# TECHNICAL/LEGAL/HEALTH YOUR OUESTIONS **OUR ANSWERS**



#### MEET THE EXPERTS-







DR MATT BROOKS Cycling GF



**PAUL KITSON** Partner from Slater & Gordon (UK) LLP



While the ratios of an internally geared hub are fixed, you can move the whole range up or down by changing the chainring and/ or sprocket size

#### ITECHNICAL

# **INTERNAL GEAR SIZE**

I am considering buying a Genesis Fortitude Adventure. It has 29 inch wheels, a 32T chainset and 18T sprocket on a Shimano Alfine 11-speed hub gear. What is the lowest gear on this model? About 16 inches? SHEILA TUCKWOOD

With internal (hub) gears, first you calculate the 'directdrive' gear size in the usual way: Wheel (29) × Chainwheel (32) ÷ Sprocket (18) = 51.6 inches. Then, to calculate the size of any of the gears provided by a gearbox, for example in the hub, you multiply the size of direct-drive by the ratio of

whichever gear you're interested in.

The table at ctc.org.uk/internalgear-ratios has data for every hubgear you're likely to come across. Here you'll see the bottom gear ratio of a Shimano 11-speed hub is  $0.53 \times 51.6 = 27$  inches. (There's no point in decimal fractions unless you've measured the tyres, which on a '29er' could be anything from 271/2 to 31in!) A similar sum with a ratio of 2.15 for top gear gives 111in. So that's the range: much higher than you thought and rather too high, I think, for an off-road adventure bike!

Assuming you're not too strong and heavy you'll probably get away with lowering those gears (without breaking the hub internals) by fitting a larger sprocket. Shimano offer a 20, but that's just tinkering at the edges, or there's a 23 if you also change the chain to 1/8in. This hub appears to be the standard fitting, so Sram's biggest 24 tooth 3/32 sprocket should also fit, perhaps with some different washers to get the chainline correct. That would give a more 'adventurous' 20 to 83in range.

# **CHRIS JUDEN**

#### [TECHNICAL **GPS FOR TOURING**

Is there a GPS system that you would recommend for touring and off-road? My dealer has mentioned the Garmin Edge 800 performance and navigation bundle but I do not really want the performance section of it. I just want to be able to plan routes and save them for future use. MARGARET MCNELIS

See my review of the new Garmin Etrex this issue. It does all you want (and more) without the sporty stuff you don't want.

For maps to put on this device, I recommend those you can download for free - or a voluntary donation - from www.velomap.org. These are based on Open Street Map data. Or if you're more into mountain-biking you might prefer the more sophisticated depiction of paths and tracks provided by the same author on www.



Send health and legal questions to the Editor (details on p28). We regret that Cycle magazine cannot answer unpublished health and legal queries. Technical and general enquiries, however, are a CTC membership service. Contact the CTC Information Office, tel: 0844 736 8450, cycling@ctc.org.uk (general enquiries) or Chris Juden, technical@ctc.org.uk (technical enquiries). You can also write to: CTC, Parklands, Railton Road, Guildford, GU2 9JX. And don't forget that CTC operates a free-tomembers advice line for personal injury claims, tel: 0844 736 8452.

[HEALTH] INR blood tests to ensure the dosage is correct. The INR

I have had to start warfarin medication. This thins the blood, so wounds will bleed more and a head injury can be dangerous. Health officials have suggested that biking is rather risky. My life is built around cycling for utility, sociability and holidays. I wonder what views CTC may have regarding any extra risk posed by warfarin for cyclists, in particular any extra validity in wearing a helmet (I always do anyway)? RUTH FEINBERG

A Warfarin is an anticoagulant used to prevent and treat blood clots in a range of conditions where clots have formed or are likely to form, such as deep vein thrombosis (DVT), pulmonary embolism (PE) and atrial fibrillation (irregular heart beat), and in those with mechanical heart valves.

Although I don't have any figures, the overall risk of cycling while on warfarin is likely to be significantly less than that associated with not treating the underlying medical condition for which it has been prescribed. That said, there is obviously a higher risk of bleeding if you fall off. In most instances, this will mean that you bruise more easily and have to apply extra pressure to any cuts. If you are unlucky enough to suffer major trauma, then there is a greater chance of more serious bleeding.

People who take warfarin require regular

dosage is correct. The INR indicates how thin your blood is in comparison to 'normal' (i.e. somebody not taking warfarin). The desired INR depends on the condition being treated (2-3 is a typical range but a few conditions require it to be higher). It is important to attend all your INR tests as the risk of bleeding is much greater if the INR gets too far above the desired range.

My advice is to keep cycling but take a few precautions. Ride sensibly (downhill mountain bike racing is probably not ideal). Wearing a helmet seems like a good idea, but don't let it make you feel over-confident and take extra risks. Some also advocate wearing additional protective gear like knee padding. This is a personal decision which will depend on your attitude to risk and the type of biking you do.

**DR MATT BROOKS** 





Satnav, where you select a destination and let the GPS unit decide and instruct you how to get there, doesn't usually work very well for cycling due to poor mapping of

minor roads and paths, and because these ways aren't prioritised from a cyclists point of view. But the author of Velomaps has done something clever with the coding that helps a Garmin plot quite sensible cycling routes.

I nevertheless prefer to plan my own, using a website such as **bikehike.co.uk** with OSM Cycle mapping. That highlights the NCN in red and regional routes in blue, but zoom Garmin's Etrex 20 and 30 are cheaper than the Edge 800 and provide touring cyclists with a more suitable selection of features



in and it reveals other bikepaths too (blue dash), plus bridleways (green dash), tracks (brown dash) and even footpaths (red dash). Bikehike also displays OS Landranger, but I find OSM more useful these days. Click out your routes on that with Options for Follow Road set to Open Street Map and Cycling, then name and save the gpx track on your PC. Connect your Etrex by USB and you can simply transfer those files to the GPX folder in its memory. Later you can select any of those tracks on the GPS unit and a wiggly line for you to follow will appear on its map.

To plot routes on PC without an internet connection, install Basecamp, a free planning and management program from Garmin, which will display the same maps (from Velomap etc.) as your GPS.

**CHRIS JUDEN** 



#### ITECHNICAL1

### **TYRES PLUS WIDE RIMS**

Can I fit 28-622 tyres to my existing Mavic A719 700C (622) wheels? They currently carry 32-622 Marathon Supreme but in winter I would like to swap to Marathon Plus to cut the risk of a punctures in the dark and rain. I fancy the 28-622 will take less effort than the M Plus in 32-622. But I could be wrong. ROBIN ALCOCK

Indeed you could fit those tyres - and be wrong! At 28mm they're the narrowest tyres compatible with those wide rims, so whilst they'll fit, they'll adopt a somewhat flattened profile, unresponsive to bumps in the road, so they'll feel even harder and take more effort than they should. To deliver their promise of reduced rolling drag, narrow tyres need to be on narrow rims. If you can pump a wider tyre up to the same pressure, it will actually roll easier!

It's not so much the weight as the stiffness of puncture-proof 'Plus' tyres that make them harder and slower than non-Plussed. The thick layer of extra rubber leaves less sidewall to flex and 'Plus' tyres become even less compliant in narrower versions (and more difficult to fit to rims) due to the shortened amount of flexible sidewall. I would not resort to 'Plus' tyres, even in winter, unless I had a serious puncture problem with thorns, flints or glass on my route. But if I did, I would fit wide ones and pump them up really hard.

**CHRIS JUDEN** 

# [TECHNICAL] **TYRES PLUS SKINNY RIMS**

I bought some 700C wheels, having phoned the company to check that they would be suitable for use on my touring bike, on which I use 32-622 Schwalbe Marathon Plus tyres. I was told the rims would be suitable for tyres up



A Shimano FD-2303 mech is designed for a 10-tooth outer-to-middle difference so will work a 9-speed 52-42-30 triple, despite being meant for 8-speed

to 38mm, but when the wheels arrived, the rim section width was much narrower than my old wheels - around 13mm. I returned the wheels, but I would like to know if it would be possible and safe to squeeze my Marathons onto such narrow rims. **ISLA MARTIN** 

According to the very helpful and definite advice at www. schwalbetires.com/tech\_info/ tire\_dimensions#rim, the retailer is wrong. This says that whilst ETRTO (European Tyre & Rim Technical Organisation) have relaxed their requirements and now permit much wider tyres to be fitted, this permission applies only to rims of 17mm internal width or wider.

That 13mm rim might, perhaps, be strong enough to withstand the higher bursting forces when a 38mm tyre is fitted to a rim that narrow, but the more acute flexing of a relatively wide tyre at the rim edge also has implications for its tendency to chafe at that point. It is unsafe to go against the recommendations of either the rim or the tyre manufacturer.

**CHRIS JUDEN** 

# [TECHNICAL]

# **OUTER-MIDDLE DIFFERENCE (AGAIN)**

I've replaced the chainset on my 9-speed winter bike with a triple, Shimano FC-5503 with 52-42-30 rings, then bought an

FD-5603 from a friend, Although I knew this to be a 10-speed triple mech, I thought it would work. But as you will know, when the outer plate is set correctly (just clearing the outer ring), the inner plate hits the middle ring. So my question is: what is the part number of the correct 105 or Ultegra mech, as I cannot find a chart that makes this clear?

**KEITH LEONARD** 

You've provoked the demon of outer-middle difference, that almost secret property of triples and their matching mechs, with which one messes at one's peril!

Basically, you need the same number of teeth difference between outer and middle ring as the triple chainset that comes in the same groupset as the mech. Previously that was usually 10 teeth, but now it's usually a bit more. On the road: Sora, Tiagra, 105 are now 11T, whilst Ultegra and Dura-Ace have a heroic 13T difference (don't go there)! MTBs have mostly gone to 12T, with a consequent reduction in middle ring tooth height and downshift performance.

An older 105 mech, specifically FD-5503 or 5504, will work, but old mechs tend to have worn-out cages. The entry level (8-speed) 2300 group still has a 10-tooth outer-middle difference, so a new FD-2303 will do. Otherwise you'll have to change one of those chainrings to 41 or 53.

**CHRIS JUDEN** 

# [TECHNICAL]

## **CHAIN LENGTH ON** 8-SPEED

How is the right chain length determined for a single chainring at the front to an 8-speed rear cassette? DAVE GALLIMORE

Chain length seldom needs to be determined with any precision when there's only one chainring. But if you want a rule, I would make it so the cage is approximately vertical (i.e. one pulley directly below the other) when engaged with a sprocket on the big side of middle, i.e. 4th gear out of eight or nine, 3rd out of seven.

**CHRIS JUDEN** 



The thick layer of springy rubber in a Schwalbe Marathon Plus tyre limits punctures but also sidewall flex, especially in narrow