

Trek: A Giant Is Growing in the Midwest

Text and photos by Gary Fisher

Trek Bicycle Corporation seemed to appear overnight as the biggest mass producer of quality bicycle frames in America. And Trek has already gained a reputation for quality frames at very reasonable prices. To find out how they achieved this initial success, I visited the Trek plant in Waterloo, Wisconsin last Thanksgiving weekend.

I'm sure you won't be surprised to hear that Trek did not spring full-blown from some bikie's imagination. It took 1½ years to tool up for production. The company was founded in December 1975 and is a wholly owned subsidiary of the Roth Corporation, a Milwaukee appliance distributor.

Trek's plans are to build 6 to 7 thousand frames this year. This is an incredible number when you consider that it takes a very industrious frame builder at least three or four days to produce just one custom frame. How do the 15 Trek workers produce some 130 frames per week? With satisfying ease. One of Trek's success "secrets" is mass production of high-quality steel framesets made possible by advanced mechanical techniques.

Take, for example, the mitering of tube ends. A highly trained frame builder takes 7 to 15 minutes to cut a fish-mouth pattern at the end of a frame

tube with a hand file. At Trek a highly automated lathe cuts tubes to within one-tenth of one degree of the correct angle with .002 of an inch accuracy, and all it takes is 50 seconds. This one lathe can be quickly reprogrammed to cut the many different miters involved in making a line of frames. One of the Trek employees has built himself a lug-less frame, simply using these exactly-mitered tubes.

Frame stress is greatest at the joints. Double butting, precision mitering of tube ends, low-temperature brazing and lugs give frame strength where it's needed. Since high temperatures can drastically weaken high-quality tubing, Trek uses silver solder on the main frame triangle. Silver melts at around 1150 degrees, heating the tubes to a dull cherry red instead of the bright orange of 1400-degree brass braze.

Silver costs a few dollars more per frame to use. However, the main reason many custom builders still use brass is because of silver's inability to flow and fill the inconsistencies and gaps often found in hand-filed and shaped lugs.

Using their modern machinery, Trek can avoid this problem and keep lug-to-tube tolerances to approximately .005 of an inch. In addition, Trek has had a series of investment-cast lugs designed

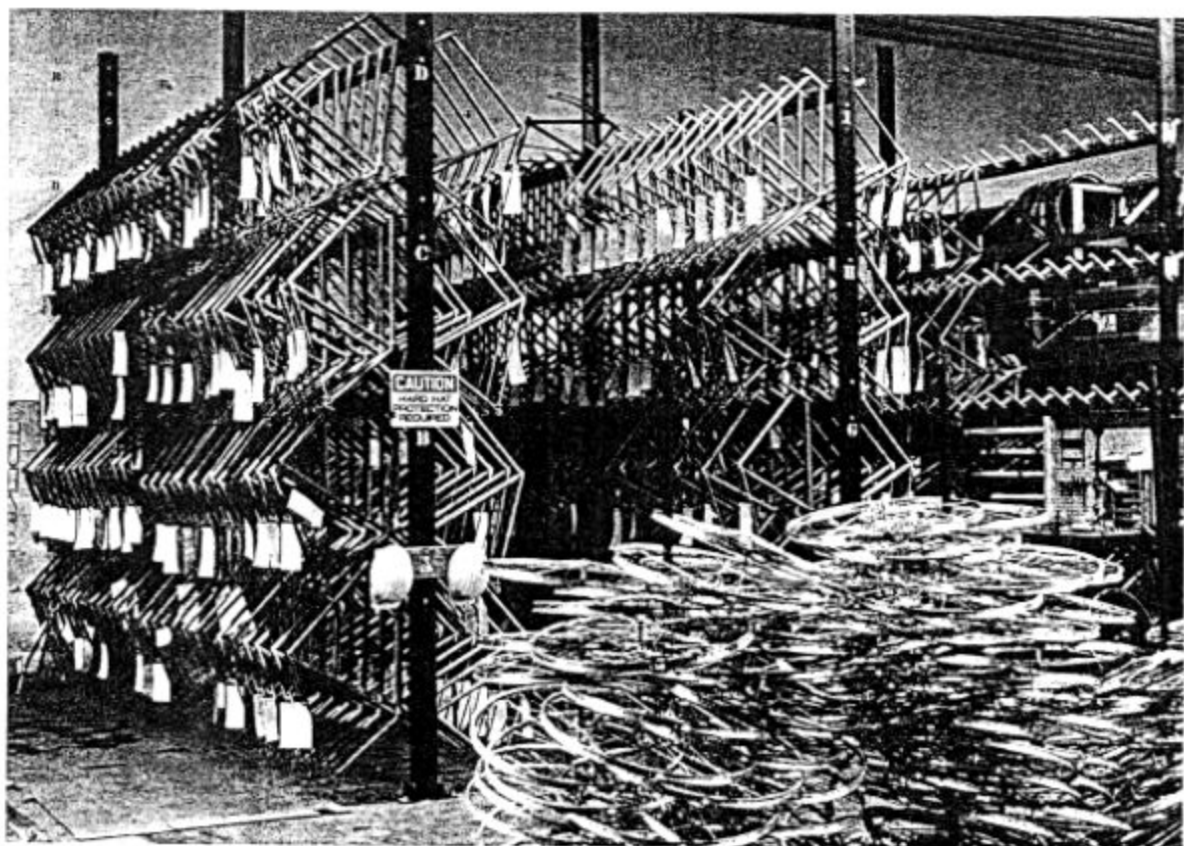
to fit their frames perfectly without the need of additional filing or bending. This means they have a range of lugs with slight variations to fit each frame size and angle. Trek's first order of Japanese Nikko Sangyo lugs was of such size that the firm sent a technician all the way from Japan to ensure Trek's satisfaction.

The long-point Italian-style lug used by Trek requires very little work either before or after brazing, as it's cast in one piece.

Trek has taken full advantage of advanced machine tools from nearby Milwaukee. I didn't see one hand file in the whole place. The closest thing was a hand-held, air-driven Dynaflex turning a small belt of emery cloth. This was used for very minor cleanup at the lugs and fork ends after brazing.

Brazing jigs were mounted on swivels and gripped the frames with quick-release levers for fast, easy and accurate operations. The more than 25 jigs made things look confusing at first, but each is set up permanently for a particular operation and frame size.

Trek uses silver alloy rods, Eutectic 1801 for the chrome-manganese Reynolds 531 and Eutectic 1810 for chrome-molybdenum Columbus and Ishiwata tubing. Eutectic 1601 is used to fill the



Undercoated frames await the final color application.

larger gaps around the seat stays. Fork ends and rear dropouts are brazed with 185 nickel bronze, brake and chainstay bridge with 16 nickel bronze; 146 brass rod is used for the stay caps.

Trek did quite a bit of homework to come up with this combination. There are over 10,000 different rods on the market. Trek's pile of experimented-upon tubing is larger than many frame builders' complete stock.

Trek chemically prepares tubing, first with a 180-degree neutral pH stripper, then with a sealer to prevent rust. The tube is color-coded and stored. When the week's work order comes up, the tubing is pulled from the racks, milled and slotted. It's cleaned in the stripper and sent to the five brazers. The brazing leaves the tubes with flux and oxidation on the surface which is removed in the stripper. The frames are then finish-machined, and the up-till-then straight forks are bent to the desired offset.

Next, frames and forks are dipped in the six chemical tanks seven more times. The last two chemicals are a phosphate rust inhibitor and a hot sealer for a better paint bond. Following inspection, an epoxy primer is sprayed on and dry sanded and two color coats of Imron Polyurethane applied. Then

they are inspected again, decals are applied, and the brass Trek head plate is screwed to the head tube.

Trek is selling their framesets and bicycles at extremely low prices when compared to those of competitors. This is partly due to the fact that importers must pay 15-percent duty on frames and 5-percent on fully equipped bikes. Then they must pay the middlemen. Trek's biggest money saver is the fact that it only takes eight hours of labor per frame.

Despite the reasonable cost, Trek is using some of the most expensive materials on the market, such as chrome-moly investment-cast fork crowns. They also use many new designs: round-oval-round chainstays and continental oval fork blades.

There are five frame sizes available. Top tube length and wheelbase are figured proportionately to give a modern-day road/touring design. In addition, a racing model with a shorter wheelbase is made with Columbus tubing.

The Ishiwata tubing is probably an unknown to many readers. But it has been used by top frame builders around the world for the past several years. It's fast gaining a high regard. I personally think Trek's Ishiwata frame an outright

bargain. Many frame makers cannot believe the price, and riders accustomed to riding frames costing much more are finding complete satisfaction with this frame.

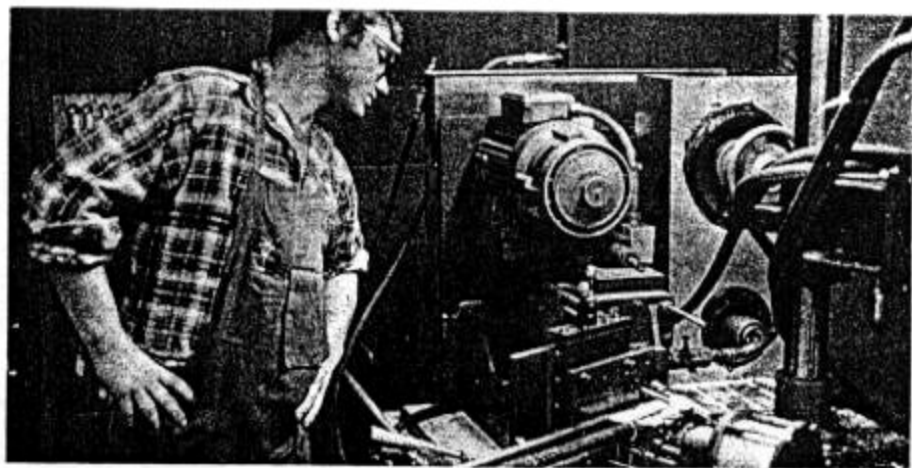
The primary drawback with a Trek machine as compared with a custom-built frame is the limited sizing available. Treks are made to fit the average rider and average riding style. However, Trek does offer some excellent optional braze-ons: down tube lever bosses, waterbottle mounts, top tube and derailleur guides.

At present Trek markets primarily in the Midwest. Fully setup bikes start with a Japanese-equipped Ishiwata hi-tensile double-butted frame for \$189.00. A model with Reynolds tubing retails for \$275.00, and an all-Campy Columbus bike can be had for \$780.00. In addition, framesets are now available in the Boston area, Colorado and California.

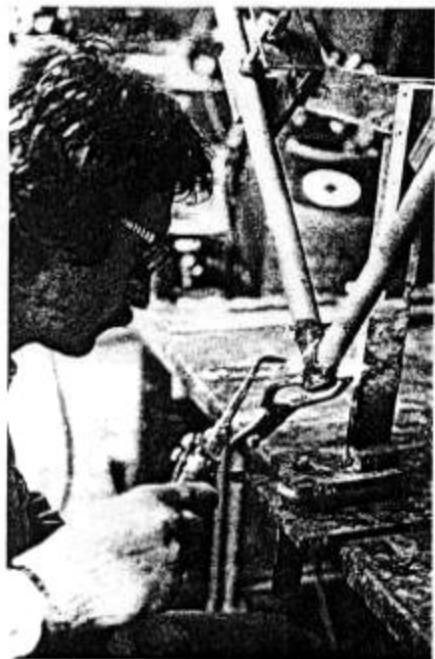
Trek plans to expand their market slowly. Future developments will probably include additional styles and frame sizes. Don't expect anything radical, though. Trek has also been experimenting with ring and induction brazing, but will not consider these alternatives to slower hand-torch methods until the same high quality can be achieved.



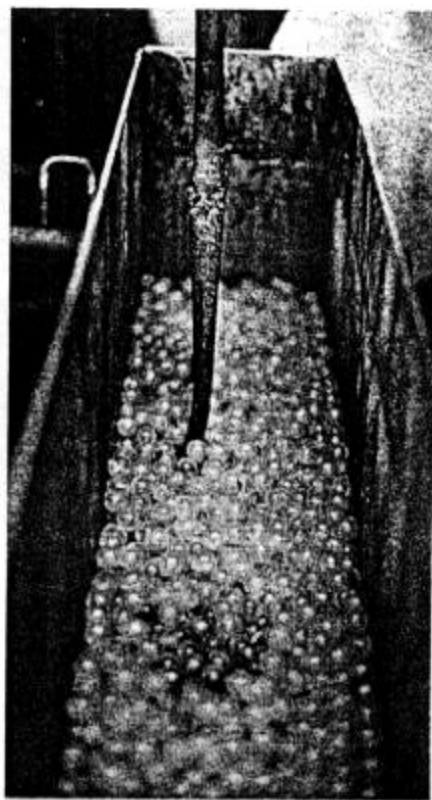
Trek hires senior citizens from rural Waterloo to do their wheel building.



Milling a tube end is a 50-second, no-hands job.



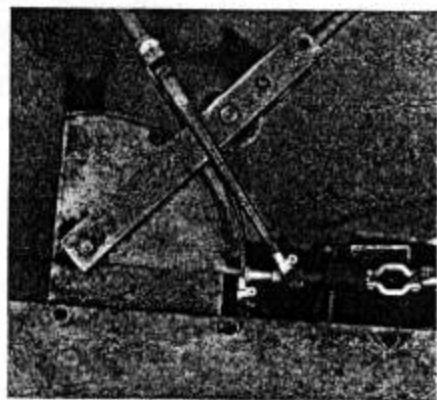
Most Trek employees are in their early 20s and active bikies.



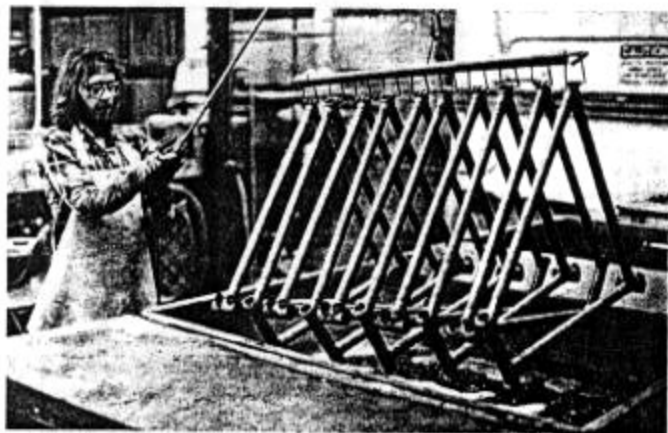
Plastic bubbles floating on top of this tank of paint remover keep toxic fumes from escaping.



An air-driven grinding wheel is used for finishing the frame.



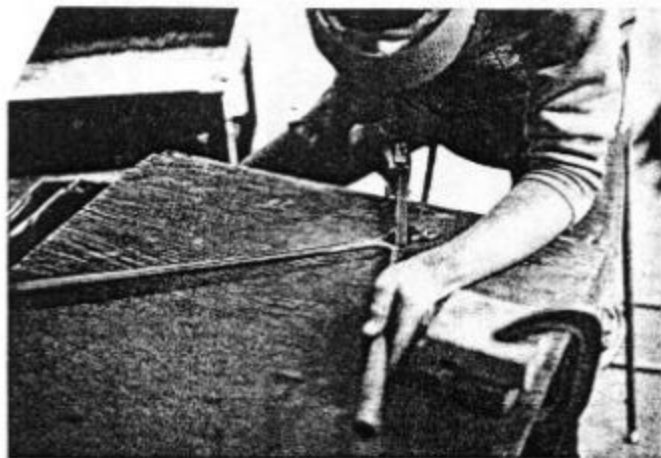
The fork-bending apparatus.



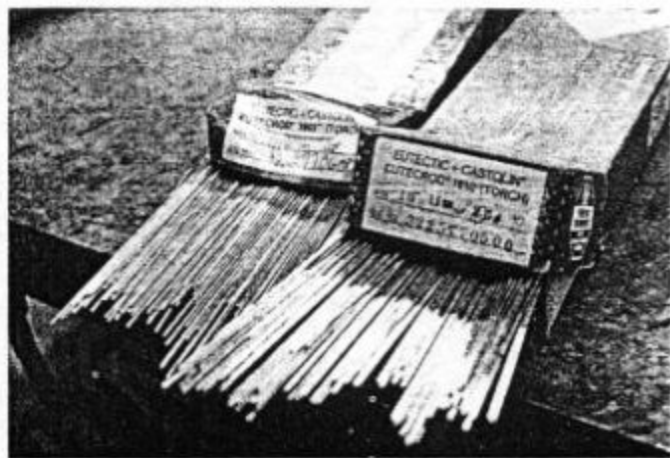
Main frame triangles come out of a hot rinse.



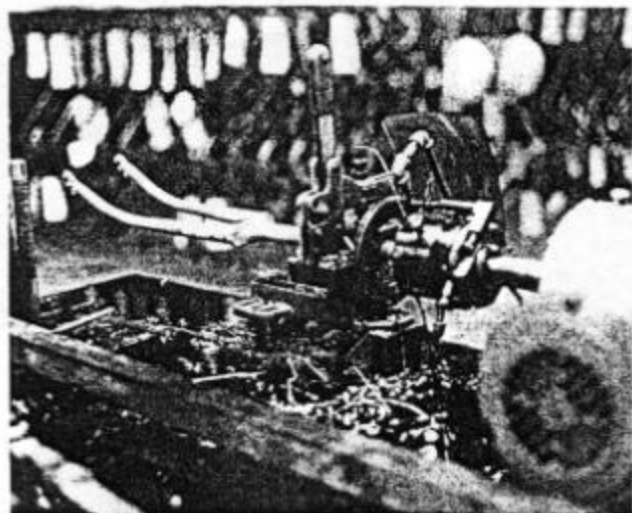
The large, spray booth enables fast, accurate paint jobs.



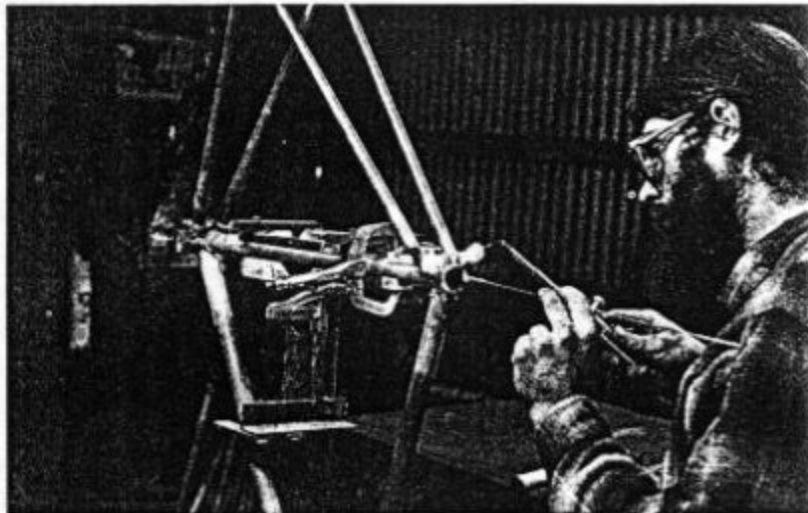
Rear dropout is cleaned with an air-driven Dynafiler.



Each one of these boxes of silver solder cost over \$700.00.



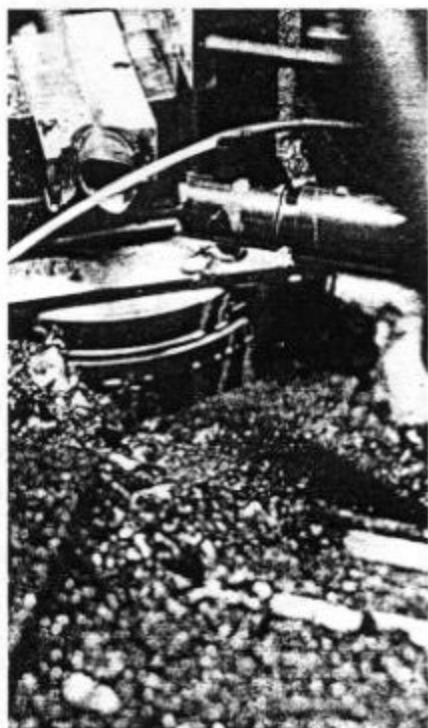
The cutting jaws on this steering tube threader snap open at the end of their automatic cycle.



A brazing jig.

Frame Size	Seat Tube	Seat Tube Angle	Head Tube Angle	Top Tube	Chainstay	Drop	Fork Rake	Wheel-base
19 $\frac{3}{4}$ "	49cm	73°	71°	53cm	44cm	5.5cm	6cm	102.1cm
21"	52cm	73°	71.5°	54cm	44cm	5.5cm	6cm	102.8cm
22 $\frac{1}{2}$ "	56cm	73°	73°	56cm	44cm	5.5cm	6cm	103.5cm
24"	60cm	73°	73°	58cm	44cm	5.5cm	6cm	105.5cm
25 $\frac{1}{2}$ "	64cm	73°	73°	60cm	44cm	5.5cm	6cm	107.5cm

	TX300	TX500	TX700	TX900
Tubing	Ishiwata 0265 hi-tensile. Double butted.	Ishiwata 022 chrome-molybdenum. Double butted. Fork blades new continental oval.	Reynolds 531. Fork blades new continental oval.	Columbus SP/SL. SP exclusively on sizes 24" up. Fork blades new continental oval.
Fork Crown	Ishiwata cutaway diamond top.	Forged semisloping Cinelli type.	Haden Europa investment cast.	Ishiwata SCMM investment cast, chrome-molybdenum, with integral tangs.
Lugs and Bottom Bracket Shells	Nikko Sangyo seamless long-point Italian-cut.	Nikko Sangyo seamless long-point Italian-cut.	Nikko Sangyo seamless long-point Italian-cut.	Nikko Sangyo seamless long-point Italian-cut. Lugs and B/B are hand drilled. Seat lug is integral allen key fastback configuration.
Dropouts	Sun Tour GS-11 forged micro-adjusting.	Sun Tour GS-11 forged micro-adjusting.	Campagnolo 1010 Record Road.	Campagnolo 1010 Record Road.
Finish	Bare metal chemical treatment and rust inhibitor: Oskite Krycoat® 187 Primer: DuPont 825 S Corlar® Epoxy Zinc Chromate Primer. Paint: DuPont Imron® Polyurethane Enamel			
Threading	Bottom Bracket: English 1.370" x 24 TPI BSC. Headset: English 1" x 24 TPI BSC.			
Braze-ons	Standard: Downtube underside stop and chainstay low-profile cable stop. Optional: Full range of custom braze-ons.			
Standard Colors	Metallic dark green, metallic ice blue, metallic medium blue, flame red.			



Closeup shows the just-mitered tube.