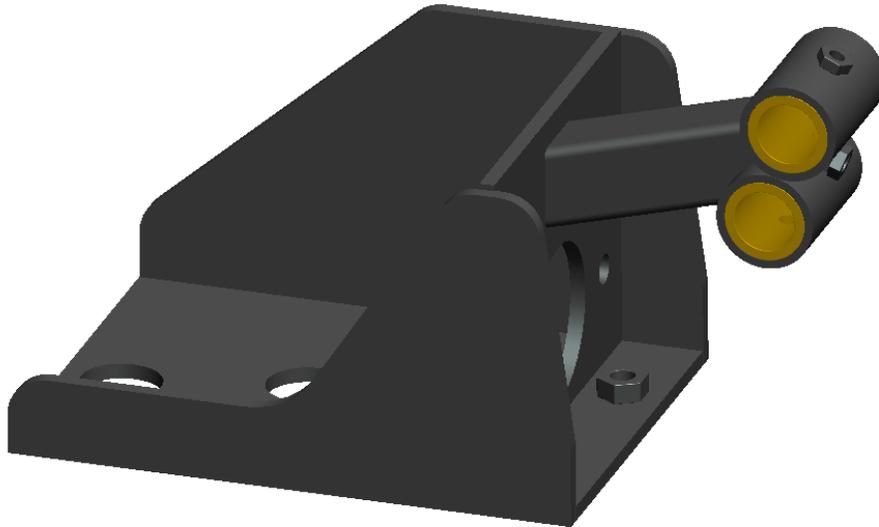


1949 to 1954 Chevrolet Dual Master Cylinder Conversion

This document is a one stop shop to getting your brake system updated on your old Chevy. Whether you're going with a disc conversion or just sticking with the stock drums the dual master cylinder is a must on today's roads. – Bri0057



Materials Needed:

3/16" Sheet Steel	3/8" washer (4)
1" ID round tube (4")	3/8" lock washer (2)
1" Square Tube (4")	3/8" nut (4)
3/8 Rod End (McMaster Carr 60645K341)	Cotter pin
3/4" ID 1" OD Brass Bushings (2) (McMaster Carr 6391K269)	1/4"-20 Grease zerk
3/8" x 1.5" bolt (2)	1/4" x 3/4" bolt (2)
3/8" x 2" bolt	1/4" lock washer (2)
3/8" x 4" bolt	1/4" nuts (3)
3/8" Castle nut	Master Cylinder (Napa M1922, 1969 Corvette)

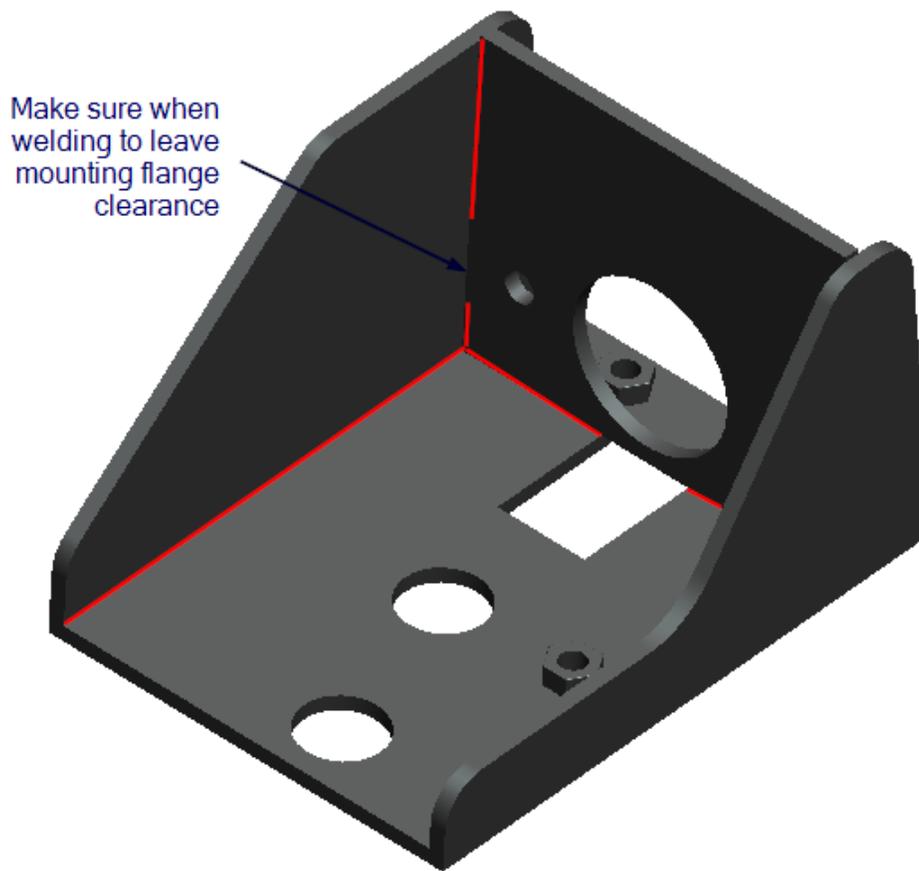
Tools Needed:

Welder	1" hole saw
Grinder or jigsaw	2" hole saw
Drill	Hack saw
3/8" drill bit	Metal File
1/4" drill bit	

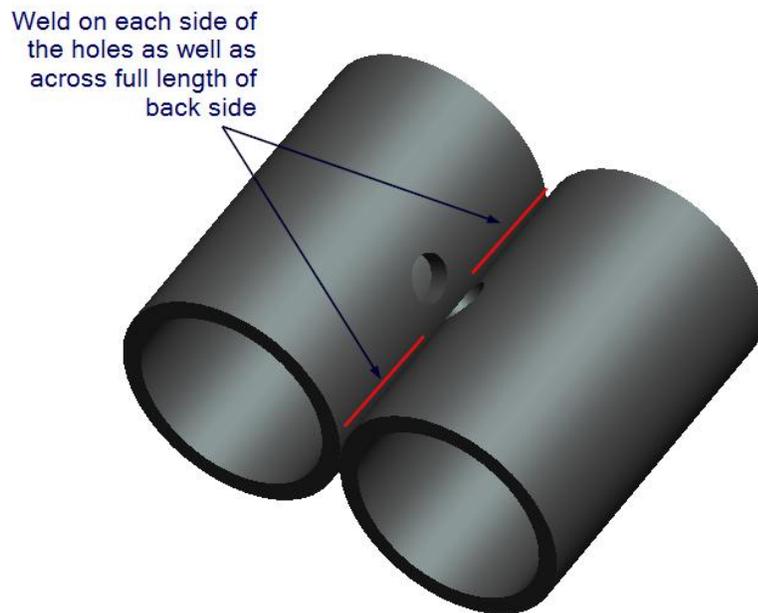
Instructions:

Start by cutting out the templates at the end of this document. Trace each out on you sheet of steel and use a cutoff wheel on your grinder or a metal blade for your jig saw to get them cut out. If you're lucky enough to have access to a plasma table, there are also .dxf files available. After your plates are cut out, drill the 3/8" holes and 2" hole for the master cylinder as well as mounting and clearance holes in the base plate.

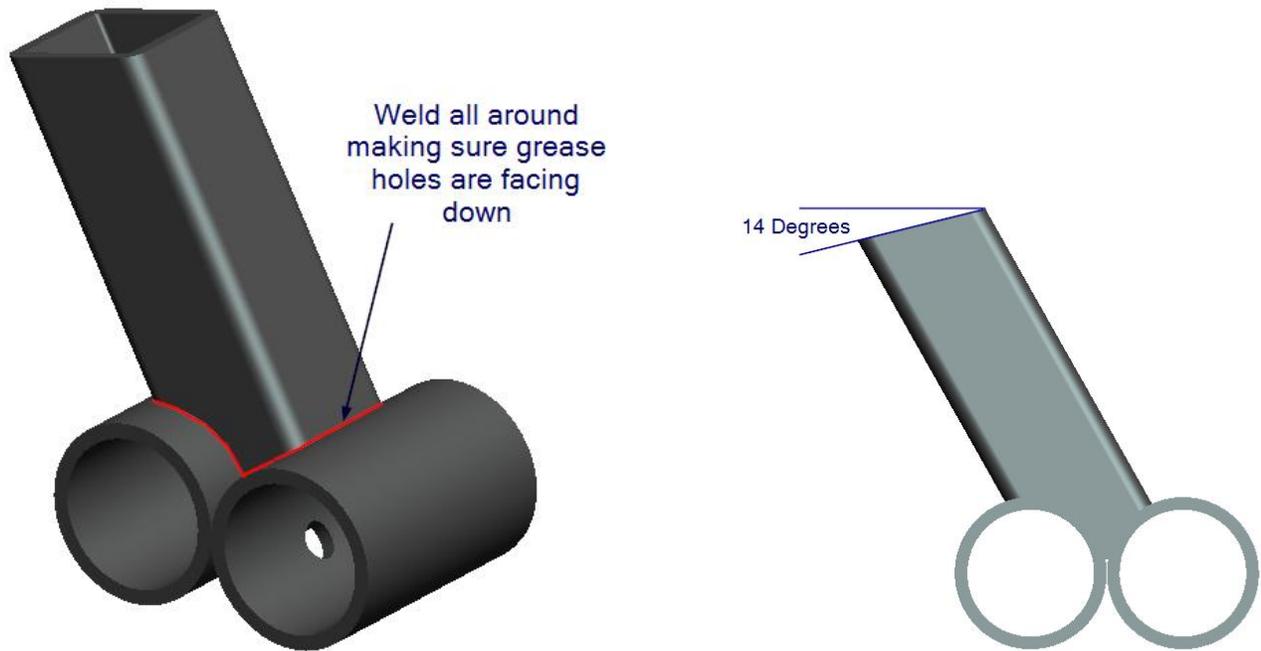
Take the base plate and weld the two 3/8" nuts to one side. Using a square or clamps, weld the master cylinder mounting plate to the base. Finally, weld the side plates to the base trying to keep them as square as possible. Remember to keep your heat down so you don't have a bunch of weld distortion. Also remember to leave a skip weld next to the mounting holes for the two 3/8" master cylinder mounting bolts.



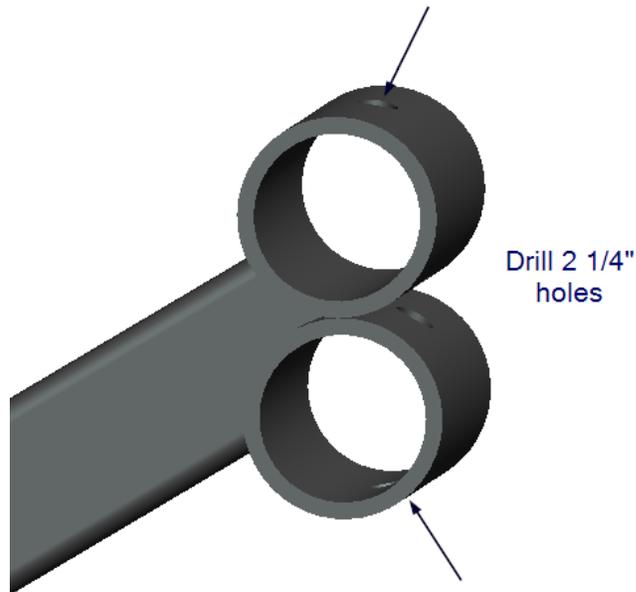
Next, cut your round steel tube into two 1.85" long sections. Drill a $\frac{1}{4}$ " hole in the center of each going through only one of the walls. With the holes drilled, lay each tube next to each other on a flat surface with the holes pointing upward at a 15 degree angle. Weld the tubes together by running a bead on each side of the holes as well as the full length on the other side. These holes will be the grease passage for the pivot.



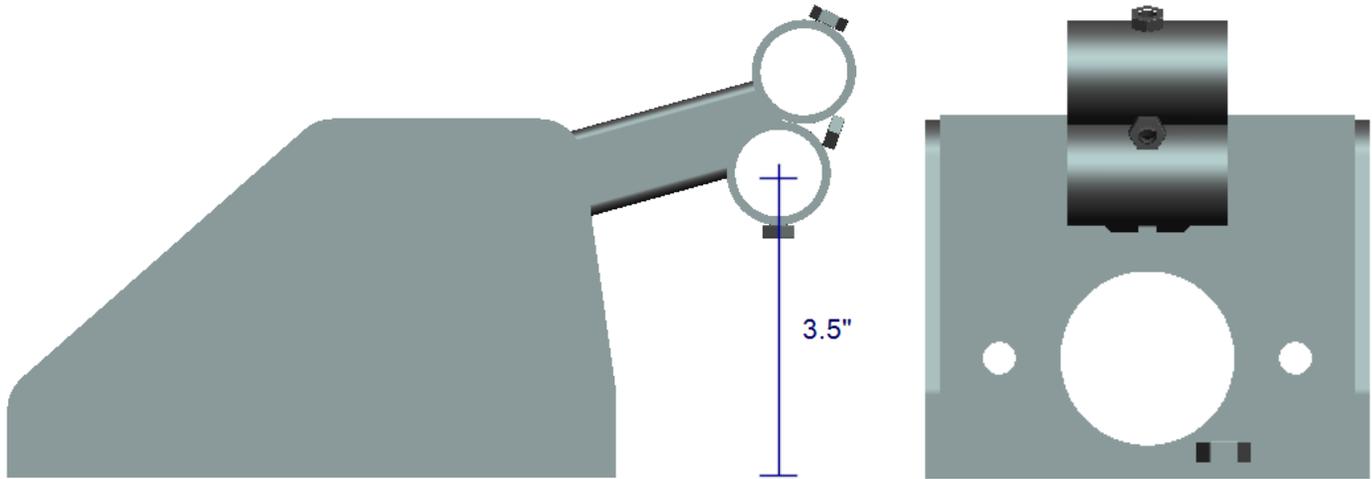
With the pivot portion and main mounting structure welded up, the hardest part is left. Using the temple for the square tube, trace and cut your tube. With your welded tubes laying on a flat surface, position the square tube on top so the angle cut end makes a 14 degree angle to horizontal and weld all around to the round tubes.



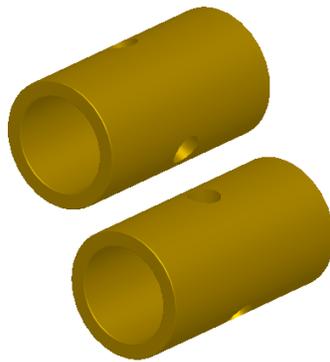
Once the pivot tubes are welded to the square tube, drill another $\frac{1}{4}$ " hole in each tube positioned in the center when looking at it left to right. These will be the holes that bolts go through to retain the pedal arm pivots. **At this point, don't weld the $\frac{1}{4}$ " nuts on just yet.**



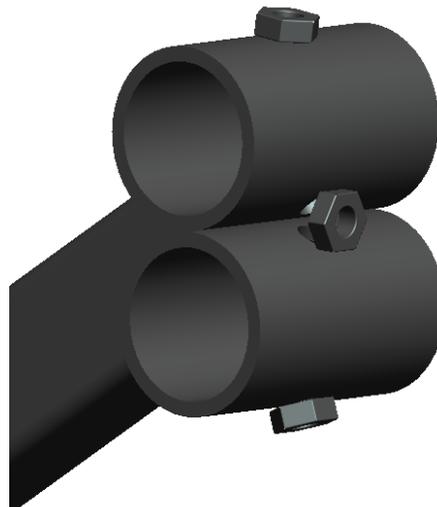
Finally, **tack weld** the square tube to the main assembly by aligning the square in the center of the place and so the lower pivot holes is centered 3.5" off the base. This distance will allow the pushrod to align correctly left to right with the master cylinder as well as position the pedal pivots in the correct factory location. The center of the lower pivot tube should be 3.5" off the base mounting surface to ensure that there is no binding of the pushrod.



Hang in there, you're almost done. Take your brass bushings and cut them down to 1.85" long and drill a 1/4" hole in the center of each. Then insert each into your pivot tubes aligning the holes you just drilled with the holes that will be the grease path. Drill the other 2 1/4" holes for the pivot retention bolts.



Once you have your bushings drilled, remove them and weld on the three 1/4" nuts to your pivot tubes.



At this point it's time to bolt in your master cylinder in and insert your pedal arms to check for pushrod clearance. Cut your 3/8" bolt to 3.5" long and install it on the pedal arm along with the rod end. With your bolt cut to length, assemble it onto the rod and check the angle of your pedal arm compared to what it is at when assembled onto the original master cylinder. By doing this on the bench, you will be able to get your pushrod length adjusted before it is all installed under the floor. If the push rod clears the master cylinder bore when you press the pedal all the way down, then you have set your pivot height correctly and you can finish weld the square tube to the mounting plate. If it binds on the top or bottom of the master cylinder bore, adjust the height by cutting it off and welding it on again.



Take your 1/4" bolts and file 1/4" of the end so it's a round cylinder. The diameter will be the width of the groove in your pedal pivot shafts. It should be roughly the minor diameter of the bolt but may vary depending on how much wear your pivots have. You can test fit these holding bolts in the pivot point to make sure they are not binding as the pedal arms are moving. File the ends of the bolts to a point where no binding is felt.



Assembly:

Now that you have everything fabricated, it takes a little bit to get this larger assembly installed. Because the master cylinder needs a larger opening in the floor to get the cover off, you might as well cut a hole slightly larger to fit the full assembly through from the top. It is possible to install the bracket from under the floor then install the master cylinder but it can be difficult to get the bolts tightened that mount the master cylinder. Bolt the master cylinder to the bracket

and assemble the pivot arm so you can bench bleed it. Once you have it bled, remove the pivot arm and install through the opening in the floor.

Once you have the bracket in place with the master cylinder bolted to it, install the pedal arms through the access panel in the wheel well. With the pedal arms installed into the pivots, tighten the $\frac{1}{4}$ " mounting bolts and then position the full assembly in place by bolting the 2 $\frac{3}{8}$ " bolts up through the frame rails.

With the assembly and arms installed, you will be able to install the pushrod assembly that you adjusted earlier. The bolt for the rod end will face towards the inside of the car to give enough clearance to the clutch pivot arm. Install the castle nut and cotter pin.

Depending on how much your parking brake rod has been tweaked over the years, you may need to put a slight bend in it to prevent it from rubbing against your new master cylinder bracket.

At this point you just need to grease the pivot, install your lines and sit back for a cold one. This is also a good time to go through the rest of the brake system and replace anything that looks worn. For this master cylinder you will need to install residual valves in the lines to prevent drain back due to the master cylinder being mounted below the wheel cylinders/calipers (10lb for drums, 2lb for discs). You may also want to add an adjustable proportioning valve between the residual valve and rear drums if you have done a disc conversion on the front. This will allow you to adjust your brakes for optimal stopping performance.



Drawings:

When you print of the following drawings, make sure you measure them to make sure your printer has not scaled them. If you print this document actual size on 8.5"x11" paper, they will print to scale correctly.

