



# OLD VS NEW

Can better bike design explain today's faster race times? Is retro riding a return to bicycle basics or simply dewy-eyed nostalgia? *ProCycling's* unique head-to-head test finds out...

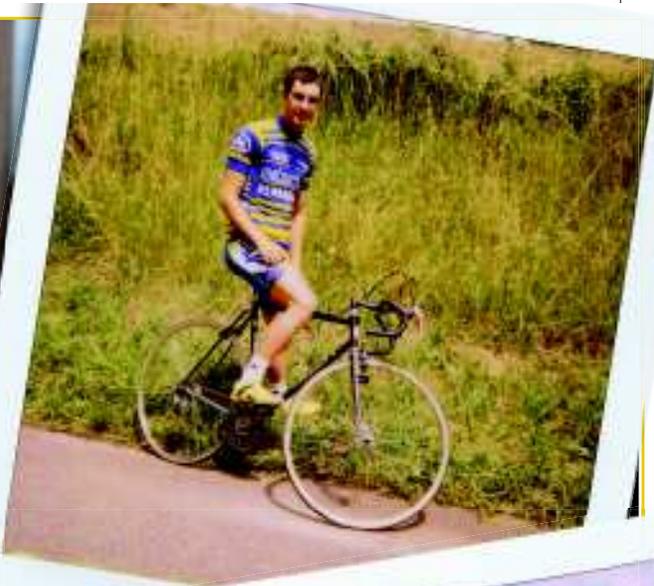
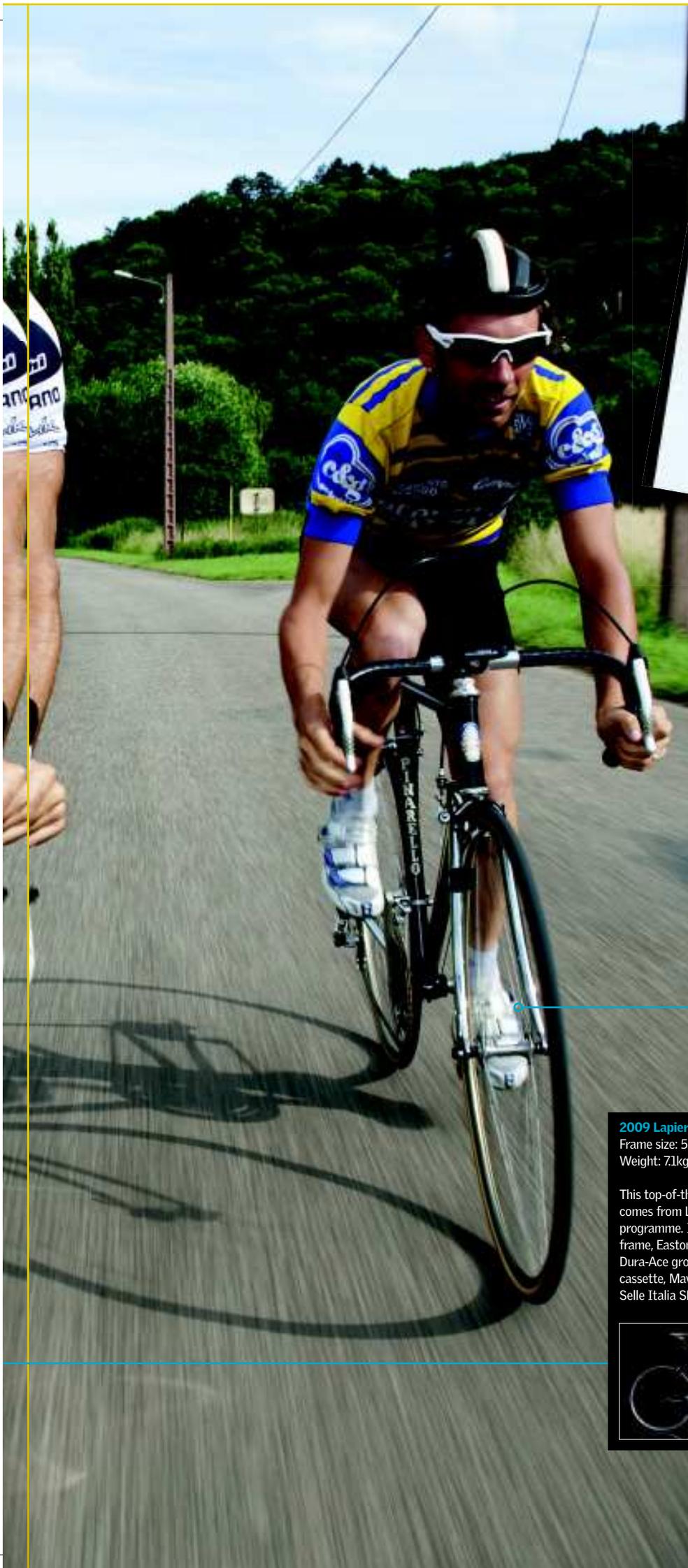
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**T**hese are some of those questions that every cycling fan must have pondered at least once. How have advances in bike technology affected performance? Could Alberto Contador ride this year's Tour on a bike made in the 80s? Can differences in weight and flex account for the increase in average speeds over the last 30 years?

While we can't zip through time, we did manage to persuade leading French sports physiologist, Fred Grappe, to conduct a test comparing an 80s racing bike with a modern one. "The difference has never been tested

scientifically," he told us, his curiosity aroused. Grappe was a serious amateur track rider in the 80s and these days is coach and technical adviser to the Française des Jeux team. So he's not only familiar with bikes from each decade, he also has a profound understanding of bike racing and its demands, both physical and mental.

Our test bikes are a 1983 steel Pinarello and a 2009 carbon Lapierre. The Pinarello comes equipped with Italian parts from the era including a Campagnolo Super Record groupset with a six speed freewheel. The Lapierre is a top-of-the-range X-Lite II frame



#### 2009 Lapierre

Frame size: 55cm  
Weight: 7.1kg

This top-of-the-range X-Lite II comes from Lapierre's Web Series programme. It features a carbon frame, Easton EC90 fork, Shimano Dura-Ace groupset with 10 speed cassette, Mavic R-System wheels and a Selle Italia SLR Carbonio saddle.



#### 1983 Pinarello

Frame size: 54cm  
Weight: 9.6kg

An unused 1983 steel frame was built up with vintage parts including a Campagnolo Super Record groupset, gold anodized downtube shifters, a gold chain, drilled-out brake levers and a Cinelli wedge saddle. The wheels feature very early lightweight rims made by Assos.



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Writer Isabel Best and French coach Fred Grappe



SRM cranks provide the raw data...



...although the riders don't get to see it



The test run is a 3km run with a 7.2% gradient

sporting a Dura-Ace groupset with a 10 speed cassette.

After agreeing to the challenge, Grappe drew up a formal test protocol for this test day. Six top amateur riders will ride each bike time trial-style (at anaerobic threshold or 95-97 per cent of their maximum heart rate) up a 7.2 per cent climb of 3km. Grappe will record objective, measurable parameters of power, cadence, speed and heart-rate on the climb. He'll then send each rider out for a further 30 minutes to get their overall subjective evaluations on bike handling, rigidity and comfort.

Both bikes are equipped with SRM PCVI cranks while riders will be asked to rate the subjective parameters on a scale of 1 to 10, with 1 meaning 'very difficult to manoeuvre', 'soggy, no reaction when standing on the pedals' or 'very uncomfortable' and 10 signifying 'easy to steer and take good trajectories', 'solid, nervy, very good reaction to accelerations' or 'very comfortable'.

Our riders are mainly from CC Étupes, a top French DN1 team coached by Grappe's assistant on our test, research student Julien

Pinot. He has the skinny looks of a cyclist and reveals that he'd ridden for Étupes until a freak virus damaged his heart a couple of years ago, cruelly cutting his cycling career short. The club is currently leading the French Cup rankings and though our riders are technically amateurs, they include one current world champion and several riders for the French national team.

THE TEST TAKES place in Besançon, home to Grappe's research department at the University of Franche Comté. The ancient fortified city is nestled in a bend of the Doubs river, surrounded by the foothills of the Jura mountains. It's a regular stage town in the Tour de France. We meet Grappe, Pinot and our first two riders of the day, Mickael Jeannin and Geoffroy Soupe, at the foot of a 3km climb up to the Fort de Planoise, a beauty spot with stunning views over the city.

As we unpack the Pinarello from its box, there are gasps of admiration for the lovely vintage details and Grappe goes a bit misty eyed. "I used to ride with a gold chain too,"

**"The difference between an 80s racing bike and a modern one has never been tested scientifically"**

he sighs nostalgically. He tells riders how in the past, you'd change your freewheel with every race, working out the ratios best suited to a particular course. I'm reminded of passages in Tim Krabbé's cult 70s novel *The Rider*, where the narrator agonises before the race about which freewheel to deploy. With the gear shifters on the downtube, it also takes more than an instinctive finger twitch to rectify a mis-judged shift on a climb.

Our riders have arrived on their own bikes so are already warmed up. While Pinot adjusts their saddle heights and handlebars according to their existing set-ups, Grappe briefs them on the tests.

The riders' computers have been set so they get no data on how they're riding – no cadence, speed or heart rate. Instead, they have to ride at what they feel to be their



## Classic retro

It's one thing to say, "Let's test an 80s bike against a modern one" but another thing to actually make it happen. A proper comparison demanded two bikes in optimum condition, including a 25-year-old model with original fixtures and fittings. Where could we find one? And would any retro-fetishists owner let us actually use their museum piece?

Luckily, a new shop called Tour de Ville came to our rescue. Open since December and based in an old paper mill in Hackney, London, the shop specialises in building up retro frames with rare vintage parts. Tour de Ville's founders Jos van Veldhoven and Keith James were quick to enter into the spirit of this test. It probably helped that van Veldhoven was a serious amateur rider in his native Holland, riding as an under-23 Espoir for the famous Farm Frites feeder team and racking up more than 100 victories in five years. In 2006, he moved to the UK where he quickly earned the moniker of "fastest courier in London" thanks to performances at the Smithfield Nocturne and the Good Friday track meets.

Tour de Ville is a response to London's booming bike scene and the growing interest in retro steel frames triggered by the fixed gear phenomenon. Since these sought-after steel frames are relatively cheap and easy to come by in Holland and Belgium, so that's where Tour de Ville source theirs.

Tour de Ville's biggest customers, however, are not trendy kids buying into courier culture, but nostalgic older guys who were racing in the 80s. "Now they're older, they're finally buying what they couldn't afford when they were racing."

When we took delivery of the test bike, we asked van Veldhoven what he thought the test would show. "I think there'll be a surprisingly big difference," he said. "It's a steel bike so it will weigh at least three kilos more. On average, you lose five watts per kilo so that could mean a loss of 15-20 watts. There are fewer gears and more flex too. I think your tests will show that apart from aesthetics, the old bike will lose on every count."

**Visit Tour de Ville at:**  
**50 Lamb Lane, Hackney, London**  
**Info@tourdeville.co.uk**



Fred Grappe and assistant Julien Pinot get the facts



This creation belongs in an art gallery



The Lapierre's saving rotating weight with Mavic R-System wheels



Noughties bling: carbon seatpost



Skinny saddle was widely questioned

## “Excellent” and “responsive” are sufficient shorthand for the Lapierre

lactate threshold level. To even out any bias of first impressions, half the riders try the Pinarello first, the other half the Lapierre. Each of the riders also set out on their own so they won't be tempted to ride at an incorrect pace.

Our only concession to modernising the Pinarello, apart from fitting the SRM cranks, is to allow riders their own pedals. While it would have been more appropriate (and entirely authentic) to test with traditional clips and cleats, sourcing so many pairs of vintage footwear simply wasn't feasible.

FROM THE OFF, there's little doubt about which bike the riders prefer. “I had to fight the bike the whole way up the climb!” Jeannin gasps, looking rather wound up as he hands back the Pinarello. Subsequent riders get even more emotional. “It's nil! Worth nothing! Zero!” spits Morgan Kneisky.

Kneisky, who can boast of having beaten Mark Cavendish with his track world championship Scratch race win this year, looks visibly relieved as he sets off back up the slope on the Lapierre. His shoulders relax as he rises over the pedals. “It's very psychological,” Pinot smiles, as we watch him dart up the lane.

The Lapierre hardly gets any comments. “Excellent”, “very stiff” and “nicely responsive” are sufficient shorthand, while the riders don't hold back when describing the Pinarello's shortcomings.

Flexibility is a dominant issue, but in surprising ways. It's not just the slender steel frame that's lacking stiffness, it's also the elegant quill stem, the hand-built wheels and the steel forks. As riders set off *en danseuse* you can actually see the whole bike flex.

This doesn't just affect climbing or sprint efforts. On the descents, the riders struggle >

## Old or new? The riders decide



**Geoffrey Soupe**  
Aged 21, 1.77m, 67kg  
Club: C.C. Étupes  
Riding style: All-rounder.  
Rides for the French

national team.

**Lapierre:** “Excellent handling and rigidity – easy to find your trajectory on descents and very reactive standing on the pedals.”

**Pinarello:** “Perhaps because of the higher handle bar set-up, I had an odd sensation of going quite fast on this, even though I know I wasn't.”



**Mélanie Guerrin**  
Aged 28, 1.69m, 57kg  
Club: V.C. Ornans  
Riding style: “Amongst women riders we're not

so specialised”

**Lapierre:** “It felt good, it was pretty stiff.”

**Pinarello:** “It's completely different to what I'm used to. It felt soggy and unresponsive when I was standing on the pedals.”



**Thomas Bouteille**  
Aged 28, 1.84m, 82kg  
Club: C.C. Étupes  
Riding style: Sprinter.

**Lapierre:** “I didn't like the saddle – it was too hard.”

**Pinarello:** “The lack of stiffness didn't really bother me. I found the forks more of a problem – it was hard to place the bike on the corners when descending.”



**Thibaut Pinot**  
Aged 19, 1.80m, 64kg  
Club: C.C. Étupes  
Riding style: Climber. Rides for French national team.

**Lapierre:** “It's very light but I found it far too stiff.”

**Pinarello:** “You just can't descend at 80kph on a bike like this.”



This work of art belongs in a museum



Shifters look great but feel dangerous



80s bling chain and six speed freewheel



Time-shifting: Super Record groupset

with the spongy Pinarello. "If you go too fast on the corners and don't pick a good line, it's very hard to rectify," Soupe reports.

Other unnerving factors on the descent include the tricky issue of having gear shifters on the downtube. "It was very dangerous. I couldn't let go of the handlebars to change into the big ring because the bike was jumping all over the place," Kneisky explains. "The brakes were also very slow to respond."

The one thing all the riders praise, however, is the retro Cinelli wedge saddle. "I'd give it an 11 out of 10," Jeannin tells us.

Top amateur female cyclist Mélanie Guerrin happens to be driving past and asks

## "I had to fight the bike the whole way up the climb!" Jeannin gasps as he hands back the Pinarello

what we're up to. A meter reader for the French electricity board, she has her afternoons free for long training sessions but can never hope to turn pro as "there are no women's pro teams in France," she laments.

Since she lives just down the road, we persuade her to add a female perspective. While she initially suspects that it's a case of mastering the awkward gear shifters, her verdict after riding both bikes varies little from the others'. Riders of the past "must have had a hellish time," she grimaces. "They deserve more respect than us."

THE NEXT DAY, Grappe sends us the stats and we discuss his key findings over the phone. It's already clear from talking to the riders that the Lapierre wins on handling, comfort and rigidity. Averaged out, their perceived rate of exertion ratings show that flexibility was the most significant variable. The only instance where the Pinarello scored higher was for the saddle.

"Saddles may have evolved in terms of weight but in terms of comfort, they've got worse," Grappe comments. "When you consider a rider does 18-20,000km a year, you can understand better why his saddle can cause problems," he adds, suggesting that modern saddles might also be related to an increase in buttock and back problems. "At the very least, this is worth looking into."

Grappe points out that there was virtually no difference between riders' heart rate and cadence on each bike, indicating "the test was well standardised." Differences in riders'

## Old or new? The riders decide



**Mickael Jeannin**  
Aged 22, 1.76m, 70 kg  
Club: C.C. Étupes  
Riding style: Track, rouleur/  
sprinter. Rides for the French  
national team.

**Lapierre:** "It's very rigid. When you're standing on the pedals, you don't feel like you're losing any energy veering left or right - it goes straight ahead."

**Pinarello:** "You don't feel in control of the bike when you're descending. You also have to brake harder and longer. After only descending 3km, my hands are already feeling tired."



**Morgan Kneisky**  
Aged 21, 1.73m, 67kg  
Club: AG2R feeder team  
Riding style: Track and sprint.  
2009 Scratch World  
Champion for French national team.

**Lapierre:** "Stiffer and more responsive than the Pinarello."

**Pinarello:** "Because it was so flexible, I had to use my arms more to control the handlebar. The saddle is not bad though."



**Sebastian Gredy**  
Aged 29, 1.73m, 59kg  
Club: C.C. Étupes  
Riding style: Climber

**Lapierre:** "I liked its stiffness, especially when I was standing on the pedals, it was very responsive."

**Pinarello:** "The saddle is good and the geometry suited me but the brake hoods are too small and hurt my wrists."

speed and power output can therefore be compared at face value, knowing effort on each bike was equal.

The key finding comes from comparing power output on each bike. "Because of the stiffness of the Lapierre, the riders were capable of providing 10 watts more in an intense time trial type effort," Grappe tells us. "Being less rigid, the Pinarello absorbed ▶

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Mélanie Guerrin offered a female perspective



3.1 per cent of the riders' energy which couldn't be used to propel the bike forward. This translates as a gain of 0.7kph on a climb and resulted in an average 18 second difference between the bikes."

Grappe calculates that on the final 18km ascent of the Galibier, which has the same average gradient as our test climb, there'd be a difference of 2-06 between bikes.

### "People haven't properly taken into account how equipment has changed since the 80s"

"In my opinion, the differences would be even greater descending than climbing since the riders braked more on the Pinarello," he says, estimating a difference of as much as 5kph in average speed. While we didn't measure riders' performances on the flat, he is confident that there would be further significant differences, particularly given the Pinarello's less aerodynamic set up.

Based on our findings, Grappe ventures a rough estimate that overall average speed differences between both bikes in the Tour de France would be "not less than 3-5kph."

At this point we bring up some interesting statistics. In 1983, Laurent Fignon won the Tour de France with an average speed of 36.23kph. Last year, Carlos Sastre won with an average speed of 40.492kph. Even last year's *Lanterne Rouge*, Wim Vansevenant, rode faster than Fignon, with an average speed of 38.76kph.

"There you have it," says Grappe, with the satisfaction of a puzzle solved. "A difference over 25 years of 4kph."

Commentators frequently attribute these dramatic differences in speeds to doping, especially since they coincide with the rise of designer drugs in the 90s. But given the results of our experiment, isn't it possible that these changes actually have a lot more to do with improvements in equipment?

"Evidently, doping has had an impact on average speeds but not on its own," Grappe argues. "For example, if you're doped and you



ride the Pinarello, you're still not going to take the descents faster than on the Lapierre.

"Here you have a study which could revolutionise things," Grappe ventures. "I would even suggest that you can attribute 60 per cent of that difference in average speed to equipment, 30 per cent to training methods and only 10 per cent to doping."

"People often talk a lot of nonsense," Grappe continues. "It's too simplistic to say it's all about doping. People haven't properly taken into account how equipment has changed. Even our riders were surprised by the differences. It seems as though we've ►

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already forgotten what bikes were like to ride 30 years ago.”

The evidence is clear that new bikes have contributed to much faster speeds. But another theme also emerged from our test – that with their more awkward bikes, cyclists of the past had to be technically more skilled. Riders had to use their arms more and be better at anticipating gear changes and braking. They had much less room for error on descents. Like a modern carving ski, it's clear that contemporary bikes require less 'bike craft'. Modern bikes may transfer all the road shock to the rider but they are essentially more forgiving too. You supply the power or pull on the brakes and the bike, it seems, has been designed to know exactly what to do.

For many of our riders, the test generated a new respect for their dads' generation of pro riders. As Mickael Jeannin put it, "They were warriors! I couldn't have done Paris-Roubaix on a bike like that! I can't even imagine how they coped in the Tour. And I'm not even talking about winning, just about getting to the end in one piece!" 

### How did the riders rate each bike?

	Lapierre	Pinarello
Handling	8.4	4.1
Stiffness	9.3	2.1
Comfort	7.0	5.0

Scores are out of 10, and an average of all rider ratings

### How did the bikes compare on timed runs?

	Lapierre	Pinarello	Difference
Time	08-56	09-15	19s
Output (w)	317.6	308.1	9.5
Speed (kph)	18.3	17.7	0.6
Cadence (rpm)	77.7	77.1	0.6
Heart (bpm)	168	167	1

These results are averages of the seven riders' data

Young riders with respect for previous generations of pros



Thanks to Lapierre and SRM for their vital test support. Thanks also to Prendas Ciclismo for the loan of the authentic retro Pinarello jersey.