



How to Build a Frame in an Anvil Frame Fixture.

Over the years, Framebuilders have followed all manners of processes to manufacture their frames and many of those processes are determined by the tools they use. With Anvil Frame Fixtures, we have found through years of hard won experience that the method described below yields the best balance between achieving the frame's design criteria while maximizing builder efficiency.

Before starting, it is critical to remember that with an Anvil Frame Fixture you run your tubes to the centerline of the fixture, not the centerline of a raw bottom bracket shell unless you start out with a blueprinted shell. A blueprinted shell is one that has been measured and dimensionally documented for centerline of the shell itself and/or lug ports.

If your bottom bracket shell is long, as most are in their as supplied condition, make sure the faces are true and parallel, and then let the length run off on the drive side. When you're done with the frame, the long side of the shell is faced down to specification. If you scribe the centerline on a 69mm shell to 34.5mm and then align the centerline of the seat tube with that mark, you'll be building in an out-of-alignment condition on your frame. What you should do is scribe your 69mm shell at 34mm from the non-drive side face and then align your seat tube centerline to that (some Anvil Frame Fixtures have an adjustable centerline BB tower so you can skip this step but you still want to start with parallel faces). If you want to use your BB shells in their as supplied condition, you can always face the appropriate BB spacer to compensate for the extra length.

To build a frame, these are the sequential steps we recommend following:

1. Set the fixture up to design specs, i.e., seat & head tube angles, head tube height, chainstay angle/BB drop, and install the appropriate bottom bracket spacer/setting.
2. Start with a blueprinted shell (one you know has true & parallel faces) installed on the BB tower.
3. Install your seat tube parallel to the fixture; tack it or weld its full circumference in the fixture if TIG welding. Do not remove the seat tube from the fixture at this point.
4. Install blueprinted head tube in the fixture.
5. Miter, prep, and check top tube fit in fixture.
6. Miter, prep, and check down tube fit in the fixture.
7. If the DT & TT fitment are correct, tack them in place. If TIG welding, weld however much you feel comfortable with. Rotate the fixture to allow you to weld as much of the BB shell and DT joint as you can following a proper weld sequence. Do not remove the frame from the fixture at this time.
8. Miter, prep, and check chainstay fit on BB shell in fixture.
9. If chainstays are correct, tack them in place. Install any bridging if you have not already done so. If TIG welding, feel free to weld them in the fixture.
10. Remove the frame from the fixture. You will install the seat stays later.

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- old Italian proverb that proves how cool we are..but seriously, don't hammer on your Anvil tooling, OK?

11. Finish brazing out of the fixture or, if tig welding, finish welding any remaining joints using a proper weld sequence.

12. Chase & face BB; ream & face head tube.

13. Check frame alignment.

Here's the key: it is easy to align any conventional frame that NEEDS¹ it as long as the seat stays are not installed. If you have head tube twist or if the seat tube and the head tube are not parallel with each other, it is easy to correct now. Same with chainstays. Spacing, parallelism, and centerline are easily corrected without the seat stays installed. Once you install the seat stays, everything you do to align a frame gets a lot harder as the stays communicate any adjustments to the dropouts. If you remove the frame to check alignment before brazing/welding has been finished, you're just chasing your tail. This is especially true at the bottom bracket since any heat application warps the BB faces and flipping the frame on an alignment table doesn't mean squat because the faces may not be warped symmetrically. You might get lucky, but that's what it is. BTW, witch wanding (applying soft heat with your torch), or if tig welding, using a fine wash pass over a section of a previously welded joint on steel frames in certain areas of the frame is a better way of bringing a frame into alignment than cold setting.

14. Once the frame has been aligned to your satisfaction, put it back into the fixture and lock it down.

15. Miter, prep, and check seat stay fit.

16. If seat stays are correct, tack or weld them out.

17. Check final alignment.

Note: I make it a point to install any braze-ons BEFORE I miter the tubes if possible and certainly before I install the affected tube in the fixture. Braze-ons will distort the tubing and it can make your life miserable doing it after the frame is built because it can affect your alignment.

¹ You, as the builder, determine what needs alignment to meet your build specifications and what doesn't.

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