

# Single Piston Hydraulic Brake Installation and Service



The Following procedures cover the installation of Hayes Disc Brakes items purchased as an aftermarket item. When you need to install any of the disc brake components, a qualified technician with the proper tools should do that installation work. Improper installation could cause severe or fatal injuries.

**Warning:** When following any of the procedures below, be sure to keep your hands and fingers from getting caught in the disc. Failure to do so could result in injury.

**Warning:** With use, disc brake components may become very hot. Always allow components to cool before attempting to service your bike.

## Starting Out

Congratulations. You have either purchased a new bicycle with the Hayes Disc Brake System, or you have purchased Hayes Disc Brake system or service parts as an aftermarket item. The purpose of this information sheet is to help you get the most out of that system.

## Personal Preference and Adjustment

In most case, the Hayes Disc Brake system has been pre-assembled for your bike. However there are a couple of adjustments that you can make to match your particular physical characteristics or personal preferences.

- **Positioning the Master Cylinder and Lever**

1. Loosen, but do not remove, the handle bar clamp screw
2. Then, position the Master Cylinder and Lever on the handlebar in your desired position.
3. Torque the handlebar clamp screw to 30-35 in-lbs (3.39-3.35 Nm).

- **Lever Reach Adjustment**

Adjust the brake lever reach by using a 2.0mm Allen wrench and turning the push rod that goes through the lever adjuster bushing. Do not attempt to force the adjustment screw beyond its limits.

## Burnish

Disc brakes require a special burnish period to achieve maximum braking power. This burnish period last for about 30-40 stops. During this period some noise may occur

## Recommended Fluids and Lubricants

Use only DOT 3 or DOT 4 brake fluid. Do not use any petroleum-based lubricants, as this will cause the rubber parts to swell. Hayes recommends the use of DOT 3 or DOT 4 brake fluid. Clean the disc and pads only with isopropyl alcohol.

## Safety Info

This brake has been designed for use on a single person mountain bike. The use on any other vehicle or device will void the warranty and can cause serious injury. As a serious rider you are well aware of the need to practice safety in all aspects of the sport. This includes service and maintenance practices as well as riding practices. Before each ride, always check your brakes for proper function and the brake pads for wear. When you ride, always wear a helmet.

## Installation

If you have purchased a bike new – with Hayes disc brakes already installed, you will not immediately be required to follow all of the following procedures. When you need to install any of the disc brake components, that installation work should be done by a qualified technician with the proper tools. Improper installation could cause severe or fatal injuries.

**There are 3 different types of caliper. Be sure to follow the instructions specific to your type.**



International Standard  
Front Caliper

International Standard  
Rear Caliper

74mm Caliper

**Warning:** When following any of the procedures below, be sure to keep your hands and fingers from getting caught in the disc. Failure to do so could result in injury.

### A. Tools Required

Screwdrivers: Torx T25 driver  
Torque Wrench  
Allen Drivers: 2mm, 4mm, 5mm  
Pliers: Needle Nose

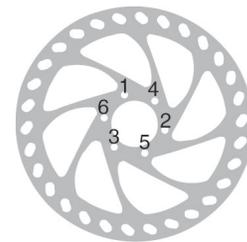
### B. Torque Requirements

Item	Torque
Disc Screws	50 +/- 5 in-lbs (5.65 +/- .55 Nm)
Handle Bar Master Cylinder Clamp Screw	30-35 In-lbs (3.39-3.95 Nm)
Caliper Bleeder	2.0 in-lbs (.23 Nm) (Torque to Seal, Do not Over torque)
Caliper Mount Bolts	80 +/- 5 in-lbs (9.04 +/- .55 Nm)
Hose Connections	60 +/- 5 in-lbs (6.78 +/- .55 Nm)

### C. Mounting the Disc to the Hub

*Note:* Mounting the brake disc to the wheel is a simple matter, but one that requires care. If the wheel has to be rebuilt, have it done by a qualified technician using a 3 cross spoke pattern. We recommend the use of a steel, quick release skewers only.

1. Clean the disc and hub mounting surface with isopropyl alcohol (not disc brake cleaners).
2. Place the disc on the hub mounting surface. Be sure that the arrow on the disc is pointing in the same direction of the forward wheel rotation.
3. Using a Torx T25 driver, install, tighten, and torque the disc screws to 55 in-lb (6.2Nm), in a star pattern sequence.



disc screw torquing sequence

### D. Mounting the “74mm” Caliper to the Frame or Fork

**Note: If you have a “International Standard” style caliper, skip to section “E”.**

1. Remove the wheel(s).
2. Mount the caliper to the frame or mount bracket using (2) M6 x 1.0 18.4mm long mount bolts and (2) mount washers. Snug the bolts, but leave them loose enough so that caliper will move on its slots.  
**Warning:** For **Manitou forks** you will need to use (2) M6 x 1.0 22mm long mount bolts. These bolts are supplied in your aftermarket kit or supplied from the bike manufacture. Failure to use the longer bolt may result in fork damage that will not allow you to tighten down your caliper properly.
3. Re-install the wheel(s).
4. Using a 5mm Allen wrench, position the fixed inner pad adjuster flush with the caliper body.  
**Warning:** Be sure the inner brake pad is adjusted so the pad material is extending past the caliper wall. Adjusting the inner pad too far counter clockwise will cause the disc to hit the caliper wall resulting in brake failure.
5. Position the caliper in its natural center position over the disc. Tighten the mount bolts to 80 +/- 5 in-lbs ( 9.04 +/- .55 Nm) leaving a .015"-.020" (.38 - .50mm) gap between the fixed inner pad and the disc.
6. Using a 5mm Allen wrench, adjust the outer pad adjuster leaving a .015" -.020" (.38 -.50mm) gap between the outer pad and the disc.
7. Adjust the amount of lever travel by adjusting the gap between the disc and pad of either the outer pad adjuster or the fixed inner pad adjuster.  
**Warning:** Adjusting more than a .020" (.50mm) gap on either side of the disc may cause the lever to go to the bar causing brake failure.
8. Spin the wheel. Check that it spins freely and that the gaps, between the pad and the disc, are equal. If the gaps are unequal, or if there is drag, readjust the caliper position by loosening the mounting bolts and adjusting the caliper as needed.  
Hint: A white piece of paper can be used as a background to help sight down the disc looking for equal clearance between the pads and disc.
9. When the gaps are equal and the wheel spins freely (without drag), torque the mounting bolts to 110 in-lbs (12.43Nm)
10. Repeat above procedure for other wheel.

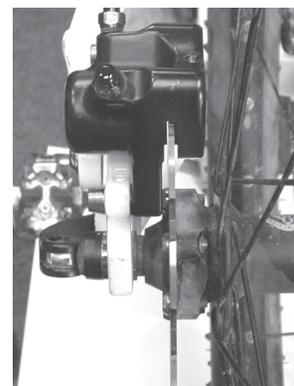


Fork Adaptor

### E. Mounting the “International Standard” Caliper to the Frame or Fork

**Note: The “International Standard” calipers are to be only used with a 6" disc and a quick release front fork.**

1. Remove the wheel(s).
2. Mount the caliper to the frame using (2) M6 x 1.0 18.4mm long mount bolts. Re-install the wheel(s).
3. Using a 5mm Allen wrench, position the fixed inner pad adjuster flush with the caliper body leaving a .015" - .020" (.38 - .50mm) gap between the fixed inner pad and the disc.  
**Warning:** Be sure the inner brake pad is adjusted so the pad material is extending past the caliper wall. Adjusting the inner pad too far counter clockwise will cause the disc to hit the caliper wall resulting in brake failure.
4. Using a 5mm Allen wrench, adjust the outer pad adjuster leaving a .015" - .020" (.38 - .50mm) gap between the outer pad and the disc.
5. Adjust the amount of lever travel by adjusting the gap between the disc and pad of either the outer pad adjuster or the fixed inner pad adjuster.  
**Warning:** Adjusting more than a .020" (.50mm) gap on either side of the disc may cause the lever to go to the bar causing brake failure.
6. Spin the wheel. Check that it spins freely and that the gaps, between the pad and the disc, are equal. If the gaps are unequal, or if there is drag, readjust the caliper following the needed steps listed above.  
Hint: A white piece of paper can be used as a background to help sight down the disc looking for equal clearance between the pads and disc.
7. Repeat above procedure for other wheel.



Checking Pad Gaps

## Service

Service should only be performed by someone familiar with the necessary service procedures, possessing a good knowledge of mechanical procedures, and equipped with proper tools and equipment. Incorrect service or repair may reduce braking performance, and could lead to a safety or personal hazard situation. If you have any doubts about the procedure described, due to limited experience or because of the lack of necessary tools and equipment, contact your local dealer or mechanic. All torque requirements should be adhered to. Remember, always "Think Safety".

### A. Cleaning and Care

The brake disc and pads should only be cleaned with isopropyl alcohol (not disc brake cleaner).

### B. Brake Pad Change

Due to wear, contamination, or damage, the brake pads will, on occasion have to be replaced.

The following procedure is to be followed for that change of brake pads.

1. Remove the wheel.
  2. Using a 5mm Allen wrench, turn the inner pad adjuster counter clock-wise until one engagement thread is exposed.
  3. Using a needle nose pliers, **remove the outer pad first.**  
*Note: The outer pad is the pad away from the wheel.* To do this, pull the tab in the center of the pad backing plate toward the center of the caliper and out. The pad is held in with a magnet.  
*Note: If you do not remove the outer pad first, you will not be able to remove the pads.*
  4. Repeat the above steps for the inner pad. *Note: The inner and outer brake pads are identical.*
- To replace the pads...
5. Using a needle nose pliers, **install the inner pad first.**  
*Note: The inner pad is the pad closest to the wheel.* Use the tab in the center of the pad backing plate to push the new pads into place. Angle the pad slightly until the force of the magnet pulls the pad into place.
  6. Now repeat the procedure for the outer pad.
  7. Install the wheel.
  8. Using a 5mm Allen wrench, adjust the inner pad adjuster to the proper gap. *Note: See installation instructions above for proper set-up.*

**Caution:** Do not try to turn the adjuster past its stopping point. Doing so may damage the brake.

### C. Hose Removal and Assembly

The follow procedures are to be used when replacing or removing the hose.

#### Master Cylinder and Caliper hose Removal

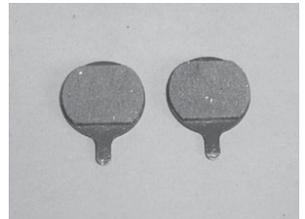
1. To take the hose off of the master cylinder end, slide the hose support down the hose.
2. Using a 8mm box wrench, remove the hose nut and slide it all the way down the hose.  
*Note: sometimes it is best to first cut the hose and used the box end of the 8mm wrench to better grab the 8mm hose nut.*
3. Slide the hose off the end of the master cylinder / caliper. There will be some residual fluid in the hose and master cylinder / caliper. Be careful to avoid spilling that fluid.
4. A new compression bushing and hose insert will be needed each time the hose is re-installed. Remove the old compression bushing and hose insert by cutting the hose next to the compression bushing. The cut needs to be clean with no fraying ends.

#### Master Cylinder and Caliper Hose Assembly

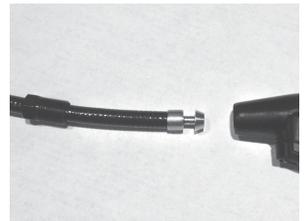
1. Cut the hose to the desired length with good scissors or cable cutters. The cut end must be clean and perpendicular to the hose itself.
2. Slide the hose cone onto master cylinder side of the hose.
3. Slide the hose nut and compression bushing over the hose. Always use a new compression bushing.
4. Push the longer end of the barbed hose insert into the end of the hose. Be sure it is inserted flush with the end of the hose. Always use a new hose insert.
5. Slide the hose into the master cylinder / caliper and install the hose nut. Be sure that the hose is inserted completely into the master cylinder / caliper end. Be sure the hose remains inserted while tightening.
6. Using a 8mm open-end wrench, torque the hose nut to 60 +/- 5 in-lbs (6.78 +/- .55 Nm)
7. Bleed the system



Removing Pads



Brake Pads  
**Note:** Inner and outer pads are the same.



Hose Fitting

## D. Bleeding the System

Air entrapped in the hydraulic system of the disc brakes can decrease performance of the system and should be removed by "bleeding" the system and replenishing the system with new brake fluid. The system is filled by pumping fluid from the lowest point (at the caliper), through the system, to the highest point, the bleeder on the master cylinder.

**Caution:** Use only new DOT 4 or DOT 3 brake fluid from a closed, sealed container.

Use of any other fluid can cause the rubber parts to degrade and cause the brake to fail.

**Caution:** DOT 4 or DOT 3 brake fluid will strip paint. Use extreme caution to avoid getting DOT 4 or DOT 3 brake fluid on paint. If DOT 4 or DOT 3 brake fluid comes in contact with paint, wipe it off immediately and rinse with isopropyl alcohol.

**Warning:** If you get any brake fluid on the brake pads, discard them and replace with new pads. If you get any brake fluid on the disc, clean it thoroughly with isopropyl alcohol.

**Warning:** DOT 4 and DOT 3 brake fluid can be an irritant when it comes into contact with human tissue.

For skin contact, brake fluid should be washed off in flowing water. For eye contact, the eye area should be irrigated with flowing water immediately and continuously for 15 minutes. Consult with medical personnel. If effects occur from inhaling brake fluid fumes, move to an area with fresh air. Consult a physician. If brake fluid is ingested, induce vomiting and consult medical personnel. Used brake fluid should be disposed of in accordance with local laws.

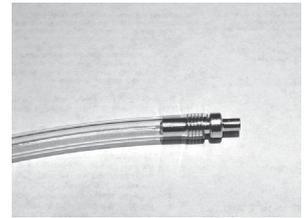
### Bleed Kit Assembly

1. Screw the cap onto the end of the bottle.
2. Cut a 2" (5cm) section of hose
3. Push the short section of hose over the cap until it slides past the ridge on the cap
4. Push the long section of hose into the master cylinder bleed fitting.

*NOTE: There are two fittings with the kit. The silver aluminum fitting is to be used with the "SO1E".*

### Bleeding the System

1. Remove the wheel.
2. Remove the brake pads so that any spilled fluid does not contaminate the pads. (See above instructions for pad removal)
3. Position the bike in a stand so that the brake caliper bleeder screw is perpendicular to the ground, and the reservoir plug on the master cylinder is the highest point on the brake system. This can be done by loosening the master cylinder clamp screws and rotating the master cylinder upright on the handlebars.  
*NOTE: For the "SO1E" the bike should remain horizontal to the ground, and the lever should remain parallel to the ground.*
4. Remove the master cylinder reservoir and press the fitting with the hose into the hole. The other end of the hose should go into a cup or bottle to catch the excess fluid. Be sure not to submerge the end of the hose in fluid. Hint: Taping a spoke to a bottle and bending it to hook around the handlebars makes a convenient hanger.  
*NOTE: The "SOLE" master cylinder reservoir plug is an aluminum plug, which needs to be removed with your fingers or a small flat head screwdriver. DO NOT remove the two T-10 Torx bolts holding the cap on. The "SO1E" requires the use of the silver aluminum bleed fitting included in the bleed kit.*
5. Completely remove the caliper bleeder's rubber cap.
6. Fill the plastic filler bottle with fresh DOT 3 or DOT 4 brake fluid.
7. Close the caliper bleeder.
8. Place the hose from the fluid bottle onto the caliper bleeder. Pump the fluid bottle until there is no air in the hose.
9. Open the caliper bleeder 1/4 turn.
10. Squeeze the fluid bottle firmly – forcing fluid into the caliper for a count of five. Stop squeezing -until the bottle returns to its natural shape. When the squeeze is released, air should be drawn out of the caliper. Continue alternately squeezing the fluid bottle, for a count of five, and releasing until no air bubbles come out of the caliper.
11. After all the air is out of the caliper; squeeze the bottle until fluid comes out at master cylinder with no air bubbles.
12. While squeezing the bottle, quickly stroke the lever to the handlebars, and release. Repeat this until no more air bubbles come out of the master cylinder.
13. With the bottle still being squeezed, close the caliper bleeder. Torque should be only to seal the bleeder. Do Not Over Torque! Then release and remove the bottle and filler hose.
14. Remove the hose and fitting from the master cylinder and insert the aluminum reservoir plug.
15. Clean the caliper and master cylinder with isopropyl alcohol. Take great care to remove all brake fluid because if the fluid comes into contact with the disc or brake pads, performance will forever be greatly reduced.
16. Clean the disc with isopropyl alcohol if it is contaminated with oil or brake fluid.
17. Replace the caliper's rubber bleeder cap, the brake pads, and the wheel/disc assembly.
18. Center the caliper over the disc.
19. Check all hose connection for leakage. Tighten if any are found.



Bleed Fitting



Filler Bottle Attachment

## Warranty

Any Hayes Disc Brake found by the factory to be defective in materials and/or workmanship within two years from the date of purchase will be repaired or replaced at the option of the manufacturer, free of charge, when received at the factory with proof of purchase, freight prepaid. Any other warranty claims not included in this statement are void. This includes assembly costs (for instance by the dealer), which shall not be covered by Hayes Disc Brake. This warranty does not cover breakage, bending, or damage that may result from crashes or falls. This warranty does not cover any defects or damage caused by alterations or modifications of new Hayes Disc Brakes or parts or by normal wear, accidents, improper maintenance, damages caused by the use of parts of different manufactures, improper use or abuse of the product, or failure to follow the instructions contained in an instruction manual for Hayes Disc Brake. Any modifications made by the user will render the warranty null and void. The cost of normal maintenance or replacement of service items, which are not defective, shall be paid for by the original purchaser. This warranty is expressly in lieu of all other warranties, and any implied are limited in duration to the same duration as the expressed warranty herein. Hayes Disc Brake shall not be liable for any incidental or consequential damages. If for any reason warranty work is necessary, return the brake to the place of purchase. In the USA, contact Hayes Disc Brake for a return authorization number (RA#) at (888) 686-3472. At that time, instructions for repair, return, or replacement shall be given. Customers in countries other than USA should contact their dealer or local Hayes Disc Brake distributor.



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