

YOU CAN DO IT EASY UPGRADES

By Vann Von Luebben

1959-64 FRONT DISC BRAKE CONVERSION

Welcome back to Project '63. Like so many enthusiasts who want to modify their Late Great Chevy for reliability, not just performance, we wanted to be sure this '63 SS had more whoa before we go. Back in the good-old-days we had such things as 425hp dual quad 409's, 411 gears and close ratio four-speed transmissions, but we also had drum brakes. In theory, drum brakes generally provide more friction area, therefore should be superior to disc brakes in performance. The proof seems to be in the pudding if you have ever needed to stop a 5000-pound tail finned Cadillac in a hurry. The 12" by 3" drums do a great job considering the forces at work, but, don't try it twice in a row or the rest of the ride gets a bit unnerving.

Once the heavy drum castings heat up, the heat is very hard to dissipate. Consequently, the brakes fade. Disc brakes on the other hand have a caliper that squeezes opposing friction materials together on a rotor or disc, usually vented, to dissipate heat unlike expanding brake shoes that push against a solid drum wall. Physics rules again, thanks to Mr. Einstein. In modern brake systems, the majority of the braking action is proportioned to the front brakes and the real advantage of a disc system is heat dissipation.

Keeping in mind the philosophy of driving the car as soon as possible, a disc conversion can be done in a relatively short amount of time and will yield major improvements to your motoring pleasure. The confidence of coming to a quick stop is well worth the investment. Eckler's Late Great Chevy has a really great kit, **P/N 520063**. We will install this kit as well as upgrade the old single master cylinder to a dual power set up. I found this kit simple to install - it's completely bolt-on. So if for some reason you ever decide to convert your Chevy back to showroom stock drum brakes, it can be easily accomplished in a matter of hours.

instruction sheet is also included in the brackets (P/N 520065). It took longer to read the detailed instructions than it did to do the job, that's how easy this kit is to install. This kit has everything needed for installation, minus tools and shop supplies, like grease. The caliper brackets are designed to bolt right to the stock spindle and eliminate binding as with some other kits and home made set-ups. It sure beats the heck out of scrounging salvage yards and swap meets just to build a set-up that works, but may not be very reassuring when you really need to stop. This 100% bolt on kit eliminates the guess work of hose and fittings sizes.

Parts Needed:

520063 1959-64 Front Disc Brake Kit
At Spindle ▲▲

Can Of Brake Cleaner

Disc Brake Wheel Bearing Grease

Tools Needed:

1/2" Inch Drive Deep & Shallow

Socket Set

Combination Wrench Set

Line Wrenches

1/2" Drive Torque Wrench

Pliers

Side Cut Pliers

Hammer

A Section Of 2 1/8" OD Pipe

Drum Brake Spring Pliers

Jack

Jack Stands

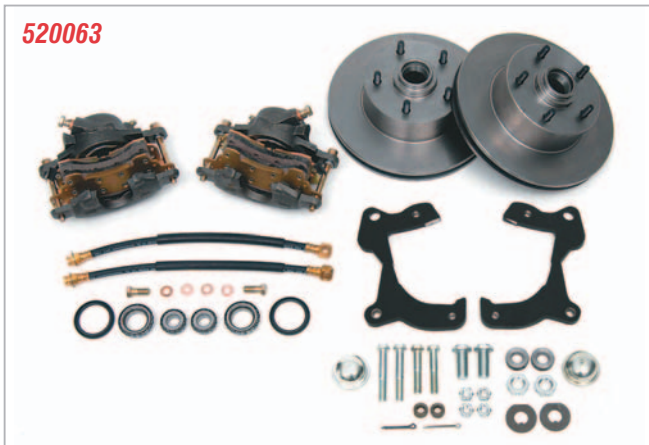
Safety Glasses

Drum Brake Adjuster

3/8" Allen Or Hex Wrench

Locking Pliers Or A Pipe Wrench

Gloves



Included in this kit are 11" vented rotors, loaded single piston GM calipers (marked left and right to aid in the simplicity of installation) wheel bearings, grease seals, brake hoses and mounting hardware including brackets (also stamped left and right but more on this later). A detailed

Time Frame:

4-Hours

Disassembly:

We will be starting on the left side (driver side) of the car. The process is the same for the opposite side as well. Jack the car up and place on jack stands under the frame. Let the jack down until the frame contacts the stands, then shake the car. You don't want to be under, or around a 4000-pound hunk of metal when it comes crashing down, so be sure your car is supported safely.

Photo #1a, 1b & 1c: I usually keep the jack under the car, just in case. I've been in shock trauma too many times, so I get just a little paranoid around heavy objects. Remove the wheel cover or cap, lug nuts and



wheel/tire assembly from the car, Photo #1a. On some cars, brake drums were riveted or pressed to the hub so you may need to remove the entire assembly, hub and all as I did on the right side. If the drum will slip off like shown on the left hand side, all the better. You may need to use a brake adjusting tool to back off the brake shoes due to rust and wear before the drum or hub assembly can be removed. Using an old screwdriver, pry off the dust cap from the hub center and remove the cotter pin from the spindle nut with pliers. Remove the spindle nut with a 1-1/16" wrench or socket. Removal of the spindle washer, hub and drum assembly is shown in Photo #1b. Your spindle should now look like the one in Photo #1c. Most of the time, the bearings and grease seals will come off with the drum/hub assembly, however, if they remain on the spindle it's no biggie. Remove these being careful not to damage the spindle surface where the grease seal rides at the inner most part of the machined surface.



Photo #2: Remove the brake shoes and hardware using the brake spring pliers and retainer tools. A word of caution - brake shoe linings (the friction material bonded or riveted to the brake shoes), especially old ones, contain asbestos. The use of a dust mask is a good idea when dealing with brake linings. If you have any questions or would like more information on the removal process, the brake section of your shop manual is an excellent source for additional step by step procedures and photos. I found the information referenced under section 6 in the 1963 shop manual supplement (P/N 517063) as well as the 1961 passenger car shop manual (P/N 517051) Photo #2.



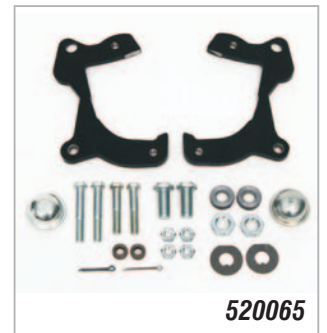
Using a 3/8" line wrench, disconnect the brake line that comes into the brake hose mounted to the upper left on the frame. This may be stubborn so soak it in penetrating fluid and repeatedly tighten and loosen. Treat this part of the project gently. This is a good time to look at your ride somewhat more intimately. Be nice to it and it will be nice to you. Be rough with it, and you will be really sorry; you may need to replace some plumbing, not just a hose. Once this is accomplished, pull out the retaining clip with your pliers, where the hose and line meet the bracket at the frame. Since we are removing the entire backing plate assembly, including the drum brake wheel cylinder, hose removal is not necessary for this installation.



Photo #3a, 3b & 3c: Using 5/8" box end wrenches or sockets, remove the bolts and nuts securing the backing plate to the spindle and knuckle, Photo #3a. Grab that old screwdriver again or a punch or chisel and straighten out the special "French" locking washer that keeps the wheel cylinder anchor pin from coming loose. Take a 15/16" deep socket and remove that anchor pin and wheel cylinder from the spindle, Photo #3b. You should now have something that resembles Photo #3c.



Photo #4: If it has not disintegrated over time, remove the flat round cork gasket from around the spindle flange Photo #4. This gasket is not necessary with the disc brake conversion. Clean the knuckle/spindle with solvent (careful, remember no turkey BBQ for the local fire department) and a wire brush. You can paint the knuckle at this time if you want to. Ensure that no paint gets on the spindle, especially that sealing surface on the inner most part of the spindle.

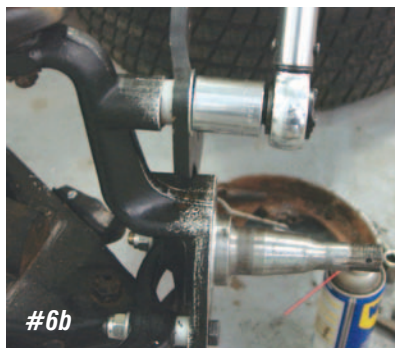
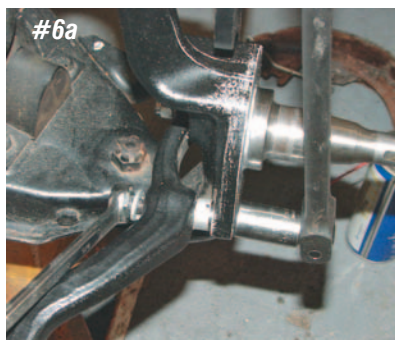


Bracket Installation:

Photo #5: You are now ready to install the brackets; they are marked "L" and "R" left and right. You can bolt them on opposing sides. The bracket kit see, (P/N 520065) as laid out and ready to install. I sprayed some argnet silver paint on the round spacers to keep the rust down. Wait for the paint to dry before installation. Install the CORRECT side caliper bracket

towards the rear of the spindle with the offset going toward the engine. The large hole in the bracket will go to the top of the spindle where the wheel cylinder anchor pin was previously in place. Take the large bolt (5/8-18 x 1-1/2" inch) and a flat washer used as a "French" lock washer and install as in Photo #5. Place the flat washer on the large bolt, then install through the large hole in the caliper bracket. Position the spacer and thread the bolt into the hole where the anchor pin used to be. Hand-tighten until snug, next proceed to the bottom two bolts.

Photo #6a & 6b: Install the bottom of the bracket to the spindle/ knuckle using the 7/16-20 x 2-1/4 hex bolt. The two bolts are similar, but one is just longer than the other as the forward bolt hole, where the other spacer goes, needs a longer bolt due to the spacer. I placed them side by side and test fitted both bolts to be sure before assembly. Loosely install the washer and nut. In the same manner apply the other bolt 7/16"- 20 x 2-1/2" to the front hole siding in the spacer as shown in Photo #6a. Use a 15/16" socket to tighten the top anchor bolt and a



5/8" wrench and socket to tighten the bottom two. Go back and use your torque wrench to apply 65 ft/lbs of torque per the provided instructions found on page 6-16 of the passenger car shop manual P/N 517051, see Photo #6b. No specs are provided in the instructions for the lower bolts, but the generally accepted SAE (society of automotive engineers torque for 7/16"-20 (threads per inch) bolts is between 60-80 ft/lb. depending upon grade. This kit came with grade eight bolts. I went with 70 ft/lb. You can find torque tables in the back of most shop manuals or you may want to try these handy tables on-line <http://www.auto-ware.com/techref/bolttorque.htm> and <http://www.auto-ware.com/techref/bolttorque.htm>.

Photo #7: When in doubt, it's best to go on the conservative side like I did. A little blue thread locker would not hurt either. I torque the darn things three times or until no movement of the nut or bolt occurs. You'll know it's tight and won't come loose that way. It works for planes and trains; it will work on your project pride and joy as well. Now peen over the "French" lock washer as in



Rotor installation:

Photo #8: You're now ready to install the bearings in the rotors. The rotors will be covered in a waxy substance known as Cosmoline, which is a preservative used to minimize rust during shipping and storage.



Remove the Cosmoline with a solvent such as lacquer thinner before you go to the next step. Some people use brake cleaner, but I find this still leaves a residue. You will need to pack your bearings and hubs with grease or else your motoring pleasure will come to a grinding halt, about two miles from where it started. Hand-pack the wheel bearings per shop manual section 2-5 (basically just fill the bearings by pressing in grease by hand) or use the nifty bearing packing tool P/N A2527 to ensure a thorough job. Pro shops use the tool and it's inexpensive insurance considering you really don't want the bearings to overheat and seize. The new rotor comes with races installed, therefore no races are provided in the kit, Photo #8.



Photo #9a, 9b, 9c & 9d: After packing the inner (larger) wheel bearings with disc brake compatible grease (your local parts professional can help you choose the correct grease for you) gently place it into the back of the rotor cavity on the race Photo #9a. Carefully position the new grease seal over the bearing into the rotor cavity Photo #9b. Using a block of wood and a hammer, lightly drive the seal into position Photo #9c. Ensure the seal is started evenly and squarely all the way around the rotor before driving it into its final position. The seal should be flush and flat, not cocked to one side, all the way around the lip of the rotor cavity, Photo #9d. Lubricate the seal where it will come in contact with the spindle by applying a small amount of grease to the seal lip.



Photo #10a & 10b: Now pack the outer (smaller) bearing in the same manner. Place the bearing on the race and slide



the rotor assembly onto the spindle carefully to ensure no damage to the seal or dropping the outer bearing onto the shop

floor occurs, Photo #10a. Position the spindle washer and nut over the threads and start the nut onto the spindle. Push the rotor all the way back on the spindle so the seal is seated on the flange at the rear of the spindle and hand-tighten the spindle nut, Photo #10b. Per the supplied instructions (remember we are installing discs and the shop manual gives drum specs) spin the rotor to ensure there is clearance and that the brake rotor rotates without incident. Using your 1/2" torque wrench and a 1-1/16" socket, rotate the rotor while simultaneously tightening the nut to 17-25 ft/lbs to seat the bearing. Back off the spindle nut half a turn and re-tighten to 10-15 ft/lbs.

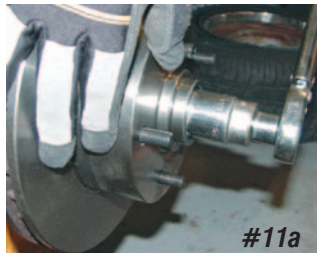
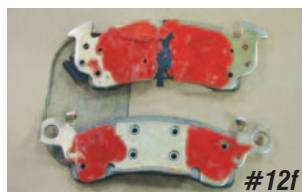
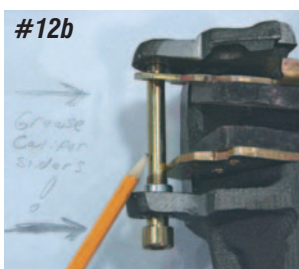


Photo #11a, 11b & 11c:

Instructions state not to rotate during final tightening. Rotate during initial torque sequence to seat your bearings only, Photo #11a. Insert supplied cotter pin. If the pin fails to line up with the slots in the spindle, then gently back off until the first available

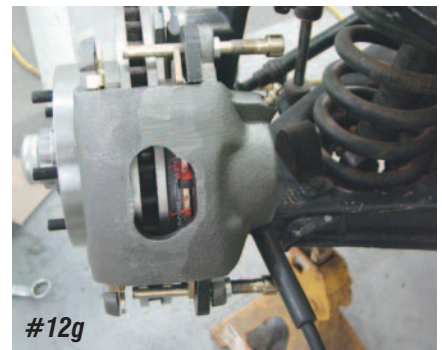
slot is found. You should find two possible locations to slide the pin through the spindle. One is vertical and the other is nearly horizontal. Some people like to just bend the cotter pin back and call it done. I get a little anal retentive about cotter pin placement and tend to do mine aircraft fashion Photo #11b. The idea is just to have the outer part of the pin half way across the spindle and the other bent in a downward direction as not to make contact with any moving parts. With a little practice you can impress your friends with your cotter pin know-how. Install the dust cap and tap into place with a piece of pipe. I found that a 2-1/8" outside diameter exhaust adapter pipe works well for this job, Photo #11c. Do not beat the center of the cap.



Caliper Installation:

Photo #12a, 12b, 12c, 12d, 12e, 12f & 12g:

The GM calipers in this kit come in what is known in the automotive aftermarket as "loaded". This means the calipers come to you as ready to install, Photo #12a.



They have all the hardware and friction material (pads) installed. All you need to do is install hoses, add a small amount of grease to the sliders and bolt them up, Photo #12b. Starting with the left side of the car, choose the caliper that has an "L" cast or marked on the backside away from the brake pads. This will position the bleeder valve towards the top when installed. The only way to properly bleed or remove all the air from the hydraulic brake system is to position the caliper this way. It will bolt up on the wrong side, but you will never be able to get any "pedal" feel when bleeding because there will be an air pocket in the system. Air moves up in a fluid, just like bubbles in the bathtub. The brake hose needs to have a copper washer installed on each side of the "banjo" bolt when installed to the caliper Photo #12c. The banjo is a hollow bolt that has holes in the threaded end which allow brake fluid to pass into the caliper. The hose must be installed onto the banjo and caliper only one way, Photo #12d. The hose must fit into the notch in the caliper. When you test fit the hose to the caliper, this will become more clear, Photo #12e. When all is well and there is a washer on each side of the bolt, tighten with a 5/8" box end wrench. Remove the caliper sliders by pulling them straight out. Be careful to not drop the brake pads. At this point it is probably a good idea to apply disc brake quiet to the back surface of the pads or install a set of pad shims to minimize squeal in the future, Photo #12f. You can pick up a single application pack for a dollar or so at the local parts house. Line up the holes for the caliper slider bolts with the bracket already installed on the knuckle and thread in your bolts through the bracket and hand tighten, Photo #12g.

Photo #13: Be careful not to contaminate the pads with grease during fitting the caliper to the bracket. Install the brake hose to the bracket on the frame, keeping in mind the turning motion of the wheels and control arm movement. Move the steering knuckle with the steering wheel forward and back as if you were making lock to lock turns. Ensure the hose does not interfere with the frame or rotating assembly in any way. You can usually reposition the hose within the bracket enough to keep this



from happening. The hose I installed did not have any interference at all and worked perfectly. Again, using your line wrench, tighten the new hose as you removed the old one, “carefully” and then reattach the retaining clip, Photo #13.

Photo #14: The tie rod assembly must be shortened 3/8 of an inch to compensate for the new caliper bracket of the same thickness. Do this by loosening the clamps on the tie rod sleeve and turn the sleeve clockwise with a pipe wrench, vise grips or other suitable tool, Photo #14. Retighten the clamps. When changing the tie rod length, or toe, I recommend you have the car re-aligned or tire wear and poor steering may result.



Photo #15: Congratulations - you have completed one side of the conversion, Photo #15. Repeat the process for the other side. The brakes will need to be bled after you finish if this is as far as you want to go at this time. Refer to chapter 6, page 6-3, of the 1961 passenger car shop manual for bleeding process or

stay tuned for a later article using the really nifty pressure bleeder P/N 563702. This part makes the job a snap, especially when working alone.



Additional Thoughts...

Original style 14” wheels will not work with this disc brake set up on Project '63, since we already have Corvette Rallies on the car and will be adding other wheels and tires later. For those who want to keep your Late Great Chevy with that “as delivered look” Late Great offers a new GM 14” by 6” wheel, P/N 562314 that will work with disc brakes. However, 1959-1961 factory wheel covers will not fit these wheels unless retaining nubs are welded to the replacement wheel.

With the installation of the front disc conversion done and on the car, you will probably want to complete the system by upgrading to a dual power master cylinder, proportioning valve and maybe rear discs as well. Watch for these upgrades on Project '63 in the next few months! So stay tuned, same Chevy Classic time, same Chevy Classic channel. Good luck! ✓