

## **Custom Titanium *Constructeur* Santana Tandem—Large, Fully Equipped, Extras**

We built this tandem with three principle design goals that we sought to achieve regardless of cost:

- 1) Fast, *comfortable*, safe long-distance riding on any terrain and in all conditions, including night riding, riding in the rain, and everything from fast group rides to riding across the country, loaded or unloaded;
- 2) Simple, reliable, well-proven, low-maintenance materials and components that work and will last for decades; and
- 3) Classic, timeless, iconic looks. Great bicycles should be beautiful, no?

The bike comes fully-equipped with about \$1,500 in options and spare parts that are not normally included in a tandem purchase, including: a high-end SON/Edelux II dynamo lighting system, Brooks Ti saddles, Shimano SPD high-end pedals, Tubus titanium rack, SKS fenders carefully installed to exactly match the curve of the tires, Zefal frame pump, stainless bottle cages and some extra parts that are specific to this bike and are hard to find.

The tandem is fully-tuned and in concours/mint condition, with only minimal signs of use.

Sales price: \$4,500 plus shipping, or the tandem can be picked up in the Baltimore/Washington DC area.

Here are the details on the bike and the build:

### **The Frame**

The frame is a custom version of Santana's Ti-700 Team titanium tandem manufactured in California with proprietary double-buttressed 3AL-2.5V titanium tubing and a boom tube from rigid 6AL-4V seamless oval titanium tubing. The entire frame is polished, which is better looking than the brushed finish on most titanium frames but is labor-intensive and added \$2,500 to Santana's custom frame cost. The welding bead is polished down for smooth, fillet-brazed-like weld junctures. Titanium frames are springy and provide a plush ride. Properly-constructed titanium tandem frames can take abuse and are truly once in a lifetime purchases.

Custom frame specifications include:

- A taller head tube for a less bent over rider position;
- No superfluous V-brake mounts on the seat stays (Santana included these ugly mounts on its stock titanium frames that were equipped with disk brakes until 2019);
- Elimination of the V-brake-specific cable stops on the top tube (also superfluous since this tandem is designed for a rear disk brake). The top tube is cleaner/better looking without the unnecessary cable stops.
- Bottom of the seat stay bridge fender mount (rather than the less attractive lateral mount that is standard); and
- Frame mounts for both a cable-actuated and hydraulic rear disk brake, allowing some flexibility on future braking technology improvements.

Santana has made a variety of Ti-700 frames over the years. By far the best series, which combine the best tubing, the best frame geometry, the best craftsmanship and the most iconic looks were the polished models from about 1999 through about 2002. This frame is from that era.

### **Frame Size**

**Captain/Front:** 23.5 inches / 59 cm frame size, C to T, (measured from the center of the crank bolt to the top of the seatpost mount)

**Stand over height:** 32 inches / 81 cm, (measured from the ground to the top of the forward top tube)

**Top tube length:** 22 inches / 56 cm

**Stoker/Rear:** 20.5 inches / 52 cm C to T, (measured from the center of the crank bolt to the top of the seatpost mount)

**Stand over height:** 30 inches / 76 cm, (measured from the ground to the top of the rearward top tube)

**Top tube length:** 26 inches / 66 cm

Tandem fit is somewhat different than fit with single bikes. If your inseam is adequate to stand over the frame top tube, the fit will be good. For tandem fitting, the larger the frame that fits, the easier it is to get the handlebars higher up to allow a slightly more upright riding position that is more comfortable and more suitable for long distance riding. I'm 5'11"/180 cm with a 33 inch/84 cm inseam and I fit this frame size perfectly, even though my single road bikes are 56 cm. My wife is 5'5"/165 cm with a 31 inch/79 cm inseam and she fits the stoker position.

### **Fork**

Chrome-molly Santana tandem fork internally coated with FrameSaver to prevent rust. The fork has mounts for a front rack.

Why a steel fork? We commissioned a Ti fork for this bike from Black Sheep in Boulder, Colorado and we didn't like the handling. We have also used a handful of carbon tandem forks on this bike. The steel fork we eventually chose handles the best, is more versatile and is safer than other fork options. It also better matches the look of the frame.

## **Wheels**

**Front Wheel:** 700c. Schmidt SON sealed-bearing Nabendynamo dynohub is extremely reliable and has almost no drag. Made in Tübingen, Germany, the hub is quiet and is designed to give at least 50,000 kilometers of trouble free riding between servicings. Velocity Dyad aero rim, Wheelsmith double-buttet spokes, 40x3. Veloplugs, no rim strips. Titanium quick release mechanism. Custom built by Andrew King of Longleaf Cycles.

**Rear Wheel:** 700c. Phil Wood sealed-bearing tandem hub—the best tandem rear hub ever built, Velocity Dyad aero rim, Wheelsmith double-buttet spokes, 40x3. Veloplugs, no rimstrips. Titanium quick release mechanism. Custom built by Andrew King of Longleaf Cycles.

The wheels are light and fast, but robust enough to require zero to low maintenance for years, even under heavy loads.

## **Tires**

Schwalbe Marathon Supreme 700x32c. The best high-performance/comfortable/durable tires available. Twice the cost of Continental Four Season, handle better and last longer.

## **Drivetrain**

Shimano Ultegra triple chainrings: 52x42x30. 9 speed cassette: 11-34; Ultegra sealed-bearing bottom brackets; Santana eccentric; Shimano XTR rear derailleur; Shimano Ultegra triple front derailleur; Shimano Dura-Ace indexed bar end shifters.

We used a nine speed cassette with a triple crank to allow both a wide gear range for climbing and the most consistent and reliable shifting without the complexity of an electronic shifting system. In our experience tandems don't work well with mechanical brifter-type shifters because of the long cable lengths and cable

stretch. 9 speed Dura Ace bar end shifters offer by far the most crisp and the most reliable mechanical tandem shifting available. The shifting on this bike is perfect.

### **Brakes**

203mm Avid mechanical rear disk brake. Simple system, excellent stopping power—enough power to stop the bike without using the front brake, and less fussy/complex than a hydraulic disk brake.

Paul Motolite linear pull front brake. Widely regarded as the best linear pull brake on the market, lots of stopping power, superb quick release mechanism, simple and much lighter in weight than a front disk.

Tektro linear pull brake levers—we chose these because the shape is elegant and they function well.

### **Lighting**

The front SON dynohub is paired with a German Edelux II front headlight—the world's best front headlight with a long and wide bright light path. The rear light is a Spanninga Pixeo LED tail light from Italy.

### **Saddles**

Matched Brooks honey-colored leather saddles. The front saddle is a B17 with a titanium undercarriage; the rear saddle is a Brooks Team Pro Finesse with a titanium undercarriage. These saddles are expensive, but are widely considered the most comfortable long-distance saddles available. They have been treated with Brooks Proofide and are broken in.

### **Rear Rack**

Tubus titanium “Carry” rack from Germany. Hard to find and by far the world's best high performance lightweight rack—carries up to 65 lbs, weighs only 8 oz.

### **Headset**

Chris King 1¼ top and bottom races, sealed. The world's best headset.

### **Handlebars/Stems**

**Captain/Front:** Nitto Noodle bars, 44 cm wide. Japanese, considered one of the best long distance bars ever made because of the flat ramps, also famously attractive.

Fizik Microtex tape.

The bike has a Santana 90 mm 20 degree rise stem, but also comes with two additional stems: a Santana 90 mm 6 degree rise stem and a Santana 100 mm 6 degree rise stem. All three are 1¼ steering tube mount size.

**Stoker/Rear:** Santana stoker stem and 46 mm stoker bars, Fixik Microtex tape.

### **Pedals**

Shimano SPD clipless, sealed bearing. We bought these pedals in Japan—they are comparable to XTR, but are grey color to better match the bike rather than XTR black. SPD pedals have the benefit of recessed cleats in cycling shoes so are more compatible with stopping and walking around while out riding.

### **Seatposts**

**Captain/Front:** 29.8 mm aluminum micro-adjusting post, Van Nicholas titanium seatpost clamp from Holland.

**Stoker/Rear:** Look carbon fiber deep setback micro-adjusting post, Van Nicholas titanium seatpost clamp from Holland.

The French Look seatpost does an excellent job of reducing shock to the stoker/rear position on the tandem, partly because it's carbon fiber, and partly because of its extreme set back. It works as well as a shock absorber post and is significantly less heavy. This is the only carbon fiber component on the bike.

### **Frame Pump**

Zefal HP from France. The tandem is equipped with a frame mount for the pump, and the pump is included.

### **Santana Bike Handling and Performance**

If haven't ridden a Santana, Santana tandems handle differently from all comparable high-end tandems. The handling is designed to mitigate the effect of stoker movements which can affect steering—called stoker steer. Santana frame geometry results in less muscling the bike around and less impact on steering when the stoker chooses to move around. We've owned and ridden tandems from a number of builders, and for us, Santana handling is ideal for tandems, since it makes for a less stressful riding experience for both riders.

### **The Ride**

Titanium frames are well-known for the plush ride, and this is especially true for Santana Ti frames with proprietary double-buttet tubes (some other titanium

tandems have straight-gauge tubes which ride more harshly). The large Schwalbe 700x32c tires also provide a comfortable ride. Brooks leather/titanium saddles have a hammock-like effect compared to the hard plastic or carbon saddles on most high-end bikes. The carbon seatpost on the stoker/rear position mitigates frame resonance. These factors add up to a tandem that is less fatiguing to ride and extremely comfortable over long distances.

### **Extras**

In addition to the two extra stems, we include an extra Shimano XT 9 speed wide-range rear derailleur in silver color, an extra silver stoker stem insert and a new Avid 203 mm rear disk brake rotor and silver rotor mount.

### **Aesthetics**

We built the bike entirely with titanium and aluminum components in gray and silver to achieve a classic, timeless, iconic look. Only the stoker seatpost is carbon fiber and black in color. The honey-colored leather Brooks saddles and white Fizik tape go well with the polished Ti frame and silver parts.

Downtube and top tube Santana decals have been removed from the frame because the bike is simply more attractive without them. Santana decals on the seat tubes and head tube are intact.

The Shimano labeling on the crank shows some rubbing—we have removed much of the branding on this bike and at the buyer's preference, would be happy to remove the printing on the cranks, which we feel would improve the look.

There is a scratch on the XTR rear derailleur that can be seen in the photos. We consider this minor, but have provided an additional Shimano XT 9 speed wide range rear derailleur in silver, for buyers who may prefer it.

### **Shipping**

Will ship worldwide at the actual cost of shipment, or the tandem may be picked up locally in the Baltimore/Washington DC area. For shipping, the tandem will be professionally packed in a tandem-specific shipping container.

Please contact us if we need to provide any additional information or answer further questions.

Thank you.