

Assembling your UTB

Ross Donaldson
R & E Cycles Mechanic and Instructor
206.527.0360
classes@rodcycle.com

July 12, 2008

1 Some general words of wisdom:

The instructions here are a précis of the two hour class I teach on S&S Bike assembly. I'll try not to overload you, but there's a lot of information cover. I'm including as many pictures as I can; refer to them often! If you find these instructions confusing, give us a call! We're happy to answer questions.

I would advise against rushing; it's not at all uncommon to take an hour and a half or more to assemble your bike the first time. Go one step at a time, and remember: if it doesn't look like it will work, it probably won't! Your bike really only goes together one way. Read through these instructions first – and don't be intimidated by the length; it's mostly pictures and white-space so you can take your own notes.

If my instructions are at all unclear, I'm happy to re-phrase them over the phone or in another email. Just let me know what works for you!

1.1 A note on work area and clothing

I prefer to work on the ground while I do this. Avoid carpet; it's easy to stain. Wear clothes you can get greasy; your bike is, by and large, very clean

– but that’s no reason not to be careful. Tarps can be helpful, but as they almost never lay flat they’re often very good for “eating” small bike parts. I like towels, old carpets, and cement best for my work surface – unless, of course, there’s a good work bench and bike stand near by.

1.2 A note on right, left, up, and down

“Right” and “Left” refer to your bike as though you were sitting on top of it. You’ll also hear “drive side” and “non-drive side;” these are mechanic’s terms and more absolute. “Drive side” is always the side of your bike with gears and chain – which is to say, the right side of the bike.

The “top” of your bike is, as with right and left, the top as though you were sitting on it. Two easy-to-find landmarks are your top tube and your bottom bracket. Your top tube is labeled in the frame diagram; your bottom bracket has a square post sticking out of either side of it. I’ve included a basic frame diagram with this document (see Figure 1, page 12).

2 Tools

In the triangle bag included with your bike, you should find an 8mm allen/hex wrench (black and L-shaped) and an S&S coupling wrench (silver with a hooked end). If you’re missing either of these, let me know. I’ll have them expressed out.

You will also need Allen/hex wrenches in 4mm, 5mm, and 6mm sizes. You have a number of options for this, but my two favorites are:

1. The Park Triangle Wrench: this is a single tool, which does not fold, and has all three wrenches forming the points of a triangle. Comfortable to hold and use, they’re the most “minimalist” solution, but not the most compact.

2. Folding multi-tool: any good bicycle-specific multi-tool will have those three sizes. My two favorites are the Serfas Mentor Micro and the Pedro's 9-in-one tool. Your local bike shop can help you choose the right tool. My best advice: avoid getting more tools than you need.

3 Assembling your Bike

Your bike is broken down into pieces, then packed into a case. Each piece is wrapped in a sheet of padding. The padding has two sides: a cordura weave with a velcro strip running along one edge, and a soft side that is fully “velcro-able.” Your first task in unpacking the bike is to take everything out of the case and remove all of the padding. It's all sandwiched together with an S&S netting – just pull the velcro at each corner and the netting will come free.

As you remove the padding, I recommend stacking it so that the sheets line up with one another, making a sort of “booklet” of padding with all the velcro along the bottom edge. This keeps the padding tidier, and makes it easier to find each piece as you need it for packing the bike later on.

Each of your wheels has a black plastic axel cap on one side; just pull these free and toss them back in the case. You'll also find a white “compression member,” consisting of a 10” PVC pipe with two white plastic caps. Take this out while unpacking the bike, then toss it back in the case for safe keeping. Throw the netting and the padding booklet back in the case as well; you won't need any of it again until you pack the bike next time.

As you remove each piece from the box and unwrap it, remark the label on the padding. You should have the following:

- 2 wheels (un-padded)
- 1 drive side crank (black, with toothed rings and a pedal attached)
- 1 non-drive crank (black, pedal, no rings)

- The front half of the frame (the front half has the “head tube,” “down tube,” and “top tube.”)
- The rear half of the frame (“seat tube,” chain stays, seat stays. Most easily identified by the rear derailleur attached to it by a cable. Be careful of the rear derailleur! Try not to let it get too wrapped up in anything.)
- Handlebars
- A fork (which will have a “steer tube” and two “blades.”)
- 2 skewers – two rods with a pair of springs, a screw end, and a lever end. One will be longer than the other.
- A saddle with a seat post attached
- A chain in a plastic bag
- Any accessories that were packed with your bike (pumps, tools, etc.)

Once you’ve identified each piece, re-assemble as follows:

3.1 Mount the Rear Derailleur

The first step is, in my opinion, the hardest. It gets easier from here! You need to attach the rear derailleur to the frame. The point of attachment is called the “rear derailleur hangar,” and is part of the right rear dropout (see Figure 4, page 15). The derailleur hangar has a sort of “tooth-paste curl” shaped tab on it. Examine the rear derailleur; you should see exposed screw-threads and a socket into which you can insert a 5mm hex wrench. Near those screw threads is another tab (see Figure 5, page 16). Thread the derailleur hangar into the frame, making sure the tabs do not overlap (Figure 6, page 17). Make sure the derailleur is screwed on firmly.

3.2 Re-assemble the Frame

Each half of the frame has half of a complete “coupler” on it. These couplers have two main components: interlocking teeth and a threaded sleeve. Your frame will only go together one way; if you find you cannot get both sets of teeth to line up with one another, try rotating one half of the frame 180°. Line up the teeth of both couplers, then screw down the sleeves. Tighten them by taking the S&S wrench, hooking its tooth into one of the square cut-outs in the sleeve, and twisting until it no longer moves.

3.3 Re-assemble the Headset, Fork, and Handle Bar Array

If you examine the head tube of your bike, you’ll find two black “cups” with “FSA” screen-printed on them. Those are your headset cups – your headset being the apparatus which allows your handlebars to turn. Now locate your fork. On it should be a stack of various parts, held on a a cap (itself held on by a bolt) at the top of the steer tube (see Figure 15, page 25). These parts are currently stacked in the correct order and the correct alignment – that is, as it stands now, they are all right-side up. You should have, from the top down:

- A top cap (which says “FSA,” and is held on by a bolt)
- A number of black, cylindrical aluminum spacers (which should also say “FSA;” one of these should be labeled “above stem” with tape)
 - A “cable hangar,” which looks a bit like a spacer with a small extension and a little “cup” on it. The cup will be split. There should be one spacer below the cable hangar.
- A headset top-cap, which should be rounded and smooth

- A gold headset “race.” The top will be flat, the bottom angled like a wedge. It will be a split ring.
- Two cartridge bearings, which look like silver cylinders with beveled edges. Each bearing settles into a headset cup, one on the top and one on the bottom. The bearings are identical and interchangeable. The important thing to know is that the beveled edges face each other.

Remove everything from the fork, making sure you preserve the order and alignment of each piece. My favorite way to do this is to take each piece off the fork and turn it upside down on the ground in front of me, stacking everything out in a line from left to right. Slide your steer tube through the head tube of your bike, starting from the bottom end (so the steer tube protrudes out of the top). Now stack the components you removed earlier back onto the steer tube. When you get to the spacer marked “above stem,” slide the handle bars onto the steer tube. Now add the last spacer and the top cap, screwing it down lightly.

3.4 Re-install your Seat

Slide the seat post into the seat tube until it stops at the seat-height marker. Tighten the bolt on the clamp (this is part of your frame, and is located on the right side at the top of the seat tube). Don’t worry about alignment at this point; you can’t get the seat straight until the bike is fully assembled.

You can now turn your bike upside-down and let it support itself on the handle bars and seat.

3.5 Hook the cables back up

Everything on your bike is controlled by cables. With two derailleurs and two brakes, you have four cables to hook up – all of which are currently split in half by means of cable splitters (see Figure 7, page 18). One half originates

in your shifter; the other half is on the frame, attached to the corresponding component.

When screwing the splitters back together, never use tools! Hand tight together, hand tight apart.

Hooking everything up is best accomplished by process of elimination:

1. Front Brake: your front brake cable has a straddle saddle (see Figs. 10 and 11, pages 20 and 21) on it and no splitter. Hook the straddle cable (attached to the cantilever brake arms) through the saddle, then set the housing into the cable hangar.
2. Rear Brake: your rear brake cable is thicker than either of the other two remaining cables; it also has no cable stop (both the shift cables have cable stops). Screw the two halves of the rear brake cable together, then set each cable housing into its stop.
3. Shifters: by now, all that's left are the shifters. Each shifter cable has a cable splitter attached to the end, and a cable stop (see Figure 3, page 14), threaded on to the cable itself. The bolts to hold the cable stops on are threaded into the downtube cable stop posts – remove them from the frame just before you start hooking the shift cables together (they both take a 4mm hex wrench).

You have two shift cables to deal with:

- (a) Your right shifter controls your rear shifting. Follow the cable that comes out of the right side of your handlebars; hold the end of it in one hand. With the other hand, follow the cable that comes out of your rear derailleur. Screw the two halves of the cable together. Repeat this process with your left shift cable.
- (b) Once the halves of each cable are hooked together, you'll need to set each cable guide onto the post. It helps to make sure your shifters are thumb shifted as far as they will go (this lets out the

maximum amount of cable from the shifter, giving you the most slack cable possible to work with). Make sure the ferrules and cable stops are set properly on the ends of the housings.

- i. For your front shift cable, pull the front derailleur out from the frame with one hand; this should slack the cable, allowing you to easily set the stop on its post with the other hand. Bolt this down firmly.
- ii. For your rear shift cable, make sure the housings are fully set at the rear of the bike (i.e. the housing into the rear deralleur is set both into the derailleur and into the chain stay cable stop). You should, by pulling firmly, be able to simply set the stop onto its post. (If you need any slack, push the rear derailleur in towards the center line of the bike with one hand.) Bolt it down too.

Congratulations – you’ve finished your cables!

3.6 Cranks

It’s time to bolt on your cranks. Each crank has a bolt mounted in to it; you’ll see threads on one side of the crank, and a hole that accepts an 8mm hex wrench on the other side. The crank with the chain rings on it (the drive side crank) goes on the same side of the frame as the derailleurs. To bolt each arm on:

1. Stand over the frame. Hold the crank in one hand; with the other, take your 8mm hex wrench and set it into the bolt-hole on the crank arm.
2. Press the crank arm against the bottom bracket spindle; start turning the hex wrench clockwise relative to the front of the crank. As the bolt threads into the bottom bracket spindle, the arm will start to pull

on. Notice that the spindle is square? So is the hole in the crank arm. Make sure they line up properly. Tighten this on very firmly.

3. Repeat with the other arm. All you need to make sure of is that you set the arms 180 degrees apart from one another. If you put an arm on the wrong side, or set them in the wrong position relative to one another, don't worry! Just remove the arm by twisting the wrench the other way – the arm will come off and you can try again.

3.7 Wheels

Each wheel needs its skewer re-installed. To do this, first match the skewers and wheels (the longer skewer goes to your rear wheel, the shorter to your front). Hold the lever-end of the skewer in your left hand. Unscrew the cap end with your right hand; remove both it and one spring. Take a wheel and set it in front of you so you can read the label on the hub, or so that the gears are on your right-hand side. Slide the skewer into the center of the hub from the left; it should protrude from the right side of the hub. Put the spring and the screw-cap onto the end of the skewer. Notice that the spring is shaped like a cone; make sure that it "points" at the hub. Once each wheel has a skewer in it, re-install the wheel on the bike. You should wind up with both skewer levers on the same side of the bike – the side opposite the gears. Once you've re-installed the wheels, flip the bike right side up and prop it up against something. Make sure you have easy access to the right side of the bike.

3.8 Chain

This is where your hands will get the greasiest. Take the chain out of the plastic bag. You should find two halves of a Sram Master Link in the bag with the chain – these will be identical gold pieces, each with a slot and a post. Set the master link aside for now; we'll start with the chain.

1. Thread the chain through the rear derailleur: on your rear derailleur are two "jockey pulleys" – little black cogs. Each pulley has a metal tab that arches over it (see Figure 5, page 24). Your job is to thread the chain between this tab and the pulley itself. This is best accomplished by rotating the rear derailleur clockwise slightly and dropping the chain through it from the top (see Figure 17, page 27).
2. Wrap the chain over the top of the cassette so that it passes around the left half of the cog it wraps around (Figure 18, page 28).
3. Thread the chain through the front derailleur, pull some slack through, and drop it onto the bottom bracket shell (Figure 16, page 26).
4. Hook up the master link: at each end of the chain is a hole. One master link half mounts into each hole. The halves should mount on opposite sides from one another (see Figure 12, page 22). With the master link halves mounted in the chain, press the halves together and pull to set (Figure 13, page 23).
5. Lift the chain up onto the crankset.

Congratulations! Your bike is fully assembled. Only a few minor adjustments are needed to get the bike ready to ride.

First, you should take a minute to make sure the breaks are fully hooked up and functional. Now:

3.9 Adjust the Headset

Your headset is adjusted by means of the top cap. Make sure the bolts that tighten your stem onto the steer tube are completely loose (you do not need to touch the bolts on the face plate of the stem, the bolts that hold the handlebars on). Tighten the the top cap until it feels firm. Your guide line is this:

- Tight enough that the wheel rotates with the handlebars. It's possible to have the cap so loose that the handlebars no longer affect the wheel. This is too loose.
- Loose enough that everything turns smoothly. If you tighten the cap too much, the headset will seize and nothing will rotate. This is too tight.

Once you've set the top cap, make sure the stem is lined up with the front wheel. (If the bars don't point in the same direction as the wheel, you'll have a hard time steering the bike!). My favorite way to do this is to sight down the frame, lining both the stem and the front wheel up with the frame itself. Once everything is where you want it to be, tighten the bolts on the stem one at a time, a little bit at a time, until they're both very tight. Now that the stem is tight, you can check to make sure your headset adjustment is correct. To do this, squeeze only the front (left) brake, lean on the handle bars, and rock the bike back and forth. If you feel a distinct "ticking," your headset is too loose; you need to loosen the stem bolts and tighten the top-cap. Pick up the front end of the bike and turn the bars from side to side; if you cannot turn the handlebars smoothly, if it binds or crunches or ticks, the headset is too tight. You'll need to loosen the stem bolts, loosen the headset, and re-tighten the stem.

3.10 Check over the bike

Take one last minute to go over the bike. Make sure that the bolts are tight, the cables are hooked together, the breaks are set up properly, and the tires are fully inflated.

You're done! Go ride!

4 Pictures

I'm including as many pictures as I can; if you can think of something you wish you had a better close-up of, or if you think our pictures are unhelpful, please let us know! We're always happy to use feedback from our users to improve our product.

If you need more technical explanations or diagrams, you can either call us or reference a book. We recommend Leonard Zinn's **Zinn and the Art of Road Bike Maintenance**, but there are many others worth your time, if you need them.

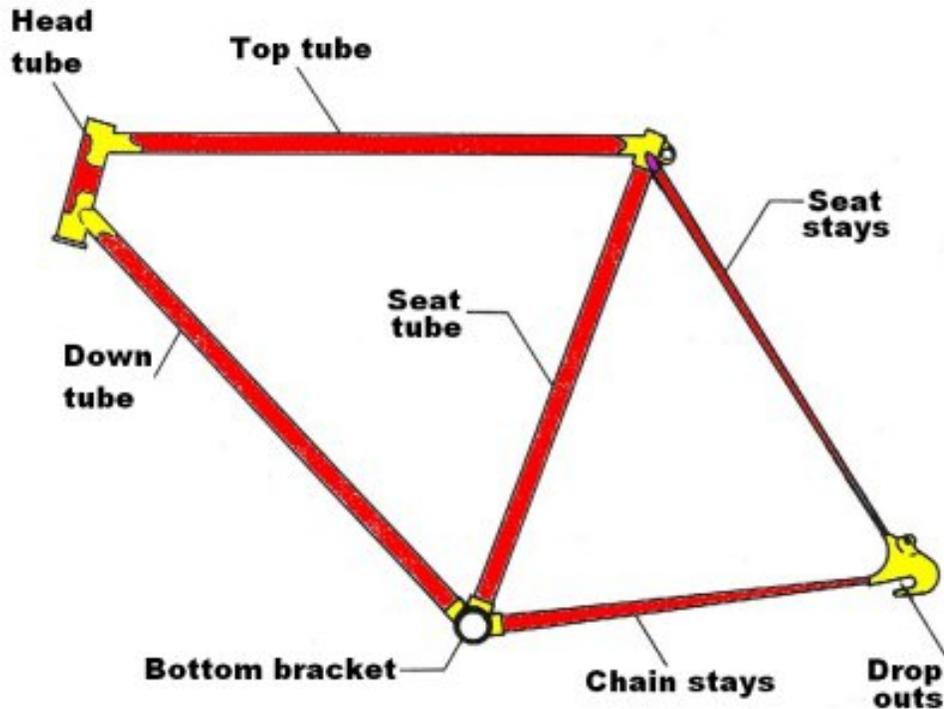


Figure 1: Some frame anatomy.

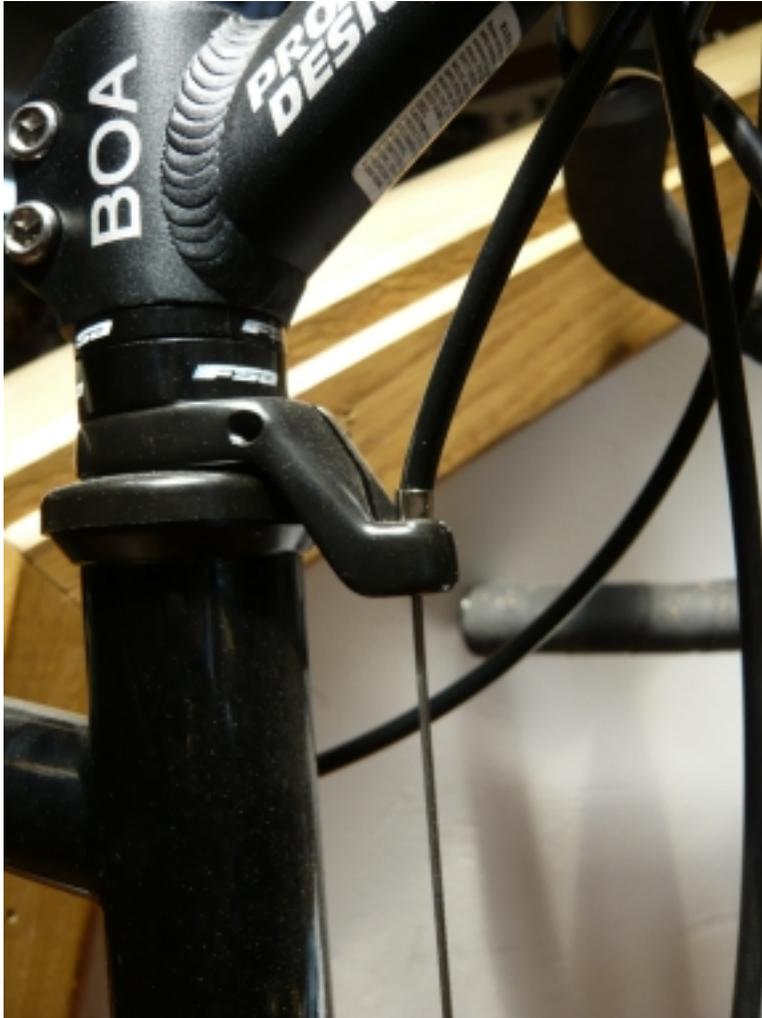


Figure 2: A cable hanger with cable housing properly seated.



Figure 3: A down tube cable stop, properly aligned. Notice the Rodriguez logo on the down tube; use it to get you relative positioning correct.



Figure 4: The rear derailleur hangar. Note the tab.



Figure 5: The circle indicates the particular tab we must concern ourselves with.



Figure 6: The proper alignment of the hanger and derailleur tabs.



Figure 7: The two halves of a cable splitter.



Figure 8: Correct placement of the silver ferrule on the end of the cable housing.



Figure 9: Incorrect: the ferrule is loose on the cable. Avoid this by snugging the ferrule onto the end of the housing.



Figure 10: A correctly set up front brake.



Figure 11: A close-up of the straddle saddle from behind; notice the straddle cable passing through the “hook” of the saddle, and the spare cable wrapping down one side.



Figure 12: A master link, with each half placed in opposing sides of the chain.



Figure 13: A master link being assembled; the opposite side of the chain would look identical to this picture. From here, the chain need only be pulled and the link will be fully installed.



Figure 14: A closeup of the rear derailleur cage, showing the jockey pulley (the black cog) and the metal tab. Each pulley has one of these tabs; make sure the chain routes between the tab and the pulley.



Figure 15: The steer tube stacked with head set parts. From left to right: a number of headset spacers, a cable hangar, another spacer, a head set top-cap, a gold split ring race, and two bearings, beveled edges facing one another.



Figure 16: The chain routed correctly through the front derailleur and laid across the bottom bracket shell to permit greater ease in connecting the ends.



Figure 17: The easiest way to route the chain through the rear derailleur cage.



Figure 18: The chain wrapped properly around the cassette.