PHOTOS DAN JOYCE & SAM STREETON

FITTING THE BILL?

A professional bike fit costs around £100. What do you get for your money and is it worth it? Editor **Dan Joyce** tries three to decide

Bike fitting systems have exploded in popularity in recent years. Maybe it's the influence of the MAMIL, wanting to ride 100 miles on a brand new razor blade of a race bike. Maybe it's bricks-and-mortar bike shops reacting to the rise of internet discounters by offering a service that the online sellers can't. Whatever the cause, there's plenty of choice in bike fits. Are they essential, useful, or just snake oil?

I've always been sceptical. After decades of cycling, I can put the saddle, handlebar, and shoe cleats where I want them without a tape measure, protractor, or mathematical equation. And the fitting systems I've read about simply made up rules about how you should sit on a bike based on extrapolations from measurements that happened to work for elite male road racing cyclists.

But I was curious to see how bike fittings worked, and whether the fitters would suggest I do anything differently. I contacted Paul Hewitt, who has been successfully fitting cyclists on his jig since the 1990s, and Trek, whose Trek Fit is based on the long-standing CycleFit system. By chance, I'd also been fitted by Bikefitting.com at a bike show earlier in the year.

TEST SUBJECT

In November and December, I visited Paul Hewitt at his shop in Leyland, Lancashire, and Trek Fit technician Sam Streeton at York Cycleworks. I took my fixed-wheel Ridgeback Solo for Paul and Sam to examine. It's the bike I ride most, for anything from urban errands to 70-mile summer rides. I'm comfortable on it, even pedalling at 150rpm or more.

Like many cyclists, I've got a bad back. In my case, it's because I shattered one of the vertebrae in a fall in my twenties. I was lucky to be able to walk afterwards – albeit with fused lower spine and a slight limp. Nerve damage to my right leg means I can't roll from heel to toe properly on that foot; the front of the foot won't support my bodyweight. On the bike, the back injury affects where I want the handlebar and my right foot presents problems when pedalling.

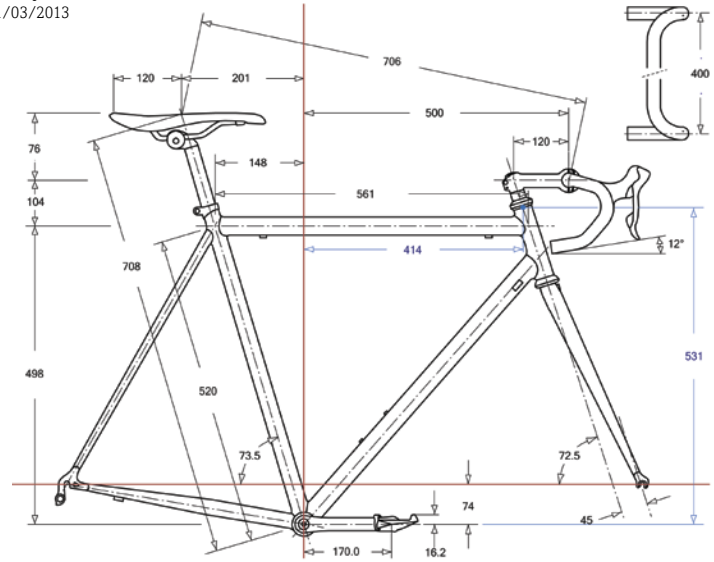
That's why my Solo has a short stem and a short drop from saddle to handlebar: I cannot tolerate a long, low position. The saddle is set back because I felt it helped me to pedal. I've since discovered it's further back than the knee-over-pedal-spindle theory would dictate. But I can't press down powerfully from the 3 o'clock position with my right foot, so depend on being able to pick up the right pedal at 11 or 12 o'clock and drive it over the top. Sitting a bit further back enables me to engage that pedal earlier. It also seems to help when climbing seated. To compensate further for my weak right foot, I use carbon-soled cycling shoes with the cleats set back as far as they'll go.

I decided that I would tell the bike fitters about my set-up choices or injuries if they

In the photos
1 Pedalling and pedalling for the Trek Fit
2 Paul Hewitt measuring saddle setback
3 Paul's jig, with Dan's bike's saddle
4 Bikefitting.com – computer says what?!

Type of Measurement: ROAD RACING SPORT
Cycling Geometry for: XX XX
Measured by: BIKEFITTING.COM
Date: 11/03/2013

bikefitting.com



asked about them. If they didn't, I wouldn't. I wasn't trying to trick them; any bike fit should address these sorts of issues.

FITTING #1: BIKEFITTING.COM

Bikefitting.com now falls under the aegis of Shimano, which is how I came to bump into Ruud Mestrom, of Bikefitting.com, at a Madison trade show. Bikefitting.com has three options: Basic, Standard, and Professional. There's no pricing scale as such. 'Most of our dealers charge their standard hourly workshop rate to perform a fit, but may knock this off the price of a new bike purchase should the customer come back,' I was told. Ruud did the Standard Analysis for me. It took less than 30 minutes.

Like the Basic Analysis, it's based on your body measurements. The Basic fitting measures inseam, torso length and arm length. The Standard fitting also includes height, each foot size, each arm length, and shoulder width. The numbers are fed into the Bikefitting.com computer program, which spits out a diagram with dimensions on it. For the Standard Analysis, you first need to pick one of 12 different types of cycling, which range from Competition Road Racing to Comfort Touring. Ruud and I picked Sport Road Racing – a fair match for my Solo, which also gets used for training on the road and on a turbo trainer.

There was no interview or pedalling involved in the fitting. I stood on a

In the photos
1 Some of the spare contact points next to Paul's jig
2 Saddle to brake lever distance
3 Hewitt Cycles is in Leyland, Lancashire

› measuring jig and Ruud wrote down the numbers; his computer didn't have internet access at the time. Ruud later emailed me the geometry diagram.

The recommendations were a mixed bag. Saddle height matched mine to the millimetre. Saddle setback, as best I can figure it given that Bikefitting.com doesn't measure from the saddle nose, was also the same. The recommended handlebar position was much lower and much further forward. It was, frankly, wrong. I didn't even try to apply these measurements to my bike. I've ridden in this kind of position before and been in pain at 10 miles and in agony at 50.

It's possible that the Standard Analysis won't work for me; I might need to use the more thorough Professional Analysis, which involves pedalling on a jig. It's also possible that Ruud transcribed something incorrectly during the Standard Analysis; we were at a busy bike show, not having a quiet fitting in a shop. But on the evidence of the numbers presented to me, this fitting was a failure.

FITTING #2: PAUL HEWITT

Paul Hewitt began offering bike fits because he builds bikes for people. He wanted to be sure the bike would fit before he built it. It costs £100 for the fitting by itself, plus a charge for labour if you want him to set that position up on your existing bike. If you're ordering a bike from him, however, it's a free service. And whatever kind of fitting it is, it's free to go back and have it fine-tuned.

The fitting jig sits in a corner, underneath

a jersey signed by Bradley Wiggins, thanking Paul for some wheels. At first, Paul and I talked through bike fitting in general terms. His philosophy is to get the saddle and handlebar 'where your body needs them to be' and then find the components and frame that will achieve that.

He's not overly prescriptive. 'A bike fitting is a good starting point rather than the end of the story,' he told me later. 'I don't think there can ever be a conclusive "this is what you should have". But even if you get someone who feels like they're in the most perfect position they can be, they'll still never know if it could have been any better. All you can do is set someone up the best you think they can be, then go from there.'

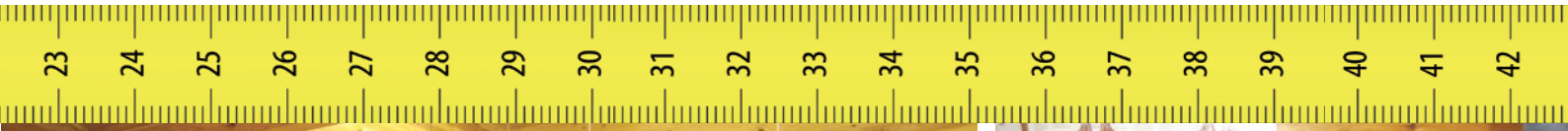
That's what we did. Paul carefully measured my Solo and then transferred those measurements – and the Solo's saddle – to his fitting jig. The jig is more sophisticated than it looks, as it enables the contact points to be moved around independently; for example, Paul can put the saddle up without moving it back, which is what happens when your raise the saddle on a bike with a 70-odd degree seat-tube.

Before I got on the jig in my lycra, Paul queried my cleat choice and position: SPDs, bolted directly to the bottom of road shoes, set back as far as they'd go. I told him that SPDs let me ride any of my bikes in any of my shoes, and that I'd used SPD-SL and Speedplay and not found them better. Paul shrugged, fitted SM-SH40 adapters to the shoe soles to stabilise the cleat in the pedal (and make walking easier), and moved the cleats forward.

I sat on the jig and pedalled. Paul observed. 'Your brake hoods are a bit low on the bars,' he said, 'so you've tilted the bars back. The saddle looks too low; you're pedalling with your heels down. You're sitting far back on the saddle to compensate for it being low. The saddle nose is tilted up slightly…'

I got on and off the jig while Paul adjusted things, using a practised eye and a plumb bob. He uses knee-over-pedal-spindle as a setting guide. ('I know what Keith Bontrager wrote about it, but I've found it works.') He changed things one dimension at time. 'How does that feel? Okay, we'll try changing that by a few millimetres…'

Eventually I was in a position that Paul was happy with and that I could tolerate. Paul then measured the jig and transferred those measurements to my bike. In doing so, he fitted a new, longer stem and a compact handlebar. This increased the reach from saddle nose to bar top but not the distance from the saddle nose to the brake hoods. So



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In the photos
4 After the Trek Fit interview, it was time for the turbo
5 Sam begins adjusting the cleats
6 York Cycleworks: soon to be bigger

"I KNOW WHAT KEITH BONTRAGER WROTE ABOUT KNEE-OVER-PEDAL-SPINDLE, BUT I'VE FOUND THAT IT WORKS"

I wasn't any more stretched out. I was sitting a lot higher. Even deducting the height of the SPD adapters, the saddle was up nearly an inch. I rode the bike around the block. Paul asked me how it felt. Odd, I said, but okay.

On my first proper test ride when I got home, I found the new position awkward. I felt I was stretching too far to reach the pedals, particularly the right one. The right side of the saddle was uncomfortable. I was pedalling with a slower, choppier, up-down cadence going downhills, and struggling to pedal uphill while seated. I was riding 1-2mph slower too, on average.

Further rides reinforced this. I told Paul. 'It is a little difficult from a bike-fitting point of view to know how much of the saddle height feeling high is down to your back injury and how much is down to you being used to, and having adapted to, the position you had before,' he said. 'It's probably a bit of both.

'I think over time you might adapt to a higher saddle height, but if it's causing you problems, then it's probably best to lower your saddle. Try 5mm at a time, until you get it to a position that is comfortable for you, then gradually move it up 2 or 3mm at a time as you get used to the higher saddle height. All the issues you mentioned seemed to point to your saddle being a little low. On the other hand, the final saddle height has got to be at a position you can comfortably manage.'

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FITTING #3: TREK

York Cycleworks have been doing Trek bike fits for three-and-a-half years. Business is brisk and they're about to expand into the property next door, so that they'll have a dedicated bike-fitting facility with motion capture facilities. When I went, it was a shed in the back yard – albeit a very nice one.

I had the Trek Precision Fit, which costs £90 at York Cycleworks. There's also a New Bike fit (£35), which just covers the basics of saddle and handlebar set-up, and a Trek Pro Level Fit (£150, or £200 with optional physiotherapist analysis), which includes the aforesaid motion capture stuff.

Trek Fit technician Sam Streeton began the bike fit by interviewing me. He wanted to know height, weight, age, the kind of cycling I did, how many hours a week I spent cycling, why I wanted to be fitted and – crucially for me – what injuries I had.

Then he did some physiological assessments. Were my shoulders and hips level? How wide were my shoulders? What was my inseam? How big were my feet? (My right foot turned out to be wider but two European sizes shorter.) What were the arches of my feet like? (High.) Were my feet tilted? (A little.) The Trek Fit puts a lot of store in symmetry, in evening out imbalances between each side of your body. 'We can see that you're left-leg dominant just by looking at your leg muscles,' he said.

The assessment also involves flexibility tests. Sam got out a massage table and checked my hamstring range and hip flexion. Trek use a 'traffic light system' for flexibility on the bike, ranging from red (a new cyclist or injured cyclist) through to green (serious recreational cyclist or advanced rider). I was surprised to find myself in the green zone for everything except my preferred handlebar height.

After this, Sam set my bike up on a turbo trainer and asked me to start pedalling. There were pros and cons to this, compared to Paul Hewitt's jig. It was good to be pedalling against resistance, as it felt more ›

natural, but Sam couldn't change anything in isolation.

IF THE SHOE FITS...

As it happened, Sam didn't really change the bike. I'd put the contact points back to how and where they were before I went to see Paul Hewitt. I did this on feel, and the saddle ended up being a bit higher and further back. My shoes still had the SPD adapters, albeit with the cleats set right back.

Sam watched me pedal. And pedal. And pedal. He measured my knee and hip angles with a kind of big protractor and declared them fine. The saddle height was okay; my heels weren't actually dipping below the horizontal when pedalling. Reach to the bars looked comfortable. 'Not short?' I asked. 'Not really. You might try a 40cm or even 38cm handlebar next time you fit a new one.'

The Trek Fit assesses saddle setback both in terms of knee-over-pedal-spindle and the rider's centre of gravity. Sam reckoned I was sitting a bit far back on either scale. 'I might move you 10mm further forward and fit a longer stem to maintain the reach but you seem okay,' he said. 'I've got to be able to justify making a change, and I can't do that. You're in the normal range.'

He elaborated on this by email. 'Your major injuries have a real reflection on what could be achieved in the bike fit, but the amount of riding you currently do shows that something about your bike set-up must be okay. When we got to the nitty gritty of pedalling on the turbo, this was true. You can't ride as much as you have and not have something correct. So the adjustments to your current position were minimal.

'The real benefits were to be had from your shoe set-up. I stacked the right shoe to make the pelvis sit more central on the saddle. I put a wedge in the left foot to address the varus tilt on the foot. I also put in a set of E-soles to support and stabilise the feet in the shoes. From my observations, these remedies had a positive reflection on your pedal stroke, but they can only be determined over time on the bike after the bike fit.'

The 3mm stack that Sam put under the right cleat made some sense to me. Although my legs are the same length, my right foot isn't ankling like the left. 'We can't change what's happened to your right foot,' Sam said. 'You could try strapping up that ankle to see if that helps.'

Test riding the bike afterwards, it felt very natural – no surprise, really, as nothing much had changed apart from my shoes. The E-soles made my shoes too tight for

Trek Fit: handlebars for any shoulder width

thick socks, but were comfortable otherwise.

Right now, my shoes are back to how they were before. That's because I wanted to try the Hewitt set-up some more. I can't honestly say I've missed the E-soles or the very thin wedge under my left cleat. But I'll definitely do some more miles with the 3mm stack under my right cleat.

CONCLUSIONS

The Trek Fit was closest to my preferred set-up, so even though it might be confirmation bias, I'll happily endorse this system. Paul Hewitt is well worth visiting too. We can agree to differ about saddle height, not only because he wasn't adamant about it but because, if I were an ordinary punter, I could just go back to him for free to refine the fit.

After trying out the Hewitt and Trek positions, I set the Solo up again by myself, according to what felt most comfortable. The contact points ended up close to where they started. But I'm using the handlebar, stem, brake levers and SPD adapters that Paul Hewitt supplied, and I'll keep the E-soles and cleat stack that Sam Streeton gave me.

I haven't had any bike fit revelations; perhaps I was wrong to expect any. On the other hand, preparing this article has shown me what I don't believe in. I don't believe in knee-over-pedal-spindle (KOPS) as anything other than a coincidental relationship; it turns out that, excepting my time trial bike, I ride a bit further back than that. (And I now think I know why.) I also don't believe you can be fitted to a bike by a formula: you need a good bike fitter and a bike or jig to pedal on.

The £100 question is: do you need a bike fit at all? If there's something about your bike set-up that you feel needs fixing and that you're not confident of solving, visit a good fitter. The fitter could solve in a few hours what might take you years. Conversely, if you're quite happy with your bike, save your cash. Never forget that the number one authority on your own comfort is you.

BikeFitting.com: website as name
Paul Hewitt: 01772 424773, hewittcycles.co.uk
Sam Streeton: 01904 626664, yorkcycleworks.co.uk – or contact your local Trek dealer.

BIKE FIT BY NUMBERS

	Original	Hewitt	Trek *	Bikefitting.com	Current **
Saddle height (BB to top)	708	734	717.5 (713)	708	713
Saddle setback (nose-BB)	51	48	65 (58)	~ 51	58
Stem length	70	80	75 (70)	120	80
Seat tip to bar	490	509	500 (496)	~ 551	510
Seat tip to lever	652	645	640 (655)	Not known	648
Drop from saddle to bar	20	45	32.5 (25)	76	22
Bar width	420	420	400	400	420
Crank length	170	170	170	170	170
KOPS?	Behind	Yes	Behind	Not known	Behind

* The measurements in brackets are mine, which I took later at home. They differ from Sam's probably due to different methods of measuring. Plus, either or both of us could easily be a couple of mm out on any measurement.

** This, like the Hewitt and Trek fittings, includes Shimano SM-SH40 adapters, which add 2-3mm to the shoe soles.

~ Bikefitting.com doesn't use saddle setback from the saddle nose, so I've calculated this. Accuracy to approx +/- 3mm.