Chop Source Bicycle Frame Jig Assembly Instructions

The following instructions explain the process to assemble the Chop Source Full Bicycle Frame Jig Kit. If you ordered the Basic Kit, some parts of these instructions will not apply.

If you have any questions regarding any part of the assembly process after reading these instructions, please email sales@chopsource.com or call/text (651) 300-9575.

See page 9 for the lengths of structural tubing required to complete the jig.

Chop Source Full Bicycle Frame Jig Kit (shown with standard feet)

Chop Source Bicycle Frame Jig with Rotisserie Stand (sold separately). Notice the feet move from the jig to the stand.

General Guidelines

Hand-tighten all fasteners during assembly (until the lock washers just start to compress) and torque fasteners when instructed.

Stamped washers typically have a sharp edge on one side and a smooth rounded edge on the other side. The sharp edge can scratch the powder coating on the plates. Install all washers with the smoother side touching the powder coating. The washer won't look as good, but scratched powder coating looks worse. This is most important for bolts that move in a slot like on the head tube fixture.

Step 1: Assemble Fixtures

Assemble each fixture as shown in the following photos to make sure you have received everything. If anything is missing, email sales@chopsource.com or call/text (651) 300-9575 and the missing parts will be sent to you right away. Please wait until all fixtures are assembled before contacting us, especially with international orders shipped in multiple boxes.

Base Clamps

Each base clamp uses two square plates and four 7/16″ x 7-1/2″ bolts (each with two washers, a lock washer, and a nut). For 2″x3″ tubing, use the outer most holes. The full bicycle frame jig kit comes with three base clamps.

Head Tube Fixture

The head tube fixture consists of two side plates, a welded box, an aluminum threaded spacer, and a threaded rod that holds the head tube cones.

Spin the aluminum threaded spacer about 5″ onto the 3/4″ x 16.25″ threaded rod and insert it through the top of the welded box. Spin a 3/4″ nut onto the bottom of the rod and slide it up into the box so that the nut recesses into the box. The nut is held from turning by two sides of the box. Spin the threaded spacer down to the box and hand tighten. Look through the lower 5/8″ pivot hole to make sure the threaded rod will not block the lower pivot bolt.

Use two 5/8″ x 4″ bolts (each with two washers, a lock washer, and a nut) to mount the box between the side plates. Use three 7/16″ x 3-1/2″ bolts (each with two washers, a lock washer, and a nut) through the side plates. The center bolt has two locations (one for 2″x2″ tubing, and another for 2″x3″ tubing). Keep things very loose so that you can slide the fixture onto the upright.

Rear Axle Fixture

The Rear Axle fixture consists of two plates that capture another small plate (with threaded holes) and a cap. Assemble the rear axle fixture by inserting the small plate with the thread holes between the two side plates as shown. Install four 7/16″ x 3-1/2″ bolts (each with two washers, a lock washer, and a nut) into the appropriate holes based on your upright size. Install the 5/16″ x 3-1/4″ bolt behind the small plate with two washers and a lock nut. Loosely install the cap with two 5/16″ button head cap screws, each with a small washer.

Bottom Bracket Fixture

The Bottom Bracket Fixture is used to support the bottom bracket shell of your bicycle frame. It comes with the plates and hardware shown below and works with 2″x2″ tubing only (customer-supplied). The 7/16″ bolt holes (in the 90-degree brackets) are slotted 3/16″ of an inch to allow for fine adjustments if the tubing they mount to it isn't welded perfectly perpendicular to the lower rails of the frame jig.

Assemble the bottom bracket fixture using four 7/16″ x 3-1/2″ bolts (each with two washers, a lock washer, and a nut). Insert one 1/2″ x 1-3/4″ bolt (with a lock washer and washer) through the hole in the 1-1/2″x5″ rectangle plate. The 1/2″ plain nut will be welded to the spacer tubing later.

Seat Tube Fixture

Notice the slightly longer bolt in the bag of hardware for the seat tube fixture. The 7/16″ x 3-3/4″ bolt serves as the pivot bolt and is 1/4″ longer than the other three bolts.

Assemble the fixture as shown below. Install three 7/16″ x 3-1/2″ bolts (each with two washers, a lock washer, and a nut) into the upper holes and lower right hole of the plate with the slot, and through the square plate. Install the 7/16″ x 3-3/4″ bolt (with two washers, a lock washer, and a nut) into the right side of the plate with the bend, and through the lower left hole of the plate with the slot, to serve as the pivot bolt. Install the 7/16″ x 1-1/4″″ bolt (with two washers, a lock washer, and a nut) into the left hole of the plate with the bend and through the slot.

Feet

Insert one 1/2″ x 1-3/4″ bolt (with a lock washer and washer) through the hole in each 1-1/2″x5″ rectangle plate. Temporarily install a 1/2″ plain nut on each bolt. The plain nuts are not zinc plated because they will be welded to the spacer tubing later. If you bought the standard feet kit, ensure you have four 1/2″ x 2-1/2″ carriage bolts with one zinc nut and one plain nut for each. If you bought the heavy-duty swivel leveling feet, each foot should have one 1/2″ jam nut and one 1/2″ plain nut on it. The 1/2″ plain nut from each foot will be welded to the tubing for the feet.

Step 2: Cut Structural Tubing to Length

Several lengths of 2″x3″ and 2″x2″ tubing (1/8″ or 11ga wall) are required to complete the jig. This should be available locally at a metal supply store or welding/fabrication shop. Many times, the store/shop will cut them to size for a small fee per cut. The lengths provided below are a guideline that should work for many different styles of frames and can be adjusted to suit your needs. See the FAQ at the end of the instructions for more details on main-rail lengths.

Some parts of the cut list will not apply depending on which bundle or individual fixtures you have purchased.

Tubing Required for Part:	Size (all 1/8″ or 11ga wall)	Qty.	Length
Full Bicycle Frame Jig Kit			
Basic Kit			
Main rails for jig	2″x3″	2	72″
Upright for head tube fixture	2″x3″	1	36″
Upright for rear axle (dropout) fixture	2″x3″	1	24″
Bottom bracket fixture*	2″x2″	1	16″
Spacer for bottom bracket fixture	2″x2″	1	4″
Seat Tube Fixture			
Upright for seat tube fixture	2″x2″	1	40″
Offset spacer for seat tube fixture	2″x3″	1	6″
Legs			
Legs	2″x2″	2	24″
Spacer for legs	2″x2″	2	4″

*If you mount the bottom bracket fixture on a welded T, you will need a 12″ piece of 2″x2″ tubing for the vertical part, a 16″ piece of 2″x2″ tubing for the horizontal part, and an additional base clamp. If you mount the bottom bracket fixture on a welded L, you will need everything in the previous sentence plus a 6″ piece of 2″x3″ as an offset spacer.

Using all 2"x2" tubing: *All fixtures work with 2"x2" tubing, so you can use 2"x2" tubing instead of 2"x3" tubing in the list above. However, if you're using 2"x2" tubing for the main rails of the jig, the 4" spacers in the list above should be made from 1"x2" tubing (to allow room for the nut welded to the spacer; see photos in step 3 under build and install feet).*

Metric Tubing: *50x50mm tubing will work for all fixtures and main rails. If you're using 50x50mm tubing for the main rails of the jig, the 4" spacers in the list above should be made from 25x50mm (or 20x50mm) tubing (to allow room for the nut welded to the spacer; see photos in step 3 under build and install feet).*

Step 3: Assemble Frame Jig

Assemble the basic structure for the jig using two main rails (72″), the upright for the head tube fixture (36″), the upright for the seat tube fixture (40″ of 2″x2″ tubing), the upright for the rear axle fixture (24″), and three base clamps.

The uprights should extend below the main rails by 1-1/2″. The upright for the head tube fixture should be spaced inward 1″ from the end of the main rails. An easy way to assemble these parts is to set the lower rails on two short scrap pieces of 2x4 lumber. Place the 2x4s about four feet apart and set the main rails on the 2x4s with about a 2″ gap between them. Slide one base clamp over the left end of the main rails and insert the 36″ upright for the head tube fixture. Slide another base clamp over the right side (about 16″ inward) and insert the upright for the rear axle fixture. Tighten the nuts until the lock washers just start to compress.

Attach the 2″x2″ upright for the seat tube fixture to the back rail of the jig using one base clamp and tubing spacer as shown below.

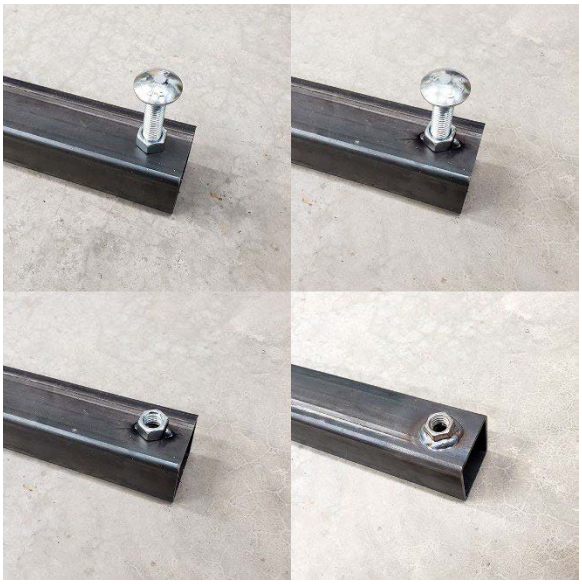
Build and Install Feet

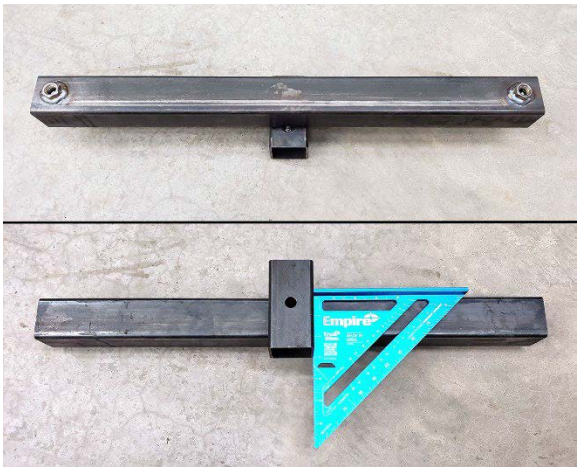
FIRST IMAGE: Drill a 1/2″ hole (centered) on one side of both 4″ spacer tubes. Drill a 1/2″ hole 1″ from each end of both 24″ tubes (centered width wise).

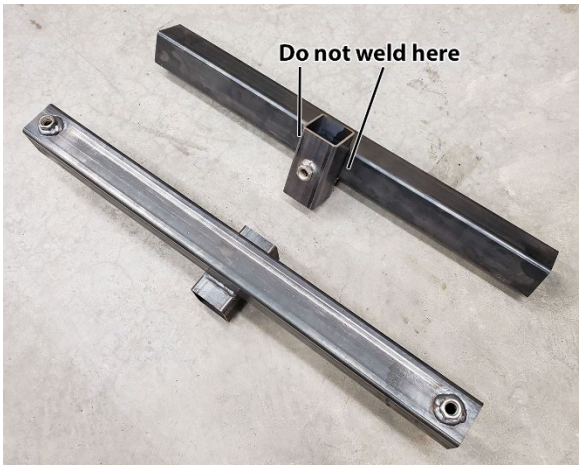
SECOND IMAGE: Thread a plain nut onto one of the 1/2″ bolts and insert it into the hole to help center the nut while you tack weld it. Remove the bolt and fully weld around the nut. Repeat for the three remaining holes. **Do not weld a nut over the holes in the 4″ spacers yet.**

THIRD IMAGE: Center one 24″ tube on top of a 4″ spacer, with the hole in the spacer facing down and the nuts facing up, and tack weld one side (top of third image). Flip it over and check that it is square (bottom of third image).

FOURTH IMAGE: Flip it back over, place two or three tack welds on each side then weld the two corner seams. **Do not weld all four seams or the weld could contact the main rails of the jig and not fit.** Weld a plain nut over the hole in each 4″ spacer in the same manner as before.







Attach the feet (carriage bolts or swivel feet) to the four nuts on the ends of the 24″ tubes and install under the lower rails of the jig. Secure using two 1-1/2″x5″ rectangle plates on top of the rails with 1/2″ x 1-3/4″ bolts (each with a lock washer and washer). If you also purchased the rotisserie stand, the feet from the main part of the jig will be installed on the stand instead. If you are using the jig on a table or lift, level the jig by adjusting the feet, and **torque the two bolts to 15 ft-lbs. Do not over-tighten or you will bend the clamp bars.**

Install Head Tube Fixture

Install the head tube fixture on the 36″ upright. Tighten the nuts just until the lock washers start to compress. Square the upright for the head tube fixture relative to the main rails (magnetic digital angle cubes work great for this) and **torque the nuts on the base clamp to 15 ft-lbs.**

Slide one centering cone down the threaded rod. Once the frame is in the jig, you'll add the top cone and a 3/4″ nut. Don't torque the nuts on the head tube fixture until you install a frame or head tube in the jig. **Do not overtighten the top 3/4″ nut.** It just needs to be tight enough to make sure the head tube doesn’t move. *The 7/16" nuts will be torqued to 15 ft-lbs and the 5/8" nuts to 55 ft-lbs.*

Install Rear Axle Fixture

Install the Rear Axle Fixture onto the rear upright. The fixture can face forward or backward. It can also face up if your upright is a 2″x2″ tube. Tighten the nuts just until the lock washers start to compress. That will be enough to hold the fixture until you are ready to use it. Install the dummy hub/axle as shown.

Don't torque the nuts on the rear axle fixture or the base clamp under it until you install a frame in the jig or have the fixture in the final position. *The 7/16" nuts will be torqued to 15 ft-lbs, and the 5/16" nuts to 6 ft-lbs.*

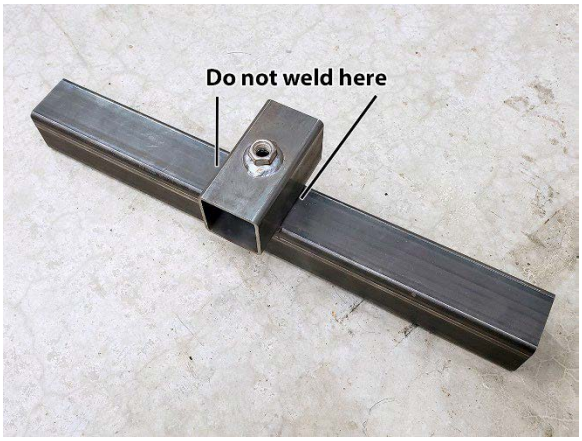
Install Seat Tube Fixture

Install the Seat tube Fixture onto the center 2x2″ upright. Tighten the nuts until the lock washers just start to compress. That will be enough to hold the fixture until you are ready to use it.

Don't torque the nuts on the seat tube fixture or the base clamp under it until you install a frame in the jig or have the fixture in the final position. *The 7/16" nuts will be torqued to 15 ft-lbs, and the 5/16" nuts to 6 ft-lbs.*

Build and Install Bottom Bracket Fixture

The support for the bottom bracket fixture is made in a similar fashion to the feet, except that it is installed on the top of the main rails and bolts from the bottom, and you only need to drill one hole. See the section for installing the feet for details. Pay attention to where the welds are placed.



Secure the welded assembly to the main rails of the frame jig using one 1-1/2″x5″ rectangle plate (clamp bar) with one 1/2″ x 1-3/4″ bolt (with a lock washer and washer).

When the fixture is in its final position torque the bolt to 15 ft-lbs. Do not over-tighten or you will bend the clamp bar.

Finish the assembly by installing the fixture on the 2x2″ tube as shown below. The cones are held in place with a threaded rod, two washers, and two nuts. Wait to install the cones until you have a frame or bottom bracket to mount in the jig. **Do not overtighten the 3/4″ nuts.** They just need to be tight enough to make sure the bottom bracket doesn't move.

Alternate welded T mount (for bottom bracket fixture)

For cruiser bicycle frames with the bottom bracket high in the frame, you may want to create a welded T from 2″x2″ tubing and mount the fixture brackets to the top of the tee facing the rear dropouts. This will require an additional Base Clamp to support the welded T.

To make the welded T, you will need a 12″ piece of 2″x2″ tubing for the vertical part and a 16″ piece of 2″x2″ tubing for the horizontal part.

Alternate welded L mount (for bottom bracket fixture)

Instead of a T, you could make a welded L (an upside-down L) from 2″x2″ tubing and clamp it to the outside of one frame rail of the jig (with a spacer) like the upright for the seat tube fixture. The fixture brackets can then be mounted to the horizontal part of the ″L″.

To make the welded L, you will need a 12″ piece of 2″x2″ tubing for the vertical part, a 16″ piece of 2″x2″ tubing for the horizontal part, and a 6″ piece of 2″x3″ tubing as an offset spacer (as shown below).

Torque Fasteners

Once you have a frame (or frame pieces) mounted in the jig and the fixtures in their final positions, ensure all 7/16″ and 1/2″ nuts are torqued to 15 ft-lbs, and all 5/16″ nuts to 6 ft-lbs. Torque the 5/8″ nuts on the head tube fixture to 55 ft-lbs.

Frequently Asked Questions:

Question: Do you have a list of the tubing required to complete the jig?

Answer: See page 9 for the cut list.

Question: Where do I buy the 2″x3″ and 2x2″ tubing?

Answer: Structural tubing should be available locally at a metal supply store or welding/fabrication shop. Many times, the store/shop will cut them to length for a small fee. Google 'metal supply near me' or 'steel supply near me'.

Question: Can I use Metric tubing?

Answer: Yes, see page 9 for more details.

Question: How long should I make the main rails for the jig?

Answer: It depends on the type of frame you want to put in the jig or what type of frame you want to build. If you're building a long cruiser, you're going to need a longer jig than someone building a 20″ BMX bike. These instructions are based on a jig with 6' main rails. That length will work for almost all bicycle frames. If you want a longer jig, you can make the rails for the jig and stand longer. You could build the jig for the projects you have in mind and purchase new longer rails later if needed. One of the nice things about a bolt together jig is that you can easily make the jig longer and you won't have to cut it apart and then weld it back together.

Tips:

When drilling holes, use a center punch so your bit doesn't wander, then drill a small pilot hole. For thin metal, a step bit works well to enlarge the hole to the required size. Use cutting oil to keep the drill bit cool. A drill press makes the job easier.

Level the jig before starting your project. Digital angle finders (available on our site) work well for this.

Keep the head tube fixture, rear axle fixture, bottom bracket fixture, and seat tube fixture somewhat loose when putting a frame into the jig. A dead blow hammer works well for moving the rear axle fixture upright back and forth. Before loosening the base clamp for the rear axle fixture upright, put a C clamp or welding clamp on the upright directly above the base clamp plates to prevent the upright from dropping down.