

**\*\*\*WARNING, READ ENTIRE DOCUMENT THOROUGHLY BEFORE REMOVING CONTENTS OUT OF PACKAGING!!!\*\*\***

**\*\*\*THIS DOCUMENT IS CONSIDERED UNCONTROLLED!!!\*\*\***

Welcome, and thank you again for your interest in my mock 1997 – 2001 Honda CR-V Rear Disc Brake Conversion. **To be absolutely clear, this kit was never intended to be installed on the vehicle at all. It is not street legal, able to withstand off road use, capable of stopping a vehicle at any speed, or even able to keep something from rolling down a level surface.** The conversion kit is strictly meant to be looked at on your desk, on a fireplace mantle, in a picture frame, or your best bet would be to keep them in the box they were shipped in. Now that we have that out of the way, on to the How-To/Guide to be able put them on a CR-V so you can look at them, not use them.

This Installation Guide will assume MANY things, most of which is that you are mechanically inclined and know how brake systems work. **I ABSOLUTELY do NOT assume ANY liability, responsibility, or have anything to do with what you do to yourself, others, or any material things.** This kit absolutely is not designed to be installed on ANYTHING. Please read the entire document before deciding to even attempt this conversion. You will find most of this conversion assembly requires customizations. A parts list will be provided, but not any tools that are required unless it is something out of the ordinary or deemed necessary. Good Luck!

### **Section 0.1 - RECOMMENDED SPECIALTY TOOLS**

- Small handheld torch or OXY/FUEL setup
- Air assisted vacuum / vacuum brake bleeder

### **Section 1.1 - ADDITIONAL PARTS REQUIRED**

<b>Quantity</b>	<b>Part Description</b>	<b>Part Number</b>
1	1997 - 1999 Honda Prelude SH = Right Rear Brake Calipers w/ Caliper Bracket	(N/A)
1	1997 - 1999 Honda Prelude SH = Left Rear Brake Calipers w/ Caliper Bracket	(N/A)
2	1997 - 1999 Honda Prelude SH = Rear Brake Rotors	(N/A)
1	1997 - 1999 Honda Prelude SH = Brake Master Cylinder	(N/A)
2	Russel Brake Lines = 30" Straight -3 AN x 10mm Banjo	657080
1	Russel Brake Line Adapters (Pair) = -3 AN to 10mm x 1.0 mm Female	641411
<b>Recommended</b> - New Left and Right Rear Wheel Bearings		
<b>***Additional Parts Needed if Kit and/or E-Brake Adapters aren't Purchased***</b>		
1	(1/2") Metal Rod - Stainless Steel preferred	(N/A)
6	M10 x 1.25 mm x 20 mm (or 16mm w/ old Bearing) Bolts	(N/A)
2	Cable Clamp for E-Brake Cable	(N/A)
*** You can't use a flanged bolt for one of the mounting bolts due to Brake Caliper Bracket interference. However, if you desire to do so, a socket head cap screw can be used for all bolts.		

This list assumes you are more 'performance oriented'; brake lines & adapters may be substituted. If you choose to substitute, it may prove rather difficult to source the adapter needed to hook up the CR-V & Prelude hoses together (I tried). A short hard line may also work, but you are tripling your connections, rather than just two with the Russell parts.

## **Section 2.1 - GETTING STARTED**

To make the required modifications, both of the rear trailing arms will need to be removed from the vehicle. Leaving them on the vehicle may be an option, but with the heat and hammering involved, it would be best to just remove them in the name of safety and simplicity. It may also be wise to replace the Trailing Arm Bushings at this point in time and to re-clock them if necessary (if you are lifted or lowered, it is recommended to prevent suspension bind).

You will need to remove ALL of the drum brake components. This requires you to remove the hub to get the drum backing plate off and to install the Conversion Bracket. When you remove the hub from the wheel bearing assembly, the inner race comes with it. These bearings are not made to be pressed on and off multiple times and because of that, I highly recommend you just replace both wheel bearings with new ones. Rust will most likely have formed in the holes as well as on the threads that will be used to bolt the new Conversion Bracket in place. If you elect to not change your wheel bearings, then shorter bolts can be used at **your own risk**.

Removal of the Torx Socket Head Bolts holding the wheel bearing bracket isn't required for this conversion, and is actually recommended to keep them in place for the metal forming process. (See pictures in **Section 3.1** for visual clarification on how the metal wraps around the bracket after being formed.)

I made this wheel bearing Write-Up years ago, and it may come of use to you in your current adventure:

<http://honda-tech.com/honda-crx-ef-civic-1988-1991-3/write-up-diy-front-wheel-bearing-replacement-2685054/>

## **Section 3.1 - Trailing Arm Metal Forming**

This section can be tricky if you let it be. Do not over complicate things by trying to make both sides match perfectly. Basically we are trying to create clearance for the caliper in this section. Rather than making clearance just in the area of the caliper, I bent all the way up the lip to keep the metal from tearing and weakening, and to keep a more uniform appearance. This section is somewhat open to interpretation – if you choose to cut out metal rather than bend it, that is **your choice and risk** to make for yourself.

Take your torch and start to heat the entire length of the bend area, working the torch back and forth. Once it is very hot or potentially glowing (depending on torch setup) start to hammer the lip down at a backwards slope working up and down the length of the trailing arm lip. Do not overwork the metal more than absolutely necessary and reheat often as needed. The faster you go or the more you bend at once the more likely you are to rip/tear it. **DO NOT QUENCH (pour liquid or use air) ON THE METAL AT ANY TIME!!!** Once you have formed it to your liking, continue to heat the metal for a while longer to allow any stress to relax. Let it air cool until it is safe to handle again.

Below are reference photos to give you an idea of how much to bend and where to bend the metal. These are just a guide, but do provide adequate clearance for the caliper throughout the life of the pads all the way down to metal on rotor contact. I would not bend them any less, but you can bend them more at the risk of fracturing the metal. The pictures are a side by side shot of an unmodified trailer arm and a modified one. Only the curled lip area is modified.



EXAM













## Section 4.1 - Brake Conversion Bracket Assembly

After the trailing arms are cooled (hopefully painted/coated at this point), it is now time to start the assembly process. You can either install the trailing arms on the vehicle or do this with them still off the vehicle. It is completely your choice, but after this section is done, they will need to be on the vehicle. Install your new or old wheel bearings and do NOT install the hubs yet. Take your Brake Conversion Bracket and bolt it on to the wheel bearing, tighten to manufacturer's torque specifications for the drum brake backing plate. The Conversion Bracket will only go one way; the orientation is shown in the pictures below.

**\*\*\* You MUST put the socket head cap screw (allen head bolt) in the hole closest to the caliper bracket hole!!! \*\*\***





Install your hub into the wheel bearing after your Conversion Bracket is fully tightened. After this step is accomplished, proceed to install the rotors and brake caliper brackets like normal according to the manufacturer's specifications but beware, there are a few issues I have found with different brake caliper brackets. Please see [Section 4.2](#) for more details if your brake caliper bracket doesn't sit on its perch and line up with the bolt holes on the Conversion Bracket. The brake caliper itself needs modified as well, please see [Section 4.3](#) for more details.



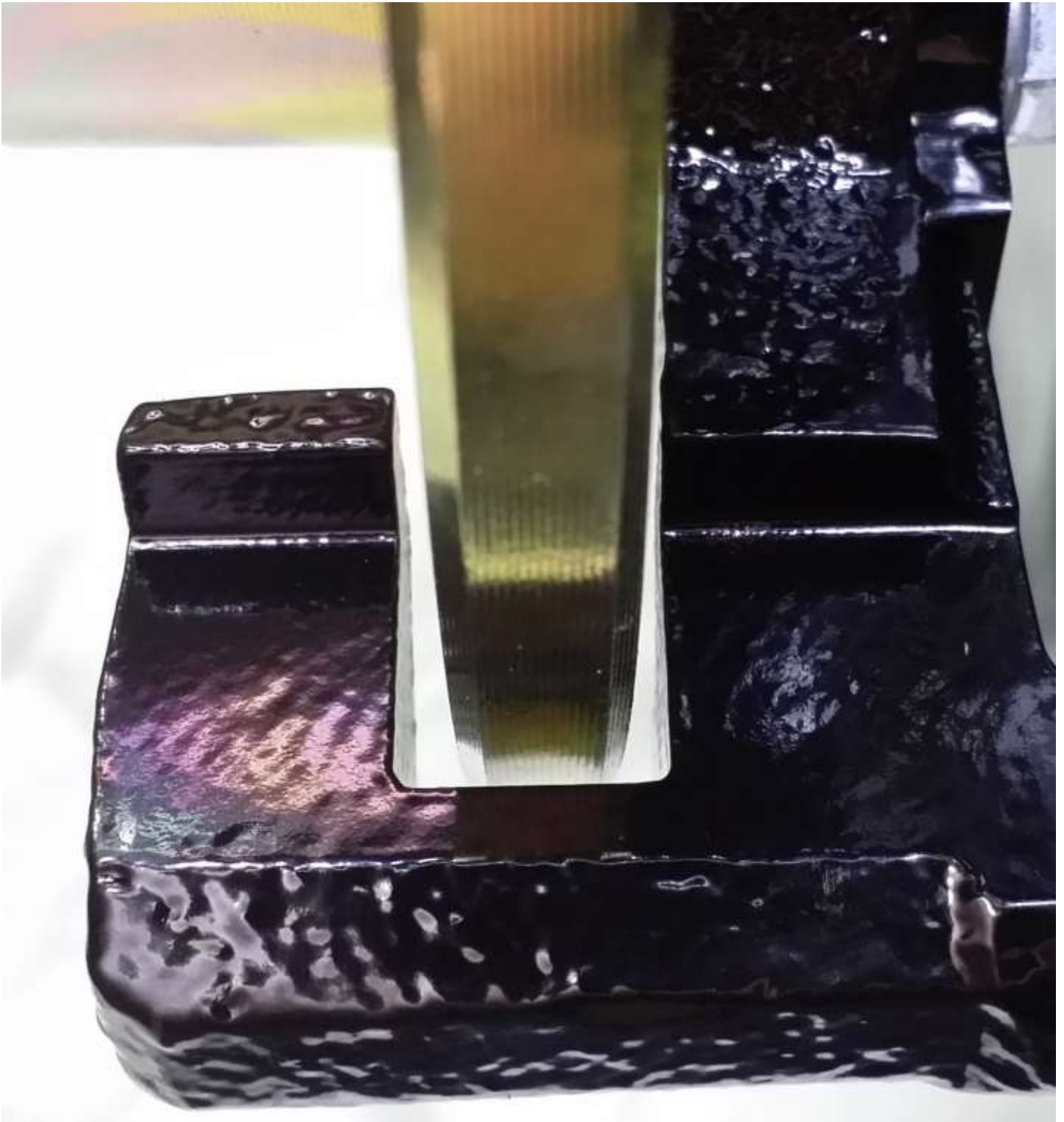


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#### **Section 4.2 - Brake Caliper Bracket Differences**

During my discovery phase of this project, I have come across at least two different bracket designs. This poses a problem in bolting up the brake caliper bracket due to the caliper bracket design. If your brackets do not line up with the holes on the Conversion Bracket as seen below, then you will have to adjust as necessary.









**In the picture below, you can clearly see one bracket has been factory machined and the other has not been.**





Take the brake caliper bracket and lightly bolt it to the Conversion Bracket. Use machinists bluing and a scribe, permanent marker, pencil, or some way to mark the top edge of the Conversion Bracket on to the brake caliper bracket. Use a grinder/cut off tool to cut it to the desired height and square it off like the bracket on the left in the picture above. In this instance, if you are unsure of yourself, make multiple small cuts/grinds and check often between cuts. After this you can install the brake caliper brackets.

















### Section 4.3 - Brake Caliper Modifications

This part may be scary for some people. I have tried just about every feasible orientation and clocking to get away from having to modify the brake caliper itself. No matter which location OR caliper I selected, there was an issue of some kind. The current Conversion Brackets are more or less a middle ground between caliper clearance, caliper modification, trailing arm modification, and the factory E-Brake cables still working.

This process is very similar to [Section 3.1](#) in the fact that it's not a perfect science. Things will need to be checked and shaped as needed or even multiple times. I will provide pictures below that show a side by side comparison of a modified caliper and one that wasn't modified. The amount of material shown removed provided ample caliper clearance to the trailing arm to account for wear and sag throughout the life of the pad. If you feel uncomfortable with what was cut away, then I highly suggest you either rethink this conversion or be prepared to modify the trailing arm **A LOT...** Do **NOT** install the calipers at this time. Just set them in their place; please see [Section 4.5](#) for details.

This is also a good time to check the E-Brake Adapters into the E-brake lever on the caliper. If they do not fit (which they probably won't), you will need to ream out the hole with a 0.250" (1/4") drill bit or maybe even slightly more, but it worked for me by using a 0.250" bit.







## Section 4.4 - Brake Master Cylinder

One would hope that this would be a straight forward brake master cylinder swap, but it just wasn't the case. I tried using the factory CR-V master cylinder and it just isn't big enough to compensate for the larger rear calipers.

**\*\*\*Do NOT bench bleed or pour brake fluid into the master cylinder yet, you will regret it if you do!!!\*\*\***

The Prelude brake master cylinder bolts up to the CR-V brake booster just fine. The problem is the stroke of the master cylinder and the stroke of the brake booster are different. After many measurements and adjustments, the only way I found to get full travel of the master cylinder was to install a spacer shim inside the master cylinder.

This spacer needs to be pretty close but it doesn't have to be exact to still achieve full travel. This is also where brake pedal adjustment will come into play. I used a stainless steel 0.500" (1/2") wide rod as it fits the master cylinder tube perfectly. The reason for stainless steel is for corrosion resistance and hardness, but it isn't required and any steel will do. I recommend lubricating the spacer with grease before you put it in the tube. The extension length required needs to be between 0.205" – 0.220" to work correctly.

My extension was slightly longer because I elected to countersink the bore slightly to allow the brake booster rod to center itself just like it would in the stock master cylinder bore. \*BUT the actual spacer length from the bottom of my taper to the other flat side was still what is listed above. (Look down the master cylinder tube and you will see it is tapered towards the center for rod alignment purposes.) For reference please see the poor quality picture below.



After this is all done, before bench bleeding the master cylinder or anything else, you need to check for pedal travel. Bolt the master cylinder with spacer installed on to the brake booster (don't connect the brake lines). Assuming your pedal was already adjusted properly, it should stop right at or just above the floor. If it does not, then you need to add or remove some length from your spacer. An 0.125" (1/8") difference may not sound like much, but when levers (brake pedals) are involved, it can mean inches at the pedal. Once you get the pedal where it needs to be, it should be very close to Factory Specs in terms of pedal height. Adjust it according to the Factory Service Manual.

After everything checks out with the pedal travel, you can prepare the master cylinder. During all the excitement of dealing in thousandths of an inch for a brake system, you may have missed the brake line is on the opposite side on the Prelude master cylinder. This is an easy fix, if you bend the brake line just right, it has plenty of line to make it to the other side. I do not have a before picture, but here is an "after" for your reference.



#### **Section 4.5 - E-Brake Cables and Brake Bleeding**

So, you made it this far did you? This is where the conversion becomes tricky. If you purchased the E-Brake Conversion Adapters, it is in a sense, a double edge sword. They remove the guesswork of cutting cables and adjusting multiple things, but they add the problem of banjo bolt interference. There is also the unfortunate problem of brake caliper bleeding screw orientation. (Please see picture below for reference.)



You can use the factory E-brake cables for this conversion. If you chose not to purchase the E-Brake Adapters, then you will need to cut the cables and purchase cable clamps/stops to secure the cable to the caliper. All that needs to be done is route the cut cable through the hole on the caliper E-brake lever and put a clamp on the cut end. How much cable should be cut? How much should hang out? How should you adjust it? Those are all questions that **YOU** have to answer for yourself. I do not recommend this method for the fact that if something fails, your vehicle might very well roll down a hill or something worse.

All that needs to be done to get the cables to reach is swap them from one side to the other. If you look where the cables go into the cabin, you will see they are crossed from the factory. You will be taking the driver's side and routing it to the passenger's side through the factory hole in the trailing arm. Then take the passenger's side and do the same over to the driver's trailing arm. The brackets won't work anymore, so some form of ties will be needed for securing the cables to the chassis on their way to the trailing arms.

Unfortunately, the rubber grommets and brackets will not work or be able to be moved to where the cable passes through the trailing arm. My solution was to take some rubber hose & zip-ties and fashion my own rubber grommet and zip-tie excessively along the cable to keep it in position. (Stainless steel zip-ties can be used here as well, but they are more expensive and can be a real pain to work with.) Zip-ties will also be your friend for routing the brake line to and along the inside of the trailing arm. I chose to route the brake line out around the strut and back to the trailing arm and finally up to the hard line. You can easily choose to route it a different way. (Sorry for the dirty picture.)





Now it's time to attach the E-brake cable to the brake caliper. To get the E-brake cable into the E-Brake Adapter, it **will** take some force. I highly recommend lubricating the E-brake cable spring with some grease to minimize wear. All that needs to be done is put the E-brake cable through the caliper's E-brake bracket and then pull the spring back on the E-brake cable. Start the cable into the cut slit on the Adapter and pull the end of the cable to the end of the Adapter. The spring will slip all the way through the Adapter to the end cap. The spring serves a dual purpose but it's mainly to keep the cable from coming out of the Adapter. Depending on your caliper's E-brake bracket thickness, you may or may not need the included washers (pictured below) as a shim. There are a few ways to install this part of the conversion:

1. You can install the E-Brake Adapters first and then hook up the brake line while leaving the E-brake cable disconnected. Bleed the brakes. Then hook up the E-brake cable. (Rather hard to do, but doable.)
2. You can install the brake line banjo bolt. Bleed the brakes. Then grind down the interference locations to install the E-Brake Adapter and cable. (Not recommended.)
3. OR while a PITA, what I did was install the E-Brake Adapters on to the E-brake cable first. Then I installed that assembly on to the caliper. Finally, I hooked up the brake line and proceeded to bleed the brakes.

This leads us to the absolute worst part of this ENTIRE swap – bleeding the brakes. Depending on what selection you chose above, it will determine just how much space you have to bleed the brakes. When I say space, I mean the brake caliper needs to be literally flipped upside-down for brake bleeding. This is where the power brake bleeder is a life saver. If you have the struts out, it might be more ideal due to less restrictions, but definitely isn't required.



You will bleed the brakes in the normal recommended sequence, but instead of having the caliper on the bracket it will be setting upside down off of the bracket. Use a wood or metal block to put inside where the pad and rotor would normally go (between the piston and “fingers”). Bleed the brakes like normal. Once you are done, turn the piston all the way back in (righty tighty) and bolt the brake caliper on to the Conversion Bracket.



**\*\*\* NOTE: It IS possible to get the E-brake cable back out of the E-Brake Adapter after it's been installed. \*\*\***

Down to the final stretch... having fun yet? Depending on wear or circumstances, your E-brake cables may need to be adjusted. If yours do, then follow the steps listed in the Factory Service Manual. It would be wise to go back over everything you touched and to get an alignment afterwards. Now it's time to give yourself a pat on the back for a job well done! Congratulations, you made it! Yeah, and all that crap... Enjoy your new nonfunctional art!!!

If you have any questions that aren't answered in this guide, feel free to get ahold of me and I will help where I can.

