

Cycling answers

Your technical, legal and health questions answered by CTC's experts

THE EXPERTS



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■ BATTERIES CHARGING LIONS

Q On page 12 of the manual supplied with my Giant Twist electrically assisted bicycle (pictured) it says, 'For extended storage: Charge the battery to full level.' It also says to charge every three months. And the label on the side of the battery (photocopy enclosed) reads: 'Fully charge Li-ion battery right after use it every time.'

This advice seems to contradict the advice (about rechargeable lights) on page 50 of the Oct/Nov issue of Cycle magazine. I wonder which is correct?

Derek Roberts, Anderby Creek, Skegness

A The photocopy of the label reveals that the battery is made by Sanyo, so I checked Sanyo's Lithium-Ion technical handbook on the internet. It says the same things as my other sources, such as: 'Sanyo recommends that Lithium-ion battery is stored at low temperature and at discharged state unless it becomes over discharged.' Storing this type of battery fully charged (at 20°C) apparently causes a permanent loss of capacity, at a rate of about 2% per month.

Hence the advice in Cycle magazine about lights, which may well be stored for months over the summer. A bicycle on the other hand, is likely to be used several times a week all year round; in



which case fully charging right after use makes perfect sense.

The battery will nevertheless lose capacity, steadily reducing the motor-assisted range of the bike – probably to less than half after two or three years. That's acceptable if you've had plenty of use out of it meanwhile. (Don't buy a replacement battery until you need it, for that will also 'go off'!)

Another difference between batteries for lights (and cameras, phones, etc.) and electric bikes is the voltage and hence the number of cells in series. The former are rarely more than 7.4V, requiring only two, whereas this bike battery is 26V, requiring seven.

Imagine this: you have an almost empty battery, slowly self discharging. One cell has got to go empty first, but with six others still pushing out the electrons it gets dragged head-over-heels into

won't be enough energy left in one cell to damage the other when it runs empty. So you can safely store those when they're flat. But with higher voltage batteries it's essential to keep at least some charge in there as a precaution against over-discharge.

A charge level of 30% is recommended by Sanyo for long-term storage, with a 10% top-up every six months. But accurate partial charging isn't simple. Li-ion chargers start fast then taper to a trickle, typically delivering 80% in the first third of their charging time – however many hours that may be. To convert this into a useful rule-of-thumb: allow 2½ times as many minutes for each initial 10%. So if your battery has a 6 hour charge time: a 10% top-up takes 15 minutes and it'll go from empty to 30% in three-quarters of an hour.

This is too sophisticated for most people. Giant need to give clear and simple instructions and have gone for the lesser of two evils, presumably reasoning that it's better to sacrifice capacity and range in a gradual and predictable way, than to risk sudden death through inadvertent over-discharge. Now you have all the information, you can choose!

Chris Juden

Giant have gone for the lesser of two evils, reasoning that it's better to sacrifice capacity and range gradually than risk sudden death through inadvertent over-discharge

a condition called reverse polarity, which kills it. Then another goes down. You get the picture. It isn't pretty. With two cell Li-ions there

BIKE GEOMETRY TOE OVERLAP

Q I read with interest your reviews in *Cycle*. However, the 'toe overlap' that some bikes have concerns me. I understand it is illegal to sell any bike other than a racing bike with toe overlap. Shouldn't this be pointed out to prospective buyers and indeed manufacturers?

Ray Horswell, Wembury, Plymouth



A I agree that it ought to be straightforwardly illegal to sell a bike where the rider's feet are likely to interfere with the steering; and that is certainly the intention of the relevant clauses in British and European Standards, which are given legal force by the UK's Pedal Cycle Safety Regulations. However: those clauses are riddled with ambiguities, inadequacies and exceptions that give manufacturers and retailers a whole lot of wriggle room: even more wriggle room, I might add, than is generally given to the unsuspecting customer's toes!

As a matter of interest, the clearance required by law amounts, at best, to an English man's size 6 for general purpose bicycles, or a meagre size 5 for racing bikes! And when 'positive foot retention devices' are fitted there is no requirement at all. That's because the only foot retention device envisaged when the standards were first written was a toe-clip, which got caught by another clause to do with the unobstructed movement of steering. This exemption has of course been made into a complete nonsense by the invention of clipless pedals. Everyone knows this but the exemption remains – for the convenience and at the insistence of bicycle manufacturers.

And there's another thing. Clearance between mudguards and tyres is 'as specified by manufacturer'. So that's as close as necessary to pass the standard rather than as far as necessary for safety!

I reckon it would be better to delete this requirement entirely rather than continue with the pretence that the public is protected from this danger. Admittedly no danger exists except at low speed, typically when making a wobbly hill start, or steering around a bike path obstacle or stationary cars. The resulting fall is unlikely to be serious, but could pitch the rider into the path of faster traffic. Has anyone died this way? How would we know? Cyclists just fall off don't they?

Chris Juden

LEGAL ROUGH ROAD RISKS

Q I use a section of unsurfaced road on my commute to work. It is used by cyclists and walkers, plus motorists for access only. It is in a very poor state with deep potholes. It was once a private road built by a local land owner in the 1800s but now serves as a shortcut avoiding busy roads.

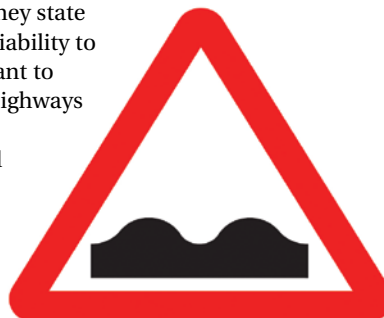
The local council have told me that they have no responsibility for maintenance as it is a 'public highway with unadopted status'. I think it's owned by adjacent landowners, who leave it in a bad state of repair to deter joy riders. Who is responsible for

maintaining this route in a safe condition? And what can I do about it if I have an accident there?

Rob Sayer, Handforth, Cheshire

A If the road has not been adopted by the highway authority then the council are correct when they state that they have no liability to maintain it, pursuant to section 41 of the Highways Act 1980.

If the road is still owned by a single land owner then the relevant authority is the House of Lords



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ruling in *McGeown v. Northern Ireland Housing Executive* [1994] 3 W.L.R. 187. This decision applies to situations where third parties have a right of way over land either through implied licence or expressed invitation.

In this situation the Occupiers' Liability Act 1957 does not apply (under the 1957 Act an occupier has a duty to 'take such care as in all the circumstances of the case is reasonable to see that the visitor will be reasonably safe ...'). In *McGeown*, Lord Keith stated that it would place an impossible burden upon landowners to maintain roads or paths in a safe condition. The House of Lords made it clear that the Occupiers' Liability Act

1957 did not apply.

If the road or path is not owned by an individual land owner and is an unadopted road then again the 1957 Act does not apply. It might be possible to argue that there is a common law duty of care (the House of Lords did not deal with this point in *McGeown*). But I am of the view that such an argument would probably not succeed.

Unfortunately, I am of the view that if a cyclist were to have an accident on the road described there would be fundamental difficulties with pursuing a claim. Furthermore, on the basis of the description of the road it would appear that anybody using the road ought to be aware that it is in a very

poor state of repair and ought to exercise greater care.

Paul Kitson

BIKE ASSEMBLY ALUMINIUM AND COPPER

Q Is copper grease okay for assembling an aluminium seat pillar into an aluminium frame? It says suitable for all metals on the tin. However I seem to remember some talk in the past about it leading to corrosion.

Paul Harrison, Carlisle

A Alumslip, a similar product from the company that makes Copaslip, is *more* suitable, but if they say 'all metals' I'm sure they mean it.

It's true that aluminium and copper react very badly with one another in the presence of dirty water – of which there's no shortage around most bikes! But the amount of oily corrosion-inhibiting chemicals surrounding the tiny flakes of the eponymous metal in Copaslip is probably enough to prevent that in almost all conditions. See www.molyslip.co.uk.

The reason Copaslip is much more widely sold and comes in smaller handy tubes is that it's more suitable for preventing corrosion between steel components, and steel is what most mating parts of most things are made from – except lightweight bicycles. Plus it was invented first, so it's more established in the marketplace.

Chris Juden



HEALTH LOW HEART RATE

Q I am 61 with a resting heart rate 34 beats per minute. Even when I cycle my heart rate seldom goes above 100, by which time I am out of breath and my speed has dropped rapidly.

My heart rate also seems to oscillate quite a bit. My feeling is that if I could get my heart rate higher, more oxygen would get to my lungs and I would be able to cycle faster. I have been to the doctor and am told I do not have a life-threatening condition. But the medical profession has a different view of fitness from the normal 60-year-old cyclist, i.e. I am considered fit by the medical profession.

What can I do to increase my fitness? Should I be concerned about my low heart rate or the oscillation in my heart rate?

Benedict Bate, Edinburgh

A Bradycardia (low heart rate) in adults is defined as a resting heart rate below 60 beats per minute (bpm). However, in very fit athletes this can sometimes be much lower because a more powerful heart muscle can pump the same amount of blood in fewer beats. Tour de France winner Miguel Indurain reputedly had a resting pulse of around 30 bpm. If due to a high level of fitness, a low resting heart rate should still increase to cope with the demands of exercise.

For most people who aren't elite athletes, a resting heart rate of less than 40 bpm is unusual. With increasing age comes a greater chance of an underlying problem, especially if there are symptoms such as chest pain, breathlessness on exertion, dizziness or fatigue. As usual there are several possible causes, some more serious than others. These can include damage to the heart's in-built pacemaker or internal electrical conducting system, side-effects of medication e.g. beta blockers, or an underactive thyroid gland.

A resting ECG which shows the heart's electrical activity can often demonstrate the presence, and type, of any abnormality. Further tests and a referral to a cardiologist may be necessary.

Be reassured that if there is an underlying problem, effective treatments are available – including medication or an artificial pacemaker. As there are several possible causes for your low heart rate, I would strongly advise you go back to your doctor and make sure it's investigated.

Dr Matt Brooks

CONTACTING THE EXPERTS

Send health and legal questions to the Editor (details on p78). 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 7JX. And don't forget that CTC operates a free-to-members advice line for personal injury claims, tel: 0844 736 8452.