

Caliper Mount Brackets

The front and rear caliper brackets were constructed from the same metal stock and to a similar weld design and only differing in dimensions and hole centres, so this section applies to both front & rear brackets.

Fred Puhn states a preference for 1/2" steel, but at the front there just isn't enough room between the vertical upright and the hub assembly to use anything thicker than the original 1/4" section, so that was the start point.

The materials used were mild steel 90deg angle sections, 6mm thick. The actual caliper mount section was from 50mm x 50mm equal section, the hub carrier/vertical link section was from 50mm x 100mm unequal section.

The first image shows both components part way through construction with the smaller caliper mount section at the top of the photo.



Fig. 1

Although at first sight this might seem a crude choice of materials but there are a few advantages to using pre-formed sections.

Firstly you know that the 90 deg angle is exactly that, you no longer have to worry about setting and maintaining it through fabrication. There are bonus points in that the change in section from vertical to horizontal has a smooth blend radius, far better than any fillet weld from a design view.

Secondly the sections are accurate enough for our needs and can reliably be used as straight edge reference points when it comes to aligning the caliper bracket.

And finally, with 6mm section and the sizes we're using, we're going to have very rigid brackets, something that Fred Puhn is quite insistent on despite the fact it's not 1/2" plate.

After the experience of making brackets for the first rear disc conversion and how difficult it was to maintain accurate alignments, the aim was to minimise distortion and use the inbuilt angles of the steel wherever practical. So the design went along the lines shown in Fig. 2

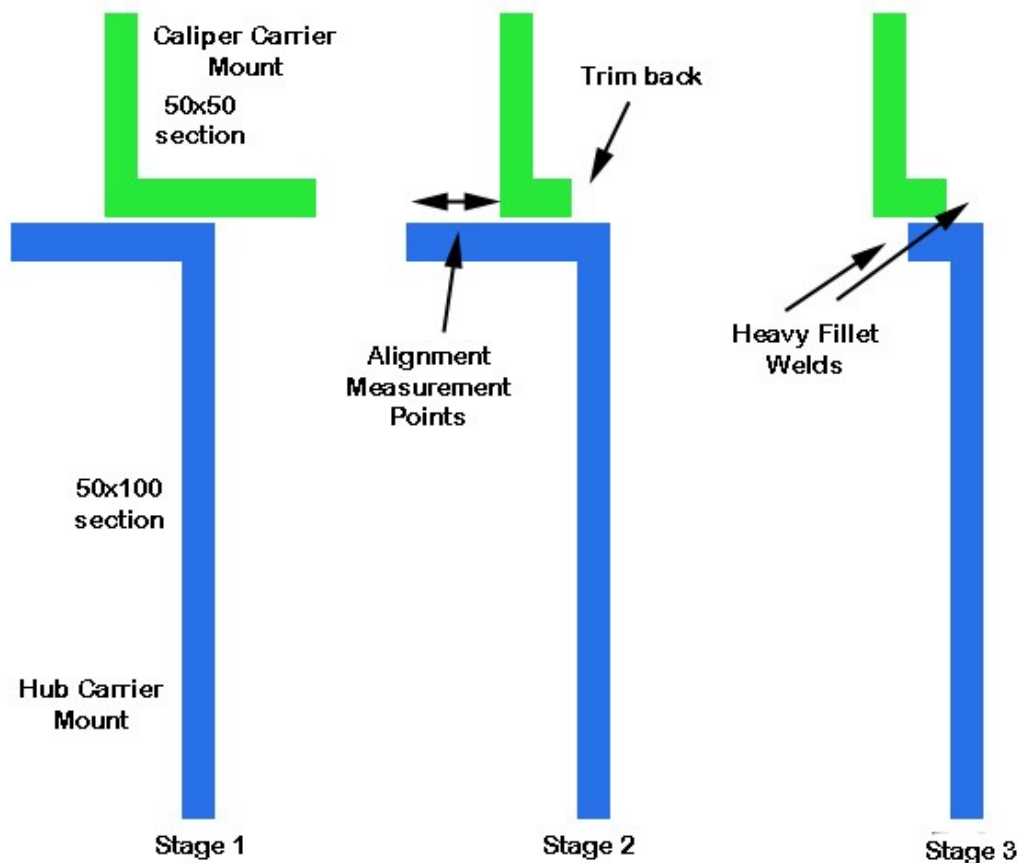


Fig 2

Stage 1 is the two components showing how they'll go together. At this point drill the bolt holes and cut the hole for the axle in the lower component (the Hub Carrier Mount in this example) but leave the holes for the caliper carrier for now.

I made an aluminium template from the front OEM mounts and used that to mark & cut the holes in the 100x50 section. At the rear I used a template from the original brake drum.

Once complete, mount this on the car and re-assemble the hub/disc to ascertain the vertical height for the caliper before drilling the holes in the 50x50 section steel. You'll find that the horizontal part of the 50x50 section hits against the disc so it needs trimming back in order to get the caliper over the disc, but this a rough cut and doesn't need to be accurate as long as you err on the generous side !

At this point you can estimate where the holes need to be in the caliper mount section by checking the caliper & brake pads you're using against the disc. This part needs reasonable accuracy but you can elongate the holes slightly later if you're not quite right. At the front all I did was put the caliper over the disc and drop it down until the tops of the brake pads were level with the top of

the disc, then mark through the caliper body holes. To make access easier I had disconnected the steering rack which allows the hub to turn more than normal.

At the rear I'm using floating calipers and this task can be simplified by stripping the floating section away and just using the lower "U" shaped bracket that holds the sliders. The pads slip into place and it's easy to see where you are.

To keep the hole spacing correct I used a template made from scrap aluminium taken from the caliper mounts so I only had to worry about the keeping the axis in line with the base of the L section.

Now we're at the part where we need to pay attention to detail. Bolt the caliper to the new mount section, drop it in place over the disc and check the pads are at the right height. What we're doing now is getting the caliper body equidistant from the front/rear faces of the disc. You can measure this but I cheated and used several shims in both sides to hold it firmly central, as in Fig 3.

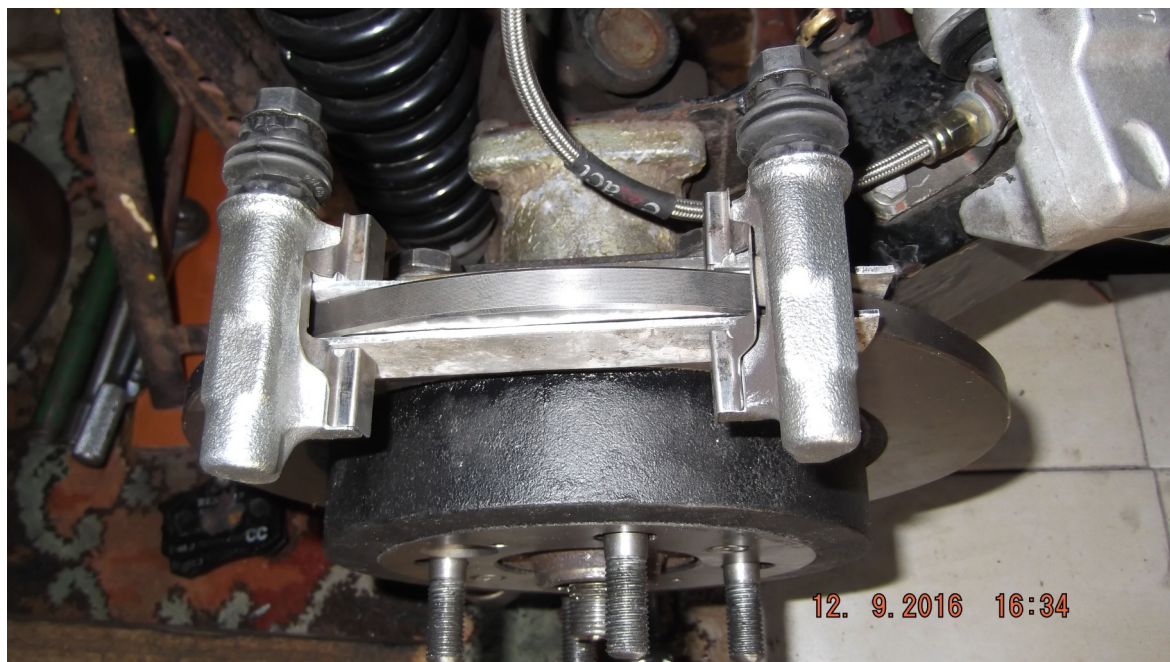


Fig 3 : Aligning the Caliper Mount section using spacers

This is quite handy as it won't move whilst you measure the distances between the end of the lower component and the caliper mount section, as in stage 2 of the schematic and Fig. 4 below.

I used a digital vernier with depth gauge to measure at both ends of the caliper mount section as shown in the mock-up for Fig 4.

Once you've got this set up in the vice and firmly clamped, weld up both ends. If it's clamped securely then there won't be any movement and the alignment will be true. I didn't trust myself here and tacked it in place first, then re-checked it on the car to make sure the caliper was still parallel. By the 3rd bracket I was just welding away.....

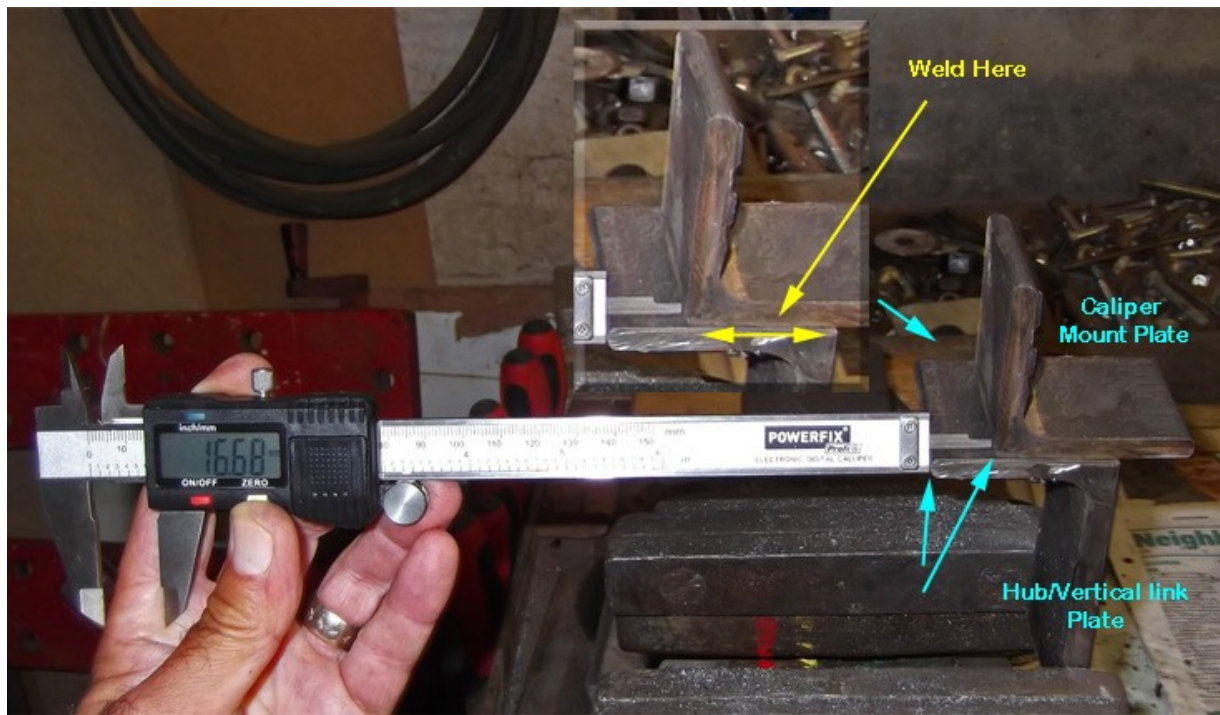


Fig 4 : Measurement locations (mock-up for illustration purposes)

Once you're happy that the caliper body is sitting parallel to the disc with no vertical misalignment, you're ready for the final stage welding.

I used a 1mm slitting disc to cut away the steel from the upper and lower components as shown in Stage 3 of the schematic. The "tack" welds at either end were actually fairly robust being about an inch long, so nothing moves. The aim was to create leg lengths equal to section thickness, 6mm, to allow a heavy fillet weld.

During the final welding I balanced either side, doing probably 1/2" of weld before swapping sides. It's a very chunky construction and I detected no distortion during welding.

By the time you're finished you have something like 3.5" of fillet weld on either side of the mount plate. Although the bracket will have some torsion because the disc and caliper mounts aren't in exactly the same plane, most of the loading is going to put the welds into shear.

I don't particularly like fillet welds in a fabrication but these are balanced on either side so there's a lot of metal to take the load. Overall I think the design is sound.

For purely aesthetic reasons I over-filled the fillet welds so that the final grinding would make it look like a square bracket with no obvious welding. The final brackets look something like the photo in Fig. 5 below.



Fig 5 : Completed Rear bracket

The front bracket is slightly different because the caliper bolts screw into the mount. With only 6mm plate I don't consider that adequate thread depth and so I welded a couple of nuts on the caliper mount plate to take the bolt thread.

There is enough room to get a spanner to a separate nut should you prefer that route, but it's easier maintenance if you don't have to fiddle about with individual nuts.

And that's about it. 4 brackets with a very simple design and construction, much easier in practice than you might think.