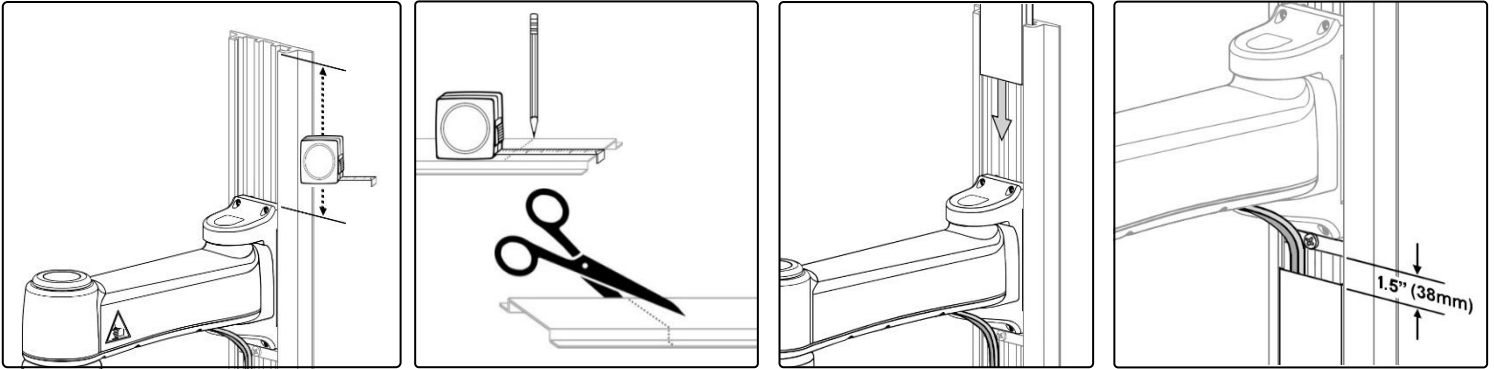


The end of the Cable Sleeve or marked Cable Bundle should be approximately 1.5"-3.5" (38-89mm) inside the Extension Cable Cover – **Figure G**. Align the captive screw with the threaded mounting hole under the center pivot assembly and secure with a #2 Phillips screw driver. Do not overtighten the screw – **Figure H**.



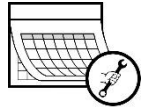
After the Lower Pivot Cover has been installed, move the arm through its entire range of motion. Make sure device cables do not bind or restrict the movement of the arm, and are clear of potential pinch points that may damage the cables.

9.0 Channel Cover Installation



10.0 Routine Maintenance

The Arm must be inspected and maintained at least once a year.



✓	Routine Maintenance Check List	Section
Counterbalance	With the device mounted, move the arm through its entire vertical range of motion. The load should maintain its position at every point in the travel of arm. If necessary, the counterbalance mechanism may be adjusted.	7.1
Swivel	Grasp the mounted device and swivel it from side to side. The device should swivel with some tension or resistance, not loosely. If necessary, the swivel tension may be adjusted.	7.2
Pivot	Grasp the Arm and pivot it from side to side at the Center Pivot and Rear Pivot. The arm should pivot with some tension or resistance, not loosely. If necessary, the pivot tension may be adjusted.	7.3, 7.4
Hardware	Inspect fasteners for looseness. Tighten as required for optimal operation and safety.	5.2, 5.4

11.0 Cleaning the VHM-P Arm

The Arm may be cleaned with most mild, non-abrasive solutions commonly used in the hospital environment (e.g. diluted bleach, ammonia, or alcohol solutions).

The surface finish will be permanently damaged by strong chemicals and solvents such as acetone and trichloroethylene.

Steel wool or other abrasive material should never be used.

Damage caused by the use of unapproved substances or processes will not be warranted. We recommend testing any cleaning solution on a small area of the arm that is not visible, to verify compatibility.

Never submerge or allow liquids to enter the arm. Wipe any cleaning agents off of the arm immediately using a water-dampened cloth. Dry the arm thoroughly after cleaning.

CAUTION: GCX makes no claims regarding the efficacy of the listed chemicals or processes as a means for controlling infection. Consult your hospital's infection control officer or epidemiologist. To clean or sterilize mounted instruments or accessory equipment, refer to the specific instructions delivered with those products.

12.0 Troubleshooting the VHM-P Series Arm

Symptom	Possible Cause	Remedy
Mounted device does not appear level or parallel to the floor.	Channel not plumb. Check with level.	Adjust Channel to plumb, or reinstall Channel.
	Weight of device not compatible with Load Rating of the Arm.	Mount device on arm with compatible Load Rating (section 3.0).
	Swivel hardware loose.	Adjust Swivel Tension Nut (section 7.2).
	Pivot hardware loose.	Adjust Pivot Tension (sections 7.3, 7.4).
	Mounting surface (e.g. wall, side of anesthesia machine, etc.) not structurally sound (does not hold mounting hardware).	Mounting surface must be reinforced or Channel must be relocated.
	Channel loose at mounting surface.	Check for plumb and tighten, or relocate (reinstall) Channel.
Mounted device drifts up or down.	Arm not counterbalanced correctly for weight of the device.	Perform counterbalance adjustment (section 7.1).
	Weight of mounted device not compatible with Load Rating of Arm.	Use arm with compatible Load Rating (section 3.0).
Mounted device difficult to move up or down.	Arm not counterbalanced correctly for weight of mounted device.	Perform counterbalance adjustment (section 7.1).
Arm pivots too freely.	Pivot tension is too loose.	Adjust Pivot Tension (sections 7.3, 7.4).
Arm is difficult to pivot.	Pivot tension is too tight.	
Device swivels too freely.	Swivel tension is too loose.	Adjust Swivel Tension (section 7.2).
Device is difficult to swivel.	Swivel tension is too tight.	
Arm inadvertently slides down Channel.	Set Screws (4) in Slide are loose.	Reposition Arm, tighten set screws in slide, and secure adjustable stop (section 5.2 and 5.4).
	Adjustable Stop is loose or missing.	Install or secure adjustable stop (section 5.2).