

TOURING BIKE BIBLE



Issue 1.06

Full of detail regarding considerations involved in choosing a SOLO touring bike, touring kit and some specific advice on different types of cycle touring.

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Photo courtesy of www.davidmyersphotography.com

See page 43 to discover why being uncomfortable wastes so much energy.



Christine Engert, on her early Thorn Nomad, on the Carratera Austral in Chile. (Christine now has a Nomad S&S.)

**NO PRICES ARE GIVEN IN THIS DOCUMENT
PLEASE SEE INDIVIDUAL BROCHURES FOR PRICES**
A comprehensive INDEX is on page 7



**THORN'S TOURING BIKE BIBLE
GOSPEL ACCORDING TO ANDY B.**



PLEASE NOTE: It's not necessary to read any of this Document in order to buy a THORN BIKE!

The streamlined, individual model PDF brochures can be viewed online, by clicking on the links to them, which you can find on pages **21** and **22**.

For customers who want as much information as possible and to understand the thought processes that underpin our bikes - this highly detailed (and therefore necessarily lengthy) document is for you!

Below you can see one of our new fleet of DEMO bikes.

It has a Rohloff hub.

It's running on top quality 650 x 50b tubeless tyres...

...but it could have 700 x 35c.

It has front and rear disc brakes...but it could have a front V brake.

It could have all manner of accessories.

YOU CAN TEST RIDE THIS BIKE!

Phone 01278 441505 to make the appointment.



**Thorn Mercury Mk3 650b
Size 55L**

Available in 10 sizes and 4 colours.

NOMAD Mk3 650b

With Rohloff (right)

With GRX
derailleurs
(below)

These are both DEMO
bikes,

**WHICH YOU CAN
TEST RIDE**

Both are running on
top quality 650b
Tyres - 55b on the
Rohloff bike and 57b
on the GRX.



Size 55L



Size 55S



Size 55L

NOMAD Mk3 26" Rohloff

With the New Nomad Mk3 26" fork
This is also a DEMO bike,

**WHICH YOU CAN
TEST RIDE**



Size 55L

CLUB TOUR Mk5 700c

(below)



Size 55S

CLUB TOUR Mk5 650b

(below)



Size 61L

THORN AUDAX Mk 4 700c

(below)



Size 55



Size 55S



Size 50L

MERCURY Mk3 700c

We have a fleet of different sizes of 700c Mercury bikes that you may test ride.

MERCURY Mk3 650b

(Right) Running with: THORN 853 Fork, super quality Schwalbe G-One speed 50b tyres, lightweight rims and a front V brake. Surely the most comfortable and most sophisticated Sport Touring Bike on the Planet?



Size 55L

You may test ride this bike and the red 650b Mercury with Disc Brakes on page 2 and compare them.

On the right is the **NOMAD Mk3 700c AB SPECIAL.**



Size 55L

INTRODUCTION

I designed this publication to read like a magazine - once it's printed.

I could've used a different format, which would've made it easier to read online. Unfortunately such a format couldn't be printed into a brochure - well - not using kit that we could afford to possess!

Our printer will only staple 18 sheets of A3 reliably, meaning that I can never hope to have more than 72 pages in any paper document. There's an **INDEX** on page **7**)

I've optimised the photos for viewing online - you can zoom right into them. I'm sorry that some pics look a bit dark, when printed but, if I was to adjust them so that they printed well, they'd be much too bright when viewed online.

I hope that it's evident that the attention to detail, in this brochure, is indicative of the attention to detail present in our Thorn Bikes.

The development of our bikes was a labour of love, rooted in first hand experience - I believe that it shows!

Thorn bikes aren't "blue sky" concepts, aimed, by a committee of accountants, at a poorly market-researched demographic, where 90% of design time is concerned with decals and paint colour.

Neither do we allocate 50% of the budget to be spent on advertisements, which contain precious little, apart from:- Pictures of beautiful bronzed people, with gleaming, polar white smiles, a few clever buzz words and the "artistic" use of blank space!

Our bikes aren't cheap but we believe them to be excellent value for money. Unless you're a serious mountainbiker, or actually race on the road, we're confident that we have the perfect bike for you.

When deciding which Thorn would best suit you and your pocket, it's important to decide how much you plan to carry. Many cyclists carry more weight than they realise, whilst others overestimate the weight that they actually carry. I suggest actually weighing your bags!

On page **23** you will find the **THORN BIKE COMPARISON MATRIX**, which compares the performances of our bikes, with different wheel sizes and different tyres, in a variety of real-world scenarios. I've tried to be as objective as possible. How often do you want to...

...make an extra big shop?

...take a short camping trip?

...drop camping kit off at base camp?

...carry sufficient extra water to cross a desert?

You'll be much happier and you'll be much more efficient at such times, if you choose a bike which will carry whatever you're likely to require, whenever you're likely to require it!

Beware, many touring bikes won't carry as much as you'd think; most only just cope with moderate loads, no matter how exotic their name sounds!

If you've dreams of exploring our planet by bicycle, a Nomad Mk3 would enable you to fulfil your dream, **with the least possible chance of experiencing a mechanical failure.**

You're most welcome to visit us; please ring to make an appointment, we can then have one of our experts available, to give you the time you need, when you arrive.

Please note that it's not necessary to visit; we've sold 1000's of perfect machines, all over the world, by telephone and email.

You're always welcome to 'phone or email our knowledgeable sales team.

Next time you purchase a new bike, or a friend or colleague asks you, as an experienced cyclist, for advice - please remember that - a "proper bike" is nice to ride and... **a bike that's nice to ride actually gets ridden!**

Money may be tight, at the moment but possibly not that

tight?

If you settle for second best now, you'll soon need to make a second purchase.

Buying right means buying once, checkout one of our superb THORN touring bikes!

Please see the links on pages **21 and **22**.**

We're passionate about our bikes and about our customers' satisfaction with them!

We put a huge effort into developing our machines.

We put a huge effort into helping cyclists select the most appropriate Thorn for their requirements.

Our mechanics then put a huge effort into individually building these bikes to the highest standard.

BUT PLEASE NOTE THAT, WHILST WE THINK THAT OUR BIKES ARE BEAUTIFUL - THEY'RE BEAUTIFUL IN A FUNCTIONAL WAY, WHICH WE BELIEVE WILL GROW ON YOU. THESE ARE MACHINES WHICH ARE INTENDED TO BE RIDDEN IN THE REAL WORLD, BY REAL PEOPLE - NOT HUNG UP ON A WALL AND TREATED AS A WORK OF ART.

Customers tell us that their Thorn is the "finest bike they've ever ridden" - we think so too - but it's nevertheless always a delight to hear it!

Please be assured that these are not simply empty words - we GUARANTEE that you will be COMPLETELY SATISFIED with your NEW THORN BIKE or we'll GIVE YOU YOUR MONEY BACK, without question or fuss. (Yes it does happen - but not very often and it also applies to those who have mistakenly purchased them as a work of art!)

Please see page **71 for full details.**

For me, every day is a school day and I sincerely hope that you enjoy reading the Thorn BIKE BIBLE.

Andy Blance Dec 2019

P.S. I'd like to apologise for this FIRST EDITION not being fully finished, before publication.

To make matters worse,

I'VE JUST FINISHED RE-ORGANISING THE PAGES, consequently I'm aware that I've made "un-artistic" use of blank space!

My plan is to fill in these blanks over time. Having blank space ready means that I can make accurate cross references and my colleagues can familiarise themselves with the NEW locations of the various topics and matrices.

I hope that I've found all the cross references and changed the page numbers to suit.

Etymology.

The word **bible** means **book**. Books evolved from scrolls, which have their early origins in ancient Egypt. Papyrus was used for these scrolls - the word *paper* comes from this.

The ancient Greeks gave the name *biblia* to books.

The word **gospel** means **good news**. It comes from the Old English - *god* meaning good and *spel* meaning news or a story, *godspel* literally originally meant good news, which later became gospel.

So we could've had...

Thorn's Touring Bike Book; the good news from Andy B.

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Can GEOMETRY affect a bike's performance?

Geometry can have a profound effect upon a bike frame's qualities in very specific areas, especially when the frame tubes have been correctly selected for optimum performance, with regard to the intended function of the bike.

Can perfect geometry actually make me go faster?

Generally no but there are a few specific examples where it can make a difference.

A team time trial bike, which is as short as possible, yet still controllable, allows the riders in the team to get closer to each other, which certainly gives an aerodynamic advantage. Such bikes are very specialised and, in any case, it's been many years since they were last made from steel.

A bike which **handles superbly** can be allowed to reach greater velocity on descents.

A bike which **carries its load well** and doesn't flex horribly, when pushed hard, will waste less of your energy than a bike which ties itself up in knots. The energy thus saved can be used to increase speed.

A bike which is **comfortable** can be ridden for longer periods at a time, thus its average speed could be higher - perhaps it can also be ridden harder? - see pages **10 and 43**

Can incorrect or unsuitable geometry actually make me go slower?

Clearly the reverse of the examples I gave before will make you go slower - a long wheelbase team time trial bike, a bike which handles badly, a bike not designed correctly to carry a load and an uncomfortable bike will all be slower to ride.

A bike which is so poorly designed, that it's grossly unsuitable for its purpose, can be much slower, in fact it could be infinitely slower - it could kill you!

So head angles and fork offsets make no difference?

Apart from the examples given previously, NO, they can't actually make you faster, that's down to heart, lungs, muscle, technique, concentration, determination and, above all else, aerodynamics.

However the optimum offset varies, not only with head angle but also with chain stay length, top tube length, wheel size, the desired characteristics and the bike's intended purpose.

90 years ago, in the first golden age of cycling, most cyclists were self sufficient - traditional British bikes carried saddlebags, whilst traditional French bikes used large front bags. The purists of the day argued the merits of each style, however French bikes handled badly when using saddlebags, instead of front bags and British bikes handled badly when using front bags instead of saddlebags. Such experiences served to reinforce the Nationally held views and opinions of the day. Luckily for our forefathers, they didn't have internet forums with armchair experts to contend with. Whichever method you chose, to carry your essential kit, was up to you (and, just as is the case today - peer pressure!)

One thing was fundamentally true - in order to carry a load at the front, rather than at the rear, required fundamentally different front end geometry. This caused much confusion, which still impacts on bicycle design to this day.

35 years ago, when I designed my first frame, almost every manufacturer misunderstood the relationship between head angle and fork offset (and the other factors mentioned above) and their effects upon stability and handling. They appeared to follow the commonly held misconceptions. To this day, I can see from other manufactures' information on geometry that around half of them still believe the exact opposite, of what is actually the case, to be true.

I don't give information about head angles. Although we are only a very small manufacturer, we've spent years doing R&D (riding actual bikes) and spent thousands of ££££s acquiring this knowledge for our own cycling, our own satisfaction and for the benefit of our customers - **we back this up with money back guarantees, see page 71 for full details.**

Our customers frequently post superlatives about Thorn bikes on the world wide web - which draws attention from large manufactures - yes, it really is true!

I'm not prepared to provide such an easy short cut for our competitors. Of course rival designers could simply fess up and get their purchasing departments to buy some of our frames and measure them themselves but that involves loss of face, work and expense - although not on the same scale as our original investment!

Head angles and fork offsets are most certainly very important - in fact, I'd say they were critical.

For any given head angle, there's an optimum fork offset, to achieve the desired handling characteristics.

AERODYNAMICS and cycling performance.

At cycling speeds up to around 15 to 20kph* more energy is used to overcome rolling resistance than is used to overcome air resistance. (*The actual speed varies as a consequence of rider position, luggage and tyre choice). The faster you go, the more energy it takes to overcome air resistance. In fact the power required to push you, your bike and your luggage through the air increases as the cube of the velocity.

The following values are what may typically be expected in **still air** and on **smooth surfaces**.

If it took 8W to overcome air resistance at 10kph
 It would take 27W to overcome air resistance at 15kph
 It would take 64W to overcome air resistance at 20kph
 It would take 512W to overcome air resistance at 40kph
 It would take 1728W to overcome air resistance at 60kph

If it took 20W to overcome rolling resistance at 10kph
 It would take 30W to overcome rolling resistance at 15kph
 It would take 40W to overcome rolling resistance at 20kph
 It would take 80W to overcome rolling resistance at 40kph
 It would take 120W to overcome rolling resistance at 60kph

Actual tyre rolling resistance can vary by a factor of 3 or more, so I hope that I've shown that, for the majority of touring cyclists, money spent on **higher quality tyres** pays big dividends.

NOTE: this does **NOT** mean narrower tyres or higher pressures - please see pages **10, 40** and **43**

AIR RESISTANCE is the largest single impediment to rapid progress on a bicycle - how can you reduce this?

If you're a road racer you can strive to obtain a more aerodynamic position and more aerodynamic clothing, at the speeds you're likely to achieve, making bicycle components more aerodynamic will also help to gain a few seconds.

As a touring cyclist you probably have the following choice; either to have a comfortable riding position, or to suffer back and neck pain stoically - content in the knowledge that you're going slightly faster. You can try and avoid flappy clothing - of course you may not want to do this if you're riding in the tropics! You can try and pack your kit into smaller and more aerodynamic panniers. Traditional saddlebags have stood the test of time; they carry the weight inside the wheelbase of the bike; they're very aerodynamically efficient, sheltered behind the rider's thighs and backside; they're also easy to access and use. You can try and avoid using front panniers wherever possible - the small loads that are usually carried in front panniers take a disproportionate amount of extra effort.

NOTE: some bike/rider/luggage combinations require the counterbalancing effect of front panniers.

NEVER compromise stability in the quest for improved aerodynamic efficiency.

A purpose-designed touring bike, with its longer chainstays (which allow a moderate load to be carried entirely at the rear of the bike) is more efficient, when loaded, than a short wheelbase Audax-type bike, which may require 4 panniers, to carry the same moderate load safely.

CONCLUSION

The marginal increases in energy consumption, brought about by small weight penalties, incurred by having a more comfortable saddle, frame or fork are of no real concern to me. They are nothing, compared to losses caused by the poor aerodynamics of the rider and their luggage.

Other than the points I've raised above, not much can be done to make a touring bike more aerodynamic - when you disregard luggage, all touring bikes are approximately as aerodynamic as each other - the same can not be said for the tourists though!

There's often a lot that cyclists can do themselves, to reduce width, in order to achieve a more aerodynamic position.

LESS is MORE

You could simply slow down and relax a little and enjoy the scenery even more - content in the knowledge of how much energy you're saving. Such a strategy will increase the likelihood of you being able to ride long distances day after day after day. Many long distance touring cyclists cover significantly greater distances every day than many sports-oriented leisure cyclists can manage in a one off event.

The late, great, Neville Chanin was very modest about his ability to tour at 200 miles a day (320km). Nev is one of only a handful of cyclists to have documented a lifetime total in excess of 1,000,000km. (Yes, one million!) Whilst Nev could never have been called slow, most cyclists could have caught up with him easily but few were able to sustain his pace - and fewer still were able to hold an intelligent conversation at the same time. Comfort and reliability were the most important attributes of a touring bike to Nev - he owned 2 identical machines - a red one and a green one. Nev rode one, whilst he serviced the other, in readiness for his next adventure.

Does WEIGHT matter?

Steel racing bikes weigh more than alloy racing bikes, which weigh more than carbon racing bikes. We make steel touring bikes, with a lifetime frame warranty - these bikes weigh more than steel racing bikes. There are many reasons for this:-

[1] Customers seeking to purchase touring bikes are generally looking for a bike that's built to last. Our touring bikes use tubes with thicker walls, to ensure a long life. Touring bikes also require more substantial and more durable components, especially saddles - these add weight.

[2] Touring bikes generally carry some luggage, this requires carriers and a frame with attachment points for them. It's also beneficial if tubes with a larger diameter are used, to produce a stiffer frame - this also adds weight.

[3] Touring bikes require wider, longer lasting, more puncture resistant tyres - these are obviously heavier than racing tyres.

[4] Our bikes come complete with securely fitting mudguards - adding any accessories to any bike always adds weight.

A high quality steel racing bike, with good quality kit, wheels and tyres, costing around £3000 may weigh around 9kg. This would give several seasons' service.

A state of the art, carbon Tour de France bike may weigh around 6.5kg and would cost > £10,000. This would need a major overhaul every year. A new cassette could cost over £350.

A Thorn Audax, with a nice quality spec, including mudguards, would cost around £1600 and weigh just under 11kg, and the frame should last a lifetime. If you threw £600 at it you could shed around 1kg. (A subsequent kg would be vastly more expensive to shed)

One of our Rohloff equipped expedition touring bikes, with a full house of upgrades, could cost >£4000 and may weigh around 17kg - we'd expect one to last at least one lifetime.

If you race, you need a racing bike and, if you're any good - not only will someone buy it for you - they'll also pay you to ride it!

If you don't race, why on earth would you want a racing bike? Would you buy a, twitchy and demanding track day car, such as a Caterham, as an everyday vehicle?

It rains in the UK - why would you be prepared to suffer a wet bum and tolerate tyres which puncture easily - or do you stick to smooth but busy, "A" roads?

In the real world, what is the cost, in terms of energy expenditure, of riding a slightly heavier bike?

If you disregard rolling resistance and aerodynamics (which I discuss elsewhere) the equation used for calculating energy is:- **Kinetic Energy (KE) =**

$\frac{1}{2}MV^2$

Thus, a 75kg cyclist, with 5kg of luggage on an 11kg bike, would use on average 202W of power to accelerate from 0 to 24kph (15mph) in 10 seconds - if the same cyclist, wearing the same clothes and riding in an identical position, had a 6.5kg bike and carried no luggage, they could reach 24kph in 9 seconds, from a standing start, for the energy expenditure of 204W.

If you used all the bits from a 6.5kg Tour de France bike on one of our medium sized Audax frames, you'd swap a 1kg frame for a 2.1kg frame - you could use the same carbon fork. This would mean that our Audax bike would weigh 7.6kg. The fact that the components would be unsuitable for use as reliable transport, is irrelevant to this comparison.

Let's see the difference in energy expenditure between a 75kg rider, with no luggage, riding from 0 to 24kph in ten seconds on each of the above bikes.

I will disregard rolling and air resistances, because they will be virtually identical in both cases.

A 75kg rider, on a 6.5 kg bike, would use **181.1W**.

A 75kg rider, on a 7.5 kg bike, would use **183.5W**.

That's less than a 1.31% difference. Once up to speed, given identical riding positions and identical tyres, there's virtually no difference whatsoever in the amount of energy required to maintain this speed - on a flat road - apart from the aerodynamics of the frame itself. A nice, slim steel frame is almost certainly more aerodynamic than a mid range, fat carbon frame - now there's a thought!

In some years, a 1.1kg penalty might've been enough to decide the winner of the Tour in a sprint finish on the Champs-Élysées but, in the real world:-

Q. Could it be that a small increase in weight wouldn't make much difference to your cycling?

Q. Do you agree that saving a small amount of weight isn't worth the many real world costs?

If you can answer:-

"YES", "POSSIBLY" or "PERHAPS" to either, or both, of the above questions - it may be of interest and/or to your advantage to read on.

"I'm old school and I believe that many cyclists still seek a bike that's made to last. I continue to believe that being durable is a positively good thing & durability is generally directly proportional to weight!" Andy B.

Can RIDER COMFORT affect a bike's performance?

It's well documented that I've been a fan of fatter tyres at moderate pressures for many years.

I was convinced that I rode faster/further/longer/more comfortably on such tyres, however I put the further/faster/longer down to reduced rolling resistance - which is partially correct **but I'd underestimated the impact of the most significant and fundamental underlying reason - COMFORT!**

Recent studies have proven that huge amounts of energy are wasted by the human body having to absorb vibration - these losses are referred to as suspension losses.

For example to maintain a constant 16mph on a smooth road

took 183Watts, to maintain the same speed on a rumble strip took 473Watts.

Increasing the tyre width and reducing pressure only used 315Watts on the rumble strip at a constant 16mph.

NOTE: the eagle-eyed will have spotted that the energy used in compensating for suspension losses, on rough surfaces, can be many times greater than is commonly assumed to be lost to rolling resistance on smooth surfaces.

THIS IS GROUNDBREAKING STUFF!
Visit page 43 for more detail and for links to support these claims.

MATERIALS used to make MODERN BIKE FRAMES.

In my opinion, high quality steel is the best possible material for a strong, comfortable, well equipped, and long lasting frame.

I can remember the thrill of owning my first high quality frame - steel of course - all frames were steel then and my new frame was the best available - it was Reynolds 531.

I remember being delighted to find that all that I'd been told about 531 was true, it was lighter, it felt stiffer and yet - it was more comfortable - it was a quantum leap forward from my gas pipe bike.

It was many years before I had the opportunity to ride anything better. When Reynolds applied a radical heat treatment to 531, they produced Reynolds 753. This was a noticeably superior material to 531, it wasn't the quantum leap between gas pipe and 531 - but it was noticeable.

The trouble was that 753 had to be silver soldered into lugs, or fillet brazed, using 50% silver.

When Reynolds devised a method of giving 4130 Cr-Mo a radical heat treatment, they produced Reynolds 725 - this has all the qualities of 753 but it can be TIG welded. According to Terry Bill, who was Reynolds' development engineer at the time, Bernard Hinault was riding a 725 frame, when he became the last rider to win the Tour de France using a steel frame.

Nowadays all the pros use carbon but, at the most, there can only be a handful of riders who could use the small weight advantage possible with a carbon frame to equal the performances of "the Badger" on his steel frame.

Team Sky had 250 frames in its warehouse, for use during Wiggo's 2012 campaign; whereas Hinault would've been given 2 new steel frames each year - I feel that this says it all!

Andy Blance.

**All THORN FRAMES
use high quality,
Heat-treated steel.**

I wouldn't wish to build our bikes with anything else and I don't want anything else for my own bikes!

The final heat treatment process can double the cost of a steel cycle tube. Heat treatment raises the UTS (ultimate tensile strength) significantly - this makes the tubes stronger and more resistant to cracking. Heat treatment also makes the tubes more resistant to denting and greatly enhances the frame's **resilience**.

Resilience can be defined technically as, the ability of a material to absorb energy when it's deformed and then release that energy upon unloading. In a high quality bicycle frame, it manifests itself to the cyclist as a tight, springy sensation.

Because heat treatment is such an expensive process, the steel tubes used in most cycles are not heat treated. Unless a frame says that it's "heat treated", or has a decal from a tubeset, which is known to be heat treated - e.g. Reynolds 725 and Reynolds 853, you can be certain that the tubes won't be heat treated.

LOOK AT THE FRAME TUBE DECAL CAREFULLY.

Most decals simply say "Butted Frame Tubes", this means that the stays (which are also known as the rear triangle) are made from a different material.

Most manufacturers of steel frames use a lower grade material for the chainstays and seat stays.

Some manufacturers use reasonable quality, non heat-treated, seamless Cr-Mo stays. Other manufacturers are even more cynical - they use carbon steel with welded seams as stays - such steel is also known as "gas pipe".

Why do some manufacturers use lower quality stays - and does this matter?

The reasons why are simple: misrepresentation, greed or incompetence!

That is, they may be trying to obtain an unfair

competitive advantage, by appearing to offer the same thing for less money - where else might they have scrimped or compromised quality?

They may be very greedy and want a premium price for a low quality product - doesn't that sound all too familiar these days?

Or maybe they don't ride a touring bike and haven't a clue how a really good frame should ride - what else might they not know about?

When considering top quality tubing, it's more expensive to make one top quality heat treated stay, than it is to make one top quality heat treated frame tube - yet there are 4 stays in each frame and only 3 frame tubes.

Does having gas pipe stays matter?

I can assure you that, if I had to choose between having a frame with top quality stays and gas pipe main tubes, or a frame with top quality main tubes and gas pipe stays, I'd always choose the frame with the top quality stays. It would weigh slightly more but it would be more comfortable and give a superior ride -

The stays are your rear suspension.

Obviously the best solution is to use top quality frame tubes and top quality stays - unsurprisingly, this costs significantly more!

If the frame tube decal says "Reynolds 725 butted frame tubes", it's easy for dishonest (or, perhaps ill-informed) sales people to say: - "This is a Reynolds 725 frame and it costs £xxx" and not even mention that the all important stays are made of gas pipe.

I'll state the following very clearly: "Every frame tube and every stay in our Thorn 858 and 969 sets is heat treated. When we use 853 or 725 frame tubes, we specify 725 stays - our decal makes this very clear."

For each and every particular touring application, whatever your level of ability, you'll benefit from having a genuinely top quality steel frame. Such a frame, if well designed, will be more comfortable than any other frame and, even if you're only reasonably strong, its resilience will allow you to turn more of your effort into forward motion.

All THORN frames are well designed- they also handle superbly.

We guarantee this - see Page 71

Aluminium frames.

Cheap (thick-walled) aluminium frames are very strong, they could have the fittings required on a touring bike and they should last a lifetime but they're heavy, very uncomfortable and they have a "dead" feel. Have you ever heard of an Aluminium spring?

Expensive (thin walled) aluminium frames are less uncomfortable and they are quite light but they can't have the fittings required for touring and they break! Dealing with a broken lightweight aluminium frame is easy - recycle it into bottle tops!

If you're contemplating a purchase from another source, ask some pertinent questions e.g. "Is every tube 725, including the stays?"
Yes? Then make certain that the vendor is prepared to state this fact very clearly on the invoice!
No? Then walk away - unless you need to save money so desperately, that you're prepared to accept a vastly inferior bicycle.



OTHER MODERN FRAME MATERIALS.

CARBON FRAMES

Carbon makes a perfect spring and great fishing rods. Carbon frames can be very lightweight and very durable - as long as you don't scratch them - a gouge in a carbon frame is a catastrophic failure waiting to happen. I'd have no hesitation using one for racing - if I raced - and of course, if somebody else was paying for it!

Try Googling "cracked carbon" and see what pictures you get!

It's difficult to manufacture a carbon frame with luggage carrier bosses - I don't know whether to laugh or cry, when I see a "cool" carbon road racing frame being used for lightweight touring - I see rattling mudguards, held on with cable ties, which have been known to suddenly jam in the wheel, precipitating an instant endo (cart wheel) followed by a face plant.

I see mega heavy alloy seat post-fitting (seat post breaking?) carriers with loads being carried, which are too high and too far back for stability. Alternatively, I see no provision for luggage at all; as the day warms up, the riders end up looking like cricket umpires, with clothing tied around their waists - how cool is that - in both senses of the word?

With most of these adapted road racing frames, I frequently see the dangers and difficulties associated with toe overlap.

TITANIUM FRAMES

It's said that Titanium frames ride *like* steel frames. That's true - in my opinion, a top quality Ti frame is *almost* as nice to ride as a top quality steel frame!

It can be argued that Titanium can be used to make springs but until Samurai swords or GLOBAL kitchen knives are made from titanium, I will continue to believe that steel is a superior material for many applications. Titanium is two-thirds of the weight of steel - but even the top quality, cycle-specific tubes are much less stiff. To make a frame which is as stiff as a good, high quality steel frame, requires a larger volume of material, which erodes most of the weight saving! The majority of customers however want and expect, a weight saving with a Ti frame, therefore they end up with a frame which isn't stiff enough - this not only wastes energy - it can sometimes give a scary ride down steep hills - particularly if it's a short wheelbase frame with road racing geometry!

Low grade Titanium

Most of the titanium tubes used in frame building today are not only very low grade - they're also "plain gauge tubes" which have been manufactured from a sheet of rolled and welded material i.e. it's not butted at all and it most certainly does have a seam!

If low grade steel is nicknamed "gas pipe", these tubes ought to be called "cooling pipe". Such tubes may be an improvement on "gas pipe" steel but they're far inferior to top quality steel, unless, of course, they are actually being used in the cooling system of a reactor!

If a new Ti frame costs less than £2000, then low grade, plain gauge, rolled and strip welded Titanium is, almost certainly, all that's being offered! Spending lots of money is no guarantee of quality either - there are some

unscrupulous people around!

Such frames remind me of Hans Christian Andersen's Classic fairy tale; "The Emperor's New Clothes".

Top Quality Titanium.

Cold drawn, seamless, double butted, 6-4 grade Titanium is very, very expensive, it makes a very fine road racing frame - I'd prefer such a Ti frame to a Carbon frame - **but once again, only if I actually raced and of course, only if someone else paid for it!**

I don't race, I want and need, a touring bike and it's either impossible, or ridiculously expensive, to make a touring frame, with the required fittings, from high quality butted Ti.

"cracked titanium" see what pictures you'll get! Or simply look to your left.

Perhaps there are some proper titanium road racing frames, being made today, or which may be made in the future, that won't break - but I doubt it.

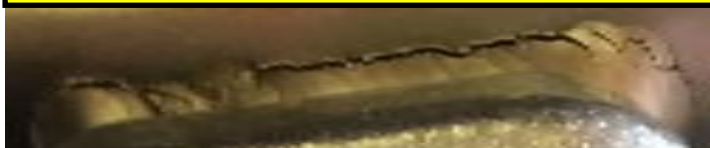
It's even less likely that anyone would commission a (heavier) cold drawn, seamless, double butted, 6-4 grade Ti tube set, with the slightly thicker walls necessary to make it less likely to crack, when it's subjected to touring loads and forces.

I certainly wouldn't want to risk such a huge sum of my own money - when steel is almost as light, is much more durable and could be repaired easily if necessary. Steel rides better, is relatively inexpensive and a steel frame can have all the fittings you require -

This pic shows 2 things - a crack in an allegedly market leading Ti touring frame and why we don't like kickstands!



I've cropped and blown up the crack below



Furthermore, all high quality Ti frames, that I've known, have also broken! Titanium has a much higher scrap value than steel, which could be good news, because it's usually impossible to make a repair, which has lasting structural integrity, to a cracked Ti frame.

Try Googling

no wonder we say:

STEEL IS REAL!

How to look after your STEEL FRAME

Much, of the following advice also applies to bikes with Alloy, Carbon and Titanium frames - Alloy corrodes in salt, all bike chains and many components are steel, such as bearings, bearing shields, BB axles, screws & pins.

All our steel frames and forks have tube walls which are thick enough to enable them, if cared for, to give a lifetime's service. Our EXPEDITION FRAMES have even thicker walls - I've assumed that they'll have an even tougher job to do.

Our fittings are stainless steel, I've used stainless because I know that, in the real world, the cables will eventually chafe the paint away from the guides and I don't want rust to get a hold there. Similarly, the bosses are stainless steel because a thread cut into carbon steel will eventually rust. Our mechanics apply cavity wax when the frames are prepared. I've put a lot of effort into designing our frames -

but this DOES NOT mean that you can neglect them.

SERVICING YOUR FRAME

Whether your frame is Steel, Alloy or Titanium, all Aluminium Alloy seat posts and shims should be removed, re-greased and replaced before and after every winter. (Or monsoon season!)

This will prevent the post from seizing into the seat tube. If you don't do this and your seat post does seize; please **contact us** for the correct advice on how to free it.

If a frame is submerged, or if you cycle with your BB submerged (as may happen during floods) you should, at the earliest opportunity, remove the BB and let it and the frame dry.

Don't leave your bike outside in the rain, if you can avoid it - when you can't avoid it, try and give it some shelter, or at least treat it to extra thick chain lube and more regular greasing.

Consider a reapplication of cavity wax at regular intervals - these intervals will depend upon where you live and whether you choose to ride in the worst of the weather.

Grease is an essential component in the following areas:-

BB threads on derailleur frames, the eccentric and the eccentric threads on our Rohloff frames and the seat clamp screw threads.

We're having a rolling change, over the next few years, which will mean that the fork steerer tubes will be ED coated. ED coating is a black finish - it's very thin, yet very resistant to rust.

It was not possible previously, to paint the forks' steerer tubes, as the headset couldn't be fitted due to the increased thickness. Steerer tube walls are thick enough for surface rust to only ever be an issue in

extreme circumstances - such as prolonged exposure to salt water.

You may apply thick grease to a bare metal steerer if you wish. BUT NOTE that extra care must then be taken, to ensure that the handlebar stem can be tightened sufficiently - otherwise, a serious incident could occur as a result.

Update all our latest forks have a black ED coated steerer.

Avoid letting a scratch turn rusty. You should apply some lead oxide paint to any scratches as soon as possible - certainly before rusting occurs. You can touch them in with suitable paint, or apply a patch, when it's convenient.

If you let a scratch go rusty, you'll need to remove the rust with fine wet and dry paper, before applying the lead oxide primer. The sanding process will increase the size of the area which needs to be touched in.

Damage caused by RUST and/or NEGLECT is absolutely NOT covered in our lifetime warranty.

KICK STANDS - A WARNING

Whilst we concede that they're sometimes very useful, there's not doubt that clamp-on kick stands can and often do, cause serious damage to frames. This damage can be caused by overtightening the stand, which at best damages the paint and frequently crushes the tubes - it's easy to overtighten them because of the powerful threads used. Conversely, not being tight enough, can cause chaffing damage to the paint, which is difficult to detect, because of the stand's position on the underside of the frame.

This can lead to severe rust damage.

Damage caused by clamp-on stands is absolutely NOT covered in our lifetime warranty.

**Update
Nomad Mk3 frames
can now have a prop stand**

Thorn Dropout Adaptor SJSC #49687

Can be Retro-fitted to all Thorn Ravens (inc RT and RST) all Raven Twins, all (Rohloff) Nomads and NOMAD Mk3 derailleur bikes.

ESGE KS comp 18 flex stand, SJSC #49938 can then be fitted, with no risk to your frame or warranty.



ESGE KS comp 18 flex stand, SJSC #49938



DERAILLEUR gear options for THORN BIKES

In 2012 Mr. Shimano changed the cable pull ratio, of the NEW 10sp MTB groupsets.

The consequence of these changes is that the ONLY ITEMS of 10sp ROAD groupsets, which are compatible with 10sp MTB groupsets, are the CASSETTES. To be clear; the following items are not inter-compatible:- The FRONT mechs, The REAR mechs, and the SHIFTERS. If anyone tells you otherwise - sorry but they are mistaken - you ignore this advice at your peril!

However, we have 2 specifications, which work perfectly for touring - these are available on our Club Tour Mk5 bikes and Derailleur Nomad Mk3 bikes.

One specification is for straight bars - the other is for dropped bars. Both of these specifications use a 26/36/48 Deore quality chainset along with a 10speed 11- 36 cassette.

If **STRAIGHT BARS** are chosen, we fit Shimano Deore Rapidfire 10 speed pods and Deore MTB brake levers, with Shimano Deore RD-M610 rear mech and Shimano Deore FD-T6000L front mech.



Shimano 105 STI ST-5700

If **DROP BARS** are chosen - we fit Shimano 105 10speed STI levers ST-5700, with Shimano Deore RD-M591L rear mech and Tiagra FD-4703 front mech.

It's also possible to have 22speed GRX STI, with hydraulic disc brakes but only on a drop bar Nomad Mk3. See the pics above. (For more information please see page 47.)

This option comes with an 11-34 cassette and 26/38 chainrings, which gives a lovely spread of touring gears. Bottom gear = 21" and top gear = 95.5" (with 650 x 60b tyres)

PLEASE NOTE. The GRX levers have a longer hood section than other STI levers, which makes them very comfortable but this also increases the reach, which means it's likely to be impossible to have a riding position that's any more relaxed than "fairly sporty". See page 26



ROHLOFF INTERNAL HUB GEARS

Rohloff first introduced their revolutionary 14 speed geared hub in 1998. I was interested in the hub at the time of its launch but (like many others, I expect) I didn't want to buy something which I felt may not work properly and which I knew I wouldn't be able to mend.

I could see the attraction of being able to change through all 14 gears using just one shifter; being able to do this - without even needing to pedal, was more attractive still! I could see that maintenance *could* be much simpler and the wheel *could* be much stronger.

We were persuaded by some strong-willed customers into building a few custom bikes equipped with Speedhubs and hearing much positive feedback from the happy owners, I decided to contact Rohloff myself in spring 2002 - I reasoned that, with the passing of the years, Rohloff would have identified and cured any problems during this time. After introducing myself, I got straight to the point and asked:-

"What problems have you had?" and "What's the service life?"

The reply from Rohloff's product manager, Carsten Geck, was:-

"No joke, Andy, but we have never had a hub fail, so we can't tell you the service life but some of our customers have covered 70,000km of world travel"

There followed more emails and my design for a Rohloff-specific frame was approved.

This was equipped with an eccentric bottom bracket to adjust chain tension, whilst using socketed vertical drop outs, which we know produce the most reliable rear ends for touring bikes.

Whenever we get the opportunity Fiona (my partner) and I like to travel on dirt roads, over high mountains, with medium-weight camping and cooking kit and up to 1 week's supply of food. I built two "Adventure Touring" bikes with Speed hubs and Fiona and I set out in Feb 2003 to ride as many unsealed mountain roads as we could find in Tasmania - there were plenty!

The bikes were better than good - they were sublime - we liked the Rohloff hub so much, that these bikes were soon joined by lightweight, sporty bikes with Speedhubs.

The strength and durability of the bikes, which we took to Tasmania (and the Andes) has now evolved into the **THORN NOMAD Mk3** bikes and, over time, the lighter weight bikes have evolved into a premium quality, multi-functional bike - the **THORN MERCURY Mk3**.

Fiona and I have covered more than 160,000km between us, on our stable of Rohloff bikes. We've crossed the Andes, with full camping kit 28 times, sometimes on the roughest roads imaginable.

We've never had any problem whatsoever with our bikes. The only servicing I've ever had to do, on any of our trips, is to wipe muck off the chain and apply new chain lube - which takes a couple of minutes!

The only adjustments I've ever had to make have been to adjust the chain tension about every 1500km.

A High Spec, stealthy looking THORN MERCURY in SIZE 580L



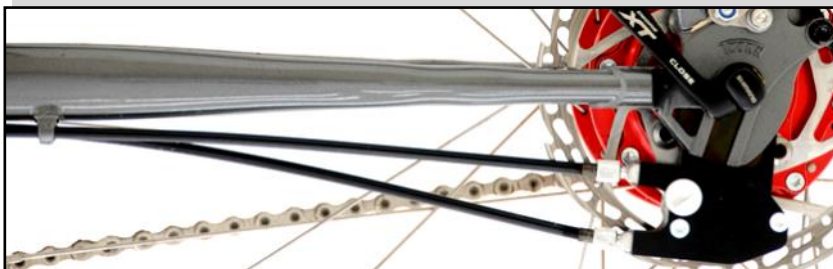
Rohloff External (Ex) Box

The Ex Box Hub (below) was introduced when disc brakes became popular. The internal gear cables precluded fitting a rotor and the External transfer box solution was developed. It's connected to the central selector shaft by a gear train. Many cyclists, who had no intention of ever fitting a disc brake, still wanted the Ex Box Hub. Over time the Ex box has shown itself to be a superior system and from 2019 onward all Thorn frames use the EX box version of the Rohloff hub.

No Rohloff specific cables are used - conventional 1.1mm gear wires run, from the gear shifter to the Ex box, using conventional brake outer - these items will be found in every bike shop in the world.

The perfect cable routing for the Ex Box goes under the chain stays, which also minimises the number of bends required, resulting in smoother operation and a longer service life for the cables. Both gear cable runs are sealed.

The Ex Box can be removed from the hub in seconds, by using the thumbscrew, allowing the rear wheel to be removed even more easily than the rear wheel of a derailleur bike.



In May 2009, Rohloff wanted to find who had covered the greatest distance using a Rohloff hub - Thomas Longin's claim

was the highest - he claimed 145,000km.

In 2013, apparently, Rohloff stripped several hubs which had covered more than 200,000km. They tell me that wear on critical components showed that these hubs were still; "Nowhere near the end of their service life". Nobody has yet worn out a Rohloff

internal gear mechanism - apparently no hub, which has had regular oil changes, has ever had a catastrophic failure of the internal gear mechanism.

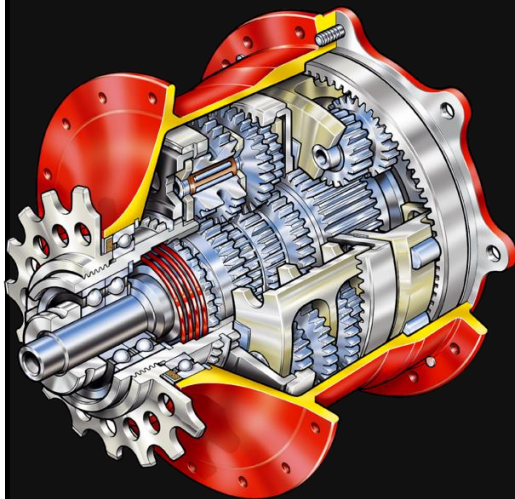
We know of one Rohloff hub which seized - because it had never had any oil in it!

We know of another, which seized 1000Km after being totally submerged, for hours in a sulphurous thermal spring - and this was after having been ridden for 17,500km - without ever having had an oil change!

Nobody has a clue what the actual service life will turn out to be.

We offer a range of touring bikes with derailleur gears and a range of bikes with the **Rohloff Speedhub**

The Raven Tour



"It might look complicated but of course I know exactly how it works - you just turn the shifter and you're in the gear you need!" Andy Blance 2008

and the **Raven Sport Tour** were first introduced in 2003.

The interest was immediate and it was intense.

We were the first to produce an off the peg touring bike, designed specifically & sensibly for the Rohloff Speedhub. Our bikes had much praise lavished on them.

Many testers said (and I have to agree) that our bikes were better thought out, better built and were better to ride, than custom built bikes costing more than twice as much. I'm amazed that, considering the way these bikes have been received, we still appear to be the only manufacturer who is determined to produce bikes that are optimised for using a Rohloff hub, in real world situations.

You can read more about the history of our Rohloff-specific frames in my document "Living with a Rohloff hub".

CLICK HERE For "LIVING WITH a ROHLOFF HUB"

This is a 35mb file; it may take considerable time for it to open, please be patient.

Optimising a bike for use with a ROHLOFF SPEEDHUB

We'd been considered to be innovative manufacturers of touring bikes and tandems for very many years, when a customer persuaded me to build him a touring bike with the Rohloff Speedhub.

The customer had asked us, because our bikes had an excellent reputation. I raised all the objections that I could think of and eventually the bike was built. I'm embarrassed when I think of the "solutions" the customer and I arrived at, for this first bike - it even had a torque arm.

We owed a debt to this customer! We contacted him a couple of years later and offered him a free Sport Tour frame and a free conversion of his hub to the OEM1 axle plate, which dispenses with the torque arm. (Needless to say, he accepted!) Our second Rohloff bike was an improvement on the first.

I soon decided that I wanted Fiona and me to have Rohloff equipped touring bikes and a period of intense testing took place.

I've always believed strongly, that you can't improve the design a bike - unless your whole life revolves around riding them - even then, it's essential that each new idea is tested in isolation, in a true scientific manner.

I was determined that an eccentric bottom bracket (EBB) offered the most reliable way of adjusting chain tension. After all it's been the method of choice on tandems for years!

I handmade our own Rohloff specific vertical dropouts and eventually Fiona and I had Thorn Rohloff bikes numbers three and four.

These bikes performed really well on tour, we both knew that we'd never want to ride with derailleur gears again but it was obvious that the cable routing deserved much more attention. The cable routing issues were sorted and proven and I then concentrated on getting the first 300 Raven Tours and Sport Tours made.

Our new eccentric bottom bracket (EBB)

The NEW Thorn stainless steel eccentric BB



is fitted to the Mk3 versions of Nomad, Mercury and Raven Twin tandem.

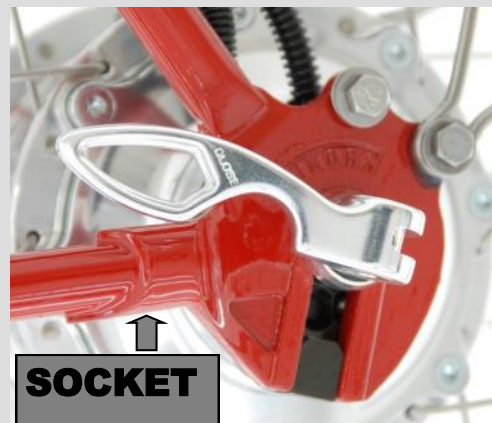
Once I'd decided to use an EBB, I was able to get Rohloff specific, stainless, socketed, vertical dropouts made. The weakest point of a bike was always the joint between the RH chain stay and the RH dropout. This is where most frames used to fail first. I've been able to make this joint very strong, by using socketed dropouts.

The standard practice used to be to cut a slot in the chain stays and braze the dropouts into the slot. The slots are stress risers.

I've heard criticism of our "ugly dropouts" (I actually think they look really nice). **The main**

Once you've owned a Rohloff equipped bike, you're very unlikely to ever want to use derailleur gears again.

thing is that we've never had one fail!



Things to avoid when purchasing a Rohloff equipped bike.

I'm sad to say that I've seen some really silly things.

I can't believe that anyone thought that it would be a good idea to have sliding dropouts on any bike - especially a touring bike. Who'd want the rear end of their bike secured with some small screws? Who'd want to have to adjust brake blocks every time they adjusted the chain? Well some people obviously haven't thought about it enough, because such bikes exist.

The reports coming through now, indicate that sliding dropouts are becoming very difficult to adjust as the frames get older.

I have to say that some of the cut away dropouts that I've seen, which require a slot in the stays, are lighter and do look prettier, perhaps this will help mitigate the empty, sinking feeling when they fail?

Bare-wire routing under the BB, for the gear cables, will soon result in a heavy feel to the shifter and require regular replacement of these cables.

Some bikes are being sold as Rohloff bikes, which are actually built using frames designed for derailleurs. Chain tension, on these is achieved by using a device like a rear derailleur. Some frames even require a torque arm.

If you rely on a chain tensioner for tensioning the chain, you'll have the problems associated with derailleur chains - i.e. a short service life and the chain will skip and fall off the chain ring and/or sprocket.

Apart from these annoying issues, you'll also have a significantly less efficient system. I didn't know whether to laugh or cry when I looked at the prices being charged for such monstrosities.

None of these frames compare with our own derailleur geared touring frames - never mind being comparable with our Rohloff-specific range, which comprises of:-

Nomad, Mercury and Raven Twin tandem

**Please read the following 4 pages carefully.
Your choice of bar determines which frame size you need.**

PLEASE NOTE:-

The Thorn Bars described in the following pages all have 25.4mm diameter centre swells - apart from our new eXp bars and Fat Flat Track (FFT) Bars which are 31.8mm.

If you're cycling in any country and you see a loaded touring bike with drop bars, it's very likely that the rider is from the UK, or from West coast USA.

The rest of the world tends to use straight bars for loaded touring!

The two most useful positions (with drops) can be duplicated and even improved upon by using "straight bars" and bar ends.

If you know which bars you want on your new bike - fine but if you're undecided, the following may help.

DROP BARS offer 3 different positions:-

- [1] The brake lever hoods, which are used about 90% of the time by most cyclists.
- [2] The **tops** (a position on either side of the stem) are used about 9% of the time by most cyclists.
- [3] The **hooks** (the actual dropped section) are very rarely used - even by racing cyclists. When they are used, it's usually to get more powerful braking than is possible from the brake lever hoods.

Q. If straight bars and bar ends are so good, how come all the riders in the Tour De France use drop bars?

When you study the riders in the TDF, unless they're actually trying to win a bunch sprint, you'll rarely see them using the hooks - not even in lone breakaways, where a rider is desperately going hell for leather, in an attempt to avoid being swept up by the peloton at the finish.

Most of the TDF riders' time is spent in the perpetual jostling of a tightly packed peloton, where they frequently have to lean on each other with their elbows and shoulders, to minimise crashes caused by their bars touching. Drop bars are narrower than straight bars + bar ends and are safer in tight groups.

In a large bunch crash, where bikes and riders are sometimes piled in a heap, drop bars present less risk of impalement for riders landing on top of fallen riders' bikes - drop bars are mandatory requirement for road racing.

If a TDF rider uses their brakes in the peloton, a bunch crash is almost inevitable. TDF riders rarely use their brakes much at all, so it doesn't matter to them that drop bar brakes could never be as good as brakes can be with straight bars - which is just as well with skinny tyres and short wheelbase bikes!

My question is - why have drop bars on a touring bike?

Is it because you're so used to using them?

Is it the look?

Or is it because you've been told that they are what you need?



Fiona using straight bars (Flat Track Bars) with bar ends (left) and the comfort bars, that she helped us develop (right).

Fiona and I have used Thorn Comfort Bars + Ergon grips, extensively for cycle camping, mountain biking and for general cycling.

During these activities we do have different hand positions - these are cycling and not cycling!

(Activities best undertaken off the bike, include eating, making tea, resting, looking at maps, examining flora and taking pics of beautiful scenery)



STRAIGHT BARS + BAR ENDS

We have several different "straight" bars.

THORN NARROW BARS are 550mm wide and have a 5° bend. The laser etched marks make it easy to cut them down to 510mm. The short centre swell allows the brake levers to be positioned sufficiently far inboard, to enable bar ends to be used - even at this width! **This produces a very aerodynamic position.** Unlike the "tops" of the drops, which use bar tape, straight bars can have very comfortable anatomical handlebar grips (such as the Ergon GP1L or GP5-L). This position offers a great view of the road and surrounding scenery, whilst also offering instant and easy gear changing and/or very effective braking. We use this position for as much as 75% of our riding. **The Thorn Narrow Bar is highly recommended for sporty use.**

BAR ENDS

Bar Ends are available in many different configurations and materials. Bar ends are biomechanically efficient - particularly when climbing out of the saddle.

Compared to the primary position, bar ends allow a 90° rotation of the wrists, which not only gives relief to the palms, the change also re-orientates the elbows, which then in turn re-align the shoulders, which then use different muscles in the cervical spine. Simply rotating your wrists through 90° produces a completely different position, which helps greatly, especially if you ride for hour after hour without a break.

Ergon GP5-L grips, with the built in "L" shaped bar end are exceptionally comfortable.

They're our preferred choice for almost every touring application.

They offer 4 different positions and the rubber inlays give exceptional grip - even when wearing woolly gloves.

Ergon GP1L grips, these are the best choice of grip for **comfort bars, or when bar ends are NOT required.**

THORN COMFORT BARS

are 620mm wide and are available polished or anodised black, they were developed by us with input from a senior physiotherapist. They are supremely comfortable, especially when used with Ergon grips, because they have an 18° bend, which puts the wrists into perfect alignment with the

Ergon GP1L



Ergon GP5-L grips



THORN NARROW BARS



The centre swell width has been kept to the minimum, to give as much useful bar space as possible.

forearms and thence with the elbows and shoulders.
PLEASE NOTE:- only one hand position is available with Comfort Bars.
 The bends take up a lot of the width and there is not physically enough room to fit bar ends and average sized hands, onto the relatively short straight section.

COMFORT BARS CAN NOT be CUT to REDUCE THEIR WIDTH.

In my opinion, these bars are the perfect width for relaxed cycling with one single "hands on the grips position". Comfort Bars "sweep back" around 45mm which means that they need a much longer stem, to get a specific reach, than would be used with 5° "straight bars."

Comfort Bars gain around 50mm of height, which makes them an excellent choice, where a very relaxed and thus fairly high position is required.

THORN Mk3 FLAT TRACK BARS are "straight" bars with a 10° bend, which starts immediately after the centre swell. The swell is deliberately very short to allow brake levers to be positioned as far inboard as possible. They have a numbered scale etched every 5mm into both ends of the bar, to facilitate shortening them to individual requirements.

These bars are 580mm wide and hard anodised black, which is wide enough for most applications.

UPDATE:-

Straight Bars generally need to be used with frames with long top tubes - Comfort bars almost invariably need frames with long top tubes.

Feedback has been extremely positive. I can certainly recommend 550mm - 580mm Flat Track Bars for both relaxed and sporty/relaxed set ups.

sjscycles

Thorn COMFORT Bars silver or black



Thorn Mk3 Flat Track Bars. Triple butted AL7075 NOW HARD ANODISED

The centre swell width has been kept to the minimum to give as much useful bar space as possible.

The scales on both ends of these bars makes it easy to cut them from 580mm to 570mm, 560mm or 550mm

sjscycles

FLAT TRACK BARS + GP5-L GRIPS = 4 Different, comfortable positions.



TRANZ X ANTISHOCK STEM 7°

Available in 5 lengths ONLY:-
 80, 90, 100, 110 & 120mm
 Whilst they don't take out big bumps, they do help to remove some vibration. They have very little effect on the steering and are recommended by those who've tried them.

NOTE: 31.8mm BARS ONLY, they're **NOT** reversible and only available in 7° rise, which limits the set ups we're able to achieve.



THORN eXp EXPEDITION HANDLEBARS. 12.5° BEND - 31.8mm CENTRE 680mm to 590mm WIDTH POLISHED and HARD ANODISED



the centre of the bars is 31.8mm therefore an oversize stem is required.
 The eXp Bars have been polished and then hard anodised, to give them the best possible protection against corrosion. Materials experts have told me that Al 7050 is the best possible alloy, for making a bar, with a long service life, that can survive big knocks.
 At 330g, these bars are certainly not light weight but I've done everything that I can do, to make them the most bombproof Expedition Touring bars available.

I designed our NEW THORN eXp Bars for seriously heavy duty use. They are 680mm wide but have scales for cutting them down, in 10mm increments to 590mm. As the bars are not designed to be used shorter than 590mm, I've been able to keep the centre swell sufficiently long, to enable bar bags, lights, cycle computers etc. to be fitted to it. Unlike all other Thorn bars (apart from the FFT)

The **NEW**, POLISHED and HARD ANODISED **THORN FFT Bars** are the same dimensions as the **eXp** Bars - except, at 620mm, they are narrower. With some set ups, it may be possible to trim them to 570mm but, for most people using a Rohloff shifter, 590mm is probably the minimum possible width. At 220g, the **FFT** Bars are significantly lighter than eXp bars. I must stress that, whilst these bars are ideal for use on sealed roads, on

THORN FFT (Fat Flat Track) HANDLEBARS - 12.5° BEND 31.8mm CENTRE 620mm to 570mm* WIDTH **NEW!**



reasonably smooth tracks or with care on rough trails, they are not suitable for use on MTBs, or on Expedition or Adventure touring bikes - after all, that's why we have **eXp** Bars! Don't be tempted to try and save 4ozs in such a critical area on an Expedition bike!

Q. Why do I say that our 5° Narrow Bars are so comfortable, when our Flat Track Bars are 10° and our eXp Bars are 12.5°?

A. For different size cyclists, with different styles of cycling, with different levels of ability, on different types of terrain, there's an optimum handlebar width.

Big guys, with very heavy loads, on dirt roads are best off having very wide bars, possibly 680mm.

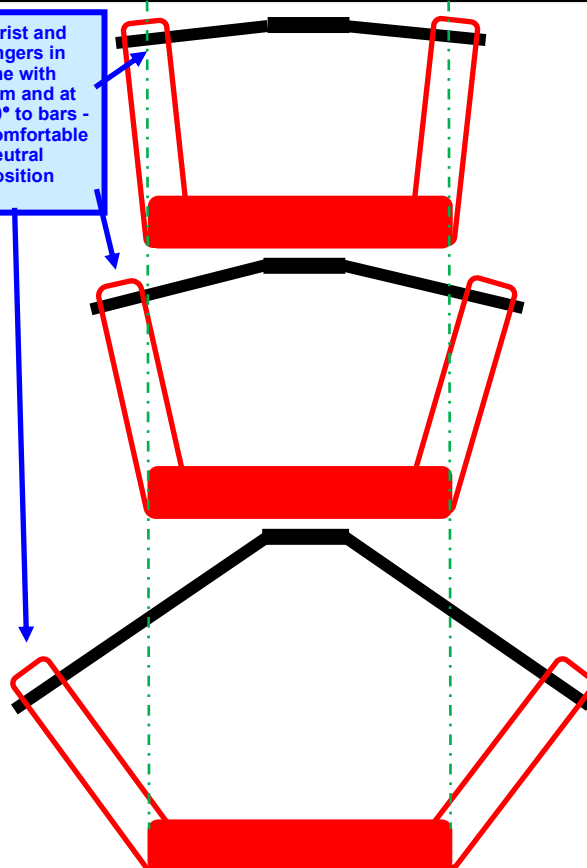
Small, experienced cyclists, with very light loads on smooth tarmac, are best off with very narrow bars, possibly 510mm. The vast majority of cyclists need something in between.

Let's accept that, as individuals, we need different width bars.

The wider your bars are, the more sweep back they need to have, in order to position your wrists in a comfortable neutral position.

The angles required, in the diagrams on the right, are highly exaggerated because the hands and arms are so short. I believe that this serves to emphasise the point, as well as saving space.

Wrist and fingers in line with arm and at 90° to bars - comfortable neutral position



Fiona getting her breath back after cresting yet another steep climb, into a raging headwind on Ruta Cuarenta (RN40) in Argentine Patagonia. Fiona's Mk1 FLAT TRACK BARS were 640mm wide, they were fitted with Zoom Ski bends. We would now fit Thorn **eXp** bars and **GP5L** grips to **Expedition** and/or **Adventure Touring** bikes.

Butterfly

Bars were once very popular in Northern Europe - now thankfully - they are much less popular!

They appear to offer many different positions. The most important position, the one that gives you access to the brakes, is a very narrow position. I find that riding for any distance, the outsides of my hands press against the inside curve of these bars, I find this very uncomfortable. When filtering through urban traffic, narrow handlebars are an advantage but **butterfly bars are not narrow themselves**, only the riding position, with easy access to the brakes is narrow. Butterfly bars are made from a very long length of tubing, consequently the bars flex significantly, when the "access to brakes" position is used.

Flexing is a positive thing, when riding slowly on flat cycle paths, it enhances comfort. At high speed, down mountain roads (or hilly country lanes) I find the flexing of the bars alarming; yet the bars must be held here, because this is where the brakes are!

Butterfly bars bend deeply,



back towards the rider, therefore the stem must be long enough (at least 120mm but 130mm would be better) to place the brake position, forward of the "centre of steering".

If you ride with your hands behind the centre of steering, you run the risk of, not only being unable to control a speed wobble but of actually precipitating one in the first place!

Given the absolute necessity of using a long stem with butterfly bars, if you select a frame which is ideal for you with butterfly bars, the frame will be too short, if you decide that straight bars with bar ends, or comfort bars, are a better idea. It is almost ironic that butterfly bars, which appear to offer such a wide choice of position, are usually unable to provide comfort, in the position that you have to use, for much of the time, in order to operate the brakes!

Can you tell that we really don't like butterfly bars?

The relationship between HANDLEBAR CHOICE and FRAME LENGTH

I feel that a frame which is alleged to be suitable for all types of bar, is unlikely to be satisfactory with any type of bar!

I designed OUR frames in different lengths, as well as different sizes - here's why....

For any given rider, a bike, which is designed for drop handlebars, will need a shorter top tube than a bike which is designed for "straight" handlebars. The reason is simple - drop bars have a pronounced forward throw, straight bars have no such throw (indeed, they usually sweep back, towards the rider.) When cycling on drop bars, using the brake hood position, the rider's hands are even further forward - a well designed drop bar bike, will have this taken into account and will have a suitably short top tube.

When drop bars are fitted to a bike, which is the correct size for its rider with straight bars, the rider will be grossly overstretched. I've found that generally, the stem length needs to be reduced by **at least 55mm** - when moving from straights to drops on the same frame.

BUT PLEASE NOTE, this could be as much as 90mm, when moving from comfort bars to drops. As most straight bar bikes are designed for use with a stem of from 100 to 120mm, drop bars would generally mean fitting a stem between 45 to 65mm - this is far from ideal!

Conversely, a frame which was ideal for a rider with drop bars, would need a stem which is 55 - 60mm longer, to achieve a comfortable position **for that particular rider** with straight bars. When used with straight bars, really long stems have a terrible effect upon the steering, making it feel like a tiller!

I hope that I've been able to explain why we believe that it's so important to choose your bars before you choose your frame.

GEAR SHIFTERS for ROHLOFF

The only 2 shifters that Rohloff manufacture are a twist grip shifter and the electronic E-14.

Rohloff only make these shifters in one size - 22.2mm. Apart from the centre section, all straight bars are 22.2mm in diameter and all drop bars (except the Van Nicholas bars see below) are 23.4mm in diameter. Until now this meant that if you wanted to use Rohloff's shifter, you had to use straight bars, or fit the shifter onto an extension of one kind or other.



ROHLOFF BIKES with STRAIGHT BARS.

We believe that Ergon GP1L grips (without bar ends) are the best option for any Thorn bike which has been chosen with our Comfort bars.

We believe that Ergon GP5L grips (see page 17) are the best possible option for all of our other straight handlebar options.

The Rohloff shifter is normally fitted to the **RIGHT** side of the bar but it's also available to fit the **LEFT** side of the bar - if you wish to have the shifter on the LHS, please make this very clear when ordering.

The Rohloff shifter has a very comfortable ridged, round profile - it's very easy to rotate - especially on all THORN Rohloff specific bikes all of which have perfect cable routing.

The indexing of the gears takes place within the hub - which means that it never needs adjusting.

Don't confuse this excellent piece of German engineering with the derailleur Gripshift system - which is tough on your wrists and generally horrible.

Rohloff E-14 Has been developed for e-Bikes. It is brilliant in situations where the internal cable routing for the twist shifter is compromised by having so many tight radius bends in it - which means **all e-Bikes** that I've seen! Fiona and I rode extensively on full suss Rohloff-equipped e-Bikes, with horrible cable routing, we now own e-Bikes, with the identical motor and frame design but with E14.



We confirm from our own experience over 1000s of miles, that E14 is a definite improvement on these specific e-Bikes.

An e-Bike already has a huge battery and a complicated wiring loom, why not have a few more wires?

PLEASE NOTE that we found the gear change to be considerably slower with E14 than with the twist shifter on our Thorn bikes (with their perfect cable routing). We also found E14 less inclined to shift under load than the twist shifter.

We really don't want, or need, to fit E14 to Thorn bikes.

I've gone to great lengths to give our Thorn Rohloff-specific bikes perfect cable routing, with gently sweeping runs and the minimum of bends.

In our opinion, E14 is an expensive, over technical solution to a problem that simply doesn't exist on Thorn bikes.

If you insist, we will supply your bike with E14 but only on the understanding that will insert a caveat into your invoice. This will say that "We supplied E14 against our express recommendation and that you agreed that you would never complain to us about it and you understood that our money back guarantee would be withdrawn."

However, despite these facts, E14 could be of positive benefit for anyone with a serious degenerative problem with their hands. For those unfortunate enough to be so affected, we will fit E14, without voiding our money back warranty.



ROHLOFF BIKES with DROP BARS

Van Nicholas have had some 22.2mm diameter drop bars made, in 3 widths, 40cm, 42cm and 44cm, which are joined in the middle.

Although Van Nicholas say that the join in the bars is sufficiently strong by itself, **they insist that one of their stems is also used!**

The Van Nicholas bars obviously allow the fitting of the Rohloff shifter, which is a huge advantage. The

limited choice of stems means that fairly relaxed positions may not be possible -

which IMO is not an issue, as I fail to understand why anybody would want drops - unless it was for a fairly sporty, or sporty position!

We WON'T supply a bike with VN bars without a VN stem!



**Links to
INDIVIDUAL BROCHURES**
(Which contain guideline prices)

THORN DERAILLEUR BIKES

**BUILDS 1a and 1b
NOMAD Mk3 26"**
(Derailleur drops or straight bars)

**WAITING FOR
REPLACEMENT
BATCH OF
26" RIM BRAKE
FORKS
DUE EARLY FEB**

Affordable
Bomb-Proof,
day to day
cycling and
Expedition
Touring.

[CLICK HERE](#) for
LINK to BUILDS 1a and 1b

**BUILDS 2a and 2b
NOMAD Mk3 650b**
(Derailleur drops or straight bars)



A superb
Adventure bike,
Monster
Gravel Bike or
European Tourer

[CLICK HERE](#) for
LINK to BUILDS 2a and 2b

**BUILDS 3a and 3b
CLUB TOUR Mk5 650b**
(Derailleur drops or straight bars)



A superb, sporty
Gravel Bike and a
super comfortable
bike for cyclists at
every level of
ability on today's
broken roads.

[CLICK HERE](#) for
LINK to BUILDS 3a and 3b

**BUILDS 4a and 4b
CLUB TOUR Mk5 700c**
(Derailleur drops or straight bars)



Our modern
take on a
versatile
Traditional
Touring Bike.

[CLICK HERE](#) for
LINK to BUILDS 4a and 4b

**BUILDS 10a to 10e
AUDAX Mk4 700c**
(Derailleur and drop bars only)



Our iconic,
lightweight steel
framed bike
now has disc
brake options.

[CLICK HERE](#) for
LINK to BUILDS 10a to 10e

**Links to
INDIVIDUAL BROCHURES**
(Which contain guideline prices)

THORN ROHLOFF BIKES

BUILDS 5a and 5b NOMAD Mk3 26" (Rohloff straight bars or drops)



Rohloff reliability and functionality + our superb steel frame make this the **DEFINITIVE** Expedition Tourer and genuinely green, multi-purpose transport.

[CLICK HERE](#) for
LINK to BUILDS 5a and 5b

BUILDS 6a and 6b NOMAD Mk3 650b (Rohloff straight bars or drops)



Rohloff reliability and functionality in a superb Adventure bike, Monster Gravel Bike or European Tourer

[CLICK HERE](#) for
LINK to BUILDS 6a and 6b

BUILDS 7a and 7b NOMAD Mk3 700c AB Special (Rohloff straight bars or drops)



The ultimate machine for reliable, efficient and comfortable travel with light to medium weight loads.

[CLICK HERE](#) for
LINK to BUILDS 7a and 7b

BUILDS 8a and 8b MERCURY Mk3 650b (Rohloff straight bars or drops)



An outstanding Gravel Bike and a super comfortable bike for cyclists at every level of ability on today's broken roads.

[CLICK HERE](#) for
LINK to BUILDS 8a and 8b

BUILDS 9a and 9b MERCURY Mk3 700c (Rohloff straight bars or drops)



The **ULTIMATE SPORT TOURING BIKE!**

[CLICK HERE](#) for
LINK to BUILDS 9a and 9b

THORN BIKE COMPARISON MATRIX

My assessment of our bikes' abilities in various situations. Tyres & Forks make significant differences to how bikes perform - see pages **30, 31, 41, 42** and **43**. In the comparisons below, each bike has its 2 most frequently recommended tyre and fork options. Notice how the scores change, sometimes significantly, when different tyres and/or forks are considered. I've also taken road surface into account.

A Club Tour (or Mercury) with 853 forks and 38c G-One Speed tyres scoring 6 on rough roads, yet only 5 on smooth roads, doesn't mean that it actually goes better on rough roads - it simply means that, compared to other bike/fork/tyre combinations, it goes outstandingly well on rough roads.

Andy Blance Nov 2019

Specification Details. (Assumes the optimum racks for each specific purpose. Also assumes that you'd remove any front carrier for lightweight use)			OUTSTANDING				ACCEPTABLE							
			EXCELLENT				UNSUITABLE							
			VERY GOOD				SHOULD NOT BE USED FOR THIS PURPOSE							
			GOOD				MUST NEVER BE USED FOR THIS PURPOSE							
BUILD	Wheel size and FORK	BIKE BARS + GEAR SYSTEM + tyres	A	B	C	D	E	F	G	H	J	K	L	M
1 a or b	26" V BRAKE FORK	NOMAD Mk3 Drop or Straight + Derailleur Schwalbe Dureme 2.0 tyres	3	2	1	1	4	3	4	4	5	4	4	4
1 a or b	26" V BRAKE FORK	NOMAD Mk3 Drop or Straight + Derailleur Schwalbe Almotion 2.15 tyres	2	2	1	1	3	3	4	3	4	4	4	4
2 a or b	650b STEEL DISC fork	NOMAD Mk3 Drop or Straight + Derailleur Schwalbe G-One Speed 60mm	4	3	2	3	5	4	4	5	4	3	5 G-One Bite	2
2 a or b	650b STEEL DISC fork	NOMAD Mk3 Drop or Straight + Derailleur Schwalbe Almotion 55mm	3	2	1	2	3	3	4	4	4	3	4	4
3 a or b	650b STEEL DISC fork	CLUB TOUR Mk5 Drop or Straight + Derailleur Schwalbe G One Speed 50mm	4	5	3	4	5	4	4	4	3	2	3	
3 a or b	650b STEEL DISC fork	CLUB TOUR Mk5 Drop or Straight + Derailleur Schwalbe Mondial 50mm	3	4	2	3	4	4	4	3	4	2	2	
4 a or b	700c 853 forks	CLUB TOUR Mk5 Drop or Straight + Derailleur Schwalbe G-One speed 38c	4	4	5	6	4	5	3	1				
4 a or b	700c ST 700 FORK	CLUB TOUR Mk5 Drop or Straight + Derailleur Schwalbe Supreme 35c	3	3	4	5	3	5	5	2	2	1	1	
5 a or b	26" V BRAKE FORK	NOMAD Mk3 Drops or Straight + ROHLOFF Schwalbe Dureme 2.0 tyres	3	2	1	1	4	3	4	4	5	5	6 18 x 2.0" MTB	6
5 a or b	26" V BRAKE FORK	NOMAD Mk3 Drops or Straight + ROHLOFF Schwalbe Almotion 2.15 tyres	2	2	1	1	3	3	3	4	5	5	5	6
6 a or b	650b STEEL DISC fork	NOMAD Mk3 Drops or Straight + ROHLOFF Schwalbe G-One Speed 60mm	4	5	2	3	5	4	4	5	4	4	6 G-One Bite	3
6 a or b	650b STEEL DISC fork	NOMAD Mk3 Drops or Straight + ROHLOFF Schwalbe Almotion 55mm	3	4	1	2	4	4	4	4	5	4	4	5
7 a or b	700c 853 forks	NOMAD Mk3 AB SPECIAL Drops or Straight + ROHLOFF Schwalbe G-One Allround 38c	4	5	3	4	4	5	6	4			2	
7 a or b	700c ST 700 FORK	NOMAD Mk3 AB SPECIAL Drops or Straight + ROHLOFF Schwalbe Supreme 40c	3	4	3	3	3	5	5	3	3	1	2	
8 a or b	650b STEEL DISC fork	MERCURY Mk3 Drops or Straight + ROHLOFF Schwalbe G One Speed 50mm	4	5	3	4	6	4	4	5	1	1	3	
8 a or b	650b STEEL DISC fork	MERCURY Mk3 Drops or Straight + ROHLOFF Schwalbe Mondial 50mm	3	4	2	3	4	4	4	4	1	1	2	
9 a or b	700c 853 forks	MERCURY Mk3 Drops or Straight + ROHLOFF Schwalbe G-One speed 38c	4	4	5	6	4	6	4	1				
9 a or b	700c ST 700 FORK	MERCURY Mk3 Drops or Straight + ROHLOFF Schwalbe Supreme 35c	3	3	4	5	3	5	4	2	1	1	2	
10 MANY SPECS	700c Carbon DISC fork	AUDAX MK4 DISC DROPS + DERAILLEUR Schwalbe G-One speed 30c	1	2	6	4	2	3	1					



THORN SOLO BIKE GEOMETRY

All dimensions **except frame sizes** are given in mm, except seat angles, which are in degrees.
Frames include high quality FSA aerospace bearing headset and nice quality 27.2mm micro adjustable seat post.

MODEL	SIZE (cm)	FRAME TUBE DIAMETERS	SEAT TUBE C to C	SLOPE	HEAD TUBE	VIRTUAL TOP TUBE C to C	BB Drop	SEAT ANGLE In degrees	CHAIN STAY	FORK OFFSET	MIDTUBE Standover HEIGHT	S/O at front of top tube
AUDAX Mk4 700C THORN 858 Seamless, Double butted Heat treated Cro-Mo frame & stays	50S	LIGHTWEIGHT OVERSIZED FRAME TUBES 28.6 top tube 28.6 seat tube 31.8 down tube 16mm seat stays .8/5/8 gauge	380	120	98	520	72	74	425	55	701	761
	52M		420	100	105	550	72	73.5	430	46	738	788
	55M		480	70	133	565	72	73	430	46	772	807
	55.5S		415	140	156	530	72	74	430	55	742	812
	58M		520	60	165	575	67	72.5	430	46	801	831
	61M		550	60	196	595	67	72	435	46	833	863
CLUB TOUR Mk5 700c/650b REYNOLDS 725 Double butted Heat treated Cro-Mo frame & stays	NEW 50S	STANDARD OVERSIZED FRAME TUBES 28.6 top tube 28.6 seat tube 31.8 down tube 16mm seat stays .9/6/9 gauge	410	90	109	530	70	74	436	55	740	765
	NEW 50L		410	90	105	565	70	73.5	441	50	740	765
	52S		440	80	125	540	70	73.5	436	55	755	785
	52L		440	80	117	580	70	73	444	50	755	785
	55S		480	70	154	550	70	73	439	55	785	825
	55L		480	70	144	590	70	72.5	447	46	785	815
	58S		520	60	188	560	65	73	439	50	820	842
	58L		520	60	179	600	65	72.5	450	46	820	842
	61S		560	50	214	575	65	72.5	441	50	850	865
	61L		560	50	205	615	65	72	453	46	850	865
MERCURY Mk3 700c/650b REYNOLDS 853 Seamless, Double butted Heat treated frame & REYNOLDS 725 stays	NEW 50S	Special O/S FRAME TUBES 30.2 top tube 30.2 seat tube 31.8 down tube 16mm seat stays .8/5/8 gauge Inc shim to fit industry standard 27.2 seat post	410	90	109	545	70	74	431	55	740	765
	NEW 50L		410	90	105	570	70	73.5	431	46	740	765
	52S		440	80	125	555	70	73.5	431	50	755	785
	52L		440	80	117	580	70	73	431	46	755	785
	55S		480	70	154	565	70	73	431	50	785	825
	55L		480	70	144	590	70	72.5	436	46	785	815
	58S		520	60	188	575	65	73	431	50	820	842
	58L		520	60	179	600	65	72.5	436	46	820	842
	61S		560	50	214	585	65	72.5	436	50	850	865
	61L		560	50	205	615	65	72	441	46	850	865
THORN NOMAD Mk3 26"/650b THORN 969 Seamless, Double butted Heat treated Cro-Mo frame & stays	40S/T	MEGA OVERSIZED FRAME TUBES 31.8 top tube 31.8 seat tube 34.9 down tube 19mm seat stays .9/6/9 gauge Inc shim to fit industry standard 27.2 seat post	440 Centre to Top	Step Through frame 180mm Head Tube		545	55	74	441	60		
	NEW 47S/T		505 Centre to Top	Step Through frame 230mm Head Tube		580	50	73	453	53		
	50S		400	100		535	55	74	435	60	725-740*	755-770*
	50L		400	100		570	55	73.5	453	53	725-740*	755-770*
	52S		430	90		545	50	73.5	441	60	750-765*	785-800*
	52L		430	90		585	50	73	459	53	750-765*	785-800*
	55S		470	80		555	50	73	447	60	800-815*	820-835*
	55L		470	80		600	50	72.5	466	48	800-815*	820-835*
	58S		505	75		570	45	73	453	53		
	58L		505	75		615	45	72	472	48		
	61S		540	70		585	40	72.5	459	48		
	61L		540	70		635	40	72	479	48		
									WRT standover heights above, first figure is for 26" x 2.0" second figure* is for 650 x 60b BLACK figures are measured RED figures yet to be measured			

WRT standover heights above,
first figure is for 26" x 2.0"
second figure* is for 650 x 60b
BLACK figures are measured
RED figures yet to be measured

FRAME SIZING - Women's frames.

We don't make frames specifically for MEN or for WOMEN but, as we make so many different sizes and models, we're confident we can supply 97% of the adult population, with the frame, for a perfectly fitting machine from our stock.

I know several female cyclists who are stronger and/or quicker than almost any male cyclist. (In my opinion, the 2 greatest cyclists of all time were Eddy Merckx and Beryl Burton.)

Generally however, women are not as heavy or as strong as male cyclists.

There's a popular misconception that, generally, women have longer legs than men of the same height. This may appear to be true, when looking at people in the street but it's not actually true of people in bare feet. High heels can't be used to advantage whilst cycling.

Why has this misconception arisen?

[1] Women generally have less upper body strength than men - when this is the case, they can't support a sporty position as well as, or for as long as, most men.

[2] Many women suffer from discomfort in the perineal area, whilst adopting a low position.

[3] Women usually have smaller hands than men. The result of any or all of the preceding points, is that women are frequently told that they require a bike position, with a significantly shorter reach than that of a man with identical body dimensions.

It's more likely, in my opinion, that a slightly shorter reach, combined with a higher handle bar position would be even more comfortable.

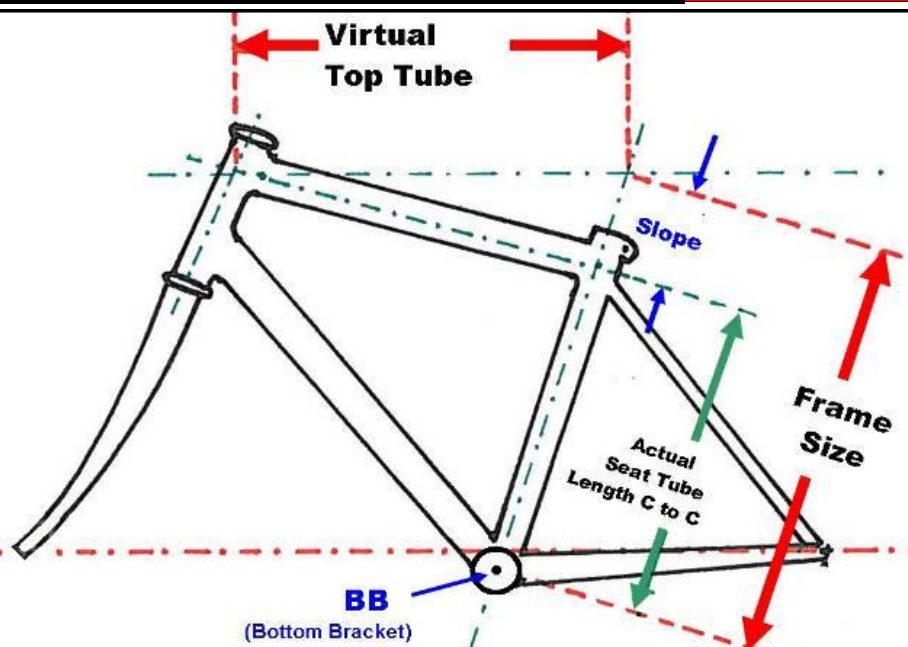
It's true that more than 90% of our customers are male but we've always made sizes suitable for women.

(And for short men, who want a relaxed position).

Mercury Mk3, Club Tour Mk5 and Nomad Mk3 frames are all available in size 50S. In addition, we make 2 sizes of step through Nomad Mk3 frames the small 40 S/T and the medium sized 47 S/T

The Audax Mk4 is available in size 50S.

The 55.5S Audax Mk4 is unique - it's a sports bike with a medium sized frame, a short top tube, no toe overlap and excellent handling.



HOW WE SIZE OUR FRAMES

Please refer to the Matrix on the previous page (24)

All our frames have sloping top tube.

This slope is beneficial in providing the rider with more clearance when standing over the top tube, at the middle of the tube. We call this mid tube stand over height.

It's essential that you can stand over your bike at this point.

Long legged riders ought to be able to straddle the bike at the very front.

I shall do my best to explain what the dimensions in the matrix mean.

The way that we size our frames is to measure the seat tube, from the centre of the BB, to the intersection of where the centre line from the top tube would intersect with it, IF the bike had a horizontal top tube - this is the "SIZE" in cm in the matrix. (e.g. 50, 52, 55, 58 and 61.

We also provide a dimension, which we

call "SLOPE" - the difference between the size and the actual seat tube C to C in mm

You'll also see, in the diagram above exactly how we measure the

VIRTUAL TOP TUBE

Our Mercury Mk3, Club Tour Mk5 and Nomad Mk3 frames are available with either Long (L) or Short (S) virtual top tube lengths. Because the Audax Mk4 is intended for sporty use most sizes have a medium length top tube.

On a sloping frame, the Virtual Top Tube is different to and much more informative than, the actual top tube C to C dimension. The greater the slope, the more meaningless the actual top tube dimension becomes.

This is our modern take on convention [2] please see "Other methods of sizing frames." in the text box below.

OTHER METHODS OF SIZING FRAMES

(This is for interest only and it's not necessary to read this.)

If you measure to the top of the actual seat tube, it won't tell you much about the frame.

[A] The current MTB convention of sizing frames using an apparently random number of inches, only works as long as all frames have a similar shape and as long as all manufacturers agree to this convention. I expect that we could call our frame sizes something like:-

15", 16½", 18", 19½" and 21"

[B] On the other hand, traditional touring bike manufacturers used 2 conventions.

[1] Frames were measured from the BB centre to the top of the seat tube. Measured this way the frame sizes above could be called :- 20½", 21½", 22¼", 23¾" and 24¾"

This makes some sense, provided that the top of the seat tube is almost level with the top tube but often they're not and then the convention becomes nonsense.

[2] Alternatively frames were often measured from the BB to the intersecting centre lines of

the seat tube and horizontal top tube. This made sense because both conventions measured top tubes between centre lines. Measured this way these same frame sizes could be called:-

19", 20½", 21¾", 23" and 24"

(We favoured this convention, until it became normal to have a sloping top tube)

I hope that I've explained why we don't use the MTB convention or either of the old touring bike conventions - a 19½" touring bike would be ludicrously small for someone who needs 19½" MTB and a 21" MTB would be monstrously huge for the shorter than average height men, or slightly taller than average height women who may ride a 21" touring bike!

Although it may seem complicated at first, we consider our method of sizing touring bikes, to be the most sensible system in use today.

VERY RELAXED: This is a position which places a very considerable amount of the rider's weight on the saddle. The rider is leaning forward slightly but is sufficiently upright to enable them to look around easily. This position is ideal for gentle cycling, or for cycling slowly and defensively in traffic.

The very relaxed position is not efficient at speed, or in high winds but it is possible to exaggerate the bend in the arms, in order to obtain a lower position, for short periods of time.

PLEASE NOTE: The bike will look more aesthetically pleasing, if comfort bars are used to gain some of the considerable height which is required. A very relaxed position is often only achievable, for very tall cyclists, by using comfort bars.

Most men and all women will need a **Short Club Tour, Mercury or Nomad Mk3** to achieve this position with straight bars.

This position is NOT achievable with drop bars.

VERY RELAXED



RELAXED



FAIRLY RELAXED



FAIRLY SPORTY



SPORTY



Achieving your perfect position on your bike

We can set your bike up in many different positions:-

VERY RELAXED, RELAXED, FAIRLY RELAXED, FAIRLY SPORTY or SPORTY

We will even take instruction to split the difference between 2 of the main positions. If this is your wish, please tick both boxes.

For example many customers choose a position between "Fairly Relaxed" and "Fairly Sporty" - we call this **SPORTY/ RELAXED**

Almost every man and most women would need a **Long Club Tour, Mercury or Nomad Mk3** to achieve this position with straight bars.

RELAXED: This is a position which places most of the rider's weight on the saddle. The rider is leaning forward a little more than with a very relaxed position but is still sufficiently upright to enable them to look around, without appreciably changing their position.

Many men but practically all women will need a **Short Club Tour, Mercury or Nomad Mk3** to achieve this position with straight bars.

This position is (almost certainly) NOT achievable with drop bars.

FAIRLY RELAXED: This is a position which places much of the rider's weight on the saddle. The position is efficient for fairly brisk riding and is suited to assertive riding in traffic. More of the rider's weight is supported by their arms and hands. The rider is still sufficiently upright to enable them to look around - but only when they make a positive effort to do so.

A few men and many women will need a **Short Club Tour, Mercury or Nomad Mk3** to achieve this position with straight bars.

This position may not be achievable with drop bars on a Club Tour, it's even less likely to be possible on a Nomad Mk3 and very unlikely to be possible on a Mercury or on a Nomad with GRX (dérailleur) STI.

FAIRLY SPORTY: This is an even lower position, which spreads the rider's weight between saddle and bars. The position is fairly aerodynamic and much more suited to brisk riding. The rider is still able to raise themselves to look around when necessary.

It may be uncomfortable to ride sedately in this position.

It's unlikely that this position is achievable with comfort bars.

SPORTY: This is a much lower position and it is well suited to covering long distances at a brisk pace efficiently and in comfort. The position is not as low as a racing position but most cyclists are not racing cyclists. It would almost certainly be

uncomfortable to ride slowly for any distance, in this position. The majority of cyclists ought to still be able to look around when necessary - others may have to ride with one hand to facilitate this. Please don't confuse "looking around" with being able to glance behind.

This position is NOT achievable with comfort bars.



FAIRLY SPORTY USING BAR ENDS



SPORTY USING BAR ENDS



The model we've used is of average height for a man in the UK (1745mm). He also has average length arms and legs for his height.

Please note, we make allowance for height, BFSO, gender and for body type.

We also add 20mm to the height of the positions shown and cut the cables to suit - this is our margin for error - you can easily drop the bars by 20mm when you receive the bike.

Please note. In the above pic of the "sporty" position, the stem we've used is longer than we'd normally use on this size bike. Normally we'd have used a longer frame to achieve this position. We fitted the 150mm stem simply to illustrate the "sporty" position. It also serves to illustrate that no one frame can be chosen for every set up position.

You can see that our model's position, when using the bar ends on a fairly sporty set up, is very similar to his position on the grips with a sporty set up. Our model's position, on the sporty set up, when using the bar ends is almost a full racing tuck. Don't underestimate the variety of positions you can achieve, with straight bars and bar ends - particularly if you choose the Ergon GP5-L bar ends.

How to get the perfect set up on your bike.



Do you currently have a bike?

YES

Are you happy with the set up?

NO

Did you keep the set up dimensions from a previous bike?

YES

Would you be happy with this set up on your NEW BIKE?
Please bear in mind that it may be for a different purpose.

NO

Can you indicate EXACTLY how this position would need to change, in order for it to be suitable?

NO

NO

Does (did) this bike have the same type of bars as you wish your new bike to have?

YES

Please apply our correction factor, see "measuring an existing bike" on page 28

NO

YES

Please fill in ALL the details requested in the section "PERSONAL DETAILS"
We will use this data to calculate the set up of your new bike.
Alternatively, you can make an appointment to visit us.
UK 01278 441505
sales@thorncycles.co.uk

Please fill in ALL the measurements in the section "Measuring an existing bike" (Which you'll find on page 24)
We will then use YOUR MEASUREMENTS to set up the position on your new bike.

Customers' Personal details

We only need these if you can't supply set up dimensions
The dimensions we need are really quite simple.

In order for US to be able to **CALCULATE** and determine a suitable position for your next THORN bike, we must have very specific and perhaps, to some people, very personal information. We need **EVERY BIT** of the information requested in the table below.

Alternatively, you may be able to complete the set up details **EXACTLY** as requested in the section **"MEASURING AN EXISTING BIKE"**.

Or, as a **THIRD OPTION**, you are most **WELCOME** to **VISIT US** and we'll be very happy to measure and advise you and/or in the case of one of our Rohloff bikes, let you take one out for a test ride.

PLEASE NOTE: Unless one of the 3 options above are followed exactly, we are unable to guarantee the results and only your statutory rights may apply.

DATA FOR THE PERSON THE BIKE IS FOR: Name

DIMENSIONS AND OTHER DATA.		GENDER M OR F
We must have an answer in every box.	WEIGHT (kg)	
	AGE	
	HEIGHT (bare feet in mm.)	
	BFSO in mm (Bare foot stand over height in mm.)	
	SHOE SIZE (continental)	
	ARM SPAN (mm)	
POSITION REQD. Please tick one box, or 2 boxes. If you tick 2 boxes, we will aim for a position between them.	VERY RELAXED	
	RELAXED	
	FAIRLY RELAXED	
	FAIRLY SPORTY	
	SPORTY	
CHOICE of SADDLE and TYPE of HANDLEBARS REQUIRED. Please tick one Please state width required, if Flat Track bars are chosen.	SADDLE LENGTH (mm) Or NAME and MODEL	
	CONVENTIONAL DROPS	
	STRAIGHT	
	FLAT TRACK width (mm)	
OTHER ESSENTIAL INFORMATION Please tick one box.	COMFORT	
	Experienced, fit and confident cyclist.	
	Less experienced but keen and reasonably fit cyclist.	
	Casual and/or nervous cyclist.	

There are 2 problems with measuring BFSO:-

[1] How far into the crotch should you push the square?
The answer is, until it causes the soft tissue to gently touch bone.

[2] It's possible to tilt the pelvis without realising it, which makes a nonsense of the result.
To avoid tilting the pelvis, stand against a vertical wall, with your head, heels and shoulder blades touching the wall.

Now try and touch the small of your back and calf muscles against the wall, the pelvis is immobilised and a meaningful measurement may now be taken.

Please see diagram on the left.
You'll need someone else to help you to take this measurement.

You may need to improvise to find a suitable square. Really big coffee table books are an option.
A carefully cut and folded sheet of card, taken from an extra large carton is another option.

ARM SPAN. This is very simple to measure. Stand facing a wall and, with your arms horizontal, touch the corner of the wall with the longest finger of one hand and then see how far you can extend the corresponding finger of the other hand. Mark this point. It's then easy to measure from the corner to the mark.

Head upright and flat against the wall.

Shoulders relaxed and shoulder blades flat against the wall.

Try and press the small of the back flat against the wall.

Try and press the knees and calf muscles flat against the wall.

Heels flat against the wall, feet 150mm apart.

HOW TO MEASURE YOUR BFSO

(bare foot stand over height)
IT DOES TAKE 2.

90° square, or LARGE COFFEE TABLE BOOK pressed up into the crotch (perineal area) until it just touches bone.

Measure from top of square (OR BOOK) to ground

Measuring an existing bike

The dimensions we ask for, will enable us to set up your new bike exactly as your favourite machine.

Please provide either "L" or "H".

Experience has shown us that these dimensions are the easiest dimensions to take, that will plot **exactly** where your saddle is, in relation to your pedals. They also establish **exactly** where your bars are in relation to your saddle.

Please use this method only.

The dimensions we need to duplicate your position.
Please refer to diagram below.

N	Overall saddle length in mm. And/or name of saddle.
S	The distance in mm. FROM THE UPPER SURFACE OF THE LOWER PEDAL (with crank in line with seat tube) to the top of the saddle, measured along the seat tube. MAKE CERTAIN THAT YOU GET THIS RIGHT - PLEASE CHECK CAREFULLY WHAT WE'RE ASKING FOR - WE'RE NOT ASKING FOR CENTRE of BB TO TOP OF SADDLE - IF YOU GET THIS WRONG YOU WILL ALMOST CERTAINLY GET THE WRONG SIZE FRAME.
B	The distance that a plumb line falls behind the CENTRE of the BB, when suspended from the nose of the saddle. IF YOU GET THIS WRONG IT WILL SERIOUSLY AFFECT THE REACH.
L	On a STRAIGHT BAR BIKE , it's the distance that the TOPS of the GRIPS are LOWER than saddle. On a DROP BAR BIKE , it's the distance that the TOP of the BARS are LOWER than the saddle. Use a long bubble level or a straight edge with a small bubble level taped to it and measure from the top of the saddle to the top of the bars (at their closest point to the stem). The bike must be on a level surface.
H	On a STRAIGHT BAR BIKE , it's the distance that the TOPS of the GRIPS are HIGHER than saddle. On a DROP BAR BIKE , it's the distance that the TOP of the BARS are HIGHER than the saddle. You can use the same methodology as described in L above to measure this
DS	This is the distance from the nose of the saddle to the centre of the bars, on a bike with 3-5° STRAIGHT BARS . These are the most common straight bars in use today, most MTB low rise bars are 5°. Our THORN STRAIGHT BARS and THORN NARROW BARS are both 5° BARS.
DD	This is the distance from the nose of the saddle to the centre of the bars, on a bike with DROP BARS
DF	This is the distance from the nose of the saddle to the centre of the bars, on a bike with 10° THORN FLAT TRACK or 12.5° THORN BARS (eXp or FFT)
DC	This is the distance from the nose of the saddle to the centre of the bars, on a bike with THORN COMFORT BARS , which have an 18° bend.
DX	This is the distance from the nose of the saddle to the centre of the bars on a bike with ANY OTHER BAR . PLEASE NOTE...YOU MUST BE ABLE TO COMMUNICATE TO US EXACTLY WHAT THESE BARS ARE.

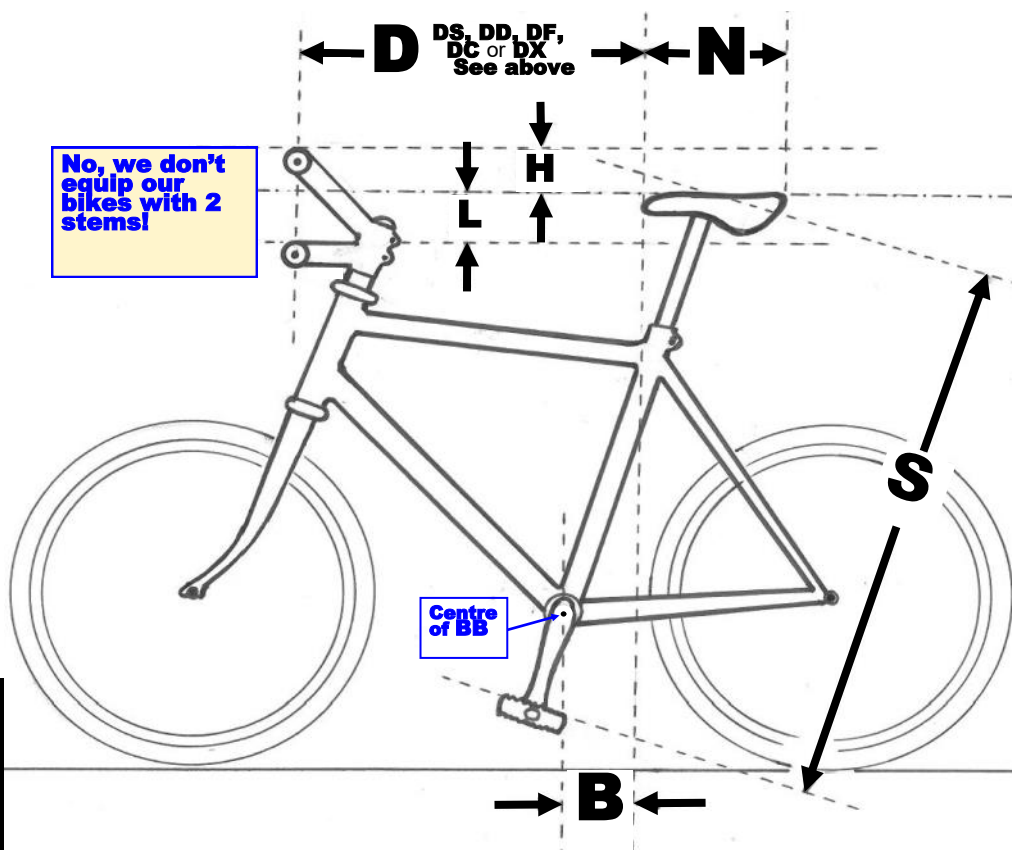
Correction of 'D'

Compared to our 5° bend straight bars, the following table shows how much shorter, or longer a stem probably needs to be in order to achieve a similar position with a different type of bar.

DS	0mm
DD	-55mm
DF	+15mm
DC	+35mm
DX	???mm

PLEASE NOTE:

The dimensions that you give us must be accurate. Please get someone else to check your measurements.



Which Thorn Frame Size? Mercury Mk3, Club Tour Mk5, Nomad Mk3 + Audax Mk4 frames only.
A step through frame (S/T) is an option for most cyclists who need or want one -
Choose 40S/T if the matrix says you could ride 50 or 52 and choose 47S/T, if it says you could ride 55 or 58.
Where I've entered 40S/T on the matrix - you must have a step through frame. *Andy B Nov 2019*

- [1] Measure your height in bare feet in mm.
 [2] Measure your barefoot standover height (BFSO) in mm
 see page 27
 [3] Look at the Height in bare feet column, then read across to find the column with the closest BFSO to your own. Your ideal frame size is given next to your BFSO. (In the same colour column)
 [4] Almost all men (and women who require a sporty position) – select **L** frames for straight bars and **S** frames for drop bars.
 [5] Women requiring a fairly relaxed position and men requiring a very relaxed position should select **S** frames for straight bars.

- [6] Where 2 frame size options are given, choose the smaller size with a Nomad Mk3 frame - for other frames, the choice is aesthetic.
 [7] Frame sizes in **RED** mean that although you will have standover clearance in the middle of the top tube, you will touch it at the very front of the bike - it's not ideal but it's sometimes inevitable for those with short legs.

Height in bare feet (mm)	BFSO Bare foot Stand Over height (mm) Average Length Legs	Ideal Frame Size	Shorter than Average BFSO	Ideal Frame Size	Longer than Average BFSO	Ideal Frame Size	MUCH Shorter than Average BFSO	Ideal Frame Size	MUCH Longer than Average BFSO	Ideal Frame Size
1510	688		666		710	40S/T	644		730	50
1525	695		673		718	40S/T	650		737	50
1540	702		680		725	40S/T	657		744	50
1555	709	40S/T	688		730	50	666		751	50/52
1570	716	40S/T	695		737	50	673		758	50/52
1585	723	40S/T	702		744	50	680		765	50/52
1600	730	50	709	40S/T	751	50/52	688		772	50/52
1615	737	50	716	40S/T	758	50/52	695		779	52
1630	744	50	723	40S/T	765	50/52	702		786	52
1645	751	50/52	730	50	772	50/52	709	40S/T	793	52/55
1660	758	50/52	737	50	779	52	716	40S/T	800	52/55
1675	765	50/52	744	50	786	52	723	40S/T	807	52/55
1690	772	50/52	751	50/52	793	52/55	730	50	814	52/55
1705	779	52	758	50/52	800	52/55	737	50	821	55
1720	786	52	765	50/52	807	52/55	744	50	828	55/58
1735	793	52/55	772	50/52	814	52/55	751	50/52	835	55/58
1750	800	52/55	779	52	821	55	758	50/52	842	55/58
1765	807	52/55	786	52	828	55/58	765	50/52	849	58
1780	814	52/55	793	52/55	835	55/58	772	50/52	856	58
1795	821	55	800	52/55	842	55/58	779	52	863	58/61
1810	828	55/58	807	52/55	849	58	786	52	870	58/61
1825	835	55/58	814	52/55	856	58	793	52/55	877	61
1840	842	55/58	821	55	863	58/61	800	52/55	884	61
1855	849	58	828	55/58	870	58/61	807	52/55	891	61
1870	856	58	835	55/58	877	61	814	52/55	898	61
1885	863	58/61	842	55/58	884	61	821	55	908	61
1900	870	58/61	849	58	891	61	828	55/58	918	61
1915	877	61	856	58	898	61	835	55/58	928	61
1930	884	61	863	58/61	908	61	842	55/58	939	61
1945	891	61	870	58/61	918	61	849	58	950	61

700c and 700c/650b FORKS

Available in 4 THORN colours for our Mercury Mk3 or Club Tour Mk5 frames:-
(Also works with previous Mercury and Club Tour frames with brakes set in the 700c position)
BRG (British Racing Green), **RED**, **BLUE** and **GUNMETAL**



700cThorn MER853VC 853 steel "V" brake fork.

These are the lightest weight steel V brake forks ever made to be sold with a lifetime warranty- **they're also, the most comfortable forks I've ever ridden.**

They may be light and comfortable but they're also very strong and reliable.

Unlike carbon forks, if you're unlucky enough to hit a big pothole, you'll be able to inspect them for damage.

Reynolds made the 853c blades and lightweight 853 steerer especially for us.

Reynolds even made the tooling for the tight-radius bend that I'd requested. These are a premium product offered at a premium price.



700c MER853VC forks are available in 2 different offsets:- 46mm offset A and 52mm offset B/C

Max tyre size, with generous mudguard clearance is 700 x 35c. **L1 = 385mm (Axle to crown race)**

We also have a version which allows either 700c or 650b rim brake wheels to be fitted.

These forks have removable V brake bosses, which, when reversed, allow either 700c or 650b rims to be used.

700c/650b MER853VC forks are available in 4 different offsets:- 46mm offset A, 50mm offset B, 55mm offset C and **70mm***

Max tyre sizes, with generous mudguard clearance are 700 x 40c and 650b x 54mm

The appropriate offset for each frame size (either 46mm, 50mm or 55mm) produces a sweet handling, medium trail bike for which Thorn are justifiably famous. This kind of geometry works with unloaded bikes or bikes which are loaded with the majority of the weight at the rear of the bike.

***The 70mm offset produces a classic low trail geometry with short Mercury or Club Tour frames. This provides exceptional handling, in the classic French Randonneur style - provided a large loaded front bag attached to one of our carriers is always used and not much else is carried on the bike.**

NOTE the 853c blades on both forks allow direct fitting of mudguards but they **don't** have Lo-Loader bosses. As reliable as these forks are; you must never try to fit a front carrier to them. The tight-radius bends flex beautifully, I didn't want a mudguard boss brazed on the bend, therefore we recommend that you use an SKS Secu clip.

Weight or either fork 850g with steerer cut to 300mm
L1 = 390mm (Axle to crown race)
(Steerer weighs 0.71g per mm and is 380mm at full length).

Thorn ST700 Fork Reynolds Super Tourist steel touring fork with V brake bosses and Lo-Loader bosses.

Max tyre sizes, with generous mudguard clearance are 700 x 40c

We also have a version which allows either 700c or 650b rim brake wheels to be fitted.

Thorn ST700/650b Fork Reynolds Super Tourist steel touring fork with V brake bosses and Lo-Loader bosses.

These comfortable forks must be used with a front V brake (or cantilever brake).

On a Mercury they must be used with a rear disc brake. On a Club Tour, they can be used with a rear V (or Canti brake) or rear disc.

There are 3 different offsets:-

46mm offset A, 50mm offset B, and 55mm offset C

The appropriate offset for each frame size produces a sweet handling, medium trail bike for which Thorn are justifiably famous. This kind of geometry works with unloaded bikes or bikes which are loaded with the majority of the weight at the rear of the bike.

The Blades are Reynolds Super Tourist blades.

These forks are offered in all 4 different finishes to match the Mercury Mk3 or CT Mk5 frames. Such a spec will make a super commuting bike, which will avoid excessive rim wear, when chosen with rear disc. These forks may be used with straight bars or Drops.

With these steel forks, I believe that the Mercury and Club Tour Mk5 are the definitive modern touring bikes. (Please see links to these machines on pages **21 & 22**).

A full mudguard with its own dedicated bosses, can be fitted with these forks.

Max tyre sizes, with generous mudguard clearance are 700 x 40c and 650b x 54mm

Weight 1055g with steerer cut to 300mm. L1 = 390mm (Axle to crown race)

(Steerer weighs 1.03g per mm and is 380mm at full length)



700c/650b/26" FORK MATRIX

Choose the most suitable fork, for the cycling you plan and focus your: THORN Club Tour Mk5, Mercury Mk3 or Nomad Mk3 bike to suit your precise needs. The appropriate choice of fork can fundamentally change the bike's capabilities.

FORK	BRAKE TYPE	MATERIAL	L1 (axle to crown seat mm)	Max tyre With M/G	Max tyre NO M/G	NOMAD Mk3	CLUB TOUR	MERCURY	Lo-Loader	Mudguard fittings?	COMFORT out of 10
MER853VC 700	V brake (Or cantilever)	REYNOLDS Competition wt 853 Steel blades and steerer	385	700/35c	700/40c	YES specific applications	YES	YES	X	YES Direct fit	10
MER853VC 700/650b	V brake (Or cantilever)	REYNOLDS Competition wt 853 Steel blades and steerer	390	700/40c 650b/54	700/44c 650b/54	YES specific applications	YES	YES	X	YES Direct fit	10
ST 700	V brake (Or cantilever)	REYNOLDS Super Tourist Cr-Mo Steel	390	700/40c	700/44c	YES	YES	YES	7.5 kg Per side	YES Direct fit	8
ST 700/650b	V brake (Or cantilever)	REYNOLDS Super Tourist Heat treated Cr-Mo Steel	390	700/40c 650b/54	700/44c 650b/54	YES	YES	YES	7.5 kg Per side	YES Direct fit	8
THORN Mk3 Steel disc	DISC	REYNOLDS Heavy Duty Cr-Mo Steel	410	700/40c 650b/65 26 x 2.8"	700/44c 650b/65 26 x 3"	YES	YES	YES	10 kg Per side	YES Direct fit	4.5
THORN Bikepacking DISC fork	DISC	SEAMLESS Cr-Mo STEEL	410	700/40c 650b/60 26 x 2.5"	700/44c 650b/65 26 x 2.5"	YES	YES	YES	Any- thing cage mounts	YES Direct fit	3
THORN NOMAD Mk3 Fork 26"	V brake (Or cantilever provided straddle wires clear any mudguards)	REYNOLDS 725 Super Tourist Heat treated Cr-Mo Steel	410	26"/2.35"	26"/2.5"	YES	X	X	7.5 kg Per side	YES Direct fit	8

NEW THORN Mk3 STEEL DISC FORK
Supplied with genuine
110 x 15mm BOOST
through axle



**For 26",
650b
+ 700c**



NOW in STOCK

**THORN UNICROWN,
STRAIGHT BLADE,
BIKE PACKING
DISC FORK** Supplied
with genuine 110 x 15mm
BOOST through axle

**For
26",
650b
+700c**



SADDLES

There's one question that I can never answer, "Which is the most comfortable saddle?"

This would be an easy question to answer - if only somebody made a saddle which was the most comfortable for everybody - but nobody does - and nobody could! Our anatomies are unique to us.

Customers come to the showroom and press their thumb down into saddles and suck their teeth. If that was a valid test, most cyclists would choose a gel saddle. In fact I believe that almost everybody would find a gel saddle very comfortable, for a short period of time. I've yet to meet the person, who's happy to ride on one, for any great distance. We sit on our "sit bones" which are a part of our pelvis called the **ischial tuberosities**. To protect the overlying muscle and skin from pressure, the tuberosities are covered by a fat pad, the "bursa". By supporting the weight of our bodies on these bones, we protect the delicate structures between and in front of them (our perineum) from pressure, which could cause bruising, numbness, pain and could possibly lead to problems of swelling and infections.

The bursae can be conditioned to become used to supporting weight, on a bicycle saddle, by



gradually increasing the duration of the exercise. If too much is done too quickly, the bursae can become painfully inflamed, (bursitis). With a gel saddle, your bones sink further and further into the gel and you end up supporting your weight on your perineal area. Add to that the absence of fresh air and you get sweaty too, which does nothing to alleviate the problem. With a firm saddle your sit bones take your weight and prevent it from being borne, by the area of your anatomy least capable of doing so.

Our **Thorn Velo** saddles have a firm, but yielding plastic base and dense padding, you don't sink too far into them. We think that they are excellent saddles to find as original equipment on any bike.

Why are women's saddles shorter than men's?

Neither Fiona, who's a senior physiotherapist, nor anyone else I asked, could offer an anatomical

reason. Shortened ladies saddles first appeared in Holland, where it was commonplace for women to ride in cycling skirts. Dutch Womens' bikes have a very short reach and, upon dismounting, cycling skirts often became hitched up on the saddles. Obviously women needed shorter saddles! Few women now ride in skirts but designers have remembered that women need short saddles, without remembering why and so the myth persists. Does it matter? Yes - the rails of top quality saddles are actually springs. Springs provide comfort. **Short springs are stiffer than long springs.**

Short saddles are therefore far less comfortable than regular saddles.

Ladies, don't assume you need a short saddle. Female sit bones are generally further apart than male sit bones - in all probability, you simply need a wider one.

Brooks leather saddles.

Brooks saddles have two reputations:- they're famous for being extremely comfortable - they're also infamous for being excruciatingly uncomfortable - I find them very comfortable! The firm hide supports the sit bones, gradually you break the saddle in, to your shape and you gently condition your bursae to the shape of the saddle. A great many people find their dream saddle with a Brooks - but usually only once it's broken in.

Why try a Brooks?

If you like your Brooks saddle, you'll not only be very comfortable, you'll also have the most robust saddle possible and it'll last ages. If you bond with your Brooks, I advise breaking in a second one, on short journeys, because even Brooks saddles don't last for ever. With a back up Brooks saddle, you'll never be faced with the prospect of a big ride, on an unbroken saddle. Once you're happy with your first Brooks, you could consider a lighter Brooks saddle, with **titanium rails**; which have even more spring.

We can sell you a bike, equipped with a Brooks B17 saddle upgrade, for significantly less, than it would cost you to buy a B17 later. Ride it only for short trips to start with and see if it suits - you can't know unless you try - if you waste money, sorry, but at least you tried one.

If you can't get on with a Brooks but you manage to find a saddle that you really like - **if you take my advice** - you'll buy a load of them immediately. These days, very few products remain unchanged for long, very soon there will be a "new super whizz bang version", which may not be as good for **YOU** and the long search for a comfortable saddle will begin again.

May 2019. I've been trying out a Brooks C17 Cambium all weather saddle. I've now covered sufficient miles to be confident in my recommendation. The Cambium is exceptionally well built using a composite of rubber and canvas. It's tough and stylish, it has a firm feel but with some give. Whilst it's fairly pricey, the Cambium will give years of fuss-free service.

SEAT

Brooks B17 Honey



THUSBUSTER LT Suspension Post

POSTS

Can the humble seat post really merit space of its own in this brochure? The alloy seat post that we fit as standard issue is a very nice quality item, it's micro-adjustable and it does its job well and has proven to be reliable. There's little reason for choosing anything else.

If you need a **suspension seat post**,

we've found the **Cane Creek Thudbuster** to be the best suss post on the market, its parallelogram movement means that the distance between your saddle and your pedals doesn't vary much, even when the post takes out a really big bump. We supply them with the neoprene cover, which keeps muck out of the pivots. Fiona and I use Thudbusters on our Sterling MTBs and we think they're great! **BUT we've never felt the need for a suspension post on any of our touring bikes!**

As I said, the standard issue post is a nice quality item. You could spend more money and choose a "sexier looking" seat post - such posts may give good service, or they may fail, possibly with severe consequences.

You could save a little weight with a variety of "designer alloy posts". You may even wish to have a high quality carbon post; theoretically this would have much more merit to it as an upgrade.

Carbon is significantly better at absorbing "road buzz" (small high frequency vibrations) than an alloy post. Carbon flexes slightly, so it tends to iron out small bumps. The trouble is that, whilst carbon can flex an infinite number of times, without breaking, it's quite easily crushed yet, because it's very slippery, a carbon post need firm clamping. Our THORN seat post clamps are powerful, if you're clumsy, you could crush a carbon post. Any high quality carbon post will be expensive but not all expensive posts are high quality.

We've decided, as a policy, NOT to offer designer posts (alloy or carbon) as upgrades.

If you wish to retrofit one of your own choosing, yourself, please feel free to do so, we may miss the opportunity to make a small profit but we'll also avoid the hassle and risks that we know are associated with these items.



CAMBium

C17AW
(all weather)

Which wheel size should I Choose? 26", 27.5" (650b) or 700c?

We manufacture a range of touring bikes we can offer:-

26" wheels (ETRTO 559)
27.5" (650b) wheels (ETRTO 584)
& 700c wheels (ETRTO 622).

There are advantages and disadvantages with each wheel size. How do you know which would be the most suitable for you, for the kind of cycling you're planning?

In the following comparisons I've applied the following 4 caveats:-

[I] I assume that identical width and quality tyres are chosen for each wheel size*

[II] I assume that identical gauge, quantity and quality of spokes are used.

[III] I assume that rims with identical profiles and wall thicknesses are used.

[IV] I assume that identical hubs are used.

*Tyres have a major impact on comfort and performance. The quality of the tyre can make more difference to comparisons than the actual tyre size. I've dealt with various tyre and rim choices and issues in pages **39 to 43**

Below are 12 facts that I know would withstand the most rigorous scrutiny.

Please also note, the reverse of these facts is also true (e.g. [6] 700c wheels are heavier than 26"

[1] Tyres and rims suitable for touring are more widely available globally in 26" than in 650b and 700c size - especially in Central and South America, Africa and Asia.

[2] 26" wheels can be built into smaller bikes and/or have more toe clearance than is possible with 27.5" (650b) and significantly more than 700c wheels.

[3] Increasing the tyre width increases the diameter of the wheel*.

*A fat 700c tyre is often referred to as a 29er; fat 650b tyres are often called 27.5" whereas a 26" wheel, with a really skinny tyre, may actually only measure 24" in diameter.

[4] Rotating weight is more noticeable when cycling than non-rotating weight*.

*Increasing the weight a bike's wheels, increases the effort required to accelerate it, more than increasing the weight of the frame by that same amount would.

[5] 26" wheels are stronger than 700c

[6] 26" wheels are lighter than 700c.

[7] 27.5" (650b) wheels fall between 26" and 700c in terms of lightness and strength.

[8] In order to make a 700c wheel as strong as a 26" wheel, more spokes are necessary and a more heavy duty rim is also required, this combined with the larger diameter rim, increases rotating weight considerably*.

* Currently there are no 700c (or 29er) rims available which are heavier duty than the rims we use for our 26" wheel expedition touring bikes. So you can't have a 700c wheel which is as strong as one of these.

[9] Increasing tyre width, adds weight.

[10] lighter wheels require less energy to accelerate.

[11] Smaller diameter wheels require less energy to accelerate.

[12] The further it is from the centre of the hub, the greater the effect that an increase in weight has*.

*e.g. A 100g increase at the tread cap requires more effort to accelerate than 100g at the rim and considerably more effort than 100g at the hub.

Here's a series of considerations, which I believe to be factual.

I've put my reasoning (in blue) to support these contentions - the previous caveats still apply.

[a] On rough road surfaces, fatter tyres, at the correct (lower) pressures, roll more easily than skinny tyres. The rougher the road surface, the fatter the tyre can be and the lower the pressure can be and still roll more easily. In such conditions these tyres are also considerably more comfortable and feel safer.

This is heresy to some cyclists - nevertheless it doesn't stop it being true! I've observed this myself, on Audax rides, when freewheeling downhill. I've overtaken and dropped other cyclists, of similar weight and greater weight, who were using narrow tyres.

In his thesis "Road Rolling Resistance" sports scientist Peter Nilges, was able to demonstrate, through meticulous measurements with SRM cranks (which record power input) that fatter tyres and lower pressures used significantly less energy in extreme conditions - even though they weighed more! See also page 43

[b] On really smooth roads skinny tyres, with supple walls, at the correct (high) pressures roll more easily than fatter tyres at lower pressures.

Track cyclists ride on the smoothest surfaces available to any cyclist. Their times are measured in milliseconds - gold medals are proof enough.

[c] On a mixture of road surfaces, such as we find in the UK, where some minor roads can have excellent surfaces, whereas some can be very poorly surfaced. I find that 700 x 35c and 700 x 40c tyres, (or moderately fat 27.5" (650b) or 26" tyres at moderate pressures) provide the most efficient and most comfortable compromise.

This is not just my opinion, generations of British cyclists came to a similar conclusion and used 27 x 1 1/4" tyres - which were actually a very similar size to many modern 700 x 35c tyres. 650 x 42b was favoured by hard-riding French Randonneurs.

[d] The larger a wheel, the more easily it rolls over bumps and the more comfortable it is.

A larger wheel attacks the bumps at a shallower angle and thus rides over them more easily. A test ride will confirm this.

[e] The fatter a tyre is, the more easily it rolls over bumps - provided it is at the correct pressure and the more comfortable it is.

Lower pressures are possible with fatter tyres, the tyre can deform more easily around the bumps. A test ride will confirm this.

[f] Changing pace on a climb, as a result of changes in gradient, or simply riding up steep hills always involves acceleration.

Clearly, any change of pace is acceleration. If the hill is steep enough, the bike slows down appreciably after every power stroke and has to be accelerated back up to speed with every half revolution of the cranks.

[g] The heavier a wheel is, the easier it is to maintain a constant speed on the flat. This is known as the flywheel effect and the ability of a flywheel to store energy and smooth out power strokes is well documented.

[h] The thicker the sidewalls of a tyre, the worse the ride quality.

It takes more energy to flex a thicker sidewall than a thinner sidewall, which means that smaller bumps are not absorbed by the tyres, resulting in high frequency vibration and larger bumps are not absorbed to the same extent.

The rider has to absorb more vibrations within their own body - wasting considerable energy - see page 43

[i] The stronger the sidewalls of a tyre, the less likely it is to suffer impact failure. Obvious to me.

[j] The thicker the tyre's treadcap the less comfortable and the slower it will be. The same reasoning as [h] above applies.

[k] The thicker the tyre's treadcap, the more difficult it is for sharp objects to penetrate. Obvious to me.

[l] The more high tech the tyre's casing, the more difficult it is for sharp objects to penetrate. Obvious to me.

[m] A high tech casing can be more resistant to penetration by sharp objects than a thick tread cap.

Sorry, this is according to Schwalbe but it's supported by significant anecdotal evidence, including my own experiences.

OTHER CONSIDERATIONS

Are fat tyres necessary for expeditions or for adventure touring?

On soft sandy surfaces you need really fat tyres to be able to cycle at all. The softer the surface, the more you weigh and the heavier your kit, the fatter your tyres need to be.

On some of our trips, Fiona and I have managed to carry on cycling on sandy tracks, with more than 35kg each in our panniers. On these same tracks, others have had to walk and push, or turn back. This has been entirely due to us using 2.25" tyres. Of course, you could walk and push. It may not sound a big deal to walk, if there's only a short section of sand - but if there are 50km of such conditions, it can take a day of hard effort to cycle but it could take between 2 and 4 days of even harder effort to walk and push.

The narrower the tyres, the more difficult it is to push the bike - too narrow and you'll probably have to carry the bike and panniers!

You may not have sufficient water for this. What happens if, after you've cycled 200km down a remote gravel road, you find a long stretch of sandy track and you don't have fat enough tyres to be able to ride - do you walk or do you turn back? I bet that you'll walk, because you'll say to yourself "How do I know if it's a long section or not - unless I carry on?"

The few people, you're likely to meet on such roads, are unlikely to know if the route is negotiable by cycle - most find it incredible that you've got where you already are by bike! Others may perhaps think that you've already done the really hard bit (the long, hot, steep but grippy climb?) and won't understand that a bit of sand - which isn't a problem for a vehicle, or horse - could affect you so much!

Don't fat tyres cause wasted effort through frictional losses?

There's helpful friction and there's unhelpful friction - attempting to cycle on ice, with ordinary bike tyres, quickly makes this point!

Unhelpful friction is the internal friction of a tyre, known as hysteresis.

The combined weight of the rider, bike and luggage flatten the bottom of the tyre, the air within the tyre compresses slightly and the energy used to deform the tyre's casing manifests itself as heat.

HYSTERESIS LOSSES are always present - whenever a tyre rolls along, a different part of the tyre becomes the contact area, this new contact area has to be compressed, causing internal friction and the previous contact area has to return to its original shape, causing more internal friction. The lower the pressures, the more energy is lost to hysteresis. The thicker the casing, the more energy is lost to hysteresis. Puncture protecting bands or belts further increase energy losses.

On all but the smoothest of roads, surface irregularities cause repeated vertical movements, which result in vibration. The lower the pressure in a tyre (and the higher the quality of that tyre) the more it can deform over the bumps, which reduces vibration.

Vibrational losses cause significant amounts of energy to be wasted - see page 43

This is the benefit of suspension, here in its simplest, cheapest and most reliable form - the pneumatic tyre!

A high quality tyre, with a supple casing, can deform and regain its shape more easily and therefore wastes less energy. The energy saved by the suspension effect, of a high quality tyre on a bumpy road surface, is greater than the energy lost to hysteresis.

The precise tyre pressure, at which the maximum benefit is realised not only varies with each tyre and also with the combined weight of cyclist, machine and

luggage but it varies constantly with road surface conditions and velocity.

The trick is to find the ideal tyre and pressure compromise for each rider in a variety of situations. This is part science and part black art - it may also be counter-intuitive and fly in the face of superstition.

Helpful friction, is grip, this can save you from injury and pain and, in any case, it's necessary in order to move forward at all!

When upright and travelling at a constant speed, a skinny, high quality road tyre - say 700 x 23c, at the correct pressure say 110psi has a narrower contact area with the road, than a high quality, fatter touring tyre - say 700 x 35c at the lower (but correct) pressure - say 65psi recommended for road use.

The actual contact areas for a rider, bike and luggage weighing 200lbs would be roughly* 0.45in² for each 23c tyre and 0.77in² for each 35c tyre. This certainly makes me think about how little rubber there is between me and eternity.

How did I arrive at these figures? In the example, the 200lbs must be supported by an equivalent force through the tyres, which have to deform by that same force and we know that there are 2 x 110psi tyres supporting 200lbs.

This is why I like psi (pounds per square inch) it's very clear what units are involved, rather than Bars.

* I say roughly, because, when deforming, the pressure in the un-deformed part of the tyre must increase. The weight of the bike and rider exert a force through the tyres and into the road surface. A smaller contact area means that there's a greater force per unit of area - I'll use square inches again. This increased force increases friction per square inch. The fatter tyre has less friction per square inch - but there are more square inches of contact area. In practice these 2 factors almost cancel each other out. If we disregard weight and aerodynamics, there's only a small overall advantage, in terms of effort required to reach and maintain a particular speed, with skinny tyres, on smooth road surfaces, compared to fatter tyres.

However, under hard braking, the force being applied into the road increases and the fatter tyre's lower pressure allows more of the tread to squish and to come into contact with the road. (Remember, I'm assuming that these are both high quality tyres and that the tyre compounds will have similar coefficients of friction.) A larger contact area allows a greater rate of deceleration - before the tyre breaks rolling friction - and skids.

Under hard braking on a **DRY** road, with a high friction surface, tyre width may not make any difference - you may endo the bike (cartwheel) before either of these tyres break traction.

That said, a well designed touring bike ought to have longer front centres* than a road racing bike and thus be capable of far higher rates of deceleration before it cartwheels. A well balanced load will actually shorten potential stopping

distances - assuming you have top quality brakes.

(*The front centres are the distance between the centre of the BB and the centre of the front hub) It's under hard braking on a **WET** road when the difference in braking capability between the fat tyres and the skinny tyres really shows up - and it's alarming - if you ride skinny tyres!

When cornering hard, a well designed fat tyre will lay down significantly more rubber than a skinny tyre. This will scrub some speed off the bike, when cornering but you're less likely to wipe out.

The difference in grip, between fat and skinny tyres, when **cornering in the wet**, is also alarming - look how many crashes there are on wet stages of the Tour de France. The Pros, in their pursuit of seconds and glory, have to risk skin and bone - you probably don't have to!

The smoother the road, the drier the road, the faster you go, the steeper the climbs, the tougher you are, the more confident you are, the more support you have - the more likely you are to benefit from skinny tyres.

The rougher the road, the more comfortable you wish to be, the steeper the descents, the greater the safety margin you wish to have, the worse the weather, the more self supported your trip - the more likely you are to benefit from fatter tyres.

OBSERVATIONS

In my experience, the best wheel size for a comfortable, load carrying, touring bike, which could go anywhere, is 26".

You can have comfortable tyres, which are wide enough for sandy tracks and mega strong wheels - without the massive rotating weight you'd have if you went for strong wheels and the same width tyres on a 29er. You can then select the appropriate tyres for your destination, these may range from 1.75" to 2.25" or even wider. There are some nice tyres appearing in 27.5" (650b) and if you don't require the strongest possible wheel for the weight and know that you can find (or take with you) replacement tyres, this size could be a valid choice. Almost all reasonable quality MTBs now use 650b so you should be able to find a good 650b MTB tyre in every city worldwide.

It's also clear that racing cyclists have chosen the best compromise of wheel and tyre size for road racing - 700 x 23c or 25c (But note, they are increasing using 700 x 28c - or even 30c at times!)

Choosing the correct wheel size, for either an expedition bike, or a road racing bike is easy. The closer you get to the middle ground, the more difficult it gets to choose between 26", 650b and 700c wheel sizes.

When cycling on the often poorly surfaced back roads and country lanes, which I enjoy so much; I found strong middleweight 700c wheels with 40c tyres to be very comparable with lightweight 26" wheels and 2.0" tyres, in terms of comfort, speed, and reliability. However lightweight 27.5" (650b) rims and top quality 50mm tyres may just have the

edge over either of the above.

The determining factor for choosing one of the above sizes in preference to the other, may be to consider what you might wish to use the bike for, in the future.

EXTREME TOURING

I suspect most of us have goals, which we hope to achieve one day; perhaps they only manifest as dreams, or wishes, at the moment?

If your future aims involve cycling to remote places, on self-supported trips, or riding long distance off road routes - I still recommend that you choose 26".

If you dream of summer-long, mile-eating touring in Europe, arriving at pre-booked hotels, or of getting fit enough to ride a 600km Audax, or even the PBP - I recommend that you choose 700c or 650b.

If you're already having such adventures, you probably know which wheel size you want for your next bike.

If you wish to participate in both extremes of extreme touring, to the best of your ability - without being constrained by your kit - you'll eventually need 2 bikes.

CONCLUSIONS

I've talked about compromises; all 9 listed below work harmoniously.

[R] An ultra-lightweight, short wheelbase 700c bike, with close clearances for 23c or 25c tyres and ultra-lightweight wheels, is the longstanding and classic recipe for a road racing bike. In my opinion, such a bike is **only suitable for racing.**

SORRY NO THORN AVAILABLE - WE'RE TOURING SPECIALISTS. WE ONLY MAKE TOURING BIKES.

[A] A lightweight 700c bike, with lightweight wheels and sufficient clearance for 25c or 28c tyres, with mudguards, could be ideal for an experienced cyclist for **Audax rides**, race training and ultra-lightweight touring, on a variety of road surfaces.

THORN AUDAX or a MERCURY (or Club Tour) with MER853VC fork. See builds 10, 9 and 4

[B] A fairly lightweight 700c bike, with reasonably lightweight wheels and generous mudguard clearances for premium quality 32c or 35c tyres and super comfortable forks, could also be ideal for Audax rides. It would be especially suitable for Audax rides, if poor surfaces, wet weather and/or longer distances are involved. Such a bike could also be the **ultimate bike for fast touring** with moderate rear only loads, on back country roads.

THORN MERCURY or CLUB TOUR with the MER853VC fork. See builds 9 and 4.

[C] A 27.5" (650b) wheel bike, with lightweight wheels and clearances for 50mm tyres could be the ultimate bike for **brisk, assertive city cycling**. It could accelerate well and could withstand numerous and often unavoidable potholes. It could stop much more quickly, especially in the wet, than skinny 700c tyres. With the right tyres, it could

also be a superb machine for very hilly rides on rough surfaces, especially in greasy conditions.

This could also be the -

ULTIMATE, LEFT FIELD WINTER TRAINING BIKE
THORN MERCURY Mk3 or CLUB TOUR Mk5 MER853VC fork. See builds 8 and 3

[D] A reasonably light 700c bike, with clearances for high quality medium width 35c or 40c tyres. Such a bike's tyres could have an excellent balance of strength, comfort and performance. Such a bike should **excel in its versatility** - it should perform well at everything - except heavy touring and high performance sporting events.

Mercury Mk3 or CLUB TOUR with ST700 FORK. See builds 9 and 4

[E] A 27.5" (650b) wheel bike, with lightweight wheels and clearances for 50mm high tech tyres could make a superb bike for leisure cycling and **general touring, including cycle camping with 4 panniers**

THORN MERCURY Mk3 with ST 650/700 or Thorn Mk3 Steel disc fork or CLUB TOUR Mk5 with Thorn Mk3 steel disc fork. See builds 8 and 3

[F] A 27.5" (650b) wheel bike, with medium heavy duty disc wheels, clearances for 55mm high tech tyres could make a superb bike for leisure cycling and **general touring, including cycle camping with either 4 panniers or 2 huge panniers.**

THORN NOMAD Mk3 and Thorn Mk3 Disc 110 x 15 through axle disc brake forks. See builds 2 and 6

[G] A robustly built, 26" wheel bike, with generous clearances for high quality fat tyres (2.0 to 2.25") ought to be the strongest and most reliable bike you could own. It should be easier on hills, carry more and be more reliable than would be possible with 29er (Fat 700c) wheels.

This is what we recommend for expeditions and world touring.

Occasionally we recommend it to those seeking a "bomb proof" bike for general use.

We've even sold some as "gym equipment" to really big guys (usually heavyweight powerlifters) who seek non weight bearing cardiovascular exercise, in the fresh air.

THORN NOMAD Mk3 and NOMAD Mk3 V brake FORKS See builds 1 and 5

[X] WILDCARD

A 700c wheel bike, with lightweight wheels and fork, with clearances for 40mm high tech tyres could make a superb bike for leisure cycling and **general touring, including European cycle camping with 2 huge panniers.**

THORN NOMAD Mk3 AB Special spec, which uses MER853VC fork for riders + luggage <115kg or ST700 fork for riders + luggage <130kg. See build 7

You can see a brief outline of the builds that I've described and links to individual brochures on pages 21 and 22

FRONT HUBS

Unless you choose a **SON dynohub**, all of our bikes come with a

Shimano Deore front hub for front rim brake builds, or a Shimano Deore 110 x 15mm BOOST disc hub, if you've asked for a disc front brake.

If you've asked for a Son 28 dynohub, we supply the standard SON 28 hub for front rim brake and the Son 28 110 x 15 BOOST hub with a front disc brake.

REAR HUBS

We supply a Shimano Deore DISC rear hub on all derailleur builds.

We supply the Rohloff EX DISC hub on all Rohloff builds.

Having the disc version costs little in terms of money or of weight but it does future proof your rear wheel. Clearly a 110 x 15 BOOST hub needs to go into a Disc fork. A standard disc front hub could be used in a rim brake only fork but there would be a terrible amount of dish - reducing this is the main reason for us to have made our disc fork 110 x 15 BOOST in the first place.

All Shimano Deore hubs are good quality items, with excellent, well sealed bearings, they will give many tens of thousands of miles of service.



SON Schmidt's Original Nabendynamo



DYNO HUBS. An upgrade to a front dyno hub ought to be a serious consideration for many cyclists. Schmidt are the only manufacturer that I'd recommend, their **SON 28** hubs are top quality, designed and manufactured in Germany by a perfectionist. They run on top quality sealed bearings. They're the most efficient and reliable dyno hub on the market. When it's not generating electricity, the wheel spins almost as freely as a "normal" front hub, even when it is generating power, it's difficult to notice the slight increase in drag.

The Schmidt **SON 28** hubs are supplied with SON A/K Nuts. The **SON 28 110 x 15 BOOST** disc version has 6-bolt rotor mounts - it fits our Thorn Mk3 Steel Disc fork, which is supplied with a through axle.

Dynamo Headlights.

Schmidt Edelux II LED

This 2.4w front light is simply awesome! It's awesome in terms of the quality of light output, it's awesome to think that you can produce such a light, without batteries and without noticeable effort!

The beam produced is superior to some 15w halogen rechargeable systems I've owned.

The Edelux is very well made - the casing is CNC machined from a solid billet.

The Edelux has a magnetic switch with 3 positions; on, off and sensor. The sensor position automatically switches on the light when light levels fall.

The Edelux has a built in capacitor, which will produce several minutes of highly visible light after the wheel stops turning. The LED has a copper heat sink to ensure a very long life and the lens is a superb example of cutting edge optical technology.

We can make a super job of installing an Edelux for you, using a substantial stainless bracket.



USB Charging devices.

Sinewave - at last there's a reliable, real world, USB charging system for your dynohub!

Many attempts have been made by other manufacturers to produce such a product but all have either suffered from water ingress or have burned out when being ridden downhill. Both **Sinewave devices** are completely waterproof, (see photo!) and they will not burn out, or overcharge whatever speed you are able to reach downhill. You can charge any electronic device, which can be charged with a 1amp input. A **Sinewave** has some very clever technology in it, for example, it won't try and charge your device until it has detected an input for 10 seconds - this ensures that your device (particularly iPhones) realises that it is being charged and accepts the charge. The USB port is completely sealed at the back and has gold plated contacts. It starts charging at 3.5mph (5.5km/h) and reaches full charge at 9mph (14km/h).



This Revolution has been functioning in a glass of water for over 2 years!



Sinewave Revolution above Sinewave Reactor below We can make a super job of installing a Sinewave for you.



WHEELS

Owning a bike with pair of high quality wheels is a source of great joy - the bike will handle better, go better, stop better, feel better and be much more reliable. The recipe for a pair of high quality wheels is always the same - good quality rims, laced into good quality hubs, using good quality spokes but **The most important ingredient** in a wheel, is the person who built it! Top quality builders cannot make a superb wheel out of dodgy components but they can make a sound wheel which would last well. However a dodgy builder can make rubbish, out of top quality components. We have the exclusive services of a master wheel builder and that's why many of our customers have travelled continuously, for years, without ever needing a spoke key.

Whilst the recipe may always be the same, the ingredients vary depending upon the intended use. Strength and reliability are the most important properties for expedition touring wheels. Whereas stiffness and lightweight are the most important properties for racing wheels - but racing wheels are no good for touring - not even lightweight, credit card touring. Reliability, when being used for their intended purpose is always at the top of the requirements for touring wheels. Racing wheels do not have to last long - maybe not even for the entire race, as riders have a team car following them!

As the loads increase (rider + luggage) it becomes increasingly more sensible to specify stronger wheels especially for touring in remote areas. As the diameter of the wheel decreases, the strength of the wheel increases. Fatter tyres also cushion rims more effectively against impacts with hole and stones.

INNER TUBES

We only use top quality tubes in our bikes. There are 2

In General terms this means that:- We advocate 700c (622) wheels, for light to medium weight touring.

We advocate 650b (584) wheels for medium to heavy weight touring, or for use on very rough road surfaces and also for those who wish to have front and rear disc brakes.

We recommend 26" (559) wheels for heavy cycle camping and expedition touring, especially in remote locations.

We use the finest double butted spokes when we build your Rohloff wheels. We use a mixture of spokes - double butted and plain gauge, when we build wheels for derailleur bikes - this helps to reduce the consequences of wheel dish, which is inevitable, with derailleur wheels.

Comparison between different wheel sizes, with tyres fitted.

26" (559), 650b (584) and 700c (622)

Overall diameter **26 x 2.0"** = 661mm

Overall diameter **26 x 2.15"** = 668mm

Overall diameter **650 x 40b** = 664mm

Overall diameter **700 x 25c** = 672mm

Overall diameter **26 x 2.5"** = 686mm

Overall diameter **650 x 50b** = 684mm

Overall diameter **700 x 32c** = 686mm

Overall diameter **700 x 35c** = 692mm

Overall diameter **26 x 2.8"** = 699mm

Overall diameter **650 x 57b** = 698mm

Overall diameter **700 x 40c** = 702mm



valves which are used on modern bikes. The **Presta valve** was designed especially for bicycles and it is much easier to inflate tyres, using a hand pump with this valve. The **Schrader valve** was designed for motor vehicles. It's always more difficult to inflate a tube with this valve, when using a hand pump. Sometimes it's impossible to do so without a good track pump (or compressor). It's dangerous to use a compressor to inflate cycle tyres - the tyre and/or rim could explode.

The trouble is that in some countries only tubes with a Schrader valve are available.

This fact has lead to advice on forums, which is so bad, that I wonder if those responsible have ever seen the tubes that are available in remote areas?

Frequently the quality of tubes which are available in remote places is very poor - the rubber doesn't stretch enough and the valves often pull out - rendering the tube useless. You really don't want to rely on using such tubes.

The best advice is to take 2 spare high quality **Presta valve tubes**, plenty of patches and **at least 2 tubes** of rubber solution - because the solution does solidify over time, once the seal is pierced.

Nowadays, Fiona and I have almost no punctures but, back in the days when we did, we mended the tube at the side of the road and re-fitted it immediately, which prevents mixing up punctured tube with sound tubes (yes that has happened!)

We always followed this procedure **except** if it was dark, or raining, or we were pushed for time.

In the case of one of the above exceptions I used one of our spare tubes and mended the punctured tube later, when it was more convenient to do so.

If you have Presta valve tubes, I believe that you'll have few, if any, problems - **I'm equally sure that, on a long tour, you will have problems with Schrader valves.**

If you are cursed by bad luck, you can always have your rims drilled locally, for locally available tubes and hope that they are of sufficiently good quality.

I've mentioned "acceleration" several times, this is really important. When the gradient changes, or the wind drops, the ability to change pace accordingly requires acceleration.

Unless a bike responds and rewards my efforts, the experience and pleasure of cycling is, for me, diluted.

Tyres and tubes and, to a lesser extent, rims make more difference to the way a bike rides than anything else.

Old time cyclists used to have a snappy saying - **"Saving an ounce on the wheels is worth saving a pound on the frame."** That's 1:16 (28.5g compared to 454g)

For many years I thought that this was an exaggeration - the laws of physics say it should be 1:2 for weight at the periphery and I thought that

the real figure may be around 5:1. **I agree with the 1:2 figure for added weight at the rims.**

However, there are other factors at work and 1:2 doesn't necessarily apply to heavier tyres and tubes, because, if the increased weight is due to a thicker casing and/or heavy puncture protecting there will be increased losses due to hysteresis (**See page 34**). There will also be an increase in **suspension losses (see page 43)**

I've compared the ride offered by the lightest, highest quality 28c tubed tyres,

Schwalbe One which weigh
2 x 245g + 2 x 105g for a lightweight tube = **700g**
with 28c **Schwalbe Marathon Plus** tyres

2 x 750g + 2 x 150g for a heavy duty tube = **1800g**

Riding the same bike hard, over challenging terrain, with the Schwalbe One tyres and 5kg of

luggage doesn't feel any harder work than riding with no luggage, over the same terrain, at the same speeds but using the Marathon Plus tyres!

This is obviously not scientific but it equates to a 4.5:1 ratio. Whilst I dislike riding with Schwalbe Marathon Plus tyres, they're not the worst performing tyres made - our grandfathers and great grandfathers might have put it more accurately if they'd said:-

"In extreme cases, a few ounces saved on the tyres and tubes could save as much energy as a pound saved on luggage"...

...more accurate but not very snappy!

700c RIMS

700c wheels are ideal for fast, lightweight touring, on reasonably good road surfaces. In my experience tyres from 30c to 40c work best with 700c rims.

With rim brakes, the best rims that we have found for touring are DT Swiss TK540, these build into exceptionally strong and fairly lightweight wheels. We've sold many bikes with a front rim brake and a rear disc - the ideal rear wheel then uses the TK540 disc rim.

650b (27.5") wheels



can be

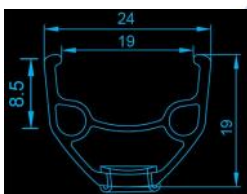
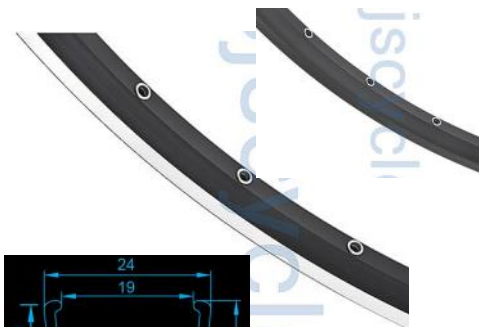


When customers want F&R disc brakes, we think that the DT Swiss R500 DB (disc rims) are the best option.

650b RIMS

an ideal compromise between heavy duty 26" wheels and lightweight 700c wheels - provided tyres of at least 40mm (1.6") are chosen.

We've had our own high quality double eyelet 6061-T6 THORN RIMS made for us in 650b, they weigh 480g and are suitable for use with tubeless tyres. They are ideal for lightweight touring on our bikes with tyres of 40 - 50b. We have a rim brake version with a CNC brake track and a disc version without the track.



For medium weight touring with 650b, it's necessary to have front and rear disc brakes, as no suitable rim brake rim for such touring with 650b exists. We fit Ryde Rival rims which are very nice quality rims at a super price.

If you have very deep pockets we can fit DT Swiss HX 491 disc brake rims. These



are lightweight and exceptionally strong - they come very highly recommended and are fitted to high end e-MTBs **The best reasons for running 26" wheels are:-**



26" RIMS

[1] STRENGTH and RELIABILITY [2] Being able to find usable tyres in remote parts of the world.

This is why we recommend 26" wheels so strongly for tandems, expedition bikes and for heavy riders.

I've found that tyres narrower than 1.6" are a liability with 26" wheels and 2.0" tyres are a much better all round option. For expedition use on sandy trails - use the widest tyre that you can.

The strongest, most dependable 26" rims for touring (which are the only rims worth considering) are Ryde Andra 30.

ANDRA 30 rims (Weight 735g) We have sold thousands of these rims, so we know how strong, reliable and long-lasting they are.

Andra 30 rims have been very popular on our 26" wheel Rohloff expedition touring bikes. Rohloff hubs have a very large flange diameter, which means that the spokes are at a more acute angle to



the rim. We have a "Rohloff version" of the rear Andra 30 rim. These are specially drilled for us for our Rohloff builds. The spoke holes are angled, so that the nipple protrudes through the rim in perfect line with the spokes.

TYRE

IMPORTANT NOTES on PRESSURES for TYRES with INNERTUBES

WARNING!

Pressures are in psi.

It may be necessary to over-inflate the tyres, in order to get the tyre beads to seat correctly on the rim.

Once seated, the pressure should be immediately dropped to suit.

Tyres must not be ridden when inflated to higher than MAX pressure - otherwise the rims may be permanently damaged - or fail catastrophically.

The MIN pressures are the lowest pressures that the tyres ought to be run at. Such pressures may be used to enhance comfort or for improved grip on tricky surfaces.

When running at the MIN pressures, extra care must be taken to avoid large stones, and potholes - this is especially important if heavy loads are carried.

At my recommended pressures, you should find the perfect balance, for most road conditions, between comfort, efficiency and reliability.

SOMETHING for NOTHING?

On the page **41** I say; "There's no quality, that I can design into a frame, that can affect performance and enjoyment, as much as choosing the right tyre." I'd like to add to that:-

"There's nothing that can make as much difference, to the way a tyre performs, as the amount of air put into it!"

Currently air is free; this means that the biggest difference that you can make, to the way your bike rides, costs absolutely nothing!

25 years ago, in 9 out of 10 cases, tyres didn't have enough air in them - nowadays I'd say 4 out of 5 tyres have too much air in them.

Why's this? The answer's simple; these days, a functional track pump is a fraction of the price of a track pump 25 years ago.

What difference does having too much air make? There's several differences that pumping too much air into your tyres can make.

Higher pressures than necessary, increase rolling resistance, the rougher the surface, the more noticeable this is. (More detail on pages **42 and **43**)**

Using pressures which are too high can cause rim failure. Please see the WARNING opposite and our tyre pressure matrices below it.

I've chosen to give tyre pressure in pounds per square inch, because it makes it clear that that a unit of area is involved. There's lots of square inches in a fat tyre's carcass.

The pressure is acting on every one of these square inches - which is just like having a long lever, to prise the sides away from the base of the rim!

Tyres have a maximum and a minimum recommended pressure; you should consider the implications of different pressures.

At the maximum pressures, tyres are less able to squirm around on rims and consequently quicker changes in direction can be made and big, out of the saddle efforts, result in more immediate forward propulsion.

At lower pressures, tyres roll more easily on uneven surfaces, this fact comes as a shock to many cyclists - perhaps the more uncomfortable the ride, the faster they think that they're going?

Tyres running lower pressures are usually much more comfortable to ride.

I've frequently used 30psi front and 36psi rear, in order to be able to continue to pedal through soft sand, on a bike with 2.25" tyres and 35Kg+ of luggage. Even though I've hit rocks at speed, with these pressures, I've never had a pinch puncture!

PLEASE NOTE: For reasons, known only to themselves, tyre manufacturers often quote higher maximum pressures, for fat tyres, than any rim can withstand.

TYRE width	SOLO			
	Recommended Pressure		ABSOLUTE Pressures	
	FRONT	REAR	MAX	MIN
23mm	108	118	130	85
25mm	100	110	120	75
28mm	88	95	105	65
32mm	70	75	90	55
35mm/1.35"	60	65	80	45
38mm/1.50"	53	58	75	40
40mm/1.60"	48	53	70	35
44mm/1.75"	45	50	65	32
50mm/2.00"	40	45	58	30
55mm/2.15"	37	42	53	28
57mm/2.25"	35	40	50	26
60mm/2.35"	32	37	48	24

TYRE PRESSURES with TUBELESS SPECIFIC RIMS

Tubeless tyres can be run at much lower pressures than tubed tyres. **Tubeless specific rims have lower maximum inflation pressures than converted rims** - this is not an issue when using tubeless tyres, which need lower pressures to realise their maximum potential. It could be an issue though when using tubeless specific rims with tubed tyres - the ability to fit tubed tyres should be seen as a backup plan in the case of a tyre being worn out or damaged beyond use.

I've been given the following max pressures for **tubeless specific rims when used with tubed tyres** - 90psi with 23mm tyres, 80psi with 25mm tyres and 70psi with 30mm tyres. This wouldn't be a problem for me, as I haven't run tubed tyres, at pressures this high, for many years.

QR Skewers, a quick release skewer is a shaft, which runs through a hollow wheel axle. The shaft has a serrated *nut* on one end and a cam action lever on the other end. Although it's permissible to rotate the nut to get close to the required tightness, the final closure must be made with the lever. The lever must **fold in tightly** but it must not be forced, as this could cause it to fail - remember your QR skewer is all that's securing your wheel into your frame!



**There's no quality, that can be designed into a frame,
that can affect performance and enjoyment,
as much as choosing the right tyre!**



Schwalbe folding tyres not only save weight; they have a higher specification, especially in puncture resistance and the quality of the rubber compound, than their rigid counterparts.

(This isn't because they can fold - it's simply because Schwalbe

chose to incorporate all their premium options in the folding tyre and all their budget options in the non-folding tyre.)

**Please also see the
650b and 700c
tubeless tyres
on the next page.**

For road use, I have several favourite **tubed tyres; they're all Schwalbe tyres and they are all folding tyres.**

I'll list and explain briefly the pros and cons of each tyre.

I hope that this will give you enough information to enable you to decide which wheel size will be best for you.

**[1] NEW Schwalbe Folding Marathon Supreme HS 469
EVEN QUICKER THAN BEFORE!**

**700 x 32c...380g
700 x 35c...440g
700 x 40c...495g
26 x 2.00"...560g**

I'd be happy to use 32c Supremes for all my Audax rides and Sport Touring - but I prefer to ride with 35 or 40c

The 35c Supreme is an excellent choice - it's slightly slower than the 32c on good roads but slightly quicker on poor surfaces. It's also slightly more comfortable than the 32c.

I notice that these 40c tyres absorb a fraction more of my limited energy but, on the other hand, they're super comfortable and confidence inspiring!

The 26 x 2.00" Supremes work really well on our 26" wheel Nomads and tandems



**NEW
SCHWALBE
MARATHON
SUPREME
HS469**

700 x 40c...500g

The Schwalbe Marathon Dureme HS410 is a sensational tyre, capable of huge mileages with very little risk of a puncture. It rolls exceptionally well and has excellent grip on both wet and dry roads. We've had another batch made especially for us of these, the finest multi-purpose 26" tyre ever produced. We ordered these especially for our 26" wheel Nomads and tandems.

26 x 2.00"...560g



**NEW
SCHWALBE
MARATHON
ALMOTION
HS453**

[2] Schwalbe Folding Mondial HS428

**700 x 35c...570g
700 x 40c...650g
650 x 50b...780g
26 x 2.15"...865g**

If you're buying a Club Tour or a Mercury for touring on badly broken roads, or on reasonable quality dirt roads, the Mondial 40c tyre would be hard to beat.

This tyre is very durable and copes well with loose surfaces, I wouldn't wish to use 700c tyres on South American Ripio but I would feel very confident using them in Southern India, Thailand, Laos or on supported tours such as the Tour D'Afrique or the Silk Road. With our bikes and 650b wheels, you need to use at least 50mm. The 650 x 50b size would be suitable for riding with care on South American Ripio. The 26 x 2.15" will cope with almost anything.

The NEW Schwalbe Marathon Almotion HS453 is

available in 2 sizes that are of interest on our 2020 touring bikes.

These tyres can be run tubeless, with tubes or with ultra-lightweight tubes with Schwalbe Doc Blue sealant

The 650 x 55b size is ideal for long distance touring on our Nomad Mk3 bikes. The 700 x 40c size would be good for long distance touring on a Mercury, a Club Tour or with a Nomad.

650 x 55b...695g



**NEW
SCHWALBE
MARATHON
MONDIAL
HS428**



**CLASSIC
SCHWALBE
MARATHON
DUREME
HS410**

Modern TUBELESS TYRES are quick and efficient!

The only reason that they're quicker is because their casings are both very supple and lightweight (see hysteresis losses page 34). Tubeless tyres are slightly more supple when they're not handicapped by the extra rubber of an inner tube.

Having a lightweight casing does however make the tyres more susceptible to punctures when riding off road, where sharp flints and brambles may be common - or indeed on some badly maintained roads. The solution (sic) is to use a liquid sealant, either with or (as intended) without an inner tube.

Fiona and I rode tubeless tyres on mountainbikes many years ago, there were advantages to be gained in terms of rolling resistance and grip but unless sealant was used, they punctured too easily. The puncture sealant available in those days was liquid latex and it went solid in a couple of months, necessitating a very mess job replacing it. If our sole cycling interest was mountainbiking, I would have put up with this in order to reap the benefits. But by that stage of our lives, MTB riding was something we did occasionally. We soon returned to tubed tyres and rims.

MTB riders must be smiling, because the latest sealant is very effective and hardly messy at all. Schwalbe have introduced 5 new super high quality tubeless tyres for road and/or lightweight off road use.

SCHWALBE G-ONE SPEED TL EASY (Tubeless)

G-ONE speed tubeless tyres. Schwalbe G-ONE speed . Schwalbe developed these tyres for extreme road conditions, such as are found on the pavé (cobble) of the Paris Roubaix. These tyres have been a revelation. These tyres are

now available in 700 x 30c - 330g, 700 x 35c - 450g, 700 x 40c - 480g, 650 x 50b - 500g

The G-ONE SPEED tyres are the quickest tyres that I've ever ridden. They grip really well on greasy roads and, thanks to the lightweight casing and the low pressures that are used with these tyres, they are so comfortable. I don't expect to get huge mileages from these tyres, so they will be relatively expensive to run but I'm happy to pay for the enhanced pleasure they give. The 700 x 30 G-One Speed tyres will fit into Thorn Audax Mk3 frames and they wouldn't be a silly choice on a Club Tour, or Mercury, which was built for fast touring but the 700 x 35c or even 700 x 40c would be even better.

The 650 x 50b tyres fit into our Club Tour Mk5, Mercury Mk3 and Nomad Mk3 and make for awesome machines!

The G-ONE ALLROUND has been designed for the latest trend - Gravel Bikes. This tyre is being fitted to the majority of these bikes.

The G-One Allround is available in 700 x 35c - 400g, 700 x 40c - 460g 650 x 57b - 600g.

Whilst not quite as good on smooth, dry roads as a dedicated tubeless road tyre, it's a superb tyre for riding on broken roads and (obviously) gravel tracks. In 700 x 35c or 40c it will fit our Club Tour and our Mercury - either of which would make a superb Gravel Bike. The 650 x 57b size would be another awesome tyre on a Nomad Mk3

G-One Allround tyres are an excellent

SCHWALBE G-ONE ALLROUND TL EASY (Tubeless)



choice for high-performance 4 season cycling.

SCHWALBE G-ONE BITE TL EASY (Tubeless)



The G-ONE BITE is a gravel tyre but with more emphasis on off road performance, it's available in 700 x 40c - 460g, 650 x 54b - 550g

Schwalbe have recently introduced TL easy versions

of the ever popular **Marathon Supreme** but only in sizes 700 x 35c and 40c

You can see the Tubeless Schwalbe Marathon Almotion in more detail on the previous page

NEW



SCHWALBE MARATHON SUPREME HS469 TL EASY (Tubeless) 35c and 40c



Please Note:

All of these tubeless tyres can run with inner tubes, rather than sealant if you wish but, as all of the G-One family have lightweight casings, they will then be as susceptible to punctures as many ultra lightweight tyres.

However by using a modern sealant, small holes, caused by thorns or shards of flint (which constitute the majority of punctures) will be repaired instantly - possibly without you even knowing!

Feb 2020 update.

For fast touring on road, with 700c rims, we now consider the best option to be:- DT Swiss TK540 rims, running G-One tyres and ultra-lightweight tubes. With tubes, G-One tyres hold their pressure for longer.

If choosing 700c wheels, for use on gravel roads, or bridleways, G-One tyres with tubes are still ideal but we recommend that Schwalbe Doc Blue sealant is added to the tube. In the event of a big cut (compared to running with sealant but without tubes) it's less messy to change the tube - and also less messy when performing the necessary annual sealant change (Simply throw the entire tube away).

700c tubeless ready rims can prove difficult when mounting and/or removing tyres - 700c tubeless specific rims are more difficult still.

We now believe that running tubeless tyres (without any tubes) is best left to those who have chosen 650b wheels.

Please Note: Even in UK conditions

To remain liquid (and therefore effective) the sealant should be given a small top up after 6 months and it should be replaced annually.

Choosing and/or Converting RIMS for tubeless tyres.

Whilst most rims that have been manufactured recently can be converted to tubeless, by the use of a Stan's rim strips (e.g. DT Swiss TK540 and Mavic Open Pro), we no longer think that this is the best option. With 700c touring bikes, it makes most sense to enjoy the benefits of tubeless tyres' light weight by using ultralight inner tubes, filled with Schwalbe Doc Blue sealant. An ultra-lightweight tube is only fractionally heavier than a Stan's rim strip. Please also see the green box above.

Many recent rims are tubeless ready and can be converted to tubeless by using tubeless tapes and a valve. (Stan's **YELLOW** tape or Schwalbe's tubeless tape). However we've found that, in 700c size, mounting and/or removing tyres from such rims is generally more difficult than with rims with a deeper central well - such as the DT Swiss TK540 rims - which are a breeze.

COMFORT

and the **EFFECTS & INFLUENCES** of
Tyre width and pressures
on **ROLLING RESISTANCE**
& **SUSPENSION**

It's well documented that I've been a fan of fatter tyres, running at moderate pressures for many years.

I've said over the last 25 years:-

"There's no quality, that I can design into a frame, that can affect performance and enjoyment, as much as choosing the right tyre and there's nothing that can make as much difference, to the way a tyre performs, as the amount of air put into it!"

25 years ago, I was regularly riding very long distance events - comfort was everything to me. I was convinced that I rode faster/further/longer/more comfortably on fatter tyres at moderate pressures, however I put the further/faster/longer down to reduced rolling resistance - which was partially correct but I'd underestimated the impact of the most significant and fundamental underlying reason - COMFORT!

The US military made some meticulous measurements of the effects of vibration on tank crews, apparently a (presumably young and fit?) human body can absorb 2kW of vibrational energy before the vibrations become too painful to endure. The US military didn't make the ensuing improvements to tank design simply to make marines' lives more comfortable - vibrational energy is absorbed throughout the soft tissues of the body, including the muscles. The energy is turned into heat as a result of viscous friction.

An Olympic gold-medal-winning track sprinter may be able to sustain a 2kW power output for 10 seconds.

A bike being ridden on a bumpy road will also create vibrations - albeit fewer than a tank! Clearly, the more resilient the frame and fork and the more compliant the wheels and tyres, the fewer vibrations there will be to absorb.

Recent, cycling-specific, studies have proven that huge amounts of energy are wasted by the human body having to absorb vibration - these losses are referred to as suspension losses. Having been trained in the Scientific Civil Service with the Ministry of Defence, I've been very impressed by the methodology used in these studies. I've been further impressed by the way the results have been analysed by experts in their field for "noise in the data".

I've paraphrased these studies and I've included links to enable you to read them in full and follow the multitude of links for yourselves. The main contention is that tyre manufacturers' testing of rolling resistance is done in the lab, using a wheel-mounted tyre on a revolving

metal drum. These tests prove conclusively that, in the lab, whilst using a steel drum, the higher the tyre pressure - seemingly without an upper limit - the lower the tyre's rolling resistance.

However, add a bike and rider to the wheels and things change. In order to achieve minimum rolling

resistance, there is an upper limit for tyre pressure - even when riding on a perfectly smooth wooden velodrome - the upper limit is even lower, when riding on smooth asphalt and it decreases more and more dramatically as the surface becomes rougher and rougher.

Jan Heine is the editor of BQ magazine, he is a very strong ex racing cyclist, who now rides ultra long distance randonnées. Jan has conducted many tests, on tyres and tyre pressures, with particular regard as to how they perform on lightweight machines, carrying the bare essentials for ultra long distance, self supported rides.

Jan showed that, to maintain a constant 16mph on a smooth asphalt road, took 183Watts, to maintain the same speed on the rumble strip, immediately beside that same section of road, took 473Watts. The measurements were taken at the rear wheel using a power tap. Increasing the tyre size and reducing pressure only used 315Watts on the rumble strip at a constant 16mph.

Jan's tests show that, with the same make and model of tyre, 25c tyres roll quicker than 23c and that 23c tyres roll quicker than 20c. Jan has found no sign of the results plateauing out and has had even better results with ultra high quality 42c tyres.

Design constraints, such as Q factor, may impose an upper limit for tyre width for efficient pedalling for each different style of cycling.

PLEASE NOTE: the eagle-eyed will have spotted that the energy used in compensating for suspension losses, on rough surfaces, can be many times greater than is commonly assumed to be lost to rolling resistance on smooth surfaces.

There's talk of fatter tyres and lower pressures saving 20% energy on "ordinary" roads. (I think that "fatter tyres" in this context were 32c! And the pressures were <70psi).

As a comparison, a pair of the most high tech aero wheels available today may save just 2%.

Some of the pros are now riding fatter and fatter tyres at lower pressures - perhaps this was another of David Brailsford's not so small advantages which helped Wiggo take the yellow jersey to Paris in 2012?

It's clear that Pros and Directeur Sportifs will latch onto these findings and it's also to be expected that the majority of weekend warriors will stubbornly refuse to believe that they could have been misled for so long by so many.

This is a fascinating subject - it appears that there are two reasons why mere mortals have even more to gain than the Pros, from using fatter tyres at lower pressures:-

[1] They have significantly less potential power available to waste in absorbing vibration.

[2] Although Pros would enjoy the same benefits, when riding at a constant speed on the flat, or when freewheeling down a steep descent, they need higher pressures than us to

prevent bobbing, when they unleash their power to attack a climb or a sprint.

Jan Heine also conducted an extensive series of tests on individual tyres. There was a huge variation in the efficiency of these tyres, with one of the weekend warriors' favourite tyres - the Conti Ultra Gatorskins faring particularly badly.

After reading these links, I'm even more confident of the validity of the conclusions that I'd previously drawn from personal experience.

The rougher the road - the better a fatter tyre rolls.

The higher the casing quality (generally a greater thread count) the better a tyre rolls. Low quality tyres (with thick casings) need to run at higher pressures than high quality tyres, of the same width, in order to minimise their rolling resistance.

See hysteresis losses on page 34.

High quality tyres are able to run, with low rolling resistance, at a wide range of pressures - this allows the tyres to be run at pressures low enough to minimise vibration on rough stretches of road, whilst still rolling efficiently on smooth roads.

The optimum pressure, for both comfort **and** speed, for any given combination of tyre, road surface, rider weight and power and load being carried, is significantly lower than the majority of cyclists currently inflate their tyres to.

Weaker riders can use especially low pressures to greater advantage than stronger riders.

Fatter tyres at low pressures lose less energy to hysteresis than narrow tyres at the same pressures, because there is less deformation of the casing, thanks to its greater width.

Tyre manufacturers' current testing methods are flawed.

Jan Heine also made a series of tests, which demonstrated that compliant, raked steel forks, with a tight radius bend, also reduced the power required to ride his test bike on the rumble strips at 16mph. The reduction was nowhere near as dramatic as those achieved via tyre pressures and tyre width but it does demonstrate that the conclusions arrived at by the original pioneers of bicycle design, using "seat of the pants" testing, were both inspired and fundamentally sound.

<https://janheine.wordpress.com/2012/08/12/suspension-losses/>.

<http://trstrialhlon.com/talking-tires-with-joshua-poertner/>.

<https://janheine.wordpress.com/2016/06/14/suspension-losses-confirmed/>.

DT Swiss have reached some interesting conclusions on this subject (see the last few pages of the following link) which I consider supports my views.

Andy Blance Jan 2018

<http://www.roadrevolution18.dtswiss.com/endurance/>

DISC BRAKES versus RIM BRAKES

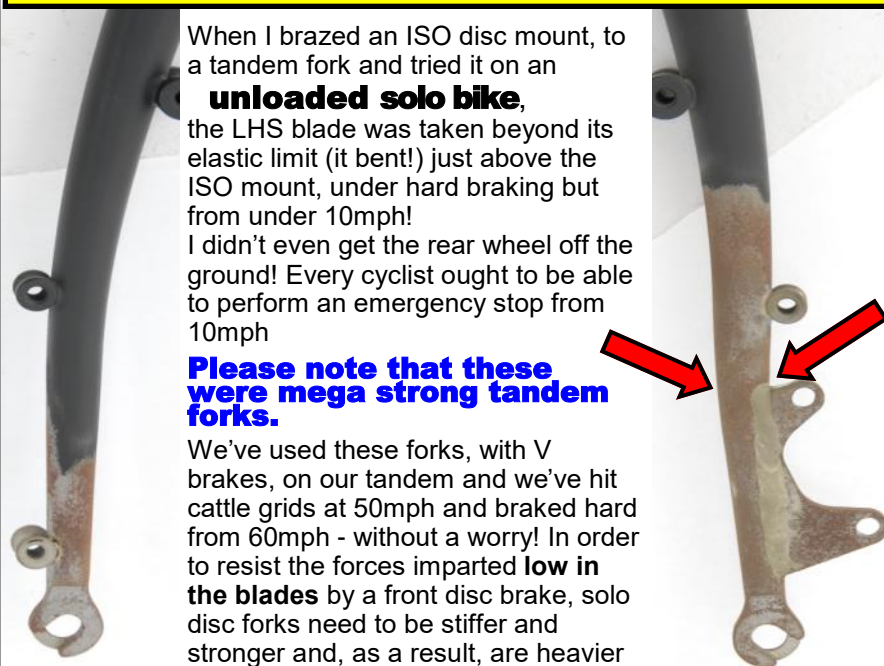
I've no doubt whatsoever that **HYDRAULIC DISC BRAKES** are preferable to **V BRAKES**, in the deep, muddy conditions, so often found when mountainbiking in the UK.

I'm also in no doubt that I prefer the simplicity and easy maintenance of **V BRAKES** for Expedition and Adventure Touring.

Disc rotors can be damaged in transit and a bent rotor is much more difficult to straighten than an out of true wheel. Indeed, if the rotor is warped enough, the wheel won't even turn! I wouldn't want to have to deal with leaking hydraulic lines in the middle of nowhere. I could make V brakes work with a bit of string.

I can understand the attraction of using disc brakes for general touring and for sport riding - I would consider using them myself - if comfort wasn't such an issue. An ideal compromise is to have a front V brake and a rear cable-operated disc brake.

Why is comfort compromised by using disc brakes?



When I brazed an ISO disc mount, to a tandem fork and tried it on an **unloaded solo bike**, the LHS blade was taken beyond its elastic limit (it bent!) just above the ISO mount, under hard braking but from under 10mph!

I didn't even get the rear wheel off the ground! Every cyclist ought to be able to perform an emergency stop from 10mph

Please note that these were mega strong tandem forks.

We've used these forks, with V brakes, on our tandem and we've hit cattle grids at 50mph and braked hard from 60mph - without a worry! In order to resist the forces imparted **low in the blades** by a front disc brake, solo disc forks need to be stiffer and stronger and, as a result, are heavier and less comfortable than tandem

forks and remember that tandem forks have to take the entire weight of the pilot.

Whether being as comfortable as possible is at the top of your agenda probably depends upon your age.

As I've got older, my joints and nerve endings have become much more susceptible to vibration. It may be that other cyclists - especially much younger cyclists, may not (**YET?!**) be as affected by the increased vibration caused by a substantially stiffer fork?

HOWEVER YOU CAN MITIGATE FOR THIS.

Running fat, top quality tyres, such as Schwalbe G-One in 650 x 50 or 57b, at low pressures (30-40psi) will restore comfort, with little compromise to general touring performance, when using disc forks. *Andy Blance Nov 2019*

Why then are THORN V brake forks so comfortable?

V brakes also impart forces into the forks but these forces are higher up in the blades (around the V brake bosses) where the blades are significantly stiffer and able to absorb the energy, without being taken beyond their elastic limit, than the tips of the forks, where disc brakes impart the braking forces.

Our V brake forks are all really comfortable. Nothing removes road buzz as effectively as traditional raked steel blades, which can flex and return to shape hundreds of times a second. Brazing tapered raked blades into a cast fork crown is the ideal and time-honoured method of construction.

To maximise the benefits, we use the lightest gauge blades that are appropriate for the fork's intended use.

When considering SPORT TOURING, in my opinion Schwalbe 700 x 35c (or 40c) G-One tyres and our 853VC forks are as comfortable as 650 x 50b (or 57b) G-One tyres and a steel disc fork.

V Brakes

Shimano Deore V brake



Choosing your brakes with "straight" bars is easy. **Shimano Deore V brakes** have nice levers, they're very powerful and they're also very well made. I wish we had brakes this good 20 years ago!

Shimano XT V brakes and V brake levers take brake performance to a whole new level. XT V brakes pivot in bronze bushings and have longer, forged arms to provide more mudguard clearance.

XT levers have a superb feel

OUR XT V BRAKES and LEVERS are now BLACK
New pics to follow

Shimano Deore 2 finger

Default Option With straight bars

V brake levers.



Shimano Deore 3 finger V brake levers.

sjsycles



Our XT brakes are now **BLACK**

Shimano XT V brake levers



Our Audax frames from Mk1 to Mk4

are designed for use with

deep drop (47-57mm) calliper brakes. Calliper brakes have been used on road racing bikes for decades, they have the most precise feel (modulation) of any bicycle brake. Road racing brakes are shallow drop and it's impossible to fit mudguards, with adequate clearance with tyres wider than 23mm.

Shimano Deep Drop calliper brakes are powerful enough to be used on sports touring bikes. The maximum tyre width, usable with deep drop brakes and mudguards, **ON OUR BIKES** is 31mm with R451. These brakes work with drop bar STI or with Shimano drop bar levers on drop bars. They also work perfectly with **BL-R550** straight bar levers - because these have the correct 5:1 pull ratio - see page **46**

Shimano R 451 Callipers



Shimano BL-R550 Levers



Using CALLIPER BRAKES with STRAIGHT BARS...

you must use road levers for straight bars if you use calliper brakes - **DON'T use MTB brake levers** - they **DON'T** provide sufficient leverage See page **46**

Cantilever brakes have been superseded by V brakes for straight bar use.

It appears as if there are no longer any cantilever brakes on the market which are both powerful enough for the job and are also easy to set up and maintain.

Compact V brakes are now the best rim brake option for drop bar derailleur bikes, which almost universally now use STI - provided you don't want to fit tyres wider than 700 x

40c with mudguards.

It's sensible to choose V brakes and Tektro drop V brake levers, with drop bars, which use bar end shifters or Rohloff

Compact V Brakes



V Brakes for drop bars

If you choose to have Standard V brakes on a bike with drop bars, you must choose the Tektro drop bar V brake levers. **This is an ideal option with a Rohloff bike.** Tektro levers pull the necessary amount of cable, to enable V brakes to be fully applied, before the lever touches the bars.

Ordinary drop bar levers will hit the bar, before maximum brake force can be applied. See page 46



TEKTRO Drop Bar V Brake Levers

If you want rim brakes, on a **DROP BAR BIKE** with STI derailleur gears and you want tyres wider than 700 x 40c plus mudguards, you have to use **CANTILEVER** brakes.

All the cantilever brakes currently available have issues of some kind. Our current advice is to reconsider either the brakes, gears or the tyre size.

WARNING! - WHY YOU MUST USE ROAD LEVERS with ROAD BRAKES and MTB LEVERS with MTB BRAKES

It appears as if the optimum average mechanical advantage required to operate bicycle brakes efficiently and effectively is 5:1.

This figure appears to have evolved over time, as a result of trial and error but 5:1 has been used for decades. Heavier cyclists generally have a stronger grip than lighter cyclists, so this usually helps to even things up. For years the brake lever gave a 5:1 mechanical advantage and both the side pull callipers and centre pull stirrups (so popular until the mid 80's) had a 1:1 mechanical advantage. Cantilever brakes, which also have a mechanical advantage of 1:1, had been used on some bikes, particularly tandems, for decades and when mountain bikes were introduced in the mid 80's, they all had Cantilever brakes mounted to brazed-on bosses. The new MTB brake levers and Cantilever brakes continued to follow the 5:1 and 1:1 mechanical advantage mantra.

By the mid 90's mountain bikes had become very popular and, in wet and mucky conditions, more powerful brakes would have helped the pads bite through the muck and into the rims. Cables often became contaminated with grit and braking performance suffered - as friction in the cables robbed riders' hands of power.

Mr Shimano's simple solution, to reduce friction in the cables, was to give the brake levers a 2½:1 leverage and give the brakes a 2:1 leverage - the net result being the desired 5:1 mechanical advantage.

Thus the linear pull brake (**V BRAKE**) was born, MTB braking became significantly better, more simple and more affordable. Other manufacturers followed suit and now all MTB brakes levers use 2½:1 mechanical advantage.

Compact V brakes with 1:1 mechanical advantage were introduced for use with conventional drop bar brake levers.

(Conventional in this context includes road STI). In our opinion, compact V brakes are the best possible choice for **derailleur** touring bikes with **drop bars**, provided tyres larger than 700 x 40c are not required or used. This is because the arms are much shorter on compact V brakes - which is why they are called compact - and the shorter arms do not allow the brake cable to clear mudguards if tyres fatter than 700 x 40c are used.

Tektro introduced 2½:1 mechanical advantage drop bar brake levers, we still consider these **drop bar V brake levers** to be the perfect solution for

Rohloff drop bar builds, when used with standard (2:1) V brakes. These levers obviously need to be used with bar end shifters or down tube shifters on derailleur builds, which severely limits their popularity.

Shimano introduced 5:1 straight bar road levers (BL-R550) to work with Calliper brakes and compact V brakes.

Without this knowledge, there's the potential for 2 serious mix and match brake disasters.

[1] If you use 5:1 levers (Drop bar road, vintage MTB or straight bar road) with 2:1 brakes (V brakes or MTB specific Disc brake) there's the tantalising potential of creating an incredibly powerful brake, with a 10:1 mechanical advantage.

BUT NOTE: in the real world, the lever will hit the bar before full force can be applied - unless compressionless outer casing is used, the wheel is kept 100% true and the brake pads are set so close to the rim that they rub when you're out of the saddle - even then you may need to adjust the brakes several times during a ride. **This is NOT advice on how to make these items work together - it's a warning on why it's dangerous to attempt it!**

[2] If you use 2½:1 MTB V brake levers with 1:1 brakes (Side pull, Cantilever, compact V or Road Disc) you'll only have 2½:1 leverage - the lever moves initially, before coming to a very solid and positive stop. The feel of the brake lever suggests a very powerful brake. **BUT NOTE:** it only **feels powerful** because 2½:1 leverage is insufficient for most people to even be able to compress the cables - you'll be unable to stop quickly in an emergency - **and you may be unable to stop at all, on steep, mucky descents.**

Obviously no THORN bike is ever supplied by us with mismatched brakes and levers. But for those contemplating building up a bike from a frame and parts - be very aware that different versions of cable pull disc brakes exist. See page 47

Hydraulic DISC brakes for straight bars.



Hydraulic disc brakes are, without doubt, the perfect choice for serious MTB use. For touring applications, with straight bars, the added complexity of hydraulic disc brakes is NOT, in our experience and opinion, worth the hassle.

The increase in potential brake power, compared to that which is available with TRP cable operated disc brakes - which are powerful enough to lock either wheel, is unnecessary.

There are situations where we can see how the extra power **would** be beneficial, if drop bars were used - see page 47.

NOT CONVINCED? If you twist our arm, we could fit any hydraulic disc system that is currently available when you specify your bike.



I've given reasons why I wouldn't want to use hydraulic discs for expedition touring.

Fiona and I used to have Hope 160mm hydraulic discs on a pair of our own Thorn Mercury bikes, which had carbon forks. We used these bikes for Audax rides and as our very special summer bikes.

Our other Mercury bikes had a cable operated Avid BB7 rear disc and XT front V brake.

Having each covered thousands of miles on both bikes, we're in a good position to make comparisons. **We now can't see any valid reason for having hydraulic discs on road-going bikes.**

The BB7 brakes are excellent and the TRP brakes are even better. They both offer all the braking performance you could need and, unlike hydraulic discs, they're so easy to look after!

In fact we've now swapped the carbon fork and Hope discs for a THORN 853c fork with a BR-R 650 front calliper + BL-R550 levers (Pg 45) and a TRP Spyre rear disc (Pg 47) This involved having a new front rim brake wheel built - so it was an expensive swap but it was worth it - the bikes are significantly more comfortable, the brake levers are more comfortable to grip, whilst the brakes are just as powerful but have better modulation (feel).

Clearly, Fiona and I are lucky to have been able to do this - but it all adds to THORN'S real world knowledge - which enables us to give you informed advice, based upon long-term personal experience.

Cable operated Disc Brakes

Cable operated disc brakes don't usually get good reviews in MTB magazines. I believe that this is because most of the brakes on the market are build down to a price and are rubbish!

The **TRP Spyke** and **TRP Spyre** brakes have become the preferred option on almost all the recent crop of gravel bikes and on most of the special ultra-fat tyre bikes designed for polar cycling.



In the Summer of 2015 we tried the Mk2 version of the TRP cable operated disc brakes.

I was interested in these brakes because **the actuating arms are arches, rather than levers.**

This unique feature has 2 very important benefits:-

- [1]** It means that both brake pads are moving pads. This makes the brakes simple to set up and adjust - it might even make them slightly more powerful than the Avid BB7 but I can't honestly say that I've noticed much, if any, difference in power or modulation.
- [2]** The arch makes the TRP brake as slim as any hydraulic calliper - which is of huge benefit, when used on a loaded touring bike.

We can fit a TRP brake to the rear of our Nomad frames and use our expedition carriers.

A further benefit is that the pads are identical in dimension to Shimano M525 pads - this means that replacement pads are available worldwide.

Whilst I would still prefer to have V brakes for expedition use, I no longer have serious concerns, if customers wish to have TRP disc brakes on their Nomads.

Like the BB7, the TRP is made in a version to suit road bike brake levers, this is called **SPYRE** and in a version to suit MTB brake levers - this is called **SPYKE**.

Fiona and I fitted our special lightweight Mercury bikes with calliper front brakes, Shimano straight bar road levers and SPYRE rear discs. This involved swapping the carbon disc forks for our THORN 853c forks, removing the Hope hydraulic disc brakes and building new front wheels. I converted to tubeless and fitted S-ONE 30c tubeless tyres. We've been thrilled with every aspect of the performance of these bikes.

I also fitted a rear SPYKE to each of our light touring Mercury bikes, in place of the BB7, as I wanted to give the TRP brakes a long term test. Fiona and I have now each covered many 1000s miles and we are very happy with the performance of our rear brakes.

SHIMANO GRX Drop bar STI with hydraulic discs

I'll start by saying that I have no doubt that the perfect bike for Cycle Camping, Adventure Touring, or Expedition Touring is a Nomad Mk3 with straight bars and Rohloff gears.

When customers know that they want **DROP BARS** and **STI DERAILLEUR GEARS** for any of the above types of touring, they're also likely to want tyres which are too wide for Compact V brakes. In situations, likely to be encountered during such tours, we know that braking performance could become an issue.

It's not possible to exert the same hand force with drop bar levers as it's possible to exert with straight bar levers, so even the excellent TRP disc callipers (see above) may be unable to provide the stopping power required with drop levers.

Life is about knowing when a compromise may be necessary and we believe that the undeniable extra power available with hydraulic disc brakes, trumps the undeniable fact that hydraulic disc brakes require more specialist tools and knowledge. Provided sufficiently fat, high quality tyres are selected and run at the appropriate lower pressures.

Provided you're also happy with the inevitable fairly sporty position (and if you're not, why on earth have drop bars?).

And provided you understand the potential downsides of such technology - we'd have few qualms about building you a Nomad Mk3 with Shimano GRX drop bar STI brakes, with hydraulic discs for Cycle Camping, Adventure Touring, or Expedition Touring. See also pages 14 and 44 and the photo on page 3.



CRANKS and CRANK LENGTHS

A crank is simply a lever - a lever to which you attach the chain ring and the pedals. The ideal length of the crank depends upon the length of your legs. If your cranks are too long, your knees will have too much of a bend in them, when the pedal is at the top and you're more likely to suffer injury. If the cranks are too short, you may not be making power as efficiently as possible.

On easy, flat terrain, a touring cyclist may perform 300 reps, with each leg, for every mile covered. (about 190 per kilometre) That's a lot of reps over a lifetime of cycling. It's crucial to look after your knees!

The old "rule of thumb" was that the length of your cranks should be around 20% of the length of your legs. Some rules of thumb are more helpful than others, unfortunately this isn't one of them.

Men of above average height, or with above average length legs, should use 175mm cranks, as should women with legs this long.

Men of average height, with average length legs should use 170mm cranks, as should women with legs this long.

Women of average height and leg length (and men with shorter than average length legs) will benefit from using 165mm cranks.

This length is only manufactured for the premium end of the market (Ultegra or XT and above) so you may never have tried 165mm cranks. Off the shelf derailleur bikes, which do have a premium chain set rarely offer 165mm cranks. They use the premium chain set either because of:- fashion, the need to hit a "price point" or, because they really need the complicated shaped teeth, cut outs and ramps found on expensive chain rings, in order to change gear slickly, with a chain which has become too narrow to perform this task properly, because it now needs to operate on a 10 or 11 speed cassette!

GEARING with ROHLOFF HUBS

With Rohloff gears, you can sidestep cycling madness altogether, you simply need one long lasting chain ring! This means that we

have been able to have some fairly nice quality cranks made for us and we have been able to have these drilled in 160, 165, 170, 175, 180 and 185mm lengths. (185 is probably too long for any of our bikes) Customers with very short legs should choose 160mm cranks.

Chain rings.

We've had 3 complete ranges of chain rings made especially for us. These rings are exclusively for hub or single geared bikes. They have very special shaped teeth - long deep teeth, designed for maximum service life! These rings would be useless on a derailleur bike.

The 3 types are 110bcd, which fits our original Thorn cranks and Shimano (and other) MTB cranks of the 80's and 90's.

We also have 104bcd rings, which fit current Thorn chainsets and the later Shimano



cranks as well as the current external bearing MTB cranks. (But not 2014 XT) In addition we had rings made for our (and Shimano's) 130bcd road chain sets but these are not as sensible an option on an expedition bike as the others.

Our chain rings are made from 7075 series aerospace alloy. You couldn't find better! They're also double sided, that is, you can wear them into a hook shape, then turn the ring around and get some more wear out of

them. You'll see that we offer a huge range of sizes, you can choose the range of gears that will suit you and your cycling.

Gearing.

I've written a lot about gearing, which you can read in our "Living with a Rohloff" brochure. (Please see the link on page 16) The Rohloff hub has an overall range of 526%. That is; the bottom gear gives more than 5 times the leverage of the top gear. Or think of it like this, at the same speed you have to pedal more than 5 times faster in bottom gear than you do in top.

In real-world cycling this means that you could be pedalling at 50rpm up a really steep hill in bottom gear at 2.4mph or spinning at 120rpm in top gear at 30mph.

The old "Ordinary" bikes (Penny Farthings) used to have the cranks connected to the front wheel, without gearing - one rotation of the cranks was one revolution of the wheel. Riders use to talk of the size of the wheels in inches (taller riders could pedal a bigger wheel). The single geared safety bicycle was invented when chain technology allowed a chain ring to drive a sprocket. The safety aspect was that the rider was not way up in the air and now had brakes which worked. Riders used to calculate the gearing and refer to it as if was the actual size of a wheel. i.e. a 2:1 gear ratio on a 26" wheel produced the same gear as a 52" Penny Farthing. In much of the native English speaking world, we use this system today.

GEARING with ROHLOFF HUBS continued.

CALCULATING the GEAR RANGE of YOUR ROHLOFF

11th gear on the Rohloff is 1:1 direct drive.

Therefore if you divide chain ring

A	24	32	42
11	X	75.6	99.3
13	X	64.0	84.0
15	41.6	55.5	72.8
17	36.7	48.9	67.3
19	32.8	43.8	57.5
21	29.7	39.6	52.0
24	26.0	34.7	45.5
28	22.3	29.7	39.0
32	19.5	26.0	X
36	17.3	23.1	X

A modern 30sp MTB derailleur set up and also highly recommended as a straight bar set up on our 26" Sherpa
The X combinations must not be used and the combinations in small print should be avoided.

B	26	36	48
11	X	88.4	117.8
13	X	74.8	99.7
15	46.8	64.8	86.4
17	41.3	57.2	76.2
19	36.9	51.2	68.2
21	33.4	46.3	61.7
24	29.2	40.5	54.0
28	25.0	34.7	46.3
32	21.9	30.4	X
36	19.5	27.0	X

Our ultra wide ratio gearing offered on all our derailleur touring bikes.
This table is correct for 700 x 35c
The X combinations must not be used and the combinations in small print should be avoided.

C	26	36	48
12	X	81	108.0
13	X	74.8	99.7
14	50.1	69.4	92.6
15	46.8	64.8	86.4
17	41.3	57.2	76.2
19	36.9	51.2	68.2
21	33.4	46.3	61.7
23	30.5	42.3	56.3
25	28.1	38.9	X
28	25.1	34.7	X

Our wide ratio gearing offered on all our derailleur touring bikes.
This table is correct for 700 x 35C
The X combinations must not be used and the combinations in small print should be avoided.

D	34	50
12	X	112.5
13	X	103.8
14	65.6	96.4
15	61.2	90.0
17	54.0	79.4
19	48.3	71.1
21	43.7	64.3
23	39.9	58.7
25	36.7	X
28	32.8	X

Many modern sportif bikes use this typical compact double set up...you get lovely close ratio gearing but you certainly need to be very fit for hilly events!
The X combinations must not be used and the combinations in small print should be avoided.

teeth by sprocket teeth and multiply by the actual wheel diameter (including tyre) you get **11th gear in inches**.
If you multiply this by 0.279 you'll get **bottom gear in inches**.
If you multiply this by 5.26 you'll get **top gear in inches**.

E.g. 40t chain ring and 17t sprocket with 26" wheel is
11th gear = $40/17 \times 26 = 61.18"$
Bottom gear is $61.18 \times 0.279 = 17.07"$
Top gear is $17.07 \times 5.26 = 89.8"$

A modern MTB may have a 22/32/44 chain set and an 11-34 cassette it therefore has a bottom gear of
 $22/34 \times 26 = 16.8"$ and a top gear of
 $44/11 \times 26 = 104"$

A modern sports bike may have a 34/50 chain set and a 12-27 cassette with a 700c wheel, it therefore has a bottom gear of
 $34/27 \times 27 = 34"$ and a top gear of
 $50/12 \times 27 = 112.5"$

With Rohloff, you can have pretty much whatever gearing you require but top will always be 526% higher than bottom.

My recommended gearing.

I frequently get asked by customers, what I'd recommend. I then ask if the customer is happy with their current gearing, they say "yes" or no, they'd like it to be different in some way. (Higher or lower)
I then ask what gears they are currently using and most people just don't know. I do know that cyclists' ideal choice of gearing varies hugely, from person to person, how am I supposed to know what would suit this customer?

It's simple to work out what gears you currently have, turn the bike upside down, be prepared to get your fingers dirty and count the teeth, then check again.

Sometimes customers don't have bikes, so here are my rules of thumb.

If you generally try and avoid carrying huge loads. If you try and avoid cycling up really steep hills but are prepared to walk up them if necessary. If you want to pedal down hills but are prepared to freewheel down really steep hills, **48 x 17** should be a good gear for you with a Raven or Nomad - you'll need to use **47 x 17** with a Mercury.

If you're looking to cycle over, whatever hills you come across and you cycle in hilly areas, and you wish to do this, with whatever kit you have on the bike and you are prepared to freewheel down steep hills my advice is to **gear low - 40 x 17** is low and should be a good gear for you with a Raven or Nomad - you'll need to use **39 x 17** with a Mercury

If you are used to having very low gears and pedal with a high cadence, or if you're looking to cycle over, whatever hills you come across and you cycle in hilly areas, at high altitude and you wish to do this, with

whatever kit you have on the bike and you need to be able to do this, no matter how ill you may feel - my advice is, **gear even lower - 40 x 19** is very low and should be a good gear for you with a Raven or Nomad - you'll need to use **41 x 19** with a Mercury

It really doesn't matter if you get the gearing wrong when you buy the bike - it's very easy and relatively inexpensive to raise or lower the gearing.

We like to send our bikes out with a 17t, or even better a 19t sprocket - because the chain will last longer than if you use a 16t sprocket and much longer than if you choose a 15t sprocket! This is a very silly place to try and save a very small amount of weight! Even if money is no object, you're better off with the bigger sprocket - you'll save time by not having to adjust and replace your transmission frequently. Rohloff won't give a warranty on the hubs, if a gear, with an input ratio smaller than **1.9:1**, is used on a solo bike.

Minimum gear ratios, for solo riders under 100Kg, which are acceptable to Rohloff are:- 33 x 17; 34 x 18; 36 x 19 and 21 x 40

For heavy riders (100Kg+) or for tandems, Rohloff say that the minimum input ratio should be **2.5:1**

Minimum gear ratios, acceptable to Rohloff, for solo riders heavier than 100Kg, or for tandem crews are:- 38 x 15, 40 x 16, 43 x 17 or 48 x 19.

However Rohloff say that even "world class athletes" are warranted to use such a gear.

It's the input ratio and not the actual gear ratios produced which is critical.

In our opinion 40 x 17, or even better 45 x 19 is an ideal gear ratio for general touring. Some may say that it is too low but if you're fit enough, or can get fit enough, to pedal at a knee saving 96rpm and if you can keep this up for one hour you will travel 25 miles, in that hour, on 700c wheels.

You may feel, as I do that, when carrying huge loads up steep hills, you could benefit from significantly lower gears - especially if you're my age, or older and you feel that you will never develop the pedalling force of a world class athlete (!!!).

As a 78Kg chap, in his late 60s, I would need to stand on the saddle and jump onto a pedal - in order to achieve the same peak loads on the hub's internals, as a 99.9Kg Olympic rower could be expected to produce!

You're welcome to be pro-active and to choose forbidden gears, as long as you take personal responsibility for your decision.

I had some threaded 19t sprockets made for us. **19t is still an option with the NEW SPLINED SPROCKETS.**

These give a significantly longer service life. there are more teeth for a start but the greatest benefit is that, as the chain doesn't have to perform such a tight bend, there's less opportunity for grit to get behind the side plates. The chain lasts significantly longer and therefore there's less wear on the

sprocket. I believe that the difference may prove to be, the difference between the cube of the number of teeth of the smaller sprocket, compared to the cube of the number of teeth of the larger sprocket - for example, 17^3 compared to 19^3 (To save you reaching for your calculator) this is 491 compared to 685, or about 40% more miles for the whole transmission.

There's a small upcharge - if you choose the 19t option - but it is nevertheless, a real bargain!

I've shown some derailleur gear set ups at the bottom of page **48**, to enable you to compare the ratios available with derailleur gears, with those available with Rohloff. If you're moving from derailleur gears to Rohloff it's an advantage to decide which chain ring and which sprocket will be most suitable for your intended application.

Confirm that the cassette and chain ring combination, that you think you have, is what you actually have! You can only be certain of this if you actually count the teeth accurately.

It's also a good idea, if you're perhaps contemplating your first long, self supported tour, to consider that you'll need gears which are much lower than anything you've previously required. Having such low gears will almost certainly mean that you don't have gears high enough to pedal, when you are descending long or steep hills. This shouldn't matter, you'll probably be glad of the rest, as you freewheel along at speed.

Not having low enough gears, when you are tired and have to ride up a long hill, when you still have some distance to travel, really does matter.

If you're looking at a sporty bike with Rohloff gears, to replace an existing sporty bike, it's sensible to make sure that your top gear is as high as the one you're currently happy with - achieving this shouldn't be a problem and, because of the huge range of the Rohloff hub, you're almost certain to gain a few lower gears - which should be considered as a bonus.

Orders for ROHLOFF EQUIPPED bikes, which were taken after MAYDAY 2016, all have the new Rohloff splined sprockets - these are really easy to change. The new splined sprocket carriers are retro-compatible and will fit every Rohloff hub ever made.

I can't see a logical argument for choosing anything other than the brightest, most reliable REAR light available - which is currently the **Moon pulsar rear LED light**. The very latest technology is encapsulated into this light. It uses a 1pc COB LED which has 15 separate LEDs and most importantly to us, uses 2 x AAA alkaline batteries. In the Overdrive mode it is amazingly bright - think modern vehicle fog lights. It has several easily accessed functions both constant and flashing a particularly useful 50% mix of flashing and constant.



SADDLES

We no longer fit a saddle to our bikes as standard. This may at first appear crazy - clearly you can't ride a bike without a saddle. You may of course have a favorite saddle already and we will fit this for you free of charge. Saddles are a personal choice and we think you should be able to choose exactly what you want. You can have any saddle currently in stock at **SJSC's retail price**.

We've purchased a range of **BROOKS OEM SADDLES**. These are supplied to cycle manufacturers solely for the purpose of fitting to NEW BIKES, they come without any packaging. We can only offer these **SPECIAL PRICES** if you specify it to be fitted to your **NEW BIKE**.

Brooks B17 Standard

This saddle is available at a really super price but in **BLACK or HONEY ONLY**.



The **B17 Standard** is the correct width for many men and for most women.

SWIFT Ti
Titanium rails



Honey

B17 Narrow
Suits some men



PEDALS

Thorn Bikes aren't supplied with pedals as standard equipment. There are many opinions about what's best and many cyclists already have their own pedals.

It's hard to advise what pedals to use on tour, it depends upon many factors. I've used SPD pedals for more than 2 decades now, I'd hate to use anything else. I feel really safe in them - my feet can't accidentally get bumped off the pedals.

So far, I've always been happy with MTB racing shoes, the areas we like to cycle in are only cold at night! MTB racing shoes transfer power really well and they're exceptionally comfortable to cycle in. I always take another pair of shoes; either Gore-Tex walking shoes or sandals - depending upon where we are. I'd hate to only have one pair of shoes and so it doesn't matter if my cycling shoes look weird when I'm off the bike.

Below you'll see popular pedal options.

We can supply your bike with any pedals currently in stock at SJSC, at SJSC retail price.

You can try real SPD pedals

Shimano M520

There's nothing that I've ever used that's benefited my pedalling as much as using SPD pedals.

If you've never ridden with SPD pedals, whether or not I'd recommend you to try them, really depends upon how old you are.

You will topple over once or twice, when you forget that you have SPDs - but you'll never have your feet locked into them when you hit the ground. Getting used to SPD pedals, away from traffic is a good idea!



There's a nice pedal on the market, which I've used on a couple of tours, it has **SPD** on one side and a flat platform on the other. The latest version is **PD A530**.

in silver (see opposite) **or black** (not shown)



I can see the attraction of using flat pedals with walking shoes or sandals.

The very best of this type of pedal currently on the market is the 500g Shimano **GR500**. The large surface area reduces pressure when using flexible soled shoes. The replaceable stainless set screws help to grip slippery shoes. Weight 533g per pair. SJSC #45806



The traditional tourists' choice of toe clips and straps is my least favoured option. They're awkward to get your feet into and if you don't, the straps get caught on things. The clips can kill your toes but that's just my opinion, based on past experience. If you're convinced that you want clips and straps, you're unlikely to find better than **MKS GR9** with steel clips and nylon straps.



THORN EXPEDITION CARRIERS.

From the pics you can see that our carriers have a very substantial build. They are not lightweight but they are not particularly heavy either.

The most important thing to be sure about, with expedition carriers, is that they won't ever let you down.

Our carriers are constructed from 1mm thick, seamless, heat treated, tubular aerospace Cro-Mo.

Whether we're talking of the front or the rear, these are the undoubtedly the strongest expedition carriers on the market - we've sold thousands, we've never heard of one breaking and our customers really do travel in the back of beyond!

They're designed for installation with M5 or M6 screws.

If you're contemplating the definitive expedition bike - don't scrimp or attempt to save a few ounces on the carriers!



sjscycles

**Special offer
available
when you
BUY BOTH**



Note:- although the mounting plate comes with the carrier, a rear light is an optional extra

www.sjscycles.com

Tubus OEM* AIRY carrier

An extremely lightweight (230g)

Titanium carrier it's expensive but it's ideal and highly recommended for use on our Mercury or Audax bikes. It may also be an excellent choice on Ravens, Sherpas or Club Tours that are purchased for lighter touring.

* The OEM carrier is supplied to us by Tubus, solely for fitting to brand new bikes, it comes with the Tubus bracket 22531 but without packaging. We can only sell this item to you when you order your bike.



We've devised a secure and Clutter-free way of attaching mud guard stays, using our own stainless steel "P" clips, which are covered with high quality shrink tube.

Excellent for small panniers or for supporting a saddle bag. Not suitable for use with a rack top bag.



Fitting a rear light to a Tubus Airy carrier



Tubus OEM VEGA carrier Lightweight Tubular Cr-Mo 510g



Ideal for fitting to bikes for light to medium weight touring, either where a Ti Airy is deemed to be too expensive or when a rack top bag is to be used.

Integral bracket for rear light. Price includes adaptors for use with BB7 disc Club Tour or Mercury. We'll fit the M/G stays using "P" clips, as with an Airy.



SPUR CYCLES

BELL. This tiny and beautifully engineered stainless steel bell rings with a **115db.** "pitch-perfect ping" Hearing is believing! Raw or diamond hard black.





LUG-

Having your kit packed away neatly looks nice and is considerably more efficient.

It's more efficient because you can find what you're looking for more quickly and it's actually more efficient, in terms of energy used, because well packed kit is aerodynamically more efficient. (See page 9)

I prefer to use a traditional canvas saddlebag wherever possible. Although the weight is comparatively high on the bike, it's carried within the wheelbase of the bike and, being directly behind the widest part of my body, it's very aerodynamically efficient. The outer pockets can be accessed easily whilst on the move and, unlike zips, the traditional leather straps and buckles are durable and easy to use when wearing thick gloves.

I like to support the underside of a large saddlebag by using a rear carrier, I anchor the bag to this with a toe strap - this stops the bag swaying around.

Carradice make the best saddlebags and they have an impressive range of different models, which you can see on the SJSC website. I've shown the largest saddlebag, the 24litre **Camper Longflap** and the 11litre **Pendle**. In my opinion, the Pendle is the ideal size for sporty day rides and the Camper Longflap is ideal for heavy Touring, if you're below about 5' 7", you'll find that the Camper is too deep and the **Nelson Longflap** will be a better choice. If you're below about 5' 3", you'll find that the Nelson is too deep and the **Low Saddle Longflap** will be the best choice.

An alternative to the traditional saddlebag, for fast day rides, is a rack top bag. I still believe that a saddlebag carries the weight better but you'd have difficulty finding a better rack top bag than the **Carradice CarraDura**.

In my opinion, a large saddlebag, used along with a pair of small rear panniers, is the ultimate combination for lightweight touring.

All the things that you'd use during the day's cycling can be carried in the saddle bag and all the items that you'll only need when you reach your hotel, can be compressed into the panniers. Ortlieb Front Roller Plus QL 2.1 paniers are ideal for this. (Please see the next page)



Fiona cornering at speed, with a full camping load, in the French Alps.

Fiona has all the kit she'd need during the day in her saddlebag - a warm layer, waterproofs, camera, purse, snacks, pump, tools and a sit-mat.

Fiona's rear panniers contain our sleeping bags and mats and food and supplies.

Fiona's clothes are in her front panniers. I was using an identical set up and I was carrying the tent, spares, cooking equipment and wine in my rear panniers.

In total we were carrying about 20-22kg each and the bikes handled brilliantly.

Carradice Camper Longflap Saddlebag
24 Litre



Carradice Pendle Saddlebag
11 Litre



Carradice CarraDura Rack Top Bag
12 Litre, includes a rain cover



For Expedition Touring

on one of our Nomad bikes, which have extra-long chainstays, I recommend using Ortlieb's huge **70 litre** rear panniers. You ought to be able to get all you need inside these bags - perhaps with your tent in a dry bag along the carrier. Fiona and I have found that front panniers can take a disproportionate amount of effort to cycle into strong headwinds and can be unnerving in strong cross winds. Front bags create extra drag even on windless days. If you have a properly considered expedition bike, it's easier to just have huge rear bags.

If you know that, at some point on your tour you'll have to carry huge quantities of water, you could keep a pair of sports rollers inside these bags and attach them when you need them. You'll be able to use the sports rollers on the rear for day rides - either during your expedition or afterwards. These giant Ortlieb bags can be cinched in from 36cm to 24cm width, which makes them useful for other forms of touring.

The bags shown are in Ortlieb's PLUS Cordura fabric. CLASSIC fabric versions are also available.



LUG-

Ortlieb luggage is seen on bikes everywhere. On the previous page I gave examples of where Ortlieb is not my first choice but for every other situation, I'd choose Ortlieb.

The Ortlieb range is huge and very many different colour choices exist. Please see the [SJSC website](#) for the full range, where you'll also find many non-current Ortlieb panniers for sale, at very attractive prices. **NOTE: Bar Bags always disaffect a bike's handling -**

the more weight in the bag - the more it's affected. Our accessory bar will help to mitigate this by lowering the height of the bag.

If you must have a handlebar bag, Ortlieb bags are far superior to anything else on the market. Fiona and I only tend to use bar bags when we have passports to keep safe. We may not even use them for this in the future because it appears as if bar bags are being deliberately targeted by thieves. In my opinion, there's no point in choosing anything other than the Ortlieb Ultimate 6M Classic Bar Bag - this is available in several colours.

Ortlieb Ultimate 6 M
Classic Bar Bag - 7 Litre



Back Roller City QL1
Panniers - Red / Black - 40 Litre.



Ortlieb Touring Panniers

Ortlieb offer two different styles of pannier, each of which is available in a choice of two different sizes and in two different materials. Finally, there are 2 current methods of attaching, securing and adjusting the panniers. Currently there are many different Ortlieb pannier options - available in a choice of colours.

The two different styles of Ortlieb pannier are the iconic roll top style (called **ROLLERS**) and the more familiar hooded top style (called **PACKERS**)

The roller panniers are not only waterproof, if closed correctly, they're water tight! I mean that **Rollers can actually be submerged**. The roll top closure can be a nuisance if frequent access is required - whereas the Packers are much easier to access but are not watertight if submerged and can allow ingress of horizontal rain or spray - especially if only partially filled.

It's worth noting that, compared to rear panniers, front panniers are more likely to be subject to spray and certainly more likely to get swamped in a ford!

Ortlieb make 3 different sizes of pannier.

They make small panniers, which they call Sport. These are available as Rollers, or Packers - they can certainly be used on the rear.

They make large panniers which they call "Back" if it's a Roller and "Bike" if it's a packer. Back and Bike panniers are too large to be used safely at the front of a bike.

They also make extra large panniers - see previous page.

Fabrics used by Ortlieb.

Ortlieb use a heavy "lorry tarp" fabric which they call "**CLASSIC**". This is PVC coated polyester it's easy to clean and waterproof but it's both heavier and not as strong as their higher-tech fabric, which they call "**PLUS**".

The Plus fabric is PU coated Cordura - it's more difficult to get oily stains out of this fabric.

Sport Roller City QL1
Panniers - Black
- 25 Litre



Sport Packer Plus QL2.1
Panniers - Denim / Steel Blue -
30 Litre



Front Roller Plus QL2.1
Black - 25 Litre



Ortlieb's pannier mounts.

The latest version of Ortlieb's method of attaching, securing and adjusting the panniers is called **QL2.1**, this is currently used on each of the 10 possible combinations of style, size and fabric.

The older, but still reliable, **QL1** system, is only available on Roller panniers made from Classic fabric. These are known as "**Sport Roller City**" and "**Back Roller City**".

To keep the price as low as possible, these are supplied without inner organisers.

Which Ortlieb panniers? (Andy's personal opinion)

When funds are tight, I can see the virtue of cost-effective panniers. In such cases, I'm happy to recommend the Roller City series - particularly the Sport Roller City. Given deeper pockets, I can't see the point of having heavier panniers made out of weaker fabric, so I recommend having **Plus panniers**.

I certainly recommend having Front Roller Plus bags as front panniers, where their watertight qualities are particularly beneficial. I'd keep items that must not get wet inside. (Down sleeping bags and jackets). These panniers are also ideal as rear bags, to supplement a traditional saddle bag. (See previous page)

Sport Packer Plus panniers are ideal for use at the rear, as sole luggage for light touring.

Bike Packer Plus panniers are probably the best Ortlieb rear bag option for heavily loaded touring. (But see expedition Touring on previous page)

For touring with 4 panniers, in general I recommend the combination of Bike Packer Plus (rear) and Front Roller Plus (front).

Andy Blance Jan 2019

Back Roller Plus QL2.1 Panniers -
Signal Red / Chili - 40 Litre.



Bike Packer Plus QL2.1
Lime/Moss - 42 Litre





AB's Glossary of Cycling Terms

Headset - The name, protected by patent and copyright given to the first threadless headset.

Anti Chaffing Strip - This is a strip of material which is fitted by most tyre manufacturers, which prevents (or delays) the tyre being chaffed through by the side walls of the rim.

BB A frequently used abbreviation for Bottom Bracket.

BB Drop - This is the vertical distance that the centre of a frame's BB is below a centre line drawn through its front and rear dropouts.

BB Height - The height above the ground that the centre of the BB is when the bike is vertically upright. **Note:** this varies with tyre size and tyre pressure which is why we quote BB drop.

BCD - This is the abbreviation for bolt circle diameter. Chain rings and crank spiders are classed according to their BCD. Rings from one BCD won't fit onto cranks with a different BCD.

Bead - The part of a tyre which locates it firmly on the rim. Beads are either [1] made from steel, which are known as wire beads or [2] made from modern high tensile man-made fibres, such beads are significantly lighter and are also flexible. Tyres with such beads are known as "folding tyres".

Block - See Freewheel (noun)

Bottom Bracket - The axle and bearing assembly, to which the left and right cranks are attached.

Bottom Bracket Shell - The cylindrical housing, which forms part of the frame, into which the bottom bracket is installed.

Brake Bridge - On a bike with Calliper brakes, the seat stay bridge is called the brake bridge. It is often a micro-cast component, incorporating a boss for the attachment of the rear brake.

Brazing - A process which involves heating up a brass alloy until it melts. Molten braze is a fantastic glue and it's used for joining tubes together, attaching bosses and fittings or filing dents.

Brazed on Bosses - Bosses are machined components with a thread, to which various items may be securely attached. Brazed on bosses are permanently fixed to the frame with braze. Thorn frames are renowned for their attention to detail. We fit many different bosses for carriers, lo-loaders, mudguard stays and bottle cages.

Brazed on Fittings - Fittings include guides, slides and stops for neat cable routing. Brazed on fittings are permanently attached using braze.

Butted Tubes - Higher quality cycle tubing is made by drawing tubes down to achieve very thin wall thicknesses. When one end of the tube is given thicker walls, to provide greater strength at the joint, the tube is said to be butted. When both ends of the tube are given thicker walls, the tube is said to be **double butted**.

Butted Spokes - Some spokes have a 14g shaft and a 13g thickened head end and are said to be butted. Hubs usually need the spoke holes enlarging to use heavier 13g spokes - which **isn't** usually a sensible thing to do.

PLEASE NOTE: Many double butted spokes are mistakenly called butted spokes. DB spokes are a good idea.

Cadence - This is simply the number of complete revolutions of the cranks, made by the cyclist, within 1 minute.

Cassette - On modern derailleur bikes, a number of (rear) sprockets are joined into an easy to fit assembly, which is known as a cassette. Nowadays 9, 10 and 11 speed cassettes are in common use.

Chainline - On a bike with a single sprocket, when you look from behind, along the chain, towards the chain ring, you should see a perfectly straight line. This is perfect chainline. With multiple sprockets and/or more than one chain ring, some compromise has to be arrived at, to ensure that all permissible ring/sprocket combinations have an acceptable

chainline. Manufacturers quote the distance from the centre line of the seat tube to the teeth of the inner (or only) ring.

Chain Ring - The large, toothed ring which fits onto the cranks is known as a chain ring.

Chainset - The combined assembly of left and right cranks, chain rings and chain ring bolts is known as a chain set. Thorn derailleur bikes are almost always selected with 3 chain rings and are said to have triple chainsets. MTB chain sets usually include the complete BB assembly; whereas Road chain sets generally don't include the BB assembly.

Chain Stays - part of a bike's frame, they are the pair of tapered tubes, which run from the BB shell back to the rear dropouts. Chain stays are usually deeply ovalised at the BB, to provide greater tyre clearance.

Chain Stay Bridge - A short length of tube which connects the 2 chain stays. The position of this bridge can dictate available tyre clearance. The bridge is also used to secure the bottom of the rear mudguard.

Cleats - Devices which are screwed to the sole of cycling shoes, which attach to the pedals, stabilising the feet and improving pedalling efficiency. MTB cleats are recessed into the sole of MTB shoes and do not interfere with walking.

Clips and Straps - See Toe Clips and Toe Straps

Coasting - See freewheel (verb)

Cold-Drawn - When tubes are repeatedly drawn through dies and over mandrels, to gradually make the walls thinner, without the use of heat, they are said to be cold drawn.

Cold-Set - An engineering term for bending something without using heat.

Crank - The alloy arms which attach to the BB axle and which have the pedals screwed into them are called cranks.

Crank Set - The left and right cranks together are called a crank set.

Crown Seat - The machined area at the top of the fork crown, which provides an interference fit for the crown race.

Crown Race - The hardened and machined lower part of the headset. This is a press fit onto the crown seat.

DB - An abbreviation for Double Butted.

Double Butted Tubes - see Butted Tubes.

Double Butted Spokes - Higher quality wheels are built using double butted spokes - typically 14/16 gauge. The 16g middle section of DB spokes is much thinner than the ends, which saves weight and gives a more resilient ride. The standard 14g bend fits snugly into hubs and the 14g thread fits into standard nipples.

Down Tube - The frame tube which runs from the head tube to the BB

Dropouts - The precision made slots into which the front and rear wheels' axles are fitted and clamped tight. Hence front dropouts and rear dropouts.

Dynohub - see Hub Dynamo

EBB - Abbreviation for Eccentric BB

Eccentric BB - A large diameter, precision machined, cylindrical alloy insert, which takes a standard BB unit, in an off centre (eccentric) position. Rotating the EBB changes the distance between the BB and the dropouts (and/or the other BB in the case of a tandem) - allowing chain tension adjustment.

Eccentric Shell - The housing, which is an integral part of the frame, into which the EBB is located.

Ex Box - Short for External Box

External Box - Rohloff call the box, into which the gear cables run, the External Box. See page 15 for more detail.

Fixed Wheel - A single speed gearing system, without a free wheel. When the wheel goes round, the cranks go round. If the cranks are prevented from going

round, the wheel can no longer rotate.

Folding tyres - See bead.

Fork - The name given to the assembly of fork blades, fork crown and steerer tube.

Fork Crown - Most steel bikes' forks are made by brazing a pair of fork blades and a steerer tube into a fork crown. Cheap fork crowns are stamped and pressed, higher quality fork crowns are accurate micro-castings.

Fork Rake - See Fork Offset.

Fork Offset - To ensure stability, the front dropouts must be some distance ahead of a line drawn through the centre of the steerer tube - this is known as the fork offset. Off set can be achieved by mounting straight blades at an angle to the steerer tube, or it can be achieved by putting a bend into the tips of the fork blades. When high quality blades, with small diameter tips are given a tight-radius bend, not only is the necessary stability achieved - the forks become significantly more comfortable to ride. Thorn cycles' forks have such bends and are a signature of our bikes.

Free Hub - A rear derailleur hub which takes a cassette, the bearings which support the cassette are in the free hub body, which is an integral part of the hub. **Freewheel** (noun) - All hubs, apart from fixed wheel hubs, used to have a screw on freewheel - single, 5, 6 or 7 speed. The bearings are in the screw on freewheel. Freewheels used to be difficult to remove, today only single speed bikes and cheap nasty rubbish derailleur geared bikes are built with a freewheel.

Freewheel (verb) - To freewheel is (apart from when riding a fixed wheel bike) when a cyclist stops pedalling and the cycle continues its forward motion. Some call it coasting.

Front Centres - When the front wheel is pointing exactly forward, the distance between the centre of a bike's BB shell and the centre of its dropouts is known as the front centres.

Front Derailleur - The mechanical device which moves the chain from one chain ring to another.

Front Hub - The central part of a front wheel, into which spokes are laced.

Front Mech - See front derailleur.

Gear Lever - See gear shifter.

Gear Shifter - A component which, on a derailleur bike (currently) pulls a cable, which in turn moves a derailleur to make it shift from one chain ring (or sprocket) to another. Derailleur gear shifters are available in many different styles. Hub geared bikes are also operated by their specific shifter via a cable.

Group Set - A collection of derailleur specific components (derailleurs, chain set, hubs brakes, gear mechs etc.) designed to be harmonious in terms of looks, price and performance. Only Road Racing Trekking and MTB Racing groupsets are offered by manufacturers. Touring bikes have to use components from both road racing trekking and mountainbiking.

Handlebar Stem (threadless 1 1/2") - An alloy component with a clamp at each end. The handlebars are inserted into one end, the other end is clamped onto the steerer tube. All Thorn frames built after 2000 used 1 1/2" threadless steerer tubes. The **handlebar stem** also has a second important function - it acts as a locking device, to prevent the headset bearings from loosening. **Note:** old bikes and Thorn frames built **before 2000** may have a threaded steerer and consequently need to use a **quill stem**. The older the bike, the more likely this is.

Head Angle - The critically important angle that a straight line drawn through the steerer tube makes with a level surface.

Headset - The name given to the complete steering bearing assembly which consists of the upper and lower head

races, along with the various seats, shrouds and seals.

Only old, or very cheap bikes use a threaded headset these days - see quill stem.

Head Tube - The tube at the front of the frame, through which the fork's steerer tube runs. The down tube and top tube are attached to this tube.

Heat Treatment - In the case of premium quality steel cycle tubes, heat treatment involves heating the tubes in a furnace to extreme high temperature, holding that temperature for many hours and then quenching the tubes at ultra low temperatures. Heat treatment is expensive but worth the effort and expense. It increases ultimate tensile strength and raises the steel's elastic limit considerably making the steel more resilient and more resistant to denting.

For more information on steel, see page 8
Hub Dynamo - A hub (invariably a front hub these days) which, when switched, uses forward motion to generate electricity to power lights, or to potentially charge electronic devices.

Hub Flange - The larger diameter, parts of the hub, into which the spoke heads are located is known as the hubs flanges

Hub Gear - See internal geared hub

Hysteresis - This is the technical term for internal friction which occurs in pneumatic tyres, as they rotate. Hysteresis losses turn energy into heat.

Indexed Gears - In the mid 1980's, Shimano made the major technological breakthrough of providing positive clicks, which could also be felt through the fingers, as the shifters reached each gear. They called this SIS - Shimano Indexing System. We all called it indexed gears.

Inline Post - A seat post which has no lay back at all and is used to position the saddle in a more forward position.

Inner tube - a tubular rubber hoop with a valve attached, which retains the air inside a tyre.

Internal geared hub - Unlike a derailleur gear system, the mechanism for providing multiple gears, is inside the hub and sealed from the elements.

L1 - A dimension used by many frame builders, it is the distance, measured in a straight line from the centre of the front axle to the fork crown seat.

Lay Back - When used to describe a seat post, it refers to the post's capacity to position the saddle further towards the rear of the bike.

Lo-Loaders - Front carriers, which are attached to bosses on the fork blades. Given a frame with the correct geometry, Lo-Loaders have a stabilising effect on the bike's steering - whereas weight carried high at the front can make a bike feel very twitchy. See page 51

Low Loaders - See Lo-Loaders.

Low Riders - See Lo-Loaders.

Micro-Adjustable Seat Post - This is a seat post which allows very fine adjustments to be made to the inclination of the saddle. Generally cyclists like their saddles to be dead level.

PCD - Pitch circle diameter, this term has generally been replaced with the term, Bolt circle diameter - see BCD

PG - An abbreviation for Plain Gauge.

Plain Gauge Tubes - Tubes which have been drawn but not butted are known as plain gauge.

Plain Gauge Spokes - Spokes which are not double butted are also known as plain gauge, the most common gauge used is 14g.

Hubs and rims usually need the spoke holes enlarging to use heavier 13g spokes - which is rarely a sensible thing to do.

Q Factor - A way of determining and comparing how wide apart a bike's pedals (and consequently the cyclist's feet) are.

QR - abbreviation for Quick Release.

Quick Release - In modern cycling terminology, a QR system is a lever with a

AB's Glossary of Cycling Terms continued.

cam action, with a powerful clamping action when closed, yet having no clamping action when open.

Quick Release Skewer - Q R skewers have a cam action and are used for securing wheels with hollow axle hubs into a frame's dropouts.

See page **40** for safety information

Quill Stem - A handlebar stem which fits inside a (usually 1") threaded steerer tube. These stems used an expanding wedge to secure them inside the steerer. They frequently seized, almost invariably creaked and offered limited height adjustment. Adjusting the threaded headset was also a tricky job, requiring large specialist tools.

Rapidfire - Shimano's ergonomic, under-bar mounted derailleur gear shifters for straight bars. The Right thumb changes to a lower gear and the Right index finger changes to a higher gear. The Left thumb changes to a bigger ring and the Left index finger changes to a smaller ring.

Rapidfire Plus - Exactly like Rapidfire except that now the thumbs, as well as the index fingers, can also operate the index fingers' levers - leaving the index fingers free for braking.

Rear Centres - The distance between the centre of a bike's BB shell and the centre of its rear dropouts is known as the rear centres and also as the chain stay length.

Rear Derailleur - The articulating device which moves the chain from one sprocket to another on derailleur equipped bikes.

Rear Mech - See rear derailleur.

Rear Hub - The central part of a rear wheel, into which spokes are laced. The rear hub is driven by a sprocket.

Resilience - Resilience is a much talked of, easy to notice, yet hard to describe property of high quality steel - it manifests itself as a tight, springy sensation.

Rim - The aluminium* hoop onto which the tyre is mounted and from which the bicycle is suspended by its spokes. (*Some top end road racing bikes use carbon rims and older or cheap bikes use steel rims)

Rim Tape - A tape which fits into the well of a rim and prevents the inner tube from being punctured by chaffing from the sharp edges of the spoke holes. A simple item, which does a vital job.

Seamless - When referring to frame tubes, it means that the tube has been formed by drawing a pierced billet of steel through dies and over mandrels, rather than by rolling steel it into a strip and welding it along its length.

Seat Angle - The angle that a straight line drawn through the seat tube makes with a level surface. This can be compensated for, or augmented by the use of an inline seat post or by the use of one with more layback.

Seat Clamp - A device for securing the seat post into the seat tube. On Thorn bikes, these are brazed onto the seat tubes, to be an integral part of the frame.

Saddle Clamp Assembly - The term given to the various components which clamp the saddle rails securely to the top of the seat post.

Seat Post - A component which is inserted into the seat tube, onto which the saddle is clamped. Thorn seat posts allow several centimetres of fore and aft movement - the exact amount is dependant upon the make of saddle.

Seat Stays - part of a bike's frame, they are the pair of small diameter tubes which run from either side of the top of the seat stays, down to the rear dropouts.

Seat Stay Bridge - A short length of tube which connects the 2 seat stays. The position of this bridge can dictate available tyre clearance. The bridge is also used to secure the front upper section of the rear mudguard.

See also brake bridge.

Seat Tube - The frame tube which runs from the BB shell to the seat clamp. The seat post fits into this tube.

Side Wall - the flexible section of a tyre, which is situated between the anti-chaffing strip and the tread cap. Light side walls are very flexible, flexible side walls provide extra comfort and are quicker than reinforced side walls but are more vulnerable to damage in severe conditions.

Also used to describe the sides of a rim, especially a rim which has a braking track designed for rim brakes to act upon.

SIS - Shimano Indexing System.

See indexed gears.

Shifter - See Gear Shifter.

Skewer - See Quick Release Skewer.

SPD Pedals - Shimano Pedalling Dynamics - Shimano's system pedal, the original and, for tourists, the best. Shimano make road SPD and MTB SPD pedals. The road pedals don't have recessed cleats and are no use for touring. See page **50**

Spider - The arms on a crank, with shoulders, seats and drillings, to allow accurate and positive attachment of chain rings.

Spoke - The majority of the weight of a bike, rider and luggage is suspended by a few spokes from the top of the rim. Thorn bikes use top quality, high tensile stainless steel spokes.

Sprocket - The correct term for the cog (or cogs) attached to rear hubs, which provide forward motion.

Steerer Tube - The tube at the top of the fork crown, which runs through the head tube and onto which the handlebar stem is clamped.

Stem - See handlebar stem.

STI - Shimano Total Integration. A drop bar only set up which integrates brake levers and derailleur gear shifters.

System Pedals - Generic term for pedals designed to work with special cleats, which lock the shoes in position.

Threadless Headset - see Headset.

Toe Clips - Metal or plastic baskets, which are screwed to pedals. Cyclists' shoes fit into them and they help to keep feet on the pedals. Toe Clips were once de rigueur - nowadays they are old hat.

Toe Straps - Designed to enable Toe Clips to keep their shoe-retaining ability, when pedalling hard.

Top Tube - The uppermost tube of a bike frame's main frame, which was once known by some as the cross bar.

Tread Cap - The section of a tyre which makes contact with the road.

Tube - see inner tube.

Tube Set - The collective name given to the 8 tubes used to make a steel bike frame.

Tubeless rims - rims which are manufactured specifically for tubeless tyres. These may be used with tubed tyres, provided significantly lower pressures are used.

Tubeless rim STRIP - these are thick rubber strips, made by Stan's, with a valve bonded in. They help seal tubeless tyres (primarily) on some but not all rims designed for tubed tyres. The increased thickness and shape push the bead up into the rim's bead-retaining hooks, making initial inflation significantly easier.

Tubeless rim TAPE - This is super tough, self adhesive tape, which forms an airtight seal over the spoke holes in conventional and most tubeless rims. 2 layers are required for high pressure use.

Tubeless tyres - Tyres designed to perform well and remain airtight without the need for an inner tube. Top quality examples offer greater efficiency. If you get a large puncture, which is too big for the sealant to seal, tubeless tyres can be fitted with tubes.

Tubeless tyre SEALANT - This is inserted into the tyre, through the valve stem (with the valve core removed) it will seal dozens of small punctures

immediately and permanently - possibly without you even realising that you'd ever punctured. The sealant remains effective for up to 6 months. The sealant makes it feasible to run supple tyres whilst minimising the chances of puncturing.

Twin Plate Crown - An alternative to a conventional fork crown. 2 machined steel plates are used, which gives exceptional lateral rigidity.

See page **31**

Valve - air is put into the tyres through the valve.

Valve core - the inner part of the valve that actually retains the air within an inner tube or tubeless tyre.

Valve stem - the outer, visible part of the valve assembly.

Wheelbase - When the front wheel is pointing exactly forward, the distance between the centres of a bike's front and rear dropouts is its wheelbase.

The Evolution of THORN Touring Bikes

I'm sorry but there are many threads running through this page. I've had to compromise between following overall time lines and following the development of each model. I know that it may be difficult to read and one day I may be able to reorganise it.

Please Note: it really isn't necessary to read this page, in order to purchase a New Thorn bike.

I've written it as much to give some provenance to owners of our older and superseded machines, as to demonstrate the development, evolution and pedigree of our current range of bikes.

Andy Blance Winter 2018

THORN 26" wheel HEAVY DUTY TOURING BIKES

It's very easy and incredibly cheap, to construct a bike which can carry large loads reliably - simply use lots of mediocre quality metal - witness the ubiquitous "Hero" bikes at work, in India!

It is much more difficult to construct a bike which can carry large loads reliably, in great comfort. Enough steel must be used to support and steady the load and absorb large bumps but not so much that the frame can't absorb multiple small impacts.

The only way to be certain of achieving this perfect balance, is by trial and error and much actual road testing. In 1983 I embarked on the long process of improving the design of touring bikes.

I live close to the edge of Exmoor (an area of severely pitched hills; there are many 20% gradients, a sprinkling of 25% gradients and a couple of 33% gradients for good measure!) I've always enjoyed descending at high speed on my bicycle. It was important to me, from the outset, to have the best-handling bike that I could possibly have. I soon realised that, if I really wanted this, I'd have to design my own! Initially I concentrated upon high-speed handling but (in 1984) upon riding the newly introduced mountainbikes from the US, it was brought home to me that, having the ultimate in high speed handling (a quality, MTBs had in abundance) was detrimental to low speed manoeuvrability (a quality of which they had little!)

It's somewhat ironic that mountainbikers wax lyrical about the "sweet handling" of their mounts on singletrack, when actually a well designed touring

bike would, literally, run rings around them!

By 1990 I believe that I owned and was riding, the very finest 700c touring bike to have been made (up to that time) the frame was made to my exact and specific design from Columbus SPX (Paris - Roubaix) tubing by Argos Racing Cycles of Bristol. Shortly after this bike was built, my interest in riding tandem intensified and I became aware of the advantages of using the, newly available 26" MTB road-going tyres, for tandem use, on severely hilly and twisty Audax rides.

I soon built myself a road-going, drop bar solo, from a Cannondale Cad 3 MTB frame, for winter "Wednesday evening club bashes".

Whilst the benefits of 26" tyres, on a solo, weren't as earth shattering as they'd been on tandem, the ferocious grip did inspire confidence on dark, hilly, twisty, mucky, poorly surfaced lanes. The Cannondale's handling left much to be desired and, whilst it was unbelievably stable at very high speed, it couldn't be steered accurately around road debris, on the steep climbs regularly used for training. I enjoyed the grip, comfort and responsiveness of the Dale and the 26 x 1.5" Nimbus tyres but I missed the handling of the Argos that I'd designed.

The next step was predictable and the Thorn Nomad was born. It had a parallel top tube and a 1" threaded steerer. At this time the 1 1/8" threadless headset was starting to appear on MTBs but there were insufficient different lengths and angles of handlebar stems available to enable us to achieve comfortable positions for most customers. After a couple of years, the supply situation of such stems improved and we



decided to introduce a new fillet brazed Nomad. This had a sloping top tube and threadless 1 1/8" headset. This frame continued in production for many years. This version of the (derailleur gear) Thorn Nomad" soon became the benchmark for expedition touring bikes.

Soon after this, I experimented with lighter weight versions, with tighter geometry, which I called the xTc. These often had lavish paint jobs; they caught the mood of the time and we were embarrassed, after a rave review in Cycling Plus, meant that our lead time went from 6 weeks to 6

months overnight. In the year 2000, Fiona and I completed a very hilly 500km Audax ride on our xTc machines. I was convinced that these lightweight 26" machines had many advantages over our 700c Audax bikes.

We began to see poorly conceived and poorly executed, copies of the Nomad appearing and we eventually decided to "copy" our Nomad ourselves!

We sought the finest frame builders in Taiwan, I tweaked the frame design a little and we called the bike the "Sherpa". We were truly astonished at the high quality of the work, yet it took a little time to realise that, if we were to give it the same quality tubes as the Nomad, the Sherpa would be a superior bike (to the Nomad) for most customers, yet cost significantly less money. Well, we gave the Sherpa a top quality tube set and with a couple of minor tweaks along the way, we've arrived at the current (derailleur equipped) Sherpa Mk3.

Sherpas are available in exactly the same sizes, as the Rohloff equipped Thorn Raven. The Raven and Sherpa don't share the same frame, each of the frames is specifically focused for its respective transmission system. The Raven and Sherpa do share the same geometry, frame tubes and forks.

For a while we had 4 families of derailleur equipped, 26" wheel heavy duty touring bikes.

[1] The Sherpa frames were made in Taiwan.

[2] The Nomad 2000 frames were made in the Midlands.

[3] The Some xTc frames were made in the Midlands and others, including ultra-short wheelbase (Nemesis) and lugged variants (xTc Classic), were made in Bridgwater.

[4] The eXp family, which were even heavier duty derailleur bikes, were made in our own frame shop, here in Bridgwater.

In 2001 my love affair with Rohloff gears started.

Between 2002 and 2005 we introduced the Rohloff eXp, eXp R and the eXXp frames being made in Bridgwater. Meanwhile, our friends in Taiwan built the Raven Tour frames (which were like a Rohloff specific Nomad) and Raven Sport Tour frames (which were like a Rohloff specific xTc). The Raven Tour and Raven Sport Tour have since merged and evolved into the THORN RAVEN, which is sportier than a Raven Tour and a bit more general purpose than a Raven Sport Tour. When we closed our Bridgwater frame shop, I used the knowledge gained from the eXp, combined with the iconic "Nomad" name, to introduce the affordable Nomad S&S a Rohloff specific, expedition frame made in Taiwan. Later, when I made it suspension compatible, like the eXXp, it became the Nomad Mk2. I have to agree with those who say that the Nomad Mk2 is the finest expedition bike available in the world

today.

The Sherpa, Raven and Nomad Mk2 geometries vary sensibly and precisely, with each frame size.

The smallest two Raven and Sherpa frames have top and down tubes which are "standard size" (1" top tube and inch and 1 1/8" down tube) this produces a more comfortable ride for riders who usually weigh considerably less than riders of the larger frames.

Medium sized Raven and Sherpas use "standard oversize" 1 1/8" top tube and 1 1/4" down tubes.

The largest frames' top and down tubes are made from extra oversize tubes (1 1/4" top tube and 1 1/2" down tube). When you also consider that a small frame is inherently stiffer and stronger, than a larger frame and yet is significantly more likely to be ridden by a lighter rider, I hope that you can see that this is a sensible approach.

However, if you're short (or have short legs) and are, let's say, powerfully built, or wish to carry very large loads, you shouldn't look at a small Raven - you should be looking at a small Nomad Mk2.

The geometries, combined with 26" wheels have enabled us to offer bikes, which have no toe overlap, even with 26 x 2.0" tyres and wide mudguards - not even if you cycle in walking boots! Each size of Sherpa, Raven or Nomad Mk2 handles perfectly, whether on tow paths, country lanes, city streets, twisty, alpine descents, on the diabolical surfaces found in South America - known as "Ripio", or Himalayan dirt roads.

The Raven and Sherpa are an absolute joy to ride, whether they're lightly loaded, loaded at the rear only, or if they have the luxury of the weight being perfectly distributed in 4 panniers. They're available in 10 sizes, including an "X" framed step through.

The Nomad rides nicely without a load but it's too much bike, for it to be a sensible option (unless you're really heavy) for those who have no intention of ever loading it up. The Nomad can carry huge loads on the rear carrier alone and it is the best choice for prolonged heavy touring. Its ability to take a suss fork give it the potential to take on serious Alpine tours.

The Nomad is now available in 10 sizes.

2 new sizes 510M and 540M have just been added (July 2014).

Having dedicated brazed on bosses for rear carriers, front lo-loaders and 3 sets of bottle bosses, means that almost all of the weight which is carried, is able to be secured directly to the bicycle frame, this is obviously superior to and safer than, using cable ties or hose clips to secure such carriers.

Nobody can be comfortable - unless they're relaxed. It's impossible to relax, unless you have confidence in your abilities. No matter how accomplished a cyclist you are, you can only compensate so much for a bike that simply doesn't handle

properly, or one which doesn't carry a load without wobbling.

2019 update

The Nomad has been thoroughly overhauled and the new Nomad Mk3 can run with derailleur gears or Rohloff. It can also be used with a Gates carbon belt and the EBB is now a full size clamp type, as fitted and proven on the Raven Twin Mk3 tandems.

It's still available in 10 sizes but 2 new step through sizes have been added.

SAFETY

Because our 26" wheel bikes handle a load perfectly, they're clearly safer than bikes which don't!

They're particularly stable in strong crosswinds, even on bumpy high speed descents and they're obviously safer to ride in such demanding situations, than bikes with twitchy steering. Yet our bikes' steering is precise enough to allow them to manoeuvre accurately around road debris, whilst climbing a 1:4 slope.

It's exceptionally difficult but clearly not impossible, to design bikes which can excel in all these areas - because changes to the geometry, which enhance performance in one of these areas, can have an adverse affect on performance in another.

It follows that bikes which excel in all of these requirements, will be safer to ride, in everyday situations, than bikes which fall short, in any one of them.

THORN MTBs I've owned and ridden MTBs since 1984. Initially I was too focused on endurance (road) riding and later on cycle touring to become a "dyed in the wool" Mountainbiker. But I have ridden some races, including the 1991 National Championships as a veteran. I've owned a derailleur-equipped, rigid, Thorn 853 MTB, that I designed. I've also designed 3 different series of Thorn Rohloff-equipped, hard-tail MTB's. Fiona and I have ridden some very serious events on these bikes - they were great! Unfortunately, the MTB world was too focused on ultra-light weight XC bikes, or on high octane All Mountain bikes to take notice of cheap to run, low-maintenance and comfortable Rohloff-equipped bikes. What could old gits like us possibly know about mountainbikes? The response was underwhelming and so we stopped making them - such a shame!

THORN 700c BIKES

At the same time as I was developing 26" wheel touring bikes, I was also developing two different 700c derailleur equipped bikes.

[1] One of these bikes was for fast touring, training and Audax rides and was the first bike to bear the name Thorn. The first batch of these frames was made, to my specific design in Italy, a project overseen by Argos Racing Cycles.

Very soon after this Robin (THORN) created a frame shop on our rapidly expanding site. Robin employed a succession of qualified frame

builders and we started making what I will call our

Original Thorn Audax.

This bike was well received by the Cycling Press and it and its many variants (Audax 853, Brevet, Cyclosporitif and Audax Classic) evolved into one bike - the **Thorn Audax Mk3**. The deep drop calliper brakes have been given the maximum possible clearance, to allow 32c tyres and the forks have been made more elegant, by removing the low loader bosses and the Mk3 has become the **Thorn Audax Mk3R**. We continue to receive many unsolicited testimonials from delighted customers. When Reynolds decided to use seamed tubes for their Cro-Mo forks, I found another supplier and we decided to call the new fork Mk4. To be clear, all the Mk3R forks are made from seamless tubes - the Mk4 fork is identical, in dimensions and spec, to the Mk3R fork, although the blades come from a different supplier. There was no real need to call these forks Mk4 - but, hey, that's what we did.

[2] The other 700c bike was a Traditional Touring Bike. I wanted to make an affordable bike, which would be regarded as

THE definitive Traditional Touring Bike.

As mentioned earlier, in 1990 I had such a frame built for myself and the **Club Tour**, in its various incarnations, has pushed towards and beyond the benchmark set by this fantastic bike.

In April 2014, the **Club Tour Mk4** went on sale. This is an absolutely superb machine for sealed roads - it's a very competent bike that's ideal for fast touring and for heavy touring or anything in between. It incorporates many of the features (but not the hub!) found in the Thorn Mercury. It's available in the same 10 sizes as the Mercury but its geometry is slightly different to the Mercury for 2 reasons

(a) Because it's likely that 60% of the Club Tours will be specified with dropped bars.

(b) Also, because the majority of cyclists with derailleur gears, have more than one bike, which is likely to include a sporty number, I felt that I should keep as close as possible to the original Traditional Touring Bike brief.

2019 update, We now have the Club Tour Mk5 in stock. The Mk5 has slightly more clearance when using 700 x 40c with mudguards but the biggest difference is that the Club Tour Mk5 has shaped chainstays which give clearance for 650 x 50b tyres to be used. If you want to use 700 x 40c, there's a small advantage to having a Mk5 frame. If you want to use 650b wheels - you have to use a Mk5 frame.

The challenge in 2010 was in developing the most versatile 700c bike possible, for use exclusively with the Rohloff hub.

The **Thorn Mercury** went on sale in late 2011. I wanted the Mercury to be our flagship model and whilst I

didn't want to waste money, I was prepared to spend what was necessary to achieve my objective. I wanted the highest possible quality steel frame. I wanted it to be able to use deep drop calliper brakes, like the Audax Mk3 but I also wanted it to be able to take 40c tyres, with mudguards and a rear disc brake if required.

To accomplish this, without it looking like a back street bodge up, I chose to design a choice of forks. (Please see pages **30** and **31**)

I'm delighted with the result of such hard work. The Mercury feels very sporty - when it's built into a sports touring bike - Fiona and I have one for our Audax riding. I've also loaded one with 40kg - spread between 4 panniers and a bar bag and I've ridden it around the hilly local lanes - it felt "OK". However it feels great with 25kg in 4 panniers. To get this into perspective, 25Kg is more than enough of a payload to allow cycle camping in Europe - where it's usually possible to buy provisions every day and water is not generally an issue.

The Mercury is at it's absolute finest, in my opinion, when it's built as a light middleweight, for fast touring (with around 12-14kg of luggage - all carried at the rear) using hostels, hotels, B&B etc.

The most recommended thing, if you want the utmost versatility, is to have 2 steel forks, so that you can optimise it for light touring or for European cycle camping.

2019 update. As with the Mk5 Club Tour, the Mercury Mk3 can run with 700 x 40c or 650 x 50b. The Mercury Mk3 also uses the full size, clamp-type EBB shell found on the Nomad Mk3 and the Raven Twin Mk3.

RELIABILITY

A touring bike is a proper vehicle, genuinely capable of providing an alternative transport solution and, as such, it must be reliable.

If your bike isn't reliable, at best you will "let the side down" by being late for work. More seriously, you could have your meticulously planned (and eagerly anticipated) holiday ruined. In some remote parts of the world, a mechanical failure can have much more serious implications; if a bike can't be pedalled, you must walk and push, which is between 4 and 6 times slower than cycling! This is a nuisance if you are an hour away from home, it's rather more serious if the nearest water is already a 2 day ride away!

In order to be able to offer the frame and fork with a genuinely meaningful lifetime guarantee, we've used the finest steel and we have not only specified the most appropriate gauge for each tube, we have gone the extra mile and also designed and specified our own Thorn tube sets!

For (much) more detail please visit page 11.

Orders for ROHLOFF EQUIPPED bikes, which were taken after MAYDAY 2016, all have the new Rohloff splined sprockets - these are really easy to change. The new splined sprocket carriers are retro-compatible and will fit every Rohloff hub ever made.

TOURING ADVICE

Touring is a "broad church".

In our opinion, touring encompasses most forms of non-competitive cycling - from pottering around for a few hours, on a summer evening, to literally a totally self-supported journey, riding around our planet.

In my opinion, Audax events can be classed as touring, whereas Sportifs can't - riding Sportifs is competitive cycling.

Clearly, you could take a bike, designed for full-on expedition touring on an Audax ride - it would be harder work than necessary - but, in most instances, you could realistically expect to finish! By contrast, you could realistically only expect mechanical failure, if you attempted a full-on expedition, on an Audax bike.

If you want to be able to engage in both extremes of cycle touring, with just one bike, some compromise is necessary. Because of the potential consequences involved, it's much more important to have a strong bike for heavy touring, than it is to have a light bike for Audax rides.

This is such an important point, both for ourselves (avoidable warranty claims) and for our customers (ruined holidays, personal injury or worse) that I make only the smallest of apologies for making it several times within this document.

Some city-dwelling cyclists only have room for one bike - we understand that but, for the majority of cyclists with a desire to ride widely differing styles of cycling, the best, and frequently least expensive option in the long run, is to have 2 or more bikes.

If we could make one bike, in one specification, that did everything perfectly, if all customers were the same size and if everybody liked the same colour, life for both

our customers and ourselves would be very easy - you'd only have to ask for a THORN.

If you really genuinely only want one bike for a wide diversity of applications, please consult us and we can advise you on the **best compromise** - we can only do this when we know your actual requirements, physical dimensions and weight. We will then let you know whether such a machine is a possibility.

Clearly we also need to know your budget.

Nobody wants to pay more than they need to for anything - I certainly don't - but please don't be coy, or play games, when stating your budget - we like to provide exactly what the customer wants, whenever possible. We will let you know if it's possible for us to supply a suitable machine within your budget.

If you've underestimated exactly what such a machine would cost and, assuming a suitable machine is possible for your specific requirements, we'll let you know how much you'd need to budget for.

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Mountain weather.

Dramatic changes to weather conditions can occur rapidly in high moorland and in mountains.

A sweltering alpine climb can be followed by a sub zero descent. Even in Wales, I've known the climb out of one valley to be in blazing sunshine and the descent into the next to be in torrential rain.

In my opinion, it's irresponsible to cycle in unpredictable environments without carrying suitable extra clothing. Every Thorn Touring bike has the luggage-carrying potential, to allow you to carry such items, without affecting the ride quality in any way. Does this sound soft? Remember Tour de France riders are tough professionals, they are much younger than me and they also have the luxury of being followed by their team cars!



Loading your bike for a tour.

Fiona and I enjoy many different styles of cycle touring. We're fortunate enough to have a stable of bikes each. Apart from our 26" wheel expedition bikes and our 26" wheel heavy touring bikes (which you can see on the following pages) we each have a pair of 700c Thorn Mercury bikes.

You can see both of my Mercury bikes at the bottom of this page. The White Team Mercury is focused for ultra-lightweight touring and Audax rides. It has Hope hydraulic discs, 28c tyres and carbon forks. It now has a THORN 853c fork (Fork 2), calliper front brake and 30c S-One tubeless tyres and is even better!

The Stealth Mercury has 35c tyres, full mudguards, a Tubus Airy Ti carrier, Son dynohub with Edelux light and Thorn lo-loader carrier, it's focused for medium weight touring, or ultra-lightweight cycle camping and, without the front lo-loaders, it's perfect for lightweight touring. (This bike is now red and has a MER853VC fork. (Fork 5) I have the ST700 fork with lo-loaders in the loft.)

You can see pics of the rare dry moments of a very wet holiday we had in early Autumn in Mid Wales. We took my Vito van, the big tent, table and chairs and set up base camp, from which we explored the surrounding mountain roads. One day we ventured further afield into Snowdonia, where we spent the night in an hotel, before returning to base camp the next day. We each managed to fit all we needed, for this adventure, into our large saddle bags. Younger, tougher cyclists could undoubtedly fit enough kit for a week, staying in hostels or B&Bs into our saddlebags. A large saddle bag carries the weight inside the wheelbase and the bike handles just like an unloaded machine. We also use these bikes with smaller saddle bags on 200km Audax rides. Saddlebags don't necessarily require a rear carrier - this saves weight.

Without the lo-loaders and with large saddle bags, our Stealth Mercury bikes are perfect for us on long Audax rides, which usually involve night riding. They're also perfect for long hostel, or B&B based tours - such as the End to End. We use our large saddle bags, some front pannier bags on the rear carrier and a bar bag. The saddlebags make the panniers difficult to access but, as we keep our over-night things in them, we only need access to them at the end of each day. We keep our "civvy" clothes to a minimum but we're still able to present ourselves neatly, if we spent a night in a nice hotel. The Edelux allows us to see where we're going at night and we may charge a GPS, if and when we get one, by connecting a charging device into the wiring of the Son dynohub.

With the lo-loaders fitted, we use a conventional 4 pannier set up, along with saddlebag and bar bag. This set up is perfect for lightweight cycle camping in the Alps - or for taking appropriate clothing for a



Fiona just about to plunge down a really steep descent. Is it New Zealand? Is it Patagonia? No - it's Mid Wales!

hotel-based cultural tour of Europe.

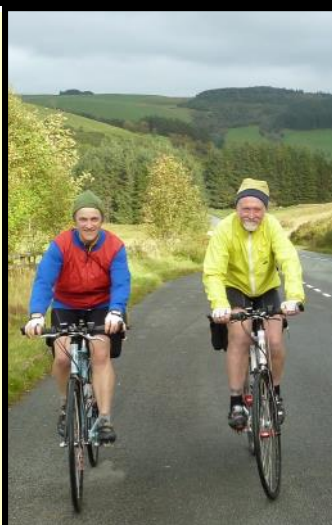
I hate wandering around in cycle clothing - unless I'm actually with my bike!

You can read about the bikes and kit we take on our big adventures, on the following pages. I'd just like to say that, if you want to take B&B tours and you also wish to ride unsupported for 10 days in mountain wilderness and you only want 1 bike to do both - you must compromise. You need a dedicated expedition touring bike and your compromise must be having a heavier than necessary bike for the B&B tours. To compromise on the strength of an expedition bike, is to invite trouble. Having an alternative pair of lighter tyres makes it much more pleasant to ride B&B tours, on an expedition bike.

Be honest with yourself, do you really plan on genuine expedition cycling?

If not, it's easier to make the compromise between a bike for cycle camping and a bike suitable for B&B tours. The bikes Fi and I used for our cycle camping adventures in the French Alps are examples of such machines.

Andy Blance Spring 2014



Transporting your Bike by Air

In the following text, I assume that you'll be travelling "cattle class", I've heard it said that things get easier if you travel first class, or business class - I wouldn't know!

Firstly and Foremost.

The following bit of advice sounds obvious but you'd be amazed at the number of people who don't do this.

Shop around and check each airline's policy on flying with your bike before you give them a penny!

It doesn't matter if you've used the same airline, for the same flight recently - check because airlines constantly change their policy and excess baggage could cost more than your actual flight!

Make certain that any agreement is written down, keep a record of the names of who said what and confirm that the information will be flagged up when you check in.

Make certain that any onward flights (which may turn out to be with the airline's partners) also include your agreed baggage. This is especially important if you have to travel between international and domestic airports, as we've done several times, when flying into Buenos Aires.

Be aware that, if you leave booking onward flights until you've arrived in the country, it may cost considerably more because internal flights usually have lower baggage limits. You may be able to agree a stopover, when you book your flights.

Currently most flights to the USA and often those via the USA, have a generous baggage limit 2 pieces of up to 32kg each - but note the size restriction - Height + Length + Depth must be less than 62", which in practical terms means 26"x 26" x 10" achieving these dimensions on a "conventional" touring bike is impossible without S&S couplings but some airlines can and do make a surcharge for transporting bikes - whether they comply with size/weight restrictions or not.

Virgin Atlantic are brilliant for cyclists - our bikes travelled **FOC** (free of charge) and with zero fuss, on our recent flights to and from Cuba (Jan/Feb 2016) - plus we didn't even need all of our allowance.

Flights to South America, from Europe, have a low sounding limit but there's usually a generous hand baggage allowance. There's often provision for paying extra for your bike - expect to pay IRO £80 out and £80 back.

Your bike can then travel as a second piece of hold luggage, with an additional 23kg baggage allowance. Again make certain that any onward flights are pre-booked.

Whilst Iberia's cabins are not the most luxurious, we've had good service, at very keen prices, when flying to S. America.

Flights to the Far East can be difficult for the cycle tourist, due to hold luggage restrictions and often ambiguous information.

At the time of writing, **Thai Airways** offer 30kg of hold baggage, this is 7kg more than their competitors. Our recent flights with them (Jan/Feb 2019) were smooth, friendly and relaxing.

If we can't make the baggage allowance, we get as close as we can (within 2kg of the absolute limit) and take a chance - we've never had to pay excess baggage charges. We arrive early for check in, we make eye

contact and we smile, we're polite - we never lose our cool, or let the smile drop.

We know what our bike boxes weigh and we put the lightest one on the scales first - the other box often doesn't get weighed.

Packing your bike for the flight.

Pre 9/11, I used to keep the bikes whole, turn the bars, remove the pedals, deflate the tyres slightly and cover the frame in pipe lagging. This worked well - baggage handlers could see it's a bike, they could wheel it around and we didn't have to squander much of our baggage allowance as packaging. Some airlines may still allow you to do this - others absolutely will not!

Tyre pressures for flying.

There's absolutely no need to deflate your tyres, when travelling in a modern jet - they all have pressurised holds. Have you ever had, or heard of, frozen luggage? No? It



proves my point.

However - the necessity of deflating tyres for air travel is a good example of a **Zombie Myth** (A myth that will not die) and there always seems to be someone who wants to deflate our tyres. We've had bikes arrive without any air in the tyres and the tyres have become unseated.

My advice is to deflate the tyres beforehand yourself, you can then make them soft enough to satisfy any prodding thumb, whilst leaving enough air in them to protect the rims and keep the tyres correctly seated. You'll also be able to ensure that your valves are closed correctly.

Bike Boxes.

Hard cases, with built in wheels are available these days, some look super and I'm sure they'd protect a professional's road racing bike well. Apart from the initial cost - up to £500 - there are 3 problems with these:-

- [1] They won't take touring bikes with mudguards and carriers.
- [2] They're a bulky item to store, whilst on holiday.
- [3] They weigh up to 15.9kg! You'll always have to travel business class, or pay for excess baggage.

Soft cases won't protect bikes anywhere near as well as hard cases. These weigh around 5 to 6kg. They're too bulky to take with you on tour (well, they are for us!) but they are easier to store until your return.

Cardboard boxes offer great protection, especially if given Duct Tape corners and

combined with bubble wrap and strategically placed pipe lagging.

Cardboard boxes cost very little -

Flat screen TV boxes are free!

They can be easily cut down to the minimum size required. They are no more difficult to store than hard cases.

They allow A to B type trips, as you can abandon them if necessary.

A heavy duty, full size box weighs around 5kg - a cut down box weighs around 3 - 4kg.

Fiona and I always use cut-down cardboard boxes.

Unless instructed otherwise, I drop the forks from the frame, with the front wheel still in it and the brake cable disconnected from the lever.

I secure the handle bar assembly, using toe straps, to the bike's pipe-lagged top tubes. I remove the pedals and the seat post.

The frame (with rear wheel still in) goes into the box first, then I place a sheet of cardboard on the RHS, to protect the frame from the front wheel and put the fork and wheel assembly in, with the padded steerer tube under the RH crank and the wheel at the front of the box.

We don't often use mudguards when travelling by air but they can be left on, with little risk of damage, using this method.

(We live in the UK and we see rain too frequently to want to choose a potentially wet destination for our holidays!)

I make the boxes as small as possible. I use clothing, protected by thick plastic bags, to wedge everything tight - chaffing is a more likely cause of damage than knocks.

On circular tours, we use hotels for the first night or so and for the last night or two. Before we book the hotel, we get confirmation that they'll look after our boxes until we return - this has always worked - the boxes have always been there.

Getting from the Airport to Town.

Consider how you'll get from the airport to the start of your tour. When we first started touring, we used to assemble the bikes at the airport and start and finish the tour from there. I used to find it very stressful assembling a bike, in a busy public space, especially when tired and even more especially when flying from a cold damp UK winter into a sweltering tropical summer!

These days we find a cost effective way of getting into town - having some local currency, before arrival, makes this first transaction easier.

Once we've arrived at our hotel, we generally chill out, catch up on sleep and wait until the next day before sorting the bikes out.

Andy B Nov 2019

Fiona and I love to go cycle camping in the mountains.

We're really fortunate because each of us has a pair of heavy duty Thorn Rohloff equipped touring bikes. Our S&S coupled bikes go on the big trips and they have the heavy wheels, fat 2.25" tyres, super tough powder coat paint finish and suss forks. (See pages 64 & 65) Our other bikes were also prototypes and we've built them up for lighter weight camping trips, closer to home. They travel on better roads (and tracks) and have lighter rims and tyres. I take pride in our bikes' strength and dependability. These bikes use the conventional Rohloff hub.

Most of what we've learned from these bikes has been incorporated into our current Thorn Bikes.

Whilst you could never accuse them of being lightweight, I'm convinced that our bikes weigh

significantly less than any other bike of comparable strength!

These bikes haven't been on our big trips but we've certainly used them. We've had many long camping weekends in Wales, we've followed the "Route des Grandes Alpes" with camping kit and we've had several one way trips, catching the train to either Cornwall or Wales, then cycle camping home.

We've even completed several hilly 200km Audax rides, including the "Dorset Coast", on them.

2018 Update, Fiona is currently using her bike for cycling to work and for visiting patients in their homes. Fiona doesn't find it too slow, or too heavy and appreciates the comfort and dependability.

Cycle camping in the French Alps.

In September 2009 we drove down to Grenoble, from where we embarked upon a self supported, cycle camping trip in the French Alps. We completed an 800km circuit, taking in 14 big cols, including the Bonnet, Galibier and Izoard.

It was truly a great adventure!

The bikes were absolutely delightful.

The French were as polite as ever.

The scenery was stunning.

The weather was mixed.

But for me, the most enormous pleasure was in catching a group of French racing cyclists, who'd sped past me, on a short climb before the second part of the descent of the Croix de Fer. I was riding my Rohloff equipped touring bike (with 26 x 1.75" tyres) loaded with full camping kit. Whilst I was closing the gap on them, I was scanning the road below for approaching traffic and there was none. The group approached a left hand hairpin at speed and grandpa out-braked their exotic carbon racing machines, cranked his bike over and then, using all the road, rode up the "inside" of them and plunged on down the descent. The look on their faces will stay with me for the rest of my life! (Obviously they sped off, into the distance, as soon as the road levelled out again).

The advantages of camping.

We like the freedom of finding a camping pitch for the night. We're consistently happy, that we don't have to spend the end of the day searching for an hotel. We can stop when we want to stop cycling for the day, rather than having to ride on (or stop early!) because an hotel or pitch has been pre booked. If we ever need to, we can camp wild. Although camping means that we have to haul camping kit over mountains, we find it less stressful than having to maintain a schedule. When the snow unexpectedly

closed our planned route over the Bonnet to all traffic, we were able to alter our plans. We found a cheap hotel for 2 nights and the next day, we were able to ride up the Bonnet, with just our saddlebags. If we'd booked everything ahead of us, we'd have had a problem getting back on schedule.

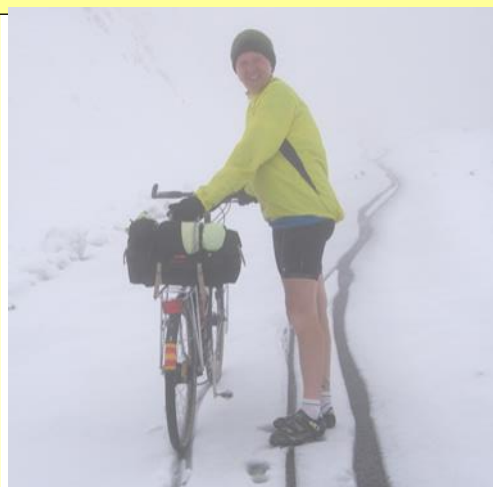
Camping is also considerably cheaper than supported rides and we couldn't afford to travel as much as we do, if we didn't camp!

Why the bikes are so good.

Having fairly long chainstays means that I can carry (almost) all of the load at the back and the weight still sits inside the bike's wheelbase, which gives superb handling with small loads, medium loads or very heavy loads. The long wheelbase allows massive but drama-free braking when required. Having a super stiff frame makes it easy for me to control the bike and the load, whether I'm flying down hill, or choosing the best line between obstacles, on steep climbs. When I stamp on the pedals - the bike responds.

Unlike most "touring bikes", my Thorn doesn't feel like a jelly, with big loads and out-of-the-saddle efforts. Despite being so stiff, the frame is super comfortable, resilient and compliant.

In short these bikes inspire confidence, reward effort and exude quality!



White out! The final few km on the ascent of La Bonnet were above the September snow line; the final 500m were un-rideable! But we did get to the top and quickly put some warm clothes on!

The ride down was very scary, the CSS brake surfaces had been polished by years of riding. In the slush, the bikes kept gathering speed - even with the brakes on full!

2019 update. We now recommend that you specify a rear cable operated disc brake for almost all disciplines of touring - expedition cycling, where the simplicity of having a pair of rim brakes, being an exception.



Fiona and I used our prototype Nomads for our adventure touring holidays - and for any cycling, which involved flying with the bike. They took us on the biggest adventures of our lives.

Fiona and I still use our prototype Nomads for our adventure touring holidays. They've taken us on the biggest adventures of our lives!

You could never accuse these bikes of being lightweight but I'm convinced that they weigh significantly less than any other bikes of comparable strength! We love these bikes so much that we've given them names, my bike is called Hector - Fiona's bike is called Bertha.

Bertha was the final prototype for the Nomad Mk2.

These bikes have long chainstays, having extra long chainstays means that we can carry (almost) all of the load at the back and it will sit inside the wheelbase, therefore we have bikes which handle superbly with medium/small to ultra heavy loads.

With suspension forks, I really don't want to be loading up the front of a bike - otherwise it nose-dives into every hole! This is not advertising hype, we actually ride these bikes hard!

We've crossed the Andes 28 times during our 7 trips. In doing so, we've climbed some of the biggest, wildest and most remote passes in the world.

Many of these crossings were 7 days between sources of supplies - the longest was 10 days. We're not superhuman or even super athletes, we are simply very stubborn and determined and we had the best kit in the world for these adventures. The finest kit is no substitute for determination but knowing that your bike can carry sufficient food and water, without wasting your effort and without breaking, helps inspire confidence. Determination is born out of confidence and self awareness; survival also depends upon preparation and luck. The weather can change suddenly in mountains and having emergency water, several extra days' food and fuel, sufficient warm clothes and a strong tent, is literally the difference between having a good travel story to tell - or never being able to tell a story again.

On one of our trips, Fiona and I climbed out of the Atacama to 4,800m+ whilst carrying 50kg each

Riding at 4500m towards the 4767m Paso San Francisco.

Fiona has the world's highest volcano, the 6891m Ojo de Salar, on her right.



Crawling westwards, at 4200m, towards the Paso Pircas Negras in 2010.

Fiona and I were, at the time, two of only a handful of cyclists ever to have ridden this pass unsupported - you can't see the 100kph headwind in the photo!



(mostly water) and, apart from 2 litres on the forks and our bar bags, all the weight was at the back. I can't say that the relentless climbing, in blazing sun, was easy but the bikes felt efficient and totally stable. We've also descended many of the most exhilarating trails in South America. The descent, on the old "road", from Uspallata to Mendoza, has 365 hairpin bends, many of which are off camber, the surface alternates with every bend in the road - sand, gravel, corrugations, loose rocks or slick rock - any of these are possible. On one really steep section, on the outside edge of every second hairpin, there was an unfenced sheer drop of hundreds of meters. As usual, there was a little room for error but the consequences, of any major misreading of the trail, were severe! It was sublime to be "right in the moment" and to carve a line through the obstacles, with 30+kg of camping kit on the back, at speeds of up to 60kph.

Yes, such behaviour may appear crazy but I prefer to think that I'm a skilled rider, who was lucky enough to be riding the finest adventure touring bike ever made, on the most exhilarating "road" to have been encountered during a lifetime of cycling! As I explained to Fiona, whilst some may think that I am on holiday, it's obvious that, as "designer and test pilot", I have to make absolutely certain that the bikes are up to their advertised job! Please don't try this on a conventional touring bike, or on a racing MTB, with your camping kit in a backpack, or in a trailer!

With their rigid steel forks fitted, H&B (Hector and Bertha) become "conventional" expedition touring (or travel) bikes and can carry any amount of weight at the front, that may be required. In 2008 we went on a (cheap) hotel based tour of Southern India's Western Ghats. H&B used their steel forks and 2.0" Schwalbe Marathon Supreme tyres to negotiate the broken tarmac. H&B certainly felt very comfortable - yes of course they were totally overbuilt for such a trip but we had no worries about these bikes being damaged in transit and of course, we didn't have to send the forks off to be serviced when we returned!

Sitting on the low parapet of a bridge in Chile, for a bite to eat. On the ripio (gravel roads), the bridges usually offer some respite from the dust and often reveal a previously hidden view to distant mountains.



Hector on smoother road surfaces in Southern India, with a relatively light load and steel forks.



Our most welcome wild campsite ever - there was no water but we had finally managed to climb above the oppressive 47°C February heat and 100% humidity of the Badlands. These Badlands, often used for the Dakar rally, were now far below us. They are the pampas, to the west of Cordoba - temperatures of 55°C were recorded there that January! The pass we were heading for (Pircas Negras) closes at the beginning of March - a narrow window of opportunity!



My Touring Tool Kit

(For Rohloff)

Andy Blance



I've used a Carp Fisherman's lead storage bag, the ESP version is the best I've seen. It's available in 2 different sizes, from angling shops. This is the large size, which is ideal for my Touring Tool Kit. It's the perfect size for carrying in the bottom of a Sport sized Ortlieb pannier.

Notice the zippered see-through pocket, I use this for small, or rarely used items.

The main compartment can be divided into different sections, thanks to Velcro dividers - these are designed to keep dozens of 100g leads separated - so no worries about strength!



Contents of main compartment.

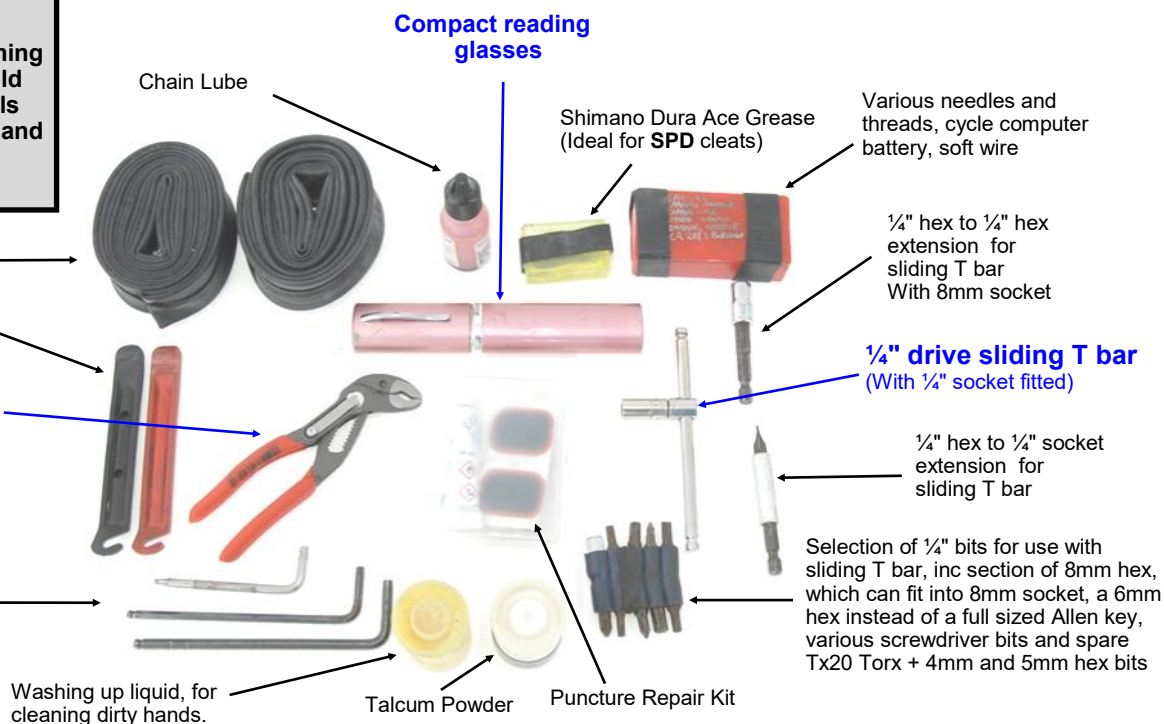
This would also have washing up gloves and rags. It would also contain specialist tools for whichever bikes Fiona and I had taken.

Mini Slip-Jaw pliers.

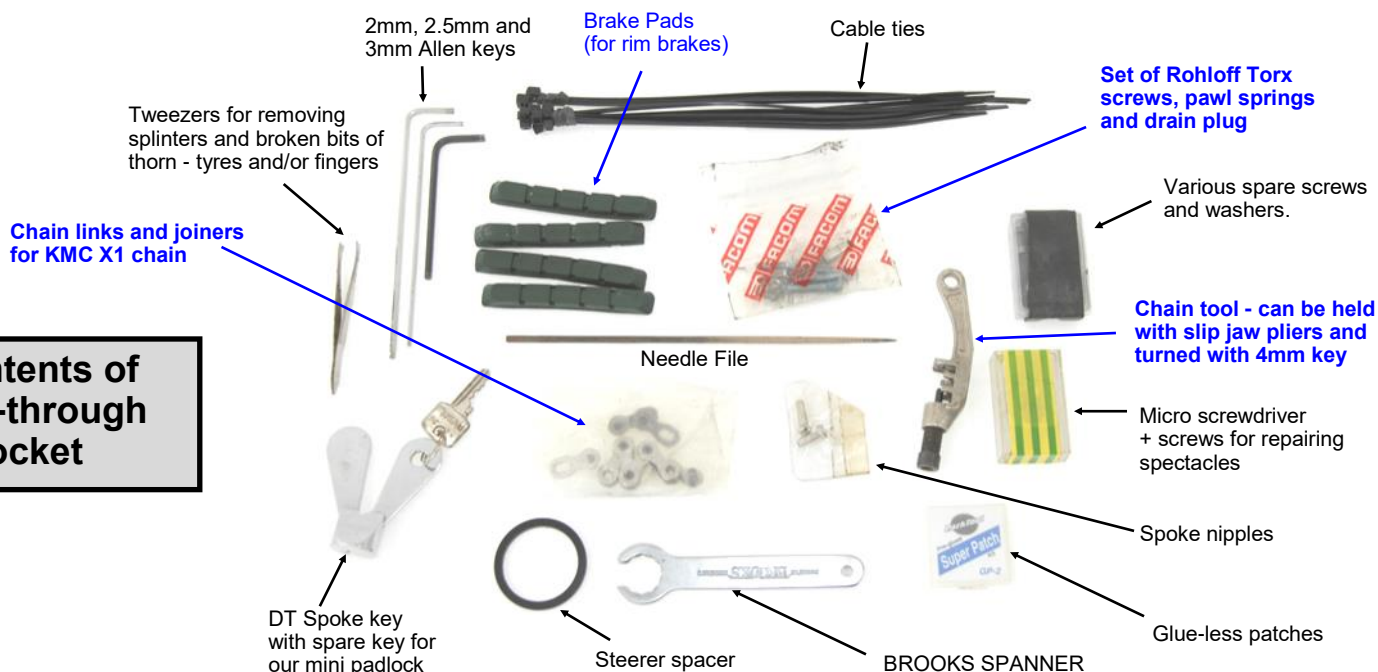
These are made in Germany and are of outstanding quality SJSC part # 39800

Tx20 Torx key'

4mm Allen key
5mm Allen key.
(I normally keep the 4mm and 5mm keys very close to hand for a few days, if I've had to re-assemble boxed bikes)



Contents of see-through pocket



Tools for Cycle Touring

Fiona and I have multiple cycling interests - the tool kits that we take vary with each style of cycling.

Fiona has her own tool kit, which she takes when riding on her own. Generally, this tool kit is fairly basic, 4 and 5mm Allen key, tyre levers, tube, puncture repair kit and a mini pump. I have a similar tool kit, which lives in the saddlebag of the bike I ride to work. I keep our bikes in first class mechanical order and it's been so long since either of us had a puncture, I really can't remember when either of us needed to use these tool kits - I never leave home without a tool kit though.

I'm much more likely to need to make adjustments when mountainbiking, consequently my MTB tool kit is expanded, to allow disc pads to be changed or even a broken chain to be mended.

When taking part in long distance Audax rides, I feel happier knowing that I have the tools to allow me to fix or adjust anything that is likely to need attention. I take chain lube and grease for cleats, as well as a few spare screws.

When going on a Touring Holiday, I take the Touring Tool Kit as shown on page **62**. I will also take any tools specific to the bikes we are taking.

For example, when we take our **Nomad Prototypes** I add an S&S tool and an eccentric adjusting tool, along with a lever to allow me to remove the pedals quickly and easily. I may also add my mending kit, as shown in the photo on this page, if we intend to be travelling in remote terrain - for example in South America.

When we take our **Mercuries**, I add an 8mm open/ring spanner, a Mercury eccentric tool and I take an 8mm Allen Key for our XT and XTR SPD pedals - I leave this in the bike boxes - generally we only need to fit and remove pedals at the beginning and end of our trip. If I have to remove a pedal, whilst on tour, due to a change of plan, I can use my sliding T bar, 8mm socket and section of 8mm hex.

My Touring Tool Kit is comprised of high quality, slim tools - these don't damage screws and can fit into awkward spaces.

I use only the tools in my kit to service our bikes at home - this

means that I can be certain that the kit has the necessary tools for every job that I'm ever likely to be faced with.

I would like to add that, in my opinion, my tool kit is superior in function and probably less heavy than, a top quality, comprehensive multi tool with pliers. When a multi tool is based around a pair of pliers - how do you use one of the tools, whilst holding something with the pliers? - With my kit I can!

Camping and Cooking

We don't sell tents or cooking equipment - you'll need to look elsewhere if you wish to purchase any of the items that I talk about.

Many Adventure cyclists go bikepacking, rather than cycle camping these days. Bikepacking is the term given when frame fitting bags, rather than panniers and carriers are used. Bikepacking may have encouraged cyclists, particularly younger cyclists, without proper touring bikes to go touring - that's a good thing! But it's a shame that manufacturers, having found a new niche product, have produced bikes aimed at bikepacking, which can't even take carriers - that's **NOT** a good thing! Bikepacking bags are very restricted in volume, consequently alternatives to a conventional tent have emerged. Some bikepackers use a tarp and bivvy bag. Others use a hammock slung between trees (or whatever) and use a tarp when it's wet. I have no experience of these styles of camping but I hear that mosquitos can be a problem - particularly when hammock camping. Going for a wee is more of a hassle in a bivvy bag. I'm too old now to put up with mosquitos or a bursting bladder - I like a conventional tent, with a large area of mosquito-proof mesh. It's a shame that, as we've got older, Fiona and I have to carry a heavier load than we carried when we were younger. This is because neither of us is happy crawling into a tiny tent these days and we also find that we now need thicker sleeping mattresses - especially when camping on rocky ground. We both notice the difference that a secondary ground sheet makes. I expect that we'll need slightly warmer bags soon. Our panniers can swallow huge volumes and our touring bikes can carry large weights - so our concerns regarding the increasing volumes are simply to do with our legs' ability to cope, rather than our bikes' ability to carry.

TENTS We have used Hilleberg tents for most of our cycle camping trips - certainly for anything that could be classed as an *expedition*!

Hilleberg tents are designed in Sweden and, these days, are manufactured in Estonia. They're a

Hilleberg Kaitum 2



perfect example of the Swedish mind-set - use the highest possible quality materials in innovative, yet traditional ways and don't skimp on the small details. **The Hilleberg tents that we've used have all been tunnel tents**, which pitch the inner and outer tents simultaneously - this makes life so easy. In a strong wind, you asses where the tent will go, you drive a peg in upwind and then attach the guy line - the tent can't blow away. You then pin down the upwind end of the tent with 2 pegs, then keeping the tent flat to the ground, you insert all the poles and then erect the tent by pulling the down wind end of the tent and securing with 2 pegs. Up goes inner and outer. All that remains is to deploy the remaining guy ropes and peg the body of the tent down.

In some parts of the world (including a Swedish winter) if your tent can't be deployed, or if it fails, it's very likely that you will die.

I know of no other tents, that could be used for cycle camping, that can be erected in such high winds. This is undoubtedly why Hilleberg tents are used on the majority of polar expeditions - and why you see so many experienced cycle campers using them.

Another feature of the Hilleberg tunnel tents, that we've owned, is they've had a door and porch at both ends. This sometimes proves useful when the wind changes but we love the fact that we can each store our own kit separately - I have a very organised way of storing my kit, which apparently looks like chaos to most people! If you are cycling with a friend, rather than a partner, having 2 doors makes it easier to sleep head to toe. Of course you don't need such a tent for camping on a French campsite in the summer - if things go wrong with a budget tent, you'll be able to take shelter in the toilet block - but we've never regretted carrying an extra 500g or so of tent. Yes, they are very expensive but they work and they will outlast several cheaper tents. Of course there are other high quality tents manufactured - I don't know enough about them to give an accurate appraisal. Fiona also has a Terra Nova free-standing expedition tent. The Terra



Nova will survive a severe storm, provided somebody is in it and it has proven ideal for hill walking. It's a bit cramped, especially for 2 for cycle camping and it is, beyond doubt, either impossible, or a worry, to erect in strong winds. Whether it is impossible or merely stressful, really does depend upon how strong the wind is and how many people are available to help!

We've had 3 Hilleberg tents - we still have 2 of them, it took 10 years of hard use in extreme conditions but we actually wore out our green Stalon - which we replaced with a Kaitum 2. The red Stalon GT is still in perfect condition

but it was never used on expeditions - we used it mostly for weekend camping with friends where its gigantic vestibule (porch) has been very welcome.

Some say that "imitation is the most sincere form of flattery" - (Actually I'd say it was always theft and often fraud!). So, just like our bikes, Hilleberg tents have been widely copied. However copies are manufactured without sufficient care, using inferior materials, most examples show no real understanding of what's been copied, or why - so the functionality is absent and the many small but important details are missing.

STOVES and COOKERS

It would seem a shame to find somewhere nice to camp and then be constrained by the availability of cafes. If I'm camping, I want to be able to at least make a cup of tea in the morning! So I need a means of boiling water. Once I have accepted that I need some sort of cooker and some sort of pan,

it seems silly not to be able to make an evening meal.

FUEL In some parts of the world there is enough wood that can be gathered and a culture which accepts open fires - there are many places where this is not possible/acceptable/safe. In reality, there is a choice between Methylated Spirit, Gas, Petrol, Paraffin, or Diesel.

Meths

The Swedish Trangia burns unpressurised alcohol (methylated spirits), the flame is adjustable. We used these extensively on our earlier cycle camping trips.

Trangias take significantly longer to boil water than petrol or gas stoves. (But Note: Butane won't burn at all below freezing!) This lack of power, combined with its adjustable flame, becomes a virtue when you cook a meal that requires low heat. It's significantly easier (and much quieter!) to cook such a meal on the Trangia than with any petrol stove that I've used.

The Trangia is much safer to use than any of the



other types of stove - if circumstances demanded I would consider using one in the porch of our tent.

Meths burners work in sub zero temperatures - although they're easier to light if the Meths can be kept warm. Trangias are available in 3 different sizes as a complete cooking system, including a stand, a windbreak, 2 pans, a kettle, a frying pan, (which doubles as a lid) and the best pot-lifter on the market. Meths can be more difficult to source in some countries than others but it's a clean fuel and fairly safe.

Gas cartridges have made gas cookers the easiest of all fuels to use and also the cleanest. At moderate altitudes, gas boils water pretty quickly and, with a good windshield and an upmarket cooker a reasonable simmer is possible. If you turn the heat down too far and the flame goes out, it can be re-ignited immediately - whereas with a petrol stove you have to wait for it to cool down if the flame is blown out. With increasing altitude, gas takes progressively longer to boil water.

Gas is an expensive fuel - even when the largest (500g) cartridges are used.

Large gas cartridges are bulky to carry. Butane has a slightly higher calorific value than Propane but Butane is not so good in cold weather, the performance drops off dramatically and at -1°C it freezes and can't be used.

Propane works well in cold conditions its freezing point is below -40°C.

Although I've never had an accident with a gas canister, I have witnessed one and it's seriously bad news. I would never use a gas cartridge in a tent - not even in the porch.

Petrol stoves are invariably **pressurised** stoves, they are usually designed to run on Coleman's fluid (aka white gas, aka Naphtha). Such stoves will also run on Petrol. White gas is expensive and difficult to purchase, it also has a lower calorific value than petrol but it does burn slightly cleaner than petrol.

We use unleaded, low octane petrol - available easily and cheaply in every small town in the world.

Petrol stoves boil water the quickest of all the fuels - they work well at high altitude and in sub zero temperatures. Petrol and Kerosene (Paraffin) stoves are used by all Polar Explorers.

Given a good windshield, some petrol stoves can be turned down to something resembling a simmer but, when planning a meal, it's best to assume that pans will require constant stirring.

It's worth remembering that a petrol stove is comprised of 2 parts, a pump and an engine. The pump is very important and, in my experience, it's the most likely part to cause problems and/or fail. The upmarket versions of the MSR cooker have a superb engine, with excellent pre-heating of the pressurised fuel - this makes them very efficient but there is only one MSR pump and we've experienced nothing but problems with them - we have had 3! The final straw was when the pump union suddenly leaked and covered me in atomised petrol, which then ignited. If I hadn't been outside and been able to immediately roll myself down a slope in damp wet grass it would have been a disaster - I would have had serious burns injuries, compounded by being several days away from any help.

Primus make a superb Omnifuel stove. By changing the jets, it will run on Gas or on Petrol (also on white gas, diesel or paraffin). The pump is a beautifully made item and it inspires confidence. The Engine works well. In the real world (as opposed to published specifications!), it's not quite as powerful as our MSR XGK-EX but it comes much closer to being able to simmer - which for us, is a more important attribute. If I was ever having to melt large quantities of snow into water, on a regular basis, I would choose an MSR XGK-EX again - but only if the pump was better, as its titanium construction is bombproof and still reasonably lightweight.

For what we do, even if I could ever trust the MSR pump, the greater adjustability of the Omnifuel's flame is more important than outright power. The Omnifuel's ability to run on easily controlled gas cartridges gives us greater flexibility with our camping cuisine.

I can't imagine using paraffin or diesel out of choice but we were once very happy to be given some diesel by a passing RV when we were running short of petrol in the wilderness of Tierra del Fuego. The diesel burned surprisingly well!

SOME THOUGHTS on FOOD for EXPEDITION TOURING

In a past life, when I was regularly riding endurance events, I obviously had to consider making sure that I had enough fuel. I've had a couple of occasions where I completely depleted my reserves leading to what cyclists of the time called the dreaded "bonk". This makes it sound less serious than it is, marathon runners refer to "hitting the wall" which sounds a bit more painful.

When we run short of muscle glycogen our bodies feel tired - when our blood glycogen levels fall it affects our mental well being and negative thoughts can take over. Both these states are unpleasant and often both occur at the same time.



AB serving porridge at 4200m in below freezing temps.

The body can run at a lower intensity on a combination of fat and glycogen. Pacing yourself is important in all high intensity endeavours.

There are some big differences between feeling that you are close to "bonking out" when riding a fairly lightweight Audax bike, with minimal luggage and having the same experience, when riding over high mountains on a heavily loaded touring bike.

Whereas if you eat some carbohydrate and ease off a bit

on an Audax bike, you ought to be able to recover slowly, whilst still riding and hopefully you can stop a bit longer at the next café or control.

On a heavily loaded touring bike in high mountains, you may already be going so slowly that it may be impossible to keep climbing if you reduce the effort.

If you are truly self-sufficient on a heavily loaded touring bike (And if not what's the point of carrying such a load?!) you can simply stop, put on warm clothes and eat, rest and recover - or make camp for the night. On a lightweight touring bike, with minimal luggage, you may not have sufficiently warm clothes to allow you to stop without risking hypothermia.

Many of my long Audax rides were in wild Wales and I rode them during a period of my life where money was very tight.

I used to follow the advice of the day and have a large plate of pasta the night before the event.

I couldn't afford to have something to eat at every café. I used to take some fruit cake and some cheese sandwiches with me. I also used to take a spoon and a Commando tin opener and I'd stop at a village shop and buy a tin of creamed rice and sit in a bus shelter, with my cape on and devour it. I used to know where all the best bus shelters were. I very rarely needed the dextrose tablets that were in my tool kit.

Pro cyclists take energy gels these days and many leisure riders seem to have followed suit, which in my opinion, is madness.

Many climbers seem to live on dehydrated rations, I've met lots of cycle tourists who also seem to live on dehydrated rations. Some of these "meals" must be better than others but I like to eat real food when we're touring.

I think that Fiona and I have got eating on adventures in remote areas sussed but we've learned the hard way.

Although we proved to be lucky on earlier trips, even when crossing 4755m passes, I remember (I'll never forget!) back in Feb 2009, when we were touring in Chile and we were shopping for the loop we were going to ride in the Andes. This involved crossing a roughly surfaced 2500m pass into a very remote part of Argentina, where there *may* be a shop, riding on dirt roads in high desert, before taking the next unsurfaced pass, which was around 2,300m back into Chile.

We knew that we couldn't count on being able to buy any food until 100km after we crossed back into Chile. We thought that it may take us 6 or 7 days - it took 10! There was nowhere that we could buy food in Argentina. It was incredibly tough cycling, sometimes through deep sand but, by careful rationing, we managed to eat something every day. The trouble was that, after the first day, I hit the wall every afternoon at around 4pm, which is why it ended up taking 10 days.

I lost 8kg of my 78kg bodyweight in 10 days.

When we returned to civilisation (and after we'd consumed a huge steak, with double egg and chips twice in the same day) we had a de-briefing session, to work out what had happened. We knew what provisions we'd taken on the loop, so we were able to get a total the calories that we'd taken with us and divided it by the number of days it had taken us. The figure came to fewer than 1200 calories per day each! We hadn't been thinking properly when we shopped. We were still in healthy living mode and following the (then) recommended advice of a low fat diet. We'd bought semi-skimmed dried milk to make up into milk to have with our tea and porridge in the mornings. We had a small quantity of oil to cook our evening meal of vegetables, lentils and rice. More annoyingly we'd only brought around 500ml of whisky with us. We'd also taken a few crackers and some cheese for lunch (a sort of indestructible sausage of soft cheese which was available in every small shop).

After this experience we made sure that we always had sufficient calories for our adventures on the remainder of this holiday.

Imagine how much your weekly shop weighs and then double it. That's how much 2 of us would need for 10 days. Remember also that we had to take fuel to cook on - we were using petrol.

Apart from the change to full fat dried milk, we took the same provisions with us but more of them - except for the veg.

I used as much full fat dried milk as was palatable in our porridge and we used significantly more honey than we'd done previously. We took plenty of olive oil with us and I used as much as was palatable in our evening meal of rice and lentils. We took lots of dried fruit and nuts and we doubled up on the quantity of crackers and (mercifully!) whisky. We got rid of all the packaging, to save weight, volume and the need to dispose of it responsibly in the wilderness and we decanted the whisky into Coke bottles. We reckon that we now had around 2500 calories each per day, so we still lost weight on each loop - we think that we may have burned around 4000 calories per day on average. - more in the high Andes.

The next 4 passes that we rode on this trip were all trouble free thanks to the full fat milk, olive oil and whisky diet!

Q. How did we manage to cook lentils on a cycling trip, whilst trying to conserve fuel?

A. The night before we depart on a loop, we wash some lentils and put them into a strong plastic pot, along with some water. In the morning we rinse them and add more water. Fiona then lets the gas off them several times during the day and as soon as we use them that evening, we repeat the process.

Recipe for high calorie lentils and rice using 1 pan.

Ingredients.

Onion and garlic (optional)

Chorizo (optional)

Olive Oil

Pre-soaked lentils (see above)

Rice

Vegetables (optional)

Veg stock cube (optional)

Chile paste - known as AJI in Chile and Argentina (optional)

Method

Chop some onion and garlic and finely chopped chorizo if you have it, fry in the pan with just enough olive oil, add the correct amount of water (about 2½ times the volume of lentils and rice) and then add the lentils and a vegetable stock cube. Bring to the boil. Let's assume that your lentils take 3 minutes longer to cook than the rice. After 3 minutes, add the rice and stir. Chop up any veg that you may have (carrots etc) and add to the pan. Keep the contents moving constantly paying particular attention to the bottom of the pan! Add a squirt of chili paste if liked. When the rice is cooked (taste to see, as the time varies with type of rice and the altitude!). Take off heat and add lots of olive oil (adding it now means that the oil doesn't de-nature). Serve into bowls and put some water in the pan to make cleaning it easier later. Enjoy, then have a big shot of whisky!



About Thorn

The business began as St John Street Cycles, in 1984 when Robin Thorn took over an almost defunct toy and cycle shop at 36 St John Street.

He chose Bridgwater quite by chance – he was having holiday in the area from his home in Norfolk, and was amazed to see the number of people on bicycles in the town. In an instant the decision was made and the shop was leased that day.

Robin borrowed a small sum from his parents and worked all hours of the day and night to build up the business. He soon became a well-known figure with his oil-stained brown overall and wild hair and beard, often working on the pavement in the sunniest weather to draw further attention to his shop.

In 1989, the first employee was taken on – Andy Blance, a friend and very experienced Audax rider.

In 1992, the first tentative moves were made into national advertising, concentrating on the touring and tandem markets, which were the particular interests of Robin and Andy.

The emphasis had completely changed from cheap bikes to very high quality, specialist machines, though still often sold at a bargain price made possible by Robin's buying prowess.

In 1993, Robin decided to move up the road to number 91-93. The entire building front was gutted to give a modern, light, air-conditioned shop and a very superior workshop; the rear was left as a long single-storey brick store. St John Street Cycles was rapidly becoming known as one of the major touring and tandem suppliers in the country. We were gaining an extremely good reputation for the quality of our service and the breadth of our knowledge in the field.

In late 1995 we began to consider manufacturing our own bikes. We had become increasingly frustrated by the mistakes and



missing features on the bikes we could buy and wanted to design what we considered to be the ideal touring bike and the ideal tandem. Andy used his wealth of experience and study of the subject to design the bikes, and the THORN brand was launched. The first bikes were so well received that we didn't even have to advertise them – they sold as quickly as we could get them made. At this point we set up our own frame shop and Andy designed complete ranges of Thorn bikes. Thorn quickly became established as a premier brand in the tandem touring market.

At the same time, our mail order business and online store had been growing apace, and our internet site recognised as an industry best.

In 2000, the limited company Thorn Cycles Ltd. Was formed, with Robin and Helen Thorn as joint owners. St John Street Cycles remains as a trading name of the company.

Unique and exclusive to THORN

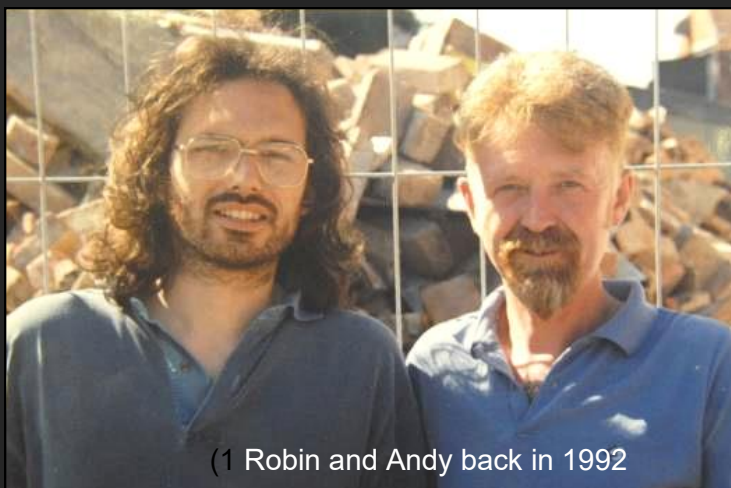
We're so confident that we have built the wheels perfectly that we give a 10 year warranty on the Hub Flange of all of our Rohloff equipped bikes with 32 spoke wheels.

This is for the original owner and is dependant upon you ensuring that ROHLOFF spokes are used if ever you need to have a spoke replaced.

Of course our wheel building is so good that it's highly unlikely that you'll break a spoke whilst cycling - no matter how rough the road or however heavily loaded you are but accidental damage whilst touring is always a possibility.

We now supply all of our bikes with spare spokes - make certain that you at least take your Rohloff spokes with you on tour.

Andy B. Autumn 2017



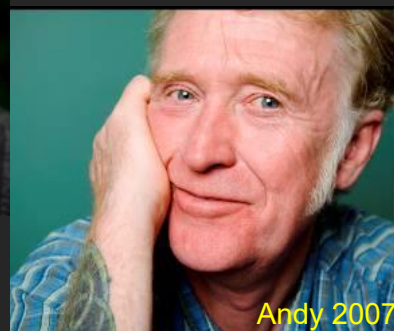
(1 Robin and Andy back in 1992



Andy 2014



Robin 2007



Andy 2007

All of our bikes have a LIFETIME* frame warranty for the original purchaser.

* NOTE. Abuse, neglect or damage caused by clamp-on stands, is NOT covered.

This warranty does NOT apply if the overall weight limit (rider and luggage) for each model is exceeded. This is 160Kg for Nomad frames or 130Kg for Club Tours frames.

120kg for Mercury frames and 100kg for Audax frames. If exceeded, a different limited warranty will apply, which if discussed, can be made clear in the sales invoice.

THORN also give UNIQUE MONEY BACK GUARANTEES of SATISFACTION.
Please note that these guarantees do NOT include Our carriage costs, pedals, tools or accessories, Or items SPECIFICALLY EXCLUDED on CUSTOMER'S INVOICE.

To get the refund, please contact us before making any arrangements.

Bikes returned in person need an appointment.

Bikes returned via a freight company are sent at your own expense and at your own risk.

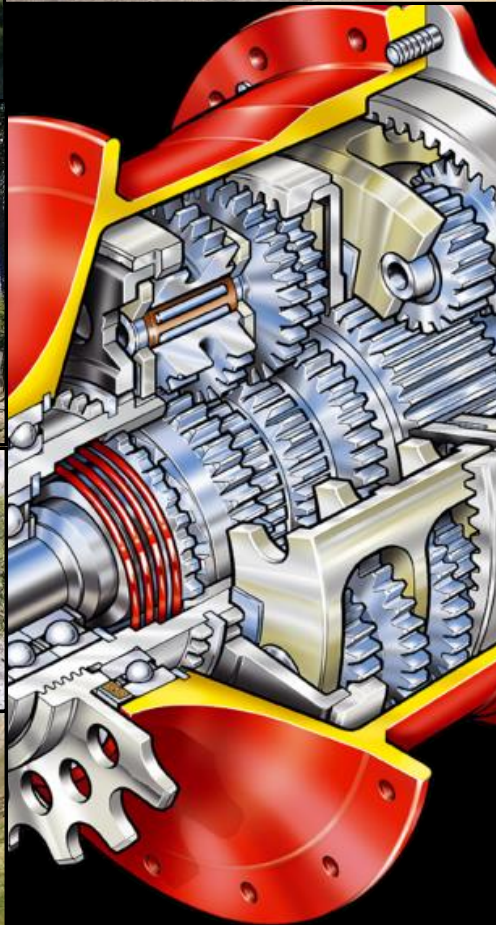


Buy a **Thorn Rohloff equipped bike**, ride it for 100 days and, if you're not totally delighted, contact us. Once the bike arrives here safely, we will refund you the purchase price of the bike, minus the cost of the items specifically mentioned in **red text** above.



Buy a **Thorn derailleur equipped bike**, ride it for 14 days and, if you're not totally delighted, contact us. Once the bike arrives here safely, we will refund you the purchase price of the bike, minus the cost of the items specifically mentioned in **red text**

Guarantees & warranties only apply to sales of COMPLETE BIKES



THORN RAVEN

26"



From £2303

10 different sizes

1 very small size with medium top tube,
4 sizes with long top tubes,
4 sizes with short top tubes,
There's also a step through size!
We're very proud of the RAVEN,
it is one of the very finest

Rohloff equipped bikes

on the planet; yet it also manages to be
the least expensive!

The RAVEN makes light work of 28kg
loads and the larger sizes will carry up
to 40kg, on an occasional basis.

The Raven has clearance for 2" tyres.

Currently there are several Ravens
undertaking the "American end to end",
Alaska to Tierra del Fuego. There are also
over a thousand Raven Tours delighting their
owners, as they go about their day to day
business, with the least possible fuss.
The RAVEN is wonderfully stable; city streets
tow paths, bridleways, mountain passes,
desserts and continents can all be tackled in
confidence.

**The NEW RAVEN is designed to
provide a lifetime's transport, as
well as keeping the dream of that
"big cycling adventure" well and
truly alive!**

Choose **MATT BLACK**
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DROPS or STRAIGHTS



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Thorn Nomad Mk 2

26"



From
£2413

10 different sizes,

5 sizes with long top tubes;
5 sizes with medium length top
tubes

The Nomad Mk2 is the **ULTIMATE
EXPEDITION TOURING BIKE** it can
carry up to 30kg at the rear*, without the
need for front bags. It will cope with
over 60kg including 20kg at the front.
These bikes are built for **great strength
and reliability**. *assuming a conventional riding
position.

The Mk2's stays have sufficient
clearance for 2.4" tyres.

The Steel fork will take 2.25" tyres

It has **stainless fittings**, including
oversized (6mm) carrier bosses.

**Mk2 Nomads
are compatible with
80 to 120mm suss forks.**

All Nomad Mk2s have **rear ISO
disc mount** and V brake bosses
and the perfect cable routing for the

**EX box
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Size
565L



Choose **matt black**
or **Tonka yellow**

Also available with
S&S couplings
NOMAD Mk2 frames
are available with
S&S couplings.
These allow bikes

to be transported easily.
Sizes up to 565L can, with extensive disassembly,
even be fitted into a 26" x 26" x 10" case - providing
the steerer of the steel fork isn't longer than 235mm.

SIZE 620L

A bike for
Giants!



CLICK HERE For
NOMAD Mk2 pdf Brochure.
It may take time for the file to open, please be patient.

Thorn Mercury 700c

from £2811



Available in 8 sizes and in 4 colours.
**GUNMETAL, BLOOD RED,
COBALT BLUE and BRG RETRO**
Long top tube frames for most men
with straight bar options.

Short top tube frames for most
men with drop bars or most women with straight
bars.

The Mercury frame can accept 35c tyres with
mudguards but not all fork and brake options work
with this size tyre.

ROHLOFF SPECIFIC



DISC BRAKE OPTIONS



DROPS or STRAIGHTS



**BOLD or DISCRETE
NEW COLOURS June '16**



The Mercury can be focused
precisely into your dream bike -
from a seriously quick sport touring
bike to a middleweight tourer.
(For much more detail, please see our brochure)

CLICK HERE For
THORN MERCURY pdf Brochure.
It may take time for the file to open, please be patient.

Thorn Audax Mk3R 700c

Derailleur equipped, ultra-light touring bike.

Available in **4 colours** and **6 sizes**
Complete bikes from **£1394**

Bike shown is THORN special spec @ £1435
(frame and fork kit only £519)

Size 570



The Mk3R represents two decades of work, manufacturing and developing, what many people tell us are the finest frames for sporty, lightweight touring, that have ever been built.

The Mk3R frames and steel forks run with tyres which measure 32mm and mudguards.

Several owners of exotic racing bikes have reported that their Mk3R, which was purchased for training, is practically as fast and handles better than their race bike - as well as obviously being able to carry a load!

We say that, for occasional use, the Mk3R will cope with 20kg of luggage, spread between the rear carrier, 3 cages and a small bar bag - but it's much happier to carry up to 15kg loaded in the same way.

If you regularly carry more than 8kg, we strongly advise that you look at the Club Tour.

Size 495

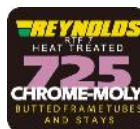


WARNING!

The Audax Mk3R is aimed at experienced cyclists, wearing "proper" cycling shoes, which require system pedals. With such shoes, there's clearance for "larger than average sized feet". There's also clearance for average sized feet, in cycling shoes, with steel toe clips. **BUT PLEASE NOTE:** There's unlikely to be clearance between trainer-type shoes and the front mudguard.

Thorn Club Tour Mk4 700c

Derailleur equipped
TRADITIONAL TOURING BIKE



Available in **3 colours & 10 sizes**, with **3 steel forks to choose from**, including a steel disc fork.
Complete Bikes from:- **£1528**

Many spec options are available



Available in **Gunmetal** (Above)
NEW BRG (British Racing Green)
Or **R&B** (Below)



DROP or STRAIGHT BAR BUILDS AVAILABLE

The Club Tour Mk4 is very competitively priced, many customers tell us that it is "The finest traditional touring bike available, regardless of price".

The **Thorn Club Tour Mk4**, was designed without compromise, to show exactly how good a **Traditional British Touring Bike** can be. It may be used throughout the week to commute to work, it can complete a 200m Audax (or CTC reliability ride) at the weekend, yet be ready to carry 28kg on your annual summer cycle camping holiday. (If necessary it will cope with up to 40kg). You're guaranteed a high quality ride, with superb handling. The Club Tour Mk4 can even take 40c tyres with mudguards.

Thorn Sherpa Mk3

Derailleur equipped
From £1368

10 different sizes

1 very small size with medium top tube,
4 sizes with long top tubes,
4 sizes with short top tubes,
There's also a step through size!



Choose **MATT BLACK** or **BLOOD RED**



Choice of **Drops** or **Straights**

We've been honing the design for over 15 years, yet the Sherpa could accurately be described as the **New traditional touring bike.**



The Sherpa can be used for day to day transport, or it can literally travel the world.

The Sherpa's very stable and it handles superbly. There's no possibility whatsoever of accidentally overlapping feet and mudguards.

The Sherpa makes light work of 28kg loads and the larger sizes will carry up to 40kg. On an occasional basis.

26" wheels are the best possible choice for heavily loaded touring.

The 26" MTB wheel has a vast variety of different tyres available and tyres for this size are obtainable in every country in the world!

The Sherpa has clearance for 2" tyres

Some 26" tyres are for MTB use, some are heavy duty for expedition use, whilst others are very quick indeed! We love to cycle on B roads and country lanes. These roads are in worse condition today, than anyone can remember. On these roads, **fat tyres**, which are **zero-maintenance suspension**, make great sense. They make just as much sense in the pot-holed streets of today's cities!

CLICK HERE For

AUDAX Mk3R pdf Brochure.

It may take time for the file to open, please be patient.

CLICK HERE For

CLUB TOUR Mk4 pdf Brochure.

It may take time for the file to open, please be patient.

CLICK HERE For

SHERPA Mk3 pdf Brochure.

It may take time for the file to open, please be patient.

BIKE SELECTION FLOW CHART

Select and spec your THORN bike in 12 steps

[1] START
Do you want
DERAILLEUR
GEARS
OR
ROHLOFF?

See pages
16, 17, 18 & 19
of this Brochure.

[2] How much
WEIGHT do you
wish to carry?
See pages 12 & 13
of this Brochure.
Useful info also on page 56

[3] Choose the most
SUITABLE WHEEL SIZE
For your specific needs.
Detailed info on
pages 32, 33 & 34
(More concise information
is given on page 35)

SHORTCUT!
Please check out the
THORN BIKE
RECIPE
pages 109 onwards
in **PART 4**
of this Brochure.

[4] Choose the type of
HANDLEBARS you want.
See pages 20, 21, 22 & 23
of this Brochure

[11] Choose
the appropriate
gear range for
YOUR
ABILITIES
and **NEEDS**
pages 48 & 49
Rohloff page 103
Derailleur pages
104 and 105

[12] FINISH
Choose accessories,
See pages 50 to 54
of this Brochure,
pay a £100 deposit,
wait a short while
and then
Enjoy your bike!

[5] Using info from
steps [1], [2], [3] and [4]
NOW choose the MODEL
appropriate to your needs
See pages 10 & 11
of this Brochure, which have
links to the appropriate
THORN brochure.
You may wish to consider
steps [8], [9] & [10] at this stage.

[10] Choose
BRAKES
which work with
selected fork and
handlebar options.
For 700c options
see fork matrix on
page 29
Pages 44, 88 & 89
may be useful for
700c and 26"
Drop bar brakes
see pages 45, 46,
47, 100 & 101
Straight bar brakes
See pages
45, 46, 47, & 102

[9] Now
Choose
TYRES -
for 700c -
pgs 38, 96 & 97
for 26" -
pages 39 & 99
Use the information
provided to choose
items which will fit in
your selected frame
and fork.
Calliper brakes also
limit the width of tyres
which can be used.

[8] CHOOSE
WHEELS -
(A) Start with **HUBS**.
for derailleur rear
pages 35, 50 & 92
for Rohloff rear
pages 18, 19 & 92
for front hubs
pages 35, 50, 51, 93 & 94
(B) Then choose **RIMS**
for 700c rims
pages 36 and 95
perhaps look at tubeless?
Pages 41, 42, 43 & 97
for 26" rims
pages 37 and 98

[6] Choose the
FRAME SIZE appropriate
to your needs.
See pages 24 to 27
Being particularly
mindful of how handlebar
choice affects this -
see **YELLOW BOX** on
page 22.
Then check out the
appropriate
THORN BROCHURE

[7] IF your favoured
model offers
a choice of fork,
CHOOSE the **FORK**
which is appropriate to
your needs
See pages 28, 29 & 30
of this Brochure;
then check out
appropriate
THORN BROCHURE

How to choose the perfect Thorn solo bike for your requirements.

Do you want DROP BARS?

We fit Road STI gear shifters on our drop bar derailleur builds. They're more ergonomic in use, than the shifter, which must be used, when drop bars are used with Rohloff.

But drop bars can certainly be used with Rohloff.

Do you want STRAIGHT bars?

Rohloff gear shifters are much nicer to use and much more trouble free, than the MTB Rapidfire shifters, which are supplied with derailleur gear straight bar bike builds.

Do you want to use DERAILLEUR gears, or a ROHLOFF hub?

More info on pages **16, 17, 18 & 19**
Derailleur geared bikes cost less to start with but a Rohloff equipped bike costs less to run. Rohloff bikes are much more reliable, require less maintenance and are much easier to adjust than derailleur systems.

The transmission in Rohloff bikes lasts much longer.
You can change gear whilst stationary with Rohloff.

Do you want to carry...

Light loads?

Moderate loads?

Moderately heavy loads?

Heavy loads?

Very heavy loads?

The weight of the coloured arrow gives a visual indication of each bike's luggage carrying capacity.

Do you want 700c wheels, 650b wheels (also known as 27.5") or 26" wheels?

For more information - see page **35**
For much more information, please see pages **32, 33 & 34**

The **Thorn Audax Mk4** is a **700c** derailleur equipped bike, it's intended for use with drop bars and primarily with light loads - although it will cope with moderate loads.

The Mk4 frame can be used with deep drop calliper brakes or a flat mount disc.
The Mk4 is NOT generally suitable for use with STRAIGHT BARS

With 700c wheels.

The **Thorn Club Tour Mk5** can be used with **700c** or with **650b** wheels.

The Mk5 is a derailleur equipped bike, which may be used with drops or straight bars and, depending upon fork, for light to heavy loads.

With 650b wheels.

The Mk5 is available with rim brakes Front +Rear or Front rim and Rear disc or DISC BRAKES F+R

With 700c wheels.

The **Thorn MERCURY Mk3** can be used with **700c** or with **650b** wheels.

The Mk3 is a ROHLOFF equipped bike, which may be used with drops or straight bars and, depending upon fork, for light to heavy loads.

With 650b wheels.

The Mk3 is available with Front rim brake and Rear disc or DISC BRAKES F+R

With 650b wheels.

The **Thorn NOMAD Mk3** can be used with **650b** or with **26"** wheels. It's intended for use with straight bars, or drops, with heavy to very heavy loads. The NOMAD Mk3 can be used with Rohloff or derailleur gears.

With 26" wheels.

The Mk3 is available with rim brakes Front +Rear or Front rim and Rear disc or DISC BRAKES F+R

THORN SOLO BIKE LUGGAGE CARRYING CAPABILITIES The weights given are in kg. These weights include pannier bags and a full compliment of BOTTLES. The MAX POSSIBLE weights also include a BAR BAG with UP TO 2kg.

Please note that it's my opinion that "relaxed sweet handling" is seldom achievable with a 2kg bar bag. Andy B Jan 2019

MODEL (With tube-set variation where applicable)	FAIRLY GOOD QUALITY SEALED ROADS			ROUGH DIRT ROADS/OFFROAD With due care and attention		
	MAX POSSIBLE on FRONT AND REAR RACKS. Care may be needed out of the saddle.	RECOMMENDED MAX on FRONT and REAR RACKS for RELAXED SWEET HANDLING	RECOMMENDED MAX REAR ONLY loads for RELAXED, SWEET HANDLING	MAX POSSIBLE on FRONT AND REAR RACKS. Care may be needed out of the saddle.	RECOMMENDED MAX on FRONT and REAR RACKS for RELAXED, SWEET HANDLING	RECOMMENDED MAX REAR ONLY loads for RELAXED, SWEET HANDLING
AUDAX Mk4 700c	No option for front panniers		12	No option for front panniers		6
CLUB TOUR Mk5 700c	36	26	18	26	18	14
CLUB TOUR Mk5 650b	40	28	20	30	24	18
MERCURY Mk3 700c	32	24	16	24	16	12
MERCURY Mk3 650b	38	28	18	26	20	16
NOMAD Mk3 650b	45	35	26	38	32	24
NOMAD Mk3 26"	60+	40	30	50+	35	27

Size 610S

Our largest size with a short top tube suitable for drops.



THORN CLUB TOUR Mk4 Gravel Bike

The biggest differences between our bike and the current crop of Gravel Bikes, is that we have a steel disc fork, that's at least as comfortable as a carbon one - but is much less of a worry when belting down a rutted gravel road! Our Club Tour also has all the fittings you'd need to fit racks and panniers, when you want to carry your luggage comfortably.



Below and Right is Graham Adcock's Club Tour pictured just before the start of the DIRTY REIVER 200km. (Which was run entirely on gravel roads in Kielder Forrest) Graham reported that the bike completed the event without issues and that he was significantly more comfortable on it than he'd have been on his carbon Gravel Bike!

Graham plans to build up a second Club Tour, as a dedicated Gravel Bike and to keep his current one for road touring.



Our long term plan has always been to see as much of the beauty of this planet as we could before the reaper called time.

As we can only afford to travel cattle class and could only take long holidays, rather than sabbaticals, our plan entailed going to the furthest away places first and gradually reducing the length of the punishing long-haul flights, as we aged, until we were left with Europe - which neither of us really knows.

We thought that, for touring Europe, we could use a vehicle and a big base camp tent and move our base camp every 5 days or so to another location. We planned on thoroughly exploring the area surrounding these base camps by bicycle. **We are in no doubt that this can still be classed as cycle touring.**

We've tried out such a plan on various

show and looked at lots of things, with a view to seeing exactly what we wanted and waiting for a good used one to come up. There's clearly a gap in the market, because to get the storage facilities we wanted, the vehicles were gigantic, plus we would've had to pay for facilities that we didn't need, berths we didn't want and technology that would undoubtedly cause trouble in the future. The concept of having a large storage capacity is a fairly modern one - so the chances of a well-loved older vehicle (at the right price) suiting us were remote. If we had wanted one 20 years ago (which we didn't) I would have built our own, based around a horse box or SWB coach.

We had a quick re-cap.

We didn't plan to go on motorhome touring holidays, essentially we wanted secure bicycle transportation and storage, a

money.

It always amazes me how much people are prepared to pay for VW Transporters. **IMO** they are vastly inferior to a Vito. They're built using lighter gauge steel, they're nowhere near as reliable and their small engines have frequently been chipped and thrashed. Unlike Mercedes, VW use cam belts and not chains, they cost significantly more to service and yet they always sell for around 60 - 70% more than a similar spec Vito. (An understandable reason for buying one - if you have deep enough pockets and the inclination to buy new every few years!) With one of the rear seats semi-permanently removed (they're easy to release but really heavy) our bikes can stand up on one side, leaving loads of space for all our other kit - including outdoor (carp fishing) chairs, field kitchen and table. It's quiet, comfortable, a



Our 2012 holiday in the Massif Central. You can see my old van and the heavy-duty tent in the background.

holidays and it's worked well for us - apart from when we've had to pitch on sodden ground, or pack up a large wet tent! Yes, getting old is horrible - but far better than the alternative!

And now for TOP GEAR - cue the Allman Brothers music...

Please feel free to skip this next section, whilst not directly concerning bicycles, I believe it's relevant to a different kind of cycle touring.

We've noticed that people of a certain age, including many of our customers, seem to buy motorhomes. As we approached that certain age, the appeal of such a vehicle mysteriously began to manifest. However we still plan to see as much of Europe as we can from the saddles of a bicycles. We were determined that the health, safety and security of our bikes must come first. We've seen so many rarely used bikes being subjected to continual grit-blasting on carriers, on the back of motorhomes. We decided that we'd want a motorhome with sufficient, easily accessed garaging space. Such motorhomes are very rare, very large and generally very expensive. We went to the Oct 2013 NEC caravan and motorhome

looked at different caravans. As nice as a long, wide, twin axle caravan and conservatory-like awning may be as a holiday home, we didn't want one. We'd realised that we wanted a genuine touring caravan.

I purchased the towing vehicle first. In Nov 2014 I bought a 57 plate, one owner, well cared for, 5 door, Mercedes Vito V6 3.0cdi, with 5 heavy duty leather seats, air con and Mercedes Command system. These commercial vehicles are built to be very reliable, with an exceptional service life - it's unlikely that we could ever wear it out - the big, clean burning engine, which was originally developed for the S class, is very lightly stressed. The suspension, also has an easy life, as we rarely use all of its 1000kg loading capacity.

I gave it better lights, I fitted Axminster carpet, I insulated it with wool and I managed to make a neat job of fitting a full-size wheel inside, as a spare. I also fitted a reversing camera. All in all I could have had a very average 2.0 VW Transporter panel van of the same age for the same

April 2017, nearly 10 years old and still looking good!



comfortable base camp and to go cycling from that. It would be good if we could also use the vehicle on a day to day basis. It began to dawn on us that a caravan may suit us better. We thought things through some more and

pleasure to drive, pulls like a train and (amazingly) it's shorter than an E-Class estate. My Vito is German built - these don't rust like the early Spanish-built Vitos, as post 2007, they were all galvanized (You can tell where they were built from the VIN plate.)

After much thought, in July 2015 we ordered a brand new Eriba 540 Touring. Many of the original Eriba's are still on the road, after 50 years of service, they hold their price so well (perhaps also because of the 9 month lead time?) that we thought we may as well buy new. We took delivery in May 2016.

We fitted a Thule wind-out awning/sunshade and installed a Gaslow system, which allows us to fill up with LPG from a forecourt pump. The Eriba is another fine example of practical German design and sound engineering. It's strong, lightweight (<930kg) and **narrow**, it doesn't have all the modern



"caravan essentials" such as sound system, microwave or TV but what it does have is all good quality. It's well insulated, it does have excellent LED lighting and it does have fully opening windows with midge-proof mesh blinds which can be deployed when necessary - these, combined with the pop-top, make air conditioning unnecessary even in very strong sunshine. It does have a top quality 3 way fridge - no more powdered milk in my tea and we can have ice with a G&T!

We paid extra to have a very effective 2 way heating system. The Germans take Eribas to ski resorts and don't pop the top down until the temperature falls below -5°C . It doesn't even have an oven or grill - we didn't really want either, as we didn't want to cook in the caravan - we either BBQ on charcoal, or I cook outside, using the caravan's LPG, on my weather-proof field kitchen, which I made when we had the heavy duty tent for base camp touring. Sometimes, when necessary, when we're tired or during a storm, we heat up something instant and relatively heathy inside on the 2 burner gas hob. Generally we only use the hob for boiling water - either for making the early morning cups of tea or washing.

We don't need a TV when we are on holiday - instead we play Crib and Backgammon for light entertainment at our little table. Our bed is super king size and very comfortable. Fiona bought 3 different weights of Baavet, we can sleep under any 1 (or 2) of them and on top of any 1 (or 2) of them - we have every situation covered. (Excuse pun!) We have a modern cassette toilet for convenience in the night.

Theoretically we could have had a shower but the space was too small for comfort, so we didn't have the optional hot water system fitted, instead we removed the shower curtain and created a little more space. We have a strip wash in the wet room when we are off the grid, using water boiled in a large kettle, which is luxury beyond our previous comprehension. (I remember times when crossing the Andes, when water was in such short supply, having to be content with a damp flannel at the end of a hard day's cycling!) The Eriba has all we need and nothing that we don't need.

It's said that Eribas sell to outdoor people, who come to a caravan from camping - we certainly fit that description.

We've cycle camped around the Alps and enjoyed every minute and, as previously mentioned, we've also enjoyed riding some challenging routes on significantly lighter bikes, using a heavy duty tent as base camp. The Vito/Eriba ensemble is not only very comfortable and relaxing to drive but also fulfils the brief of providing excellent, secure garaging facilities for bicycles and warm, dry and comfortable night time accommodation for us as we get older.



The Vito is also very practical (if a bit thirsty) on a day to day basis and will carry 4 people in safety and comfort without having to re-install the 5th seat. When towing the Eriba, the fuel consumption hardly suffers and, taken as an outfit, it appears to be as economical as most other outfits (or motorhomes).

Caravans, bicycles and vans, 3 things that Jeremy Clarkson hates, yet, as we've found, they can work harmoniously together.

cue the Allman Brothers music again...

Thanks to my Vito's pulling power and the narrow caravan (it's narrower than the wing mirrors of my Vito) we can travel on small roads, without a line of frustrated traffic stuck behind us. Although it looks very retro, the suspension and brakes are very modern and it handles superbly. We love our Eriba and, whilst we can see the appeal of a Motorhome, especially the convenience for those who wish to go on driving holidays, we're happy that we've made the right choice for us.

THORN BIKE COMPARISON MATRIX

My assessment of our bikes' abilities in various situations. Tyres & Forks make significant differences to how bikes perform - see pages **26, 27, 37** and **38**. In the comparisons below, each bike has its most frequently recommended tyres and fork. The score in each column could change significantly if different tyres or forks were considered.

Andy Blance Nov 2019

BUILD	Specification Details. (Assumes optimum tyre width and quality for the purpose, as well as the optimum racks for each specific purpose)		Short distance commuting WORK CLOTHES and SHOES	General leisure riding, country lanes, tow paths etc.	Longer distance commuting with Cycle specific clothing & shoes	Fast Touring and/or AUDAX rides. Smooth Roads <8kg	Light-weight OFROAD Gravel roads and Bridle-ways <5kg	Light-weight B&B touring on B roads <14kg	Light-weight cycle camping on sealed roads <20kg	Light-weight cycle camping on Dirt roads <20kg	Heavy Cycle Camping on sealed roads <35kg	Heavy Cycle Camping on DIRT ROADS <35kg	Adventure Touring HOLIDAYS Cycle Camping on really rough tracks <25kg	Expedition Touring. Round the world , self supported etc. 40+kg
	Wheel size FORK	BIKE BARS + GEAR SYSTEM + tyres	A	B	C	D	E	F	G	H	J	K	L	M
1a	26" V BRAKE FORK	NOMAD Mk3 STRAIGHT + DERAILLEUR Schwalbe Dureme 2.0 tyres	3	2	1	1	4	3	4	4	5	4	5	4
1b	26" V BRAKE FORK	NOMAD Mk3 DROPS + DERAILLEUR Schwalbe Dureme 2.0 tyres	2	2	1	1	3	3	4	3	4	3	3	3
2a	650b STEEL DISC fork	NOMAD Mk3 STRAIGHT + DERAILLEUR Schwalbe Almotion 55mm	4	3	3	2	5	4	4	5	4	3	4	3
2b	650b STEEL DISC fork	NOMAD Mk3 DROPS + DERAILLEUR Schwalbe Almotion 55mm	3	2	3	2	4	4	4	4	3	2	3	2
3a	650b STEEL DISC fork	CLUB TOUR Mk5 STRAIGHT + DERAILLEUR Schwalbe G One Speed 50mm	4	5	4	3	5	4	4	4	3	2	3	
3b	650b STEEL DISC fork	CLUB TOUR Mk5 DROPS + DERAILLEUR Schwalbe G One Speed 50mm	3	4	4	3	4	4	4	3	3	2	2	
4a	700c 853 or ST fork depending on use	CLUB TOUR Mk5 STRAIGHT + DERAILLEUR Schwalbe Supreme 35c	4	4	5	4	4	5	5	3	2	1	2	
4b	700c 853 or ST fork depending on use	CLUB TOUR Mk5 DROPS + DERAILLEUR Schwalbe Supreme 35c	3	3	5	5	3	5	5	2	2	1	1	
5a	26" V BRAKE FORK	NOMAD Mk3 STRAIGHT + ROHLOFF Schwalbe Dureme 2.0 tyres	3	2	1	1	4	3	4	4	5	5	6	6
5b	26" V BRAKE FORK	NOMAD Mk3 DROPS + ROHLOFF Schwalbe Dureme 2.0 tyres	2	2	1	1	3	3	4	3	4	3	3	4
6a	650b STEEL DISC fork	NOMAD Mk3 STRAIGHT + ROHLOFF Schwalbe Almotion 55mm	4	5	3	2	5	4	4	5	6	5	5	4
6b	650b STEEL DISC fork	NOMAD Mk3 DROPS + ROHLOFF Schwalbe Almotion 55mm	3	4	3	2	4	4	4	4	4	4	4	3
7a	700c 853 forks	NOMAD Mk3 AB SPECIAL STRAIGHT + ROHLOFF Schwalbe G-One Allround 38c	4	5	4	4	4	5	6	4			3	
7b	700c 853 forks	NOMAD Mk3 AB SPECIAL DROPS + ROHLOFF Schwalbe G-One Allround 38c	3	4	4	3	3	5	5	3			2	
8a	650b STEEL DISC fork	MERCURY Mk3 STRAIGHT + ROHLOFF Schwalbe G One Speed 50mm	4	5	4	3	6	4	4	5	1	1	3	
8b	650b STEEL DISC fork	MERCURY Mk3 DROPS + ROHLOFF Schwalbe G One Speed 50mm	3	4	4	3	4	4	4	4	1	1	2	
9a	700c 853 or ST fork depending on use	MERCURY Mk3 STRAIGHT + ROHLOFF Schwalbe Supreme 35c	4	4	5	5	4	6	4	3	1	1	2	
9b	700c 853 or ST fork depending on use	MERCURY Mk3 DROPS + ROHLOFF Schwalbe Supreme 35c	3	3	5	4	3	5	4	2	1	1	2	
10 MAX SPEC	700c Carbon DISC fork	AUDAX MK4 DISC DROPS + DERAILLEUR Schwalbe G-One speed 30c	1	2	5	6	2	3			X	X	X	X