

Stealth Products
®



**Disc Brake
Systems**



ADI

Disc Brake Systems

Owner's Manual - Maintenance Guide

ADI HA-10, -12, and -14
Disc Brake Systems

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Stealth Products is committed to 100% customer satisfaction. Your complete satisfaction is important to us. Please contact us with feedback or suggestions to help us improve the quality and usability of our products.

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General

Read and understand all instructions prior to the use of the product. Failure to adhere to the instructions and warnings in this document may result in property damage, injury, or death. Product misuse or failure to follow instructions will void your warranty.

Immediately discontinue use if any function is compromised, if parts are missing or loose, or if any component shows signs of excessive wear. Consult with your supplier for repair, adjustment, or replacement.

All persons responsible for fitting, adjustment, and daily use of the devices discussed in these instructions must be familiar with and understand all safety aspects of the devices mentioned. In order for our products to be used successfully, you must read and understand all instructions on care and maintenance.

The installation instructions will guide you through this product's options and possibilities.

Instructions are written with the expressed intent of use with standard configurations. They also contain important safety and maintenance information, as well as describe possible problems that can arise during use. For further assistance, or more advanced applications, please contact your supplier or **Stealth Products** at (512) 715-9995 or toll free at (800) 965-9229.

Always keep the operating instructions in a safe place so they may be referenced as necessary.

All information, pictures, illustrations, and specifications are based on the product information that was available at the time of printing. Pictures and illustrations shown in these instructions are representative examples and are not intended to be exact depictions of the various parts of the product.

 CAUTION

These products are designed to be fitted, applied, and installed exclusively by a healthcare professional trained for these purposes. The fitting, application, and installation by a non-qualified individual could result in serious injury.

Warranty

Our products are designed, manufactured, and produced to the highest of standards. If any defect in material or workmanship is found, **Stealth Products** will repair or replace the product at our discretion. Any implied warranty, including the implied warranties of merchantability and fitness for a particular purpose, shall not extend beyond the duration of this warranty. **Stealth Products** does not warrant damage due to, but not limited to: misuse, abuse, or misapplication of product, and/or modification of product without written approval from **Stealth Products, LLC**. Any alteration or lack of serial number, where applicable, will automatically void this warranty.

Stealth Products, LLC is liable for replacement parts only. **Stealth Products, LLC** is not liable for any incurred labor costs.

Stealth Products warrants against failure due to defective materials or workmanship.

Covers: 2 years
Hardware: 5 years
Electronics: 3 years

In the event of a product failure covered by our warranty, please follow the procedures outlined below:

Call **Stealth Products** at (512) 715-9995 or toll free at (800) 965-9229.

Request a Return Authorization (RA) form from the Returns Department and follow the documentation instructions.

You can download additional copies of this manual by accessing the Stealth website (<https://stlpro.site/stealth-docs>) and searching "ADI Disc Brake" in the search bar at the top of the page.

Supplier Reference	
Supplier:	
Telephone:	
Address:	
Purchase Date:	
Model:	

Warning Labels

Warnings are included for the safety of the user, client, operator, and property. Please read and understand what the signal words **DANGER**, **WARNING**, **CAUTION**, **NOTICE**, and **SAFETY** mean, and how they could affect the user, those around the user, and property.



DANGER

Identifies an **imminent** situation which, if not avoided, may result in **severe injury, death, and property damage**.



WARNING

Identifies a **potential** situation which, if not avoided, may result in **severe injury, death, and property damage**.



CAUTION

Identifies a **potential** situation which, if not avoided, may result in **minor to moderate injury and property damage**.

NOTICE

Identifies important information not related to injury, but possible property damage.

SAFETY

Indicates steps or instructions for safe practices, reminders of safe procedures, or important safety equipment that may be necessary.

Limited Liability

Stealth Products, LLC accepts no liability for personal injury or damage to property that may arise from the failure of a user or other persons to follow the recommendations, warnings, and instructions in this manual.

Stealth Products does not hold responsibility for final integration of final assembly of product to end user. **Stealth Products** is not liable for user death or injury.

Testing

Initial setup and driving should be done in an open area free of obstacles until the user is fully capable of driving safely.

Intended Use

ADI's disc brake systems are intended to be used with manual wheelchairs. They are designed to attach to the camber tube region of the wheelchair and slow or stop the wheelchair upon brake lever activation.

Disc brakes offer the user a positive lock independent of tire pressure or wear, reduce upper body fatigue, augment user control, and afford users of all physical abilities near-effortless braking ability.

Requiring substantially less pressure to activate (1-2 lbs. of pressure versus roughly 20 lbs. required for wheel-lock brake systems), disc brake systems are ideal for users with impaired trunk control and/or non-functional tricep strength. Additionally, ADI's systems offer multiple brake lever options and configurations tailored to meet the needs of users with a) right, left, or bilateral upper extremity weakness, b) impaired hand control, or c) a right or left upper extremity amputation.

Features

Actuation

ADI disc brake systems offer three different types of brake actuation lever: *Variable, Para and Attendant*.

Wheels

ADI Sun Fusion 16 Series wheels are disc brake ready. The DB model has a spline machined directly into the hub, and the DM model is ready to have a rotor mounted directly to the wheel.

The Spinergy SPOX and LX, and the Dino from Round Betty require the spline drive insert.

Chair Compatibility

ADI's HA-10, -12, and -14 disc brake system offers model-specific 0°, 2°, and 4° camber options for the following wheelchairs:

Motion Composites: *Apex*

Sunrise/Quickie: *Zippie, Q7*

TiLite: *Twist, ZR, ZRA, TR, TRA, TR3, Aero Z, Aero T*

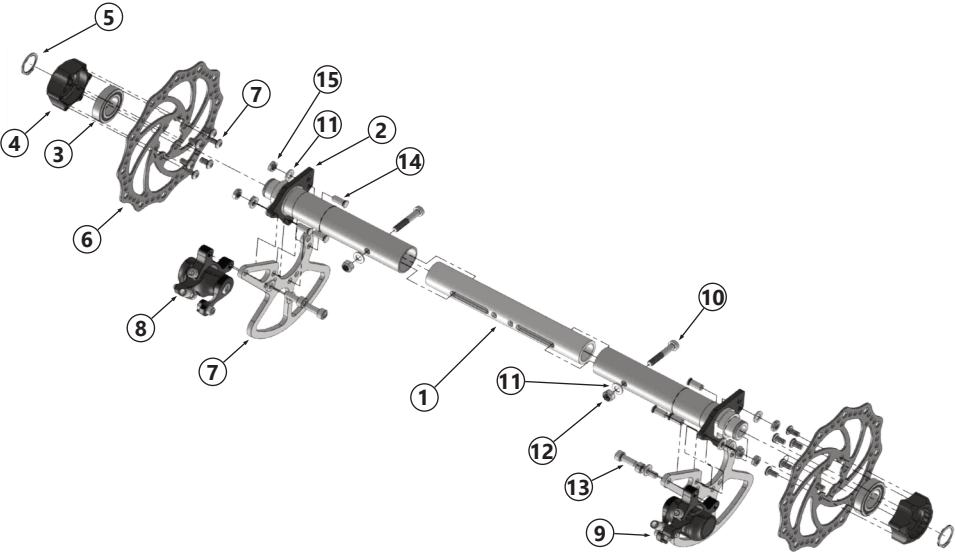
Disc Brake Package Components

ADI's Disc Brake Packages are comprised of two parts:

- A disc brake kit (HA-10, -12, or -14); and,
- A brake actuator lever (Variable, Para, or Attendant).

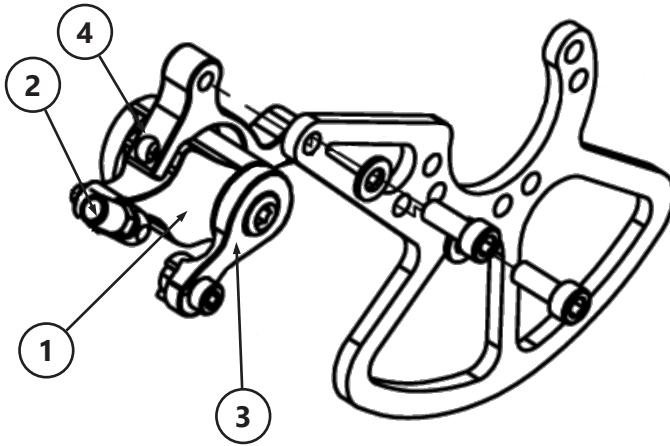
HA-10, -12, and -14 Disc Brake Kit

Below is a diagram of components included with the HA-10, -12, and -14 brake kit:



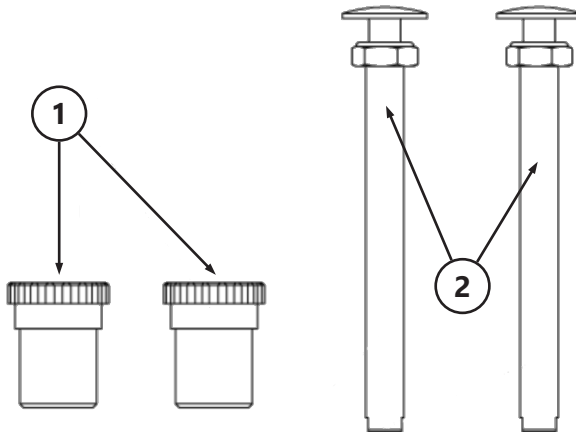
ID	Part	Description	Qty.
1	Center Tube	Camber Telescoping Center Tube	1
2	Camber Tube End Piece	Camber Tube End Piece	2
3	Bearing	Wheel Bearing	2
4	Disc Hub	Disc Brake Hub	2
5	Retaining Ring	Retaining Ring	2
6	Rotor	Brake Rotor, 160mm	2
7	Button Head Cap Screw	M5 x 0.8 x 10mm BHCS	12
8	Caliper, Right	Brake Caliper	1
9	Caliper, Left	Brake Caliper	1
10	Socket Head Cap Screw	M6 x 1 x 40mm SHCS	2
11	Washer	M6 Flat Washer	12
12	Locknut	M6 Locknut	2
13	Socket Head Cap Screw	M6 x 1 x 16mm SHCS	4
14	M6 Stud	M6 x 15mm Press-In Stud	6
15	Locknut	M6 Locknut	6

BASIC CALIPER COMPONENTS



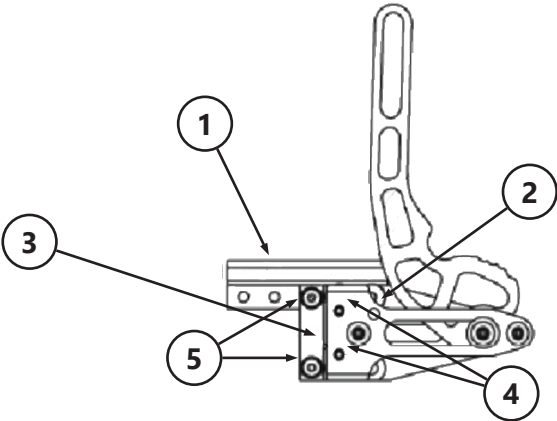
ID	Part	Function	Qty.
1	Caliper	Compresses Brake Pad	2
2	Caliper Input Ferrule	Houses Brake Cable	2
3	Moving Arm (Caliper)	Engages Brake Cable	2
4	Adjustment Bolts	Adjust Caliper Position	2

SPLINE DRIVE INSERT COMPONENTS



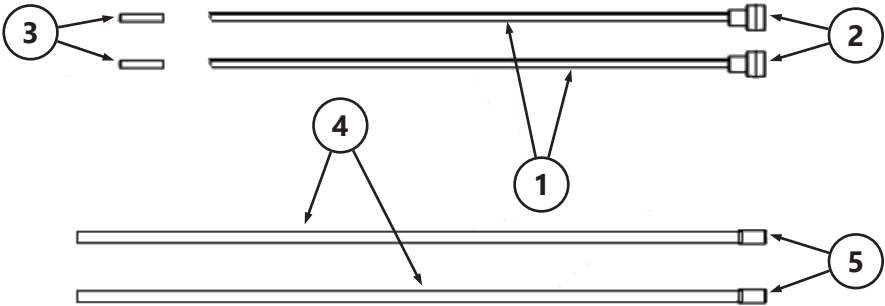
ID	Part	Function	Qty.
1	Spline Drive Inserts	Pressed into Hub to Fit Axle	2
2	Axles	Rotate the Tire	2

VARIABLE LEVER ASSEMBLY



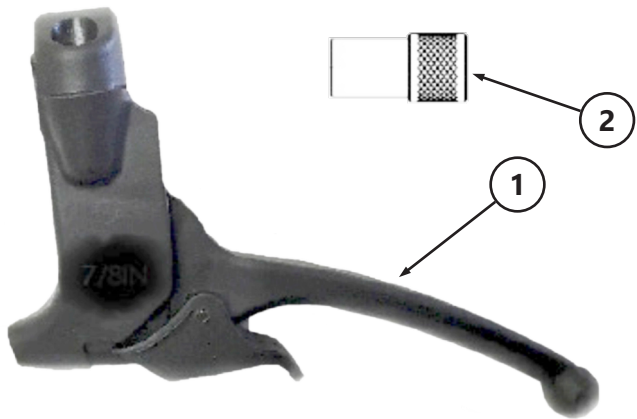
ID	Part	Function	Qty.
1	Lever Adjustment Bar	Attaches lever assembly to frame clamp	1
2	Cable Block	Seats and secures brake cables	1
3	Cable Housing Clamp	Seats and secures cable housing	1
4	Cable Block Set Screw (10-32)	Tighten to secure brake cables	2
5	Cable Housing Clamp Screws (10-32)	Tighten to secure cable housing	2

VARIABLE LEVER BRAKE CABLES AND HOUSING



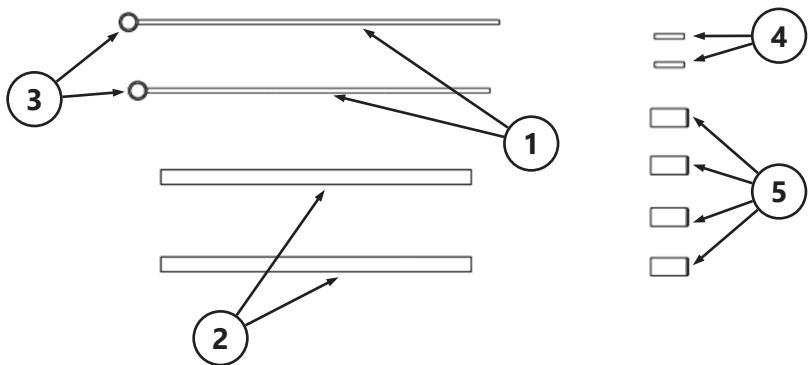
ID	Part	Function	Qty.
1	Brake Cables	Pressed into Hub to Fit Axle	2
2	MTB Brads	Cap and help seat brake cables	2
3	Metal End Caps (Cables)	Seats and secures cable housing	2
4	Brake Cable Housing	Tighten to secure brake cables	2
5	Metal End Caps (Housing)	Tighten to secure cable housing	2

PARA LEVER ASSEMBLY



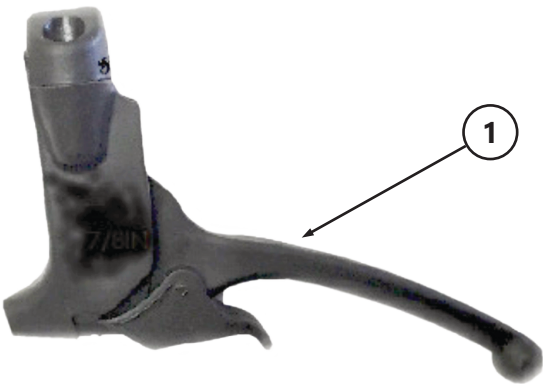
ID	Part	Function	Qty.
1	Lever	Engages Brake System	2
2	Lever Adapter Insert	Enables Cane Compatibility	2

PARA LEVER BRAKE CABLES AND HOUSING



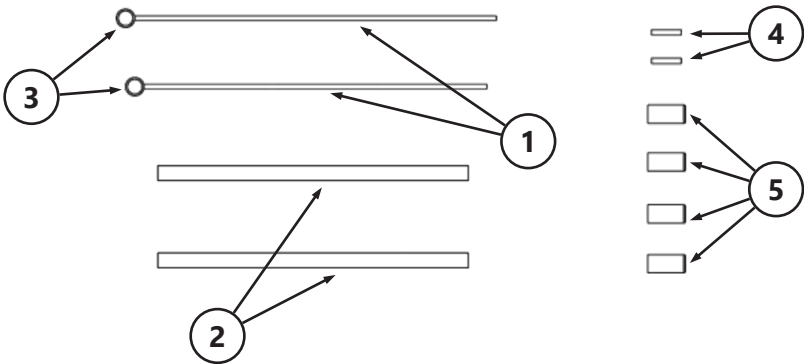
ID	Part	Function	Qty.
1	Brake Cables	Connect disc brake calipers to lever system	2
2	Brake Cable Housing	Houses and protects brake cables	2
3	MTB Brads	Cap and help seat brake cables	2
4	Metal End Caps (Cables)	Crimped to prevent cable wear/unraveling	2
5	Metal End Caps (Housing)	Cap and help seat cable housing	4

ATTENDANT LEVER ASSEMBLY



ID	Part	Function	Qty.
1	Lever	Engages Brake System	2

ATTENDANT LEVER BRAKE CABLES AND HOUSING



ID	Part	Function	Qty.
1	Brake Cables	Connects disc brake calipers to lever system	2
2	Brake Cable Housing	Houses and protects brake cables	2
3	MTB Brads	Cap and help seat brake cables	2
4	Metal End Caps (Cables)	Crimped to prevent cable wear/unraveling	2
5	Metal End Caps (Housing)	Cap and help seat cable housing	4

Preparations

Only a qualified service technician may install ADI disc brake systems.



WARNING

An incorrect installation of the brake system or its accessories may cause damage to the hardware and/or injury to the user.

Tools

Use the proper tools to install and adjust the ADI disc brake system to the desired position for the user. Ensure all fasteners are adequately tightened.



CAUTION

The use of improper tools may damage the device. Inadequate tightening of fasteners can lead to premature failure of the device or discomfort for the user.

Installation Plan

Set up an installation plan before beginning the installation. This plan should take into account:

- where the brake actuator lever will be placed;
- how the disc brake system will be operated; and,
- the amount of necessary clearance for other hardware and accessories.



CAUTION

Any connection must be secured with all delivered screws. Use only the screws provided in the package.

Brake Installation Instructions: HA-10, -12, and -14

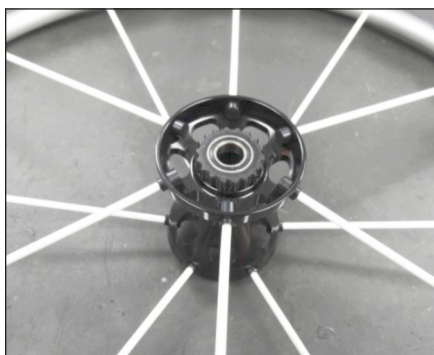
REQUIRED TOOLS:

- Tape Measure
- Hex Keys: 3/16", 3/32", 5/32", 4mm, 5mm
- Builder's Square
- Wrenches: 7/16, 10mm

Step 1: Use a tape measure to take the original measurements of the wheelchair's delivered configuration - wheel spacing, center of gravity, rear seat to floor, etc.



Step 2: If using Spinerger SPOX, Spinerger LX, or Round Betty Dino wheels, press spline drive inserts into both wheel hubs (See *Spline Drive Insert Installation*). If the wheelchair is already equipped with ADI Sun Fusion 16 DB Series wheels, proceed to Step 3.



Spline Drive Insert Installation

1. Remove the inside bearing.

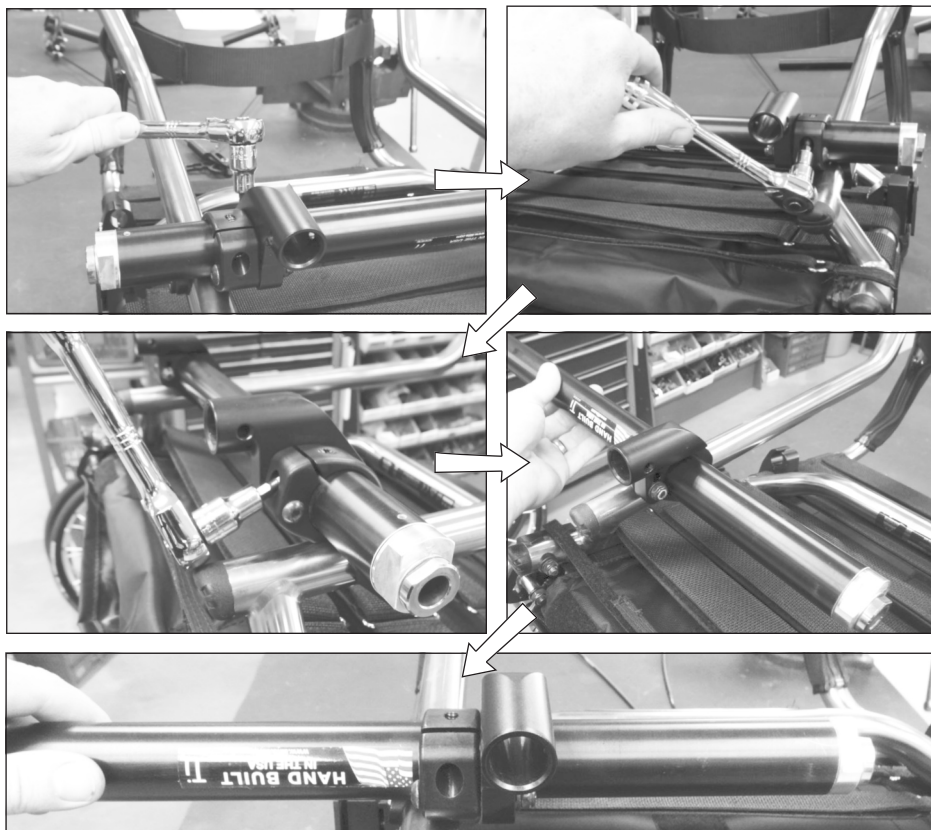
- a. Remove the inside wheel bearing by tapping on the inside with a drift pin and a small hammer.

2. Press the spline drive insert inside the wheel hub.

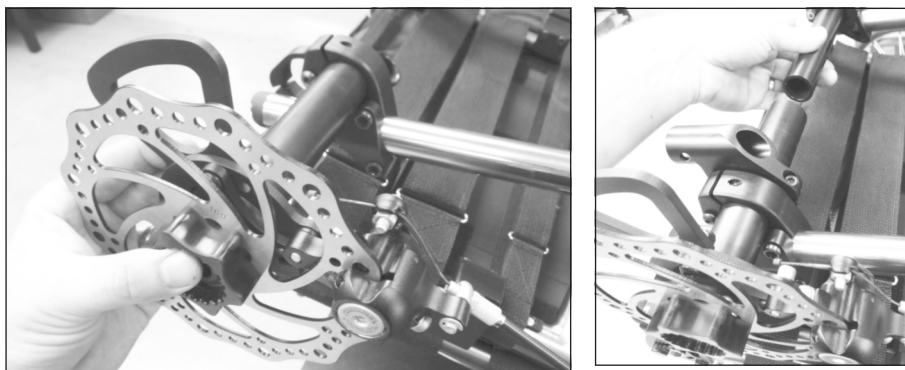
- a. Align the spline drive inside the wheel hub.
- b. Use a hydraulic press to insert the spline drive into the hub. Be sure the spline drive insert is fully seated in the wheel hub.

Installation Instructions

Step 3: Carefully remove the original camber tube by loosening the screws on the chair's clamps.



Step 4: Slide each disc brake assembly into place, one at a time, placing the telescoping center tube in between the assemblies.





Step 5: Beginning rearward, loosely install two M6 x 1 x 40 bolts through the camber tube ends and the center tube slots, with two 6mm locking nuts toward the front of the assembly.



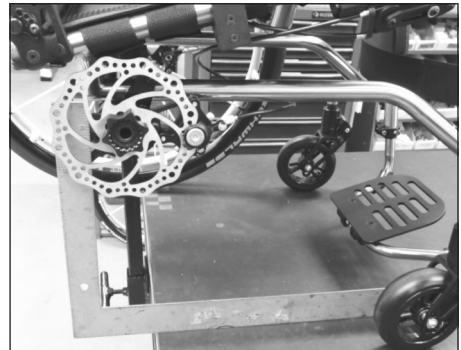
Step 6: Using wheels with spline drives installed, position each disc brake assembly according to the specifications noted from the measurements taken in Step 1.

- Look for any possible interference to the brake system's moving parts.
- Allow at least 3/16" of clearance from the disc brake to any part of the chair.



Step 7: When the desired wheel spacing has been achieved, tighten the M6 camber tube bolts.

Step 8: Using a builder's square, rotate the camber tube so the vertical, flat surfaces of the camber tube weldment are at a 90° angle to the floor and the back column of the builder's square, and are at ride height. This sets proper camber angle.



Step 9: Tighten the chair's camber tube clamps and lock this position.

- Camber tube clamps should be torqued per manufacturer's specifications to avoid rotation during braking.



Step 10: Install the brake lever kit according to the specific lever installation instructions.

- Some modification may be necessary to allow sufficient lever/cable clearance.
- Installation instructions for specific brake lever kits can be in the next section.

Step 11: Ensure the axles fit the new system and adjust them for minimum end play.

Lever Kit Installation Instructions

Each disc brake package will include a brake lever kit specified when the brake package was ordered.

These instructions cover all three styles of brake lever. Instructions specific to one or more styles, but not all, will be marked with the names of the styles they apply to.

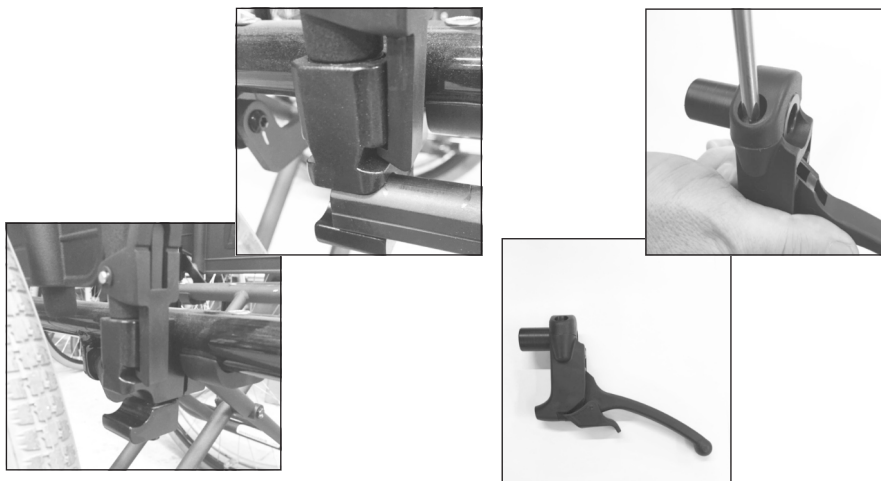
Note: Perform these steps **after** the disc brake hub assemblies have been installed and adjusted to the wheelchair.)

REQUIRED TOOLS:

VARIABLE LEVER	PARA LEVER	ATTENDANT LEVER
Side Cut Pliers Zip Ties Hex Keys: 3/32", 1/8", 3/16", 4mm, 5mm	Side Cut Pliers Zip Ties #2 Phillips Screwdriver Hex keys: 3/16", 4mm, 5mm	Side Cut Pliers Zip Ties #2 Phillips Screwdriver Box Cutter Hex Keys: 3/16", 4mm, 5mm

Step 1 - Preparation and Lever Installation

1. **[PARA]** Using a #2 Phillips screwdriver, attach the 7/8" to 3/4" adapter to the lever's clamping section.
 - Ensure the upper pivot point is toward the rear of the mechanism before tightening the top cap. Check lever action for smooth operation.
2. **[VARIABLE & PARA]** Identify and remove the wheelchair's OEM wheel lock, leaving the existing frame clamp attached.



- It is recommended that after the lever is mounted, it should not extend past the chair's frame when engaged fully forward.
3. **[VARIABLE & PARA]** Insert the lever adjustment bar into the existing frame clamp. Adjust to proper position and use a hex key to secure.



4. **[ATTENDANT]** Dual locking attendant levers come in two cane diameters: 7/8" and 1". Ensure you have the correct diameter for your application by measuring the cane diameter at the lever's desired location. Determine the desired mounting locations for the levers. Use a box cutter to cut away any obstructive padding or grip material and ensure space for the lever handle. Attach the brake lever clamp on the wheelchair handle. When the lever is in the desired location, use the #2 Phillips screwdriver to secure the lever to the handle.

Step 2 - Installing the Cable Housing

1. **[VARIABLE]** Determine the length of cable/housing required to reach from the upper hole in the lever handle to the cable input ferrules on the same-side and opposite-side calipers. Cut two lengths of cable housing, starting with the opposite side caliper, and ensuring the cuts are clean and free of obstructions.
- The cable attaching the lever to the opposite-side caliper should make a gentle "S" shape along the underside of the chair, allowing some slack for adjustments.
 - To gauge the necessary length of housing, gently crimp a metal end cap to one end of the housing and insert this crimped end into the cable input ferrule on the caliper.
 - Cut the tubing to the same length, to provide equal drag and allow the user to easily switch the side the lever is mounted on, if necessary. (Note: The Variable Lever comes assembled for the side specified on the order. To switch sides it will be necessary to disassemble the lever.)

- To gauge the necessary length of the housing, gently crimp a metal end cap to one end of the housing and insert this crimped end into the cable input ferrule on the caliper. (Do this with both the same-side and opposite-side calipers, ensuring equal length on both sides.)
 - If necessary, use zip ties to secure the cable housings to the chair. The cable housing attaching the lever to the same-side caliper should meet and run roughly parallel to the cable/housing attaching the lever to the opposite-side caliper.
 - Check that the cuts are clean and the housing is free of obstructions that can drag on the cable.
2. **[PARA & ATTENDANT]** Determine the length of cable/housing required to attach the lever to the cable input ferrule on the caliper. Cut a length of housing, ensuring the cuts are clean and free of obstructions that may drag on the cable. Gently crimp a metal end cap to both ends of the housing.
- The cable attaching the lever to the opposite-side caliper should make a gentle "S" shape along the underside of the chair, allowing some slack for adjustments.
 - To gauge the necessary length of the housing, gently crimp a metal end cap to one end of the housing and insert this crimped end into the cable cable input ferrule on the caliper. Then route the housing to the lever input and mark the length to ensure a clean, clear housing cut.

Step 3 - Installing the Cable

1. **[VARIABLE]** Run one end of each cable through the front of the holes in the cable block, pulling the cable until the ends with MTB brads are fully seated in the cable block. When the cables are fully seated, use a 3/32" hex key to tighten the set screws on the cable block. (Fig. 1)
- Feed the ends of each cable into the housing, leading the cable through the cut ends of the housing first. Place the housing clamp over the cables and insert the cut ends of the cable housing into the slots in the housing clamp. Secure the housing clamp screws with the 3/32" hex key. (Fig. 2)



Figure 1

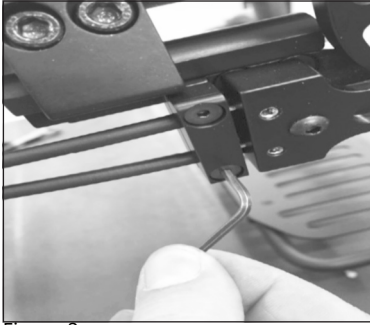


Figure 2

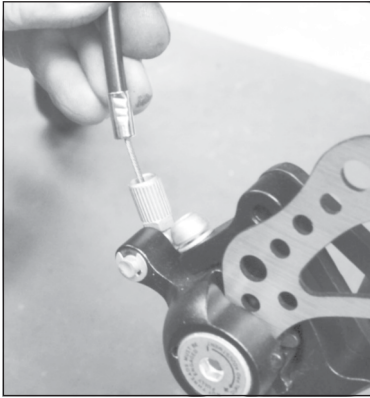


Figure 3

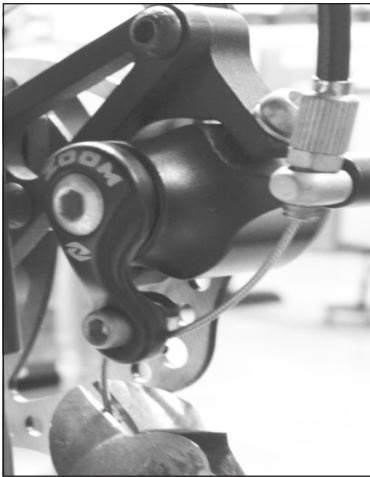


Figure 4

2. **[PARA & ATTENDANT]** Run one end of the cable through the lower hole in the lever, pulling the cable until the MTB brad fits securely in the recess. Feed the cable through the cable housing, checking for smooth operation.
3. **[ALL]** Run the cable through the caliper's cable input ferrule and down through the slot on the caliper's clamping arm, ensuring the cable housing is fully seated in the cable input ferrule. (Fig. 3)
 - Ensure the lever handle is pulled all the way back in the neutral position.
 - The ends of the cables should be fully seated in the cable input ferrules.

Pull to remove slack from the cable, tighten clamp screws with a 4mm hex key. Cut away any excess cable, approximately 6" to 1'. Using the end caps provided, cap off and crimp the cable ends to prevent wear and unraveling. (Fig. 4)

- If necessary, use zip ties to secure the cable housing to the chair.

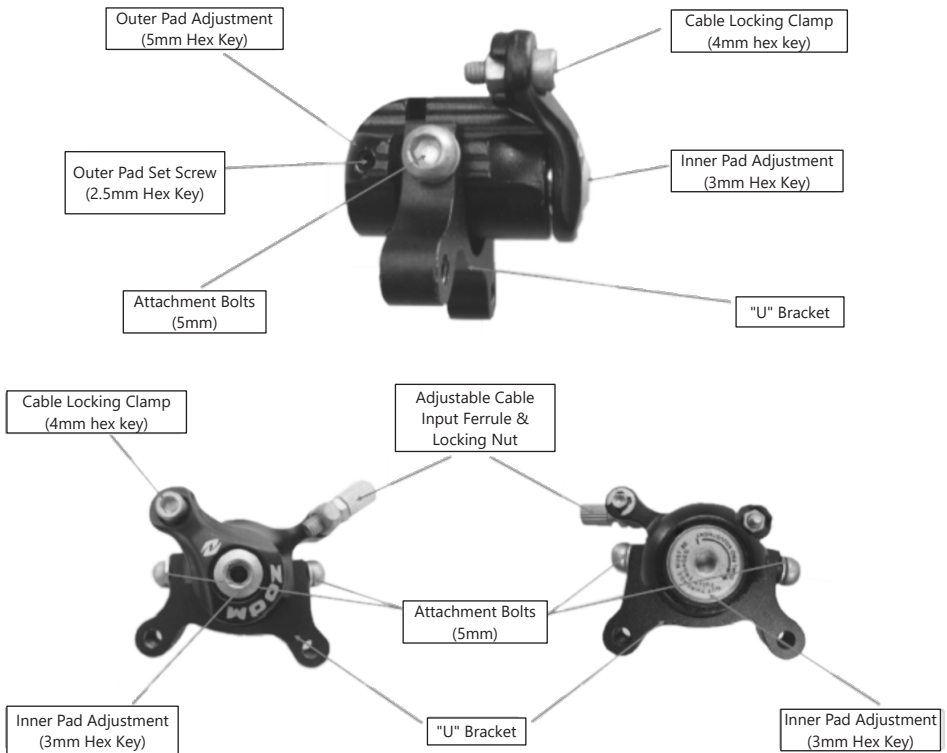
Step 4 - Testing

1. **[ALL]** Test the brake system before use, ensuring the system locks and releases fully and easily. To achieve full and even braking through the entirety of the lever action, adjust the calipers and brake pads. (See Caliper Adjustments in the next section.)
 - The first four clicks when activating the brake lever should provide increasing drag while allowing the wheel to continue turning. The fifth click should lock both wheels firmly and keep them from turning.

Caliper Adjustments

This section details caliper components, and lists the tools and steps required to adjust them.

CALIPER COMPONENTS AND REQUIRED TOOLS



REQUIRED TOOLS:

- 8mm open end wrench
- Hex Keys: 2.5mm, 4mm, 5mm
- Two business cards

Calipers have four points of adjustment:

- Inner Pad Adjustor
- Outer Pad Adjustor
- Attachment Bolts
- Cable Input Ferrule

- Step 1:** Begin by checking that the movable arms on both calipers are at a full open position when the brake is in the neutral position with little to no slack in the cable system.
- Step 2:** Loosen the attachment bolts with a 5mm hex key. Position the caliper so there is an equal gap between pads on either side of the disc.
- Step 3:** Attachment bolts also adjust the caliper angle. Ensure the disc is not askew in relation to the pads before tightening the attachment bolts.
- Step 4:** Loosen the outer pad set screw with a 2.5mm hex key before adjusting the brake pads.
- Step 5:** Slide one business card on either side of the disc between the pads. Carefully tighten the inner and outer adjustment mechanisms a little at a time until the business cards are tight against the disc. Loosen incrementally, just enough to slide the cards out.
- Step 6:** Engage the brake levers, checking for full wheel braking. The wheels should lock smoothly and easily, without significant force applied to the lever. Make slight adjustments to the outer pad locking screw with a 5mm hex key to achieve these settings.
- Step 7:** When full braking with minimal lever effort has been achieved, use a 2.5mm hex key to tighten the outer pad locking screw. (Note: During this adjustment, the brakes must be fully engaged.)
- Step 8:** Test the brake system using a series of hard stops and slow braking. Make note of any veering/tracking caused by the brakes. Adjust this tracking by turning the cable input ferrules. When tracking is even, after several tests, tighten the cable input nut with an 8mm open end wrench.

Dealer Assistance

During first time use by the client, it is advised that the dealer or service technician assists in assembly and explains the configuration of user positioning to the customer (the user and/or the attendant). If needed, the dealer can make final adjustments.

User Testing

It is important that the customer is fully aware of the installation of the disc brake system, how to operate it, and how it can be adjusted according to the needs of the client. A dealer should explain and demonstrate the necessary installation steps, and should explain the functions of the device's components.

- Have the user test the position of the brake actuator lever(s).
- Is the hardware in the proper position for the client?
- Can the user safely operate all the controls with minimal effort?

If necessary, make adjustments to the positioning. Explain potential problems to the customer and how to best address them.

Conditions of Use

ADI disc brake systems are intended for use as installed by the dealer, in accordance with the installation instructions in this manual.

The foreseen conditions of use are communicated by the dealer or service technician to the user and/or attendant during the first time use.

If the usage conditions change significantly, please contact your dealer or qualified service technician to avoid unintended damage.

Cleaning

Use a soft, damp cloth to clean the hardware and its components. Ensure that all cleaners are approved for finished steel and aluminum.

Disinfecting

Gently wipe the hardware with a soft cloth dampened with a household disinfectant.

General Maintenance

These care and maintenance guidelines will keep the hardware in good condition for a longer period of time and will prevent damage.

Check and tighten all fasteners on a regular basis. Check components for any breakdown, Repair or replace parts as needed. Gently remove dust and dirt from hardware with a soft, damp cloth.

Inspect calipers periodically to ensure even clamping and wear on the pads, and test brakes to ensure even braking. Adjust calipers and levers as necessary.

SAFETY

Repair or replace parts as needed.

NOTICE

Improper installation or alteration of the hardware included in ADI disc brake systems will void the warranty.

[illegible]

[illegible]

[illegible]



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Warranty Information



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