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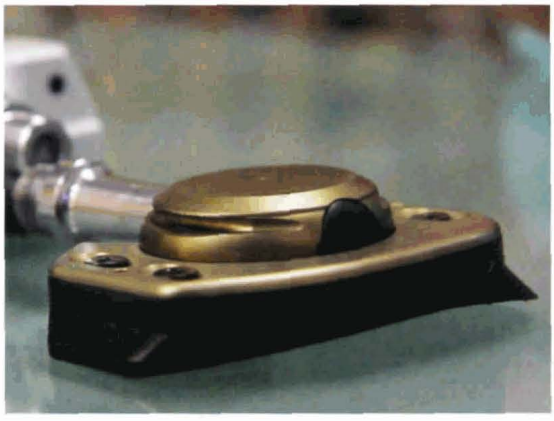
3 COOL BITS [OF DESIGN]

SPEEDPLAY X/2 PEDAL. The first time Jens Voigt saw Speedplay pedals he said, "What is this? A toy?" After trying them, his feedback changed: "I would go so far as to say, I choose my team based on what pedal they run," that pedal being Speedplay. This perfectly sums up Speedplay's rise in cycling. The design of the first Speedplay X/2 in 1992 was so revolutionary, so startling, compared to all the pedals on the market before it, pedals based on ski bindings, that it shocked people. Half the size and weight, it was double sided, increased cornering clearance dramatically, reduced pedal stack, was more adjustable and provided a more secure engagement with no slop in the mechanism. It essentially did everything a pedal is supposed to do and did it much better than anything that had come before. Speedplay has continued to develop that revolutionary design with the latest iteration called the Zero, as well as add entirely new pedal designs, and guess what? It's still better than any other pedal on the market. Just ask Jensie…. *Price in 1992, $155; 207 grams (pair); speedplay.com*



THE ORIGINAL ZIPP 404. The year was 1992. Shallow alloy was state of the art. A small company out of Indianapolis, Indiana, launched an outlandish looking wheel called the 440. It was a 58mm deep, full-carbon tubular that simply changed everything, forever. No one would look at materials or aerodynamics the same way again. Zipp has been developing that 58mm depth ever since into the world-beating 404 we know so well today. Zipp's 440 truly launched the deep-V revolution and the rest of the wheel industry followed. And they haven't stopped following since. NACA airfoils, hybrid-toroidal, wide body—Zipp has pioneered every major aero-rim shape since and the humble 440 started it all. Along with that 58mm depth went a skinny 19mm width, a 16/32 spoke count and a recommended 18mm-22mm tire width. The wheels, tubulars of course, weighed only 1,255grams for a set, still an incredibly impressive number, and cost only $784. That's less than half what a 404 Firestrike front wheel costs today.
Price in 1992, $784; 1,255 grams (pair); zipp.com

KING CAGE BOTTLE CAGES. Sometimes great design comes in humble packages. The King Cage bottle cages are made in a garage in Durango, Colorado, and are still the best bottle cages ever made—have been since 1991. That's no mean feat considering scores of other big brands have taken aim at the bottle cage and produced some great cages in carbon, injection-molded plastic, stainless steel and a bevy of other materials. While many of those cages do their job well, none have improved on Ron Andrews' original design. Using a series of homemade jigs, his Ti King Cage is made in about 30 seconds with eight lever throws from a 27cm tube of 3-2.5 Ti. After a couple quick welds and some finish sanding it's ready to go at only 28 grams and $60. The Stainless Steel cage weighs only 48 grams and costs just $18. They hold bottles securely over terrain that is barely rideable, from the pavé of Paris-Roubaix to nasty DH trails in the Pacific Northwest, and won't mark up your bottles either. King Cage also makes a cool flask cage and a bunch of other unique products. *Today's prices: $60 (Ti), $18 (Stainless); 28 grams; kingcage.com*

THE MOST AERODYNAMIC PEDAL SYSTEM. PERIOD.

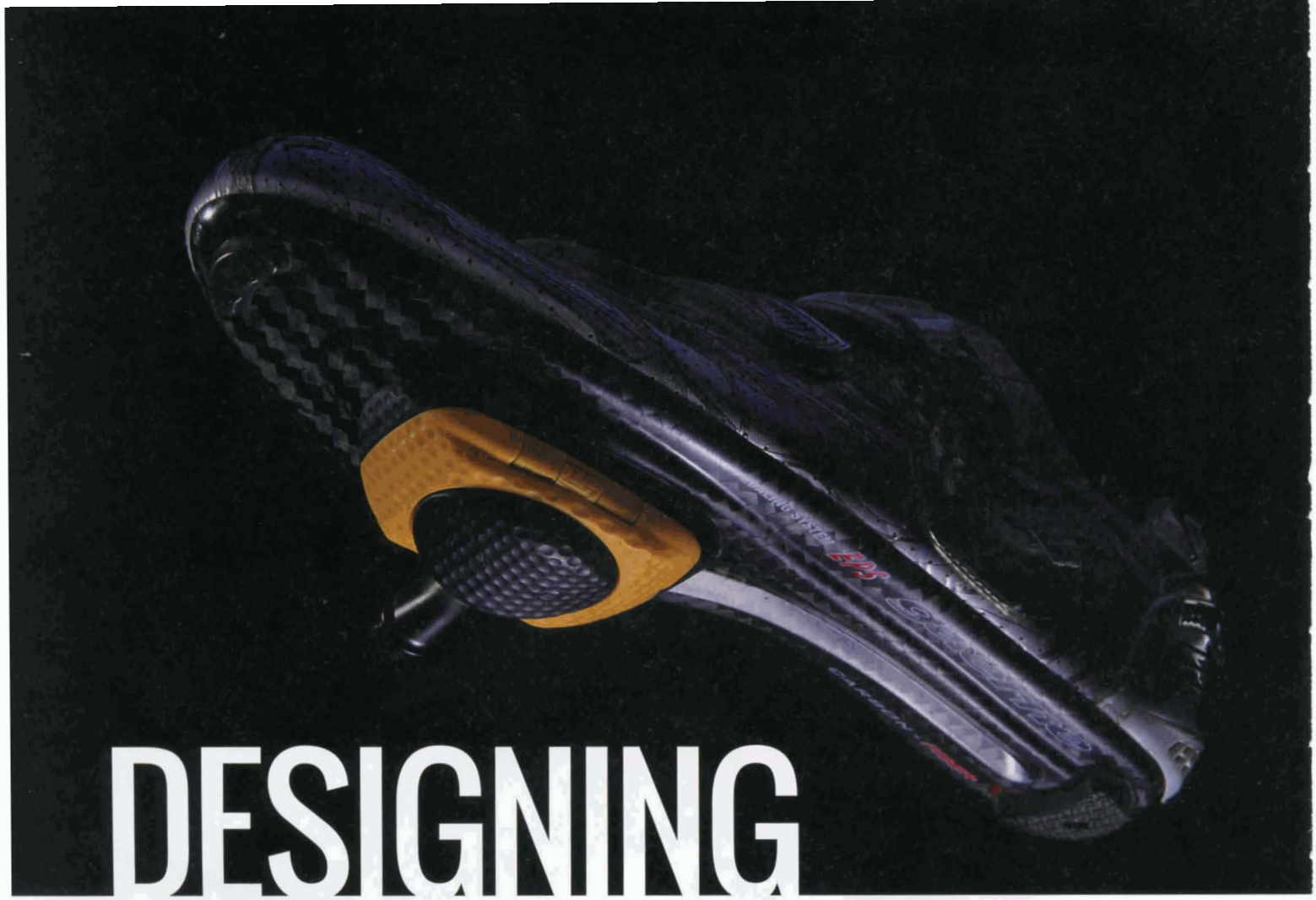
Pedals of the 2015 UCI Hour Record of 54.526 km

As its name suggests, the Speedplay Zero Aero Pedal System is designed to increase speed by slashing wind drag. With its tiny frontal area, dimpled surface and streamlined profile, every aspect of the Zero Aero design has been optimized to boost speed. Made for Time Trials and Triathlons where seconds count, the Zero Aero provides more speed with the same power – that's why it's called free speed! To learn more, visit **Speedplay.com**.

SPEEDPLAY

Zero Aero Pedals include Zero Aero Walkable™ Cleats.

Hand assembled at Speedplay in San Diego, California



DESIGNING SPEED

[SIR BRAD'S ZERO AERO PEDALS]

In mid-2014, before Bradley Wiggins had officially announced his world hour record attempt, I chatted with Richard Bryne, inventor and co-founder of Speedplay pedals. He told me that if Wiggins went for the hour there would be "no more meat on the bone." Bryne meant that with Wiggins' track background and British Cycling's technological machine behind him, anyone attempting to beat Wiggins would not be able to find free speed in technological or aero advantages. Little did I know at the time, but Bryne and Speedplay would be a big part of scraping that meat off the bone. When Wiggins went 54.526 kilometers in a single hour on June 7, he was the first rider to pedal the new Speedplay Zero Aero in anger.

"Ironically, the first rider that I showed the prototype Zero Aero pedals to was Bradley Wiggins," Bryne remembers. "Bradley has ridden Speedplay pedals for about the last six years so I suggested he could use the new Zero Aero pedals to go after the UCI hour record. He downplayed his interest in the hour at the time but seemed very keen to try the Aero pedals. A few months later I got a call from Bradley's equipment manager asking if Speedplay would provide the new Aero pedals for his hour attempt. We agreed that Bradley would be the very first rider to use them."

The new Zero Aero can trace its roots back to 1996 and the U.S. National Team's Project '96, designed to deliver medals at the Atlanta Olympics. Dr. Chester "Chet" Kyle had put standard Speedplay pedals in the wind tunnel and found that they delivered an advantage similar to a disc front wheel versus a standard front wheel when compared to other clipless pedals of the day. Bryne filed this info away for future use.

"We knew aerodynamics was finally becoming a serious product differentiator, so we set out in 2013 to replicate the aero pedal tests Chet had told me about in 1996," Bryne says. "We started by building a special human-like robotic mannequin with articulating joints that could pedal a bicycle just like a human rider would in the wind tunnel. The mannequin was the key to the accuracy of our wind-tunnel test. We confirmed Chet's results and proved just how important a role pedals play in the overall drag of a cyclist. The difference between Speedplay pedals on four-hole shoes with covers versus Look or Shimano pedals on shoes with covers was equivalent to 33 seconds per hour at a speed of 30 mph. So we then set out to improve the already great aerodynamics of our pedal system. The result of that effort is the new Aero Zero pedal system."

During this development Speedplay was also developing a walkable cleat that featured a curved rubber cover to provide traction and a natural walking gait. It didn't take long for Bryne to realize that co-developing the Aero pedal with the new cleat could reduce drag even further, creating the most aero pedal system possible. How fast? While specific wind-tunnel tests have yet to be conducted Bryne estimates the new pedal is worth about a minute at Wiggins' hour-record pace. Put it this way: If a rider attempts to beat 54.526 kilometers and is under contract to ride, say, a Shimano pedal, he needs to ride like he has only 59 minutes to do it.

Of course, Wiggins got a hot-rodded version of the Aero Zero built by Bryne himself. "To me, it is a huge honor to be involved in record attempts—especially the legendary hour record," he says. "For this event, I personally built and prepared the pedals. I will not divulge what I did with Bradley's pedals but I can assure that the pedals I made for him were absolute pull-out-all-the-stops, race-tuned, special editions." *speedplay.com*